

**Ministry of Education and Science of Ukraine
Sumy State University
Economic Research Centre
Youth Scientific Community of Sumy State University**

14th International Student Conference

**"Economics for Ecology"
ISCS'2008**

*Sumy, Ukraine,
May 6-9, 2008*



XIV Міжнародна студентська конференція

"Економіка для екології"

**м. Суми, Україна,
6-9 травня 2008 р.**



14th INTERNATIONAL STUDENT
CONFERENCE
**"ECONOMICS FOR ECOLOGY"
(ISCS'2008)**

May 6-9, 2008, Sumy, Ukraine

**The conference
organizers:**

Sumy State University (Economic and Management
Department)

Economic Research Centre

Youth Scientific Community of Sumy State University

Lyubov Pshenychna

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Head of Sumy regional youth organization of all-
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**The topics of the
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theoretical problems, case studies, methodology, co-
operation examples, environmental education, NGO
activities and so on

**The conference is
directed to:**

students, young researchers, representatives of
youth organisations and NGOs

**Conference
languages:**

the official conference language is **English**

Conference place:

Sumy State University

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"Economics for ecology" (ISCS 2008)**

Tuesday, 6	Arrivals
08:00 – 11:45	Registration of the participants
12:00 – 13:30	Official conference opening
14:00 - 14:40	Lunch
15:00 – 17:45	Plenary session
16:45 – 17:00	Coffee Break
18:00 - 19:00	Departure to the recreation center for settlement
19:00 – 19:30	Accommodation
19:40 – 20:40	Dinner
20:40 – 21:00	Ukrainian party
Wednesday, 7	Conference Working Day
08:00 – 09:00	Breakfast
09:30 – 11:00	Workshops
11:00 – 11:15	Coffee Break
11:15 – 13:45	Workshops
13:45 – 14:30	Lunch
14:45 – 16:45	Debates
16:45 – 17:00	Coffee Break
17:00 – 19:00	Conclusions of the workshops
19:00 – 20:00	Dinner
20:00 – 23:00	International party
Thursday, 8	Excursion Day
07:30 – 19:00	Excursion (Sumy region)
19:30 – 20:30	Dinner
20:30 – 23:00	Farewell party
Friday, 9	Departure
08:00 – 09:00	Breakfast
09:30	Departure to Sumy

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GENETIC MODIFIED PRODUCTS: SALVATION OR THREAT

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Ukrainians eat genetic modified products. And nobody knows how it influences on their health and children's health.

What are the genetic modified products?

Genetic modified products are those, which includes the genetic modified organisms, which DNA is changed such way, which it is impossible reach in nature. GMO can include fragments of DNA from some alive organisms. Technology of the formation GMO so imperfect that it result can be a source of biological and ecological risk for person and surrounding ambiances.

Products, which contain GMO, cause big agiotage in the world. Nobody knows, where exactly transgen wait for us. There many variants – from bread to sweet drinks. The main reason for appearance GM products are insufficient amount of the feeding products on the planet.

The world production genetic modified products.

For the first time GMO were invented in 1980. Though the first modified organisms were invented on the grounds of animals, nowadays the most wide-spread are transgen plants. The first transgen cereals were plant in 1988. As of ISAAA (International service of monitoring with using biotechnology) the area for growing GMO for 2007 year enlarged to 114,3 mln hectares. There are basic GMP, which were growing in 2007 in the world: soybean – 58,6 mln hectares, corn – 35,2 mln hectares, cotton – 15 mln hectares, turnip – 5,5 mln hectares. The world leaders of production tares, modified oils and corns remains the USA (57,7 mln hectares), Argentina (19,1 mln hectares), Brazilia (15 mln hectares), Canada (7 mln hectares). China and Poland became the new countries, which started growing the GMP in the industrial scales.

What price pay people for chip and junk food?

The list of GM products is big. It includes: sausages, meat dumplings, fast cooking porridges, dry soups, tinned vegetables, chocolate, chips, souses, ketchups, yogurts, sweet, fizz, prepared food. Ecologists complete this list with products of the most famous brands – Coca-Cola, Pepsi, Gallina Blanca, Knorr, Lipton. Bakers products, sweet and chocolate are include soybean flour. Soybean oil also complete to cheese and savedairy food. Terribly, that GMO use in the food for children.

From the words of the doctor biological sciences Kateryna Kartava, physicians don't know, what disease can defeat person after using GMO products. But life shows, that using such products can cause allergy, breach metabolism, stability mikroflora (organism) to antibiotic and as is often the case in complication different diseases, and also getting the herbicides in the organism.

Modified soybean can be reason of cancer gullet. Steady using GMO products several generations of people can bring about change of our genotype and even innate crippling of infants.

Mayonnaise, “light” mayonnaise, butter, oleomargarine, chips, sausages and other – are the products which made on the base of modified plants oils trans fats nearly don’t split our ferments, because there are no these molecules in the nature and they appeared as a product of chemical modification. As a result – “americans” disease spare weight, exchange breaches.

Can the GM products become the charge of Ukraine for entering to the WOT (world organization of trade).

In many countries world partners impose prohibition to the GM products for that time it’ll pass necessities test for safety.

Since the first of November 2007, all food, which sell in Ukraine must have marking about contains GMO and respective precaution: if the product has more than 0,9% GMO, it can be bad for health. It was the decision of ministers’ cabinet for execution requirement WOT put into practice such marking.

But Americans side WOT raise an objection to such actions. After all the USA is one of the biggest supplier exactly such food. So, probably, their actions can estimate, as unwillingness to lose markets sales for theirs products.

Don’t harm if you don’t help.

To detect GMO coast 380 hryvnias, and their volume plus else 200. There are only three laboratories in Ukraine, and all of their in the capital. Foundation such laboratory coast 500000 hryvnias. But they need in every regions centres. When the people familiarization with information about composition of food, person can decide – to buy chipper food with GMO, or more expensive without their. There are few biological natural products, and they coast in two time more expensive than GM products. Ukraine can afford to grow organic plants. Nowadays we pay alike money for both variety food. And don’t know, what danger wait us using GM products.

INCREASE OF ACCOUNTING ROLE IN BIOLOGICAL RESOURCES PRESERVATION

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The processes of economic integrations are dominated in the development of international economy for the ten years. Economic integration of Ukraine into the European Union is holding by unification of accounting and legal, methodological base of ecological management and ecological safety of Europe.

But, there is no a special law and a clear system in Ukraine, that could regulate the use of natural resources and guarantee their preservation. The National

accounting Standard № 30 “Biological assets”, established in Ukraine, was a great achievement in the regulation of natural resources by accounting.

Agricultural activity is differed from the activity in other branches of economy. So a special accounting system in agriculture should be worked out.

However, this Statement doesn't solve the problems of preservation and conservation of natural resources. It just defines methodological principles of formation of information concerning biological assets and process of their biological transformation in agriculture. The new objects of accounting - “Biological assets” are introduced in the National accounting Standard № 30 and International accounting Standard №41.

“Biological assets” - are alive organisms (plants and animals). So, they are natural resources of country, which should be calculated correctly for the preservation of economic and ecologic potential of agriculture [1].

According with ecological and economical paradigm of XXI century the term “Biological assets” consists of the whole biosphere [2]. At the same time, National Standard №30 and International accounting Standard №41 “Agriculture” include only plants and animals to the biological assets. But such important resources as land and water aren't included into these Standards. Organisms that are alive were named as “assets” - resources that can yield a profit. Those biological organisms, which can't yield a profit to the enterprises, were ignored by this definition.

National accounting Standard № 30 orients agricultural accounting to increase profit for enterprises.

Scientific researches concerning the new principles of agricultural accounting point out to non perspective existing model of economic development for Ukraine. “...the model of aggressive economic development is absolutely non perspective for Ukraine because of the limitation of renew resources”, - are pointed by O. Veklich and F. Yaheeva [3].

Economization of economic mechanism in Ukraine should be oriented on satisfaction of integrated interests of society, including ecology and sociality of economic reproduction.

The comprehension of importance of solving this problem for society impel for learning in details and thorough analysis of accounting information role.

Ukraine has great deposits of natural resources, but excessive exploitation of them can reduce their quantity and possibility to bring ecological service for society. As a result, possibility of future production and stable profit will be reduced for enterprises.

So, we think, it's necessary to make some changes in the National Standards of accounting which define Accounting of ecological activities as a part of stable society development, to determine new objects of accounting concerning ecological aspects. It's necessary to introduce a new account “Natural expenses” for accumulation of accounting records about expenses of natural preservation activity.

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ECONOMIC INSTRUMENTS TO CONTROL POLLUTION AND MANAGE WASTE

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There are two principal approaches to pollution control and waste management: the command-and-control and economics strategies. At first in most developed countries, the command-and-control approach was the predominant strategy. This involves direct regulation with monitoring and enforcement systems. The command-and-control approach shows how much pollution levels will be reduced. This approach was criticized as economically inefficient and difficult to enforce. The command-and-control approach to pollution control and waste management relies primarily on regulatory instruments (for example, standards, permits, licenses, land use controls).

In recent years, many countries, primarily industrialized ones, have adopted economic instruments to introduce more flexibility, efficiency, and cost-effectiveness into pollution control measures. These instruments act as incentives to polluters to choose their own means of pollution control. To various degrees, they incorporate the polluter-pays and user-pays principles. According to the polluter-pays principle the polluter pays a financial penalty for higher levels of pollution and pays a smaller penalty or receives a financial reward for lower levels of pollution. According to the user-pays principle, the user of a resource pays the full social cost of supplying the resource, such as for water and related services including treatment costs.

Overall, the economic approach has several advantages, it can: promote cost-effective means for achieving acceptable levels of pollution; stimulate development of pollution control technology and expertise in the private sector; provide government with a source of revenue to support pollution control programs; provide flexibility in pollution control technologies. Despite these strengths, economic instruments have certain disadvantages. One significant problem is that the effects of economic instruments on environmental quality are not as predictable as those under the traditional regulatory approach, since polluters

may choose their own solutions. Other problems are that some polluters may choose to pollute if the charge is not set at an appropriate level and that they require sophisticated institutions to implement and enforce them.

Economic instruments

Pollution charges. These are prices paid for pollution of environment, based on the quantity and/or quality of the pollutant (s). Their application is particularly appropriate when the damage of pollution can be estimated reliably. They include effluent or emission charges, user charges, product charges, administrative charges, and tax differentiation.

Market creation. Under this approach, markets can be created in which actors can buy "rights" for actual or potential pollution or where they can sell these "rights" to other actors. Market creation generally takes one of two forms: marketable permits or liability insurance.

Subsidies. Subsidies include grants, low interest loans, and tax incentives that act as incentives to polluters to change their behavior or reduce the costs of pollution abatement to be borne by polluters, both private and public. Tax incentives involve tax credits or accelerated depreciation for industrial investments in equipment to abate or control pollution. This incentive also may take the form of special tax relieves for firms that adopt management practices and production technologies that minimize the release of environmental pollutants. Subsidies can provide a genuine incentive to industry to reduce its discharges. Nonetheless, they do not discourage the continuation of highly polluting industries, nor do they encourage alterations in polluting production processes or inputs of raw materials. Moreover, the taxpayer, rather than industry, bears the costs of these pollution control subsidies.

Deposit-refund systems. Under this approach, consumers must pay a surcharge when purchasing potentially polluting products. When the consumers or users of the product return it to an approved center for recycling or proper disposal, their deposit will be refunded. This instrument is applied to products that are both durable and reusable or are not consumed or dissipated during consumption such as beverage containers, automobile batteries, and pesticide containers. They also can be applied to substances that have significant potential for damaging the environment.

Enforcement incentives. Enforcement incentives are economic instruments tied to direct regulation. They are designed to encourage dischargers to comply with environmental standards and regulations. Enforcement incentives include noncompliance fees or fines, performance bonds, and liability assignment. They also include denial of public subsidies and financing and partial or total suspension of plant operations.

In practice, economic instruments are rarely used alone to achieve environmental protection objectives. Generally, they supplement direct environmental regulations to raise revenues for financing pollution control activities or other environmental measures, provide incentives to better implement regulations, and stimulate technical innovation.

Effective enforcement mechanisms and institutions are crucial to the success of any strategy to improve environmental quality and management of wastes. Accordingly, the selection and implementation of each regulatory and economic instrument or mix of instruments must incorporate a strategy for enforcement.

ENVIRONMENTAL, SOCIAL AND ECONOMIC ASPECTS OF GLOBAL CLIMATE CHANGE

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Climate change is the largest environmental change expected this century. It is likely to intensify droughts, storms and floods, which will undoubtedly lead to environmental migrations and potential conflicts in the areas migrated to.

One of the most significant aspects of the impacts of climate change, which has unfortunately not received adequate attention from scholars in the social sciences, relates to the equity implications of changes that are occurring and are likely to occur in the future. In general, the impacts of climate change on some of the poorest and the most vulnerable communities in the world could prove extremely unsettling. And, given the inadequacy of capacity, economic strength, and institutional capabilities characterizing some of these communities, they would remain extremely vulnerable to the impacts of climate change and may, therefore, actually see a decline in their economic condition, with a loss of livelihoods and opportunities to maintain even subsistence levels of existence.

The scientific community has reached a strong consensus regarding the science of global climate change. The world is undoubtedly warming, and the warming is largely the result of emissions of carbon dioxide and other greenhouse gases from human activities.

Carbon dioxide and other gases warm the surface of the planet naturally by trapping solar heat in the atmosphere. This is a good thing because it keeps our planet habitable.

However, by burning fossil fuels such as coal, gas and oil and clearing forests we have dramatically increased the amount of carbon dioxide in the Earth's atmosphere and temperatures are rising. The vast majority of scientists agree that global warming is real, it's already happening and that it is the result of our activities and not a natural occurrence.

The evidence is overwhelming and undeniable. We're already seeing changes. Glaciers are melting, plants and animals are being forced from their habitat, and the number of severe storms and droughts is increasing:

- The number of Category 4 and 5 hurricanes has almost doubled in the last 30 years.

- Malaria has spread to higher altitudes in places like the Colombian Andes, 7,000 feet above sea level.
- The flow of ice from glaciers in Greenland has more than doubled over the past decade.
- At least 279 species of plants and animals are already responding to global warming, moving closer to the poles.

If the warming continues, we can expect catastrophic consequences:

- Deaths from global warming will double in just 25 years -- to 300,000 people a year.
- Global sea levels could rise by more than 20 feet with the loss of shelf ice in Greenland and Antarctica, devastating coastal areas worldwide.
- Heat waves will be more frequent and more intense.
- Droughts and wildfires will occur more often.
- The Arctic Ocean could be ice free in summer by 2050.
- More than a million species worldwide could be driven to extinction by 2050.

Some regions are likely to be especially affected by climate change.

- The Arctic, because of the impacts of high rates of projected warming on natural systems and human communities,
- Africa, because of low adaptive capacity and projected climate change impacts,
- Small islands, where there is high exposure of population and infrastructure to projected climate change impacts,
- Asian and African megadeltas, due to large populations and high exposure to sea level rise, storm surges, and river flooding.

Migration and movement of people is a particularly critical source of potential conflict.

The goal is to bring global warming under control by curtailing the release of carbon dioxide and other heat-trapping "greenhouse" gases into the atmosphere. We can contribute to this global cause with personal actions. Our individual efforts are especially significant in countries like the US and Canada, where individuals release 10,000 pounds of carbon dioxide per person every year. We can help immediately by becoming more energy efficient. Reducing our use of oil, gasoline and coal also sets an example for others to follow. Also we have to reduce electricity usage around the home. The largest source of greenhouse gases is electric power generation. The average home actually contributes more to global warming than the average car. This is because much of the energy we use in our homes comes from power plants which burn fossil fuel to power our electric products.

Societies have a long record of adapting to the impacts of weather and climate. But climate change poses novel risks often outside the range of experience, such as impacts related to drought, heat waves, accelerated glacier retreat, and hurricane intensity. These impacts will require adaptive responses such

as investments in storm protection and water supply infrastructure, as well as community health services. Adaptation measures essential to reduce such vulnerability, are seldom undertaken in response to climate change alone but can be integrated within, for example, water resource management, coastal defense, and risk-reduction strategies. The global community needs to coordinate a far more proactive effort towards implementing adaptation measures in the most vulnerable communities and systems in the world.

INVASIVE PLANTS: ECOLOGICAL THREAT OR BIOMASS POTENTIAL FOR ENERGY USE?

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The main goal of this paper is contribution to discussion about use of invasive plants potential and minimalizing of their ecological threat. Can economic and legislative instruments help to solve ecological problems? The authors focus on CBA analysis as an effective tool to compare socioeconomic costs and benefits and on technological and law aspects connected with invasive plants, concretely knotweed. The CBA analysis data basis is gained from two case studies of invasive plant knotweed (*Reynoutria*) in the Czech Republic.

The spread of invasive organisms is considered one of the most serious ecological problems in the 21st century. Invasive species is usually defined as “a species that is non-native to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health.” Many invasive plants cause huge losses in agriculture, livestock, fisheries, and other resource production systems. Some significantly alter ecosystems, even resulting in costly damages due to increases in fire, flooding, and erosion.

Knotweed (*Reynoutria*) Japanese and Bohemica is one of the most widespread invasive plants in the Czech republic. This plant usually occupies positions along natural biocorridors (river flood-plain) or artificial corridors (e.g roads, railways, brownfields...). Knotweed poses a significant threat to riparian areas, where it can survive severe floods and rapidly colonize scoured shores and islands. Once established, populations are extremely persistent.

On the other hand, quick growth and spreading displays big economical potential as biomass source usable as input into energy production from renewable energy sources.

On the other hand, quick growth and spreading displays big economical potential as biomass source usable as input into energy production from renewable energy sources.

There's growing demand for technologies using local alternative energy sources as a complement or even substitute to central energy technologies (mainly thermal

power stations using fossil inputs). Only biomass and solar energy is usable in the Czech Republic conditions thanks to low number of appropriate water flows and only occasionally strong wind.

Both is based on solar energy, nevertheless plants utilize it four times more effectively than solar cells.

Knotweed is very perspective source of biomass, in comparison with standard plants nowadays used for biomass production it has several advantages: (i) possibility to use poor or even contaminated soil and highland areas which aren't suitable for corn production. (ii) Yield of dry mass can reach 30-40 tons per hectare (10 000 sq. m.), which is above standard in comparison with other plants. (iii) Knotweed doesn't demand any supporting fertilization, which rapidly reduces costs for its growing.

Knotweed is not named on list of plants of Ministry of agriculture of the Czech Republic which contains plants allowed to be grown for energy use. Moreover, production of knotweed is prohibited because of its invasive character. Authors of the paper think that it is not necessary to prohibit knotweed growing. Its energy potential is very high and when current legal regulations is respected knotweed can be grown without ecological threat.

The results of CBA analysis value socioeconomic costs and benefits of knotweed growing. As an input for CBA analysis data from projects of knotweed extermination located in the central part of the Czech Republic were used. The projects were realized by non-profit nongovernment organization for municipalities and supported by municipal budgets.

The main socioeconomic costs were set by valuation of extermination of 1 hectare of spontaneous knotweed vegetation considered as negative ecological burden. The pure opportunity costs method is not appropriate because of difficult valuation of affected areas value decrease. Willingness-to-pay method is not suitable because of low foreknowledge and low ability of objective harm valuation by affected subjects. Defensive costs method displays the same disadvantage.

For valuation of main socioeconomic benefits price of 1 GJ energy produced from technology using renewables was used. This price is considered as an equivalent of average price of 1 GJ energy produced from technology using fossil fuels.

The socioeconomic net value of knotweed growing is positive. As a result of CBA analysis we can set complex of conditions for feasibility of knotweed growing. The grower would be certified by the state authority. This instrument is nowadays widely used by growing certain species, e.g. cannabis for technical use.

This licence would be bond to conclusion of Voluntary Agreement for environment protection according to EU legislation (e.g. 96/733/ES). Voluntary Agreement would obligate grower to prevent knotweed spreading out of the growing area and he would be responsible for e.g. monitoring of plant occurrence in specified area.

Moreover, already valid national legal regulations with existing sanctions for nonpreventing of invasive plants spreading could be used.

TRADE, ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

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Until recently international trade theory left environmental impacts outside its purview. Now, when they are linked, free trade is often depicted as either a scourge or savior of the world's natural resources. Supporters of free trade rightfully point out that trade brings higher income, modern technology, and better access to environmentally friendly products and techniques. Unfortunately, opponents of unrestrained trade can claim with equal justification that it also has often led to increased pollution and natural resource depletion.

The theory of comparative advantage asserts that countries will tend to specialize in the production and exports of goods they produce relatively efficiently. Relative efficiency involves a double comparison, as among goods as among countries.

At a higher level of abstraction, the focus of the analysis can be on the effects of environmental policy on trade or the effects of trade and trade liberalization on the environment. In the former, the conventional questions of interest are the effects on the pattern of trade (comparative advantage), the volume of trade, the gains from trade and their international distribution, and factor earnings, an international distribution question.

The macroeconomic effects of environmental policy on the trade balance, unemployment, inflation, and the exchange rate are also of interest. In the focus of the analysis is on the effects of trade and trade liberalization on the environment, the interesting questions are the positive or negative effects of trade on the quality of environmental resources, the implications of trade and trade liberalization for optimal environmental policy, and the welfare consequences of trade after taking into account trade-environment interactions.

How does environmental policy affect trade and welfare? The introduction of the pollution tax on an export good will divert resources from its production, undermine apparent comparative advantage, and reduce trade and the gains from trade. In the limiting case, the environmental tax will return the country to autarky or even reverse the direction of trade. Nevertheless, welfare will be increased by the pollution tax so long as the social costs of production of the commodities are the greater than the value of the commodities foregone by imposing the tax.

Alternatively, welfare will increase so long as an environmental tax, valued in commodities foregone, is less than the marginal environmental damage avoided.

CLUSTERS AS A NEW FORM OF SUSTAINABLE TERRITORIAL DEVELOPMENT

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There are three most popular definitions of clusters. First, clusters are regionally limited forms of economic activity inside related economic sectors linked to scientific research institutes, universities, etc. Second, vertical industrial networks, narrow economic sectors in which adjacent stages of production form clusters nucleus. Third, clusters are areas of industry with high level of aggregations or sets of sectors with high level of aggregation. These are mega-clusters. From the systemic point of view cluster is a set of enterprises which belong to different interconnected areas. Clusters are incorporated into a uniform organizational structure, which elements are interconnected and have common functions for maintenance of its own potential development and competitiveness. And one more definition: cluster is the result of improvements in the business environment "it is a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities" As the sum of its parts is of greater value than each individual company or institution, clusters create synergy.

Advantages of clusters

1. Clusters improve competitiveness (which results in improved productivity) in three ways;
2. Improve productivity through improved access to specialized suppliers, skills and information.
3. Innovation is given more importance as the need for improvement in processes of production is highlighted. Firms working together can satisfy this need.
4. Once established, clusters will grow as a result of the creation of new firms and the entrance of new suppliers.

Reasons for the growth in popularity of clusters

The growing number of people involved in economic-development activities. The decentralization of decision-making processes to the regional and city levels and the renewed importance of international organizations have left many new policy planners with the need to find new tools to define their policies:

a) use of increasingly frustrating traditional industry policies such as providing subsidies for uncompetitive industries, attempting to build new industries from scratch and trying to attract incompatible foreign investments are unproductive; b) the globalisation of international markets. With the reduction in the number of barriers trade, producers can compete freely in any economy at the global level. Given this, regions realize that they must compete internationally in the industries in which they enjoy an advantage. Globalization is thus leading to a

specialization of regional economies. Clusters support this trend by building on local differences, seeking an endogenous growth of regional economies, reinforcing the assets already present in the local economies.

Scenarios for cluster development

Some authors [3] offer the following scenarios for cluster creation and financing:

1. " top-down", i.e. with prime formation of consultative coordination and monitoring bodies, with definition of cluster strategy as a whole and its resource support;
2. " down-up ", i.e. forming of separate projects and programs which integrate potential cluster participants;
3. the mixed variant when both approaches are united.

As a rule, clusters are directed at the achievement of the following purposes [3]: competitiveness increase of clusters participants due to introduction of new technologies; decrease (reduction) of expenses and improvement of quality of the appropriate high technology services due to synergy effect and unification of approaches to quality, logistics, engineering, information technologies etc.; maintenance of employment in conditions of reforming of big enterprises and outsourcing; consolidated lobbying of clusters participants interests in different authorities.

Achievement of the above mentioned purposes may provide ecological clusters. They may be effective mechanism for popularization and introduction of innovations in production of goods ecologically friendly goods and services which will provide efficiency increase and growth of competitiveness between regional enterprises. Ecological clusters have reliable potential for investment. In our opinion ecological clusters give an opportunity for grouping geographically close ecologically safe productions which have constant interrelations with scientific research institutes, laboratories, and business structures, public institutes, whose strategy and tactics are maintenance and increase of sustainability and efficiency of a region. About 80 % of all economic actives of a region should be concentrated in an ecological cluster, which basic purpose is maintenance of sustainable social, economic and ecological development.

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INVESTMENT VENTURES OF SUMY REGION

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In present day circumstances search-problem of the inner investment sources and intensification of the investment activities at the regional level still remains vital. One of the obstacles that stands in potential investors' path is lack of the reliable information about economic, financial and juridical conditions of the home market – facts that determine the appeal or investment expediency of a certain economic sphere. One of the ways to tackle appointed problem is the complex rating evaluation of the region investment expediency. It helps organs of government to take all measures to increase regional economic attractiveness, and investors – to choose a proper region. They use abroad the rating investment environment and creditworthiness evaluations such as World Economic Forum, Heritage Foundation, Fitch, Ratings, and Moody's Investors Service. These data influence the capital investment choice of countries. Ukraine, for instance, by Heritage Foundation economic liberty index, had in 2005 the 88 place among 161 countries under investigation. [2] The investment appeal evaluation and prognosis of Ukraine and its regions should be bound directly with state regional policy. The aim of which is to guarantee the development of all regions regarding integral factors: efficient use of available economic and natural potential, territorial labour division and reciprocal economic cooperation. Using official data of State Statistics Committee, Government of Ukraine, Ministry of Economics, Ministry of Finance, National Bank of Ukraine and others, Ukrainian Institute Reforms of worked out the methods of regional investment appeal evaluation. Regional economic development, market infrastructure, financial sector, human resources, enterprise and local authority are the components of the given method. According to these indicators Sumy Region has the 25th place – by regional economics development index, the 25th place – by financial and market infrastructure index, the 20th – by enterprise and local authority index. These explain the 24th position of the region among foreign investors, though it takes the 8th position among home ones. Experts emphasise on such economic spheres of Sumy Region as: timber and wooden wares production, coke and oil-refining production, mining operations, telecommunication service, light industry. Judging by expert estimation, local authority's work factors, which affect investment attractiveness of the region, are: absence of a strategic plan of regional development (44%); absence of the qualitative information about potential investment objects (31%); absence of necessary basic investment knowledge and practical skills of strategic planning (40%). The following factors will essentially improve the investment process in our region: transparency of the local authority's work (38%); active position of local authority for bringing in investors (31%); creation of the favourable terms for

investors (29%); social partnership between the authority and business (26%); the high professional level of the officials (18%).

Thus, success of investment projects strongly depends on the competence and readiness of the organs of state and local government to dialogue with the public and industrial sphere (business).

In order to suite all preceding criteria, Sumy local authority tries to administrate the holding of investment forums – international and national – for bringing in money into the regional economics. Foreground tasks in the sphere of bringing in investments into the economics of the region can be:

development of the engineering, oil-refining, food and light, timber and wooden wares industries; inculcation of the innovative technologies; inculcation of the resource- and energy-saving technologies; development of small and middle business; development of municipal economy; measures of environmental and nature protection; development of tourism; revival of historic and cultural monuments; development of high-ways and railway transport; development of telecommunications; development of social sphere.

As a result of these investment projects' realisation the following can be expected: inculcation of new technologies for competitive output; manufacture of new products; output growth of the regional production plants; expansion of network of the retail trading and utility companies in all built-up areas of the region; improvement of public utility services; creation of additional workplaces; growth of housing building volume; development of small and middle business; effective use of land resources; augmentation of local budgets. Consequently, an investment climate both of Ukraine and its regions remains unfavourable. The policy assistance at regional level should pay the key role in bringing in investments to a region. The forming of regional investment programs in practice is not perfect. Mostly they constitute the ordinary report of district projects with imperfect economic bases. Financial methods of economic development stimulation – method of special aims and purposes, in particular, should be more actively applied. Its essence consists in a specification and strict direction of the planned resource expense and in permanent control of the expense and its effectiveness.

Thus an investment process must be governed. The world experience of the favourable investment environment forming shows that the unique technology of this process verification doesn't exist. Basic principles of investment come up from essence and terms of investment process realisation; as any investor is interested in the reliability and efficiency of his own money. Therefore management technology, built with investor interests' account will work at any level.

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UNITED STATES ECOLOGICAL RESEARCH STRATEGY

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In virtually every major environmental act, Congress has required that the U. S. Environmental Protection Agency (EPA) not only ensure that the air is safe to breathe, the water safe to drink, and the food supply free of contamination, but also that the environment is protected. As a result, EPA's Office of Research and Development (ORD) has established research to improve ecosystem risk assessment and risk management as one of the seven highest priority research areas for investment over the next 10 years.

To meet the combined requirements of the legislation, it is increasingly clear that scientific solutions to ecological issues can no longer be isolated to one stress, one scale, one level of biological organization, or one medium. It is also obvious that because of the complexity of environmental problems and the ecosystems on which they act, environmental problems are not as likely to be solved as they are to be managed. Because not all ecological changes are "bad," ecosystem management becomes more a matter of social tradeoffs among alternative uses rather than simply a matter of protection.

The goal, therefore, of the Ecological Research Program is to: "provide the scientific understanding required to measure, model, maintain, and/or restore, at multiple scales, the integrity and sustainability of ecosystems now, and in the future."

In the context of this program, ecological integrity is defined in relative terms as "maintenance of ecosystem structure and function characteristic of a reference condition deemed appropriate for its use by society." Sustainability is defined as "the ability of an ecosystem to maintain relative ecological integrity into the future."

It is ORD's vision that by 2008, EPA researchers will have developed the next generation of measurements and models and technologies necessary to protect the present and probable future sustainability of ecosystems at local, watershed, and regional scales. Obviously, this is not a vision or goal that can be accomplished by ORD alone, but it is one that will be dependent on contributions from in-house and extramural programs, other agencies, the academic community, states, and others. Research within ORD must then be prioritized, capitalizing on the strengths of the organization and the needs of customers it most closely supports.

Consistent with the recommendations from a recent report from the National Research Council entitled, "Building a Foundation for Sound Environmental Decisions," the Ecological Research Program proposes to maintain a "core" research program and applies those same capabilities to the Program Office's high-priority needs. The core research ensures that ORD maintains the capability EPA needs now and in the future, whereas the program priorities ensure that the core program is applied to the most critical needs. Because of the demands on ORD

from multiple customers, including Congress, the public, the scientific community, and the Program Offices (to mention but a few), organizing ORD's research can be approached from multiple directions driven by these different customers. The structure is not unlike a Rubik's cube, in that once one face is structured to take full advantage of all the expertise within ORD, the other sides are unlikely to be as consistent in pattern. The research presented in this strategy begins with the core research as the primary face of the strategy, and then the high-priority needs, as determined by the risk posed, as the secondary axis for organizing the research areas.

- **Program Objectives**

The Program is developed around the following four fundamental research areas and objectives:

- **Monitoring Research.**

Developing indicators, monitoring systems, and designs for measuring the exposures of ecosystems to multiple stressors and the resultant response of ecosystems at local, regional, and national scales.

- **Processes and Modelling Research.**

Developing the models to understand, predict, and assess the current and probable future exposure and response of ecosystems to multiple stressors at multiple scales.

- **Risk Assessment Research.**

Developing and applying assessment methods, indices, and guidelines for quantifying risk to the sustainability and vulnerability of ecosystems from multiple stressors at multiple scales.

- **Risk Management and Restoration Research.**

Developing prevention, management, adaptation, and remediation technologies to manage, restore, or rehabilitate ecosystems to achieve local, regional, and national goals.

These four objective areas are consistent with the strengths of ORD's research (i.e., the core research of ORD). The specific research issues to which these capabilities are applied are, however, always changing. More emphasis on the relative risk is at the forefront of improving the ability to make future ecosystem management decisions, considering EPA's move to more flexible regulations and decentralized decision making. Therefore, a better understanding of the impact of multiple stressors, at multiple scales, and at multiple levels of biological organization are underlying factors that run throughout the strategy. Although these are not new areas of research in ORD, the core, in-house program will emphasize research considering these factors over the next five to ten years. Further, the in-house program will primarily concentrate on aquatic endpoints. These will assist the Agency both on the short- and long-term to work toward water quality improvements (both biological and chemical) from a multimedia perspective. Terrestrial research will proceed, but again, primarily as it influences water quality. The ORD grants program complements the in-house research by expanding both the capability and the scope of the research.

KEYSTONES FOR ATTAINMENT ECO-EFFICIENCY OF CLEAN PRODUCTION

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The World Business Council for Sustainable Development guideline ‘reduce toxic dispersion’ is the weakest formulation of the seven and reflects the vigour with which some branches of the global industry have defended their products in spite of their prevalent unsafe for environment. Clean production is one way in which eco-efficiency has been put into effect. Yet the pressure to develop green chemicals and alternative non-toxic products has been intense and increasingly successful. Environmental pressure has forced the phasing out of different toxic products. At the same time new products have been developed – as alternatives to banned and threatened substances. While the Stockholm Convention covers only twelve out of the 70,000 chemicals now in use, this should not diminish its importance. It lays down a marker for greener production. It shows a readiness to phase out toxic materials whatever their economic significance, and it means the eyes of the world now have the full range of chemicals in their sights.

“Eco-Efficiency” conception opens with the following explanations:

- reduce the material intensity of goods and services
- reduce the energy intensity of goods and services
- reduce toxic dispersion
- enhance material recyclability
- maximise sustainable use of renewable resources
- extend product durability
- increase the service intensity of products

Following these guidelines can give companies a competitive head-start into the next century – but not if they are treated as an add-on to “business as usual”... Eco-efficiency does require a profound change in their theory and practice of core business activities. All seven of the above principles bear on the goals of ‘Zero Waste’. ‘Zero Waste’ has become one of the watchwords of eco-efficiency. In the words of Edgar Woolard Jr, former chairman of DuPont, “The goal is zero: zero accidents, zero waste, zero emissions.”

Not only three main theses underline principle of eco-efficiency: reduce, reuse and recycle (famous 3R) but repair, remanufacture, refine and so on as well.

There are four strategic paths that are being pursued, each running alongside and reinforcing the others.

1. *Production avoidance*. There are many spheres of the economy (such as transport, water and waste) where production can be avoided through smart systems. At the level of systems, this involves the redesign of ‘productive systems’ so that they require fewer material inputs to produce a desired outcome.

2. *Extended product life*. This can be achieved by concentrating on another series of ‘re-s’ – repair, re-manufacture, re-covering, refining and reuse. To

facilitate these, increased product life needs to be incorporated in the initial design. For example the cost of repair can be lowered through the modularising of design and the automation of fault diagnostics. The modularising of components across products will help repair and remanufacture. In cases where product life is heavily influenced by changes in appearance (fashion) rather than functional operation, products can be designed to allow for skin changes or recovering. Dynamic modularisation allows technical advances to be incorporated into a re-covered product.

Activities such as repair can be carried out by the user, but repair is most likely to be expanded if it is made the responsibility of the original producer. If a producer's goal is to extend product life (and the market should be shaped so that there is an incentive to do so), then we should expect there to be an increase in the leasing, rather than selling, of durable goods. Leasing would encourage long life design, and allow the manufacturer to plan the periodic activities such as maintenance, overhaul, re-skinning and so forth, that are necessary for continued product effectiveness. In the case of refining (of oils and solvents for example) renting the substances allows the manufacturer to remove the contaminants so that they can be reused.

3. *Extended material life.* This is where recycling is relevant. In the case of end-of-life durable goods, recycling involves the reverse engineering of the assembly or flow processes by which they were produced. Industry symposia on the subject discuss such issues as the establishment of disassembly lines, new types of binders (such as glues and solders) that can be readily cracked open, and ways of decomposing composites or replacing them with recyclable materials. These processes are again often best undertaken by the original producers (using take-back, buy-back or leasing arrangements of the original commodities). They can then use more expensive but longer lasting materials (which would otherwise be lost to scrap) and 'learn from undoing' in order to revise product design to ease disassembly and recycling.

4. *Increased product utilisation.* Many durable products are severely underused. One approach to increasing utilisation is through share schemes, like Lufthansa's car pool, or user friendly hire schemes. Another is through actual or de facto borrowing or leasing schemes. The disposable camera is one example; another would be the supply of equipment from a leasing company on request. These are all means of improving resource productivity, defined as an increase in outcomes per unit of material input.

Results of these strategies are the emergence of a 'new service economy' in which manufacturers sell not commodities but service packages to achieve required outcomes. Manufacturing is transformed into a branch of the service sector, producing goods that are judged primarily on their performance as part of a service package.

THE INFLUENCE ON ECOLOGY AND ECONOMY OF COMPLEX USING OF NATURAL RESOURCES IN MINING-ORE INDUSTRY

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The intensive using of natural resources led to necessity to include the environmental regulations demands in mining-and-processing enterprises' activity. At first, environment protection developed as biological branch of knowledge. In modern, when scales of consuming activity grew up, the changes of natural balance as consequence of insufficient attention to ecological factor influenced considerably development of national economy. That's why the problem of environment protection makes great economic sense.

The technologies of complex and full resources using, especially in mining-ore industry are the main directions of science research. The deficit of resources is an underwater reef, which prevents Ukrainian economy progress. At the same time, practice of management evidences of artificial deficit. Today, we throw out on dump the great volume of resources, which is called the "wastes". A colossal sum of money is spent on transportation, utilization and maintenance of rising wastes avalanche.

Today the largest quantity of wastes is generated in mineral raw complex, including extractive and dressing enterprises. Near 70-75% of wastes total volume arises in these brunches. Only 6-7% of wastes are utilized now.

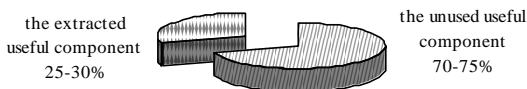


Figure 1 – The diagram of natural resources using

It is necessary to switch to utilization of the secondary resources, to application of low-wasted and resource-saving technologies. This way the losses can be converted to profits. Without doubt, a complex of legal, economic, organizational and administrative measures is needed. Flexible and successive state policy, which can economically encourage enterprises to care about primary resources, and everywhere where it is possible to substitute them by secondary resources, is needed. Its means necessity of integral economical mechanism, which can aim at full using the "second circle riches".

The using of secondary resources allow to, firstly, to reduce utilization of valuable natural resource, to keep it for future generations and cut down environmental damage; secondly, it is as a rule, economically profitable owing to large content of useful components and comparatively low expenses for transportation; thirdly, application of secondary material guarantees lowering the

industrial wastes quantity, that facilitates reducing the expenses on environment pollution prevention.

The scientific and technical progress in mining-ore industry is capable to change traditional conception of material base. The complex processing of material along with volume of production output increase and the assortment expansion allows reducing the expenses. By-product producing at the same amount of wastes reduces its cost price as material expenses are distributed through all production volume. Besides, complex processing provides increase of effectiveness of basic funds and economy of capital investments using.

The experience of wastes reusing for example OJSC “The Central mining-and-processing combine” demonstrates the effectiveness of complex technology, which utilizes both the primarily and the secondary resources. The using of lying tailings allows enterprise to get supplementary major items of production (concentrate) and following by-products (sand, crushed rock). Such kind of situation has a positive influence on the whole enterprise and environment. First of all the area of tailings pond diminishes, it follows reducing of maintenance costs on dam fortification and lowering probability of area flooding.

The dynamics of expenses on concentrate producing from lying tailings is given on the fig. 2.

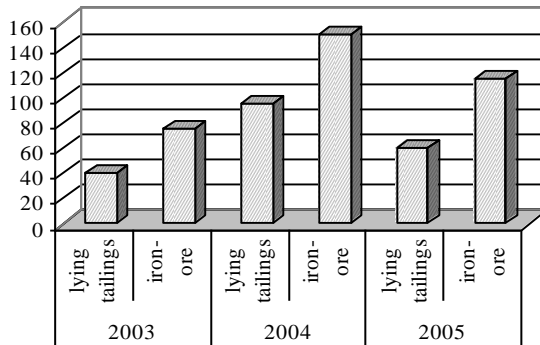


Figure 2 – The dynamics of expenses on concentrate producing from primary and secondary resources, UAH

The cost price of products from tailings at the Central mining-and-processing combine is lower than the ones obtained from iron-ore. There is no necessity in initial stages of technological process. The feed is piped to redressing.

As, Kriviy Rih is a heart of mining-ore industry. There are five ore-dressing combines that return to a nature great volume of wastes as a result of their activity. That’s why the experience of the lying tailings processing is ecologically and economically acceptable for all ore-dressing enterprises. The problem of nature resources complex using is important, actual and perspective. All economists should always remember that resources are exhaustive. This point of view is the beginning of effective manager’s decision or successful scientific work. The volume of wastes grows up in geometry progression when the nature deposits work out.

PROBLEMS OF FINANCIAL PROVISION FOR ENTERPRISE'S ECONOMIC GROWTH

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Scientists discussions has for a long time centred on the decreasing investments and the difficult liquidity situation which most companies face. The capital structure is one of the primary factors, allowing to optimize the size of investments and reach sustainable development over the medium to long term.

Now managers are more and more asked by a question to determine a target capital structure for their firms. The capital structure concerns the proportion of capital that is obtained through debt and equity. There are tradeoffs involved: using debt capital increases the risk associated with the firm's earnings, which tends to decrease the firm's stock prices. At the same time, however, debt can lead to a higher expected rate of return, which tends to increase a firm's stock price.

Variability and dynamism of an environment, and also development of internal factors entails necessity of account set of factors at formation of capital structure and reach sustainable development.

The decision about capital structure depend upon several factors. One of them is the firm's business risk — the risk pertaining to the line of business in which the company is involved. Firms in risky industries, such as high technology, have lower optimal debt levels than other firms.

Another factor in determining capital structure involves a firm's tax position. Since the interest paid on debt is tax deductible, using debt tends to be more advantageous for companies that are subject to a high tax rate and are not able to shelter much of their income from taxation.

A third important factor is a firm's financial flexibility, or its ability to raise capital under less than ideal conditions. Companies that are able to maintain a strong balance sheet will generally be able to obtain funds under more reasonable terms than other companies during an economic downturn. Brigham recommended that all firms maintain a reserve borrowing capacity to protect themselves for the future. In general, companies that tend to have stable sales levels, assets that make good collateral for loans, and a high growth rate can use debt more heavily than other companies. On the other hand, companies that have conservative management, high profitability, or poor credit ratings may wish to rely on equity capital instead.

Thus, financial managers should consider the managerial, financial, political, social and other factors when planning the strategic sources of capital funds and formation a capital structure, then examines the factors comprising return on equity — financial leverage, weighted average cost of capital — in light of current and projected industry trends.

However, now one of the main problems of optimization of enterprise's capital structure is search of sources of its formation.

In view of the poorly functioning banking system, the majority of enterprise financing has to be derived from internal sources. This also implies that tax policies should leave companies sufficient room for manoeuvre in the financing area. At the same time, attempts must be made to improve the credit conditions for companies, to maintain low real interest levels, and to improve the banking system's strength. Attracting foreign credits and investments could be another significant part of financing and investment in Ukraine.

However, it is not only the scarcity of supply, an insufficient demand for credit and investment too, leads to a decline in investment. To date not only foreign investment has been limited; many domestic enterprises prefer to invest their funds in foreign countries rather than investing it in the domestic economy (capital flight). The preconditions for increasing the readiness of domestic and foreign investors to invest in Ukraine are stable economic policies, absence of erratic fluctuations in the taxation approach, and the creation of a level competitive playing field.

In the short term it is very important for growth to what extent the lack of liquidity impedes companies from expanding their production. Deficient ongoing financing was again and again mentioned as the cause for production reductions. This argument was then used as justification for the continuance of state subsidies to companies. The reduction of state subsidies must therefore also be looked at from the point of view of financing. In spite of the partial withdrawal of the state from company financing, there are signs that the liquidity situation of companies has not deteriorated. Notwithstanding the disappearance of a part of state financing, the financial situation of companies, surprisingly, has already slightly improved over the short term, which must have helped growth.

At the same time, it is necessary to give more attention to questions of increase in enterprise's debt financing.

The state has drastically reduced its demand for credit, thereby making more bank credits available to the economy. Bank credits to the economy have clearly risen, both in nominal and actual terms. Long term credits, relative to all credits to the economy, have risen minimally. The founding of a micro-bank should help financing of small and medium sized enterprises.

At the same time, now the long-term enterprise's crediting is on low enough level.

The readiness to make investment credits available will only increase when and if credit providers receive adequate securities. In the first place, this requires that companies have clear title to their property, particularly to real property. On the other hand, the creditor must have a right to the assets of the debtor in case the credit is not repaid. This requires that enforceable claims can be made in bankruptcy suits, processes which are still not available. Realistic enforcement of forfeiture and security rights – even vis-a-vis state owned companies – must be strengthened. An adequate legal basis for the protection of minority partners must also be created.

STABLE DEVELOPMENT OF UKRAINIAN ECONOMY IMPOSSIBLE WITHOUT ECOLOGICAL EDUCATION OF THE POPULATION

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Nowadays it is said a lot about ecological education of the population but in practice its condition is enormously unsatisfactory. There's a conviction that ecological upbringing is the duty of schools. Thus through ecologyization of education objects ecological mentality is formed in the children's souls and the subject of Ecology must occupy a serious place in the system of educational objects.

But at the same time we shouldn't forget that the most effective way of upbringing is the example of economic attitude to the use of the natural richness.

