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Between 1992 and 2023, the worldwide usage of photovoltaics (PV) increased exponentially. During this period, it evolved from a niche market of small-scale applications to a mainstream electricity source.[4] From 2016-2022 it has seen an annual capacity and production growth rate of around 26%- doubling approximately every three years.

Since the 1950s, when the first solar cells were commercially manufactured, there has been a succession of countries leading the world as the largest producer of electricity from solar photovoltaics. First it was the United States, then Japan,[8] followed by Germany, and currently China.

By the end of 2022, the global cumulative installed PV capacity reached about 1,185 gigawatts (GW), supplying over 6% of global electricity demand,[9] up from about 3% in 2019.[10]In 2022, solar PV contributed over 10% of the annual domestic consumption of electricity in nine countries, with Spain, Greece and Chile over 17%.[9]

In 2022, the total global photovoltaic capacity increased by 228 GW, with a 24% growth year-on-year of new installations. As a result, the total global capacity exceeded 1,185 GW by the end of the year.[9]

Asia was the biggest installer of solar in 2022, with 60% of new capacity and 60% of total capacity. China alone amounted to over 40% of new solar and almost 40% of total capacity, but only 30% of generation.[22]

North America produced 16% of the world total, led by the United States. North America had the highest capacity factor of all continents in 2022 at 20%, ahead of South America (16%) and the world at large (14%).[22]

Almost all of the solar in Oceania (39TWh) was generated in Australia in 2022, in either case amounting to 3% of the world total. However, Oceania had the highest proportion of electricity that was solar in 2022 at 12%, ahead of Europe (4.9%), Asia (4.9%) and the world overall (4.6%).[22]

During the Reagan administration, oil prices decreased and the US removed most of its policies that supported its solar industry.[30]: 143 Government subsidies were higher in Germany and Japan, which prompted the industrial supply chain to begin moving from the US to those countries.[30]: 143

The average price per watt dropped drastically for solar cells in the decades leading up to 2017. While in 1977 prices for crystalline silicon cells were about $77 per watt, average spot prices in August 2018 were as low as

$0.13 per watt or nearly 600 times less than forty years ago. Prices for thin-film solar cells and for c-Si solar panels were around $.60 per watt.[43] Module and cell prices declined even further after 2014 (see price quotes in table).

This price trend was seen as evidence supporting Swanson"s law (an observation similar to the famous Moore"s Law) that states that the per-watt cost of solar cells and panels fall by 20 percent for every doubling of cumulative photovoltaic production.[44] A 2015 study showed price/kWh dropping by 10% per year since 1980, and predicted that solar could contribute 20% of total electricity consumption by 2030.[45]

The followed figures for select countries represent the cost per kilowatt of utility-scale solar generation, as well as price per kilowatt-hour in 2022 and a comparison with 2010. Dollars are in 2022 international dollars. Data are from IRENA.[46]

During the 1980s, Professor Martin Green developed numerous technologies which made solar power generation more efficient.[30]: 143 Many of Green"s students later became important in China"s solar industry, including Shi Zhengrong (who founded Suntech with the support of Wuxi city government).[30]: 143