

Nuclear Power: A view to ASIA general

*US Nuclear Infrastructure Council (USNIC.org)
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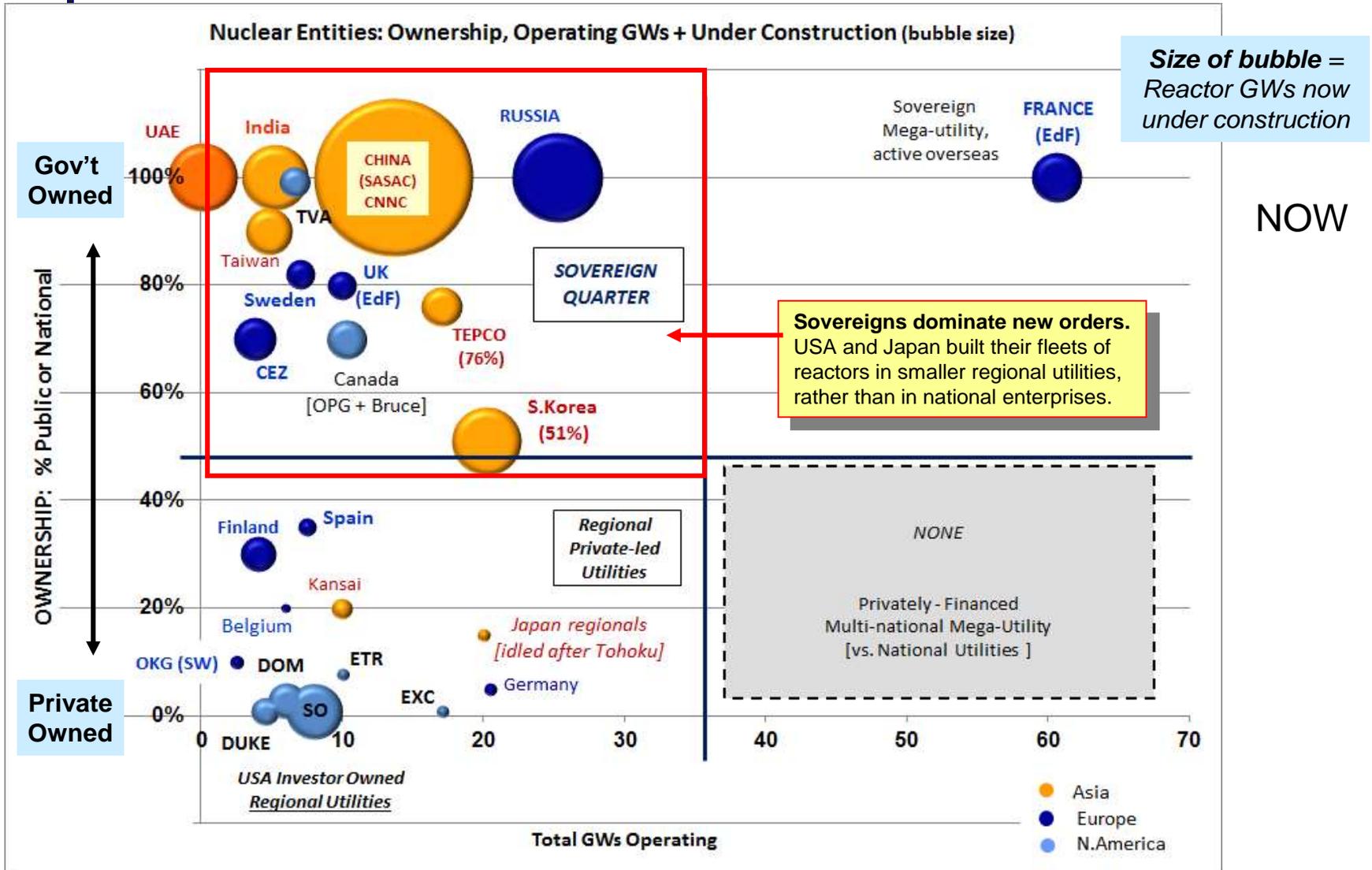
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New construction of reactors is a Sovereign decision, more than mere economics.

