IUEC - the only realized project in the world which guarantees to any country willing to develop nuclear power generation an equal access to services in the uranium enrichment.
Multilateral Nuclear Approaches to the NFC
International Uranium Enrichment Centre as an example of cooperation

Gleb Efremov
Director General
International Uranium Enrichment Centre

MGIMO University
October 09, 2019
Increase in global energy consumption goes on

Global Energy Consumption 1965-2013

Energy Matters
euanmearns.com
BP 2014 data

- Biofuels
- Geothermal & biomass
- Solar
- Wind
- Hydro
- Nuclear
- Coal
- Gas
- Oil
Main factors affecting global energy production growth
Which way to choose?
In the middle-term perspective possible increase in nuclear energy generation is expectable. Due to the IAEA forecast a demand could grow from current 391 GWt up to 874 GWt in 2050.
Prerequisites for Multilateral Nuclear Approaches

As a result, some States, especially nuclear newcomers, could pursue nuclear technologies, including sensitive, which can be used to produce nuclear materials directly usable in nuclear weapons.

Any NPP operator, if it doesn’t have respective technologies and capacities to produce the nuclear fuel, should be confident that fuel supplies are secured throughout its NPP’ operation period.

MGIMO University
October 09, 2019
An access to sensitive NFC technologies is an easily legal way in obtaining materials for nuclear weapons production.
Treaty on the Non-Proliferation of Nuclear Weapons (NPT)

*Article I:* Each nuclear-weapons state (NWS) undertakes not to transfer, to any recipient, nuclear weapons, or other nuclear explosive devices, and not to assist any non-nuclear weapon state to manufacture or acquire such weapons or devices.

*Article II:* Each non-NWS party undertakes not to receive, from any source, nuclear weapons, or other nuclear explosive devices; not to manufacture or acquire such weapons or devices; and not to receive any assistance in their manufacture.

*Article III:* Each non-NWS party undertakes to conclude an agreement with the IAEA for the application of its safeguards to all nuclear material in all of the state's peaceful nuclear activities and to prevent diversion of such material to nuclear weapons or other nuclear explosive devices.

*Article IV:* 1. Nothing in this Treaty shall be interpreted as affecting the inalienable right of all the Parties to the Treaty to develop research, production and use of nuclear energy for peaceful purposes without discrimination and in conformity with Articles I and II of this Treaty.
North Korea conducted its first nuclear test
Multilateral Approaches for the fuel cycle are seen as a potentially important way to create an industrial infrastructure that will support development of nuclear generation and at the same time not contribute to the risk of nuclear proliferation.

“When we say “multilateral approaches to the nuclear fuel cycle” in the realm of nuclear power, this is a correct, yet an abstract notion.” said PIR Center Founder, Dr. Vladimir Orlov during his visit to Angarsk on July 5, 2017.

Multilateral Nuclear Approaches

Institutional systems for nuclear non-proliferation and nuclear security

- Treaty on the Non-Proliferation of Nuclear Weapons (NPT)
- IAEA Comprehensive Safeguards Agreement (Obligatory based on Article 3 of NPT)
- IAEA Additional Protocol
- Partial Test Ban Treaty (PTBT)
- Convention on Physical Protection of Nuclear Material
- Treaty of Nuclear Terrorism Prevention
- Nuclear-Weapon-Free Zone Treaty

Comprehensive Test Ban Treaty (CTBT) still not enforced

Supply-side approach (Non-proliferation according to conditions set by the supplying countries)

- Nuclear Supplies Group (NSG): Out of Scope of NPT
- London Guideline
- Nuclear related Dual-use equipment, material, software and related technology
- Zangger Committee
- Nuclear exclusive goods

Demand-side approach (Measures to reduce incentives on the side of receiving countries)

- Measures for enhancement of non-proliferation by bilateral agreements
- Multilateral Nuclear Approach including fuel supply guarantee (MNA)

Other international agreements/cooperation

- PSI, GTRI, UN Security Council Resolution 1540, etc.
The initiative of the President of the Russian Federation was voiced at the EurAsEC Summit (25 January 2006, St. Petersburg) «We need to create the prototype of a global infrastructure that will give all interested countries equal access to nuclear energy… The key element of such an infrastructure should be an international centers network under the IAEA control for the provision of nuclear cycle services, including uranium enrichment».

