



**ROSATOM**

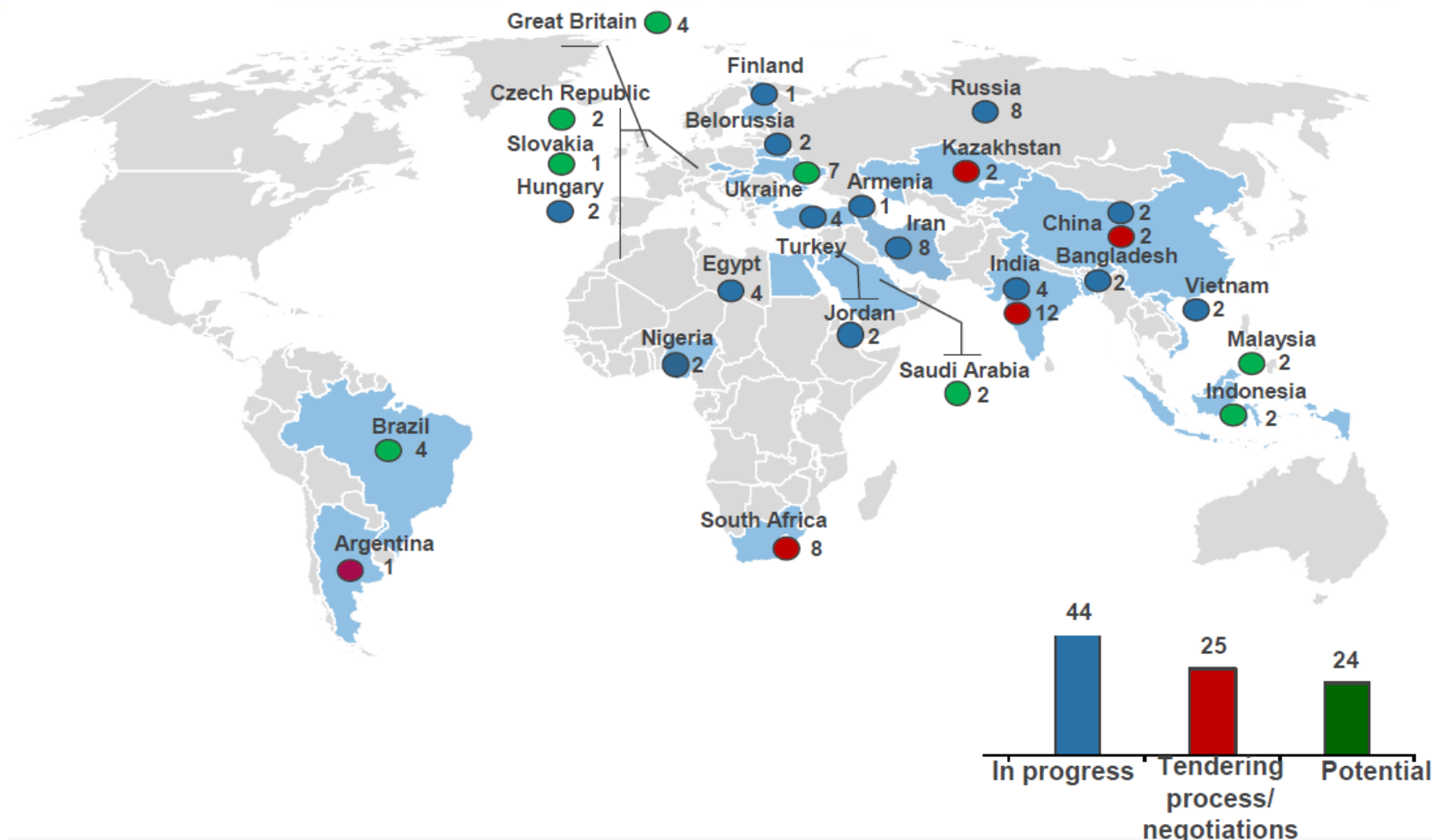


# Rosatom in Europe

Entretiens européens

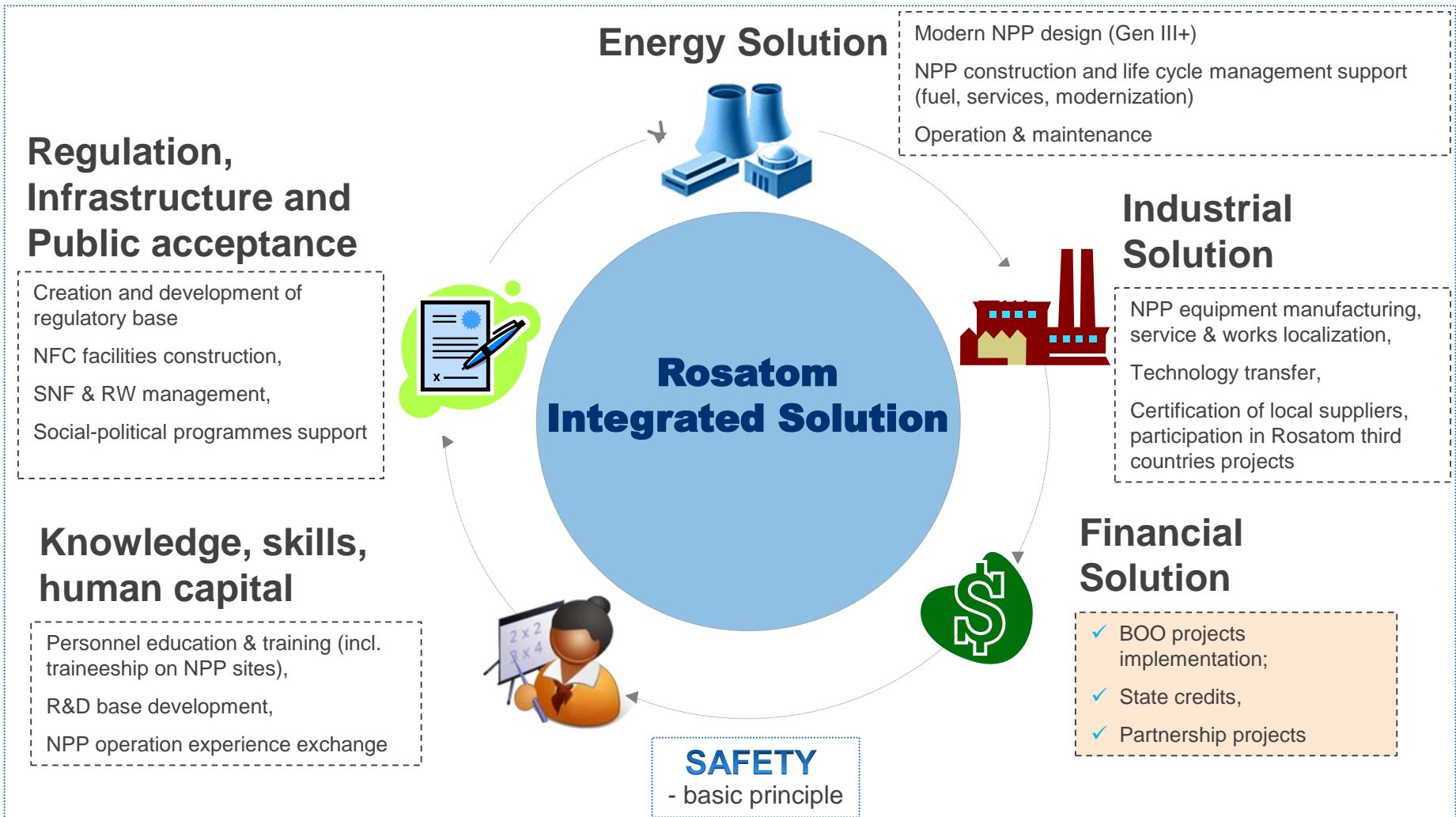
20 October 2016, Bruxelles, Belgium

# Rosatom NPPs projects in the world



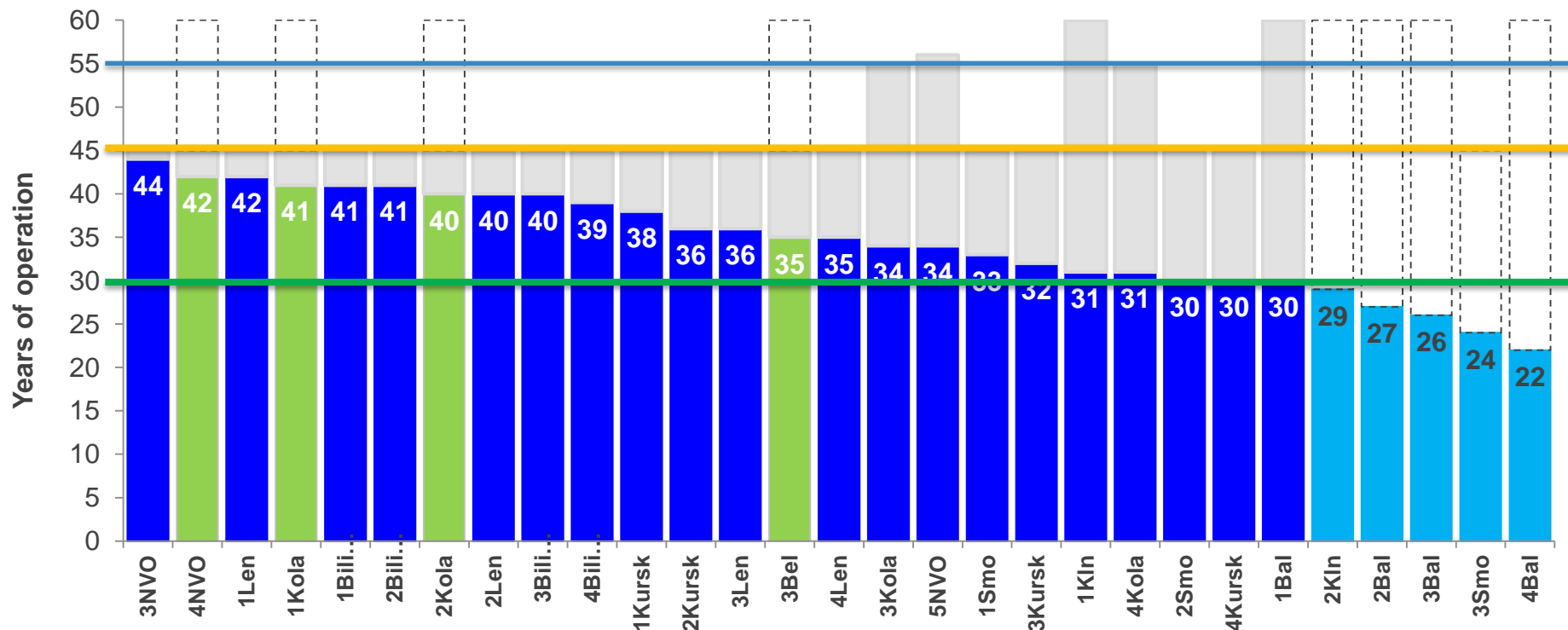
Rosatom NPP construction long-term perspective backlog is more than 90 units

# Rosatom integrated NPP construction solution



# Long-term operation (LTO) activities in Russia

■ works completed for LTO beyond 30 yrs 
 ■ ongoing works for LTO beyond 30 yrs 
 ■ ongoing works for LTO beyond 45 yrs  
■ SC Rosatom decrees for LTE are issued 
  expected lifetime



34 Units in operation (+2 in test operation)

24 **Units licensed for LTO**

9 **Units with LTO projects in progress**

✓ The LTO objective of Rosatom until 2025 is to keep 9 units of 6897 MW total capacity in operation



