

Can the World Solve the Climate Urgency with Renewable Energy?

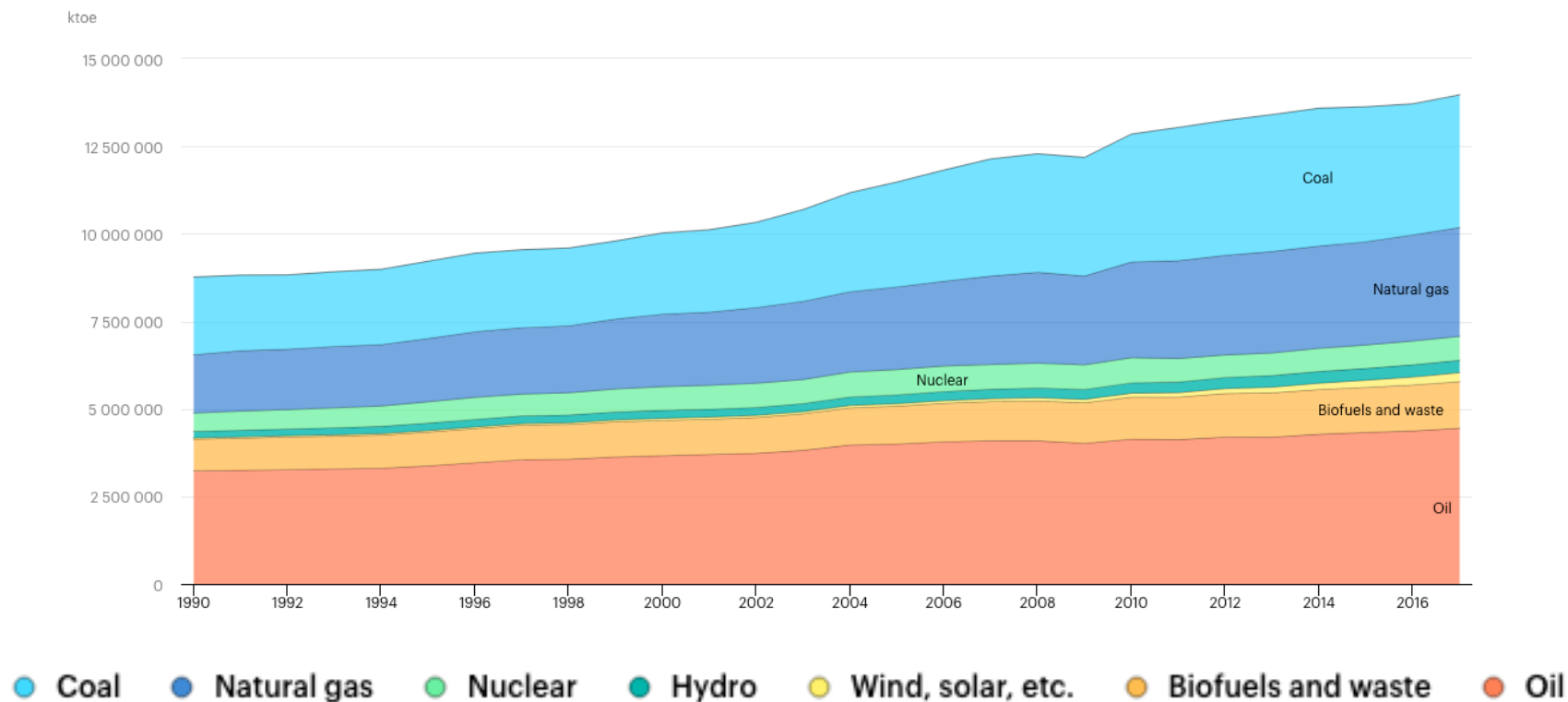
Dave Renné

International Solar Energy Society

ASES SOLAR20/20 Virtual Conference
Keynote Session: Clear Vision for Worldwide Action
24 June 2020



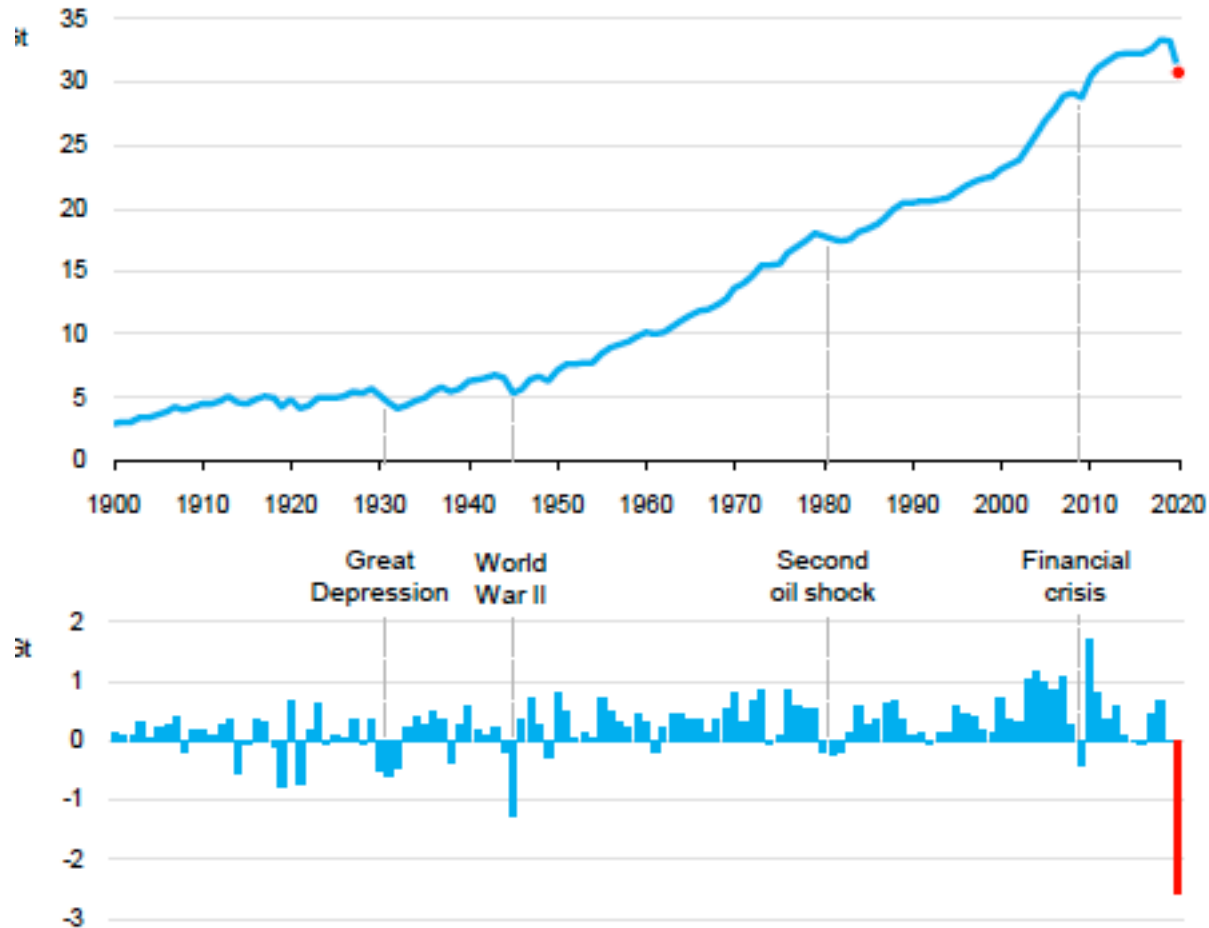
Total Primary Energy Supply by Source



Coal has contributed 30% to the 1.0°C increase in global temperatures observed since the beginning of measurements

