GLOBALE ENERGIEWENDE – WUNSCHDENKEN ODER REALITÄT?

REN21 Renewable Energy Policy Network for the 21st Century

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GLOBALE ENERGIEWENDE –
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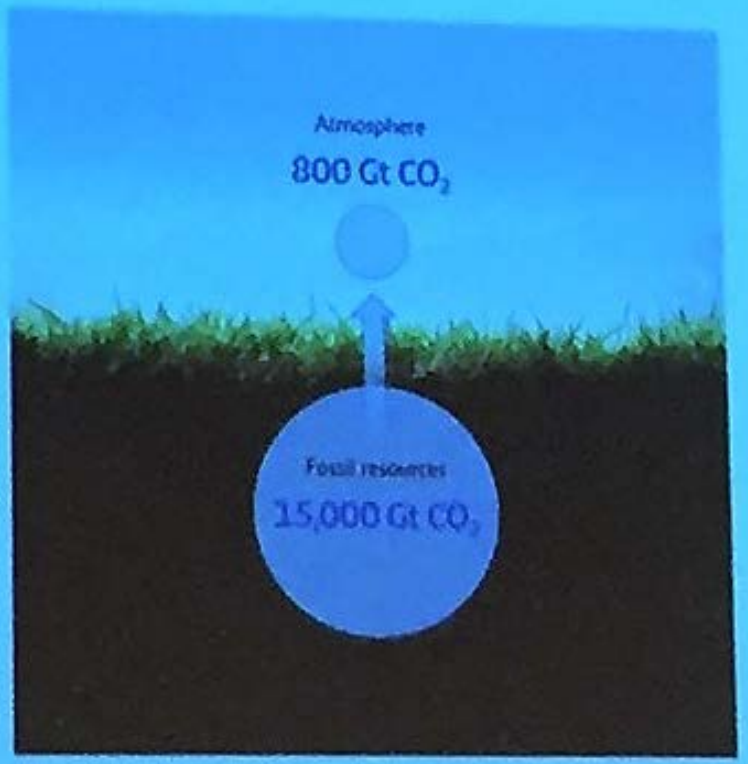
NOTWENDIGKEIT

COP23 | FIJI
UN CLIMATE CHANGE CONFERENCE
BONN 2017



Source: Bauer et al. (2014); Jakob, Hilaire (2015)

REN21 Renewables 2017 Global Status Report

- **The report features:**
  - Global Overview
  - Market & Industry Trends
  - Distributed Renewable Energy for Energy Access
  - Investment Flows
  - Policy Landscape
  - NEW: Enabling Technologies and Energy Systems Integration
  - Energy Efficiency
  - Feature: Deconstructing Baseload

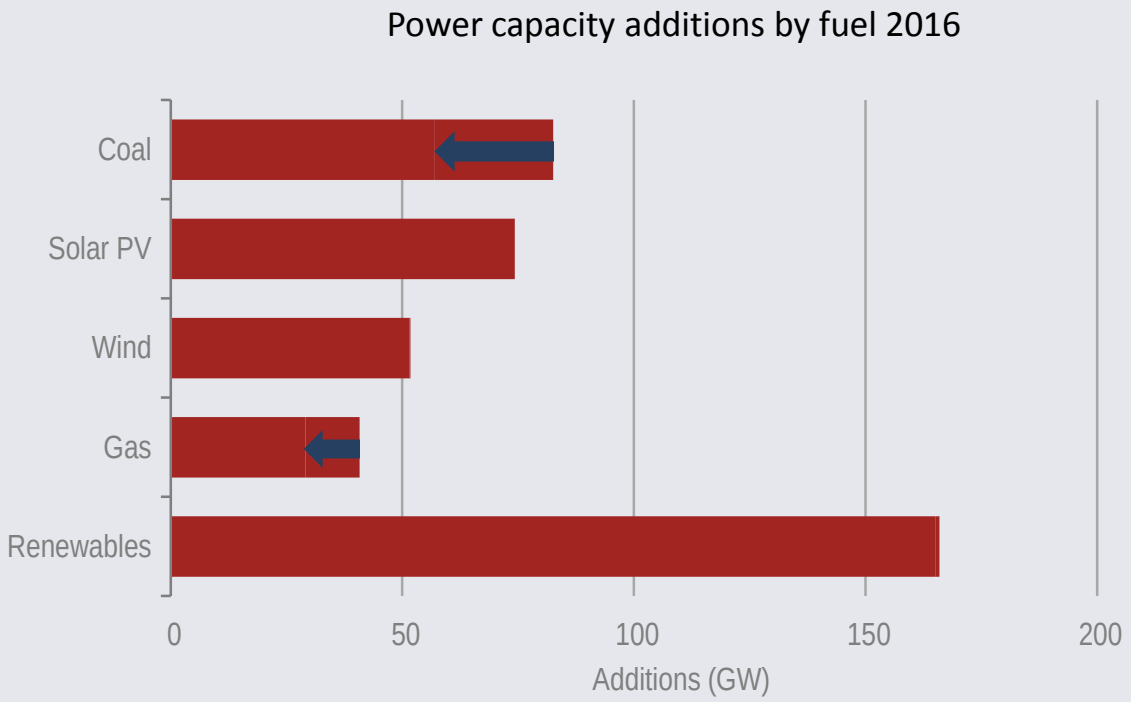
In 2016 investors were able to acquire more renewable energy capacity for less money.

