Oñati International Institute for the Sociology of Law
Instituto Internacional de Sociología Jurídica de Oñati
Oñati Socio-Legal Series
ISSN: 2079-5971

Oñati Socio-Legal Series, v. 2, n. 3 (2012) – Corporate Responsibility: Towards the Social Economy
ISSN: 2079-5971

Business response to environmental challenges: three cases of Russian industrial companies

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Vikhanskiy, O., Churkina, N., Zaverskiy, S., 2012. Business response to environmental challenges: three cases of Russian industrial companies. *Oñati Socio-legal Series* [online], 2 (3), 68-88. Available from: http://ssrn.com/abstract=2009399

Abstract

Three decades ago environmental protection was perceived by businesses as an additional cost-generating activity, but nowadays the idea that environmental policies can be profit-generating is gaining wider recognition. In Russia the environmental policy of many companies still follows the old "end-of-pipe" paradigm. However, changes in national government regulations, shifts in public opinion and international environmental initiatives force some companies to change their attitude to environment protection. Our study is focused on an analysis of environmental policies of three Russian companies: UC RUSAL, world leader in aluminum production, GAZ Group, the largest vehicle producer in Russia, and Baikalsk TsBK, a pulp and paper producer. We examine the development of environmental responsibility within these companies and the relationship between their business goals and environment protection tasks. We reveal the positive and negative effects of environmental activities and the problems the companies face while developing and implementing their environmental policies. On the basis of these cases we suggest government policy implications for emerging economies, which must include a change in priorities – from imposing penalties and environmental payments to creating new incentives for business on the basis of private-public partnerships.

Article presented at the Conference on The Social Economy. Corporate Responsibility, Private Property & Partnerships. Workers' Rights and Cooperatives, held at the International Institute for the Sociology of Law, Oñati, Spain, and as part of the Summer Courses Programme of the UPV/EHU, 6-8 July 2011.

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Key words

Environment; corporate responsibility; Russia; cases; industry; scale of market.

Resumen

Hace tres décadas las empresas percibían la protección del medio ambiente como un coste adicional a su actividad, pero hoy en día, la idea de que las políticas ambientales pueden generar beneficio está cobrando mayor reconocimiento. En Rusia, la política medioambiental de muchas empresas todavía sigue el antiguo paradigma de "tubo terminal". Sin embargo, los cambios en las regulaciones del gobierno nacional y en la opinión pública, y las iniciativas medioambientales internacionales han obligado a algunas empresas a cambiar su actitud hacia la protección del medio ambiente. Nuestro estudio realiza un análisis de las políticas ambientales de tres empresas rusas: UC Rusal, líder mundial en la producción de aluminio, GAZ Group, el mayor productor de vehículos en Rusia, y TSBK Baikalsk, productor de papel. Examinamos el desarrollo de la responsabilidad ambiental dentro de estas empresas y la relación entre sus objetivos de negocio y la protección ambiental. Se muestran los efectos positivos y negativos de las actividades ambientales y los problemas a los que se enfrentan las empresas al desarrollar y aplicar sus políticas ambientales. Sobre la base de estos casos se sugieren implicaciones políticas gubernamentales en las economías emergentes, que deben incluir un cambio de prioridades, desde la imposición de sanciones y pagos ambientales, a la creación de nuevos incentivos para empresas basados en alianzas público-privadas.

Palabras clave

Medio ambiente; responsabilidad corporativa; Rusia; estudios de caso; industria; escala de mercado.

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1. Introduction

Three decades ago environmental protection was perceived by businesses as an additional cost-generating activity, and the key stimulus for the company to reduce its negative impact on the environment was compliance with the standards and norms set by the governments and avoidance of the possible fines.

However, gradually some companies' environmental policies began to outpace the governments' initiatives. The companies, mostly those from the developed economies, began to accept voluntary obligations for reducing their negative impact on the environment, which were not mandatory under the effective government regulations. These voluntary policies became known as corporate environmental responsibility.

Initially, as the examples of this behavior began to emerge, environmental responsibility was understood in terms of policies which did not imply generation of profit (Friedman 1970). Today, however, the idea that environmental policies can be profit-generating, is gaining wider recognition (Ambec & Lanoie 2008; Lyon & Maxwell 2007).

While the direct effects of environmentally responsible behavior on the company's profits are not easy to measure, a number of considerations can be named which motivate such behavior of the companies.

1. Environmental policies help to reduce costs through resources and energy saving, reduction of environmental fines and ecological risks prevention. For example, a two-year project that began in late 1996 and completed in April 1999 and was aimed at reducing waste and emissions at the chemical manufacturing plant Dow's Midland, Michigan, not only achieved emission reductions of 43 percent, but at the same time saved the company some $5.3 million per year, balanced against one-time expenses of $3.2 million (Natural Resources Defense Council 1999).
2. Active ecological policies help to create a positive image of the company among its stakeholders – e.g. investors, clients and international organizations. In Asian countries (except Japan, which has neither a carbon market nor official regulations on GHG emissions) companies are pressed to reduce their GHG emissions by their customers, investors and competitors. For example, Siam Cement Group (Thailand) has taken on voluntary obligations to reduce its GHG emissions under pressure from public organizations, industry associations and the government of Thailand (Carbon Disclosure Project 2007).
3. Active environmental policy helps the company to create competitive advantage. "Amoco Corporation, the US based oil and chemical corporation, states that "environmental leadership produces business leadership" (Robbins 2001). This can be illustrated by the case of the Shell Group. The company has anticipated early the increase of the price of carbon emissions, which drove it to evaluate its own emissions, design emission-reduction strategies and develop its presence in the carbon market. In fact, the Shell Group has created the first active carbon market in 2003. This enabled it to promote the need for reduction of carbon emissions at the governmental level, and its experience was incorporated into the European Union Emissions Trading System, which came into operation in 2005. At that time the companies which were not ready for the emission restrictions, had to buy emission allowances, thus increasing their costs, or to reduce their emissions urgently (Hoffman 2006).

