



REC'S SOLAR MARKET INSIGHT

Q1 2016



ENERGIZING LIFE TOGETHER

June 6, 2016

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- 4 REC Market Study:
Climate Change - Closing the COP21 Gap



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2

3

4

2.2 MW, Singapore

REC Highlights Q1 2015



Major REC Q1 2016 Highlights

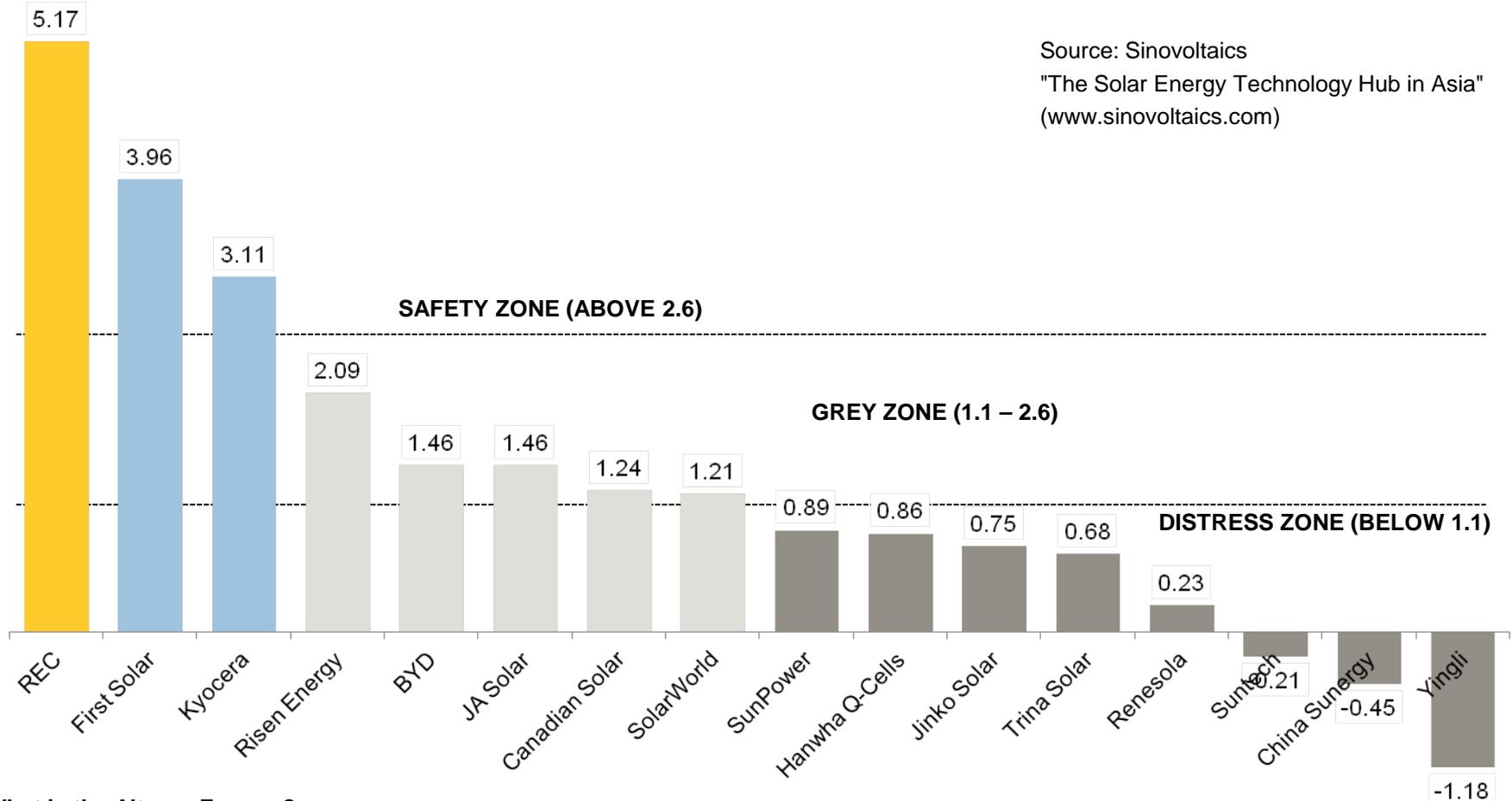


- Significant increase in Q1 sales over Q1 2015 – module shipments +37%
- Almost 60% of module shipments in Q1 2016 were to the US – steady sales in all other regions
- REC scores best among PV manufacturers in regards to financial health and bankability according to third-party analysis
- REC moves from 3rd place to 2nd place amongst the leading residential solar PV module manufacturers the US market
- REC's TwinPeak solar PV module is one of four named to "best of the best" list of high-efficiency solar PV modules
- Start of transition to 100% half-cut PERC cell production at REC's Singapore facility
- Start of expansion of the award-winning REC TwinPeak Series
- Debut of REC panels under full warranty on floating PV installation in Central Florida
- REC joining Global Solar Council as a founding Corporate Member – leading corporations around the world joining forces to accelerate the deployment of clean, reliable, emissions-free solar energy

REC scores best in proven Altman-Z score



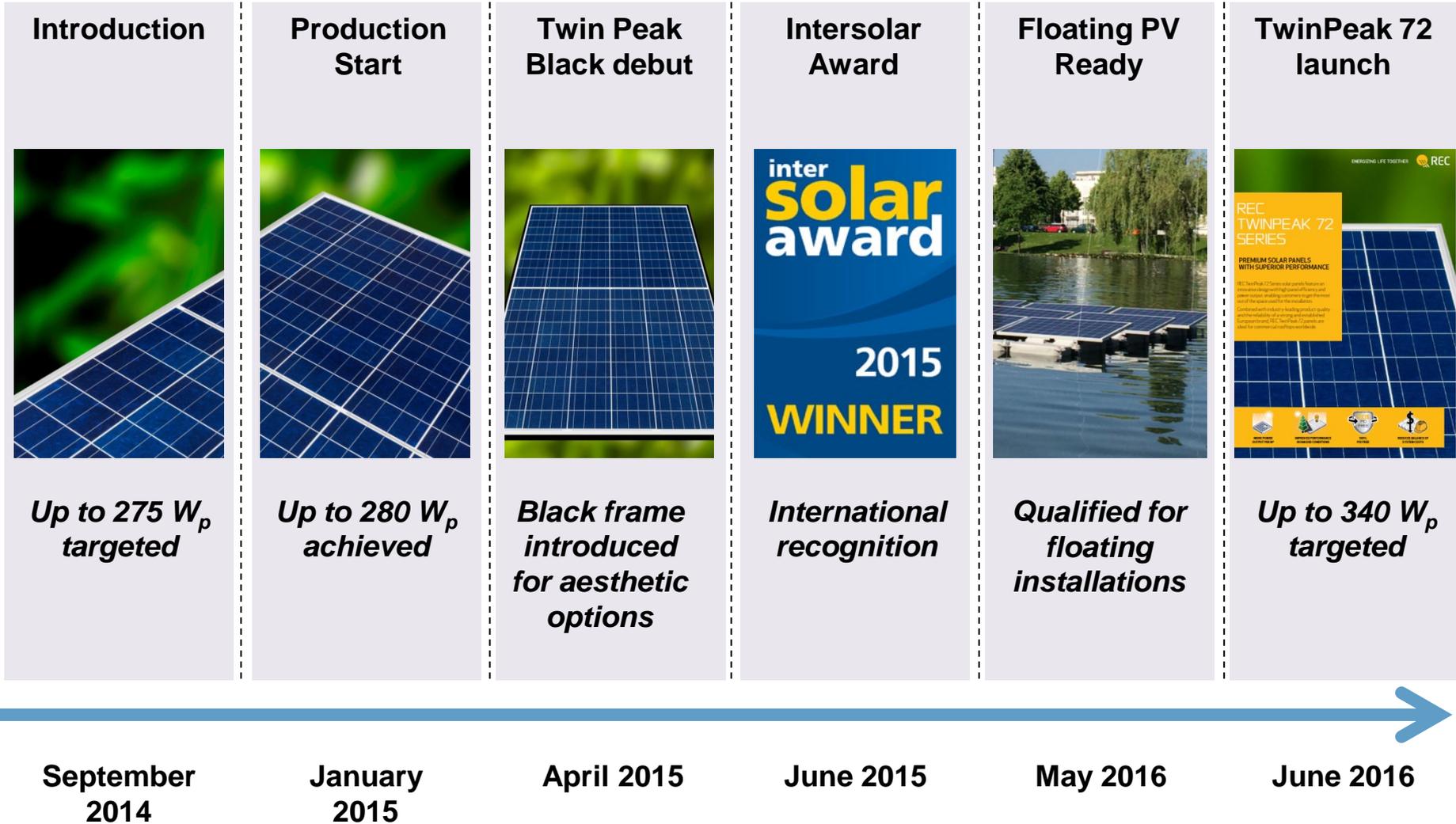
Altman-Z scores of PV manufacturers (as of March 9 & 10, 2016)



What is the Altman-Z score?

