Hydro Turbines and Generators, 2019 Report

The "Report"

February 26, 2020

David R. Hetherington
President
McCoy Power Reports
1910 Byrd Ave, Ste 134, Richmond VA, 23230
p) US: 804 677-8900
w) http://mccoypower.net/
e) davidh@mccoypower.net

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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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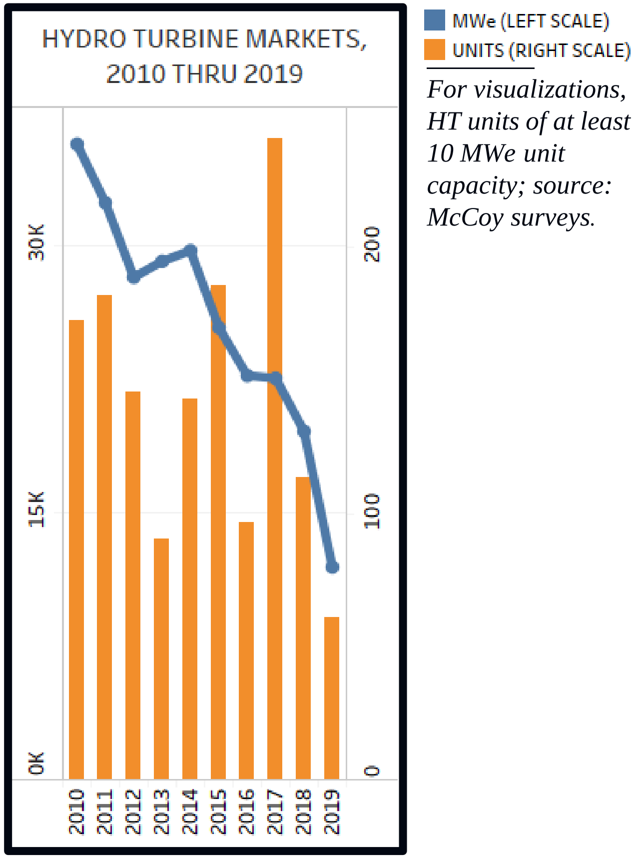
Summary

The hydro turbine (HT) markets for units of at least 10.0 MWe unit capacity amounted to 9,085 MWe and 80 units during 2019 (image right). On-year, capacity volume declined 46% to the lowest level since 1999 while unit volume declined 39% on-year to its lowest level on record (McCoy data only goes back to 1980).

On the pages that follow, we offer insights related to geographic demand, unit size, utilization in the USA and Europe, and OEM competitive performance.

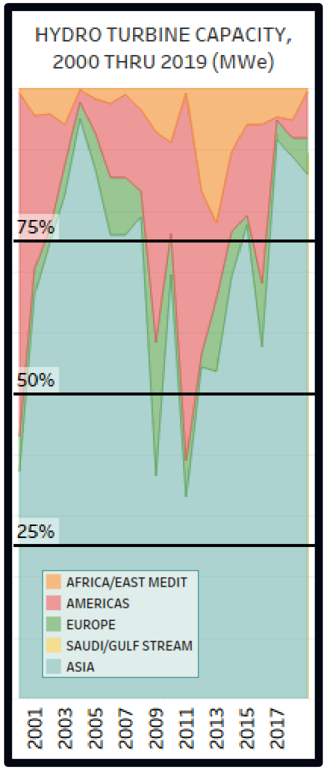


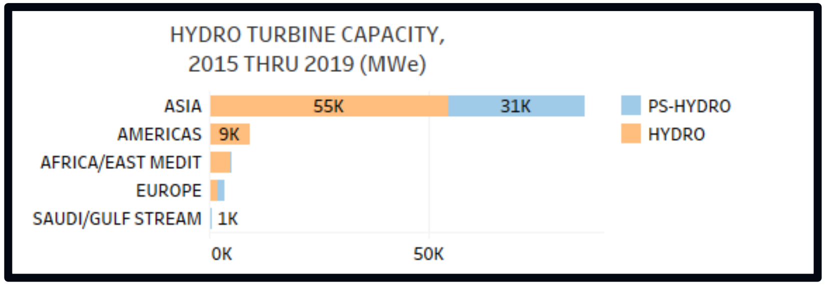
For visualizations, HT units of at least 10 MWe unit capacity; source: McCoy surveys.

