

# NPP Construction in Russia and Abroad

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ASE Group

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# ASE Group– Rosatom State Corporation EPC Division



Nuclear Power Complex



Applied and Basic  
Science



Nuclear and Radiation  
Safety



Nuclear-Powered Ice-  
breaker



Design and Construction of NPPs, Research  
Reactors, SNF and RAW Facilities



Uranium Mining



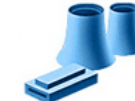
Uranium Enrichment



Fuel  
Fabrication



Equipment  
Manufacturing



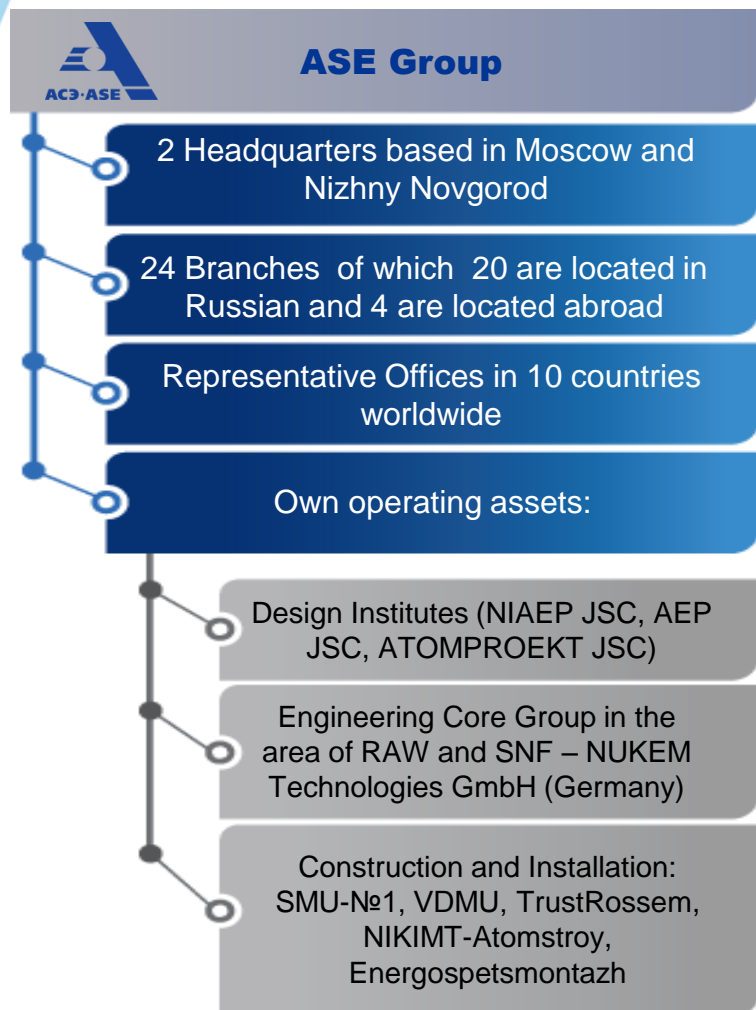
Electricity  
Generation



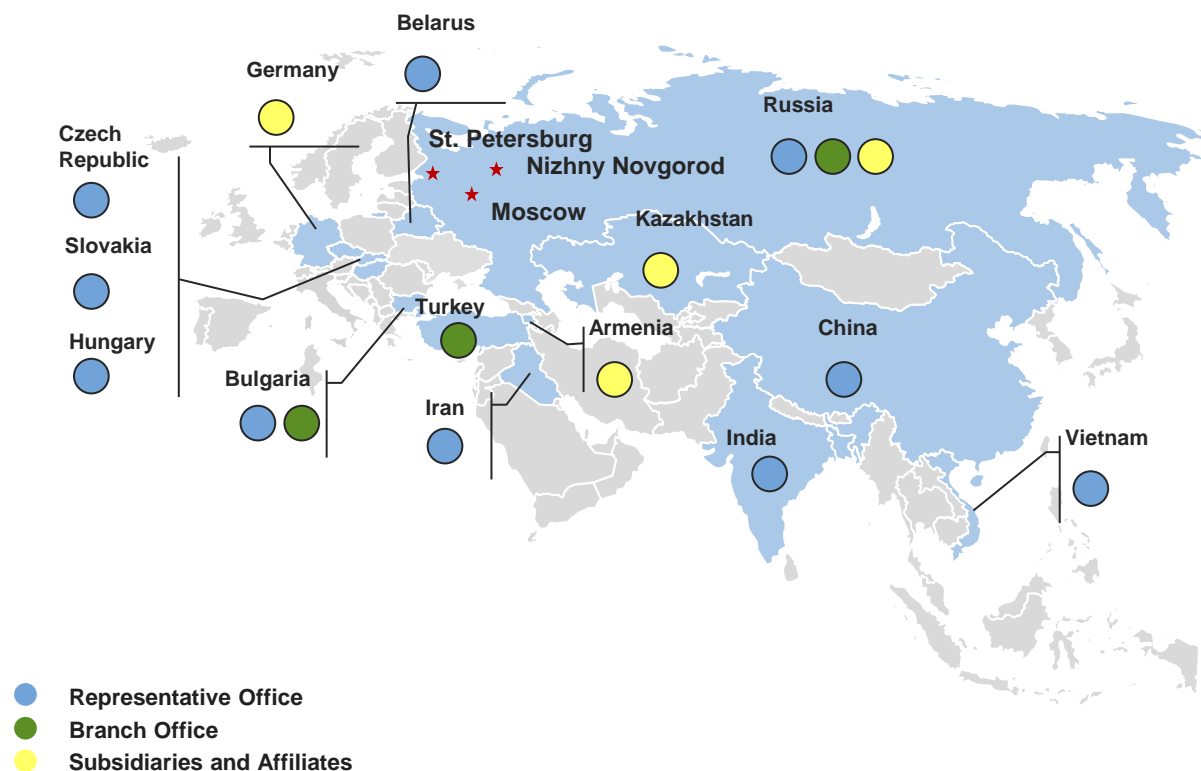
NPP'  
Servicing and  
Upgrading

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# ASE Worldwide Presence

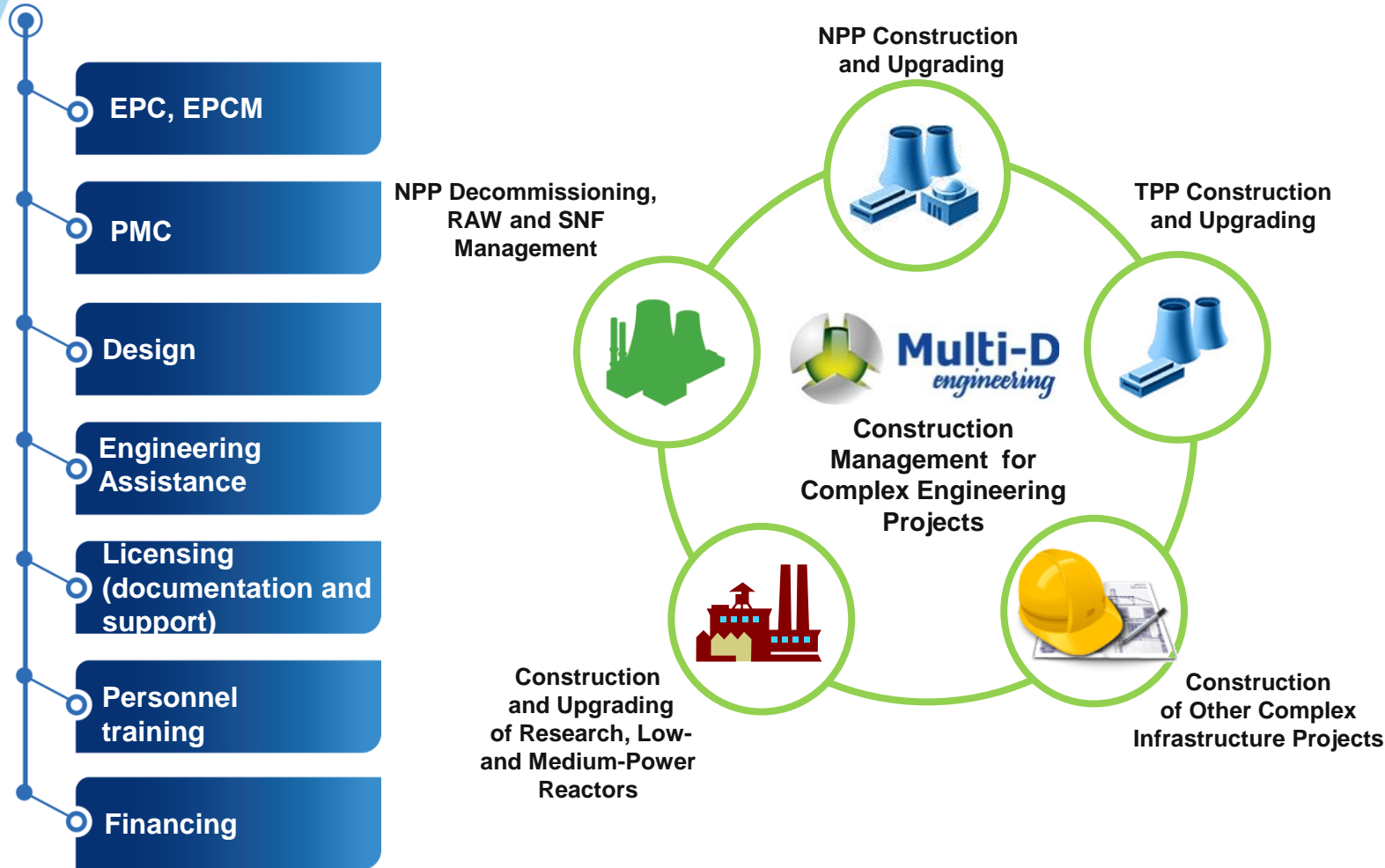


## Worldwide Presence



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# Tailored Proposal for Each Project's Customer: from Individual Services up to Complex Turn-Key Contracts



