

УДК 327.8

PROSPECTS OF NUCLEAR ENERGY COOPERATION IN EUROPEAN UNION.

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All decisions in nuclear industry always crossed with political issues. Because it is initial to government politics to save their own state in peace, stability without any threats or disaster to environment. In the EU, to take decision to use nuclear power or not is the prerogative of the Member States. Fourteen out of twenty-seven European countries have nuclear power plants in operation. There are member states such as Belgium, Finland, France, Spain, Netherlands, Czech Republic, Germany, Hungary, Romania, Slovakia, Bulgaria, Slovenia, Sweden, and the United Kingdom. Today there are more than 140 power reactors producing more than twenty-five percent of all the EU electricity [1].

The main nuclear industry contributions to EU energy objectives:

- Different energy options,
- decreasing CO₂ pollutions,
- providing security of energy supply,
- achieving sustainable development and creating work places.

The need for energy supply is growing at EU level and nuclear power will remain a significant source of electricity generation over the next twenty – thirty years. Safe operation of existing and future nuclear power plants is a key goal to provide electricity to all regions.

Cooperation between Europe and third countries operates different from other levels. The European Atomic Energy Community (hereinafter as Euratom or EAEC) was established by one of the Treaties of Rome in 1958 to develop the peaceful uses of atomic energy [2]. It initially comprised France, Belgium, Luxembourg, Italy, Germany, and The Netherlands at a time when energy security was a prime concern after World War Second. The Treaty originally considered common EU ownership of nuclear materials. First, it was political decision. EU should to counter to United States (hereinafter as US) dominance and cooperate with the US by providing guarantees of peaceful use, being the basis of the first multilateral safeguards system preceding the Nuclear Non-Proliferation Treaty (hereinafter as NPT). Now it includes all European Union members, but in reality, it is legally separate from the EU.

Europe was enthusiastic about nuclear energy. The Euratom Treaty provided a stable legal structure that encouraged the growth and development of the nuclear industry while depreciating

security of fuel supply and safety. It covers all civil nuclear activities in the Europe and aims to provide a common market in nuclear materials, to ensure transparency and to guarantee that nuclear materials are not diverted from peaceful purpose.

Euratom has signed bilateral agreements to ease trade with its major partners. It also operates regional system of safeguards designed to provide that materials declared for peaceful use are not diverted to military use. Today Euratom has own rights and participate as a member of the Generation IV International Forum. It has remained substantially unchanged and is exceptionally independent of EU parliament's control; however, that was criticized many times. Euratom funding was 118 million euros for fission research including radiation protection and 233 million euros for nuclear research at the European Comissions Joint Research Centre, as well as over 2.2 billion euros for International Thermonuclear Experimental Reactor fusion project only for 2012-2013.

Euratom reports annually on Europe nuclear matters, especially uranium supply in the world. We all know how the uranium market was profitable last years. However, after Fukushima disaster the all industry became in downward trend. This tendency has affect to the EU and it increase post-Fukushima mood in states of EU. That means all people including government sector were concerning about security and safety of their power plants. The uranium market was falling down.

According to the UxC nuclear industry market research, the price of uranium oxide concentrates has fluctuated from 24 to 28 US dollars per pound now [3]. While before the accident, it was more than 100 US dollars per pound. However, it is a good time for nuclear plants because the small prices to uranium products help to product more cheap energy. Many countries struggle with supply and demand indicators. Even the biggest companies such as " Cameco " JSC (Canada) and " Kazatomprom " JSC (Kazakhstan) in the uranium mining industry announced about reducing for 20 percent the overall uranium production for 2017-2020. They want to affect and control the uranium price market. Of course, it is a long-term process. Thus, EU has a great time for develop their collaboration inside and outside the union and choose priorities of cooperation in nuclear energy industry before the price is suitable to power plants.

The European Nuclear Education Network is a program, which promotes educational and research collaboration across European countries for EU and non-EU students all over the world. Students can earn credits in a nuclear discipline outside of their homeland to gain the post-graduate diploma of the European Master of Science in Nuclear Engineering. The Universities of UK, France, Switzerland helped define the mission of the European Sustainable Nuclear Energy Technology which was launched in 2007 and aims to maintain its educational links with the rest of Europe.