Developed by Edward Altman in 1968, the Altman-Z score is a measure used to predict the probability that a business will go into bankruptcy. It is a function of tangible assets, working capital, retained earnings, EBIT, market value of equity, total liabilities, and historical revenue. The score is widely accepted by auditors, accountants, courts, and database systems used to evaluate loans.

REC Expands its TwinPeak Module Success Story



Singapore Minister Event



- March 2016: At its manufacturing facility in Singapore and in the presence of Minister for Trade and Industry, S Iswaran, REC unveiled plans to invest S\$200 million (approx. US\$145 million) in the next 3 years to further increase its productivity and efficiency
- Furthermore, REC will invest S\$50 million (approx. US\$36 million) in R&D efforts to maintain REC panels at the leading edge over the next 5 years





15.53 MW, Kaua'i, USA

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2

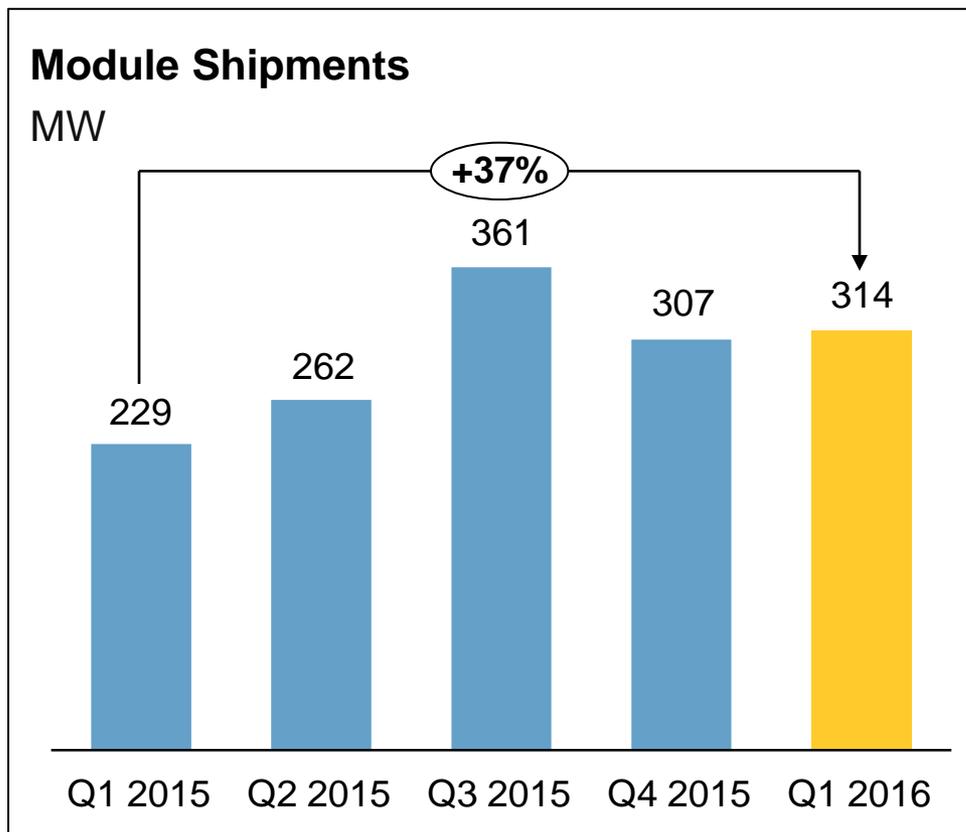
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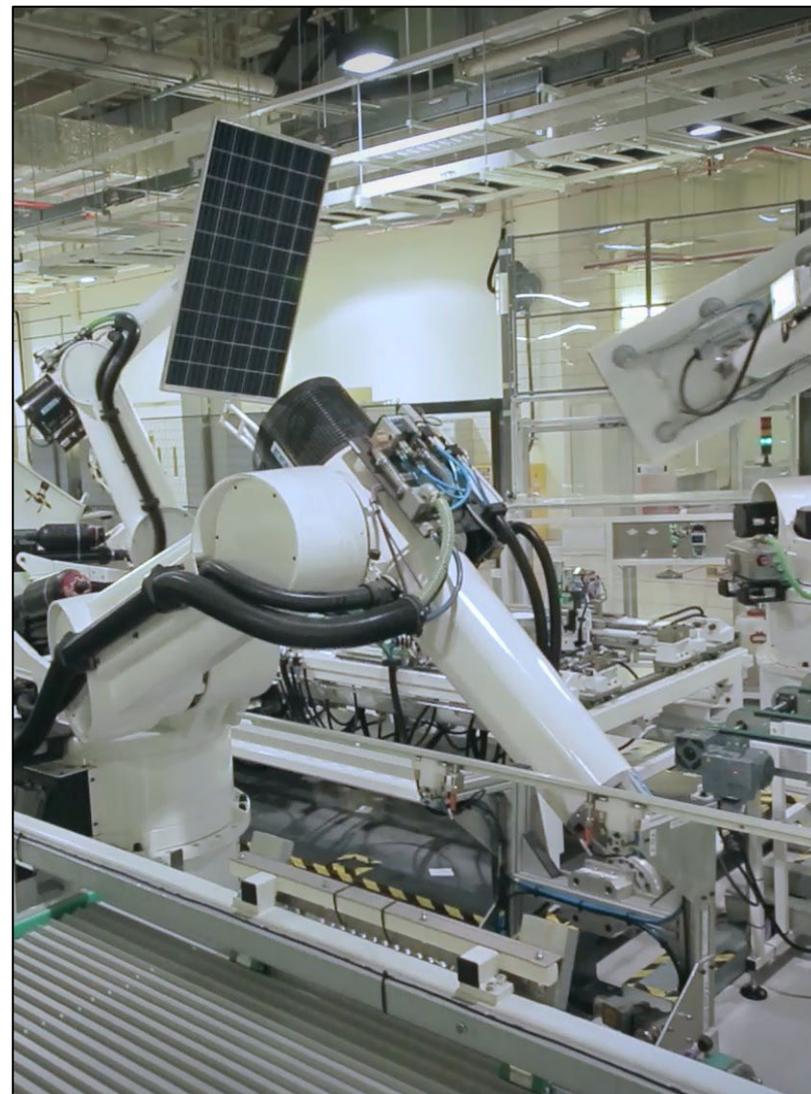
Q1 2016 Performance Highlights



