Boilers, 9M'19 Report

The "Report"

December 2, 2019

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

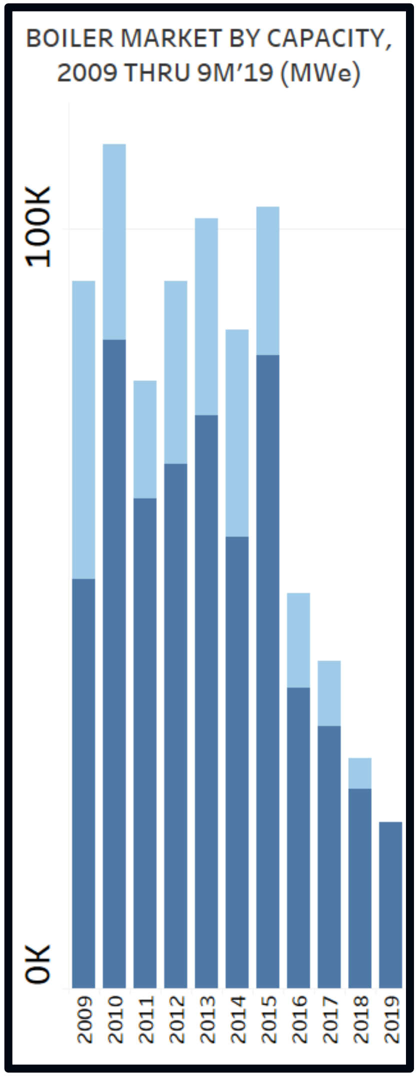
Table of Contents

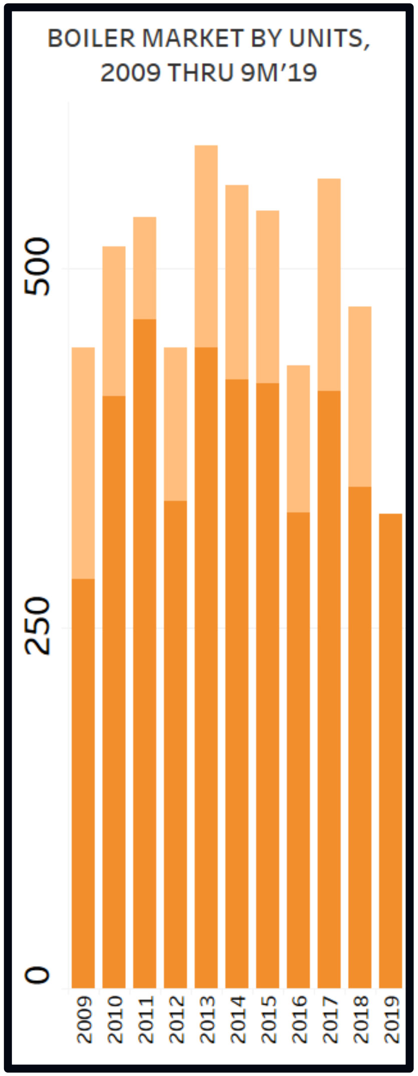
McCOY POWER REPORTS

Global Market Summary

The Boiler original equipment markets amounted to 22 GWe and 329 units during 9M'19, on-year declines of 17% and 5% respectively (images right).

On the pages that follow, we present the market internals of technology selection, geographic dispersion and unit-capacity migration before digging a bit deeper into the Biomass, Waste to Energy (WTE) and Fossil technology segments. We finish with a brief market share discussion and a look at on-grid utilization in the USA and Europe.





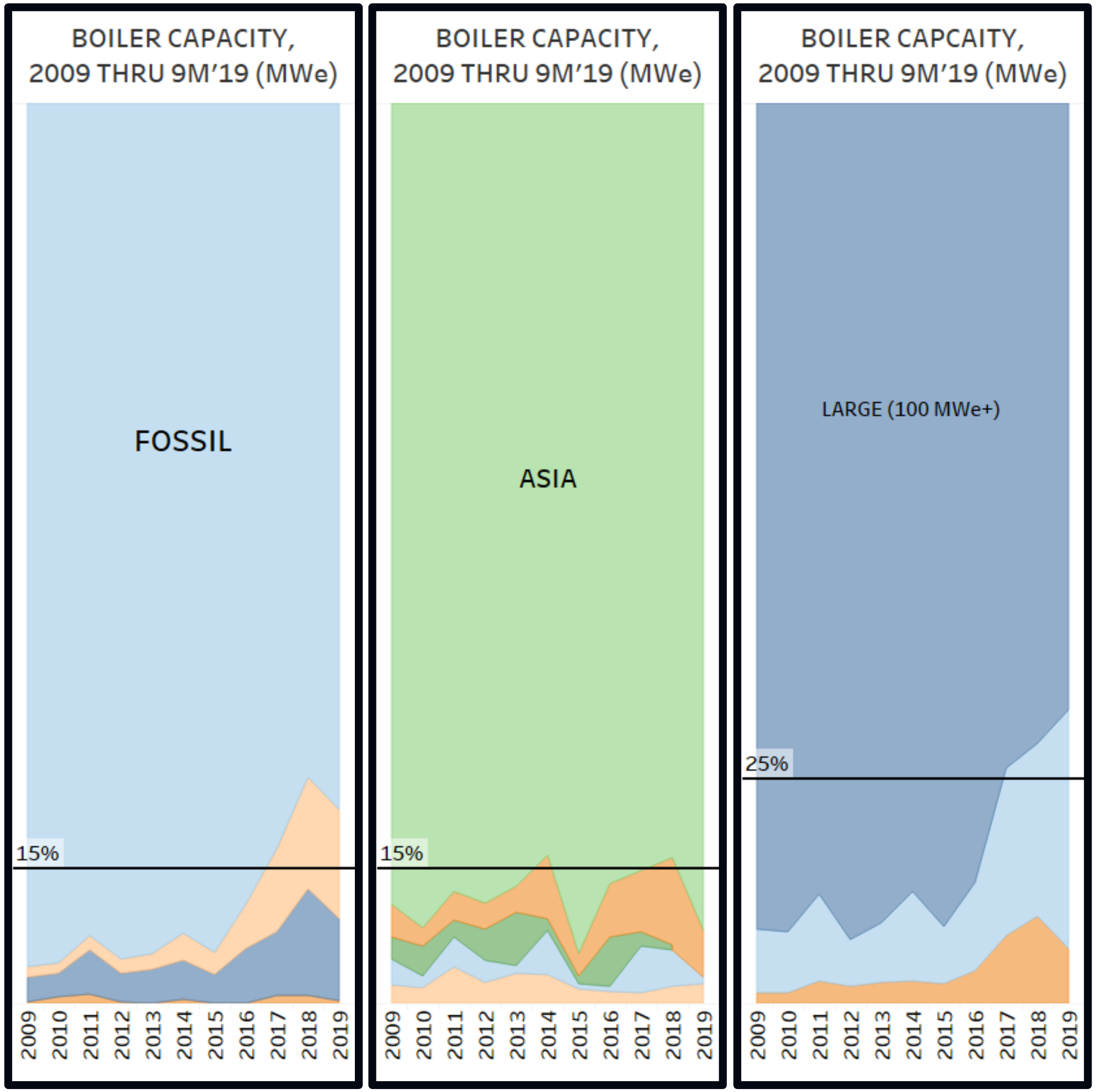
4Q PERIODS
1Q-3Q PERIODS
4Q PERIODS
1Q-3Q PERIODS