# First criticality of a Gen III+ unit: Novovoronezh-6 with AES-2006

20 May 2016 at 16:11



# Ongoing and planned newbuild nuclear projects in the EU and neighboring countries

- **EPR**

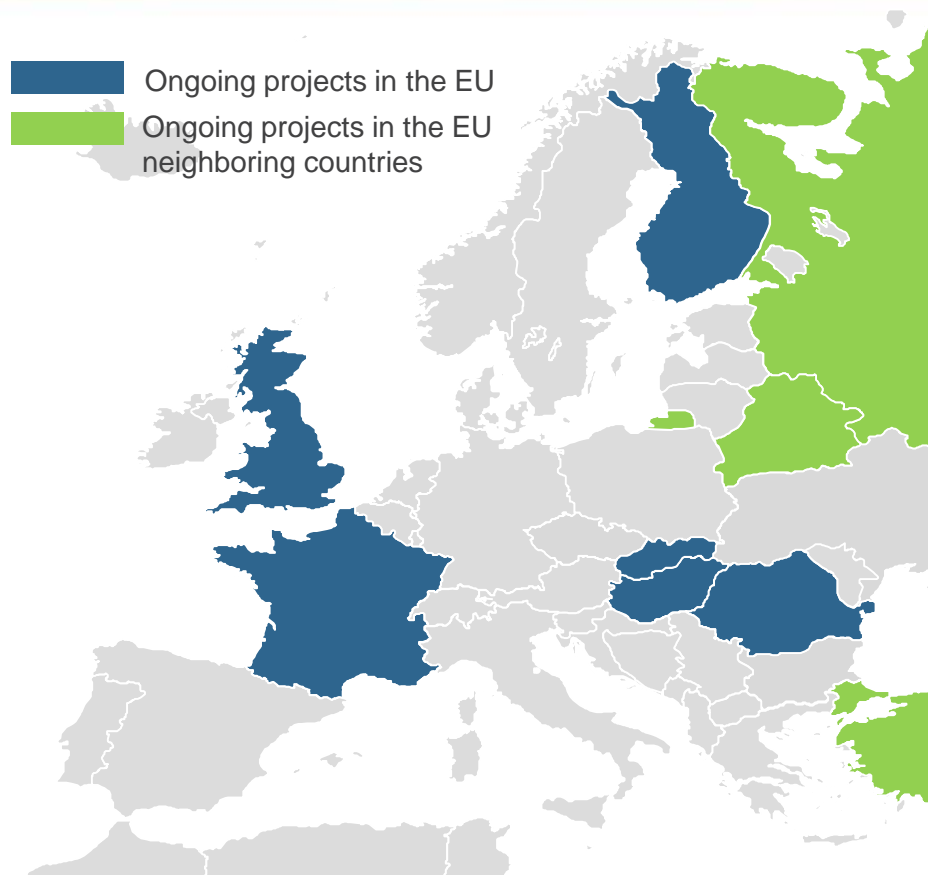
- Olkiluoto-3, Finland
- Flamanville-3, France
- Hinkley Point C, UK

- **VVER**

- Mohovce NPP 3-4, Slovakia
- Hanhikivi-1, Finland
- Paks units 5 and 6, Hungary
- Ostrovets NPP units 1 and 2, Belarus
- Akkuyu NPP, 4 units, Turkey
- 8 units under construction in Russia

- **CANDU**

- Cernavoda units 3 and 4, Romania



**Important newbuild programme in Europe, with significant involvement of Rosatom**

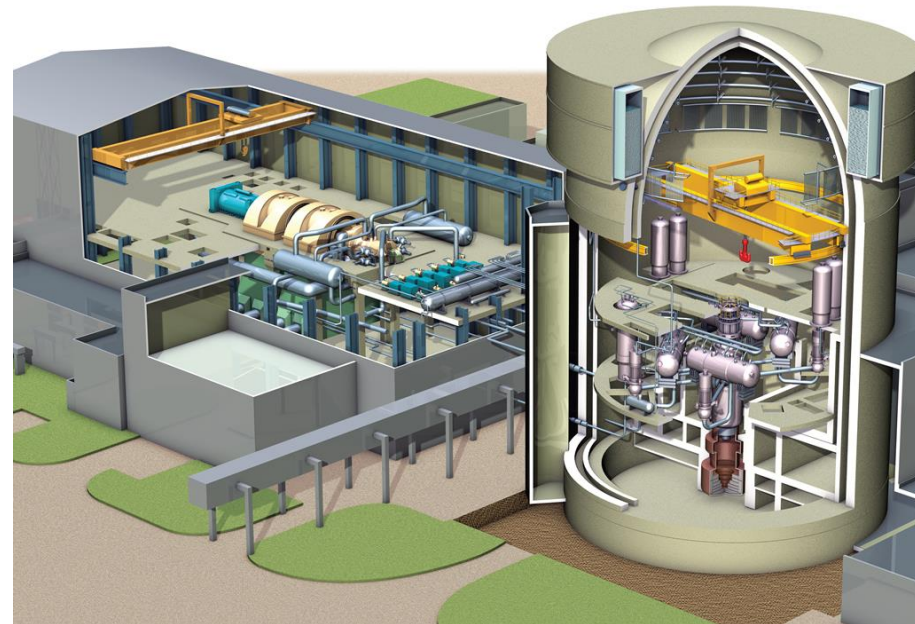
# Construction of a VVER plant in Europe

- **European companies potentially involved in:**

- Civil construction
- Supply and installation of the turbo-generator
- I&C supply
- Engineering
- Equipment supply
- Certification and supervision of manufacturing & construction
- Financing

