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AWEA WEBINAR SERIES 2020 - MARKET OUTLOOKS

Asia-Pacific Offshore Wind Industry Outlook and the Impact of COVID-19

SPEAKERS:



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ROBERT LIEW

PRINCIPAL ANALYST, POWER AND RENEWABLES RESEARCH

TUESDAY, 12 MAY 2020 - 3 PM SGT



The Asia Wind Energy Association was established in December 2016 to become the leading trade association for the wind energy sector in Asia Pacific.


The association acts as the regional platform for all wind power industry stakeholders to collectively promote the best interests of the wind power sector.


The Asia Wind Energy Association is supported by a wide variety of stakeholders from the offshore and onshore wind industry.


Information



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Mark Hutchinson

**Vice President,
Head of APAC Power & Renewables Consulting
Wood Mackenzie**

Mark has over 30 years of energy sector experience, including 24 years of energy consulting and research experience in Asia. In his career, he has overseen numerous power market studies, in particular in support of business strategy, investment and country entry decisions, and he understands the concerns of boards, investment committees and lenders.

Mark's expertise spans strategic advice, finance, M&A, contract negotiations and due diligence in the power, oil, gas and coal sectors. In January 2018, Mark took on the task of integrating in Asia the offerings of two renewables research and advisory firms, Greentech Media and MAKE, when they were acquired by Wood Mackenzie.



Robert Liew

Principle Analyst, Commercial Leader for Wind Markets, Power and Renewables Research, Asia Pacific

Robert has over 10 years of analyst experience, having worked in research functions in New Zealand, Thailand, China, and Singapore. He has expertise in market intelligence, strategy planning, analysis, and forecasting in the wind power sector in Asia Pacific. He is responsible for regional Asia Pacific reports, offshore wind, emerging markets, and has completed numerous projects for supply chain companies, private equity, and IPP/utilities with a focus on Asia Pacific markets. His opinions have been quoted by leading newspapers and trade publications – Bloomberg, The Economic Times, Recharge, Windpower Monthly, etc. Robert has a master's degree in public policy from Tsinghua University specializing in renewable energy. He has spent over 35 years in Asia Pacific living in Taiwan, Singapore, New Zealand, Thailand, and China where he has spent the last eight years working at MAKE, a leading Danish wind consultancy before merging with Wood Mackenzie. Robert works out of our office in Singapore.

COVID-19 impact on power markets in Asia Pacific

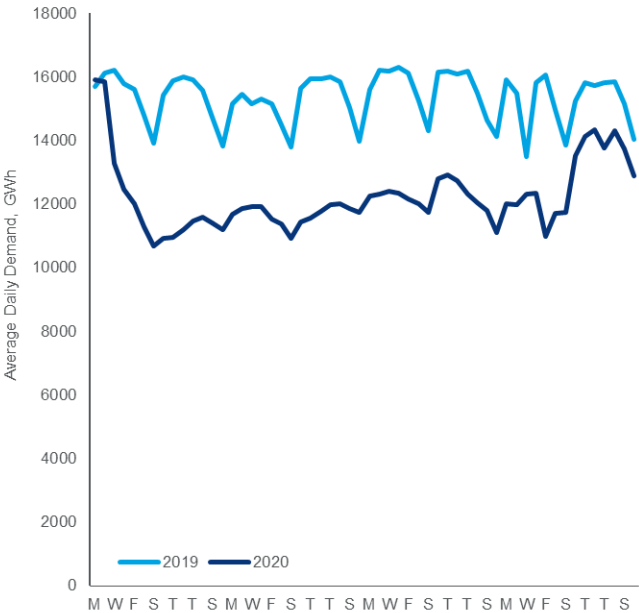
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Malaysia – Easing of Lockdown has seen an increase in consumption

Lockdown started on 18 March

Average hourly generation by day: March 16 to May 10
(Week 12-19)



Source: Wood Mackenzie, GSO

% Growth from 2019 to 2020

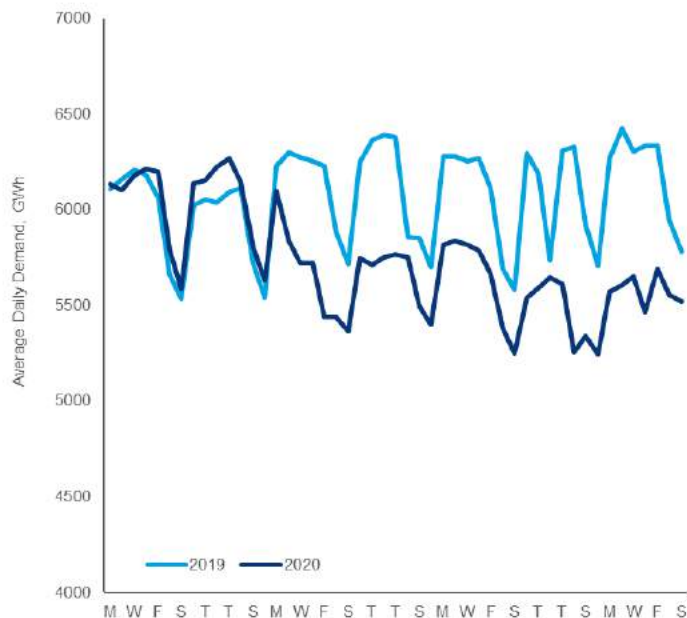


Source: Wood Mackenzie, GSO

Singapore Demand – “Circuit breaker” (semi-lockdown) started from 8 April has caused a ~9% drop in power demand

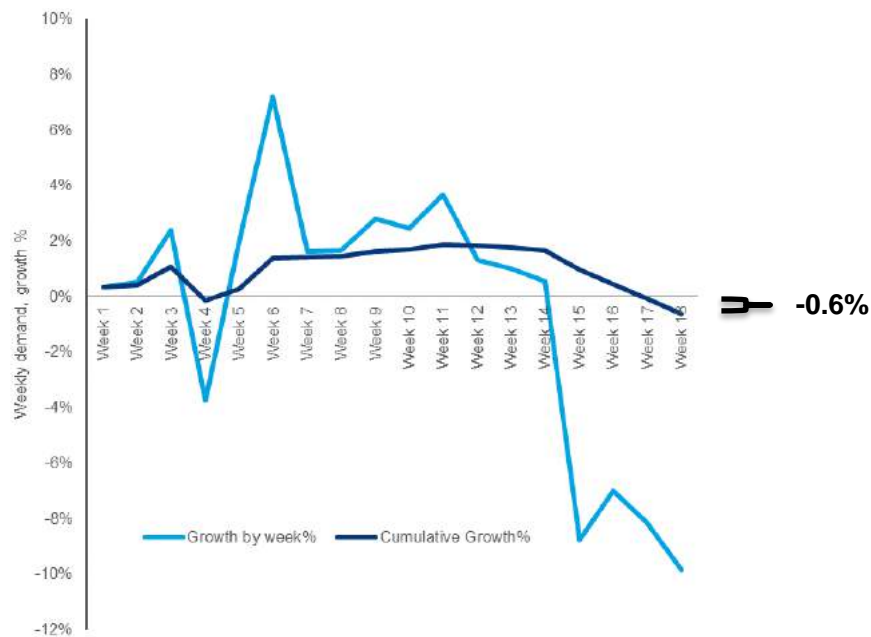
Circuit breaker (semi-lockdown) started on 8 April; Easing of lockdown to resume additional businesses from 12 May