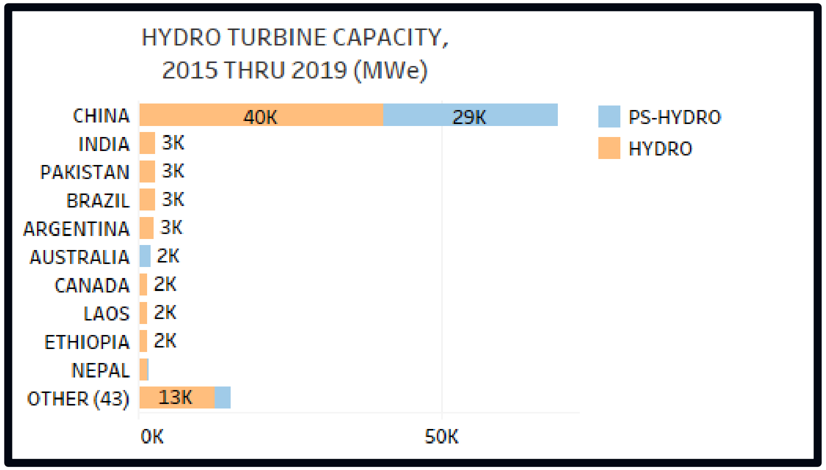
Analysis: Geographic Demand

Asia was the dominant region again in 2019, comprising 85% of all 2019 capacity (image near right).

For the past five years through 2019, Asia comprised 82% of capacity demand (image far right, top) and China alone accounted for 66% (image far right bottom).







For visualizations, HT units of at least 10 MWe unit capacity; source: McCoy surveys.

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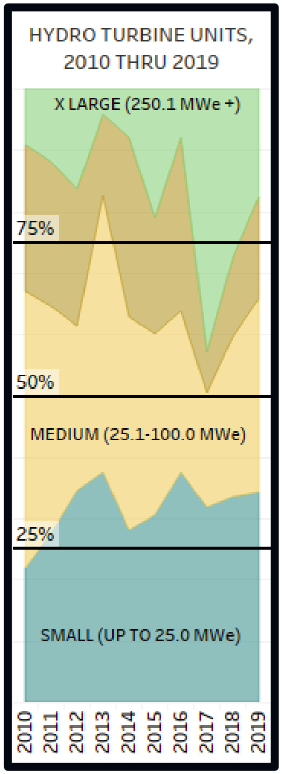
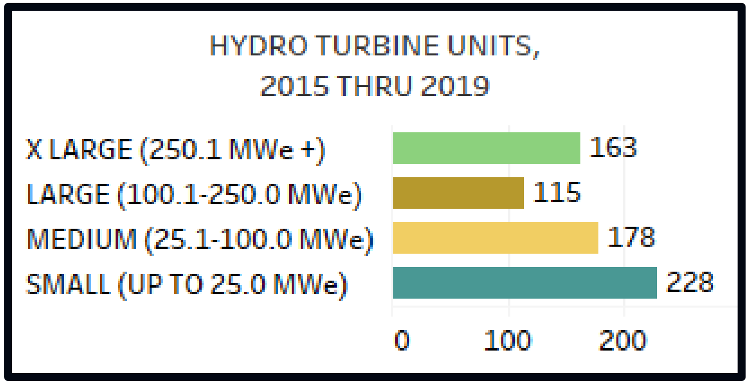
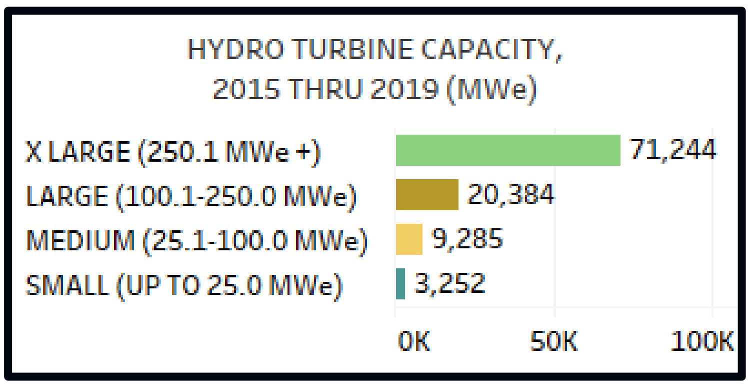
Analysis: Unit Size Segmentation

Small and Medium sized HT units combined for 66% of the market in 2019, the highest such portion of the market since 2013 (image below left).