Boiler units of 5 MWe and up; sources: McCoy surveys and publicly available information.

Segment Analysis by Capacity

The dramatic decline in recent capacity volumes has done little to change capacity market internals.

Fossil remains the dominant technology (image near right), Asia the dominant region (image middle right) and Large unit selection the overwhelming choice (image far right), albeit far less overwhelming in recent years.



FOSSIL
WTE
BIOMASS
OTHER

Far left image.

ASIA
EUROPE
SAUDI/GULF STREAM
AFRICA/EAST MEDIT
AMERICAS

Middle left image.

LARGE (100 MWe+)
MEDIUM (20-99.9 MWe)
SMALL (LESS THAN 20 MWe)

Near left image.

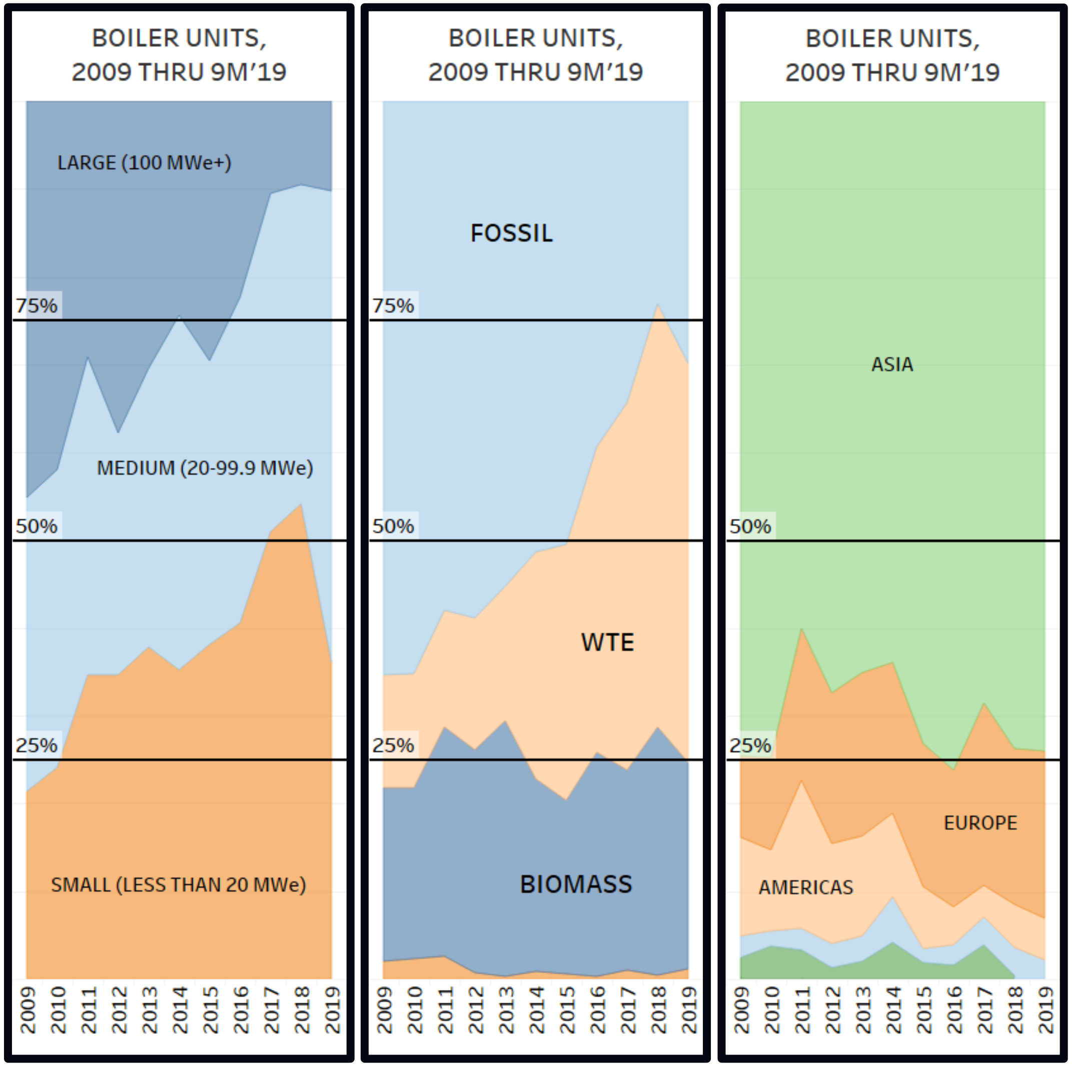
Boiler units of 5 MWe and up; sources: McCoy surveys and publicly available information. 12M periods only except 9M'19.