Only the incase of ecological culture on all levels of authority may provide the realization of adopted ecological and economic programs. Their success also depends on the social organizations, trade unions and religious communities.

Ensuring of the stable development of economy impossible without ecological education of the population which would have a positive influence on the level of ecological culture, consciousness and behavior of people in the nature.

So achieve this it is necessary to create an active program of the ecological education of the population which would provide the expansion of the certain scientific knowledge's about regularities of the development of the nature and inform about the responsibility for the conditions of the environment according to the norms of the generally acknowledged morality and legal aspects of the natural usage and the protection of the environment.

Through the means of mass media to propagate the understanding of the richness of nature not only as a source of the physical needs but also as a source for completeness of spiritual life of every person.

Constantly to inform the population about certain ecological problems of the area and about the laws of local and regional counsels to solve them. On the level of church leadership to recommend the formation among believers the persuasions of careful and economical attitude to the natural resources and personal responsibility for every action in the nature.

The culture in general and the ecological culture specifically depend on many factors, among them is one of general its ecological education.

Today the ecological education has a general place between the constituent principles the creating foundation of ecological security of Ukraine. The rise of common level of ecological education allow to decide the most important, compound and difficult task as ecological activity of people in all spheres: energetic, industry, farming, transport, military service and the ecological of all our economics.

The main aim of ecological education is forming the ecological culture of separate person and the society on the whole, to forming skills, an ecological knowledge, an ecological mentality, and the awareness, which rest on the attitude to nature as an universal, the unique value. Ecological education on the hand must be the independent element of the universal system of education on the other hand, to play the integrative role in all systems of education.

Now, the education looks at as a continuous process during all life, which is necessary to change.

Methodical problems of ecological education take down to find the answers to the questions: why, when, whom and how to teach.

It's known, to teach is difficult and more difficult is to change the knowledge to the persuasions, but the most difficult is to achieve, that the persuasions start be norm of life. The aim of ecological education is the last in contrast to engineering or some others professional education. It's the aim of securing the knowledge.

Ecological knowledge must to serve the people not only under the time of fulfillment the professional obligations but constantly in the everyday life, on holidays at the working place. It's can only under the circumstances, when the knowledge goes to the highest form-in the habit, in the culture of behavior. The peculiarity of ecological education is its infinite.

The ecological problems can't to decide only with efforts of expert of problems, which use together and need to decide together. And for this everyone must have the minimum of ecological knowledge.

Today the ecological education look as one process that include all ages, social and professional and grouping on these principles:

- systematic and uninterrupted, that secure the organizational conditions of forming the ecological culture of person between the separate paws of education, the unity of formal and informal education of population;
- the orientation to the idea wholeness nature, the universality of relationship all nature's components and processes;
- the between disciplined approval to the forming the ecological mentality which foresee the logical connect and deepen the system of nature knowledge, the logical subordinate, the versatile knowledge, the basis aim of ecological education;
- the relationship of regional ethnography, the national and global thought, that promote the deepen understanding of ecological problems on the different levels;
- the regional ethnography principle of ecological education have to be perfect and put into base;
- the concreteness and objective of knowledge and skills;
- the connecting tighprofessional ecological knowledge with high more in general human value, synthesis of nature-education and socio-humanistic knowledge.

The knowledge, as a constituent of ecological education, which include the cognitive and active components of studies.

In the boundaries of educational upbringing it's important to organize examinational educational and knowledge excursions.

During the last years it's partly activated the tourist activity, but scales of the regional ethnography must be widened.

Because nowadays there're a lot of those who know more about exotic of the overseas areas than about peculiarities of the native land. It you really love your land you must know it.

The excursions for workers of enterprises, public organizations, promote the understanding that in nature there isn't a division on important and unimportant, boyish and significant, everything is important and rational there, there is a correlation of all alive in biosphere. Bigger effectiveness of the ecological education can be reached through practical participation in nature protection steps.

Planting trees and gardens, celebrating festivals for protection of environment, flower days - it is not the full list of concrete possibilities. It is useful to regain the holiday of forest, the main task of which was planting the land with trees and propagation of forest.

Ecological instruction on enterprises and organizations can bring a considerable benefit into the practice. Because the pollution of environment threatens the workers' lives and health. Though ecological danger is less noticeable as technical but not less important because years decreases health of population.

We have examples of increase in quantity of diseases and death in populated places, situated on the banks of polluted rivers. And our rivers contain not only industrial wastes but everyday life wastes, corks of bottles and a huge amount of usual dust.

Ecological education must take important place in one pedagogical system of forming the right attitude to nature. From pre-school age it is important to secure regular of children with nature in order to gain simple knowledge and forming fundamental bases of natural usage. In the primary and secondary schools, educational material from the bases of ecology may organically enter into programs of all subjects.

And for elder pupils ecology must be studied like a separate subject. Till this time pupils have already the bases of knowledge's and they can analyze, generalize and make conclusions about main principles of building and development of the world.

That course of ecology (with at least two-hours per week) must form in graduates of schools personal importance and responsibility for future of the planet. Provided that ecological education is realized in pre-school, school and after school on all layers of population and constantly, it can be successful.

The cognitive components include not only system of ecological knowledge but they determine inside culture of person, forming readiness for active conscious activity for humanization relationship in the system "Person-society-nature".

ANALYSIS OF ECOLOGICAL SITUATION IVANO-FRANCOVSK REGION

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On territory of region which occupies 2,4% (1,398,000 km²) areas of Ukraine formed 8,6% general volume of waters in the rivers of Ukraine, 6,3% areas of earths of forest fund (636 thousands of hectare) of the state are concentrated and 9% general supply of wood. In an area there are 224 deposits 26 types of minerals (oil, gas, potassium salts, build materials but other), over 300 sources of mineral waters.

In an area there are a lot of original and unique natural complexes with the various flora and fauna. The cedar-spruce and pine-tree forests in a natural reservation „Gorgany” are stored.

General it amount 457 naturally protected territories by an area 196,000 hectare (14 of region).

At the same time in the region over 500 industrial enterprises of power, oil, gas, woodworking and other chemical industries are placed. Over 4% territories busy oil pipes, more than 2000 mining holes are bored for the booty of oil and gas, 134 cleansing buildings, 30 large industrial factories such as Potassium factory Burshtyn Electric Power Station and other

These objects stipulate the certain technogenic loading on an environment. On territory of area 4 naturally territorial complexes were formed with the different degree of anthropogenisation:

- industrially city (Ivano-Francovsk, Kalush, Burshtyn, Nadvirna, Kolomyja);
 - industrially oil-mining (Dolina, Rozhnyatyn, Pasichna, Bitkivsk);
- Ecological problems in these complexes are related to the extras and up casts of contaminants in atmospheric air and water objects.
- agricultural (Rogatynsko-Galycki, Tlumachsko-Sniatynskiy) – ecological problems are related to degradation of earths.
 - forest industry (Verkhovinskiy, Osmolodskiy, Vigodskiy, Bolekhivskiy, Solotvinskiy, Vorokhtyanskiy).

To the territories with the most difficult ecological situation belong Galichina (Burshtinska EPS), Kalush (society „Oriana”, joint-stock company „Lukor”), Nadvirnyanskogo (society „Naftokhimik of Prikarpatya”) and Tismenickogo (society „Ivano-frankivskcement”, society „Tismenicya”) districts.

One of the basic ecological problems is the contamination of atmospheric air, superficial and underground waters, and soils.

After the index of extras on 1 apt. km (15 t/km²), the Ivano-Francovsk area occupies a 5 place among the areas of Ukraine which testifies to considerable contamination of atmospheric air. Exceeding of GDK is fixed on the oxide of

carbon, nitric, dust oxide, which are utilized enterprises, which are placed in cities and from the extras of motor transport Basic soil are Burshtinska EPS (80% extras are from the stationary sources of area), VAT of „Ivano-Frankivskcement”, society „Naftokhimik of Pre Carpathian”.

Sharp is a problem of contamination of natural waters, development of erosive processes which are investigation on slopes more than 5%, to absence of the system of anti erosions measures on agricultural lands. To promote fertility of soils utilize the method of mulching, as soils mainly wet, it can be an effective anti erosion measure From mineral fertilizers in the first turn give advantage phosphoric and potassium, and also at their bringing pay a regard to diminishing of sour reaction of soils of Pre Carpathian liming theoretical bases of which till this time stay not enough studied. Hydrolysis acidity of brown forest soils is predetermined eaten up cation of hydrogen. Amount of reverse waters which brush off in the water objects of area in 2007 year makes 862,000,000 m³. Comparatively with a previous year the amount of down faulted in the reservoirs of the not enough cleared flow waters diminished on 4 million m³, due to the improvement of work of cleansing buildings on KP „Ivanofrankivsk vodoekotekhprom”.

The accumulation of industrial and domestic waists is conditioned absence of the system of utilization of industrial waists, by insufficient attention to this problem of organs of executive power and local self-government. The basic creators of waists is Burshtinska EPS is an ash, slag, it was one of most powerful in Ukraine (2,4 millions kW), the first block gave electric power in 1965 year, and in 1969 it is brought into an action all 12 power units; society „ATP-0928”- is hard domestic offcuts; a most chemical industrial complex „Oriana ltd” throws out hexachlorbenzol; society „Naftokhimik of Prikarpatya” – waist of cleansing buildings, lees reservoirs; society „Ivano-frankivskcement”- is hard azbest-cement waists. But exist also and subjects of entrepreneurial activity of, which carry out collection, purveyance of separate waists as the second raw material.

We, estimating an ecological situation which was folded now in the Ivano-Francovsk area, consider a necessity to offer such nature protection measures.

1. To inculcate the system of integral management natural resources on pool principle.
2. To complete forming of regional ecological network and optimization of structure of the naturally protected territories, objects.
3. To inculcate the system of separate collection of hard domestic offcuts and processing of utility waste.
4. To provide development of charts of organization of the the use of land of territories of village soviets and their stage-by-stage realization.
5. To provide defuzing of useless for the use pesticides.
6. Jointly with the organs of executive power and local self-government to provide the proper guard of forest resources.

ECONOMICS AND ECOLOGY

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Economics and ecology are often presented as opposing disciplines. Both fields have strengths and weaknesses. A new transdisciplinary field, ecological economics, attempts to bring together the strengths of both disciplines with a vision for a sustainable future. In this paper, we focus on one particular concept championed by ecological economists, natural capital.

Economics and ecology often receive two different responses from natural resources professionals. Economics, which deals with the allocation of scarce human-made and natural resources, is viewed unfavorably by many who are concerned about effects of society on the environment and natural resources. Ecology, which deals with nature's allocation of scarce resources, is more often viewed in a favorable light. Economics is burdened, in particular, by a misperception that it is synonymous with finance. That is, financial decisions (i.e., profit, the "bottom line", etc.) are confused with the much broader equity and efficiency concerns that provide the theoretical underpinning for economics. For many years, resource economists have addressed natural resource and environmental issues in theory and in practice. The most recent offshoot of these earlier efforts is the newly evolving field of ecological economics (Prugh 1995).

According to Costanza et al. (1997), ecological economics is a transdisciplinary field that focuses on the three linked goals of sustainability, fairness in distribution, and efficiency in allocation. As a result, ecological economists have more interest in a vision of the future, methods for analyzing problems in new ways, and institutions and instruments that are needed to implement this vision. The vision includes recognition that: (1) our planet is essentially a closed system in which our societies are subsystems; (2) a sustainable future exists for all species that is constrained by the global ecosystem; (3) we should be cautious and humble, given the many uncertainties that exist; and (4) our policies must become more proactive, with clearer thought about the interrelationships of the earth's subsystems. Costanza and Daly (1987) noted that neither economists nor ecologists were adequately addressing this vision, and that a new, integrated approach, ecological economics, was required.

The vision is ambitious, and several aspects (e.g., interspecies distribution of wealth and intergenerational equity) may be very difficult to achieve. Nonetheless, we can move forward in other cases. Specifically, a more formal recognition of the role of natural capital and its relationship to sustainability is needed (Prugh 1995). In the case of boreal forests, the stocks and flows of forest resources can be assessed to determine prospects for sustainability. This can be and is being accomplished through the emergence of natural resource accounting. To provide an understanding of how natural resource accounting may be applied to boreal forests, we first review the origin and purpose of natural resource accounting. Then we

summarize several cases in which natural resource accounting has been applied and describe the United Nation's Satellite System for Integrated Environmental and Economic Accounting (SEEA). Finally, we present an example of stocks and flows from Michigan's (United States) boreal forest resources. Natural resource accounting work from Canada, Finland, Norway, and other countries with boreal forests should be examined to provide more insights regarding forest conditions; the major missing data for a circumpolar assessment may be from Russia.

A META-ANALYSIS OF ENVIRONMENTAL KUZNETS CURVE STUDIES

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The environmental Kuznets curve (EKC) is a hypothesized relationship between various indicators of environmental degradation and income per capita. In the early stages of economic growth degradation and pollution increase, but beyond some level of income per capita, which will vary for different indicators, the trend reverses, so that at high income levels economic growth leads to environmental improvement. This implies that the environmental impact indicator is an inverted U-shaped function of income per capita. Typically, the logarithm of the indicator is modelled as a quadratic function of the logarithm of income. An example of an estimated EKC is shown in Figure 1. The EKC is named for Kuznets (1955) who hypothesized that income inequality first rises and then falls as economic development proceeds.

Two alternative theories may explain the observed inverse-U relationship between many pollutants and income. It could be that the natural pattern of economic development involves a transition from subsistence agriculture, which is not pollution intensive, to the more polluting early stages of manufacturing, to less polluting service industries. This is sometimes called the "composition effect." In part, the transition away from polluting industries could be the result of wealthy countries shifting pollution-intensive manufacturing processes to less developed countries. If so, then it will not be possible for all nations to experience improving environmental quality, as the poorest nations will never have poorer ones on which they can dump polluting processes.

Alternatively, it may be that the environmental Kuznets curve is based on two entirely separate relationships. First, many economic activities pollute the environment, and wealthy countries with more polluting activity generate more pollution. This has sometimes been called the "scale effect." Second, environmental quality is a normal good, and wealthier countries' citizens demand more of it in the form of regulations requiring reductions in the amount of pollution per unit of activity pollution intensity.. This has sometimes been called the

“technique effect.” Overall pollution is the product of polluting activity and pollution intensity, and consequently the pollution-income relationship has a theoretically ambiguous shape.

Most commonly, EKC models in two different forms: polynomial terms on the income variable, usually the cubic level or logarithmic regression function:

$$y = \alpha + \beta_1 x + \beta_2 x^2 + \beta_3 x^3 + \gamma z + \varepsilon,$$

$$\ln(y) = \alpha + \beta_1 \ln(x) + \beta_2 \ln(x)^2 + \beta_3 \ln(x)^3 + \gamma z + \varepsilon,$$

where y is the dependent variable representing a measure for environmental quality, x is the income variable, α is the intercept term, the β s are the coefficients on the income terms, z is a vector of other factors that influence y , γ is the coefficient vector of z , and ε is the error term. In practice, y will be the gross level of pollution, or pollution per capita, or pollution density. The income variable can be the aggregate level of Gross Domestic Product (GDP) or GDP per capita, or national income (per capita). The signs of the beta-coefficients determine the relationship between environmental quality degradation and income.

According to the signs of the β coefficients, the environment-income relationship can be categorized into 7 types including: monotonic increasing, monotonic decreasing, inverted U-shape (EKC type), U-shape, N-shaped, insignificance and none. Insignificance means that the estimated β coefficients have consistent signs for an EKC relationship, but the results are not statistically significant. None refers to a situation where no relationship can be inferred. Based on examination of the final impact to the environment, these seven types of environment-income relationship can be collapsed into two groups: environmental quality worsens and environmental quality improves. Specifically, improve means that the environmental quality indicator eventually shows an improvement with continuing economic growth. Improvements are demonstrated by monotonic decreasing and inverted-U scenarios. Worsen refers to cases where economic growth will aggravate environment degradation. It includes monotonic increasing, U-shape and N-shape cases.

ECOLOGICALLY-ECONOMIC EXPENSE RESULTING THE WASTE HOUSING

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Under the circumstances of Ukraine’s integration into the world market one can observe the increase of the interest of the economic activity subjects towards the creation of the well-organized control system over the keeping of the ecological demands, as the failure of laws and rules may become a ground for reasonable expenses.

Under the economic damage which is the result of the natural breaking one should understand actual and possible expenses, realized in a price form which were done concerning the economic subjects as the result of the eco-destructive influence. Here one should include as well additional expenses upon the loss compensation.

Ecologically economic expense is the expenses of the economic subjects depending on the breaking of the natural system (expenses and additional expenses upon their prevention).

The rate of the economic expenses goes back to the definition of three main constituted: lost, underdone and compensatory. They use two more definitions in economic account: the possible and the prevented expenses. The possible or expected expense is the conventionally theoretical sign of the loss that is expected in future. The prevented expense is summarized by means of the eliminated expense quantity which really had place due to the realization of the cleaning measures. The figures of the ecologically economic results give an opportunity to estimate the profit of different measures, connected with the improvement of the atmosphere quality, energy and material saving, transport stream optimization.

In a real life 60% - 90% of the economic expenses resulting the natural breaking is realized beyond the walls of the polluting factories. A great part of the nature breaking expenses is composed by externals – these are the expenses created by the activity of one economic subject, but accepted by other subjects (adjacent factories, local inhabitants, local and central government).

There were done attempts to solve the problem of planning and calculation of expenses and housing the factories waste by the Ukrainian scientists in the middle of 80-s – at the beginning of 90-s. Such scientists as Demina T.A., Balats`kyj O.F., Melnyk L.G. studied this problem.

As the general rule of payment (taxing), so the norms of payment (taxing) are registered by the decree of the Cabinet of Ministers of Ukraine of 1.03.1999 № 303, the details are mentioned in the instruction of the Ministry of the Ecologic Security and the Financial Ministry of 19.07.1999 № 162/379 (the norms of taxing correlated by the decree of the Cabinet of Ministers of Ukraine № 402 of 28.03.2003). According to the decree of the Cabinet of Ministers of Ukraine of 21.07.2005 № 626 the norms of payment for the pollution of the surrounding nature were increased 2.373 times in 2006 in comparison with the norms of 2004. The total payment for the pollution of the surrounding nature must be personally paid by the payer every quarter of the year, taking into consideration the following things: actual quantity of exhaust, norms of payment and taxing, correcting coefficient.

In 2003 in Ukraine the rate of the ecological payment for outlet, emission, housing of the waste within the fixed limits was 234 mln. grn.; the rate of the payment for outlet, emission, housing of the waste above the fixed limits was 26 mln. grn.

Let's observe the expenses on housing of the waste and the limits of the harmful substances outlet into the atmosphere by BAT "Sumychimprom". It was planned to spend 200,000 grn. upon housing of the waste in 2003.

Table 1 – The Calculation of the Payment for the Outlet of the Harmful Substances into the Atmosphere in 2001 by the Stationary Sources of BAT "Sumychimprom"

Name of the Polluting Element	Outlet Limits, tn	Actual Size of Outlet, tn	Norms of Payment for Outlet, grn tn	Correcting Coefficient Sum of Payment	Calculated within the Limit, grn
Dioxide Nitrogen	329,046	204,284	53	1,6875	18270,65
Amianth	399,893	93,381	10	1,6875	1575,8
Sulfurous Anhydride	2959,25	1526,718	53	1,6875	136545,84
Carbon Oxide	514,878	21,45	2	1,6875	72,39
Carbonic Elements	52,353	10394	3	1,6875	52,62
Gas Fluorine Epolupes	34,771	5,642	132	1,6875	1256,75
Solid Materials	708,543	689,128	2	1,6875	2325,81
Ozone	0,026	0,001	53	1,6875	0,09
Carbon Sulfide	1,400	1,400	171	1,6875	403,98
Formaldehyde	0,090	0,005	132	1,6875	1,14
Sulfuric Acid	244,939	184,137	87	1,6875	27033,61
The Sum	X	X	X	X	187538,68

As you can see from the table 1, the planned limits of outlet for 2001 were much lower than it turned out in reality. Moreover, the actual outlet of the harmful elements into the atmosphere by the stationary sources was much lower than the one that was predicted. As the result the general predicted sum of payment for the pollution of the atmosphere by the stationary sources in 2001 was 1.85 times (158314.89 grn) higher than the real figure of this payment.

Ecologically economic expense must compensate not only the negative results of the influence upon the environment, but also guarantee the further development and regeneration of its state, i.e. guarantee that in future the environment will get the previous state without negative after-effects, and it wont bring any harm to the inhabitants. The compensation is only a temporary repaying of the environmental breaking that doesn't necessarily lead to the previous state. So the absolute liquidation of the dangerous factors of influence upon the environment is badly needed, but it depends on its development without obstructions that requires money.

ENVIRONMENTAL EXPENSES MANAGEMENT AT INDUSTRIAL ENTERPRISES

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The services of environmental protection enterprises are of special actuality in Ukraine, chiefly in the fields considered as industrial giants which are therefore the main natural resources consumers and the environmental degradation sources.

After the State Statistics Committee data, approximately 180 000 ha. of land are allotted for householding and industrial litter utilization. Though, nobody knows the precise number. By approximate calculations, today there are nearly 4 thousand dumps to say nothing of the local ones, that are in many cases unregistered and utilized with the law violation.

At the same time, a high level of involving secondary energy resources into industrial process is stated by statistics.

Thus, among the tasks of modern accountancy the following problems have acquired special urgency:

- 1) the methods of accounting the environmental accounting objects
- 2) the true and complete assets profit chain presentation after their industrial transformation
- 3) the creation of accounting documentation packet for the enterprises creating and using environmental accounting objects in accordance to environmental and taxation laws

The indication of environmental accounting objects grouping is the industry they belong to and the direction of their economic activity. Thus, depending on their environmental effect industrial enterprises may be divided into those creating negative conditions for environment and those directing their activity towards the negative effect minimization through the special technologies application and ecological balance renovation. So, any enterprise will have environmental accounting objects group in accordance to the chosen enterprise specialization.

Natural resources are of interest for the environmental accounting in terms of the application volume ratio, their interchangeability, application efficiency, the degree of effect on environmental structure. Therefore, it's necessary to define the following:

1. Natural resources used at the enterprise may be exhaustible and inexhaustible. In case of exhaustible resources utilization it's necessary to define the dynamics and ratio of the resource volume and sources decrease and the raise of prices for the natural resource used.

2. The position of the natural resource in the technological process; the alternative resource to substitute the given one without the final product quality decrease. In case that the natural resource is a raw material for the product, some recycled waste, inexhaustible natural resources, new types of energy, new

technologies should be found to raise the resource utilization useful result with natural resource expense reduction.

3. The determining the current expenses and profit of the application natural resources and measures to reduce their utilization, and the determining profit trends in comparison in case that these substitution has not taken place.

The inexhaustible resources utilization accounting peculiarity is their absence on the balance of the enterprise; the profitability of their involving in production process; the dependence of this natural resource economic value on the facilities technical capabilities; the absence of the accounting procedure of its incoming and outcoming as a stock (depending on whether it is used as fuel or raw material).

The regulation of exhaustible natural resources utilization in production process and the creation of tax regime for stimulation of intensive natural resources utilization and the restriction of some kinds of natural resources excavation are regulated with some correspondent legislative acts and displayed in tax and accounting state documents.

Besides the payments for environmental pollution, the environmental expenses of an enterprise are represented in financing a number of environmental protection measures, defined in the Decision of the Cabinet of Ministers in Ukraine "About the Statement the List of Activities Subjected to Environmental Protection Measures" of September, 17, 1996 N1147. The main purpose of environmental protection measures is the reduction of the economic activity negative effect on environment, i.e. water resources protection and efficient use, air protection; land, mineral resources, vegetable and animal resources protection and efficient use; forest reserves protection, industrial and householding wastes efficient use and storing; nuclear and radiation safety. The analysis of expenses and incomes of environmental accounting objects introduction into the economic activity is based on accounting documents. The documentation basis for assets circulation presentation at industrial enterprises has already been developed; as to the ecological enterprises, the specific of their operation is not completely presented in accounting documents.

Thus, it is necessary to improve the methods of accounting registration the operations on environmental accounting objects circulation for every enterprise on the basis of the dynamic laws and taking into consideration the enterprises' specific characters. The methods application efficiency depends on the state of accounting process at the enterprise.

A TYPICAL BUSINESS-PROCESS MODEL FOR A WASTEWATER TREATMENT PLANT

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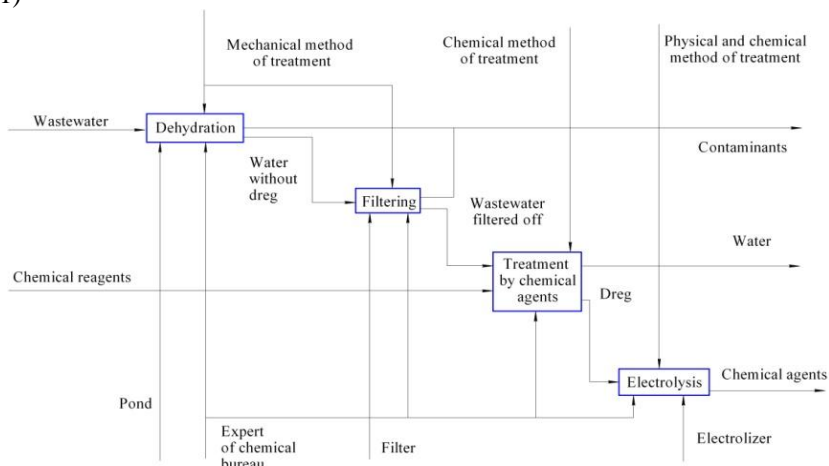
The protection of the water source against the exhaustion, pollution and their conservation for the national economy's needs – is one of the most important problems, that demand the immediate decision. The urgency of the creation of the system of the effective management by the wastewater treatment plants is caused by.

The most Ukrainian plants, particularly engaging in the wastewater treatment, have the functional structure of the management, that leads to the disinterestedness of the building blocks in the end, the multiple increase in the duration of the works' execution, the increase in the nonproductive outlays and the deterioration of the quality of the supplied goods and services.

As the functional method has a number of disadvantages, so the problem of the organization of the process method is appeared. The works of V.V.Repin, V.G.Eliferov, V.A.Ivlev and others are dedicated to the questions of the organization of the process method in the CIS countries.

The technological processes and the high-performance methods of the wastewater treatment have been analyzed with the purpose of solving this problem.

The methodology IDEF0 was chosen to describe the business-processes. Here the modelling of the processes begins with the construction of the so-called context-dependent diagram, that describes the plant's work or the process as whole (pic.1)



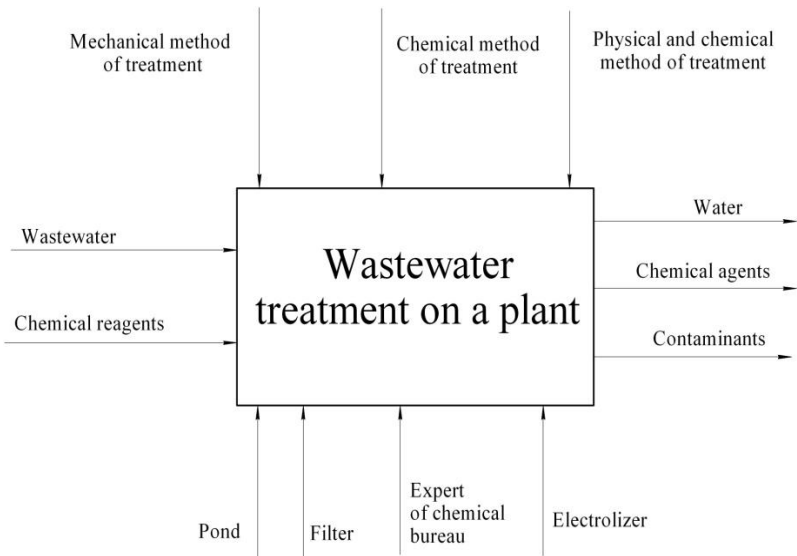
Picture 1 – The context-dependent diagram of the process of the wastewater treatment on plant

Only one block, representing the function and the most important entries and exits, the mechanisms, necessary for the work, and also the managing effects, is represented on the context-dependent diagram. Then the process is divided into the smaller subprocesses and so on, to the set level of the detailed elaboration.

The division of the business-process into the following subprocesses:dehydration, filtering, treatment by chemical agents and electrolysis, have been done in accordance with the principles of the technological process of the wastewater treatment.

After this, the internal interfaces of the entry, exit, control and mechanism for every subprocess were determined, and the obtained interfaces were connected with the subprocesses of the business-process of the wastewater treatment on plant.

As the stage of the treatment by chemical agents is the most important, laborious and effective while carrying out the wastewater treatment on plant, so at the next step the works' order, carrying out in the process of the treatment of the wastewater filtered by the chemical reagents, were determined in accordance with the technology of the chemical method of treatment. The diagram, corresponding to the present process, is represented on the pic.2



Picture 2 – The diagram of the decomposition of the process of the wastewater treatment on plant

As a result of the conducted investigations a typical business-processes model for a wastewater treatment plants was made, the interfaces of the entry, exit, control and mechanism were described.

ESTABLISHMENT OF BUDGETING AT THE ENTERPRISES

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Company without budgeting can be compared with tourists without a compass. In modern economy conditions budgeting is not just a system showing the level of business processes organization.

Budget is the key instrument of management process. Today almost all companies either commercial or not for profit prepare budgets.

Budget is the process of production and financial planning of future company's operations. Unlike accounting forms (i.e. balance sheets and profit and loss statements) budgets reflect the forecast of the enterprise's future activity for the period according to its strategy. When the results are achieved we can estimate the level of the goal achievement and make the decision on the necessity of the correction.

So the budget is the complex of interlinked balanced plans of the enterprise and its divisions in natural and monetary items which unites financial and investment activities of the enterprise and which allows to compare the cost and the result got in different intermediate periods and for whole period.

Moreover budgeting serves as the instrument of the enterprise's strategy realization. It allows to adjust strategic company goals with tactical plans of their achievement and supports the implementation of these plans connecting them to the operative processes.

Budgets allow to save for main managements tasks:

- 1) Setting objectives for the nearest and long-term prospective
- 2) Coordination of the company' work and making it transparent
- 3) Deviation management and control
- 4) Personnel motivation

The process of budgeting can be divided into two parts which are the preparation of operational and financial budgets.

Operational budget includes sales budget, purchase budget, direct material cost budget, overheads budget, direct labour cost budget, sales expense budget and administrative expense budget, profit and loss statement budget.

Financial budget is the plan which reflects the sources of funds and directions of their use. Financial budget includes investment and credit budgets, cash flow budget and balance sheet budget.

The methods of budget preparation are the following.

Traditional method of the budget preparation is based on the previous period activity with some corrections caused by the change of some factors which are expected to effect the enterprise's activity in the next period.

Zero based budgeting means the preparation of budget without any using of the previous data. It is often used for new enterprises or expending the company's capacities.

Activity-based budgeting means preparation of budgets for the key activities.

In practise it is preferably to combine these methods.

Sometimes fact level of the capacity use does not equal the planned one so the estimation of current and planned results can be incorrect.

One of the ways of settling this problem is using flexible budgets where planned revenue and expenses are recalculated for the current volume achieved during the period. The difference between the current value and the value foreseen in the budget is the deviation. The deviations calculated in such a way give us more valuable information than deviation calculated using statistic budget. Using the results of deviations analysis helps managers in planning and control of operating activity.

The process of budgeting establishment at the enterprise starts with analysis of its organisational structure. Analysis of the organisational structure of the organisation allows to point the centers of financial responsibility which will not necessarily correspond its hierarchical structure. Then we should chose a person from each centre who will be responsible for preparation, timely presentation and execution of budget. We should also chose the coordinator whose liabilities will include the following:

- 1) taking all budgets together into the main budget;
- 2) its approval by management;
- 3) informing responsible persons with the last approved numbers;
- 4) organizing meetings on the budget policy of the enterprise.

Generally budget coordinator is the financial manager.

Then the participants of the budgeting process discuss the implemented system of budgeting together. This should be reflected in the budgeting standard. The budgeting standard is the document where the following items are pointed being approved by all participants:

- 1) order of preparation and terms of presentation of budget to the coordinator;
- 2) terms and procedure of budget approval;
- 3) scheme of deviation analysis;
- 4) the order organizing planned and unplanned meetings.

The standard of budgeting may have some changes if necessary which should be approved by all the participants of the budgeting process i.e. the budget committee.

Then each person responsible for budgeting of his department instructs the department regarding using new or previously used reporting forms, terms of their preparation and analysis if it is necessary.

Next step is defining the list and the content of budgeting reports, frequency and form of their presentation according to peculiarities of business. For example,

information on the bank cash balance is an every day need while it is enough to control raw material consumption once a week. The budgets will differ by their form. For instance purchasing department should prepare budgets both in natural and monetary items and chief of the production department will present the information in natural items only.

When all the forms and terms of budget preparation and analysis are agreed in accordance with business processes we start to implement software for fastening and making budget process reliable and transparent.

So the above measures lead to the enterprise process of budgeting.

The starting point is the sales budget, according to which the production budget is developed then the budget of material purchase is created, then we prepare sales and administrative expense budget. As the result the profit value is got.

The data of the profit and loss statement, starting balance sheet and capital cost budget allow to prepare the most necessary budget cash flow.

Quite another process takes place in service organisations. Their budgets do not contain so big material cost element as production ones.

Their budget can be prepared in the following way. At first the sales value is forecasted. Then all cost of the order which can be classified as direct expense for this order either fixed or variable are deducted.

Now we get the amount of the contribution margin but not in its traditional meaning (i.e. it is not the difference between the sales and variable costs). This contribution margin will be close to EBITDA (earnings before interest and tax, depreciation and amortisation).

This contribution margin should cover about 30% of fixed salary which is one of the biggest expense articles in service firms. Then about 30% of fixed office costs like rent and telephone expense.

With 20% of the contribution margin good managers try to cover expense for the company and its personnel development.

And if they were lucky in this reporting period their dividends should be the rest 20% of the contribution margin.

Today budgeting becomes an important instrument of enterprise strategy implementation by business processes coordination and effectiveness rise.

INTEGRATED ASSESSMENT OF ECOLOGICAL AND ECONOMICAL EFFICIENCY OF FUEL-ENERGY VERTICAL AND HORIZONTAL MERGED COMPANIES

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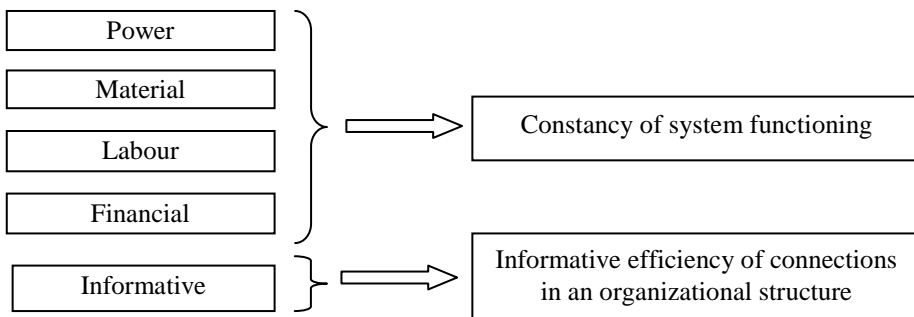
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Determination of efficiency of merging processes, also in industries of fuel and energy complex, is a complicated methodological and practical problem.

Steady development of any enterprise, in particular power, is necessary to examine on the basis of methodology of the systems.

Both suppliers and users of all types of resources and eventual products have a strong influence on functioning of any enterprise, including power. Every organizational structure which functions in the conditions of market can be presented as an open system, which is determined by principles of marketing and logistic. Thus, at the market or in his segment, an enterprise is under an obligation not only to win the consumer, but also form the system of relations between partners on the chain of transformation of the resources.

Strategy of market development in any economic system must be built foremost on the basis of positive tendencies of macroeconomic changes, providing of the permanent state and after it the deepening of relations of markets is possible. For providing of these terms the process of optimization of separate constituents of the system is needed. Functioning of the optimum system is accompanied achieving a minimum of its generalized power, material, labour, financial and informative descriptions. The first four descriptions testify to constancy, and last - fifth, about informative efficiency of connections in an organizational structure (pic.1).



Picture 1 – Description of the optimum functioning of the system

Presently division of resources at all levels of management is possible to consider far ineffective. High charges of transactions in the conditions of incompleteness of markets and vagueness of information give the ineffective division of resources in Ukrainian economy. The division of resources is the functioning of material, informative, financial, money streams in the different types of the systems.

System of pricing, built on the basis of methods of highly developed countries, can not adequately take into account the feature of development in Ukraine. In addition, such methods were created in relation to stable economies.

On the basis of theory of analysis of the systems and by methodology and tool of marketing and logistic an exit from a socio-economic crisis must be related to the change of strategy of companies. It is necessary to change not only the state of the system but also its management. Presently it is possible at the waiver of paradigm of maximization of profits and income and passing to the paradigm of steady development of companies on the protracted period time. A theory and practice show that a problem can not be solved without the construction of mechanisms which provide steady development. Such approach is applicable to all companies, including power enterprises.

In general case constancy of functioning of the system - is the generalized concept which is determined the large group of factors. The loss of constancy can take place on different factors. Basic from which followings: situations of crises; unforeseen at planning external and internal actions; consequences of restructuring.

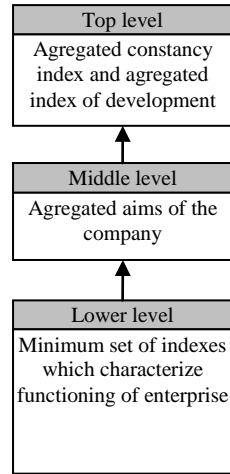
Structural approach of steady development of power enterprise is assumed by the construction the mechanisms of redistribution the resources and providing of steady development of the production economic system on the basis of choice functions. The choice function will convert the plural of alternatives in the plural of rational decisions.

A rational compromise is determined by principles of optimum set at top level of management. It is necessary and enough to select three levels of management.

At lower level the minimum set of indexes is formed which determines only most essential for the power enterprise description of his functioning.

At middle level - the strategic aims of this enterprise are aggregated, and at the top level - the index of constancy is aggregated and the index of development is aggregated.

The multilevel system develops certain intervals-stages on which the correction of relations is carried out between power enterprises, and also between power enterprises and users of energy, and their function of choice will be realized by concrete mechanisms (pic.2).



Picture 2 - Levels of management on the power enterprise

ECOLOGICAL AUDIT

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Ecological audit - is the designed systematic independent process of evaluation of the object of ecological audit documentarily, that includes collection and objective evaluation of proofs for establishing how the definite types of activity, measures, terms, systems of management by the natural environment and information on these questions to the require the legislation of Ukraine about the natural environment preserve and other criteria of ecological audit. Criteria of ecological audit include the active nature protection law of Ukraine the standards of series DSTU ISO 14000, normative acts of the Central organ on the problems of dwelling-municipal economy, local regulations, ecological programs practical experience of ecological audit and perfection of the system of it. Proofs CEA: Positive:

- active ecological position and activity of city public organizations: «MAMA-86», Nizhyn ecological youth organization - «NEMO», «Green peace », educational establishments; existence of infrastructure of ecological cooperation of the city management system with the city public;
- active ecological position of city chairman consulter and the Chairmen of municipal counsel of environment protection in Ukraine; existence of public management by ecological education in Nizhyn and Nizhyn district. an organizational cell - organization «NEMO», which includes the enthusiasts of ecological motion from the city and district educational departments, school teachers of schools, pupils and students;
- active ecological position of local press, especially the « Nizhyn announcer» newspaper; the absence of the municipal river system of taking out water from the Oster river;
- not overloading of power of cleansing building by flow waters;
- the existence of four rubbish receivers, where the wastes are separated;
- the use of local nature protection funds on purpose of improvement of the hydrological state of the Oster river, green planting works, channel building in the places of over watering . Negative:
- weak, episodic coordination of cooperation of three levels of city ecological management: administrative and enterprise department; the absence of city sewage network, that results in the casting of muddy waters from central part of town, other embankment and town market in the Oster river;
- belonging of Nizhyn to the Chernobyl area, high death rate of population; the necessity in the capital reconstruction of the Nizhyn running water networks which has been functioning from 1928.;

- the emergency state of cleansing building of constructions ;castings of polluted waters in the system municipal sewage system by the local enterprises 10 mild exceeding of norms, that results in perishing active to the silt on cleansing building;

Conclusions CEA:

1. In Nizhyn the city administration and public organizations are taking measures in improvement of the ecological state and making of water objects healthy; however they don't require to the demographic situation and state of objects of life-support that were actually exists in a town.
2. The legal and economic problems of water-supply and overflow-pipe in the town are unsettled.
3. Cleansing building of Nizhyn are overloaded during the rush hours of work of sewage system by rain flows and polluted waters of separate enterprises.
- 4 Ecological situation within the bounds of town territory should be estimated the ecological state of the Oster so that it doesn't meet the requirement of nature protection legislation and Water code of Ukraine.
- 5 There is no systematic ecological control in the town. Monitoring of flow waters is not carried out. The system of state ecological approvals operates, but ineffective.

EFFICIENCY OF INTEGRATION PROCESSES IS IN THE CONDITIONS OF CROSS-CULTURAL INTERACTION

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Today globalization, internationalization and integration processes engross the whole world. More and more enterprises do business under the circumstances of multinational medium. In so doing the main thrust in the sphere of global competitiveness move forward culture, values and spirit sphere, not forward matter sphere. That is why international competitiveness of countries first of all is connected with strong positions of national cultures in the world market and with providing of effective international relations in the conditions of cross-cultural interactions. Knowledge of specific of the cultural systems forms the special competence of the firm, brings new competitive edges, and that is why substantially promotes efficiency of cooperation with a foreign partner. It is important to understand culture differences not as a threat or obstacle of effective economic cooperation.

Our researches confirm a hypothesis about the tendency of increase of international economic relations efficiency in direction of increase of culture distance. Therefore an ability to consider cultural differences as resource is more expedient economically today. It can be attained, if to understand the culture as

variety of the general culture conditioned knowledge according to cognitive conception.

The analysis of business and organizational cultures features of the foreign business-partners allows not only to feel you more confidently among the extraordinary variety of cultures but also to extend possibilities to exchange culture conditioned knowledge.

As far as Ukraine is the member of numerous international economic organizations, including The WTO, it is very important for our country to create the mechanism of effective cross-cultural co-operation. Today the interaction of different cultures must become the vector of international economic relations development. Researches, that we have carried out in order to define the place and specificity of existence of Ukrainian business structures in the general system of international economic relations, confirm that Ukrainian economy aspire to become more opened.

The ethnometric model of the scientist Geert Hofstede became the base for analysis. His model is based on the determination of 5 cultural dimensions: power distance (PDI), uncertainty avoidance (UAI), individualism/collectivism (IND), masculinity/femininity (MAS), long-term orientation (LTO). We have carried out the researches based on G. Hofstede's methodic in Ukraine. As the result we have got the following numerical parameters of these indexes: PDI – 78; UAI – 93; IND – 30; MAS – 54; LTO – 40 points.

We used both the obtained for Ukraine data and numerical parameters of Hofstede's indexes for other countries in order to carry out comparative analysis of domestic culture and cultures of other countries (we used the formula of average geometrical of cultural dimensions). Thus we counted the parameter of culture distance.

Calculations showed that cultures of such countries as Romania, Bulgaria, Russian federation, Greece, Poland, Portugal, Spain, France and Czech Republic are near to our one. Denmark, Ireland, Sweden, Austria, Great Britain, Finland, Israel, Switzerland, The USA are countries with cultures that differ from our one considerably.

If to consider results from a position cognitive conception of culture in international economic relations, the statement that for Ukraine from point of international cooperation countries with cultures that differ from our one are more interesting must be true. The results of our researches in the sphere of search of interrelation between the indexes of economic collaboration and indexes of culture distance confirm correctness of cognitive conception.

There are the values of coefficients of correlation (K_{cor}), which were calculated for the followings arrays of data for 2007: 1) volume of export-import operations – culture distance: $K_{cor} = -0,07$; 2) Ukrainian Diaspora – culture distance: $K_{cor} = -0,32$; 3) volume of direct foreign investments – culture distance: $K_{cor} = 0,35$; 4) joint ventures – culture distance: $K_{cor} = 0,11$.

Positive value of K_{cor} for such arrays of data, as an amount of joint ventures – culture distance and volume of direct foreign investments – culture distance confirms cognitive conception, because the direct foreign investing and creation of joint

ventures provides the direct co-operating with a foreign partner, and therefore potential exchange of knowledge, norms, values, experience and so on.

Export-import operations foresee the short-term co-operating with a foreign partner during a negotiation process. It also makes possible to exchange the culture conditioned knowledge, but not in such volume, as during investment activity or creation of joint ventures. What is about the index of Diaspora Ukrainian people do not go abroad in order to exchange the culture conditioned knowledge. Negative value of K_{cor} for the proper arrays of data confirms this fact.

However today in the conditions of intensive development of knowledge economy we can prognoses the change of dependence between export-import operations and index of distance of cultures toward a positive value. Country-importer is interested in goods which include the features of national culture of the trade partner-country. While buying these goods one can both use its functional features and receive unique knowledge, which are included with its cultural component.

Our research allow to define the vector of efficiency of our country's future international contacts, that is in collaboration with which countries it is necessary to turn the special attention on establishment of effective economic relations in the conditions of intercultural co-operations. We also can develop suggestions about the change of export policy accents of our country in the direction of saturation of domestic goods by the cultural component.

ECOLOGICAL DEBT OF OIL & GAS IN AFRICA

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INTRODUCTION: The exploitation of oil and gas in Africa is one of the most important causes of external indebtedness. It is a story of pollution, displacement and spillage. An oil well is a death sentence if it is located in your backyard. Every destruction action attracts a debt. The exploration, extraction, transport, refining and consumption of oil are causing impacts at the local, national and global level which put at risk the survival of populations, due to the destruction of ecosystems, the de-capitalisation of national economics and the changes in the climate. The revenue accruing from oil and gas exploitation is certainly huge. The problem is that they do not translate to positive change in the nations of Africa.