For the five-year period through 2019, Small units comprised 33% of the market and Medium units 26% (image below right, top). By capacity, X Large units were 68% of the market and Large units 20% (image below right, bottom).







X LARGE (250.1 MWe +)
LARGE (100.1-250.0 MWe)
MEDIUM (25.1-100.0 MWe)
SMALL (UP TO 25.0 MWe)

For visualizations, HT units of at least 10 MWe unit capacity; source: McCoy surveys.

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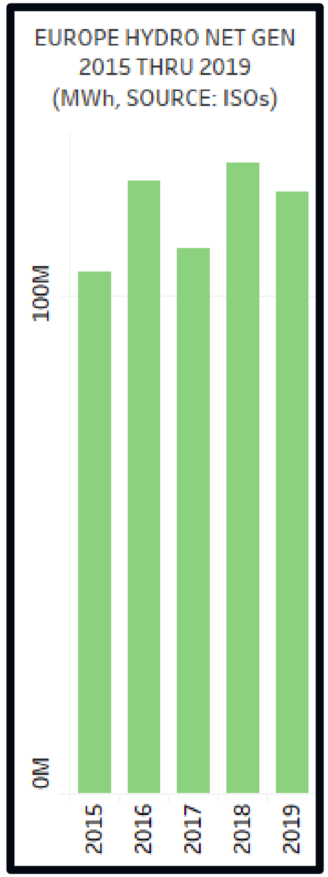
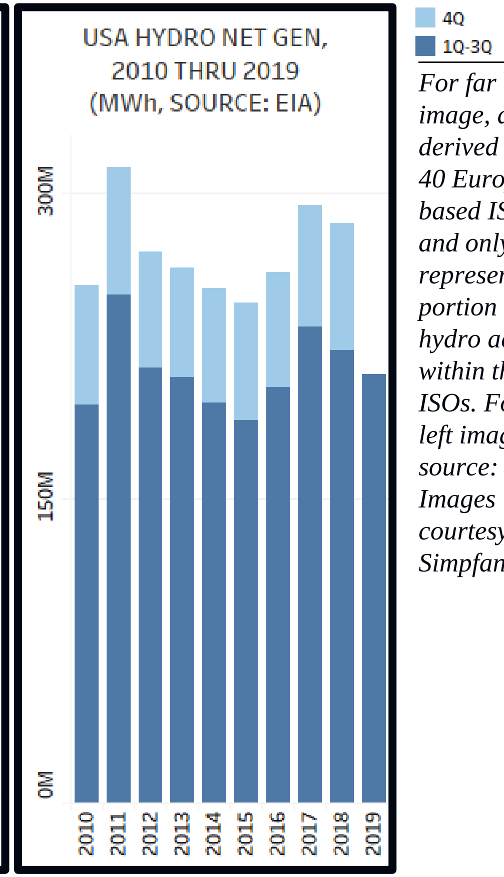
Analysis: On-Grid Performance, USA and Europe

Though the markets for new HTs are down significantly in 2019, fleet utilization in Europe and the USA shows consistency.

In Europe, hydro technologies generated 121M MWh, down on-year 4.4% yet the second-best year of the past five (image near right). As a portion of Europe's 2019 net generation, hydro was 5.8%, the highest measure of the past five years.

In the USA, 9M'19 hydro net generation was 211M MWh, down 5.3% on-year. As a portion of all net generation, USA hydro was 6.7% in 9M'19, down from 7.0% in 9M'18 (image far right)





For far left image, data is derived from 40 Europe based ISOs and only represents the portion of hydro activity within those ISOs. For near left image, source: EIA. Images courtesy of Simpfany.

