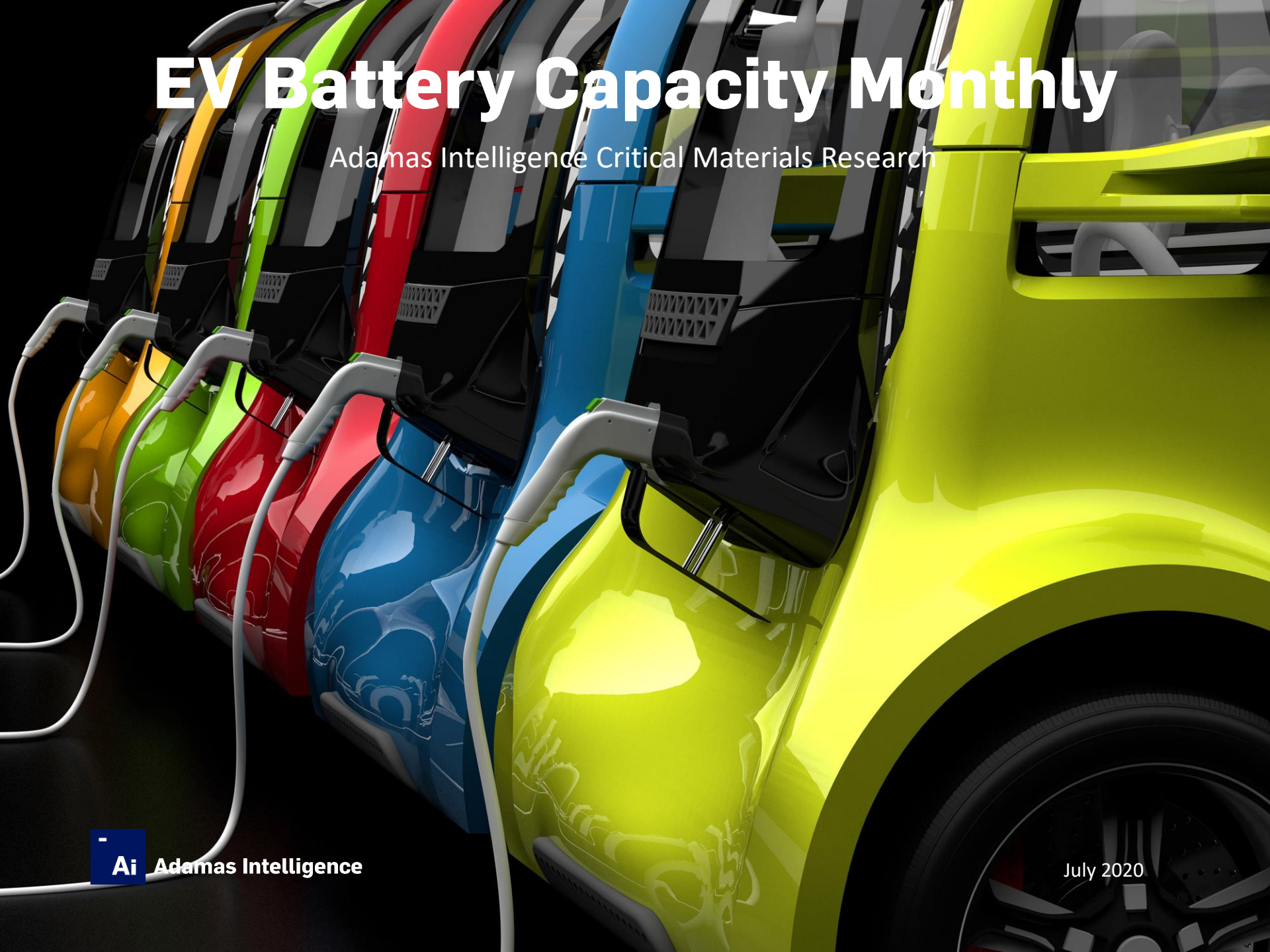
EV Battery Capacity Monthly

Adamas Intelligence Critical Materials Research



Adamas Intelligence

July 2020

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- This document has been prepared in a management-style format that enables the reader to quickly visualize key trends and extract key data points.

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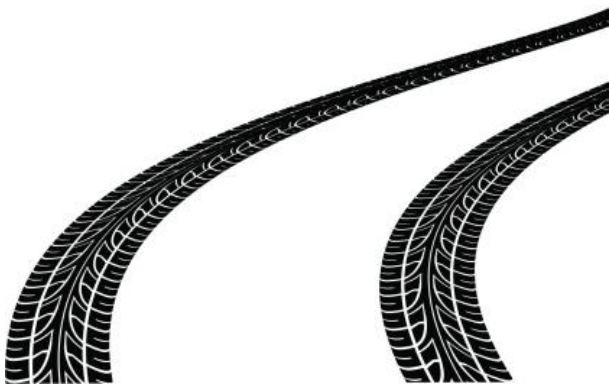


Key Developments

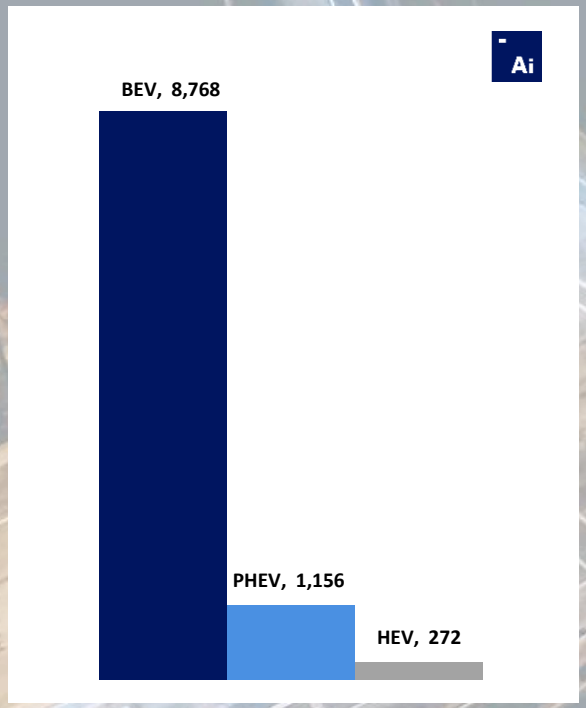
In July 2020, a total of 10,196 MWh of battery capacity was deployed globally in all newly sold passenger EVs combined, a 69% increase over the same month the year prior as global EV sales in all regions (up 32% YoY) show signs of recovery. By cell supplier, LG Chem led with 3,247 MWh deployed. By EV maker, Tesla led with 2,293 MWh deployed globally. The global sales-weighted average battery capacity of all newly-sold passenger EVs combined increased by 28% year-over-year, from 17.2 kWh to 22.1 kWh, as BEV and PHEV sales growth outpaced that of HEVs over the same period.

- **EV Types**: BEVs were responsible for 86% of all passenger EV battery capacity deployed globally in July 2020 (down from 87% in July 2019), PHEVs were responsible for 11% (up from 9% in July 2019) and HEVs were responsible for 3% (down from 4% in July 2019).
- **Regions:** Asia Pacific was responsible for 44% of all battery capacity deployed globally in July 2020 (down from 46% in July 2019), Europe was responsible for 37% (up from 27% in July 2019) and the Americas were responsible for 19% (down from 27% in July 2019).
- **Makes/Models:** With 2,293 MWh deployed (22% of the global total), Tesla continued to lead the pack by capacity deployed in July 2020, followed by BYD with 678 MWh and Renault with 566 MWh deployed. By model, the Tesla Model 3 took the top spot in July 2020 with 1,432 MWh deployed – as much as the next three leaders combined: the Tesla Model Y (566 MWh), the Renault Zoe (524 MWh) and the Audi e-Tron Quattro (407 MWh).
- **Cell Suppliers:** Q2 leader LG Chem deployed 3,247 MWh of passenger EV battery capacity in July 2020, followed at a distance by CATL (2,004 MWh deployed) and Panasonic (1,873 MWh deployed). Samsung SDI and BYD rounded off the top five with 764 MWh and 685 MWh deployed, respectively.
- **Chemistries:** With 24% market share, NCM 6-Series cells led with 2,481 MWh deployed followed by NCM 5-Series cells with 1,948 MWh, NCM 811 cells with 1,723 MWh, and NCA Gen 3 cells with 1,303 MWh deployed.

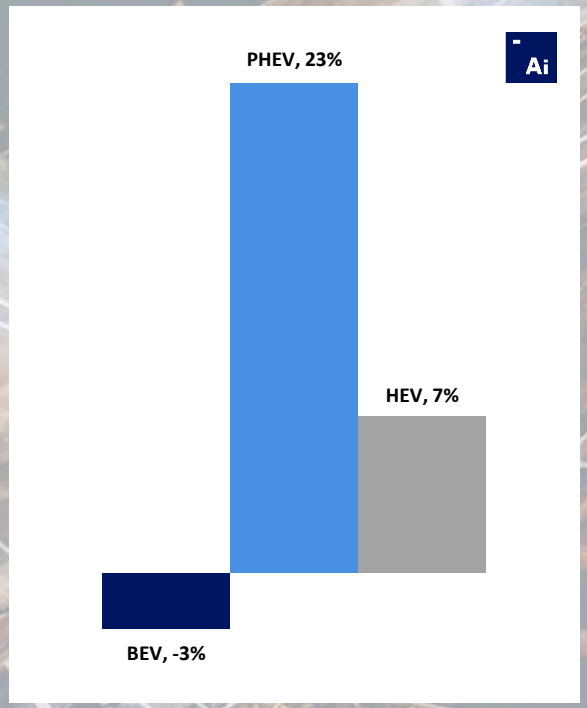
- **SWA:** The global sales-weighted average (“SWA”) battery capacity of all newly-sold passenger xEVs (BEVs, PHEVs and HEVs) combined increased by 28% year-over-year, from 17.2 kWh in July 2019 to 22.1 kWh in July 2020.

Global Battery Capacity Deployed by EV Type

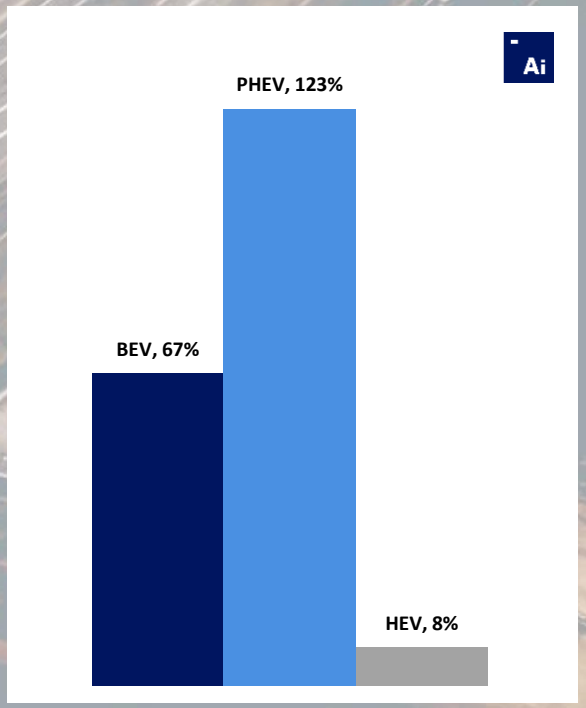
MWh Deployed



MoM Change



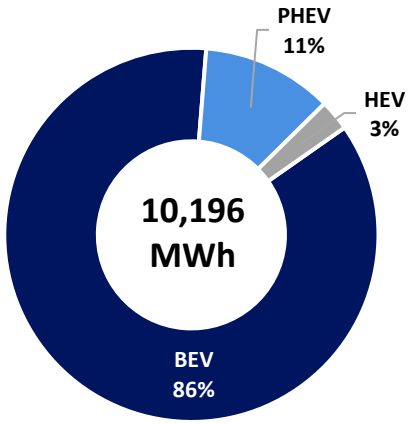
YoY Change

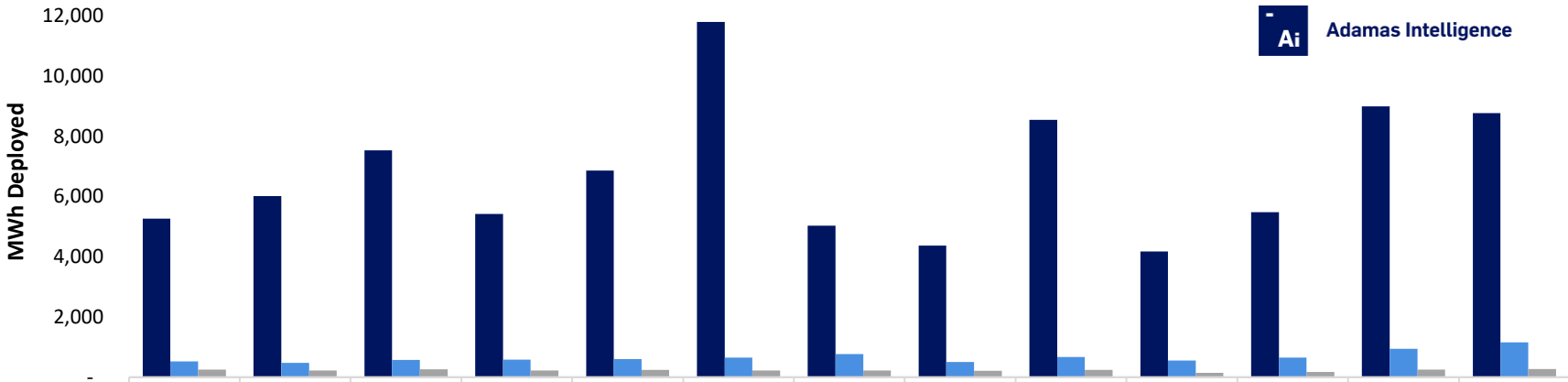


Global Battery Capacity Deployed by EV Type

In July 2020:

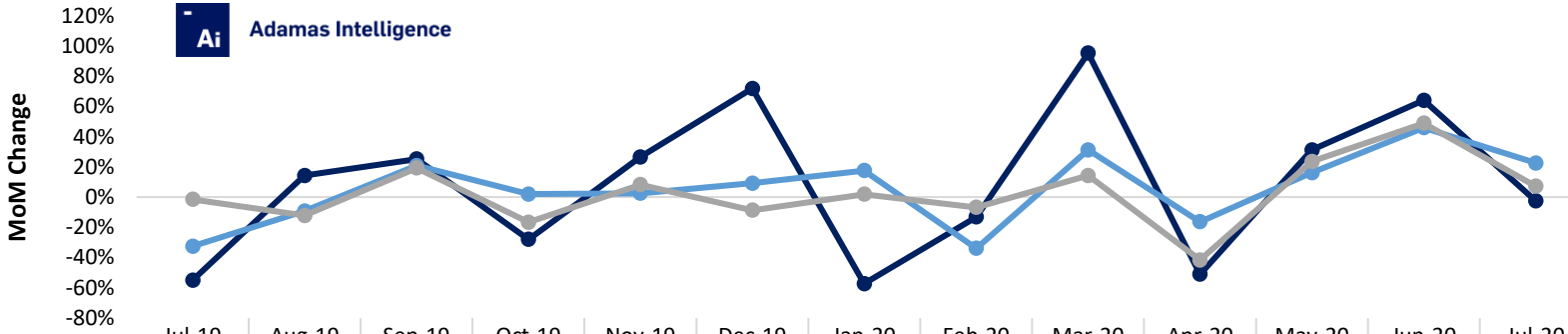
- Global battery capacity deployed in **all passenger EVs combined amounted to 10,196 MWh**, an **increase of 69%** over the same month the year prior.
- Global battery capacity deployed in **all passenger BEVs combined amounted to 8,768 MWh**, an **increase of 67%** over the same month the year prior.
- Global battery capacity deployed in **all passenger PHEVs combined amounted to 1,156 MWh**, an **increase of 123%** over the same month the year prior.
- Global battery capacity deployed in **all passenger HEVs combined amounted to 272 MWh**, an **increase of 8%** over the same month the year prior.





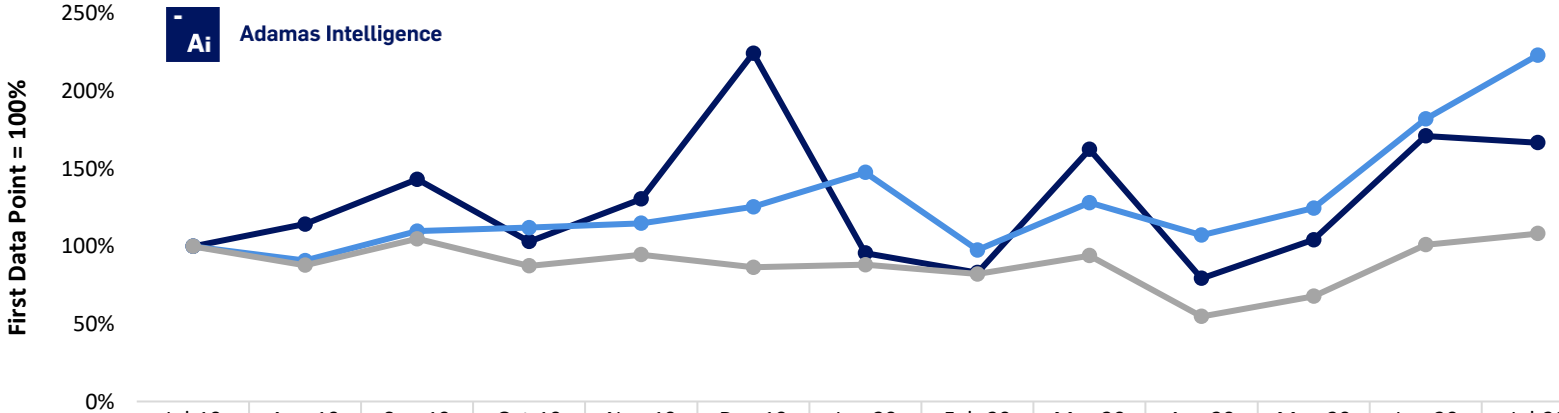
	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
BEV	5,259	6,011	7,529	5,421	6,862	11,799	5,031	4,370	8,540	4,175	5,480	8,996	8,768
PHEV	518	470	569	580	595	650	765	506	664	555	646	943	1,156
HEV	251	221	263	219	238	217	221	206	236	138	170	254	272

Month-over-Month Change in Capacity Deployed



	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
BEV	-55%	14%	25%	-28%	27%	72%	-57%	-13%	95%	-51%	31%	64%	-3%
PHEV	-33%	-9%	21%	2%	3%	9%	18%	-34%	31%	-16%	16%	46%	23%
HEV	-1%	-12%	19%	-17%	8%	-9%	2%	-7%	14%	-42%	24%	49%	7%

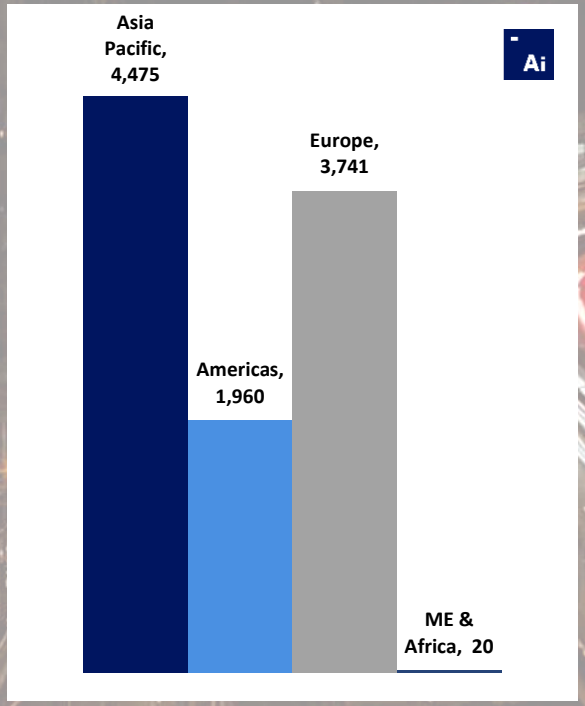
Global Battery Capacity Deployment Index



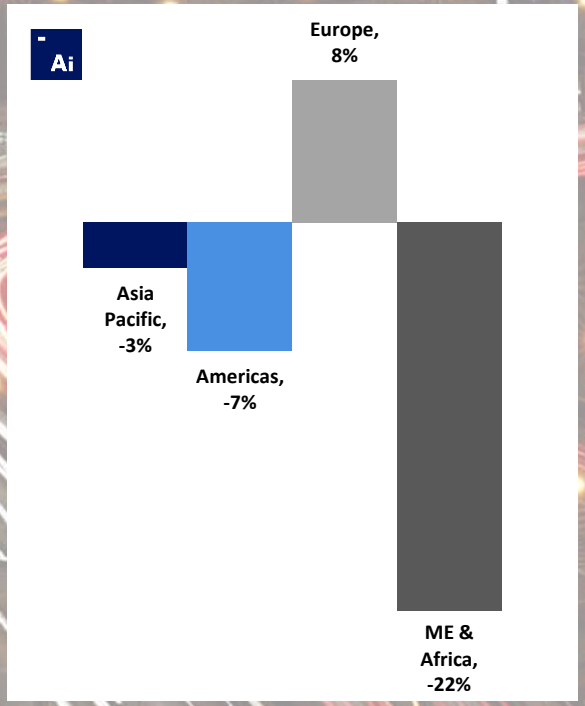
	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
BEV	100%	114%	143%	103%	130%	224%	96%	83%	162%	79%	104%	171%	167%
PHEV	100%	91%	110%	112%	115%	125%	148%	98%	128%	107%	125%	182%	223%
HEV	100%	88%	105%	87%	95%	86%	88%	82%	94%	55%	68%	101%	108%

Global Battery Capacity Deployed by Region

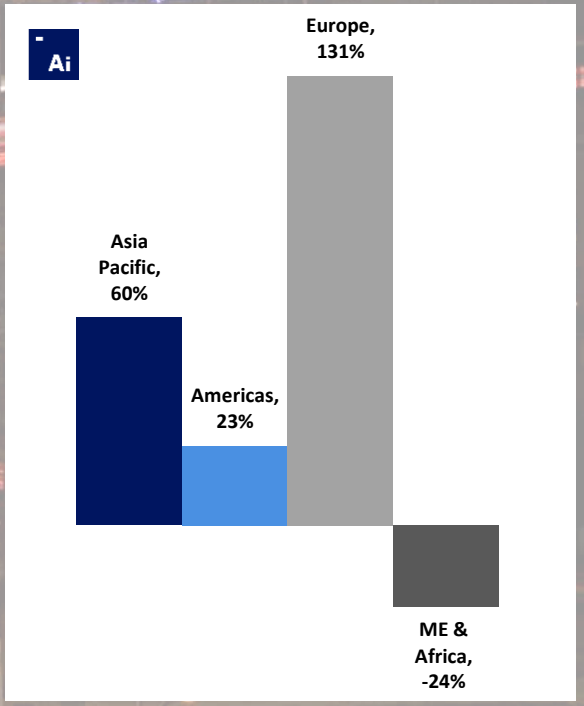
MWh Deployed



MoM Change



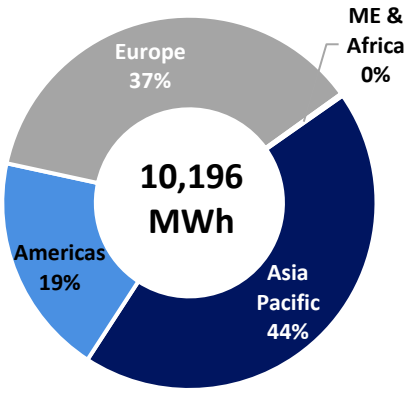
YoY Change

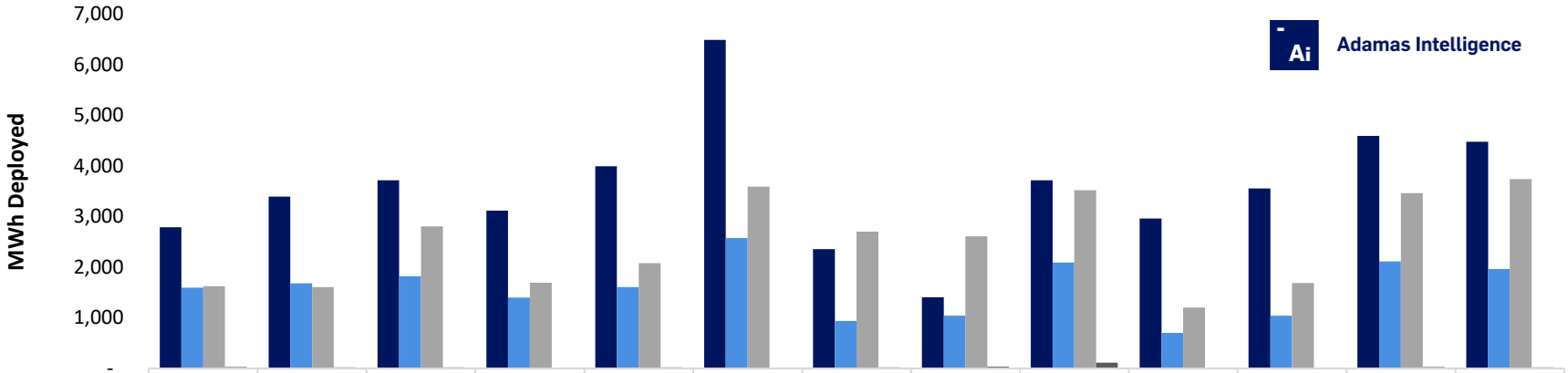


Global Battery Capacity Deployed by Region

In July 2020:

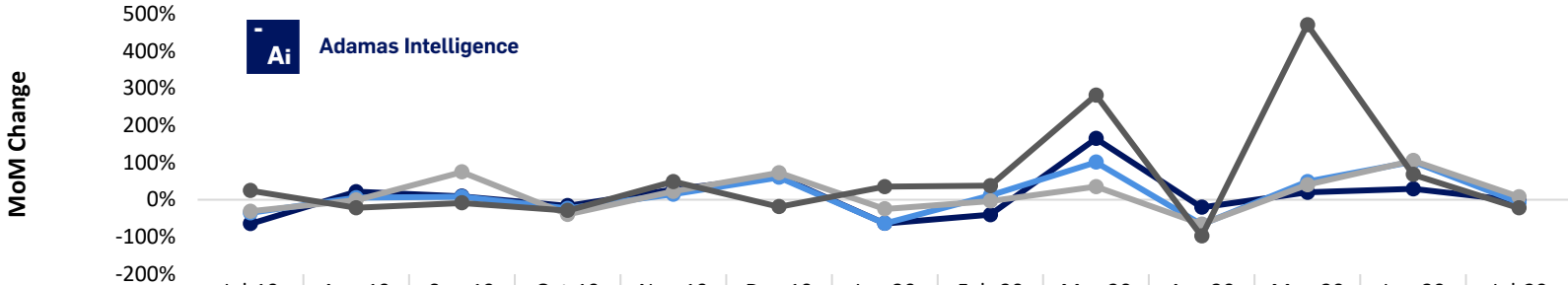
- Passenger EV battery capacity deployed in **Asia Pacific totaled 4,475 MWh**, an **increase of 60%** over the same month the year prior.
- Passenger EV battery capacity deployed in the **Americas totaled 1,960 MWh**, an **increase of 23%** over the same month the year prior.
- Passenger EV battery capacity deployed in **Europe totaled 3,741 MWh**, an **increase of 131%** over the same month the year prior.
- Passenger EV battery capacity deployed in the **M.E. and Africa totaled 20 MWh**, a **decrease of 24%** versus the same month the year prior.





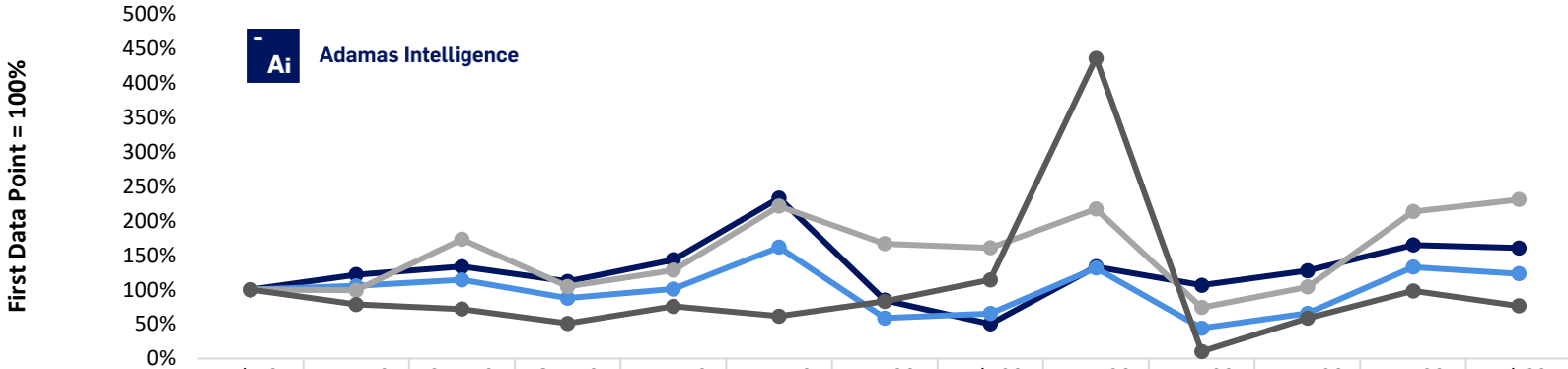
	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
Asia Pacific	2,789	3,395	3,718	3,117	3,993	6,490	2,357	1,404	3,716	2,963	3,554	4,593	4,475
Americas	1,592	1,681	1,818	1,396	1,605	2,575	936	1,041	2,092	701	1,043	2,115	1,960
Europe	1,622	1,606	2,807	1,694	2,077	3,586	2,703	2,607	3,519	1,202	1,684	3,459	3,741
ME & Africa	26	20	18	13	19	16	21	29	112	3	15	25	20

Month-over-Month Change in Capacity Deployed



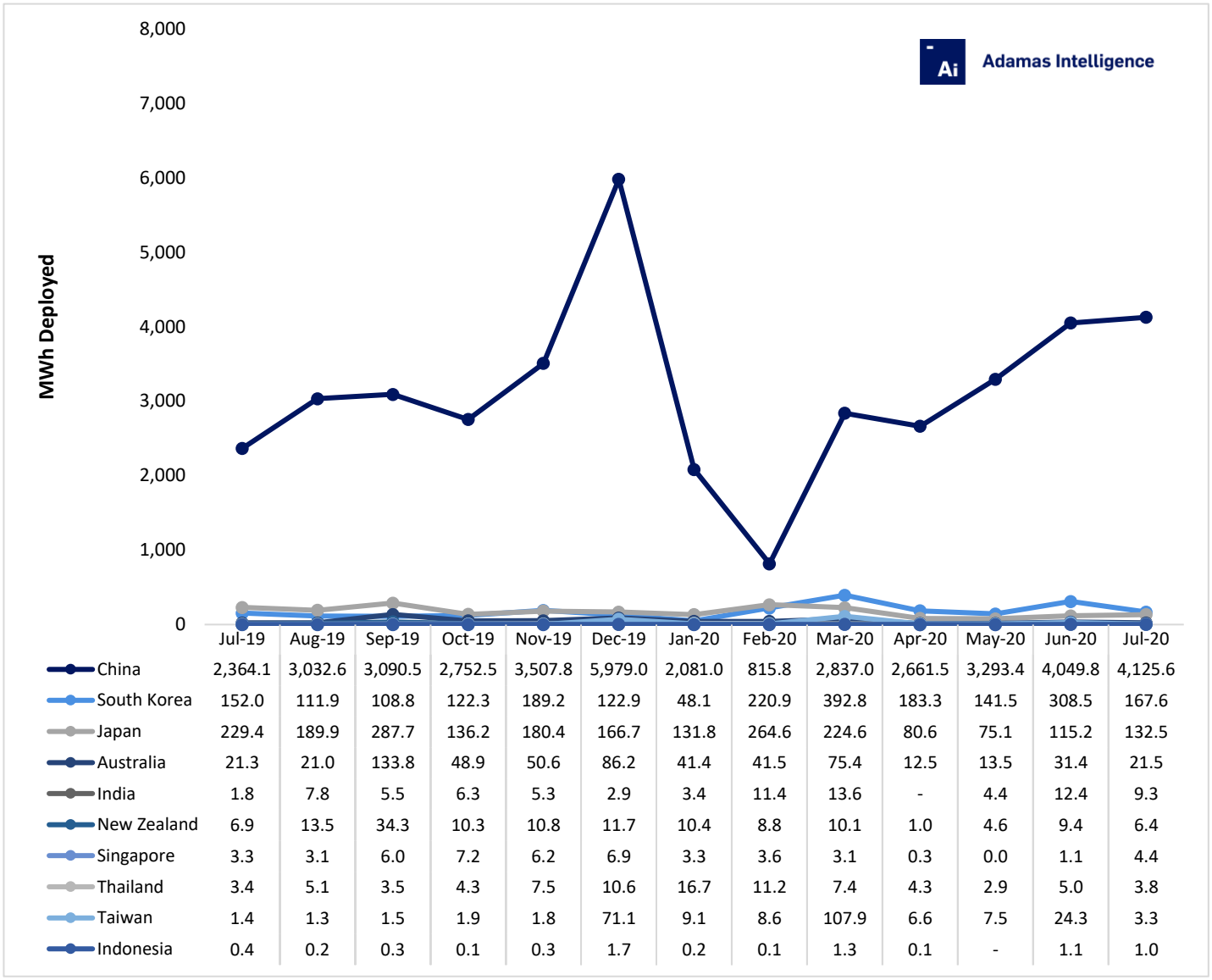
	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
Asia Pacific	-65%	22%	9%	-16%	28%	63%	-64%	-40%	165%	-20%	20%	29%	-3%
Americas	-35%	6%	8%	-23%	15%	60%	-64%	11%	101%	-67%	49%	103%	-7%
Europe	-31%	-1%	75%	-40%	23%	73%	-25%	-4%	35%	-66%	40%	105%	8%
ME & Africa	25%	-21%	-9%	-29%	49%	-19%	35%	38%	282%	-98%	471%	68%	-22%

