Perspective areas of cooperation with Latin American countries

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ROSATOM: More Than a Corporation

- **№ 1** in uranium enrichment
- **№ 1** in new NPPs construction abroad
- **№ 2** in uranium reserves, incl. Rosatom foreign assets
- **№ 1** in power generation in Russia
- **№ 2** nuclear fleet globally with **28,3 GWe** total installed capacity
- Projects in over **40** countries on **5** continents
- Over **260 000** employees in Rosatom enterprises and R&D institutions
- The world’s only company of the complete nuclear power cycle.
Possible areas for Latin America regional nuclear cooperation

- Nuclear fuel cycle
- Nuclear Medicine (Isotopes)
- Equipment Manufacturing
- Nuclear development and research centers
- Gamma Irradiation
- NPP Construction, Operation, Maintenance, Power Generation

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Rosatom Integrated Offer

Rosatom integrated offer supports national nuclear programme development on the intergovernmental level from policy adoption to the reactor decommissioning.

Integrated Offer:
- Infrastructure Solution
- PR Solution
- Industrial Solution
- Nuclear facility
- Operation & Maintenance
- Back End
- Staff Training

Nuclear Facility Project
- Decision announcement
- IGA on peaceful use of nuclear energy
- Final decision on nuclear facility construction
- Nuclear facility construction launch
- Commissioning
- Decommissioning

Essential services
Optional services

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Rosatom contributes to infrastructure development and supports customers throughout the whole national nuclear energy programme.

**Rosatom Complex Approach to Infrastructure Development**

- **NPP Site**
  - Emergency management system
- **Material infrastructure**
- **Grid assessment**
- **Operation safety and nuclear waste treatment**
- **Technological safety elaboration**
- **Manufacturing capacities development, local industry involvement**
- **GOVERNMENTAL SUPPORT**
  - Financial scheme elaboration
  - Stakeholders involvement and public opinion addressing
- **Nuclear infrastructure staff training (NEPIO, Regulator et.c.)**
- **National position and nuclear planning**
- **Nuclear legislation**
- **Nuclear authorities establishment**
- **Regulation**
  - IAEA safeguards, nuclear safety, nuclear materials control and accounting

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Regional balance

Even with conservative hypothesis the regional balance will be of overall deficit starting 2024 – increasing of renewables will not fill in the gap and additional baseload will be needed

Assumptions

- Growth rate of demand was estimated between 1.5% and 3% for all countries*
- Fase out of old blocks was delayed for 20/30% of the Nominal capacity
- Giving the low installed capacity and demand – Paraguay was not considered in the analysis (the large hydro capacity installed will fill in the demand need without problems)
- Additional interconnection capacity will be needed in case of shared project between countries (the time to the deficit ensure that additional capacity can be built)

At 2030 there will be ~ 8 GW of deficit: Argentina ~1,2 GW, Brasil with ~3.6 GW and Chile with ~ 2.5 GW.
New Hydro projects could help to fill the gap but will not be enough anyway and the growth renewables should be pair with stable generation capacity

* www.cndc.bo; www.centralenergia.cl; Departamento de Potencia del de Ingeniería Eléctrica (Uruguay); Enerdata; www.adeera.com

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The current price in Latin America indicated that – despite large hydro – will be economically viable to add Nuclear baseload

Success of the ITAIPU and Yacyretá hydro plants (share capacity and investment) shows that this type of projects can be realized – this imply probably a lower LCOE needed for the NPP and will help decrease the average price in the region

* Climatescope report 2015  ** Projected Costs of Generating Electricity 2015 Edition

Note

- Price - with exception of Argentina – already allow to payback LCOE of standard NPP.
- Despite large Hydro plants, national energy resources and low oil price the average price of the region is quite high.
- Growth of renewable energy will not fill in the baseload but could potentially increase pick in spot price giving their loading profile.

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Optional configurations for Nuclear Research and Development Centers

Configuration options:
- Research Reactor
- Irradiation Plant
- Cyclotron
- Medical Center
- Laboratories
- Research and Training Center
- Lecture auditoriums
- Museum
- Exhibit hall
- Civil infrastructure
- Sport facilities
- Campus and residences

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Identification of potential customers

Customers and their needs are important to be identified to elaborate a sound and efficient technical proposal: training/science vs. training/science/business.
Sustainable Nuclear – Rosatom Comprehensive Back-End and Nuclear Fuel Cycle Solution

Rosatom strategy long-term priority is to create closed fuel cycle

Scope of Back End services offered by Rosatom to its overseas customers

Comprehensive solution for fuel of Russian origin

- construction of the long-term storage;
- supply of dual-purpose casks (transportation and storage);
- transportation of spent nuclear fuel to Russian Federation for its reprocessing in the form of irradiated fuel assemblies and further return of reprocessing products.

Fuel fabrication

VVER Reactor

Long-term Storage

Reprocessing

RW Disposal

Enrichment

Mining & Milling

activities currently performed by Rosatom

activities that Rosatom is planning to be engaged in

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Rosatom comprehensive approach to NPP Projects development covers addressing public acceptance of nuclear energy.

- Rosatom offers its assistance in creating national nuclear PR-block
- Russian PR experts are eager to provide consultancy services to customer’s PR-block in following areas:

1. Conducting survey on public acceptance of nuclear energy
2. Developing communication programmes for all groups of stakeholders

Communication programme:

- Communication strategy, Road maps elaboration;
- Promoting Nuclear information centers (NICs) in hosting country;
- Promoting education as a publics acceptance driver;
- Being always open to media – a key channel to tell people the true about nuclear technologies: arranging workshops and press-tours for national PR-experts;
- Being prepared to implement emergency communications;
- Using various channels: TV, mobile apps, books, etc.
Rosatom activities in Latin America countries

ARGENTINA
- MoU on cooperation in peaceful uses of atomic energy (2010)
- IGA on cooperation in peaceful uses of atomic energy (2014)
- MoU on cooperation of NPP construction (2015)
- MoU between TVEL and CNEA (2015)
- PPDA on NPP construction (2015)
- Contract on Mo-99 supplies (2013)
- MoU on cooperation with CASA (2014 and 2015)

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- MoU on cooperation with CASA (2014 and 2015)

BRAZIL
- Joint work on new NPP project in ABDAN Group
- Cooperation with universities
- IGA on cooperation in peaceful uses of atomic energy (1994)
- MoU on cooperation in peaceful uses of atomic energy (2009)
- Mo-99 supplies to CNEN (2015)

BOLIVIA
- IGA on cooperation and IGA on NRDC construction
- PDA on NRDC construction
- Contract for NI assessment
- Contract for site investigations

CUBA
- MoU on cooperation in nuclear medicine (2013)
- IGA on cooperation in peaceful uses of atomic energy (2016)

PERU
- Consultations on cooperation with IPEN in nuclear technologies

MEXICO
- IGA on cooperation in peaceful uses of atomic energy (2015)
- Supply of enriched uranium to NPP Laguna Verde (2003-2016)

PARAGUAY
- MoU on cooperation in peaceful uses of atomic energy (2016)
Thank you for your attention!

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