



Nuclear Reactors (NSSSs), 2019 Report

The Report

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From the Editors

To our subscribers:

Since 1993, McCoy has measured the breadth, depth, and competitive elements of the power generation markets we serve. Our scope includes a clear mandate to judge market share.

Quarterly market performance updates provide transparency and insight, but the appropriate interval with which to assess OEM efficacy is annual.

All our best,
Bob McCoy
Dave Hetherington

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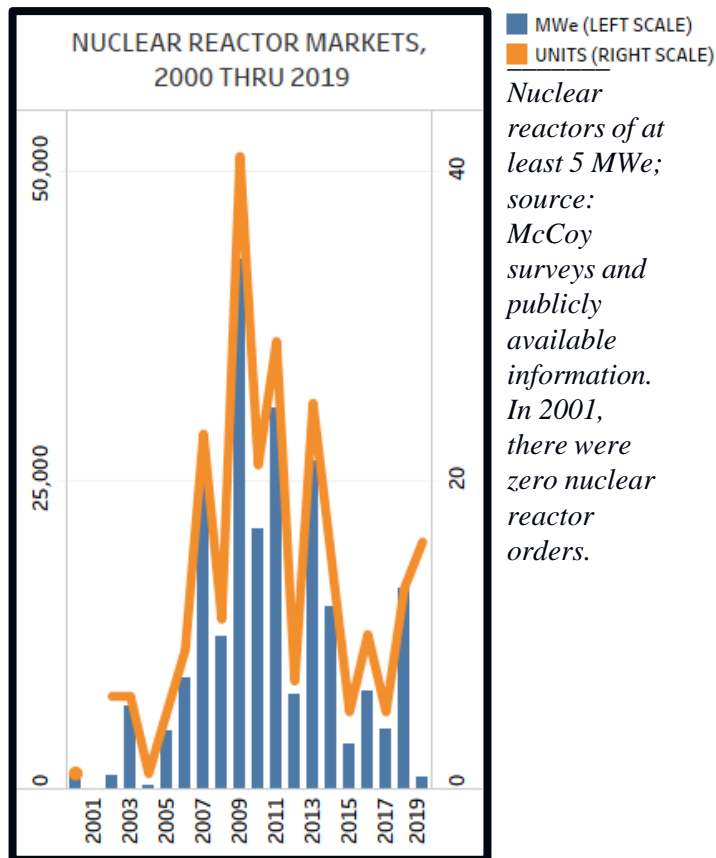