The number of cases when companies have gained obvious advantages by aligning their interests and environmental protection needs is increasing. Hoffman (2006), having examined the policies for reduction of GHG emissions implemented by Alcoa, Cinergy (now Duke Energy), DuPont, the Shell Group, Swiss Re, and Whirlpool

concludes that "a proactive approach is necessary to prepare for the coming market transformation and that doing nothing means missing myriad near-term financial opportunities and setting themselves up for long-term political, operational, and financial challenges". American Electric Power, General Electric, Siemens, Magna International, Honda, Peugeot and Toyota Motors are also named as the examples of companies taking an increasingly proactive approach to GHG emissions' reduction (Cogan 2003; Kerschner & Geraghty 2007).

Thus, the most "proactive" companies have several things in common: they are industry leaders, they are large companies and they belong to the developed economies. However, currently many other companies are at the different stages of transition to the environmental responsibility.

Robbins (2001) defines four types of environmental approach which correspond to the different stages of transition to environmental responsibility.

1. *Traditional (compliance) approach*: the company's ecological policy is aimed at meeting the obligatory requirements set by the government. Companies adopting this approach usually concentrate their environmental efforts on emissions treatment at the end of the production cycle.
2. *Preventive approach*: the company's ecological policy goes beyond the obligatory requirements in order to prevent possible ecological risks, enable saving of resources and energy and attempt to change the environmental protection code. The Company's environmental activities include environmental audit and evaluation of environmental risks, and adoption of resources saving technologies.
3. *Strategic approach*: the company's ecological policy becomes a part of its overall strategy and is aimed at utilizing new possibilities, such as development of a positive image for different stakeholders and entering market niches for green products. Companies adopting this approach usually aim to eliminate negative impacts of their production on all stages of the production cycle, include environmental issues into their R&D activities, and actively promote the company's environmentally responsible image among the stakeholders.
4. *Sustainable development approach*: the company aims at securing the role of the "environmental leader" and aligns its environmental policies with solving global and national problems of environment protection. This approach implies development of a complex corporate environmental strategy which takes into account global environmental problems, e.g. climate change.

Among the theories considering the transition of the connection between companies' interests and protection of the environment from conflict towards coincidence, one of the most accepted is the theory of environmental (or ecological) modernization. This theory states that the improvement in environmental responsibility is a function of economic development and social modernization (Fisher & Freudenburg 2001; Mol & Sonnenfeld 2000). Environmental modernization implies not only a switch to new technologies to reduce adverse impact on the environment, but also changes in the views of managers and the general public in order to consider environment protection as one of the top-priority tasks. Environmental modernization is also accompanied by the foundation of institutions to provide mechanisms for the interaction of business, government and society to disseminate best practices in environment protection (Robbins 2001).

The concerns for correlation between economic development and environmental responsibility became extremely important in the 1990s, with the needs to reduce global GHG emissions to mitigate climate change. The feature of GHG is that its negative effects are spread worldwide, regardless of the location of the emitter. Finally, the Kyoto protocol was ratified, which states that participating countries

should reduce GHG emissions by 5% on average by 2012 compared to their emissions volume in 1990. However, Kyoto protocol restrictions were imposed only on developed and transition countries.

But, as expected, the major contribution in global GHG emissions in future will be provided by developing countries, mostly by China and India. The OECD (2008) forecasts the growth of GHG emissions in OECD countries in 2005-2030 by 23%, and in BRIC countries by 46%. The need to commit the developing counties to GHG reductions led to an international agreement following post-Kyoto negotiations, which stated that though the principal responsibility for GHG reductions is imposed on developed countries, the developing countries would also take part in the achievement of general goal of GHG reductions by half by 2050 (UNFCCC 2007). However, the commitments for developing countries are not based on absolute volume of GHG reduction (as for the developed), but should be much more diversified and involve energy efficiency improvement or GHG reduction per GDP unit.

Thus, international policy on GHG reduction is the example of environmental policy differentiation according to the stage of economic development at country level. It is implied that restrictions on GHG emissions for developing countries should be more liberal, providing them the opportunity for development and modernization as the higher level of environmental responsibility and hard constraints on GHG emissions can be accepted by them just at the higher level of economic development.

2. Introduction to the case-studies

Our study is focused on analysis of experience of three Russian companies, controlled by Basic Element Company. Basic Element is Russia's leading diversified investment company and its main assets are concentrated in six economic sectors - Energy, Resources, Manufacturing, Financial Services, Construction and Aviation. We focus on three companies:

- Baikalsk TsBK (Baikalsk Pulp and Paper Mill), controlled by Continental Management Timber Industrial Company that manages the lumber-related line of business of Basic Element Company[1];
- GAZ Group, controlled by Russian Machines which manages Basic Element's manufacturing and engineering assets in a wide range of industries, including automotive, road-construction equipment, automotive components, rail cars, aircraft and defense vehicles;
- UC RUSAL, controlled by En+ Group, which manages all of Basic Element's companies and enterprises involved in the production and sale of aluminum, electric power, and the extraction and processing of bauxite, nepheline ores, and oil.

This sample of companies makes sense not only because of different industries insight, but also because of their different scale of operations: UC RUSAL is a global company, the world leader in aluminum production, GAZ Group is the leader on national level, being the largest vehicle producer in Russia, and Baikalsk TsBK is the leading enterprise at regional level. The principal aim of our investigation is to analyze the experience of these companies in relation to the following issues:

- the development of environmental responsibility within these companies and the relationship between their business goals and environment protection tasks;
- the positive and negative effects of environmental policies experienced by these companies;

[1] The ownership of Baikalsk TsBK is specified for the time when the research was conducted. In 2010 Continental Management Timber Industrial Company sold the enterprise.

– the problems the companies face while developing their environmental policies.

The study of the environmental policies of these companies will contribute to the understanding of the present-day environmental modernization process in companies from emerging economies that have to deal with the high environmental standards of developed countries under competition on world markets.

It is no coincidence that the majority of case studies of companies which can be considered as environmentally responsible are based on the experience of the companies from developed countries. This experience demonstrates that environmentally responsible behavior formation is possible only with appropriate government policy. In addition, flexible regulation measures are more likely to stimulate innovations than prescriptive ones. Furthermore, the application of properly designed regulation can result in additional profit for companies under new conditions (e.g., Lanoie, Laurent-Lucchetti, Johnstone, & Ambec 2007).