- **Newly installed renewable power capacity set new records** in 2016, with 161 gigawatts (GW) added, increasing the global total by almost 9% relative to 2015.

- For the fifth consecutive year, **investment in new renewable power capacity** was roughly **double the investment in fossil fuel generating capacity**, reaching USD 249.8 billion.

- 2016 was the **third year in a row where global CO_2 emissions** from the energy sector remained stable despite a 3% growth in the global economy and an increased demand for energy.

2016 – Renewables hitting new records driven by solar PV and wind



Renewables breaking an all-time record accounting for two thirds of global net capacity additions;
For the first time PV becoming the global leader in net capacity growth before coal.

Renewable Energy “Champions”

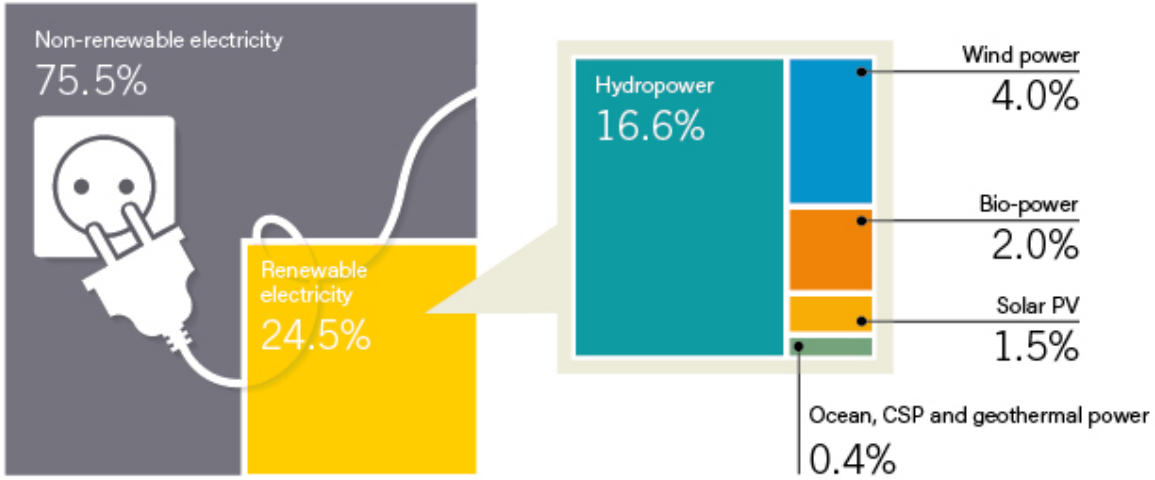
Annual Investment/Net Capacity Additions/Production in 2016

	1	2	3	4	5
Investment in renewable power and fuels (not including hydro > 50 MW)	**China**	United States	United Kingdom	Japan	Germany
Investment in renewable power and fuels per unit GDP[1]	**Bolivia**	Senegal	Jordan	Honduras	Iceland
Geothermal power capacity	**Indonesia**	Turkey	Kenya	Mexiko	Japan
Hydropower capacity	**China**	Brazil	Ecuador	Ethopia	Vietnam
Solar PV capacity	**China**	United States	Japan	India	United Kingdom
Concentrating solar thermal power (CSP) capacity[2]	**South Africa**	China	–	–	–
Wind power capacity	**China**	United States	Germany	India	Brazil
Solar water heating capacity	**China**	Turkey	Brazil	India	United States
Biodiesel production	**United States**	Brazil	Argentina/Germany/Indonesia		
Fuel ethanol production	**United States**	Brazil	China	Canada	Thailand

Power Sector

By year's end, renewables comprised an estimated **30%** of the world's power generating capacity and **24.5%** of global electricity demand

Estimated Renewable Energy Share of Global Electricity Production, End-2016



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Heating and Cooling

Modern renewable energy supplies approx. **9%** of total global heat demand.

