



AKKUYU NGS AŞ



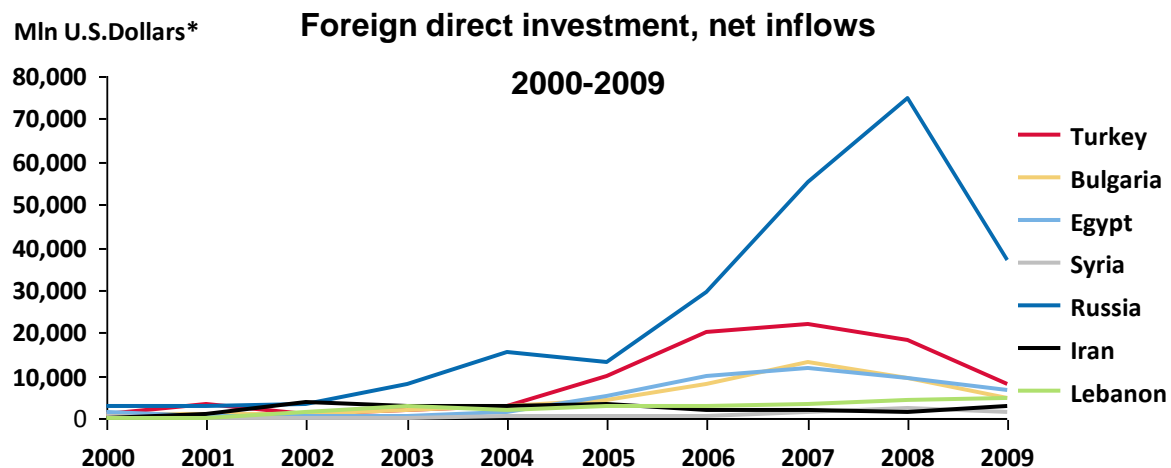
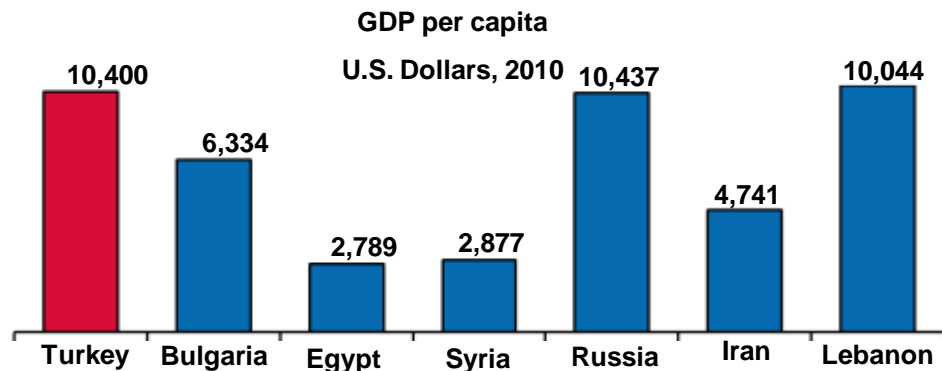
17th International Energy and Environment  
Conference and Exhibition

# Implementation of First Nuclear Power Plant Project in Turkey

AKKUYU NPP, JSC

Istanbul, Turkey  
June, 2011

# Turkey is a developed country with good prospective for growth



## Comments

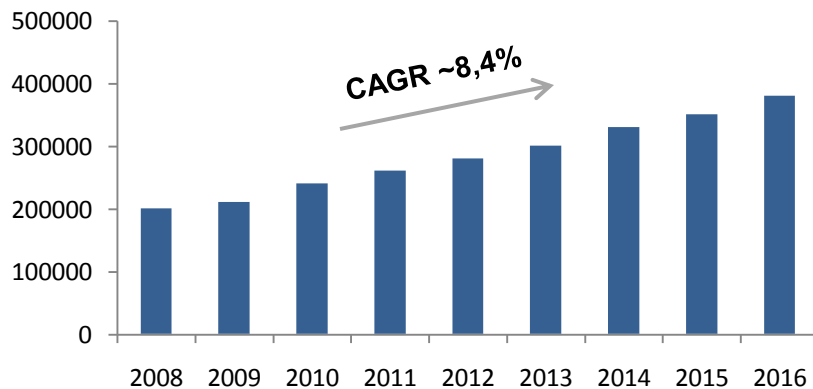
- Turkey is a developed country with 16th largest GDP in the world (735 bln USD in 2010)
- Inflation dropped to single-digit figures since 2003 (CPI = 8.5% in 2010)
- S&P rating for Turkey is BB, with positive outlook
- Reforms planned by the ruling party aim to further bring Turkey in line with EU regulatory standards, which will result in an improving investment environment

