THORIUM RESEARCH AND DEVELOPMENT ACTIVITIES IN TURKEY

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Country profile

- Area: 783,562 km² (37th)
- Population: 78 million (17th, 2014)
  - 26% of population is under 15 ages.
  - 8% of population is above 65 ages.
- GDP: 753 billion $ (17th, 2014)
- GDP per capita: ~10,000 $ (64th, 2014)
- Installed power: 69.5 GWe (2014)
- Electricity Consumption: 257 billion kWh (2014)
Country profile

Average annual electricity demand growth rate: 5.6% (2002–2014)
Akkuyu NPP project

IGA with Russian Federation on May 12, 2010.

4 units of VVER 1200

4800 MW (Total Capacity)

20 billion USD

35 billion kWh

60 years
Akkuyu NPP project

Pre Construction
- 12.5.2010: PC established
- 13.12.2010: EIA & Electricity L.
- 2011: EIA Approved
- 2011: IGA Signed
- 2011: PPA is finalised but not signed
- 2011: Construction L.

Construction
- 01.12.2014: Construction L. Application
- 27.01.2016: Electricity Generation L
- 2016: EIA & Electricity L
- 2016: PPA signature
- 2017: Construction L.
- 2023: Unit 1
- 2024: Unit 2
- 2025: Unit 3
- 2026: Unit 4

Operation
- 2023: Unit 1
- 2024: Unit 2
- 2025: Unit 3
- 2026: Unit 4
Sinop NPP project

IGA with Japan on May 3, 2013.

4 units of ATMEA 1
60 years

4480 MW (Total Capacity)
22 billion USD
33 billion kWh
Sinop NPP project

Pre Construction
- Sep. 2009
- 3 May 2013
- Oct. 2013
- June 2014
- 1st quarter of 2015
- End of 2015

Construction
- 2019
- 2023

Operation
- Unit 1
  - 2024
- Unit 2
  - 2027
- Unit 3
  - 2028
- Unit 4

Key Events:
- IGA signed
- EIA study start
- PC Establishment
- Seismic study start
- IGA ratified by parliament
- Site evaluation
- Unit 1 construction
- Operation start
Th exploration and development activities

- Turkey has 380 ktons of reasonably assured Th resources whereas the feasibility of their extraction should be studied.

- Research and development activities should be promoted to determine the feasibility of Th mining and fuel cycle.

Technologies should be developed for separation of complex minerals and
Research on Th fuel cycle

- There are advanced academic research on Th fuel cycle in Turkey which should be supported by the industry.

- Reactor types studied include CANDU-6, MSBR, HTGR where Th utilization had been demonstrated and also prototype reactors AHWR, GT-MHR, HTMR-100, RM-BWR, ACR-700, HNR, VVER-1000 (with core and blanket).
Research on ADS

- Turkey should be integrated to international R&D activities on ADS which is expected to be commercialized in the middle of this century.

- There are theoretical academic research studies on ADS in Turkey which should be verified by industrial demonstrations.
Infrastructure development

- Indusrial baseline for nuclear technologies should be separated from nuclear regulatory activities.
- Legislative framework for R&D should be improved to promote the flexibility of organizations and researchers on their activities.
Conclusion

- Th is considered as a potential resource to decrease the energy import dependency of Turkey.

- The strategic plan of MENR until 2019 includes research and development activities of U and Th reserves to determine the feasibility of their extraction.

- NEPIO is responsible for coordinating these activities.
THANK YOU!