Government authorities from emerging economies, including Russia, would benefit from getting acquainted with the existing practices of business environmental development, through understanding how to develop "properly designed regulations" which could help to complement the tasks of economic development with environmental protection goals.

The study of Baikalsk TsBK is conducted on the base of published sources of information. The study of the experience of the UC RUSAL and GAZ Group is based both on the publicly available sources of information (GAZ Group 2008; Rebrik I. 2008; UC RUSAL 2007, 2008a, 2008b) as well as on internal company documents and a series of interviews with the heads of the Environmental and Health, Safety & Environment Departments of the companies studied and managers of the environmental projects of their controlling holdings. However, to provide the confidentiality of assessments and opinions the names of interviewees will not be identified, and references will be given only to public sources.

3. Case 1. Baikalsk Pulp and Paper Mill (Baikalsk TsBK): from environmental to humanitarian problems

3.1. Company profile

Baikalsk Pulp and Paper Mill (Baikalsk TsBK) is one of the leading enterprises of the Irkutsk region (East Siberia) and a principal employer of a town of Baikalsk (population 16 000). 51% of shares of Baikalsk TsBK are owned by Continental Management Timber Industrial Company and 49% - by the state. Baikalsk TsBK produces pulp, wrapping paper and ancillary products (bolt timber, pulpchips and construction materials). About 80% of production is exported to China. The main consumer of the bleached sulfate viscose pulp (unique product of Baikalsk TsBK) is the Russian defense industry.

3.2. Background of the company's environmental policy

In the 1950s development of the Soviet aircraft and space industry required production of new materials, and Baikalsk TsBK was built in 1966 to produce high-quality pulp and cord for these purposes. It was decided to place the plant on the waterside of Lake Baikal since the technology implied the year-round use of a large volume of water with minimal mineral content. Lake Baikal, the world's deepest lake, has been designated by UNESCO as the World Heritage Site.

At the time of its launch Baikalsk TsBK was equipped with the unique waste treatment facilities, which allowed minimizing water pollution. Still, the location of the enterprise on the waterside of Lake Baikal, surrounded by the nature reserve made Baikalsk TsBK the target for accusations by environmental activists. As a

Oñati Socio-Legal Series, v. 2, n. 3 (2012)
ISSN: 2079-5971

result, environmental policy was the priority of the enterprise from the first years of its existence.

The idea of Baikalsk TsBK's conversion in order to diminish its environmental damage to Lake Baikal first emerged in 1987. It was decided to stop pulp production and convert the enterprise into a furniture manufacturer. However, this option was inappropriate from both economic and environmental perspectives. An alternative proposal was to modify the water supply of the enterprise and introduce the re-circulated water supply system. In 1991 this proposal was adopted by the State Committee for Environmental Protection. However, regional authorities under pressure of environmentalists blocked this decision. With the collapse of the Soviet Union all programs on Baikalsk TsBK conversion were postponed.

It should be mentioned that until now experts do not agree on the extent of Baikalsk TsBK's negative impact on environment. The State Report "On the condition of Lake Baikal and measures for its protection in 2004" issued by the Ministry of Natural Resources of the RF (2005) states that "Baikalsk TsBK certainly contributes in total anthropogenous impact on Lake Baikal water area due to the volume of dumped waste waters". However, "the whole water of the Baikal Lake keeps pure" in spite of the presence of "the selected areas of insignificant local pollution which should be monitored and controlled regularly", including Baikalsk TsBK area.

In 1992 Baikalsk TsBK applied to the United Nations Industrial Development Organization (UNIDO) and asked it to provide independent examination of the enterprise and its impact on the environment and Lake Baikal. The international experts came to conclusion that Baikalsk TsBK's negative impact on environment is insignificant and localized and does not tend to increase. However, the UNIDO proposed a program for Baikalsk TsBK modernization, including adoption of new technology of pulp production based on a re-circulated water supply system.

As a result, Baikalsk TsBK decided to meet the requirements of the state authorities, society and international experts and adopted the "Program of measures on setting up the re-circulated water supply system at Baikalsk TsBK in 2006-2007" in February, 2006. The construction of re-circulated water supply system was supposed to reduce water consumption by 40 times and eliminate the dumping of waste waters into Lake Baikal.

3.3. Development of the company's environmental policy

Since 2006 the private stockholder of Baikalsk TsBK, Continental Management Timber Industrial Company, invested $12.4m. in the construction of a re-circulated water supply system. Starting from July, 2007 Baikalsk TsBK was ready to run the re-circulated water supply system, but the date of starting-up was postponed to September 2008 since the municipal treatment facilities were not constructed in time.

Originally the waste waters of the town of Baikalsk ran through the Baikalsk TsBK treatment facilities, that is impossible with the re-circulated water supply system. If the town did not install separate treatment facilities, all the waste waters of Baikalsk would drain directly to Lake Baikal without any purification. The construction of municipal waste treatment facilities was financed by the regional and federal budgets, but due to delays in financing the deadline for installment of the of treatment facilities was extended. In December, 2007 Continental Management Timber Industrial Company proposed to cover 50% of costs of bioreactors for municipal treatment facilities. The company explained this proposal by its interest in speeding up the launch of the re-circulated water supply system. Finally, on September 5, 2008 the new system of water supply on the Baikalsk TsBK started to operate.

3.4. Results of implementing the environmental policy

By putting into operation the re-circulated water supply system Baikalsk TsBK overcame the negative attitude of the local community and state authorities, gaining recognition for its environmental efforts. Y. Trutnev, Minister of natural resources and ecology of the Russian Federation, said that the launch of the re-circulated water supply system is "a very important event not only for Irkutsk region but for all Russia", and the head of the Federal agency on control over use of natural resources V. Kirillov mentioned that Baikalsk TsBK would be one of the few applicants for a certificate as an environmentally friendly enterprise.