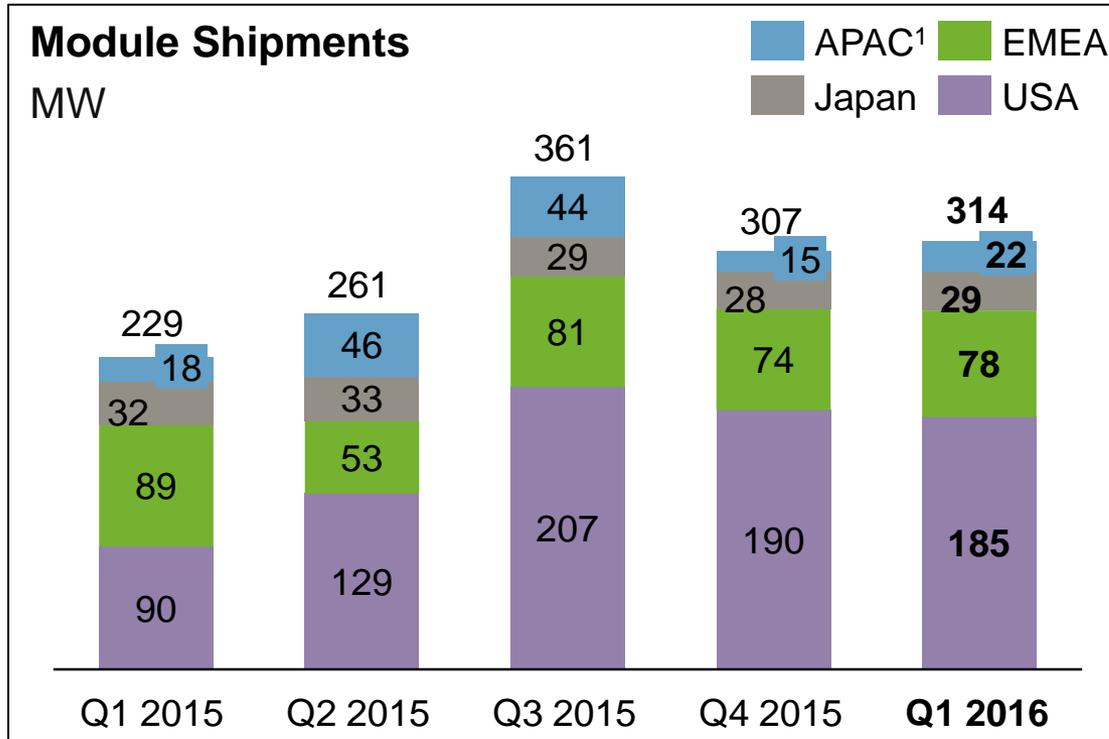
Increased module shipments in Q1 2016



- Increased quarterly module shipments of 314 MW in Q1 2016
- Q1 Module shipments represent a 37% increase over Q1 2015 shipments

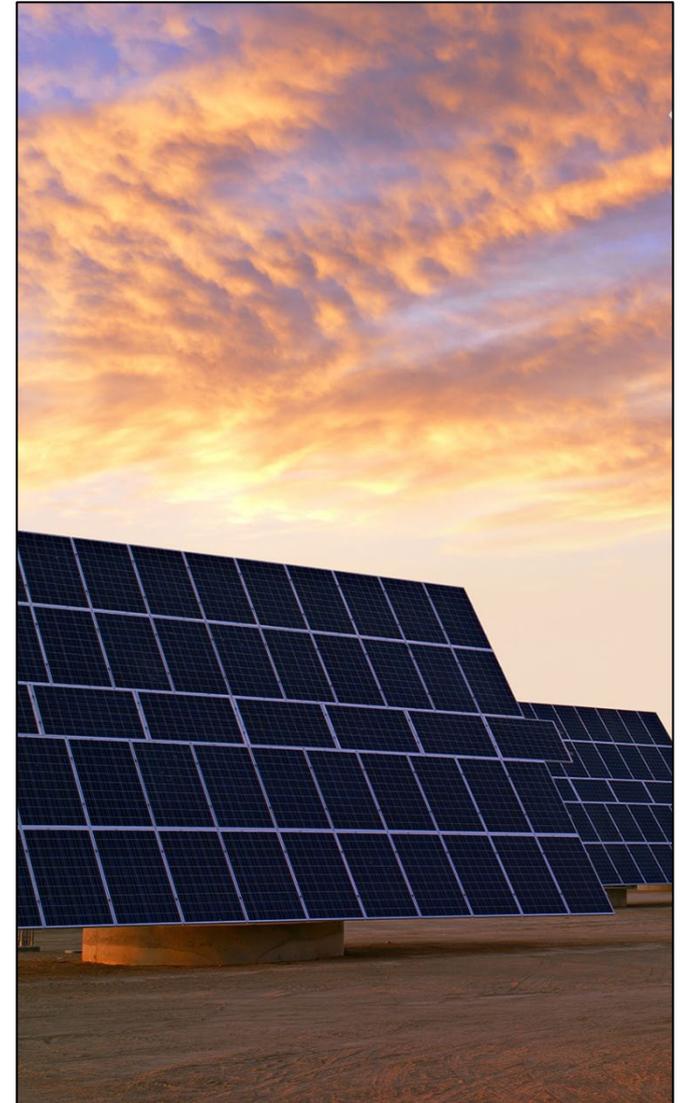


Continued strong sales in the US



- Almost 60% of module shipments in Q1 2016 were to the US
- More than doubling module shipments into US compared to Q1 2015
- Steady sales in all other markets

¹ excl. China





24 MW, Canino, Italy

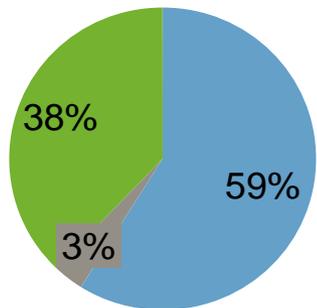
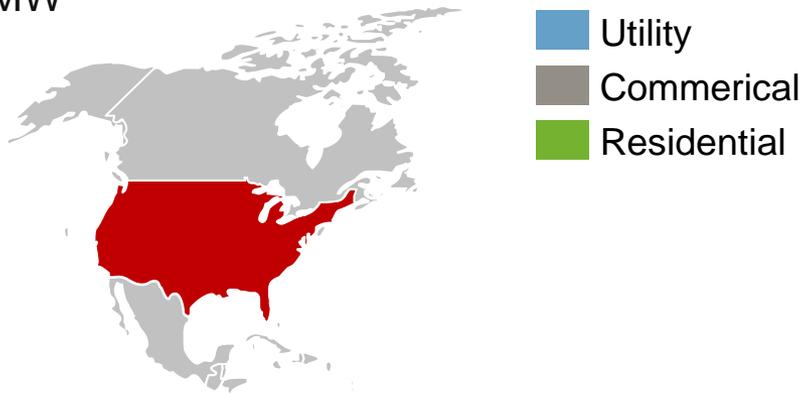
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Q1 2016 Regional Performance Highlights

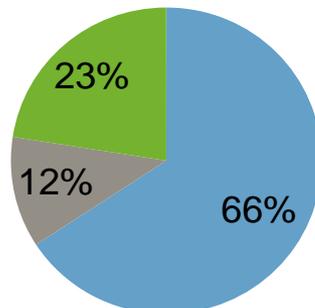


Q1 2016 Module Shipments¹

MW



REC Q1 2016



Total US Market

¹ REC and US market segment splits are best estimates

• Market Development Highlights

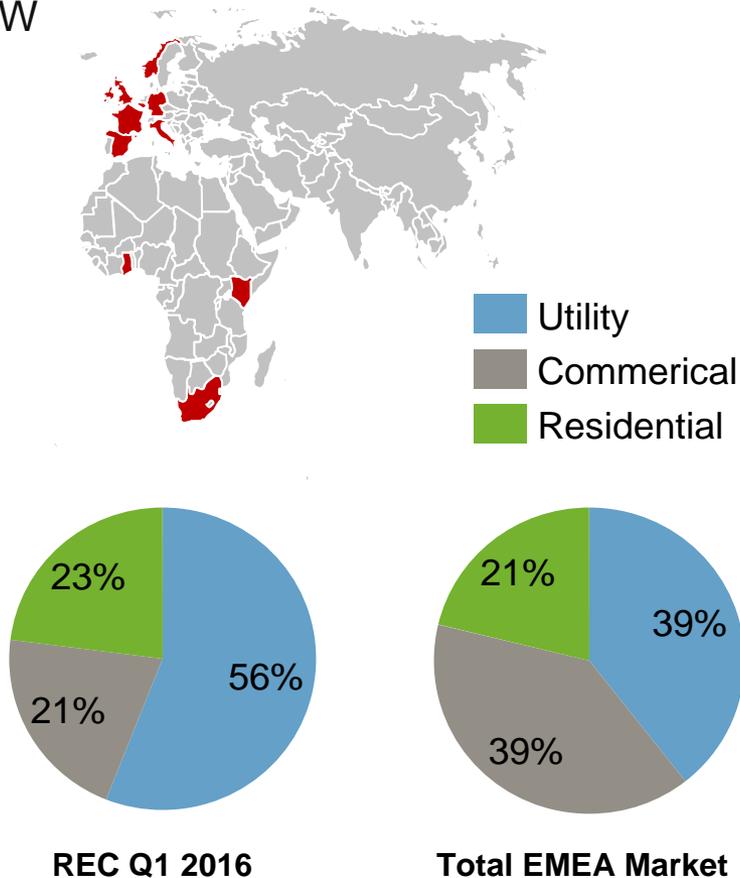
- Extension of the Federal Investment Tax Credit has led to a more sustainable demand growth in 2016 with many projects now able to run into 2017
- Supreme Court stay of the Clean Power Plan is not expected to affect solar PV demand over the short term
- City of Palo Alto negotiate a solar PV PPA at \$37/MWh – though to be a record low for a solar PV PPA

