16th INTERNATIONAL MULTIDISCIPLINARY SCIENTIFIC GEOCONFERENCE S G E M 2 0 1 6

ECOLOGY, ECONOMICS, EDUCATION AND LEGISLATION

CONFERENCE PROCEEDINGS

VOLUME I

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ECOLOGY AND ENVIRONMENTAL PROTECTION

ENVIRONMENTAL LEGISLATION, MULTILATERAL

RELATIONS AND FUNDING OPPORTUNITIES

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30 June – 6 July, 2016

Albena, Bulgaria

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Published by STEF92 Technology Ltd., 51 "Alexander Malinov" Blvd., 1712 Sofia, Bulgaria
Total print: 5000

ISBN 978-619-7105-65-0

ISSN 1314-2704

DOI: 10.5593/sgem2016B51

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CHALLENGES OF THE ENVIRONMENTAL REFORM IN RUSSIA

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ABSTRACT

Current environmental reform in Russia is rooted in the 90s when first attempts to move to more transparent, realistic and effective policy and practices were made. Lessons learnt by regulators and regulated community were not always positive; moreover strong industrial associations had been opposing changes while federal authorities had not been convinced that Integrated Pollution Prevention and Control (IPPC) principles could be applicable in Russia.

Back in 2014, the new IPPC Law was passed in Russia becoming the main legislative instrument regulating pollutant emissions from larger industrial installations. It aims to achieve a high level of protection of the environment taken as a whole by reducing harmful industrial emissions across the country, in particular through better application of Best Available Techniques (BAT). To form the necessary basis for implementing BATs and granting Integrated Environmental Permits (IEPs), Russian BAT (IPPC) Bureau was formed. It co-ordinates development of Information and Technical Reference Books (ITRBs), that are prepared by special Technical Working Groups as standardization documents. The development procedure is based Seville process principles but takes much shorter, which leads to shortcomings in information exchange process and low level of industrial participation. This is why environmental benchmarking provides for rather rough assessment of technological parameters (specific consumption of raw materials, energy and water and emission factors for key pollutants) typical for Russian industries. Still, key BATs were identified for ten sectors studied in 2015, including manufacturing of cement, glass, ceramics, lime, copper, inorganic fertilizers, etc.

In 2016, recommendations for environmental regulatory authorities and industry should be prepared to facilitate the transition to integrated permitting and help to further develop the environmental reform towards the improvement the effectiveness and transparency of environmental regulation. It is suggested that environmental permitting procedure should be similar to the procedures implemented in European countries. Leading industries have already expressed their interest to participate in pilot projects and on the voluntary basis to submit data needed to grant IEPs.

Keywords: environmental reform, Best Available Techniques, technological parameters, Integrated Environmental Permits.

INTRODUCTION

In 2014, Russia stepped into a fundamental environmental reform aiming at the improvement of environmental regulation while forming favourable conditions for national industries. To a certain extent, this reform is similar to that started in the European Union back in 1996, when Integrated Pollution Prevention and Control Directive set conditions for not only minimising environmental impacts, but also protecting environment as a whole [1]. According to the national plans, Russian environmental reform should develop quite fast. Two main engines working out the necessary instruments are the Ministry for Natural Resources and Environment (MNRE) and the Federal Agency for Technical Regulation and Metrology (Rosstandart). Rosstandart is responsible not only for working out Information and Technical Reference Books (ITRBs) on BATs, but also for learning from international experience and suggesting on further development of environmental legislation with regards to BATs.

TECHNOLOGICAL PARAMETERS, EMISSION FACTORS AND EMISSION LIMIT VALUES

Russian IPPC Law [2] introduces a new environmental regulation term, namely, a technological parameter. Technological parameters include specific consumption and emission values (those calculated per unit of production, preferably – per tonne of product but in some cases per GJ of energy generated or per cubic metre of water treated). In principles, these parameters are very close by nature to consumption and emission levels reported in most Reference Books of Best Available Techniques (BREFs) developed and widely used in Europe. On the other hand, stronger attention is paid to energy consumption and to **specific** consumption and emission values (that are not always present in European BREFs). While identifying BATs, experts look for lower technological parameters and consider (when data are available) economic aspects of particular technological and technical solutions.

Pollutants wise technological parameters are identical to emission factors [3, 4] and have same measurement units. While intervals of technological parameters characterize industry as a whole, Emission Limit Values are calculated for each installation based on emission factors and maximum capacity. Due to the special role of Rosstandart in Russian environmental reform, a new national Technical Committee TC 113 "Best Available Techniques" was formed to play a role of Russian BAT (IPPC) Bureau. In 2015, sector-oriented Technical Working Groups (within TC 113) prepared ten ITRBs as Russian standardisation documents [5].