\* Calculated in constant prices, national currency

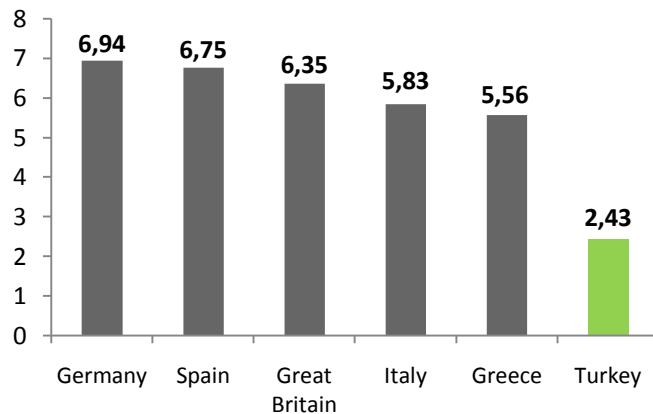
Source: The World Bank, IMF, S&P, CIA, Booz & Company analysis

# Turkish electricity market overview

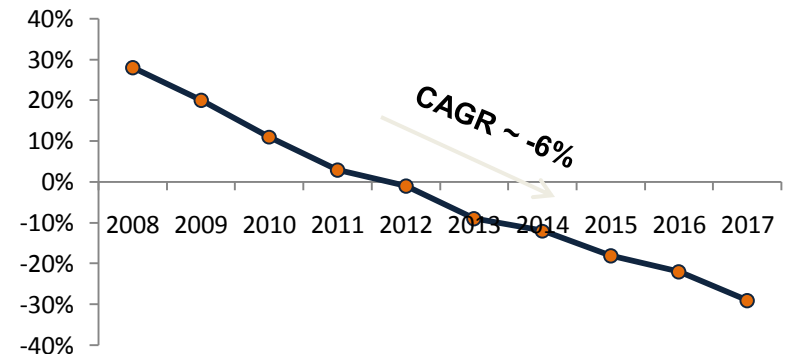
Electricity consumption (GWh)\*



Electricity consumption (MWh per capita, 2008)\*\*



Capacity reserve (%)\*



- Turkish economy and electricity consumption growth are among the highest in Europe, key demand increase is due industrial growth of Turkish economy
- Turkey lags behind other developed countries on electricity consumption per capita that indicates a high potential for growth in this sector
- Akkuyu NPP is an optimal solution for growing electricity demand in industrial sectors, implemented in full concordance with carbon free requirements

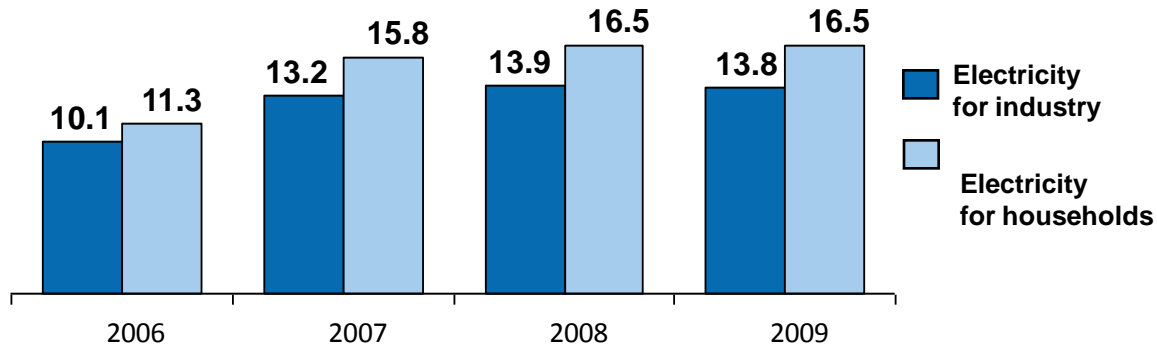
\*TEİAŞ, Turkish state electricity grid company, main scenario, 2008 forecast