• REC Performance Highlights

- Continued strong sales into the utility and residential markets
- REC currently ranks as second largest module supplier into the US residential market and #1 in CA
- Debut of REC panels on a floating solar PV installation in Central Florida

Q1 2016 Module Shipments¹

MW



¹ REC and EMEA market segment splits are best estimates

• Market Development Highlights

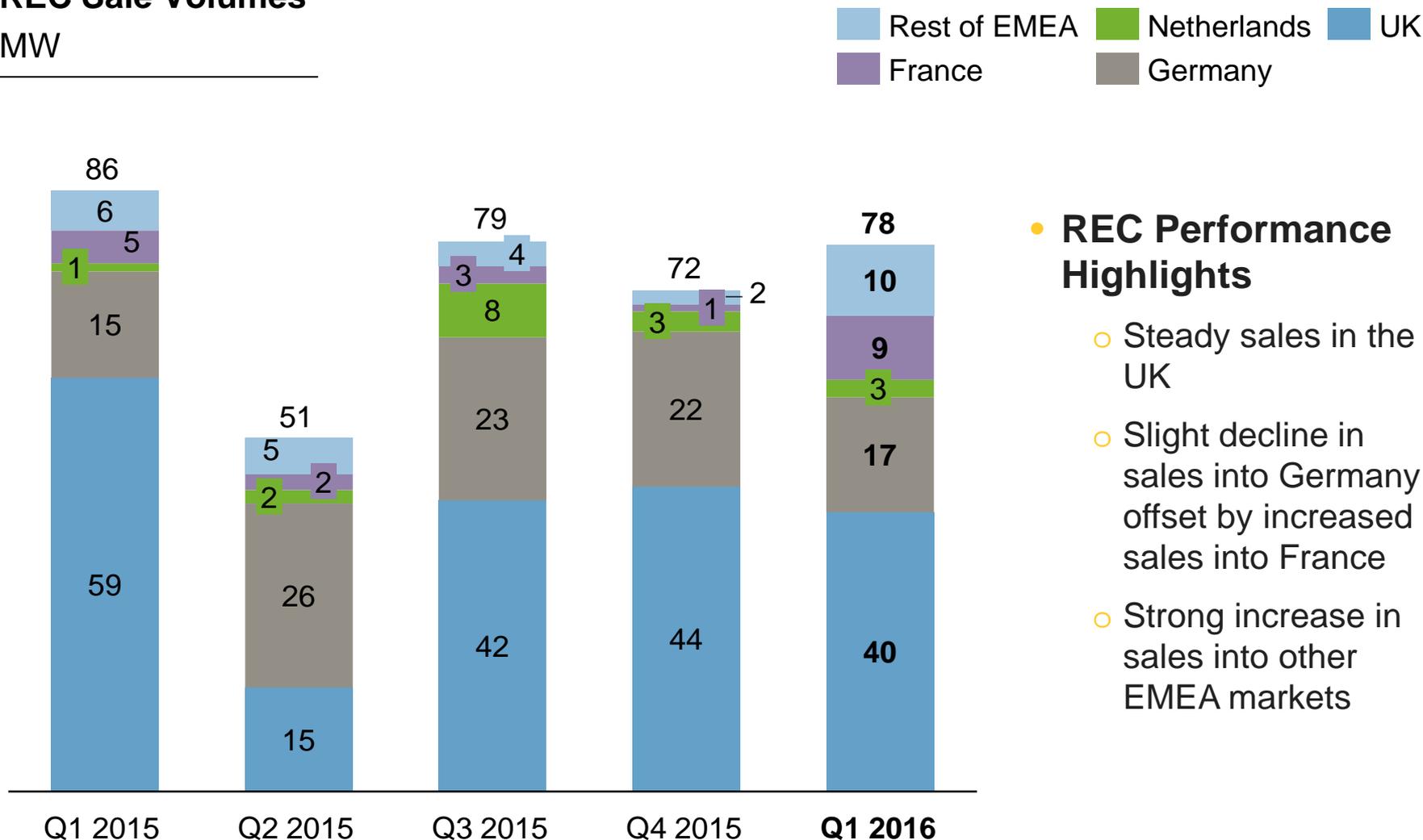
- Tariffs bid in the 4. German power auction continue downward trajectory – between 6.94 and 7.68 Euro Cents per kWh
- Nevertheless and despite stable FiT since Sep 2015, with 193.5 MW installed capacity in Q1 2016, demand in Germany is still behind plan of annual installations of 2,400 - 2,600 MW
- French authorities green light proposal to triple solar PV capacity by 2023 to 20 GW
- UK solar PV installation in large scale segment show a slight peak in Q1. A number of projects on ROC grace period will be build later in 2016.

Regional Highlights – EMEA: The UK and German markets continue to account for the bulk of sales



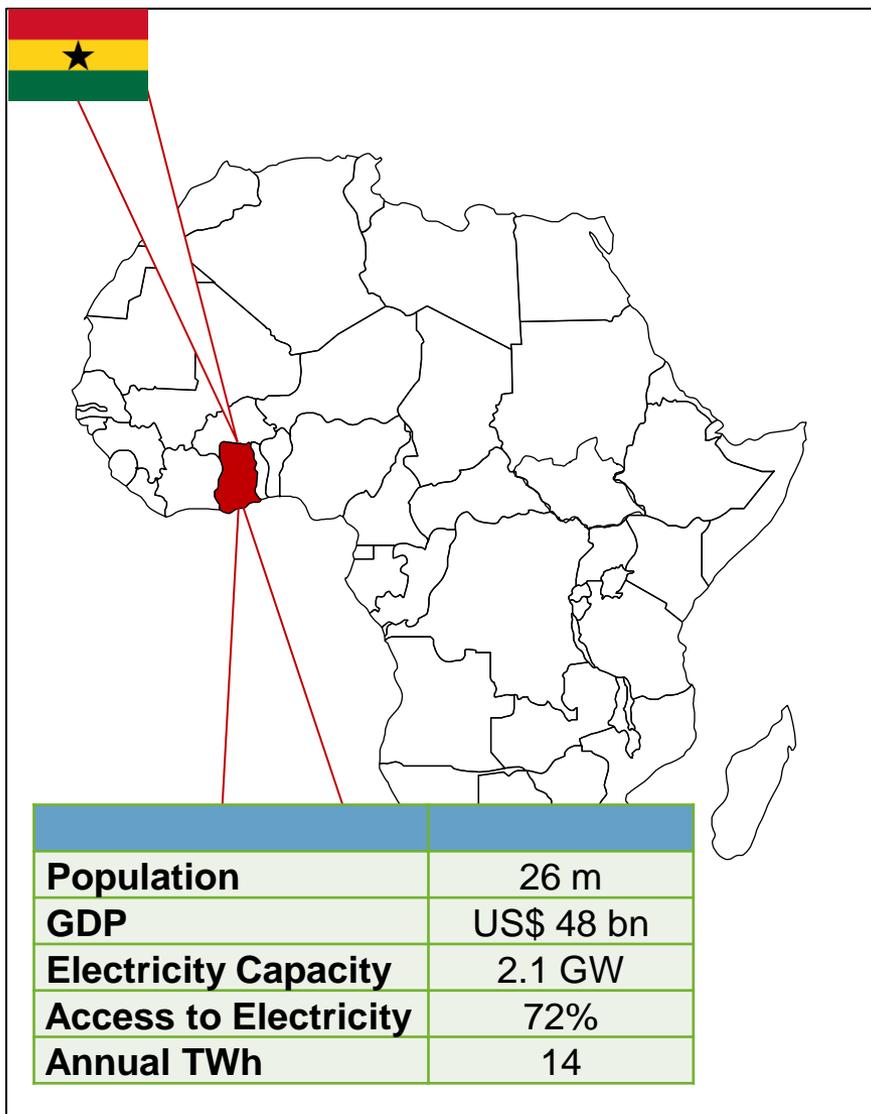
REC Sale Volumes

MW



• REC Performance Highlights

- Steady sales in the UK
- Slight decline in sales into Germany offset by increased sales into France
- Strong increase in sales into other EMEA markets