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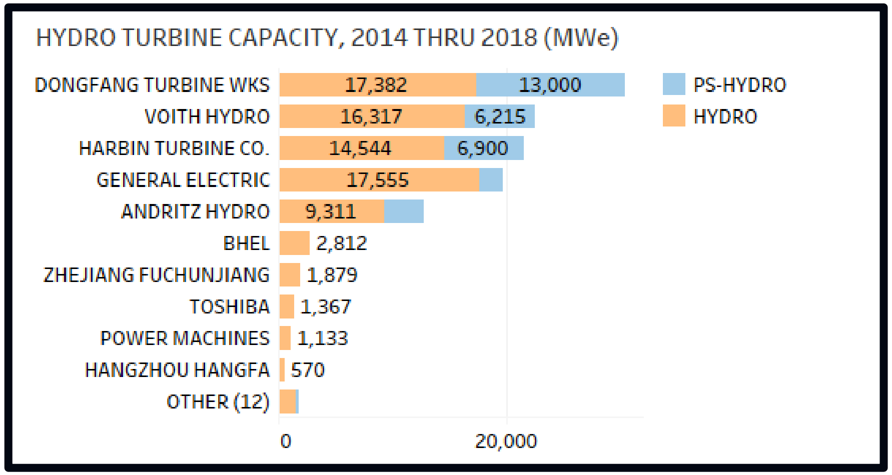
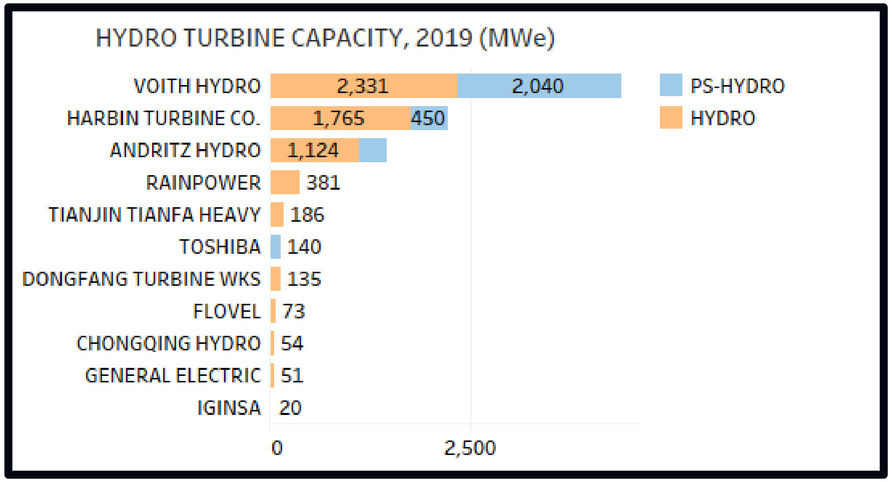
Market Share Analysis: Capacity

Dongfang was the leader of the capacity market for the five-year period ending 2018, capturing share of 26%. Voith was second with 19% followed closely by Harbin with 18% and GE with 17%. (image top right)

In 2019, Voith separated from the pack with share of 48%, nearly doubling up second-place Harbin's 24% share. Andritz was third with 16% share (image below right)





For visualizations, HT units of at least 10 MWe unit capacity; source: McCoy surveys.

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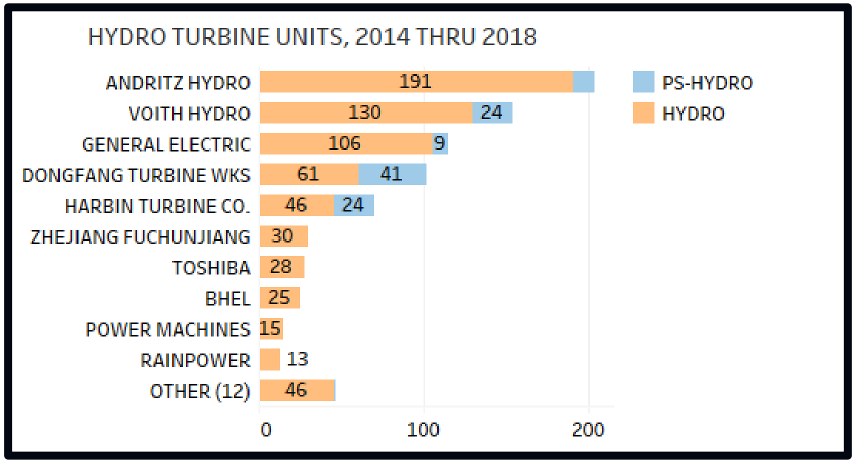
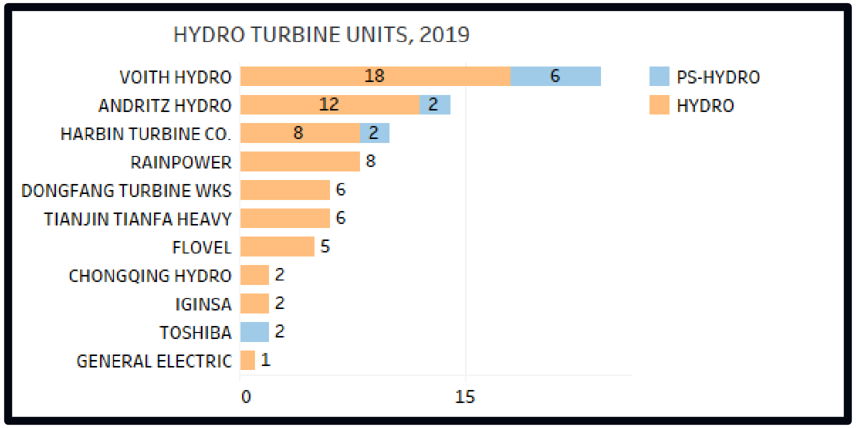
Market Share Analysis: Units