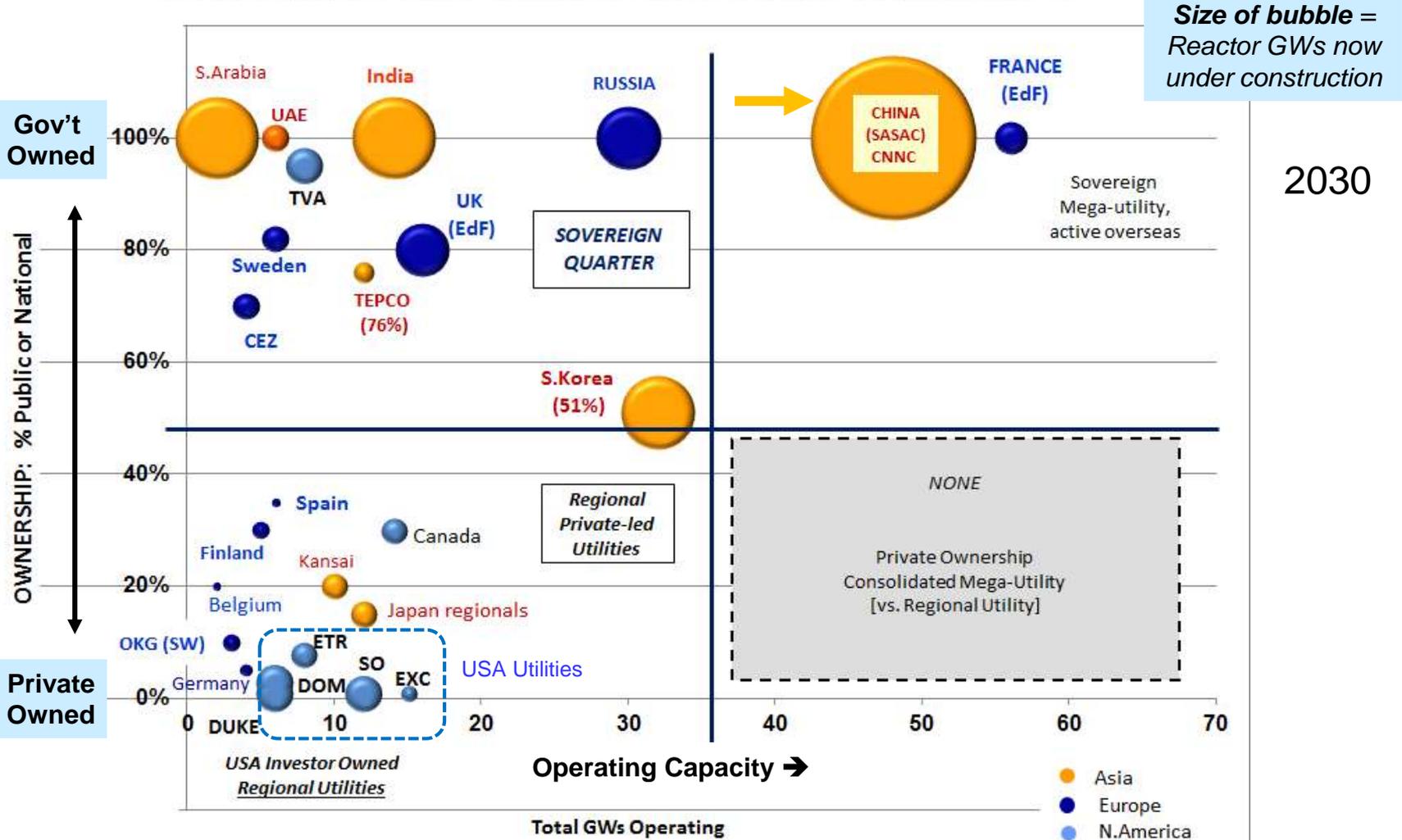
New Reactors: Where's the Growth?... **Asia, MidEast**