**Objectives of the initiative**

- To increase the role of nuclear power in ensuring the global energy security;
- To develop the global nuclear energy infrastructure via the establishment of an international NFC centers network;
- To provide the non-discriminatory and guaranteed access to NFC products and services for states that are developing nuclear power;
- To reduce the threat of nuclear proliferation.
Establishment of IUEC

In accordance with the Intergovernmental Agreement from 10.05.2007 the authorized organizations of the Russian Federation (JSC «Techsnabexport») and the Republic of Kazakhstan (JSC NAC «Kazatomprom») founded the International Uranium Enrichment Centre (IUEC).

On September 05, 2007, the IUEC was established in the form of an Open joint-stock company, which provides:

- IUEC’s financial independence from the state budgets of the countries-participants;
- shareholders rights to participate in the management of the IUEC.

Main activities according to the IUEC’s Articles of association:

- supplying uranium enrichment services at market prices;
- export, import and other transactions pursuant to applicable laws, agreements and contracts signed by the Company including exports and imports of nuclear and radioactive materials.

Main purpose of the IUEC - to secure supplies primarily (but non-exclusively) for institutional participants of the IUEC from the states meeting terms and conditions of the Agreement.
IUEC current corporate structure

2007: set up of Russia-Kazakhstan venture
2010: ascension of Ukraine
2012: ascension of Armenia

- Russian Federation
  - ROSATOM: 50% + 1
- Shares for new IUEC members: 20% - 1
- Republic of Kazakhstan
  - NAC Kazatomprom: 10%
- Ukraine
  - State Concern Nuclear Fuel: 10%
- Republic of Armenia
  - Armenian NPP company: 10%
  - Armenian NPP company: 10%
The IUEC is an international institution established inter alia in consultations with the IAEA and for the benefits of its Member-States as it is reflected in its founding documents. The Agency participates as an observer in the work of the IUEC Joint Consultation Commission possessing a deliberative vote.
Participation conditions

- Compliance with the obligations provided by the international nuclear weapons non-proliferation regime (Agreement*, preamble; JSC «IUEC» Articles of association, article 1.1)

- Intention of the IUEC participant to develop nuclear power (Agreement, preamble), existing or perspective needs in EUP for their own nuclear power plants, which will be covered by the IUEC deliveries

- Cooperation of the IUEC member-state with the IAEA (Agreement, article 8)

- Use of the enriched uranium produced by the IUEC and exported from the Russian Federation for fuel fabrication (powders, pellets, fuel assemblies) for nuclear power generation (Agreement, article 5)

- Access to the IUEC capacities primarily (but non-exclusively) for institutional participants from the states which do not develop national uranium enrichment facilities on their territories (Agreement, article 3)

* intergovernmental Agreement on the IUEC establishment
Advantages for IUEC shareholders

Participation in IUEC provides to shareholders:

<table>
<thead>
<tr>
<th>Advantage</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Increase of power production security</td>
<td>Increase of power production security through the guaranteed EUP/SWU supplies at market prices (the Russian Federation Government guarantees set forth by intergovernmental Agreement)</td>
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<tr>
<td>Assured access to uranium enrichment</td>
<td>Assured access to uranium enrichment for the purpose of providing uranium enrichment services to fabricate fuel (e.g. powder, pellets, fuel assemblies) used for nuclear energy generation.</td>
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<tr>
<td>Availability to ensure supply</td>
<td>Availability to ensure supply by using the enrichment capacities of all Russian facilities.</td>
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<tr>
<td>All rights as shareholder</td>
<td>All rights as shareholder according to the Russian law.</td>
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<tr>
<td>Participation in the strengthening of international non-proliferation</td>
<td>Participation in the strengthening of international non-proliferation regime.</td>
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</table>