Average hourly generation by day: March 23 to May 10
(week 13-19)



Source: Wood Mackenzie, EMC

% Growth from 2019 to 2020

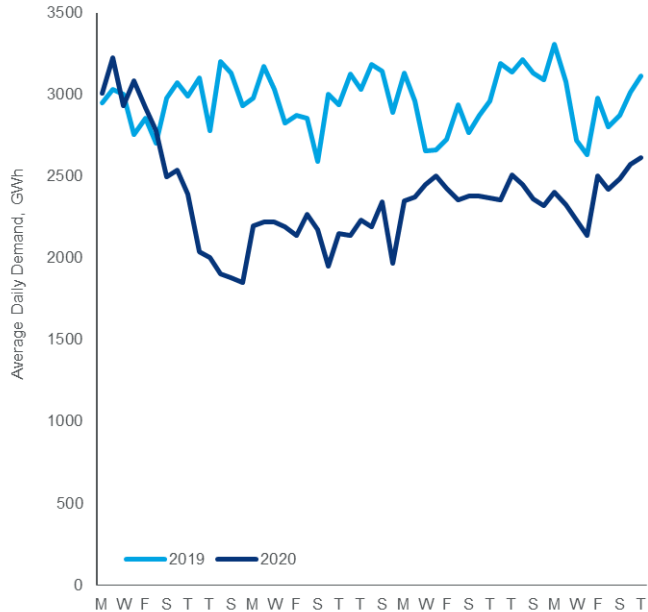


Source: Wood Mackenzie, EMC

India – Power demand with partial uplift of Lockdown has improved by 10% since early May with a drop of ~15% instead of ~25% during full lockdown

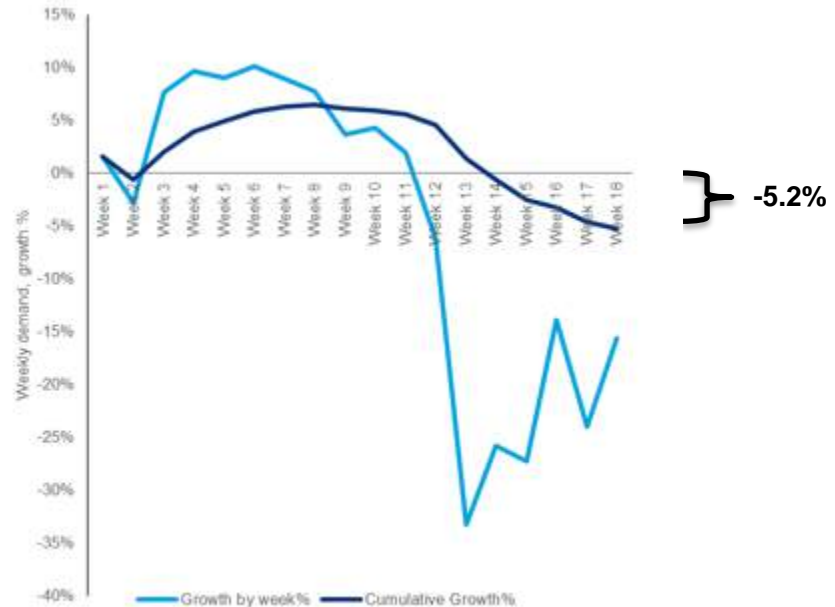
Lockdown started on 25 March; Lockdown partially lifted from 20 April

Daily average generation: March 16 to May 06
(Week 12-19)



Source: Wood Mackenzie, Ministry of Power

% Growth from 2019 to 2020

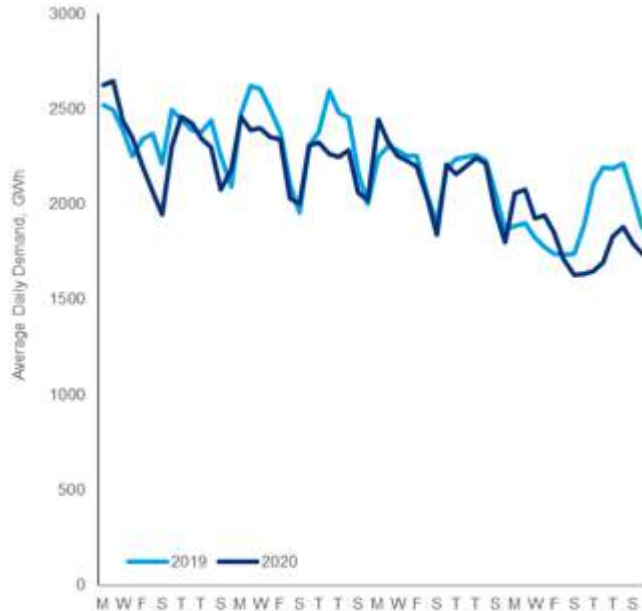


Source: Wood Mackenzie, Ministry of Power

Japan – power demand continues to fall since lockdown despite unusually cold weather