However, in October 2008 Baikalsk TsBK came to face significant problems due to the escalation of the global economic crisis. The adoption of new technology forced the enterprise to give up the production of bleached viscose pulp which was its most profitable product. In the pre-crisis market situation Baikalsk TsBK could still make a little profit on the alternative product (unbleached pulp) and planned to increase its profit by an increase in production, but with the decrease in demand and sharp price decline unbleached pulp became unprofitable. In October 2008 the price of this product in China (the main importer of Baikalsk TsBK products) fell to 350 dollars per ton (30% decline since January 2008), while Baikalsk TsBK's costs of unbleached pulp production amount up to 500 dollars per ton.

When the losses exceeded 2 million dollars per month in November 2008, Baikalsk TsBK had to stop production. This led to numerous problems, including:

1. Social tension caused by mass release of labor without the opportunity of alternative employment. Baikalsk TsBK's labor force amounts up to 2.3 thousand workers, and almost every family in the town with a population of 15 thousand people depends on the enterprise to make its living. Moreover, Baikalsk TsBK was providing numerous social programs for the local communities, including healthcare, education, culture and sport.
2. Reduction of tax revenues for the municipal and regional budgets.
3. Risk for the population of Baikalsk to stay without heating and hot water supply in winter since the enterprise's combined heat and power plant (CHPP) provides heating for the whole town. Baikalsk TsBK management had to appeal to the regional government to provide CHPP with fuel.
4. Irretrievable destruction of the population of bacteria in biological solids in the treatment facilities

In an attempt to solve the problems Baikalsk TsBK management requested the Federal agency on water resources to allow it to revert to the open water supply system, which would help the enterprise to survive in the short-term period by restoring the production of bleached pulp. At the end of 2008 the price for bleached pulp amounted to 800 dollars per ton, while Baikalsk TsBK production costs amount to 650-700 dollars per ton. If the enterprise is allowed to revert to the open water supply system, it the obligation to develop the special environmental protection program for the next few years. Finally, in 2010 the Government of the Russian Federation took a decision to reopen Baikalsk TsBK.

Baikalsk TsBK is an example of a company that from the very outset has developed its environmental policy in response to the public requirements, leaving the production process in the framework of old paradigm (environmentally friendly innovations considered only as additional costs, not profits). Thus, the factors of environmental "profitability" were not created. But through the years the pressure of state authorities and society on the enterprise has constantly increased. In the 1960s, when Baikalsk TsBK was built, the task of ensuring supplies for the defense industry was given higher priority than the preservation of the unique nature reserve. In contrast, now environmental protection becomes the highest priority of the governmental policies, moving even social issues to the second place.

The paradox of this case is that one of the leading enterprises in implementation of environmentally friendly technologies in past times becomes an "environmental outsider" nowadays. The treatment facilities created in Baikalsk TsBK in the 1960s were unique and highly advanced, serving as the basis for development of the similar technologies years later. However the company could not benefit from the advanced treatment facilities and develop an environmental policy which could help it catch up with the evolving environmental requirements.

4. Case 2. GAZ Group – from lean production to environment protection

4.1. Company profile

GAZ Group is the largest vehicle producer in Russia. GAZ Group assets include 17 automotive and machine building enterprises in 10 regions of Russia and 1 automotive plant in the United Kingdom. The company has a diversified range of products including light commercial vehicles, trucks, road-making machines and construction site engines (excavators, graders, forklift trucks), buses, light vehicles and a wide range of automotive components. The company's market share in Russia constitutes 56% for trucks, 48% for buses, 5% for light vehicles. GAZ Group is among the Top-20 producers of light commercial vehicles (LCV) in the world. Pavlovskiy bus plant, which is a part of GAZ Group, is one of the world's Top-10 bus producers.

4.2. Background of company's environmental policy

According to one of the interviewed experts, the company's activities for environmental protection have been set in action since November, 2002, when the environmental policy of JSC "GAZ" (the predecessor of GAZ Group) was elaborated and officially approved. In 2005, when GAZ Group was founded, more attention was paid to environmental issues. Environment protection and resources saving became important factors taken into consideration in decision-making processes.

As a first step to understanding the situation with environmental protection issues at GAZ Group, all the enterprises carried out the preliminary analysis: they checked whether the environmental regulatory documents were present, what was the situation with environmental laboratory control and production control, and how the specific areas of environmental policy (air protection, waste management, water consumption and drainage system) were organized. The company also made a self-assessment in the field of personnel and government relations in regards to environmental issues. This allowed it to find out the level of ecological responsibility at each enterprise and to reveal weak points in their environmental policy.

According to one of interviewees, it was found that at many enterprises the environmental tests were organized poorly, the reconstruction of treatment facilities was needed; the number of accredited laboratories was insufficient. The analysis also showed the lack of environmental standards and low competence of personnel in environmental issues. Besides, at some enterprises production management was also poor.

The development of environmental responsibility of GAZ Group originated from the need to meet government standards which were tightened. According to one of the company's representatives, one of the main driving forces for environmental responsibility to become one of the company priorities was the opportunity to reduce environmental payments and "toughening of government standards and regulations". Another driving force was the attention of international investors to the environmental activities of the company, as it was planning to issue securities at the international market at that moment.

4.3. Development of company's environmental policy

The specific feature of environmental policy of GAZ Group was strongly influenced by a new production system, introduced at the enterprises and based on the principles of "lean manufacturing" – a set of techniques aimed to optimize production process and get rid of excessive costs (Monden 2007). The experience of GAZ Group proved that the improvement of production management also leads to improvement of environmental parameters.

Reduction of air and water pollution emissions. *New production system enabled GAZ Group to reduce its emissions not only by means of treatment facilities modernization, but also by improvement of production processes* – environmental maintenance of technological processes, introduction of new production technologies, equipment and materials. For example, the introduction of new painting components system resulted in better quality of paint coating, lowering the production costs, as well as decrease in waste water volumes by 500 thousand m^3 per year and air pollution emissions by 70.5 tons per year.