Regional Battery Capacity Deployment Index



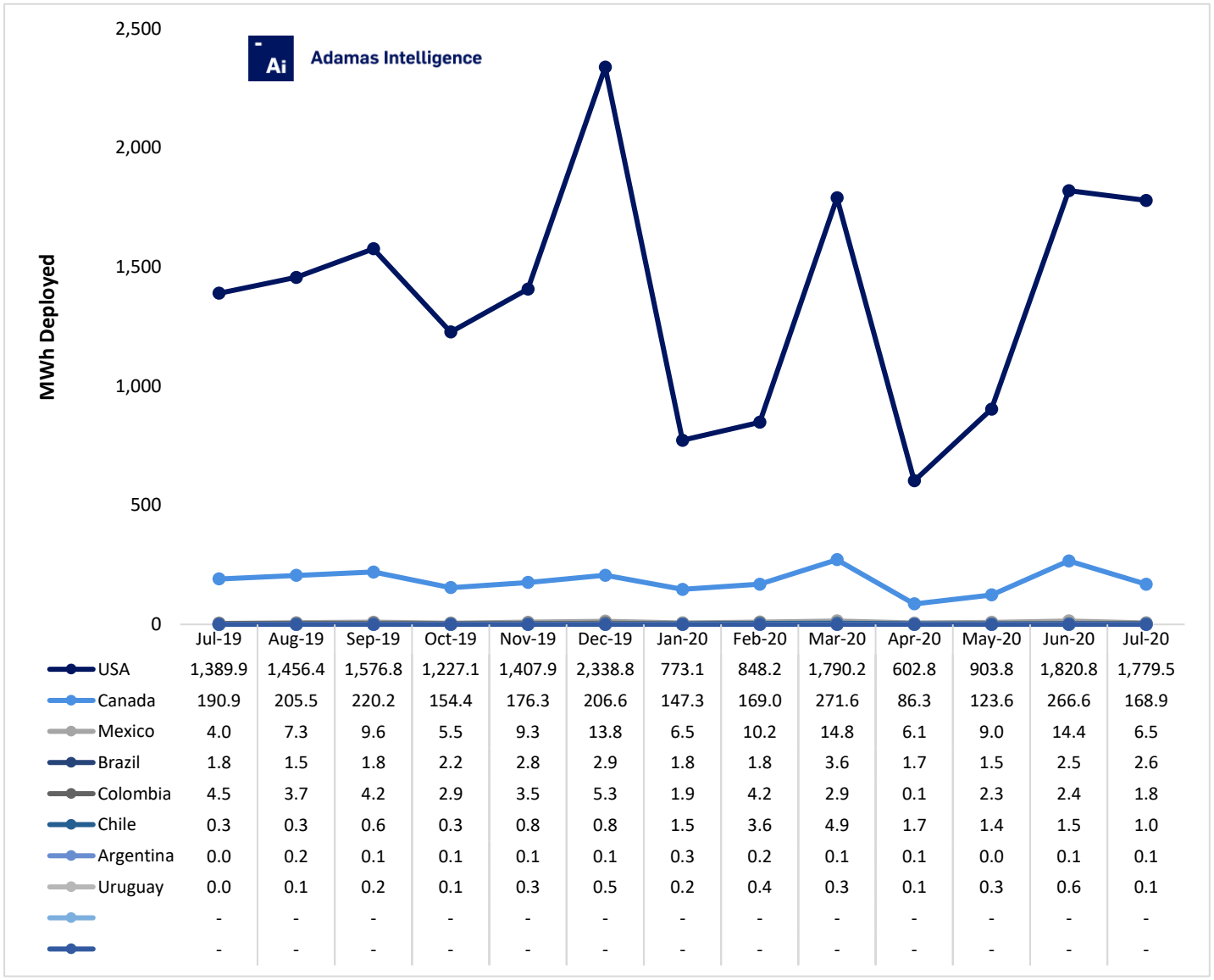
	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
Asia Pacific	100%	122%	133%	112%	143%	233%	85%	50%	133%	106%	127%	165%	160%
Americas	100%	106%	114%	88%	101%	162%	59%	65%	131%	44%	65%	133%	123%
Europe	100%	99%	173%	104%	128%	221%	167%	161%	217%	74%	104%	213%	231%
ME & Africa	100%	79%	72%	51%	76%	61%	83%	114%	436%	10%	58%	98%	76%

Asia Pacific Top 10 Countries by Battery Capacity Deployed



	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
China	2,364.1	3,032.6	3,090.5	2,752.5	3,507.8	5,979.0	2,081.0	815.8	2,837.0	2,661.5	3,293.4	4,049.8	4,125.6
South Korea	152.0	111.9	108.8	122.3	189.2	122.9	48.1	220.9	392.8	183.3	141.5	308.5	167.6
Japan	229.4	189.9	287.7	136.2	180.4	166.7	131.8	264.6	224.6	80.6	75.1	115.2	132.5
Australia	21.3	21.0	133.8	48.9	50.6	86.2	41.4	41.5	75.4	12.5	13.5	31.4	21.5
India	1.8	7.8	5.5	6.3	5.3	2.9	3.4	11.4	13.6	-	4.4	12.4	9.3
New Zealand	6.9	13.5	34.3	10.3	10.8	11.7	10.4	8.8	10.1	1.0	4.6	9.4	6.4
Singapore	3.3	3.1	6.0	7.2	6.2	6.9	3.3	3.6	3.1	0.3	0.0	1.1	4.4
Thailand	3.4	5.1	3.5	4.3	7.5	10.6	16.7	11.2	7.4	4.3	2.9	5.0	3.8
Taiwan	1.4	1.3	1.5	1.9	1.8	71.1	9.1	8.6	107.9	6.6	7.5	24.3	3.3
Indonesia	0.4	0.2	0.3	0.1	0.3	1.7	0.2	0.1	1.3	0.1	-	1.1	1.0

Americas Top 10 Countries by Battery Capacity Deployed



	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
USA	1,389.9	1,456.4	1,576.8	1,227.1	1,407.9	2,338.8	773.1	848.2	1,790.2	602.8	903.8	1,820.8	1,779.5
Canada	190.9	205.5	220.2	154.4	176.3	206.6	147.3	169.0	271.6	86.3	123.6	266.6	168.9
Mexico	4.0	7.3	9.6	5.5	9.3	13.8	6.5	10.2	14.8	6.1	9.0	14.4	6.5
Brazil	1.8	1.5	1.8	2.2	2.8	2.9	1.8	1.8	3.6	1.7	1.5	2.5	2.6
Colombia	4.5	3.7	4.2	2.9	3.5	5.3	1.9	4.2	2.9	0.1	2.3	2.4	1.8
Chile	0.3	0.3	0.6	0.3	0.8	0.8	1.5	3.6	4.9	1.7	1.4	1.5	1.0
Argentina	0.0	0.2	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.1	0.0	0.1	0.1
Uruguay	0.0	0.1	0.2	0.1	0.3	0.5	0.2	0.4	0.3	0.1	0.3	0.6	0.1
	-	-	-	-	-	-	-	-	-	-	-	-	-
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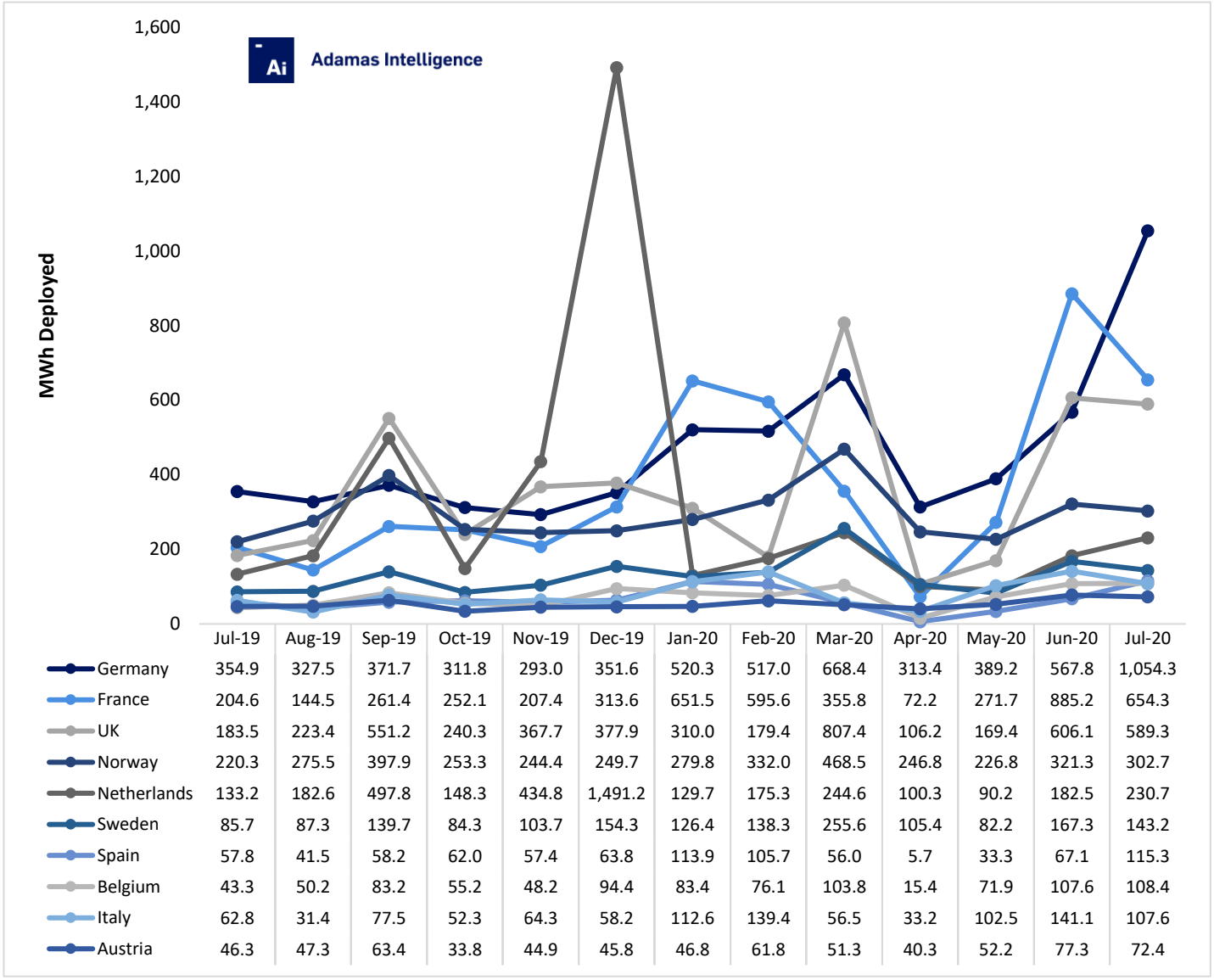
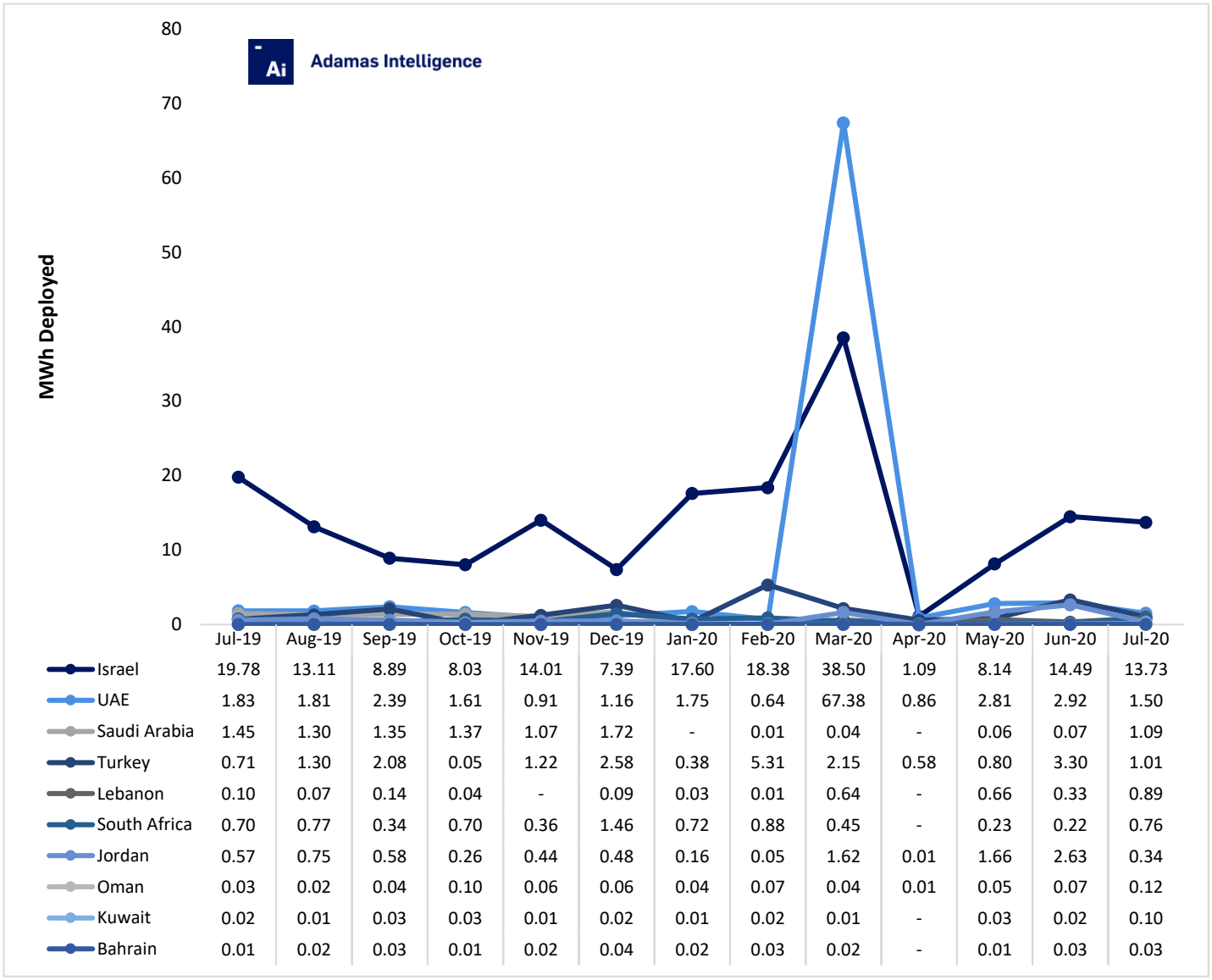
Europe Top 10 Countries by Battery Capacity Deployed



	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
Germany	354.9	327.5	371.7	311.8	293.0	351.6	520.3	517.0	668.4	313.4	389.2	567.8	1,054.3
France	204.6	144.5	261.4	252.1	207.4	313.6	651.5	595.6	355.8	72.2	271.7	885.2	654.3
UK	183.5	223.4	551.2	240.3	367.7	377.9	310.0	179.4	807.4	106.2	169.4	606.1	589.3
Norway	220.3	275.5	397.9	253.3	244.4	249.7	279.8	332.0	468.5	246.8	226.8	321.3	302.7
Netherlands	133.2	182.6	497.8	148.3	434.8	1,491.2	129.7	175.3	244.6	100.3	90.2	182.5	230.7
Sweden	85.7	87.3	139.7	84.3	103.7	154.3	126.4	138.3	255.6	105.4	82.2	167.3	143.2
Spain	57.8	41.5	58.2	62.0	57.4	63.8	113.9	105.7	56.0	5.7	33.3	67.1	115.3
Belgium	43.3	50.2	83.2	55.2	48.2	94.4	83.4	76.1	103.8	15.4	71.9	107.6	108.4
Italy	62.8	31.4	77.5	52.3	64.3	58.2	112.6	139.4	56.5	33.2	102.5	141.1	107.6
Austria	46.3	47.3	63.4	33.8	44.9	45.8	46.8	61.8	51.3	40.3	52.2	77.3	72.4

Jul-2020

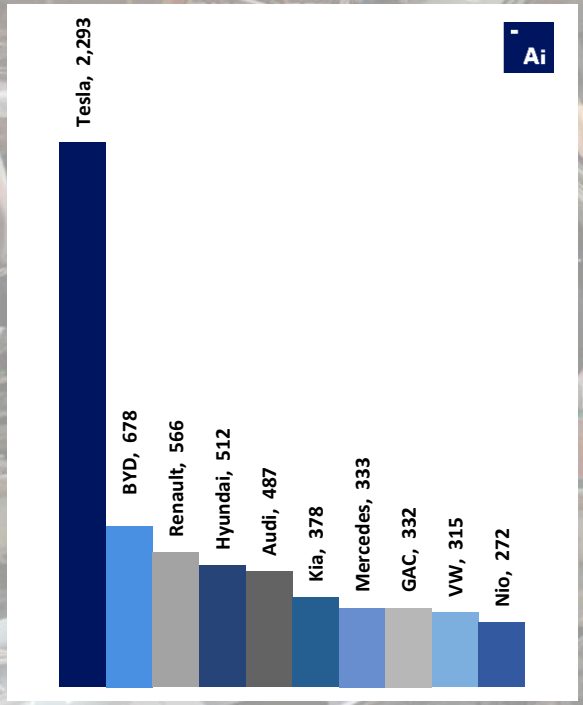
M.E. and Africa Top 10 Countries by Battery Capacity Deployed



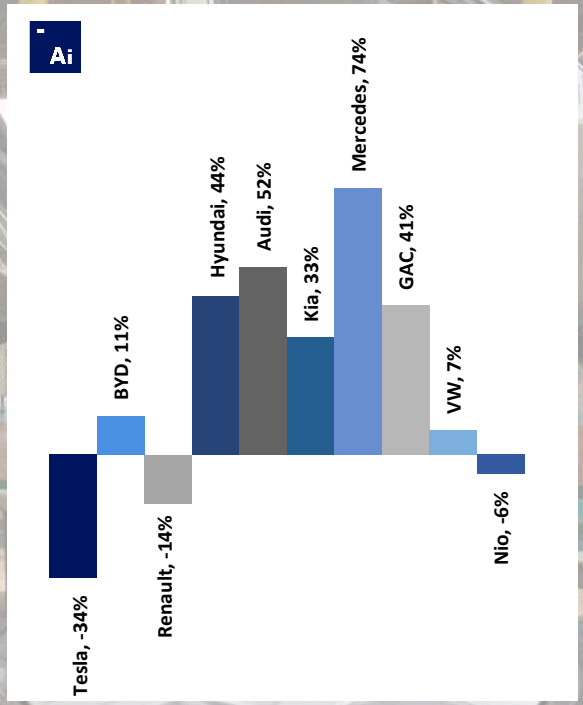
	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
Israel	19.78	13.11	8.89	8.03	14.01	7.39	17.60	18.38	38.50	1.09	8.14	14.49	13.73
UAE	1.83	1.81	2.39	1.61	0.91	1.16	1.75	0.64	67.38	0.86	2.81	2.92	1.50
Saudi Arabia	1.45	1.30	1.35	1.37	1.07	1.72	-	0.01	0.04	-	0.06	0.07	1.09
Turkey	0.71	1.30	2.08	0.05	1.22	2.58	0.38	5.31	2.15	0.58	0.80	3.30	1.01
Lebanon	0.10	0.07	0.14	0.04	-	0.09	0.03	0.01	0.64	-	0.66	0.33	0.89
South Africa	0.70	0.77	0.34	0.70	0.36	1.46	0.72	0.88	0.45	-	0.23	0.22	0.76
Jordan	0.57	0.75	0.58	0.26	0.44	0.48	0.16	0.05	1.62	0.01	1.66	2.63	0.34
Oman	0.03	0.02	0.04	0.10	0.06	0.06	0.04	0.07	0.04	0.01	0.05	0.07	0.12
Kuwait	0.02	0.01	0.03	0.03	0.01	0.02	0.01	0.02	0.01	-	0.03	0.02	0.10
Bahrain	0.01	0.02	0.03	0.01	0.02	0.04	0.02	0.03	0.02	-	0.01	0.03	0.03

Global Battery Capacity Deployed by Make

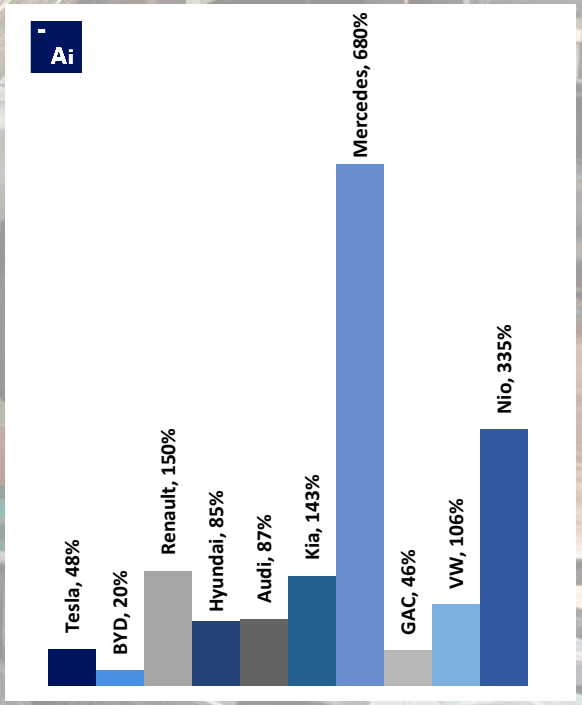
MWh Deployed



MoM Change



YoY Change

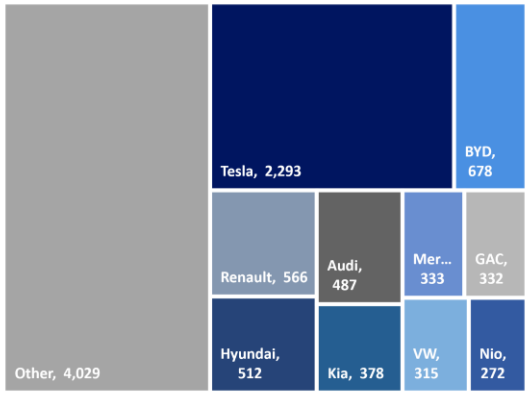


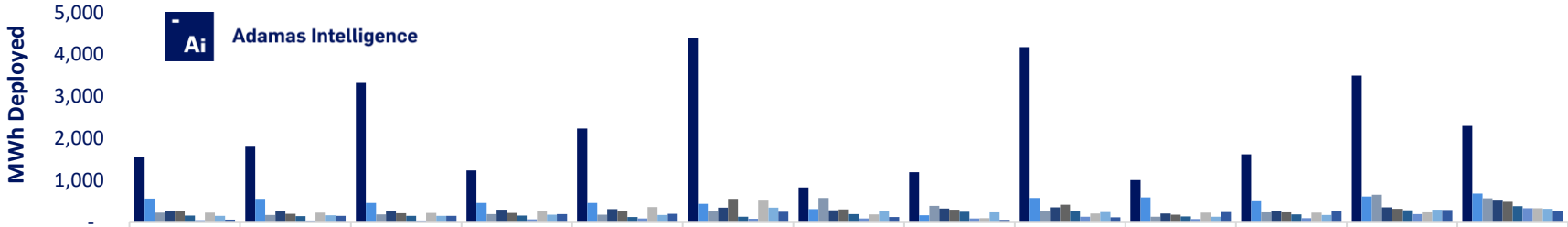
Global Battery Capacity Deployed by Make

In July 2020:

- **Tesla deployed 2,293 MWh** of passenger EV battery capacity an **increase of 48%** over the same month the year prior.
- **BYD deployed 678 MWh** of passenger EV battery capacity, an **increase of 20%** over the same month the year prior.
- **Renault deployed 566 MWh** of passenger EV battery capacity, an **increase of 150%** over the same month the year prior.
- **Hyundai deployed 512 MWh** of passenger EV battery capacity an **increase of 85%** over the same month the year prior.

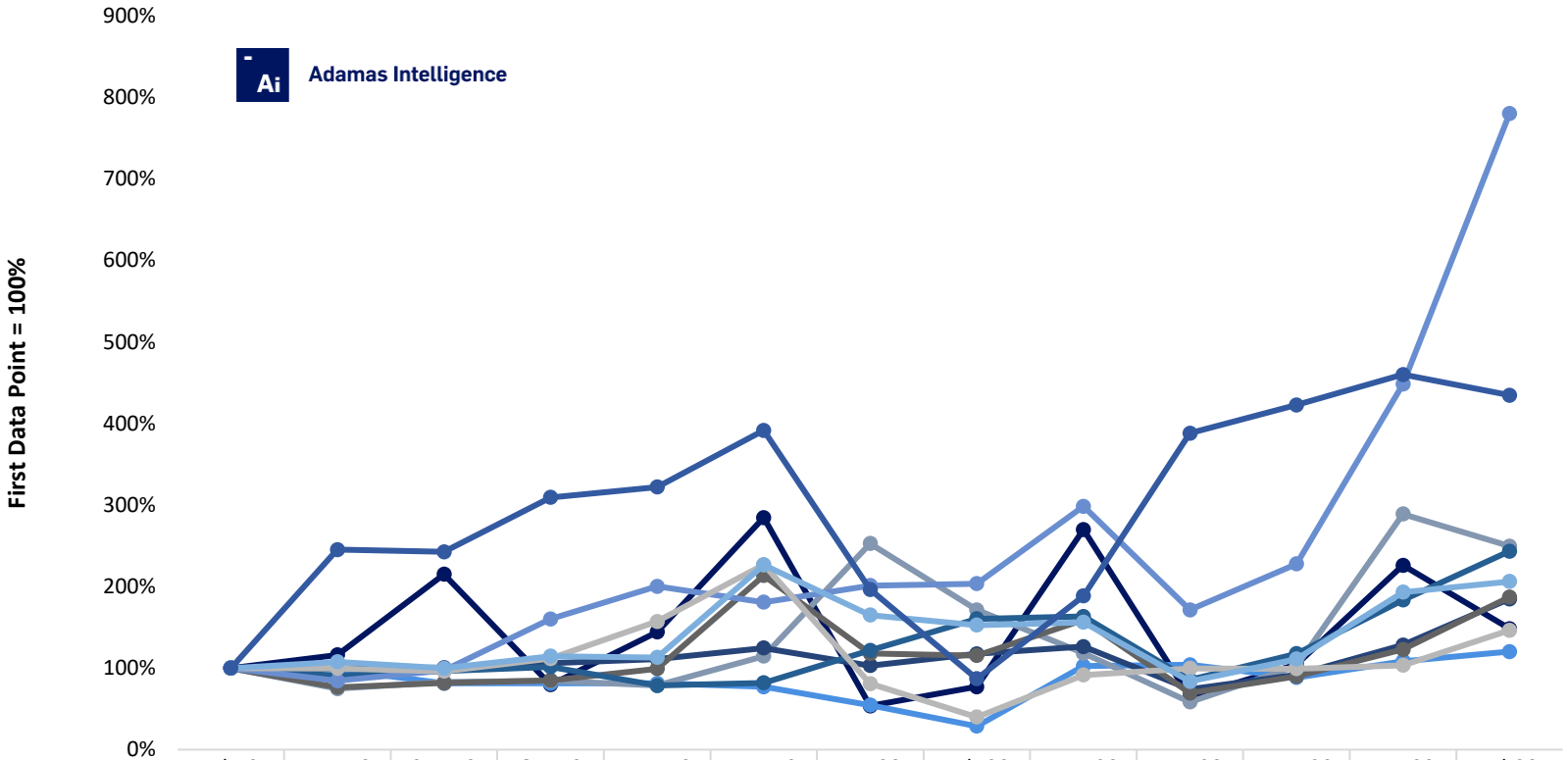
MWh Deployed by Make in Jul-2020





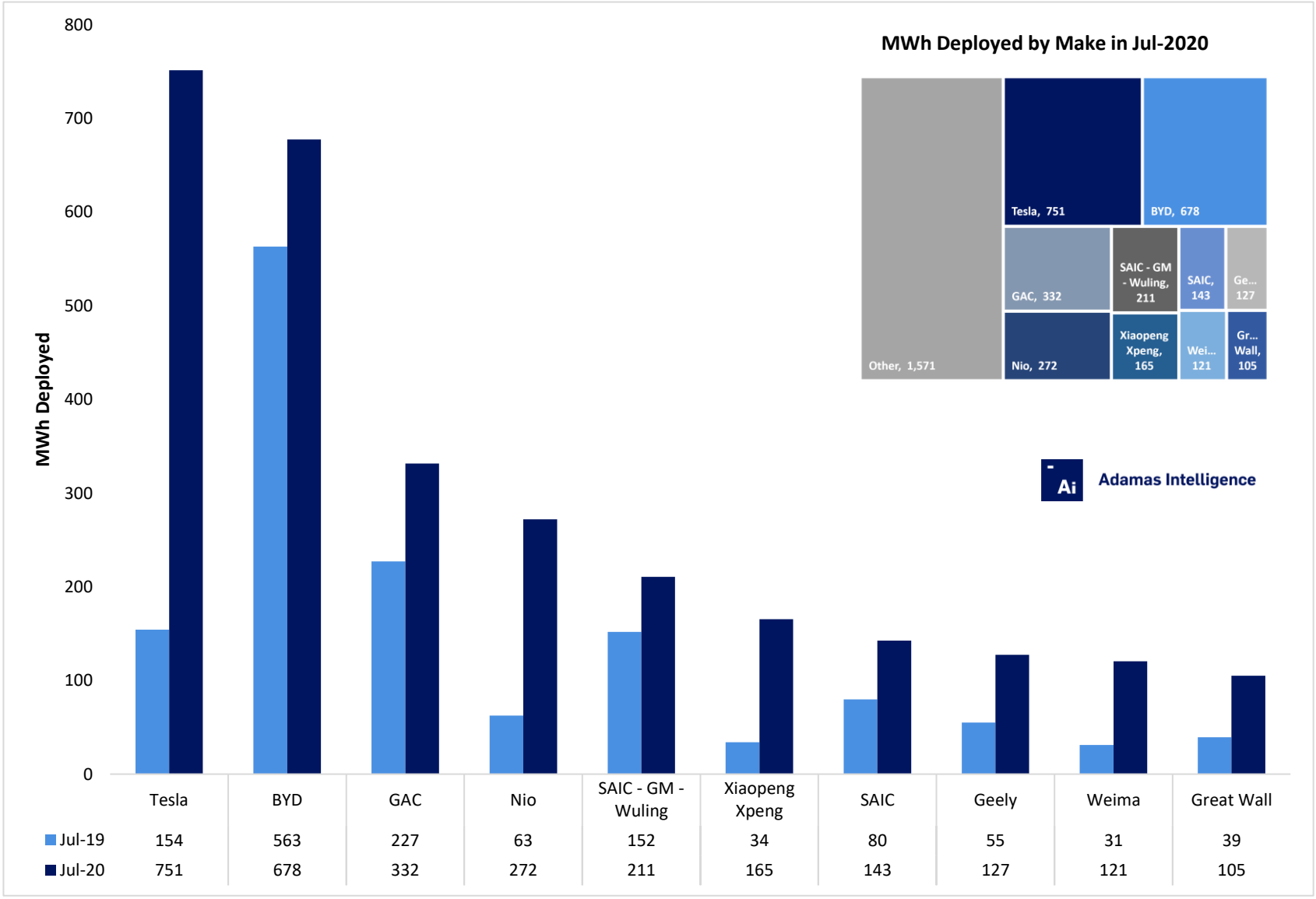
	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
Tesla	1,546	1,796	3,326	1,231	2,230	4,399	830	1,194	4,175	1,000	1,617	3,496	2,293
BYD	564	554	459	459	459	435	308	163	578	588	500	612	678
Renault	227	170	188	192	179	260	574	389	269	133	233	656	566
Hyundai	277	276	279	294	308	345	286	326	351	205	255	356	512
Audi	260	199	213	221	258	556	307	300	415	181	234	320	487
Kia	155	141	150	158	122	127	189	249	254	133	183	285	378
Mercedes	43	36	42	68	85	77	86	87	127	73	97	191	333
GAC	227	226	218	254	357	515	184	91	208	226	226	235	332
VW	153	164	152	175	173	346	252	233	238	128	170	295	315
Nio	63	154	152	194	202	245	123	54	118	243	265	288	272