Technological parameters included into these ITRBs were set as a result of benchmarking run by national experts; international data were also taken into consideration. These parameters were discussed with stakeholders representing industries, environmental regulators universities and non-governmental organisations. It is necessary to point out that technological parameters do not deal with the state of environment and with environmental quality standards but characterise exclusively technological processes and technical means (such as 'end-of-pipe' techniques). Being completely new to many stakeholders, this point is often misunderstood. Criticising ITRBs in general and technological parameters in particular, environmentalists often require considering the state of environment while identifying BATs and respective technological parameters.

In fact, analysing available emission values, experts paid attention to toxic substances and environmental pollutants causing such impacts as acidification, eutrophication, ozone layer depletion, Los-Angeles and London smog, etc. Thus, priority environmental problems were considered, while local and regional environmental issues were left for environmental authorities to be discussed during the permitting procedure. This position conforms to the international experience and assumes that when necessary, operators can be asked not only to comply with BATs, but also set additional means to protect vulnerable environments or to minimise public health risks in densely populated areas [6, 7].

Operators should be free to select BATs and additional means since ITRBs are voluntary standardisation documents. Still, Russian IPPC Law [2] requires that special **legislative documents** introducing technological parameters have to be issued in 2019. Therefore technological parameters interpreted by MNRE will become obligatory, which makes them different from emission and consumption factors used in the European Union. BAT Conclusions (BATC) that are being developed and issued gradually by the European IPPC Bureau are simply shortened versions (digests) of BREFs, and European operators remain free to select techniques described in BREFS and BATC and to interpret respective emission factors.

If the environmental authority (MNRE) has in fact to revise and in a way to legitimate technological parameters identified by experts in the standardisation procedure via sector benchmarking (and supported by numerous stakeholders), it is likely that we'll see a conflict of interests. Besides that, it is hard to imagine that MNRE has experts enabled to review work done by researchers, industrialists and environmentalists aiming to reach a well-substantiated compromise. It is a serious challenge because this conflict might undermine Russian environmental reform and ruin results of hard work of Russian BAT (IPPC) Bureau and many highly qualified experts.

Coming back to Emission Limit Values, we have to emphasise that a reliable permitting procedure needs to be developed, tested and gradually introduced in Russia. Regulatory authorities have to define (in a transparent, accountable manner) legally binding requirements for IPPC installations. Typically, permits establish limits for pollutant emissions into air and water and for generation and management of waste, together with any other environmental conditions that are specific to particular installations. If properly designed, permit conditions also provide incentives for the regulated community to protect the environment in an effective and cost-efficient way, and ensure that private and public interests are equally respected. Integrated permitting means that emissions to air, water (including discharges to sewer) and land, along with a range of other environmental effects must be considered together. At this stage it is utmost important to select a short but well-substantiated list of technological parameters and to transfer them into measurable units (concentrations of key contaminants or surrogate parameters) that can be monitored and controlled both by operators themselves and by regulating authorities [7, 8].

LISTS OF POLLUTANTS

Lists of pollutants to be monitored, controlled and reported form another challenge of the environmental reform in Russia. Historically, a well-known principle "the more you list the better" had been used by Russian environmental authorities. A new list of

contaminants to be regulated was issued in July 2015 but contains 254 air pollutants, 249 water pollutants and 63 soil pollutants [9]. The list is dramatically shorter than the list of sanitary and hygienic standards for air (about 2500 substances) and the list of water quality standards for fisheries (over 1000 contaminants).

The problem is that it is not fully understood (yet) how the new list is going to be used in practice. If we assume that it is a list of substances to be included in various environmental monitoring programmes, we have to clarify in what cases (presumably in impact areas) particular substances are to be monitored. If all these substances are to be regulated (emission limits set and compliance checked), then undeniably there are too many of them. Perhaps, the new list is a kind of a reference one: if a technological process implemented at an IPPC installation is characterised by **significant emissions** by several substances listed in [9], then it is necessary to come up with a reliable self-monitoring programme and either measure or calculate these emissions. But it's just a speculation.

Initially, it was expected that a new BAT based regulation system would lead to the significant decrease of the number of substances to be covered by environmental permits. For example, current (single medium) permits of brick industries cover over 20 air pollutants, while only 4-5 of them originate from main technological processes of plants using natural gas as the only type of fuel [4]. Other contaminants deal with garages, secondary servicing units, etc. In Europe such activities are regulated by General Binding Rules [10]. Similarly, if an industry turned from chlorine bleaching to peroxide one, there is no reason to look for organochlorinated compounds in wastewater.