Asia, MidEast continue to dominate new construction: N.Am, EU lag

Sovereign Nuclear Energy Landscape 2030

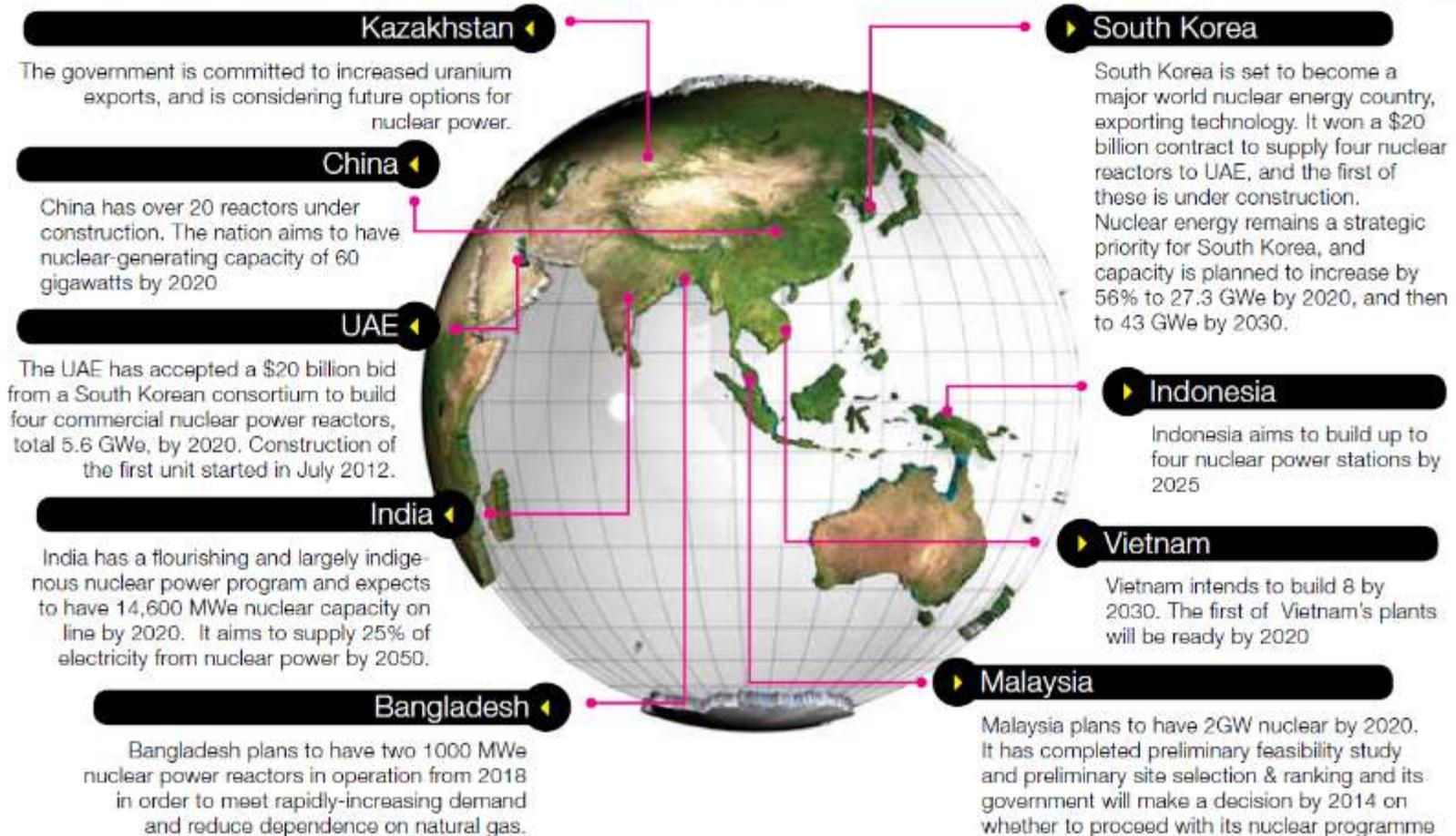
Nuclear Entities 2030: Ownership, Operating GWs + Under Construction (bubble size)