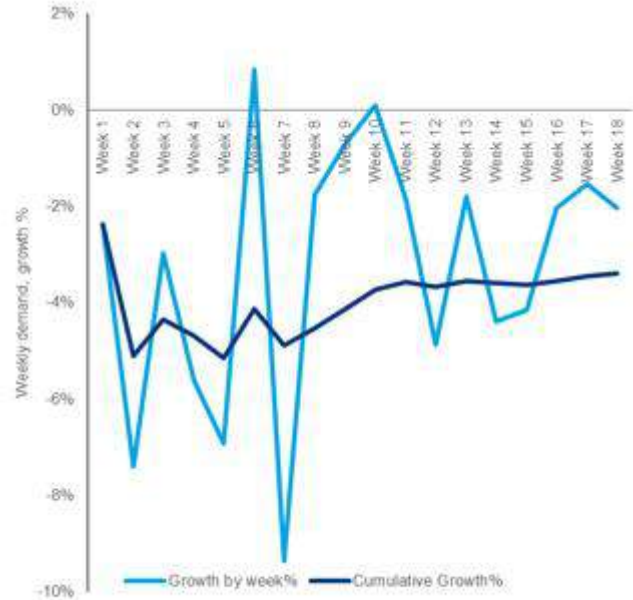
Lockdown started on 7 April

Daily average generation: March 16 to May 10
(Week 12-19)



Source: Wood Mackenzie, OCCTO

% Growth from 2019 to 2020

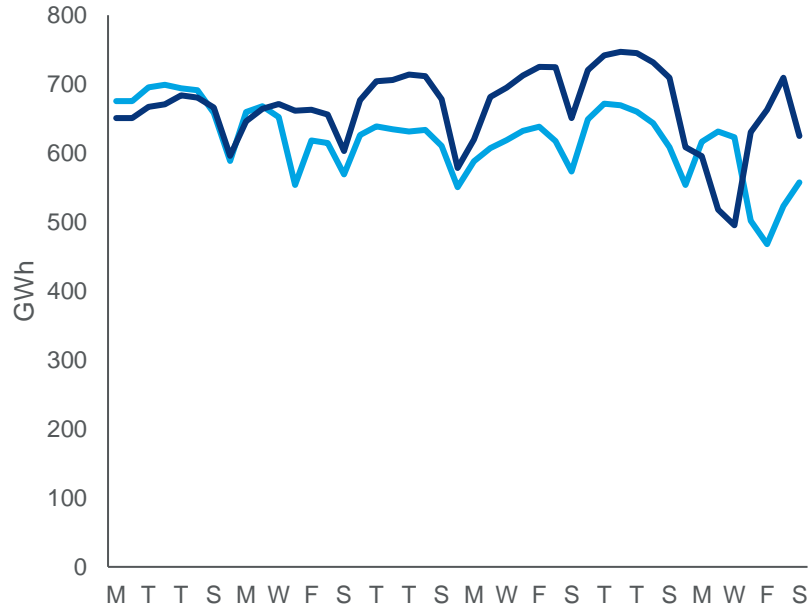


Source: Wood Mackenzie, OCCTO

} -3.4%

Vietnam – power demand in recovery with 3% overall decline thus far

Daily average generation: March 22 to May 5
(Week 13-19*)

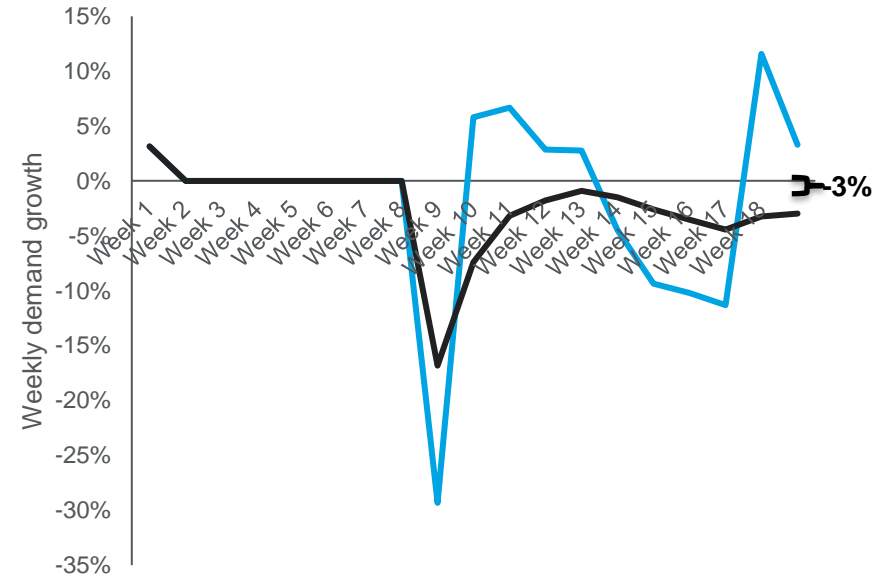


Source: Wood Mackenzie

— 2020 — 2019

% Growth from 2019 to 2020

Growth by week (%)



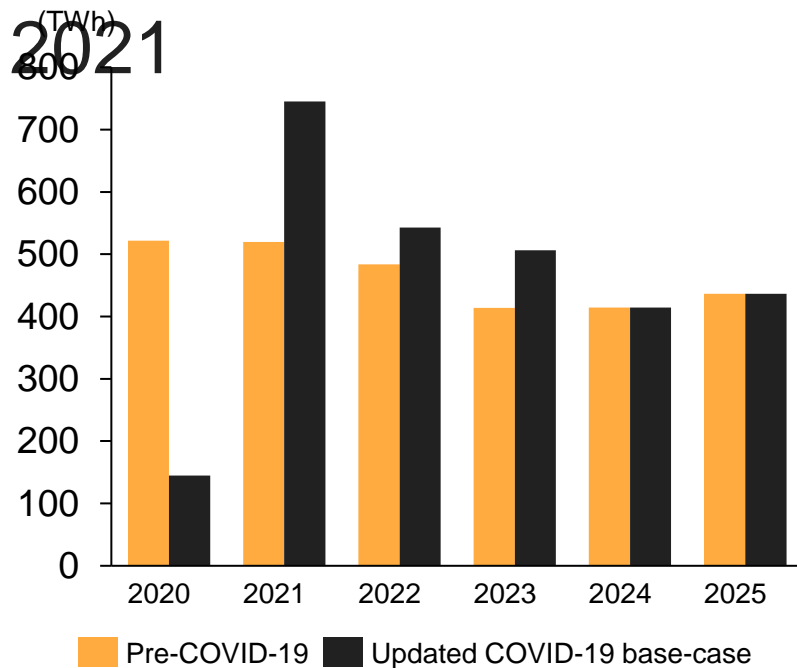
Source: Wood Mackenzie

— Growth by week (%) — Cumulative growth (%)