\*\*TEİAŞ

# Electricity tariffs are growing in Turkey as a result of market liberalization

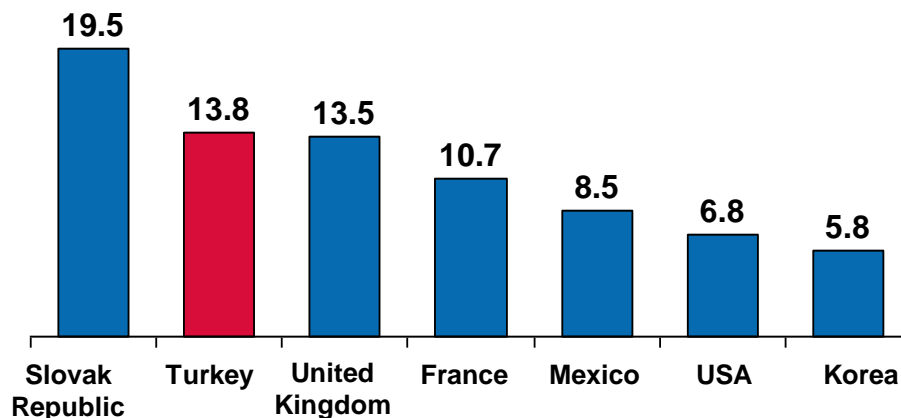
## Retail tariffs

US cent/kWh, 2006-2010



## Electricity for industry tariff comparison

US cent/kWh, 2010



Source: Key World Energy Statistica, IEA; Booz & Company analysis

## Comments

- Energy demand is growing faster than in many European countries
- In 2004 government began privatization of the Turkish electricity market
- Power sector reform proved successful and will continue
- Key outcomes:
  - ✓ cost-reflective wholesale tariffs
  - ✓ elimination of cross-subsidies of customers
  - ✓ distribution companies privatization
  - ✓ beginning of the generation companies privatization
  - ✓ definition of the full market opening date
- Integration of the nuclear energy into energy mix in Turkey is one of the key decisions to meet growing energy demand
- About 20% of electricity was generated by renewables in 2009 in Turkey and a share of renewable energy is planned to increase to at least 30% by 2023

# Akkuyu NPP Profile

**Akkuyu is the first Rosatom's foreign NPP construction project implemented on BOO principles**



**Site: Akkuyu, province Mersin, Turkey**

## General parameters of the Akkuyu Project

- CAPEX: \$ 20 bn.
- Legal basis: Intergovernmental Agreement, May 12, 2010
- Project design: NPP-2006 (VVER-1200)
- Number of units: 4
- Total capacity: 4 800 MW
- Construction period: 2012-2022
- PPA period: 15 years, fixed price terms

## Project implementation environment

- The first NPP to be constructed in Turkey
- First BOO project totally implemented by Rosatom's affiliated companies
- Significant Russian and Turkish state support
- Potential engagement of international investors
- Involvement of Turkish suppliers in NPP construction and operation in future

# BOO Projects in Turkish Republic

- Proven model of power generation project implementation
- Until recently, BOT (build-own-transfer) has been the prevailing model with relatively short-term contracts
- Under BOO (built-own-operate) model with long-term contracts, the company undertakes to design, build, operate and maintain a power plant, thus maximizing efficiency and life cycle
- In 2010, 45.4% of Turkish power was produced by EUAS, 30% - by privately owned generation under the BOT-BOO-TOR models, 19% - by independent power producers and 5.6% by industrial consumers, primarily for their own needs but with surpluses sold
- Akkuyu NPP Project is to be realized under BOO principle

# BOO Projects – benefits for the country

- ✓ Competitive bidding
- ✓ Broad range of possibilities to minimize project cost
- ✓ Risk sharing with private sector
- ✓ Access to advanced technology
- ✓ Flexible and prompt construction schedule

# Akkuyu Project Development Chronology

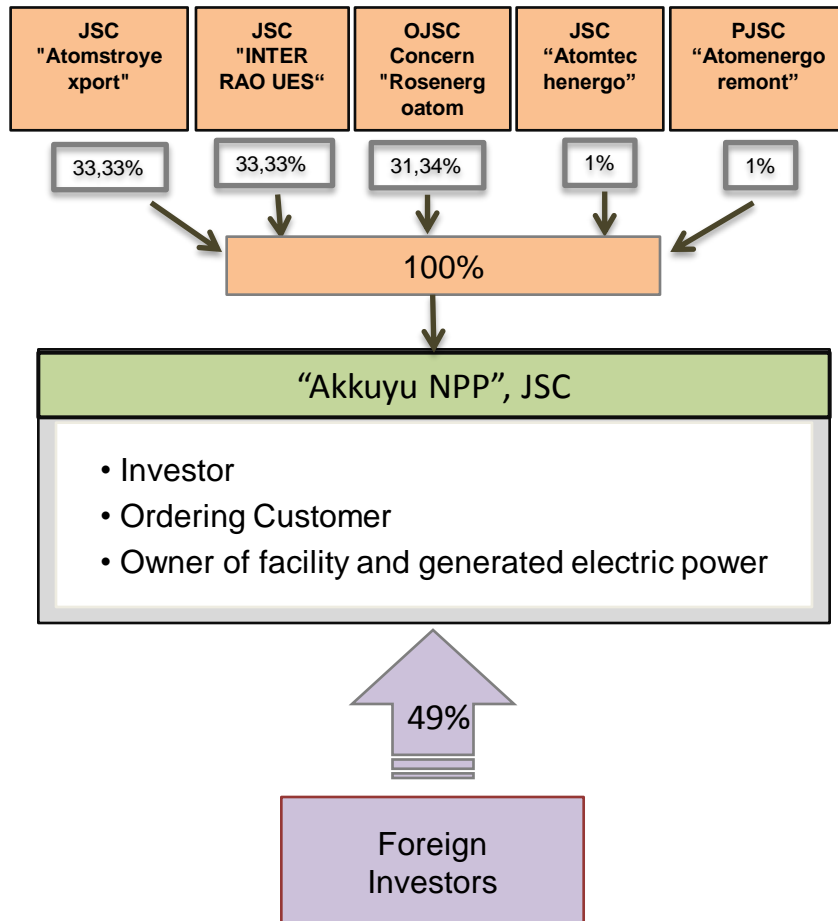
## Status:

- 13.01.2010 Joint statement of Deputy Head of the Russian Government Igor Sechin and Minister of energy and natural resources of Turkey Taner Yildiz on cooperation to construct NPP in Turkey; start of bilateral negotiations
- 12.05.2010 Signature of Agreement between the Government of the Russian Federation and the Government of the Republic of Turkey on cooperation in relation to the construction and operation of a nuclear power plant at the Akkuyu site in the Republic of Turkey (IGA)
- 21.07.2010 **Entry into force of the Law ratifying IGA in Turkey (Law No. 27648 dated 21.07.2010)**
- 15.11.2010 Project Company shareholders identified by the Russian Government
- 13.12.2010 **Entry into force of the Law ratifying IGA in Russia**
- 13.12.2010 **Project Company, Akkuyu Electricity Generation JSC (AKKUYU NGS ELEKTRIK URETIM ANONIM SIRKETI) was established in Turkey**
- 26.05.2011 Start of full scale site survey activities
- 2011 Completion of land allocation to Akkuyu NGS AS; start of preliminary engineering design; PPA negotiations; preparations for licensing and EIA





# Akkuyu nuclear power plant – tailor made JSC

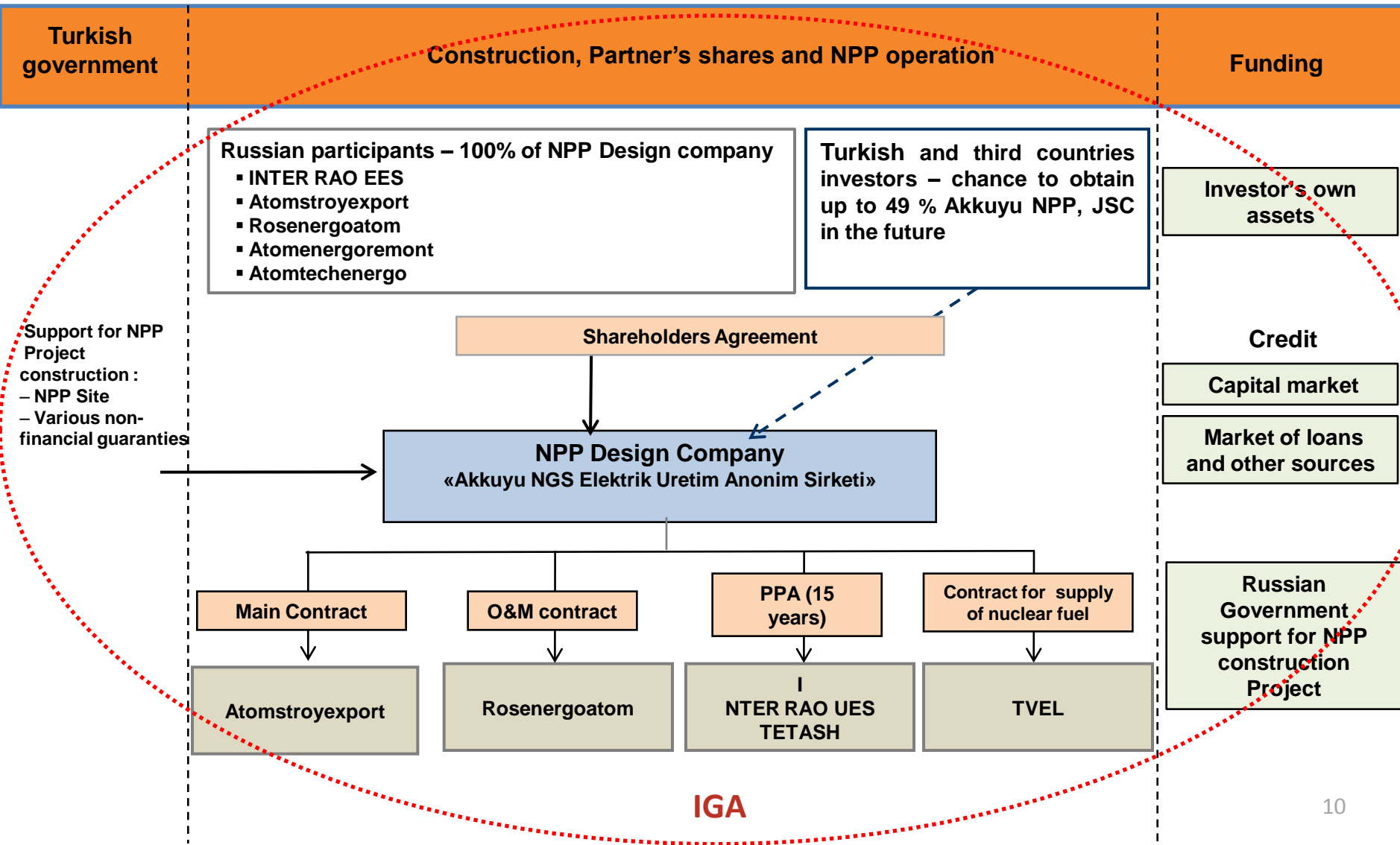


## COMMENTS

- "Akkuyu NPP" is a tailor-made JSC incorporated in Turkey
- Initially Rosatom affiliates own 100% stake of the Akkuyu NPP, JSC and retains the majority stake during the whole lifetime of the Project (51%-100%)
- International investors are welcome to join the project at any stage of its implementation and can own up to 49% stake

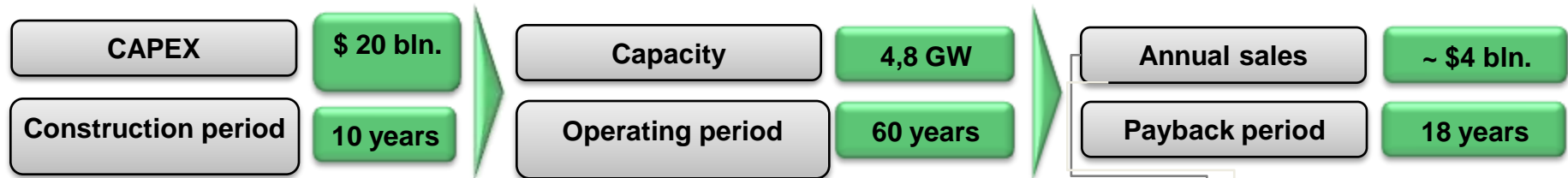
# First NPP in Turkey:

## First BOO NPP Project in the world



# Investment opportunity

## Key investment parameters



## Project implementation environment

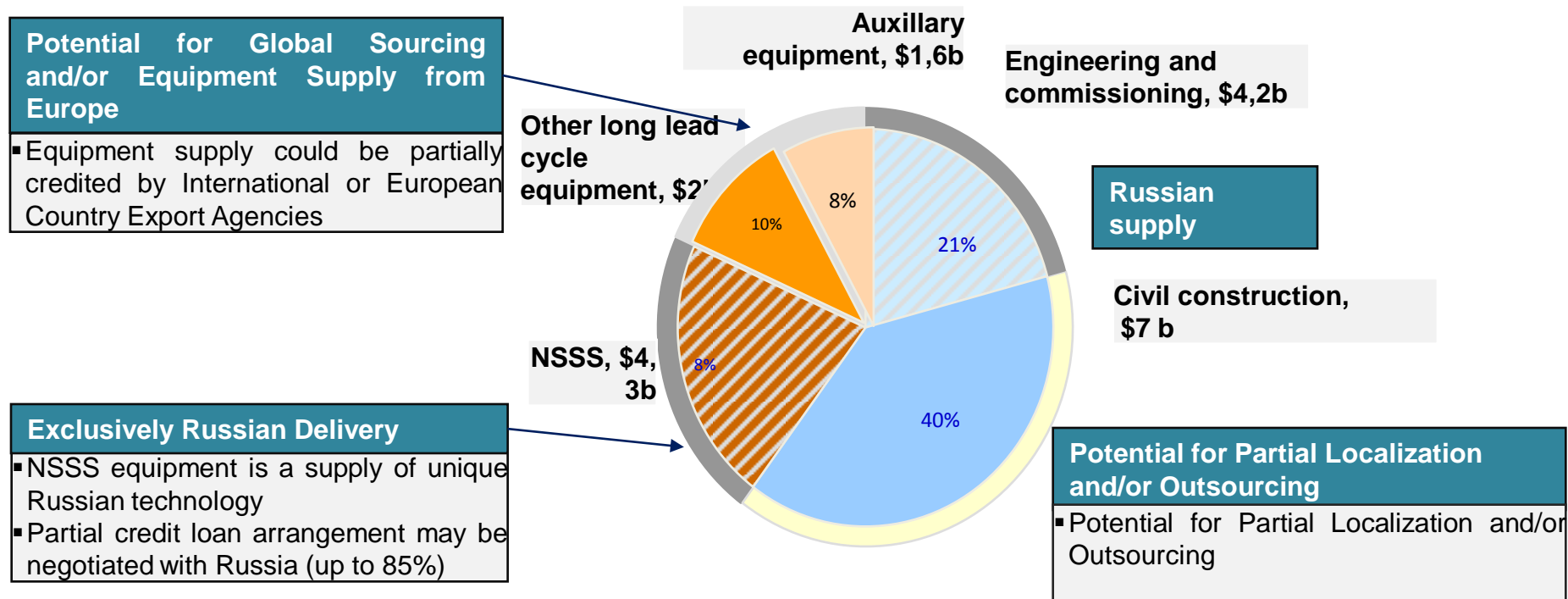
- Initial financing of the project is provided by Russian party
- The Russian State provides financial support by direct and indirect measures
- The project presumes electricity export to the European and Middle East countries
- Project financing approach presumes balancing equity and debt mechanisms. The latter one includes various debt sources and instruments, it is also considered potential involvement of European export agencies (Coface, Hermes)