Automaker's Battery Capacity Deployment Index



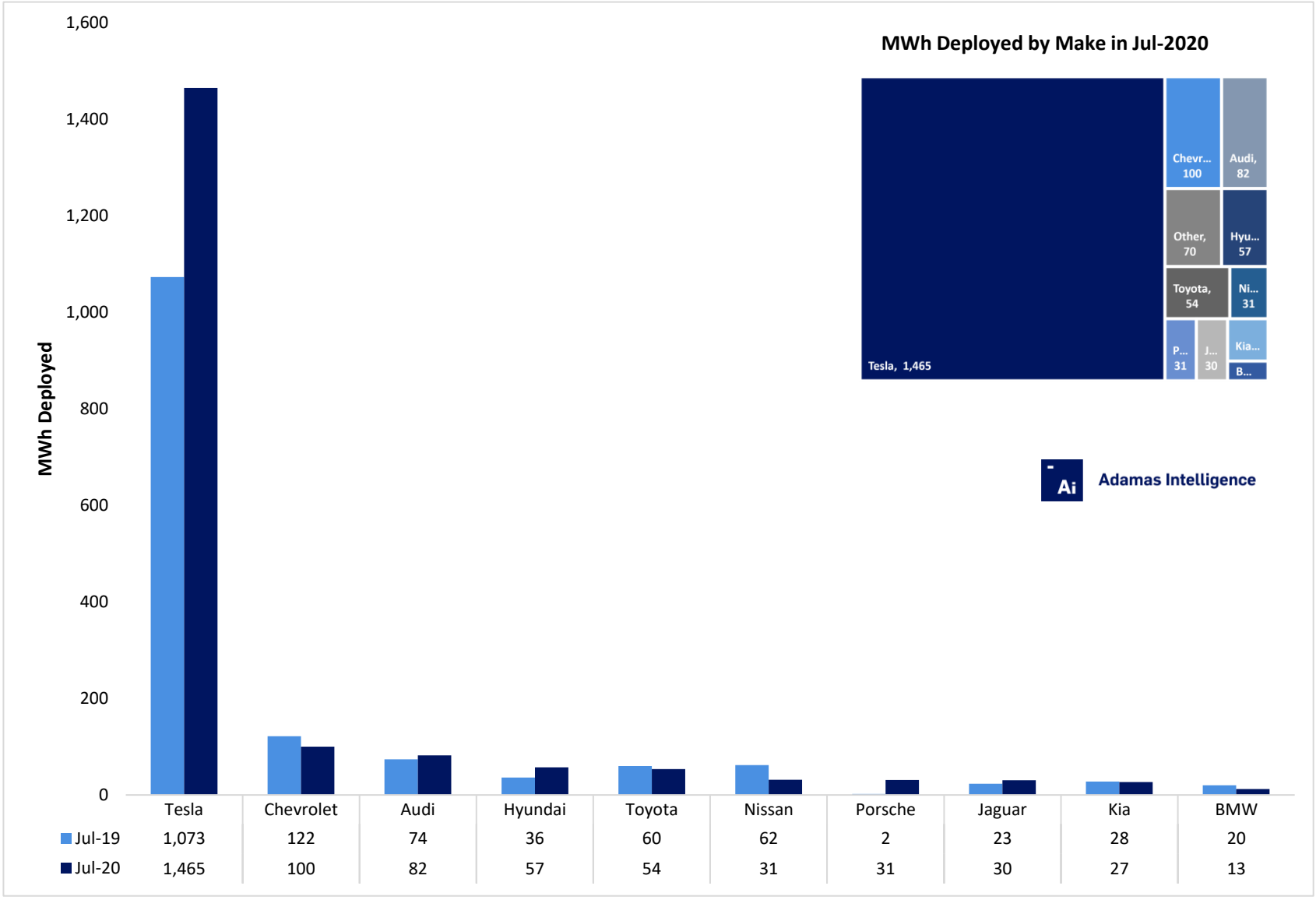
	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
Tesla	100%	116%	215%	80%	144%	285%	54%	77%	270%	65%	105%	226%	148%
BYD	100%	98%	81%	81%	81%	77%	55%	29%	103%	104%	89%	109%	120%
Renault	100%	75%	83%	85%	79%	115%	253%	172%	118%	58%	103%	289%	250%
Hyundai	100%	100%	101%	106%	111%	125%	103%	118%	127%	74%	92%	128%	185%
Audi	100%	77%	82%	85%	99%	214%	118%	115%	159%	69%	90%	123%	187%
Kia	100%	91%	97%	102%	79%	82%	122%	160%	163%	86%	118%	184%	243%
Mercedes	100%	84%	97%	160%	200%	181%	201%	204%	298%	171%	228%	448%	780%
GAC	100%	100%	96%	112%	157%	227%	81%	40%	92%	100%	99%	103%	146%
VW	100%	108%	100%	115%	113%	227%	165%	153%	156%	84%	111%	193%	206%
Nio	100%	245%	243%	309%	322%	392%	197%	87%	189%	388%	423%	460%	435%

Asia Pacific Top 10 Makes by Battery Capacity Deployed



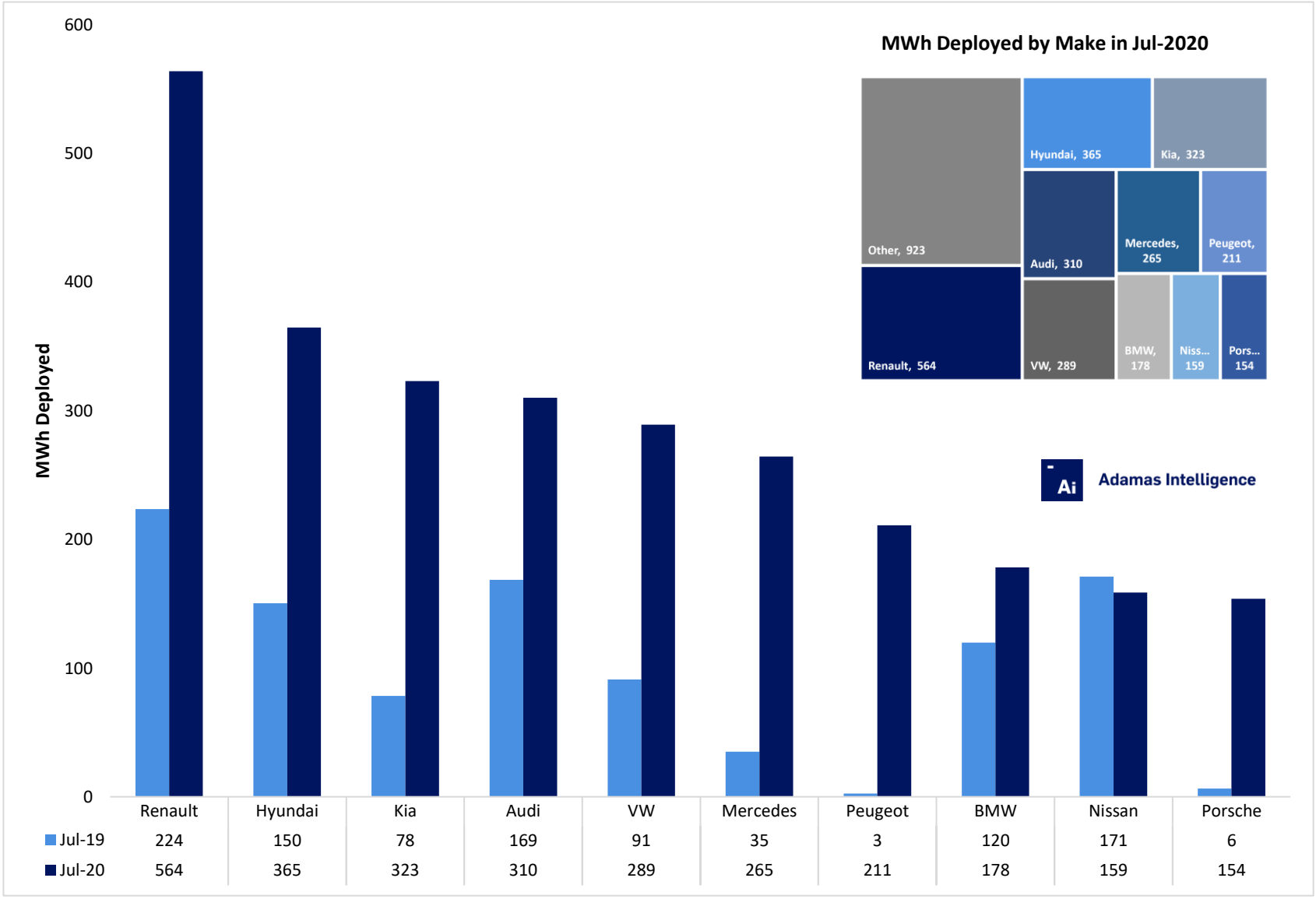
	Tesla	BYD	GAC	Nio	SAIC - GM - Wuling	Xiaopeng Xpeng	SAIC	Geely	Weima	Great Wall
Jul-19	154	563	227	63	152	34	80	55	31	39
Jul-20	751	678	332	272	211	165	143	127	121	105

Americas Top 10 Makes by Battery Capacity Deployed



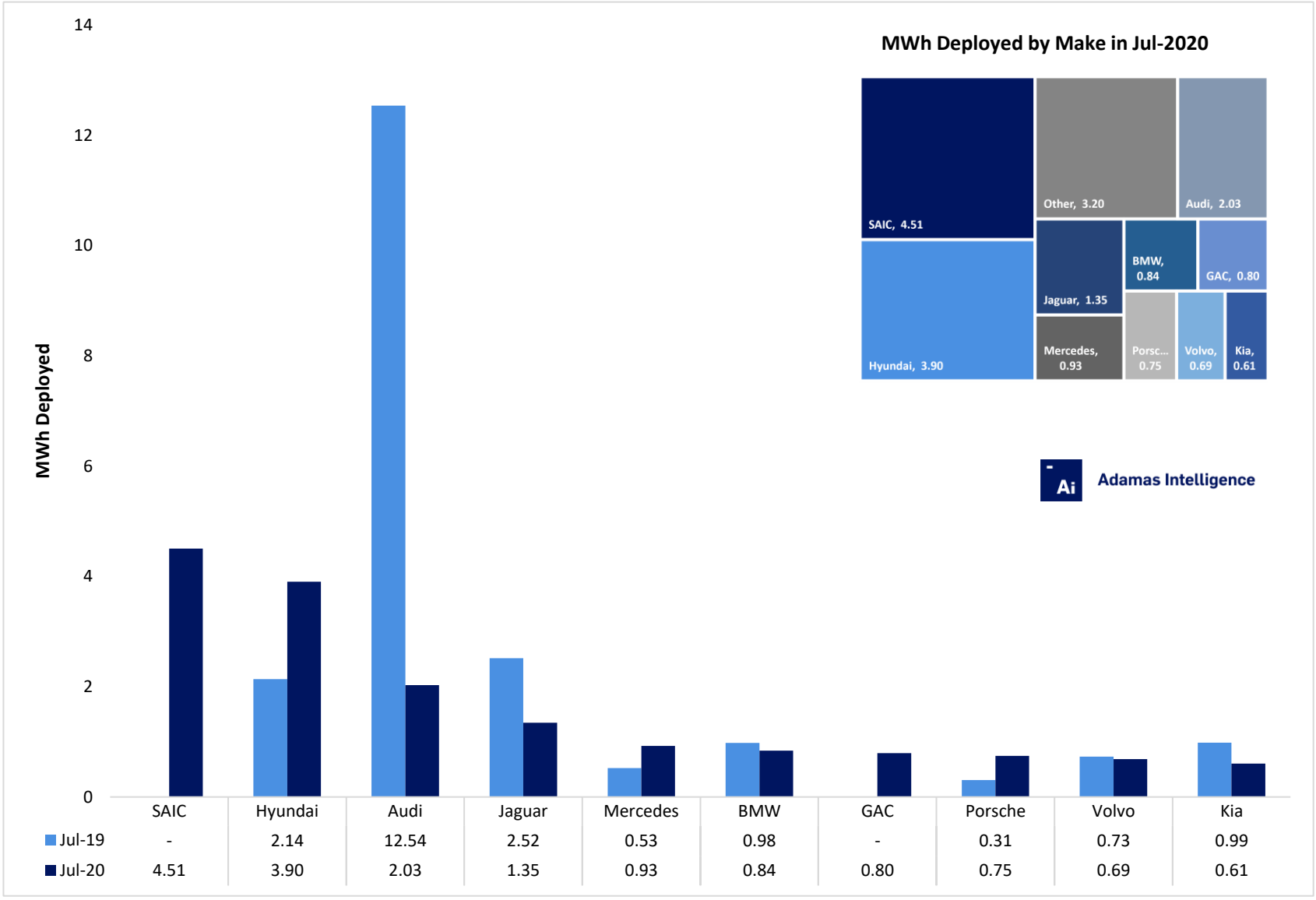
	Tesla	Chevrolet	Audi	Hyundai	Toyota	Nissan	Porsche	Jaguar	Kia	BMW
Jul-19	1,073	122	74	36	60	62	2	23	28	20
Jul-20	1,465	100	82	57	54	31	31	30	27	13

Europe Top 10 Makes by Battery Capacity Deployed



	Renault	Hyundai	Kia	Audi	VW	Mercedes	Peugeot	BMW	Nissan	Porsche
Jul-19	224	150	78	169	91	35	3	120	171	6
Jul-20	564	365	323	310	289	265	211	178	159	154

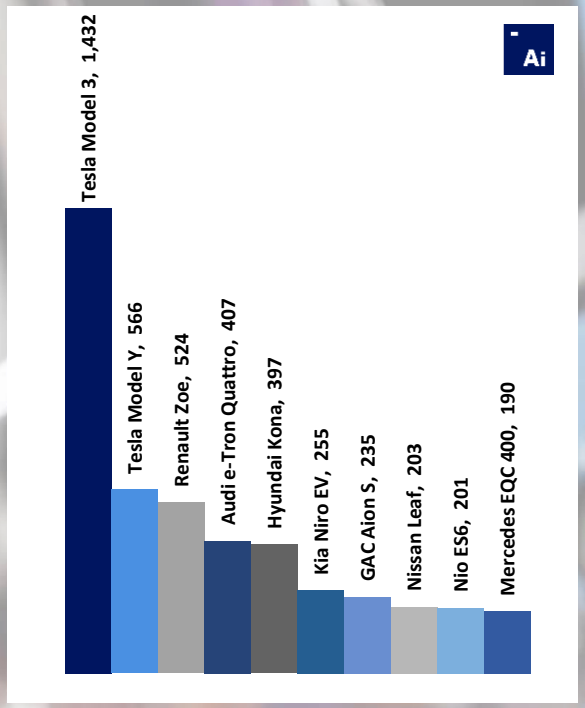
M.E. and Africa Top 10 Makes by Battery Capacity Deployed



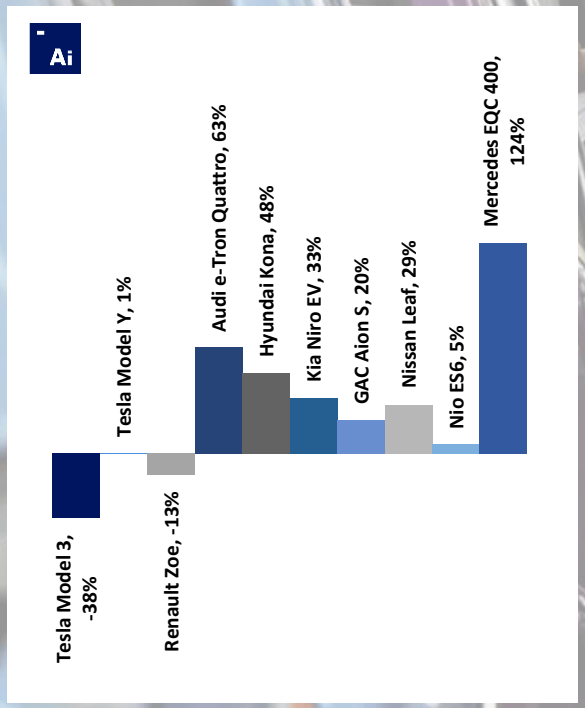
	SAIC	Hyundai	Audi	Jaguar	Mercedes	BMW	GAC	Porsche	Volvo	Kia
Jul-19	-	2.14	12.54	2.52	0.53	0.98	-	0.31	0.73	0.99
Jul-20	4.51	3.90	2.03	1.35	0.93	0.84	0.80	0.75	0.69	0.61

Global Battery Capacity Deployed by Model

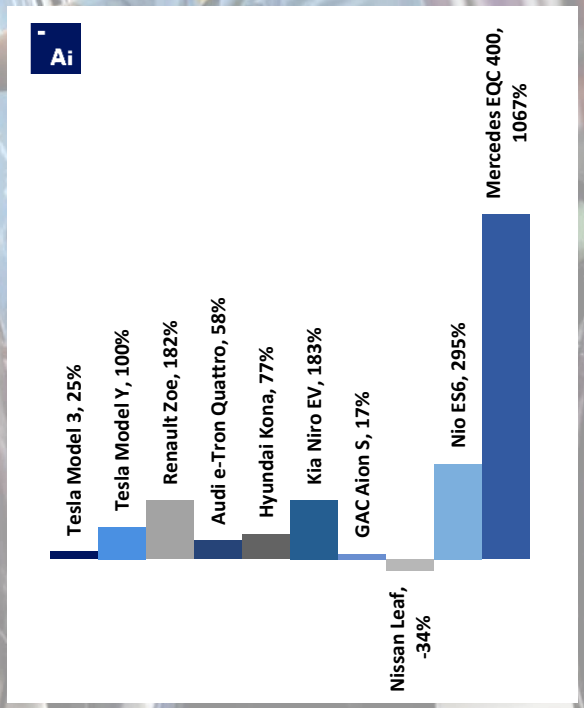
MWh Deployed



MoM Change



YoY Change

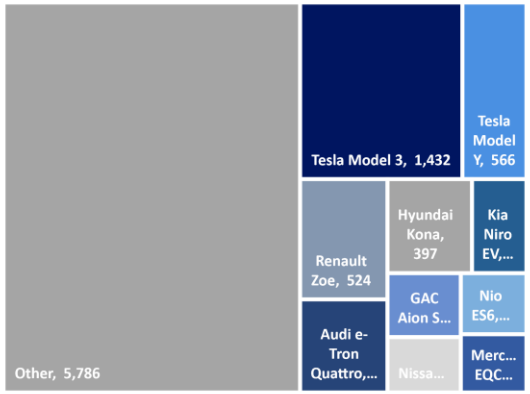


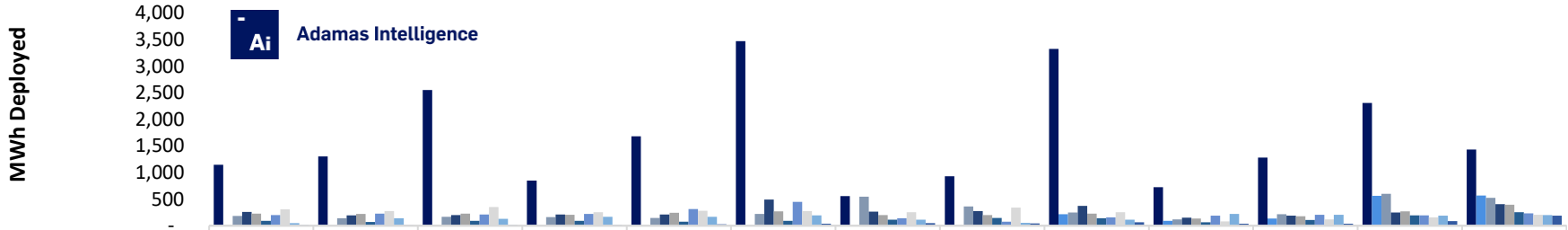
Global Battery Capacity Deployed by Model

In July 2020:

- **Tesla Model 3** was responsible for deployment of **1,432 MWh of battery capacity** globally, an **increase of 25%** over the same month the year prior.
- **Tesla Model Y** was responsible for deployment of **566 MWh of battery capacity** globally, an **increase of 100%** over the same month the year prior.
- **Renault Zoe** was responsible for deployment of **524 MWh of battery capacity** globally, an **increase of 182%** over the same month the year prior.
- **Audi e-Tron Quattro** was responsible for deployment of **407 MWh of battery capacity** globally, an **increase of 58%** over the same month the year prior.

MWh Deployed by Model in Jul-2020



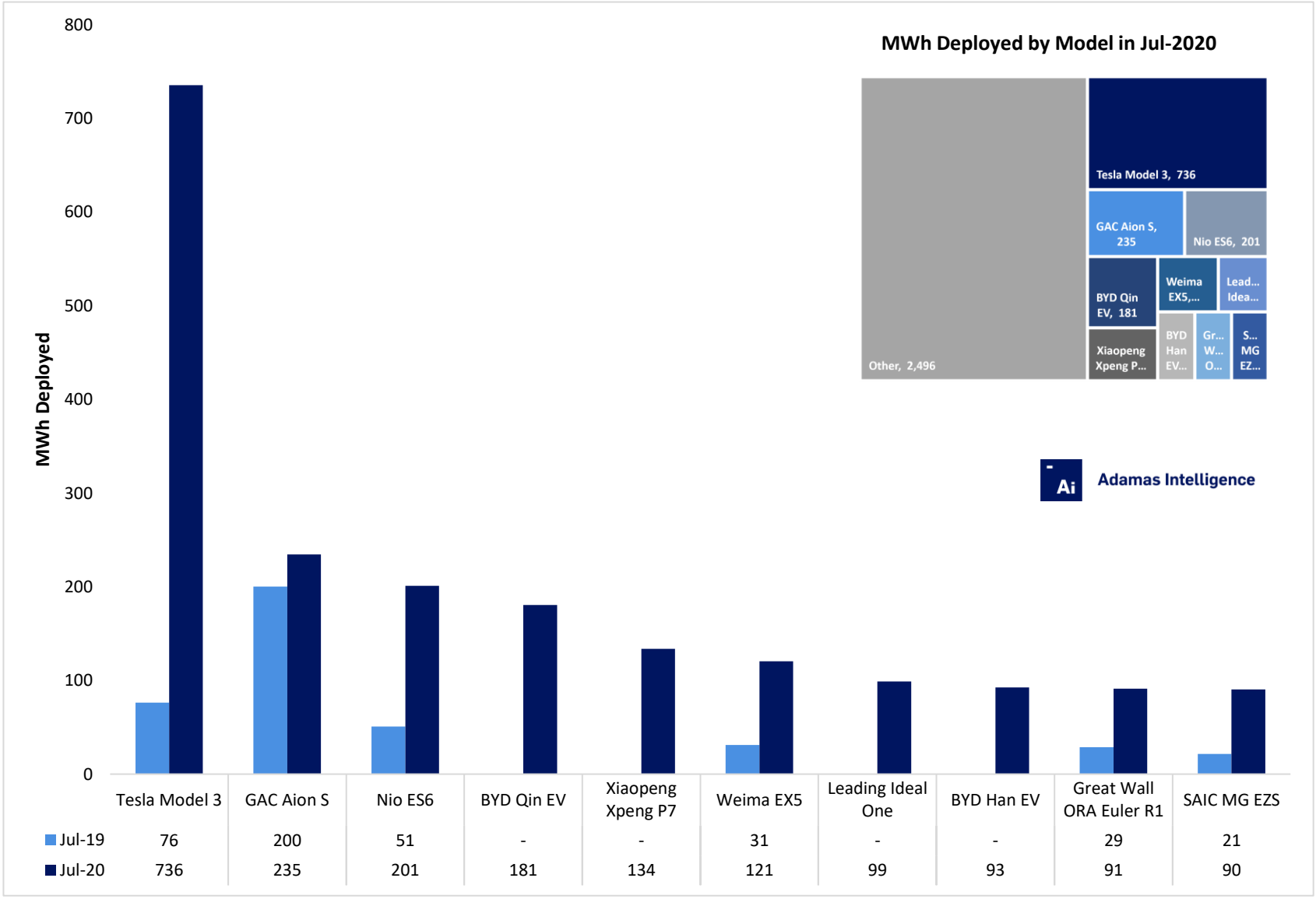


	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
Tesla Model 3	1,148	1,305	2,553	851	1,679	3,468	559	927	3,322	726	1,283	2,308	1,432
Tesla Model Y	-	-	-	-	-	-	-	-	218	90	135	563	566
Renault Zoe	186	139	166	163	146	224	546	362	246	116	217	600	524
Audi e-Tron Quattro	258	194	199	213	208	492	265	274	375	153	189	250	407
Hyundai Kona	224	221	226	208	240	268	200	199	227	134	179	268	397
Kia Niro EV	90	72	92	94	76	90	112	143	138	67	109	192	255
GAC Aion S	200	224	212	223	313	448	140	76	157	190	206	196	235
Nissan Leaf	310	276	352	253	283	275	253	341	254	79	119	158	203
Nio ES6	51	140	128	170	166	196	115	52	114	224	207	191	201
Mercedes EQC 400	16	13	18	14	27	36	48	41	65	39	36	85	190

Model's Battery Capacity Deployment Index

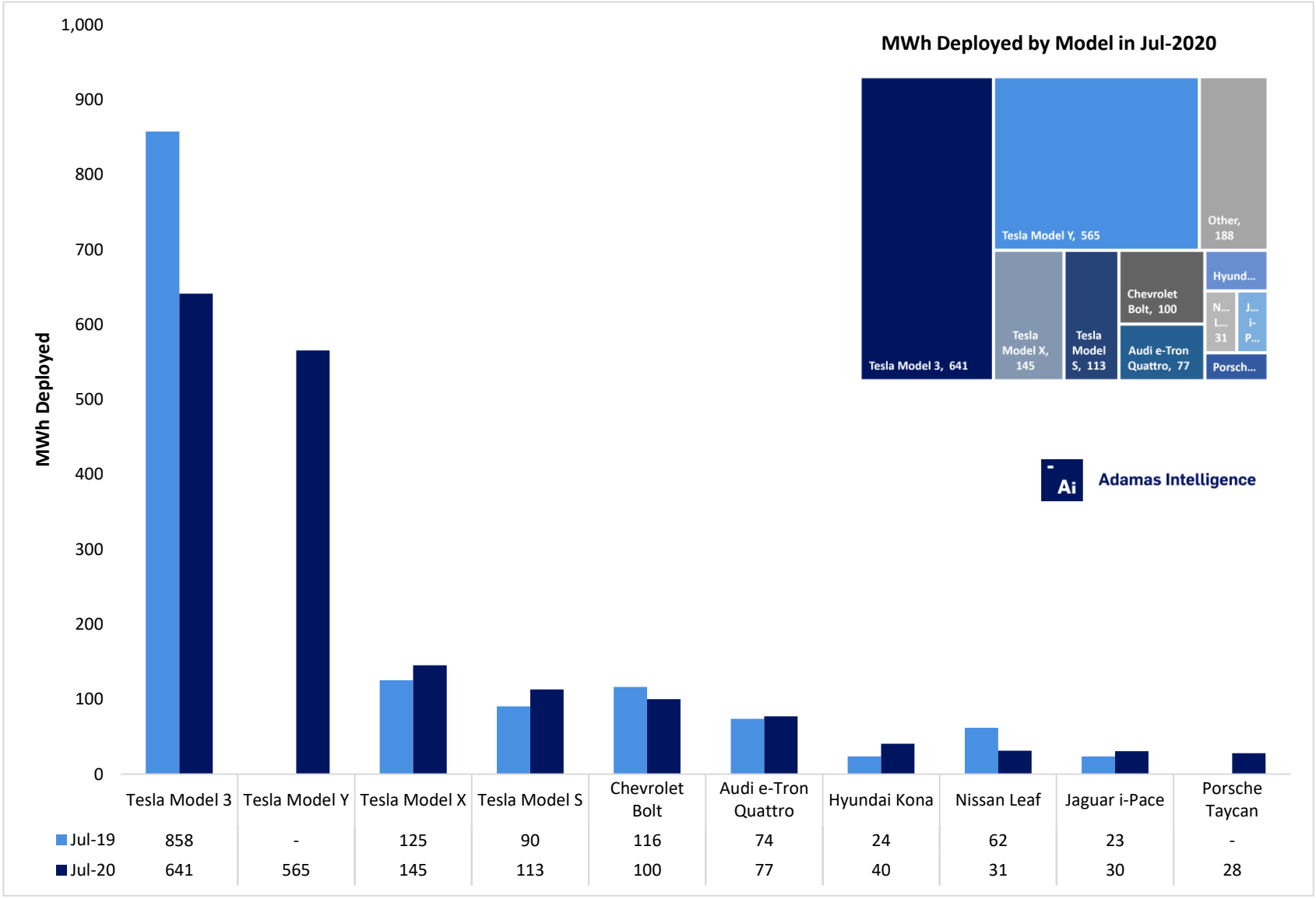
	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
Tesla Model 3	100%	114%	222%	74%	146%	302%	49%	81%	290%	63%	112%	201%	125%
Tesla Model Y	0%	0%	0%	0%	0%	0%	0%	0%	100%	41%	62%	258%	259%
Renault Zoe	100%	74%	89%	87%	79%	120%	293%	195%	132%	63%	117%	323%	282%
Audi e-Tron Quattro	100%	75%	77%	83%	81%	191%	103%	106%	146%	59%	73%	97%	158%
Hyundai Kona	100%	98%	101%	93%	107%	120%	89%	89%	101%	60%	80%	120%	177%
Kia Niro EV	100%	80%	103%	105%	84%	99%	124%	159%	153%	75%	121%	213%	283%
GAC Aion S	100%	112%	106%	112%	156%	224%	70%	38%	78%	95%	103%	98%	117%
Nissan Leaf	100%	89%	114%	82%	92%	89%	82%	110%	82%	26%	38%	51%	66%
Nio ES6	100%	275%	251%	334%	326%	386%	226%	102%	224%	440%	407%	375%	395%
Mercedes EQC 400	100%	78%	113%	88%	166%	218%	296%	251%	398%	237%	223%	520%	1167%

Asia Pacific Top 10 Models by Battery Capacity Deployed



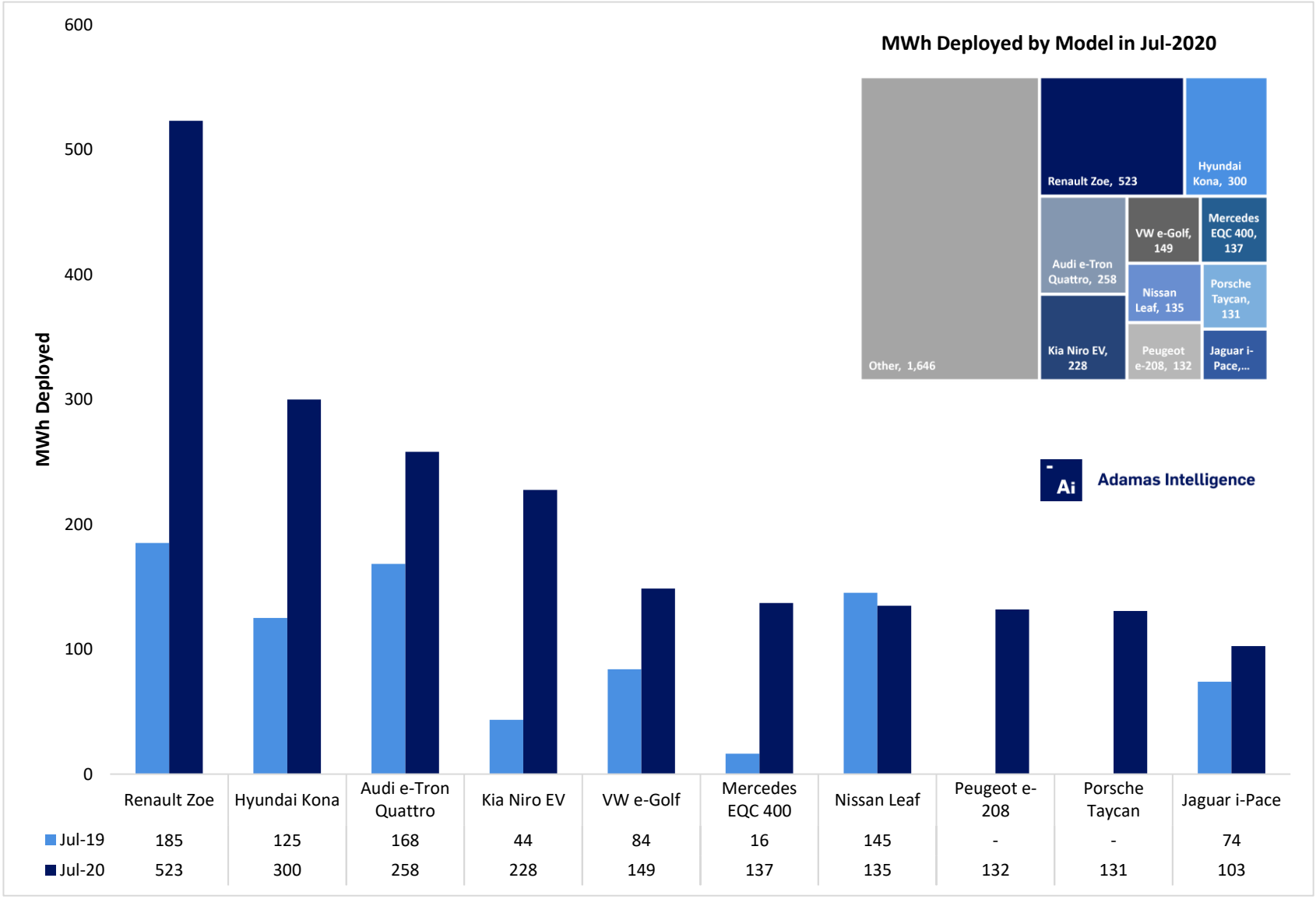
	Tesla Model 3	GAC Aion S	Nio ES6	BYD Qin EV	Xiaopeng Xpeng P7	Weima EX5	Leading Ideal One	BYD Han EV	Great Wall ORA Euler R1	SAIC MG EZS
Jul-19	76	200	51	-	-	31	-	-	29	21
Jul-20	736	235	201	181	134	121	99	93	91	90