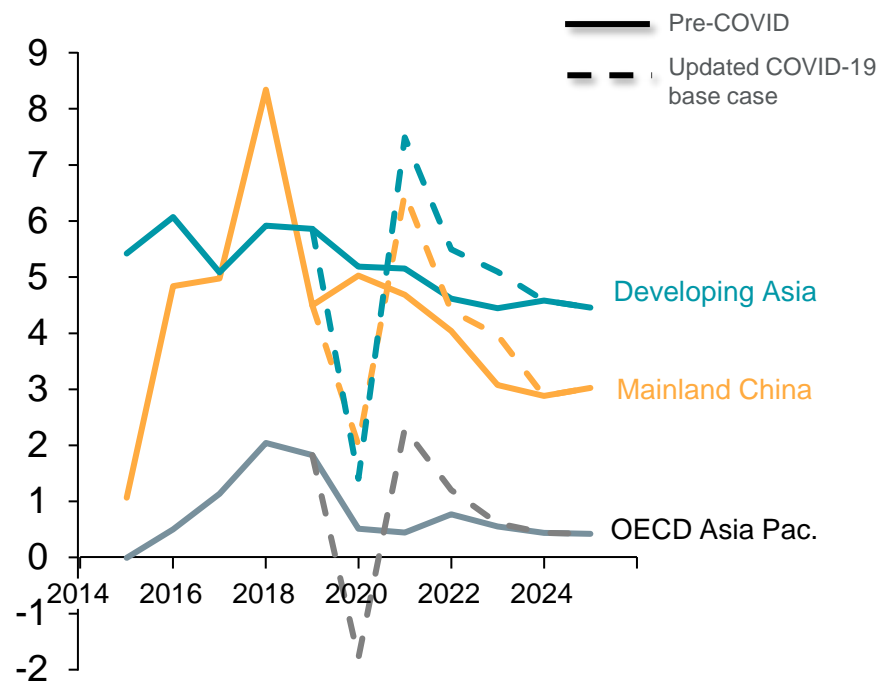
Note: * partial week

The updated COVID-19 base-case: 2-3 month power demand disruption then strong recovery in 2021

Asia Pacific annual change in power demand: Pre-COVID-19 vs. updated base case



Power demand % growth outlook in Asia Pacific



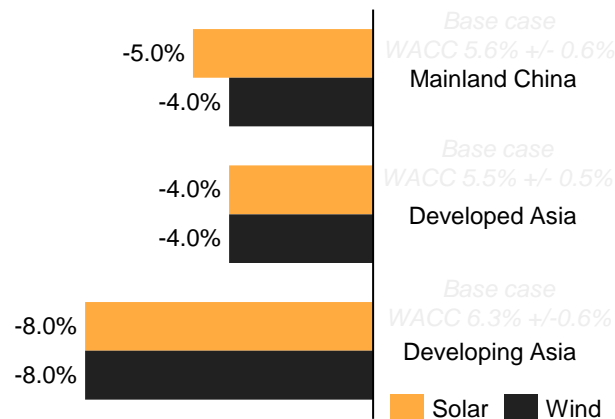
Note: Developing Asia includes India, Southeast Asia and rest of Asia. Developed Asia Pacific includes Japan, South Korea, Singapore, Taiwan region, Australia, New Zealand.

Source: Wood Mackenzie

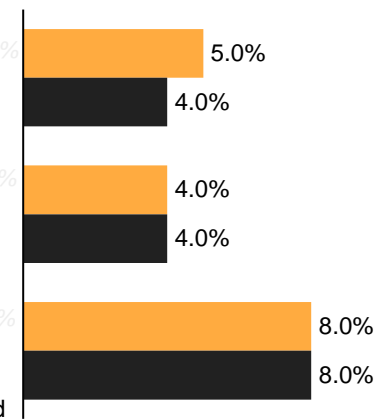
Credit availability and interest rates could have significant impact on the competitiveness of renewables...

Impact on renewables LCOE in APAC

WACC is decreased by 10%



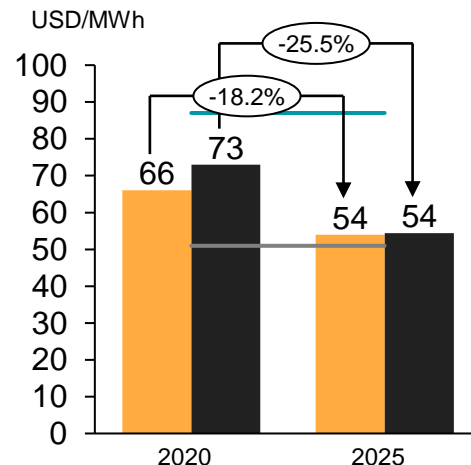
WACC is increased by +10%



Absolute basecase WACC and absolute % increase shown in blue

- A 10% increase in WACC could lead to a 6% increase in LCOE in renewables.
- Higher the share of CAPEX as part of LCOE, more significant the impact of financing cost on LCOE.
- Double-digit percentage decline in wind and LCOE in the next five years still very plausible

Pre-COVID LCOE outlook



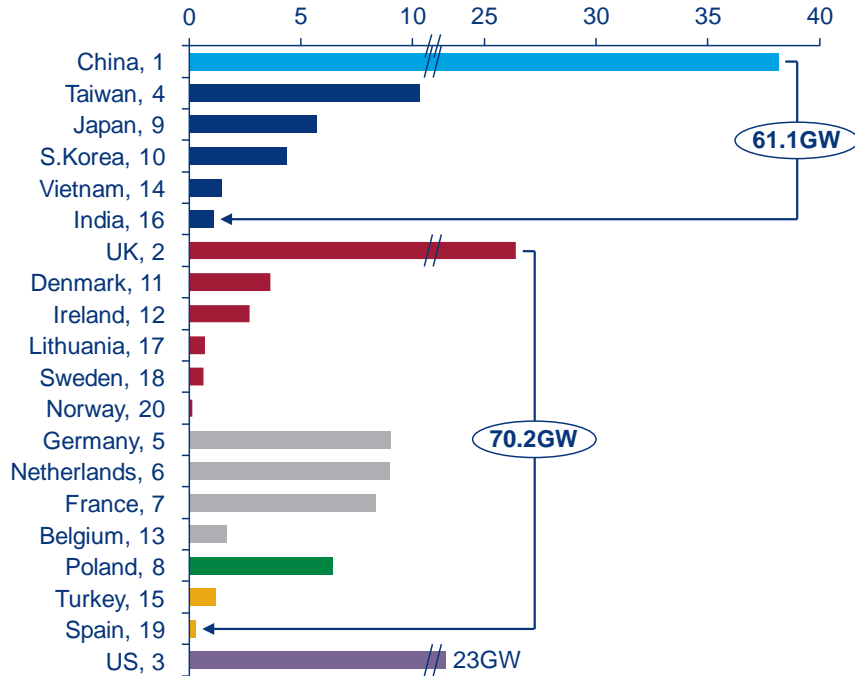
Offshore wind power outlook for Asia Pacific

