

Motivations for nuclear programmes in Iran & Saudi Arabia

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Why order uneconomic nuclear capacity?

Three main factors that might allow/motivate utilities/countries to order uneconomic nuclear plant

1. Lack of financial responsibility falling on the utility. Due to weak regulation in monopoly markets & insulation from the market in competitive systems
2. Availability of finance that does not reflect project risk. For example, sovereign loan guarantees, regulatory assurances that costs can be passed through
3. Military aspirations. Links to weapons or submarine programmes

Saudi Arabia: Electricity industry structure

- Sector dominated by state-owned Saudi Electric owning most capacity (74GW, mostly oil & gas) & transmission, distribution & retail
- Demand growing rapidly ~7%
- Electricity and Cogeneration Regulatory Authority (ECRA) exists but not clear how independent it is & what its powers are
- Influential King Abdullah City for Atomic & Renewable Energy (KA-CARE) calling for 41GW of new solar, 17.6GW of new nuclear & 9GW of new wind by 2032. Realistic esp. for nuclear?

Saudi Arabia: Nuclear programme

- Nuclear programme announced 2009. 2017, RFI for 2 large reactors announced with 5 responses (Rosatom, CNNC, KEPCO, Areva, Westinghouse)
- Supplier to be selected 2018, order placed 2019, first power 2027
- Timetable appears unrealistic but finance shouldn't be a problem
- Also attempts to buy SMRs for desalination, front –runner KEPCO with 'SMART' technology
- Saudi Arabia's policy to build the full fuel cycle (enrichment, reprocessing) raises concerns about proliferation

Iran: Electricity industry structure

- Process of privatisation & liberalisation under way since 2000 but state-owned TAVANIR, vertically integrated, dominates the sector
- About 90% of capacity gas or oil fired
- There is an Iranian Electricity Market but not clear how significant it is
- Iran Electricity Market Regulatory Board (IEMRB) exists but government seems to set prices

Iran: Nuclear programme

- Nuclear programme dates back to early 70s when 6 reactors ordered, 4 from Siemens, 2 from Framatome
- After Iranian revolution, work on Framatome reactors abandoned, work on 2 Siemens reactors not started. 2 Siemens reactors (Bushehr) largely complete in 1979 but damaged in Iran-Iraq war
- 1 abandoned & 1 completed by Russia – Russian reactor in Siemens containment. Construction re-started 1996 but not complete till 2013. Operation appears highly problematic
- 2014, Iran agreed to buy 2 reactors from Rosatom with an option for 6 more
- Construction start 2019 for 1st reactor, 2nd 2 years behind

Iran: Finance & military connections

- Low oil price & sanctions restrict Iran's funding capability, likely to need Russian finance
- Iran's enrichment & reprocessing facilities have long led to proliferation concerns

Conclusions: Saudi Arabia & Iran

- Saudi Arabia, Iran (& China, Taiwan) have several factors in common.
- Military connections have been or are a consideration in all 4 cases
- The nuclear programmes were conceived & driven by centralised authoritarian regimes & based on continued forecast rapid demand growth
- Electricity sector largely publicly-owned companies, mostly by central government
- Independent and rigorous economic regulation of the electricity sector is largely absent
- The proposed programmes in Iran & Saudi Arabia are at an early stage with no construction yet & the timetables are unrealistic