• Market Development Highlights

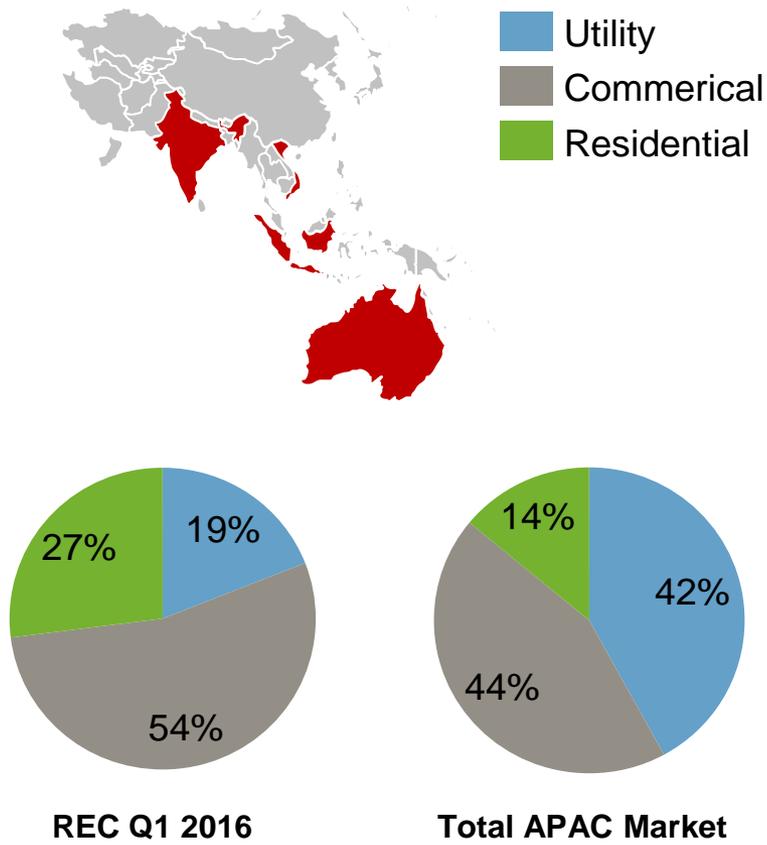
- Electricity tariff hikes of 59% in Ghana result in highest net tariff in the country approaching US\$0.54/ kWh for a non-residential consumer with an annual demand of 600 kWh or more
- Development makes home or commercial installation of solar PV systems for self-consumption an increasingly attractive proposition

• REC Performance Highlights

- REC panels to provide solar power to 4 villages across Ghana
- The four systems total 189 kW and provide clean electricity to 573 households as well as street lighting
- Designed as micro grids for rural areas with no traditional grid connection
- A World Bank project, realized with REC's partner Trama Tecno Ambiental in Spain

Q1 2016 Module Shipments¹

MW



¹ REC and APAC market segment splits are best estimates

• Market Development Highlights

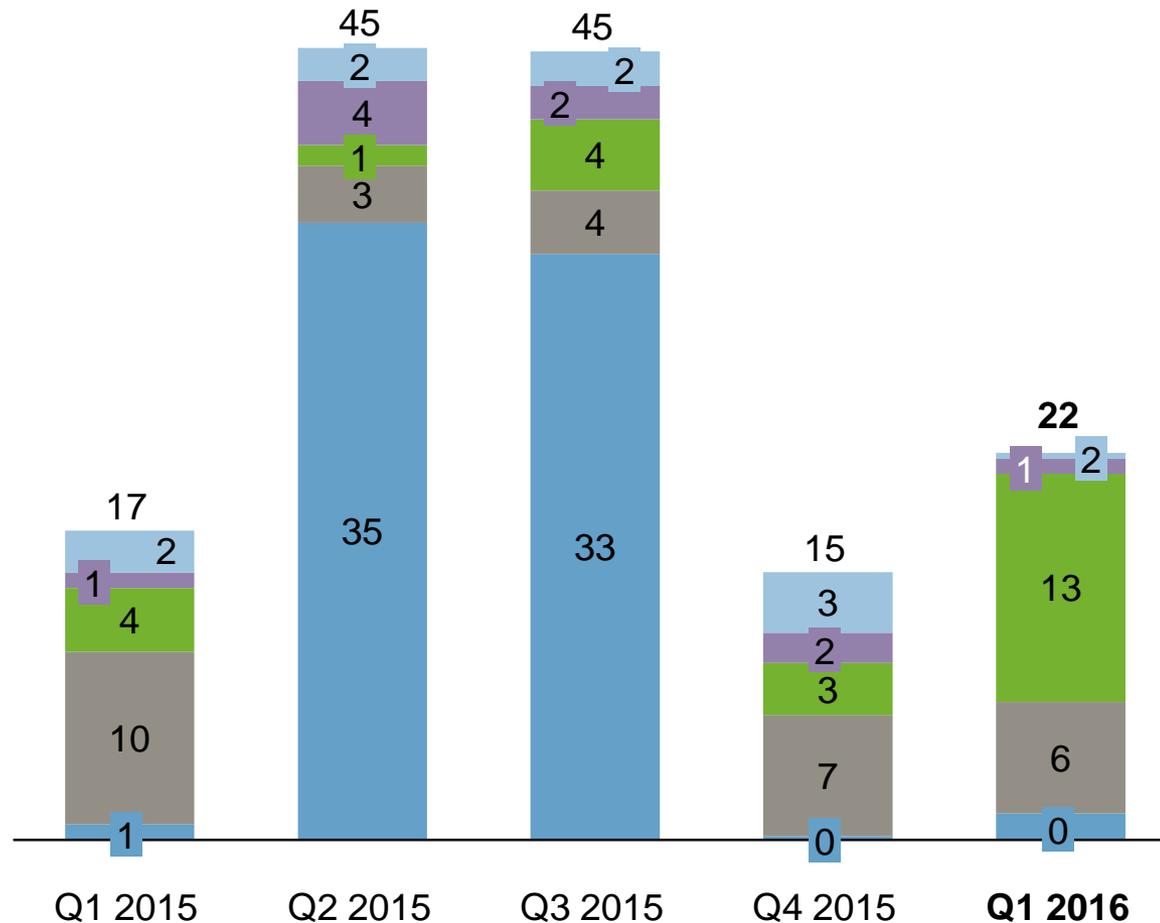
- Indonesia expected to launch FiT imminently with a current quota of 1.5 GW in place
- Weighted average FiT expected to be approx. US\$0.10/kWh but certain regions will enjoy higher tariffs
- Indonesia's transmission network needs significant upgrades for new connections

Regional Highlights – APAC: India was top sales region in Q1



REC Sale Volumes

MW

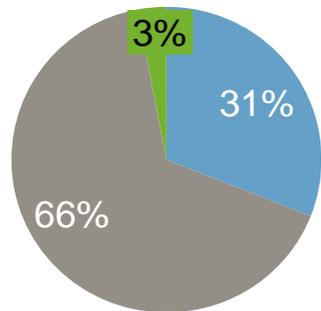
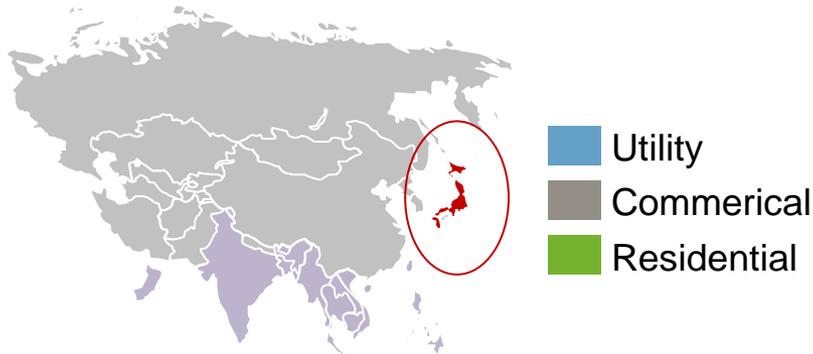


REC Performance Highlights

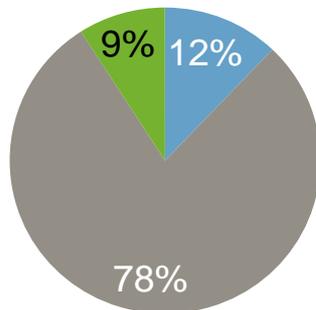
- REC announces a S\$50 million R&D agreement with the Solar Energy Research Institute of Singapore
- Increasing sales into India including securing REC's largest order to date in that market – a 7 MW supply agreement
- As an emerging region, APAC is dominated by high growth rates but also strong fluctuations

Module Shipments¹

MW



REC Q1 2016



Total Japan Market

¹ REC market segment module shipment volume splits are best estimates

• Market Development Highlights

- Japan's Ministry of Economy, Trade and Industry targets that by 2030, solar PV will account for 7% of total power production under their draft plan
- The support mechanism for utility-scale solar expected to switch from FiT to an auction system likely starting in April 2017
- Solar PV installations are expected to peak in 2016 – new FiT applications have already peaked

• REC Performance Highlights

- Solid sales to Commercial and Utility segments
- Good exposure to residential customers at PV Expo 2016.