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# Successful track record of 10 GW over 10 years



| #  | Project             | Unit   | Country | Design type                | Installed Capacity, MW | Type of Works            | Start-Up       |
|----|---------------------|--------|---------|----------------------------|------------------------|--------------------------|----------------|
| 1  | Tianwan NP          | Unit 1 | China   | VVER                       | 1060                   | Design, Procurement, PMC | 2006           |
|    |                     | Unit 2 |         |                            | 1060                   |                          | 2007           |
| 2  | Rostov NPP          | Unit 2 | Russia  | VVER                       | 1006                   | EPC                      | 2010           |
| 3  | Bushehr NPP         | Unit 1 | Iran    | VVER                       | 1000                   | EPC                      | September 2011 |
| 4  | Kalinin NPP         | Unit 4 | Russia  | VVER                       | 1000                   | EPC                      | November 2011  |
| 5  | Kudankulam NPP      | Unit 1 | India   | VVER                       | 1000                   | Design, Procurement, PMC | 2013           |
| 6  | Yuzhnouralsk GRES-2 | Unit 1 | Russia  | Combined cycle power units | 400                    | EPC                      | February 2014  |
| 7  |                     | Unit 2 |         |                            | 400                    |                          | November 2014  |
| 8  | Rostov NPP          | Unit 3 | Russia  | VVER                       | 1000                   | EPC                      | December 2014  |
| 9  | Novovoronezh NPP-2  | Unit 1 | Russia  | VVER                       | 1200                   | EPC                      | March 2016     |
| 10 | Kudankulam NPP      | Unit 2 | India   | VVER                       | 1000                   | Design, Procurement, PMC | August 2016    |