Reduction of wastes. *First, the reduction of wastes is a result of improvement of production management and technological processes*, e.g. the change in technology for metal sheet cut, or standardization of types of materials (for instance, in 2006 the list of metals consisted of 5000 positions, now it contains only 3500 positions and it is planned to reduce it to 2000 metal types). One of interviewees pointed out that the enterprises are actively implementing innovation proposals, aimed to reduce losses of raw materials, improve resources saving and recycle the used materials. He estimates that in 2008 about 170 innovations were implemented at GAZ Group enterprises. Wastes are also reduced in result of laundering, dry-cleaning and mending of working cloths, tissues, rags, linen and gauntlets, which makes it possible to use them longer.

Second, the reduction of wastes comes from the improvement of waste operations. At GAZ Group enterprises the wastes are collected separately by classes and types. This prevents the possible mixing of the wastes of different danger classes, and wastes, which are intended either for burial or for recycling. Every enterprise of GAZ Group has specially equipped areas for wastes with marked boxes. A special company – "GAZVtorResurs" – was set up to carry out maintenance services for the Group member companies: wastes collection, preparation for utilization, sterilization, transportation and waste treatment. "GAZVtorResurs" deals with GAZ Group member companies on a contractual basis, and has special discounts for recyclable materials. There are additional investments into waste recycling facilities, aimed not only to reduce waste amounts, but also to recycle wastes.

Third, the use of recyclable materials is intensified by introduction of new equipment, for example, regeneration facilities for lubricating and cooling liquids, as well as treatment facilities for circulating water supply systems. According to the company's representative interviewed, during the last 5 years 230 treatment facilities for circulating water supply systems were installed at GAZ Group plants. The profits derived from recycling activities are directed towards improvement of environmental security and production development as well. This policy, as the company's representative points out, is stimulating the company departments to use their resources more efficiently.

Resources saving. *The resources saving activities were spread among the group member companies in the same "chain reaction" way as with production system improvements. The changes spread from a single pilot production site to reference sites in other departments and companies and so forth to each workplace*. The positive results achieved at reference sites encourage the employees to follow that example and encourages them to trust new ideas. For this purpose, in July 2008 GAZ Group enterprises have started pilot projects of reference production sites, demonstrating the energy saving activities implemented at GAZ Group advanced

member companies. The professional training of energy service specialists was also arranged at these reference sites.

For example, JSC «Tver Excavator Plant», a member company of GAZ Group, adopted a plan to cut energy consumption by 10% in 2008 and save $615,000. This plan includes the use of more efficient production equipment, energy-saving lighting appliances with metal-halide lamps, cancellation of overtime work, introduction of weather-related regulation of heat supply. As of November 2008, the total savings from these activities already exceeded the initially set target value.

Although in 2007 a number of Group company members had not yet introduced energy saving activities as a regular planned process, in 2008 the full scale monitoring of energy saving was implemented in every enterprise. The costs of all types of energy resources were fixed on a monthly basis. The company set a goal to reduce the expenditures on energy resources by 10% for GAZ Group as a whole.

It is worth noting, that in the current financial crisis the energy saving activities are not treated as less important. Moreover, it is considered that it allows enterprises to adapt better to the present market conditions. For example, in November 2008 the company issued an internal instruction titled “On anti-crisis energy measures at enterprises”. According to the document, each enterprise should establish a working group elaborating anti-crisis activities on energy issues. The document also prescribes stopping maintenance of equipment and facilities which are now out of the production process, to prevent the energy equipment from being used during off-hours, to lower the temperature inside the production facilities, to separate emergency lighting from the public electricity supply in order to minimize the energy consumption during off-hours, to impose restrictions on shower operation time.

Environmental education of employees. Professional training and personnel development in the field of environment is carried out at GAZ Group in accordance with the company’s professional educational policy. Every year the company determines its needs in personnel development programs on environmental issues. For 2009, for example, it is planned to conduct the environmental educational program for senior staff, as the company is preparing to introduce the Environmental Management System based on ISO 14000 and OHSAS 18000.

Apart from environmental educational programs, GAZ group adopted the principles of personal responsibility of senior management, based on the Key Performance Indicators (KPI) in the sphere of environment protection. The environmental policy of the company relies not only on tough control and administrative methods of management, but also on creating involvement of employees in environmental problem solving. One of the methods to create such involvement is to organize environmental competitions between enterprises in which certain targets and incentives for winners are set.

4.4. Results of implementing the environmental policy

In general, the goal of the environmental policy of the GAZ Group is to meet the government environmental standards of Russia. The environmental policy of Group member companies aims to achieve and follow the official standards set for air pollution emissions, release of polluting substances, waste burial, etc.

However, the experience of the GAZ Group proves that the company managed to change its attitude to environment protection. The company has set up an environmental management system, which enables coordination of environmental policy with the company’s activities in other areas (production, finance, labor protection and technical safety). The adoption of this environmental management system created a systemic foundation for the company to take into account environmental aspects in its operations and investment activities. This approach

created favorable conditions for improving both environmental protection as well as the efficiency of production.

Apart from meeting government regulations and attracting international investors, GAZ Group managed to improve its operational efficiency through resources saving and developing the environmentally responsible image of the company. The GAZ Group now treats the environmental safety of production as integral part of business strategy, and environmental projects as profitable investments.

5. Case 3. UC RUSAL – from local to global environmental activities

5.1. Company profile

The United Company RUSAL was founded in March 2007 by merging the assets of three companies: RUSAL company, previously the world's third largest aluminum company, SUAL group, one of the world's top ten players in the aluminum industry, and the alumina assets of Glencore (Switzerland). As a result, UC RUSAL became the world's largest producer of aluminum and alumina. UC RUSAL's assets include bauxite and nepheline ore mines, alumina refineries, aluminum smelters, a casthouse business for production of alloys, foil mills and production of packaging materials as well as power-generating assets. UC RUSAL owns the two largest aluminum smelter plants in the world – Bratsk Smelter and Krasnoyarsk Smelter. Today the company accounts for more than 12% of world output of primary aluminum (4.2 m. tons) and 15% of the world's alumina production (11.3 m. tons) every year. The company operates on five continents, in nineteen countries and in twelve regions of Russia. The company's headquarters and major aluminum assets are located in Russia. The products of UC RUSAL are sold to customers in 70 different countries. In 2007, only 22% of sales were attributed to Russia and CIS countries. The majority of sales were export sales outside the CIS.