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Summary

The 2019 nuclear reactor markets amounted to 16 units and 1.0 GWe. On-year, units were up by four but capacity was down by 15.2 GWe.

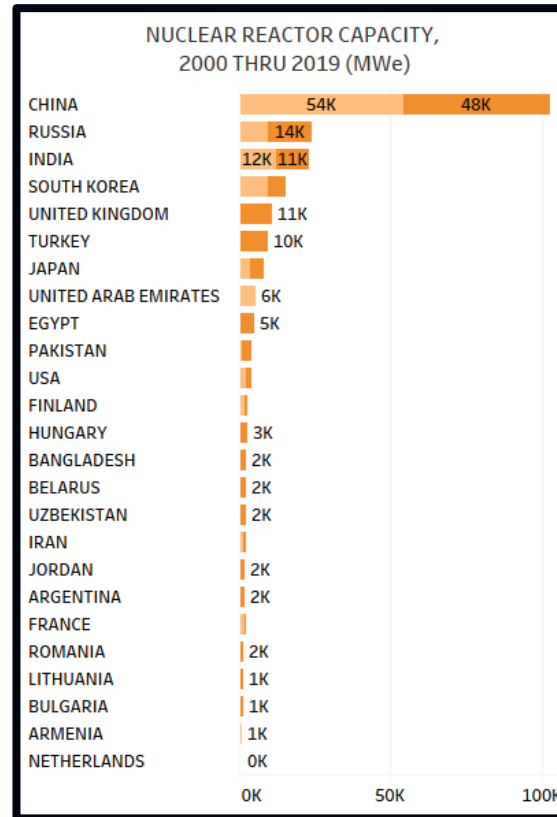
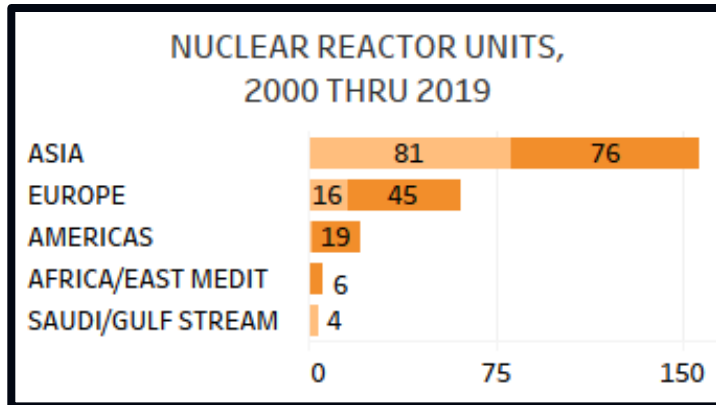
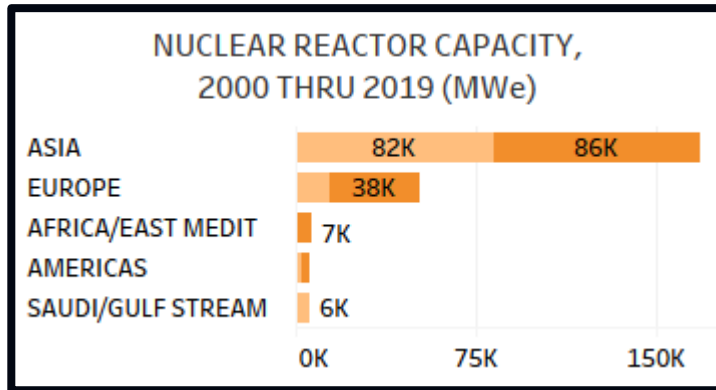
On the pages that follow we present market observations regarding demand geography, market share of technology owners, current levels of baseload demand, and how the nuclear fleets of USA and Europe are operating.