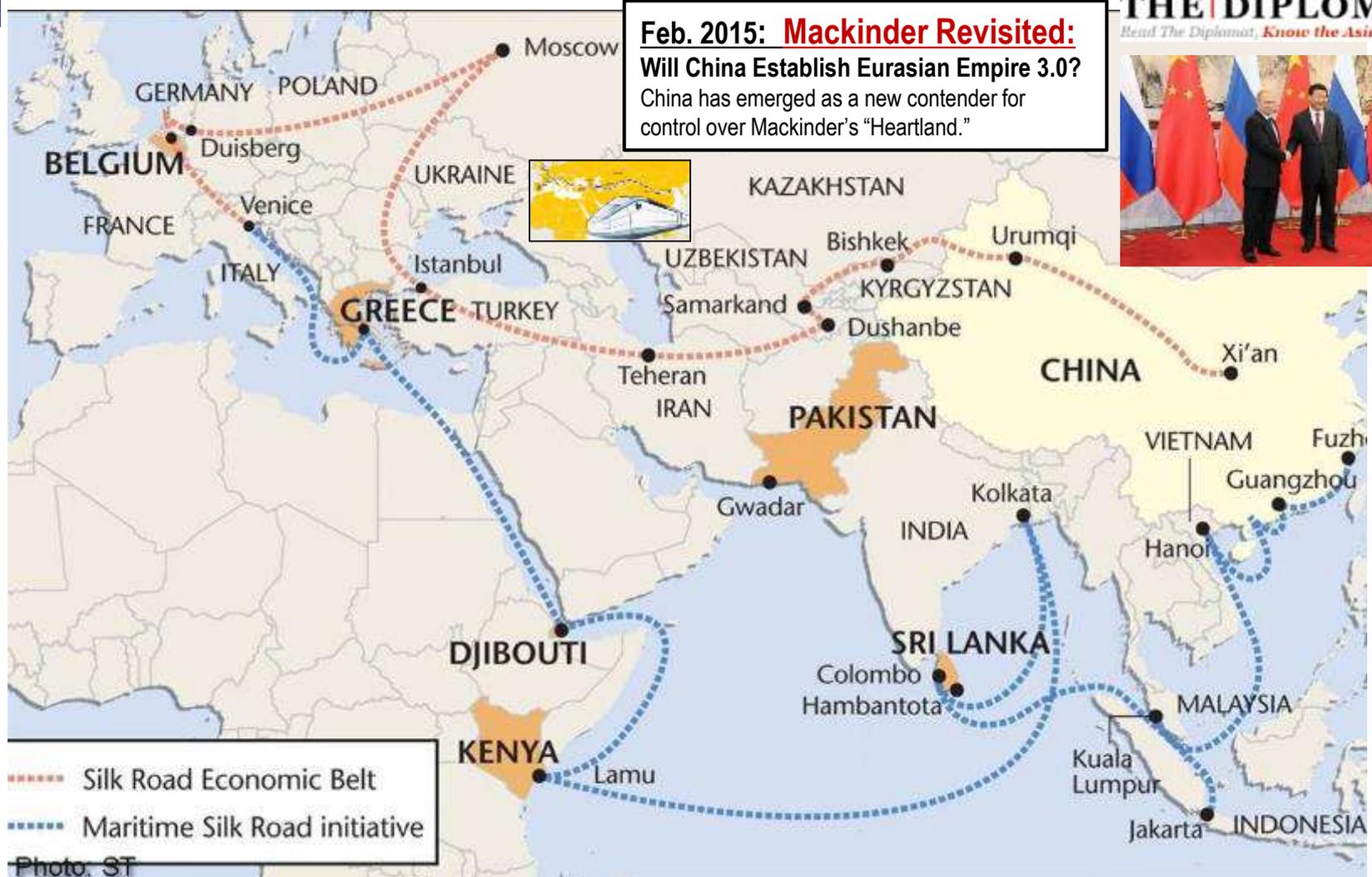
Sovereign Nuclear Energy Landscape 2030

Overview of Nuclear New Builds in Asia

Source:  World Nuclear Association



China's New Silk Road "Economic Belt"; 2 Routes



Feb. 2015: Mackinder Revisited:
Will China Establish Eurasian Empire 3.0?
 China has emerged as a new contender for control over Mackinder's "Heartland."



China: Use Floating Reactors to Assert Sovereignty

Seizing territory with Nuclear Energy

China plans fleet of floating nuclear power plants to provide energy to South China Sea islands



Yet again, China is floating around the idea of building floating nuclear plants, but this time they are planning on an entire flotilla -- in the South China Sea.

