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THE STATE ATOMIC ENERGY CORPORATION ROSATOM

Rosatom role in the present nuclear industry

Zdeněk Šíma

Rosatom Central Europe

Brno,

Rosatom key facts & figures

Rosatom NPP competencies - portfolio of successful projects

102

RUSSIAN-DESIGNED NPP UNITS HAVE BEEN BUILT GLOBALLY

OF WHICH

78

VVER NPP UNITS

Rosatom is the leader in NPP construction

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36 VVER UNITS

Belarus, Ostrovets NPP
VVER-1200

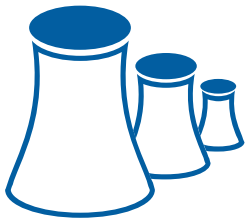
Turkey, Akkuyu NPP
VVER-1200

China, Tianwan NPP
VVER-1200

Hungary, Paks NPP
VVER-1200

Bangladesh, Rooppur
NPP, VVER-1200

India, Kudankulam NPP
VVER-1200



IN IMPLEMENTATION
PORTFOLIO OVERSEAS

Rosatom: the leader of NPP construction worldwide

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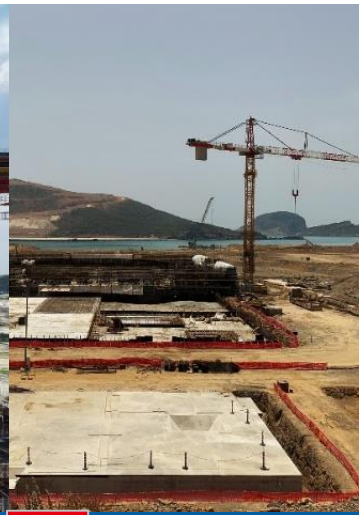
SUCCESS
STORY:

36 units	**in implementation**
12	**countries**

Belarus, Ostrovets NPP, VVER-1200

Bangladesh, Rooppur NPP, VVER-1200



Turkey, Akkuyu NPP, VVER-1200

India, Kudankulam NPP,

Hungary, Paks II NPP, VVER-1200

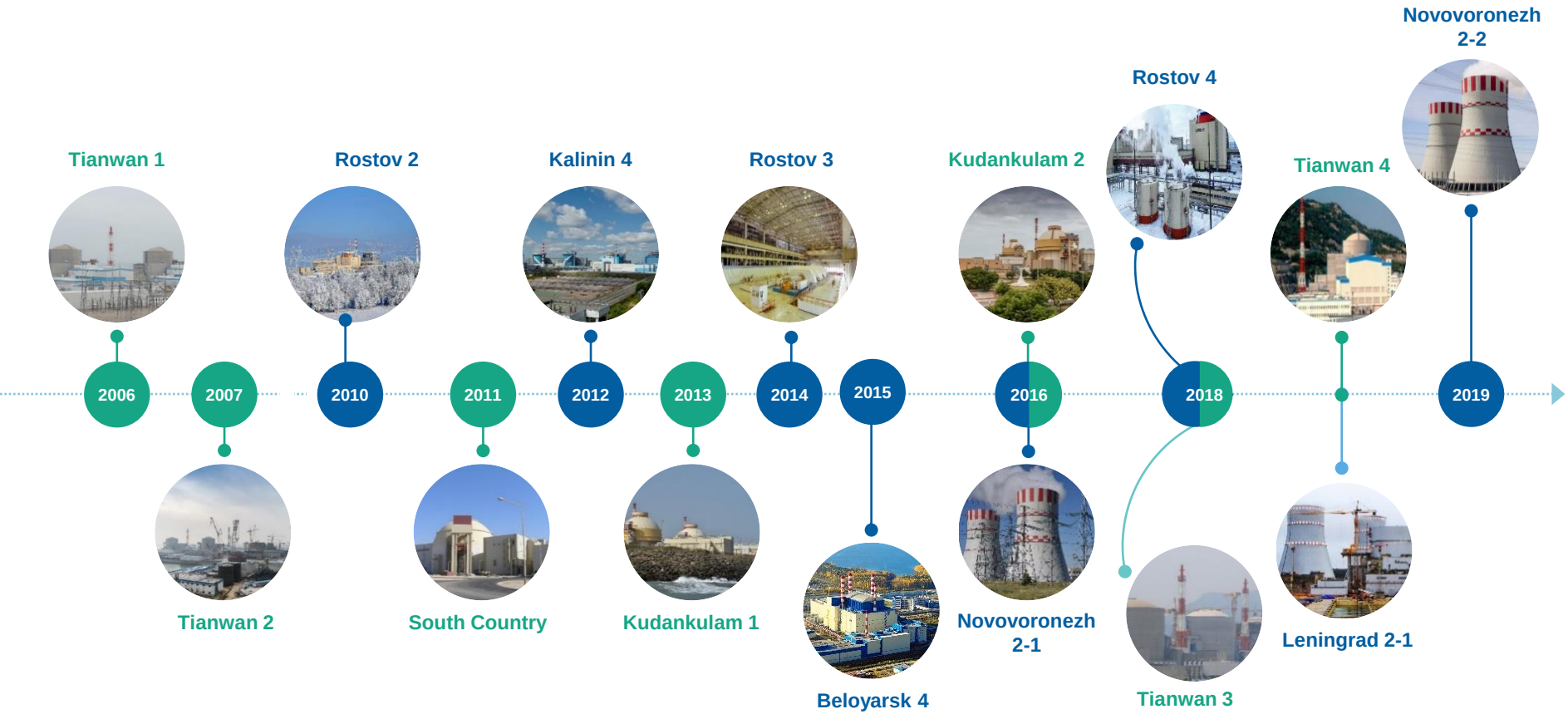
Finland, Hanhikivi-1 NPP, VVER-1200

Egypt, El-Dabaa NPP, VVER-1200

China, Tianwan NPP, VVER-1200

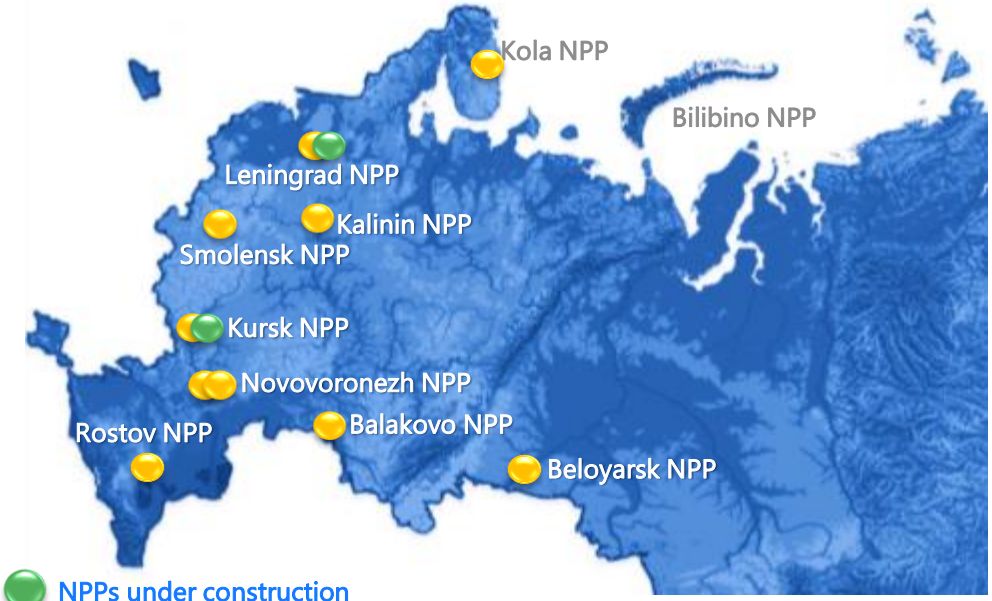
Rosatom is the only company implementing serial NPP construction globally

15 NPP UNITS IN 14 YEARS CONNECTED TO THE GRID



NPP construction abroad *NPP construction in Russia*

Nuclear power industry in Russia outlook



NPPs under construction

NPPs in operation

ROSATOM PROJECTS: NPPs UNDER CONSTRUCTION

VVER-1200

Unit 2
Leningrad NPP-2
FC 05.2020, CD 01.2021

VVER-TOI

Units 1, 2
Kursk NPP-2
Unit 1 FC 10.2024, CD 10.2025
Unit 2 FC 10.2026, CD 10.2027

COMPLETED INNOVATION PROJECTS IN OPERATION

*FC –First Criticality, COD – Commissioning Date

BN-800

Unit 4
Beloyarsk NPP
FC 02.2014, CD 12.2016

VVER-1000

Unit 4
Rostov NPP
FC 12.2017, CD 09.2018

VVER-1200

Unit 1
Novovoronezh NPP-2
FC 03.2016, CD 12.2017

VVER-1200

Unit 2
Novovoronezh NPP-2
FC 02.2019, CD 10.2019

VVER-1200

Unit 1
Leningrad NPP-2
FC 12.2017, CD 10.2018

Supply models of Rosatom's projects abroad (contractual arrangements models & financial models)

