Distributed photovoltaic power generation

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Globally, distributed solar PV capacity is forecast to increase by over 250% during the forecast period, reaching 530 GW by 2024 in the main case. Compared with the previous six-year period, expansion more than doubles, with the share of distributed applications in total solar PV capacity growth increasing from 36% to 45%.

Commercial and industrial systems remain the largest growth segment because they are usually more inexpensive and have a relatively stable load profile during the day that can enable larger savings on electricity bills, depending on the policy scheme in place.

Of all renewable technologies, additional growth potential is highest for distributed PV because consumer adoption can be very rapid once the economics become attractive. Distributed PV growth could therefore be almost 30% higher in the accelerated case, assuming:

4) real-time self-consumption at a value-based price (usually between the wholesale and retail price), whereby utilities or regulators estimate the value of PV generation based on avoided generation capacity expansions, fuel expenditures and any additional costs, and on benefits to the system or society (grid integration costs, CO_2 reduction value, capacity credits, etc.);

The use of these schemes to increase distributed PV deployment varies by segment and region. Over 80% of residential growth during 2019 24 will be from buy-all, sell-all schemes or net metering, mainly in the United States and China. Conversely, the main driver for commercial growth is self-consumption in real time, largely because of the good match between electricity demand and peak PV production at midday.

Value-based tariffs cover 30% of distributed PV growth up to 2024, especially driven by commercial systems in Europe and residential systems in Australia. Most US states, some countries in Europe, and relatively nascent markets such as Latin America and the Caribbean, India and Association of Southeast Asian Nations (ASEAN) economies are still implementing net-metering schemes that remunerate excess generation with retail tariffs.

Residential solar PV capacity expands from 58GW in 2018 to 143GW in 2024, and annual capacity additions are expected to more than triple to over 20GW by 2024. China"s residential PV growth is forecast to accelerate substantially compared with the previous six years. As a result, the country registers the largest installed residential solar PV capacity in the world by 2024 thanks to FITs under the buy-all, sell all model, surpassing the European Union, the United States and Japan.

The United States is the second-largest growth market after China, with expansion driven by federal tax

incentives and annual net-metering schemes in many states (Figure 2.15). In addition, California"s new mandate requiring PV panels on new homes and buildings of up to three storeys after 2020 contributes to growth.

Australia and Japan lead Asia Pacific deployment, while growth continues to be limited in India and other emerging and developing countries due to minimal policy incentives, the absence of regulations (or their inadequate implementation), and low, cross-subsidised residential electricity tariffs, making the economics unattractive. In Latin America, residential expansion is expected to accelerate because of new net-metering and self-consumption policies in Brazil, Chile and Argentina.

Commercial and industrial solar PV capacity is forecast to expand from 150GW in 2018 to 377GW in 2024, with annual capacity additions increasing by 50% to 44GW in 2024. China remains the largest growth market, but unlike for the residential segment, expansion in the AsiaPacific region is larger than in Europe and North America, mainly owing to strong policy incentives in Japan, Korea and India.

In the European Union, commercial PV growth in the main case forecast accelerates compared with the previous six-year period, thanks not only to sustained deployment in Germany but also to emerging growth markets such as France, the Netherlands and Spain as a result of improved policy environments.

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