5.2. Background of company's environmental policy

Generally, Russian aluminum smelter plants are large enterprises, being major employers and major taxpayers for the towns of their location. Smelter plants are situated very close to such cities and towns as Krasnoyarsk, Bratsk, Novokuznetsk and Sayanogorsk. At the same time, aluminum production brings substantial negative environmental impacts during all stages of production. During bauxite and nepheline ore mining, dust, soot, hydro carbonates, carbon dioxide, sulfur and nitrogen are emitted to the atmosphere. Alumina production requires the large amount of intake water and waste water. For the electrolysis process, a huge amount of electrical power is required. As a result, according to one of the interviewees, "the activities of aluminum plants were always watched over very carefully by the public and by supervisory authorities as well".

The public attention given to aluminum plants is sometimes revealed in rather odd ways. A striking example of this is described by Chairman of the Supervisory Board of Basic Element Company Oleg Deripaska. Once, the environmentalists came to one of the RUSAL's enterprises in Siberia. These "defenders of nature" found a man who climbed up a factory chimney over 30 meters high and chained himself to it with handcuffs. The "green videoteam" made the necessary camera records and left, but forgot to take the man off from the chimney, and he dropped the handcuff keys accidentally. Only six 6 hours later was he was released. Fortunately, that was not lethal for him, although it was in November. "The environmental problems should be solved jointly, in complex, without any "green partisanship", ecological extremisms, attempts to intimidate or to teach a lesson to someone" – concludes Oleg Deripaska (Medovnikov & Oganesyan 2008).

The awareness that an active environmental policy is essential for an aluminum company, appeared long time ago, since the beginning of 1990s. However, at that time the company lacked the effective technical solutions for maintaining the high

Oñati Socio-Legal Series, v. 2, n. 3 (2012)
ISSN: 2079-5971

environmental standards. Although a number of environment-related issues were solved as a part of routine business operations, the accumulation of environmental problems continued gradually. As one of interviewed experts said, in the beginning of 2000s, in response to the increasing public attention to the company's activities, environmental safety started to be treated as "essential for business survival".

During the early steps towards corporate environmental responsibility, the company followed the old paradigm for environmental policy, implying that it had to bear the environmental costs in order to comply with governmental standards and to avoid public dissatisfaction.

5.3. Development of company's environmental policy

Introduction of environmentally friendly technologies. To reduce emissions, the company carried out the *modernization of gas-treatment facilities*. The old out-of-date electro-filters, mounted 20 years ago, were replaced with efficient facilities for dry gas treatment, which can remove up to 99% of fluorides and dust, and up to 97-98% of tar and benz(a)pyrene.

However, the majority of UC RUSAL plants were originally constructed in the middle of 20th century, when environmental and resource-saving problems were perceived as a matter of marginal importance. As a result, the company faced not only the task of introducing waste treatment facilities, but also to carry out the technological modernization of all production technology in accordance with modern environmental standards. Despite the required capital costs, the company decided to carry out the overall modernization of production facilities.

In 2003 the modernization of the Sayanogorsk Smelter plant has started, and in 2004 the Krasnoyarsk Smelter plant was modernized. The Khakas Smelter plant, which was put into operation at the end of 2006, was constructed in compliance with high environmental standards. Now it is the most high-technology aluminum smelter plant in Russia and one of the most energy efficient smelter plants in the world. The ideas of environmentally friendly production are being applied in the construction project of Boguchanskoye Energy and Metals Complex – the large investment project of UC RUSAL and the Russian hydro-power generating company JSC RusHydro, aiming to complete the construction of the 3,000MW Boguchanskaya Hydropower Plant and to build a greenfield 600,000 tonnes-per-annum aluminium smelter.

One of the most important directions for technological development of the company is the modernization of the Soderberg technology, which is used for production of more than 80% of aluminum in Russia and involves the emissions of fluorides, carbon dioxide, benz(a)pyrene, tar, dust and perfluorinated hydrocarbons. For instance, the modernization of Soderberg technology by means of automated systems of feeding the potlines with alumina, allows to reduce the hazardous emissions into the atmosphere, including GHG emissions, to 15-20% and also to increase the productivity of the potline.

It is worth noting that UC RUSAL is taking advantage of the international experience of the aluminum industry. RUSAL is a leading member of the International Soderberg Club. At the same time, the company is developing its own R&D capabilities in order to improve this technology further. Every year UC RUSAL invests more than $100m in research and development of new technologies. The development of a new automated alumina feeding system was carried out by the Engineering and Technological Center (ETC) of RUSAL, which was founded in 2002 and located in Krasnoyarsk. The Center serves as a foundation of R&D and engineering capabilities of UC RUSAL company. In particular, ETC is elaborating the novel energy efficient production technologies RA-300, RA-400 and RA-500 which are more effective than Soderberg technology. For example, the RA-300 facility at

Khakas Smelter would enable the reduction of GHG emissions per unit of production by 20%.

Thus, in 2000s the main focus in the technological policy of the company was shifted from the "end of pipe" treatment to the development of environmentally friendly production technologies, which enable the reduction of emissions.

As a result, the company managed not only to decrease its negative impact on environment, but also to reduce its costs due to the resource-saving, and thus to obtain new advantages from environmental policy. For instance, the modernization of Soderberg electrolysis technology improves energy efficiency by 20%. The introduction of energy saving technologies is especially important for an aluminum company, as energy costs constitute about 25-40% of the production costs.

Resources saving and waste reduction. Apart from the technological modernization, UC RUSAL defined the new directions of resource saving during the production process. First of all, the most important advantage of aluminum from the viewpoint of the environment is that this metal is easy to recycle. The production of 1 ton of secondary aluminum requires 20 times less energy than production of 1 ton of primary aluminum. The processing of a ton of secondary aluminum allows saving of about 8 tons of bauxite and 4 tons of chemical reagents. Finally, there are no differences between primary and secondary aluminum, and thus aluminum recycling is both economically and environmentally effective. UC RUSAL intends to increase its share of the secondary aluminum market to 50% by 2013.