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Standard EPC model + Sovereign Model (IGA financing)	**Belarus**	2 Units (VVER-1200); EPC + Fuel Supply	**Hungary**	2 Units (VVER-1200); EPC + Fuel Supply + O&M
	Egypt	4 Units (VVER-1200); EPC + Fuel Supply + O&M + Spent Fuel Treatment	**Bangladesh**	2 Units (VVER-1200); EPC + Fuel Supply
BOO model + BOO as a Particular Case of Project-Based Model	**Finland**	1 Unit (VVER-1200) EPC + Fuel Supply + O&M PPA (Mankala model)		
	Turkey	4 Units (VVER-1200) EPC + Fuel Supply + O&M + Spent Fuel Treatment PPA 15 years in US$		
Scope Sharing Model + Sovereign Model (IGA financing)	**India**	6 Units (VVER-1000)		
Scope Sharing Model + Corporate-Based Model	**China**	4 Units (VVER-1200) Supply		

AKADEMIK LOMONOSOV FNPP

FNPP will replace aging power generating capacities providing electrical power to the city of Pevek, one of the major Arctic ports in the North-East of Russia

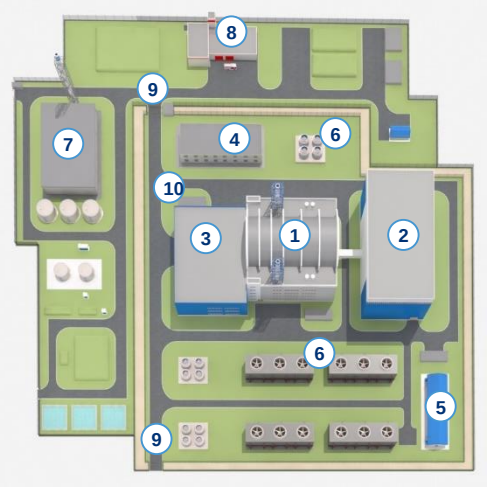
19 December 2019 the FNPP was connected to the grid at Pevek

Land-based NPP Concept Design Based on RITM Series SMR
Layout

2×57 MWe → 114 MWe

2 RITM-200 Reactors

Rosatom is prepared to offer a flexible, tailor-made small NPP solution, based on **RITM series SMR**, which is designed to address most peculiar customer demands



1. Reactor building
2. Turbine building
3. Radwaste building
4. Administration building
5. Cooling tower pumps
6. Cooling towers
7. Water treatment building
8. Fire station
9. Security gates
10. Backup generators

Czech Republic and VVER: unique level of integration in the nuclear field

Over 60 years experience of efficient collaboration between Czech partners and Rosatom on **VVER TECHNOLOGY**

Operating NPPs in the Czech Republic

NPPs	UNIT TYPE	CAPACITY* Gross *MW*	Grid Connection *year*
Dukovany 1	VVER-440 V-213	500	**1985**
Dukovany 2	VVER-440 V-213	500	1986
Dukovany 3	VVER-440 V-213	500	1986
Dukovany 4	VVER-440 V-213	500	1987
Temelin 1	VVER-1000 V-320	1080	2000
Temelin 2	VVER-1000 V-320	1080	2003
Total (6)		**3904**	

** IAEA PRIS*

Potential major local suppliers

The Czech Republic was **the first country** in the world which mostly **independently built 6 VVER-based** power units using the Rosatom design. It created a **unique pull of engineers** and **manufacturing companies** in the Czech Republic who have a **deep** understanding of the VVER technology.

THE CZECH REPUBLIC IS A UNIQUE COUNTRY WITH FAVORABLE CONDITIONS TO LOCAL SUPPLIERS INVOLVEMENT INTO NPP PROJECT SUPPLY CHAIN

Doosan Škoda Power	ŠKODA JS a.s.	I&C Energo, ZAT	ŠKODA PRAHA	METROSTAV, SKANSKA, HOCHTIEF	ÚJV, ŠKODA PRAHA	ABB, Spálovský
✓ Potential turbine island supplier	✓ Potential nuclear island supplier (Mochovce NPP project)	✓ Potential suppliers of I&C	✓ Potential supplier of BoP	✓ Potential contractors for construction works	✓ Potential contractor for engineering and design works	✓ Potential contractor for electric equipment

Nearly all lots except major equipment of nuclear island **can be supplied by Czech** companies

For the past 12 years, the Russian Party has engaged the Czech industry in the local and foreign projects for CZK 7.5 billion

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MORE THAN 25 CZECH COMPANIES

supply various equipment and services for Rosatom projects

SKLÁRNY MORAVIA, a.s.

I.B.C. PRAHA spol. s r.o.

PRAKAB PRAŽSKÁ KABELOVNA

MPOWER

MSA CHELPIPE GROUP

ZPA Smart Energy
Going the Smarter Way

LDM

ÚJV

ZPA GROUP

ARAKO INDUSTRIAL VALVES

ARMATURY Group

HAND MADE s.r.o. VITRUM SKLÁRNA JANOV CZECH REPUBLIC

bid

kabex®

TES

SIGMA®

KRONA NÁŘADÍ KROMĚŘÍŽ

…and many others

ROSATOM

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