State atomic energy corporation “Rosatom”

Sustainable financing for nuclear projects in a global perspective

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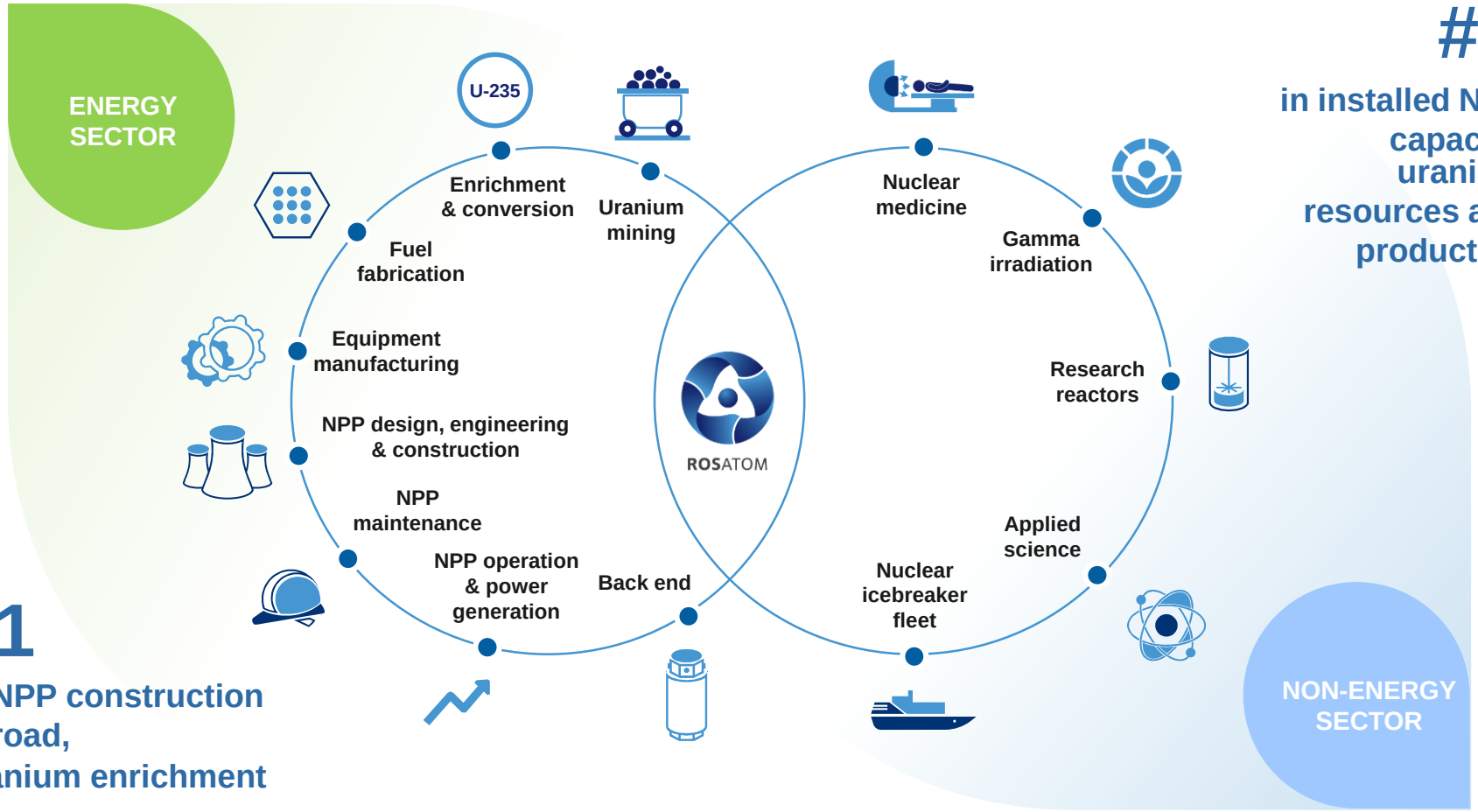
22.01.2020