In 2016, the vast majority of renewable heat continued to be supplied by **biomass**, with smaller contributions from **solar thermal** and **geothermal** energy.

Deployment of renewable technologies in this market continued to be constrained by factors such as comparatively **low fossil fuel prices** and a relative **lack of policy support.**

Transport

In 2016, **liquid biofuels** provided around **4%** of world road transport fuels, which account for the majority of transport energy use.

Biogas use in transport grew substantially in the **United States** and continued to gain shares of the transportfuel mix in Europe.

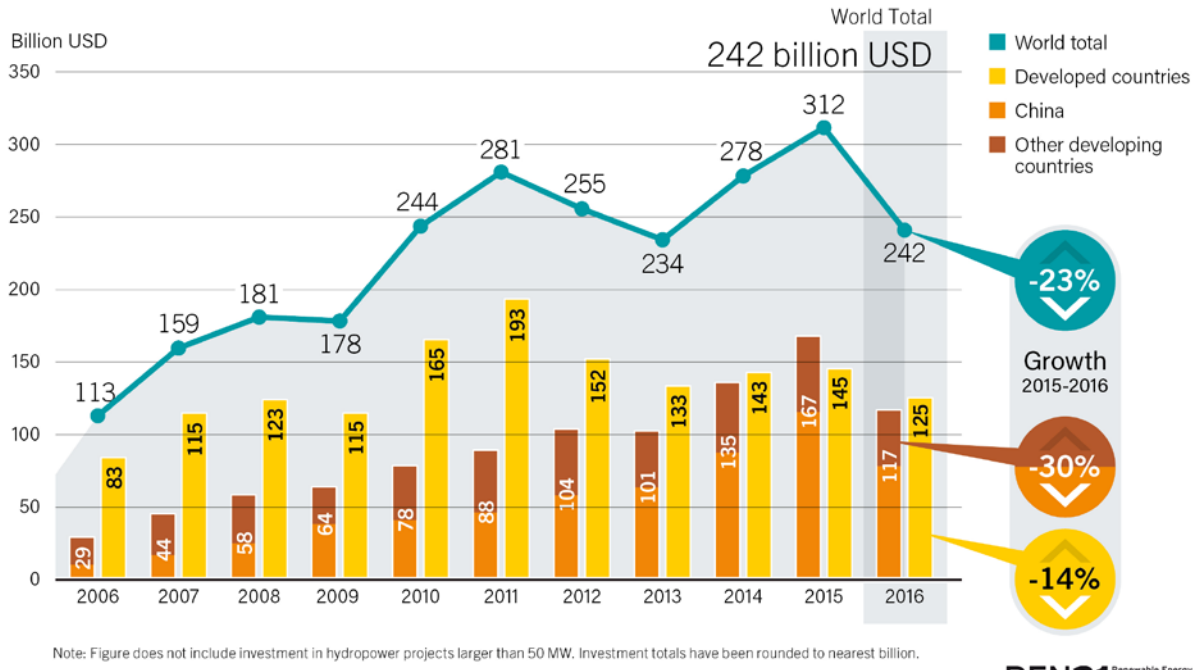
Further **electrification** of the transport sector has the potential to create a **new market** for renewable energy and to facilitate the integration of **variable renewable energy**.

Global Investment in Renewable Energy

Global new investment in renewables was **USD 241.6 billion** in 2016

Developing/emerging economies invest nearly as much in renewables as developed countries

Global New Investment in Renewable Power and Fuels, Developed, Emerging and Developing Countries, 2006-2016



Note: Figure does not include investment in hydropower projects larger than 50 MW. Investment totals have been rounded to nearest billion.

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Source: BNEF.

