

CN275-81

## Public involvement in the discussion on nuclear energy, the environment and climate change: the case of the ROSATOM Public Council's project "Green Square"

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**Abstract.** The ability to build a dialogue with stakeholders in a way that broad and ambitious goals and objectives are perceived positively by the key stakeholders, mainly by public, is becoming an indicator of the professionalism – the competence of a business company. This is particularly relevant in the case of enterprise activities which impact the environment and implement knowledge-based, skill and technology intensive programs.

There is a case of creation and functioning of the ROSATOM Public Council to provide informal approach for organizing discussion between the Corporation and the public. In 2017 -2018 the ROSATOM Public Council initiated project "Green square" on forming public expert environmental community in the regions where major facilities of the ROSATOM are located.

Main topics for discussions were the following: Value of nuclear energy for overcoming ecological limitations of economic development and legislative aspects of nuclear energy development/ Potential of the development of the renewable sources of energy in the nuclear regions/ Environmental education projects to promote the subject of carbon-free energy (interactive educational games, quests, internet platforms, multimedia technologies) / Role of regional experts in their work with the media/ Public Perception study on nuclear and renewable energy and the concept of "Green square".

Creating the possibilities for the formation and self-development of concerned and skilled citizens, the ROSATOM Public Council facilitates building the qualified public dialogue on aspects of the development of nuclear technologies including their role in solving the problem of climate change.

**Introduction.** As is known, the ROSATOM is an extensive infrastructure industry which provides economic, energetic and technological needs for the State. Meanwhile, the ROSATOM's activity in working with one of the key stakeholders – public, including local community, has the significant importance for the industry.

This article is aimed at informing about one of the ROSATOM Public Council's activities of living informal cooperation with civil society directed at achievement of bilateral interests. The plans of national and international leadership in the sphere of knowledge-based nuclear technologies and sustainable development including global environmental concerns such as the problem of climate change require the harmonization with stakeholders and initiating dialogue. This dialogue is possible if the participants use proper terminology with the knowledge of technical and technological specifications of nuclear facilities and environmental impact. The dialogue can be realized on principles of openness, accessibility of information and respect to other people's opinions. Therefore, only trained representatives of stakeholders should engage in dialogue, since the level of the discussion goes beyond educational standards. That is why interested parties need active and qualified representatives, who can represent their views on complicated technical subjects and environmental problems.

**Methods.** The notion of public expert is widespread in the sphere of education. That is a representative of public organizations, civil institutions, state-community authorities at the regional and educational levels who is put forward as a participant of public (state-community) assessment of education and is certified [1].

In 2017 the ROSATOM Public Council initiated project on forming public expert environmental community in the regions where major industries of the ROSATOM are located. This work includes sensitivity training programs of stakeholders, developing guidance materials about the nuclear industry and current challenges, organization of lectures in regional universities and supplementary education establishments and so forth.

In the same year series of events were held dedicated to the participation of interested parties among students and professors in the dialogue and dissemination of thematic information at the territory of 8 regions – Krasnoyarsk, Kursk, Leningrad, Sverdlovsk, Tomsk and Chelyabinsk regions, Moscow and Saint-Petersburg.

Professors and students of universities, senior students and teachers of general and supplementary education had an opportunity to participate in the development of scientific and technical projects with the topic “Water and atom”, eco-games “Alternative atom” and preparation of presentations on diverse subjects by their choice: Atom and Renewables: Environmental aspects/ Future energy sources/ Role of the Russian nuclear energy in achieving the goals of United Nations Framework Convention on Climate Change / Nuclear medicine in at the service of oncology/ Appliance of the neutron activation scanning in security systems/ Nuclear power station as a pole of innovation-based growth in a region / Sources of the radio phobia of the residents / Why do I want to be a public expert? etc.

**As a result**, during the year 2017, in cooperation with 25 educational and public organizations, about 150 active citizens were involved in the outreach activities in the sphere of nuclear energy. They gave 35 public presentations in 8 regions for more than 1000 people. Interested regional representatives participated in annual reports “Public dialogue. The role and position of experts”, special sessions “Energy of the young people is the energy of the future” within public forum-dialogues which are held annually by the Public Council of the ROSATOM [2-4].

In 2018 the Public Council activity continued to sensitize interested members of the public about nuclear technologies and modern trends in energy development. 85 students, 3 grad students and 48 professors of fourteen universities and subject matter experts implemented 37 projects within the following major directions according to the specificity of the establishment: Value of nuclear energy for overcoming ecological limitations of economic development and legislative aspects of nuclear energy development; potential of the development of the renewable sources of energy in the regions (Sverdlovsk, Tomsk, Leningrad, Chelyabinsk and Krasnoyarsk regions, Arctic Russia); Environmental education projects to promote the subject of carbon-free energy (interactive educational games, quests, internet platforms, multimedia technologies); Role of regional experts in their work with the media; Public Perception study on nuclear and renewable energy and the concept of “Green square”.