Stockholm

ROSATOM: PRODUCT PORTFOLIO



#1

in NPP construction abroad, uranium enrichment

#2

in installed NPP capacity, uranium resources and production

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ROSATOM: KEY FIGURES

133.2 Bn USD
10-YEAR PORTFOLIO OF OVERSEAS ORDERS

RUSSIAN DESIGNED NPPs AVOIDED
210 M tonnes of CO2*

R&D INVESTMENT
4.5% of revenue

250 000
EMPLOYEES

16.5 Bn USD
REVENUE

36 UNITS
IN IMPLEMENTATION ABROAD

0 INES
LEVEL–2 INCIDENTS

GLOBAL PRESENCE - over 50 countries

*based on the world electricity generation structure by source of energy in 2018

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CLIMATE AGENDA

NB! Every 10th person in the world has no access to energy

+25%

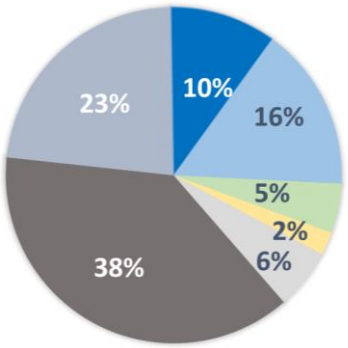
The world population will **increase by 25%** from **7.7 to 9.7 billion by 2050** causing the **energy demand at least to double**

The main focus of Climate change agenda is COP21 fulfillment and CO2 reduction

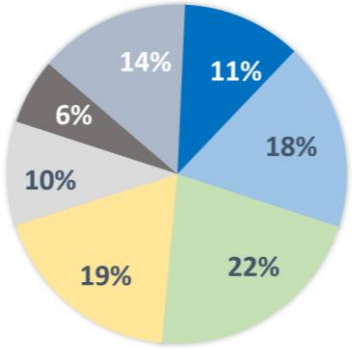
Long-term goal is to keep the increase in global average temperature below 2°C above pre-industrial levels and to pursue efforts to limit the increase to 1.5°C

ENERGY MIX FORECAST (TWh, %)

2018, total 26,6 TWh



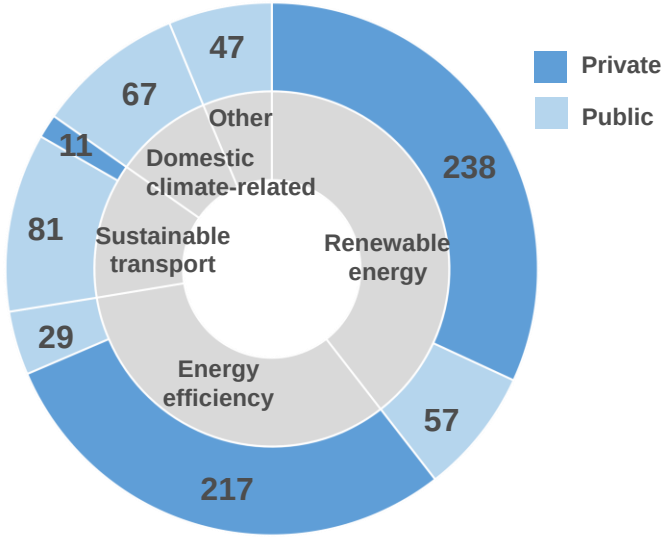
2040, total 38,7 TWh
(scenario "well below 2°C")



Coal Natural gas Nuclear Hydro Wind Solar Other

Source: IEA world energy outlook, 2019

GLOBAL TOTAL CLIMATE FINANCE 2015-2016 (USD bn, annualized), total 747 bn USD



Source: The Sustainable Development Goals UN Report, 2019

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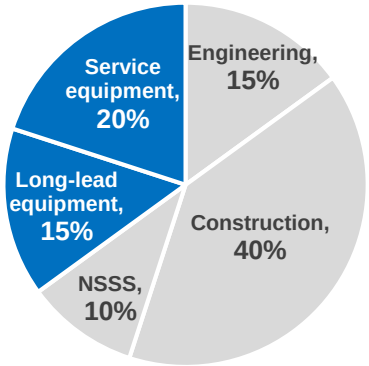
NPP PROJECT AVERAGE PARAMETERS