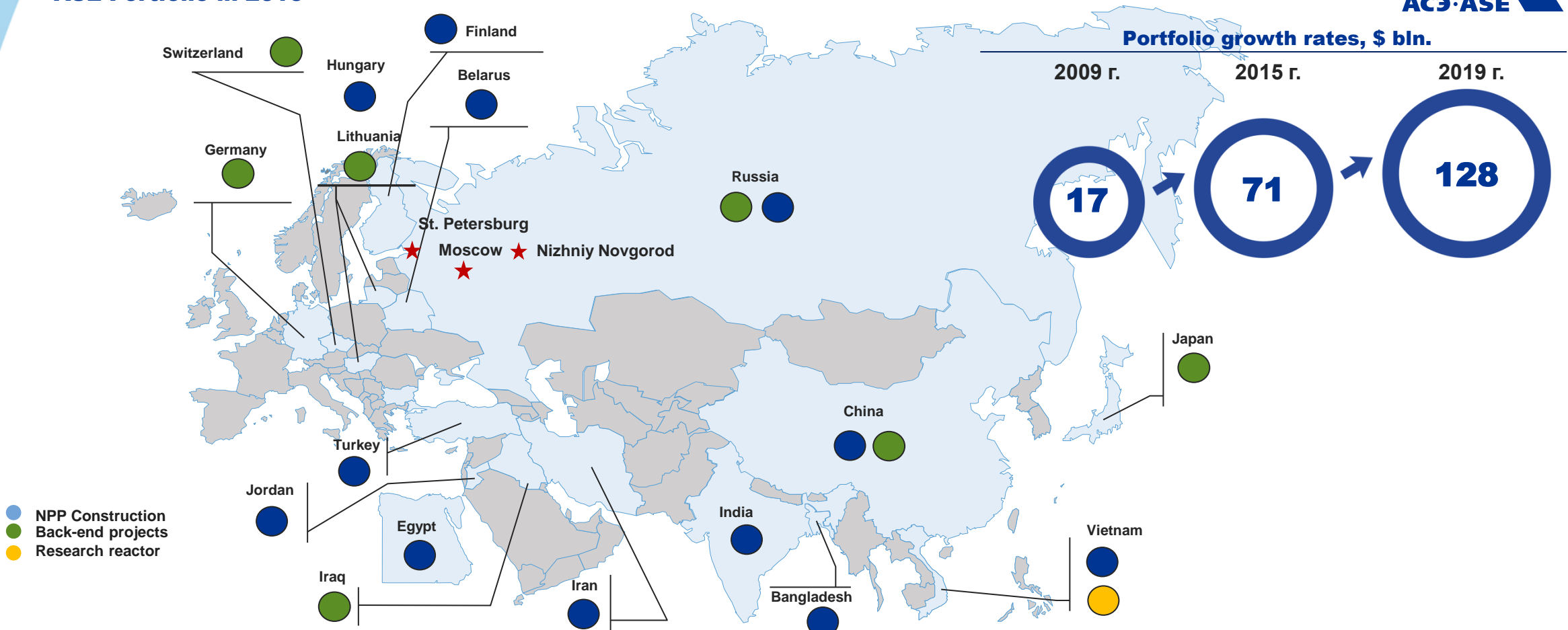
**10 GW over 10 years**

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# ASE Portfolio increased in 4 times over last 6 years and will double by 2019



## ASE Portfolio in 2016



\* Динамика портфеля указана с учетом планов по сооружению АЭС

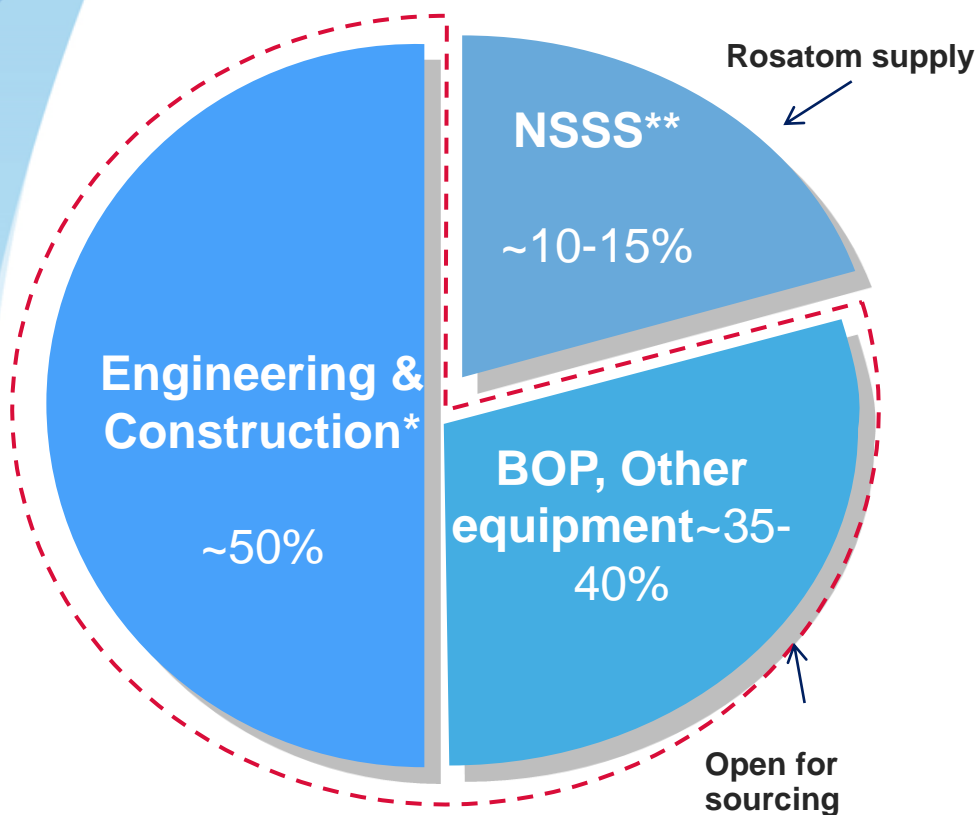
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# CONSTRUCTION OF A NPP BRINGS NUMEROUS OPPORTUNITIES



## Typical CAPEX structure of NPP construction



\* Incl. design, project management, commissioning, training etc..