Americas Top 10 Models by Battery Capacity Deployed



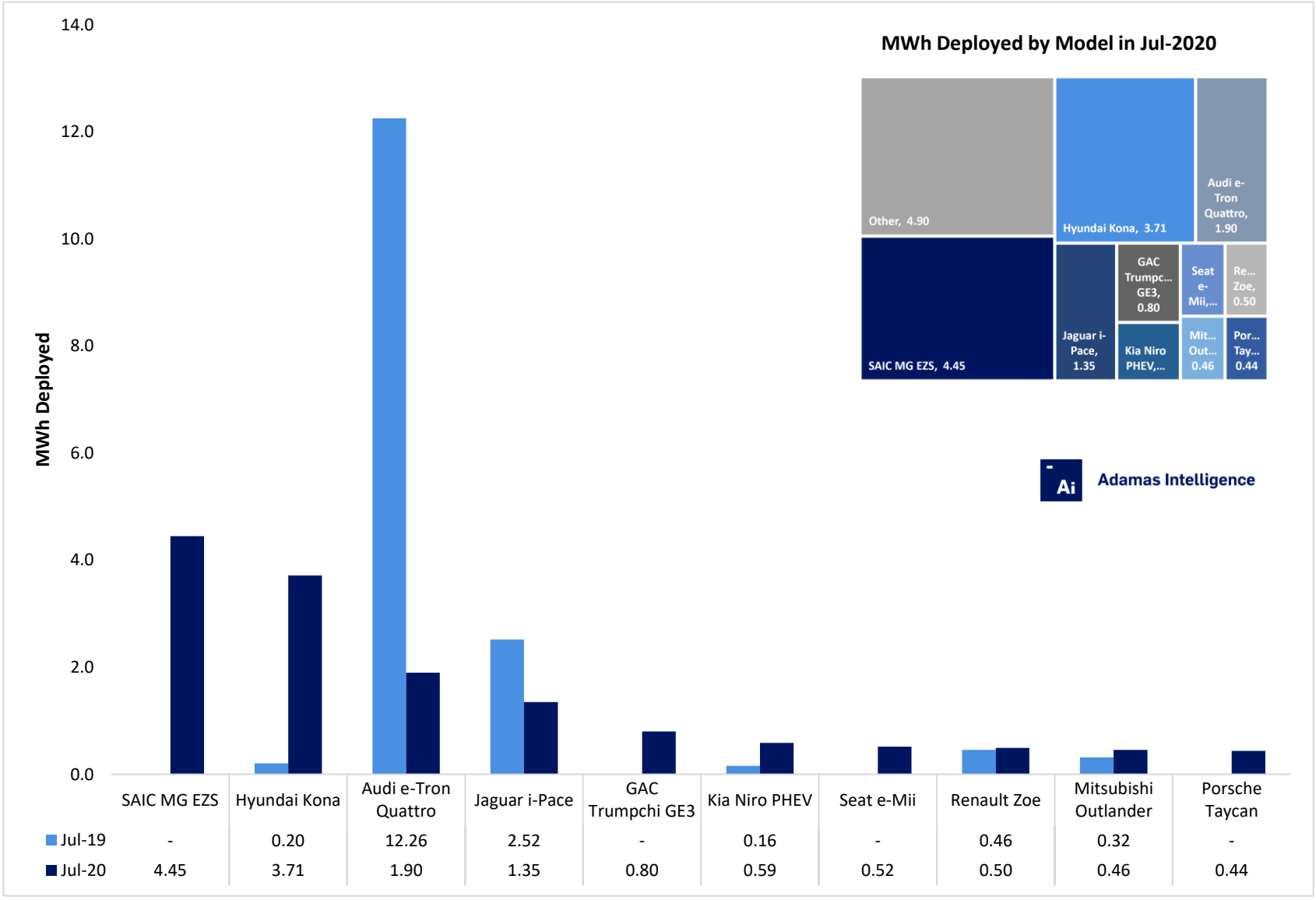
	Tesla Model 3	Tesla Model Y	Tesla Model X	Tesla Model S	Chevrolet Bolt	Audi e-Tron Quattro	Hyundai Kona	Nissan Leaf	Jaguar i-Pace	Porsche Taycan
Jul-19	858	-	125	90	116	74	24	62	23	-
Jul-20	641	565	145	113	100	77	40	31	30	28

Europe Top 10 Models by Battery Capacity Deployed



	Renault Zoe	Hyundai Kona	Audi e-Tron Quattro	Kia Niro EV	VW e-Golf	Mercedes EQC 400	Nissan Leaf	Peugeot e-208	Porsche Taycan	Jaguar i-Pace
Jul-19	185	125	168	44	84	16	145	-	-	74
Jul-20	523	300	258	228	149	137	135	132	131	103

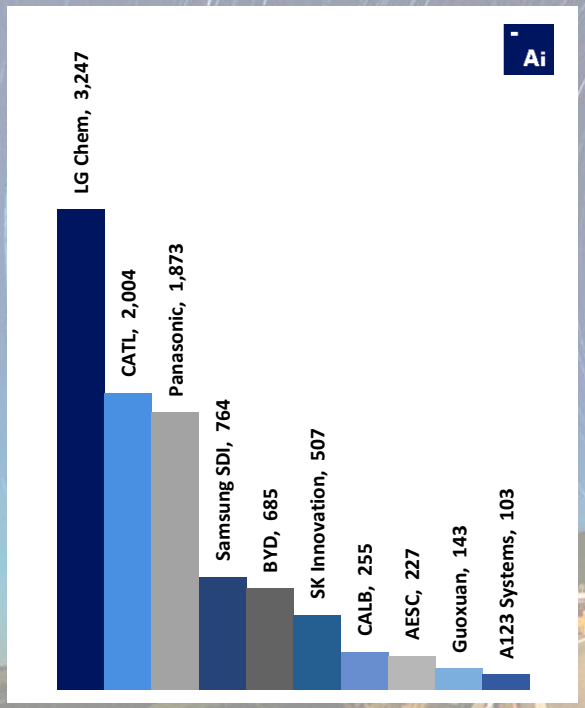
M.E. and Africa Top 10 Models by Battery Capacity Deployed



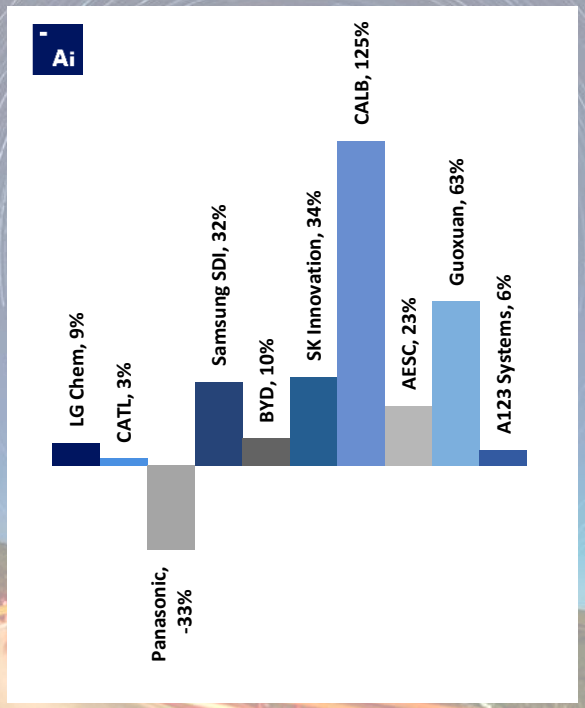
	SAIC MG EZS	Hyundai Kona	Audi e-Tron Quattro	Jaguar i-Pace	GAC Trumpchi GE3	Kia Niro PHEV	Seat e-Mii	Renault Zoe	Mitsubishi Outlander	Porsche Taycan
Jul-19	-	0.20	12.26	2.52	-	0.16	-	0.46	0.32	-
Jul-20	4.45	3.71	1.90	1.35	0.80	0.59	0.52	0.50	0.46	0.44

Global Battery Capacity Deployed by Cell Supplier

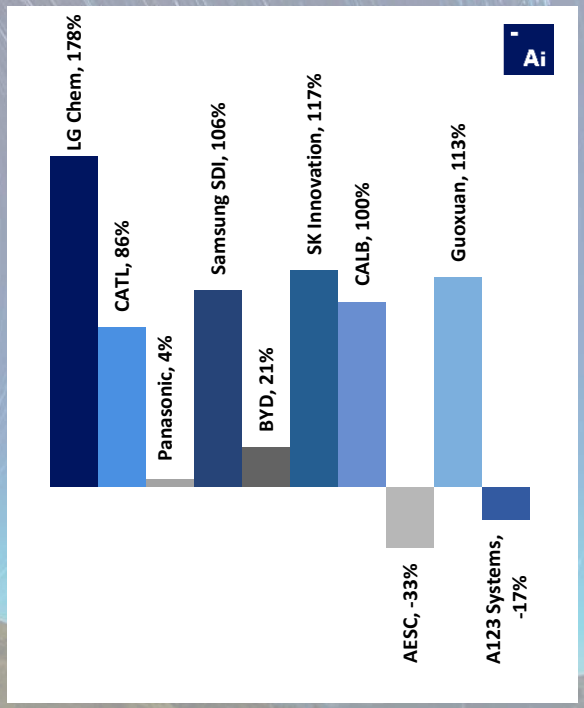
MWh Deployed



MoM Change



YoY Change

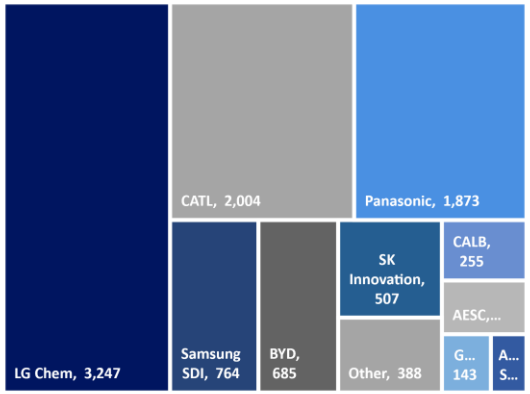


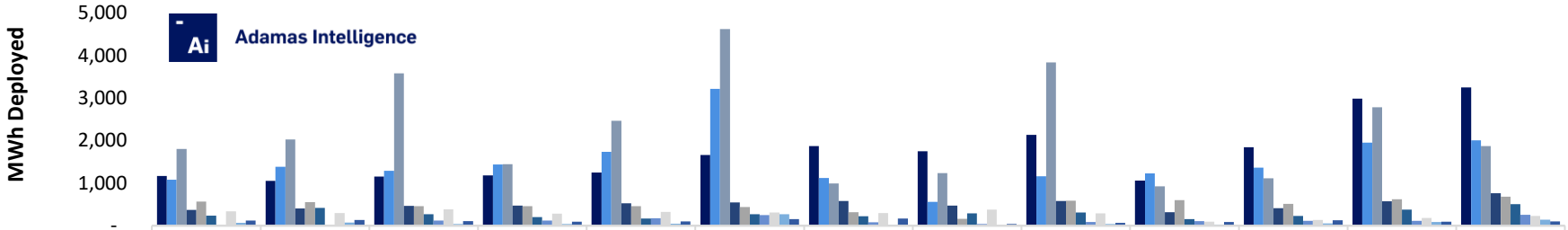
Global Battery Capacity Deployed by Cell Supplier

In July 2020:

- **3,247 MWh of LG Chem** passenger EV battery capacity was deployed globally, an **increase of 178%** over the same month the year prior.
- **2,004 MWh of CATL** passenger EV battery capacity was deployed globally, an **increase of 86%** over the same month the year prior.
- **1,873 MWh of Panasonic** passenger EV battery capacity was deployed globally, an **increase of 4%** over the same month the year prior.
- **764 MWh of Samsung SDI** passenger EV battery capacity was deployed globally, an **increase of 106%** over the same month the year prior.

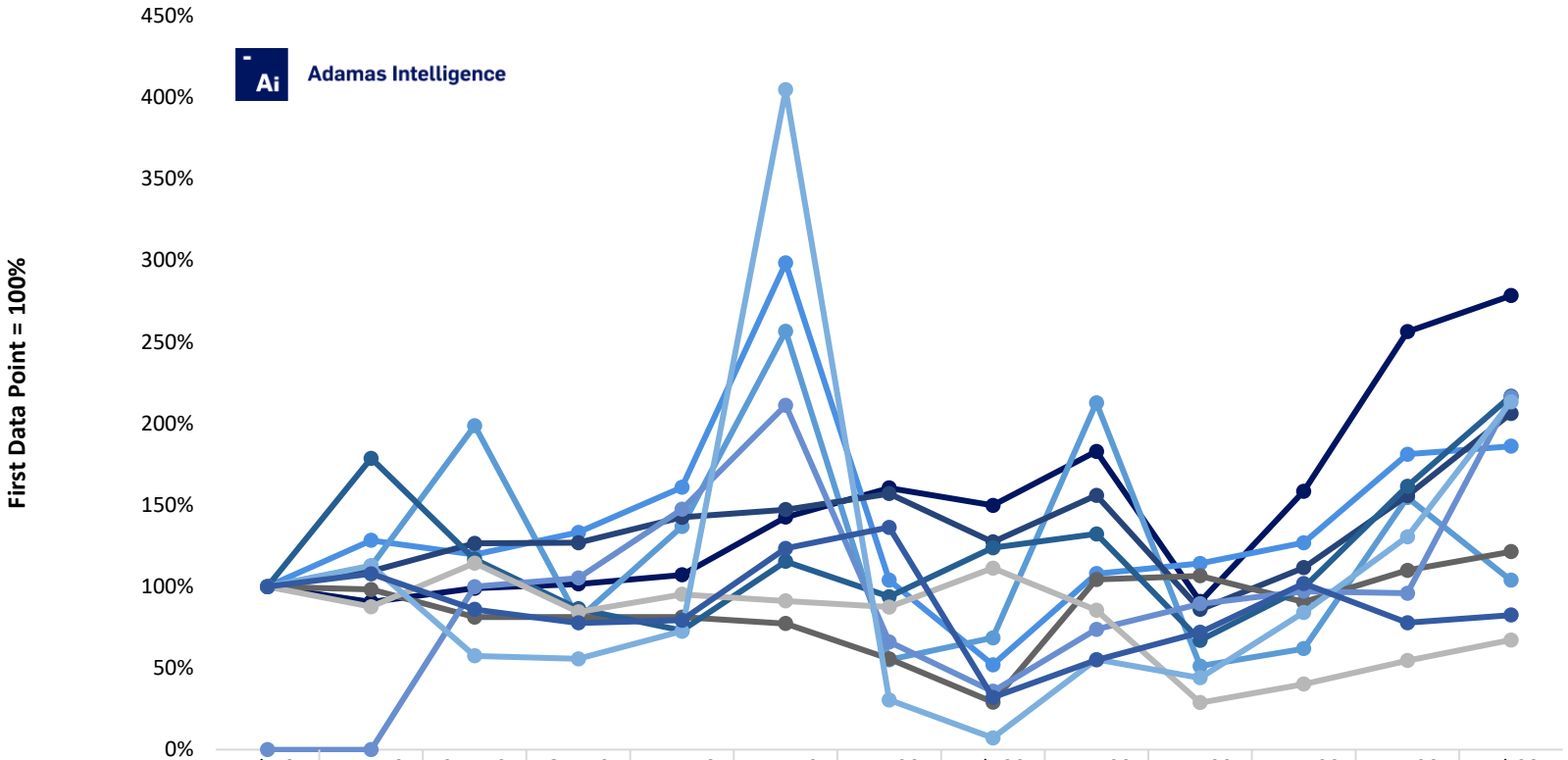
MWh Deployed by Cell Supplier in Jul-2020





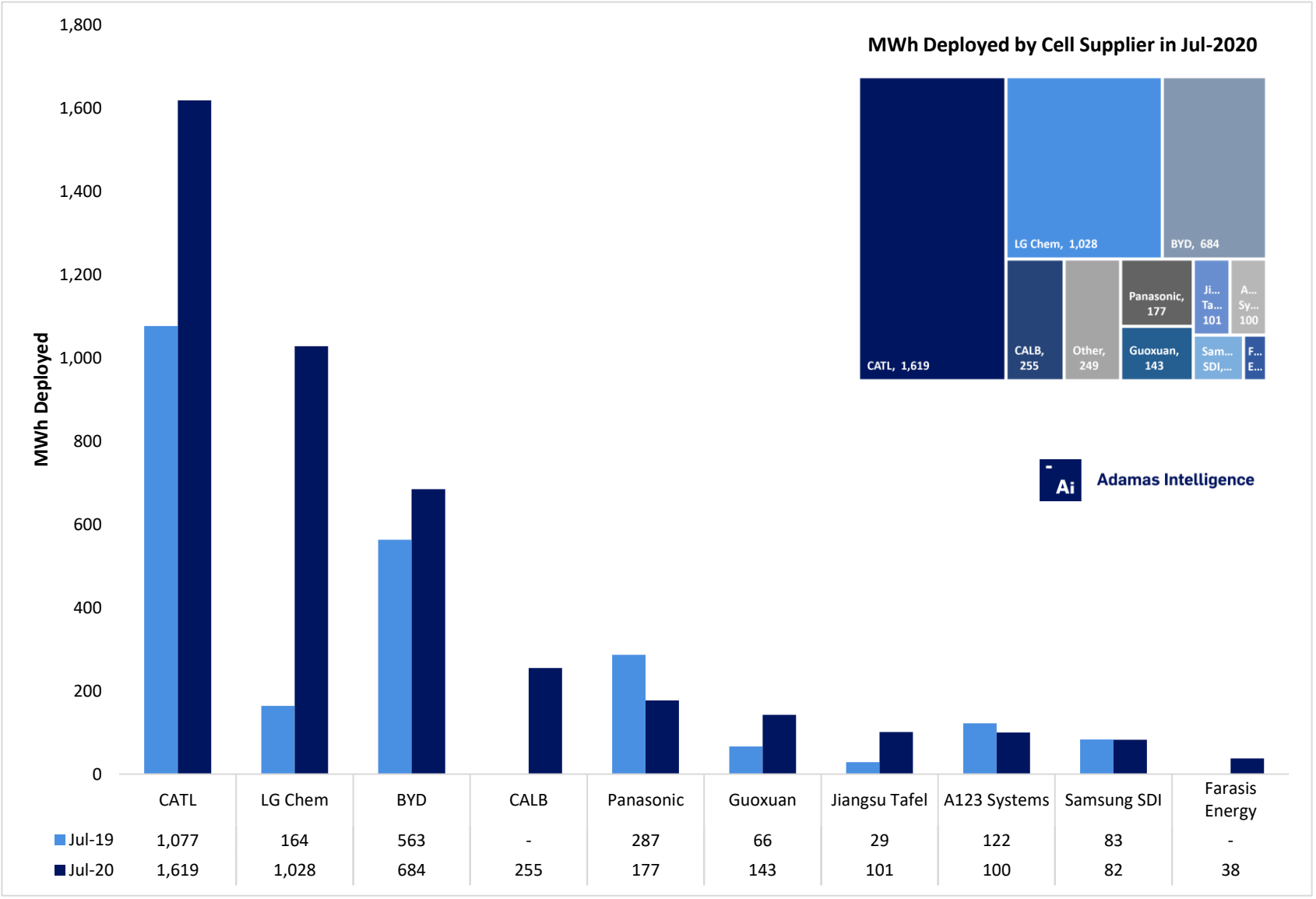
	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
LG Chem	1,166	1,057	1,155	1,185	1,250	1,662	1,872	1,747	2,132	1,059	1,847	2,989	3,247
CATL	1,078	1,382	1,290	1,436	1,733	3,215	1,120	561	1,164	1,231	1,367	1,952	2,004
Panasonic	1,802	2,029	3,581	1,444	2,465	4,624	994	1,237	3,834	925	1,117	2,786	1,873
Samsung SDI	371	406	469	470	528	546	582	472	578	319	413	577	764
BYD	564	554	459	459	459	436	314	165	589	601	511	620	685
SK Innovation	234	417	273	202	171	270	219	289	309	157	233	378	507
CALB	-	-	118	124	174	249	78	42	87	106	115	113	255
AESC	338	296	386	286	322	308	295	376	289	97	136	185	227
Guoxuan	67	76	39	37	49	271	20	5	37	30	56	87	143
A123 Systems	125	134	107	97	99	154	170	40	69	90	127	97	103

Cell Supplier's Battery Capacity Deployment Index



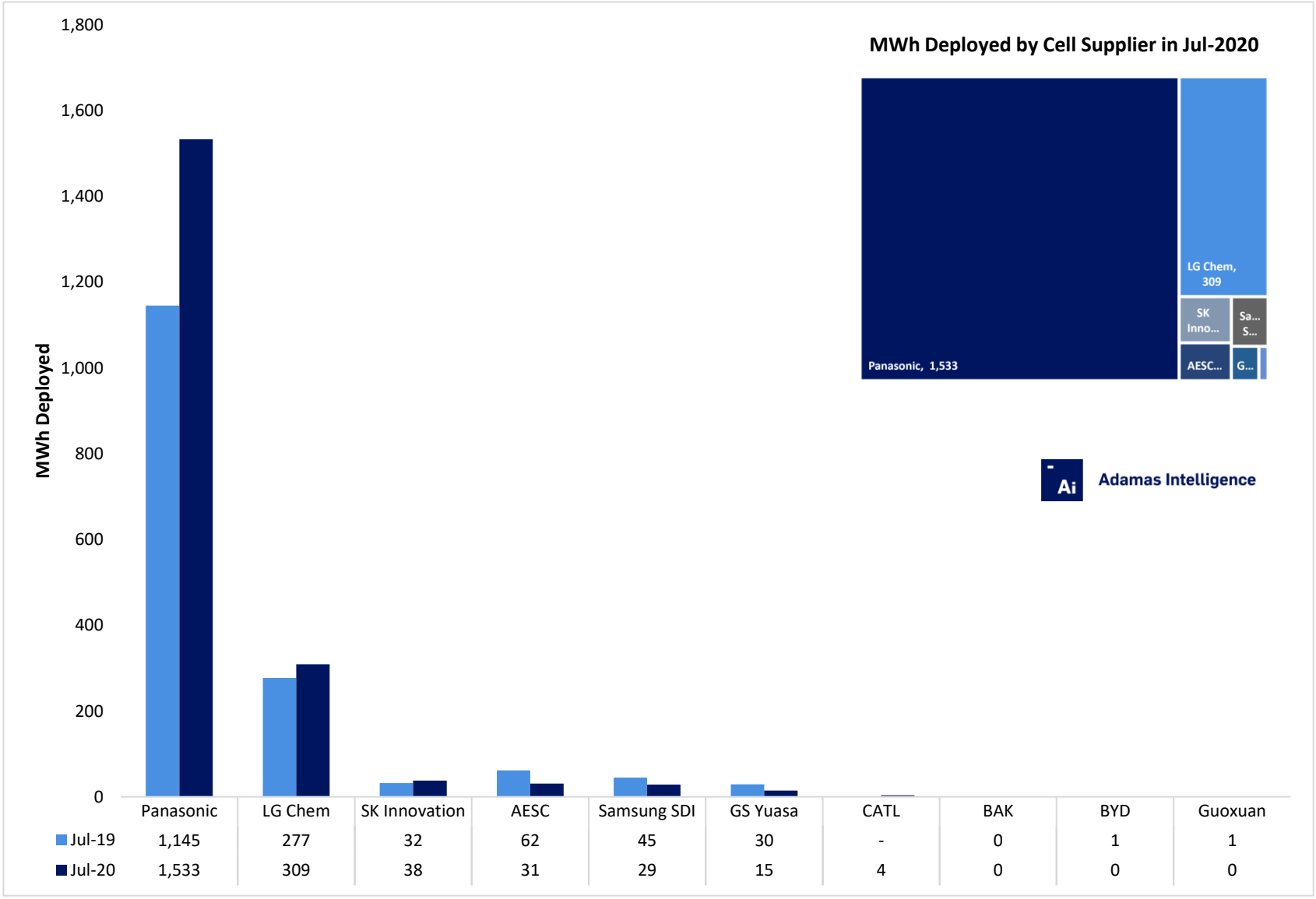
	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
LG Chem	100%	91%	99%	102%	107%	143%	160%	150%	183%	91%	158%	256%	278%
CATL	100%	128%	120%	133%	161%	298%	104%	52%	108%	114%	127%	181%	186%
Panasonic	100%	113%	199%	80%	137%	257%	55%	69%	213%	51%	62%	155%	104%
Samsung SDI	100%	110%	127%	127%	142%	147%	157%	127%	156%	86%	112%	156%	206%
BYD	100%	98%	81%	81%	81%	77%	56%	29%	104%	107%	91%	110%	121%
SK Innovation	100%	179%	117%	86%	73%	115%	94%	124%	132%	67%	100%	162%	217%
CALB	0%	0%	100%	105%	147%	211%	66%	36%	74%	90%	97%	96%	216%
AESC	100%	88%	114%	85%	95%	91%	87%	111%	86%	29%	40%	55%	67%
Guoxuan	100%	113%	58%	56%	73%	405%	31%	7%	55%	44%	84%	131%	213%
A123 Systems	100%	108%	86%	78%	79%	123%	136%	32%	55%	72%	102%	78%	83%

Asia Pacific Top 10 Cell Suppliers by Battery Capacity Deployed



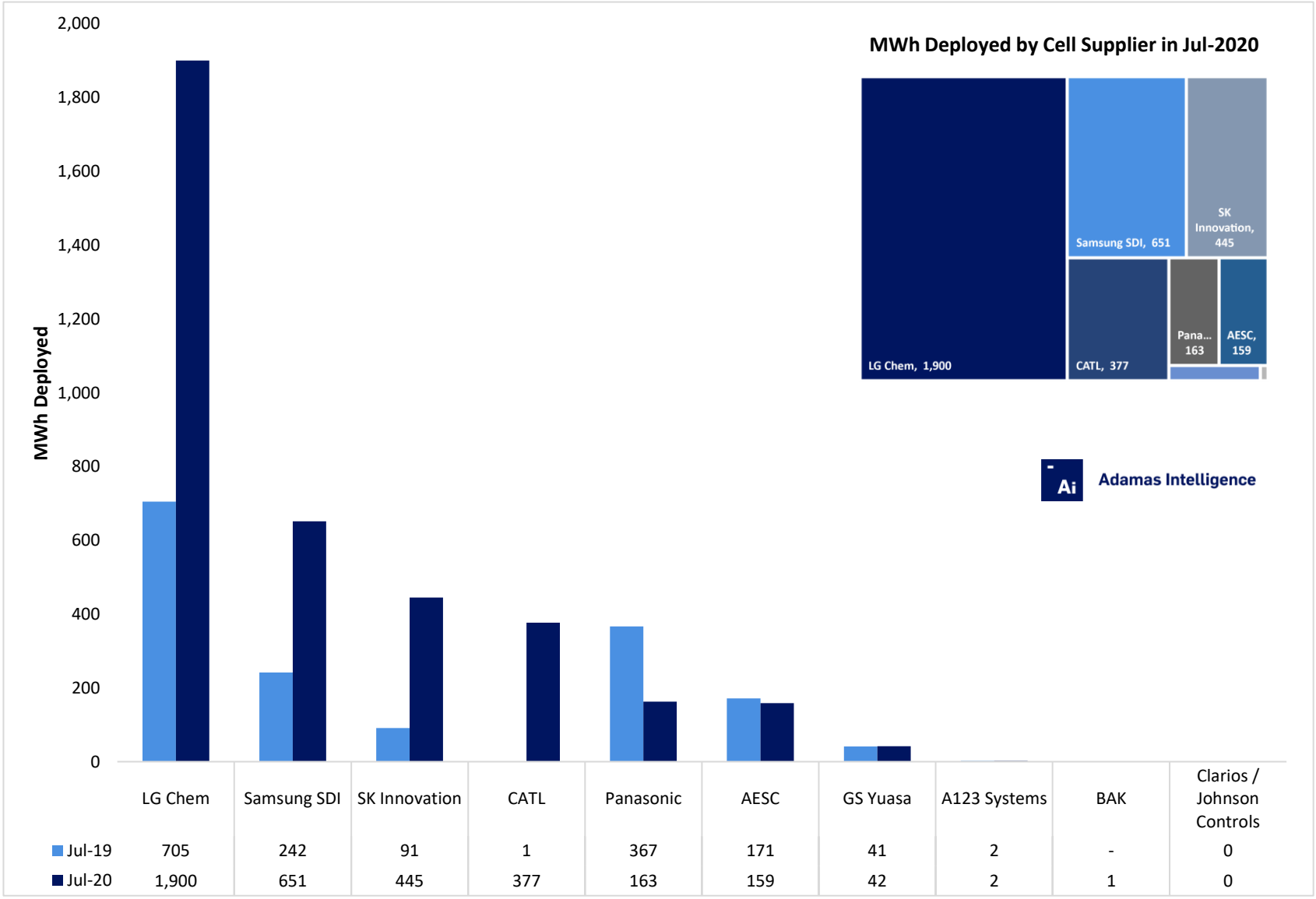
	CATL	LG Chem	BYD	CALB	Panasonic	Guoxuan	Jiangsu Tafel	A123 Systems	Samsung SDI	Farasis Energy
Jul-19	1,077	164	563	-	287	66	29	122	83	-
Jul-20	1,619	1,028	684	255	177	143	101	100	82	38

Americas Top 10 Cell Suppliers by Battery Capacity Deployed



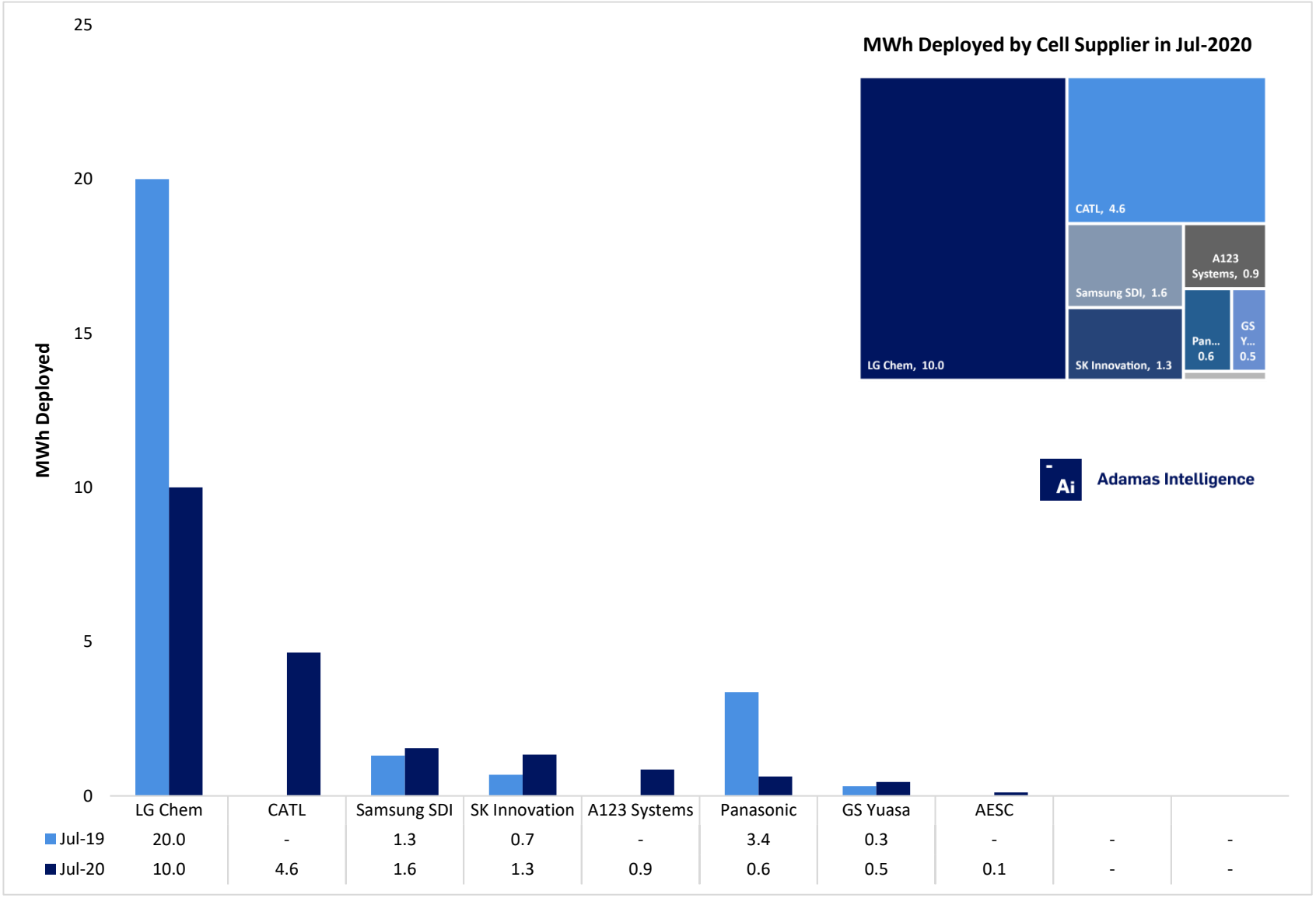
	Panasonic	LG Chem	SK Innovation	AESC	Samsung SDI	GS Yuasa	CATL	BAK	BYD	Guoxuan
Jul-19	1,145	277	32	62	45	30	-	0	1	1
Jul-20	1,533	309	38	31	29	15	4	0	0	0

Europe Top 10 Cell Suppliers by Battery Capacity Deployed



	LG Chem	Samsung SDI	SK Innovation	CATL	Panasonic	AESC	GS Yuasa	A123 Systems	BAK	Clarios / Johnson Controls
Jul-19	705	242	91	1	367	171	41	2	-	0
Jul-20	1,900	651	445	377	163	159	42	2	1	0