McCOY POWER REPORTS

Segment Analysis by Units

In contrast to capacity internals, unit volume internals shows an industry amid rapid change.

Large units declined from 45% of the 2009 market to just 10% of the 9M'19 market (image near right), Fossil technology dropped from 65% of 2009 units to 30% of 9M'19 units (image middle right), yet Asia remains the central geographic region with 75% of 9M'19 unit volume (image far right).



FOSSIL
WTE
BIOMASS
OTHER

Far left image.

LARGE (100 MWe+)
MEDIUM (20-99.9 MWe)
SMALL (LESS THAN 20 MWe)

Near left image.

ASIA
EUROPE
SAUDI/GULF STREAM
AFRICA/EAST MEDIT
AMERICAS

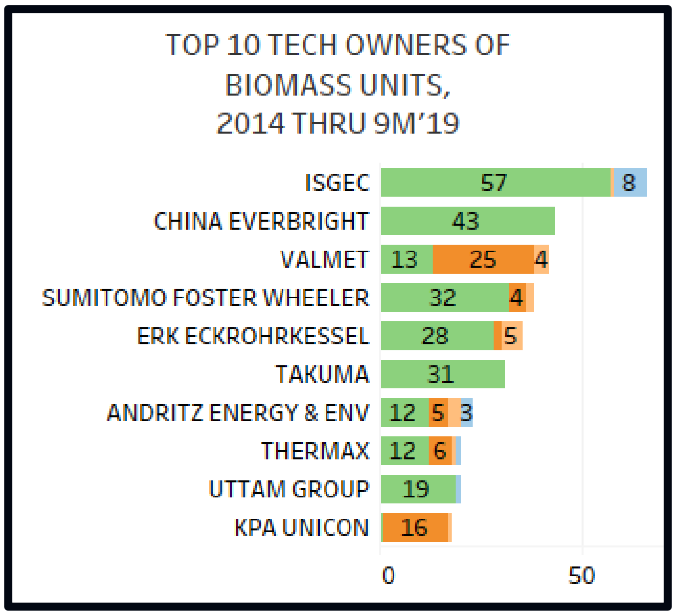
Middle left image.

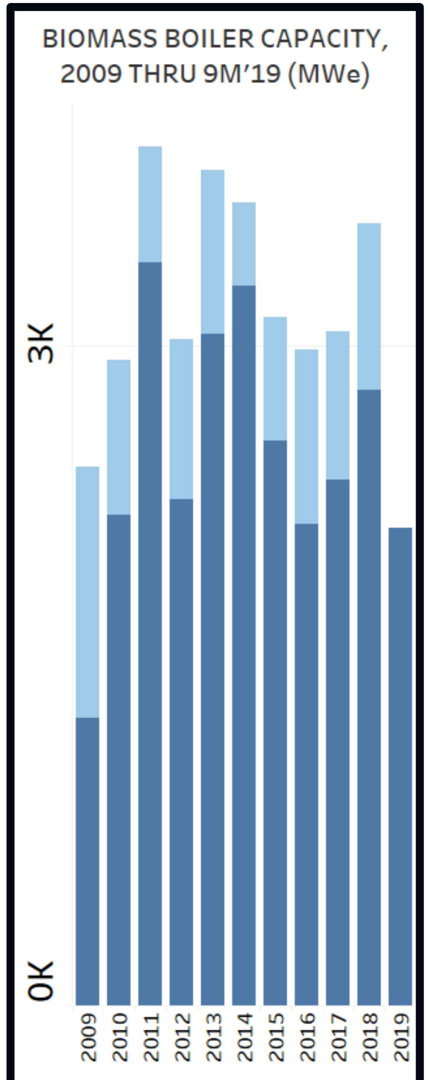
Boiler units of 5 MWe and up; sources: McCoy surveys and publicly available information. 12M periods only except 9M'19.