Another example of the company's activities in the field of resource-saving is the introduction of a re-circulated water supply system for the main production processes. In the end of 2007, 55% of UC RUSAL plants were using a re-circulated water supply system. The company is planning to stop waste water discharge and to introduce a re-circulated water supply at all major production facilities.

The waste-free technology for aluminum reprocessing also leads to cost reductions. The main directions of waste management of UC RUSAL are the following: enlarging the amounts of recycled and used wastes; utilizing the hazardous wastes, and safe warehousing of the wastes.

The activities of UC RUSAL in the field of overall modernization of production facilities on the basis of environmentally friendly and resource-saving (above all, energy saving) technologies involved a shift in the company's policy from minimizing the negative environmental impacts to the goals of sustainable development and minimizing the risks of global climate change.

Reducing the risks of global climate change. In 2007 UC RUSAL announced the strategic initiative "Paving The Way To A Safer World", which includes activities for minimizing the environmental impacts, as well as activities for reducing the risks of global climate change.

In 2007, the Krasnoyarsk Smelter plant became the first Russian enterprise in which the GHG emissions were directly instrumentally measured. According to the obtained data, in 2007 the smelter plant has achieved a reduction of perfluorocarbons emissions per production unit by 80%, compared to the 1990 level. A GHG emissions inventory is being conducted also at other company's plants and should be finished in 2009. This would allow the establishment of a corporate system of GHG emissions management. Notably, the company is taking this inventory of GHG by itself. As one of interviewed experts said, at first the company was going to invite a foreign expert for that purpose. However, finally the company declined this idea "due to the mentality differences, specific features of Russian legislation, statistical and technical standards".

The system of GHG emissions management, implemented by UC RUSAL, is going to be integrated into the existing company management system. The architecture of

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this system is based on the environment management model described in ISO14001:2004. UC RUSAL is the first Russian company to implement such a system. Few companies worldwide use such systems demonstrating the integrated approach to climate change issues.

An important additional factor, contributing to the creation of UC RUSAL's strategy in the field of climate change, is the preferential usage of environmentally friendly power sources. More than 80% of aluminum is produced by means of hydroelectric power energy. In accordance with the strategy for development of power supply sources, the company invests into the new power generating facilities based on hydropower energy, gas and atomic energy. The company is seeking opportunities for development of more effective and environmentally friendly power generation technologies based on coal.

The implementation of the "Paving The Way To A Safer World" initiative would allow UC RUSAL to reduce the direct GHG emissions by 50% to 2015, and in the long term perspective – to eliminate the carbon emissions during all stages of production cycle.

UC RUSAL has set an achievable goal for a middle term perspective, and also formulated a long term task which does not impose any time constraints, but provides the company with a guideline for future development.

Environmental education of employees. UC RUSAL realizes that implementation of its plans is impossible without competent, professional employees. The company strives to create good conditions for improvement the professional qualifications of the employees in the field of environment. As one of interviewees has pointed out, the educational programs are essential, as "it is the people who really conduct the environmental policies". Firstly, the company informs the personnel about the potential negative environmental impact in case of violation of production rules. It is considered that the company's employee must not only obey the safety rules and environmental standards, but also understand the consequences of their violation. Secondly, the company conducts various environmental education programs which are adapted to the target audience: senior management personnel, workers, contractors, etc. Apart from gaining environmental knowledge, little by little the company's employees are becoming committed to taking part in the solution of environmental problems. For instance, the company is carrying out the "RUSAL-ECO" project. Under this project, the employees take part in patrolling the specially protected natural territories of Altai-Sayan region.

Rehabilitation of the environment. In spite of the active environmental policies implemented by UC RUSAL, the specifics of aluminum production make it impossible completely to avoid the negative impact of the industry on the environment. Therefore, as one interviewee told us, in addition to minimizing the negative effects on the environment, the company has to implement a number of programs aimed at compensation of these effects, such as land re-cultivation and preserving bio-diversity. One of the examples of these activities is the development of a monitoring system for populations of rare and endangered flora and fauna in Altai-Sayan region within the impact zone of the Sayanogorsk Aluminium Smelter, funded by UC RUSAL. This is a unique initiative, since no system of bio-monitoring in Russia currently exists on the federal or regional level, and this private project may become a first step for creating such system.

Community participation. Most of UC RUSAL's enterprises are major employers and taxpayers in the towns where they are located. Therefore the company needs to take into account the needs and opinions of the local communities while developing its environmental policy. The interviewed representative of the company pointed out the need for preventive measures for avoiding possible public discontent in future. This is ensured by facilitating public discussions, conducting

public opinion surveys and making official agreements with the regional governments.

Another means of communication between the company and the public is the network of "Environmental information centers" on the company's enterprises, which were initiated at Krasnoyarsk Aluminum Smelter in 2006. These centers provide the local community with information about the enterprises' environmental activities, serve as the means of discussing environmental problems, and also deliver environmental training programs for children.

Communication with the local communities creates mutual benefits for both society and the company. On one hand, it promotes trust between the company and the society through providing access to information on the company's environmental policies. On the other hand, company's activities serve the community by providing environmental education and promoting environmentally-friendly behavior among the younger generation.

5.4. Results of implementing the environmental policy

The interviewed company's representative was sure that UC RUSAL's proactive environmental policy enabled the company to solve the tasks it had set for the first stage of transition to environmentally responsible behavior. The company has not only succeeded in meeting the demands of both the authorities and the communities, but has also ensured efficiency of its green investments. This efficiency includes measurable results, such as cost reduction due to energy saving and reduction of production waste, and also several intangible ones:

1. *Promotion of a positive image of the company among the local community, investors, customers and international organizations*. The international image of the Russian companies with respect to their environmental behavior is currently unfavorable. Therefore UC RUSAL sees communicating its position on the environment to international organizations as one of its important aims. It was one of the first Russian companies to join the United Nations Global Compact, and the first one to join the United Nations Development Program in order to take part in international projects for minimizing the risks of the climate change. The company participates in the activities of the International Aluminium Institute for the sustainable development of the aluminum industry, including implementation of environment management system and standards. At present all aluminum smelters and 70% of alumina refineries are ISO 14001 certified.
2. *Potential competitive advantage*. As a leader in implementing the system of management of GHG emissions, the company has developed new competencies which are not possessed by other companies. Today UC RUSAL aims to share its expertise with the domestic businesses.