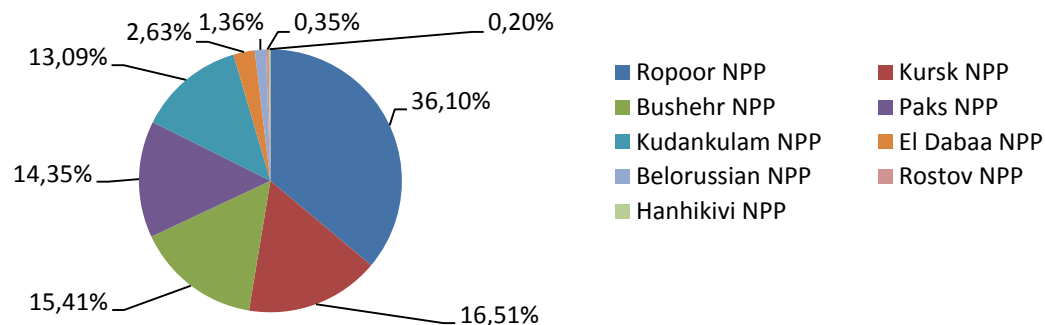
\*\* Nuclear Steam Supply System

## E-Catalogue functions

|  |  |
|--|--|
| <b>Contractor/<br/>Engineering<br/>Company</b> | <ul style="list-style-type: none"> <li>• Selection of producers and suppliers;</li> <li>• Availability and cost of equipment and materials on the market;</li> <li>• Equipment selection for the design and change management.</li> <li>• Reducing the time of design and NPP construction.</li> </ul> |
| <b>Customer /<br/>Generating<br/>Company</b>   | <ul style="list-style-type: none"> <li>• Standard description of all producers and products;</li> <li>• Unification of requirements for procurement;</li> <li>• Preliminary estimates of NPP construction cost;</li> <li>• Procurement management during NPP operational life cycle.</li> </ul>        |
| <b>Supplier/<br/>Producer</b>                  | <ul style="list-style-type: none"> <li>• Platform for equipment and materials promotion;</li> <li>• Increased involvement of engineers and developers</li> <li>• Ability to plan sales and production;</li> <li>• Third markets expansion beyond projects</li> </ul>                                   |

# PROCUREMENT PLAN

## 2017 Procurement Plan, projects (more than 150 bln. Rub.)



## Plan for equipment purchase in 2017

### Types of electrical equipment

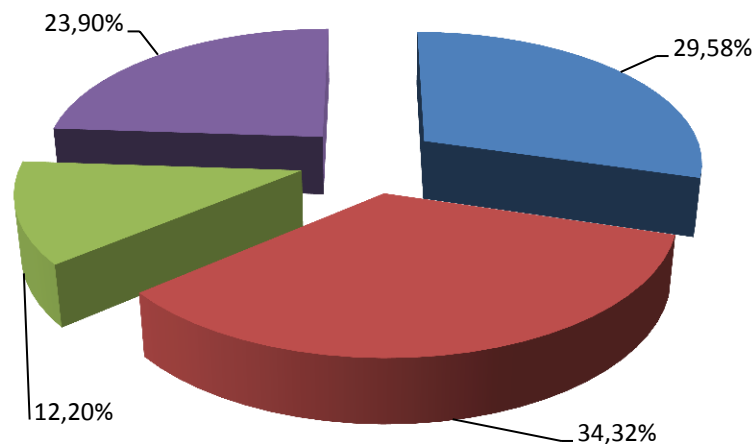
|  |       |
|--|-------|
| Board equipment                          | 51,7% |
| Thermal monitoring devices and equipment | 26,7% |
| Communication and signaling systems      | 11,9% |
| Transformers                             | 1,3%  |
| Diesel generator plant                   | 0,3%  |
| Other equipment                          | 8%    |

### Types of heat mechanical equipment

|                         |       |
|-------------------------|-------|
| Ventilation equipment   | 64,9% |
| Gates/doors/hatches     | 8,5%  |
| Load-lifting equipment  | 2,7%  |
| Pumping equipment       | 1,6%  |
| Heat-exchange equipment | 1,4%  |
| Tanks and vessels       | 1%    |
| Laboratory equipment    | 0,6%  |
| Other equipment         | 19,1% |