The current contribution to the IUEC stock capital is negligible:

- 10 % of shares cost 2 600 000 RUR (as of today = 44 581 USD)
## Rights of Shareholders

<table>
<thead>
<tr>
<th>Rights of Shareholders</th>
<th>1 share</th>
<th>1%</th>
<th>2%</th>
<th>10%</th>
<th>25%+1</th>
<th>30%+1</th>
<th>50%+1</th>
<th>75%+1</th>
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<tbody>
<tr>
<td>Voting authority at the General Shareholders’ Meeting</td>
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<td>Dividends right</td>
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<td>A part of companies value to be held in case of the liquidation of the company</td>
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<td>The right to demand buy-back of shares under certain conditions</td>
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<td>Access to the information available in the register of shareholders</td>
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<td>Recourse to the court against the member of the Board of Directors</td>
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<td>Introduction 2 proposals on the agenda of the General Shareholders’ Meeting</td>
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<td>Right to nominate candidates to the Board of Directors, to the Audit Commission of the IUEC, as the sole executive body</td>
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<td>Right to seek convening of the extraordinary General Shareholders’ Meeting</td>
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<td>Access to the list of participants of the General Shareholders’ Meeting</td>
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<td>Right to seek inspection of the IUEC’s financial and business operations by the Audit Commission</td>
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<td>Blocking solutions general meeting of shareholders on the reorganization of the company, offering making changes and additions to the Article of Association</td>
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<td>Right to seek convening of the General Shareholders’ Meeting (repeatedly)</td>
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<td>The holding of a General Shareholders’ Meeting</td>
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<td>The decision at a General Shareholders’ Meeting (except for issues that require a qualified majority)</td>
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<td>Solutions on all matters of a General Shareholders’ Meeting except for the reorganization of society</td>
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Procedure of the IUEC new member entry

I. Signing by the government of the new member-state separate agreements with the governments of the existing member-states of the IUEC in which the authorized IUEC shareholder-organization from the new member-state is defined (validity of the Agreement is 10 years from the time of signing, the Agreement is extended tacitly every ten-year period in the absence of the Parties’ objections).

II. Approval of the transaction by the Governmental commission on foreign investments control in the Russian Federation, headed by the Head of the Government of the Russian Federation in pursuance of the Federal law dated 29.04.2008 No. 57-FZ “On the procedure of foreign investments into legal entities of strategic importance to ensure the defense and security of the state”.

III. Approval of the transaction by the President of the Russian Federation in pursuance of the Federal law dated 05.02.2007 No. 13-FZ “On specifics of management and disposition of the property and assets of organizations that operate in the field of nuclear energy use”.

IV. Execution of corporate procedures to obtain the block of IUEC shares from the Russian share by the authorized shareholder-organization of the new member-state.

Upon entry - holding the General meeting of shareholders to introduce changes into the Board of Directors’ structure:

1. Change (if required) of the number of Board Directors (currently – 7 members).
2. Election of the new shareholder’s representative to the Board of Directors.
Key activity areas

- Guaranteed reserve of LEU
- Guaranteed supplies
Guaranteed supplies for shareholders

Long-term agreements to supplies IUEC products provide the possibility of using the pricing model calculated on the basis of spot market quotations. Discounts, established in each individual case depending of transaction details, the main ones are: volume of product supplies, period of validity of the agreement, the marketing of products, payment terms.
Cooperation with Ukrainian stakeholder

Basic long-term agreement was signed in 2012, prolonged in 2017 (for the next 3 years)

Annual supplies for Ukrainian NPPs started in 2012, volume of supplies 60 000 SWUs

Total trade turnover estimates $ 40 000 000

The model involves Ukrainian natural uranium (appx. 90 tons per year), its reprocessing and enrichment at the IUEC and fuel fabrication at TVEL
Guaranteed Physical Reserve of LEU in Angarsk

Guaranteed reserve of low enriched uranium (LEU) in Angarsk is a secure supplies mechanism for the IAEA Member States in the case of an emergency.