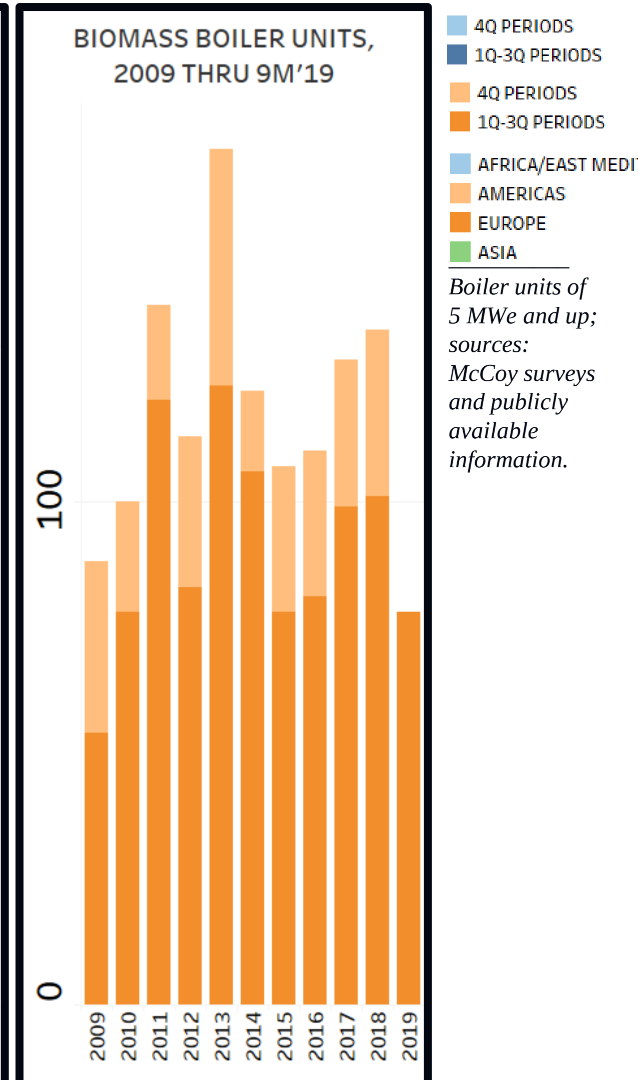
McCOY POWER REPORTS

Boiler Technology Segments: Biomass

The Biomass markets declined by both capacity and units during 9M’19 to their lowest 9M levels since 9M’09 (images near and far right). Of all ordered units since 2014, India based Isgec was the market leader with 66 units, 57 units in Asia, and overall share of 9.7%. China Everbright finished second with all orders derived from the China market. Valmet was third with 25 units in Europe, 13 in Asia and four in the Americas. (image below).





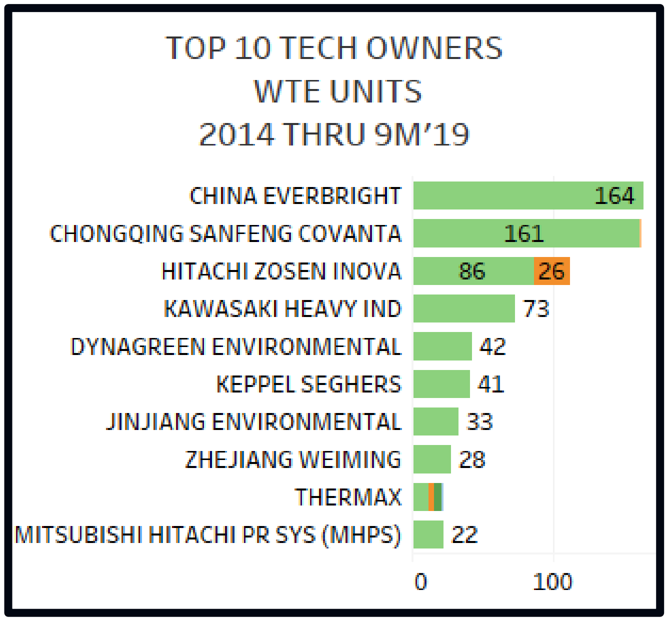


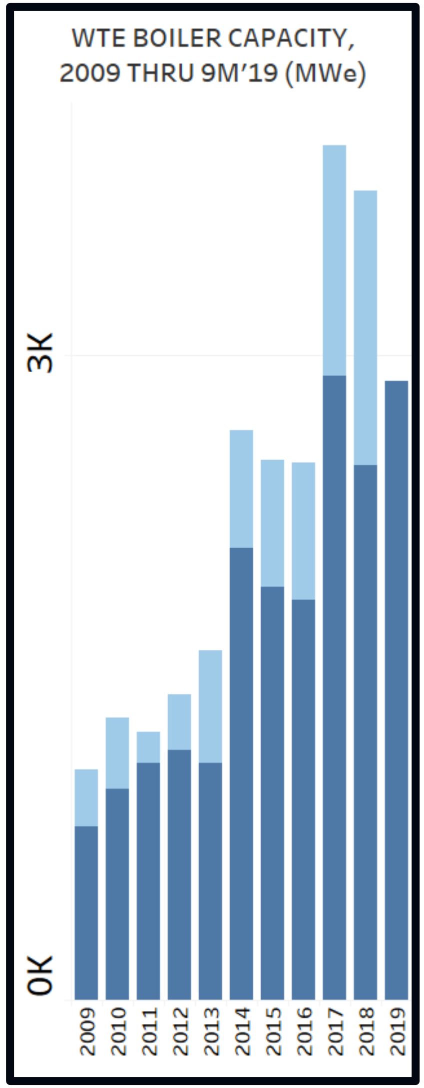
Boiler units of 5 MWe and up; sources: McCoy surveys and publicly available information.

