

China
Market Status & Outlook
To
US NIC Global Nuclear Energy
Markets Summit

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The Great Wall of China



Silk Road (618-907 AD) (Silk Road Initiative) (2013-)



Belt and Road Forum

- Unveiled in 2013 – Silk Road Initiative
- Nov 2014 - \$40 billion Silk Road Fund
- May 2017 – BRF-29 heads of State & 130 countries (+\$14.5 billion)
- Policy, infrastructure, trade, financial & people-to-people
- Nuclear: China-Argentina - Hualong One & AFCR Candu (CNNC/SEC/SNC-Lavalin)

China Electricity

- Installed capacity 1508 GW-2015
- 70% Coal, 25% Hydro & Renewables, 3% oil & 2% Nuclear
- Largest in the world (70% built within last decade)
- Expected 1600 GW by 2020
- Per capital – 3500Kwh (5500kwh by 2030)
- Residential consumption – 13% vs 20% in Europe and 34% in the US

Nuclear Power

- Operation: 23 in 2014; 33 in 2015; 36 in 2016
- Under construction: 21 in 2015 & 21 in 2016
- Unit approval: 6 in 2016 & 8-10 in 2017 (?)
- 58 GW by 2020, 100 GW by 2025, 150 GW by 2030 & 200 GW by 2050
- Largely self-sufficient in design & construction
- Major strength in nuclear supply chain

BP Energy Outlook 2017

- Rapid nuclear expansion in China – 11% p.a.
- Three quarters of the global increase in nuclear generation (the rest of the world=1/4)
- Roughly = one new reactor every 3 months for the next 20 years
- DOC-IEA Market: China ranked top in civil nuclear market for US export in 2014-2015

13th 5-Year Plan (2016-2020)

- Increase energy efficiency & use of non-fossil energy
- Complete AP1000 units & approve new units
- Construction of Hualong One (Fuqing)
- Construction of demo CAP1400
- Construction of Phase III Tianwan #5 & #6
- Plans for inland plants
- SMR - Floating nuclear plants
- Demonstrate reprocessing plant

Major Players

- China National Nuclear Corp (CNNC) (CNEC)
- China General Nuclear Power Corp (CGN)
- State Power Investment Corp (SPIC)

Hualong International Technology (HPR1000): CNNC (ACP1000) & CGN (ACPR1000)
Chinese Academy of Sciences
Tsinghua University/Chinergy

Proposed Mega- Mergers

CNNC/Huadian/Guodian - 297 GW, \$310 billion
CGN/Datang/Shenhua – 241 GW, \$370 billion
SPIC/Huaneng – 263 GW, \$270 billion

Global Markets & Exports

- Determined to export nuclear technology with global market focus on CAP100 (with Westinghouse), CAP1400, Hualong One & HTR-600
- Manufacturing capacity – annual 8000MW
- Belt Road Forum for International Cooperation

Nuclear Exports:

- Asia-CNP300, Hualong One & HTR600
- Argentina-Hualong One & Candu-AFCR
- Romania –Candu-AFCR
- Turkey – CAP1000
- Saudi Arabia – HTR600
- South Africa – Hualong One & CAP1000
- UK – Hualong One, SMR
- Brazil, Egypt, Sudan, Algeria, Uganda...

Opportunities

Market conditions: political, quasi-government corps as customers, localization demand, HAF604 process, culture & business practice differences, IP concerns, currency and US export control (outdated for LWRS)

US - Unparalleled reputation in quality & safety; advanced technologies & unmatched operational performance

- Advanced technologies, standards & special services
- Plant life extension
- Backend fuel cycle
- Advanced materials
- Joint development of advanced technologies
- Partnership for better access new market

USNIC Strategy Report

- Retain leadership in nuclear energy innovation, safety & non-proliferation
- Clarify civilian nuclear export regulation regarding non-proliferation goal, global influence and national security
- Modernize 810 assurance process for China (Section 123 agreement, weapon state, matured nuclear technologies)

Note: Streamline visa process

NE OINEC budget needs to include supporting collaboration with China (with UK, France, India & Japan)

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Thank You!

Q & A