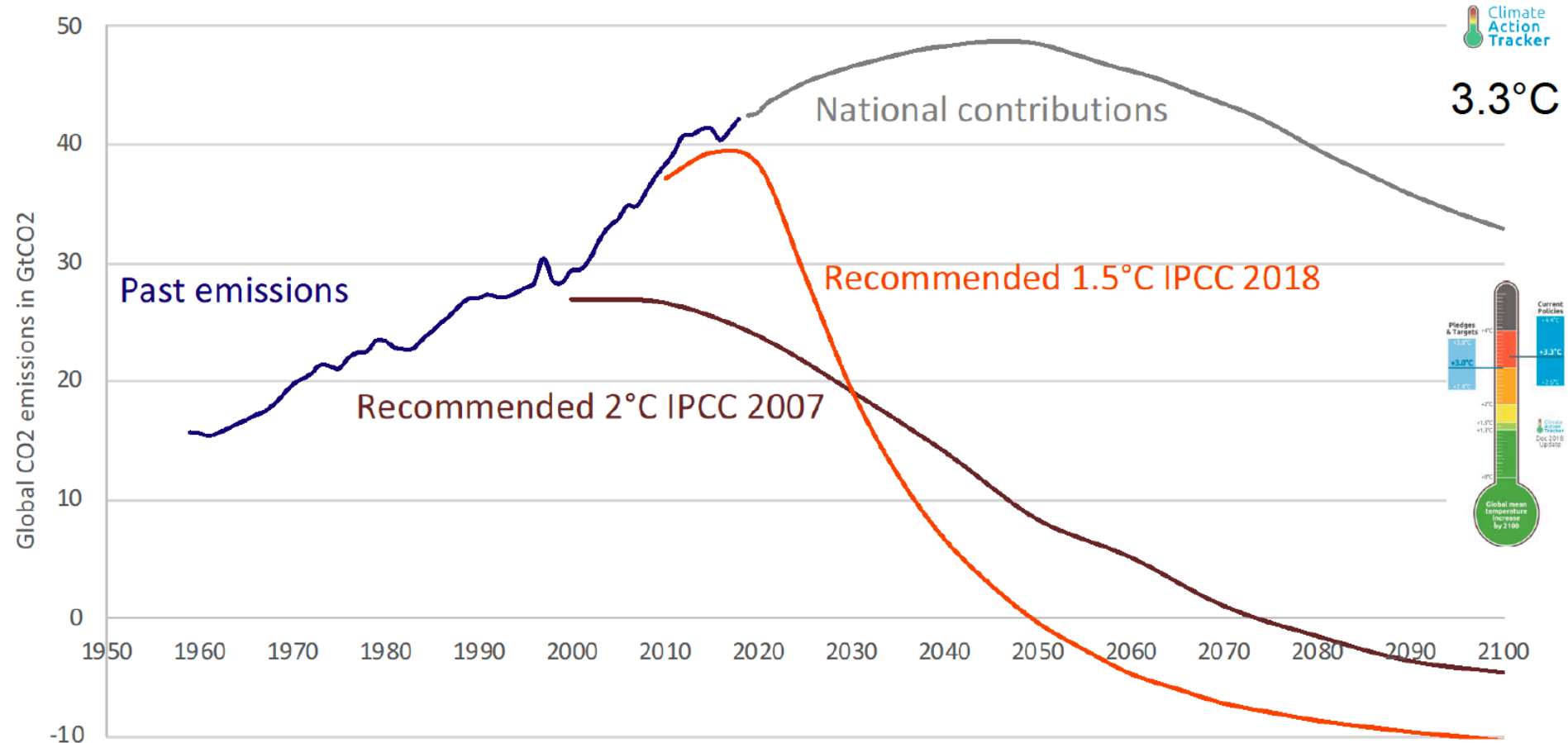
Source: <https://www.iea.org/>; see “Data and Statistics”