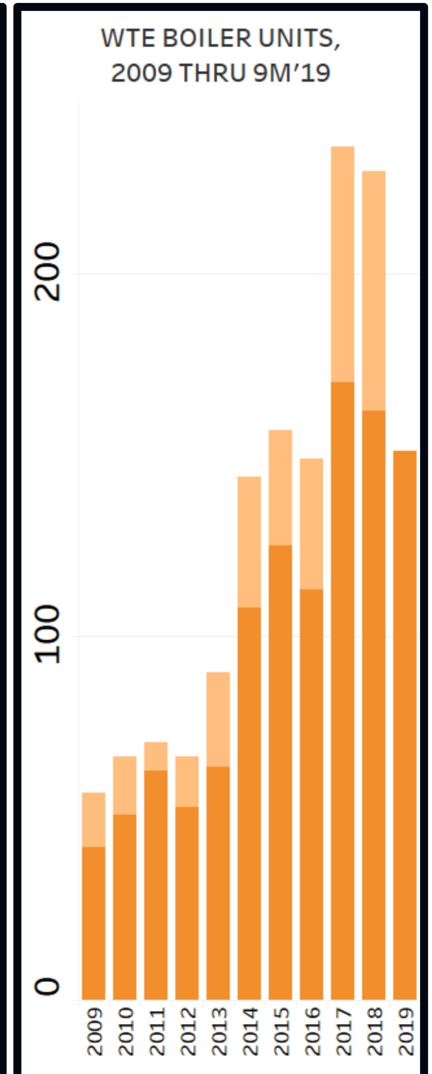
McCOY POWER REPORTS

Boiler Technology Segments: WTE

On-year, the WTE markets were up 16% by capacity, down 7% by units, and showing signs of a market-top after a decade of rapid expansion (images near and far right). Of the 1,064 units ordered since 2009, only 178 or 17% were based outside of Asia. The market leaders of the WTE revolution were China Everbright with 164 units and Chongqing Sanfeng with 161; these two tech owners combined for 31% of all ordered units since 2009 (image below).





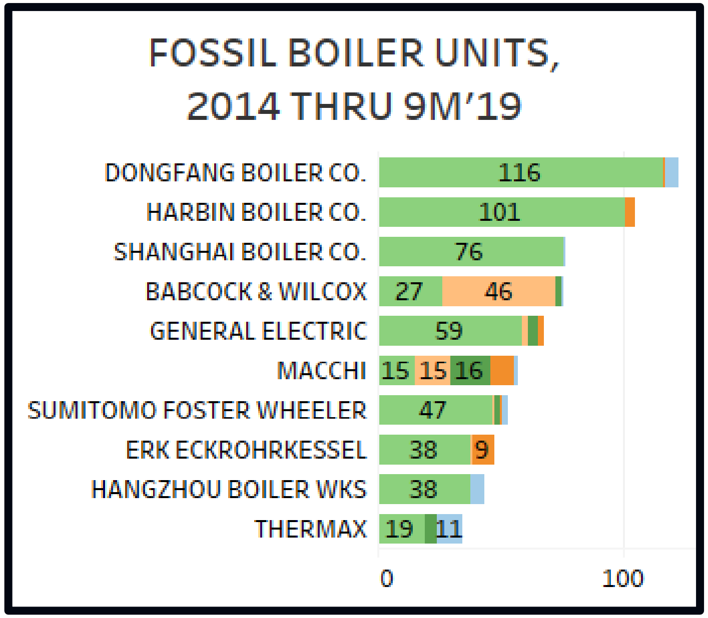


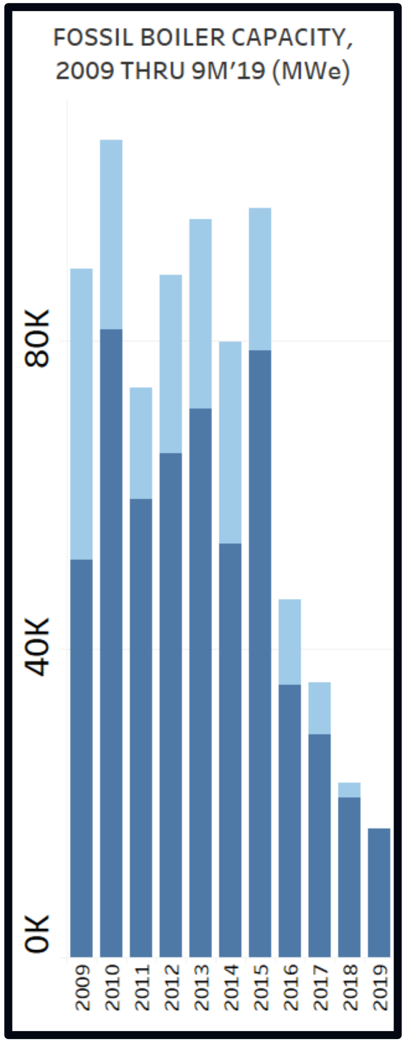
4Q PERIODS
1Q-3Q PERIODS
4Q PERIODS
1Q-3Q PERIODS
AFRICA/EAST MEDIT
AMERICAS
EUROPE
ASIA

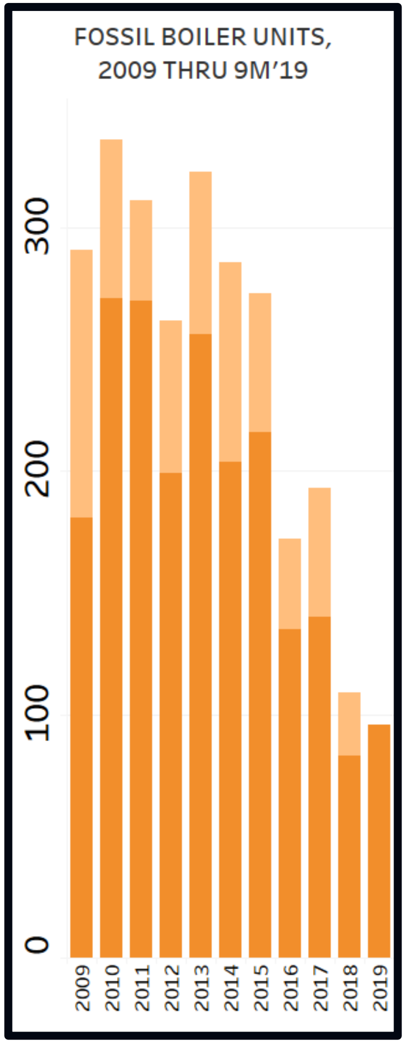
Boiler units of 5 MWe and up; sources: McCoy surveys and publicly available information.