NPP project lifecycle

NEGOTIATIONS	CONSTRUCTION	COMMISSIONING	OPERATION	DECOMMISSIONING
1-2 years	*6-8 years*		*60+ years*	*10+ years*

2 units NPP of 2400 MW provides ~ 15 TWh of electricity per year

CAPEX STRUCTURE



Equipment supply likely to be financed by ECA and commercial banks

10+ bn USD	**Project cost**
6-8 years	**Construction period**
60+ years	**Electricity generation lifecycle**
15+ years	**Payback period after commissioning**

Risks of large infrastructure projects, which affect financial decisions:

- Nuclear industry specifics
- Possible delays in construction
- Cost overruns

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ROSATOM GLOBAL EXPERIENCE: COUNTRIES PROFILE

	Bangladesh	Hungary (EU)	Finland (EU)
NPP specifics	1st NPP in the country, 90% Russian state credit financing	80% Russian state credit financing	BOO model, 34% - Rosatom share
GDP, *USD bn*	288,4 *(+7,9% per year)*	161,2 *(+5,1% per year)*	274,2 *(+1,7% per year)*
Population, *mln people*	161,4	9,8	5,5
Installed electricity capacity, *GW*	21,4	8,9	17,2
Electricity generation by source (>1%)	**79%** **18%**	**15%** **23%** **8%** **50%** **4%**	**14%** **6%** **19%** **33%** **19%** **9%**

Coal *Gas* *Oil* *Biofuels, waste* *Nuclear* *Hydro* *Wind, solar*

Source: IEA, OECD, The World Bank

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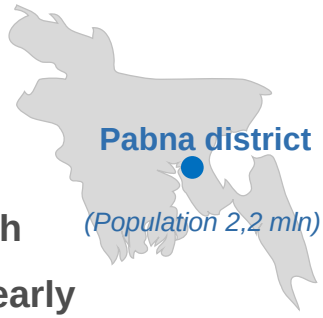
ROSATOM GLOBAL EXPERIENCE: ROOPPUR NPP, BANGLADESH

Capacity 2 units x 1150 MW



Highlights

- 1st NPP in Bangladesh
- Capacity to satisfy nearly 10% of Bangladesh's energy demand
- Participation of Indian companies in SMR works

Financing

90% State credit of Russia

10% financing from Bangladesh party

- **6000 working places** during construction period
- **Education** for Bangladesh students to become nuclear professionals
- **Infrastructure d**evelopment (dock construction on Pabna river)

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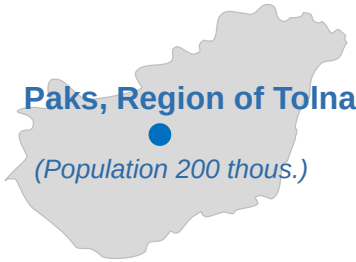
ROSATOM GLOBAL EXPERIENCE: PAKS II NPP, HUNGARY

Capacity 2 units x 1198 MW

Highlights

- Strong safety requirements based on EUR and WENRA standards
- Existing Paks site operates 4 VVER-440 units, operation period by 2037



Key suppliers

ROSATOM, ALSTOM, framatome, SIEMENS

Financing

80% State credit of Russia

20% financing from Hungarian party

- **3 000 working places** during for operation period
- **55% of non-Russian suppliers**

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ROSATOM GLOBAL EXPERIENCE: HANHIKIVI-1 NPP, FINLAND

Capacity 1 unit x 1265 MW

Highlights

- Finish nuclear regulator STUK is one of the most tough regulation authorities
- BOO model, co-ownership with ~ 40 local companies

Financing

State financing of Russia: EUR 2,4 bn (NWF)

ECA and commercial loans: up to EUR 2,8 bn

Rest – share capital of project company

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- Capacity to satisfy nearly **10% of Finland's energy demand** by the late 2020s
- **4000 working places** during intensive construction period

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SUSTAINABLE FINANCING EXPERIENCE

DEVELOPMENT BANKS INFRUSTRUCTURE FINANCING
(examples)