In **NIGERIA** the oilfield began production in 2003 and it has recover oil deposit of over 600 million barrels. Cases abound where rivers are not only polluted but are also set on fire in a bid to conceal evidence of crude oil spillage.

Exploration/Prospecting: This phase of oil business is marked by seismic activities that involve the use of dynamites and other explosives. These explosives

have direct impact on the aquatic stocks in the area as well as the fauna. Other side effects are noted in diminished food supplies, increased cases of hypertension and endocrine imbalance. The ultimate impact is on the fish supply on which the economy of the local people hangs.

Exploitation & Transportation: Oil spills, pipeline explosions and resultant conflicts mark the exploitation and transportation stages. Pipelines are routinely left to rust and rupture before efforts are made to replace them. Natural remediation may take generations to return the environment to its natural state.

ANGOLA is a prime example of a richly endowed nation that has found her riches a curse rather than a blessing. It is remarkable to note that because crude oil here is produced offshore the production pace has remained high. Fuels accounted for 94.8 per cent of national exports by value in 1991. The total annual output of crude petroleum in 1998 was 268 million barrels per year.

In **SOUTH AFRICA** the most worrisome problems here relate to highly polluting refineries. The health issues related to these refineries are constant challenges. More recently petrol pipelines in South Durban have been springing leaks of alarming proportions. In a recent leak, up to 71,000 litres of petrol was recovered from groundwater after the spill.

Livelihood Challenges: Time is long past when oil communities rejoiced at the announcement of crude oil finds in their territories. Today they receive such announcements with trepidation.

(1.) Lack of fisheries study. The people see fisheries as a strategic resource of livelihood of the inhabitants of the coastal areas of the project.

(2.) Unacceptable low level of attention paid to the coastal vegetation and soils that they see as ultimate points of impact when spills occur.

Burning Gas: The people in most oil communities in Nigeria live with gas stacks that flare gas 24 hours a day at temperatures of 13-14,000 degrees Celsius. These gas flares produce 35 million tons of CO₂ and 12 million tons of methane, more than the rest of the world. This makes the oil industry in Nigeria one of the biggest source of global warming in the world.

Gas & Flares: Indiscriminate gas flaring has been the lot of the people of the Niger Delta for about 40 years now. The effect of gas flaring has been dramatic: continual noise, acid rain and retarded crop yield, corroded roofs and lung diseases. Nigerians have been told that the various facilities and projects such as the proposed West African Gas project would greatly reduce gas flaring. The way this would be achieved has not been transparently presented to the people.

CONCLUSION: Oil and gas extraction has been done with little or no environmental mitigation provisions. The question is, what will it take to return the environment to its natural state? The economic matrix must allow for these before profits can be declared. The environmental costs are evidently discounted from the accounting books. These unbalanced balance sheets need to be revisited. Today's world is interconnected and interdependent. Diamonds in Sierra Leone, oil in the Niger Delta and Sudan, diverse minerals in the DRC, etc. In responding to

the symptoms the West often waives these conflicts off as "African problems that require African solutions". That must be seen as true in a certain sense. "The history of externally driven solutions has not delivered durable peace on the continent."

(1.) Loss of species, destruction of habitats, environmental dislocations, impoverishment of whole people groups, and subjugation for profit all constitute ecological debt.

(2.) Exportation of global warming through fossil fuel consumption adds to this debt.

(3.) Alternative energy sources must be developed and popularised to reduce the ever-increasing ecological debt.

(4.) Ecological debt is a debt long overlooked. It is time for international negotiation processes and dialogue on this massive debt owed.

(5.) There must be a moratorium for say ten years on all new oil exploration while a massive environmental audit is carried out in all existing oil/gas fields. The audit will reveal what actions need to be taken to restore our devastated environments. It will also show components of what debt needs to be addressed

THE MECHANISM OF FAVOURABLE FINANCIAL-CREDIT SUPPORT OF INNOVATIVE ORIENTED SMALL AND MIDDLE BUSINESS AS A SOURCE OF SUSTAINABLE DEVELOPMENT OF UKRAINE

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In contradistinction to leading industrially advanced countries (IACs – G7, EU) Ukraine almost is free of "sustainable development-growth" attributes (high innovating inherently). One of the main reasons is the longstanding unsatisfactory development of small and middle business, particularly innovating-oriented (scientific-) industrial business (IOI-SMB). It can be proved by (on the base of) the following comparative express analysis (for 2005-2007 years) (benchmarking study) of USA (a), EU (b), Ukraine (c). The number of SMB enterprises (units per 1000 person) is: a) 74; b) 35-70, average number is 45; c) 6-8. The share of SMB in GDP, %: a) and b) 50-60; c) 11-12. GDP per one person (thous.\$ per one person): a) 40-44; b) 30-33; c) 1,9 -2,4. The unemployment, %: a) 4-6; b) 8-10; c) up to 20-25 (including permanent and seasonal workers abroad). The share of "middle class", %: a) and b) 50-70; c) 10. The share of innovative product in gross industry output, GDP, %: a) 78, more 50; b) 60, more 50; c) 6-7, 5-7. The share of intensive (innovative) factors in + Δ 1% GDP, %: a) and b) 60-90; c) 0,5-1. The level (%) of technological pollution per average area unit of the country (Ukraine =100): a) 15; b) 30-35. The cumulative ecological-economic loss in the economy

(%GDP) is: a) and b) 3-4; c) 15-20 (one of the highest loss level in the world, maybe the highest level). The life expectancy (years) and the trend in population: a) and b) 75-85, increase; c) 66-67, decrease. In a great contradistinction to IACs, there is the lack of enough loyal sources of financing in Ukraine, which is the main deterrent of SMB (at first IOI-SMB). The matter is that bank credits, particularly investment credit, are hardly available. The preferential financial-credit support of the government (as a part of appropriate programs) and big business almost is absent during existent needs. And also Ukrainian venture big business that almost in whole finances low-risk projects in building and real estate sphere and is not venture at classical (west science) understanding doesn't give a financial support of high-risk innovative projects. Besides the venture funds system isn't high developed. The funds with government's share are absent. The work of the Ukrainian state innovative company (USIC formed on the ex-state innovative fund of Ukraine) is burokrated. Workers of USIC are not interested in the efficiency of the one, that's why the USIC work isn't widely public, is very limited and effective, etc. That's why, it is appropriately that Ukrainian IOI-SMB still remains just like a large unsatisfactorily involved reserve of "innovative sustainable developing-growth".

Taking into account all marked points, to activate the development of IOI-SMB (base SMB) and all Ukraine in the "sustainable" direction is widely-complex effective and that's why expedient to enlarge the activity of "Mechanism of favourable state finance and credit support of projects and development of IOI-SMB" (farther – Mechanism) on a base of already existent government organizations of USIC and state banks (Ukreksimbank, Oschadbank). It consists of USIC (the experience of project examinations) and state bank syndicate (farther – Syndicate, for syndicating of credit risks) with Ukreksimbankom (one of the best banks of country) as leading manager (the experience of crediting). The basic task of Mechanism is more loyal and favourable crediting than free market (commercial banks and so on). It expects using state money to finance investment-innovative projects in the IOI-SMB area, which were declared and selected (by USIC and Ukreksimbank together). Such projects have to be in keeping with "Priority directions of innovative activity in Ukraine" (and with national, particular branch or regional development programs), which take into account the basic innovative country and regions necessities and lie inplane with the "innovative sustainable development-growth". To strengthen the commercial interest of Syndicate in more effective and more active using state money it is expedient to turn a considerable part or all percents from allotted and returned credits to the capitalization of state banks of Syndicate (to increase the credit potential of the state), and the rest (capital amounts) will go back to the original source (the state budget). Such organization of Mechanism will level the foregoing basic defects of USIC and will improve considerably: efficiency of the state facilities selected in support "Priorities directions of innovative activity in Ukraine"; activity and efficiency of IOP-SMB development and development of "innovative sustainable growth of development" in Ukraine. Basic and fully sufficient after the power and duration

source of Mechanism tasks and activity financing is: total additional charge by the proprietors of illegally private state enterprises (about 3 thousands – information given by General prosecution of Ukraine for 2005 year) to the state budget (to the fair market value) for 5-10 years term in not one milliard.\$ per year. The considerable part of charge will be sent at financing widely publicly useful Mechanism activity; plus small part in the projects credits of Syndicate bank facilities (for strengthening of responsibility and use efficiency of provided budgetary funds). Taking into account "not payment" for the state budget of the indicated ("short-paid") facilities, the cost of credits for their mean can be set at privilege-favourable (for active and effective development of IOP-SMB and its projects) level. At medium- and long-term prospect the proprietors of the noted enterprises only win from the indicated application of over-paid for them facilities– due to the considerable and complex improvement of the national economy development-growth.

Conclusions: The innovative-oriented small and middle business in Ukraine is very powerful source of " sustainable development", but it is only potential source. Offered Mechanism of favourable credit support for such business is the effective mean of considerable actualization in Ukraine all just indicated.

ECOLOGICAL SITUATION IN THE AREA OF BLACK SEA & SEA OF AZOV

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The Black Sea and the Sea of Azov are inland seas connected to the small Sea of Marmora (= Marmara Sea) by the narrow (750m) and shallow (min. depth 32m) Bosphorus Strait; Strait of Dardanelles further connects Sea of Marmora (= Marmara Sea) to Mediterranean Sea.

The main polluting components of the sea environment are petroleum products. A constant level of the petroleum content in the sea water is caused by the operations of industrial enterprises, ports, discharges of waste during bunkering, and by sewage discharged by municipal services into the rivers flowing into the sea, etc.

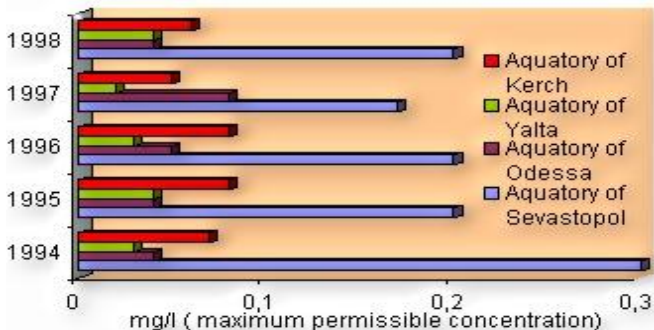
In accordance with monitoring results obtained by the State Inspection for protection of the Black Sea, and data from research expeditions of the Ukrainian Research Centre of Marine Ecology, the content of petroleum products in the open parts of the Black Sea surface layers generally does not reach the permissible level (0.05 mg/l). The coastal water area of Greater Yalta is the cleanest with a presence of petroleum products in the samples of 0.02 mg/l.

Many ports of Ukraine experience a slightly increased concentration of petroleum products. Thus, water samples taken in many points around the port area

of Odesa, Illitchivsk and Kerch in many cases show a content of petroleum products reaching the permissible pollution level or even exceeding it by as much as 50%.

In general, the monitored coastal regions in 1998 display a trend of stabilization of petroleum product pollution on a certain level below the permissible level with a slight increase in the Kerch area.

Petroleum product content (mg/l) in sea water samples from the major regions of the Black Sea.



The pollution of the Black Sea areas by synthetic surfactants (surface active substances) remains low, and is generally below the permissible level. However, in areas of municipal sewage discharge the synthetic surfactant concentration in many cases is slightly higher.

In many cities the municipal sewerage systems are in critical condition, which causes frequent accidents with release of large amounts of unpurified sewage into the coastal waters. In the context of the large pressure imposed on the ecological system these discharges lead to a sharp drop in the oxygen concentration in the water areas, causing suffocation of local fish.

During recent years no beaches have been closed due to excessive sea water pollution by chemical agents, however, in several instances beaches have been closed in Odesa, Eupatoria and Sevastopol by the Ministry of Health Care of Ukraine in consequence of epidemiological contamination.

The constant concentration of biogenous substances in the coastal waters below the maximum permissible level of pollution positively affects the ecological situation in the entire ecosystem of the open sea areas. Another positive factor is the absence during the last few years of the phenomenon of algal blooms in the coastal waters, which can be observed only with high concentrations of biogenous substances.

Concentrations of organic carbon as an indicator of the general content of organic substances in the sea water generally lies within a range of 0.5 to 3 mg/l. A high concentration of organic carbon, 3.5 mg/l, was observed in a zone in Odesa between the sea water and the Danube River water. The highest concentration of

organic carbon, 5.7 mg/l, was detected in the centre of the north-western part of the sea.

The problems of the Black Sea need close attention and call for a system approach. The strategic directions of sea environment protection and regeneration of its resources in Ukraine will be laid down in the National Programme of Protection and Rehabilitation of the Black Sea and Sea of Azov, which is now drafted by the Ministry of Environmental Protection and Nuclear Safety of Ukraine with the participation of interested ministries and agencies and scientific and public bodies. The Programme comprises measures to reduce the polluted sewage and waste discharge into the seas, preserve their biological resources, regenerate biological diversity, and provide for sustainable nature management in sea and coastal waters.

However, the scale and complexity of the problems of degradation of the Black Sea and Sea of Azov ecological systems far extend the boundaries of the individual coastal countries. Ukraine is putting in a lot of efforts to ensure efficient international cooperation on the preservation of the sea environment.

The major international document, which lays down the framework for joint regional principles, is the Convention on Protection of the Black Sea Against Pollution. Ukraine signed the Convention in 1992 and ratified it in 1994. The main objective of the Convention is the establishment of favourable conditions for joining efforts to protect the Black Sea and Sea of Azov environment and their resources, taking into account economic, social and medical aspects of its pollution. The Convention sets out prioritized measures concerning prevention, reduction and supervision of sea pollution created by sea and land activities, as well as ways of cooperation in cases of emergency. It also states that the parties will cooperate in the research and development of the national law to better evaluate ecological losses and determine responsibilities. The integral part of the Convention are the Protocols on reducing sea pollution from the sources located on land, prohibition of the creation of graveyards on the seabed and pollution with petroleum products and other hazardous substances, which turns the Convention into the practical guide of regional environmental management.

Today the joint activities within the framework of international cooperation encompass the development of balanced regional criteria for environmental quality, coordination of the national programmes for reduction of discharges of hazardous substances and biogenes, and the implementation of a balanced system of sea water monitoring.

ECONOMICAL AND ECOLOGICAL BENEFITS OF USING ETHANOL

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The prices for fossil fuel are steadily rising. Many people in Ukraine are being scared by this situation because majority of vehicles in our country operate on gasoline. The best alternative for it is E85. And it is quite possible to convert a vehicle that was designed for gasoline to operate E85.

Ethanol is known as a fuel since the beginning of the XXth century. Developing the new models of cars, Henry Ford hoped that ethanol would become the main fuel for automobiles. However, due to the supplies of cheap oil of open deposits, gasoline became principle fuel for transport.

Today in Europe there are already 185 fully operational biofuel plants. Another 58 plants are currently under construction.

At present in Ukraine we have all necessary scientific, technological and industrial conditions for the development of ethanol production.

Ethanol is a product that can be derived from almost any vegetable matter. However, the most widely used ethanol feedstock is corn.

Corn gets energy from the sun through a process known as photosynthesis. Ethanol is made primarily from corn but can consist of wheat, sorghum and potatoes.

Corn is smashed it into flour and runs through a set of screens to create a fine powder. Powder is mixed with water. This mixture passes through steamers that help break apart the molecules. Then, yeast and sugar are added and we obtain the substance, which consists of 15% ethanol. The distillation process results in 100% ethanol (Fig. 1).

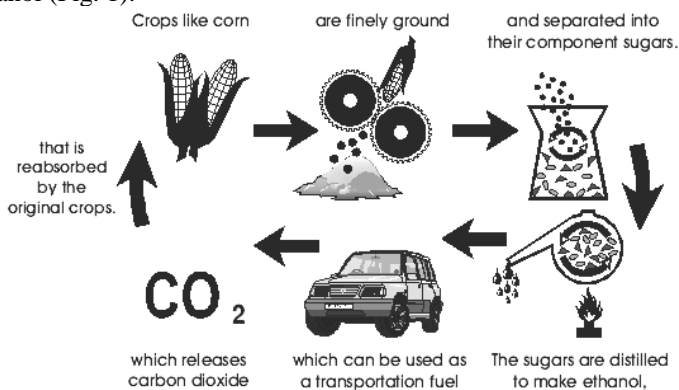


Figure 1 – The cycle of ethanol production

A fuel carrier then combines 85% ethanol with 15% unleaded gas to form

E85 fuel for distribution. The fuel carrier arrives at the gas station and pumps E85 fuel into special tanks. Flexible fuel vehicles can refuel at the gas station with E85 or regular gasoline. E85 vehicles emit carbon dioxide, which can be turned into oxygen by new corn plants.

Today, it costs more to produce ethanol than gasoline, because of different tax and government support structures. Federal and state tax advantages make ethanol competitive in the marketplace. If the tax and support structures were the same, the cost of ethanol would be cheaper than gasoline.

Considering the experience of the USA, they imports nearly two-thirds of the petroleum it uses (Tab. 1). Ethanol is made from renewable crops grown in the USA and its use can reduce the need to import oil, promote energy security, and reduce the trade deficit.

Table 1 – World production of ethanol

Country	Production of ethanol, millions liters		
	2003	2004	2005
United States of America	10900	13950	16141
Brazil	14428	15338	16001
France	817	830	909
Russia	745	760	750
Germany	280	270	432
Great Britain	410	400	348
Ukraine	284	290	246
Canada	204	245	231

Wheat will always be important for Ukraine, but we need no more than 20% of Ukraine’s land to grow sufficient wheat and other foodstuffs to feed our population. We have the land, the people and the capacity to become one of the world’s greatest exporting countries.

Compared to gasoline, using E85 reduces ozone-forming volatile organic compounds by 15%, carbon monoxide by 40%, particulate matter by 20%, nitrous oxides by 10%, and sulfate emissions by 80%.

Using ethanol can reduce total carbon dioxide emissions. Ethanol is made from crops that absorb carbon dioxide and give off oxygen. This cycle maintains the balance of carbon dioxide in the atmosphere when using ethanol as a fuel.

There are millions of vehicles on the road today. Reducing the emissions from those vehicles provides a significant benefit to our public health and the environment. Using ethanol as a transportation fuel can help accomplish that goal.

Because ethanol may be made from so many different sources Ukraine is now on the brink of a period in which it could enjoy greater agricultural success than at any time in its history, because it is a producer of agricultural commodities and also a producer of feedstocks for the biofuels market domestically.

Even if we use half of our production capacity to meet local needs, we can

still build up ethanol plants, pay for the plant investment within three years, and export as much as two million tones of ethanol per year to Europe and other buyers.

FACTORS OF ECOLOGICAL AUDIT PURSUING AT THE AGRARIAN-INDUSTRIAL COMPLEX PROCESSING FACTORIES

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In compliance with the project of the federal statute “About ecological audit” (September 30, 2003) ecological audit – it is an independent, complex, documentary assessment of the compliance of demands, including guidelines and normative documents in the sphere of environmental protection, requirements of the international standards, by the subject of economical or another activity, and compiling recommendations for such activity improvement. But first of all, audit – it is a commercial activity and it is aimed at profit earning (it follows from the definition of the notion “audit” in the federal statute “About the auditing service” from August 7, 2001).

For the further development of the ecological audit in the Russian Federation it is necessary first of all to work out more perfect and noncontradictory legislation. The understanding of the directorate of the agrarian-industrial complex processing factories that ecological audit is necessary is important as well. This aim can be achieved by realization of the following measures:

- to define economic interest of the enterprises in the ecological audit of the manufacture in compliance with the environmental protection requirements. At this point may be used such measures as reduction of taxes from the income gained from the realization of production manufactured in compliance with ecological requirements; financing of the ecologically safe manufacture that can lead to increasing of the competitiveness compared to not environmentally safe enterprises;
- to apply issuing of the ecological certificates in compliance with international requirements to the processing factories after the ecological auditing that will allow them to improve their reputation at the domestic market and afford an opportunity to enter the markets of other states;
- to apply sanctions (stiff penalties) in point of the enterprises which do not hold an ecological audit.

The following items can become the motivation for the management to make a decision to do ecological audit of the processing factory:

- receipt of the objective information concerning the state of nature-conservative activity of the factory and recommendations for adjusting activity in accordance with environmental legislation requirements;
- receipt of reliable information for preparing and applying ecologically reasonable decisions, estimation of existing ecological situation and environmental effects of any implemented activity factual results;
- evidence of the tax allowance concerning charging of property tax in the range of main funds of nature-conservative destination;
- projecting and adoption of the environmental protection controlling system at the factories and its certification in compliance with State Standard of the Russian Federation ISO 14 000 and/or international standards ISO 14000 that will afford to provide production competitiveness and its promotion at domestic and world market of goods and services;
- settlement of conflict situations and controversial questions concerning endamage to the environment, in arbitration tribunal or in trial;
- reduction of penalties and expenses for nature management and environmental pollution;
- revelation of supplementary means at the cost of economy of raw material, electricity, fuel and other natural resources.

All these will favour increasing of environmental protection measures, at the same time forged facts concerning ecological audit cannot be tolerated.

So, during making a decision to hold ecological audit the enterprise follows three groups of factors (which influence every separate subject of economical activity differently): ecological, economical and social. At the same time these factors can often be correlated to each other. For instance, environmental conditions worsening leads to degradation of the flora and fauna, destruction of the ecosystems and emerging of the social problems – worsening of the health of nation and ecological quality of life, at the same time becoming damage for the economics, since an enterprise bear losses making payments for emission of harmful substances and ecological damage to the environment.

Recognizing the importance and significance of the ecological and social factors, still economical factors make the most serious influence for making a decision to hold ecological audit. It is undoubtedly that economical interest - profit earning – nowadays is the main purpose of every business.

Desire for mobilization of national and especially international investment is the greatest stimulus for environmental protection activity optimization in the group of economical interests. Majority of investors as a rule demands an obligatory holding of ecological audit. Received auditor's conclusion influence the final decision concerning the investment of a project

AUTOMATION OF ELECTROMAGNETIC RADIATION MONITORING AS THE FACTOR OF ECOLOGICAL SAFETY MAINTENANCE

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The statistical analysis given in tab. 1 [1] testifies, that in Ukraine the medico-demographic threats are destabilizing factors of territories steady development maintenance . Degradation of environment is the reason of deterioration of the population health condition and abrupt decrease of population natural reproduction (see tab. 1).

The table 1. Dynamics of medico-demographic parameters in Ukraine

Parameter	1990	1995	1997	1999	2001	2003	2005	2006
Amount of the conditionally healthy people in an aggregate number of the population, %	62,6	53,7	50,0	46,6	42,1	34,2	28,2	26,1
Factor of a natural gain of the population (on 1000 population)	0,5	-5,8	-5,9	-7,0	-7,6	-7,5	-7,6	-6,4

Degradation of environment leads not only threat to health of the population, but also to growing of losses in economy and delay in socio-economic development of the state.

Therefore according to the Law of Ukraine "About protection of environment" all accepted technical and economic decisions should have a high degree of ecological reliability and safety.

The problem of calculating the anthropogenesis factors influence on environment and accordingly return influence of environment on the population has the important practical meaning in a context of ecological safety maintenance.

The available facts show importance of an estimation influence on natural environment of the electromagnetic fields of various nature, occasional or regular action (base stations of mobile connection, flying objects location finding devices). So for example, the foreign researchers Wertheimer and Leeper have established connection between intensity of electromagnetic emissions and children leukemia sickness rate [2].

By the standards of the different countries, including Ukraine [3] consummates control of electrical equipment on value of a field that they generate, the requirements

on restriction of intensity of emissions and time of stay of the people under action of electromagnetic field also are exposed. Having the information about used equipment it is possible to lead preliminary research of radio devices influence through numerical methods of modeling of an electromagnetic field. So there is a urgent necessity of automation of electromagnetic emissions monitoring realization with the help of computer modeling, such approach can considerably reduce time of monitoring realization, and also lower expenses for special measuring devices.

Monitoring of electromagnetic radiation – is procedure of intensity level definition of a electromagnetic field with the purpose of the analysis of a environment condition (comparison of the received intensity amount with threshold limit value of the emissions), prevention of any losses connected with loss of health by the workers.

For solving the tasks of electromagnetic emissions monitoring automation improvement of system which calculates intensity of electromagnetic field in a premise is necessary. This system is based on algorithm of modeling situation of electromagnetic field intensity in space bounded by dielectric walls.

Input data for system functioning is amplitude-frequency characteristic of devices, linear sizes of a premise, location of devices and their orientation in space.

The system simulates dipole emissions in presence of walls-barriers and allows to get parameters on which it is possible to characterize a level of electromagnetic pollution, and also to forecast possible consequences of long stay of the personnel in a researched premise.

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CARBONIC ACID CATALYTIC REDUCTION AND KYOTO BILLIONS FOR UKRAINE

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Average world temperature has risen per 0.6 degree (Celsius) during last century, and it is forecasted that temperature will rise per 1.4-5.8 degrees by 2100.

Ukraine has adopted the Climate Change Framework Convention in February 2004, and Kyoto Protocol – on the 16th of February 2005. According to

these documents emission size has been decreased in Ukraine enterprises during power effective technologies application projects realization and besides there is national quota excess (500 millions tons difference comparing with 1990), which can be sold in the international market.

Ukraine and Russia have 75% of all worlds' emission excess. Quota customers are EU leading countries, Japan and Canada.

CO₂ is the main "problematic" gas for today. By estimate CO₂ annual resource is equal 490 billions m³ in Ukraine.

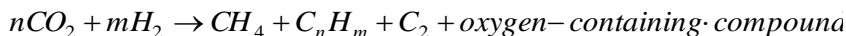
Atmospheric emission decrease issue has being studied in Lviv Department of the National Research Economic Institute (NREI) for a long time and at the end of January 2007 technology development was finished. The main point of it is that burned natural gas is reduced to valuable methane of the same volume in the special reactor.

There are four setting types and any of them may be used everywhere, where generation by-product is concentrated CO₂ (at thermoelectric power stations, in metallurgy, during cement or lime production).

But the greatest effect can be reached at spirit industry. An ordinary local winery throws 12 millions m³ of fermentation products (almost pure carbonic acid) out annually.

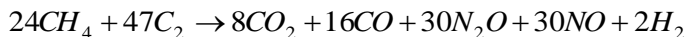
This setting doesn't require traditional fuel types, doesn't throw burning product out to the environment, and doesn't have other harmful waste.

Reaction of carbonic acid conversion to methane:



92,8% of methane and 6,36% of diesel fraction are being generated as a result of CO₂ hydrogenation, residues are synthetic carbohydrates.

Electric power costs are equal 4,4 kilowatts per hour for 1 m³ of hydrogen and 0,5 m³ of oxygen are partly covered by generated methane burning in oxygen:



75% of necessary electric power can be provided by feed of thirty volumes of water steam, which were generated after reaction. According to NREI economists' calculations: 1 ton of CH₄ generating prime cost is equal \$75 or \$53,9 per 1000m³. This process profitability is equal 40%.

Advantages of this setting application:

- 1) natural gas economy;
- 2) decreasing of greenhouse gas atmospheric emission.

The last one, according to Kyoto protocol, is encouraged with euro-bonuses. That is why in time not only spirit can be sold, but CO₂ emission quota.

Emission prices are equal 5-20 dollars per one ton, and possible incomes on Ukraine quota sale, according to German advisory panel evaluation, is equal from 740 millions of dollars to 2,9 billions of dollars.

Thus, developed countries got an opportunity to buy necessary amount of quota as emission decreasing units, and Ukraine has an opportunity to modernize entire industry for European businessmen money.

ECONOMICAL, ECOLOGICAL AND SOCIAL ASPECTS OF LOGISTICS ACTIVITIES

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Nowadays, logistics is a fast developing management practice. Current tendencies of logistics activities, such as outsourcing, integration of suppliers, manufactures and distributors into unit value chain promote achieving a significant economical effect.

Although, fast development of logistics which covers purchasing (sometimes even raw material and energy mining), transport, manufacturing and distribution operations, has a significant influence upon economical, ecological and social systems.

Ecological impact of logistics represents in different forms:

- environmental components pollution;
- changing of qualitative parameters of natural resources reproducing;
- forming and collection of wastes;
- reliefs and landscapes destruction.

At the same time, we can identify some social influences of logistics:

- deterioration of human health due to environmental pollution;
- decreasing of labour productivity;
- increasing of traumatizing and death-rate due to transport development;
- sound influence;
- negative esthetic impact, caused by decreasing parks, squares and 'green' territories;
- increasing of social-economic instability.

All abovementioned forms of logistics impacts may change economic system performance.

Using of logistics at economical level allows to make processes of purchase, transportation, storage and distribution management more easily and efficient due to their integration; to minimize use of production resources.

At the same time, ecological and social aspects of logistics activity represent in many forms of ecology-economical harm: decreasing of production resources

use efficiency; increasing of additional costs to clear the polluted environmental components, to collect and dispose wastes.

It stipulates necessity of taking into account the ecological and social aspects of logistics activity alongside with its economical performance and efficiency.

Current logistical tendencies also consider these aspects. For example, modern tendencies of transport regulation require to decrease levels of sound, air pollution and fuel use. Developing of e-commerce permits to decrease quantity of storehouses and trips and organize distribution process more effectively and less environmentally harmful.

THE DEVELOPING OF CORPORATE MANAGEMENT AS A FACTOR OF INVESTMENT CLIMATE IMPROVEMENT

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In the conditions of progressive economy, a vital question is the question about business culture and correct corporate management as the necessity for achievement of the desired results in firm activity. Dissociating management and ownership of a joint-stock company requires a creation of the new monitoring system of enterprise activity. This is the exact duty of supervisory board.

A corporate management is a policy and practical activity of enterprises supervisory board which is an instrument to defend shareholders rights as proprietors of enterprise. Many of investors are sure that good corporate management brings higher profits to shareholders. So, often the criterion of investing in an enterprise is its full and honest using of key principles of corporate management. Consequently, the question of culture in an economy becomes more important every year.

Not only the governments of the biggest world countries take part in the forming of general points and principles of corporate management, but also different organizations and business groups.

When the government efforts are directed on the improvement of legislation, the activity of business groups is directed on forming of rules and procedures of corporate management, based on international practice, national features and own experience.

The result of such work is appearing in different countries codes of corporate management or the best practice. They are the collections of voluntarily norms of business practice and standards, which set and regulate the order of corporate relations. Business circles accept them to the use for subsequent development of business, built of trust and observance the norms of business culture. The best known among them are Code of Cadbury (Great Britain, 1991),

Code of the best practice for the German corporate management (2000), Basic directions and problems of corporate management of General Motors (1994). The similar code was developed in Ukraine by Stock Market State Commission in June, 2002. It's called Recommendation of the best corporate management practice for the joint-stock companies of Ukraine. It is based on the principles of international standards of joint-stock companies management.

It is fixed in Recommendations that nowadays Ukraine is in the conditions of constantly growing international competition for a capital. That's why Ukrainian enterprises will become more attractive for investors if only they will show the high standards of corporate management, business ethics and pay more attention to providing the interests of shareholders. Stock Market State Commission suggests to include such norms in statutes or internal documents of companies. The Ukrainian code includes five substantive points with concrete steps for joint-stock companies on the way to introduce the best practice of supervisory board work and observance of corporate culture standards.

The first of them is shareholders rights and their proper defence. This point foresees the rights of shareholders to dispose their shares, to receive the part of income, to participate in management, rights to receive all necessary information about a company in time and regularly, rights to have equal attitude to every shareholder and requirements to defend the rights of small shareholders. To open the information regularly is the way to make a positive image of enterprise and earn investors confidence. Therefore the best practice of corporate management foresees its timely and complete opening, and also providing free of charge access to information. One more point of the best corporate culture is good providing of the general meetings of shareholders', the possibility to take part in them for all shareholders personally or through a representative, and also taking to jurisdiction of general meetings to make a decision (but not simply assertion) about considerable agreements. The important moment of high-quality corporate management is clear determination of supervisory board authorities. But supervisory board must always act in behalf of proprietors.

The observance of such corporate management standards would accelerate growth of enterprises and improvement of investment climate in Ukraine. Such codes of conduct assume that market forces will provide effective introduction and change of ethics standards and activity of joint-stock companies.

RECYCLING OF WASTES AS THE INTEGRAL PART OF RESOURCE-SAVING AND ENVIRONMENTAL PROTECTION

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Nowadays Ukraine occupies one of the leading places in the world on environmental pollution. Scientific-and-technological advance, population increase, augmentation of peoples' needs conduces to drastic influence on environment.

Industrial production of Ukraine is characterized by high level of natural resources utilization, where end product in its resource-intensity and environmental pollution 3 times exceeds the world standards. Specific weight of the territory of Ukraine that comprises 2,7%, hazardous emissions into atmosphere comprise 18%, emissions of water wastes into water basin – 12%, disposal and storage of solid and liquid wastes – 19% from the national rates. At the period of industrial growth of the country there was thrown out 14,3 million tons of hazardous substances into atmosphere, including 8,8 million tons from stationary sources, into the water basin there was thrown 4,3 billion m³ of polluted waters, accumulation of solid and liquid wastes comprised 15 billion tons with annual increase 1 billion tons. In 1995 there was considerable fall of commercial industry, but hazardous emissions into atmosphere reduced only to 11 million tons, including stationary resources up to 6 billion tons, and still emission of waste waters even increased up to 4,5 billion m³. Basic contaminants of environment are companies of metallurgy 33%, energetics 30%, coal industry 10%, chemical and petrochemical industry 7%. As we can see, even drastic drop in production volume testifies of low efficiency of nature usage.

Annually production process in Ukraine attracts 1,3-1,4 billion tons of natural resources and minerals, and 800 million tons return as waste products. According to the fixed data in Ukraine 1,3-1,4 billion tons of natural resources and minerals are utilized and only 800 million tons return to the natural environment. Just within a year in the country there were accumulated approximately 40 million m³ wastes, being removed in more than 650 city dumps or destroyed in 4 garbage-disposal plants.

In Ukraine every year approximately 1,5 billion tons of wastes, accumulated as waste products storages, waste banks, dumps. Total volume of accumulated solid wastes comprises more than 20 billion tons that occupy the area of about 120 thousand hectares. Recycling of these wastes is low.

The scale of contamination of environment has already reached in the country its critical levels. Just in 1995 plant facilities created 130 million tons of wastes, only 15% are utilized, and only 0,4% are destroyed. Ecologists think that the basic air contaminants are companies of energetics, metallurgy and transportation.

To make the environment better some time and financial resources needed. Still in the first place it is necessary to provide efficient environmental means of economic and organizational character. It is obligatory to achieve harmony between “society – manufacture – nature”. In connection with it ecological and economical optimization of manufacture and territory is a form of reaching stable development for securing environmental safety.

Modern measures, directed on reliability growth of the subjects of management functioning in fuel and energy complex; uppermost it is necessary to use technologies of non-traditional energetics and wastes recycling of household and living origin, that in its turn will reduce anthropogenic load on environment and influence fuel and energy resources deficit.

We believe people should use the concept of social production ecologization. That is, to implement resource saving and ecologically safe technical and environmental processes, ways and methods of rational control for environment and resource potential, owing to that environmental protection is realized. It is necessary to secure process of implementation technological system, management solutions that allow increase efficiency of natural resources use and saving of quality of environment on local, regional and global levels.

ECOLOGICAL DEBT IN ECOLOGIZATION OF ECONOMY TASKS SOLVING

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Further development of ukrainian economy requires not only the solving of row of current socio-economic problems but also transition from the consumer model of functioning of economy to the model of sustainable development, as an industrial production of Ukraine is oriented to extensive of growth.

It appropriately entails the additional burden on an environment, the present state of which requires realization of whole complex of , directed on the reducing of destruction influence of public production (both current and potential) on nature and man.

Forming of mechanism of ecologization of economy, which must change character of nature management, has to be based on the deep study of methodology of mutual relations of society and environment, principles of sustainable development.

Concordance of interests of different generations is the one of basic principles, on which the solving of the indicated tasks has to be based . This fact is many scientists-economists. In particular, russian economist Ryumina E.V. this principle as one of key in alteration of methodology of economic analysis with the purpose of conception of sustainable development realization [1].

Economic science has not produced the approach to account of mutual relations between generations concerning the state of environment. It is related to difficulty of cost measuring of the production influence on an environment and man, cost measuring of natural-resource potential, lack of research methods of comparison of the proper indexes in time, and with other theoretical and methodological problems also.

We suggest that a category which can become the instrument of account of different generations' interests is an ecological debt. However, an ecological debt is a «new» category in the economy of nature utilization. At the first time, ecological debt was introduced in the economy of nature management theory with the purpose of analysis of descriptions of the sustainable development [2]. Thus the necessity of consideration of mutual relations between a society and nature was grounded as a credit and monetary. The origin of ecological debt was examined in the context of these relations.

On the basis of analysis of the existent researches of category a «ecological debt», two approaches to interpretation can be selected:

1. The ecological debt is determined as the debt of society before nature shown in a money form [2, P. 17].
2. Interpretation of ecological debt is based on the so-called humanitarian approach to economy and environment. Therefore debt is defined not only from position of cost (economic) estimation but also from point of morally-ethics principles – as guilt of human before nature [3, P. 41-45].

We consider that both interpretations are not quite correct.

Remarks on the first approach. Promissory relations suppose equal from economic and from law points of view rights for two participants – creditor and borrower. To our opinion, nature is not to be considered as a creditor.

Remarks on the second approach. Moral aspect of mutual relations of human and nature is important indeed. However this aspect is not the field of economical science researches. In this case the ecological debt using opportunity as an economic instrument of adjusting of nature management is thrown away.

To our opinion the of conception of credit (debt) and monetary relations is possible and desirable in case when promissory relations will be examined in the temporal aspect as the promissory relations of one generation before other. However, it is necessary to the row of theoretical and methodological problems, in particular:

1. What are ecological percents (interest) on an ecological debt, and, how can they be calculated?
2. How are of ecological debt and economic harm from ecological violations correlated?
3. What are the methods of comparison of debt in different moments or points of time? Is it possible to use the traditional charts of compounding and discounting?
4. Others.

We suppose that an ecological debt must be as a loss of national wealth as a result of the inefficient use of resources and contamination of environment. In this case, a difference in interpretation of debt and harm is obvious. As the debt is the lost national wealth, and the harm is a short-received national income.

Certainly, practical realization of this theoretical approach requires the search of transformation mechanisms of existent theoretical, methodical base, to answer all viewed questions. However, to our opinion, this approach allows to form the effective financial mechanisms of nature management.

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THE FACTORS WHICH COUSES LOSS OF WILD LANDS IN TANZANIA

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There is an actual problem of wild lands loss in Tanzania, the country on the East of Africa.

Among the *causes of wild lands loss in Tanzania* we are ready to mention the next ones:

- *Deforestation*. The deforestation technique of slash and burn, utilized extensively to clear large areas of forest for agricultural and other purposes, causes an enormous amount of environmental damage. The removal of all trees and ground cover destroys animal habitats and greatly accelerates erosion, adding to the sediment loads of rivers and making seasonal flooding much more severe.
- *Agricultural expansion*. Due agricultural revolution people use fire to modify or eliminate natural vegetation and this situation caused to the death of organisms which is very important to the formations of soil. For example, in Tanzania people are used industry fertilizers to make crops growing well but this fertilizers poison to living organisms and cause dying of organisms.
- *Population growth*. While populations remained small and human technology modest, their impact on the environment was localized. As populations increased and technology improved and expanded, however, more significant and widespread problems arose. Because many people are finding areas for

settlement and working also need of wood and coal in cities. People are able to modify the environment by their activities. They don't think about the environment because first of all they want to meet their needs such as eating, furniture, money, etc.

- *Mining activities.* Miners are using local ways of mining also without recovering the loosed soil.
- *Overgrazing.* Domestication and herding of grazing animals eventually resulted in overgrazing and soil erosion. This situation happens in northern Tanzania especially to the tribe called masai they have a tradition of keeping high number of cattle which affects grasses covering the land.
- *Illegal trade in endangered species and wildlife products.* There are some people who control illegal trade of woods and wild animals. But all this is made mostly through illegal ways and causes many areas to be unprotected.
- *High number of refugees.* Because many countries nearby Tanzania are in unstable political situation and some of them are even involved into civil wars Tanzania is to accept a lot of refugees who look for settlements.
- *Poor methods of fishing.* There are some fisheries using chemicals for fishing activities and this situation causes many fishes and other water living organisms to die.
- *Industrial activities.* Carbon dioxide, sulphur dioxide and other types of contaminants pouring from industrial smokestacks contribute to worldwide atmospheric pollution. Carbon dioxide contributes significantly to global warming, while sulphur dioxide is the principal cause of acid rains and also chemical pollution of the water.
- *Soil Erosion.* Nowadays there is a severe form of soil erosion in Tanzania. Soil erosion is a natural geological process which greatly accelerated by human activities such as deforestation, overgrazing of cattle, and poor agricultural practices. These destructive processes continue at an increased rate every year, also as overpopulation.
- *Timbering activities.* Forest as a cover of land which protects moistures and evaporation of water from the land but it affected by timbering activities as a raw material to local and heavy industries.
- *Waste throwing.* Wastes such as nylon and plastic bags is an actual problem in many areas of Tanzania especially in capital city Dar es Salaam.
- *Acidic rainfall.* Forests, lakes, ponds, and other terrestrial are being severely damaged by the effects of acid rain. Acid rain is caused by the combination of sulphur dioxide and nitrogen compounds with water in the atmosphere to produce rain with a very low pH. Normally, rainwater has a pH of 6.5, making it very slightly acidic. However, with the addition of sulphur and nitrogen compounds, the pH of rainwater may drop to as low as 2.0 or 3.0, similar to the acidity of vinegar. In addition to chemically burning the leaves of plants, acid rain poisons lake water, which kills many aquatic inhabitants.

- *Increase of temperature.* Increase in temperature causes high evaporation which removes a lot of water from the soil and also this causes the death of living organisms in soil.
Possible solutions of the wild lands loss in Tanzania:
- Government should educate people how to use the good methods for agriculture.
- People should change their behavior to the wastes (not to throw wastes everywhere especially plastic bags which can't be changed in another product).
- Industries should innovate the new technologies of using wastes as raw materials.
- Industries should be constructed far away from natural water resources.
- Education of planting and recovering trees should be provided in schools and other educational establishments.
- All sources of water should be kept safe.
- Government should make the law which can punish people who are involved into illegal activities.
- Farmers should make and use local fertilizers in order to make their plants to be grown well.
- Environmental NGOs should be encouraged in the country.
- People should be educated to use other energies such as fuel and gas for cooking instead of using firewood and coal.
- Special areas for mining should be prepared in order to protect the soil erosion.

THE REPERCUSSIONS OF MINNING ON THE ENVIRONMENT OF GHANA AND FEASIBLE SOLUTIONS

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Small-scale mining is delineated to include both the exploitation of mineral deposits using fairly rudimentary implements at low levels of production with minimal capital investment (often characterized by lack of insufficient knowledge, education and techniques, structured administration and management also capital). While the large-scale mining, particularly gold has become predominant, small-scale mining, which predates such operations, has continued to be an important economic activity, principally within the far-flung areas of countries which can boast of gold. The minerals being mined in Ghana are gold, diamonds, bauxite and manganese, but the most dominant mineral commodity is gold. Small-scale gold mining in Ghana alone is reported to produce more than 400,000 ounces annually. Apart from gold and diamonds, other small-scale activities serving for employment

for a lot of people are salt, kaolin, silica, sand, brown clay, aggregates and crushed rocks.

Small-scale mining was a respected tradition in Ghana for centuries, but became a persecuted profession after the British colonized the region in the early 19th century and banned the practice. Ghana's independent government legalized small-scale mining in 1989, but the government grants few mining concessions to peasants, forcing most people to mine illicitly. Small-scale mining in Ghana consists of groups of 8 to 15 people using the most rudimentary concentration methods followed by the extraction of gold using highly toxic mercury, the use of which has been outlawed worldwide. The crude mining techniques used are hazardous to them and their environment and expose the entire population of the country to mercury-related illnesses. This problem is not restricted to Ghana but is worldwide in scope.

You can see some data from a global report by Mining, Mineral and Sustainable Development (MMSD) on Small Scale Mining below:

Country	Total number of workers in thousands
Bolivia	72
Brazil	10
Burkina Faso	100-200
China	3000-15000
Ecuador	92
Ghana	200
India	500
Indonesia	109
Malawi	40
Mali	200
Mozambique	60
Peru	30
Philippines	185.4
South Africa	10
Tanzania	550
Zambia	30
Zimbabwe	350

Since the enactment of the Small Scale Gold Mining Law in 1989, which effectively legalized small-scale gold mining in the country, industrial operations, collectively, have made important contributions to national gold output, foreign exchange earnings and employment. Accompanying this pattern of socio-economic growth, however, have been increased environmental complications – namely, mercury pollution and land. The removal of the forest cover is rapidly drying up rivers and streams, leading to the extinction of river hosted animal and plant species. Surface mining represents a serious threat to the last vestiges of Ghana's

forest resources and threatens the rich biodiversity of the country's tropical rainforest. There is a growing conflict between sustainable forest management and mining activities.

The process of mining and processing of the mineral involve activities which give rise to various environmentally-related diseases. During the process of mining, toxic chemicals such as cyanide, arsenic, sulphur dioxide and gases are produced with very serious health consequences on the residents of the affected communities. Not only are water sources polluted this way, but poisonous gases are also released freely into the atmosphere giving rise to pulmonary diseases such as tuberculosis and silicosis. Mining-related diseases which have been on the increase since the inception of surface mining include acute conjunctivitis, schitomiasis, mental cases, boils and other skin diseases, and mining related malaria.