McCOY POWER REPORTS

The Fossil markets fell 20% by capacity and rose 16% by units during 9M'19 (images near and far right). 9M'19 unit flow benefitted from increased activity out of Europe and the Americas regions. The market leaders remain the China based entities of Dongfang, Harbin and Shanghai which combined for 27% of all units and 54% of all capacity since 2009 (image below).







4Q PERIODS
1Q-3Q PERIODS
4Q PERIODS
1Q-3Q PERIODS
AFRICA/EAST MEDIT
AMERICAS
EUROPE
ASIA

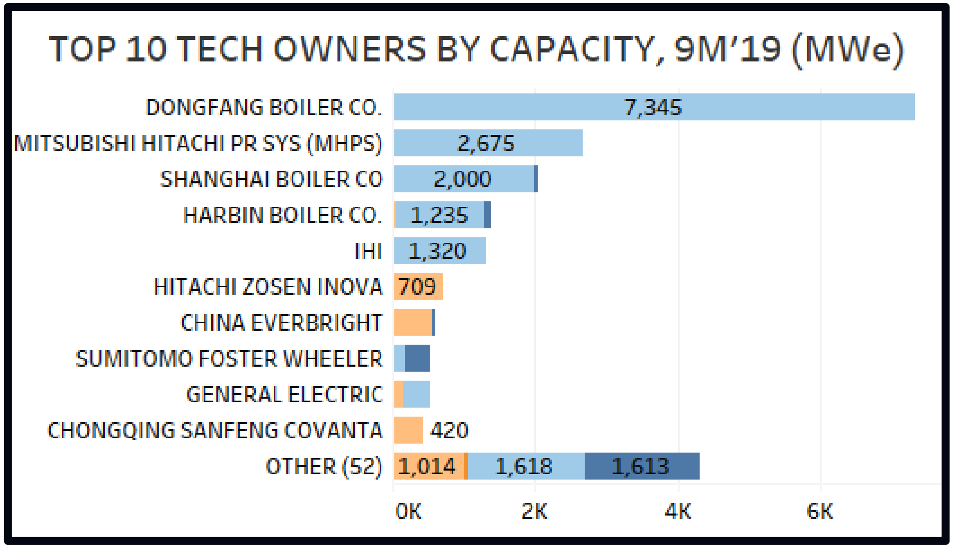
Boiler units of 5 MWe and up; sources: McCoy surveys and publicly available information.

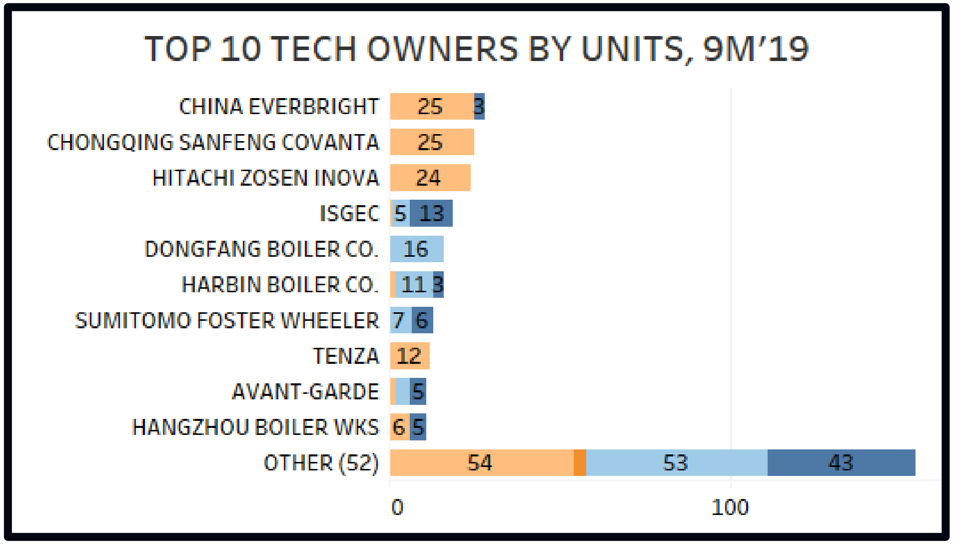
McCOY POWER REPORTS

Market Share Discussion

62 different technology owners won at least a single Boiler order of at least 5 MWe unit capacity during 9M’19. Of these, Dongfang was the capacity leader with 7.3 GWe of entirely Fossil-derived order flow which amounted to overall share of 34%. MHPS finished second with 2.7 GWe of Fossil order flow and market share of 12% (image top right).

9M’19 unit volume leaders were China Everbright with 28 awards and share of 8.5%, followed by Chongqing Sanfeng with 25 awards and share of 7.6%, and Hitachi Zosen was third with 24 units and share of 7.3% (image bottom right).





BIOMASS
FOSSIL
OTHER
WTE

Boiler units of 5 MWe and up; sources: McCoy surveys and publicly available information.