Solar PV

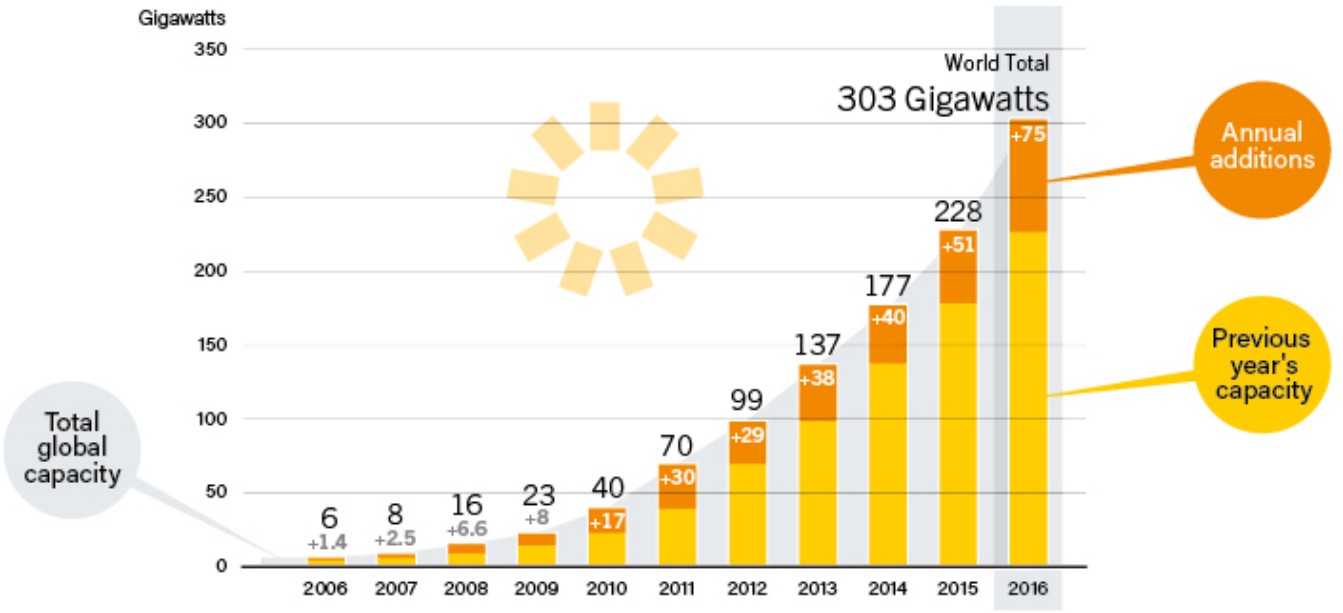
75 GW of solar PV capacity was added worldwide

Global solar PV capacity totaled **303 GW**

Forecast 2017:

100 GW

Solar PV Global Capacity and Annual Additions, 2006-2016



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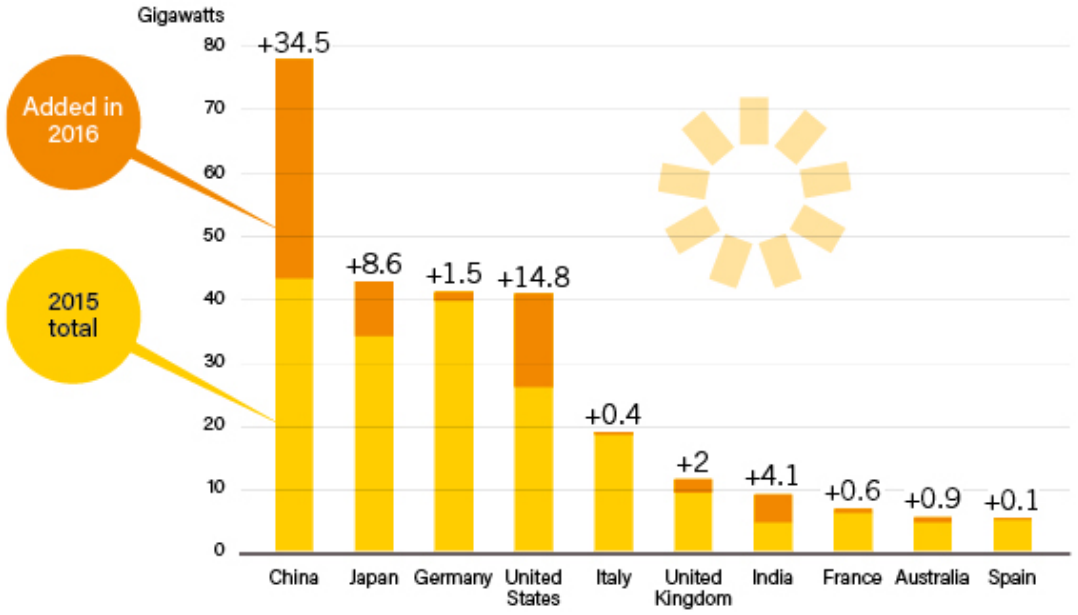
Solar PV