Protected species such as the Red River hog, the roan antelope, the red Colobus monkey and the black Colobus monkeys are some of the species associated with tropical rainforest. At the community level, the threat to ecological biodiversity has economic implications. Increased mining activities in the area have partly led to the reduction or extinction of certain flora and fauna species that the communities depend on. Many communities complain that snails, mushrooms, medicinal plants, etc. are no longer available in the area due partly to mining activities gradation.

In general environmental effects can be categorized under the following: Mercury pollution, Cyanide pollution, Direct dumping of tailing and effluents into rivers, improper construction of tailing dams, acid rock drainage, improper closure, river siltation, erosion damage and deforestation, landscape destruction, garbage and solid waste, tropical diseases (malaria), cultural damage due to invasion of sensitive tribal lands.

The Ghanaian Mineral Commission has been burdened with most of the jurisdictional responsibilities related to small-scale mining, but with a diminutive staff working with a pool of highly insufficient research resources lack of control and enforcement, inadequate environmental legislation, economic limitations, it is clearly incapable of facilitating sufficient environmental improvement on its own.

It is concluded that marked environmental improvements can only be achieved if:

- 1) assistance is provided to the Minerals Commission from local governmental bodies and academic units;
- 2) industry-specific environmental management tools and strategies are designed and implemented;
- 3) concerted effort is made to prospect for deposits suitable for small-scale gold mining, a key to preventing unnecessary exploration; and a nation-wide industrial mercury study is commissioned, and a mercury retorting program is implemented;
- 4) effective environmental sustainability education is interminably carried out.

Although mitigation efforts have had a limited impact, it is expected that the measures now being considered for adoption will improve the efficacy of the Government of Ghana's drive towards improving environmental management in resident small-scale precious metal mining operations.

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THE PROBLEM OF GLOBAL WARMING

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The issue of global warming can seem overwhelming and complex, but the scientific explanation for the phenomenon is relatively simple.

Earth has a built-in system for temperature control made up of gasses in the planet's atmosphere. When the sun's rays strike and warm the Earth, these gasses operate like a blanket, trapping some of the sun's warmth inside and allowing some of the heat to be released into space. This process warms the Earth enough to make it hospitable for living organisms.

Human destruction of forests and other natural areas and our use of fossil fuels such as oil and coal have caused an unnatural accumulation of gasses like carbon dioxide (CO₂) and other heat-trapping gasses in the atmosphere.

This accumulation of excess gasses has caused rapid warming the likes of which the Earth has never seen before. It is as if we have added a second blanket under which the Earth and its inhabitants are now being stifled. It is the impacts of this human-caused global warming that Defenders is concerned with.

Among the causes of global warming and its impacts we are ready to identify the next ones:

1. Power Plant Emissions

More than two-thirds of our nation's supply of electricity still comes from fossil fuels. It is the burning of these fuels that releases heat-trapping gasses. And as long as the amount of heat-trapping gasses continues to rise, global warming will continue to bring about disruptive changes in the environment.

2. Vehicle Emissions

Vehicle emissions are second only to power plant emissions as a contributor of greenhouse gasses. According to a report released in June 2006 by the U.S. Public Interest Research Group titled *The Carbon Boom: National and State Trends in Global Warming Pollution since 1960*, in 2001 alone our cars, trucks and other forms of transportation emitted over 2 billion tons of CO₂.

3. *Forest Destruction*

Forests absorb CO₂ that naturally exists in the atmosphere, but they cannot work fast enough to counteract the tons of greenhouse gasses that we produce each day. Unfortunately, we are also losing our CO₂-absorbing forests at a dangerous rate due to clear cutting, conversion to agriculture and other development. Without this natural filter we face a much harder uphill battle against global warming.

4. *Household Products*

The everyday household items that you might use in your home could be indirectly contributing to global warming. Buying products that are made in an environmentally harmful manner could result in the loss of resources and further increase the threat of global warming. For example, buying non-recycled paper products results in the need to cut even more of our CO₂-absorbing forests.

When talking about the possible solutions to global warming problem we are ready to make an accent on the next points:

1. We have the technology and ingenuity to reduce the treat of global warming today. Solutions are already available that will stimulate the world economy by creating jobs, saving consumers money, and protecting our world security. By investing in renewable energy and energy efficiency, and increasing the efficiency of cars we drive, we can take essential steps towards reducing our dependence on oil and other fossil fuels that cause global warming.
2. Using energy more efficiently and moving to renewable energy (wind, solar, geothermal, and bioenergy) would significantly reduce our emissions of heat-trapping gases. Most of the world currently produces 70 percent of its electricity from fossil fuels such as coal, natural gas, and oil, but only two percent from renewable sources. Since the burning of fossil fuel releases large amount of carbon dioxide-the leading cause of global warming, but renewable energy does not, increasing the share our electricity generated from renewable resources is one of the most effective way to reduce global warming emissions.
3. Cars and trucks are another significant source (25 percent) of the world carbon dioxide emissions. A serious effort to address global warming must therefore reduce emission from cars and trucks. Many technologies already exist that can do this, while also creating new jobs in the worlds automotive sector and other industries throughout the world. In addition, consumers would save billions of money on gasoline.
4. By putting energy efficiency, renewable energy, and vehicle technology solutions in place at national laws, we can reduce our contribution to global warming while creating a stronger, healthier, and more nations.

FINANCING OF ECOLOGICAL SERVICES AS A WAY OF MAINTENANCE OF QUALITATIVE LIFE OF THE UKRAINIANS

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International Convention on Human Rights tells us, that every people in the world were deserved the worthy level of living, that means a normal quality of human life. It is considered, that life's quality is an integral estimate of physical, psychological, mental and social human functioning based on people's subjective perception. It can be achieved through psychological, social, physical and spiritual well-being, which directly depends on a condition of health of the man. In our country the authority helps people to survive by means of state and municipal systems of public health services. There are hospitals, polyclinic, items, urgent medical aid etc. All these establishments are financed to account of the budgetary funds. The Demographic crisis and negative gain of the population in Ukraine are indicative of very low efficiency to such activity. On our sight, the quality of human life directly depends on quality of environment, which is a base to vital activity of the person. Exactly the answer of the nature on irresponsible human behavior results in catastrophic degeneration of a human population. And exactly not only their future, but the future of all another generations of Ukrainians depends from each person and a whole society.

The community has an opportunity to increase a standard of living with the help of ecological services, which in enough should be supplied by municipal management. Unfortunately, both theoretical substantiation, and the practical introduction of institute of ecological services in public sector of economy are absent. It results on regular and, as a consequence, in most cases without productive attempts to shift the responsibility on reduction of harm from pollution of an environment from the one level of authority to another.

Synthesizing the approaches to determination of concept "service", we offer following integrated definition. This is some action, advantage, help, action or way of the satisfaction of requirements of persons, populations, group or society, which have the certain features. These particularities consist in the following:

- the consumption occurs on a place and during granting;
- they are not connected to production of minerals, industrial and agricultural manufacture;
- they are made on the basis of the preliminary arrangements;
- the manufacturers and consumers enter direct contact;
- they are imperceptible and do not result in possession by something;
- they are non-material.

Traditionally services are divided on paid and free-of-charge. Thus by sphere of paid services the scientists name that is formed and functions on principles of purchase - sale of services as result of trading-economic activity.

Other sphere in their opinion is connected to the state budget, which is formed and functions at their expense. However it is difficult to agree with such opinions. For the consumer they really remain free-of-charge. However movement of means by their granting all the same occurs. The source of such means changes. For this reason it is not necessary to divide services depending on the commercial level on paid and free-of-charge. More effectively to classify services depending on sources of their financing on own and budget (figure 1).

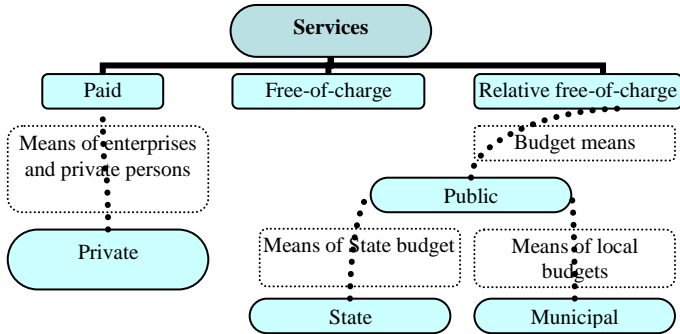


Figure 1 – The Classification of Services

As mentioned above, the most importance is that the public authority can influence quality of human life by financing services on protection of an environment. We have attributed such services in structure relative free-of-charge services. According to it we offer the following definition of concept ecological service. It is the special kind of activity, which satisfies needs of the man, community or society in qualitative life, improves a condition of an environment and is financed at the expense of budget means. Such formulation allows outlining the basic attributes of this specific kind of activity. The granting of ecological services will promote:

- increase of a level of human potential, that means improvement of quality of life both for the separate man, and for all society(community);
- improve quality of an environment as bases of human life ability;
- to be given free-of-charge to consumers;
- to be financed at the expense of budget means (state and local).

Summarizing it is necessary to add, that the problem of distribution of powers on financing ecological services between separate levels of budget system requires the further consideration. And also in a condition of constant deficiency of financial resources the question of search of additional means is not solved (means, which can be distributed through budget system of Ukraine). Besides there is absent effective mechanism of an effective utilization of budget means of an ecological orientation.

GENTLE ECOLOGY FOR NIZHYN

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Nizhyn is a district center of the Chernihiv region. It is situated on the both banks of the Oster-River. It is a junction of railway and automobile ways. The territory of Nizhyn is 42 sq.km and its population is 79.9 thousand inhabitants.

Nizhyn is industrial the developed center of Chernihiv region and the enterprises of machine-building, food and chemical industries play a considerable part in life of it. Specific gravity 16 basic industrial installation in the general production amount is as following: food industry – 31,7 %, machine-building industry - 33,3 %, chemical industry - 15,0%.

The Oster river a left tributary of the Desna-River flows through Chernihiv region. The area of its basin is 2 950 sq.km, the length is a 199 km. The number of small rivers, which fall into the Oster-River is 65, and their length is a 509 km. The basin of the Oster-River is marshy and there are peat bogs here. The Oster-River is used mainly for economic everyday needs, and for fish-breeding. The Oster draining system is built in the black-water of the Oster-River.

The main enterprises, the suppliers of the sewage, are:

- plant «Progress»: where photo goods, photo-equipment, medical equipment, and household goods are produced;
- Nizhyn mechanical plant which produces the equipment and devices for agro cultural and industrial complex;
- Nizhyn agricultural machine-building plant which produces equipment for poultry farming, automobile and bicycle parts, armature for gas and water pipes;
- Nizhyn beer plant, the producer of different kinds of beer;
- Nizhyn zhyrcombinat which producer and sells drying oil, varnishes, oils and oilcake.
- Nizhyn paint plant(NIFAR) which produces varnishes and paints, washing pastes, and means for protection of vegetation.

The other enterprises, the suppliers of the sewage, are:

- milk plant;
- Nizhyn furniture plant;
- Nizhyn central repairing plant;
- meat-packing plant;
- the Railway station “Nizhyn”.

As for the water-supply and overflow pipe I must say that separate state and public organizations and structures of ecological direction operate in our town nowadays. They carry out their functions according to the law and within the limits of authority regulations.

Such organizations and structures are:

1. Nizhyn administration of plumbing-sewage economy;
2. Regional state ecological inspection of Nizhyn region;
3. Sanitary-epidemic station;
4. Ecological structures of town council;
5. Department of the sanitary cleaning of the town;
6. Public ecological organizations called «Zeleny Svit», «MAMA-86», «NEMO».

Water-supply in Nizhyn is carried out from the centralized system, public and private wells. The sources of the centralized system - underground water of Nizhniecreydiany and Buchatsky horizons; the sources of the public objects are subsoil waters, the depth of which is over 5 ms. The first water-supply system and pump stations were built in a town in the town in 1928. The length of the centralized water-supply system is 175,2 kms, the number of public wells is 225. 10% of them need repairing.

Cleansing construction were built and put into operation in 1975. The projected capacity of the first is 14 343m³/day. But according to the project the perspective leading of power is foreseen to 27 105 m³/day. In 1999 4 555thousand of m³ of sewage passed the complete biological cleaning .

Cleansing building are intended for complete biological economic everyday and industrial sewage of enterprises of Nizhyn.

In conclusion I would like to say that town administration, town Council and public organizations take every measure as for the improving of the ecological state and ecological sanitation of water objects, however they are inadequate to the demographic situations and the state of objects of living maintains that were actually formed in the town.

THE AS THE WAY TO ENERGY SAFETY OF THE ECONOMY OF THE UKRAINE

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The burning issue of the world economy for today is a lack of renewable energy supply.

The essential growing of the world prices, the decrease of the reserves, complicated problems of the transportation, ecological position give the push for searching for of the alternative sources fuel. The fuel possible to get not only from oil. The last scientific investigations confirm that main spares to oils on the Earth will finish in 50 years.

The decision of this problem is a development production renewable sources to energy, i.e. receiving the biofuel as the result of the processing of biological materials (a vegetal matter or an animal extraction).

The Cabinet Minister of Ukraine has confirmed "Program of the development production diesel biofuel" resolution #1774 from December 22, 2006. The purpose of the program consists in increasing level ecological and energy safety of the Ukraine, reduction to dependencies of the national economy from import oil products, ensuring the agrarian sector and transport branch diesel biofuel (biodiesel).

Biodiesel, what have proven the investigations, at hit in water do not bring the harm to plants and animal. Aside from this, he subjects to practically full disintegration: in ground or in water microorganisms 99% biodiesel process for 28 days; this proves minimality soiling the rivers and lake.

Biodiesel on 75% is more pure common diesel oil. In product of combustion biodiesel on 8-10% oxide of carbon less, nearly on 50% smut less and far less sulphurs.

The technical features allow biodiesel certain to compete with traditional diesel oils. Turning on biodiesel not it is necessary in addition to equip neither engine itself, nor its systems.

Europe - is leading producer biodiesel due to assisting total legal and political condition. The main producers of the Europe - Germany (1 669 000 tone per annum), France (492 000. tone), Italy (396 000 tone). Germany wields the most production power in Europe, 48% volume European production. The expenses beside 0,88€ form on fabrication for the liter (including factor of the adjustment to low energy value) without indirect tax. This is an equivalent market price on natural diesel. Political, legislative, tax support and public position are a warranty to competitiveness biodiesel in Europe.

Especial attention deserves the invention a scientist - an engineer from Kramatorsk - cavitation reactor. Allows to reach the intensification of some chemical process that is to say conducts one chemical reactions without catalyst, other - with minimum amount reagent, other - with speedup in a hundreds once. In this instance, cavitation allows to conduct the reaction an etherification (the reception methyl alcohol that is named biofuel) by leaps and bounds. The essential advantage is that can be used raw material any quality (not only colza, but and sunflower, corn, soya, hemp, palm and others, aside from this and vegetable fat).

Intrinsically consumption of the colza in Ukraine forms whole 20%, but for want of export duty, Ukrainian processing of biodiesel unable to compete with exporter on the prices (the much of cultivated colza on territory of the Ukraine goes on export, basically in Germany). The construction plants on production biodiesel greatly has consolidated demand for colza and has reduced by sowing area of the sunflower, which on today exceed scientifically motivated rates.

Thereby, development and construction complex on conversion biological cheese on biodiesel is perspective. This currently in condition of the entering the Ukraine in WOT and significant increasing of the prices on fuel. Computed on by us payments confirm recoupment one such complex on length is 3-4 years. According to Program Ukraine plans before 2010 year build not less 20 plants on production biodiesel.

FEATURES OF WATER MANAGEMENT ORGANIZATIONS ACTIVITY COMPLEX EVALUATION

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Water management budgetary organizations carry out comprehensive activity in the field of water economy, earth's land-reclamations, providing of population and national economy industries necessities in water resources. But unlike a self-supporting sphere, efficiency in which is determined objectively the level of profitability, the budgetary organizations and establishment's activity estimation method in a considerable measure is indefinite and continues to have subjective character. The Ukraine statutory broker on a water economy conducts the organizations work indexes bulletin, which contains the large information array. It is enables to estimate organization after separate directions or works types, but does not allow to carry out general complex (or rating) organization activity description. Quite often the organization work general estimation from the side of higher establishment largely depends on leader ability to report about its activity.

A task to develop the method of water management budgetary organizations work estimation on the certain indexes system basis which would maximally engulf their entire activity spectrum appeared for the increase of management effectiveness and budgetary facilities use. As a result it is possible to estimate water management budgetary organizations activity efficiency after an integral index - rating.

For the leadthrough of budgetary water management organizations work results complex estimation (rating determination) the separate indexes of their activity, which can form a group after blocks and also unite in the generalized indexes, are used. Such methodical approach feature for water management budgetary organizations is indexes after large-sized blocks research:

- operating block;
- financial- economic block;
- inspector activity index block;
- waters and soils monitoring index block;
- skilled work index block.

Taking into account a method, estimation criteria and every index from the resulted blocks ponderability, an analyst determines an integral index that is water management budgetary organization rating.

The resulted method enables complex to estimate organization activity effectiveness (including water management type) after different work directions in default of such summarizing efficiency index as profitability

Table 1 – System of water management budgetary organizations work efficiency rating estimation indexes

	Name of block				
	Operating block	Financial - economic block	Inspector activity index block	Waters and soils monitoring index block	Skilled work index block
1.	The actually executed works and budgetary financing is on a general fund volumes correlation	A rate of receipts is to the state and local budgets volume growth (decline)	The actual special fund of water and geological reclamative expeditions and parties particle is to the budgetary financing	An amount of checking is for a 1 specialist	A particle of workers is under age 30
2.	Indexes from opened between an economic network from alluviums cleaning	Volume of untapped facilities after the budgetary programs, got from the state budget	Attitude of permanent repair volume is toward present observant mining holes	Amount and % considered businesses about administrative violations on a 1 specialist	A particle of workers is with higher education among leaders and specialists
3.	Herbicides application are for the vegetation delete indexes	An average monthly volume of requiring payment services grant is on one person and rate of their growth (diminishing) to the previous year	An amount of water and soils quality indexes measuring is on a 1 laboratories worker	% sums of the exacted fines are from the imposed fines lump sum	Plentitude of workers scope is in relation to preparation, retraining and shots qualification increase
4.	Indexes are from agricultural lands watering	Sum and particle of the facilities, directed on measures implementation, related to functional plenary powers of the Ukraine Statutory broker on a water economy, attracted in an area	Specific gravity of requiring payment services volumes is on a 1 worker of waters and soils monitoring laboratories	An amount of cases of losses extra charge is for bank-protection legislation violation	Particle of leaders and specialists which pass the qualification increase in the State institute of management and economy of water resources
5.	The drained earths use	An index is generalized from labour payment		% amounts of general with other organs verifications are from their general amount	Fluidity of shots is on a current date
6.	The index of mechanization of observational works is generalized	The index of account receivable reduction (growth) is generalized to year beginning		% implementation of the facilities receipt planned indexes is in a budget for the national value water objects lease	A particle of young specialists is among leaders and specialists
7.	The index of work is generalized from an energy-savings	The index of account payable reduction (growth) is generalized to year beginning		Sum of fines and losses, imposed on the violators of bank-protection legislation	Particle of workers which study, in the general quantity of workers

RESOURCING MEANING OF ASSIMILATION POTENTIAL OF ENVIRONMENT

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The free goods are subservient to satisfaction of necessities of humanity in its production, cognitive, recreational activities and other types of activity. A man, co-operating with nature during the activity, is permanently in the system of public relations. Community development destroying an environment, is based on the wide use of the free goods. One of type of the free goods, which is widely used by people is assimilation potential of natural environment.

From the ecological point of view assimilation potential of environment is an ability of natural territory or water area without self-destruction to decompose natural and anthropogenic substances (garbage, wastes) and remove their harmful influence in the subsequent cycles of biological (biotic) rotation, where these substances are involved. The terms of life of most harmful contaminating substances are limited. Due to physical, chemical and biological processes that taking place in biosphere harmful substances disintegrate and include in a natural geochemical cycle and harm to health not inflicting to population and natural systems.

From the economic point of view there is a necessary to examine assimilation potential of natural environment as an unique natural resource.

Let analyse natural resourcing definiteness of assimilation potential of territories. Usually we consider natural objects and natural phenomena, whose mechanism of development, properties, location are determined by objective natural laws.

Questions about concrete meaning of concept «natural resources» decided by different authors (Minzh, Gophman, A. Golub, A. Gusev, A. Kolotievskiy, Kasianov, S. Bobylvov and others). The opinions of scientists of concrete meaning of concept «natural resources» are different, but, analysing them, it is possible to make the conclusion that a natural resource is examined as a natural factor, satisfying a public requirement in a resource. The possibilities of using of this natural factor must be studied. Natural factor must possess by features of using value.

We will notice that society co-operates not with isolated, but with the aggregate of natural components, having a territorial form, i.e. all natural resources are territorial timed.

Thus, the basic criteries of taking of natural factors to the category of natural resources are:

- finding of natural factors is in the system of natural connections;
- satisfaction the public necessities (production, aesthetic, communication, cognitive) of people;
- being responsible for the criterion of public utility, it is as the potential use values;

- natural resources are territorial timed.

Assimilation potential of natural environment is responsible for all criterion signs of taking of natural factors to the category «natural resource». Consequently, it is an unique natural resource which is studied yet not enough and not included to the system of economic relations. It satisfies the necessities of society in recovering of natural environment, maintenance of its stability and ecological balance.

As a natural resource, assimilation potential possesses such properties:

- renewing (by influence of natural and anthropogenic factor);
- cyclicity;
- dynamic changeability;
- irreplaceability;
- systematic and complex character.

Quantitatively assimilation potential is close to such scientific and technical norms as limit possible concentration of harmful substances (a peak concentration of admixture is in the atmospheric air, landed surface, water environment which in the periodic influencing or during all life of man does not negative influence on him and natural environment), maximum permissible emission (scientific and technical norm which is set with a condition, that maintenance of contaminating substances is in atmosphere, land, water did not exceed the norms of quality last for a population, animal and vegetable world) substances.

From here we can define assimilation potential as certain barrier (limit) which will help us to define the volumes of the anthropogenic loading on an environment.

Assimilation potential is territorial timed. The assimilating capabilities of the forests, meadows, reservoirs, their separate parts, are different from their biotic and abiotic maintenance. It requires the complete studies in the sphere of maximum values of the anthropogenic loading on natural complexes, their restoration capabilities for maintenance of stability of natural environment.

Assimilation potential is an important, system and complex ability of environment, that plays a direct role in renewal and proceeding in the natural resources of ecosystems.

In – first, resource meaningfulness of assimilation potential allows to use it for satisfaction of necessities of society in maintenance of stability, renewal of natural environment and ecological equilibrium in practical activity.

In - second, him surrounding generating capabilities allow to restore an environment with all aggregate of reproduction of biotops, biocenoses and ekosistem (biotic and genetic biodiversity) for the certain interval of time.

To date with scientifically – practical point of view a problem of forming and using of assimilation potential as a major natural resource is not enough studied, that requires the new approaches for the development of the organizationally - economic mechanism system of his use.

REDUCING COST WITHIN THE FIRM AND THE ENVIRONMENTAL PERFORMANCE

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Cost reduction is at the heart of maintaining competitiveness of any firm. Cost Leadership implies that a firm sets out a broad scope and serves many industry segments, or even related industries and competes which is important to its cost savings. . The sources of costs advantage are varied and depend on the structure of the industry. They may include the pursuit of economy of scale, proprietary technology, preferential access to raw materials, and other factor.

The idea that companies can simultaneously reduce their costs and improve their environmental performance is very popular in environmental circles and has been proven attractive to some managers as well.

Another important factor to be pointed out is that even the low-hanging fruit can only be gathered after an investment of management time, and that resource is hardly free. Investments in environmental improvement, like all other investments, are worthwhile only if they deliver value after all the management costs have been included. It also turns out that the prevalence of opportunities for private costs savings in a particular business will be influenced “by the structure of the industry in which the business is competing and the changes that this industry is undergoing; by the importance of human capital to the business’s success; and by the time horizon over which the business evaluates its progress.”

Accounting for environmental costs and performance can support a company’s development and operation of an overall environmental management system. Such a system will soon be a necessity for companies engaged in international trade due to pending international consensus standard ISO 14001, developed by the International Organization for Standardization.

As we know in real life information does not flow with complete freedom between managers on different levels or between managers and shareholders. In particular, the firm’s senior managers know less about environmental costs and opportunities than do the middle-level managers. If information flowed freely within a firm, senior managers and shareholders could detect opportunities for costs savings as easily as the managers who are immediately responsible for the operations. An effort to remove some of the impediments in information flow could result in opportunities to save costs. There might be cases though where the relevant information is buried but there is no way to disinter it; in this case environmental pressure can not drive the cost savings unless some incentive - whether a government rule or an internal executive initiative - brings it to light.

Most of the immediately evident forms of environmental cost savings that firms can capture in the short run take the form of reductions of quantities of

purchased materials and services. Firms that produce less waste need to buy fewer waste management services, and perhaps fewer raw materials as well. Reductions in price also may happen when improved environmental performance leads to lower per-unit costs for certain specialized purchased services, like purchased environmental impairment liability insurance. More commonly, though, quantity reductions drive the short-term cost savings

Through pollution prevention companies can realize significant savings, resulting in a cost advantage

relative to competitors. Indeed, pollution prevention may save not only the cost of installing and operating end of-pipe pollution-control devices, but it also increase productivity and efficiency. Less waste means better utilization of inputs, resulting in lower costs for raw materials and waste disposal. Pollution prevention also may reduce cycle times by simplifying and removing unnecessary steps in production operations. Furthermore, pollution prevention offers the potential to cut emissions well below required levels, reducing the firm's compliance and liability costs. Thus, a pollution-prevention strategy should facilitate lower costs, which, in turn, should result in enhanced cash flow and profitability for the firm.

Pollution prevention is a challenge for the private sector because it requires diverse forms of innovation. Pollution prevention can require the redesign of the products, the reconfiguration of manufacturing processes, and the realignment of supplier and customer relationship.

Evidence also suggests that in the early stage of pollution prevention, there is a great deal of easy and inexpensive behavioural and material changes that result in large emissions reductions relative to costs gain, the so called "low-hanging fruit."

As the firm's environmental performance improves, however, further reductions in emissions become progressively more difficult, often requiring significant changes in processes or even entirely new production technology.

Many companies are using supply chain and product stewardship initiatives to help them to improve their environmental performance and profile while reducing costs. For instance, increasingly more firms want their suppliers to work toward certification under the environmental management standards of the International Standards Organization (ISO).

Savings from capital, labour, and information are harder to capture in the short run than savings from purchase materials and services. In the long term, the firm may be able to capture savings in some of these other categories, but not all.

IS ECONOMIC GROWTH A CAUSE OR CURE FOR THE ENVIRONMENTAL DEGRADATION: THE CASE OF ENVIRONMENTAL KUZNETS CURVE

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The relationship between economic growth and pollution has been a focus of research by economists for many years. There are two basic competing views with respect to this relationship: the first one states that economic growth is harmful to the environment due to ineffective use of resources, while the second one states that technological process and economic growth improve environmental quality.

In 1995, Grossman and Krueger (1995) on the basis of cross-country analysis introduced the inverted *U-shape* relationship between pollution and per capita income. Due to the form of the relationship the curve was named the Environmental Kuznets Curve (EKC), after Simon Kuznets, who in 1955 showed that at the early stages of a country's development the gap between poor and rich increases, while when the country becomes wealthier the inequality gap decreases.

The main objective of this study is the estimation of the functional form of the EKC for different air pollutants in Ukraine. We want to see whether or not Ukraine follows developed and developing countries that do exhibit the EKC relationship.

The data set used in this study consists of three blocks: (i) income block, (ii) pollution block, and (iii) meteorological block.

The Income block includes— data on a city level for 50 big Ukrainian cities. Basic variables in the income block are average annual wages in regions and per capita income. Data for per-capita income and wages is taken from the Ukrainian Statistical Year Books.

The pollution block consists of *concentrations*. Concentrations are measured in mg/m^3 . The data set includes concentrations of such pollutants as CO_2 , NO_2 , SO_2 , dust and IAP (*index of air pollution*).

The meteorological block is presented by such indicators as the number of days in a year with *smog*, *precipitations*, *winds*, and *annual average temperature*. Based on these indicators, a vector of climate variables was constructed which includes: percentage of days with smog, winds, precipitation during a year; average temperature.

Basic model that we are going to test is taken from Egli (2004), who tested the EKC hypothesis for Germany using pooled data. Egli (2004) found a reduced form model with only squared terms for income that underlies the inverted U-shape relationship. He used the following specification:

$$E_t = \beta_0 + \beta_1 Y_t + \beta_2 Y_t^2 + \beta_3 Y_t^3 + \beta_4 S_t + \beta_5 I_t + \beta_6 D_t + \varepsilon_t \quad (1)$$

where Y stands for per capita income, S – industry’s share in GDP, I - sum of imports and exports from pollution intensive production relative to GDP, D is the reunification dummy for Germany.

In our model, the pollution-income relationship is based on theory using available data. Due to the fact that we have a panel data for 50 big Ukrainian cities, the model (1) will be changed slightly and expanded.

The model that we are estimating in our study is:

$$E_{it} = \beta_0 + \beta_1 Y_{it} + \beta_2 Y_{it}^2 + \beta_3 Y_{it}^3 + \beta_4 T_{it} + \beta_5 W_{it} + \beta_6 R_{it} + \beta_7 S_{it} + \varepsilon_{it} \quad (2)$$

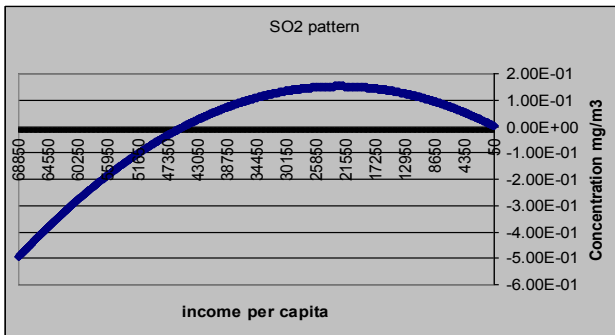
where E_{it} stands for pollution in a city i in year t , Y stands for per capita income in each particular city, T - is average annual temperature in each city i , W – is the percentage of days in the year with wind in each particular city, R - is the percentage of days in the year with precipitation in the city, S – is the percentage of days in the year with smog in each city. In general, model (2) is restricted in a sense that we have a single intercept for all cities. According to that assumption, within one country the pollution would be the same if all economic and climate factors were equal. That assumption can be overcome by incorporating dummy variables for all but one city, which is a control unit.

In the case when there is strong link between income and climate variables, equation (2) will be affected by multi-collinearity due to correlation of income with other variables. The relationship between pollution and income based on instrumental variable approach can be specified as follows

$$\ln SO2_{it} = \alpha_0 + \alpha_1 \hat{Y}_{it} + \alpha_2 (\ln \hat{Y}_{it})^2 + \alpha_3 \ln W_{it} + \alpha_4 \ln R_{it} + \alpha_5 \ln S_{it} + e_{it} \quad (3)$$

In which \hat{Y}_{it} is the predicted value of capital for each particular city.

Looking at the graph 1, it is seen that income and income squared are both significant, and indeed represent the inverted U-shape relationship.



Graph 1 – The pollution – income relationship (case of SO2)

The key point that we may conclude from the table is that according to our predictions the concentration of SO₂ should start to decline in Ukraine, when the per-capita income will be at level of about UAN22000. The obtained results are not in contradiction with the previous works of Western scientist, and we say that Ukraine has its own EKC (at least for SO₂). The rest of the pollutants did not show the inverted U-shape relationship, however we assume that it could be due to the small period of observation, and low volatility in data, more econometric analysis should be done in that spree.

ECOLOGICAL BUSINESS PROBLEMS IN SUMY REGION

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Principles of forming of economic mechanisms of environment and nature protection activity were set by the Law of Ukraine "About the guard of natural environment".

One of the important directions of working out sustainable development problems is creation and ecological services market development in Sumy region.

Although Sumy region has considerable enterprise personnel such directions of ecological enterprise as processing of wastes, consulting, providing, ecological audit, ecological insurance, production of nature protection equipment, measurings devices, etc, develop not enough.

The modern market of ecological works can not substantially influence on an ecological situation in a region yet. Principal reasons of such situation are: problems of insufficient development of legislation, absence of favourable terms and proper support of all forms of ecological enterprise.

At the same time, with a review on experience of the developed countries, resulted higher directions of enterprise are profitable enough and act considerable part in a public problems decision process. Experience of countries with a market economy shows that the most effective method of working out ecological problems is forming of independent branch of economics - ecological enterprise of that owners who in the practical activity combine own economic interests with the state aims of nature protections and priorities.

The basic directions of ecological business problems solving at the level of Sumy region are:

- active voice in the national legislative process of support of ecological enterprise by the grant of concrete suggestions to perfection of current legislation (deductions of taxes, mechanism of redistribution of payments for contamination of environment, favourable crediting of purchases of equipment, and others like that) with the use of the experience accumulated in a region;

- informative support of ecological enterprise (providing of openness and access of businessmen to ecological information, organizing of free advising on legal and ecological issues in magazines and through the Internet, creation of electronic base of ecological enterprises of region, and so on);
- investments assistance in the nature protection business;
- perfection of tender selection performers procedures of nature protections works, which are financed on territory of region due to state and local budgets;
- perfection and simplification of public and communal domain objects lease procedure, including privileges, for the aims of assistance the separate forms of ecological enterprise (processing of wastes of dumps and others like that);
- support of creation and activity of ecological enterprises and businessmen association in Sumy region with the purpose of assistance ecological safety of region problems solving, account of opinion of ecological businessmen at a decision-making at regional level, decision of ecological questions, that in accordance with an international legislation behave to jurisdiction of ungovernment agencies (ecological audit, registration of ecological public accountants, etc);
- development of prognose estimations and program of development of ecological enterprise in Sumy with forming of market of services on the basis of domestic and international standards.

Ecological audit gives real possibilities of optimization of production process on enterprises nowadays. For sure private sector should be actively engaged in warning and removing ecological problems, and also optimization of economic activity by the rational use of natural resources and diminishing of wastes in an environment, introduction of the control nature protection activity system, and also by possibility of collecting an income from the conduct of the ecologically directed activity.

As conclusion, forming of the ecological management system will enable to provide successful realization of economic policy of the state, will lead to forming of the ecologically oriented business and will assist effective steady and sustainable development of Sumy region.

POTENTIAL OF WIND POWER IN UKRAINE

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Ukraine as most of industrial countries observes development of wind energy usage in the large and medium capacity windmills installation.

Compared with any other Newly Independent States, Ukraine is way ahead in wind power usage. Total installed capacity has now reached over 51 MW, and installation is still continuing with domestic manufacturing facilities being established. Over 80 million kWh of electricity have been produced since the first Ukrainian wind farm came into operation.



Fig.1 – Example of installations.

A strong wind power industry support was given by a Ukrainian government Law issued in 1996 in the form of Complex Wind Farms Construction Program with a target of 1990 MW of capacity to be installed by 2010. Twenty three Ukrainian plants are involved in production of the USW 56-100, with the Yuzhmash factory responsible for the assembly. The turbine is based on a design from the American company US Windpower, which successfully installed many

thousands of similar machines in California during the 1980s and early 1990s. Still new generation technologies are required to enhance higher efficiency of wind power generators. Ukraine is striving for 100% components for windmills are manufactured in the country giving a big opportunity for launching manufacturing on the basis of Soviet industrial parks. Nowadays 10 turbines of USW 56-100 are produced monthly in Ukraine. Among operating wind power stations are Donuzlav WPS with installed capacity of 10.7 MW, Saki WPS – 2.5 MW, Novoazovsk WPS – 3.3 MW and Truskavets WPS – 0.75 MW.

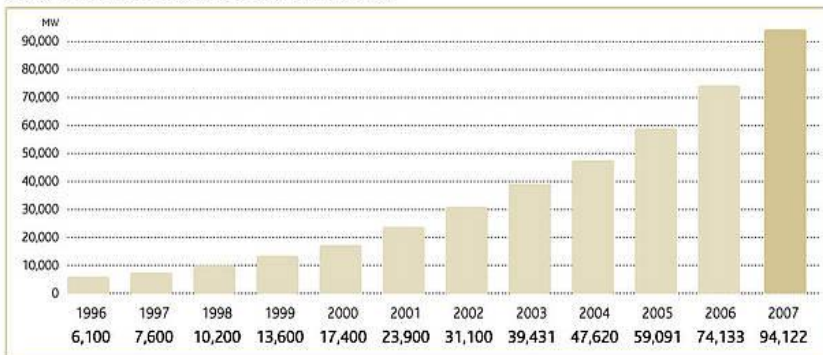
Another potential segment for wind power generating is installing small-capacity windmills up to 20 kW for the needs of agriculture sector which is estimated to have the potential to cover all agriculture and upcountry land electricity demands.

The most promising areas for locating windmills are those with the average wind speed of 5 meters per second, namely: Black Sea and Azov Sea coastline, Odesa, Kherson, Zaporizha, Donetsk, Luhansk, Mykolaiv regions as well as in the mountainous regions of Carpathinans and Crimea. The Crimean coasts make Ukraine second after Norway among countries possessing shallow water areas that are suitable for large wind farms and can account for 1,000 MW out of total 5,000 MW capacity of wind generation potential estimated in Ukraine. Crimea potential alone is sufficient to generate more than 42 billion kWh/year of electricity.

Still if Ukraine covers targeted capacity of 1900 MW by 2010 it will constitute only a part of what is being produced by many of European countries.

Table 1 – Global cumulative installed capacity – world potential

GLOBAL CUMULATIVE INSTALLED CAPACITY 1996-2007



BASIC ASPECTS OF OIL PRICE FORMATION

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Recent oil (and other commodity) price rises, and continued rapid industrialization in China and India, have raised concerns about longer term energy security. Almost all mainstream energy forecasters predict growing global demand growth, underpinned by developing country growth and continued, albeit much slower, growth in demand in the industrialized economies.

An important concern that global capacity to substantially increase oil production will be increasingly constrained by the size and distribution of the geological resource base. As a result of such succession of events, prices are likely to stay at high levels, and may even rise further if demand continues to grow.

Views about long term prices are vital inputs to many energy investment decisions that have long lead times and a capital stock that turns over only very slowly.

The optimal price oil is the long run marginal cost (LRMC), where the LRMC includes environmental costs in addition to the full cost of doing business. This is a well-established principle of efficient market pricing. At the same time, there is much room for uncertainty in the future dynamics of the world oil prices, concerned with a number of factors relating to both - demand (world economy growth rates), and supply - proposition (oil production).

As an analysis of the situation on the world oil market shows, a number of factors will contribute to maintaining of high level of world oil prices. According to expectations, the growth of world oil demand will be sustainable, despite high oil prices.

History shows that current high oil and other commodity prices should eventually come down as supply and demand respond to high prices. But there will be lags in these responses because of the long lead times usually required to make new energy investments, turn over the capital stock, and even to change users' expectations and behavior.

Numerous studies have provided estimates about the effect of oil price shocks on the global economy. Though consensus on the precise magnitude of the impact is lacking, most of them agree that oil shocks reduce the overall economic growth.

In a market where the balance between supply capacity and demand is tight, and below historical levels, effective mechanisms to significantly reduce the risk of further price volatility are few in the short term. This is mainly because:

- On the demand side, capacity to switch industrial fuels is limited in the short run and, consumers tend to be relatively price insensitive in industrialized countries, but more price sensitive in developing countries. Government efforts to manage demand in the short term through administrative fiat or exhortation, may have a short term impact but have their own costs on consumers and business.

- On the supply side, high prices should eventually lead to increased new investment. While long lead times for new production development mean the short term supply response is limited, governments can help by removing unnecessary barriers to urgent needed investments.
- Strategic stocks held by consuming countries are likely to have a limited role to play because of their relatively small size. They are more likely to be held in reserve or only used, as was the case with the recent release of 29 million barrels of crude oil by the USA and International Energy Agency, to meet perceived specific shortages in the market.
- The role of OPEC and other major oil producers to address price volatility problems is significantly constrained due to the current lack of spare capacity

The threat of climate change, poses issues for the continued growth in use of fossil fuels (coal, oil and gas) – that for more than 200 years have been the most convenient and cost effective fuels for modern economic development – and are likely to continue to have cost advantages (excluding any consideration of possible externalities) in some important uses for a long period to come.

However, even those forecasters who believe that prices will eventually retreat from today's levels, and that global supplies can be developed to meet increased demand at prices below today's, believe that, for the short term, the balance between global demand and supply capacity will continue to be very tight and it likely that prices could remain high or increase. The latest short term forecasts of the Energy Information Administration (EIA) of the US Department of Energy, for example, predicts that prices will remain above 2007 level through 2008.

Oil exporters have been able to generate windfall profits from high oil price levels. However, their trade relations with importers could eventually be harmed as a result of the negative impact on economic growth of high energy prices, although there are few signs of this yet.

In this respect, the attention directed towards the issue of energy security by the international community has been greatly heightened by the increase of oil prices to record levels in nominal terms, although prices are considerably lower than their peaks in the 1970s, over the past 18 months which has contributed to high volatility and rising energy prices overall. Rising and volatile energy prices pose a risk to the world economy and to all countries, but the poorer importing countries are less able to cope with increased prices. Importers generally are also concerned about the meaning of short term price shocks for longer term secure supply of reasonably priced energy.

Recent events in oil and other markets have brought the issue of energy security to the forefront. High and volatile prices raise concerns about short term risks to economic growth and about longer term energy security. Although it will mean different things to different countries, there is a strong common interest in ensuring the world can produce and use energy at reasonable costs and in a sustainable way to ensure the quality of life of the world's peoples.

ECOFEMINISM: A NEW CONCEPT OF SUSTAINABLE DEVELOPMENT

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Ecofeminism, or ecological feminism, is a term coined in 1974 by Françoise d'Eaubonne. It is a philosophy and movement born from the union of feminist and ecological thinking, and the belief that the social mentality that leads to the domination and oppression of women is directly connected to the social mentality that leads to the abuse of the environment. It combines eco-anarchism or bioregional democracy with a strong ideal of feminism. Its advocates often emphasize the importance of interrelationships between humans, non-human others (e.g., animals and insects), and the earth.

Feminism is concerned with the way in which women in general have been subordinated to men in general. Ecology is concerned that human activity is destroying the viability of the global ecosystem. Ecofeminism argues that the two are linked. Ecofeminism has a major contribution to make to our understanding of the current destructive relationship between humanity and nonhuman nature. As its name implies, ecofeminism brings together the insights of feminism and ecology:

The key issue for ecological economics is not sex-gender difference but the gendering of human societies.

For ecofeminists the most important aspect of the present global economy is that it represents a value system that subordinates both women and nature and sees itself as superior to traditional subsistence economies. The modern economic system is based on a dualistic hierarchy of values mainly expressed through money/profit but also as prestige. External to these values are the unvalued or undervalued, the resilience of the ecosystem, the unpaid and unrecognized domestic work of women, and the social reciprocity in communal societies as represented in non-market economies.

A central tenet in ecofeminism states that male ownership of land has led to a dominator culture (patriarchy), manifesting itself in food export, over-grazing, the tragedy of the commons, exploitation of people, and an abusive land ethic, in which animals and land are valued only as economic resources. Other ecofeminists explain how the degradation of nature contributes to the degradation of women.

The link between women's subordination and the degradation of the natural world lies in women's centrality to the support economies of reproduction, unpaid domestic work and social reciprocity -- i.e. the home and the community. The unvalued economy is the world of women, of women's experience - a WE- economy. The valued economy, on the other hand, is male-dominated, representing men's experience - a ME-economy.

Ecofeminist political economy offers an explanation of how destructive economic systems are constructed and sees the WE-economy as the basis of an

alternative, non-exploiting, sustainable economy. Because the ME-economy has largely left women behind, in the lives and experience of women lies the possibility of an alternative path. Throughout history, women have formed the backbone of economic and social systems, although their work has been largely unacknowledged.

What would an ecofeminist economy look like?

1. There would be a shift of focus from disembodied and disembodied structures to patterns of work and consumption that are sensitive to the human life cycle and to ecological sustainability.

2. Local production would be oriented to local needs using sustainable local resources with minimal waste.

3. Basic food provisioning would be local and seasonal. Food would be grown locally where possible, but direct purchasing arrangements could also be agreed upon with local farmers. Farmers' markets would be encouraged where they do not already exist.

4. Provisioning of necessary goods and services would be the main focus of economic systems, not money-making. It should be possible for people to live and work entirely within a provisioning system.

5. The emphasis would be on useful work rather than employment. That is, people would not need to do harmful work in order to have a livelihood. Any additional profit-based economic activity would be subject to stringent resource/pollution and labour exploitation rules.

6. Work and life would be integrated. The workplace and living base would be interactive. People of all ages and abilities would share activities. Households would vary from single person to multi-person.

7. Necessary work would be fulfilling and shared by both genders. Work and leisure would interact. Festivals and other celebratory activities would regularly punctuate productive work.

8. Inter-regional and international trade would be seen as a cultural as much as an economic exchange. Travel would be undertaken for education and communication rather than consumption.

9. Personal security would rest in the social reciprocity of a provisioning WE-economy rather than in money accumulation systems, particularly in old age.

Building an economic system which truly values women and nature requires clear vision and understanding, as well as much political work, beginning in the local communities where everyone lives.

There are good reasons why feminist and ecological approaches to economic transformation are intertwined and interdependent, so understanding and drawing from feminist perspectives can strengthen ecological economics both theoretically and in its uses and applications.

In fact, feminist ecological economics is already helping to generate a new vision of an economy which is socially and ecologically sustainable – and to show how to bring it into existence.

SUSTAINABLE ENERGY DEVELOPMENT

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Recent reports released by the Intergovernmental Panel on Climate Change (IPCC) in 2007 state unequivocally that the world is warming and that human activity – rather than just natural variations – has contributed to current levels of warming. The reports provide a comprehensive analysis of how climate change is affecting natural and human systems.