Global Energy-Related CO₂ Emissions and Annual Change, 1900-2020



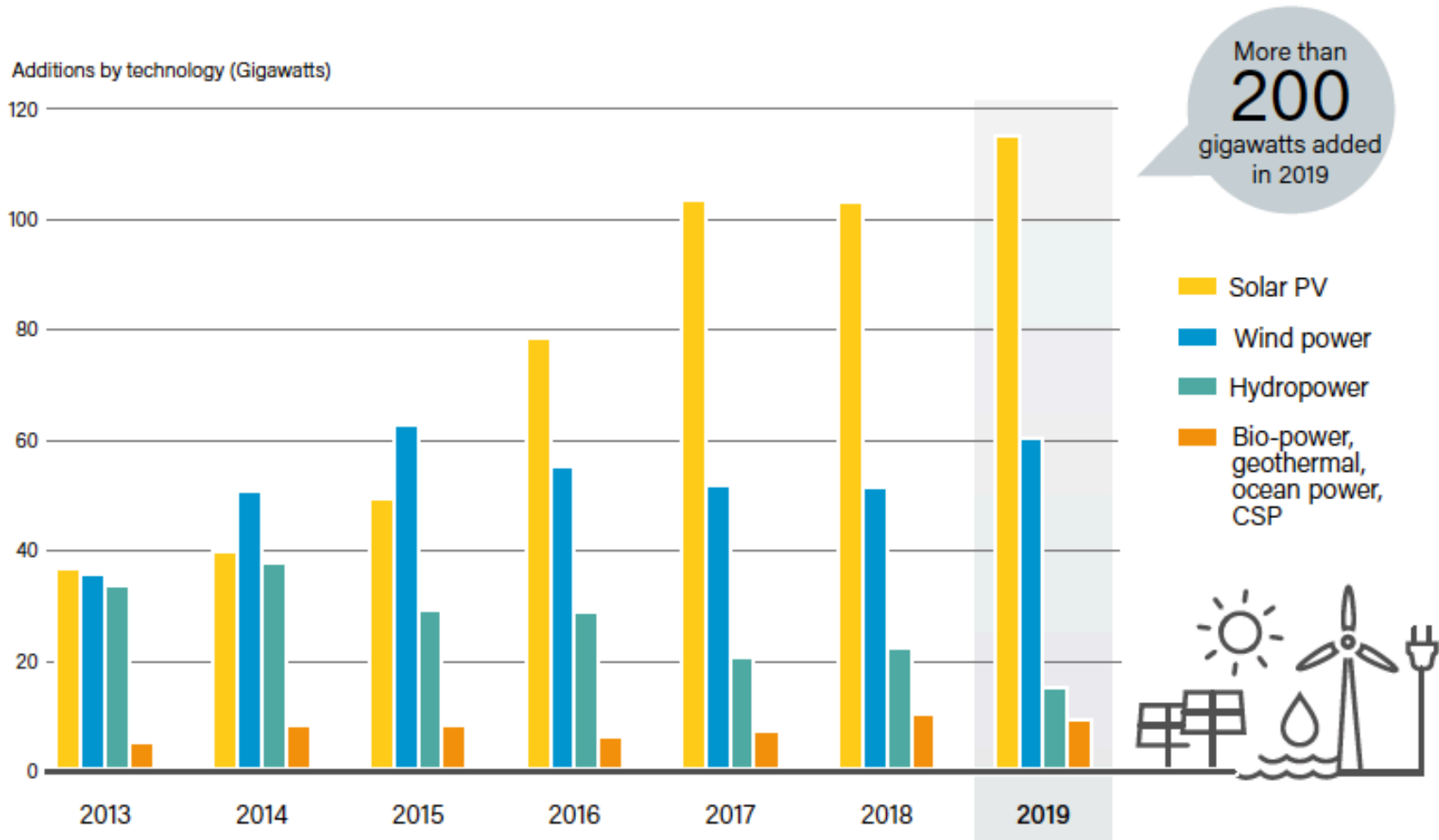
Source: IEA Global Energy Review 2020

Urgency for Action



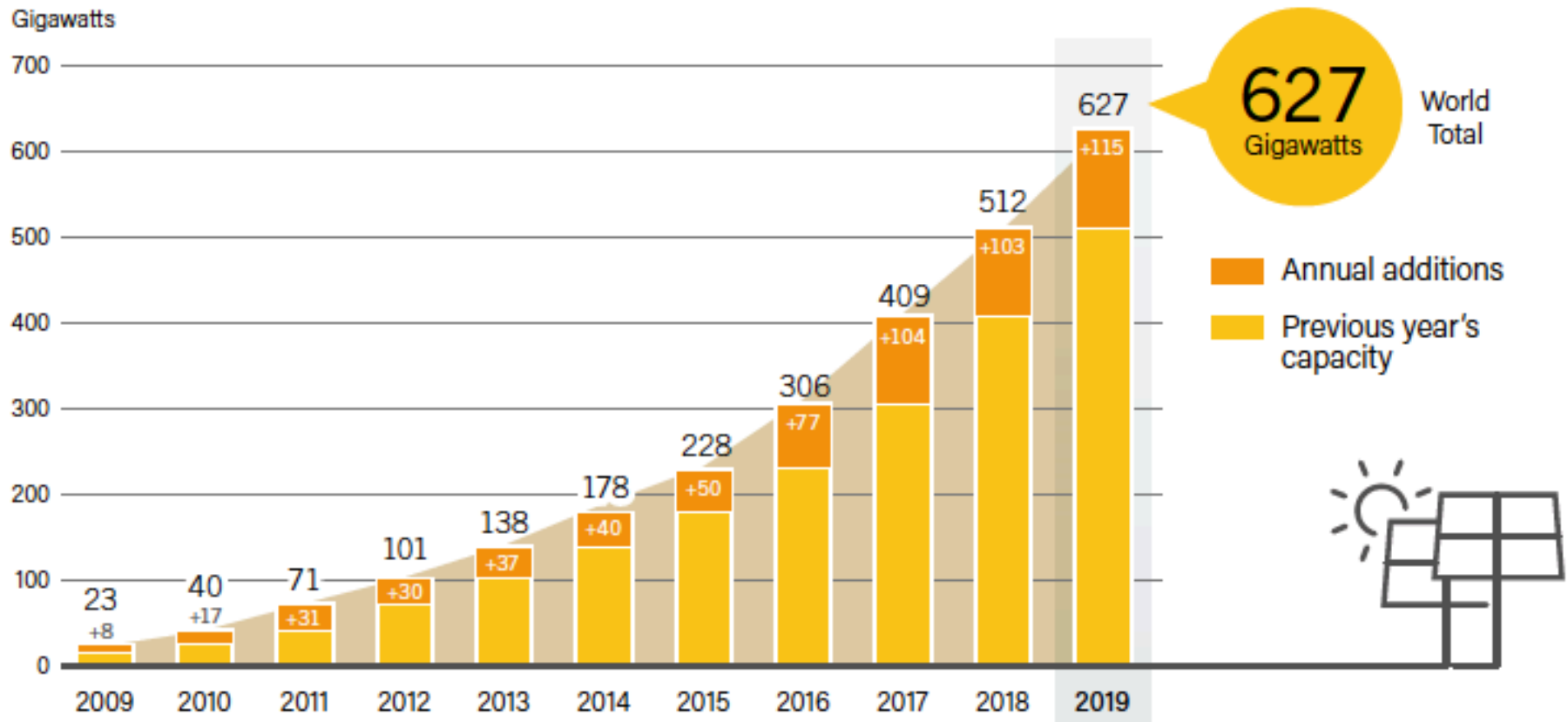
Source: New Climate Institute

Additions of RE Power at end of 2019



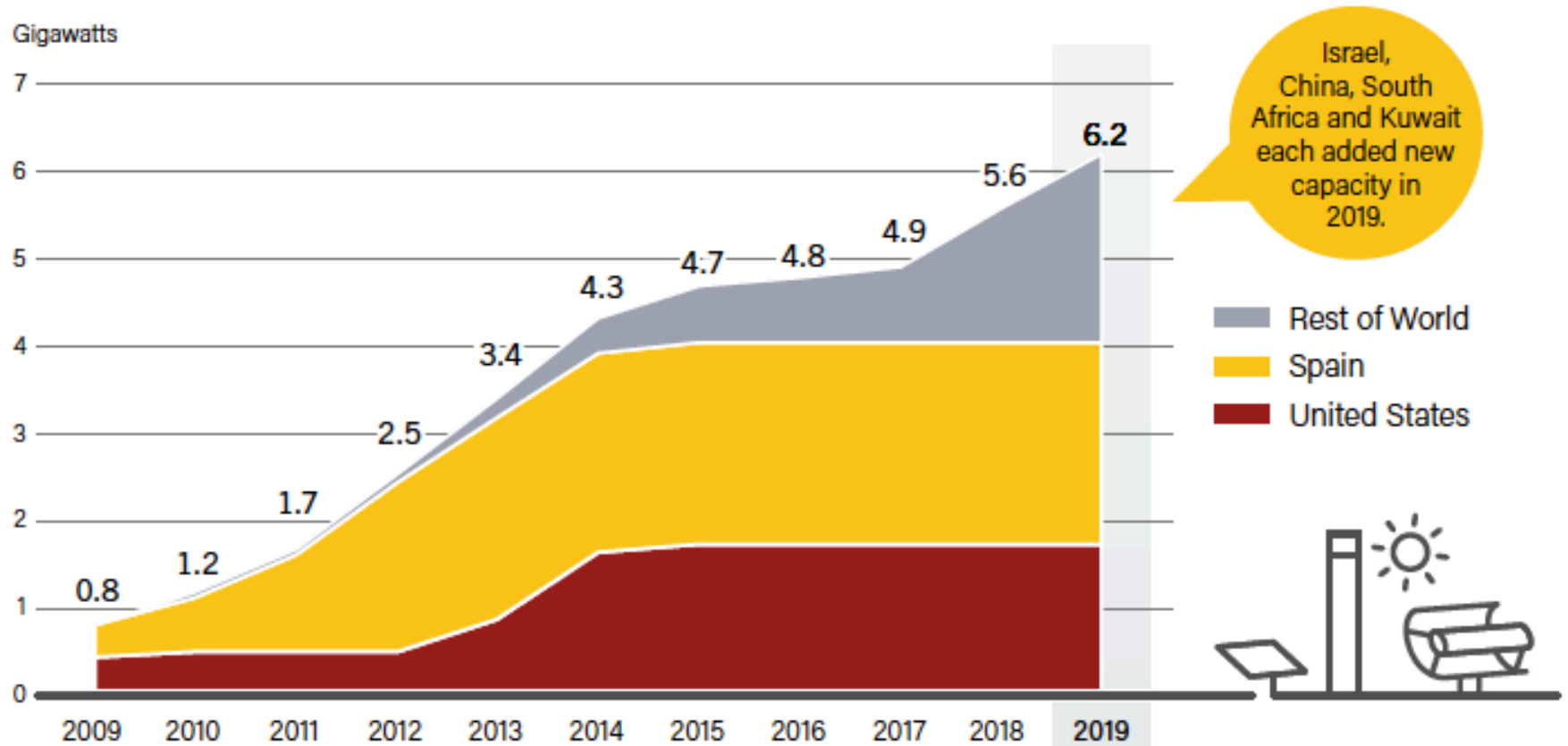
Source: REN21 GSR 2020

Global PV Capacity = 627 GW at end of 2019



Source: REN21 GSR 2020

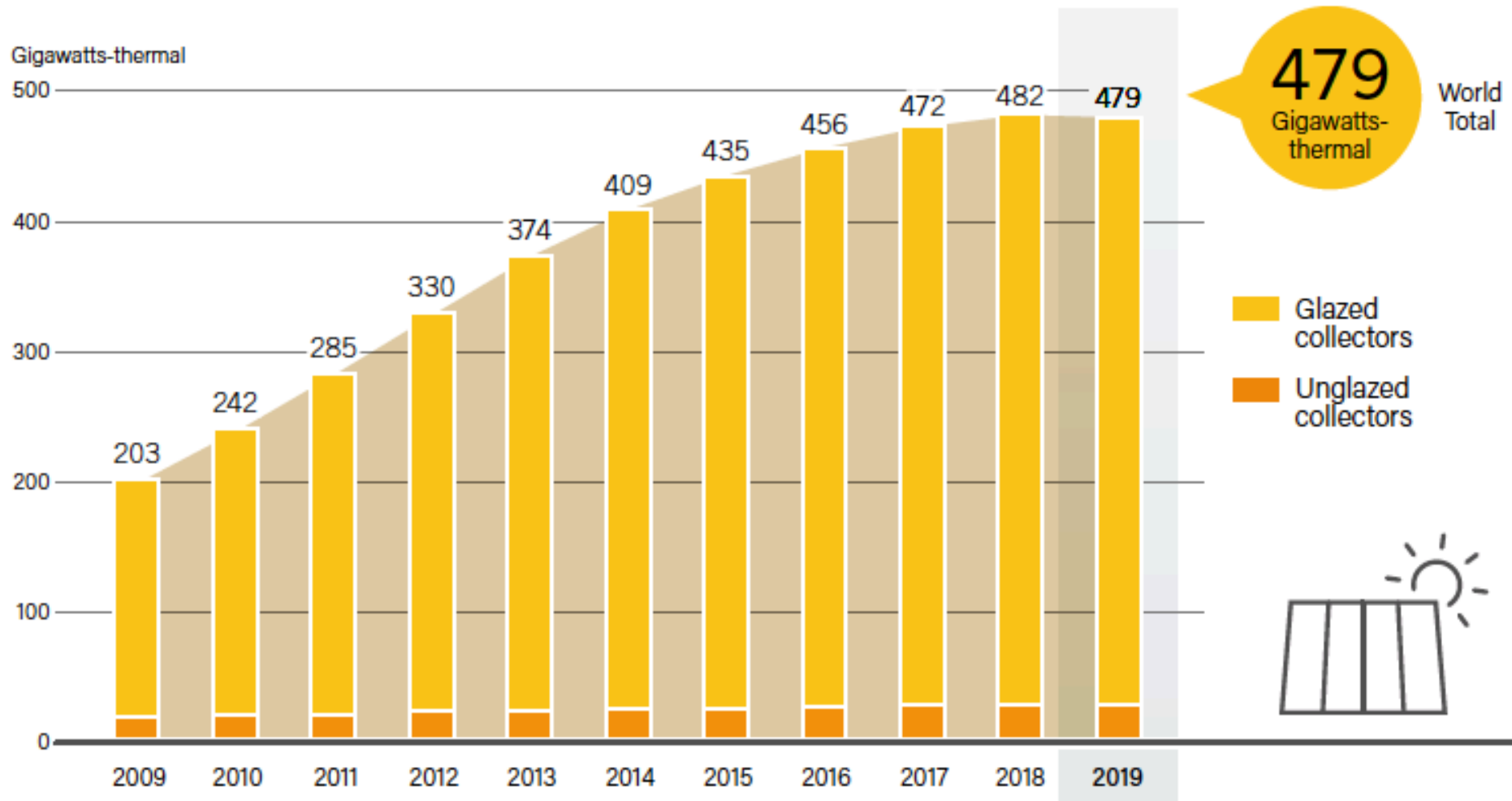
Global Concentrating Solar Power Capacity = 6.2 GW at end of 2019