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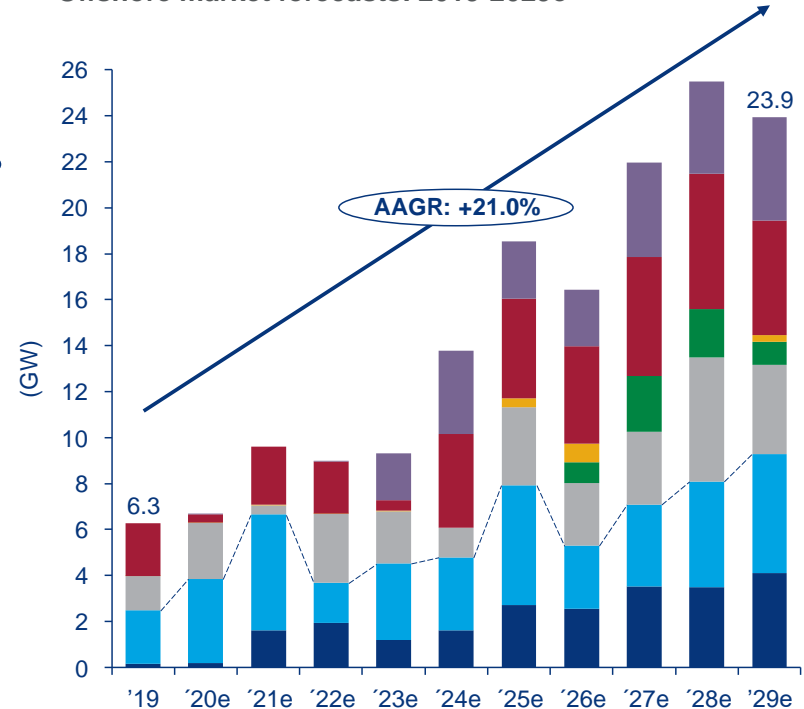


155GW of new offshore capacity results in a 23.5% CAGR over the 10-year outlook

Offshore top 20 markets: New capacity '20e-'29e



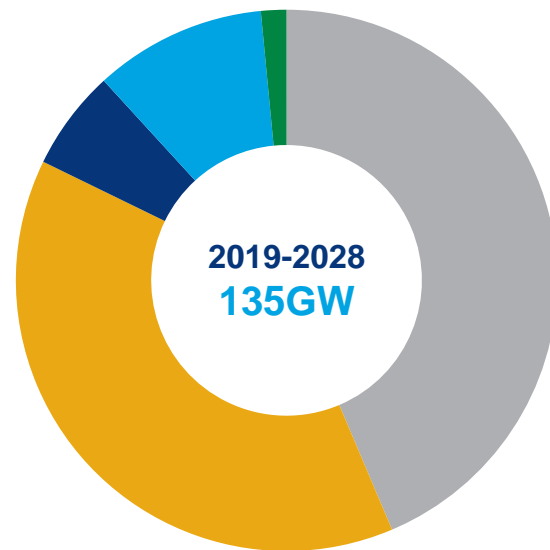
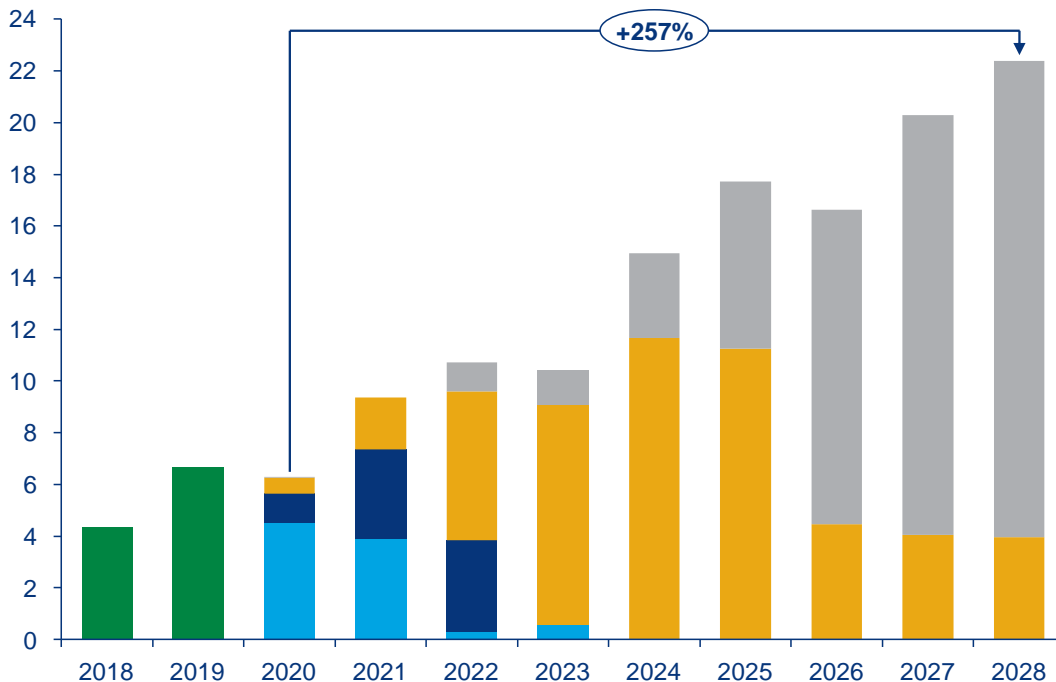
Offshore market forecasts: 2019-2029e



Offshore offers long-term visibility with 84% of 2019-2025 capacity awarded

Global offshore outlook by status

(GW)

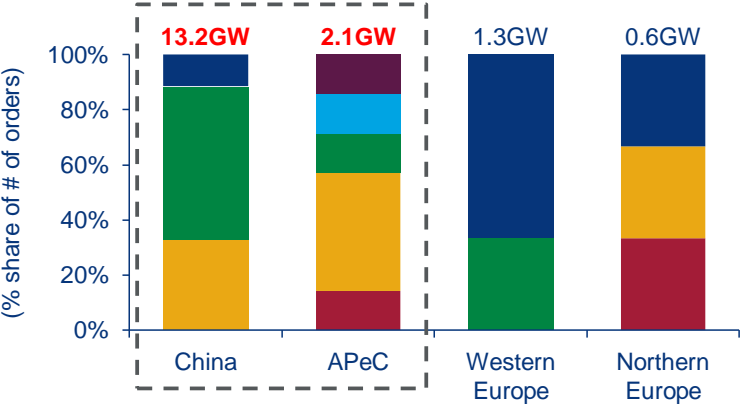


Not awarded support scheme | Awarded supportive scheme | FID | Under construction | Operational