One of the experts demonstrated that changes in energetic support and the amount of greenhouse gases emissions on the way to the post-industrial period are evident in the distribution of static indicators which depend on the level of GDP per capita [5]. The twofold reduction of the amount of the greenhouse gases emissions per capita, calculated on the basis of climate indicators for the period before the middle of the 21st century, is achieved through the transformation of the global energy mix into the following format: - 40 % traditional power generating system is based on the energy commodities consisting of the hydrocarbon deposits; - 40 % the framework of basic

compounds of nuclear energy; - 20 % solar, wind RE, small hydropower plants, covering local and case-by-case energy supply.

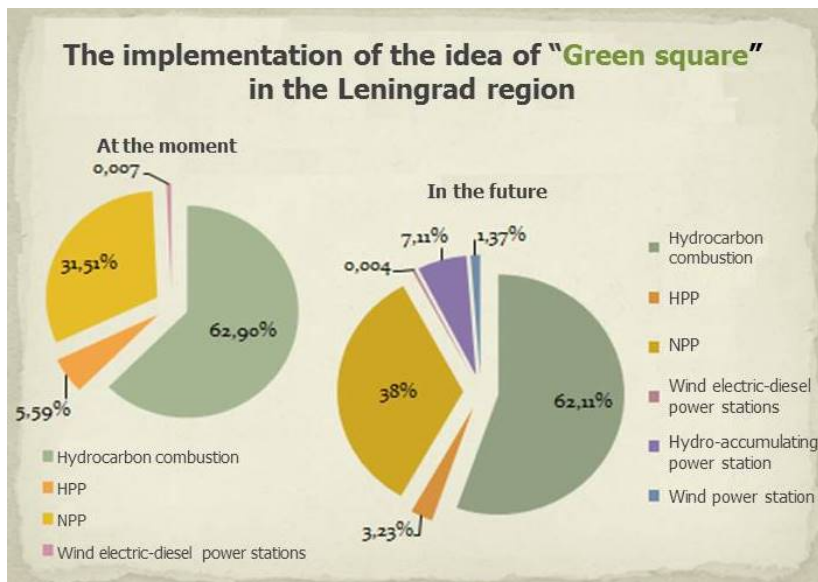
According to students and professors of RANEPA, while implementing development strategies for types of energy without emissions it is important to follow the procedure of the full cycle of the development and adoption decision until the moment of its realization with the public involvement [6]:

**From planning to implementation**



Pic.1.

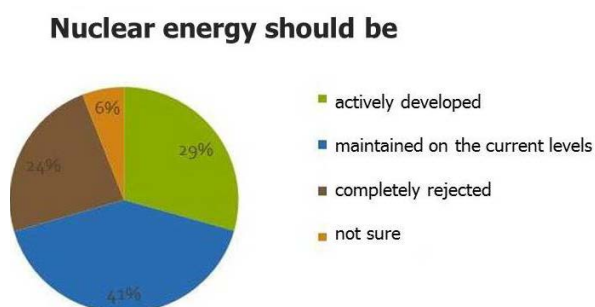
In terms of transition to carbon-free energy sources in the regions, students of the Saint Petersburg Mining University can observe the following perspectives:



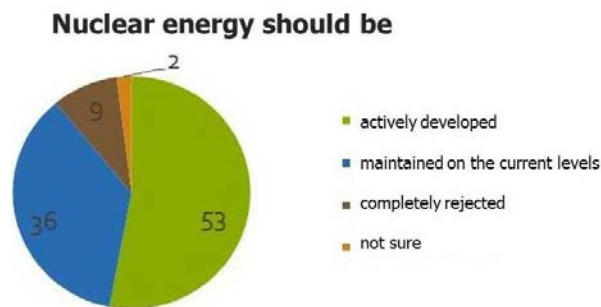
Pic. 2.

In doing so, many experts monitor the increasing of the capacity of all generating types, which ultimately will lead to the changes in the countries and territories' energy matrix. Meanwhile, according to the surveys made by the participants of the "Green square" project, the majority of the population realizes the harm produced by the sources of electrical power based on the hydrocarbon combustion and wants to have renewable sources of energy in their localities.

Another important aspect which drew participants' attention was the informational and educational one. Sociological studies were conducted as a part of the project in the South-West State University to identify the students' knowledge of nuclear energy safety. The diagram with the large sample of responses is represented below.



Pic.3. Results of the first testing



Pic.4. Results of the control testing

The results of the first testing became the basis for the development of lecture materials and the mind game "Clear energy", and after their realization the second testing was made (picture 5).

**Conclusion.** Science education and environmental education become not only the way to form ecological culture, fight against radio phobia and lack of nuclear education, but it's also a means to increase public awareness in the area of nuclear energy in general.

The participants of the project, who have chosen for elaborating the topic of the promotion of nuclear science and technology in the media, consider that it is necessary to find words speaking about nuclear technologies and carbon-free energy development that would be well understood by the public. The key factors in expansion of public dialogue, which contributes to the achievement of interests of the stakeholders involved, are seen as the involvement of talented students, training of the staff and promotion/realization of ambitious goals and programs of the corporation and other large companies through the critically important areas for the society where new power-generating and other contemporary technologies can be implemented.

Creating the possibilities for the formation and self-development of concerned and skilled citizens, the ROSATOM Public Council facilitates building the qualified public dialogue on aspects of the development of nuclear technologies including their role in solving the problem of climate change.

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