By units, Andritz was the leader for the five-year period ending 2018 with share of 25%, followed by Voith's 19% and GE's 14%. (image top right)

In 2019, Voith was the unit leader with 24 and share of 30%. (image below right)





For visualizations, HT units of at least 10 MWe unit capacity; source: McCoy surveys.

2019 Official League Tables – Hydro Turbines[(i)]

TECHNOLOGY OWNER	MWe 12M'19	MARKET SHARE
VOITH HYDRO	4,371	48.1%
HARBIN TURBINE CO.	2,215	24.4%
ANDRITZ HYDRO	1,459	16.1%
RAINPOWER	381	4.2%
TIANJIN TIANFA HEAVY	186	2.0%
TOSHIBA ENERGY SYSTEMS & SOLUTIONS	140	1.5%
DONGFANG TURBINE WKS	135	1.5%
FLOVEL	73	0.8%
CHONGQING HYDRO	54	0.6%
GENERAL ELECTRIC	51	0.6%
IGINSA	20	0.2%
TOTAL	9,085	100.0%

TECHNOLOGY OWNER	UNITS 12M'19	MARKET SHARE
VOITH HYDRO	24	30.0%
ANDRITZ HYDRO	14	17.5%
HARBIN TURBINE CO.	10	12.5%
RAINPOWER	8	10.0%
DONGFANG TURBINE WKS	6	7.5%
TIANJIN TIANFA HEAVY	6	7.5%
FLOVEL	5	6.3%
CHONGQING HYDRO	2	2.5%
IGINSA	2	2.5%
TOSHIBA ENERGY SYSTEMS & SOLUTIONS	2	2.5%
GENERAL ELECTRIC	1	1.3%
TOTAL	80	100.0%

(i) Source: McCoy surveys. HT units of 10 MWe and up.

2019 Official League Tables – Hydro Generators[(i)]

TECHNOLOGY OWNER	MV 12M'19	MARKET SHARE
VOITH HYDRO	3,910	46.4%
HARBIN EL MACHINERY	2,992	35.5%
ANDRITZ HYDRO	455	5.4%
INDAR	335	4.0%
TIANJIN TIANFA	186	2.2%
TOSHIBA ENERGY SYSTEMS & SOLUTIONS	165	2.0%
DONGFANG EL MACH WKS	135	1.6%
FLOVEL	73	0.9%
CHONGQING HYDRO	54	0.6%
GENERAL ELECTRIC	51	0.6%
RAINPOWER	46	0.5%
IGINSA	20	0.2%
TOTAL	8,421	100.0%

TECHNOLOGY OWNER	UNITS 12M'19	MARKET SHARE
VOITH HYDRO	19	28.4%
HARBIN EL MACHINERY	11	16.4%
DONGFANG EL MACH WKS	6	9.0%
TIANJIN TIANFA	6	9.0%
ANDRITZ HYDRO	5	7.5%
FLOVEL	5	7.5%
INDAR	5	7.5%
RAINPOWER	3	4.5%
CHONGQING HYDRO	2	3.0%
IGINSA	2	3.0%
TOSHIBA ENERGY SYSTEMS & SOLUTIONS	2	3.0%
GENERAL ELECTRIC	1	1.5%
TOTAL	67	100.0%

(i) Source: McCoy surveys. Hydro generator units of 10 MV and up.

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