Global thermal energy storage capacity = 21.2 GW-hr at end of 2019

Source: REN21 GSR 2020

Global Solar Thermal Heating and Cooling Capacity = 479 GW_{th} at end of 2019



Source: REN21 GSR 2020

Est. Renewable Energy Share of Electricity, 2019

72.7%

Non-renewable
electricity

27.3%

Renewable
electricity



Renewable
electricity

15.9%
Hydropower

5.9% Wind power

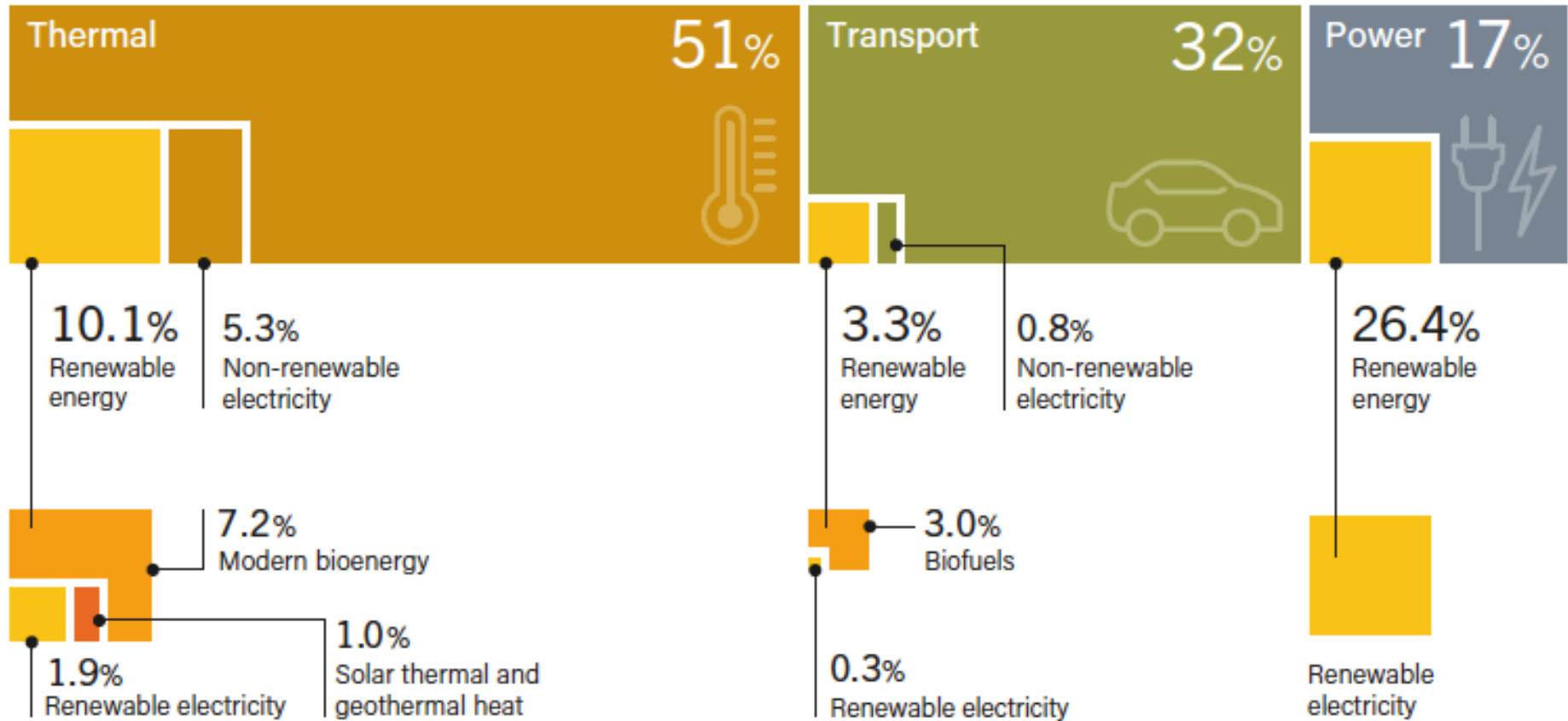
2.8% Solar PV

2.2% Bio-power

0.4% Geothermal, CSP
and ocean power

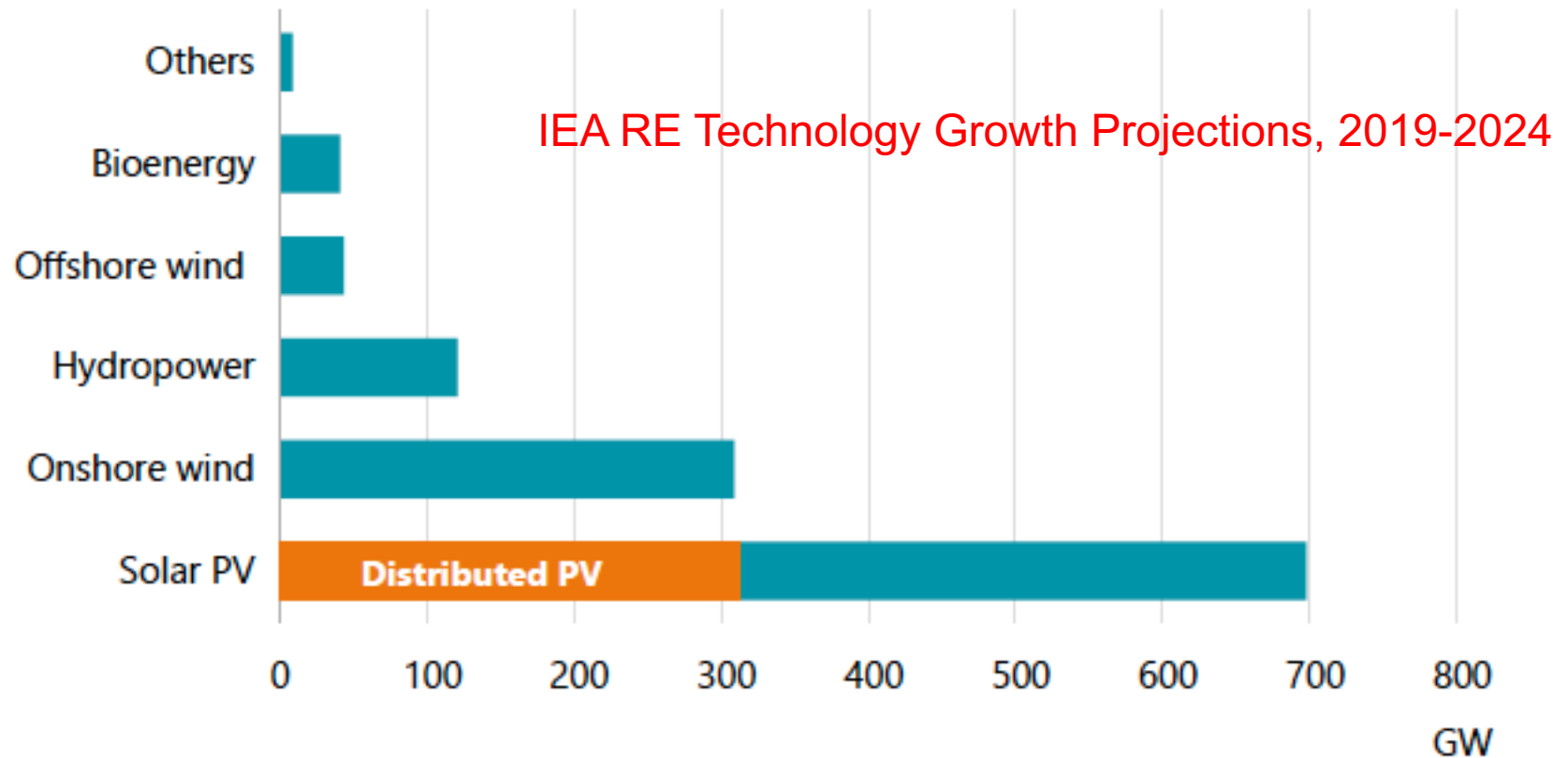
Source: REN21 GSR 2020

Final Total Energy Consumption by Sector, 2017



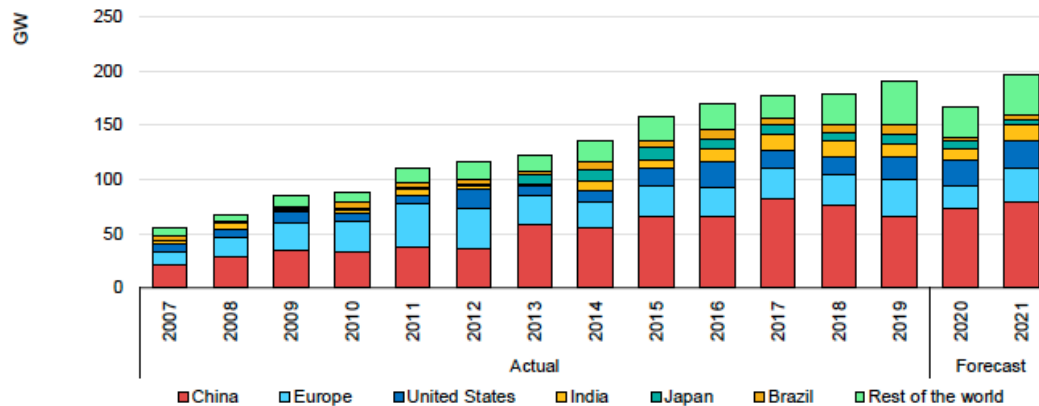
Source: REN21 GSR 2020

The 5-yr Prospects in 2019 Were Positive...

