Nuclear pathway to the decarbonized sustainable future

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Nuclear gives green light to the countries’ economic boost and social development

ECONOMIC DEVELOPMENT AND HIGHER LIVING STANDARDS

LOCAL SUPPLIERS
REVENUES

ENERGY ACCESS

JOBS CREATION

R&D DEVELOPMENT

COSTS OPTIMIZATION

ENVIRONMENTAL PROTECTION

economic GROWTH

higher LIVING STANDARDS

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Nuclear Is…
Benefits for Local Economies

THE CONSTRUCTION OF THE NPP WILL RESULT IN COMPREHENSIVE SPILLOVER EFFECTS FOR THE NATIONAL DEVELOPMENT

PUBLIC INCOME

• New taxes from local and foreign suppliers, from electricity sales
• Increasing the region’s investment attractiveness

ENERGY SECTOR

• Stable power supply for local industry and household needs
• Reducing electricity prices in the region

EMPLOYMENT

• Up to 10 000 employed for the development of nuclear infrastructure
• Up to 3 000 new jobs created to operate NPP

NATIONAL DEVELOPMENT

• Developing local higher education and upgrading local labour force skills;
• Facilitating high-tech industries development

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Nuclear Is…
Multiplier Effect on National Economy

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USD 1.9
local industry income

USD 4.3
GDP growth

USD 1.4
extra taxes inflow

USD 1
invested

2 VVER-1200

Construction
20-30% localization

Operation
Nuclear is key element of decarbonizing electricity

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>CO2 Emissions (kg per MW*h)</th>
<th>Indirect Emissions</th>
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<tbody>
<tr>
<td>COAL</td>
<td>820</td>
<td>792</td>
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<tr>
<td>DIESEL</td>
<td>792</td>
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<td>GAS CC</td>
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<td>SOLAR PV - UTILITY</td>
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<td>11</td>
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<td>WIND ONSHORE</td>
<td>11</td>
<td>12</td>
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</table>

* Studies including IPCC

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Nuclear technology opens the way to innovations

NUCLEAR TECHNOLOGY

- NPP construction
- Research and development
- Environmental protection
- Heavy industry
- New materials
- Food irradiation
- Nuclear medicine
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**ROSATOM: keeping the pace**

14 NPP UNITS were commissioned by Rosatom over the last 12 YEARS

*Russia Leningrad NPP* Unit: I (2018) VVER-1200


*India Kudankulam NPP* Unit: I (2013), II (2016) VVER-1000

*Russia Beloyarsk NPP* Unit: IV (2015) BN-800

*Iran Bushehr NPP* Unit: I (2011) VVER-1000

*Russia Novovoronezh NPP-2* Unit: I (2016) VVER-1200

*China Tianwan NPP* Unit: I (2006), II (2007) VVER-1000

*Russia Kalinin NPP* Unit: IV (2011) VVER-1000

*China Tianwan NPP* Unit: III (2017), IV (2018) VVER-1000

*Russia Kalinin NPP* Unit: IV (2011) VVER-1000

*China Tianwan NPP* Unit: III (2017), IV (2018) VVER-1000

*Russia Kalinin NPP* Unit: IV (2011) VVER-1000

*China Tianwan NPP* Unit: III (2017), IV (2018) VVER-1000
Stable Generation and Sustainable ENERGY Mix

SPECIFIC CONDITIONS BRING DEMAND FOR...

GEOGRAPHIC CONDITIONS:
- Remote areas
- Limited territories

TRANSPORTABILITY & FLEXIBLE PLACEMENT

INFRASTRUCTURE CONDITIONS:
- Undeveloped power grids
- Energy storage is onerously expensive

PLUG-AND-PLAY GRID CONNECTION

MARKET CONDITIONS:
- Energy price volatility
- Fuel dependency

COSTS PREDICTABILITY

EXCESSIVE FOCUS ON RENEWABLES:
- Climate conditions
- Energy intensive industries

STABLE GENERATION

SMRs ARE THE BEST SOLUTION

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LATIN AMERICA: ROSATOM PRESENCE AND EXPERTISE

MEXICO
Today Rosatom satisfies 100% of the Mexican NPPs’ demand in enriched uranium

BOLIVIA
- Contract for design, supply, and construction of a Center for Nuclear Science and Technology in the Plurinational state of Bolivia (2017)

CHILE
- Memorandum of understanding to promote cooperation in the nuclear and lithium sphere signed
- Memorandum of cooperation in personnel training signed

ARGENTINA
- Intergovernmental agreement on peaceful uses of nuclear energy (signed in 2014) serves as a foundation for cooperation
- Two-year contract for the weekly supplies of molybdenum-99 to Argentina (2018)
- Rosatom fuel company TVEL implemented a number of nuclear fuel cycle projects with Argentinian companies
- Strategic document confirming partnership in the peaceful use of nuclear energy signed (2018)

BRAZIL
- Rosatom is the largest supplier of isotopes for Brazil’s needs (primarily I-131 and Mo-99)
- In 2017 and 2018 Uranium One, Rosatom’s ore mining division, won tenders for uranium production supplies to Brazilian NPPs
- Project Development Agreement for the joint implementation and operation of Irradiation Center
- Potential strategic partnership with Eletronuclear in NPP construction

PARAGUAY
An intergovernmental partnership agreement on peaceful use of nuclear energy was signed (2017)

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Opportunities for partnerships and cooperation

STRONG COLLABORATION IS A KEY DRIVER FOR US TO MOVE TOWARDS THE BETTER FUTURE TOGETHER
THANK YOU FOR YOUR ATTENTION