Recently published ITRBs contain lists of so-called marker parameters (substances). For instance, the determination of emissions to water covers the measurement of single substances, as well as, largely, the measurement of sum parameters. Sum parameters can be characterised as quantitative surrogate parameters representing either a group of substances containing the same chemical element, such as Total Organic Carbon or Total Nitrogen, or showing similar characteristics, e.g. the oxidisability by dichromate in the case of the Chemical Oxygen Demand [11]. In any case, whatever you call parameters to be measured and reported, their selection should be delegated to technologists (and BAT experts) rather than environmental authorities. Environmental standards of water quality used in Russia are those set for fisheries. Strangely, any water body is considered to be that of the (potential) fishery use, and identical water quality standard are applied to fast and cold Siberian rivers and shallow southern lakes [12]. Official requirements are set for concentrations of such nutrients as iron (0.1 mg/l) and manganese (0.01mg/l). Industries using ground water from surface water bodies or aquifers reach in iron and manganese can never meet odd standards and have to pay pollution fees for peculiar properties of natural environments.

In the European Union, there is no environmental water quality standard for iron, while in the USA the standard is set at 1 mg/l. This example shows that it is necessary to re-consider environmental quality standards in Russia and to set them, first, at realistic and substantiated levels, and, second, for particular (but large) catchments and biogeochemical provinces. Regulation wise, Emission Limit Values should be set for iron only in those cases when it is emitted into wastewater due to specific technological processes.

In general, it is reasonable to divide substances (and parameters) to be monitored into three separate though interrelated groups. The first group should cover pollutants included

into self-monitoring programmes of IPPC installations as well as into the programmes of official inspections and checks. Such inspections often include sampling procedures and/or direct measurements made on the spot (in wastewater and sometimes in stack gases). Logically, the first group should be limited to marker parameters listed in respective ITRBs. The second group should contain contaminants included into the state environmental monitoring programmes (impact, regional and global ones). Concerning BATs and IEPs, the key issue is monitoring of environmental conditions near installations conducted by environmental authorities. The third group should cover greenhouse gases, emissions of most of which are calculated based on internationally recommended methods.

BEST AVAILABLE TECHNIQUES: MYTHS AND DELUSIONS

Despite the fact that BATs have been discussed in Russia since the 90s, both professional community and decision makers continue relying on myths and delusions speaking about future application of BAT concept in our country.

A simple word **best** appeared to be not that simple: it opens a window for various speculations. Synonyms and quasi-synonyms used in Russia include such adjectives as modern, perspective, innovative, advanced, effective, etc. It is true: EU Directives introduced BAT definition that means the most effective and advanced stage in the development of activities and their methods of operation [1, 6], but since 1996 everybody in the EU uses BAT abbreviation with regards to environmental protection and integrated environmental permitting. In Russia, BATs attract attention not because of the practical suitability of particular techniques for providing the basis for Emission Limit Values and other permit conditions, but as means to modernise the national economy. In the official acts BAT based regulation is called a process of 'surrendering outdated technologies'. Undeniably, stricter environmental requirements can foster technological and technical progress, but BAT concept serves the environment and aims to minimise negative impacts. Other results of its implementation can be important but should not receive priority attention.

Innovative and advanced are terms that are sometimes used to argue that BATs are no affordable for the industry. However, we should not forget about **available** techniques, those developed on a scale, which allows implementation in the relevant industrial sector, under economically and technically viable conditions. Natural Capital Management wise BATs are always beneficial [13]; moreover, BATs identified for Russian industries proved their economic applicability in Russia.

Import substitution (phase-out) is another delusion associated with BATs. Environmental conservation solutions should be international by their nature. Identifying BATs experts compare environmental performance and resource efficiency of various technological and technical solutions, not taking into consideration origins of companies manufacturing particular devices. Thinking of availability it is possible to suggest that Russian manufacturers could begin producing, at the initial stage, 'end-of-pipe' equipment and making it available (cost wise) on the national market. Again, quality and environmental performance issues should play the key role in identification of any equipment needed to prevent and, where that is not practicable, to reduce emissions and the impact on the environment as a whole [6]. Finally, Environmental and Energy Management Systems

are well-known and widely used BATs, while it is difficult to imagine that management systems can be used to phase-out import.