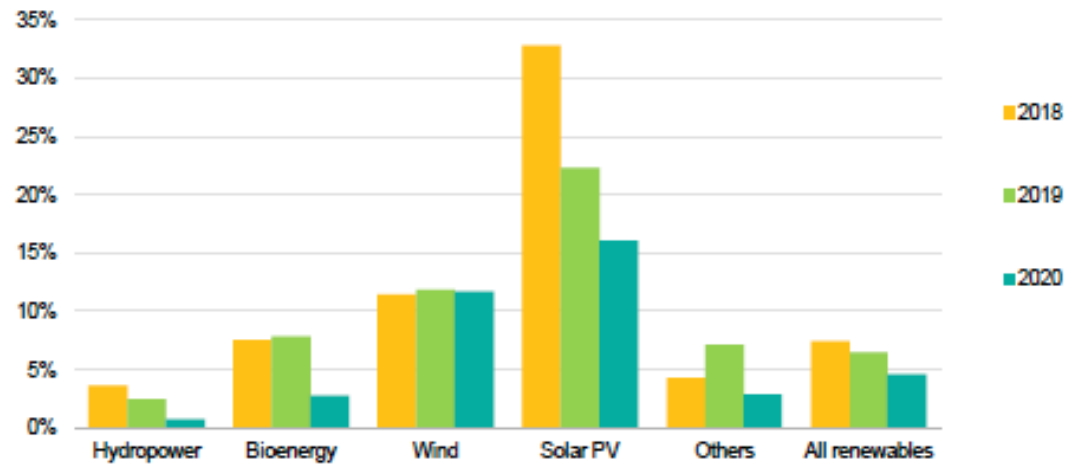


Source: IEA Renewables 2019

...Until COVID-19

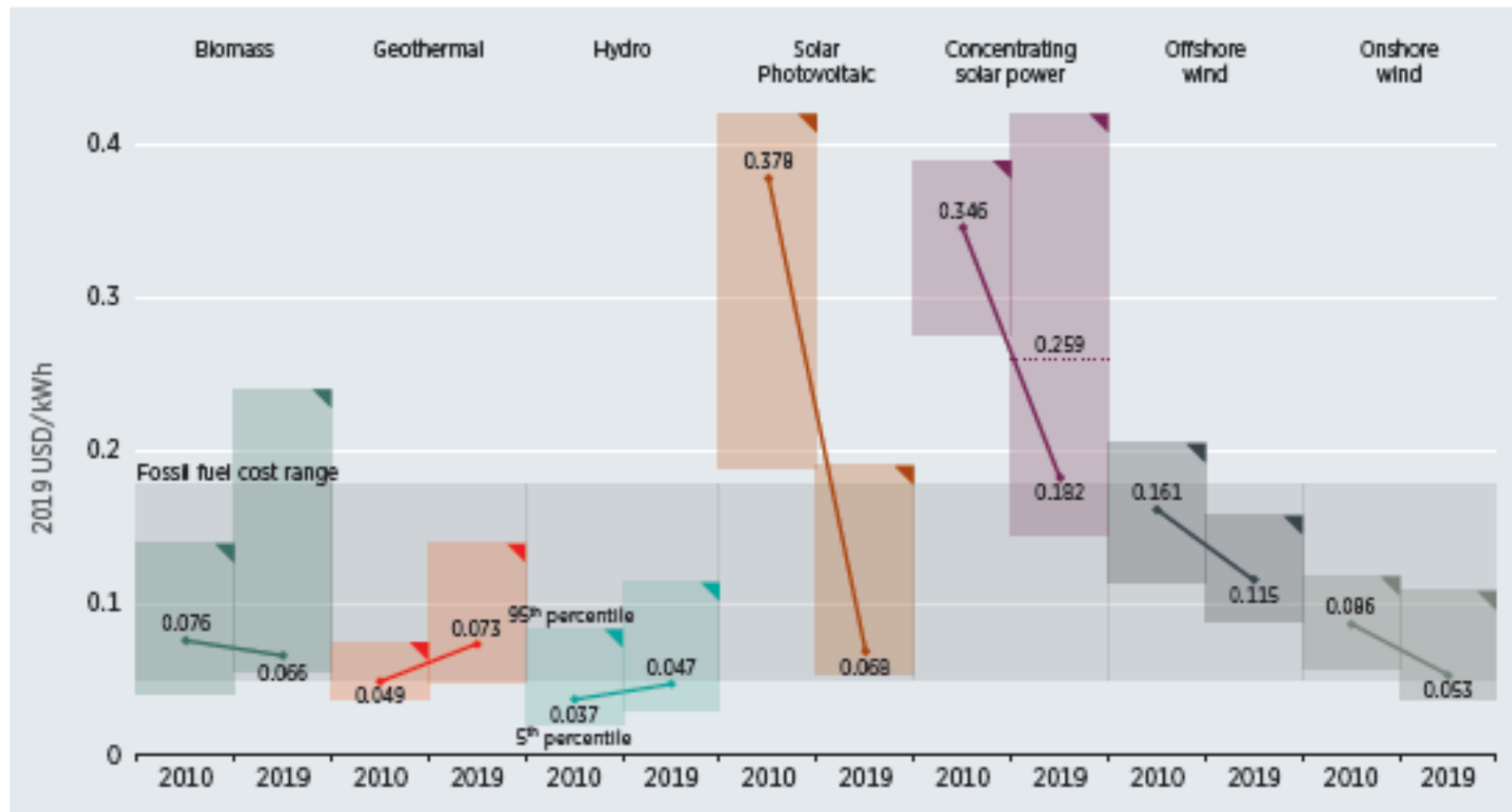


Source: IEA Renewable Energy Market Update 2020-2021



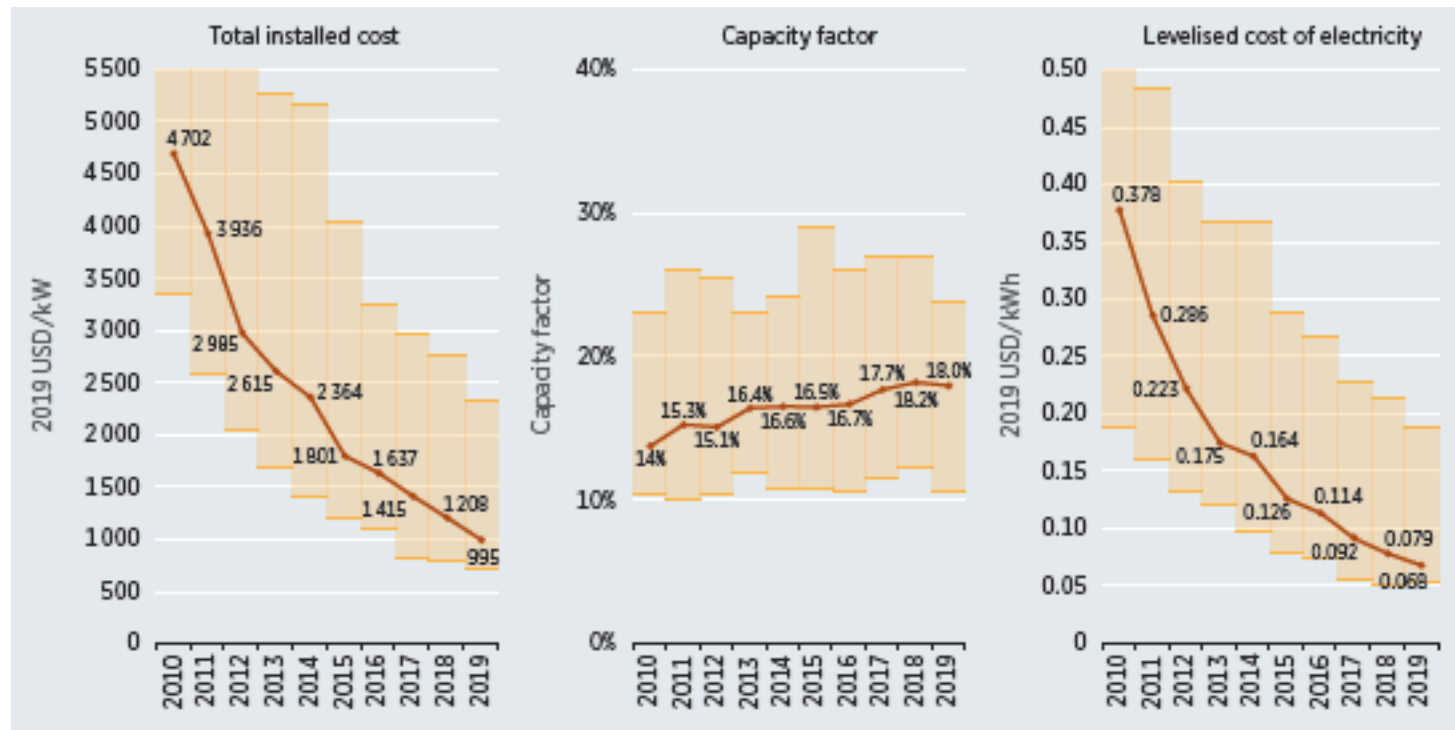
Source: IEA Global Energy Review 2020 (The Impacts of COVID-19)