The findings underscore that fact that climate change is a key development concern. The people most at risk from climate change live in countries that have contributed the least to the atmospheric build up of carbon dioxide and other greenhouse gases linked to the recent warming of the planet.

Further, those most affected are also least able to cope, making it an issue of inequality and insecurity.

The inefficient and polluting energy systems in Ukraine are glaring economic and environmental problems interwoven with promising opportunities for reducing global greenhouse gas emissions. Ukraine economy suffered from the low productivity and living standards associated with inefficient energy use long before central planning came to an end.

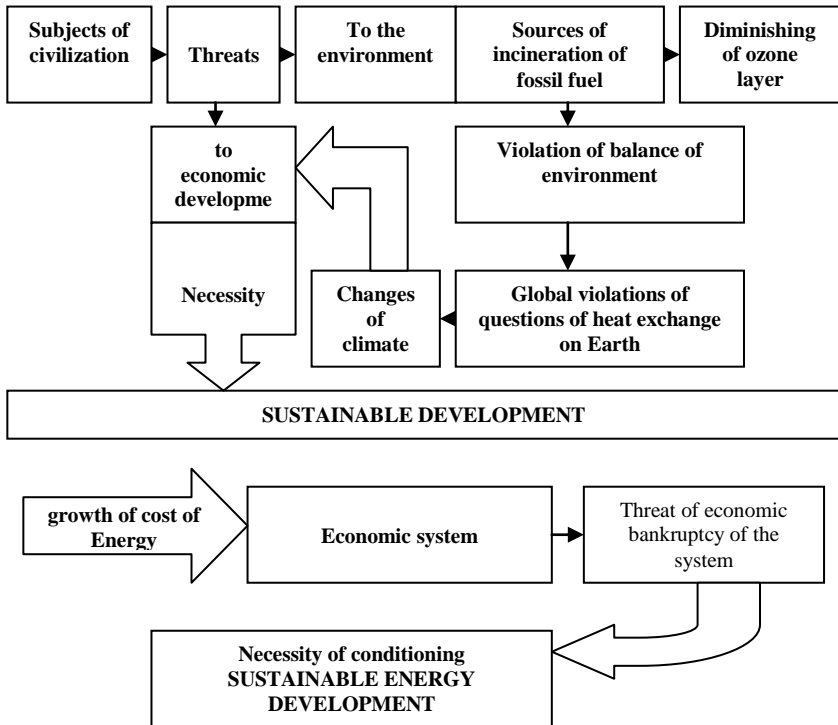
Scientists have a prognosis:

- that world energy demand will grow by two-thirds in the next 30 years;
- that fossil fuels will continue to dominate the energy mix;
- that nearly two-thirds of the growth in energy demand will arise in developing countries;
- that financing the required new energy infrastructure is a huge challenge, depending largely on the framework conditions created by governments;
- that international energy trade will expand dramatically;
- that natural gas demand growth will outpace that of any other fossil fuel, but will itself be outpaced by demand growth for renewables;
- that transport will dominate the growth in oil use;
- that electricity use will grow faster than any other energy end-use;
- that the proportion of the world's population without access to electricity will fall by a third; or, conversely, that 1.4 billion people will still lack access to electricity in 2030;

The production, transformation and consumption of energy give rise to environmental problems, such as the emission of CO₂ and local pollutants like SO₂, which are of growing concern worldwide.

IEA Ministers recognise that current energy trends are not sustainable and that a better balance must be found between the three Es – energy security, economic development and protection of the environment.

Energy is part of many environmental problems, including climate change, and must be part of the solution. The IEA has been engaged for more than a decade on designing cost-effective approaches to reduce CO₂ emissions, from the international policy architecture (including trading mechanisms) to energy efficiency policy and the promotion of clean technologies.



Picture 1 – Ground SUSTAINABLE ENERGY DEVELOPMENT

Ukraine must be active in initiatives within the UN system to promote sustainable development and follow up the Johannesburg Plan of Implementation and the UN’s Millennium.

In the future a major scientist’s activity must main continuing coordination of all of the interested parties to produce a major interagency publication and development Energy Indicators for Sustainable Development: Guidelines and Methodologies.

UN Energy is designed to better connect energy activities throughout the UN system, to continuously improve efficiency and mutual support.

ECOLOGICAL IMPROVEMENT AND SUSTAINABLE DEVELOPMENT IN VOLLEYBALL ON THE BEACH OF RECREATION TERRITORIES BY ADAPTING THE EU-ECO-AUDIT

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Nowadays the concept of ecological management and audit is very popular, but in Ukraine we have no experience and normative-legal base, which could be supported corresponding to administrative mechanisms. Particularly this concerns the audit of recreation territories, athletic and other cultural actions connected with them.

Because of defect of ecological privity youth instead of that to repose on local beach with the help of active plays, transforms them in public scrambles. The volleyball on the beach is very popular and successful game, in Kharkov in summer we may play on the beach of Alekseevskoe lake, in Kharkiv region – Pechenezhskoe, Travyanskoe lakes. But for future success we need some improvements for environment, some warranties for sustainable guard and increase aspectual wealth of the nature. In this case the model of eco-audit is very successful☺.

Our investigation revealed that the main difficulty was to increase the level of awareness about ecological issues with the employees of the various enterprises, and to identify the responsible departments within the enterprises and to initiate the actual auditing process. It is important that employees of all levels and all departments of the company participate in the process. This needs to include slope grooming, as well as advertising and marketing, and service and management. All participated in an analysis of strengths and weaknesses, and in a discussion to determine an environmental policy for the company, and the formulation of goals and principles for environmental management. This broad participation in the initiation of the auditing framework is essential for its successful implementation. Thereafter it is essential to develop a framework specific to the peculiarities of a volleyball on the beach. Therefore we decided in the implementation of our framework that it is essential to map the following ecological phenomena and human influences for each beach area: geology and soils, climatic issues, hydrology, vegetation, fauna, building measures, damages distinguished by causes and land use all the year round. In addition, visitor management and ecological information offers were evaluated to learn about the already existing environmental activities of the territories of beach volleyball.

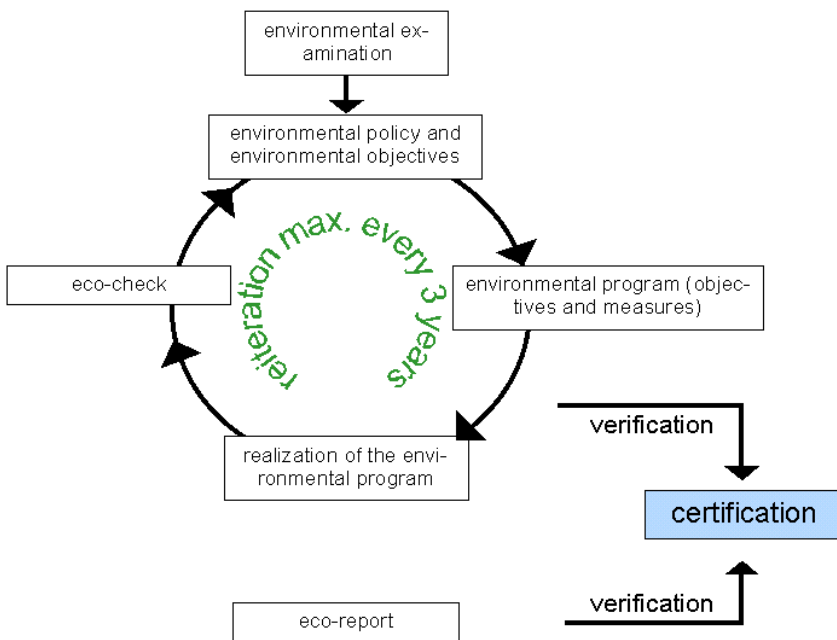


Figure 1 – Model of the EU- Eco Audit process

We think, that the implementation of the audit framework leads to the following improvements:

- enhanced consideration of habitats for bird species that are particularly sensitive to disruptions during the summer season;
- eliminate intensive agriculture in sensible recreation areas;
- protected valuable habitats;
- improved management of water resources;

Related to the EU-ECO-Audit we see, that competitive advantages for those enterprises which join the auditing process can only be expected if it is accompanied by an intensive marketing effort illustrating the main idea, the effects on the environment, the involved experts and clearly stating who is responsible for the certification process. Despite all this effort one must keep in mind that for most winter clients the environmental certification is only one additional attribute of a winter destination and not an essential one (such as snow assurance).

Combined with a Geographic Information System, the EU-Eco-Audit proves to be an excellent method for undertaking an ecological improvement close to practice. In contrast to more conventional restrictions and regulations, the audit process entices the enterprise to become pro-actively involved in environmental management on a continuous basis and to make it an integral component of their management routine. This may also lead to reduced costs and improvements in the

organizational structure. Furthermore the Audit contributes to a positive, “green” image of the volleyball on the beach and increases its attractiveness during international competitions to host mega events.

Despite this positive balance that can be drawn from working in different regions, a widespread realization of this idea will depend on the question, if the immediate benefits of managing volleyball runs and marketing also will be profitable to local tourism. Also, it is to be expected that the awarding of volleyball competitions will more and more be associated with the existence of a credible ecological concept and a sustainable management. At the same time, the importance of the Audit for sport competition venues will gain in significance. This is especially valid because of the rating that competition venues grab with international sport contests, considerable for the weight and the touristic commercialisation within international comparison.

INFLUENCING OF EXTERNAL ENVIRONMENT AS A SYSTEM ON STRATEGY OF ENTERPRISE

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Forming on the enterprises of strategy of development what was based on the foresight of prospects of influence of external environment requires departure from the usual understanding, that success of firm depends only on good organization of production, effective use of all types of resources. The process of search of co-ordination of administrative decisions to the external environment and adaptation of internal processes is one of important tasks of activity of enterprise.

The environment determination is an open system which is proper to the certain requirements such as: integrity, hierarchical, synergetic. Means of integrity is that any change of structure of the system, its communications and conduct influences on functioning of its elements. Synergetic is property of the system, uninherent to its components. The hierarchical means that any system can be represented as subsystem of more high order from one side, and with other - includes elements which it is possible to represent as certain system.

Many scientists are interpreted the concept "system" on different, depending on an object and article of research. The most capacious and structural determination of the system is given Erohina E.A.: «the system is examined as aggregate of objects and processes, urgent by components, associate and interactive between itself, which form single whole, possessing properties, uninherent to making his components, taken individually» [1]. The Ukrainian scientists M.V. Bormotova and C.K. Zolotarev represent the category «economic system» as: «difficult purposeful guided dynamic aggregate of elements, which carry out production, distributing and consumption of material welfares with the

purpose of satisfaction of increasing human necessities in the condition of narrow-mindedness of resources» [2].

The external environment has a different influence on enterprise and requires different strategies. All of them have certain position at the market, life cycle, description of commodities and services. But in the same time, there are some fundamental moments of influencing of external environment on strategy of enterprise. So, for example, on activity of enterprises the intensive influencing of unfavorable events is on the slump of the economy growing. In also time stability and balanced of economy abbreviates possibility of development of insolvency of enterprises. This period is the effective form of economic co-operation and adaptation of enterprise and stable activity. According to one of basic tasks there is determination of points of equilibrium of the economic system. This condition is very effective using of resources. It should be noted that it is necessary to examine a dynamic equilibrium.

A theory about the equilibrium of the system was first represented in the XVII item by the European scientists of T. Gobbson and Leybnytsem. They examined a public equilibrium as certain certain proportional correlation between parts of society. In an economic theory conception of equilibrium was learns by such scientists as T. Poppy, S. Fortei and in the development passed certain stages. The most ponderable deposit is had by the following directions:

- classic model of economic equilibrium (Adam Smith, D. Rikardo, L. Valras and other);
- keynsyanskaya model of common economic equilibrium (Keyns);
- monetarism (M. Frydman).

As the account of influencing of all macroeconomic conformities to the law at forming of strategy of enterprise is an intricate problem, for simplification we will take advantage of assumption, that by basic factors determining the state of economic equilibrium, are:

- combined demand;
- suggestion of goods and services;
- volume of natural resources necessary for production.

We will make the system of the got differential equalizations:

$$\begin{cases} \frac{dX}{dt} = a_1(a_2Y - a_3X) - a_4YZ \\ \frac{dY}{dt} = c_1(c_2X - c_3Y) \\ \frac{dZ}{dt} = d_1XY - d_2Z \end{cases}$$

where Y - is money term of volume of profits;

X - is volume of goods and services;

Z - is volume of the natural resources used for production.

Determinations of managing parameter of order which depends on volume of natural resources necessary for production and his adjustment will help enterprises to get the effective functioning.

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ACCOUNT OF NATURE-PROTECTIVE EXPENSES ON ECOLOGICALLY HARMFUL PRODUCTION

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Nowadays there are a lot of dangerous plants and factories which partly led to critical ecological situation in Ukraine. In the most cases such enterprises are in the stage of bankruptcy and are subject to the perfect restructuring and sanitation due to of negative influence on environment over inefficient using of nature sources and insoluble economic-ecological problems.

Primary estimation of accordance by each enterprise to ecological requirements can be executed by the specialists, as a rule, who knows well the state of technologies and other features of enterprise, where these technologies are used. For this purpose specialists from abroad propose to use criteria of testing production's state.

The information which has got after ecological testing and destination, can give transparent picture about production problems, quality of products, which is produced, willingness and ability of enterprise to develop with according to the modern demands of guarding environment and have the proper charges. A similar approach allows to establish the «area of the higher attention», the size of operating on a natural environment is not here examined. In this turn, quantitative estimations of antropogene action are used with the goal of establishment degree an ecological danger of industrial object.

Actual action of industrial enterprise on environment (throwing out of contaminating substances, wastes, and uses resources) changes in course of time.

However, on the most enterprises nature protective charges can make considerable sums which are possible to optimize only by condition an effective management by them. That is why it is important to carry out monitoring of charges on nature protective activity with their analysis and presenting reports about the expense of means. With the aim of realization this position it is

necessary of presence the account's system and analysis of nature protection charges on the enterprises. Elaboration of such system must begin from a location origin of charges, related to the types of nature protective activity, their revelation, resource providing and the most correct distributing. According to recommendations the ISO 14000-96 (ISO 14000) types of nature protective activity have the following classification:

- directed on formation a nature protective policy, aims and tasks of enterprise;
- related to organization of nature protective enterprises' functions;
- directed to realize the planning an ecological actions for all life cycle of products and realization the developed plans;
- directed on conducting an ecological monitoring;
- types of activity are related with revealing an estimate, by compensation of socially economic-ecological loss, conditioned by contamination environment and exception of natural resources from economic turnover. Adding up of charges on the indicated types of activity gives us the picture of general enterprises' expenses in the guarding environment sphere and rational using natural resources.

It is very important, that the elements of charges must be set in such way, in which they are distributed for different subdivisions or workplaces, and for the type an ecological problem too. After identification elements of charges, information sources are exposed about them. The collection information system about charges can be chosen on every enterprise, which must secure the concordance all information with financial materials, abacuses and etc.

Nature-protective charges can be analyzed only by presence of the proper base for their comparison, because the charges, which are taken only in absolute (cost) expression, can give us the wrong conclusions (growth the nature protective charges and motion of some period can be caused by the runaway of charges), while their increase is conditioned by growth of scales production, that resulted to growth the nature protective charges. That is why, the size of nature protective charges must be correlated with a production volume or other index which reflects the change of scales activity an enterprise.

In general efficiency of nature-protective activity of enterprises in the conditions by insufficiency development economic policy in Ukraine, personal interest of enterprises and corporations in the sphere of environment and rational nature-using is very much low.

Enterprises which are practise an ecological management, in theory have a lot of substantial advantages. At first, it is the decrease expenses at: resource- and energy-saving; utilization, sale of by-products and production's wastes; minimization of paying for resources and contaminations of environment. Secondly, growth of profits due to higher prices on ecologically cleaning products; increase of competitiveness; creation new types of products. Thirdly, a favourable

image, ability to the permanent renovation the assortment of products, the best possibilities for export outputs export.

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THE DEVELOPMENT OF TOURISM SECTOR IN THE REPUBLIC OF AZERBAIJAN

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The objective of this abstract is to show the importance and effectiveness of tourism sector in the economic sphere of the country and present it in the XIV Scientific Conference on the subject of Economist for Ecology to be held in Sumy, Ukraine between May 6 and 9 2008. In this thesis I will try to justify the importance of tourism sector development to search the perspectives and problems in this regard in the Republic of Azerbaijan.

The main reason for raising the role of tourism in the economical and integration system of the Republic of Azerbaijan is the country's location in a good geographical and economical position, some international projects pass through its territory and some of the countries use the opportunity of Azerbaijan as a transit service.

Azerbaijan is available for tourism and takes the main place for its geographical area position in carrying freight, and transport passengers as an available - transnational transport corridor in Europe and Asian and East- West.

We look at the Tourism Market in the country as a perspective structure mechanism of its area, territory and structure improvement of its economical system.

According to recent statistics of WTO, tourism provides 10 percent of the world's income and employs almost one tenth of the world's workforce. By the year 2010 these numbers will double. International tourism is the world's largest export earner and an important factor in the balance of payments of most nations. The receipts from international tourism can provide a valuable source of earnings for many countries both developed as well as developing. Although tourism is sensitive to the level of economic activity in the tourist generating countries, it provides more stable earnings than primary products. The income from tourism increases a higher rate than merchandise export in a number of countries. It stimulates investment in

infrastructure, most of which also helps to improve the living conditions of local people. Tourism has become one of the world's most important sources of employment and this sector may help regional development in the country. Besides, tourism can be effectively used to address the problems of poverty. However, there are also negative sides of tourism's development for local communities. For example, in most all-inclusive package tours more than 80 percent of travellers' fees go to the airlines, hotels and other international companies, not to local businessmen and workers. Besides, large hotel chain restaurants often import food to satisfy foreign visitors and rarely employ local staff for senior management positions, preventing local farmers and workers from reaping the benefit of their presence. Many tourists never leave the hotel grounds or cruise ship, reducing the possibility of tourist income for local businesses.

Development of tourism industry has multiplier effect on country's economy, there for tourism's income is not easy to measure. The multiplier theory has been created by Keynes. In according to Keynes's theory the flow of money generated by tourist spending multiplies as it passes though various sections of the economy. The benefits from infrastructure investments, justified primarily for tourism – airports, roads, water supply and other public utilities – may be widely shared by the other sectors of the economy. Tourist facilities such as hotels, restaurants, museums, clubs, sports complexes, public transport and national parks are used also by domestic tourists and visitors, businessmen and residents, yet a significant portion of the costs may be borne by international tourists. The flow of money generated by tourist spending multiplies as it passes through various sections of the economy through the operation oh the multiplier effect. In other words, tourist expenditure not only supports the tourist industry directly but helps indirectly to support many other industries which supply goods and services to the tourist industry.

It is significant social impacts of tourism. This sector of economy is a powerful force for improving international understanding and contributing to peace among all the nations of the world.

In particular possible positive effects of tourism:

As a perspective way the social-economical importance of tourism and its role in Azerbaijan economy is mainly supported with the way using optimally of oil incomes and economical raise. The optimal distribution system has to be assisted with the way of increasing of tourism incomes according to the fall temp of oil incomes. That's why the tourism field and its regional specters are priority directions for social and economical development of the republic.

THE ECONOMIC APPROACH TO VALUATION CONSUMER VALUE OF ENVIRONMENTAL QUALITY

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Environmental valuation techniques are primarily driven by the principle that individuals are self-interested and demonstrate preferences that form the basis of market interactions. These market interactions demonstrate how individuals value environmental goods and services. The market-based nature of economic theory emphasizes the maximization of human welfare. The environment, thus, is used as an instrument to achieve human satisfaction. In turn, the environmental quality can be treated like any other commodity. In this manner, environmental valuation can be viewed as a mechanistic approach in which the total value of an environmental system is assessed in terms of the value of its individual parts.

Environmental valuation is largely based on the assumption that individuals are willing to pay for environmental gains and, conversely, are willing to accept compensation for some environmental losses. The individual demonstrates preferences, which, in turn, place values on environmental resources.

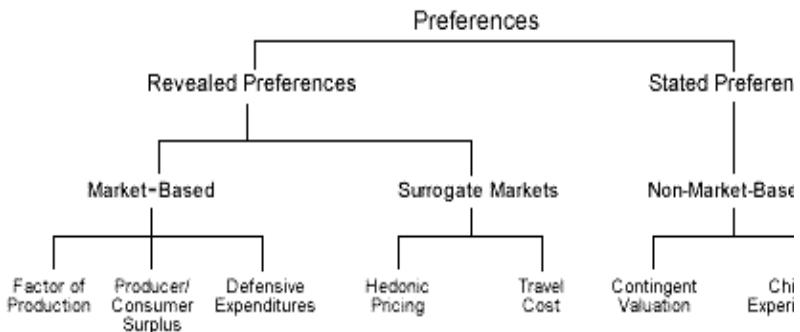


Figure 1 – Environmental Valuation Methods

The value of a natural resource can be monetized based on its value as a **Factor of Production**. This technique is methodologically straightforward; however, it is limited to those resources that are used in the production process of goods and services sold in markets. Because many goods and services produced by the environment are not sold in markets, the factor of production method generally fails to capture the total value of the resource to society. The standard method used to measure the net economic benefit of a good or service in a market involves an examination of consumer and producer surplus.

Consumer Surplus is the difference between what each customer is willing to pay and the price of the good or service and is represented by the area falling above the price line and below the demand curve. **Producer Surplus** is the difference between what a producer is paid for a good or service and what it costs to supply. Measuring the consumer surplus, however, generally involves the use of econometric techniques and requires time series information on the market price of the good or service and the quantity consumed at each price level, along with other factors affecting the demand for the product.

A final market-based valuation method is that of **Defensive Expenditures**, which are made on the part of industry and the public either to prevent or counteract the adverse effects of pollution or other environmental stressors. The defensive expenditures method, also known as the averting behavior approach, monetizes an environmental externality by measuring the resources expended to avoid its negative impacts on a surrounding community.

The **Hedonic Price** method of environmental valuation uses surrogate markets for placing a value on environmental quality. The real estate market is the most commonly used surrogate in hedonic pricing of environmental values. Air, water, and noise pollution have a direct impact on property values. By comparing properties with otherwise similar characteristics or by examining the price of a property over time as environmental conditions change and correcting for all nonenvironmental factors, information in the housing market can be used to estimate people's willingness to pay for environmental quality.

The **Travel cost** method is employed to measure the value of a recreational site by surveying travelers on the economic costs they incur when visiting the site from some distance away. These expenditures are considered an indicator of society's willingness to pay for access to the recreational benefits provided by the site. The travel cost method can be used to measure not only the elimination of a site but also the impact of access restrictions and changes in environmental quality.

The **Contingent Valuation** method (CVM) is a non-market-based technique that elicits information concerning environmental preferences from individuals through the use of surveys, questionnaires, and interviews. When deploying the contingent valuation method, the examiner constructs a scenario or hypothetical market involving an improvement or decline in environmental quality. Based on survey responses, examiners estimate the mean and median willingness to pay for an environmental improvement or willingness to accept compensation for a decline in environmental quality.

In **Choice Experiments** respondents are presented with a menu of alternatives relative to environmental policy options, such that preferences for various components or attributes can be examined at a more refined level. Whereas CVM produces a single value for a change in environmental quality, choice experiments provide independent values for the individual attributes of an environmental program.

These methods form a battery of useful economic approaches for estimation consumer values of environmental quality. All of the methods deserve continuing scientific scrutiny, have room for improvement, and should be employed cautiously and with a critical eye.

ENVIRONMENTAL MANAGEMENT OF SOIL BIODIVERSITY AND ECOSYSTEMS FOR PRODUCTIVE AND SUSTAINABLE AGRICULTURE

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Biological indicators of soil health

It is well-known that there is a need for technical assessments to advise farmers, policy-makers and planners on indicators and methods for the assessment and monitoring of soil health and functions. These should focus on improving knowledge: on the roles and importance of diverse soil organisms in providing key goods and services; and on the positive and negative impacts of existing and new agricultural technologies and management practices.

In order to facilitate comparison at many scales, it is important to agree on and adopt standardized approaches to the use of soil health indicators. Currently, standard methodology is used for most bioindicator measurements (e.g. microbial biomass) but sampling strategies may vary (e.g. depth of soil used for sample collection). Basic requirements for the development of specific bioindicators would be:

- relevance to basic attributes of soil function;
- response to management in acceptable timeframes;
- ease of assessment or measurement;
- robust methodology with standardized sampling techniques;
- cost-effectiveness;
- compatibility with physical and chemical indicators of soil health.

Soil biotic systems are extremely complex, and assessment of soil health and ecosystem function by direct measurement of overall biodiversity is impractical. Therefore, the need to develop indirect assessment methods is compelling. In order to be practical for use by practitioners, extension workers, scientists and policy-makers, the set of basic soil health indicators should be applicable over a range of ecological and socio-economic situations.

Appropriate use of soil health indicators will depend to a large extent on how well these indicators are understood with respect to the ecosystem of which they are part. Tools and methodologies to measure soil health should be adapted to

end users (Table A). Tests should be able to measure properties of soil health that are meaningful to the actor's understanding of soil and its process, and to give results that are reliable, accurate within an acceptable range, and easily understood and used.

Soil organism and biotic parameters, such as abundance, diversity, food web structure, and community stability, meet most of the criteria for useful indicators of soil quality. They respond sensitively to land management practices and climate. In addition, they correlate well with beneficial soil functions, including water storage, decomposition and nutrient cycling, detoxification of toxicants, and suppression of noxious organisms. Visible indicators such as earthworms, biogenic structures, e.g. termite mounds, insects and moulds are comprehensible and useful to farmers and other land managers, who are the ultimate stewards of soil quality. Several farmer-participatory programmes for managing soil quality have incorporated abiotic and simple biotic indicators.

The activities of soil organisms interact in a complex food web with some subsisting on living plants and animals (herbivores and predators), others on dead plant debris (detritivores), on fungi or on bacteria, and others living off but not consuming their hosts (parasites). One of the major difficulties in the use of soil organisms per se, or of soil processes mediated by soil organisms as indicators of soil health has been methodological, i.e. what to measure and how, when to measure it, and how to interpret changes in terms of soil function.

Table A, summarizes the characteristics of potential soil health indicators required at different levels. It presents examples that end users can select and use in order to provide a suitable set of indicators of soil health according to local monitoring capacities. There is also a need to ensure that they are relevant to the given region, farming system, soil type, climate, etc.

Development of an assessment and monitoring framework

The identification of appropriate indicators of soil health assessment is complicated by the fact that they must account both for multiple dimensions of soil functions, such as productivity and environmental well-being, and the multiple physical, chemical and biological factors that control biogeochemical process, and their variation over time and space.

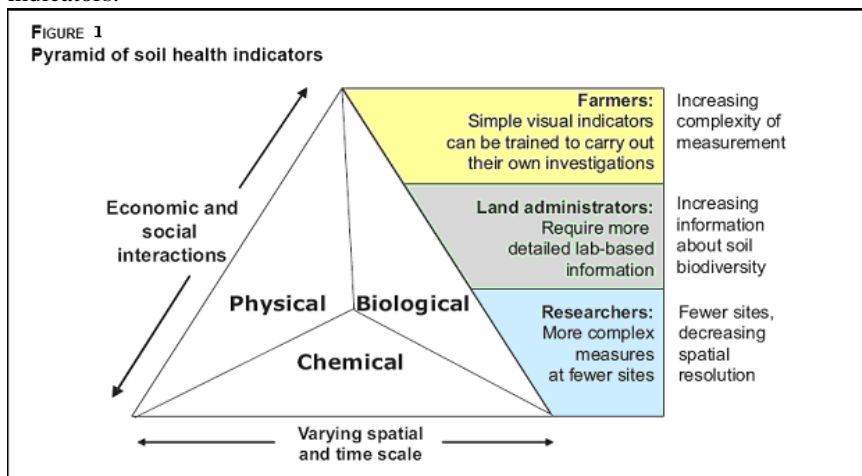
All of the soil parameters typically need to be measured simultaneously at a field site, although there can be gaps in the data if some analyses are not feasible or the facilities are not available. The database is most useful where the soil properties are analyzed in conjunction with one another. Thus, it is more useful to have data on all soil properties at a single point, than to have separate databases of generalized properties.

TABLE A

Practical tools for measuring soil health and their basic characteristics

Specific characteristic of soil health indicators for:			
Farmers	Extension workers	Policy-makers	Researchers
For use in the field: Self-assessed, easy and practical, based on visual indicators with interpretative guidelines relevant to region, farming system, soil type, climate, etc.	Visual indicators and simple low-cost field- and laboratory-based test kits that are easy to interpret	Minimum data set of soil health indicators, plus those associated with crop productivity and quality, environmental quality, off-site impacts, etc.	In-depth information on soil health, soil biodiversity, etc., including a range of laboratory-based indicators.
Practical examples of monitoring tools and indicators			
Nature of roots (density, morphology, colour, disease, depth). Decomposition of litter. Macrofauna, including indicators such as worm casts and pores. N-fixing organisms, e.g. legume root nodules. Plant population profiles (+ weeds). Smell and taste. Soil physical indicators, e.g. waterlogging and compaction.	Soil respiration measurement. Presence of pathogens (basic keys to symptoms). Soil pH, conductivity Total C/N ratio Microbial biomass. Nutrient levels. Physical indicators, e.g. bulk density, aggregate stability, and infiltration rate.	<i>Farm scale:</i> Percent of potential yield reached (based on water use efficiency). Farmer income, profitability. <i>Catchment scale:</i> Soil erosion. Depth of water table.	Enzyme activity (rapid techniques, e.g. BIOLOG) Molecular detection of mycorrhiza, biocontrol agents, etc. Molecular biodiversity assessments Nematode identification and assessment. DNA/RNA methods for detection of functional gene diversity (N-fixation, etc.)

Figure 1 presents the suite of soil health assessments in the form of a pyramid, with three sides corresponding to biological, chemical and physical indicators.



The top of the pyramid represents the group of simple indicators that farmers would use, linked to the more complex measures lower in the pyramid.

The more technical indicators occur in the lower part, but may move up as protocols are simplified or surrogate indicators are developed. There is a decrease in spatial resolution and scale with increasing complexity of the indicators. Therefore, simple indicators higher up the pyramid (e.g. total C) will be more useful for stakeholders who require soil health information at more detailed scales.

INCORPORATING OF TERRITORIAL - BRANCH FEATURES FOR WATER CONSUMPTION TARIFF POLICY

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Existing specifications of payment for special use of fresh water resources take into account territorial features and provide branch differentiation of tariffs for consumption of fresh water from natural sources. But tariff policy for enterprises of different areas is based on nation-wide principles and is not connected to territorial peculiarities of regions.

For different territories factors which influence fresh water shortages and water tariff policy (fig. 1) will differ.

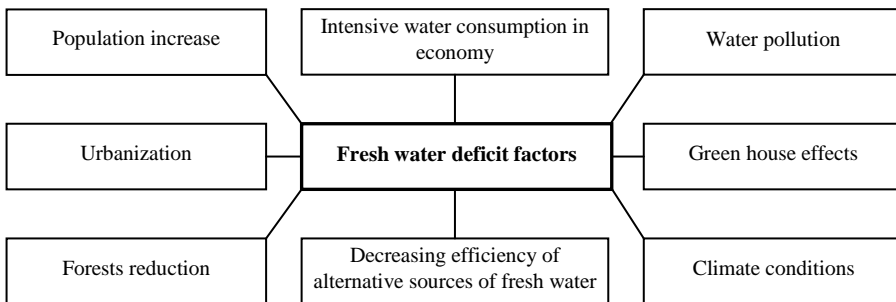


Figure 1 – Factors which should be taken into account for development fresh water tariff policy

Ukraine is insufficiently provided with water resources, and the problem of water provision for population in the nearest future will be very sharp. Two water pools Dneprovskiy and Volynsko-Podilskiy AB provide more than 61 % of prognosis resources and 47 % of operational stocks of fresh water potential. The basic prognosis resources of fresh water potential are placed in 6 areas. For southern and southeast regions with rather significantly urbanized territories, a droughty climate and absence of a sufficient wood cover water value will be greater, than for northern and western regions.

If to consider use and removal of freshen waters in Ukrainian economy that the greatest consumers are:

- electric power industry;
- housing and communal services;
- agriculture;
- iron and steel industry.

Considering economic specialization of regions, it is possible to draw to a conclusion, those southeast regions: Zaporozhye, Donetsk, Dnepropetrovsk, and Lugansk except climatic restrictions have the restriction, caused by rigid competition for fresh water between the most water-capacious areas: electric power industry, metallurgy, housing and communal services, chemical industries. The enterprises compete for the established norms of selection, for capacities of water supply systems and emissions in water sources. Thus, the price of water in conditions of modern market economy should take into account its deficiency caused both natural restrictions, and anthropogeneous loading.

Territorial-branch analysis of territory, concerning formation of water deficiency should be based on the systemic approach i.e. it must consist of estimation subsystems which have close functional links.

The system of tariffs for special use of fresh water resources should carry out distributive and nature protection functions through economic mechanisms. For fresh water tariff policy it is possible to apply the following methods offered by the author for enterprises of different areas which are on the territory of a certain region:

- **“Resource value” method.** It is offered to take a degree of importance of a resource as a basis of the given method for the enterprise. I.e. to learn a situation and to define what opportunities an enterprise has for water-saving or how far an enterprise can do without the part of water not given to it.

- **“Stimulation of technological changes” method.** To minimize water consumption by enterprises of water-capacious areas is possible due to realization of stimulation policy of introduction of law waste technologies, and recycling systems. For example, if an enterprise uses the modern technology which allows using per unit of produced goods an optimal amount of water, then tariffs for 1 m³ of water should be lower, than for enterprises which use out-of-date technologies.

The problem of use of fresh waters from underground sources by enterprises for the technological purposes is rather sharp today. It is known, that underground waters are less polluted than surface and represent a strategic stock of the country, as their period of self-purification is much greater than the period of surface waters reproduction. Therefore the tariff policy for enterprises which use waters from underground sources for the technological purposes should be more rigid.

The offered innovations will force enterprises to accept actions, concerning water-saving technologies involved in manufacture, for example to invest in law waste and cleaning technologies, i.e. the part of the profit will be economically convenient for directing the water-capacious enterprises on updating and

replacement of water-purifying constructions and modernization and start water recycling. The effective system of tariff policy should have both direct and indirect influence on processes of the balanced production load on territory of our country.

APPROACHES TO FORMATION OF ECOLOGIC-ECONOMIC CLASSIFICATION OF RENEWABLE NATURAL RESOURCES

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Resources which are used by mankind are various enough, and classification is necessary for their studying. Nowadays there are many approaches to formation of classification of natural resources. Among the most widespread classifications of natural resources it is possible to name the following:

- by origin;
- by kinds of economic use;
- by depletion feature.

Classification of natural resources from the point of view of their depletion and reproduction is of great value. Recently, classification of natural resources by basic possibility and a way of restoration which has great value for the theory and practice of economics of wildlife management has been offered.

Considering modern rates of development of production it is impossible to reach a balanced development without detailed studying of tendencies of self-reproduction of renewable resources.

According to modern classifications of natural resources, they are divided on inexhaustible and depleted. In turn, depleted resources are divided on renewable and non-renewable. Renewable natural resources are capable to self-reproduction for the periods which can be compared with terms of their consumption. But detailed classification of renewable resources which would be useful to modern economists for the account of natural rates of restoration, till now is not generated.

It is useful to classify renewable resources from time perspective which is necessary for their self-reproduction.

It is offered to enter factor of reproducibility which can be used for definition of rates of consumption of natural resources, or for an establishment of ecological restrictions of consumption.

$$k_e = \frac{T_p}{t}, \quad (1)$$

where T_p - calculated period (it is possible to accept 10 years);

t - time necessary for reproduction of natural resources.

Depending on the calculated values of factor it is possible to define natural resources as a certain kind of renewed natural resources (tab. 1).

Table 1 - Classification of renewed natural resources depending on time factor

Kind of renewed natural resources	Value k_g (At $T_p=10$ years)	Resource example
Highly renewable	$k_g \geq 10$	The superficial water resources, some kinds of animals and plants, wind power and the sun
Medium renewable	$1 \leq k_g \leq 10$	Some kinds of trees, animal
Low renewable	$0 \leq k_g \leq 1$	Underground waters

Thus, as a classification sign in the offered approach the time interval for which there is a restoration of a resource without intervention of the person acts. If use time renewable a resource exceeds time of its regeneration, the balance of consumption is broken, and the resource can be completely settled. The most effective variant will be realised, when resource use will be carried out by rates which answer rates of its reproduction.

If to define extraction norms of natural resources as h , and rates of reproduction of natural resources as y use of natural resources will be sustainable until the norm of extraction does not exceed rates of a natural increase of resources. To support sustainable inflow of resources in economy, observance of a following condition is necessary: $h \geq at$.

The offered classification of resources by a time sign will give the chance to consider time factor at consumption of resources that is important for ecologic-economic processes of their use.

CREATION OF ECOPOLIS "ECO-SUMSCHYNA" ON THE TERRITORY OF SUMY REGION

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Sumy State University, Sumy, Ukraine

Urbanization processes, which has dynamically developed during the last centuries, caused the list of economic, ecological and social problems, gathered in the unique combination in any concrete territory.

Therefore there is a necessity to develop conceptual approaches and organizing preconditions for forming of research-production-education complex (ECOPOLIS). It would function for creation and selling ecologically sound goods.

These goods might become a source of getting additional capital for the territory and besides would be able to solve a considerable part of mentioned problems.

Preconditions for creation of ECOPOLIS “Eco-Sumschyna” on the territory of the region are :

- territory of the Sumy region is environmentally clean (according to UN data Sumy region is one of the six Ukrainian regions and the only on the left side of Dnipro with satisfactory level of ecological pressure) (picture 1);
- research-production-education complex of the region fits to creation of ecologically sound goods (the region is a traditional centre for self-generated ecological initiatives, manufacturing ecologically sound goods and technologies at machine building and device building industries, agrarian complex, energy sector, education, social and cultural sector);
- historically the Sumy region has traditions for sustainable development of territories. Real ECOPOLIS of Nepluyev Labour Community existed on the territory of the present Sumy region more than one hundred years ago. During forty years the Community was a unique socio-economic phenomenon of environmentally sound life style and vital activity. The first in the Soviet Union system of payment for nature use was introduced in the late of 1980-s with further systems’ spreading into the other parts of the country).



Picture 1 – Results of integral ecological estimation of Ukrainian regions

Creation of ECOPOLIS gives an opportunity to reach the complex of economic items: manufacturing of competitive products; enlargement of export region potential; increasing a share of scientifically based products; rising of production effectiveness due to decreasing of resource intensity; reduction of needs in initial resources; getting opportunities to create additional labor places;

improving the region's image due to specialization on social goods; involving investors to realization of ecological projects, enhancing creative component in labor organization and opportunities of creative self-realization; promotion of environmental consciousness among the population and forming ethical attitude to the environment.

The main instruments of projects' realization are:

- legal measures (setting up and realization of rulings (concepts, programs etc.);
- rising the level of ecological education at preschool, school, high school and post-graduate levels);
- organizing measures (creation of associations, clubs, NGO's etc.);
- informative measures (press-conferences, competitions, PR-companies etc.);
- economic measures (tax privileges, privilege credits, penalties etc.);
- ecologically sound goods and services (table 1);
- ecologically sound technologies (table 1);
- ecologically sound communications (transport paths, lines providing delivery and exchange of resources, products and resulted in decreasing ecologically destructive influence on the environment).

Table 1 - Classification of ecologically sound goods according to their functions

№	Function	Example
1.	Administrative	<ul style="list-style-type: none"> ▪ technologies of social systems' management
2.	Scientific	<ul style="list-style-type: none"> ▪ know how; ▪ scientific documentation; ▪ data base; ▪ sorts of plants, breeds of animals; ▪ design or technological documentation etc.
3.	Production	<ul style="list-style-type: none"> ▪ nature saving equipment (filtration facilities, devices for lands' recultivation etc.); ▪ monitoring systems; ▪ devices for waste utilization
4.	Exploitation	<ul style="list-style-type: none"> ▪ services on exploitation of ecologically sound goods
5.	Organizing	<ul style="list-style-type: none"> ▪ services on promotion of ecologically sound goods into the markets; ▪ managerial technologies

6.	Trade and service	<ul style="list-style-type: none"> ▪ services on selling ecologically sound goods
7.	Education	<ul style="list-style-type: none"> ▪ educational materials (textbooks, guidebooks etc.); ▪ educational technologies (methods of education and training programs conducting); ▪ mass media materials
8.	Environmental management	<ul style="list-style-type: none"> ▪ control technologies for nature systems and their reproduction
9.	Urban management	<ul style="list-style-type: none"> ▪ technologies of settlements and urban landscapes creation
10.	Art and culture	<ul style="list-style-type: none"> ▪ culture-purposed goods and services
11.	Information	<ul style="list-style-type: none"> ▪ services on gathering and processing ecological information
12.	Auditing	<ul style="list-style-type: none"> ▪ ecological auditing and consulting
13.	Financing	<ul style="list-style-type: none"> ▪ financial control and providing effective use of resources in ecological sphere
14.	Social and psychological	<ul style="list-style-type: none"> ▪ technologies of influence on social systems to implement ecologization of economic system and society
15.	Health protection	<ul style="list-style-type: none"> ▪ services on health protection

In the case of successful implementation of the major organizing forms of ECOPOLIS at the regional level, the experiment can be realized for innovative transformations in the other Ukrainian regions forwards sustainable development.

ROLE OF ECOLOGICAL NORMATIVES IN PROVIDING SUSTAINABLE DEVELOPMENT OF COUNTRY

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During many ages environment exploitation did not cause substantial changes in nature balance. However, significant contradictions had gradually arisen between human needs, force of their involvement in processes of ecological systems and possibility of natural renewal of environment, that is, the situation had

turned up when a man not realizing the consequences of his actions began to destroy the environment — the material essence of his existence.

Ecology scientists began to pay attention of the society to the emergence of many threatening circumstances for the Earth's biosphere, starting from the end of the 19th century with the discussion about the irreversible losses of many kinds of flora and fauna, about dangerous for health and sometimes for human life pollution by toxic substances of air and water basins, about climate instability etc. With the development of industrial production, intensification of agriculture and fishery, growth of towns, expansion of artificial environment the negative impact of a human being upon natural environment leads to the violation of the functioning mechanism of ecosystems.

One of results of scientific searches in the sphere of the interrelation of human being and nature is the emergence of the notion of ecological safety and the development of mechanisms for its provision.

The ecological safety of the environment- is such its state within boundaries of its certain volume, under controlled parameters of technogenic influence, when the development does not take place of natural or technogenic processes resulting in material losses and negative impact on health and psychoemotional human factors. This is the balancing of the interrelation of natural, technical and social systems, the formation of natural cultural environment meeting sanitary hygienic, aesthetic and material needs of residents of each Earth region with preserving natural resources and ecological potential of natural systems and the capability of biosphere as a whole for self-regulation. The important component of ecological safety is the state of the protection of person, society and country from threats created by natural calamities and technogenic catastrophies. Today ecological safety is one of strategically fundamental constituent parts of the national safety of Ukraine and the most important aspect of the protection of interests and priorities of the country in international integration processes, therefore, the problem of ecological safety is to be considered in the framework of the largest problem - national safety as a whole because the latter serves the only objective - the provision for the vitally important interests of the whole population of the country.

In accordance with the acting Law about the protection of environment each citizen of Ukraine is entitled for his safe life and health environment. This right is guaranteed, besides measures directed at preventing ecologically harmful accidents, catastrophies, natural calamities, also by normatives as to the quality of environment which is a legal measure, while determining boundaries of behaviour permitted for environment.

One of major means for controlling ecological safety are ecological normatives. The normatives concerning the content of harmful compounds in natural environment are based on the concept of limiting admissible concentration (LAC). It is such concentration of chemical compounds in natural environment which influencing daily human organism does not cause in it pathological changes or diseases for a long time.

The excess of admissible anthropogenic loading on natural environment, the excess of LAC of harmful chemical compounds diminishes the level of ecological safety. As ecological safety is not theoretically determined unit and as ecosystems have the reserve of strength and are capable to resist anthropogenic influence the violations of ecosafety under the contamination of natural environment are determined as its dangerous state resulting in harming ecosystem as a whole and human being in particular. At present normatives for technogenic compounds in natural biocenosis are based on sanitary hygienic principles and norms, that is, on priorities of human being protection. These principles are basic for hygienists in determining LAC for various compounds in air, water and foodstuffs. In Ukraine sanitary ecological criteria and normatives are developed at departmental level. Therefore, rather often they appear to be divorced from economic categories, that is, do not take into account how much the solution of ecological problems cost for society. As a result in Ukraine, along with the cruellest in the world system of normatives for air and water quality, quick degradation of environment is observed.

Hence, normatives of LAC existing now in Ukraine which determine conditions opposing the whole number of ecological crimes do not meet the character of their safety and require their improvement. Here, it is necessary to take into account the fact that to provide for the ecological safety is impossible only by nature protection measures apart from social, economic, political and demographic problems. All they are so interconnected that the solution of each one may be found only under their joint consideration.

HYDROGEN ENERGY AS REAL ALTERNATIVE OF OIL AND GAS IN UKRAINE

Kristina Miroshnikova

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Dmitry Mendeleev told that to heat the furnace with oil is like to heat it by bank notes: because oil is unique, most valuable chemicals are raw material.

The burning (incineration) of hydrocarbons is created with appreciable environmental problems, especially by using it for needs of transport. The problem of toxic emissions can solve perfection of technologies but emissions of carbonic acid change a global climate and has inevitable consequences of the using of mineral fuel.