http://shanghaiist.com/2016/04/25/20_floating_nuclear_power_plants.php

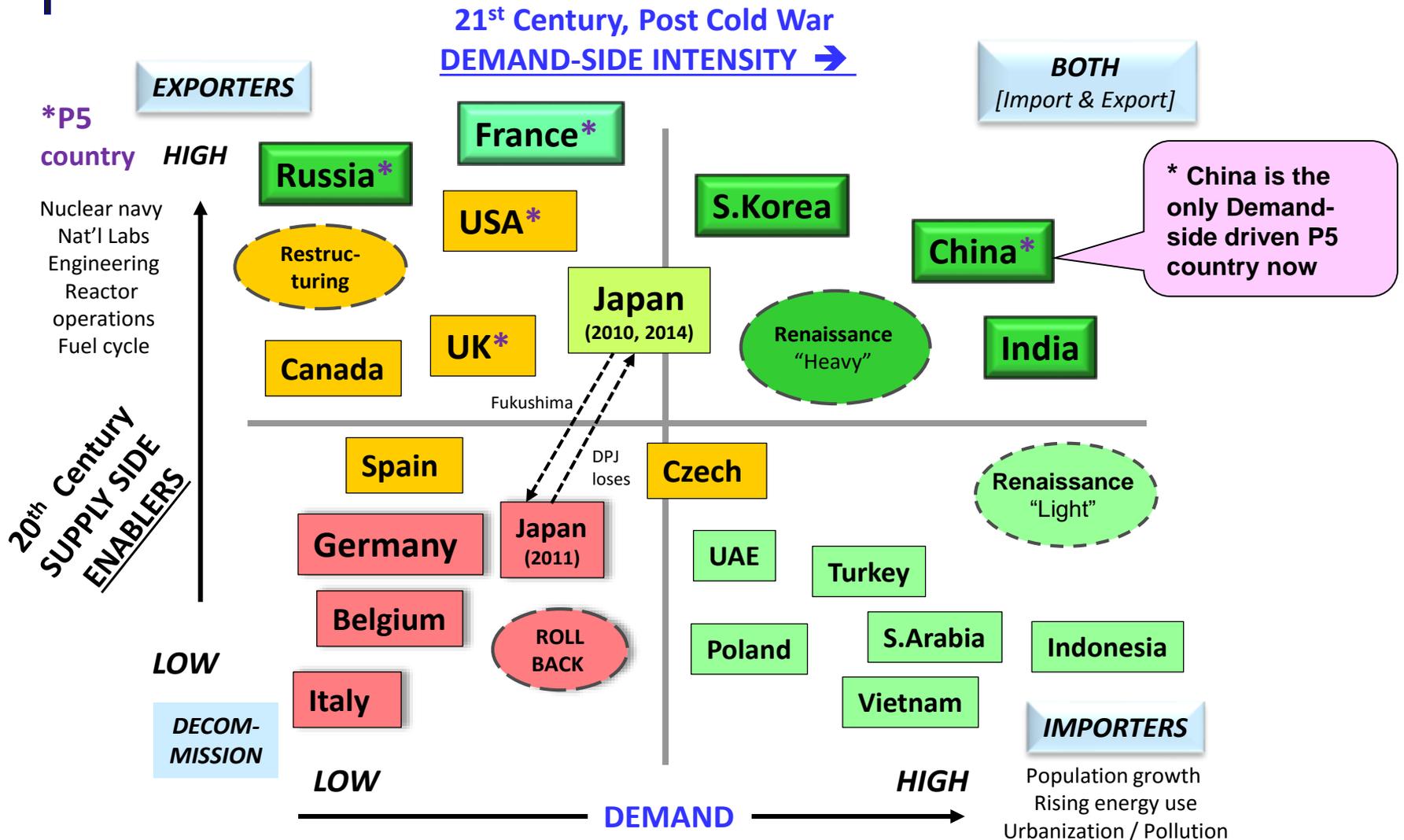
