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

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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 (Fujing)
- 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)
Thank You!

Q & A