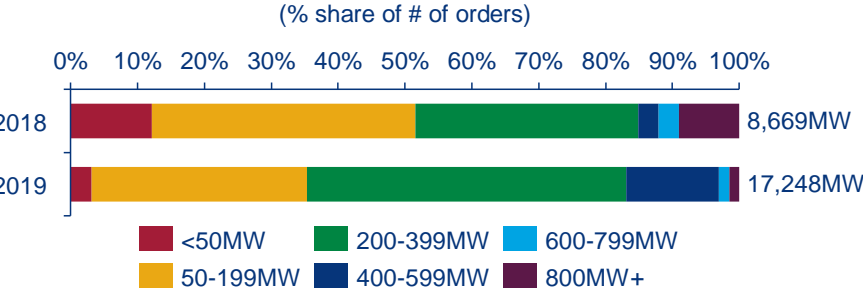
Projects in firm stages of development

Global avg. offshore order in 2019 was 265MW for 5.9MW rated turbines

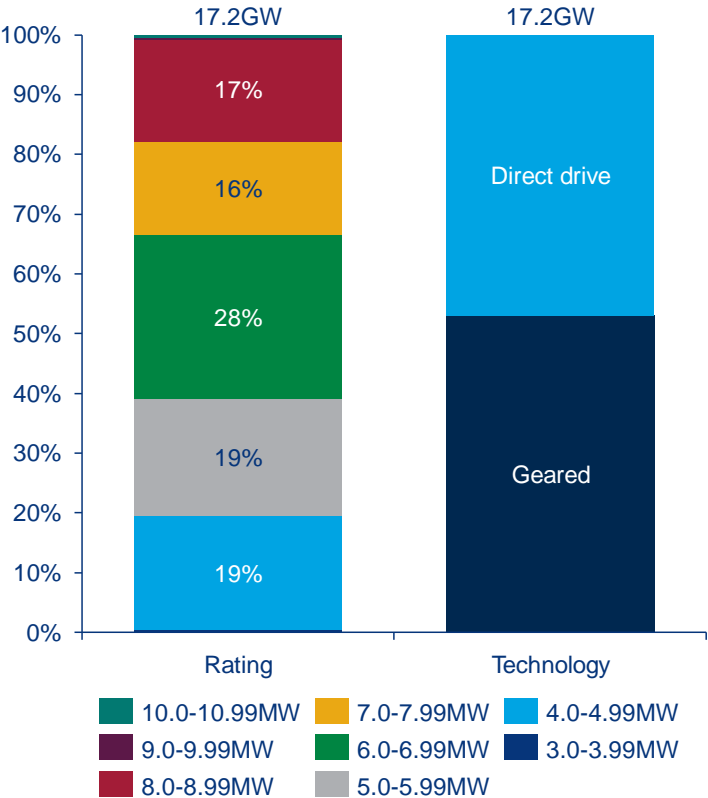
Number of offshore orders by size segmentation, FY/2019



Number of global offshore orders by size segmentation, FY/2019



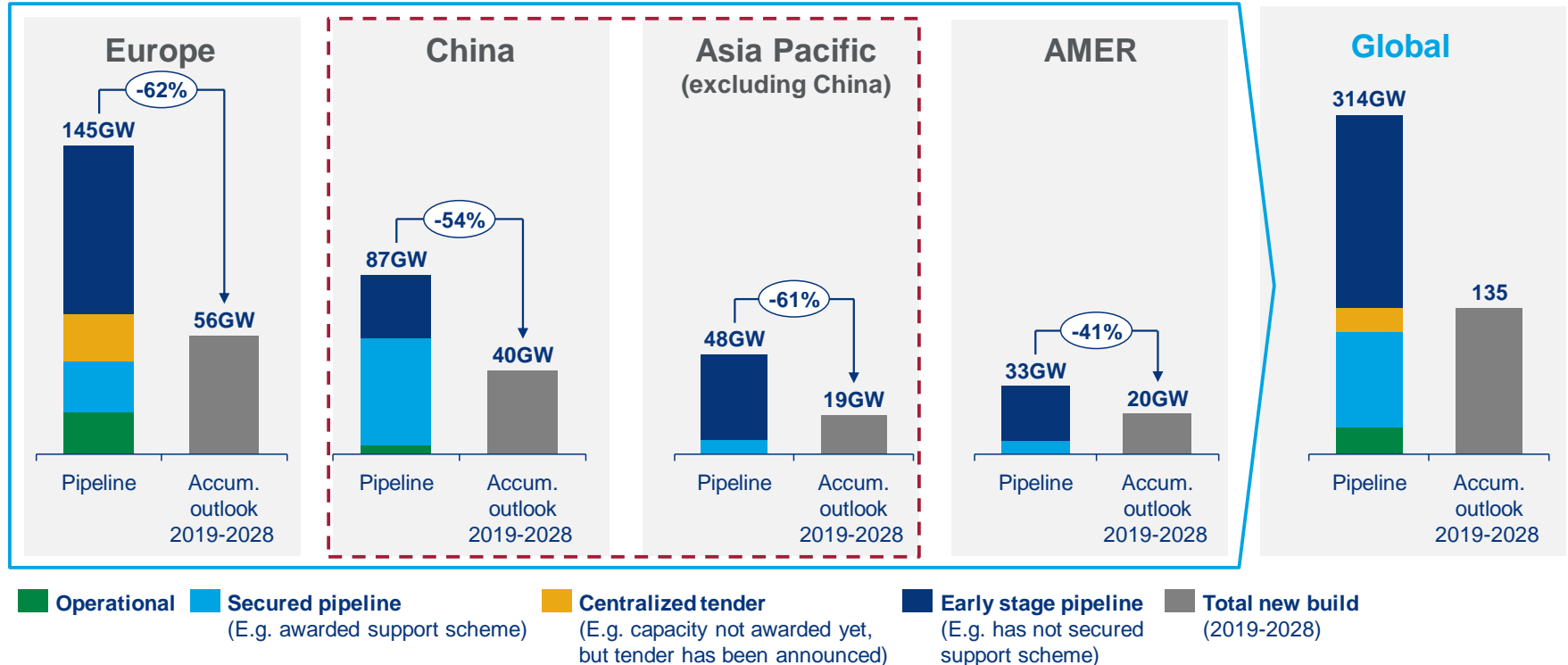
FY/2019 offshore firm order intake: Order mix