Five nations claim disputed island chains



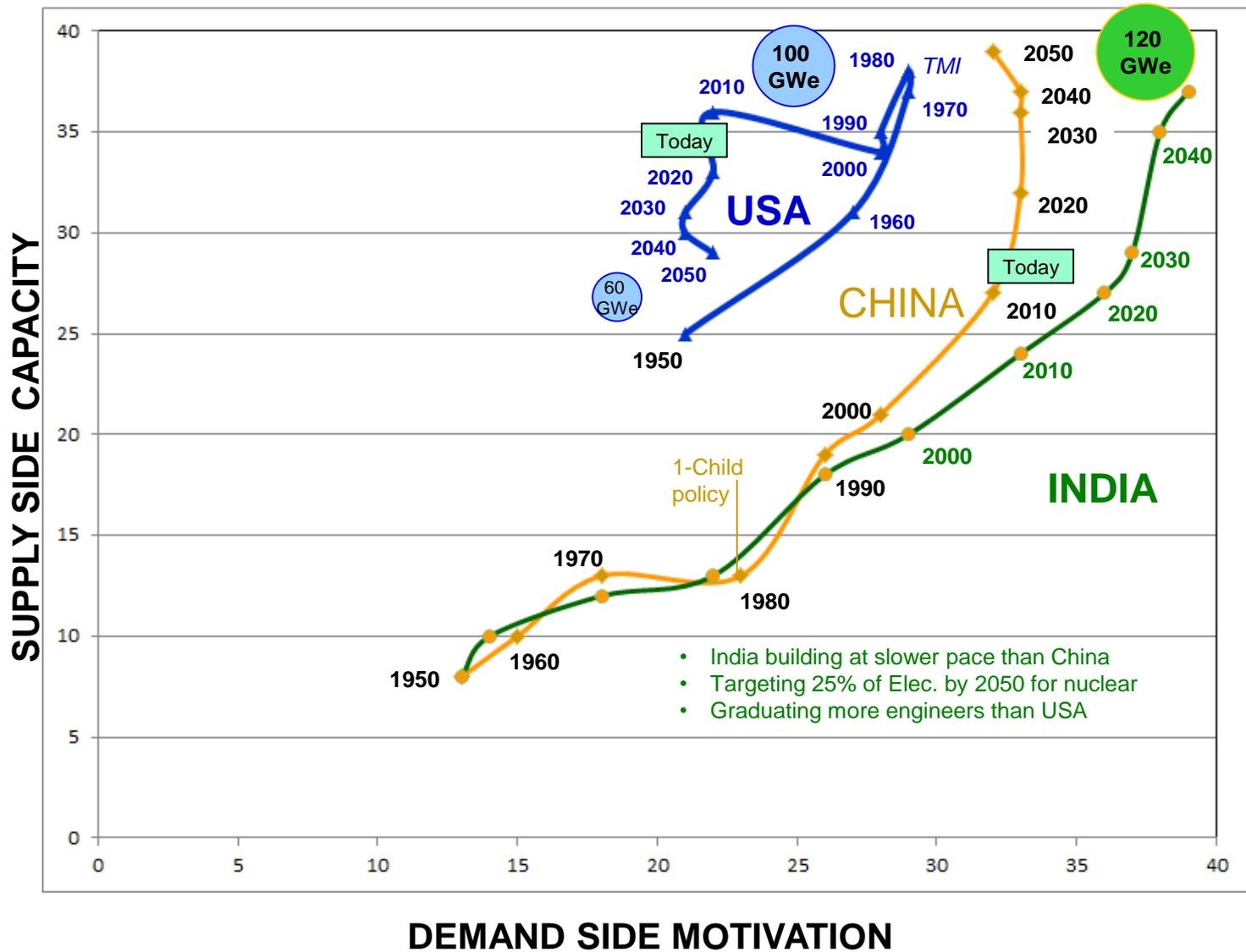
<http://thechinatimes.com/online/2012/08/4903.html>