China added **34.5 GW** (up 126% over 2015), increasing its total solar PV capacity 45% to **77.4 GW**, far more than that of any other country

Forecast China 2017: 50 GW

Solar PV Capacity and Additions, Top 10 Countries, 2016



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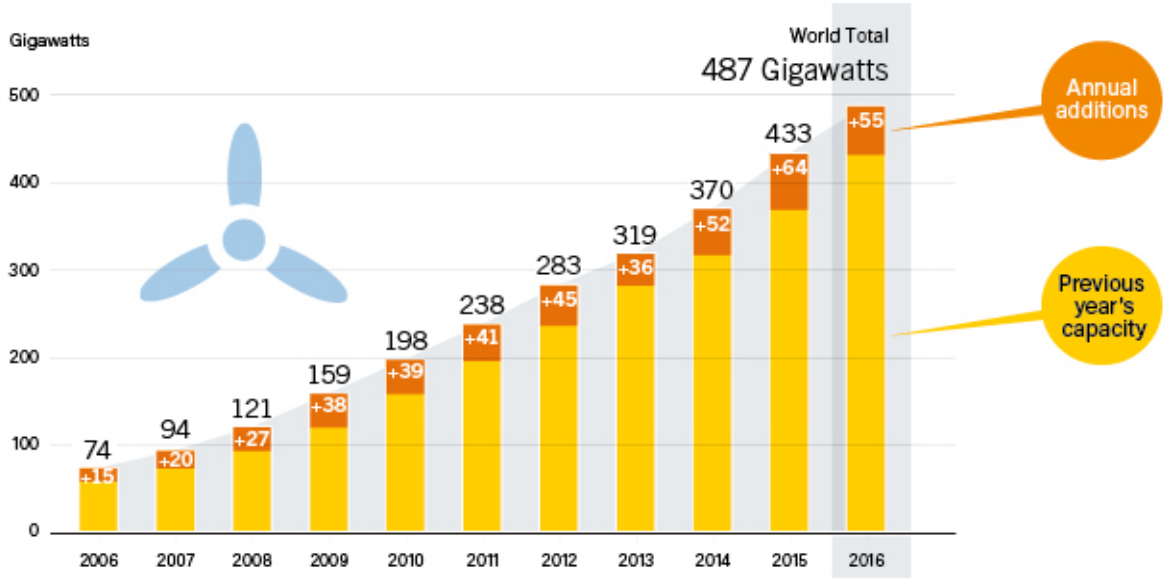
Wind Power

55 GW of wind power capacity added

Global total increased 12% to **487 GW**

Wind Power Global Capacity and Annual Additions, 2006-2016



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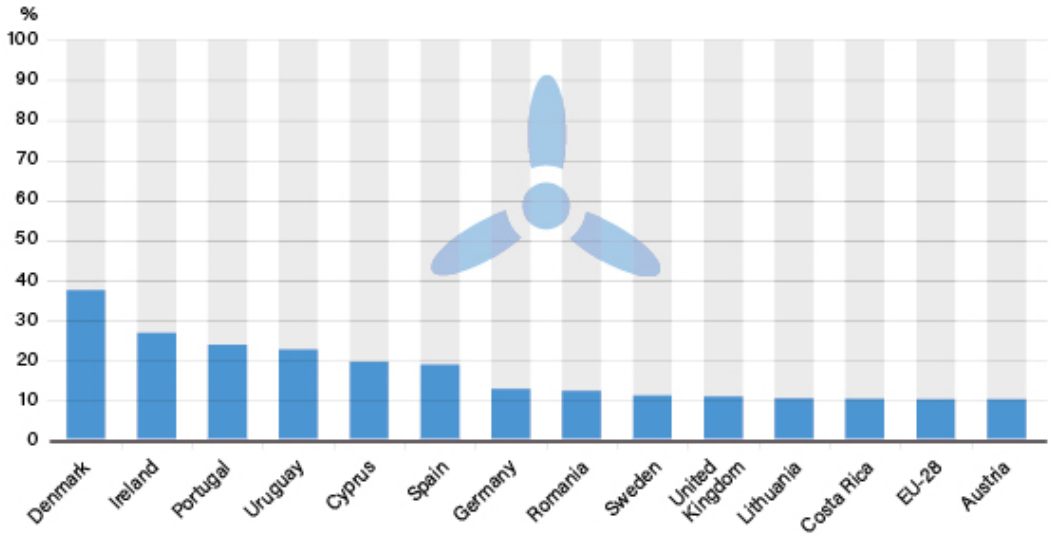
Wind Power