PPA: contract period – 15 years for 50% of energy output,  
fixed price 12,35 US cents per kWh

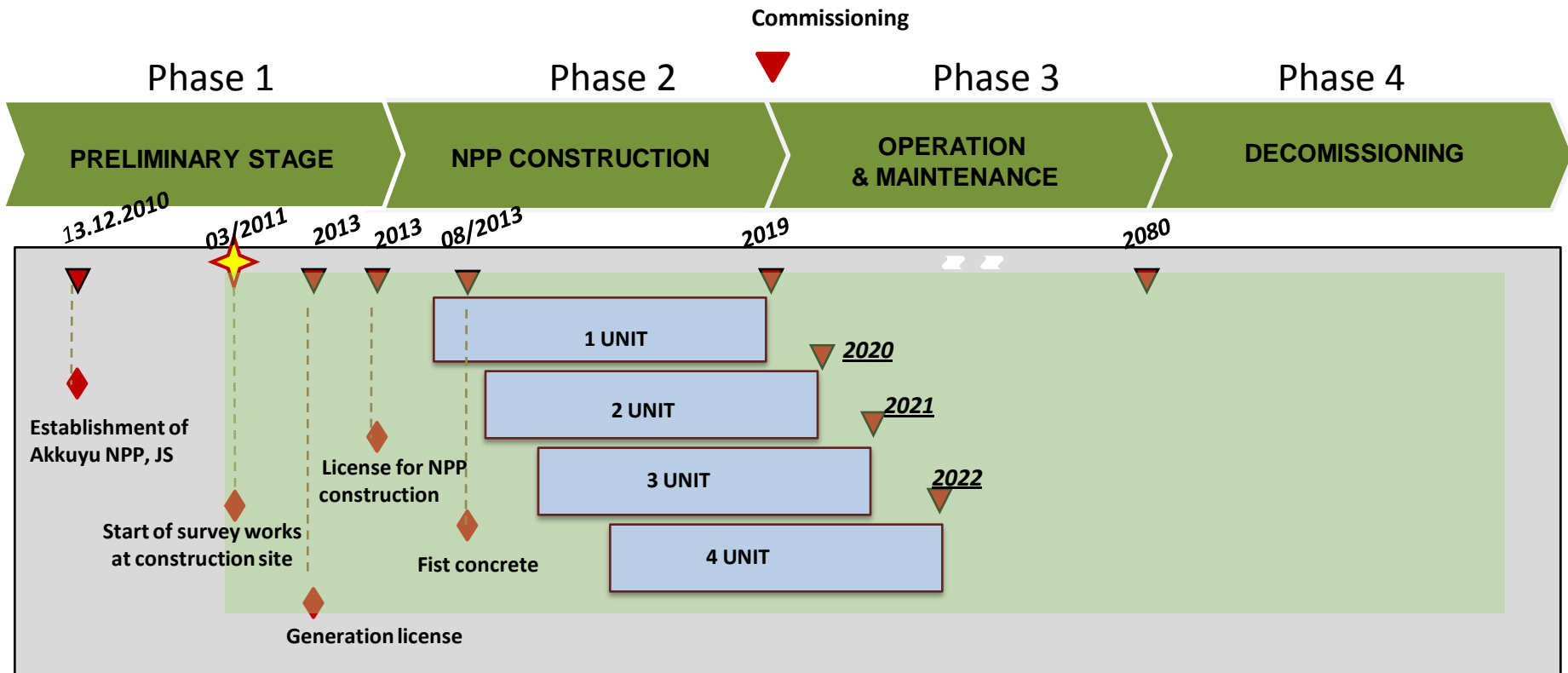


# Akkuyu NPP Financing structuring

## AKKUYU NPP CAPEX Structure



# Major phases and milestones of the Project



- In order to conclude PPA Project company must obtain generation licence.
- After first unit commissioning in 2019 the project would ensure partial self-financing for the remaining construction works due revenue from generated electricity.