In Ukraine there is a powerful economic argument: there are not enough reserves of oil and gas in the country, it is not possible to buy energy carriers by the world prices, deliveries by reduced prices depend on relationship with Russia. That is for Ukraine it not an output.

Are there some alternatives for Ukraine?

There are renewed energy sources. Now in Ukraine there is a low interest of renewed sources (less than 10), but it does not mean the scarcity of these sources, it means the low level of introduction of using technologies of their using.

What are the sources? First of all it can be the solar energy, a hydraulic power, a wind energy, a power of the sea waves. The second is important issue a geothermal energy. It practically is inexhaustible and eternal, but the problem of its cost is a thorny question (thorny question). Also it is a tidal energy, using power of a biomass.

I'm going to consider in detail the use of hydrogen as fuel in a context of the concept of substances which accumulate energy.

The using of hydrogen as fuel excludes an opportunity of strengthening of a hotbed effect. Harmful substances are not allocated (the automobile engine throws out 45 toxic substances including carcinogens, are not present danger of formation of stagnant zones of hydrogen - It easily disappears.

Let's note negative qualities of hydrogen. It is low density and volumetric calorific value, wider limits of explosivity and more heat of ignition in comparison with hydrocarbons. Application of the concept of substances which accumulate the energy, described below, will allow to lower negative influence of these lacks of hydrogen as fuel which are noticeably blocked by its advantages.

There are many technological developments on application of hydrogen as fuel in the industry, on transport and in a life. So, per 1972 to the USA on proving ground of firm " General Motors " competitions of city vehicles in which 63 cars with various systems of engines participated, including on storage batteries, ammonia-prosior and two cars on hydrogen were spent. The last have borrowed the first and second places. The car of firm " Volkswagen " convertible on hydrogen in which the fulfilled gases were purer than city air sucked in in the engine has shown the best results.

How is it possible to receive hydrogen and avoid its explosion?

The using of substances which accumulate energy will solve the problem. Thus the scheme of process consists of three stages:

Reception of substances which accumulate energy, using one of the named energy sources.

Reception of hydrogen by means of substances which accumulate energy.

The using of hydrogen as fuel.

I hope you remember school experience: if you put in water sodium hydrogen it starts allocation it blows up. Now imagine, that it occurs in the chamber of combustion: hydrogen in a free kind appears only in case where it and should blow up. And onboard it is not like this - it is connected with water. In this illustrative example of substances which accumulate energy, sodium has acted.

Certainly, isn't it industrial technology? It is an example. But I'll present your attention to the industrial technology developed during USSR existence in flights to the Moon.

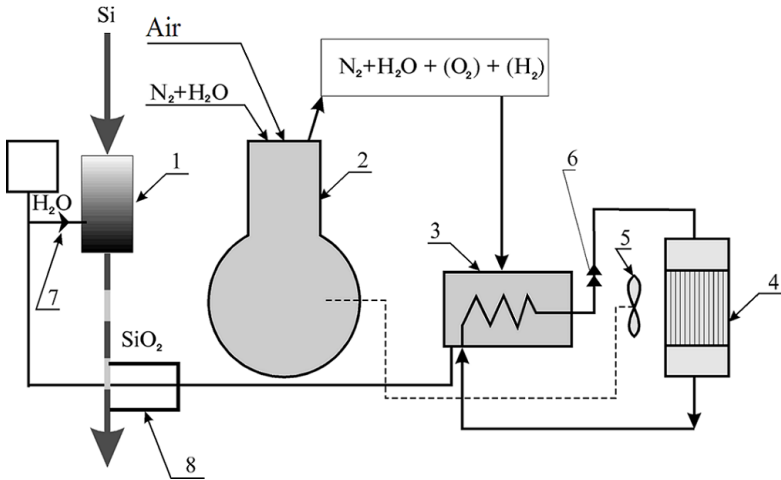
It was based on following reactions

$Q + C + SiO_2 \rightarrow Si + CO_2 \uparrow + H_2O$ — Restoration of silicon by carbon

$Si + 2H_2O \rightarrow SiO_2 + 2H_2 \uparrow + Q$ — Reception of hydrogen

$2H_2 + O_2 \rightarrow 2H_2O + Q$ — Burning of hydrogen

Silicon from oxide is restored, using a source of heat (for example, it can be the solar furnace) (reaction 1). Silicon represents fine substance which accumulates the energy, not demanding special conditions of storage. It is delivered to a place of necessary reception of energy (including to the transport engine). In a special reactor there is a reaction of replacement of hydrogen (reaction 2). And at last hydrogen acts in the engine as fuel. Oxide of silicon which was formed as a result of the second reaction, can be used repeatedly. The scheme of a reactor looks as follows:



1 Reactor

2 Piston internal combustion engine

3 Condenser the Radiator of cooling

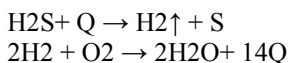
4 Stimulator of charge

5 Stimulator of charge

6 Stimulator of the charge the

7 Cooler of silicon

It is impossible not to pay attention to the fact, that Ukraine is located on coast enormous (1 billion tons) a warehouse of hydrogen sulphide (Black sea). Is hydrogen sulphide (H₂S) a mineral? Is it native? Hydrogen in very dense packing: energy of formation of hydrogen sulphide approximately in 14 times is less, than energy of formation of water. It means, that if we spend one watt hour of energy on decomposition of hydrogen sulphide, we shall receive of 14 watt from burning the allocated hydrogen? Hour of energy. That is 1 we in this case are relieved of reaction. We still have only two reactions:



At quite real pressure hydrogen sulphide (nearby 20 atmospheres) becomes to a swill at normal temperature. It allows to receive specific density much more, than at compressed and even liquid hydrogen to conduct process of decomposition H₂S in electrolytic cells.

Warsaw, Maksimenko A.I. (Ukraine) and Tereshuk in 1997 have offered extraordinarily a perspective way of reception and use of hydrogen by means of decomposition of the hydrogen sulphide extracted by an original method from deep layers of some reservoirs, in particular, from the Black sea. The given method doesn't demand expenses of national scale, and it can be applied in a national power system and even is absolutely free.

Economic preconditions of development of hydrogen technologies in Ukraine. You can ask me: Whether hydrogen power is in Ukraine now when in the country the industry is stopped. Can be engaged, the science is not financed for a long time, new technologies do not appear? I consider, that the unique chance to be pulled out (to get) in numbers of industrially developed countries of the world is given to Ukraine.

If Ukraine at restoration of power and motor industry goes traditionally, then it will choose backwardness, for long decades.

Choosing strategy of development of hydrogen power engineering, Ukraine is compared with motor industry...with BMW concern! Really, per 1968 in institute of mechanics AH the USSR converting of the car on hydrogen led work to partial loadings, and the Kharkov scientists were accepted in its active participation. Surprisingly, but in the seventieth years taxmotors and it was Moskvich 412 in Kharkov with an internal combustion engine on hydrogen!

Also it can be supposed, that a number of the western countries and the private companies will invest their money in these enterprises, they will see this new direction. New business will be more attractive for investors, than the studying of becoming outdated western technologies. Also there will be thousand new workplaces and there will be independence of deliveries of mineral energy carriers.

In this case Ukraine will take a worthy place in world economic system as the supplier of technologies of construction of power systems.

There is a dilemma in front of Ukraine: to come back to the future (buying up of the written off technologies in the West) or go to the future in other words to develop high technologies and technological leadership. Let's make a correct choice!

THE ROLES OF NGOs TOWARDS SUSTAINABLE DEVELOPMENT IN TANZANIA

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A non-governmental organization (NGO) is any non-profit, voluntary citizens' group which is organized on a local, national or international level. NGOs perform a variety of service and humanitarian functions, bring citizen concerns to Governments, advocate and monitor policies and encourage political participation through provision of information.

Some are organized around specific issues, such as human rights, environment or health.

In wider usage, the term NGO can be applied to any non-profit organization which is independent from government. NGOs are typically value-based organizations which depend, in whole or in part, on charitable donations and voluntary service.

Typical Forms of NGOs in Tanzania

- *Developmental organisations*

These NGOs basically work on social and developmental research and consultancy for instance developing rural areas as well as protecting/conserving environment. E.g.; DANIDA and SIDA develops rural areas by implementing different projects, building schools, hospitals, contracting roads, protecting and conserving environment etc.

- *Sports oriented organisations*

These NGOs aimed at developing sports in a country basing on creating and developing youth talents.

- *Financial groups*

These are financial groups/NGOs which established for the purposes of providing loans or funds to the people.

E.g.; SACCOS provides loans to majority of people especial those who unemployed for them to open or to start business or small project to sustain their lives.

- *Health organisations*

These are NGOs based on providing health services as well as providing health education.

E.g.; ANGAZA provide health services to majority of people in Tanzania and educating people on how to protect themselves on diseases such as HIV/AIDS.

- *Religious NGOs*

Large percentage of NGO Funding goes to religious based Organisations.

E.g. MSIMBAZI CENTRE in Dar es Salaam had established to help orphans.

The roles of NGOs in sustainable development in Tanzania.

Non-governmental organizations (NGOs) have played a major role in pushing for sustainable development at national and international level.

But NGOs are not only focusing their energies on governments and inter-governmental processes. With the retreat of the state from a number of public functions and regulatory activities, NGOs have begun to fix their sights on powerful corporations - many of which can rival entire nations in terms of their resources and influence.

Aided by advances in information and communications technology, NGOs have helped to focus attention on the social and environmental externalities of business activity..

Although it is often assumed that NGOs are charities or enjoy non-profit status, some NGOs are profit-making organizations such as cooperatives or groups which lobby on behalf of profit-driven interests. For example, the World Trade Organization's definition of NGOs is broad enough to include industry lobby groups such as the Association of Swiss Bankers and the International Chamber of Commerce.

Such a broad definition has its critics. It is more common to define NGOs as those organizations which pursue some sort of public interest or public good, rather than individual or commercial interests.

Even then, the NGO community remains a diverse constellation. Some groups may pursue a single policy objective - for example access to AIDS drugs in developing countries or press freedom. Others will pursue more sweeping policy goals such as poverty eradication or human rights protection.

However, one characteristic these diverse organizations share is that their non-profit status means they are not hindered by short-term financial objectives. Accordingly, they are able to devote themselves to issues which occur across longer time horizons, such as climate change, malaria prevention or a global ban on landmines. Public surveys reveal that NGOs often enjoy a high degree of public trust, which can make them a useful - but not always sufficient - proxy for the concerns of society and stakeholders.

Advantages of having NGOs in Tanzania

- They have the ability to experiment freely with innovative approaches and, if necessary, to take risks.
- They are flexible in adapting to local situations and responding to local needs and therefore able to develop integrated projects, as well as spectral projects.
- They enjoy good rapport with people and can render micro-assistance to very poor people as they can identify those who are most in need and tailor assistance to their needs
- They have the ability to communicate at all levels, from the neighbourhood to the top levels of government.
- They are able to recruit both experts and highly motivated staff with fewer restrictions than the government.

REVIEW OF THE DECENTRALIZATION PROCESS AND ITS IMPACT ON ENVIRONMENTAL AND NATURAL RESOURCES MANAGEMENT IN TANZANIA

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Decentralization is commonly viewed as the transfer of legal and political authority from the central government and its agencies to the field organizations and institutions. This review analyzes the process, institutional and legal framework within which the environmental and natural resources management operates in Tanzania. It specifically focuses on the decentralization within central and local governments' role in environmental management.

Lawyers' environmental action team. The Lawyers' Environmental Action Team is the first public interest environmental law organization in Tanzania. It was established in 1994 and formally registered in 1995 under the Societies Ordinance. Its mission is to ensure sound natural resource management and environmental protection in Tanzania. It is also involved in issues related to the establishment of an enabling policy environment for civil society, including civil liberties and human rights.

Background to the Environmental Problems Facing in Tanzania. Tanzania covers an area of 945,000km² and is one of Africa's most ecologically rich countries. The diverse climatic and physical conditions range from arid, semi-arid, and mountainous areas of afro-alpine vegetation, woodland and dry land savannah. About 40% of Tanzania is covered by forests and woodlands, which host various types of ecosystems. Tanzania's eastern coastline extends about 240km north to south along the Indian Ocean. Additionally, there are several lakes, rivers and swamps, which contain diverse types of aquatic life. The major environmental problems are; 1) loss of wildlife habitats and biodiversity; 2) deforestation; 3) land degradation; 4) deterioration of aquatic systems; 5) lack of accessible, good quality water; and 6) environmental pollution.

Land Degradation. Human impacts on deforestation; soil erosion, overgrazing, and degradation of water resources and loss of biodiversity have all resulted into land degradation. Poor agricultural practices such as shifting cultivation, lack of crop rotation practices, lack of agricultural technology and land husbandry techniques exacerbate the problem.

Pollution Management and Urbanization. Pollution is a major problem in urban areas of Tanzania. Improper treatment and disposal of solid and liquid wastes are the major contributors to urban area pollution. The combined results of these problems are that both air and water have been contaminated with pollutants, which are detrimental to human health.

Agricultural and Range Land Resources Management. Agriculture and rangeland resources are the backbone of Tanzania's economy. It is estimated that

about 55% of the land could be used for agriculture and over 51% for pastoral lands. However, only about six percent of the agricultural land is cultivated with the practice of shifting cultivation which causes deforestation and land degradation on the pastoral land.

Management of Forest Resources. Forest resources provide both direct products and by-products. The forest reserves are also linked with agriculture, beekeeping, energy, water uses and biodiversity. The mismanagement of forest resources significantly contributes to deforestation and environmental degradation.

Management of Wildlife Resources. Tanzania is one of the few countries with vast number of wildlife resources. Tanzania's "protected areas" cover about 25% of the total land. The protected land is comprised of national parks, game reserves, game controlled areas and the Ngorongoro Conservation Area. Unfortunately, communities living around these protected areas, live in uncertain conditions visited by persistent attacks by the wild animals and destruction of their crops.

Management of Mineral Resources. The Tanzanian economy depends upon mineral resources for a major source of its revenues. However, mineral exploitation is often done without regard to environmental and social impacts. Thus the Mining Act of 1998 addressed this problem and required mining companies to conduct environmental impact assessments. Mining activities are major cause of environmental degradation by deforestation, destruction of habitat, loss of biodiversity and general damage to the land.

Local Government Reforms and Environmental Management. Besides the public sector and local government reforms stressing the need to decentralize, several other macro-policy documents published in recent years have also reiterated this new thinking in government. Several government policies published between 1995 and 1998 and the amendments made on the Local Government Acts have emphasized the need for local communities to participate in the environmental management.

To attain sustainable development, Tanzania needs to balance its accelerated economic growth with efficient management of the environment, coupled with sustainable use of natural resources.

National Forestry Policy. National Forestry Policy (NFP) seek to achieve its policy goal of "enhancing the contribution of the forest sector to the sustainable development of Tanzania and the conservation and management of natural resources for the benefit of present and future generations.

National Environmental Policy: The National Environment Policy (NEP) recognises the indispensable role of local governments in achieving its policy objectives. Local governments construct, operate and maintain economic, social and environmental infrastructure, and establish local environmental policies and regulations.

National Land Policy: The main objective of the NLP is to promote and ensure wise use of land, guide allocations, prevent degradation and resolve

conflicts. On the issues related to environmental management, this policy is one of the major guiding principles to local authorities, which are in dire need of decision making mandates on land use and resources. The NLP tries to protect the environment and natural resources

ECOLOGIZATION OF ECONOMICS AND ECOLOGO-ECONOMIC EFFICIENCY

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The major requirement of the modernity is an ecologization of economy. Under the ecologization of economy the purposeful process of the transformation of economy is understood, directed on the decline of negative influence of processes of the production and consumption of commodities which cause ecological consequences. The ecologization of economy foresees the realization of the system of the special organizational measures, innovative processes, the reconstruction of sphere of the production and the consumer demand, the technological conversion, the rationalization of the natural management, and also the transformation of the nature protection activity. The basic components of the ecologization of economy are:

- forming of international and interregional markets of ecological factors and values;
- passing to the new system of pricing, taking into account ecological factors, damage and risk;
- expansion of the system of requiring payment of the natural management;
- submission of the organization of the production to ecological limitations and the principle of the balanced natural management;
- transition of production to the strategy of high-quality growth on the basis of technological rearmament under ecologo-economic control;
- refusal from the wasteful-approach to the environment protection;
- change and ecological orientation of pattern of requirements and standards.

At present indicated components are basic problems of ecologization of economy in Ukraine. The subjects of the economic activity must take into account the influence of the economic adjusting of the natural management, and also to carry out the estimation of economic efficiency of the organization of the process of production. The purpose of this research is the ground of economic efficiency of the production taking into account the conception of eco-efficiency, and also the consideration of basic elements of ecologo-economic analysis.

At present eco-efficiency, that is more effective use of natural resources,

considered as one of the most perspective strategies of steady development of industrial enterprises. Eco-efficiency is understood to be such organization of management activity which allows a management subject to carry out the production processes and produce products with the least affecting on the environment and receipt of the additional economic effect. Ecologo-economic efficiency is not only basic direction for the optimization of the production, and foresees an application of ecological innovations also. With the purpose of acceptance of effective administrative decisions in the field of the natural management the subjects of the economic activity must carry out the ecologo-economic estimation of the production. The ecologo-economic analysis of economic activity includes the followings structural components:

- ecological examination;
- ecological diagnostics;
- ecological situational analysis;
- ecological audit.

The complex application of elements of ecologo-economic analysis is needed with the purpose of the increase of the efficiency of the natural management, that provides more complete ecologization of the production. The level of the ecologization is estimated on the followings directions: economic indexes; power indexes; landed indexes; indexes of comparison; presence or absence of «hot» places. The complex estimation of the ecologo-economic efficiency is determined by the system of indexes of the ecologo-economic level of the production, it allows the subjects of economic activity to form the effective mechanisms of adjusting of the level of the ecologization of management.

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"DEMAND" ON AN INFORMATION ECONOMY IN UKRAINE

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Information economics means the sectors and industries that have extremely rapid productivity growth driven by the enormous and ongoing technological revolutions in data processing and data communications. The question is: will it have importance in future? Will this wave of innovation and technological development have consequences similar to the trio of steam power, metal forging, and automatic machinery? Or will it turn out to have a much smaller impact on long-run economic growth as previous leading sectors did?

The analytics of the effect of a leading sector on overall productivity growth is simple and straightforward. If total factor productivity growth in the rest of the economy is growing at a rate π_R , and if total factor productivity in the leading industries and sectors is growing at a faster rate π_L , then total factor productivity growth in the economy as a whole will be equal to:

$$\pi = \sigma(\pi_L) + (1-\sigma)(\pi_R) \quad (1)$$

where σ is the share of total expenditure on the goods produced by the economy's fast-growing technologically-dynamic leading sectors. As the process of innovation and technological revolution in the leading sectors proceeds, we would not expect the leading sector share σ of total expenditure to remain constant. If the goods produced by the leading sectors are superior (or inferior) goods, the share σ will rise (or fall) as economic growth continues: only if the income elasticity of demand ε_I for its products is one will changes in the overall level of prosperity leave the leading sector share unchanged. If the goods produced by the leading sector have a high (or low) price elasticity of demand, the falls over time in their relative prices will boost (or reduce) the share of total expenditure σ : only if the price elasticity of demand ε_P is one will the fall in the relative price of leading sector products produced by the technological revolutions leave the leading sector share unchanged.

To assess the aggregate economic impact of an explosion of invention and innovation in a leading sector we need thus five pieces of information:

- The initial share of expenditure on the leading sector's products, σ_0
- The magnitude of the relative pace of cost reduction, $\pi_L - \pi_R$, during the leading sector's heroic age of invention and innovation.
- The duration of the leading sector's heroic age of invention and innovation.
- The income elasticity of demand ε_I for the leading sector's products.
- The price elasticity of demand ε_P for the leading sector's products.

To gain a sense of the importance of these factors, we have to consider a few simulations with sample parameter values.

So with a price elasticity of demand of 0.5, by the twelfth year the expenditure share on leading sector products has fallen below 1.5%. By the twenty-eighth year it has fallen below 1.0%. By the fortieth year the expenditure share has fallen to 0.7%.

Rapid productivity growth in the leading sector has next to no effect on productivity growth in the economy as a whole. This is Baumol and Bowen's (1966) "cost disease" scenario: innovations become less and less important because the innovation-resistant share of the economy rises over time. Indeed, as time passes the rate of aggregate growth converges to the rate of growth in the productivity-resistant rest of the economy.

With a price elasticity of 4 the expenditure share of the leading sectors grow rapidly. With a productivity growth wedge of 5% per year, the leading sector share of spending surpasses 10% by year 12, 30% by year 20, and reaches 89% by year 40.

In these simulations, there is only one reason for the sharp difference in the effects of innovation in the leading sector: the different price elasticities of demand for leading-sector products in the two scenarios. When demand for leading sector products is price-elastic, each advance in technology and reduction in the leading sector's costs raises the domination of the leading sector in the economy and thus brings the proportional rate of growth of the aggregate economy closer to the rate of growth in the leading sector itself. This is the "economic revolution" scenario: not only does productivity growth accelerate substantially and material welfare increase, but the structure of the economy is transformed as the bulk of the labor force shifts into producing leading-sector products and the bulk of final demand shifts into consuming leading-sector products.

What determines whether demand for a leading sector's products is price-inelastic—in which case we are in Baumol and Bowen's "cost disease" scenario in which technological progress in the leading sector barely affects the aggregate economy at all—or price-elastic—in which case we are in the "economic revolution" scenario, and everything is transformed? The more are high-tech products seen as "luxury" goods, and the greater is the number of different uses found for high-tech products as their prices decline, the larger will be the income and price elasticities of demand—and thus the stronger will be the forces pushing the expenditure share up, not down, as technological advance continues.

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COMBINED CYCLE ENERGY PRODUCTION

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A combined cycle is characteristic of a power producing engine or plant that employs more than one thermodynamic cycle. Heat engines are only able to use a portion of the energy their fuel generates (usually less than 50%). The remaining heat from combustion is generally wasted. Combining two or more "cycles" such as the Brayton cycle and Rankine cycle results in improved overall efficiency.

In a combined cycle power plant (CCPP), or combined cycle gas turbine (CCGT) plant, a gas turbine generator generates electricity and the waste heat is used to make steam to generate additional electricity via a steam turbine; this last step enhances the efficiency of electricity generation. Most new gas power plants in North America and Europe are of this type. In a thermal power plant, high-temperature heat as input to the power plant, usually from burning of fuel, is converted to electricity as one of the outputs and low-temperature heat as another output. As a rule, in order to achieve high efficiency, the temperature difference between the input and output heat levels should be as high as possible. This is achieved by combining the Rankine (steam) and Brayton (gas) thermodynamic cycles. Such an arrangement used for marine propulsion is called Combined Gas (turbine) And Steam (turbine) (COGAS).

In a thermal power station water is the working medium. High pressure steam requires strong, bulky components. High temperatures require expensive alloys made from nickel or cobalt, rather than inexpensive steel. These alloys limit practical steam temperatures to 655 °C while the lower temperature of a steam plant is fixed by the boiling point of water. With these limits, a steam plant has a fixed upper efficiency of 35 to 42%.

An open circuit gas turbine cycle has a compressor, a combustor and a turbine. For gas turbines the amount of metal that must withstand the high temperatures and pressures is small, and expensive materials can be used. In this type of cycle, the input temperature to the turbine (the firing temperature), is relatively high (900 to 1,350 °C). The output temperature of the flue gas is also high (450 to 650 °C). This is therefore high enough to provide heat for a second cycle which uses steam as the working fluid; (a Rankine cycle).

In a combined cycle power plant, the heat of the gas turbine's exhaust is used to generate steam by passing it through a heat recovery steam generator (HRSG) with a live steam temperature between 420 and 580 °C. The condenser of the Rankine cycle is usually cooled by water from a lake, river, sea or cooling towers. This temperature can be as low as 35 °C

By combining both gas and steam cycles, high input temperatures and low output temperatures can be achieved. The efficiency of the cycles add, because they are powered by the same fuel source. So, a combined cycle plant has a

thermodynamic cycle that operates between the gas-turbine's high firing temperature and the waste heat temperature from the condensers of the steam cycle. This large range means that the Carnot efficiency of the cycle is high. The actual efficiency, while lower than this is still higher than that of either plant on its own.

The thermal efficiency of a combined cycle power plant is the net power output of the plant divided by the heating value of the fuel. If the plant produces only electricity, efficiencies of up to 59% can be achieved. In the case of combined heat and power generation, the overall efficiency can increase to 85%.

The HRSG can be designed with supplementary firing of fuel after the gas turbine in order to increase the quantity or temperature of the steam generated. Without supplementary firing, the efficiency of the combined cycle power plant is higher, but supplementary firing lets the plant respond to fluctuations of electrical load. Supplementary burners are also called duct burners.

More fuel is sometimes added to the turbine's exhaust. This is possible because the turbine exhaust gas (flue gas) still contains some oxygen. Temperature limits at the gas turbine inlet force the turbine to use excess air, above the optimal stoichiometric ratio to burn the fuel. Often in gas turbine designs part of the compressed air flow bypasses the burner and is used to cool the turbine blades.

Combined cycle plants are usually powered by natural gas, although fuel oil, synthesis gas or other fuels can be used. The supplementary fuel may be natural gas, fuel oil, or coal. An integrated solar combined cycle power station is currently under construction at Hassi R'mel, Algeria.

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APPLICATION OF REMOTE EDUCATIONAL TECHNOLOGIES IN FORMATION OF EXPERT - ECOLOGIST COMPETENCE

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The problem providing ecological safety in Ukraine makes urgent necessity of qualitative improvement of ecological education. Effective ecological politics implementation is impossible without qualified experts capable to perceive quickly the new requirements of ecological management [1].

Among the main principles of ecological education process next can be allocated:

- systems concept of learning ecology- economic systems;
- continuity of education during the whole conscious life of a man;
- regular updating, renewing, improvement of ecological knowledge, abilities, skills and life's orientations of the man etc.

The continuity principle of ecological education process means, that it must start on a preschool level and proceed at all stages of formal education, and also to cover the post higher education, which purpose is the increasing of professional knowledge level, acquaintance with advanced achievements of ecology and nature protection.

In conditions of anthropogenic failures increasing special importance takes ecological education of the technical higher schools students and ecology experts of engineering level [2]. Lately, with intensive development of a science and information technologies, competence of the experts and members of administrative staff does not meet the increased requirements more often, therefore acceleration overcoming of difference between current and necessary levels of the competence became the main problem. Realizations of mentioned above is possible with the help of advanced technologies, particularly with the help of remote training system. It allows to provide virtual education, which, mainly, covers independent job with educational material in dialogue mode with computer.

To increase the efficiency and support of the remote and independent training its suggested to create intellectual educational web-system with high level of different processes automation in remote education. Such system includes the following features: adaptability, intellectuality and hypermedity. Adaptability - provides ability of system to adapt for current student requirements, correcting presentation of educational material, rate and style of training. Intellectuality - provides technologies of artificial intelligence application for improvement of different processes at Internet education. Adaptability of training systems, control of knowledge, process of creation of new training rates etc is necessary to relate to such processes. Hypermedity specifies the key form of existence of training rates, which are given to the trainee. All system and form of submission of educational materials constructs in view of maximal use of advantages, which gives hypertext (hypermedia) in comparison with the simple text.

Intellectual educational web based system should carry out the following tasks:

- creation and adjustment of educational process and training environment on the basis of modeling the purposes in educational inquiry that is maintenance of planning, management, estimation, coordination and realization of independent educational activity of the users;
- realization of the intellectual educational content conception for support works with educational and scientific heterogeneous electronic resources and maintenance of modern methods of their processing;
- maintenance adaptability and personalization of users activity in system.

The model of professional competence for any certain specialty can be conditionally divided at some levels: the first level matches to complete secondary education, second level - bachelor, third - expert, fourth - master. Each of the certain levels contains a set of educational materials (objects), which form hierarchical structure and can be unite to some competence.

Strictly formalized competence can belong and may be connected with one or several specialties. It depending on:

- as far as common they are;
- to what level of professional competence model they belong.

Let's present ours knowledge as educational hierarchically structured objects and split them on subjects. Each educational object has the weight, it allows to divide them on competence levels. When the best objects with greatest weight in the certain level has been learned, the level will be considered as closed. The specialty consists from several competencies, which are connected to tops of educational objects. Allocating separate competencies of one specialty, and comparing them with competence it is possible to see that some knowledge, skills of some specialties can cross.

The automatic formation of the dynamic training plan will allow to individualize the educational programs depending on a professional level of the expert - ecologist. It at some level solves one of modern training tasks - constant updating and refreshing of knowledge.

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ECOLOGICAL ASPECTS OF SOCIAL RESPONSIBILITY

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Corporate social responsibility is a free choice of company in favour of an obligation to improve the well-being of society, realizing the proper approaches of running business and selecting corporate resources. The social responsible conduct of the enterprise means the necessity of integration of economic, social and ecological aspects in its direct activity.

In the modern world the greater number of leaders of enterprises understand that the economic success of company depends not only on its commercial

successes and high quality of products but also from its activity in the decision of the burning problems, concerning the territory where this company operates.

In a global economy, increasingly organizations have a responsibility to facilitate, demonstrate and promote corporate social responsibility. Long-term sustainability demands that organizations rethink their business goals and objectives from solely focusing on making a profit to corporate citizenship. Today, the impact of social responsibility is beginning to be seen in communities throughout the world – from human rights and labour practices to health care and the environment.

Questions of social responsibility are inseparable from the problems of ecology and the preservation of the environment. A company can not be considered socially responsible, if it realizes one or another program of population support, but ignores ecological requirements.

To the middle of the last century the predominant position in society had not preventive but reactive character. Nowadays the situation changes. Today many enterprises pay attention to long-term strategic ecological programs such as processing of wastes, introduction of alternative energy sources. A similar policy, directed in the future, shows the high degree of corporate social responsibility of such companies.

Necessity of introduction of this approach became the basic task of Global Agreement, initiated by Kofi Annan in July, 2000, and uniting today more than 2 900 companies from 90 countries of the world. The key for the Global Agreement is 10 principles. Three from these principles directly related to ecological activity, namely the requirements:

- to form careful attitude to ecology;
- to make initiatives concerning support of ecological responsibility;
- to stimulate the development and distribution of ecologically safe technologies.

It is necessary to note that, corresponding to the folded terms, enterprises try to inculcate the full set of management standards which includes in itself the standards of ISO 9000 (“Quality of products”), ISO 14000 (“Preservation of the environment”), OHSAS 18000 (“Health protection and industrial safety”), SA 8000 („Social Accountability”). With the entry of Ukraine into WTO, the presence at the company of certificate of SA 8000, along with the certificates of ISO 900, ISO 14000 and OHSAS 18000, gradually will become one of terms signing contracts.

If you consider that of all the institutions which are currently getting more powerful in the world, they are essentially the global players - the multinational corporations and the non-governmental organisations. The institutions which are decreasing in power and influence are those tied to the jurisdiction of the nation state - governments first and foremost. It is tempting therefore to look towards the multinationals to take a lead in creating solutions for global problems where the governments seem incapable of achieving co-operative solutions.

Corporations have been given the rights of an individual, and they have commensurate responsibilities. Just as it is a moral duty for individuals to contribute to the community in which they live, corporations are also obliged to contribute to their community through volunteering, charitable donations, sponsoring community and cultural events, and so forth.

Furthermore, the moral obligation of firms to be socially and environmentally responsible is greater than that of individuals, mainly because of the powerful role corporations play in society. Corporations own more infrastructure, physical capital, land, financial capital, and knowledge than governments, and they are the most powerful economic force in society today. As a result, they can significantly influence government policy, international trade, and the growth of national economies.

Another tendency should be noted, that was named «Ethic investing». It supposes that the choice of financial institutions for cooperation is also conditioned by ethic reasons. In this case the preference is given to companies that meet ecological criteria and criteria of social responsibility. Cases are known when investors under the influence of ecological organizations transferred their money from banks that invested in most threatening to the planet's climate oil- and gas-producing industries.

Now Ukraine is in a position for one or two decades to form key institutional, public, civil bases on the creation of which the leading countries of the world worked 50-80 years. It concerns also the forming in Ukraine of the system of social responsibility. On this stage the state needs by means of regulatory mechanisms to form and to regulate the social responsibility of employers. And only after the getting of the required result, for example, of achievement of the European level, it is possible to pass from direct to indirect partnership.

The questions of preservation of the environment for businesses more and more go from limitations to possibilities. And here exactly leading and voluntary initiatives of business are very important. And one begin to understand that social responsibility and its ecological constituent is not temporal fascination but necessary factor of influence aimed to redirect the industry.

INCREASE OF EFFECTIVENESS OF PROTECTION OF GRAIN AND FORAGES FROM DEFEAT BY MICROTOXINS

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Grain crops are one of the basic products of production of an agriculture. For preservation of their quality and reduction in losses it is necessary to supervise such parameters as a moisture and temperature. During storage at occurrence of a

superfluous moisture there is a probability of affection by its mould that leads to such consequences as:

1. Decrease in food value as affected fungi use fodder raw nutrients for the growth.
2. Deterioration of gustatory qualities as fodder raw has a smell of a mould and unpleasant taste.
3. Change of physical properties of a fodder grain.
4. Presence mycotoxines which leads to a growth inhibition of animals and reduction in their efficiency.

At development of mouldy mushrooms decrease nutritional value of a forage, the content of vitamins, amino acids and exchange energy, and formed thus mycotoxines negatively influence on productive qualities of agricultural animals and birds.

Symptoms of presence of mycotoxines in forages:

Bird:

- The lowered appetite, weak growth, bad conversion of a forage;
- An atrophy of ovaries; low hatchability and eggs have the wrong form;
- Haemorrhage of liver;
- Decrease in a titre of antibodies;
- The low content of antibodies, lymphocytes and phagocytes;
- Defeat of an oral cavity.

Pigs:

- Refusal of food; the general infringements in reproductive system, abortions;
- A diarrhea, sharp intestinal frustration, vomiting;
- Changes of a chemical compound of blood.

Horned cattle:

- Reduction of consumption of food, a low daily average gain;
- Increase in quantity of dead fetus and abortions;
- A delay of a placenta and metritis;
- immunosuppressy;
- Displacement of an abomasum, ketose;
- The rests of toxins in milk.

Mykotoxines do not destroyed at a heat treatment of grain products, and getting with forages in an organism of animals, collects in meat, eggs and milk. Therefore their presence in forages represents greater danger not only to animals, but also to health of the human as some of them are carcinogens and their hit in food should be excluded. Growth of mouldy mushrooms depends on three interdependent factors: humidity of grain, access of oxygen, temperature of grain.

For reduction of moisture content in grain manufacturers are compelled to dry it up to such values which are necessary for safe storage. All preparation is connected with greater expenses of energy, combustible materials and a manpower. But, at correct processing grain pawned on storage by the preparations interfering development of a mould, necessity for these measures disappears.

For reception of desirable result with a moist grain, use preparations on the basis of organic acids, such as « Filax, Luprosyle, Mould- zap., Myco carb, etc. ». The basic function of preparations is prevention of occurrence of mould funguses in grain, mixed fodder, bran ... the Basic active components of all preparations is propionic acid , acetic acid, sorbic acid. Propionic acid is an effective inhibitor of a mould, and at high concentration (from 0,4 %) can be applied in forages as an antibacterial component. The acetic acid - is absolutely safe for use in forages. It is effective basically against yeast and bacteria. Sorbic acid also is nontoxic for animals, it participates in a metabolism, as well as other fat acids. Besides sorbic acid possesses a wide spectrum of influence on yeast and a mould, but is less active against bacteria.

Use antimouldy preparations has such advantage:

- Reduction of expenses by drying;
- Reduction of expenses by ventilation and hashing of raw material;
- Reduction of loss of weight of raw material
- Provides long and reliable protection;
- Allows to store grain with the increased humidity till 1 year without deterioration of its quality!;
- Will neutralize mycotoxines which are developed mainly Aspergillus Sp. and Fusarium Sp;
- Prevents redistribution of water in a forage which occurs at fluctuations of temperature during storage;
- Prevents caking and lumping of forages and raw material in places of storage;
- It is safe for use by the personnel.

THE APPROACHES TO ECOLOGICAL AND ECONOMICAL AUDIT OF RECREATION TERRITORIES

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For present-day to problem of use the lands for recreation is spared raised attention but this does not promote reduction of the natural nature of this phenomena.

On Ukraine legislative base in the field of ecological audit is small. To the main normative-legal document possible to refer: "Law of the Ukraine about ecological audit" from 24.06.2004 1862-IV, Law of the Ukraine "About guard surrounding ambiances", law "About preparation and certification of ecological auditors". In accordance with law of the Ukraine "About ecological audit", (st.2), recreation territories is possible to refer to object of ecological audit. The Long-

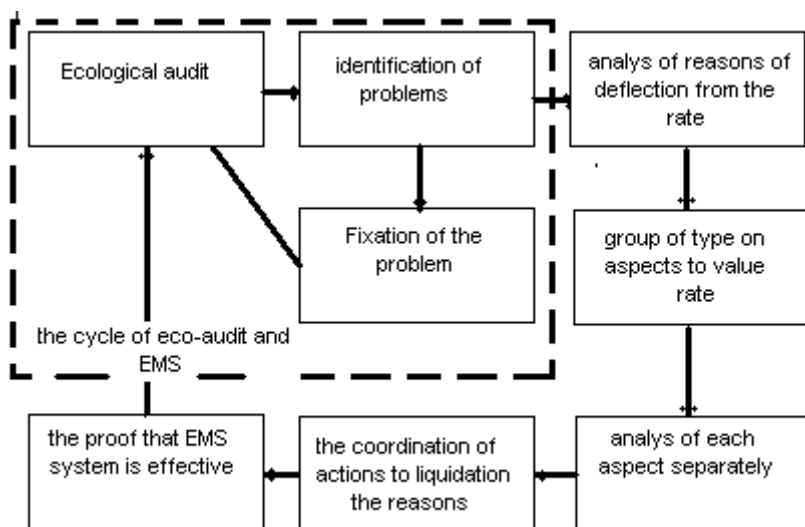
run objective of the undertaking Eco-audit is an estimation to efficiency of the fullness and motivation of measures, taken for guard environment on object of ecological audit (in this instance - else and concrete cost public good, residing on this territories),(st. 8).

Other documents, in which declaimed some belongings to eco-audit are: The Constitution of the Ukraine; The Law of the Ukraine "About property"; The Law of the Ukraine "About natural residing under guard fund of Ukraine"; The Law of the Ukraine "About guard surrounding natural ambience"; The Law of the Ukraine "About patention separate types of landscapes to business activity"; The Decree-law KMU "About standardization and sertification"; The Timber code of the Ukraine; The Water code of the Ukraine; "Zemelinyy code of the Ukraine"; The Law of the Ukraine "About animal world"; The Law of the Ukraine "About ecological expert operation",etc. But in split of so extensive list these documents are not sections of one chain, but simply cite one on another.

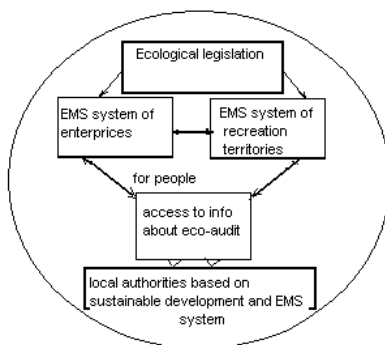
This speaks of that that in our country we haven't The cycle of Eco-audit and environmental Management system (EMS). We have no system supported administrative mechanism on all level authorities.

In USA exists the system of the ranking recreation lands, got as a result eco-economic estimation of resourses' potential. Data about interesting territory possible to find in report Environmental Protection Agency (EPA). In that place is kept information on already realizable projects of guard of the nature, which comprise of itself program of ecological management and audit on the base standard ISO 14000. In this, certainly, USA and countries of EU have overtaken former soviet countries, since, in spite of law "About access of the public to ecological information" and other documents, specifying free access of the people to information, such information isn't enough. It is difficult to find (in the form of the reporting exactly, but as to recreation territories - often impossible). The Methodses on estimation eco-economic potential of territory are founded, basically, on standard statistical criterions, and little differ . In such situations solving importance for successful realization of the estimation of the territory and for undertaking audit has an intercoupling between the sovereign legislative organ of authority and organ of the local authority (regional, district level).

On next scheme we can see relationship between all parts of eco-audit and EMS system:



We think, all this defects are connected with that that Ukraine temporarily be gravely adapted to market economics with all its nuances. Changes are necessary, and not only on paper or in conference halls, but also in most attitude of the people to simple things. We must to learn to value the public good, which the



nature gaved to us so generously (but it is impossible value, not having valued☺!)

On the picture you can see scheme of eco-audit cycle which can be used in our country.

THE MANAGEMENT OF THE CYCLE OF KEEPING THE GOODS SELLABLE

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Every person, making goods, commodities, est. want his goods to dominate the market and keep this position as long as possible. But this is not so easy as each eco article has its own cycle of keeping sellable. It can be compared with the cycle of bio objects which pass several stages from its birth to the death.

The cycle of keeping the goods sellable – it's timeperiod beginning from the introducing the good to the market and its quitting the market as a result of appearing new goods which meet the expectations of the consumers more than the old ones. There are 5 phases of the cycle: the inventing, introducing to the market, increasing sells, maturity and degrading. The first aim is to make the goods comparable and the advertising. During the second phase the goods must be produced stably and the quality must be excellent. At the same time one must identificate the brand and the position of the market. Maturity phase has the aim of supporting and increasing the profits, preserving its positions on the market, take the modification measures and look for new ways of getting profits. During the last, final one must lower the expenses. If one knows the phase in which the goods are, then a strategy can be planned to make more profits.

The given conception is based on the idea that any goods comodities are superseded by more sophisticated or cheaper, improved ones. The enterprises which want to be successful should keep in mind this cycle and handle it properly. The first of handling this cycle is to prolong the sells which can be achieved by means of modifications.

In general modification is the process of improving the characteristics and the quality of the existing eco goods in order to prolong its sellability cycle. There are ways to prolong cycle by means of modifications:

1. Modification of marketing complex. The given modification determines the change of one or even several elements in order to concentrate attention on new goods, for instance:
 - change of price (to lower the price, to introduce special discounts, to simplify the conditions of credit or to increase the prices offering goods with higher quality);
 - change of ways which keep sells alive;
 - changing in advertising (change of the form – press, TV). Ads must underline the merits of the merits of the eco goods;
 - change of the package. It has a protective function (protects the goods) and informative function (serves as an instrument of getting more needed information);
 - change in selling (increasing the sells, searching new ways to expand sells);

- service (quicker delivery, expanding of the technical aid for the customers, bigger credits);
 - change of brand policy.
2. Modification of the goods. It determines the following characteristics of the goods:
- improving the quality (functional characteristics, prolonging the functioning of the goods, improving the eco qualities);
 - modernization (improving and simplifying the use, improving the design).
3. Modification of the market. The search of the consumer goods is needed or the positions of the old ones must be fortified. New consumers can be found in such ways:
- by means looking for new geographical markets;
 - changing the sworn enemies into active consumers;
 - to win over the consumers of the other goods.

The cycle can be represented as a determined consequence of its existing on the market has its own limits. The handling of the given cycle enables the native enterprises to work on outer markets, to be more competent in the market economy.

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ECONOMIC-ECOLOGICAL ROLE OF THE IRRIGATION IN CONDITIONS OF STEPPE ZONE OF UKRAINE

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The area of Steppe zone of Ukraine is nearby 25 million hectares that makes 40 % of all territory of Ukraine. Its role is determined by exclusively high

economic resources of chernozems to what testily archeological digs of barrows of Scythian and Sarmatian times. Now steppes of Ukraine are tilled practically all and already many centuries provide with food stuffs the population of many regions of the country.

Chernozems of Steppe zone together with favorable climatic conditions is able to provide a high level of production of agricultural products. The lack of moisture of soil is limiting factor of resistant reception of heavy yields. In the Steppe zone a rainfall for a year is fluctuating within the limits of 300-450 mm. From this amount of moisture of 35-50 % it is spent for physical evaporation, surface runoff and an infiltration.

Hence, for formation of the yield, at the optimum agrotechnics, there are 200-300 mm of a moisture. If to consider, that on 1 centner grain is spent 10 mm of rainfall the possible productivity will make only 20-30 centners/hectares on the average. In the Steppe zone are observed practically annually the periods without rainfall by duration more than 2 months. At this time dry winds in May and July are especially dangerous from which yields of many crops perish. It convincingly testifies to necessity of restoration of the lost irrigated blocks and the further increase in the irrigated area for a steppe zone up to 4 million hectares.

The modern social and economic condition of national economy incontestably convinces, that the alternative to an irrigation is not present. The irrigated hectare gives agricultural production in 2-3 times more, than on the nonirrigated lands.

However the big problems in this plan are three directions: a) the further studying of ways of increase of efficiency of irrigation hectare, b) an economical expenditure of irrigation water; c) improvement of ecological conditions of locality.

All these problems can be solved successfully under condition of observance of physical and chemical properties of soil covering and biological features of cultivated crops.

First of all, the irrigation of field crops should be realized in strict conformity with settlement norms irrigating, vegetative and water supply irrigations. It will allow to establish real number of irrigations on each culture separately and to eliminate unsystematic irrigations, that will prevent occurrence of artificial saline soils. And the main thing, will allow to establish a monetary estimation of irrigated lands and economic efficiency of management of irrigating systems.

Direct and indirect expenses for carrying out of an irrigation are connected with these factors (here enter expenses for the petroleum products, the electric power, a payment of workers, a soil cultivation, on management of crops etc.). For example, in conditions of state enterprise "Vozrozhdeniye", district Melitopolsky, province Zaporozhye, the level of profitability of a winter wheat has made 71 %, Lucerne's on hay - 69 %, vegetable cultures - more than 80 % etc.

Use of irrigated lands in Steppe of Ukraine enables essentially to reduce change of yields on years. To increase the efficiency of the lands and the level of production of cultures on irrigated lands, to enter into crop rotations no conventional, economic farm crops.