### Valves and pipelines

|           |     |
|-----------|-----|
| Valves    | 99% |
| Pipelines | 1%  |



- Long Term Manufacture Equipment
- Heat Machinery Equipment
- Electrical Machinery
- Valves



# Our current project: Russia, Novoronezh NPP-2 (Units 1 and 2)



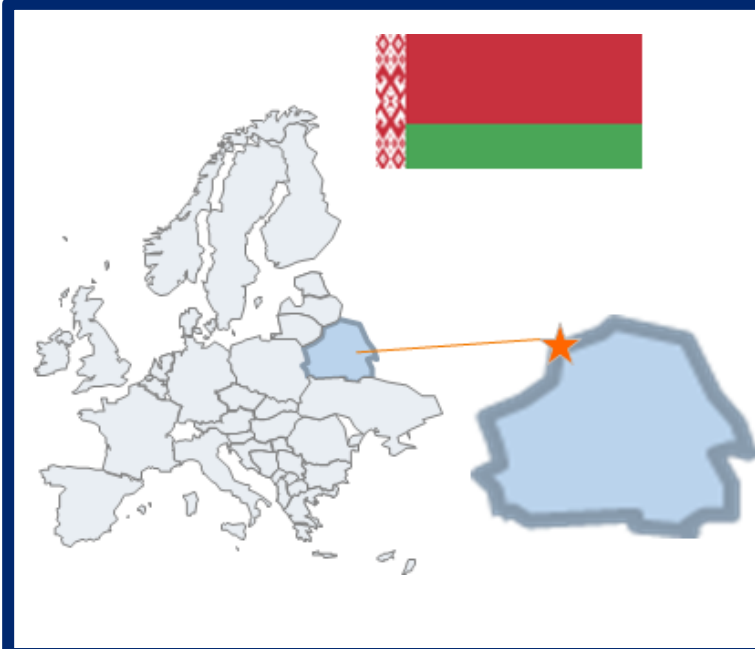
## Key Project Parameters

- **Design:** VVER.1200
- **Gross capacity:** 2\*1200 MW
- **Commissioning:** Unit 1 – March 2016,  
Unit 2 – 2017



- Passive heat removal system
- Core catcher
- 60 year design lifetime

# Our current project: Belarus, Belorussian NPP (Units 1 and 2)



## Key Parameters

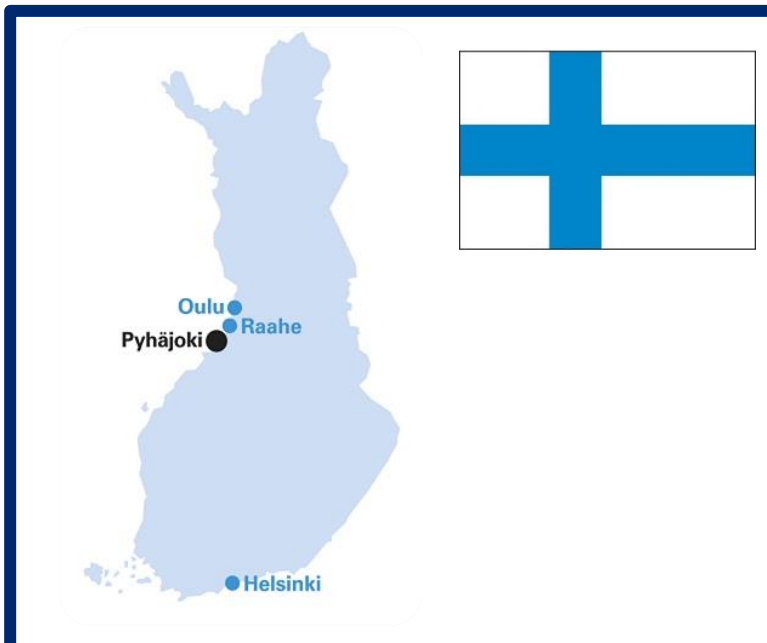
- **Design:** VVER.1200
- **Gross Capacity:** 2\*1200 MW
- **Commissioning:** Unit 1 – 2018,  
Unit 2 – 2020
- First NPP project in Belarus
- High level of involvement of local Belorussian manufactures and civil construction companies
- Russian Federation credit financing



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# Our current project: Finland, Hanhikivi Project Oy



## Key Parameters

- **Design:** VVER.1200
- **Commercial Capacity:** 1175 MW
- **Commissioning:** 2024

**Reference project: LNPP-2, Sosnoviy Bor,  
Russian Federation**



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# Thank you!

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