“Redefining Leadership in Nuclear Energy Markets”

Supply vs Demand Factors and National Strategies



Nuclear Energy Pathways: USA, China, India



Sovereign Nuclear Energy Landscape 2030



Sovereign Nuclear Energy Landscape 2030

Southeast Asian states are moving to push ahead with nuclear power plants in an about-turn **from the focus on safety risk.....**

in the search for energy security.

These plans are supported by generous terms provided by the governments of

South Korea, Japan, China, Russia and France, which would provide the technology.



Nuclear Power in Korea

South Korean nuclear power plants

Four out of the country's 23 nuclear reactors are now closed. The Hanul No. 5 reactor automatically shut down on Wednesday due to a technical glitch.

STATUS OF REACTORS

● In operation ● Shut down



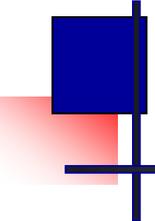
NET CAPACITY — ELECTRIC OUTPUT IN MEGAWATTS (MWE)



Sources: World Nuclear Association; Global Energy Observatory.

W. Feb. 29/01/2014

REUTERS



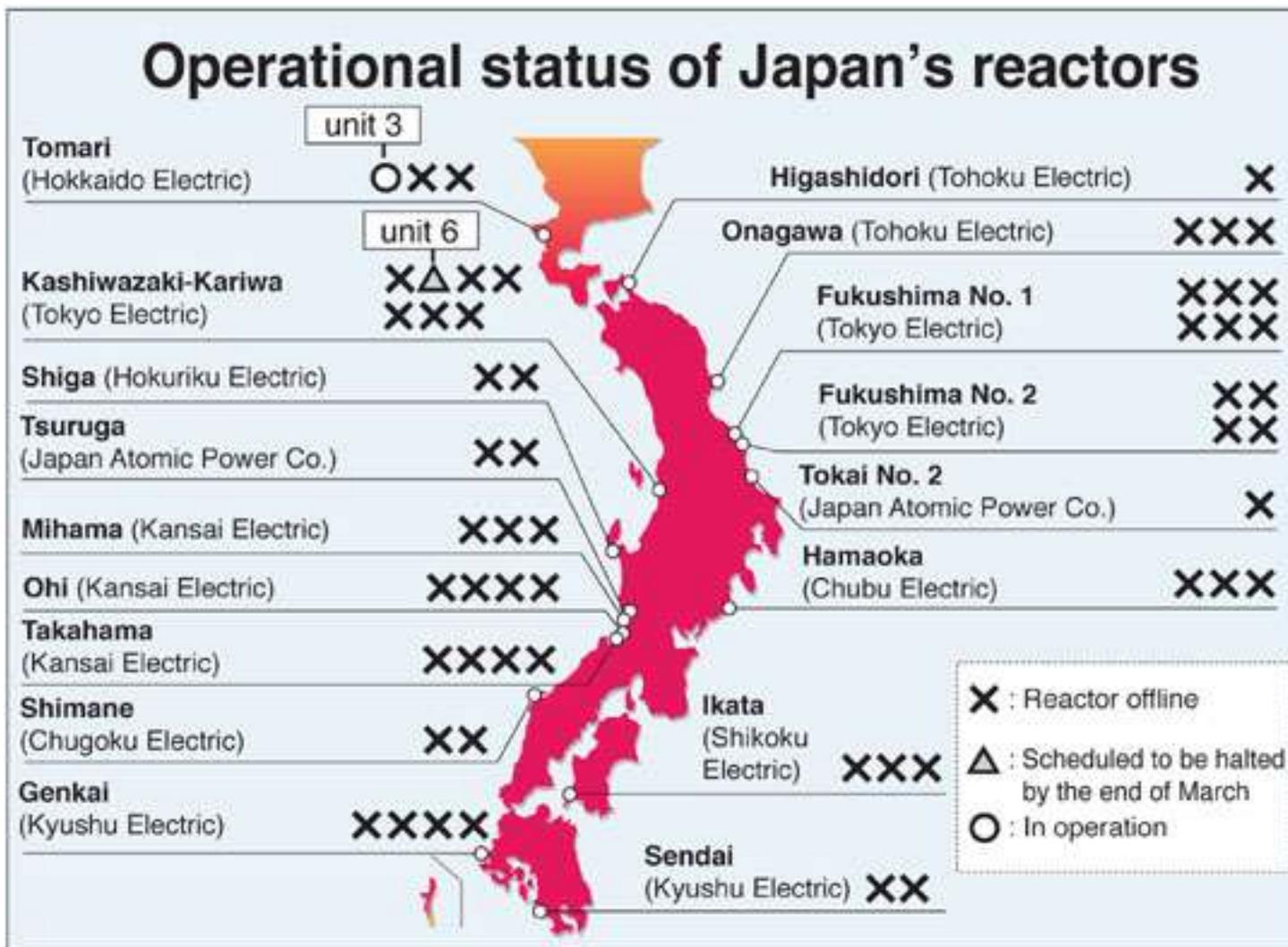
Nuclear Power in ROK - Korea

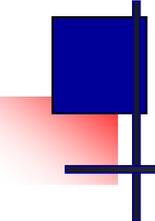
- South Korea is a major world nuclear energy country, exporting technology. It is building four nuclear reactors in UAE, under a \$20 billion contract.
- 25 reactors provide about one-third of South Korea's electricity from 23 GWe of plant.
- Nuclear energy remains a strategic priority for South Korea, and capacity is planned to increase by 70% to 38 GWe by 2029.
- The country is seeking relief from treaty commitments with the USA which currently constrain its fuel cycle options.

South Korea imports 97% of its fuel, by ship. Some \$170 billion was spent on imported energy in 2011, one-third of all imports. Without nuclear power, this import bill would have been about \$20 billion higher according to KEPCO.

Power demand in the Republic of Korea (South Korea) has increased by more than 9% per year since 1990. Over the last three-and-a-half decades, South Korea has enjoyed 8.6% average annual growth in GDP, which has caused corresponding growth in electricity consumption – from 33 TWh in 1980 to 545 TWh in 2014.

Nuclear Power in Japan





Nuclear Power in Japan

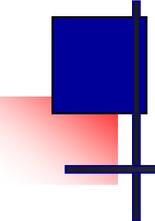
- Japan needs to import about 84% of its energy requirements.
- Its first commercial nuclear power reactor began operating in mid-1966, and nuclear energy has been a national strategic priority since 1973. This came under review following the 2011 Fukushima accident but has been confirmed.
- The country's 50+ main reactors have provided some 30% of the country's electricity and this was expected to increase to at least 40% by 2017. The prospect now is for two thirds of this, from a depleted fleet.
- Currently 42 reactors are operable and potentially able to restart, and 24 of these are in the process of restart approvals. The first two restarted in August and October 2015.
- June 16, 2016—Within the past week, four reactors in Japan moved closer to restarting**

Nuclear Power in India

Planned Nuclear Power Plants in India

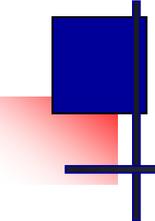


Source: World Nuclear Association



Nuclear Power in India

- India has a flourishing and largely indigenous nuclear power program and expects to have 14.6 GWe nuclear capacity on line by 2024 and 63 GWe by 2032. It aims to supply 25% of electricity from nuclear power by 2050.
- Because India is outside the Nuclear Non-Proliferation Treaty due to its weapons program, it was for 34 years largely excluded from trade in nuclear plant or materials, which has hampered its development of civil nuclear energy until 2009.
- Due to earlier trade bans and lack of indigenous uranium, India has uniquely been developing a nuclear fuel cycle to exploit its reserves of thorium.
- India has a vision of becoming a world leader in nuclear technology due to its expertise in fast reactors and thorium fuel cycle.