RE Generation Costs Continue to Drop



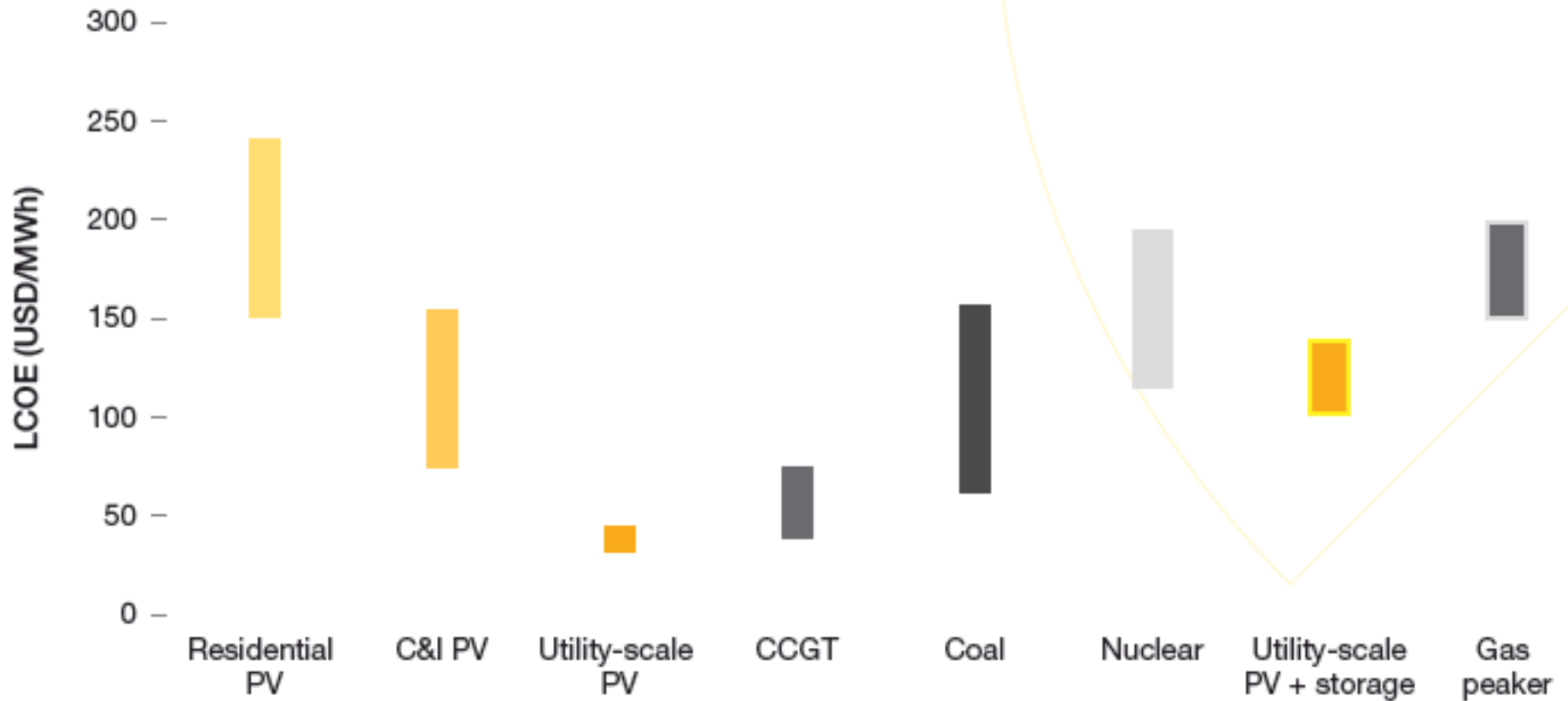
Source: IRENA "Renewable Power Generation Costs 2019"

PV Cost Drops are Driven by Declines in Utility-Scale Solar



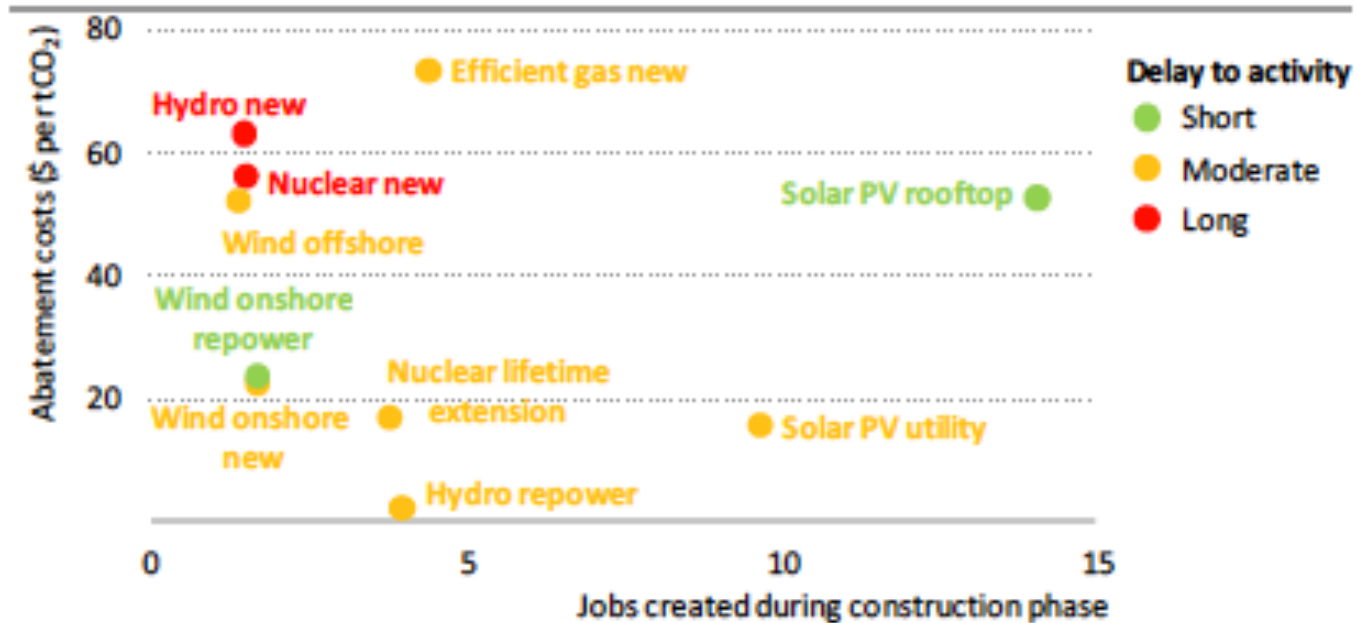
Source: IRENA “Renewable Power Generation Costs 2019”

Solar PV Electricity Costs in Comparison with Conventional Sources, 2019



Source: SPE Solar Market Outlook 2020

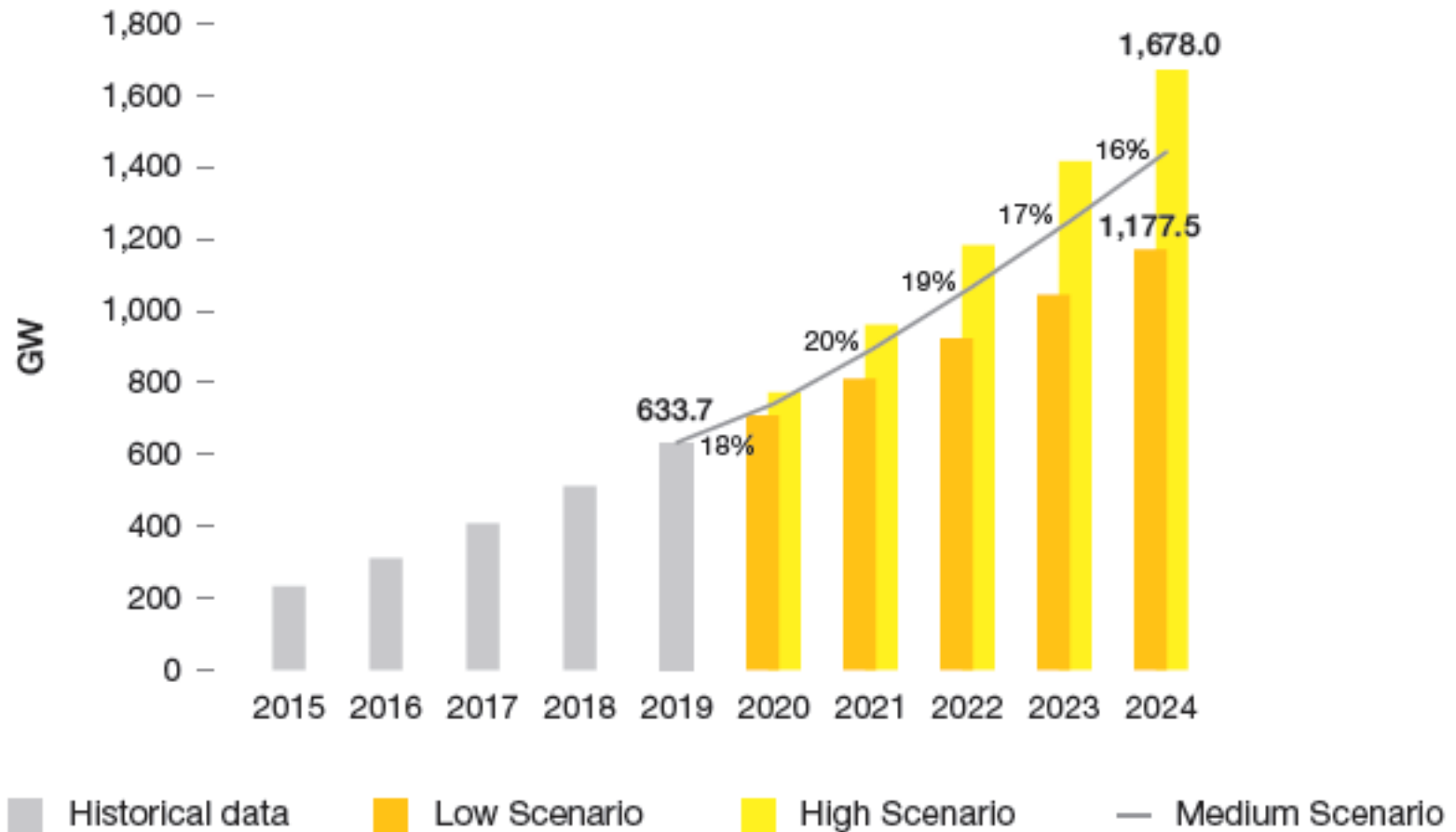
Job Creation per \$M Capital Investments...a Message to Policymakers



Abatement Costs = Cost associated with reducing GHG emissions by 1 tonne CO₂ equivalent.