Note: Only announced, firm orders are included.
Source: Wood Mackenzie

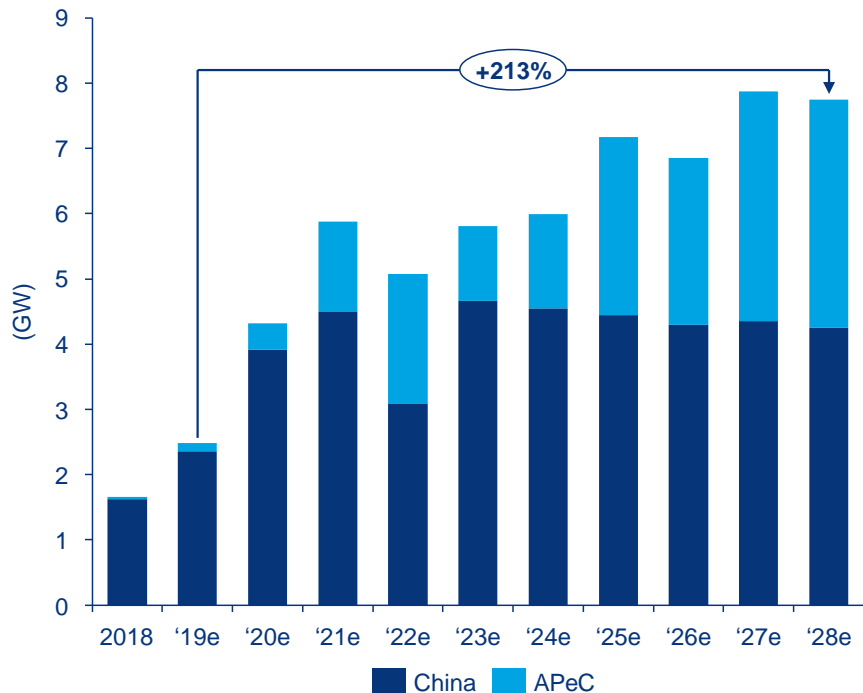
314GW of offshore wind projects have been stacked up across the globe