Owing to smaller dependence of efficiency of crops on irrigated lands from weather conditions (coefficient the variation of productivity twice has less, than on nonirrigated lands), they carry out a role of the stabilizing factor in maintenance of production of agricultural products at a level, sufficient for maintenance of needs of the state.

Necessary condition conducting an irrigation farming is not only receptions of optimum growth and productivity of cultures, but also increase of ecological reliability which includes water-keeping modes of an irrigation, preservation of soil fertility, improvement of quality of irrigation water, effective operation of irrigated systems. Norms and methods of irrigation should coincide strictly to soil-hydrological conditions an irrigated field, with the obligatory account of features of absorption of moisture by plant.

ENVIRONMENT AND TECHNOLOGY: USE OF INNOVATION, TECHNOLOGICAL ADVANCES, OPERATIONS RESEARCH AND OPTIMIZATION TO TACKLE CLIMATE CHANGE PROBLEMS

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Nowadays, climate change crisis became a proven fact while only a couple years ago it was only one of scientific theories. As the result, every person, business, organization and government faces a complex problem of planning for the sustainable future. On one side, we are experiencing highly unpredictable climate changes due to human-related activity. On the other side, we live in the world of limited resources and a surplus of carbon dioxide in the atmosphere.

It is widely accepted that we are facing with a massive problem in planning for the sustainable future. The old-fashion primary objective of every business that is maximizing profit (or minimizing costs) is becoming obsolete. Now, we have at least two conflicting objectives in our decision making and those are minimizing environmental impact and maximizing expected profits. Moreover, the problem of minimizing environmental impact is complex by itself as it consists of minimizing use of fossil fuel, maximizing carbon sequestration, optimizing our use of energy, etc. Due to these facts mathematical modeling and operations research techniques are required to tackle these optimization problems.

Currently, businesses are taking the lead in building the environmentally sustainable future and governments are only providing support for those initiatives. It is completely different from the situation in the past decades, when governments

were imposing environmental regulations on industries. Transformation of the business environment towards green products and projects is impossible without support of the customers who are willing to pay (and pay higher price in many cases) for green products and technologies to minimize their environmental footprint. The education plays an important role here and sometimes the environmental education takes such unusual channels as TV advertisements and computer games that indirectly teach people to be environmentally responsible. The examples include TV advertisement to change one traditional light bulb to the energy-efficient compact fluorescent light (CFL) bulb or to save the planet by developing renewable energy resources in the free computer game PowerUp created by IBM. The Porchlight project in Canada aims by distributing one free CFL bulb to each household in the country to show people that we can all take action on climate change. If every household in Canada replaced one old light bulb with a CFL, it would be like taking 66,000 cars off the roads; up to now around 1.2 million bulbs were changed that way.

Many companies increase their publicity and environmental awareness by publicizing their environmental initiatives like greenhouse gas emissions reduction resulted from clean technologies or from minimizing processing times and customer waiting times. The competition has increased due to the fact that companies and businesses can make profits by going green. The new term that describes the phenomenon of businesses taking the lead in sustainable development is called “green rush”. The most known “green rush” industrial sectors are the renewable energy and innovative technologies for operating buildings. Renewable energy sources are well-known solar panels and wind mills. Innovative technologies for operating buildings include “green” housing and geothermal heating and cooling. These two directions created the concept of distributed power generation that will replace centralized power generation at the power stations by power generated at the residential buildings and re-distributed among the consumers.

As we already mentioned, mathematical modeling, optimization and simulation techniques are utilized in many areas of engineering and science to analyze and improve performance. In particular, it is important for solving complex economic, business and environmental problems arising in modern fast-changing world. Mathematical models become a necessary tool of cost-benefit analysts due to recent developments in algorithms and software. The main challenge of realistic models – tackling uncertainty – requires considering multiple scenarios and a number of conflicting objectives to optimize. We describe below two case studies performed at McMaster University that demonstrate how operations research combined with simulation and optimization is used to solve these types of problems.

The first case study deals with minimizing border crossing delays for commercial trucks. Recent studies on border crossings have shown that the current infrastructure is incapable of servicing the workload without significant delays.

These delays lead to increases in shipping costs and as a net result have a negative impact on the bottom line of businesses on both sides of the border. It is estimated that the cost of transit time and uncertainty of delays at the Canada-USA border is over \$5 billion per year. In addition, the environmental impact caused by emissions from the vehicles at the border is very significant. Using historical data on truck arrivals, processing times, staffing patterns, etc., we developed a simulation model of the border, identified the problems and their sources, and proposed a solution to the border congestion problem providing the largest improvement (including environmental benefits) for the least cost.

The second case study describes modeling improved store design to help meeting greener goals at newly planned locations. A fast-food restaurant chain wants to reduce the environmental impact of their business while maintaining the company's high level of customer service. Resulting designs are ranked based on customer service level and environmental impact (defined as the average quantity of emissions produced by customer vehicles using parking lot and drive-through lane). The simulation model that we developed provides the optimal solution to meet these goals.

In conclusion, innovation, technological advances and modern information technology including operations research and optimization will be the leading forces driving sustainable development and rational use of natural resources.

INFLUENCE OF USE INFORMATION-COMMUNICATION TECHNOLOGIES ON ENVIRONMENT

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Developments in computer and telecommunications technology have pushed information into the forefront of business. Information is now considered the most important factor of production in a world economy that is gradually becoming globalised. These developments are also the principal pillars upon which the change from an industrial age to an information society hinges. This paper spells out the role of information in the new "information society" and how it affects the fortunes of a nation. A historical approach to underdevelopment and poverty is undertaken and applied, by analogy, to the call for African countries to use electronic formats to solve the continent's myriad problems.

Information-communication technologies (ICT) industry seriously can impact the environment at different levels and in various dimensions. The ICT industry designs application programs which can ensure cleaner production patterns. Being an enabler of development, ICT can make a valuable contribution to sustainable environmental management; improve environmental monitoring and response systems; facilitate environmental activism; raise awareness and enable a

more efficient use of resources. The industry uses material resources to manufacture products such as computers, hardware, and devices, but it also produces wastes.

Applications of ICT for environmental protection are becoming common around the world. For example using ICT to collect, store, process and disseminate environmental database and information. This provides users with access to up-to-date information, thereby increasing and enhancing efficiency in environmental monitoring. It also facilitates the prevention and mitigation of environmental degradation. For instance, the websites of the Food and Agricultural Organisation (FAO), the United Nations Environmental Programme (UNEP), World Meteorological Organisation (WMO) and the World Resource Institute (WTI) are very good sources of data and information on the environment.

Table 1 below indicates the effects and opportunities created by ICT at three orders: physical existence of ICT (first order), on-going use and application of ICT (second order), and accumulative effects (third order).

Table 1: Environmental Effects and Opportunities Created by ICT

First Order Effects	Second Order Effects	Third Order Effects
Design and Manufacture of ICT equipment - ICT production is relatively lightweight industry - Use of toxic components - New waves of technology are more energy-efficient	Increase and Decrease in use of Transport - E-commerce have significant environmental impacts from the increases in home deliveries - IT employees have less travels, then less pollution ICT managed control systems in business can reduce environment impacts	Decoupling economic growth and energy consumption and/or carbon emissions - Possibilities of reducing energy used and/or CO ₂ per unit GDP
Operation of ICT equipment: Save energy use by stand-by mode	Distribution and manipulation of environmental information such as ISO 14000 label/ certification	Changing settlement patterns - Conflicting pressures on local settlement
Disposal of ICT equipment - Increase in recycling and reusing		

Geographical Information Systems (GIS) and Global Positioning System (GPS) are typical ICT based tools for environmental purposes. A GIS is an automated system that enables the capture, storage, checking, integration, manipulation, analysis, display, and modelling of complex spatial data. It comprises hardware, software, and specified procedures for solving complex planning and management problems and formulating coherent management

strategies. A GPS on the other hand, is a space-based radio positioning system that provides 24 hour three-dimensional position, velocity and time information to suitably equipped users anywhere on or near the surface of the planet. A combination of these two technologies provides an important means to analyse and access environmental information. All information and databases on the environment posted on the Internet, the Webs, TV, etc. are good instruments for environmental education and awareness creation.

ENERGY SAVING AS ONE OF BASIC DIRECTIONS OF ACHIEVEMENT OF SUSTAINABLE DEVELOPMENT

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Energy is a major factor in the process of transformation of nature a man. Deciding influence has a level of development of energy on consisting of economy of the state, decision of problems of social sphere and standard of living of population. The production of energy, its portage and consumption, purchased global character.

By a side by side with this all of almost 80% types of contamination of biosphere predetermine exactly power industry, which includes getting, processing and use of fuel. The annual consumption of energy in the world is now approached a to 20-25 milliard of tons of conditional fuel. Investigation of it are exhaustions of world fossil block fuels. Thus incineration of organic fuel in power plants is accompanied the enormous troop landings of harmful matters and side heat in an environment.

A problem of energy saving is very topical for the countries of the whole world and, in particular, Ukraine. Growth of scales of production and consumption of energy results in quantitative and high-quality changes in co-operating of humanity with an environment. The unprecedented rates of anthropogenic redistribution of materially-power streams in a natural environment are instrumental in the origin of row of economic and ecological problems: exhausting of sources of natural fuel, violation of natural landscapes, mechanical, chemical and thermal contaminations of environment, change of climate etc.

Eco-system is the supplier of resources and terms, necessary for existence of frame of society. The level of its welfare, which is characterized such indexes as, in same queue, quality of labour resources, supplied in the production system determines a growth of population rate, life-span and level of morbidity which, depends on their quality.

The production of energy, which is the necessary mean of existence and development of humanity, negatively influences on nature and environment.

Development of fuel and energy complex is impossible without reproducing of natural resources.

Improving the state of environment is possible at the decline of consumption of energy and stimulation of saving of resources. Introduction of энергосберегающих technologies results in diminishing of volumes of natural resources which are utilized for producing goods and services, that results in reduction of contamination and diminishing of charges on the guard of environment.

Thus, on the present stage of development of humanity there is a necessity for the translation of power industry on the intensive way of development, in driving to the order of the use of power mediums on all of levels, in a search and use of alternative (ecologically clean and inexhaustible) energy sources, that is basic priority measures and directions of development of energy saving as one of basic ways of achievement of sustainable development of humanity.

CONCEPTUAL ASPECTS OF LOW-WASTED PRODUCTIONS

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Modern conception of waste processing based on the complex use of existing methods of waste processing turned out its narrow-mindedness and insolvency. The use of these methods does not solve the mentioned problem and only transforms it into another dangerous state. Surely most potential of waste minimization is concentrated on the stage of planning and production of means of production and products, where the possibilities of resources stream management on the last stage of product's life cycle must be placed.

Reasons of high waste-intensiveness and therefore damage-intensiveness and nature-intensiveness of production are both the method of production and necessities of society.

In view of preceding one of directions of solving this problem is creation and application of low-wasted, zero-wasted and complex technologies.

Zero-wasted technology is not only production technology of any product but also is a principle of organization of production functioning, regional industrial production unions and territorial-industrial complexes on the whole. In that case all of the components of raw material and energy are rationally used in the closed cycle so an ecological equilibrium is not violated.

Principle of unviolation of ecological equilibrium in this context supposes that the matter is not simply about the preservation of resources which were involved in the production of specific materials, but about the increase of the value contained in it due to application of knowledge to the process of its processing and second use.

The second key moment affects production raw material intensiveness that supposes change of configuration of the production systems and products with the purpose of reduction of amount of necessary materials. In view of this a cost analysis of resource streams and analysis of ecological possibilities and costs are of big interest.

By replacement of some product by other one meaning of new qualities and functions of product for an consumer needs to be estimated and at the same time the ecological cost of all product's life cycle must be estimated with the advent of its new quality or function. An ecological cost in this case includes a requirement in financial and power resources and negative influence on environment.

With taking these moments into account it is possible to develop the rational chart of the use of alternative products. As used here it would be expedient to use the method of functional-cost analysis.

ESTIMATING ENERGY EFFICIENCY OF BIODIESEL AS A SUBSTITUTE FOR DIESEL FUEL

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Biodiesel is a renewable diesel fuel substitute that can be made by chemically combining any natural oil or fat with an alcohol such as methanol or ethanol. In Europe, biodiesel is available in both its neat form (100% biodiesel, also known as B100) and in blends with petroleum diesel. Most European biodiesel is made from rapeseed oil. In the United States, initial interest in producing and using biodiesel has focused on the use of soybean oil as the primary feedstock, mainly because this country is the world's largest producer of soybean.

To evaluate energy efficiency of using the fuel we need to define different kinds of energy flows. It can be made by analyzing life cycle of the fuel. Types of life cycle energy inputs are:

- total primary energy - all raw materials extracted from the environment that contain energy. In estimating the total primary energy inputs to each fuel's life cycle, we consider the cumulative energy content of all resources extracted from the environment;

- feedstock energy - energy contained in raw materials that end up directly in the final fuel product. For biodiesel production, feedstock energy includes the energy contained in the soybean oil and methanol feedstocks that are converted to biodiesel. Likewise, the petroleum directly converted to diesel in a refinery contains primary energy that is considered a feedstock energy input for petroleum diesel. Feedstock energy is a subset of the primary energy inputs;

- process energy. It is the energy contained in raw materials extracted from the environment that does not contribute to the energy of the fuel product itself, but

is needed in the processing of feedstock energy into its final fuel product form. Process energy consists primarily of coal, natural gas, uranium, and hydroelectric power sources consumed directly or indirectly in the fuel's life cycle;

- fossil energy - primary energy that comes from fossil sources specifically (coal, oil, and natural gas). All three of the previously defined energy flows can be categorized as fossil or nonfossil energy.

- fuel product energy - the energy contained in the final fuel product, which is available to do work in an engine, is what we refer to as the "fuel product energy." All other things being equal, fuel product energy is a function of the energy density of each fuel.

Total energy demand is calculated on each stage of the petroleum diesel and biodiesel life cycles. Biodiesel life cycle include 6 stages: soybean (or rapeseed) agriculture, soybean transport, soybean crushing, soy oil transport, soy oil conversion, biodiesel transport. Diesel fuel life cycle include 4 stages: crude oil extraction, crude oil transportation, crude oil refining, and diesel fuel transportation.

Two types of energy efficiency are represented. The first is the overall "life cycle energy efficiency." The second is the "fossil energy ratio." Each illuminates a different aspect of the life cycle energy balance for the fuels studied.

The calculation of the life cycle energy efficiency is the ratio of fuel product energy to total primary energy:

$$\text{Life Cycle Energy Efficiency} = \frac{\text{Fuel Product Energy}}{\text{Total Primary Energy}} \quad (1)$$

This ratio estimates the total amount of energy that goes into a fuel cycle compared to the energy contained in the fuel product. This efficiency accounts for losses of feedstock energy and additional process energy needed to make the fuel.

The fossil energy ratio tells us something about the degree to which a fuel is or is not renewable. It is defined as the ratio of the final fuel product energy to the amount of fossil energy required to make the fuel:

$$\text{Fossil Energy Ratio} = \frac{\text{Fuel Energy}}{\text{Fossil Energy Inputs}} \quad (2)$$

If the fossil energy ratio has a value of zero, a fuel is completely nonrenewable and provides no usable fuel product energy because of the fossil energy consumed to make the fuel. If the fossil energy ratio is 1, it is still nonrenewable because no energy is lost in the process of converting the fossil energy to a usable fuel. For fossil energy ratios greater than 1, the fuel begins to leverage the fossil energy required to make it available for transportation. As a fuel approaches "complete" renewability, its fossil energy ratio approaches "infinity." That is, a completely renewable fuel has no fossil energy requirements.

From a policy perspective, these are important considerations. Modern policy makers want to understand how much a fuel increases the renewability of energy supply. Another implication of the fossil energy ratio is the question of climate change. Higher fossil energy ratios imply lower net CO₂ emissions. This is a secondary aspect of the ratio, as we are explicitly estimating total CO₂ emissions from each fuel's life cycle.

Compared on the basis of primary energy inputs, biodiesel and petroleum diesel are essentially equivalent. Biodiesel has a life cycle energy efficiency of 80.55%, compared to 83.28% for petroleum diesel. The slightly lower efficiency reflects a slightly higher demand for process energy across the life of cycle for biodiesel. On the basis of fossil energy inputs, biodiesel enhances the effective use of this finite energy resource because it leverages fossil energy inputs by more than three to one. Because 90% of biodiesel feedstock requirements (soybean/rapeseed oil) are renewable, biodiesel's fossil energy ratio is favorable. Biodiesel uses 0.3110 MJ of fossil energy to produce 1 MJ of fuel product; this equates to a fossil energy ratio of 3.215. In other words, the biodiesel life cycle produces more than three times as much energy in its final fuel product as it uses in fossil energy.

Thereby, biodiesel can effectively leverage limited supplies of fossil fuels, can help reduce air pollution and greenhouse gas emissions, can reduce the dependence on foreign petroleum.

THE ECONOMIC REGULATION IN FORESTRY

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Forest is a constituent and very important part of biosphere, an element of landscape. The forest is a source of raw materials often identified with timber. The forest is an object of forestry management, the basis of the state forest reserve of Ukraine. So the forest is a versatile notion. It can be investigated in natural-historical aspect, in technical, economic, legal, historical and medical aspects.

Special place takes the problem of the country timber supply equally with saving and rational use of forests as the most important component of nature complexes.

The constant growth of timber use and versatile importance of forests in people's life predetermine the necessity to organize correct scientifically substantiated and well-balanced use of a forest in the country.

Versatile use of nature factors makes the use of forestry the most important sector of nature usage, increases its role in the system of environmental protection, taking care of rational use of natural resources and environment.

In the legal management relationship the forestry use is a system of measures how to realize and regulate nature usage to satisfy the requirements of national economy and population.

The state property of the land, water, natural resources and forests form the basis of nature use in Ukraine. The owner of the forests is the state, which has an exclusive right to use them. This right is given to different forests users according to the corresponding acts. The state determines the procedure and regulations how to use forests.

The forest use is regulated by the State Forest Code of Ukraine, enactments and orders of the Cabinet of Ministers of Ukraine.

While managing forestry in accordance with Forest Code of Ukraine the planning managerial organs must secure:

- strengthening of water protecting, securing, climate regulating, improvement and other useful natural qualities of forests which contribute to people's health care, environment and national economy development;
- constant inexhaustible forest usage;
- extended replanting, improving the quality of forests, increasing of their productivity;
- forest saving, their fire protection, protection from pests and illnesses;
- rational use of the State Forest Fund land;
- enhancing efficiency of forestry production.

Development forestry on principles of ecology-balanced development must provide for next stages

1 stage - overcoming crisis condition in branch, making normative-law base, restoration of economical connection, using production potential for satisfaction own needs..

2 stage – structural rebuilding branch, reform forms of property, economical mechanisms stimulation and regulation effective forest using.

3 stage – dishonour of steady development, creation ecological safed productions, satisfaction economic's needs in resourses production of forest with talking into account ecological demand.

STATE SPONSORSHIP OF THE UKRAINIAN CULTURE

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The national culture is inexhaustible spiritual memory of society. People which don't remember and respect the past, don't deserve the future. Therefore a national culture is a strategic resource which must be protected. The culture acquires the double value for the Ukrainian society and Ukraine on the whole.

Firstly, national culture is the method of expression national identity. It educates personality in everybody, provides pre-conditions for its successful development. Secondly, a national culture comes forward today as the determinative of competitiveness. Today in the world competition takes place at the level of cultures, namely - national cultures. We are interesting to the world by an original national cultural person. Only in such case the attention will be paid on us.

Such small countries, as Norway, Finland, Holland, Switzerland have already built the export policy according to this process. As the slogan of export encouragement in these countries serves an utterance "Sell the culture". Today the European companies present the state, investing considerable facilities in conducting of artistic actions - exhibitions, concerts, theatrical performances - in countries, where they intend to work.

Considering the state of the culture budgetary financing in Ukraine, we discovered absence of successive cultural policy in it. Charges on culture account less than 1 % to the budget, while for the countries of European Union not less than 2%. According to the world experience of financing the cultural activity, such basic sources of financing as budgetary and outbudgetary are existed.

Budgetary financing:

- direct financing (museums, libraries, archives, television);
- grants;
- general and having a special purpose transfers to the subnational budgets (national programs of development of culture);
- compatible participation of power organs with different levels (socio-economic programs of regional development, increase of employment, help to small business).

Outbudgetary financing:

- tax protected policy;
- bringing the cultural legacy in active cultural activity;
- supporting cultural funds (model of financial resources division «in the distance of prolate hand»);
- personal funds of cultural organizations.

As a result there were selected prospects and directions of the successful cultural financing.

Prospect of financing the cultural industry:

- Stimulation of cultural sphere financing from the side of unstate sector;
- Providing to the population free access to the cultural values, fixing of cultural infrastructure in regions;
- Development of the line state support mechanisms for scanty means and socially unscreened groups of population;
- Realization of protectionism policy in relation to the domestic art;
- Education in young generation sense of national consciousness, devotion to the Ukrainian culture.

Directions of cultural financing:

- forming the financing multichannel system of cultural sphere;
- providing favourable environment, encouragements of financial and moral character for development of sponson, patronage;
- creation state and local funds of the voluntarily offerings on culture development;
- introduction of competitive mechanisms of cultural activity financing;
- taxation diminishing for culture and art establishments;
- renewal and development of the system artistically educational work of cultural establishments with a rising generation;

In our view, the method of budgeting, oriented to the result is the most perspective method of organization the cultural development financing. The essence of it consists in financing not cultural establishments but directly cultural measures.

In conclusion we should mark that both our state and our culture are today “on cross-roads”. Thus the last is rather reason than result. If today the state will not render proper support to the financing of cultural development, tomorrow it can not only lose chances to plant competitive of oneself in a global environment but also get a fatal blow on the national culture. However we shouldn’t forget that any support deforms a natural evolution. The state must interfere in development of culture as little as it possibly and as much as it needed. Cultural weighed policy is necessary for this process. It will foresee stimulation of such important alternative sources of cultural development financing as: patronage of art, sponson and others.

THE PROBLEM OF ENERGY CONSUMPTION

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Nowadays the problem of energy consumption becomes extremely urgent in the whole world. As most of energy resources are nonrenewable. And energy consumption worldwide increases every year.

If looking at a prioritized list of the top 10 problems, with energy at the top, we can see energy is the key to solving all of the rest of the problems – from water problem to population growth problem:

1. Energy. 2. Water. 3. Food. 4. Environment. 5. Poverty. 6. Terrorism and war. 7. Disease. 8. Education. 9. Democracy. 10. Population

Take the second problem on the list, for example: water problem. Billions of people all round the world live without reliable access to clean water. The problem can be solved with the use of energy resources. Our planet has huge resources of water, but most has salt in it, and it is often thousands of miles away from where

we need it. It's possible to desalinate the water and pump it vast distances. But without cheap energy, there is no acceptable answer.

Energy likewise plays the dominant role in determining the quality of our environment, the prevention of disease, and so on, down the entire list of global concerns. In short, energy is the most important factor that impacts the prosperity of any society.

World energy consumption is projected to increase by 57 percent from 2004 to 2030. Much of the growth in worldwide energy use is expected in developed countries. In contrast to the developed countries increase in energy consumption undeveloped countries and countries in transition is projected to be more modest. In the Eastern Europe countries and the countries of former Soviet Union (EE/FSU) energy demand in the industrial and transportation sectors is projected to grow on average by 1.6 percent per year from 2002 to 2025.

Fossil fuels (oil, natural gas, and coal) continue to supply much of the energy used worldwide, and oil remains the dominant energy source, given its importance in the transportation and industrial end-use sectors. Non-fossil fuel use also grows, but not as rapidly as fossil fuel use. The outlook for non-fossil fuels could, however, be altered by state policies or programs, such as environmental laws aimed at limiting or reducing pollutants from the combustion of fossil fuel consumption and encouraging the use of non-fossil fuels.

World **oil** use is expected to grow from 78 million barrels per day in 2002 to 103 million barrels per day in 2015 and 119 million barrels per day in 2025.

Natural gas is projected to be the fastest growing component of world primary energy consumption. Natural gas consumption worldwide increases in the forecast by 1.9 percent per year on average over the projection period, from about 100 trillion cubic feet in 2004 to 163 trillion cubic feet in 2030. Rising world oil prices increase the demand for natural gas, as it is used to displace the use of liquids in the industrial and electric power sectors in many parts of the world. Industrial uses throughout the world are projected to make up 43 percent of total natural gas use in 2030.

World **coal** consumption is projected to increase from 5,262 million short tons in 2002 to 7,245 million short tons in 2015.

Worldwide, electricity generation in 2030 is projected to total 30,364 billion kilowatt-hours, nearly double the 2004 total of 16,424 billion kilowatt-hours.

World **net electricity** consumption nearly doubles in the More than one-half (59 percent) of the projected growth in demand occurs in the developed countries, where electricity use increases on average by 4.0 percent per year from 2002 to 2025, as compared with 2.6 percent per year worldwide.

Carbon dioxide is one of the most prevalent greenhouse gases in the atmosphere. Anthropogenic (human-caused) emissions of carbon dioxide result primarily from the combustion of fossil fuels for energy, and as a result world energy use has emerged at the center of the climate change debate. World carbon

dioxide emissions are projected to rise from 24.4 billion metric tons in 2002 to 30.2 billion metric tons in 2010 and 38.8 billion metric tons in 2025. Much of the projected increase in carbon dioxide emissions occurs among the developed countries, accompanying large increases in fossil fuel use. The developed countries account for 68 percent of the projected increment in carbon dioxide emissions between 2002 and 2025.

Economic growth is one the most important factors to be considered in projecting changes in the world's future energy consumption. Over the 2004 to 2030 period, world economic growth (real GDP) is projected to average 4.1 percent annually. Economic activity, as measured by gross domestic product (GDP) is expected to expand by 5.1 percent per year in developed countries, as compared with 2.5 percent per year in the mature market economies and 4.4 percent per year in the transitional economies of EE/FSU.

WORLD ECOLOGY PROBLEMS

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Introduction.

In today's world, preservation of the environment is of importance for the future of civilization. In the near future the importance of maintaining the environment at a level capable of supporting human life and ensuring the reproduction of renewable natural resources and preservation of non renewable resources will eclipse all other human achievements to date. The demographic explosion and scientific and technological revolution of the 2nd half of the 20th century have led to a sharp increase in exploitation of natural resources, and thus to their depletion.

For example, currently more than 3.5 billion of oil and about 4.5 billion of coal and charcoal are taken out of the ground every year. Furthermore, the human race produces a huge quantity of industrial and domestic waste. Between 1970 and 1990, the planet was stripped of almost 200 million hectares of forest; there has been serious degradation and desertification of vast tracts of land; soil pollution by waste, rubbish, slag-heaps, heavy metals, pesticides, toxins, radioactive materials, and abandoned and disused factories. Pollution of the atmosphere is caused mainly by the industrial and transport sectors, which combined emit millions of tones of solid and gaseous substances; of these, the major pollutants are soot, carbon dioxide, sulfurous gases, chlorofluorohydrocarbons, and acids. Also under threat are the planet's water resources, which are of no less importance for the survival of the human race. Water resources, therefore, become polluted by oil products and other forms of waste. The enumerated ecological problems, individually and

collectively, are leading to the rapid decline in bio-diversity of fauna and flora, both in specific regions and on the planet as whole.

In today's world, the ecological problem is the biggest problem in both developed and developing countries. In my presentation, I will explain how this problem has become critical in different places like; USA, China and Ukraine.

U.S.A

USA as mainly responsible for global warming, global warming and global climate change are now something we must get used to, as there is no effort to at least to slow down this problem. Dangerous trend caused mainly by CO2 emissions as the result of dominant fossil fuels use, and the major blame for this giant ecological problem goes to United States. In United States CO2 emission per capital is six time the global average citizen and more than 30 times that of a citizen in developing countries which is more than worrying information as the world leading country is the main responsible for global warming problem and leads in CO2 emission. US contribute almost 25% of greenhouse gas emissions which is definitely too much considering US covers only 9% of the world population. United States as the world's leading country should have moral responsibility and put serious efforts in order to solve this problem and not making it even more difficult. But America is used to it's traditional style that includes lots of cars, heavy industries and dominant fossil fuels use, and by the current looks of it, this situation won't change significantly in upcoming years.

CHINA

China as the reason for air pollution, now china seriously suffers because of air pollution problem. This huge country is boosting large economic growth lately and owes it almost all to coal, and since coal is fossil fuel with very harmful effect for environment because it does not only release dangerous greenhouse gases into the atmosphere but also contributes to air pollution. Renewable energy is the only hope for countries like China. For instance in 1999 CO2 emission reached 18.57 million tones, air pollution emission reached 11.59 million tones and industrial dust emission reached 11.75 million tones, according to statistics released by State Environmental Protection Administration of China.

China is aware of her air pollution problem and tries to fight it by investing more funds in renewable energy sector and particularly in wind energy sector, but as long coal based power plants will dominate China's industry , there is really no place for significant ecological improvement.

UKRAINE

In Ukraine, the level of ecological intensity is much less compared to USA and China, but still the Ukrainian government should take appropriate measures up on environmental protection, so as to avoid ecological problems that might happen in the near future. Although there is high impact upon the environment such as; water pollution, air pollution, water discharge, wastes, soil erosion and degradation, over damping of soil, and so on in many Ukrainian regions in the year 2001 as shown in the table bellow.

The indicators of impact upon the environment by the regions of Ukraine in 2001.

Regions	Water impressions Millions of cubic meters	Air emission Thousands of tons	Water Discharge Millions of cubic meters	Wastes Thousands Of tons	Soil erosion and degradation Thousand of hectors	Over dumping of soil Thousand of hectors	The quantity of victims Thousands of people
The autonomous republic of Crimea.	1699	32,6	186,2	10207	181,1	0,6	0,8
Vinnitsa	708	71,7	73,7	442	105,9	75,9	0,6
Dnipropetrovsk	2196	848,6	815,1	1759569	71,3	34,5	2,5
Donetsk	2384	1588,7	1223,0	564296	36,5	21,7	12,1
Zaporozhyya	1625	233,3	259,9	103475	86,7	25,8	1,1
Ivano-Frankivsk	115	143,8	90,8	45371	40,4	23,8	0,2
Kyyv	1112	87,4	73,3	20896	35,8	83,3	0,6
Lugansky	707	439,6	379,3	119761	29,9	15,1	5,8
Lviv	306	114,5	279,7	81262	191,8	75,2	1Д
Mykolayv	339	13,5	88,7	2486	66,9	15,0	0,5
Odesa	2531	20,8	252,2	1282	77,6	17,6	0,6
Poltava	273	64,9	83,6	5294	23,6	46,3	0,9
Sumy	114	30,5	53,2	28111	20,4	90,4	0,8
Ternopil	82	9,6	38,5	61	92,0	67,7	0,2
Kharkiv	371	156,1	300,8	32820	13,7	48,4	1.1
Chernigiv	141	18,2	23,9	1968	178,7	399,2	0,5

The highest level of ecological intensity is found in Zaporozhyya region (46% of the gross value added), Donetsk region(41%) and Dnipropetrovsk region (40%). The lowest level of ecological intensity is in Lviv region (15%), Ternopil region (16%) and Kharkiv region (16%) in 2001.

In order to solve or at least to reduce this world ecological problem, I would like to advise the following measures:

1. Every government should impose heavy fines to heavy industries which in one way or another are responsible for environmental pollution.

2. Education should be provided to every citizen about the importance of environmental preservation and about the impacts that we are going to face due to environmental pollution.

3. Every government should try to use alternative sources of energy like wind energy, solar energy and other sources which do not pollute environment.

4. Every government should license and finance certain environmental protection activities, in the sphere of environmental protection in the following areas: Utilization, storage, re-location, disposal, burying, and destruction of industrial and other waste materials and substances (apart from radioactive ones); conducting ecological certification and ecological audits.

5. Development and setting up of ecologically clean up means of transport.

6. Creation of an ecological market, in which products which are more harmful to the environment, or which are produced using technology which has a harmful impact on the environment do not have any competitive advantages due to lower price or taken out of the market.

Conclusively, the world ecological security is the most important in the future development of every country, so, every citizen and every government is obliged in protecting environment, in which our future and future of the future generation is depending on it.

NECESSITY OF ECOLOGICAL INSURANCE IN UKRAINE

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In today's world, preservation of the environment is of crucial importance for the future of civilization. In the near future the importance of maintaining the environment at a level capable of supporting human life and ensuring the reproduction of renewable natural resources and preservation of non-renewable resources will eclipse all other human achievements to date. The following environmental problems could be identified as characteristic for Ukraine at present and nearest future:

- air and water pollution;
- inadequate supplies of drinkable water;
- energy use and carbon emissions;
- high level of energy and carbon intensity;
- renewable energy;
- nuclear issues;
- deforestation;
- radioactive pollution in the North-West of Ukraine.

Today the environmental pollution and third party liability insurance have become a necessity for enterprises for the following reasons:

- Firstly, activities of many enterprises are environmentally hazardous;
- Secondly, the government has lately displayed increasingly high concern for environmental protection;
- Thirdly, man-caused accidents frequently cause irreparable damage to the environment, as well as harm to the health and life.

Ecological insurance is one of the economic mechanisms for protecting the environment and is a reliable source of compensation for damage. What is meant by ecological insurance is insurance which involves the liability of the insurer for damage incurred by the insured if a claim is made. Moreover, location of enterprises in dangerous zones becomes unprofitable due to the high insurance premium with the introduction of a system of differentiated insurance tariffs according to level of risk. Furthermore, the insurance policy can provide for the charging of a large premium in the case of non-observance of ecological regulations and the payment of compensation by the insured in the case of a claim for which the organizations or persons are liable. Insurance cover covers compensation in the case of a claim. Therefore, in the case of an ecological catastrophe, if the guilty party is insured, compensation for all damage caused, or part thereof is automatic. From the insurers perspective it is important to work in a number of regions and with a number of enterprises in order to provide adequate diversification of risk. Economic instability and the absence of a legal underpinning for ecological insurance exacerbates the problems, as sometimes government funds are not sufficient to pay out compensation for even part of the ecological damage.

Ecological insurance guarantees investment in highrisk forms of manufacturing. Insurance is a tool of additional extra-budgetary financing measures for preserving the quality of the natural environment and natural resources. The sphere of ecological insurance includes insuring the risks of emissions that exceed the norm and hazardous element dumps, ecological losses that result from ecological disasters, and ecological insuring of new technologies (including biotechnologies).

The main objective of the ecology insurance is to indemnify the insured for the losses incurred by the damage to the environment and third parties due to the execution of environmentally harmful activities.

The insured are enterprises the activities of which may cause indeliberate or accidental environmental pollution, as well as damage to life, health and/or property of third parties.

Risks: Neftepolis Insurance Company covers risks and indemnifies for losses occurred due to:

- Damage to the environment (natural landscape disruption, water bodies and atmosphere pollution etc.);
- Damage to property of third parties;

- Damage to life and health of third parties.

Scope of damage to life, health and property of third parties, as well as environmental damage is defined as per the regulations of the Civil Code of the Russian Federation and other statutes and legal norms.

Basic rate for the ecology insurance amounts to 0,25 - 1,0% of the sum insured and depends on the location of the facility, its technical conditions and the industry processes.

Currently, the environmental legislation of Ukraine includes over 200 laws and by-laws. Almost all of them were adopted or amended after the adoption of the Constitution of Ukraine (1996). The Agreement on partnership and cooperation between the European Union and Ukraine (1994) commits the parties to resolve a number of environmental problems (Article 63) and to harmonize the laws and regulative bylaws of Ukraine with European legislation (Article 51). The laws which are closest to meeting European requirements are the Law of Ukraine "On Ecological Expertise" and the new edition of the Law of Ukraine "On the Protection of Atmospheric Air".

In that way it's really necessary To develop and ratify the concept for developing ecological insurance in Ukraine, which should outline the structure, priorities, and order of implementing the appropriate legislative, legal-standard, and methodological documents; the regulatory scheme for creating the insurance market, taking into account European requirements and reference points.

So the Cabinet of Ministers' must to prepare and approve decision "On mandatory ecological insurance of the responsibility of hazardous sites that were privatized without considering ecological requirements."

ANALYSIS OF SOCIAL, ECOLOGICAL AND ECONOMICAL ASPECTS OF RESOURCE SAVING TRANSFORMATIONS

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Energy and resource saving technologies development allows essentially reduce the resource intensity of the gross domestic product of Ukraine and now is one of priorities of a modern state policy in our country. Necessity of resource and energy saving activization is dictated by its significant financial, economic, social, ecological advantages which can be achieved by domestic economical agents (tab. 1). At the same time, resource saving transformations of economic system accompany with some negative aspects (tab. 1).

Table 1 – The positive and negative aspects of resource saving transformations of economic system

Positive aspects	Negative aspects
1	2
Economical	
<ul style="list-style-type: none"> – increase of resources productivity, growth of economic benefit per unit of an integrated resource; – reduction of resources' prices owing to downturn of their demand at the constant proposition; – improvement of the basic macroeconomic parameters of development of the country, economic growth; – increase of investments in the future business cycles due to resources' preservation in existing cycles; – increase of domestic production's competitiveness; – export - import structure improvement; – economy restructuring; – growth of employment level in sphere of services and information sector 	<ul style="list-style-type: none"> – growth of unemployment in obtaining and processing branches; – additional expenses for retraining, improvement of professional skill of workers, their employment; – probable growth of a share of non-renewable resources involved in processes of manufacture and consumption; – the accelerated moral depreciation of production owing to intensive introduction of innovative resource saving technologies, the necessity of often production replacement; – growth of expenses for creation and use of new generations of resource saving technologies, caused by their science linkage, labour inputs increase, exhaustion of resource saving potential
Ecological	
<ul style="list-style-type: none"> – reduction of environmental contamination owing to resource saving measures realization at stages of: – manufacture (reproduction) of a resource; – manufacture (reproduction) of initial resources which are used for manufacture (reproduction) of the saved resource; – conditional recycling (disposal) of waste products of the saved resource; – manufacture of the fixed capital, which are necessary for conditional manufacture (reproduction) of the saved resource; – conditional transportation and storage of the saved resource; – conditional manufacture, transportation and storage of the saved resource, owing to possible occurrence of extreme situations 	<ul style="list-style-type: none"> – increase of environmental pollution in connection with the growth of resources' volumes, involved in manufacture, as a result of their price reduction; – the increased environmental pollution as a result of manufacture and operation of new types of resources which are highly toxic substances sometimes; – growth of levels of anthropogenic and man-caused loadings on environment owing to population growth

1	2
Social	
<ul style="list-style-type: none"> – growth of population welfare due to resources' prices reduction; – decrease in population morbidity owing to the improvement of an ecological situation, environmental contamination levels reduction; – increase of a creative component of work, wide opportunities for professional skill improvement, self-improvement; – reduction of heavy and monotonous work share, improvement of work conditions, increase of skilled work share; – decrease in an industrial traumatism 	<ul style="list-style-type: none"> – population growth due to improvement of resource and food base; – difficulties of psychological adaptation to a new trade, especially for persons of a pension age, owing to economy restructuring; – increase of psychological disorder of separate workers, necessity of constant increase of workers' qualifying level; – stratification of the population due to various ability of people to acquire knowledge and to use them in practical activities

Presence of these aspects demands acceptance of the regulating measures, capable to smooth or prevent undesirable consequences of public transformations at various levels of managing. In particular, as such measures it is necessary to name updating of state and regional ecological and economical policy, directed on regulation of processes of manufacture and consumption, stimulation of transition to the new society paradigms, eco-oriented life styles. Besides this, social policy should be also corrected in order to provide social protection, retraining and the subsequent employment of the workers, discharged due to resource saving projects realization in various spheres of economical production, the educational programs directed on formation of new system of values, psychological adaptation of the population to social paradigm change.

Despite of the specified negative social, ecological and economical aspects of resource saving transformations, world experience testifies, that the sum of positive effects of such structural transformations, first of all, ecological and economical, exceeds the sum of their negative consequences. Thus, it is confirming the expediency of transition of Ukraine to the sustainable development model, based on resource saving technologies.

SANITARY HEALTH AREAS OF MIDDLE CITY TERRITORY

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With the objective understanding of maintenance of modern ecology, problems of ecological education, modern philosophical, psychological and pedagogical and ecological tendencies of decision of ecological problems of global

scale the concept of ecologization is selected, as a process of introduction of the new technological systems, approaches in the decision of modern problems without the noticeable worsening, and vice versa with the purpose of improvement of natural environment and resources economy.

A new tendency in Ukraine, which develops, is an ecologization of education and ecologization of educational environment related to it – to the state of educational building, grounds round educational establishment, planting of greenery of his territory.

In Ukraine the ecologization of educational environment goes out from the structure of territorial resources (city gardens and parks, public gardens and boulevards, embankments, out-of-town parks, areas of rest), and also territorial activity of people. The areas of territories divide on:

- area of in-city territories of fellow creature – or to “territories near the threshold of house“, to which greenery of balconies and terraces, gardens belongs on roofs etc.;
- area of middle city territories – located in the distance 10-20 minute pedestrian or 10-15 a minute transport availability from habitation (district parks or parks of housings zones);
- area of distant in-city territories – located in the distance 20-30 a minute transport availability from habitation (city parks, forest-parks);
- area of out-of-town territories of fellow creature – is on contact city and suburban area boundaries with its forests, meadows, reservoirs or fields;
- area of middle out-of-town territories – is in an houered or one-and-half houered transport availability;
- area of distant out-of-town territories – is in two- or threehouered transport availability and located in national parks, territorial tourist complexes.

Educational establishments behave to the areas of middle city territories. In accordance with requirements their planting of greenery of tree blow up 10 m not nearer, but bushes – not nearer 5 m from building of educational establishment. The variety of assortment of tree-and-bushed breeds, grass and cultural plants must serve as original educational evident material. On 1200 m² of educational territory blow up 100-120 copies of trees and 1200 – 1500 copies of bushes. As a rule, the planted trees and shrubs areas are occupied by 40-50% territories of educational establishment.

On sanitary-hygenic indexes almost every educational establishment does not require an optimum norm (in all a 20-30% planting of greenery). Principal reasons - almost all of them are near-by streets with a large transport loading, and also trees are cut down through the considerable defeat of *Viscum album L.*

Planting on the areas of higher educational establishments is played mainly sanitary-hygenic and architectonically plan role. In their planning it is possible to select a parade orchestra before a main educational corps, alleys, which unite educational, production and sporting buildings, internal public garden. On a

perimeter areas arrange insulating from streets, housings apartments and buildings of wall from trees with thick foliage and bushes.

An economic area is dissociated from other by territories green bars or high palisades from *Viburnum opulus L.*, *Humulus lupulus L.*, *Juniperus sabina L.* On free of roadway territory create lawns – orchestra or park. Being settled in areas of territories have a good kind alpine mountains with phytoncical plants. They can be created and in apartments. Blowing up is recommended *Helichrysum bracteatum Willd.*, *Origanum vulgare L.*, *Tussilago farfara L.*, *Rhodiola rosea L.*, *Sedum spurium Bieb.*, *Thymus serpyllum L.*, *Tanacetum vulgare L.*, *Pyrethrum parthenium (L.) Smith.*, *Melissa ficinalis L.* At planting of greenery of audiences and class rooms it is possible to utilize room plants which place on walls or medical corners: *Tradescantia zebrina L.*, *Chorophytum comosum Thunb.*, *Aloe arborescens Mill.*, *Monstera deliciosa Liebm.*, *Clivia nobilis Lindl.* In period of October and November, and also in period of March and April make “Sasher” (linen knapsacks are for dry petals) with inflorescences, petals and sheets of *Menta piperita L.*, *Rosa damascene Mill.*, *Anethum graveolens L.*, *Petroselinum crispum (Mill.) A.W. Hill.*, *Anisum vulgare Gaertn.*, *Lavandula angustifolia Mill.*, *Crataegus monogyha Jacq.*, *Syringa vulgaris L.* The existent norms of planning are foreseen by the areas of lot lands of educational area depending on the type of higher educational establishment and contingent of students. On 1000 students for national universities 5,5-7,5 hectares are offered, technical higher educational establishments – 6-8 hectares, agrarian, – 7-8 hectares, medical, pedagogical, legal, – 3-4 hectares.

The green planting next to the decision of tasks of territorial character play an important architectonically composition role and are one of basic factors of realization of general layouts. At planning planting of greenery of educational establishments is taken into account his health action all over the year. Beautifully look out a spring *Scilla bifolia L.*, *Pulsatilla grandis Wend.*, *Primula veris L.*, *Adonis vernalis L.*, *Anemone sylvestris L.*, *Crocus heuffelianus Herb.*, *Convallaria majalis L.*; in summer – *Rosa alba L.*, *Lilium candidum L.*, *Centaurea scabiosa L.*, *Leucanthemum vulgare Lam.*, *Calendula ficinalis L.*; in autumn – *Solitago graminifolia (L.) Salisb.*, *Callistephus chinensis (L.) Ness.*, *Dahlia pinnata Cav.* Green the masses create in all of areas and along uniting them foot-ways.

Approximate correlation of higher educational establishment zone areas of territory (except for building) must be as follows: sporting - 15-25%, educational-experimental – 30-40, park – 45-50, economic – 5-10%.

No doubt an ecologization of studying environment and education is important component part of humanizing.

FINANCING OF ENVIRONMENTAL PROTECTION ACTIVITY IN UKRAINE

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At the modern terms of manage the problem of anthropogenic pollution of environment, worsening of quality and exhaustion of natural resources has global character. Economic activity of man is related to the emission in the environment of different harmful admixtures of, which can entail irreversible changes in ecosystem.

All anymore and more research workers reflect above the question of diminishing of anthropogenic pressure on nature, how to reduce the level of pollution and how to pick up a thread territories are already muddy. It should be noted that for such measures (nature protection) must be effective financing mechanism.