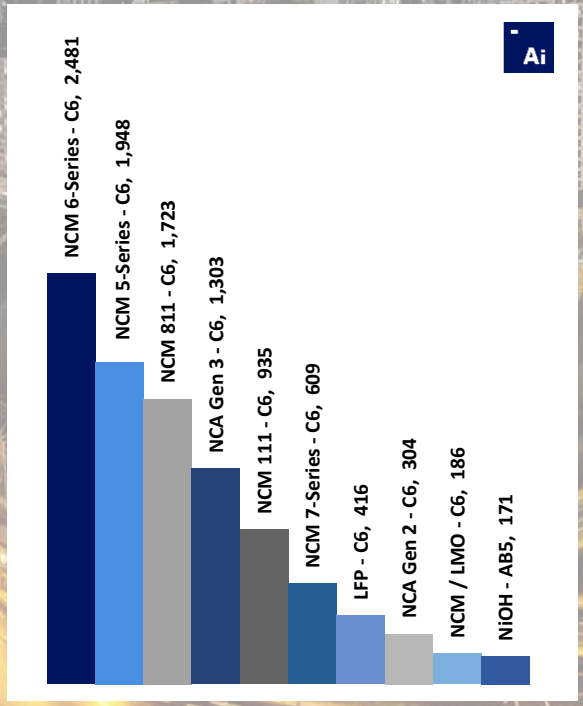
M.E. and Africa Top 10 Cell Suppliers by Battery Capacity Deployed



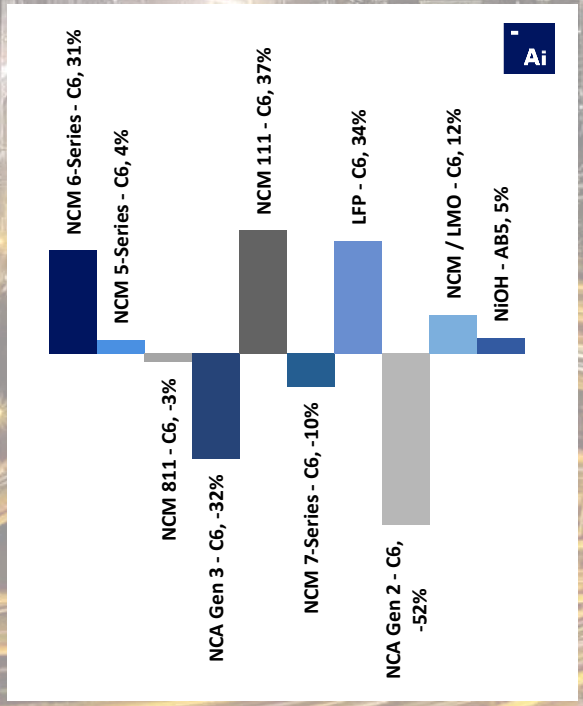
	LG Chem	CATL	Samsung SDI	SK Innovation	A123 Systems	Panasonic	GS Yuasa	AESC		
Jul-19	20.0	-	1.3	0.7	-	3.4	0.3	-	-	-
Jul-20	10.0	4.6	1.6	1.3	0.9	0.6	0.5	0.1	-	-

Global Battery Capacity Deployed by Cell Chemistry

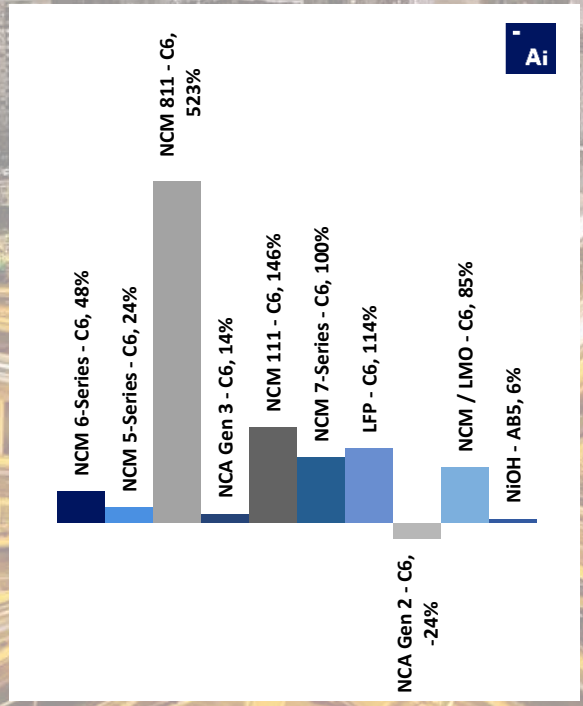
MWh Deployed



MoM Change



YoY Change

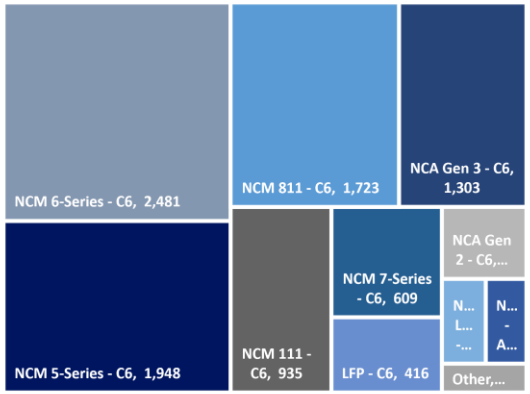


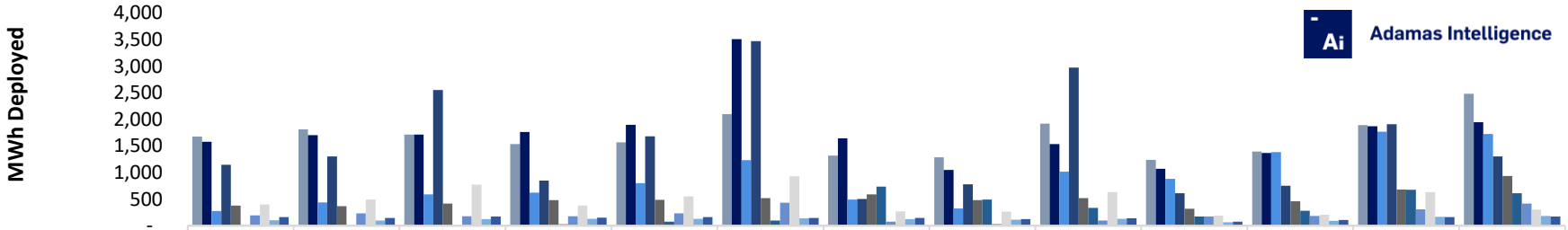
Global Battery Capacity Deployed by Cell Chemistry

In July 2020:

- **2,481 MWh of NCM 6-Series - C6** battery capacity was deployed globally in passenger EVs, an **increase of 48%** over the same month the year prior.
- **1,948 MWh of NCM 5-Series - C6** battery capacity was deployed globally in passenger EVs, an **increase of 24%** over the same month the year prior.
- **1,723 MWh of NCM 811 - C6** battery capacity was deployed globally in passenger EVs, an **increase of 523%** over the same month the year prior.
- **1,303 MWh of NCA Gen 3 - C6** battery capacity was deployed globally in passenger EVs, an **increase of 14%** over the same month the year prior.

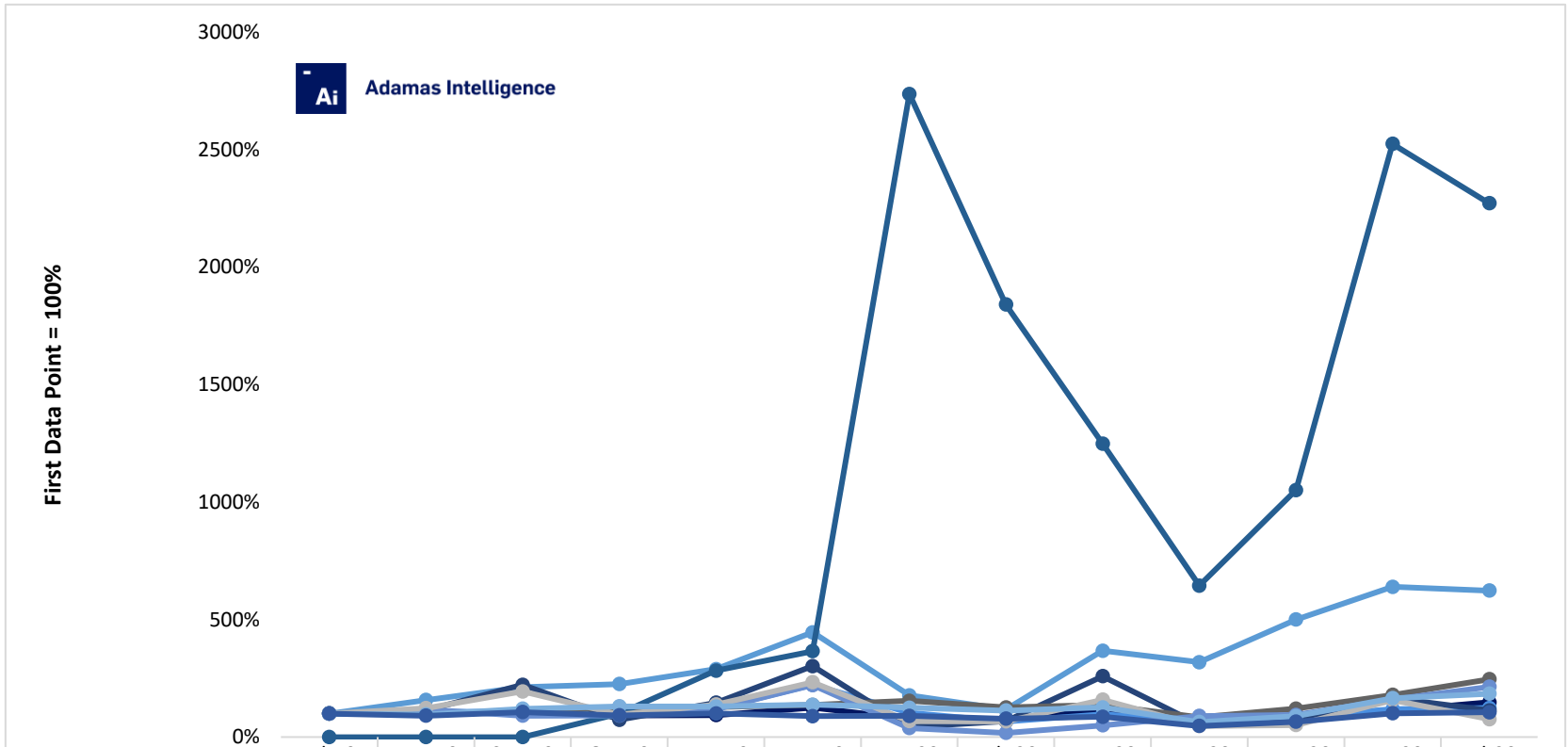
MWh Deployed by Cell Chemistry in Jul-2020





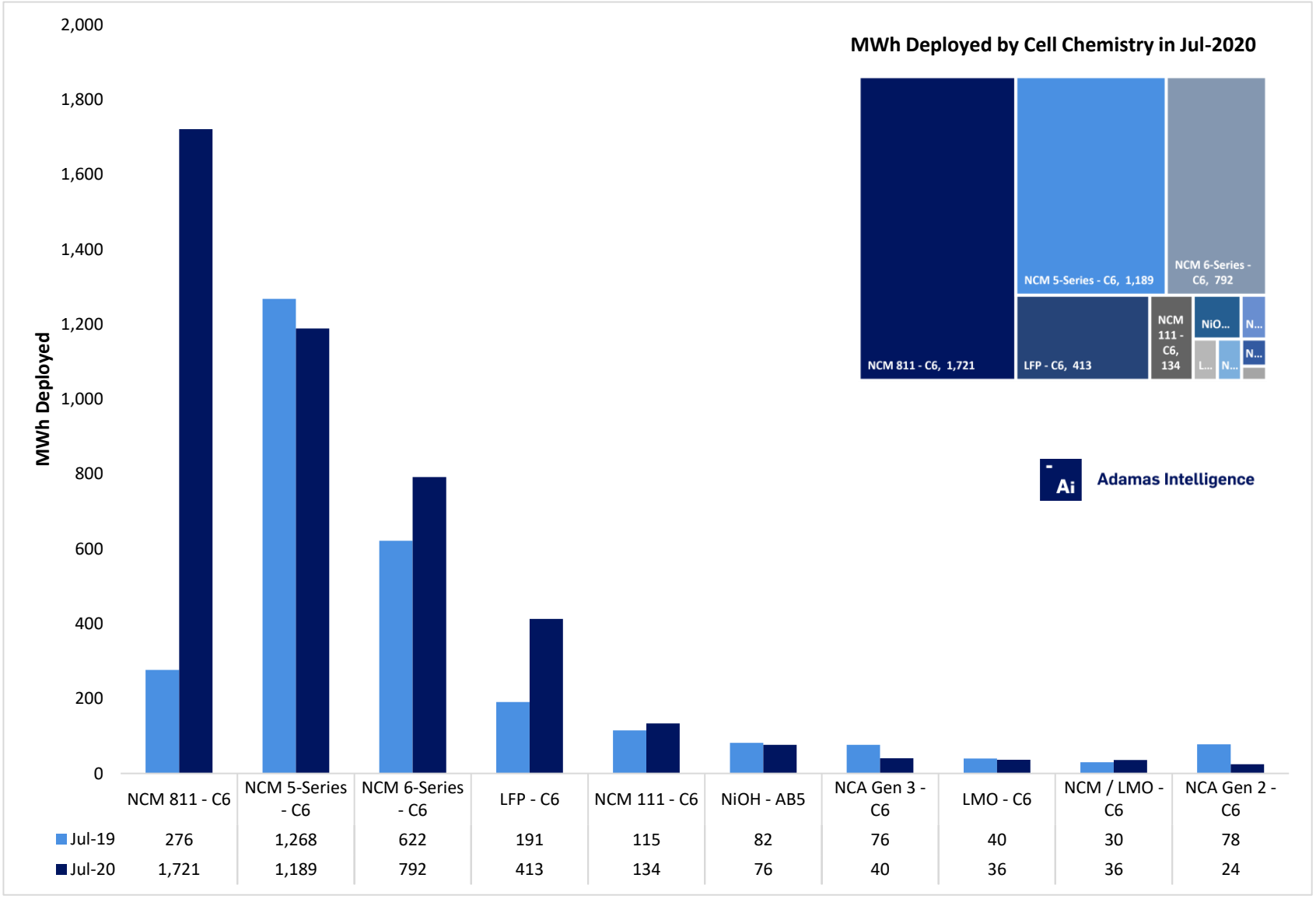
	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
NCM 6-Series - C6	1,676	1,812	1,710	1,535	1,567	2,095	1,318	1,287	1,917	1,238	1,395	1,890	2,481
NCM 5-Series - C6	1,576	1,701	1,712	1,760	1,899	3,506	1,643	1,051	1,536	1,068	1,368	1,870	1,948
NCM 811 - C6	276	436	589	623	799	1,232	490	325	1,015	881	1,382	1,768	1,723
NCA Gen 3 - C6	1,148	1,305	2,553	851	1,679	3,468	501	776	2,972	613	752	1,909	1,303
NCM 111 - C6	379	367	415	481	488	519	587	479	518	320	461	681	935
NCM 7-Series - C6	-	-	-	27	76	98	734	494	335	173	282	677	609
LFP - C6	194	230	177	179	230	430	76	35	98	175	183	310	416
NCA Gen 2 - C6	399	492	774	380	552	931	271	267	635	190	204	630	304
NCM / LMO - C6	101	97	122	132	131	139	126	114	127	65	90	167	186
NiOH - AB5	161	147	171	149	163	143	146	126	140	77	106	163	171

Cell Chemistry's Battery Capacity Deployment Index



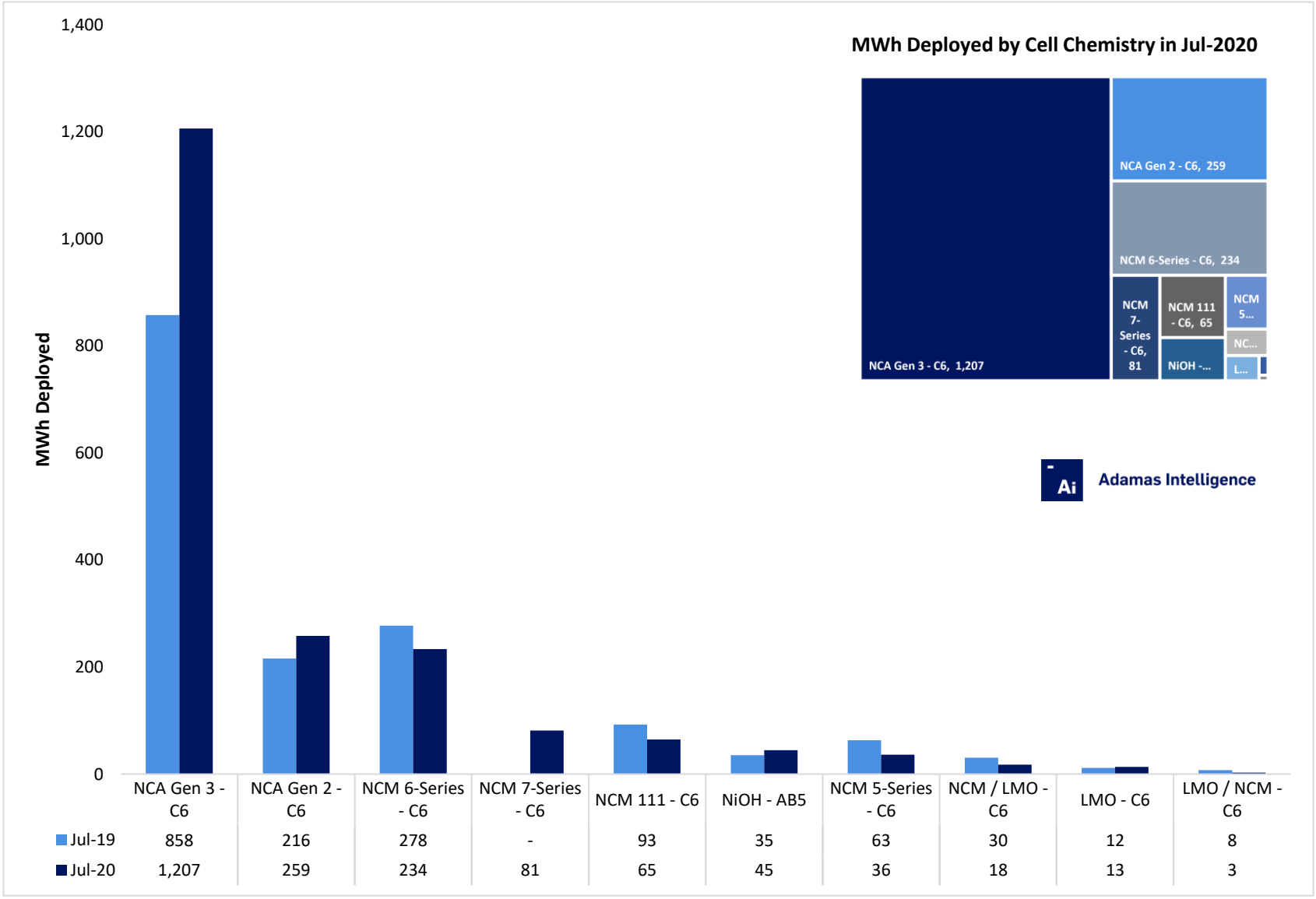
	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
NCM 6-Series - C6	100%	108%	102%	92%	94%	125%	79%	77%	114%	74%	83%	113%	148%
NCM 5-Series - C6	100%	108%	109%	112%	121%	222%	104%	67%	97%	68%	87%	119%	124%
NCM 811 - C6	100%	158%	213%	226%	289%	446%	177%	117%	367%	319%	500%	640%	623%
NCA Gen 3 - C6	100%	114%	222%	74%	146%	302%	44%	68%	259%	53%	65%	166%	114%
NCM 111 - C6	100%	97%	109%	127%	129%	137%	155%	126%	136%	84%	122%	179%	246%
NCM 7-Series - C6	0%	0%	0%	100%	283%	366%	2736%	1840%	1249%	645%	1051%	2524%	2272%
LFP - C6	100%	118%	91%	92%	119%	221%	39%	18%	50%	90%	94%	160%	214%
NCA Gen 2 - C6	100%	123%	194%	95%	138%	233%	68%	67%	159%	48%	51%	158%	76%
NCM / LMO - C6	100%	96%	121%	131%	130%	138%	125%	113%	126%	64%	89%	165%	185%
NiOH - AB5	100%	91%	106%	93%	101%	89%	91%	78%	87%	48%	66%	101%	106%

Asia Pacific Top 10 Cell Chemistries by Battery Capacity Deployed



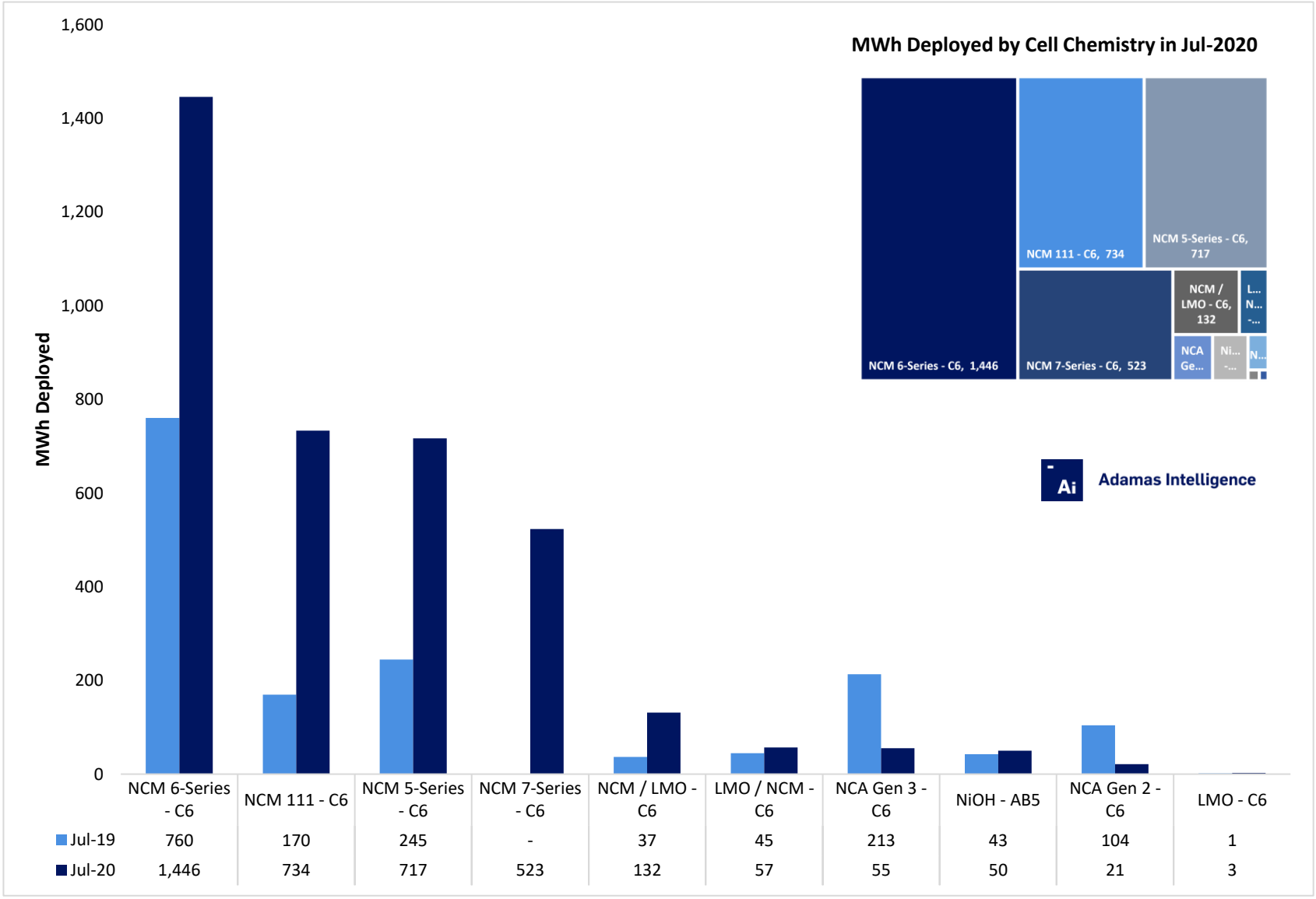
	NCM 811 - C6	NCM 5-Series - C6	NCM 6-Series - C6	LFP - C6	NCM 111 - C6	NiOH - AB5	NCA Gen 3 - C6	LMO - C6	NCM / LMO - C6	NCA Gen 2 - C6
Jul-19	276	1,268	622	191	115	82	76	40	30	78
Jul-20	1,721	1,189	792	413	134	76	40	36	36	24

Americas Top 10 Cell Chemistries by Battery Capacity Deployed



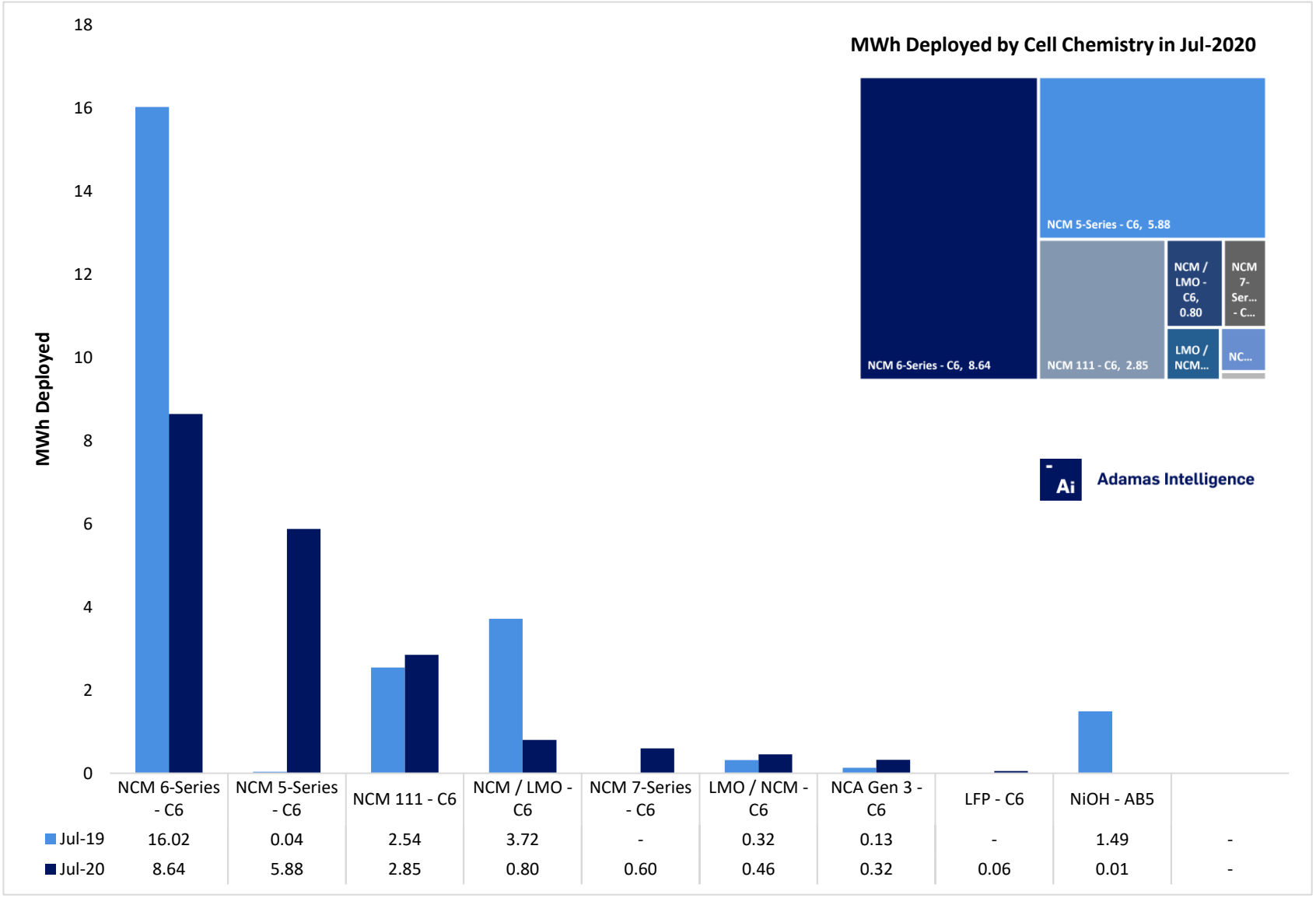
	NCA Gen 3 - C6	NCA Gen 2 - C6	NCM 6-Series - C6	NCM 7-Series - C6	NCM 111 - C6	NiOH - AB5	NCM 5-Series - C6	NCM / LMO - C6	LMO - C6	LMO / NCM - C6
Jul-19	858	216	278	-	93	35	63	30	12	8
Jul-20	1,207	259	234	81	65	45	36	18	13	3

Europe Top 10 Cell Chemistries by Battery Capacity Deployed



	NCM 6-Series - C6	NCM 111 - C6	NCM 5-Series - C6	NCM 7-Series - C6	NCM / LMO - C6	LMO / NCM - C6	NCA Gen 3 - C6	NiOH - AB5	NCA Gen 2 - C6	LMO - C6
Jul-19	760	170	245	-	37	45	213	43	104	1
Jul-20	1,446	734	717	523	132	57	55	50	21	3

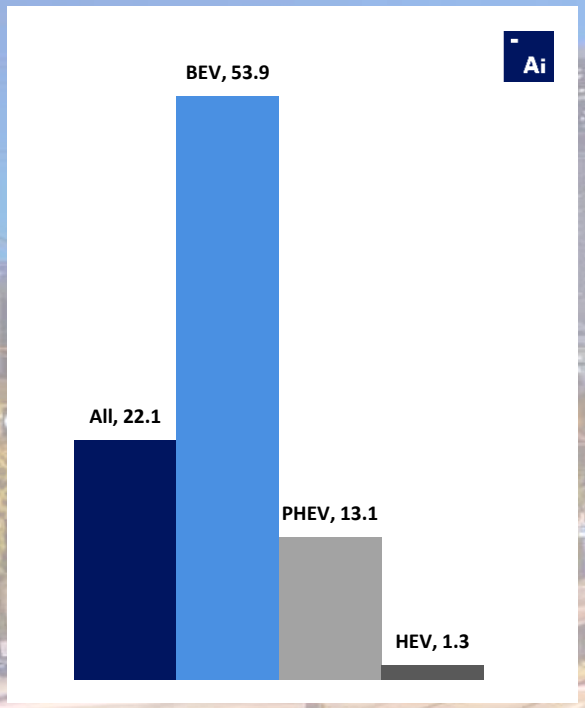
M.E. and Africa Top 10 Cell Chemistries by Battery Capacity Deployed



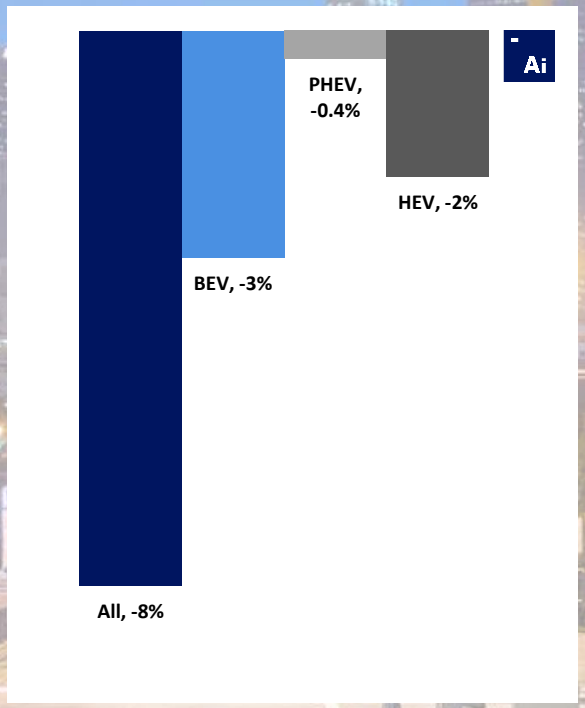
	NCM 6-Series - C6	NCM 5-Series - C6	NCM 111 - C6	NCM / LMO - C6	NCM 7-Series - C6	LMO / NCM - C6	NCA Gen 3 - C6	LFP - C6	NiOH - AB5	
Jul-19	16.02	0.04	2.54	3.72	-	0.32	0.13	-	1.49	-
Jul-20	8.64	5.88	2.85	0.80	0.60	0.46	0.32	0.06	0.01	-

Global SWA Battery Capacity by EV Type

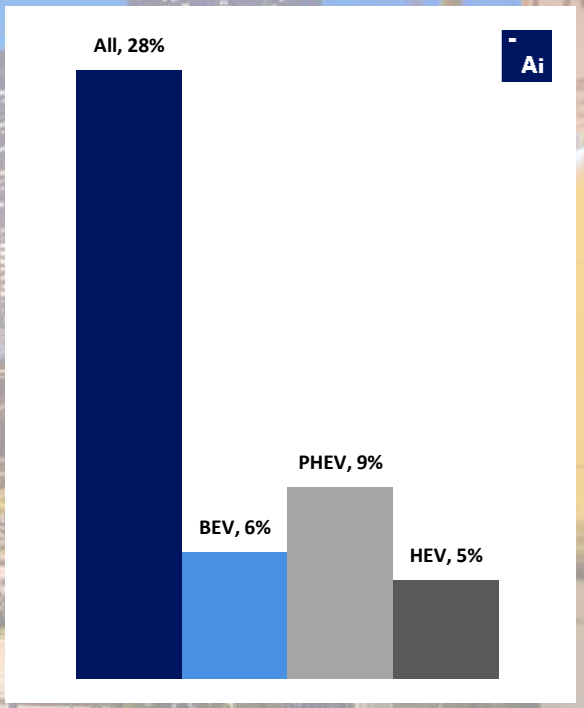
SWA Battery Capacity (kWh)



MoM Change



YoY Change



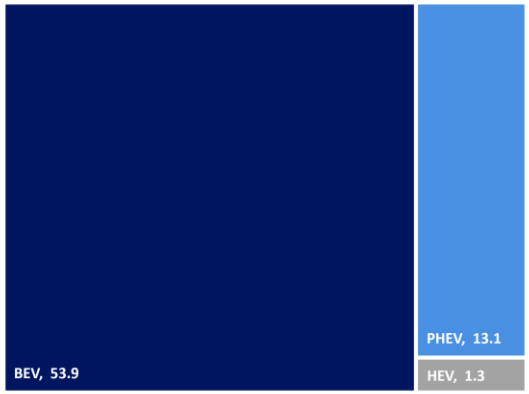
SWA = Sales-Weighted Average

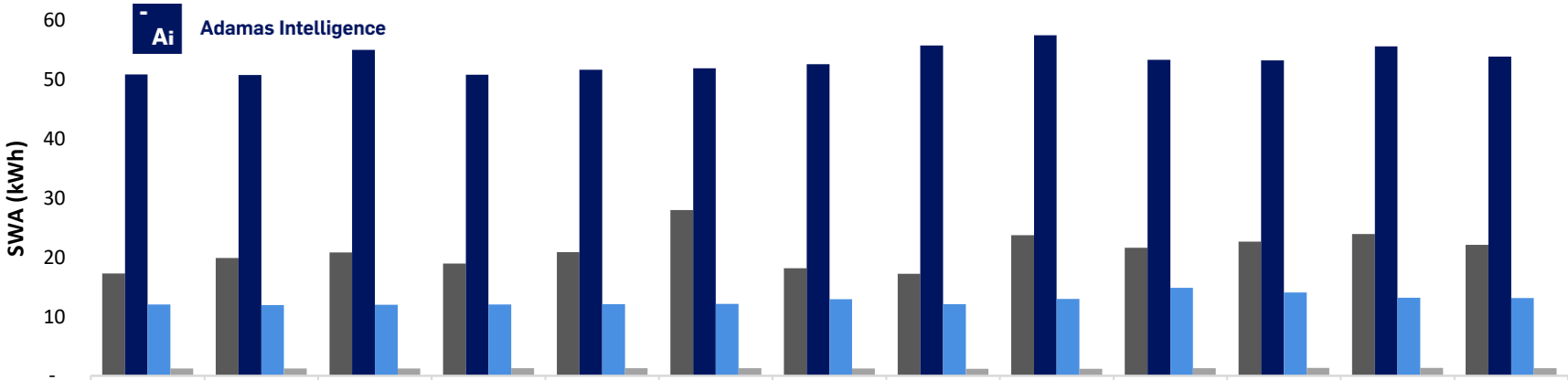
Global SWA Battery Capacity by EV Type

In July 2020:

- The global SWA battery capacity of **all EV types combined was 22.1 kWh**, an **increase of 28%** over the same month the year prior.
- The global SWA battery capacity of **all BEVs sold globally was 53.9 kWh**, an **increase of 6%** over the same month the year prior.
- The global SWA battery capacity of **all PHEVs sold globally was 13.1 kWh**, an **increase of 9%** over the same month the year prior.
- The global SWA battery capacity of **all HEVs sold globally was 1.3 kWh**, an **increase of 5%** over the same month the year prior.