573 kW, Dubai, UAE

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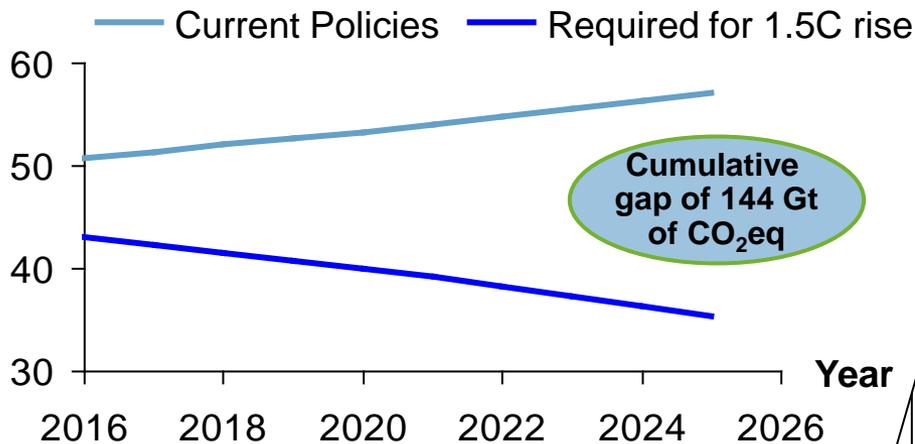
REC Market Study: Climate Change - Closing the COP21 Gap



REC has presented estimates of global solar PV deployment required to meet COP 21 goals

- To limit temperature increases to 1.5°C and to prevent sharply increased emission requirements in later years, emissions need to be reduced by an additional **144 Gt of CO₂eq** by 2025.

Global CO₂eq emissions, Gt

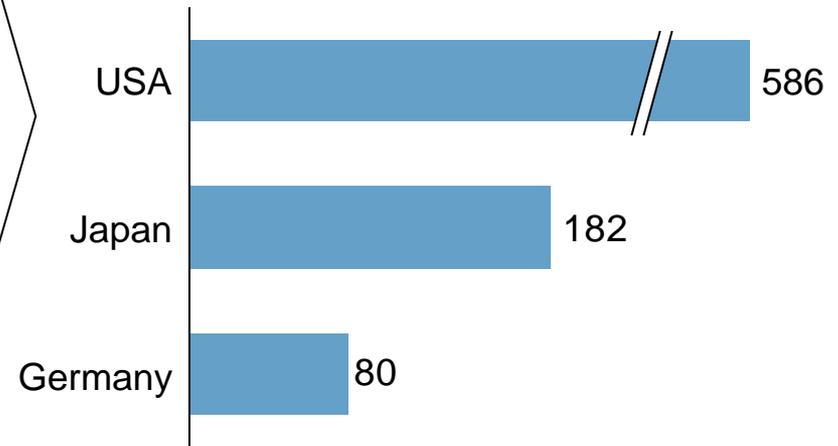


- If solar PV is to meet 25% of the required emissions, the cumulative **solar PV installed capacity** needs to increase by **4,800 GW** by **2025**

And REC has also started to do this work at the country-level as well

- Individual country** contributions to the global target can be calculated based on **country level contributions** to CO₂ emissions as well as **existing policy actions** in place to mitigate emissions

New Solar PV Additions required, GW

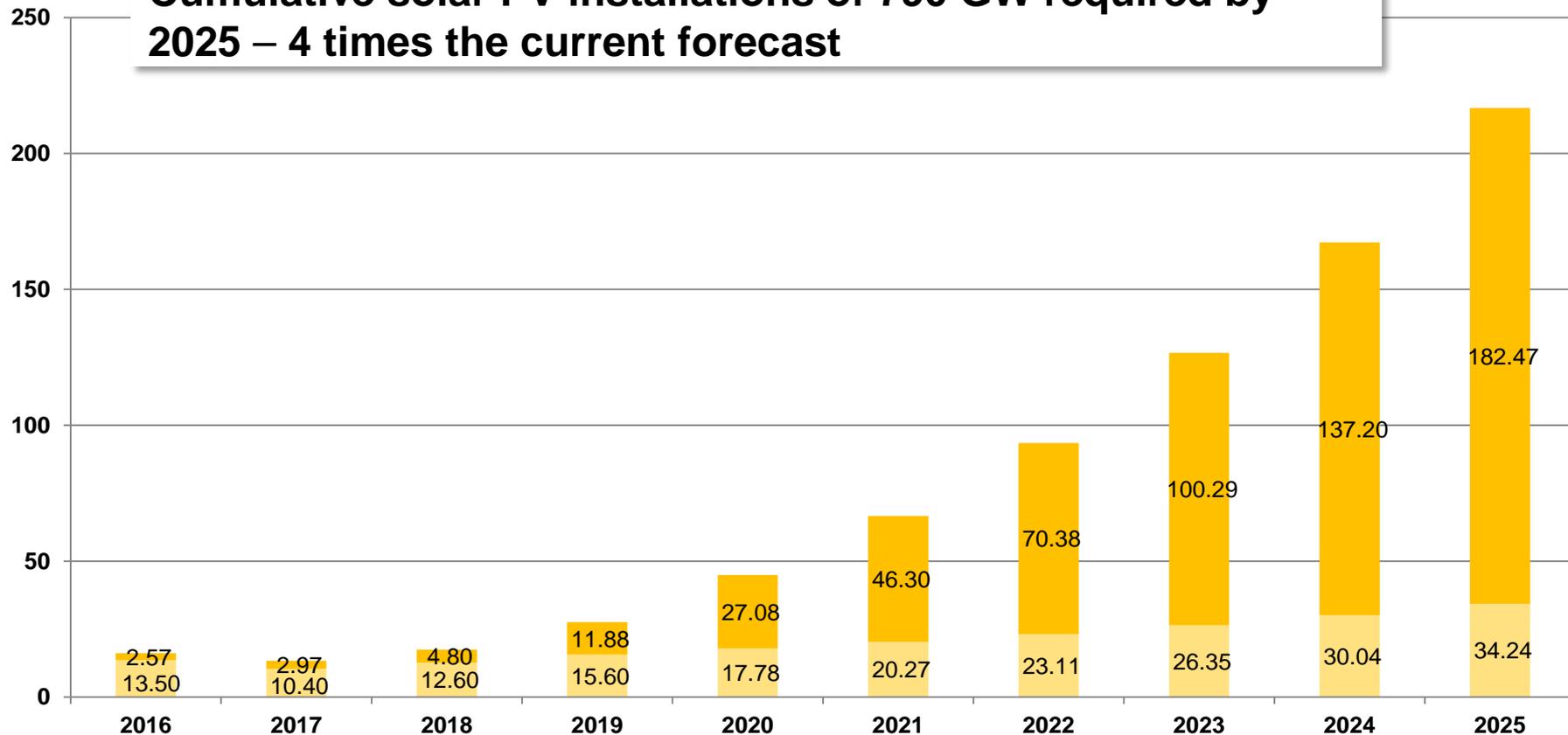


- The 4,800 GW** of new solar PV required can be **dis-aggregated** to the **country-level contributions** required to help develop effective solar PV **policy** for every country