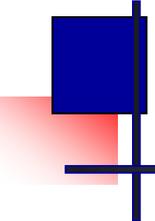


India Rules Out GE Reactors Lacking Working Plant Elsewhere

India won't buy GE Hitachi Nuclear Energy's atomic reactors that haven't been used in nuclear power plants before, the country's top atomic-energy bureaucrat said.

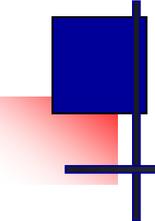
“Right now they have offered us reactors that do not have a reference plant,” Sekhar Basu, secretary at India's Department of Atomic Energy, said in a phone interview referring to the need for an operating example. “We will not buy a reactor that doesn't have a reference plant.”

GE Hitachi has signed an accord for supplying reactors for an atomic power plant at Kovvada in India's southern state of Andhra Pradesh. India also has pacts with Westinghouse Electric Co., [Electricite de France SA](#) and Russia's JSC Atomstroyexport for purchasing reactors. GE Hitachi Nuclear is a venture between General Electric Co. and Hitachi Ltd.



Nuclear Power in Indonesia

- **Indonesia has a greater depth of experience and infrastructure in nuclear technology than any other southeast Asian country except Australia.**
- **A 10 MWe experimental nuclear power reactor is planned to be built at Serpong, near Jakarta.**
- **Conceptual design has been completed by Russia.**
- **Plans for larger units are delayed**



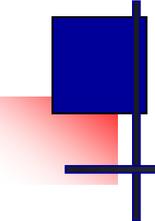
Nuclear Power in Vietnam

Russia has agreed to finance and build 2400 MWe of nuclear capacity from 2020.

Japan has agreed similarly for another 2200 MWe.

Electricity use is expected to triple from 2015 to 2030.

Vietnam is the most significant of the three lower Mekong countries, with a population of 88 million. It produced 127 TWh gross of electricity in 2013, 57 TWh from hydro, 43 TWh from gas, 25 TWh from coal and had 2 TWh net import from China. Consumption was about 114 billion kWh, giving per capita consumption of 1250 kWh/yr. In 2013 Vietnam produced 124.6 TWh from 32 GWe of plant (at year end).

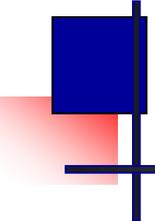


Nuclear Power in Taiwan

In April 2014, the Taiwanese government decided to halt the remaining construction of the Lungmen power plant.

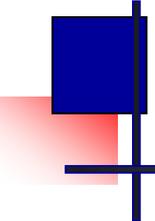
The first reactor was sealed after the completion of safety checks, and construction of the second reactor was halted. A final decision may be subject to a national referendum.

No final plan has been advanced for lay-up of the plant.



Nuclear Power in Thailand

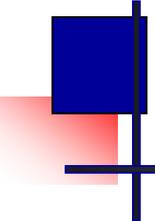
In Thailand, two reactors are planned and four proposed.



Nuclear Power in Malaysia / Indonesia

Malaysia plans to build two reactors in coastal areas of southern Johor.

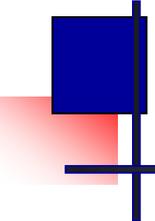
Indonesia is considering smaller reactors on Bangka Island and in West Kalimantan.



Nuclear Power in Philippines

The Philippines is debating re-commissioning the nuclear plant built in Bataan by the US corporation Westinghouse in the 1980s but never made operational because of safety concerns.

It was built close to a seismic fault line near the then-dormant Mount Pinatubo and was at the center of intensive corruption investigations.



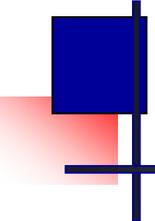
Nuclear Power in Bangladesh

Bangladesh plans to have two large Russian nuclear power reactors in operation, the first from 2022.

This is to meet rapidly-increasing demand and reduce dependence on natural gas.

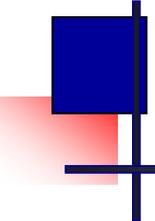
Electricity demand is rising rapidly (9% in FY 2013) and capacity was 11.3 GWe in January 2014, plus some 500 MWe of import capacity from West Bengal in India which in 2012 provided over 5% of electricity.

Over 30% of the population remains without electricity, and the other two-thirds experiences frequent power cuts. Some 5.0% of government expenditure is being allocated to 'power and energy'.



Nuclear Power in Singapore

**Great country to do business in,
.....no go for Nuclear at this time.**



Nuclear Power – Site - WNA

<http://www.world-nuclear.org/information-library/country-profiles.aspx>

Nuclear Power

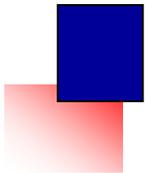
Asia....use locals, but.....

**And what is the biggest challenge
for major construction projects
today.....?**



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