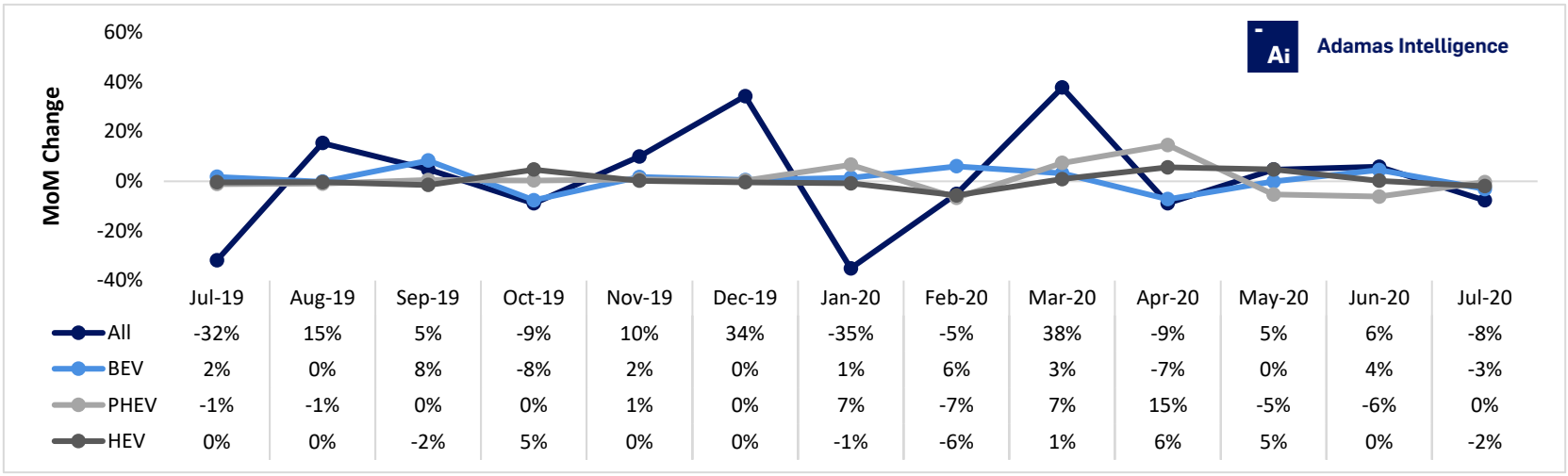
SWA Capacity (kWh) by EV Type in Jul-2020





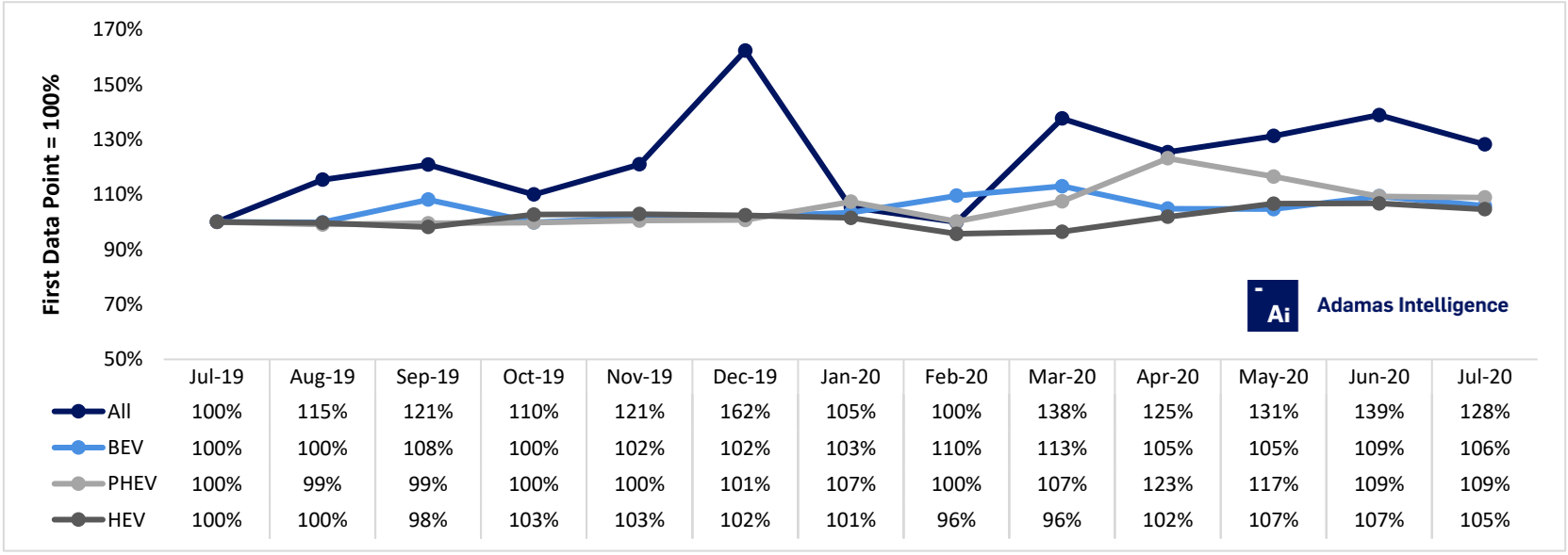
	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
All	17.2	19.9	20.8	19.0	20.9	28.0	18.2	17.2	23.7	21.6	22.6	24.0	22.1
BEV	50.9	50.8	55.0	50.8	51.7	51.9	52.6	55.7	57.5	53.3	53.3	55.6	53.9
PHEV	12.1	11.9	12.0	12.0	12.1	12.1	12.9	12.1	13.0	14.8	14.0	13.2	13.1
HEV	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.2	1.2	1.3	1.3	1.3	1.3

Month-over-Month Change in SWA Battery Capacity



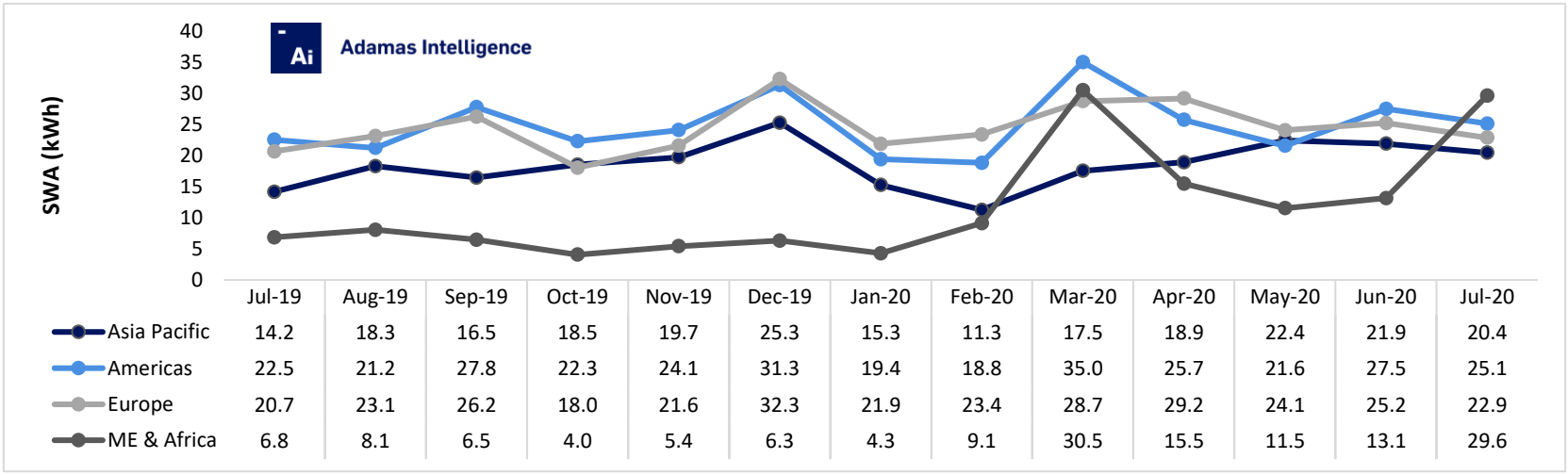
	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
All	-32%	15%	5%	-9%	10%	34%	-35%	-5%	38%	-9%	5%	6%	-8%
BEV	2%	0%	8%	-8%	2%	0%	1%	6%	3%	-7%	0%	4%	-3%
PHEV	-1%	-1%	0%	0%	1%	0%	7%	-7%	7%	15%	-5%	-6%	0%
HEV	0%	0%	-2%	5%	0%	0%	-1%	-6%	1%	6%	5%	0%	-2%

Global SWA Battery Capacity Deployment Index



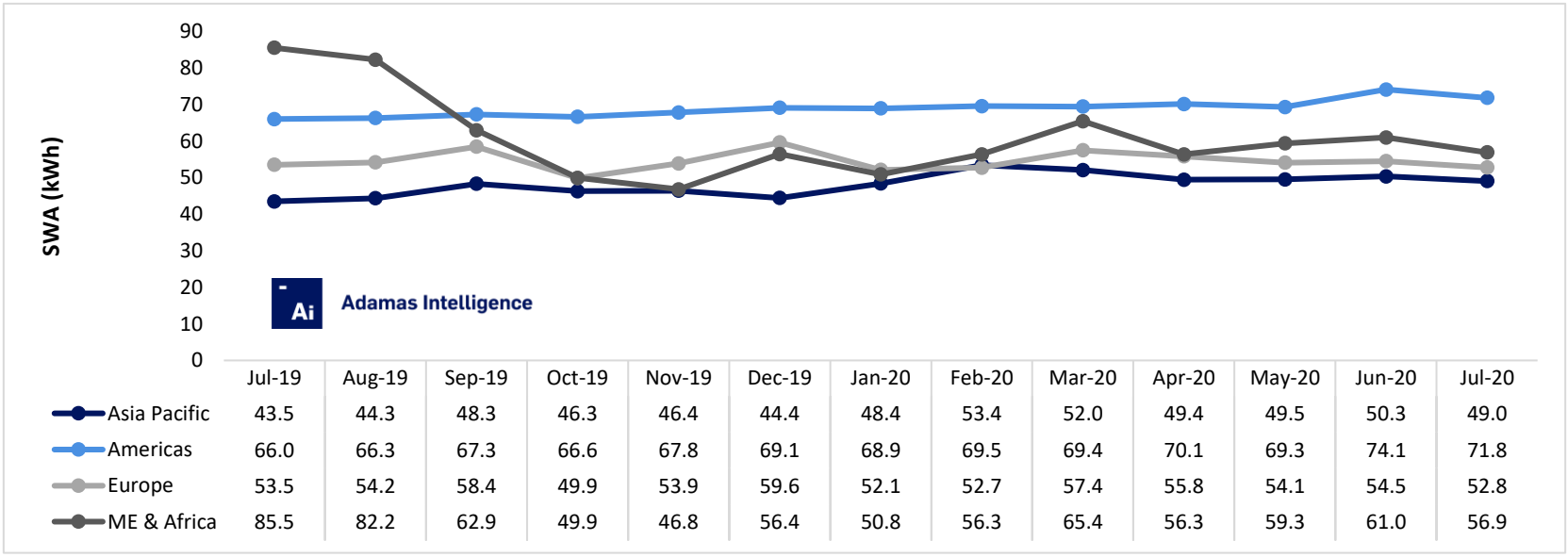
	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
All	100%	115%	121%	110%	121%	162%	105%	100%	138%	125%	131%	139%	128%
BEV	100%	100%	108%	100%	102%	102%	103%	110%	113%	105%	105%	109%	106%
PHEV	100%	99%	99%	100%	100%	101%	107%	100%	107%	123%	117%	109%	109%
HEV	100%	100%	98%	103%	103%	102%	101%	96%	96%	102%	107%	107%	105%

All EV Types: SWA Battery Capacity by Region



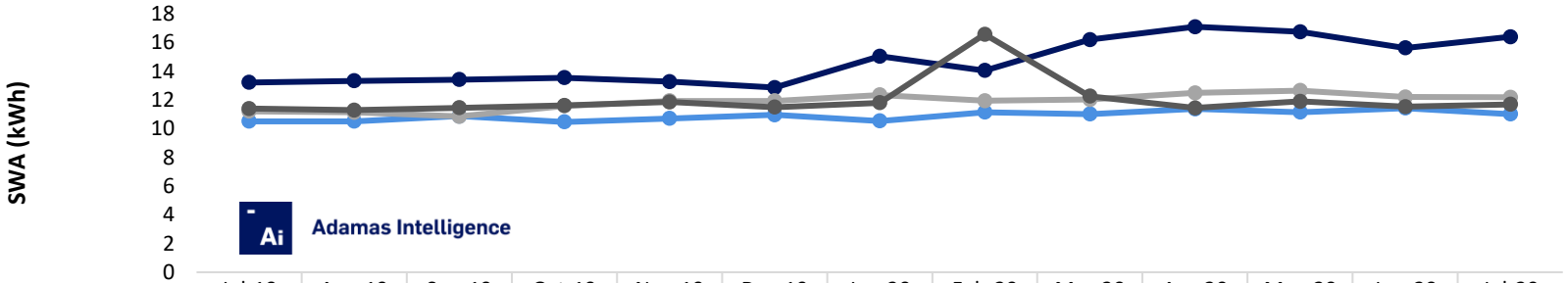
	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
Asia Pacific	14.2	18.3	16.5	18.5	19.7	25.3	15.3	11.3	17.5	18.9	22.4	21.9	20.4
Americas	22.5	21.2	27.8	22.3	24.1	31.3	19.4	18.8	35.0	25.7	21.6	27.5	25.1
Europe	20.7	23.1	26.2	18.0	21.6	32.3	21.9	23.4	28.7	29.2	24.1	25.2	22.9
ME & Africa	6.8	8.1	6.5	4.0	5.4	6.3	4.3	9.1	30.5	15.5	11.5	13.1	29.6

BEVs: SWA Battery Capacity by Region



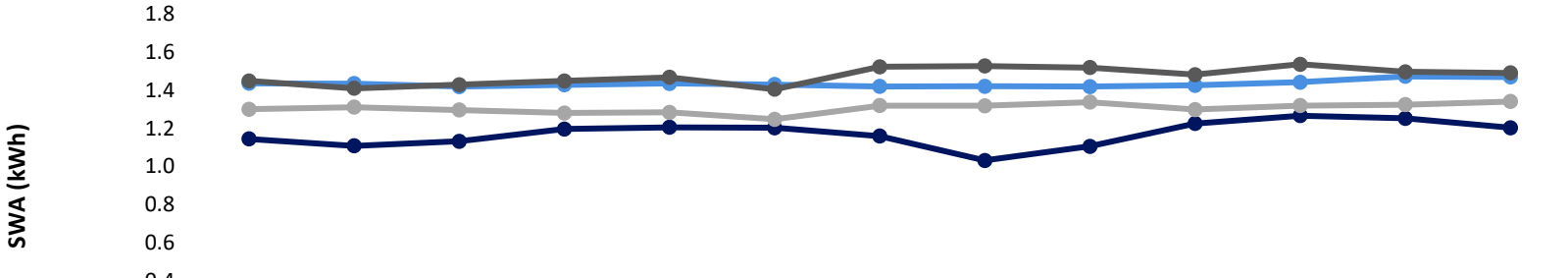
	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
Asia Pacific	43.5	44.3	48.3	46.3	46.4	44.4	48.4	53.4	52.0	49.4	49.5	50.3	49.0
Americas	66.0	66.3	67.3	66.6	67.8	69.1	68.9	69.5	69.4	70.1	69.3	74.1	71.8
Europe	53.5	54.2	58.4	49.9	53.9	59.6	52.1	52.7	57.4	55.8	54.1	54.5	52.8
ME & Africa	85.5	82.2	62.9	49.9	46.8	56.4	50.8	56.3	65.4	56.3	59.3	61.0	56.9

PHEVs: SWA Battery Capacity by Region



	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
Asia Pacific	13.2	13.3	13.4	13.5	13.3	12.9	15.0	14.0	16.2	17.1	16.7	15.6	16.4
Americas	10.5	10.5	10.9	10.5	10.7	11.0	10.5	11.1	11.0	11.4	11.1	11.4	11.0
Europe	11.2	11.1	10.8	11.6	11.9	11.9	12.3	11.9	12.0	12.5	12.7	12.2	12.2
ME & Africa	11.4	11.3	11.4	11.6	11.9	11.5	11.8	16.6	12.3	11.4	11.9	11.5	11.7

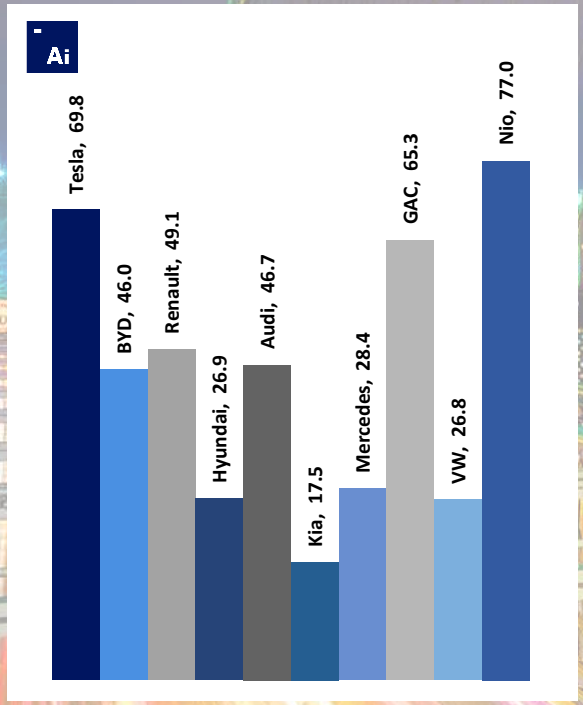
HEVs: SWA Battery Capacity by Region



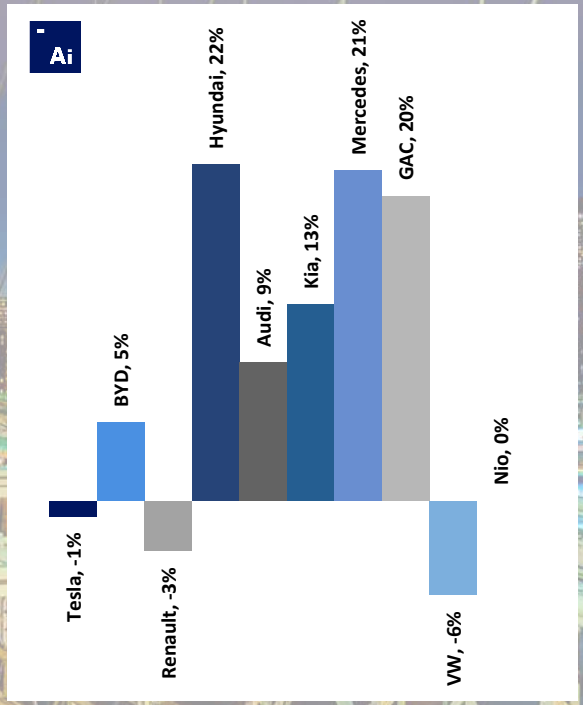
	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
Asia Pacific	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.0	1.1	1.2	1.3	1.3	1.2
Americas	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.5	1.5
Europe	1.3	1.3	1.3	1.3	1.3	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3
ME & Africa	1.4	1.4	1.4	1.4	1.5	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5

Global SWA Battery Capacity by Make

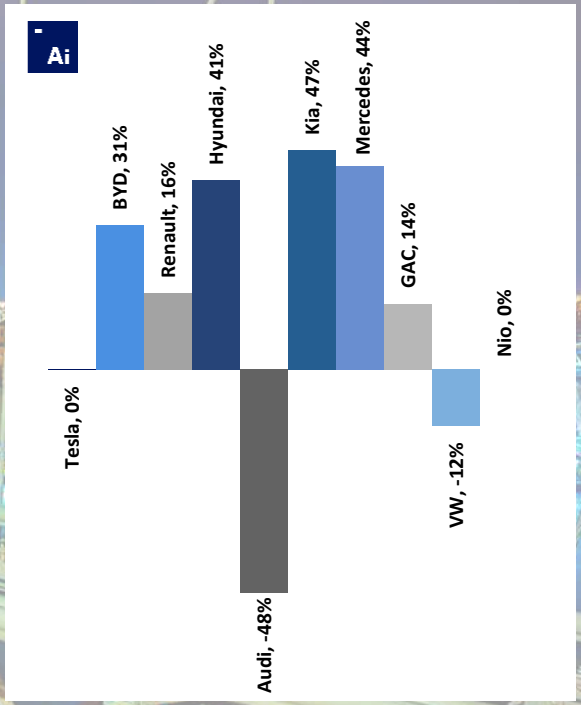
Global SWA by Make (kWh)



MoM Change



YoY Change



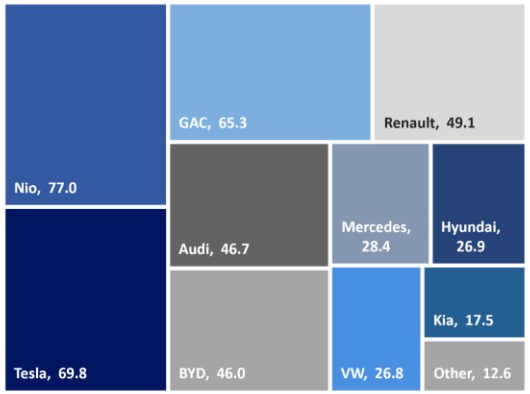
SWA = Sales-Weighted Average

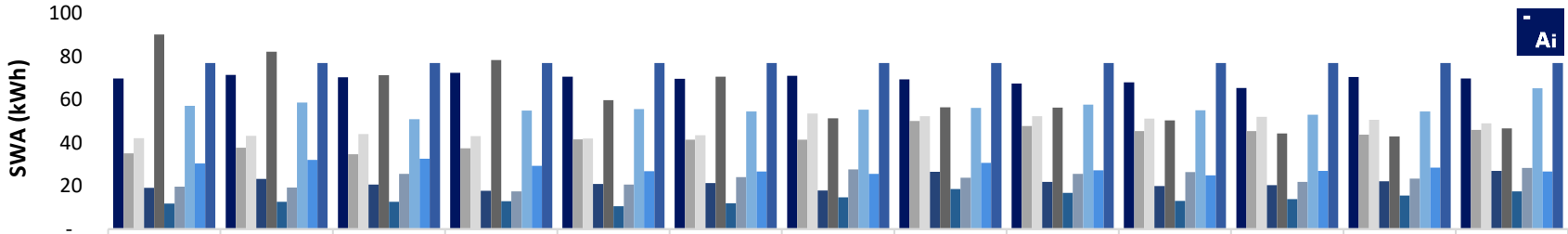
Global SWA Battery Capacity by Make

In July 2020:

- The SWA battery capacity of all EVs sold globally by **Nio was 77.0 kWh**, **unchanged** from the same month the year prior.
- The SWA battery capacity of all EVs sold globally by **Tesla was 69.8 kWh**, **unchanged** from the same month the year prior.
- The SWA battery capacity of all EVs sold globally by **GAC was 65.3 kWh**, an **increase of 14%** over the same month the year prior.
- The SWA battery capacity of all EVs sold globally by **Renault was 49.1 kWh**, an **increase of 16%** over the same month the year prior.

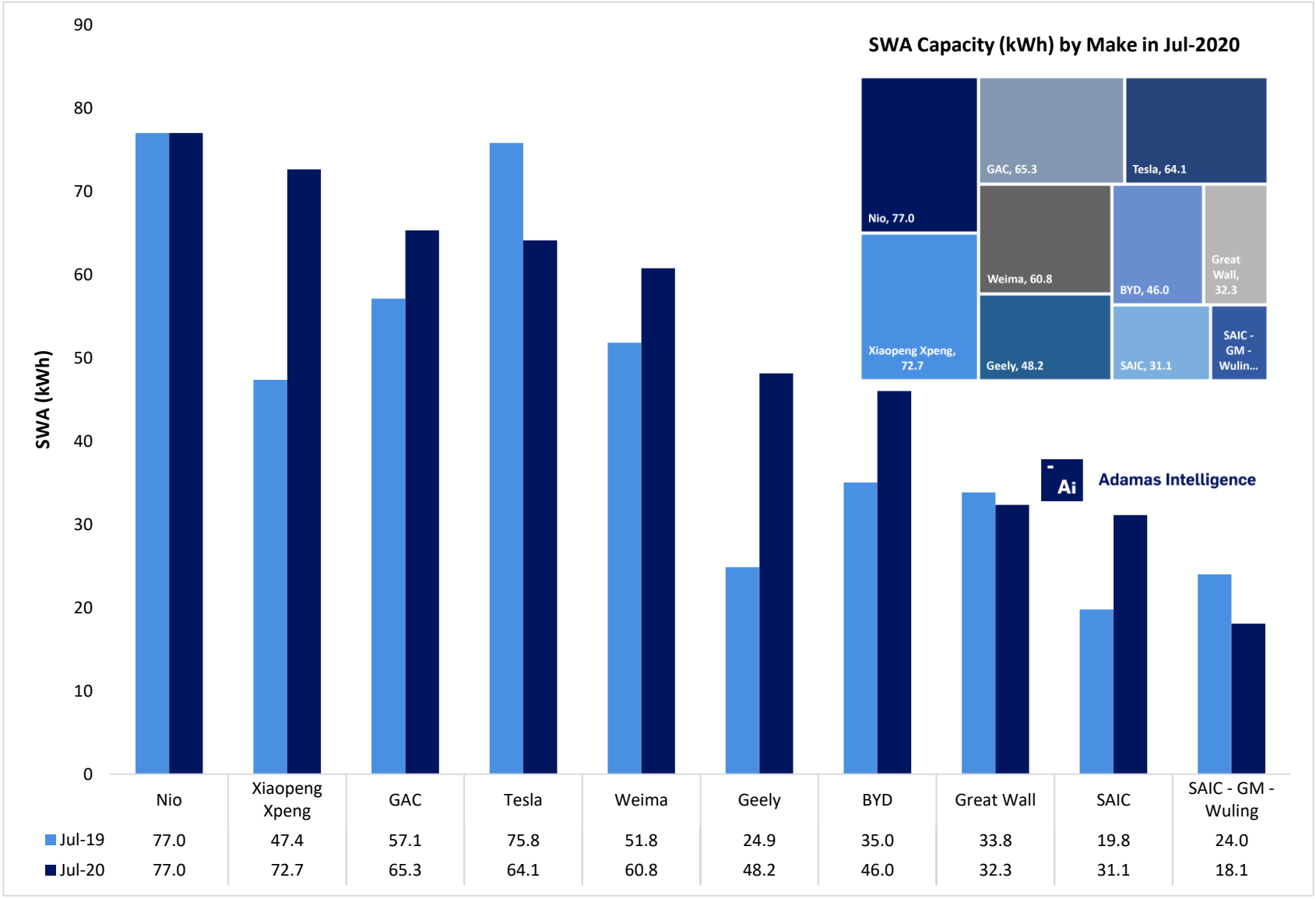
SWA Capacity (kWh) by Make in Jul-2020





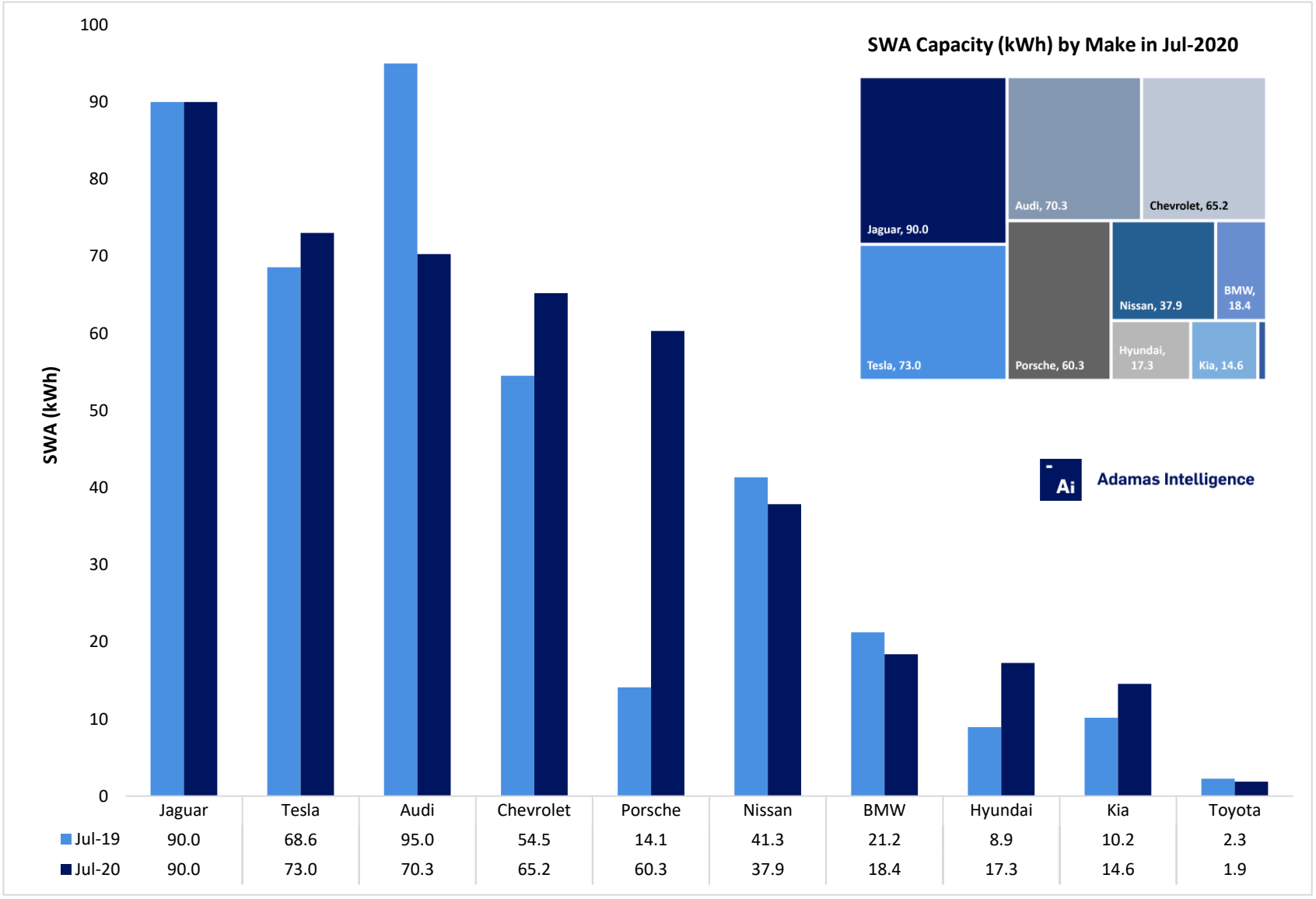
	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
Tesla	69.8	71.4	70.3	72.4	70.7	69.7	71.1	69.4	67.5	68.1	65.5	70.5	69.8
BYD	35.1	37.7	34.8	37.4	41.6	41.4	41.4	50.1	47.8	45.4	45.4	43.8	46.0
Renault	42.1	43.2	44.0	43.2	42.0	43.5	53.6	52.4	52.3	51.3	52.0	50.7	49.1
Hyundai	19.1	23.3	20.6	17.7	20.9	21.4	18.0	26.5	21.9	19.9	20.4	22.1	26.9
Audi	90.2	82.2	71.3	78.4	59.7	70.7	51.4	56.4	56.3	50.4	44.3	42.9	46.7
Kia	11.9	12.7	12.7	12.9	10.7	12.0	14.7	18.6	16.9	13.0	13.9	15.5	17.5
Mercedes	19.7	19.3	25.7	17.5	20.6	24.0	27.6	23.8	25.6	26.4	21.9	23.4	28.4
GAC	57.1	58.6	50.9	55.0	55.6	54.5	55.4	56.1	57.7	55.1	53.0	54.5	65.3
VW	30.5	32.1	32.6	29.4	26.9	26.7	25.6	30.7	27.3	25.0	27.0	28.5	26.8
Nio	77.0	77.0	77.0	77.0	77.0	77.0	77.0	77.0	77.0	77.0	77.0	77.0	77.0