Source: IEA WEO2020 Special Report

Total Solar PV Market Scenarios 2020-2024



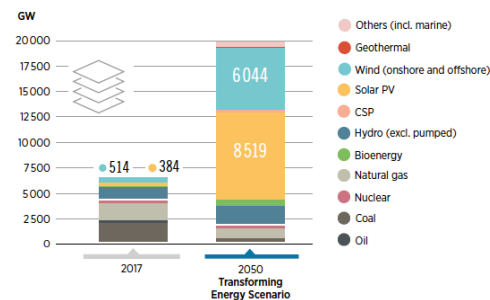
Source: SPE Solar Market Outlook 2020

Three Possible Pathways to 100% Renewables

IRENA REMap

Global Renewables Outlook Edition 2020

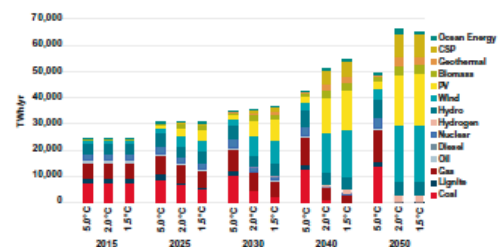
Solar PV Capacity, 2050: 8519 TW



University of Sydney

Achieving the Paris Climate Agreement Goals

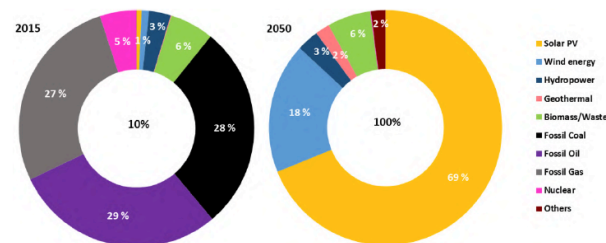
Solar PV Capacity, 2050: 12,864 TW



Energy Watch Group/LUT

Global Energy System Based on 100% Renewable Energy

Solar PV Capacity, 2050: ~79,000 TW



Key Take-Away Messages

COVID-19 Impacts and Responses Providing Important Lessons for Climate Change Mitigation Strategies

- The pandemic is having a measurable impact on carbon emissions, and a significant short-term impact on the RE economy
- Projections for the near-term are reductions in RE activity
- Historical growth in capacity and drop in prices for wind and solar is largely unabated
- Longer-term projections therefore remain very optimistic
- Electrification of all end use energy consumption will continue to grow; a favorable outcome for solar PV
- 100% Renewables by mid-century represents an essential energy system transformation that is feasible, practical, and economically prudent.
- The transformation will result in energy equity and security, and significant environmental and social benefits

In Closing...

The creation of wealth and prosperity powered by fossil fuels over the past two centuries have also led to growing income disparities, energy injustice, and major environmental threats;

People are responding...a global revolution is taking place to fight these inequalities, environmental crises, and government inaction;

The response is transforming our energy supply into a renewables-based distributed system with universal access and democratization, providing energy justice and environmental recovery and improvement for everyone.

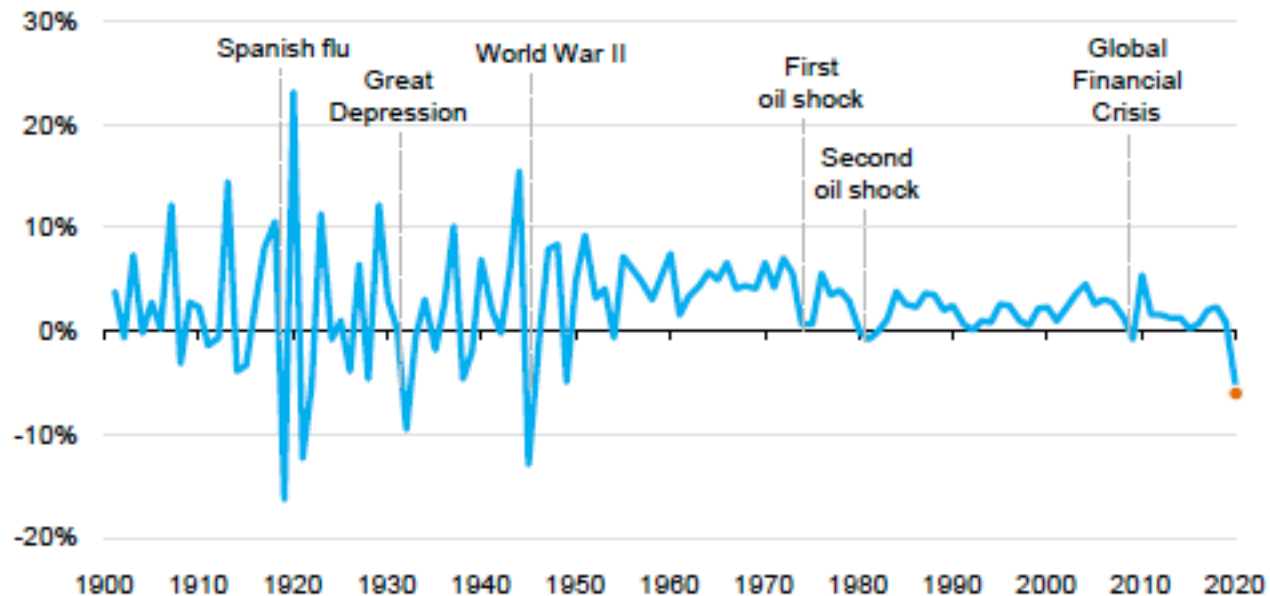
Thank You!

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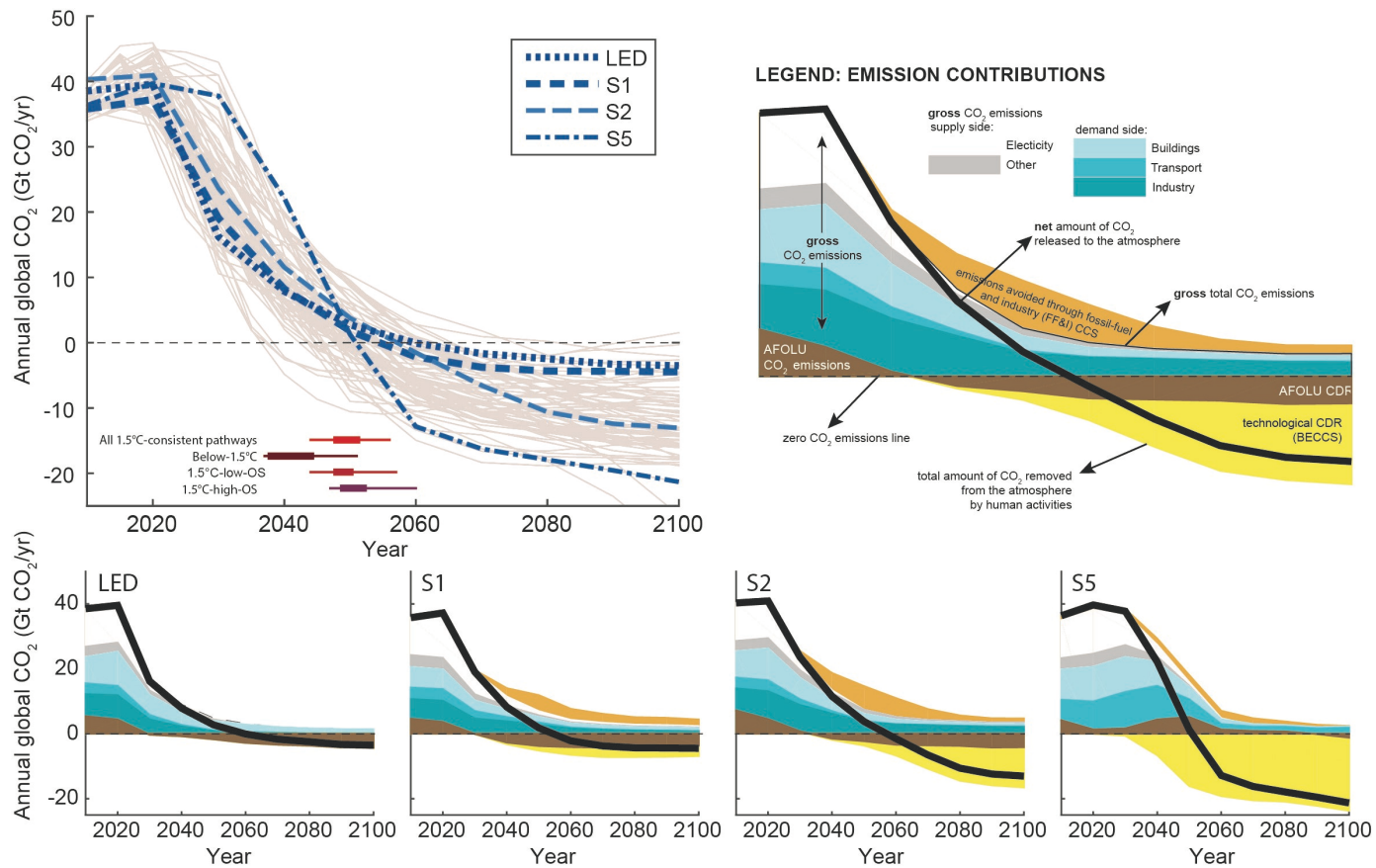
Extra Slides