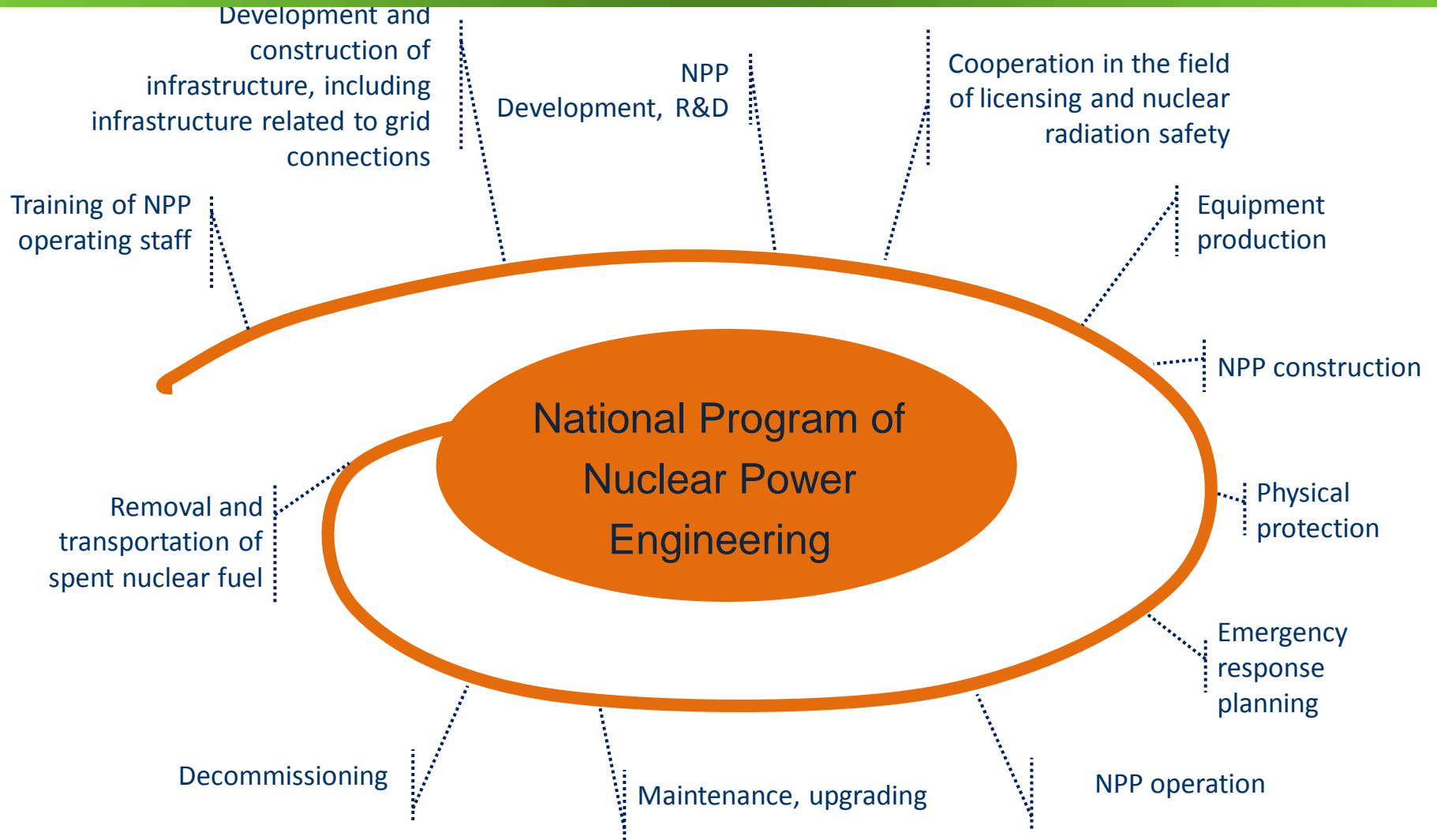
# Akkuyu Project support

1. IGA ratified by the parliaments of Turkey and Russia
2. Strong support by Turkish PM, MENR, state agencies
3. Growing economy and demand for power
4. Recognition by Turkish public of global warming and threat of emissions
5. Lack of serious alternatives; secure fuel supply; fixed price PPA
6. Availability of Russian funds for initial phase
7. Interest of Turkish and international investors

# Akkuyu Project challenges

1. 1<sup>st</sup> NPP in Turkey - Lack of precedent & clear road map in licensing process
2. Lack of strong legislation
3. Selected opposition, political and environmental
4. Fixed price PPA
5. High capital cost
6. First NPP executed under “BOO” scheme

# Large-scale approach to cooperation





# Turkish-Russian cooperation under Akkuyu NPP Project

- Phased increase of national participation in Akkuyu NPP construction
- Local labor force availability - maximum participation of local companies in civil works
- Training and involvement of Turkish specialists in Akkuyu NPP construction
- Licensing support: continuous interaction with Regulatory agencies of Turkish Republic
- Cooperation in developing “nuclear” competence in Turkish Republic
- Cooperation in holding public events, such as exhibitions, conferences, seminars, workshops



# Turkish-Russian cooperation on Akkuyu NPP Project

## Russian side:

- Engineering Design
- Issue of design documentation
- Construction management/supervision
- Supply of equipment and materials
- Special installation works
- NPP commissioning
- NPP operation
- Personnel training

## Turkish side:

- Construction and installation works
- Supply of equipment and materials
- Participation in operation and maintenance