- The Fuel bank consists of more than 120 tU of LEU in the form of UF6 with an enrichment of 2.00% to 4.95%.
- The Reserve has been established and is maintained at the expense of the Russian Federation.
- The Reserve is maintained at the IUEC facility being under the IAEA safeguards.
- The decision to release the material from the LEU Reserve is made by the IAEA Director General.
- The price of LEU from the reserve is based on spot market quotations published by internationally recognized companies.
- The IUEC provides for the LEU Reserve storage, maintenance and sales of LEU to the IAEA from the Reserve.
Guaranteed physical reserve of LEU in Angarsk

1. Agreement between Russia and the IAEA about Establishment of a Reserve of LEU for the Supply of LEU to the IAEA for its Member States

2. Manufacture of LEU Reserve by Russian Enrichment Plants

3. Request to the IAEA DG from a State-Customer for LEU delivery

4. Agreement between the IAEA and a State-customer for LEU delivery (Model agreement)

5. Commercial Contract The IAEA – Customer

6. Notification of the IAEA DG to deliver LEU to a State-Customer

7. LEU Delivery in the framework of Commercial Contract (JSC “IUEC”, the IAEA)

8. Transfer of LEU ownership from RF to the IAEA

9. Transfer of LEU ownership from the IAEA to a Customer

10. LEU Transfer to a Customer through the IAEA

1. Commercial Contract JSC “IUEC”, the IAEA

The IAEA

The JSC “IUEC”

Reserve of Low Enriched Uranium (property of RF)

The Government of the Russian Federation

The State Corporation “Rosatom”

Energy Company - Customer – LEU Customer

October 09, 2019
Guaranteed physical reserve of LEU in Angarsk

On March 29th, 2010 in Vienna the IAEA Director General Yukiya Amano and General Director of the State Corporation “RosAtom” Sergey Kirienko signed the Agreement between the Government of the Russian Federation and the International Atomic Energy Agency regarding the establishment on the territory of the Russian Federation of a physical reserve of low enriched uranium and the supply of low enriched uranium therefrom to the International Atomic Energy Agency for its member states.
On March 29th, 2010 in Vienna the IAEA Director General Yukiya Amano and General Director of the International Uranium Enrichment Centre (IUEC) Alexey Lebedev signed the Contract between the International Atomic Energy Agency and the International Uranium Enrichment Centre regarding the implementation of certain of the technical and commercial aspects of the Agreement between the Government of the Russian Federation and the International Atomic Energy Agency regarding the establishment on the territory of the Russian Federation of a physical reserve of low enriched uranium and the supply of low enriched uranium therefrom to the International Atomic Energy Agency for its member states.
Guaranteed physical reserve of LEU in Angarsk

On November 25th, 2010 the Reserve with the amount of more than 120tU of LEU, as defined by the Agreement, was located at the IUEC storage facility under the IAEA safeguards.
In the process of establishing the guaranteed physical reserve of LEU in Angarsk, IAEA and Russian experts developed on the basis of the Russian export control legislation a scheme that allows for the transfer of the LEU which is free of the national flag.
Guaranteed physical reserve of LEU in Angarsk

On December 17th, 2010 the first PIV inspection was performed by the IAEA at the IUEC storage facility. The IAEA inspectors checked the existence of the nuclear material and sealed containers.
Guaranteed physical reserve of LEU in Angarsk

On December 17th 2010 upon the completion of the IAEA safeguards inspection procedure, the inauguration ceremony of the LEU Fuel Bank was held. During the ceremony the representative of the IAEA delivered a welcoming address on behalf of Yukiya Amano, the IAEA Director General:

«...I am pleased that with 120 tonnes of LEU in the Reserve, whose costs are funded by the Russian Federation, it is now fully stocked at the IUEC under the IAEA safeguards. This week, the IAEA inspectors completed their first inspection of the LEU Reserve, which constitutes now a part of the existing mechanism of assurances of supply of LEU for nuclear power generation...»
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Thank you!