Rate of Change in Global Primary Energy Demand, 1900 - 2020



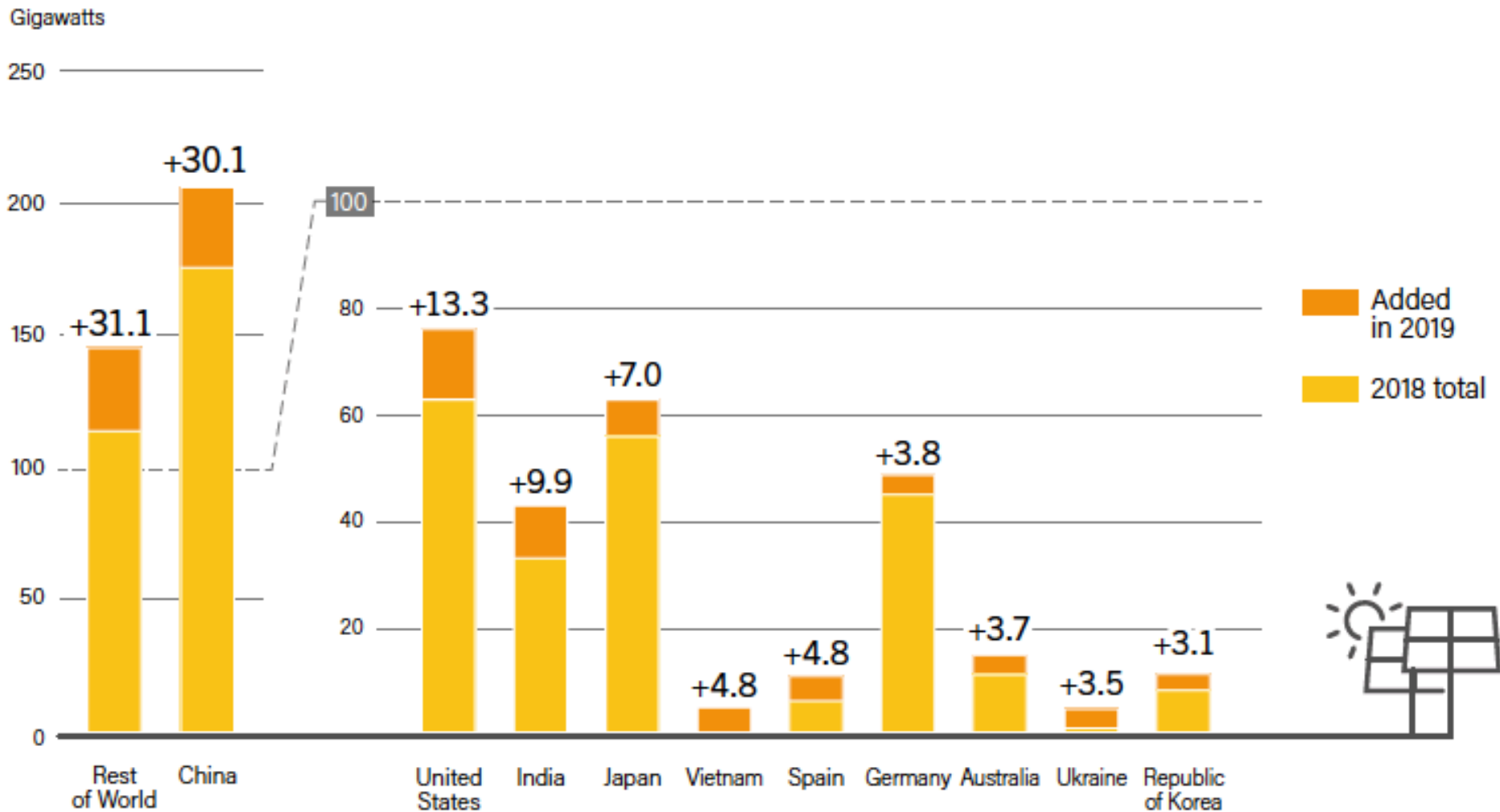
Source: IEA Global Energy Review 2020

Urgency for Action



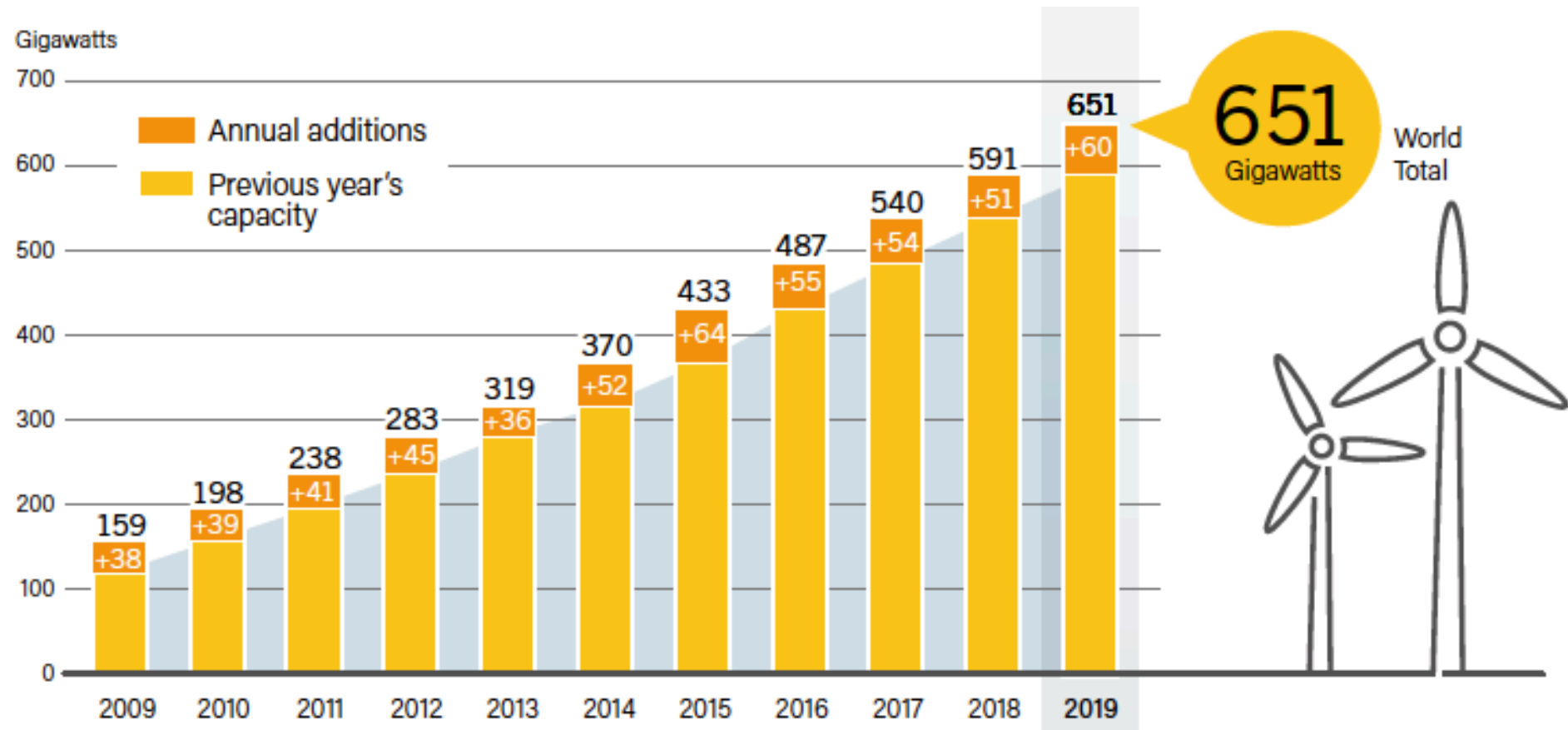
Source: IPCC SR15

Global PV Capacity Additions: Top 10 Countries



Source: REN21 GSR 2020

Global Wind Capacity = 651 GW at end of 2019



Source: REN21 GSR 2020