GW

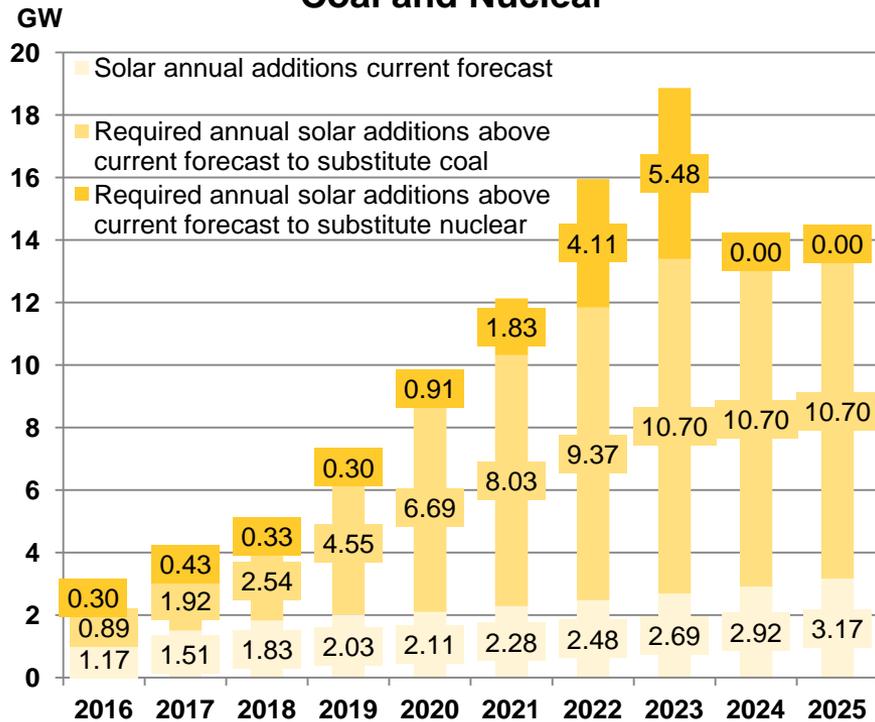
- Current forecast annual solar PV additions in US
- Proposed solar rampup above current forecast in US (practical solution)

Cumulative solar PV installations of 790 GW required by 2025 – 4 times the current forecast



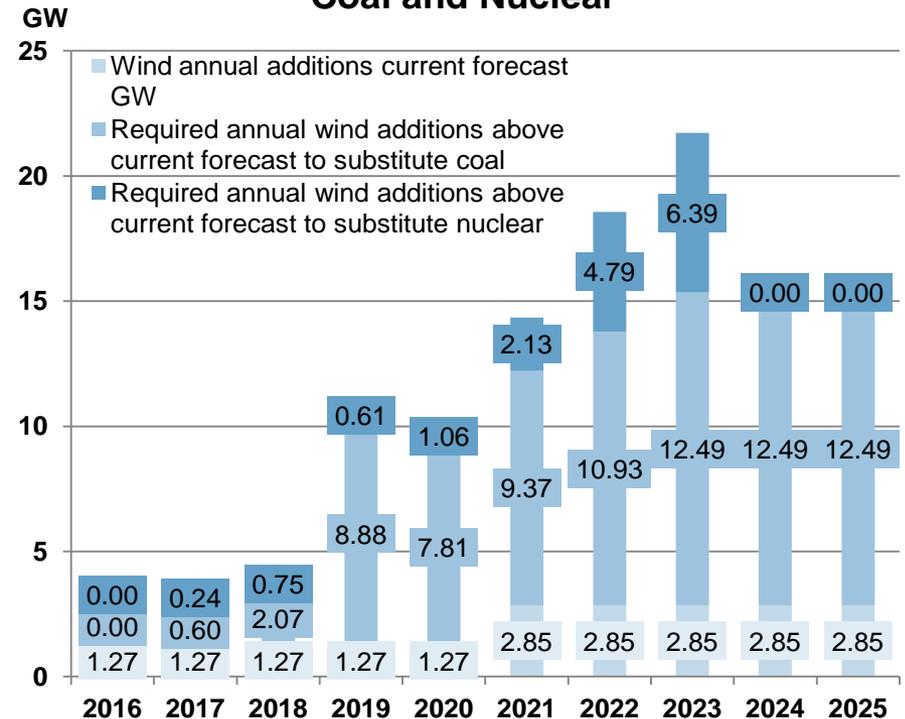
Source: IHS 2015 (incl. PV outlook until 2020); REC internal analysis

Proposed Rampup Solar to Substitute Coal and Nuclear



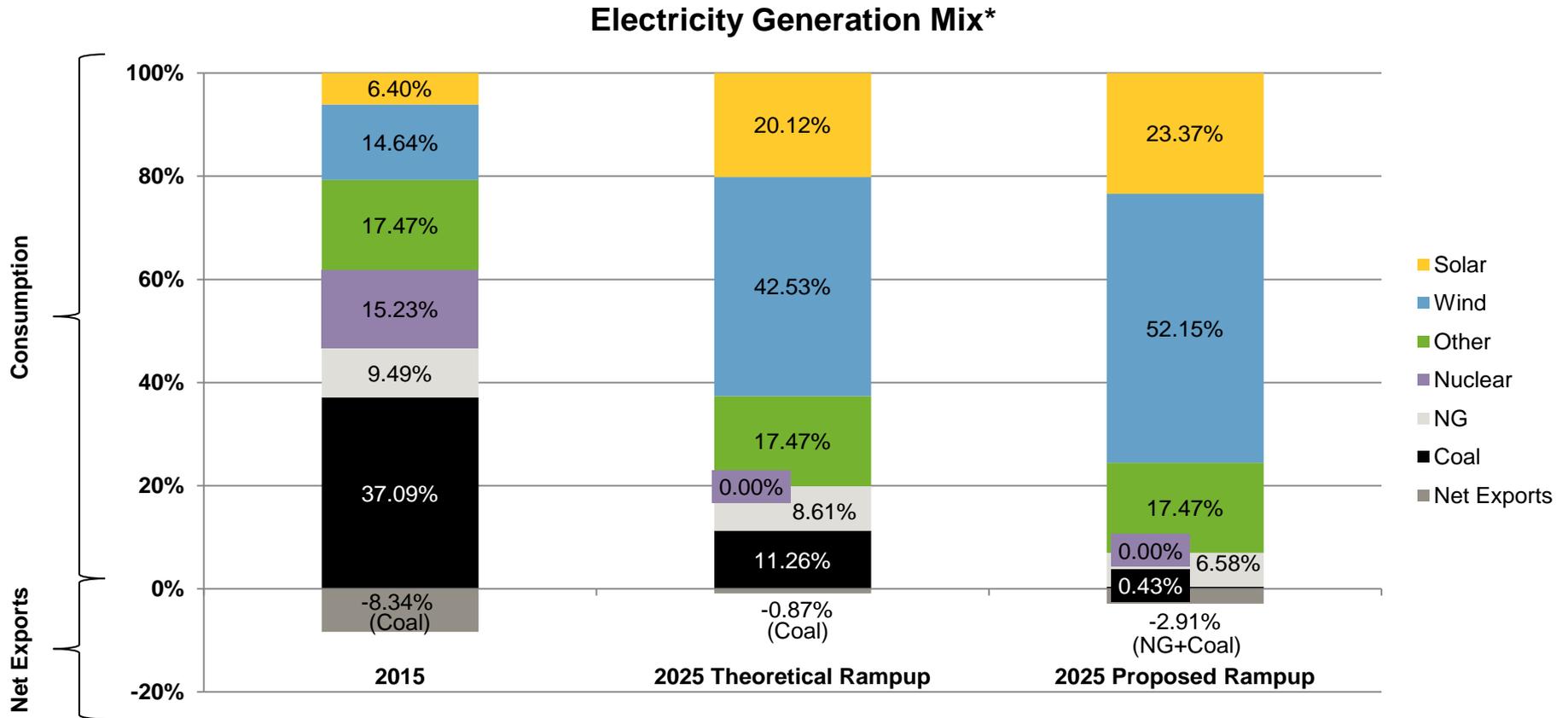
Source: IHS 2015 (incl. PV outlook until 2020); REC internal analysis

Proposed Rampup Wind to Substitute Coal and Nuclear



Source: EWEA Wind Energy Scenarios 2030; REC internal analysis

- Substituted coal and nuclear power generation capacities will be replaced **~30% by solar and ~70% by wind**
- This ramp up will require **each year, on average 8.31 GW of solar capacity in addition to the current forecast** → **cumulated total capacities by 2025 represent a 4.6-times ramp up** of the current forecast
- Furthermore, this ramp up will require **each year, on average 9.71 GW of wind capacity in addition to the current forecast** → **cumulated total capacities by 2025 represent a 5.5-times ramp up** of the current forecast