Environmental NGOs express their concerns and argue that strict environmental quality standards help minimising environmental impacts of Russian industries even though that Emission Limit Values are sometimes not feasible and operators are forced to pay high pollution fees or to prepare crafty reports. Some environmentalists say that turning to BAT based regulation would mean setting too soft conditions for industries and forgetting of environmental quality standard at all. This is nothing but a myth because where environmental quality standards require stricter conditions than those achievable by the use of the BAT, additional measures should be included in the permit, without prejudice to other measures which may be taken to comply with environmental quality standards [6]. We already mentioned that some environmental quality standards are not well substantiated and set at too low levels and this is a challenge for the harmonisation of environmental standards rather than a shortcoming of BAT based regulation.

BEST AVAILABLE TECHNIQUES AND INNOVATIONS

Innovation is a process of introduction of changes that are significant departures from the usual way of doing things. It can be also defined as a transformation of an idea into a novel product, operational process or new service. Innovation consists of all scientific, technological, commercial and financial steps necessary for the successful development and marketing of novel manufactured products, the commercial use of new or improved processes and equipment [14].

Environmental performance wise innovations emerge when significant decrease of emissions, improvement of resource efficiency and environmental performance. For older factories required to reach technological parameters set in ITBRs, BATs do represent innovations, while for newer installations BATs are nothing but realities. Coming back to import substitution one can say that new techniques (technologies and 'end-of-pipe' solutions) worked out in Russia can be regarded as innovative ones only if they possess technological parameters described in ITRBs as those corresponding with BATs. BATs are characterized by such aspects as (1) application of low waste processes, (2) substitution of hazardous substances by less hazardous ones, (3) optimal use of energy, water and raw materials, and (4) recycling approaches.

BAT based environmental regulation is a novel idea for the Russian Federation, and its transformation into the logical system is a valuable innovation itself. This is why, as far as environmental safety is concerned, BATs may well form a core element of the national innovation process.

BEST AVAILABLE TECHNIQUES AND ENVIRONMENTAL INSTITUTIONS

The presumption of environmental danger of any economic activity is typical of many legislative systems including that one of the Russian Federation. According to the current legislation, operators are obliged to prove that environmental performance of their installations prevents from forming conditions dangerous for human health and/or biota. Normally this is done during the Environmental Impact Assessment (EIA) process by which the anticipated effects on the environment of a proposed development or project are assessed. If the likely effects are unacceptable, design measures or other relevant mitigation measures can be taken to reduce or avoid those effects. In Russia, EIA includes evaluation of anticipated pollution levels (calculated using simple dispersion models).

Concentrations of key contaminants should not exceed respective environmental quality standards. Still, there can be neighbouring enterprises, highways and other impact sources contribution towards the overall pollution pattern. Again, as we already mentioned, Russian environmental quality standards quite often are too strict and even not realistic, while measurements made both by industries and authorities in many cases are accidental and do not provide for reliable data needed to make informed decisions.

To initiate the environmental reform and to motivate industries to follow BAT principles, it is necessary to identify responsibilities of operators and regulators. At the current stage, it is reasonable to require that installations must demonstrate that they comply with technological parameters, emission factors and BAT based Emission Limit Values. At the same time, the responsibility to assess environmental and public health risks should be delegated to environmental and sanitary (public health) authorities. Then these authorities would be responsible for the development of rationales to require that additional (to BAT) measures should be included in the permit to minimise hazards and comply with environmental quality standards.

CONCLUSION

Recently, in April 2016, the Ministry for Natural Resources and Environment published a draft list of 300 enterprises responsible for 60% of environmental emissions in Russia. All of them have to be granted Integrated Environmental Permits in the period of January 2019 – December 2022. It is a serious challenge because most operators and regulators at the regional level (in the Federation subject) do not realise what steps need to be taken. Some sectors believe that they should use two and a half years to oppose the reform and to be excluded from the list of IPPC installations (food and partially ceramic industry are two typical examples). Others aim to turn to BAT based regulation and hope that this will help to promote harmonization of Russian water quality standards with European ones (wastewater utilities lead in this field).

Russian environmental legislation is overcomplicated and contradictory, and while various stakeholders are eager to improve it, their objectives, experiences, responsibilities and methods differ, and it is difficult to imagine that a dramatic progress can be made very soon.

For a huge country, two years form just a short period during which only first steps of the environmental reform could be made. We do realise that it is far too early to make straightforward conclusions. Still, the progress assessed and challenges described suggest that there is an urgent need to develop a dialogue between regulators and regulated community. Strangely, in a number of economic sectors, industrialists are better prepared and stronger motivated to move to more transparent, realistic and effective policy and practice than environmental authorities themselves. It is utmost important to begin listening to each other, to look for mutual understanding and to start working together.

The environmental challenges in our country are many and interlinked. Safeguarding our natural resources and promoting sustainable development for ourselves, our children and future generations is an ambitious goal, and the environmental reform is a step we must make to reach this goal.

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