The basic sources of financing of nature protection activity in Ukraine are:

- the state budget (general fund);
- local budgets (general fund);
- funds of Environmental Protection;
- own funds of enterprises;
- international technical help.

The most ecological costs are carried out from off-budget sources, mainly by enterprises facilities.

1. The state budget.

Financing of environmental protection activity at national level today is presented two centralized sources

Financing of environmental protection activity at national level today in Ukraine it is presented two centralized sources:

- By the state budget, in accordance with a issue “environmental protection”
- By the state fund of Environmental Protection.

It is necessary to mark that under the Budgetary code a budget (State and local) can consist of general and special funds.

Thus, the manager of facilities can liquidate the separate programs or create new after the proper grounding.

There are such budget environmental protection program within general fund, as:

1. For Ministry of ecology and natural resources of Ukraine:

- geologo-ecological researches and measures;
- measures wiht creation and conservation nature-protected fund, conducting of cadastres of animal and vegetable kingdom, Red book.

2. For the State committee of forest economyof Ukraine:

- creation of the protective forest planting and protective forest belt;

- preservation of the nature-protected fund.

3. For the State committee of water economy of Ukraine:

- protection from the harmful action of waters of rural settlements and agricultural lands;

- complex torrent-control defence in a pool to Tisa in the Zakarpatskiy area.

4. For the State committee of land resources:

- creation of antierosion hydrotechnical buildings and recultivating of the broken lands.

2. Local budgets.

In connection with the deficit of local budgets the facilities on environmental protection activity selected not enough. Speaking about local funds of Environmental Protection, they are insignificant on the volume of facilities.

In the expenditures of these funds measures of fight against environmental pollution are not priority. It is connected with insignificant volumes of funds facilities and comparatively multicost nature protection measures, directed on a fight against environmental pollution.

3. Funds of Environmental Protection

The noted funds are formed for an account:

- charge for environmental pollution;

- money penalties for violation of norms and rules of guard of environment and harm, caused violation of legislation about the guard of environment as a result of economic and other activity.

Facilities of the State fund are used fully in quality irretrievable grants, as in a current legislation possibility of financing is not foreseen after a turning chart (loans, credits and others like that).

4. Own funds of enterprises.

In the general structure of costs on the environmental protection the personal funds of enterprises have most specific gravity.

Current costs on basic environmental protection measures were distributed thus: 63% from the total volume of facilities on a guard and rational use of water resources, 13% - on the guard of atmospheric air, 11% - on the rational use, preservation and rendering safe of production and everyday wastes, 12% - on the guard of mineral resources, lands, vegetable, animal resources and preservation of the nature-protected fund.

5. Other sources.

The foreign technical help (grants and favourable credits) is an important source of financing of environmental protection

The international cooperation with such countries, as the USA, Netherlands, Denmark, Germany, Switzerland, Great Britain is the most scale for Ukraine.

Consequently, as see, a basic source of financing of environmental protection activity are the own funds of enterprise. It is necessary to create such business climate, for which businessmen would be interested in renewal of natural resources, decrease in pollutant emission and break etc.

ECO-LABELLING AS ONE OF THE MOST IMPORTANT INSTRUMENTS OF ECOLOGICAL MANAGEMENT AND SUSTAINABLE DEVELOPMENT

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The theme of ecological labelling is now one of the most actual and resonance in the world. First its usage was recommended on the World summit in Rio de Janeiro in 1992, and since than it has been taken on arming by the leading countries and its implementation was supported by all advanced international organizations, such as UNO, World Trade Organization, and European Union.

The program of actions of UNO on sustainable development directly addresses the states, business and public with an appeal to change priorities of consummation and «in collaboration with industry, public and other groups to provide development of the ecological labelling and other information about the ecological aspects of products in order to help consumer to make a realized choice». The ecological labelling is mentioned as an important instrument in many documents of Commission on sustainable development (CSD) and Organization of economic collaboration and development (OECD) for the development of sustainable consumption.

The ecological labelling is the developing practice of the products labelling, indicating the affecting on the environment, which can be resulted by the usage of these products or their packing. The ecological labelling gradually gains obligatory character. Its purpose is to convince a user to buy environmentally less harmful products. In a number of countries the ecological labelling of the imported products becomes an obligatory condition of its import permission.

Unlike the «green» symbols and statements of firms-producers about the ecological character of its goods, ecological labelling is developed by the third indifferent side, and is given to those goods which meet the public ecological requirements.

Since May, 1, 2004 Ukraine became the direct neighbour of EU. And already on October, 8, 2004 Ukraine was accepted in Global Network of Ecological Labelling (GEN), created in 1994 by the association of independent organizations, carrying out measures on the ecological labelling. The program of the ecological labelling in Ukraine which was presented by All-Ukrainian public organization “Living planet”, that was acknowledged by a world association, and Ukrainian national sign of the ecological labelling «Zeleniy Zhuravel’» had been enlisted to the international register of GEN. For today GEN unites the ecological labelling of European countries, and also more than 35 not-EU-member countries.

Certainly, a policy and strategy of EU will directly influence on further development of Ukraine. One of the fundamental elements of the European policy now is sustainable development of ecological technologies and environmentalism.

To achieve these aims Commission of EU developed the Integrated trade policy a basic task of which is diminishing, as far as it is possible, harmful impact of goods production on nature on all stages of its life cycle. A primary objective is thus achieved – to combine the improving living conditions of population with the environmentalism. In other words, by the ecological labelling a world community tries to form an advanced situation, when producers, improving a quality of the products, simultaneously would guarantee their ecologically clean production, and these conditions would create a long-term industrial competitiveness of goods.

By an amount and rates of the certificated ecological management systems Ukraine falls behind the developed countries and occupies the 54th place in the world and 27th in Europe.

Presently there are 1630 enterprises which got the certificates of the quality management system, including only 55 with the ecological management systems. Only 108 types of products of 22 producers got an ecological certificate on international ecological criteria, in accordance with the requirements of international standards of ISO 14000 series.

In 2006 as compared with 2004 implementation of such certificates in Ukraine was multiplied on 10 %. For the same period in Latvia an increase was multiplied in 32 times, in Lithuania – in 12 times, to Czech and Russia – in 6,5 times, Romania – in 4,6 times.

In Ukraine an ecological certification in general is not inculcated in an agricultural production and forestry.

Taking into account, that in accordance with the European and international standards requirements, the ecological certification is carried out on principle of voluntary, state support should make not only for forming of positive image but also for the creation of more favourable economic terms for distribution of this type of activity.

The basic directions and mechanisms of state supported implementation of the ecological management and ecological products certification systems in Ukraine are determined by the government program, developed in 2007.

The Program purpose consists in creation during 2008-2011 of the adapted to the international and European requirements system of the state supported implementation of the ecological management and ecological products certification systems which will correspond to sustainable development of Ukraine, the defence of human health and natural environment.

Wider implementation of the ecological management and ecological products certification systems will make for the system diminishing of the ecological influence on the health, for the rational use of resources at all stages of life cycle of products.

In 2008 Ukraine will be accepted in World trade organization. Program of the ecological labelling development must become the important constituent of this integration. Harmonization of standards will provide the access of the Ukrainian goods to the world markets, their equal participating in international co-operation.

VALUE OF CLIMATIC CHANGES MONITORING OF FOR ESTIMATION OF ECODESTRUCTIV INFLUENCING OF GLOBAL WARMING PROCESS

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Yet at the end of 60th of XX century awareness of necessity in efforts coordination on collection, storage and information processing about the state of natural environment began to spread. Due to monitoring of climatic changes it is possible conducting of complex analysis of reasons, estimations of credible development directions and scales of environment and climate changes, and also research of intercommunications between lithosphere, atmosphere, hydrosphere and biosphere taking into account human influence, prognosis of regional effects and ground of measures on adaptation of Ukrainian economy to the unfavorable consequences of climate change.

The world network of the stations of the background (global) monitoring is presently created, which the supervisions on the certain parameters of the state of natural environment are conducted on. The idea of creation of the Global system of environmental monitoring (GSMOS) was outspoken at Stockholm conference of UNO on an environment in 1972 The background monitoring complex stations of Ukraine are located in biosphere preserves (Black sea, Askaniya-Nova) and are part of global international networks of supervision. The GSMOS purpose is the study of Earth as integral natural system – certain by the International geosphere-biosphere program (MGBP) and leans against wide application of space facilities of supervisions. The MGBP implementation began from 1990 and foresees seven key trends:

1. Conformities to the law of chemical processes in a global atmosphere and role of biological processes in the rotation of gas components. Projects which are executed to these directions have for an object, realization of analysis of influencing of ozone level changes in a stratosphere on penetration to the earthly surface biologically dangerous ultraviolet radiation, estimation of aerosol influencing on a climate and other.
2. Influencing of biochemical processes in an ocean on a climate and reverse influencing. Projects foresee complex researches of global interchange of gases between an ocean and atmosphere, sea-bottom and scopes of continents, development of methods of prognostication of reactions of biochemical processes in an ocean on human processes in a global scale.
3. Study of off-shore ecosystem and influencing of ecosystem land-tenure changes.
4. Co-operation of vegetable world with physical processes accountable for forming of global water rotation. Within the framework of this direction researches will be conducted also on the program of global experiment with the purpose of

study of energy rotation and water as additions to the measures on the World program of climate researches.

5. Influence of global changes on continental ecosystem. Development of prognosis methods of climate changes influencing, concentrations of carbon dioxide and land-tenure on ecosystem and also research of global changes of ecological variety is foreseen.

6. Design of the Earth system with the purpose of prognosis of its evolution. The models of the Earth system are developed and quantitative estimations of global, physical, chemical and biological interactive interprocess communication are carried out in the Earth system during the last 100-th of years.

Study of global changes of climate, is considered one of basic directions of the global monitoring, are one of the most effective facilities of monitoring of climatic changes space. Present new satellite track systems, and also communication, through Internet considerably extend possibilities of joint access to information.

Basic directions in conducting of researches and systematic supervisions after a climate in hydrometeorological service of Ukraine are:

- providing of conducting of regular supervisions on a network, which includes the points of the supervisions included in the Global system of supervisions after a climate and the Regional supporting climatic network in the YI region (Europe);
- technical and technological development of network of hydrometeorological supervisions;
- development of treatment technologies and data management;
- conducting of systematic scientific researches in area of climate, including the questions of vibrations estimation and directed changes of regional climate, consequences estimation of their negative influence on an economy and state of natural environment;
- development of adaptation strategy of industries to the changes of regional climate; consumers maintenance forms by climatic information.

Hydrometeorological service takes part in the World climatic program of Worldwide meteorological organization in part of supervisions, data management, monitoring and presentation of information, service by climatic information and prognoses. Information of supervisions after a climate enter the Global system of telecommunication of Worldwide meteorological organization and accessible for a free and opened international exchange.

Monitoring of climatic changes is the providing of information and analytic system for technological (innovative), economic, ecologic and economic and social estimation of consequences of global (regional) warming. In particular, an innovative constituent requires estimation of innovative potential for effective neutralization of negative consequences of human of long durations climatic anomalies in different sectors of economy. Requires substantial transformations of regional climate account of change of social parameters (costs) in life-support subsystems, and also qualities of life.

ECOLOGICAL EDUCATION: PROBLEMS AND SOLUTIONS

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Nowadays the problem concerning forming and realization of sustainable development conception in Ukraine is increasing. So, the matter is qualitative improvement of ecological education. The ecological situation that sets in Ukraine is characterized as crisis. The struggle for consequences of negative anthropogenous influence is not actual. The main accent displaces to the side of disaster prevention, that is work concerning perspectives: forecasting and modeling of their possible occurrence.

Among the main tasks we should point out the creation of systematic ecological education and public informing about the environment, the influence on it from the side of different subjects and methods of their improvement in.

Nowadays ecology is a discipline that unites humanitarian and natural sciences and helps to form the general model of relations between nature, society and from another side it defines the sense and development perspectives for all humanity.

The system of general complex and continuous ecological education must be established with the goal of ecological culture increasing. Among the main ideas of ecological education are:

- the forming of outlook on the base of modern ecological situation;
- the understanding of nature value varieties;
- the understanding of ecological interrelations which refuse the alive systems internity as the process of substance, energy and information exchange;
- the transition from anthropocentric natural resources learning to ecocentric and polycentric approaches;
- the understanding of ecological crisis as a cultural crisis;
- the realizing of moral choice concerning the methods of expedient activity with ecological and moral imperatives.

Among the disadvantages of the existing ecological educational system are the following: the nature is considered as energetic and resource source of production and its value is determined as economic. The ecological aspect of nature's understanding as the place of human's living was on the backstage of ecological education. The main criteria of it was rational natural management. Despite all these disadvantages it was a great step forward from the general ecological illiteracy. The gradual degradation of all natural life-support systems, increasing of ecological disasters pay a great attention on the world's society and Ukraine is not an exception.

The analysis of the perspectives state's development and the best modern works in a branch of ecological education allowed to make a conclusion about the necessity of basing on works of Ukrainian specialists concerning "The Project

Conception of the ecological education in Ukraine”. Ukrainian specialists admit that forms and methods of our traditional educational system including ecological education have a lot of advantages in comparison with foreign system.

Also Ukraine has a lot of qualified scientists who are able to create and introduce effective conception of ecological education in coordination with our traditions, mentality, the regions’ specificity and the state’s interests in the 21 century.

The main conceptual point of ecological education is based on logical and gradual saturation of programmes in different education levels including High school.

For the educational process ecologization it is necessary to keep three main principles: the continuous ecological preparation, interdisciplinary and professional orientation. The problem of ecological education should take one of the first places in Ukraine. The priority tasks must be the following:

1. The legislative basis improvement: the approval of “The ecological education Conception in Ukraine” and the adoption of law about the ecological education.

2. The development of scientific and reasonable state’s strategy development.

3. The adoption of organized actions directed on the effective infrastructures creation of ecological education.

4. The informational supply of the whole ecological educational system among the citizens.

5. The governmental and public support.

6. The international co-operation in the field of ecological education.

To my mind, the most important question is a creation of Coordinational interdisciplinary council of the ecological education, which will accelerate its development and quality. The main points of the Council must be the following: the definition of tactic and strategic directions, co-ordination and the control about the keeping these conception including concrete programmes, the promotion of the “Law about the ecological education” in Ukraine.

The ecologization of educational system, the specialists’ preparation in this context must be an integral part of society’s ideology in 21 century.

Only on the background of the ecologization it is possible to form new moral principles, to estimate the meaning and the role of the environment in people’s life activity.

DOES ECONOMIC FREEDOM INFLUENCE ENVIRONMENTAL POLLUTION: THEORY AND EVIDENCE

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Economic freedom is considered as a factor of economic growth. From the other side atmospheric pollution is a kind of market failures. We assume negative relation between pollution and economic freedom. However economic freedom itself can not be considered as an explanatory variable for pollution trend. A set of macroeconomic determinants should be considered also. Moreover we should be aware of country specific effects (transition or developed economies, structure of energy resources) and time effects (for ex. scientific progress, economic slowdowns, crises).

Turning to literature that covers economic factors and economic consequences of environmental regulation (government intervention) we are particularly interested in two hypothesis: environmental kuznets curve (EKC) hypothesis and Porter hypothesis.

Researchers D. Grossman and Alan Krueger found empirical evidence, that environmental pollution (specified by pollutants) growth with the growth of GDP per capita, reaches maximum and then decreases. Theodore Panayotou, named this tendency – Environmental Kuznets Curve (EKC) in honor of Simon Kuznets hypothesis.

A lot of works were published after this initialization. But there is no consent exists. A good current review of the investigations and problems proposed by Christoph Martin Lieb.

EKC hypothesis were tested for Ukraine by the EERC alumni – Iryna Piontkivska. She finds supporting evidences for the hypothesis and also included institutional (stringency of environmental regulation) and economic characteristics (such as business activity). But technological side (efficiency of natural resource transformation) of relation were omitted. Abatement effect were represented by GDP per capita. Two questions arise here. First question is the multicollinearity of independent variables, second – the stringency of environmental regulation. Traditionally the indicators of stringency of environmental regulation are defined ex post, in other words if country succeed in cutting down pollution environmental regulation considers as effective and stringent. The questions mentioned complicate the choice of controlled instrumental indicators for policy recommendations.

Interesting ideological conclusion and empirical finding is one of William Brock and Scott Taylor. The researchers proved that technological progress in abatement technologies is the source of cutting down pollution, from the other side scientific progress is the determinant of economic growth.

We are intended to reveal maximum of economic determinants (using econometric analysis) which are explain the dynamics of major industrial and

agriculture pollutants as well as to explain the mechanisms of their influence. The idea is not to investigate whether EKC exists or not, but the objective is how to focus environmental-economic policy for cutting down environmental pollution and for economic growth.

We want to extend existing approaches. From one side using Ukrainian and other transition country data, from another side combining technological effect with regulatory effect.

Initially we have analyzed the relation between economic freedom (proxy – Index of economic freedom IEF) and environmental capacity of GDP, caused by economic activity (proxy – SO₂ capacity of GDP). The second proxy equals: country emissions of SO₂ (thousand tons) divided by real gross domestic product (billion dollars). We have employed the method of least averages for selection of the fitted curve. Ordinary least square regressions have been run for the purpose of coefficient testing.

On the second stage we have analyzed the relation “atmospheric pollution – IEF and macroeconomic indicators”. Since GDP represents a key macroeconomic indicator we have excluded it from the left hand side. For atmospheric pollution we have incorporated factor analysis (method of principal components) for the purpose of revealing latent structure within the set of variables. Doing multiple regression analysis we have run stepwise regressions, estimated fixed and random effect models.

We have used panel data. Data set includes observations of 25 European countries (including Ukraine and post-soviet transition European economies) for the period 1990-2003. Macroeconomic indices were collected from WDI, we use emissions data from European Environmental Agency data sets and IEF scores from the Heritage Foundation.

Conclusions. Using regression analysis we have proved that economic freedom has statistically significant impact on GDP environmental capacity. Increase in the level of economic freedom lowers GDP environmental capacity. In particular we have found that environmental elasticity of IEF is equal $2 \cdot IEF$. Therefore the effect of IEF on GDP environmental is elastic and the magnitude of the effect is much higher in transition economies than in developed.

Increase in the level of economic has a powerful statistically significant negative effect on countries’ SO₂ emissions but only together with interaction term – negative effect of government expenditures on the emissions. From the other side no effect of the mentioned factors have been found for NO_x.

The most promising fact for liberal vector of reforms is the following: an increase in the share of high-technologies in GDP has a strong negative impact on both SO₂ and NO_x. Moreover fixed time effect models have showed better statistics than random effect models, therefore we can conclude that technical progress as a function of time supports our results. Considering technical progress as an indirect characteristic of countries’ economic freedom we have verified our hypothesis also.

VALUATION OF ENVIRONMENTAL ASPECTS COMPOSING A SYSTEM OF ENVIRONMENTAL MANAGEMENT AND AUDIT (SEMA)

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Valuation of environmental aspects is one of the most important steps in elaboration and implementation of environmental management systems. It is also a very important part of environmental audit. In this paper a system of valuation and assessment of environmental aspects, based on the EU recommendations, with requirements and features of Ukrainian environmental legislation taken into account, is suggested.

According to the concepts given in ISO 14000 standards, environmental aspect is an element of object activity, product or service, which could coexist with the environment. Environmental influence of an object is a modification of environment, positive or negative, which could completely or partly be a result of the object activity or use of this product or service. Nowadays there are a lot of methodical approaches and recommendations for determination and differentiation of environmental aspects based on the EMAS (Environmental Eco-Management and Audit Scheme) and ISO 14000 standards.

Procedure for identification of powerful environmental aspects could be described in the following way:

- 1 - exposure to all environmental aspects;
- 2 - definition of ponderability criteria, with the legislation being taken account of;
- 3 - definition of ponderable environmental aspects based on ponderability criteria.

It is suggested to identify riskiness of an aspect for the environment under normal conditions by two indices – hazardousness of influence and susceptibility of a receptor – atmospheric air, water objects, soil etc. (tables 1-2). Risk of causing harm to environment by accidents or off-opt situations could be identified through a possible level of consequences of such situation and by probability/frequency of its occurrence. Susceptibility of the environment is to be identified by the category of soil, where the object is situated, and environmental value.

Table 1- Definition of discharge riskiness for the environment

Susceptibility of a receptor	Class of hazardousness/mode of combined action of pollutants in discharges			
	Discharges contain chemical substances of Class 4 hazardousness	Discharges contain chemical substances of Class 3 hazardousness and/or chemical substances for which factor of combined activity is higher than 1,0	Discharges contain chemical substances of Class 2 hazardousness and/or chemical substances for which factor of combined activity is higher than 1,0	Discharges contain chemical substances of Class 1 hazardousness and/or chemical substances for which factor of combined activity is higher than 1,0
Zone of low pollution potential	A	A	B	C
Zone of temperate pollution potential	A	B	B	C
Zone of increased pollution potential	B	B	C	C
Zone of high pollution potential	B	B	C	C
Zone of very high pollution potential	B	C	C	C

Table 2 – Assessment of hazardousness for various levels of influence on plant and animal world

Susceptibility of a receptor (presence of species and groups in zone of object influence)	Kind of influence			
	No influence	Short-term influence, which does not lead to changes in groups and populations	Influence, which lead to reversible changes in groups and populations	Influence, which lead to irreversible changes in groups and populations
Plant world	A	A	B	C
Animal world	A	B	B	C
Species of flora that are included in The Red Data or the Green Book	B	B	C	Impossible
Species of fauna that are included in The Red Data or the Green Book	B	C	Impossible	Impossible
Species of flora and fauna that are included in The Red Data or the Green Book	B	C	Impossible	Impossible

THE NATURE RESOURCES POTENTIAL AS A BASIC FOR THE FORMATION OF THE ECOTOUR

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Ecotourist potential of some object or territory is aggregate of timed to the given object: territory of natural bodies and phenomena, and also terms, possibilities and tools, suitable for forming of ecotourist product and realization of the proper rounds, excursions, programs.

It is expedient to divide all elements of ecotourist potential into 3 groups:

- components of natural and cultural landscapes and landscapes;
- tools of realization of ecological rounds (programs, excursions);
- terms of their realization.

To the group it is necessary to take «Components of natural and cultural landscapes»:

- especially guarded territories and equatorials (national parks, natural parks, reserves), and also monuments of nature, botanical and zoological gardens. Preserves are not intended for tourism specially, but they are attractive objects, and also rich sources of ecological knowledge, ecotourist subjects;
- naturale and historical museums and etc., and also objects interesting and instructive for demonstration of ecological principles of the nature using;
- natural and cultural landscapes with their aesthetic dignities, territories possessing the special cultural and historical value.

In a group the «Tools» are included: ecotehnological types of transport, and also objects of placing of tourists and equipment of tourists;

- ecologically net and mainly local products of feed;
- skilled guides-environmentalists, and also didactic and generally informative materials.

To the group the «Terms» belong:

- ecological favorableness of locality, including from point of contamination, sanitary-epidemiology situation, risk of natural calamities;
- fitness of territory for the aims of round and its availability;
- possible recreational loadings, volumes of the use of waters, power and other resources, terms of visit and forms of contacts with the objects of supervisions.

The resources of ecological tourism are:

- components of nature and nature-territorial complexes (ecosystems and landscapes);
- historical and architectural and archaeological objects.

For Ukraine can become the resources of ecological tourism - variety of natural areas, landscapes, a plenty of preserves, reserves, national parks, cultural monuments, is relative low closeness and traditional hospitality of population. Create the special attractiveness of country for tourists riches of ethno culture, variety of folk holidays, consuetude, handicrafts, trades, and also the original Ukrainian kitchen.

Serious collection of specific information about a region, including such parameters, as features of climate, food resources of territory, closeness of population and its possible participation in providing of the tourist program, traditions and consuetude of local habitants, must precede to planning of ecological rounds, recreational capacity of territory.

NATURE AND LANDSCAPE CONSERVATION SYSTEMS IN THE CZECH REPUBLIC AND UKRAINE – A METHODOLOGY OF RESEARCH

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A comparative study has been initiated dealing in nature and landscape conservation systems in two countries, the Czech Republic and Ukraine. The goal is to provide systematic information for researchers, government and administration employees, NGO's, business firms, students, as well as other interested persons. The study reacts to the fact that there is little knowledge of the Ukrainian nature and landscape conservation system in the Czech Republic, as well as little knowledge of the Czech system in Ukraine.

The study aims to compare the official conditions of nature and landscape conservation in the two countries. It also attempts to provide some elementary evaluation of success or failure of nature and landscape conservation systems. The sources of input information and data are the internet, statistical documents, and published materials. In some cases, e-mails, phone calls or other inquiries to government officials, scientists, environmental activist or other persons are to complete the information.

A qualitative methodology has been designed in order to collect the relevant information. Some quantitative data are being collected as well, however the methodology is mainly qualitative and most of the input and output will be in a narrative form. The core of the methodology is a series of analytical questions to which answers are sought for each of the countries. Individual questions are arranged into groups of common characteristics. Each individual question is substantiated in writing, as well as each group of questions.

The analytical query, which presents the largest part of the work, will be followed by a synthetical part. The synthethis will summarize the findings, and serve as a basis for offering suggestions. Recommendations for systems' improvement will be provided. These suggestions will be directed at government officials, however also at other parties (NGO's, scientists, educational personnel, etc.).

The system of nature and landscape conservation is not understood as the government administrative structure only. The study does not limit itself to inquiry into state nature and landscape conservation institutions. System is understood as a set of entities comprising a whole where each component interacts with or is related to at least one other component and they all serve a common objective.

Therefore, in our case, we consider also officially registered NGO's and unofficial environmental movements. The factors outside of the system (lobbies,

various government ministries, political parties and influential individuals, business associations and individual influential companies) need to be considered as well, even though they are sometimes difficult to map (at least in a scientific manner). The state of education, as related to sustainability issues and nature conservation, needs also to be analyzed, as well as the ambiguous role of the media.

Some inquiry into protected values (organisms and ecosystems, characteristic landscapes) has to be carried out initially. However, the inquiry has predominantly the point of view of social disciplines (using approaches of economics, sociology, political science, etc.), not natural sciences. The government organisational structures for nature and landscape conservation are to be inquired and compared. The existing environmental law and its development is to be researched, as well as matters of the actual law enforcement. The economic instruments supporting nature protection are to be described.

Attention needs to be given also to the activities of non-government organisations, and to the relevance of scientific research for practical nature conservation. Ideally, the study will collect also some data that could be fed into chosen indicators of success or failure of the government policies. The study will not attempt to get deep into specific topics. It should provide a general overview, an initial description and elementary evaluation, that could serve as a base for a more specific research in the future.

THE CONCEPT AND FEATURES OF THE ECOLOGICALLY ORIENTED INVESTMENTS

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Further deepening of ecological crisis in Ukraine compels to search the ways of development of our economy, which would take into account its ecological constituent and put it in the row of priorities. By pre-condition of decision of contradictions between the economy growing and saving of the state of environment are introduction and expansion of ecological investments.

Taking into account a sharp ecological situation in Ukraine today, bringing in of ecological innovative investments in the economy of country can assist the improvement of its ecological situation.

The processes of economy ecologization must become the important aspect of decision of existent ecology-economic problems in Ukraine. Processes of economy ecologization on the whole, and production sphere in particular, it is necessary to examine through the prism of the system ecologization investment and innovative processes.

It is necessary to examine investment activity ecologization in a few aspects:

- investment activity is in the nature protection sphere of management;
- account of ecological factor in realization of all investment projects;
- ecologically oriented innovative investment activity as particular constituent of the ecological investing.

Let's consider concept and features of ecologically oriented investments as a base of processes investment activity ecologization in Ukraine.

Ecologically oriented investments include all types of property and intellectual values, inlaid in economic activity and directed on a decline and liquidation of the negative anthropogenic affecting environment; saving, improvement and rational use of nature and resource potential of territories; providing of ecological safety of countries which ecological, social and economic results are arrived at as a result of.

These results are expressed on next levels

- ecological – consists in the decline of the anthropogenic, tekhnogennoy loading on an environment, in upgrading consumption of resources;
- socio-economic – in the increase of standard of living of population, efficiency of public production and increase of national riches of country.

A socio-economic result are expressed in social and economic results.

Social results are expressed in the improvement of physical development of population and reduction of morbidity, increase of life-span and period of active activity, improvement of terms of labour and rest, maintenance of ecological equilibrium (including saving of genetic fund), saving of aesthetic value of natural and anthropogenic landscapes, monuments of nature, protected areas and other territories, creation of favourable terms for creative potential of personality and development of culture, for perfection of moral consciousness of humanity.

Economic results consist in an economy or prevention of losses of natural resources, living and materialized labour in a production and nonproduction spheres of national economy, and also in the national consumption.

Ecologically oriented innovative investments - it one of forms of the ecological investing, which is carried out with the purpose of introduction of achievements of scientific and technical progress in activity of enterprise.

The ecologically oriented innovative investments classify on directions of allocation of investment capital in spheres: productions, appeals (different types of transport, shifting complexes et cetera), nature protection complex (in the system of cleansing buildings, complexes on processing of wastes, ecological monitoring et cetera), produce, socio- infrastructure.

Specific feature of ecologically oriented investments is circumstance that such kind of the investments do not bring direct economic effects in most cases. At the same time concomitant social and ecological effects from realization of these projects can be considerable.

In the conditions of low investment activity both from the side of internal (private and state) and from the side of foreign investors investments, sent in the

sphere of providing of extractive environmental safety are excessively small, although a requirement in them is enormous and vitally needed.

The feature of ecological investments is their high capital intensity. In this connection it is possible to draw conclusion about complication of accumulation of necessary financial resources by enterprises on this stage of development of economy of Ukraine, about impossibility of the effective use of many financial sources and necessity of state stimulation and sponsorship of ecological investment activity.

State stimulation must foresee both the stimuli of positive motivation (the new Ukrainian legislation can be acknowledged progressive in this direction), directed on stimulation and introduction of ecological investments and stimuli of negative motivation (setting of norms of the troop landings, fines, collections for the use of natural resources and contamination of natural environment et cetera).

It is necessary to underline that decision about participating in an investment project and his state sponsorship it is necessary to accept taking into account the different groups of criteria and estimations. In this connection procedure of selection of ecological investment projects must include both the formalizovannyye methods of calculation of quantitative criteria of estimation of economic efficiency within the framework of ecological attestation of projects and unformalized (expert) methods of analysis of different aspects of projects.

Development and introduction of ecological innovative investments will allow to reduce loading on a natural environment, to avoid ecological crises and catastrophes, and to transition to sustainable development.

THE ENVIRONMENTAL PROBLEMS OF ICT DEVELOPMENT

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Information and communication technologies (ICT) have been a driver for development in the knowledge economy. Government, civil society and the private sector in many countries are making a concerted effort to create a favorable enabling environment for innovation in ICT. This includes a wide array of issues including ICT policy, intellectual property laws, education and training, creation of investment opportunities etc.

ICT is helping us share and map environmental information, develop more active networks, and make more informed and accurate decisions. However, those same computers may bring about a harmful fate for us all. Piles of waste computers are accumulating in the EU, Japan, the US, India, and China.

The International Association of Electronics Recyclers projects that 1 billion computers will be scrapped worldwide by 2010, at a rate of 100 million units per year. About 40% of the heavy metals, including lead, mercury and cadmium, in

landfills come from electronic equipment discards. The health effects of lead are well known; just 1/70th of a teaspoon of mercury can contaminate 20 acres of a lake, making the fish unfit to eat. The number of electronic products entering the waste stream is projected to increase dramatically unless reuse and recycling options expand.

Electronic waste, "e-waste" or "Waste Electrical and Electronic Equipment" ("WEEE") is a waste type consisting of any broken or unwanted electrical or electronic appliance. Recyclable electronic waste is sometimes further categorized as a "commodity" while e-waste which cannot be reused is distinguished as "waste". Both types of e-waste have raised concern considering that many components of such equipment are considered toxic and are not biodegradable. Responding to these concerns, many European countries banned e-waste from landfills in the 1990s.

E-waste is now the fastest growing component of the municipal solid waste stream because people are upgrading their mobile phones, computers, televisions, audio equipment and printers more frequently than ever before. Mobile phones and computers are causing the biggest problem because they are replaced most often. In Europe e-waste is increasing at three to five percent a year, almost three times faster than the total waste stream. Developing countries are also expected to triple their e-waste production over the next five years.

The European Union would further advance e-waste policy in Europe by implementing the Waste Electrical and Electronic Equipment Directive in 2002 which holds manufacturers responsible for e-waste disposal at end-of-life. Similar legislation has been enacted in Asia, with e-waste legislation in the United States limited to the state level due to stalled efforts in the United States Congress regarding multiple e-waste legislation bills.

The United States generates more e-waste than any other nation, according to the Environmental Protection Agency. More than 4.6 million tons of it entered U.S. landfills in 2000, and that amount is projected to grow fourfold in the next few years.

Some of that waste is recycled. For example, steel, aluminum and copper are often stripped from outdated machines and reused in newer models. But even recycled parts come at a price. An estimated 50 to 80 percent of e-waste collected in the United States for recycling is exported to areas such as China, India or Pakistan, where workers taking apart the old machines are handling toxic chemicals that can pose serious health problems.

Obsolete computers are a valuable source for secondary raw materials, if treated properly, however if not treated properly they are a major source of toxins and carcinogens. Rapid technology change, low initial cost and even planned obsolescence have resulted in a fast growing problem around the globe. Technical solutions are available but in most cases a legal framework, a collection system, logistics and other services need to be implemented before a technical solution can be applied. Many materials used in the construction of computer hardware can be

recovered in the recycling process for use in future production. Reuse of tin, silicon, iron, aluminum, and a variety of plastics – all present in bulk in computers – can reduce the costs of constructing new systems. In addition, components frequently contain copper, gold, and other materials valuable enough to reclaim in their own right.

Most major computer manufacturers offer some form of recycling, often as a free replacement service when purchasing a new PC. At the user's request they may mail in their old computer, or arrange for pickup from the manufacturer. There are also a variety of donation options, including charities which may offer tax benefits. Some manufacturers are beginning to assume greater responsibility for what happens to their products after they become obsolete. For example, Dell, Hewlett-Packard and Gateway have recently expanded programs to collect old computer equipment.

Reduce, reuse, recycle has become a common, environmental slogan. In the case of e-waste it also represents an important, easy-to-remember hierarchy of recycling benefits.

1. Reduce the consumption of products that ultimately become e-waste by maintaining older equipment or purchasing higher quality products with a longer useful life.

2. Reuse products by selling them or donating them to others, especially computer re-use organizations, extending their useful life and keeping them out of the waste stream.

3. Recycle your unwanted electronics with an environmentally responsible recycler who will either refurbish them for reuse, or break them down to commodity level where they can be used again as raw materials.

THE MECHANISM OF IT-DECISION CHOOSING AT THE ENTERPRISE

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The majority of the business problems can be solved with the help of information-communication technologies (ICT). Considering scales of manufacture and financial possibilities this is the most effective way to achieve competitive strength for industrial enterprise in the new economy. IT-decisions are based at the ICT application.

Making the IT-decision choice, it is necessary to consider not only quality of particular task performance and an expense for its performance, but also the possibility of the chosen system further development.

The process of IT-decision choosing includes following stages:

1. Purposes definition. The purposes of ICT-system introduction are dictated by a concrete task in view. The problems can be defined by their character of occurrence: problems/threats appearing (i.e. factors which resulted or can lead to considerable decrease in manufacture volumes or profit in the foreseeable future) or new development prospects appearing. The problems character defines critical terms of IT-system introduction.

2. The coordination with enterprise business strategy. At this stage it is necessary to define possibility of the several purposes association. It can be reached by introduction of uniform information-communication system. Such association of adjacent problems in the common information base allows to minimize expenses for ICT introduction and to achieve synergetic effect. For example, when retail trade is computerizing, it is possible to automate order system using the information on current sales.

3. The analysis of enterprise possibilities. Corresponding resources are necessary for service the complex ICT-system throughout all term of its use. In most cases, the more problems can be solved by the IT-system, the more problems can arise during its use. It is necessary to consider all expenses for IT-decision introduction, equipment installation, personnel training, manpower presence (the personnel of corresponding qualification) for ICT-system support by "own forces" of the firm, or foreign experts presence and prospective efficiency of their reaction.

4. Indicators definition. If the purposes are defined qualitatively at the first stage, it is necessary to define the minimum quantity indicators which the IT-decision should provide, at this stage. There can be indicators of efficiency increasing, labor input reduction in manufacture, working hours liberation, etc.

5. The market analysis. Possible alternatives of IT-decisions are defined at this stage. They must correspond to the purposes defined above, to enterprise criteria and possibilities. The information about the IT-product and its suppliers is collected for the further analysis.

6. Choice of a method for the IT-decision estimation. Depending on presence (or reception possibilities) of initial data about IT-products and their suppliers it is possible to apply one of the IT-decisions comparison methods: a method of prototypes (based on the data about successful use at other enterprises), a method of efficiency definition (expenses and benefits from the IT-decision comparison), an expert method, a method based on "sufficiency" criteria definition.

7. Estimation and choosing. IT-decisions are estimated according to the chosen method, then IT-system is chosen on the basis of the received data, and the decision on its introduction is made.

The offered algorithm allows to choose the most effective alternative of the problem solving with the help of ICT use in the industrial enterprise.

ENVIRONMENTAL PROBLEMS IN THE LIGHT OF SCIENTIFIC AND TECHNICAL PROGRESS. ECOLOGICAL AND ECONOMICAL ASPECTS

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Unity of a Man and Nature is contradictory: development of our society is impossible without scientific and technical progress which results in industrialization of manufacturing and leads to nature resources depletion on our planet.

The best minds of the mankind said about the danger of mindless attitude to our Nature, but our society showed itself rather careless, for what it pays now with different natural catastrophes.

An important reason for global contradictions on our planet is considered to be huge accumulation of productive capacity. It puts pressure on the nature and contributes to the depletion of its resources.

Discovery of radioactivity in the end of XIX century made a significant turnover in the scientific outlook. It marked the revolution in physics, set new practical tasks to everyday life and technique and opened new possibilities.

Ecology and economics derive from one root. The ability to keep house is connected with careful attitude to everything around. Economical science and ecology are allies and they are neither competitors nor rivals.

As an example one can mention rapid development of economics in the region with great environmental resources and satisfactory general ecological conditions and vice versa technologically rapid development of economics without taking ecological limitations into account leads to further forced stagnation in economics.

Programme for environmental protection has been worked out by the state and it includes wide application and increase of payment for environmental pollution, it enables rational exploitation of natural resources and regulation of prices for nature-intensive goods.

It is necessary to take into consideration the significance of ecological factors in the commercial activity of the enterprise.

Unsatisfactory consideration of this factor may lead to significant economical losses of national economics such as limitation and suppression of export and import operations according to ecological requirements and economical losses for environment and population connected with production supply which doesn't meet the requirements.

Now central item of economical mechanism of nature management it considered to be the system payments for natural resources, waste products. Foreign experience shows that system of payment for natural resources and nature management under new conditions should include the following elements:

- Tax payment to the budgets of various levels for right to use natural resources;
- Special payments to off-budget funds to reproduce and to protect natural resources.

It deals with effective mechanism of cooperation between environmental authorities, other state representatives and entrepreneurs oriented to the joint organization and realization of ecological programmes and projects, search for financial resources, information exchange in this sphere, improvement of tax system taking into consideration entrepreneur's contribution to environmental protection etc.

This concept engages companies that provide foreign-economic activity and that have to increase environmental costs because of high ecological parameters for ecological programmes and measures.

Now the most important task for our state is to provide society with effective direct and indirect economical instruments for successful formation of ecologically oriented business.

World practice lets us to make a conclusion about increase of costs to keep ecological system safe. According to German economists, each euro contributed to environmental protection prevents direct ecological damage of 3 euro and of 15 euro – contributed to air protection.

During ecologization of economics specialists specify some peculiarities. For example, to minimize the damage made to the environment in particular region one should produce only one kind of product.

There are no limits to human curiosity. Scientific and technical progress cannot be stopped. It determines social and economical development of the society and level of life. But one has to pay for it, because nothing is given free. We have to adapt to new concepts: from “absolute security” to methodology of “acceptable risk”.

STRUCTURAL RECONSTRUCTION OF UKRAINIAN ECONOMY IN THE CONTEXT OF ECONOMIC AND ECOLOGICAL PROCESSES

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The harmony between the man and nature is crucial for all countries of the planet Earth in the 21st century. The experience of post-industrial countries of the world, such as the USA, Japan, Great Britain and Germany, shows that natural and resource problems can be solved at the expense of structural and technological transformations. Due to a sharp increase in prices for fuel and raw materials in the 1970s these countries started profound systematic modernization of their

economies on the basis of energy-saving technologies. As compared to 1970, at the beginning of the 1990s energy intensity of industrial output and emission of CO₂ respectively reduced in the USA by 39%, in Japan - by 40.3% and in Great Britain – by 45.2%. A characteristic feature of structural reconstruction of economies of the countries of Organization for Economic Cooperation and Development in the 1970-1980s was a reduction of material production volumes, in particular environmentally dangerous and resource-intensive ones, which was set out to the developing countries. Nowadays 70-75% of GDP of developed countries is made at the expense of tertiary sector of economy – the service sector, production and consumption of which are environmentally-friendly.

Ukrainian economy is resource-intensive with a heavy industry bias, which determines a high anthropogenic pressure on nature. In the industrial sector of our economy the ratio of ecologically "aggressive" industries, such as mining industry, energy sector, metallurgy, coke and petrochemicals production, increased from 21 to 56.4% for 1990-2006.

Resource-intensity of Ukrainian initial national product exceeds the world level 3 times, and almost a tone of natural resources is spent per one unit of GDP, though in the USA it is only 3 kg. In the structure of industrial production there is a low ratio of consumer and investment industries, in particular that of machine building, the industry which determines the country's scientific and technical progress (in 1990 its contribution was 30.5%, but at the beginning of 2007 – only 12.5%). Estimates of modern technological structure demonstrate Ukraine's considerable lagging behind as compared to the developed countries of the world. Unlike all post-industrial economies, which receive 85-90% of GDP growth at the expense of production and sale of high-tech products, at experts' estimates the contribution of knowledge to the production of Ukrainian GDP does not exceed 2%. Technologically outdated and environmentally-dangerous productions of the third and the fourth levels, whose ratio is 97%, dominate in our country's industry, while high-tech fifth and sixth level ones do not exceed 2-3%. Irrational structure of economy determines a high level of technogenic pollution of the Ukrainian territory, which, at the experts' estimates, is 3.2 times higher than that in 12 EU-countries taken together.

Taking into account abovementioned structural disparities and their negative impact on the ecological situation in Ukraine, the issues regarding a complex solution of the ecological and structural problems become vitally important.

Studying scientific literature on the steady development enables to draw a conclusion that technology and technological way of production are considered the most important determinants of the economic development and environmental stabilization. We refer to the works of a famous Russian ecologist N.F. Reimers, who was one of the first to pay attention to the connection between great technological revolutions and ecological crises. He demonstrated that in the course of historical development increasing anthropogenic activities of a human being

inevitably lead to ecological crises, each of which called for changes in technological way of production.

From the conclusions received on the basis of the "Technological Revolutions" Concept by N.F. Reimers it follows that the achievement of steady development is possible only in case of constant innovation of technological base of the social production. Therefore, while implementing structural reconstruction of the Ukrainian economy, innovation of its technological structure has to be paid special attention to. Progressive changes of the latter lay in the increase of the ratio of most high-tech productions of the fifth and the sixth technological levels as well as simultaneous reduction of the ratio of resource-intensive and environmentally-dangerous productions of the third and the fourth technological levels. However, we agree with the opinion of the researchers, who consider that in industrial economies to which Ukraine can be referred, the most advanced post-industrial technologies cannot be copied effectively or used through a limited scope of possible re-distribution of resources, which other productions of sectors of domestic market have. According to this, the main contradiction of the Ukrainian economy technological development is in the fact that on conditions of incompleteness of industrial cycle, the most advanced technologies of the fifth and the sixth technological levels cannot become wide-spread and lagging behind in developing them will inevitably lead to a wide technological and economic gap with progressive countries of the world. We consider that this contradiction can be adequately solved only with participation of the government and through priority state financing of high-end technologies at the expense of budgetary funds as well as developing demand for the products of advanced technological levels on the basis of state orders system.

УДК 502.15(043.2)

*Рекомендовано до друку
Вченою радою Сумського державного університету
(протокол №8 від 10 квітня 2008 р.)*

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Економіка для екології / Матеріали конференції.
– Суми: Вид-во СумДУ, 2008. – 212 с.

ISBN 978-966-675-175-1

Матеріали XIV Міжнародної наукової конференції (м. Суми) «Економіка для екології» присвячені проблемам доквілля та економічним методам їх розв'язання. Проаналізовано можливі механізми досягнення стійкого розвитку.

Для студентів економічних і екологічних спеціальностей вищих навчальних закладів освіти та широкого кола читачів.

ISBN 978-966-675-175-1

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Наукове видання

Матеріали

XIV Міжнародної студентської конференції

"Економіка для екології"

м. Суми, Україна,
6-9 травня 2008 р.

Дизайн та комп'ютерне верстання

Дениса Смоленнікова

Олександри Нілової

Materials of

14th International Student Conference

"Economics for Ecology"

Sumy, Ukraine,
May 6-9, 2008

Design and desktop publishing by

Denys Smolennikov

Oleksandra Nilova

Підп. до друку

Формат 60x84 1/16. Папір ксерокс. Гарнітура Times New Roman. Друк офс.

Умовн. друк. арк. Обл.-вид. арк..

Наклад 120 прим. Вид. №

Зам. №

Видавництво СумДУ при Сумському державному університеті

40007, Суми, вул. Р.-Корсакова, 2

Свідоцтво про внесення суб'єкта видавничої справи до Державного реєстру

ДК №3062 від 17.12.2007

Надруковано у друкарні СумДУ

40007, Суми, вул. Р.-Корсакова, 2