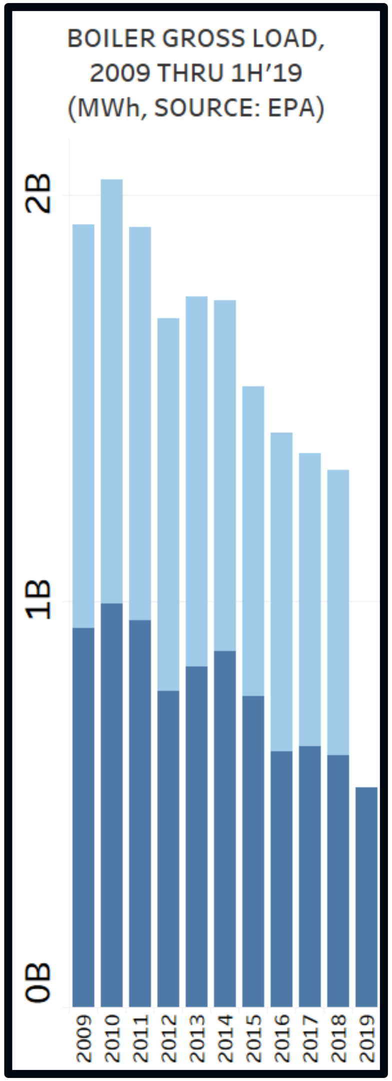
On-grid Utilization: USA and Europe

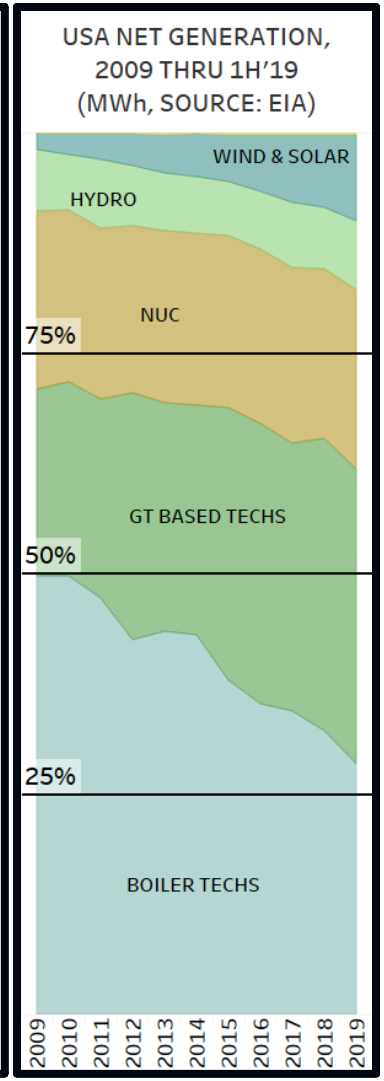
Moving to on-grid utilization, Boiler technologies show further declines in both the USA and Europe.

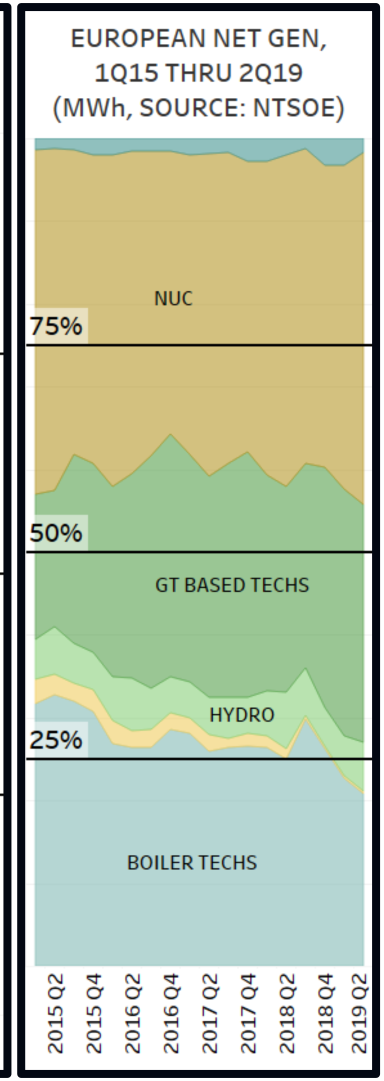
Gross load for the USA Boiler fleet declined 13% during 6M’19 (image near right) and declined to 28% of all 6M’19 USA net generation from 32% in 2018 (image middle right).

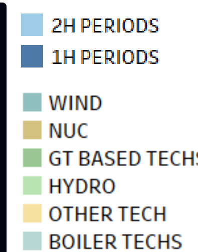
In Europe, Boiler technologies declined to just 21% of 2Q’19 net generation, down from 25% of 2Q’18 net generation (image far right).

In conclusion, falling utilization rates and a rapidly declining original equipment capacity market pose big challenges to the industry, while steady unit volumes suggest a relevant if smaller-scale future.