At least **24** countries met **5%** or more of their annual electricity demand with wind power

Enough global capacity to meet **4%** of total electricity consumption

Share of Electricity Demand Met by Wind Power, Selected Countries with over 10% and EU-28, 2016



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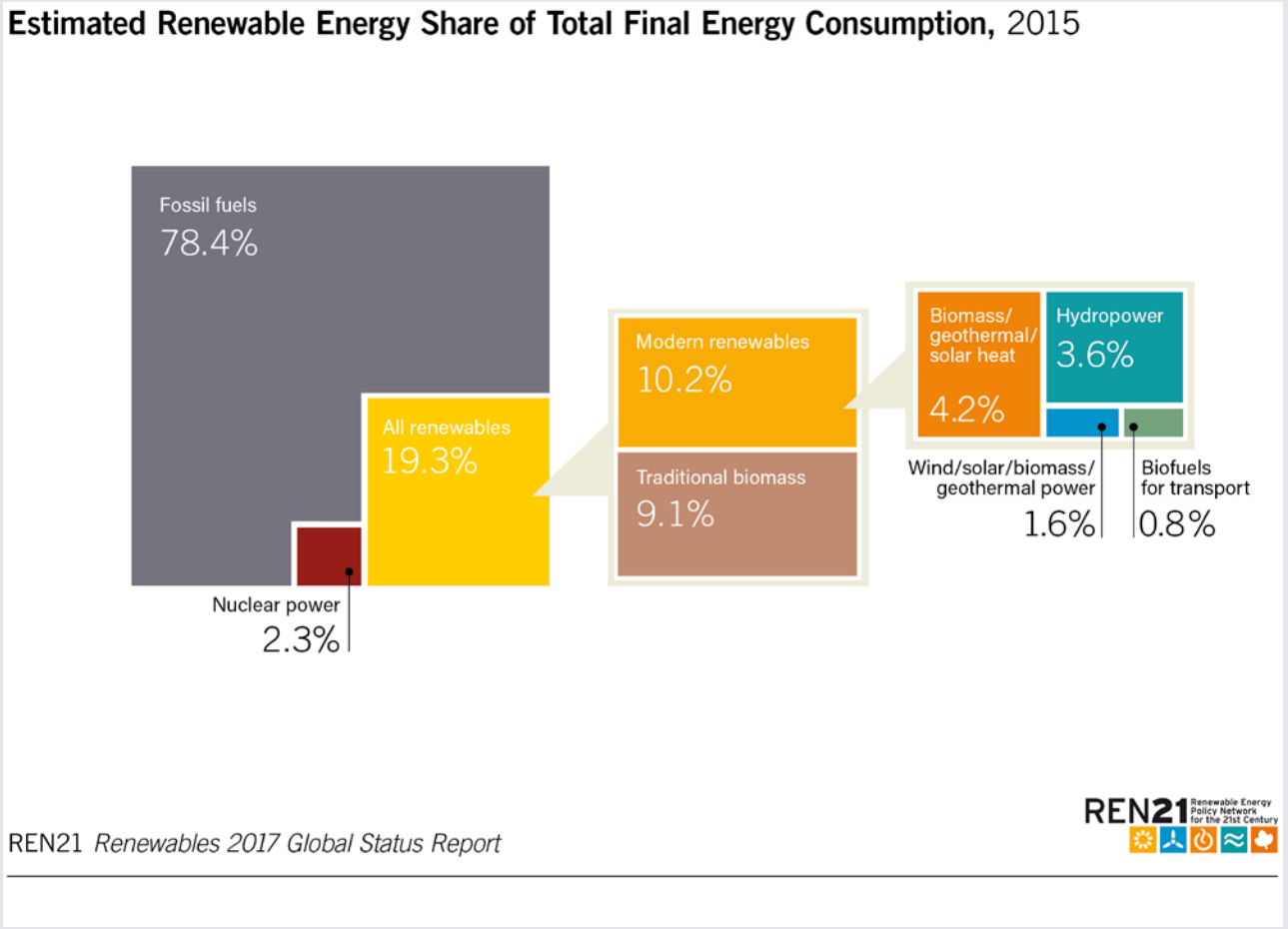
Renewable Energy in the World

As of 2015, renewable energy provided an estimated **19.3%** of global final energy consumption



100% Renewables: Pipe dream or reality?