Asia Pacific Top 10 Makes by SWA Battery Capacity



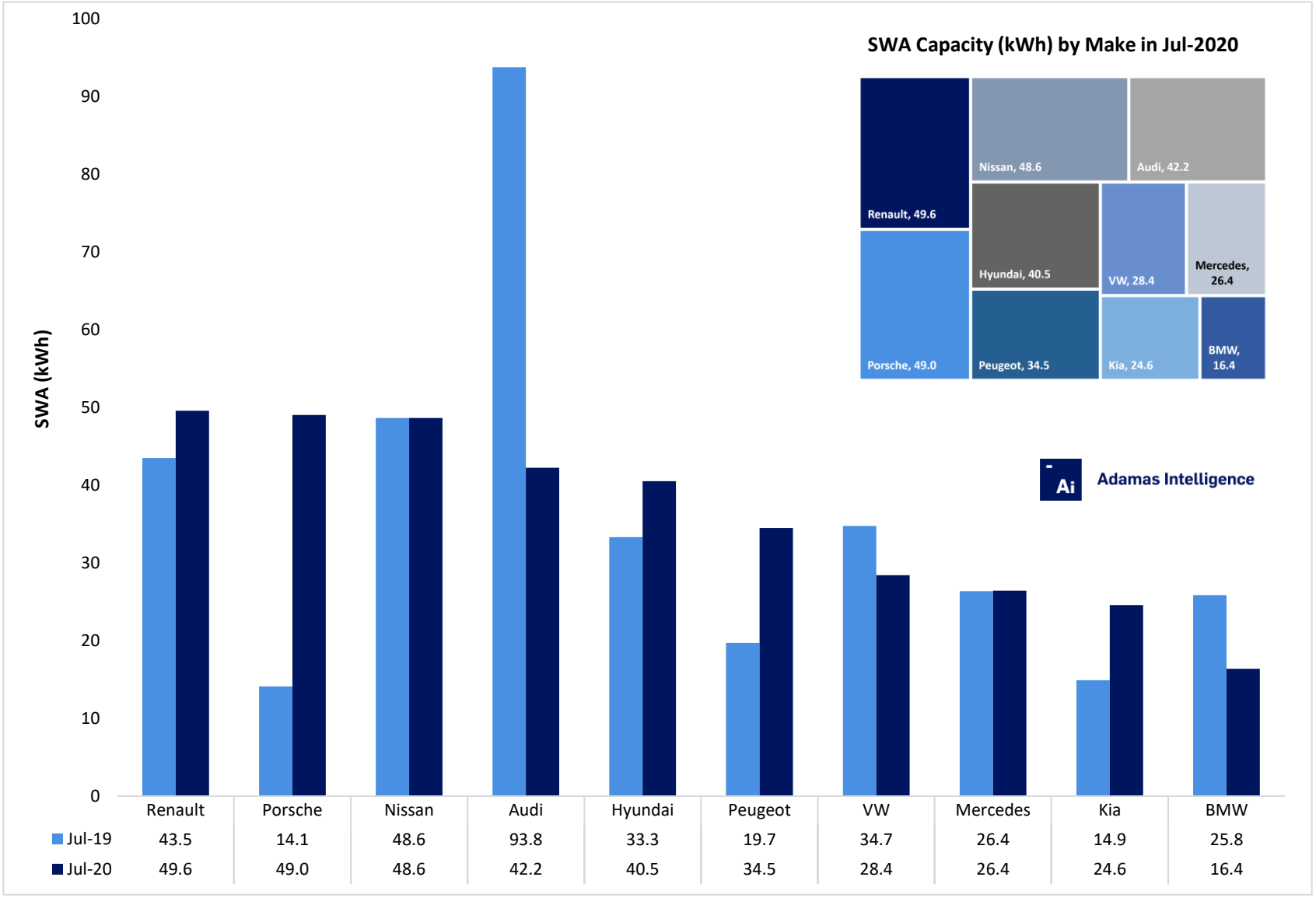
	Nio	Xiaopeng Xpeng	GAC	Tesla	Weima	Geely	BYD	Great Wall	SAIC	SAIC - GM - Wuling
Jul-19	77.0	47.4	57.1	75.8	51.8	24.9	35.0	33.8	19.8	24.0
Jul-20	77.0	72.7	65.3	64.1	60.8	48.2	46.0	32.3	31.1	18.1

Americas Top 10 Makes by SWA Battery Capacity



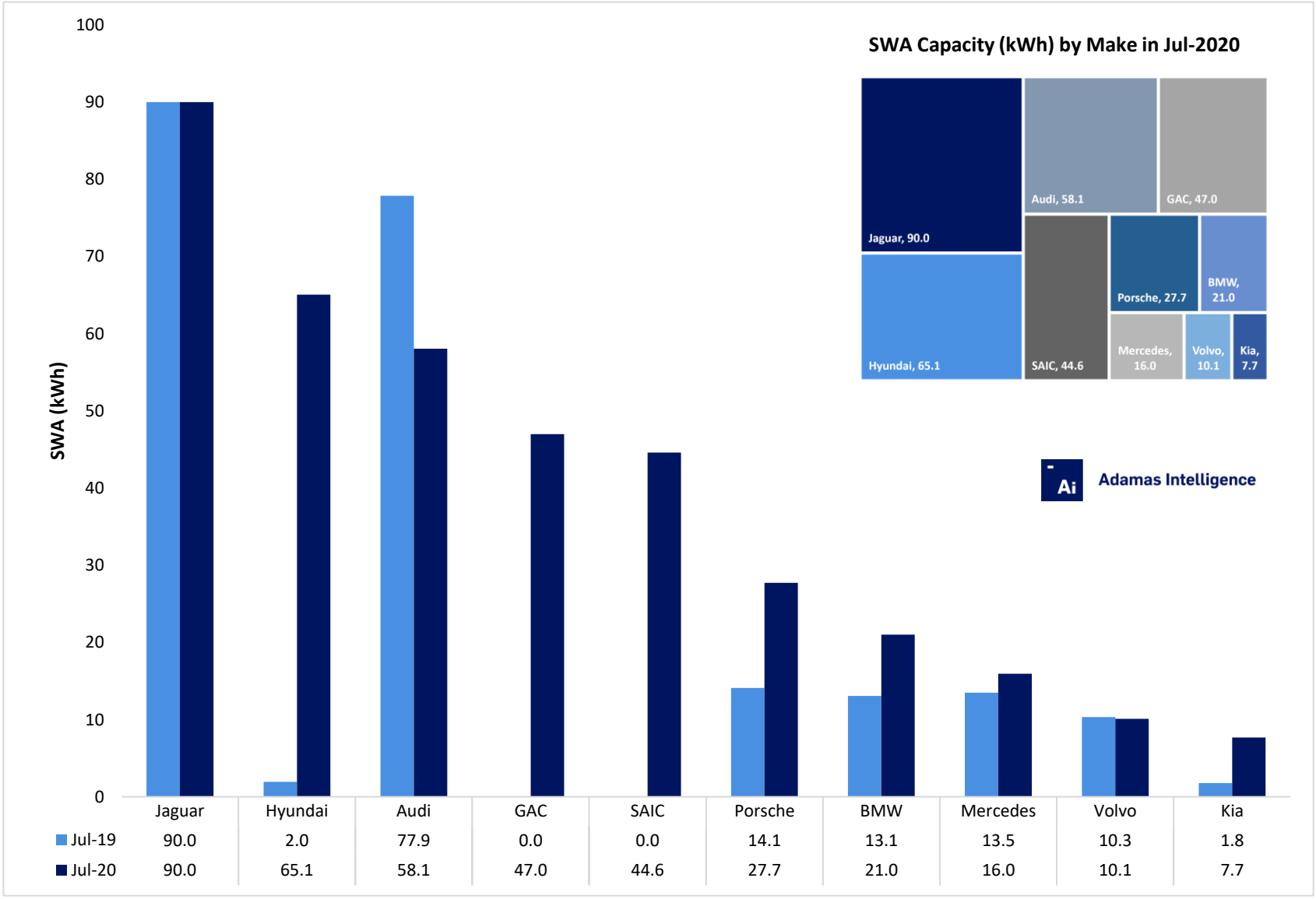
	Jaguar	Tesla	Audi	Chevrolet	Porsche	Nissan	BMW	Hyundai	Kia	Toyota
Jul-19	90.0	68.6	95.0	54.5	14.1	41.3	21.2	8.9	10.2	2.3
Jul-20	90.0	73.0	70.3	65.2	60.3	37.9	18.4	17.3	14.6	1.9

Europe Top 10 Makes by SWA Battery Capacity



	Renault	Porsche	Nissan	Audi	Hyundai	Peugeot	VW	Mercedes	Kia	BMW
Jul-19	43.5	14.1	48.6	93.8	33.3	19.7	34.7	26.4	14.9	25.8
Jul-20	49.6	49.0	48.6	42.2	40.5	34.5	28.4	26.4	24.6	16.4

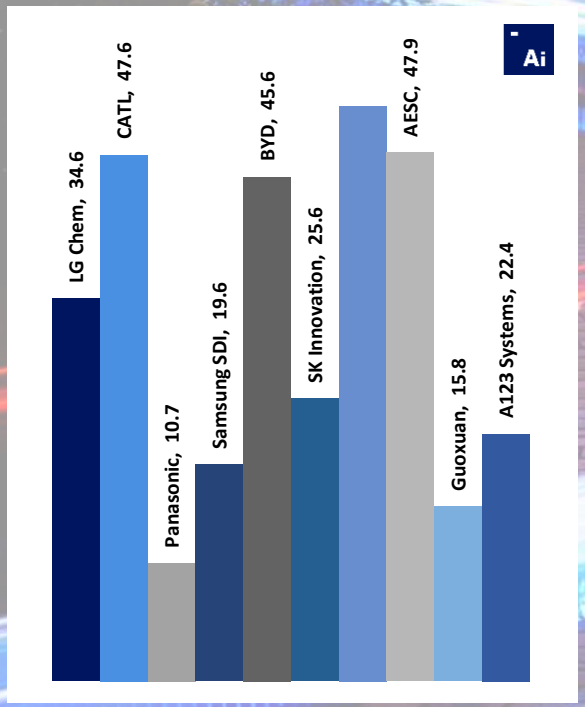
M.E. and Africa Top 10 Makes by SWA Battery Capacity



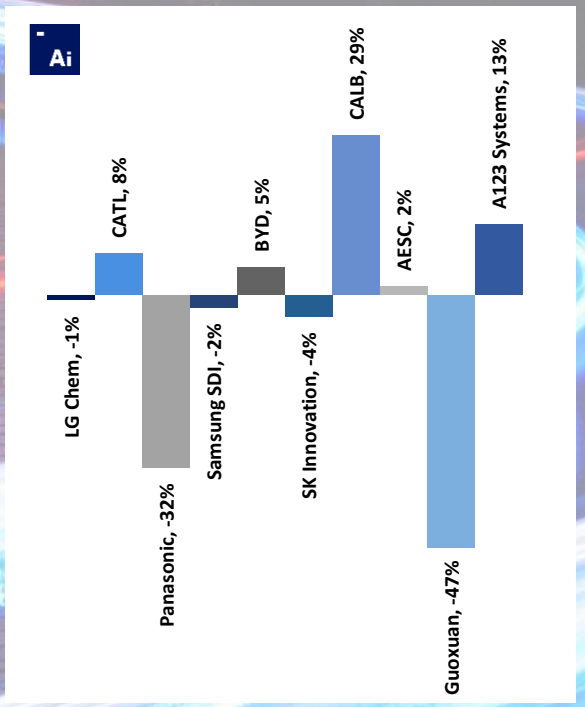
	Jaguar	Hyundai	Audi	GAC	SAIC	Porsche	BMW	Mercedes	Volvo	Kia
Jul-19	90.0	2.0	77.9	0.0	0.0	14.1	13.1	13.5	10.3	1.8
Jul-20	90.0	65.1	58.1	47.0	44.6	27.7	21.0	16.0	10.1	7.7

Global SWA Battery Capacity by Cell Supplier

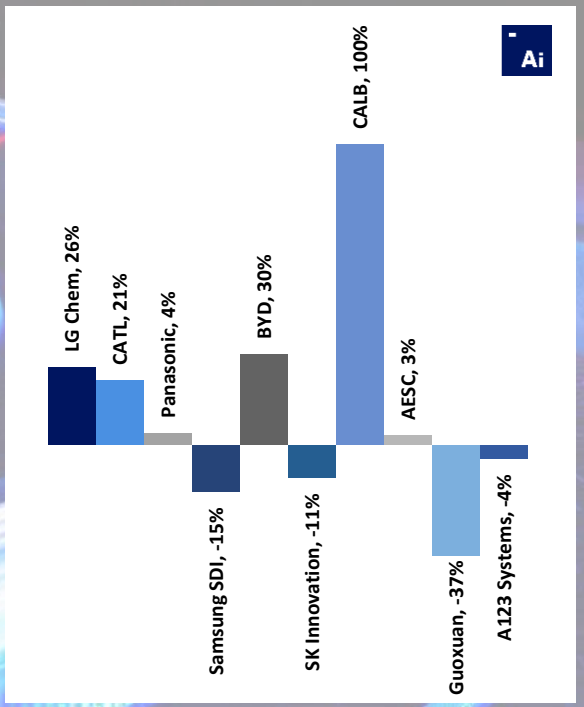
Global SWA by Supplier (kWh)



MoM Change



YoY Change



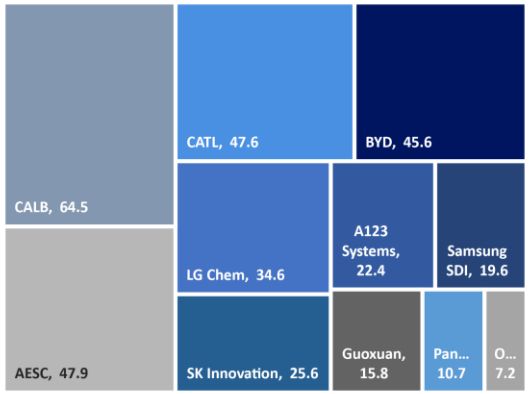
SWA = Sales-Weighted Average

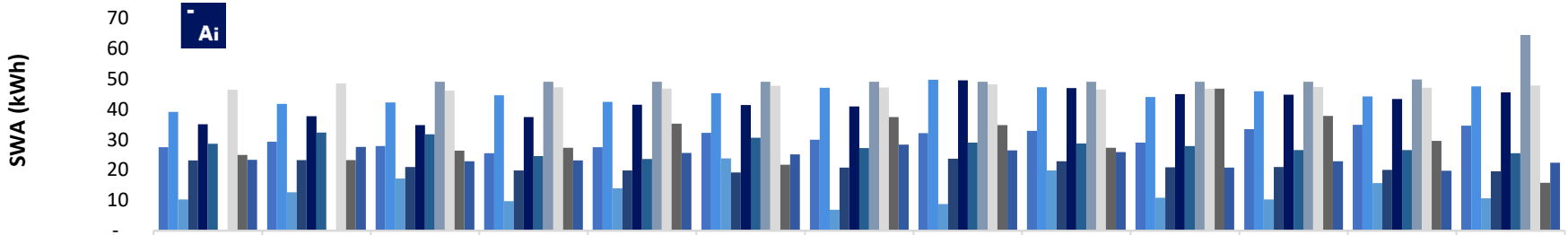
Global SWA Battery Capacity by Cell Supplier

In July 2020:

- The SWA battery capacity of all EVs deployed globally with cells from **CALB was 64.5 kWh**, an **increase of 100%** over the same month the year prior.
- The SWA battery capacity of all EVs deployed globally with cells from **AESC was 47.9 kWh**, an **increase of 3%** over the same month the year prior.
- The SWA battery capacity of all EVs sold globally with cells from **CATL was 47.6 kWh**, an **increase of 21%** over the same month the year prior.
- The SWA battery capacity of all EVs deployed globally with cells from **BYD was 45.6 kWh**, an **increase of 30%** over the same month the year prior.

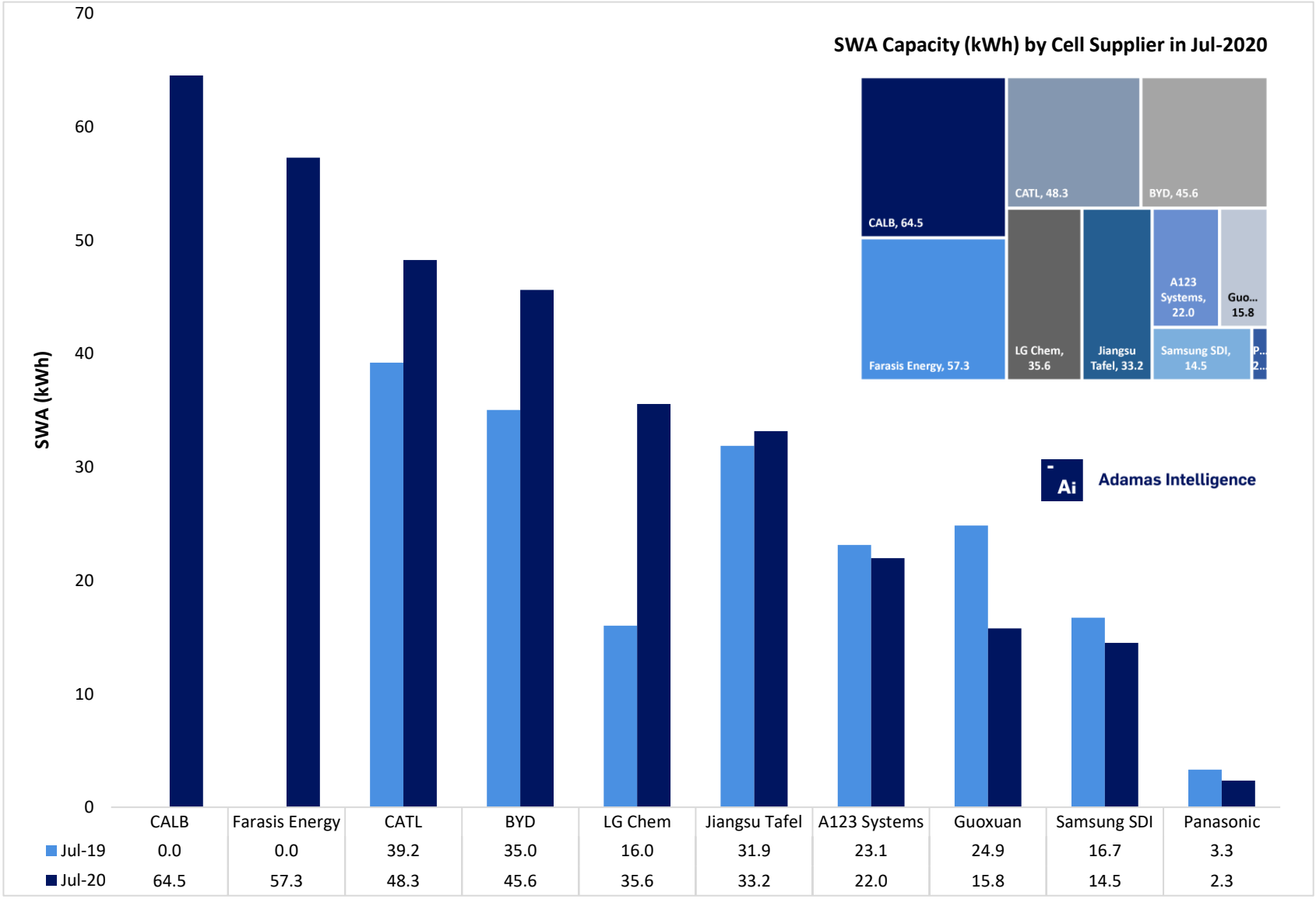
SWA Capacity (kWh) by Cell Supplier in Jul-2020





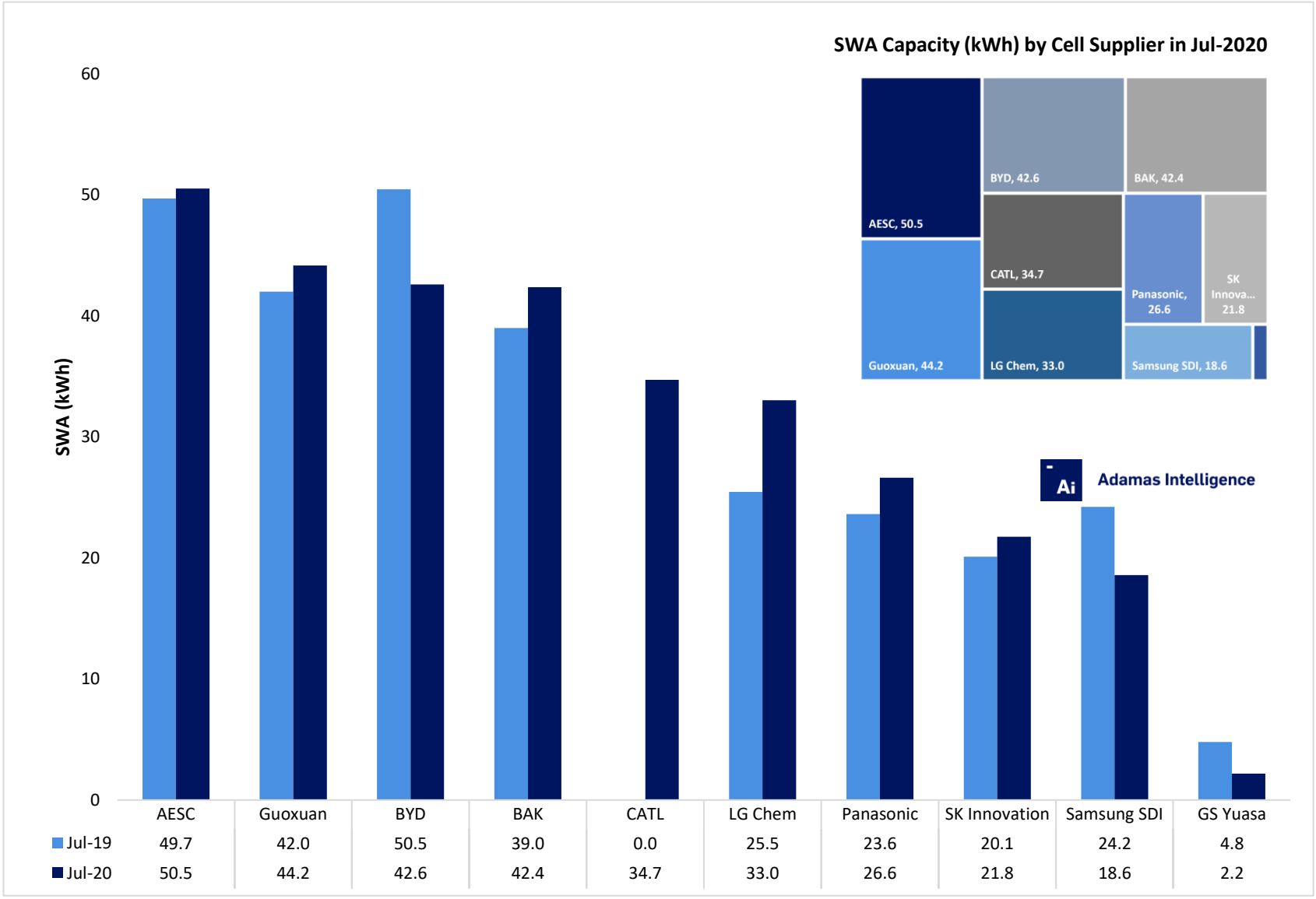
	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
LG Chem	27.5	29.4	27.9	25.5	27.5	32.2	30.0	32.1	32.9	29.1	33.4	34.9	34.6
CATL	39.2	41.8	42.2	44.6	42.5	45.3	47.1	49.8	47.2	44.1	46.0	44.2	47.6
Panasonic	10.3	12.6	17.2	9.7	14.0	23.9	6.9	8.8	19.9	10.9	10.3	15.7	10.7
Samsung SDI	23.1	23.2	21.0	19.9	19.9	19.2	20.8	23.7	22.9	20.9	21.0	20.0	19.6
BYD	35.1	37.7	34.8	37.4	41.6	41.5	40.9	49.6	47.0	45.0	44.8	43.4	45.6
SK Innovation	28.6	32.3	31.8	24.6	23.6	30.6	27.2	29.1	28.7	27.9	26.6	26.6	25.6
CALB	-	-	49.1	49.1	49.1	49.1	49.1	49.1	49.1	49.1	49.1	49.8	64.5
AESC	46.5	48.5	46.2	47.3	46.8	47.7	47.2	48.3	46.5	46.8	47.4	47.1	47.9
Guoxuan	24.9	23.2	26.4	27.3	35.2	21.8	37.4	34.8	27.4	46.8	37.9	29.6	15.8
A123 Systems	23.4	27.6	22.9	23.1	25.7	25.2	28.4	26.5	25.9	20.8	22.9	19.8	22.4

Asia Pacific Top 10 Cell Suppliers by SWA Battery Capacity



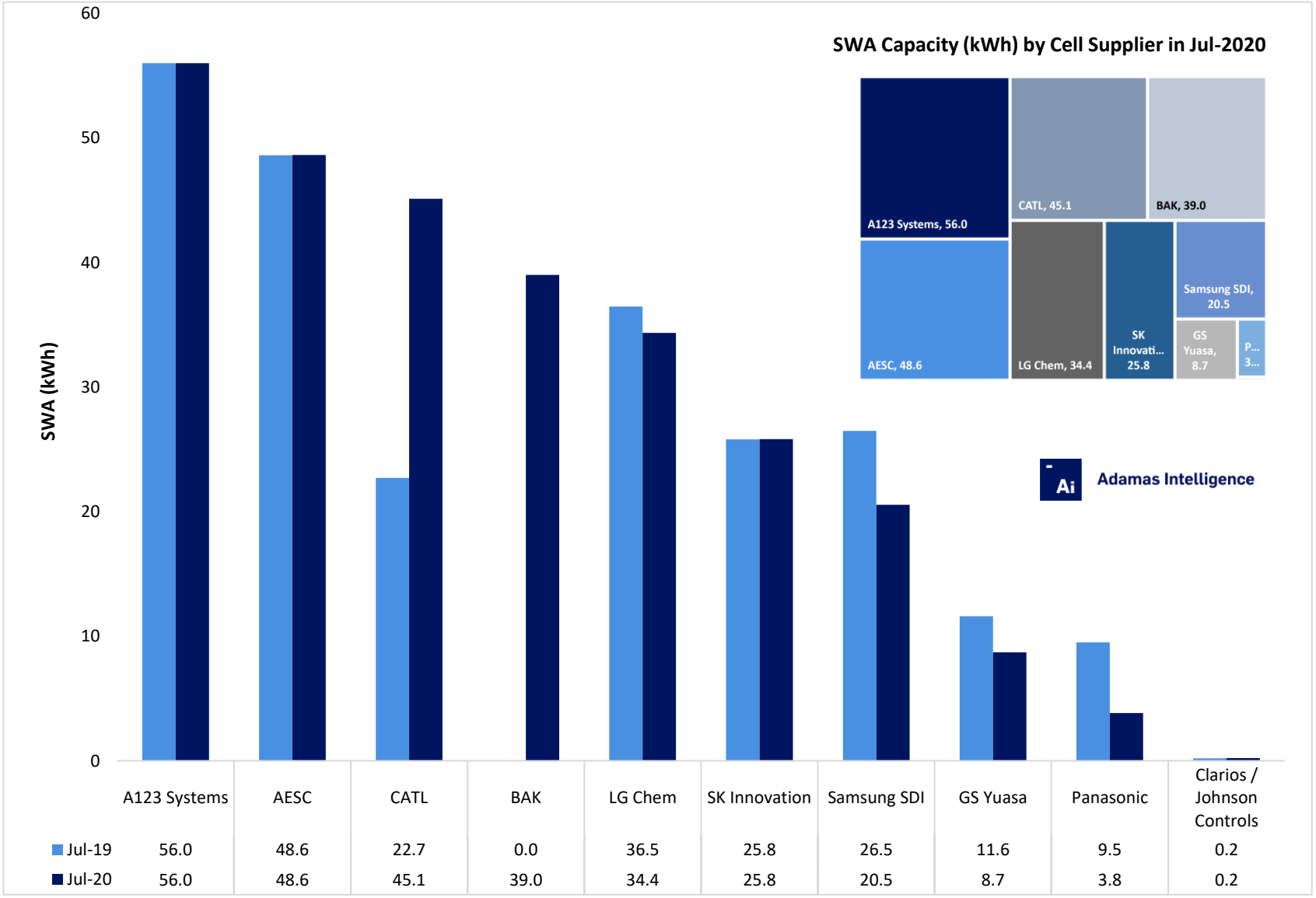
	CALB	Farasis Energy	CATL	BYD	LG Chem	Jiangsu Tafel	A123 Systems	Guoxuan	Samsung SDI	Panasonic
Jul-19	0.0	0.0	39.2	35.0	16.0	31.9	23.1	24.9	16.7	3.3
Jul-20	64.5	57.3	48.3	45.6	35.6	33.2	22.0	15.8	14.5	2.3

Americas Top 10 Cell Suppliers by SWA Battery Capacity



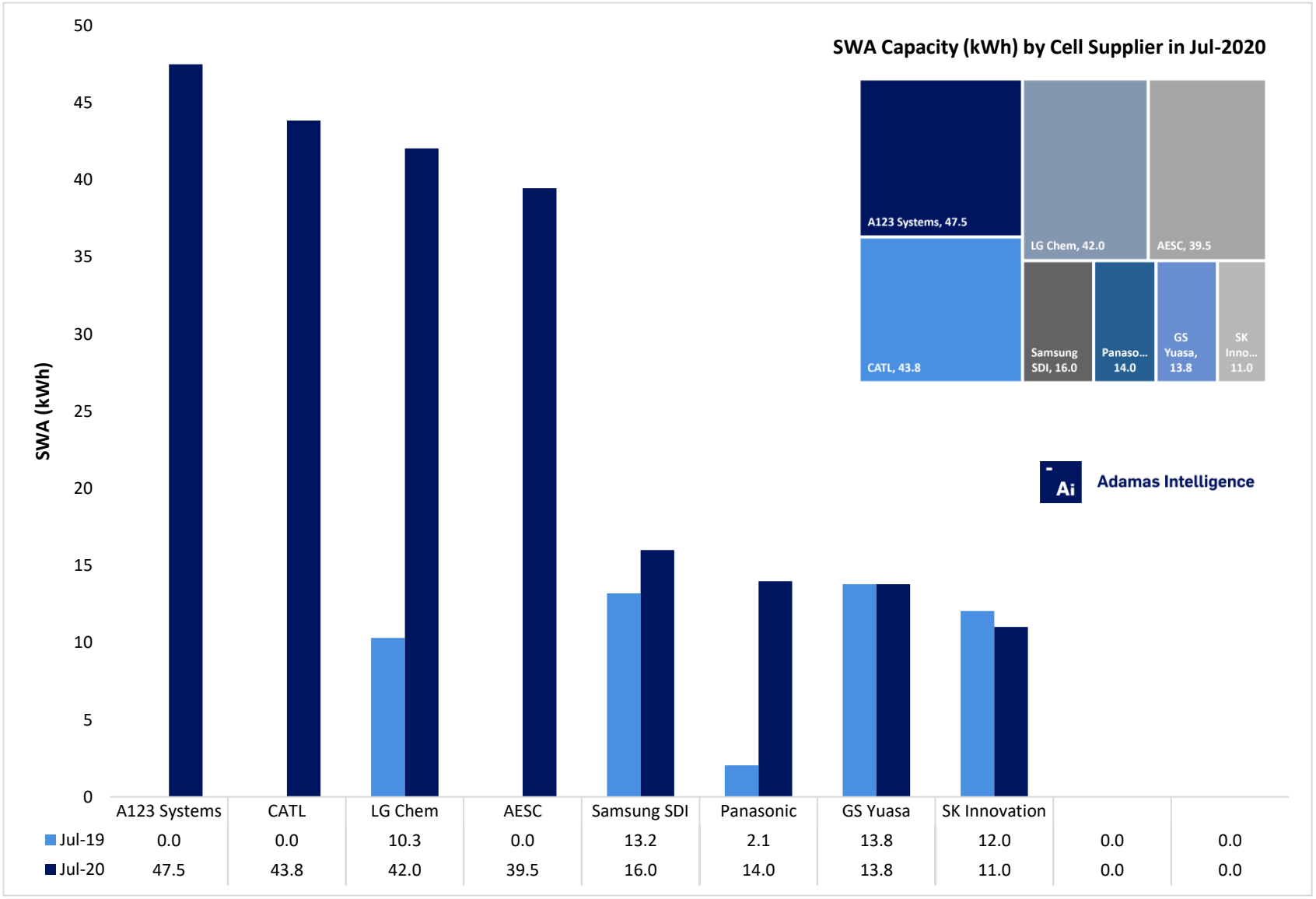
	AESC	Guoxuan	BYD	BAK	CATL	LG Chem	Panasonic	SK Innovation	Samsung SDI	GS Yuasa
Jul-19	49.7	42.0	50.5	39.0	0.0	25.5	23.6	20.1	24.2	4.8
Jul-20	50.5	44.2	42.6	42.4	34.7	33.0	26.6	21.8	18.6	2.2