Sources: EIA, EPA and NTSOE. Images courtesy of Simpfany. EPA tracks combustion units of at least 20 MWe unit capacity, EIA tracks all units of at least 1 MWe unit capacity, and NTSOE tracks units of at least 100 MWe unit capacity

McCOY POWER REPORTS

9M'19 Official League Tables – Technology Owner (i)

TOP 25 TECHNOLOGY OWNERS	MWe 9M'19	MARKET SHARE
DONGFANG BOILER CO.	7,345	33.6%
MITSUBISHI HITACHI PR SYS (MHPS)	2,675	12.2%
SHANGHAI BOILER CO	2,030	9.3%
HARBIN BOILER CO.	1,380	6.3%
IHI	1,320	6.0%
HITACHI ZOSEN INOVA	709	3.2%
CHINA EVERBRIGHT	615	2.8%
SUMITOMO FOSTER WHEELER	526	2.4%
GENERAL ELECTRIC	524	2.4%
CHONGQING SANFENG COVANTA	420	1.9%
ANDRITZ ENERGY & ENV	370	1.7%
BHI	350	1.6%
WUXI BOILER WORKS	335	1.5%
ISGEC	329	1.5%
HANGZHOU BOILER WKS	252	1.2%
WESTERN POWER	250	1.1%
ZHEJIANG WEIMING	198	0.9%
SIBENERGOMASH	180	0.8%
JFE ENGINEERING	178	0.8%
TAKUMA	165	0.8%
THERMAX	159	0.7%
VALMET	158	0.7%
AVANT-GARDE	141	0.6%
CALDEMA	81	0.4%
TENZA	72	0.3%
OTHER (37)	1,082	5.0%
TOTAL ORDERED CAPACITY	21,843	100.0%

TOP 25 TECHNOLOGY OWNERS	UNITS 9M'19	MARKET SHARE
CHINA EVERBRIGHT	28	8.5%
CHONGQING SANFENG COVANTA	25	7.6%
HITACHI ZOSEN INOVA	24	7.3%
ISGEC	19	5.8%
DONGFANG BOILER CO.	16	4.9%
HARBIN BOILER CO.	16	4.9%
SUMITOMO FOSTER WHEELER	13	4.0%
TENZA	12	3.6%
AVANT-GARDE	11	3.3%
HANGZHOU BOILER WKS	11	3.3%
WUXI BOILER WORKS	10	3.0%
GENERAL ELECTRIC	9	2.7%
ZHEJIANG WEIMING	9	2.7%
WESTERN POWER	8	2.4%
SINOMA	7	2.1%
JFE ENGINEERING	6	1.8%
THERMAX	6	1.8%
ANDRITZ ENERGY & ENV	5	1.5%
BHI	5	1.5%
MITSUBISHI HITACHI PR SYS (MHPS)	5	1.5%
CALDEMA	4	1.2%
KPA UNICON	4	1.2%
PARAT HOLVERSEN	4	1.2%
SIBENERGOMASH	4	1.2%
TAKUMA	4	1.2%
OTHER (37)	64	19.5%
TOTAL ORDERED UNITS	329	100.0%

(i) Boiler units of 5 MWe and up; sources: McCoy surveys and publicly available information.

McCOY POWER REPORTS

9M’19 Official League Tables – Manufacturer[(i)]

TOP 25 MANUFACTURERS	MWe 9M'19	MARKET SHARE
DONGFANG BOILER CO.	7,345	33.6%
MITSUBISHI HITACHI PR SYS (MHPS)	2,675	12.2%
SHANGHAI BOILER CO	2,030	9.3%
HARBIN BOILER CO.	1,510	6.9%
IHI	1,320	6.0%
ISGEC	571	2.6%
CHINA EVERBRIGHT	490	2.2%
GE POWER	480	2.2%
CHONGQING SANFENG COVANTA	420	1.9%
ANDRITZ ENERGY & ENV	370	1.7%
BHI	350	1.6%
HANGZHOU BOILER WKS	342	1.6%
WUXI BOILER WORKS	335	1.5%
ZIO PODOLSK ATOMENERGOMASH	330	1.5%
HITACHI ZOSEN INOVA	289	1.3%
SUMITOMO HEAVY IND	284	1.3%
WESTERN POWER	250	1.1%
SIBENERGOMASH	180	0.8%
STANDARDKESSEL BAUMGARTE	178	0.8%
TAKUMA	165	0.8%
THERMAX	159	0.7%
VALMET	158	0.7%
AVANT-GARDE	141	0.6%
ZHEJIANG WEIMING	128	0.6%
CALDEMA	81	0.4%
OTHER (41)	1,263	5.8%
TOTAL ORDERED CAPACITY	21,843	100.0%

TOP 25 MANUFACTURERS	UNITS 9M'19	MARKET SHARE
ISGEC	28	8.5%
CHONGQING SANFENG COVANTA	25	7.6%
CHINA EVERBRIGHT	22	6.7%
HARBIN BOILER CO.	22	6.7%
DONGFANG BOILER CO.	16	4.9%
HANGZHOU BOILER WKS	14	4.3%
TENZA	12	3.6%
AVANT-GARDE	11	3.3%
ZIO PODOLSK ATOMENERGOMASH	11	3.3%
HITACHI ZOSEN INOVA	10	3.0%
WUXI BOILER WORKS	10	3.0%
WESTERN POWER	8	2.4%
GE POWER	7	2.1%
SINOMA	7	2.1%
STANDARDKESSEL BAUMGARTE	6	1.8%
THERMAX	6	1.8%
ZHEJIANG WEIMING	6	1.8%
ANDRITZ ENERGY & ENV	5	1.5%
BHI	5	1.5%
MITSUBISHI HITACHI PR SYS (MHPS)	5	1.5%
CALDEMA	4	1.2%
KPA UNICON	4	1.2%
PARAT HOLVERSEN	4	1.2%
SIBENERGOMASH	4	1.2%
SUMITOMO HEAVY IND	4	1.2%
OTHER (41)	73	22.2%
TOTAL ORDERED UNITS	329	100.0%

(i) Boiler units of 5 MWe and up; sources: McCoy surveys and publicly available information.

McCOY POWER REPORTS