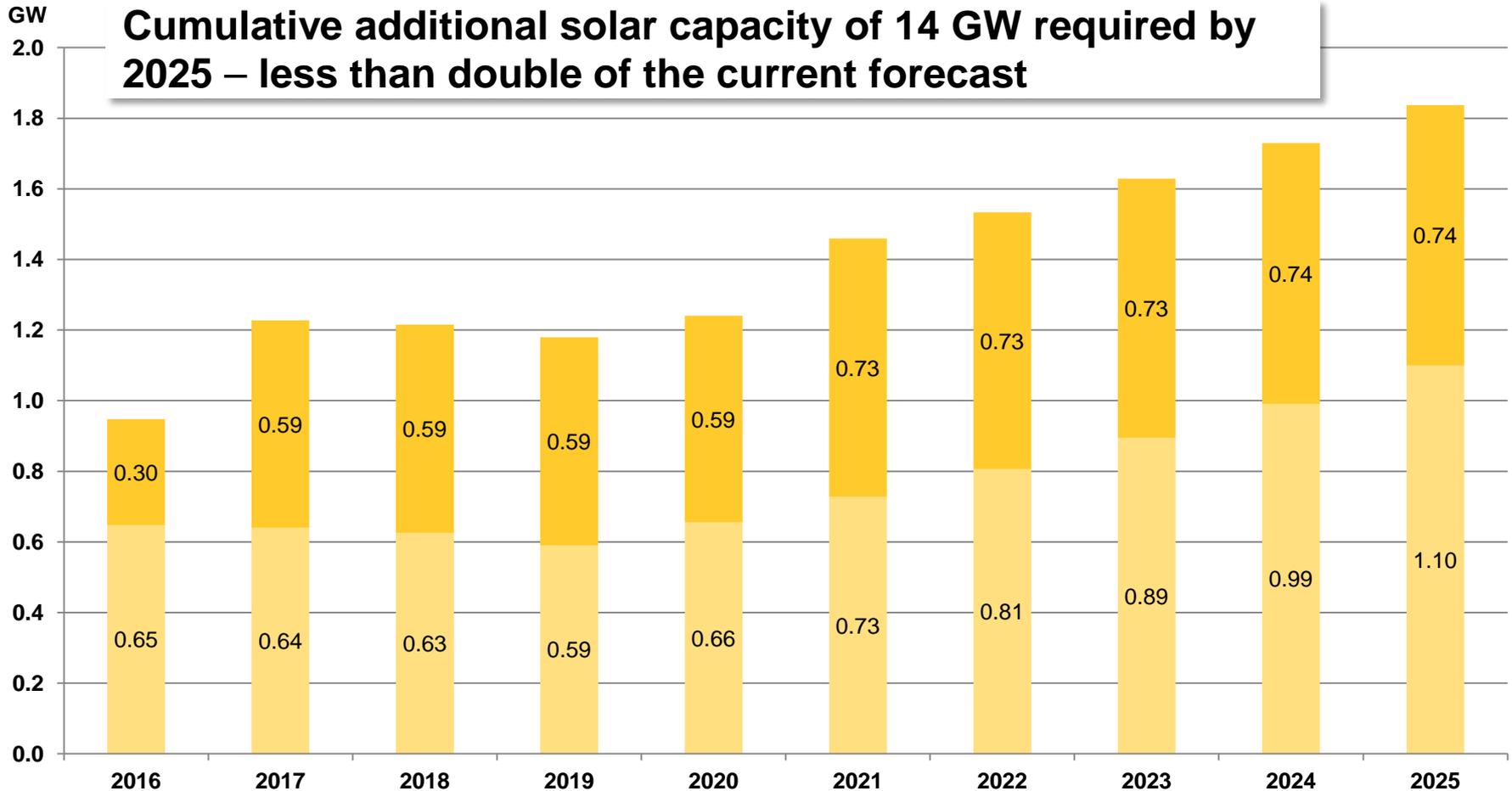
Source: BMWi, AGEB (Energiedaten Jan 2016); REC internal analysis

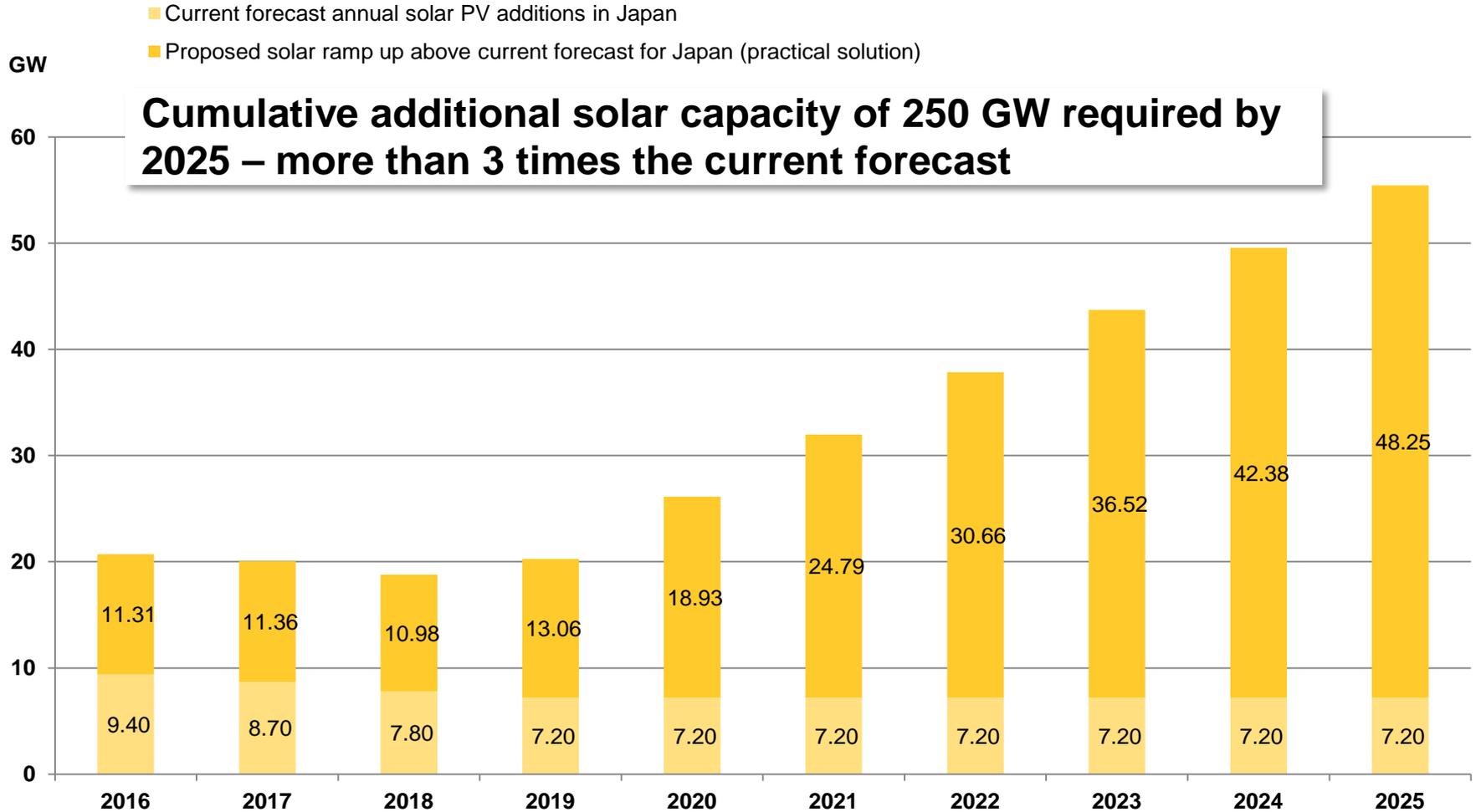
* Assuming constant electricity consumption

- The proposed ramp ups will bring **solar and wind** alone (without biomass and hydro electricity) to a total **share of ~75% in the German electricity consumption mix**
- The **set target for renewable energy to represent 40-45%** in the German electricity consumption mix by 2025 is **far too low** to close the cumulated emissions gap by 2025 and fully exit nuclear power generation by the end of 2022

Proposed Solar Ramp up in The Netherlands

- Solar annual additions current forecast
- Solar annual additions proposed rampup above current forecast (2016-2025)





Source: IHS 2015 (incl. PV outlook until 2020); REC internal analysis



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