Europe Top 10 Cell Suppliers by SWA Battery Capacity



	A123 Systems	AESC	CATL	BAK	LG Chem	SK Innovation	Samsung SDI	GS Yuasa	Panasonic	Clarios / Johnson Controls
Jul-19	56.0	48.6	22.7	0.0	36.5	25.8	26.5	11.6	9.5	0.2
Jul-20	56.0	48.6	45.1	39.0	34.4	25.8	20.5	8.7	3.8	0.2

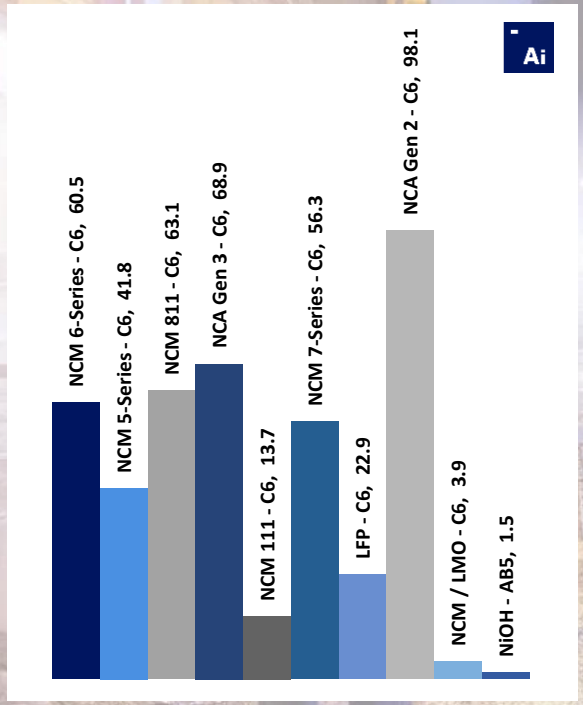
M.E. and Africa Top 10 Cell Suppliers by SWA Battery Capacity



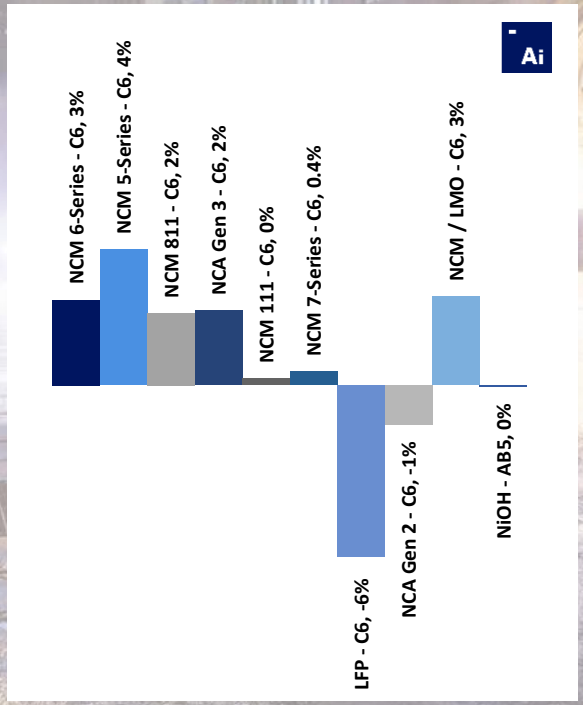
	A123 Systems	CATL	LG Chem	AESC	Samsung SDI	Panasonic	GS Yuasa	SK Innovation		
Jul-19	0.0	0.0	10.3	0.0	13.2	2.1	13.8	12.0	0.0	0.0
Jul-20	47.5	43.8	42.0	39.5	16.0	14.0	13.8	11.0	0.0	0.0

Global SWA Battery Capacity by Cell Chemistry

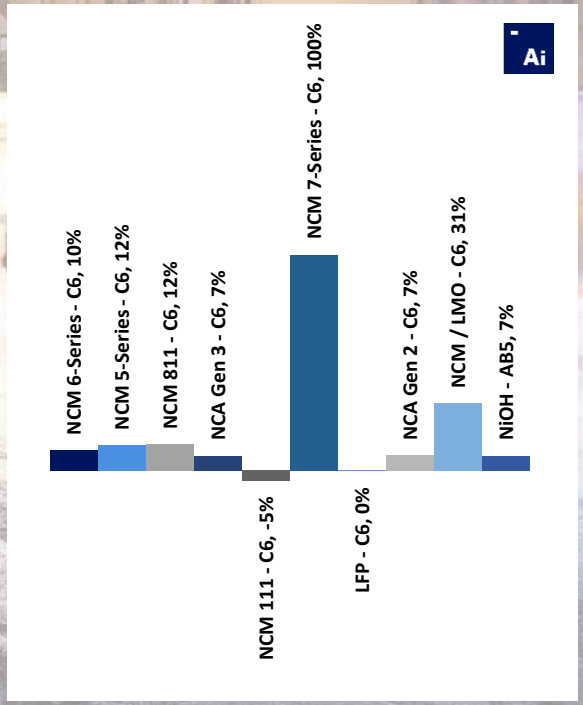
Global SWA by Chemistry (kWh)



MoM Change



YoY Change



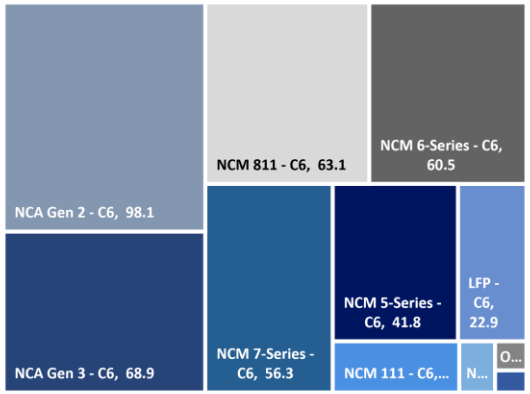
SWA = Sales-Weighted Average

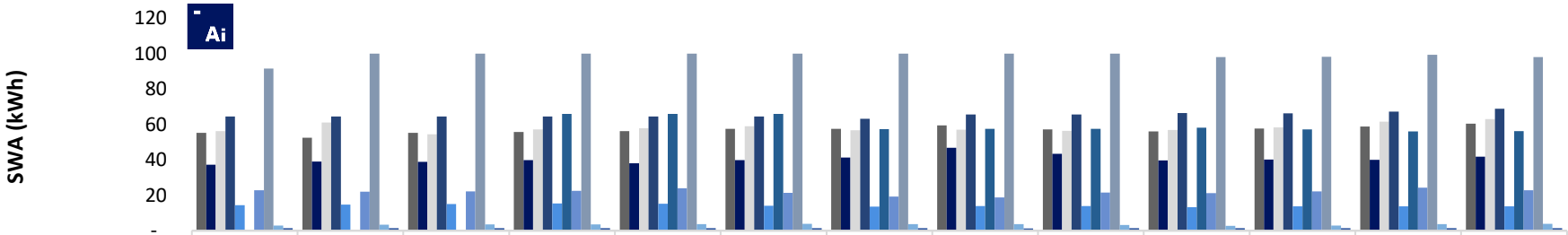
Global SWA Battery Capacity by Cell Chemistry

In July 2020:

- The SWA battery capacity of all EVs deployed with **NCA Gen 2 - C6 cell chemistry was 98.1 kWh**, an **increase of 7%** over the same month the year prior.
- The SWA battery capacity of all EVs deployed with **NCA Gen 3 - C6 cell chemistry was 68.9 kWh**, an **increase of 7%** over the same month the year prior.
- The SWA battery capacity of all EVs deployed with **NCM 811 - C6 cell chemistry was 63.1 kWh**, an **increase of 12%** over July 2019.
- The SWA battery capacity of all EVs deployed with **NCM 6-Series - C6 cell chemistry was 60.5 kWh**, an **increase of 10%** over July 2019.

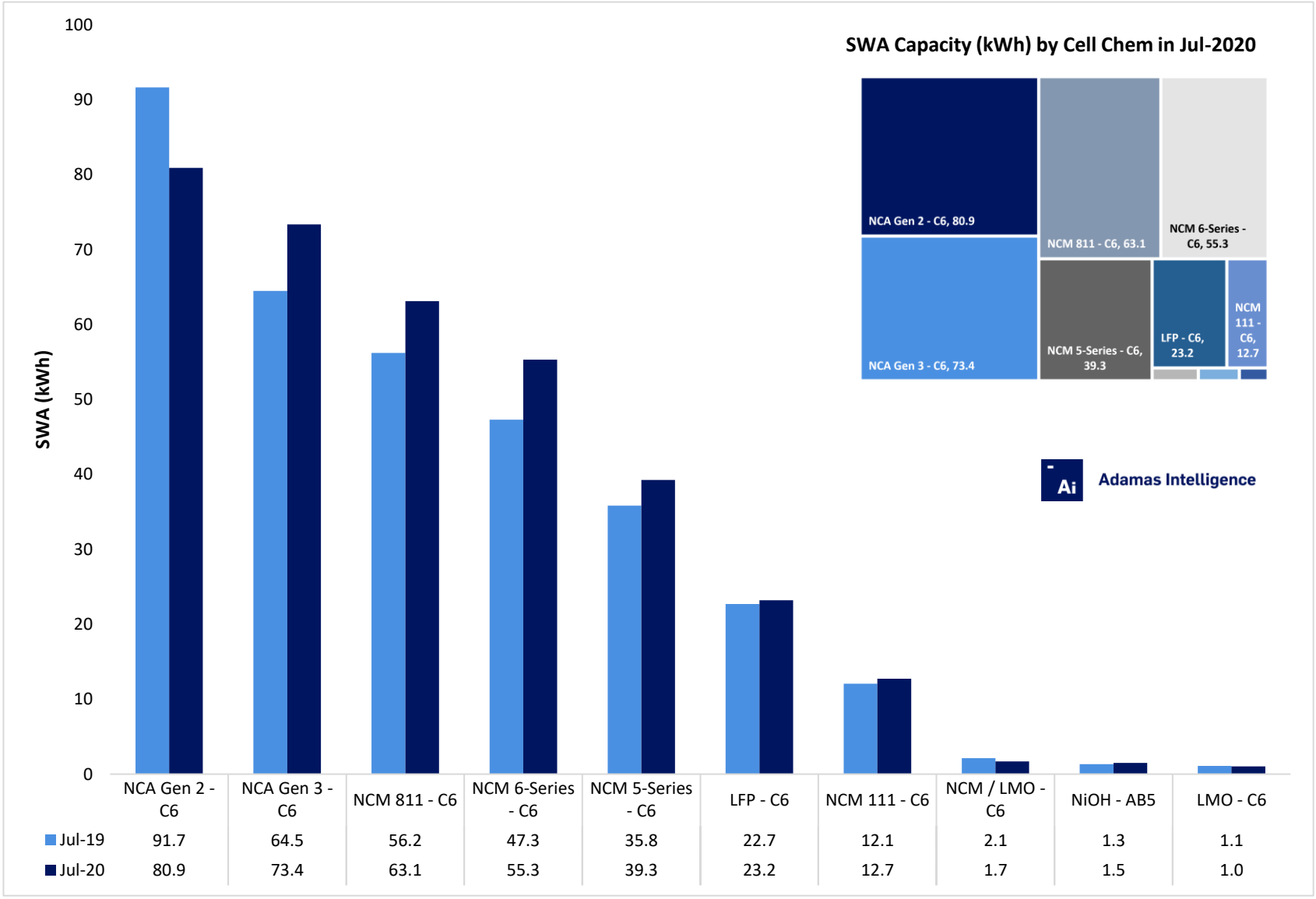
SWA Capacity (kWh) by Cell Chem in Jul-2020





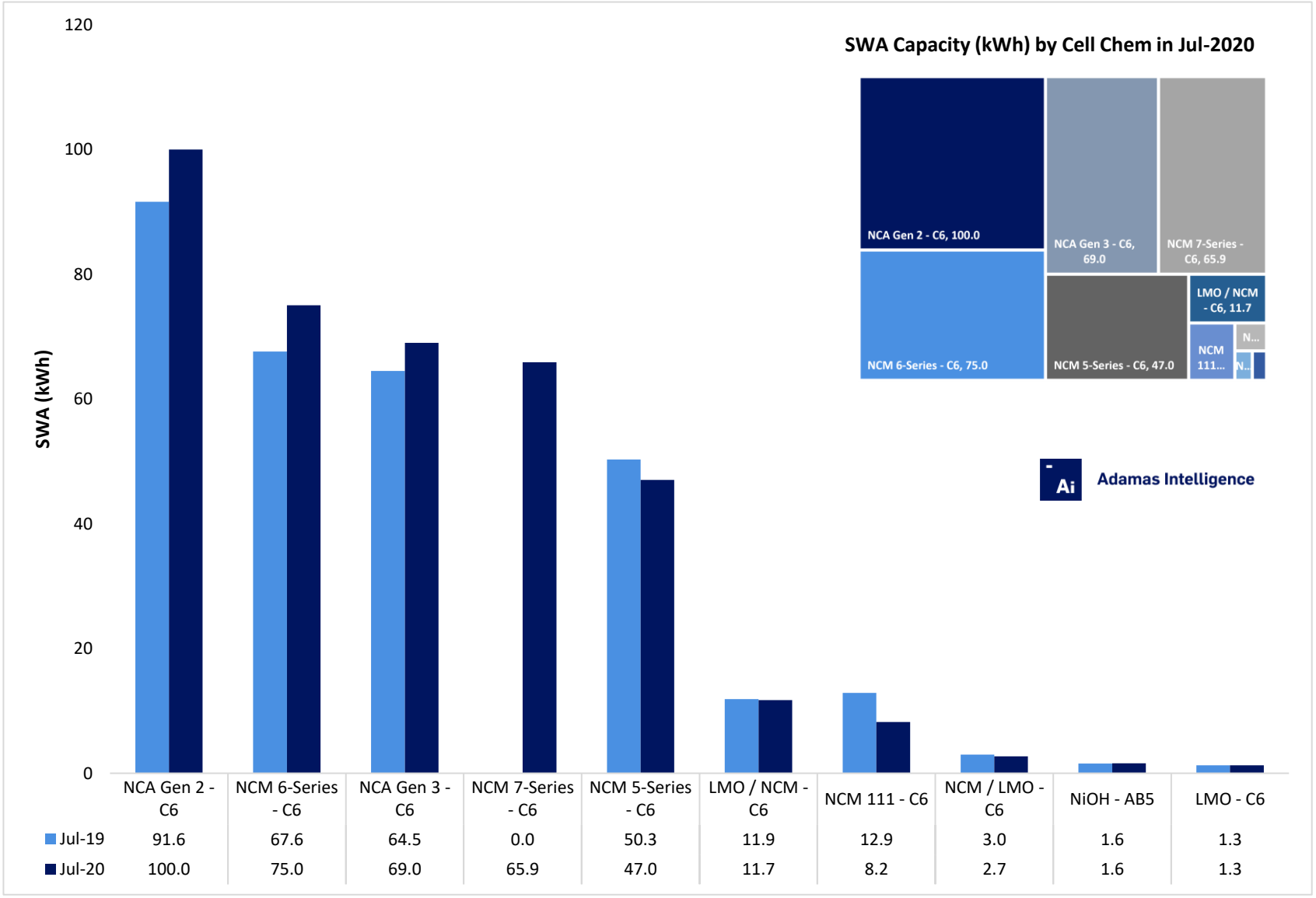
	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
NCM 6-Series - C6	55.2	52.5	55.2	55.7	56.2	57.5	57.5	59.6	57.2	56.0	57.6	58.9	60.5
NCM 5-Series - C6	37.3	39.0	38.9	39.9	38.1	39.9	41.3	46.9	43.4	39.7	40.2	40.0	41.8
NCM 811 - C6	56.2	61.1	54.5	57.2	57.9	59.1	56.7	57.0	56.5	56.9	58.4	61.7	63.1
NCA Gen 3 - C6	64.5	64.5	64.5	64.5	64.5	64.5	63.2	65.6	65.6	66.5	66.3	67.3	68.9
NCM 111 - C6	14.4	14.8	15.0	15.4	15.3	14.1	13.6	14.0	13.9	13.3	13.7	13.7	13.7
NCM 7-Series - C6	-	-	-	66.0	66.0	66.0	57.5	57.6	57.5	58.2	57.2	56.1	56.3
LFP - C6	22.9	22.0	22.1	22.5	24.0	21.4	19.3	18.8	21.6	21.3	22.1	24.3	22.9
NCA Gen 2 - C6	91.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.1	98.2	99.5	98.1
NCM / LMO - C6	3.0	3.4	3.5	3.6	3.7	3.9	3.7	3.8	3.2	2.7	3.0	3.8	3.9
NiOH - AB5	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.5	1.5

Asia Pacific Top 10 Cell Chemistries by SWA Battery Capacity



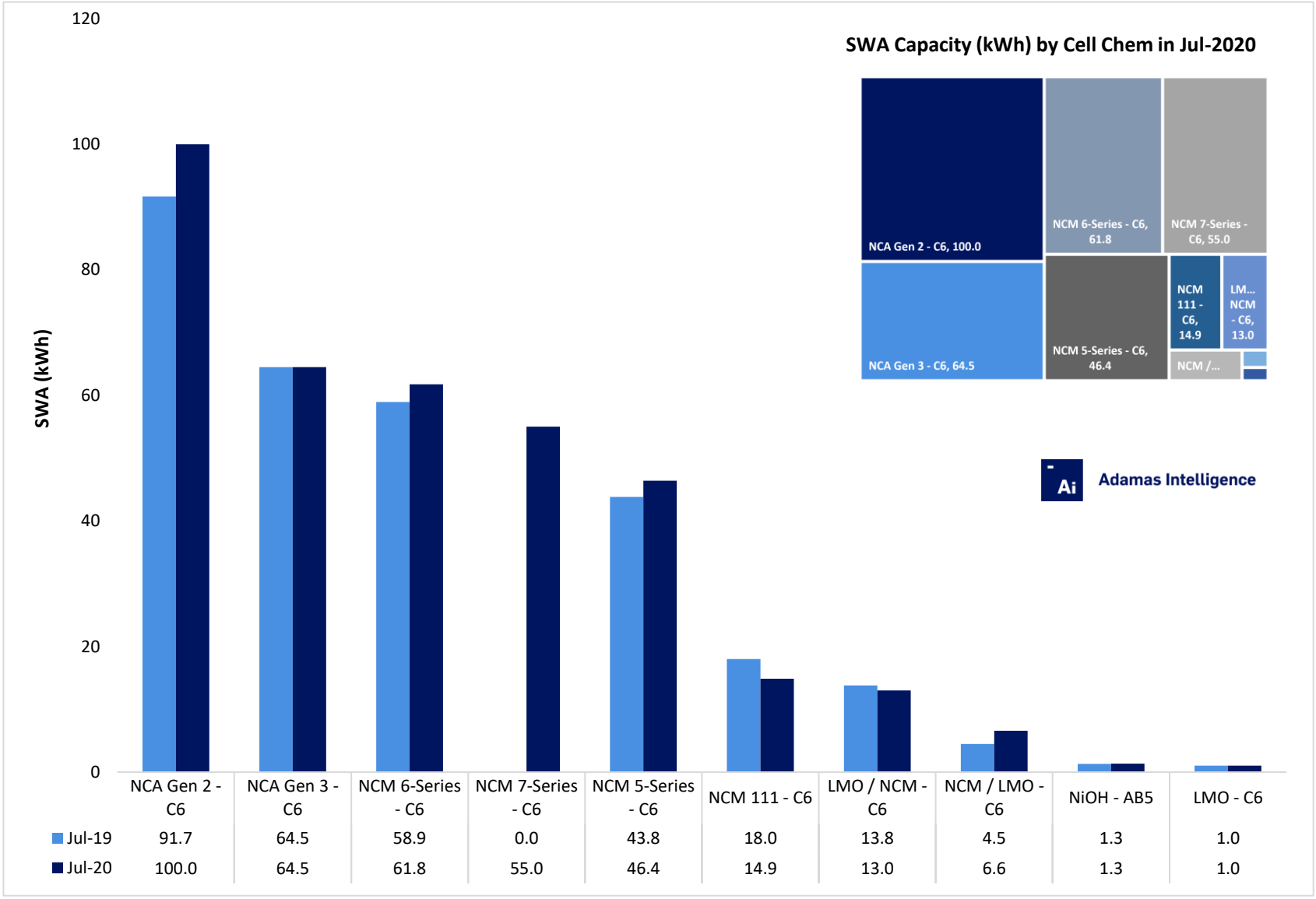
	NCA Gen 2 - C6	NCA Gen 3 - C6	NCM 811 - C6	NCM 6-Series - C6	NCM 5-Series - C6	LFP - C6	NCM 111 - C6	NCM / LMO - C6	NiOH - AB5	LMO - C6
Jul-19	91.7	64.5	56.2	47.3	35.8	22.7	12.1	2.1	1.3	1.1
Jul-20	80.9	73.4	63.1	55.3	39.3	23.2	12.7	1.7	1.5	1.0

Americas Top 10 Cell Chemistries by SWA Battery Capacity



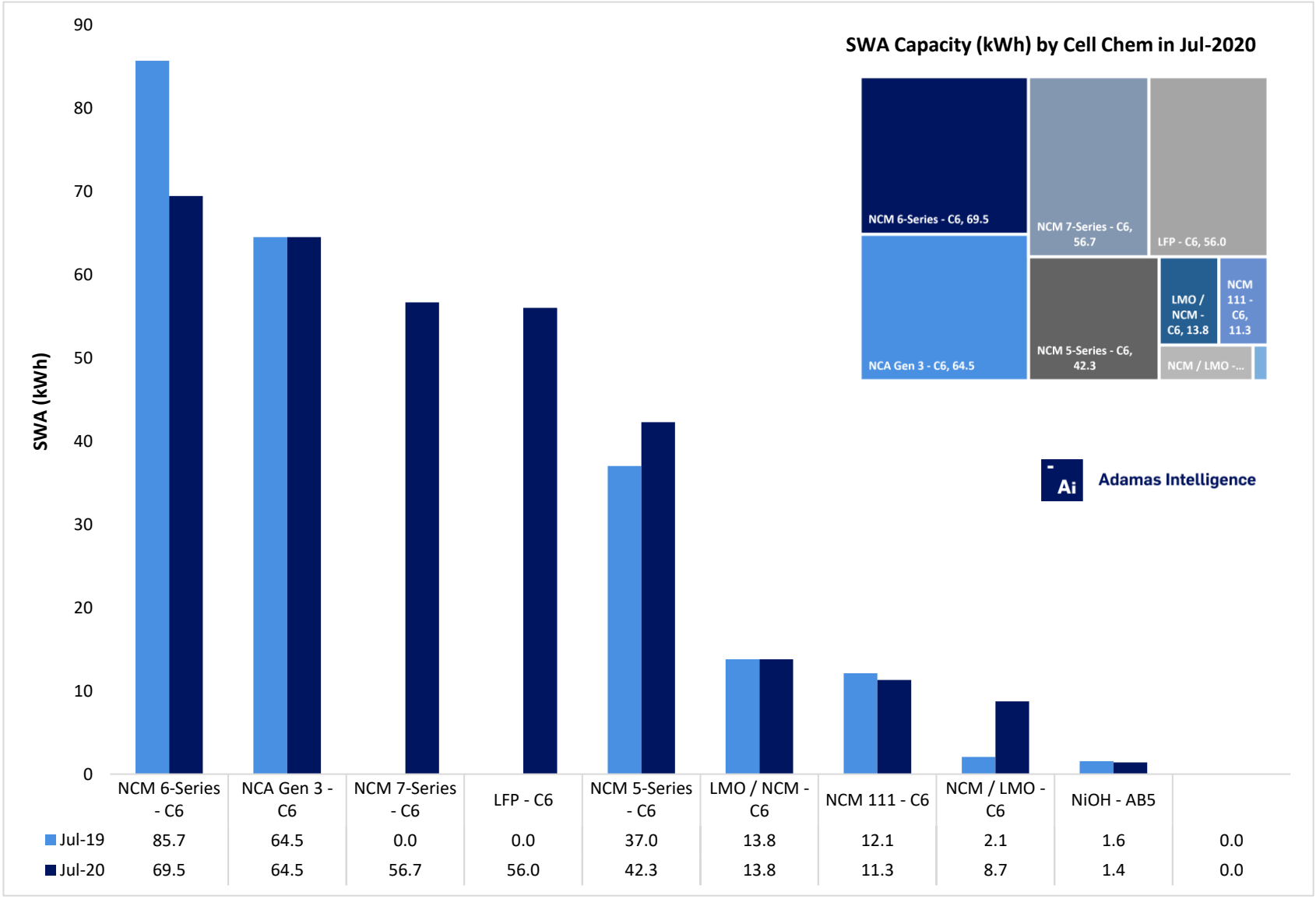
	NCA Gen 2 - C6	NCM 6-Series - C6	NCA Gen 3 - C6	NCM 7-Series - C6	NCM 5-Series - C6	LMO / NCM - C6	NCM 111 - C6	NCM / LMO - C6	NiOH - AB5	LMO - C6
Jul-19	91.6	67.6	64.5	0.0	50.3	11.9	12.9	3.0	1.6	1.3
Jul-20	100.0	75.0	69.0	65.9	47.0	11.7	8.2	2.7	1.6	1.3

Europe Top 10 Cell Chemistries by SWA Battery Capacity



	NCA Gen 2 - C6	NCA Gen 3 - C6	NCM 6-Series - C6	NCM 7-Series - C6	NCM 5-Series - C6	NCM 111 - C6	LMO / NCM - C6	NCM / LMO - C6	NiOH - AB5	LMO - C6
Jul-19	91.7	64.5	58.9	0.0	43.8	18.0	13.8	4.5	1.3	1.0
Jul-20	100.0	64.5	61.8	55.0	46.4	14.9	13.0	6.6	1.3	1.0

M.E. and Africa Top 10 Cell Chemistries by SWA Battery Capacity



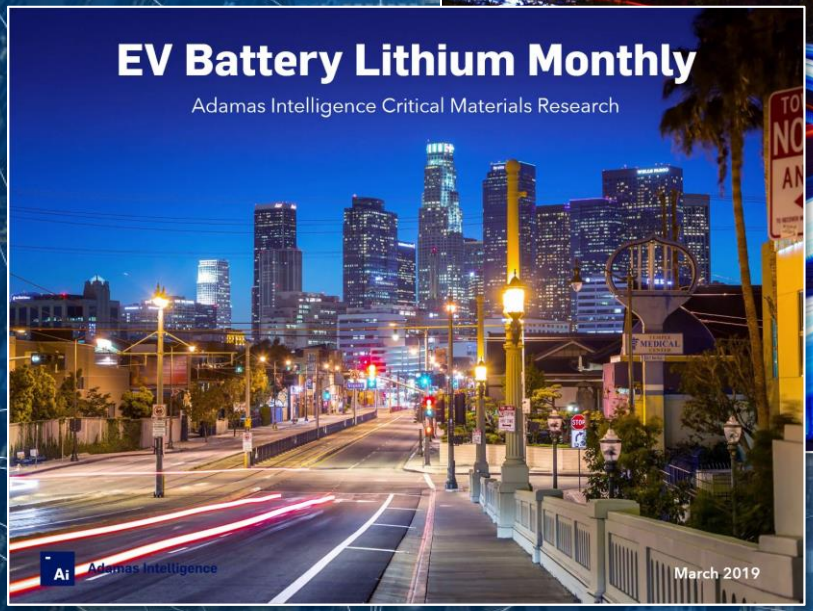
	NCM 6-Series - C6	NCA Gen 3 - C6	NCM 7-Series - C6	LFP - C6	NCM 5-Series - C6	LMO / NCM - C6	NCM 111 - C6	NCM / LMO - C6	NiOH - AB5	
Jul-19	85.7	64.5	0.0	0.0	37.0	13.8	12.1	2.1	1.6	0.0
Jul-20	69.5	64.5	56.7	56.0	42.3	13.8	11.3	8.7	1.4	0.0

Terminology & Abbreviations

Term or Abbreviation	Definition
BEV	Battery electric vehicles are powered solely by electricity from an onboard battery. Most BEVs have a driving range of 150 km to 300 km, while some luxury models have ranges up to 500 km. BEVs are propelled by one or more electric motors that convert energy stored in the battery into motion.
PHEV	Plug-in hybrid electric vehicles on the other hand are powered by electricity from an onboard battery, and when the battery is depleted, switch to an internal combustion engine powered by gasoline or diesel. While PHEVs typically contain much smaller batteries than BEVs, they use electric motors of similar size – a noteworthy fact in the context of rare earth demand for electric vehicles.
HEV	Hybrid electric vehicles, like their plug-in hybrid counterparts, combine an internal combustion engine system with an electric propulsion system but generally cannot be propelled by electricity alone. In a typical HEV, the internal combustion engine and electric motor transmit power simultaneously thereby improving fuel efficiency.
LCE	There are numerous lithium compounds used in batteries, so it is common to refer to the lithium content in terms of lithium carbonate equivalent ("LCE").
LFP	Cathode type; lithium-iron-phosphate ("LFP") with chemical formula $LiFePO_4$.
LMO	Cathode type; lithium-manganese-oxide ("LMO") with chemical formula $LiMn_2O_4$.
LMO / LNO	Cathode type; blend of 75% lithium-manganese-oxide ("LMO") with chemical formula $LiMn_2O_4$ and 25% lithium-nickel-oxide ("LNO") with chemical formula $LiNiO_2$.
LMO / NCM	Cathode type; blend of 75% lithium-manganese-oxide ("LMO") with chemical formula $LiMn_2O_4$ and 25% lithium-nickel-cobalt-manganese ("NCM") with chemical formula $Li[Ni_{0.33}Co_{0.33}Mn_{0.33}]O_2$.

Term or Abbreviation	Definition
NCA 1st Gen	Cathode type; lithium-nickel-cobalt-alumina ("NCA"); high-cobalt
NCA 2nd Gen	Cathode type; lithium-nickel-cobalt-alumina ("NCA"); medium-cobalt
NCA 3rd Gen	Cathode type; lithium-nickel-cobalt-alumina ("NCA"); low-cobalt
NCM 111	Cathode type; lithium-nickel-cobalt-manganese ("NCM") with chemical formula $Li[Ni_{0.33}Co_{0.33}Mn_{0.33}]O_2$.
NCM 5-Series	Cathode sub-group; lithium-nickel-cobalt-manganese ("NCM") with 5 parts nickel to 5 parts cobalt + manganese
NCM 6-Series	Cathode sub-group; lithium-nickel-cobalt-manganese ("NCM") with 6 parts nickel to 4 parts cobalt + manganese
NCM 7-Series	Cathode sub-group; lithium-nickel-cobalt-manganese ("NCM") with 7 parts nickel to 3 parts cobalt + manganese
NCM 811	Cathode type; lithium-nickel-cobalt-manganese ("NCM") with chemical formula $Li[Ni_{0.80}Co_{0.10}Mn_{0.10}]O_2$.
NCM / LMO	Cathode type; blend of 75% lithium-nickel-cobalt-manganese ("NCM") with chemical formula $Li[Ni_{0.33}Co_{0.33}Mn_{0.33}]O_2$ and 25% lithium-manganese-oxide ("LMO") with chemical formula $LiMn_2O_4$.
NiOH	Cathode type; nickel hydroxide ("NiOH") with chemical formula NiOH; used in NiMH batteries for HEVs.
LTO	Anode type; lithium-titanium-oxide ("LTO") with chemical formula $Li_4Ti_5O_{12}$.
C6	Anode type; graphite ("C6") with chemical formula C_6.
AB5	Anode type; AB5 alloy ("AB5") in which A= $La_{0.50}Ce_{0.35}Nd_{0.12}Pr_{0.03}$ and B5 = $Ni_{3.55}Co_{0.75}Mn_{0.40}Al_{0.30}$; used in NiMH batteries for HEVs.

Other monthly reports from Adamas Intelligence:



Inquire: info@adamasintel.com