It is important to note how the company's environmental behavior has evolved over the years. At the initial stage its activities were aimed at reducing fines for violating environmental regulations and preventing the negative consequences of public discontent. Now the company begins to capitalize on the positive consequences of implementing its environmental policy.

Any company's policies are best tested in the times of the crisis. In the current economic situation, UC RUSAL is not renouncing its environmental obligations. On December 10, the company has announced the intention to reschedule its environmental modernization for two of its plants – Ural and Bogoslovsky Aluminum Smelters, where production facilities date back to 1939 and 1940. The pre-crisis schedule implied that this modernization would take place by 2015, but the company management decided to advance these activities: it is anticipated that cost reduction and production optimization will create benefits for the company in the current conditions of the credit crunch and decline of commodity prices'.

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ISSN: 2079-5971

Due to its activities, UC RUSAL is now seen as one of the few Russian companies which have managed to make a transition to sustainable development. Marco Borsotti, UN Resident Coordinator and UNDP Resident Representative in the Russian Federation, gave a favorable evaluation of these activities: "Russian business has moved to a new stage of development, giving special attention to the planet's safe future" (UC RUSAL 2008a).

6. Conclusion

The cases of Baikalsk TsBK, GAZ Group and UC RUSAL demonstrate a remarkable diversity in the ecological policies of enterprises belonging to the same holding company. At the initial stage of the development of environmental responsibility all three companies had to implement environmental policies in order to meet the requirements set by the state. However, all three have arrived at different results:

1. Baikalsk TsBK remained within the framework of the old paradigm in which environmental responsibility is considered as an additional cost driver;
2. GAZ Group managed to combine economic and ecological benefits through incorporating its ecological policy into a framework for general modernization of production system, which helped to reduce costs;
3. UC RUSAL developed the most integrated environmental strategy which not only allowed the company to meet environmental standards, but ensured its leadership in environmental protection.

The varying stages of the companies' environmental responsibility imply that the return on their environmental efforts and the benefits of being environmentally conscious for them also vary. While Baikalsk TsBK was not able to make any returns on its environmental activity, GAZ Group and UC RUSAL are now able to employ the advantages of their environmental responsibility, but to a different extent:

- GAZ Group extensively exploits the advantages of cost reduction due to resource saving, waste reduction and decreased payments for environmental damage. To some extent it also enjoys the benefits of having an image of an environmentally responsible company, primarily in the eyes of foreign investors.
- UC RUSAL has managed to ensure the highest return on its environmental efforts, which includes cost reduction, promotion of the company's environmentally friendly image both locally and internationally, and advancement of its competences in solving environmental problems, including global issues such as climate change.

The three cases also illustrate the types of difficulties which the companies encounter on their way to ecological responsibility:

1. *Insufficient time.* This problem, quite specific for the economies which are making a rapid transformation, was most pronounced in case of Baikalsk TsBK. The enterprise was not able to modernize fast enough to catch up with the increasing public environmental demands and maintain its profitability at the same time.
2. *Lack of qualified environmentalists.* The paradigm of ecological thinking is relatively new for Russia, as well as for other emerging economies. One of companies' managers interviewed comments that "therefore we need to shift environmentalists' mindset to a business approach, switching from a cost-effectiveness to a value-creation model".
3. *Limited investment sources.* Despite the fact that all three companies have managed to find the means to finance their environmental efforts, these investments remain massive and put a big strain on the companies' finances. This raises a problem of integrating state policies and the

companies' activities. In this context, one of interviewees proposes the following mechanism: "It would have given business considerable support if the government allowed companies to use their environmental payments for implementing environmental protection programs authorized by the government".

The case of Baikalsk TsBK demonstrates that even large companies may not be able to ensure the profitability of their environmental efforts without external help. This brings up the question - what should the government's role be in facilitating corporate environmental responsibility? This question is particularly important for the emerging economies where public environmental policy is currently under development.

7. Policy implications

In emerging economies the development of corporate environmental responsibility is often encumbered because public policy in these countries is not aimed at ensuring any economic returns for the companies on their environment protection measures. In the case of Russia the challenge is that environmental policy still follows the old "end of pipe" paradigm , in which the role of government consists of establishing environmental standards and imposing fines on the companies if the standards are not met. Within this paradigm there are no incentives for the companies which actively develop environmental responsibility and introduce advanced initiatives for environmental protection. At the same time, experience of the developed countries suggests that government should play an active role in encouraging the development of corporate environmental responsibility.

In emerging economies the development of corporate environmental responsibility requires changing government priorities – from imposing penalties and environmental payments to creating new incentives for business on the basis of private-public partnerships. These new incentives should facilitate solving the most acute problems of the companies. The cases of the three Russian companies suggest three main kinds of incentives:

1. Ensuring additional investment sources for corporate environmental activities through providing tax relief for companies implementing environmental initiatives, permissions to use environmental payments for financing corporate environmental investments, public R&D subsidies and subsidized loans for the purchase of environmentally friendly equipment.
2. Providing environmental educational programs for the business managers and business educational programs for the environmentalists.
3. Supporting the promotion of best practices through private-public partnerships, in order to facilitate information sharing and to prevent the situation when each company has to start its environmental development from scratch.

Moreover, all interviewed managers said that government should also set clear "rules of the game". While there is a general understanding that public environmental policies will evolve along the same lines as in the developed countries, it is essential for businesses to understand how quick the pace of this evolution might be and how rapidly the standards will be changed. One of interviewees mentioned that "the key problem is that we are too often in a hurry". The case of Baikalsk TsBK shows that companies need time to adapt to the new requirements, while this time is not always available. The rate of changing environmental standards should correspond to the time framework of production modernization, and this remains one of the vital issues in the development of the corporate environmental responsibility.

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ISSN: 2079-5971

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