Nuclear reactors of at least 5 MWe; source: McCoy surveys and publicly available information. In 2001, there were zero nuclear reactor orders.

Observation: Demand Geography

For the 20-year period through 2019, Asia’s 168 GWe of demand accounted for 71% of global demand (image right, top). By decade, Asia-based demand went from 79% of all capacity for the decade through 2009 and fell to 64% for the decade through 2019. By units, Asia led with 157 or 63% of global demand (image right, bottom) for the 20-year period through 2019. By country, China, Russia and India combined for 63% of all capacity awarded since 2000.

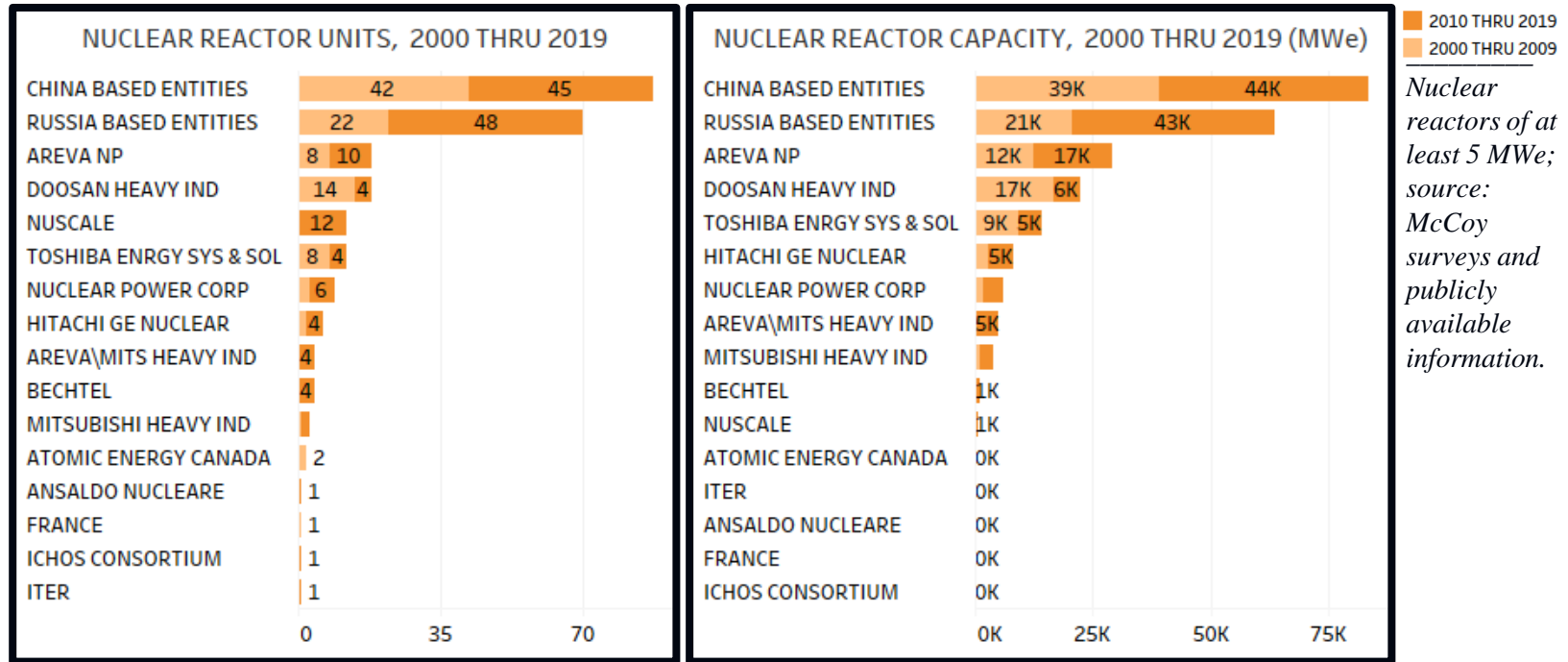


■ 2010 THRU 2019
■ 2000 THRU 2009

Nuclear reactors of at least 5 MWe; source: McCoy surveys and publicly available information.

Observation: Market Share

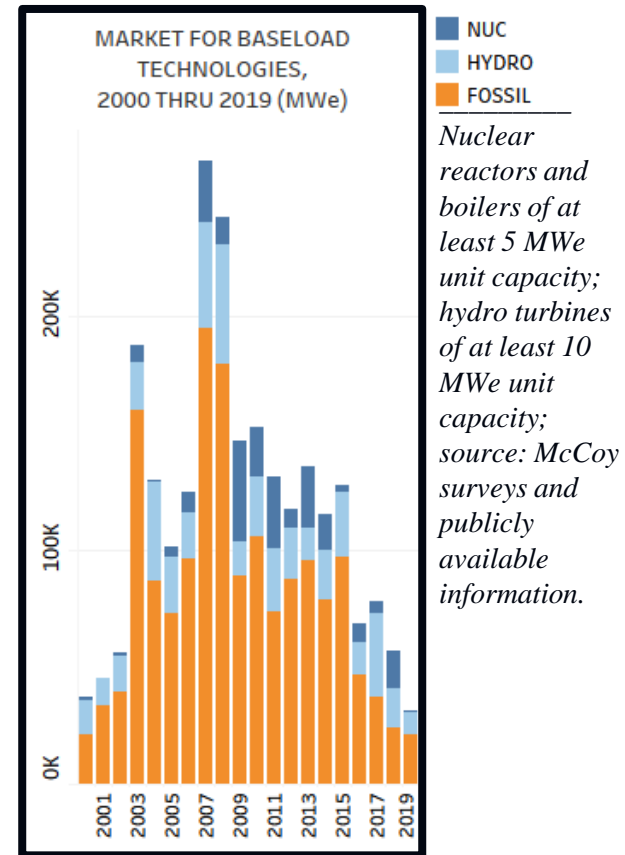
China and Russia based entities are the leading nuclear technology owners. For the decade through 2009, these entities captured 58% of capacity and 62% of units. For the decade through 2019, they captured 65% of capacity and 64% of units (images bottom).