The World Bank, 2011: 1,2 bn USD for Padma Multipurpose Bridge Project

JBIC and NEXI, 2016: 280 mln USD for Gas-Fired Power Plant for Japanese company

European Investment Bank, 2014: 200 mln EUR for Budapest urban transport project

EBRD, 2017: 100 mln EUR for Budapest airport in 2017

European Investment Bank, 2010: 350 mln EUR for Westmetro project in 2010

European Investment Bank, 2015: 200 mln EUR in distribution and transmission networks

SUSTAINABILITY CRITERIA FOR COMMERCIAL BANKS FINANCING

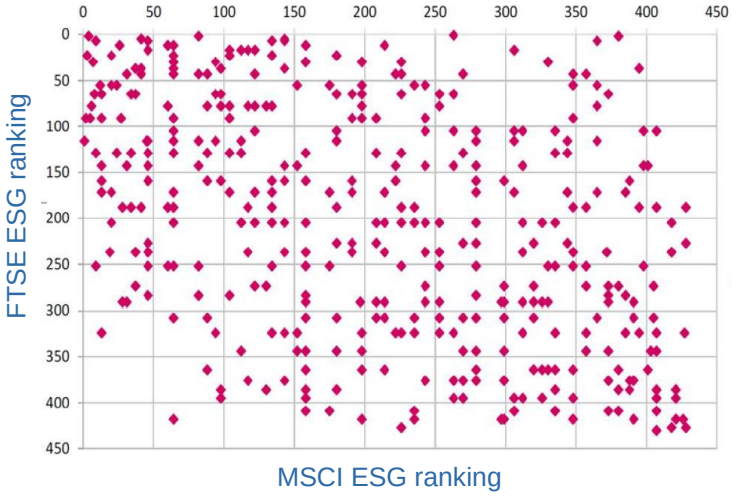
1. **KPI in sustainable development and its progress**
2. **Compliance with sustainable development requirements of a certain bank**

Additional requirements:

- Sustainable products and projects
- ESG Rating
- Visibility of commitment to SD principles

plastic

TOP 450 COMPANIES IN JAPAN



NB! Almost zero correlation between scores

Source: Renaissance Capital ,2019

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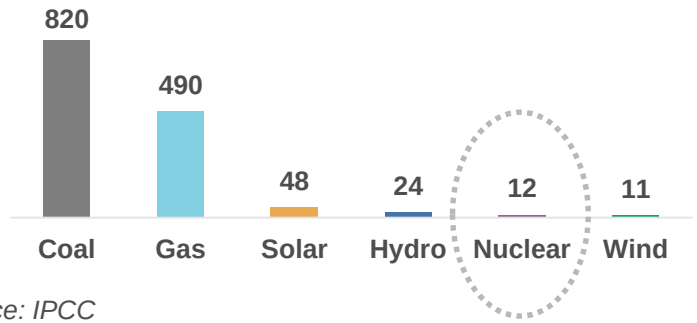
SUSTAINABLE FINANCING SHOULD BE AVAILABLE FOR NUCLEAR PROJECTS

ROSATOM

EMISSIONS OF SELECTED ELECTRICITY SUPPLY TECHNOLOGIES (gCO2eq / kWh)



Source: IPCC

On December 16th 2019, the European Parliament decided to classify nuclear power and natural gas as "transitional" technologies and to include them in the Taxonomy on sustainable finance

Do no significant harm criteria (DNSH):

- No pollution
  (CO_2 emissions up to 100 g / kWh)
- ? min water consumption
- ? circular economy
- ? ecosystems

- Operation of all Russian-design NPPs in the world **saves of CO2 emissions ~ 210 mln tonnes/year** *
- Provides 2400 MW of **low-carbon energy** with **stable supply for 60 years** which is enough to power on average 1.8 mln homes**
- Creates about **3,000 of new working places** to **work at NPP** and more than 10,000 indirect jobs**
- Brings **USD 3-4 bln of orders to local industries** during construction period**

NPP construction contributes to at least 6 UN SDGs

** Rosatom estimates (based on the world electricity generation structure by source of energy in 2018)*
*** Rosatom estimates for NPPs (2x1200 MW)*

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