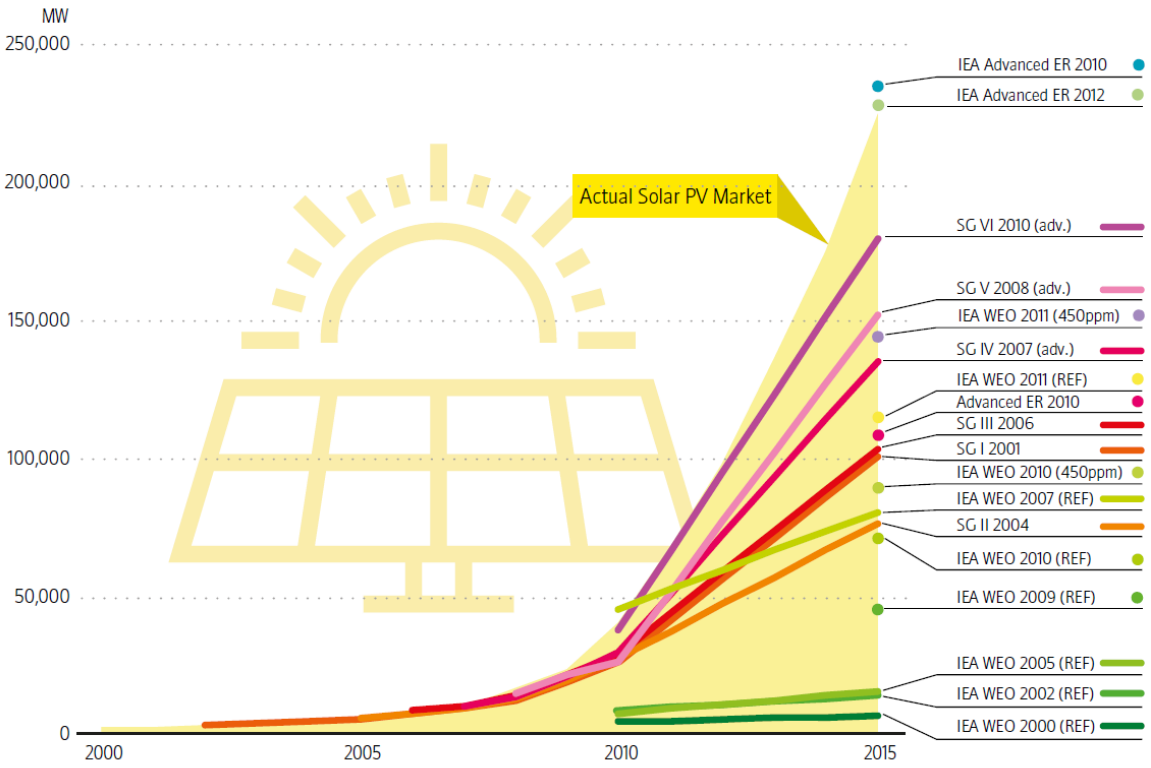
- **114 experts interviewed**
- **Conservative , moderate, progressive perspectives**
- **Giving their opinion on:**
  - feasibility of 100% renewable energy future
  - macro-economic impact of such a future
- **All regions of the world represented**
- **Not prescriptive but a starting point for debate**
- **12 Great Debates**

Overview of the Results – the 12 Great Debates

1. 100% Renewables: A logical consequence of the Paris Agreement?
2. Global Energy Demand Development: Efficiency on a global level?
3. Renewable Power Generation: The winner takes all?
4. The Future of Heating: Thermal or electrical applications?
5. Renewables for Transport: Electrification versus biofuels?
6. Interconnection of Sectors: System thinking required
7. Storage: Supporter or competitor of the power grid?
8. Technology versus Costs: Which should come first?
9. Scaling-up Investments and Work Force: 100% renewables for socio-economic change
10. Utilities of the Future: What will they look like?
11. Mega Cites: Mega possibilities
12. Energy Access Enabled Through Renewables: How to speed up connections?