- **Rosatom involved in:**

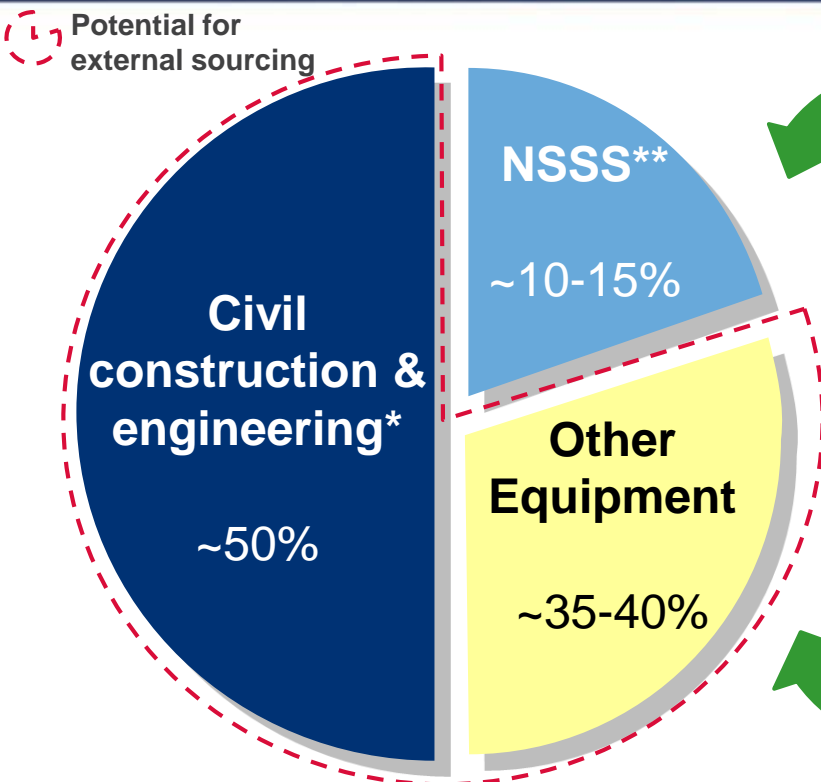
- Supply of nuclear island equipment
- Engineering and construction supervision
- Fuel cycle
- Financing



**Rosatom's NPP projects in Europe are European infrastructure projects**



# Construction of a NPP brings numerous opportunities to suppliers



**Exclusive Russian supply**



ROSATOM

## Examples of realized supplies

- Valves, pumps and piping (6%)
- Other equipment (5%)
- Air cooling systems (3%)
- Turbine and generator equipment (6%)
- Electrical equipment (9%)
- I&C (6%)

- ▶ ~ 15% - Russian supply
- ▶ ~ 30-40% - local content
- ▶ ~ 45-50% - global sourcing

➤ Rosatom is ready for and has extensive experience in sourcing goods and services for new NPP construction projects

➤ Orders volume for 2015-2030 – more than \$300 bln.

\* Including design, project management, erection and commissioning works, training, etc.

\*\*Nuclear steam supply system



# Rosatom cooperation with some European companies (non-exhaustive liste)



- ✓ Successful joint business in nuclear fuel manufacturing and supply to world market
- ✓ Historic cooperation in I&C supply for Rosatom projects in Russia (modernization of I&C at 8 units) and abroad



- ✓ 2007 –JV between Rosatom and Alstom on Arabelle turbo-generator
- ✓ Contract for supply of Arabelle turbo-generator for Baltic NPP and for Hanhikivi NPP



- ✓ joint development of Multi-D project management suite for nuclear newbuild projects



- ✓ Joint implementation of Kozloduy NPP units 5,6 LTO project
- ✓ Cooperation on LTO



- ✓ Cabling of containment structure in Rosatom's NPP



- ✓ 2013 – agreement on industrial license for production of specific electro-technical equipment
- ✓ 2014 – start of production on Rosatom facility
- ✓ 2015 – MoU on cooperation

# Conclusions

- Rosatom has significant backlog of nuclear power contracts in Russia and overseas:
  - NPP construction
  - Operation, fuel cycle, electricity trading
  - Maintenance and LTO
  - Decommissioning
- Europe is the key client for Rosatom
- Rosatom plays an important role in the European NPP construction, operation, maintenance and lifetime extension programmes
- European companies are important partners for Rosatom for both national and overseas nuclear power projects