Observation: Baseload Technology Demand

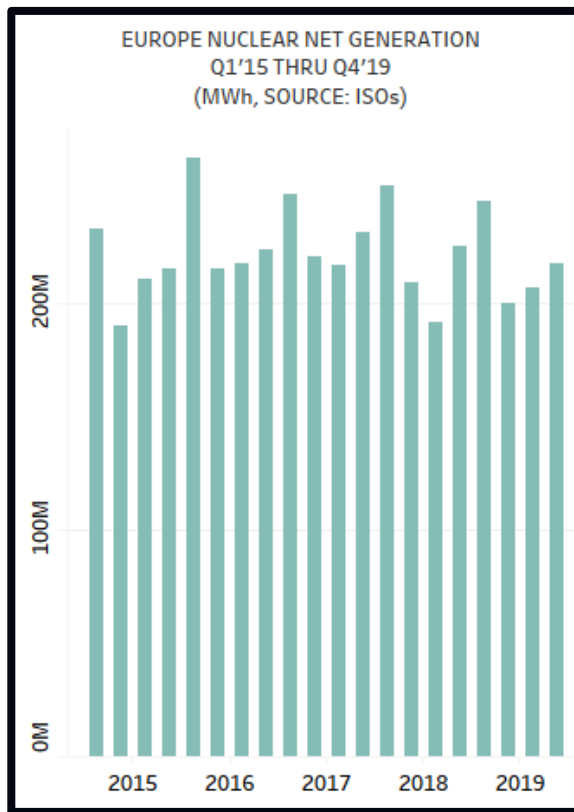
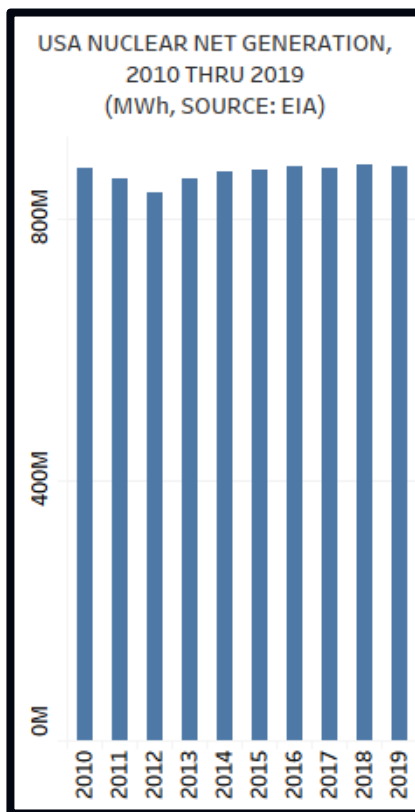
The markets for nuclear technologies can be volatile with rapid expansions and retracements, but over the past five years, demand for nuclear and other baseload technologies like fossil and hydro has slumped. For the five-year period through 2014, demand for baseload technologies of fossil, hydro and nuclear amounted to 653 GWe, an average of 131 GWe per annum. For the most recent five-year period through 2019, demand was 363 GWe, an average of 73 GWe and a decline of 44%.

Finally, in 2019 alone, the market for these baseload technologies was just 32 GWe.



Observation: Fleet Utilization, USA and Europe

USA's nuclear fleet generated 880M MWh of net generation in 2019, down on-year a negligible 0.2%. This level of nuclear net generation amounted to 19.7% of all USA 2019 net generation, up from 19.3% in 2018. Europe's nuclear fleet generated 868M MWh in 2019, down 1% on-year but represented 41.4% of Europe's net generation, up from 40.0% in 2019.



Source for far left image: EIA. For near left image, nuclear reactors operating within the networks of 40 Europe based ISOs; source: Europe based ISOs. Images courtesy of Simpfony.

Official League Tables – 10 Years Thru 2019

TECHNOLOGY OWNER	MWe, 10 YR THRU 2019	MARKET SHARE	TECHNOLOGY OWNER	UNITS, 10 YR THRU 2019	MARKET SHARE
ATOMSTROYEXPORT	28,516	21.2%	CHINA	29	19.9%
CHINA	28,200	21.0%	ATOMSTROYEXPORT	24	16.4%
AREVA NP	16,700	12.4%	CHINA NATIONAL NUCLEAR CORP (CNNC)	15	10.3%
CHINA NATIONAL NUCLEAR CORP (CNNC)	16,090	12.0%	RUSSIA	13	8.9%
RUSSIA	13,620	10.1%	NUSCALE	12	8.2%
DOOSAN HEAVY IND	5,700	4.2%	ATOMENERGOMASH	11	7.5%
HITACHI GE NUCLEAR	5,475	4.1%	AREVA NP	10	6.8%
TOSHIBA ENERGY SYSTEMS & SOLUTIONS	5,085	3.8%	NUCLEAR POWER CORP	6	4.1%
AREVA\MITS HEAVY IND	4,800	3.6%	AREVA\MITS HEAVY IND	4	2.7%
NUCLEAR POWER CORP	4,200	3.1%	BECHTEL	4	2.7%
MITSUBISHI HEAVY IND	3,076	2.3%	DOOSAN HEAVY IND	4	2.7%
BECHTEL	1,200	0.9%	HITACHI GE NUCLEAR	4	2.7%
NUSCALE	720	0.5%	TOSHIBA ENERGY SYSTEMS & SOLUTIONS	4	2.7%
ATOMENERGOMASH	650	0.5%	MITSUBISHI HEAVY IND	2	1.4%
ITER	167	0.1%	ANSALDO NUCLEARE	1	0.7%
ANSALDO NUCLEARE	100	0.1%	COMISION NACIONAL DE ENERGIA ATOMICA (CNEA)	1	0.7%
COMISION NACIONAL DE ENERGIA ATOMICA (CNEA)	35	0.0%	ICHOS CONSORTIUM	1	0.7%
ICHOS CONSORTIUM	18	0.0%	ITER	1	0.7%
TOTAL ORDERED CAPACITY	134,352	100.0%	TOTAL ORDERED UNITS	146	100.0%

Nuc units of 5 MWe and up; source: McCoy surveys.