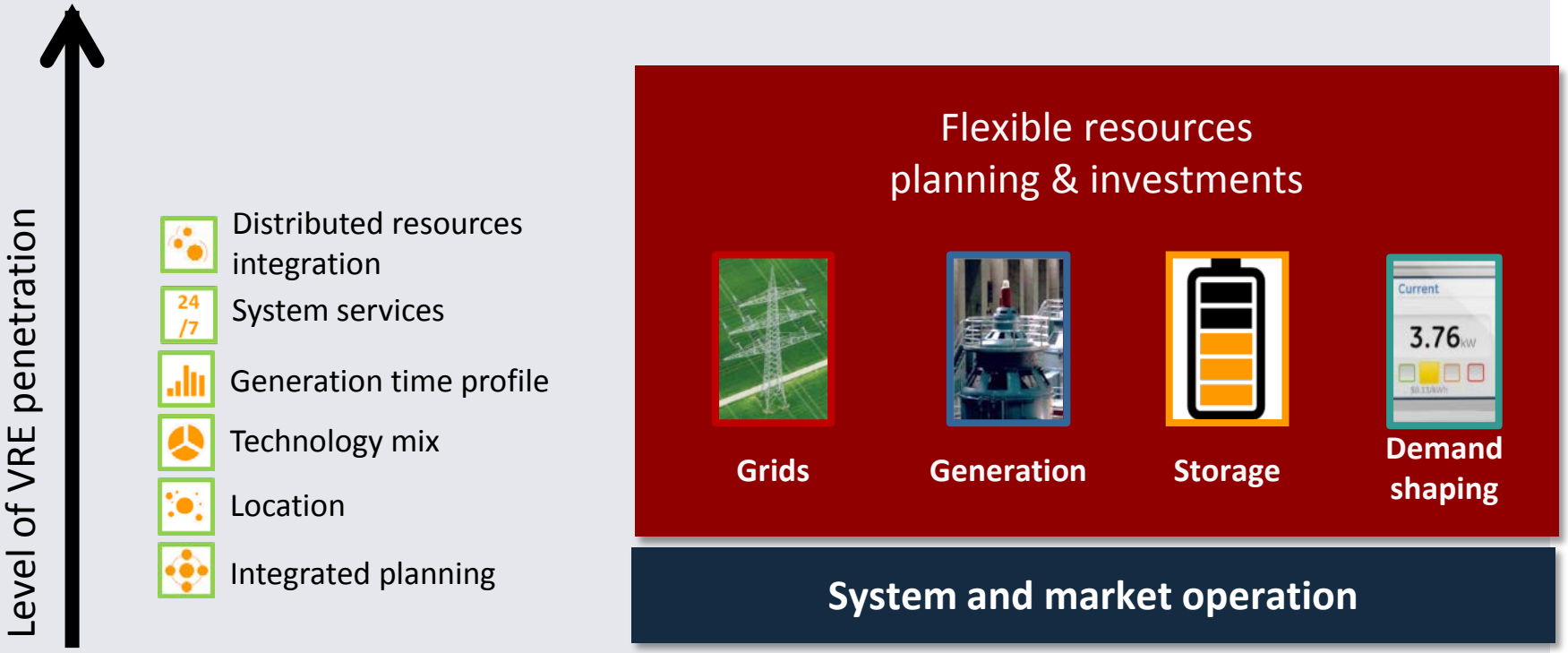
Historic projections fall short – solar PV

Figure 17: **Solar photovoltaic projections versus real market developments**



Source: REN 21 – Global Status Report 2004 – 2016

Policy design should optimise system value of variable renewable deployment



Conclusions

- **Record installed capacity, however progress not fast enough to reach Paris Agreement goals**
- Energy transition is happening in the power sector.
- For 100 % renewable energy to become reality, all renewable energy technologies need to be deployed and more focus needs to be put on heating & cooling as well as transport.
- Fossil-fuels need to be kept in the ground, fossil-fuel subsidies need to be phased out.
- Policy matters: system approach needed for linking power, heating and cooling as well as transport sector.

Renewable Energy Policy Network for the 21st Century

Global Status Report: yearly publication since 2005

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Mexico International Renewable Energy Conference (MEXIREC) 11-13 September 2017

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