Definitive range of services will be determined on competitive basis after evaluation of experience and competence of Turkish partners

# NPP infrastructure development

**Akkuyu NPP is a large- scale project serving as a catalyst of regional infrastructure development**

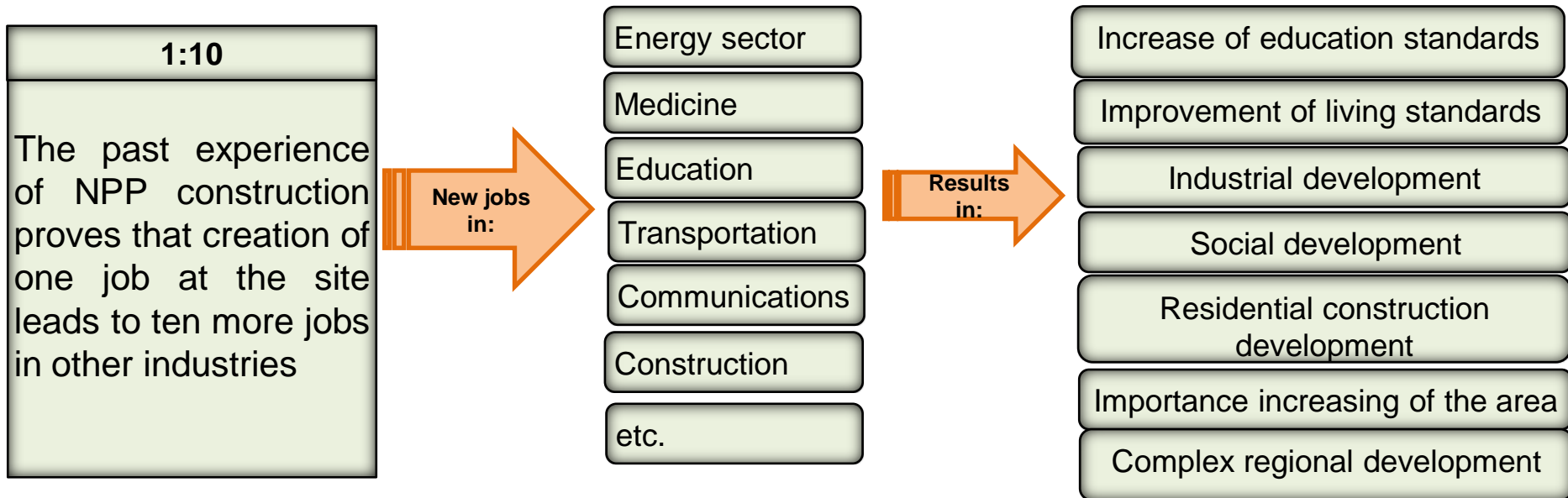
## **NPP Construction Needs:**

- Workers' township
- Harbor and sea port infrastructure
- Motorways
- Power grids
- Social services



**Thousands of jobs will be created at the site, tens of thousands – off-site**

# NPP infrastructure development (cont.)



**Thus, synergy provides employment for the local community at the macroeconomic level**

# Akkuyu NPP – activities in 2011

- AKKUYU site land allocation for Akkuyu NPP, JSC operations with the existing site license
- Consultations with Ministry of Energy, Ministry of Environment, Treasury, Ministry of Labor
- Consultations and regular meetings with TAEK on licensing road map
- Forming special work groups :
  - codes and standarts
  - engineering surveys
  - reference NPP
  - composition of PSAR
  - long cycle of manufacturing
- Consultations with major state agencies EUAS, TETAS, TEIAS
- Signing contracts with JSC Atomstroyexport and Turkish companies selected on competitive basis and having certificates of competence
- Design and site survey work
- Preparation of licensing documentation
- Financial model development
- Establishing Information Center in Mersin
- Select and begin training of Turkish students





# Training of skilled personnel



Starting in September 2011, 50 Turkish students will start their training in the Russian National Research Nuclear University (**MIFI**)



These trained specialists will constitute the Akkuyu NPP key staff



- MIFI is one of the three most respected RF Universities
- Internationally recognized educational capabilities
- Rich experience in training specialists proficient in nuclear facility operation
- Practical training at RF nuclear power plants

# Public Information Center

## Mission:

To provide the public a transparent information about nuclear energy

## Equipment and technologies

- Large panoramic screen
- Computer animation
- Stereo-sound
- Special education tables with personal monitors and interactive

## Methods

- Straight communications
- Simple language and comparisons
- Bright pictures
- Interactivity

## Objectives:

- Informing community about nuclear power engineering
- Transforming information centers into culture and education regional centers
- Involving students from Turkish State Universities in joint projects
- Providing information to the mass media
- Vocational guidance of high school graduates
- Russian language courses



**THANK YOU FOR ATTENTION!**  
**İLGİNİZ İÇİN TEŞEKKÜR EDERİM!**



**AKKUYU NGS AŞ**