Twelve European countries joined to promote the role of nuclear energy in the EU's energy mix in March 2013. The states that signed the agreement are the France, the Netherlands, UK, Czech Republic, Bulgaria, Finland, Poland, Hungary, Lithuania, Romania, Slovakia and Spain. The coordinating country of this group is Czech Republic. A joint statement was written to commit with collaboration on safety and creating great opportunity for investors in decreasing low-carbon infrastructure projects. They focused to press ahead with the low-carbon technologies, including nuclear power plants and renewable energy.

In 1991 NE (Nuclear Electric) from UK, EDF (Electricite de France) from France, UNESA (private company of Spanish Electricity Association) from Spain, Vereinigung Deutscher Elektrizitätswerke from Germany and Tractebel from Belgium started a collaboration to produce standardized European Utility Requirements (hereinafter as EUR) for light water reactors. The EUR organization today includes 17 European utilities that might build new Generation III plants which has additional defense and double walls in the future.

Energy co-operation and integration of energy networks is developing rapidly, not only between East and West Europe, moreover, with other border countries. By the way, *Nuclear energy* and *carbon markets* have never been part of Europe-Turkey bilateral cooperation. Euratom could, with its well-established framework, provide Turkey with great support and opportunity for the implementation nuclear energy plans. This would be positive for both Turkey and the EU in

terms of regional nuclear safety. The EU can make a contribution to the establishment of a nuclear energy sector in Turkey. This can notably be completed by integrating Turkey into the framework of Euratom.

The cooperation between EU and Iran are optimistic after US leave from Joint Comprehensive Plan of Action (hereinafter as JCPOA), also well known as “Iran Nuclear Deal”[4]. JCPOA is the product of more than a decade of negotiation. The Western countries worried about nuclear proliferation risk in Iran’s extension program. The huge trouble for Europe, there was a possibility that the US, Israel, or both would launch military attacks. It has increased the risk of a nuclear arms race in the region. Escalation of the current instability could eventually directly impact the Europe. Therefore, EU should to avoid misunderstandings and collaborate more closely with Iran in nuclear deals.

The EU currently faces many internal challenges, such as Brexit, migration crisis, and depreciation from its core democratic values by some member states. For example, in case of Brexit, UK will quit from Euroatom and lunch to create own concept of nuclear energy priorities and policy. That means EU should decide new cooperation with UK in future. Also, Switzerland and Germany have anti- nuclear sentiments and fierce. The government of both countries shut down the several nuclear and coal plants and furthermore, they strongly believe that renewable resources able to compensate much of losses. Despite this, to close all nuclear energy reactors seems to be difficult and will cost higher than expected. Actually, these plans can be considered medium-term goals because of impossible closure in short-term goals. Fossil fuel prices and technology are still cheaper, easier and efficient than solar and wind power generation. International Atomic Energy Agency (hereinafter as IAEA) will struggle with that and eventually, renewable energy will be more affordable for all states all over the world.

Nuclear energy issue has an important role not only in EU, but also in a whole world. This area of interest is crucial for governments in terms of security, non-proliferation and safety. Viable standards of life must be defended and highly regulated by them. Spread nuclear weapons is sufficient threat to the region. It is impossible to separate politics from nuclear energy industry. Firstly, all member states were enthusiastic about nuclear energy plants and generations. Nevertheless, after Japanese Fukushima nuclear disaster, some European energy officials to re-think about nuclear power generation. As it was mentioned above, some of countries lunch to shut down the the old nuclear plants. In the same time, it is inevitable to diversify the economics, to low carbon emissions and create more work places. Cooperation in this term, using uranium products and building new nuclear generations for using in peaceful purposes must be go ahead in optimistic way. All agreements must consist needed clauses of security, environmental friendly technology and social impacts. Euratom has a key role in supervising the common market of nuclear energy. Together with European commission, European parliament and IAEA, EU representatives should demonstrate and intensify transparency in potentially jeopardy zones to reduce the misperception on nuclear deals. Systematically, cooperation in EU should be through regional work, negotiations, discussions platform to strengthen the nuclear safety and security.

Literature

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