Global and regional offshore wind portfolio

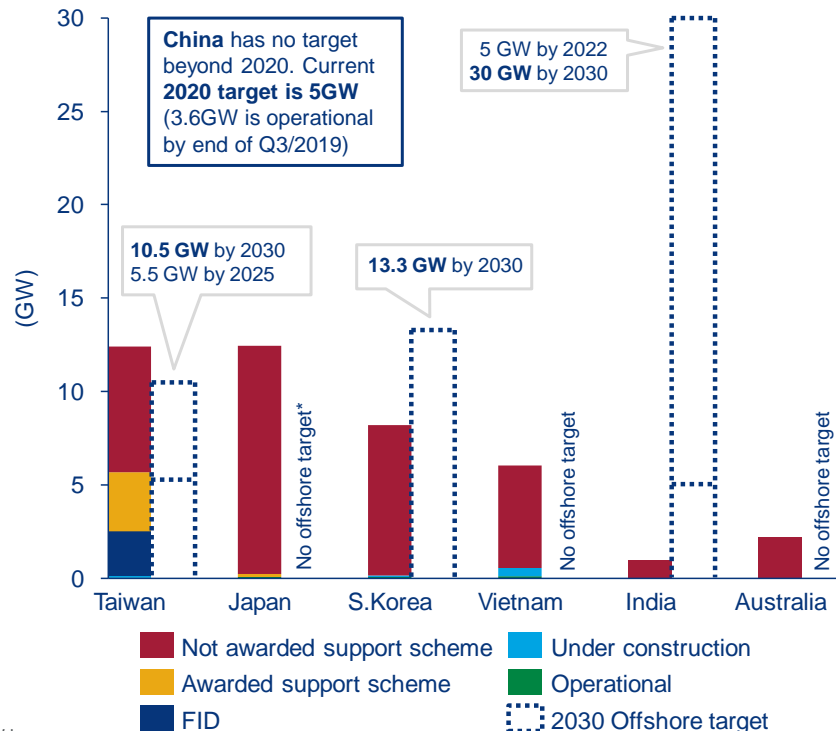


Ambitious APAC excl. China (APeC) offshore wind targets total 54GW by 2030

China and APeC outlook, new annual added, 2018-2028e



Pipeline vs national offshore targets in APeC, 1H/2019

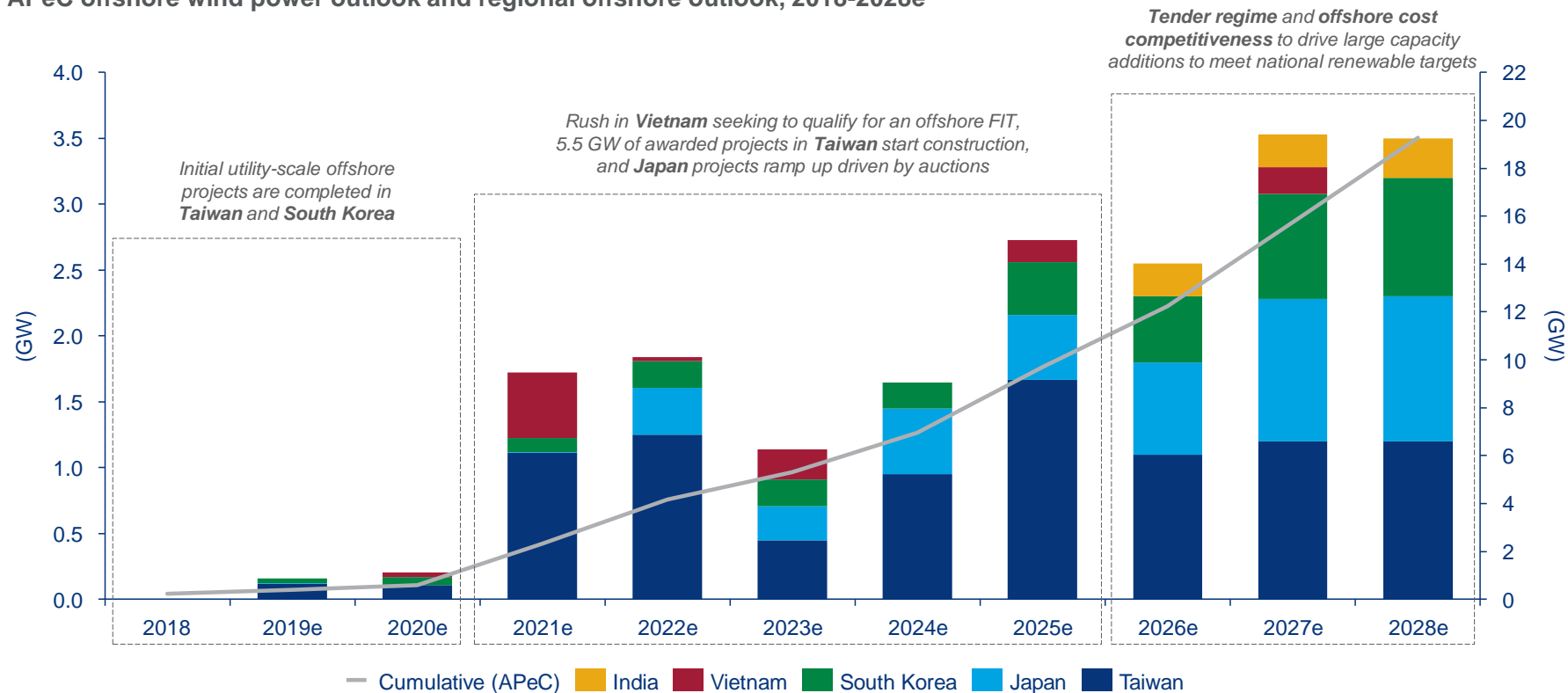


Note: *Though Japan has no national offshore wind target, the wind power industry is lobbying for 10GW by 2030.

Source: Wood Mackenzie

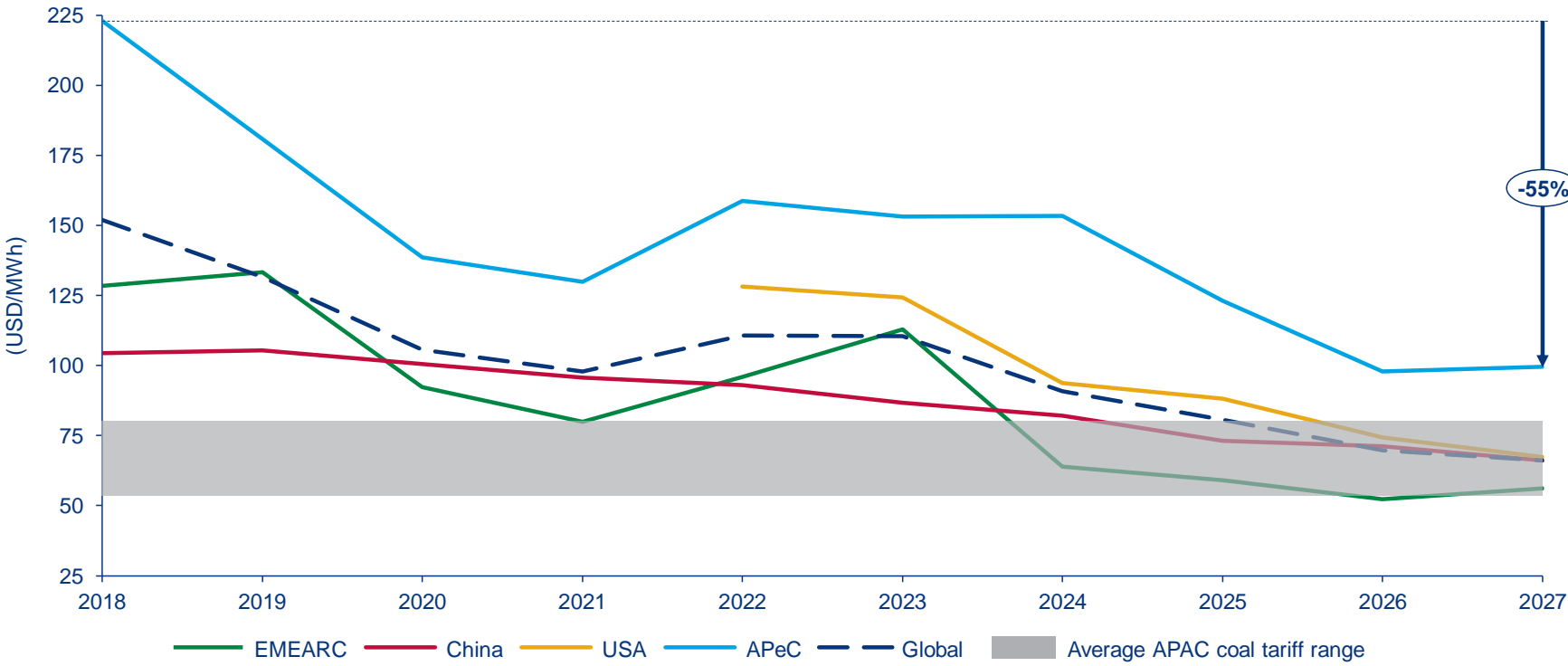
Over 1GW of fast-track projects in Taiwan will start the boom in APeC offshore

APeC offshore wind power outlook and regional offshore outlook, 2018-2028e



The average global offshore LCOE will decrease by half between 2019 and 2028

Global fixed-bottom offshore wind LCOE, 2018-2027



Coronavirus has limited impact on offshore wind compared to other sectors

● Supply chain capacity and logistics impact

- **Excess supply in Europe** leaving significant reserve capacity among suppliers to catch-up in 2H 2020
- **~7% of new capacity** additions in 2019 has been impacted by the COVID-19
- **Risk of delayed global expansion in the supply chain** ramp-up in major emerging markets

● Demand side and installation impact

- European sub-suppliers pre-coronavirus were **already facing a slow 2020**
- Only **minor delays during Q1 and Q2 in 2020 in China** are expected
- **Limited downside in Europe**, as only one tender, is planned for 2020
- Installation impact on **Asia Pacific excluding China and the US will be minor** (if any)

● Risks we're monitoring

- The **need for Coronavirus provisions** in contracts signed after the coronavirus pandemic emerged,
- **Uncertainty in the financial markets**
- Increased currency risk are likely to **delay planned FID decisions**
- Projects call of **force majeure because of supply chain issues** for wind turbine parts.
- Potential **shortage of key raw materials** in the supply chain
- Potential **delays in the planned offshore wind auctions** in 2020