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Renewable Energy in Europe

Current situation, challenges and opportunities for sustainable jobs in a growing industry

Rainer Hinrichs-Rahlwes, EREF Vice-President

Seoul, South Korea, 24 October 2019

KIREC-Side Session: Renewables opportunity: new Industry and green jobs

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About EREF

- Federation of associations from EU Member States, working in the sector of energy produced from renewable sources
- Voice of Independent Producers of Energy from Renewables
- Advocating level playing field and non-discriminatory access to energy markets
- Cooperating with national, European and international associations for stable and reliable policy frameworks in Europe and beyond
- Reaching out to international organisations and networks (e.g. REN21, IRENA, Global100RE, IEA, ...)

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B. Europe's Achievements and Challenges

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II. Targets and frameworks for 2020

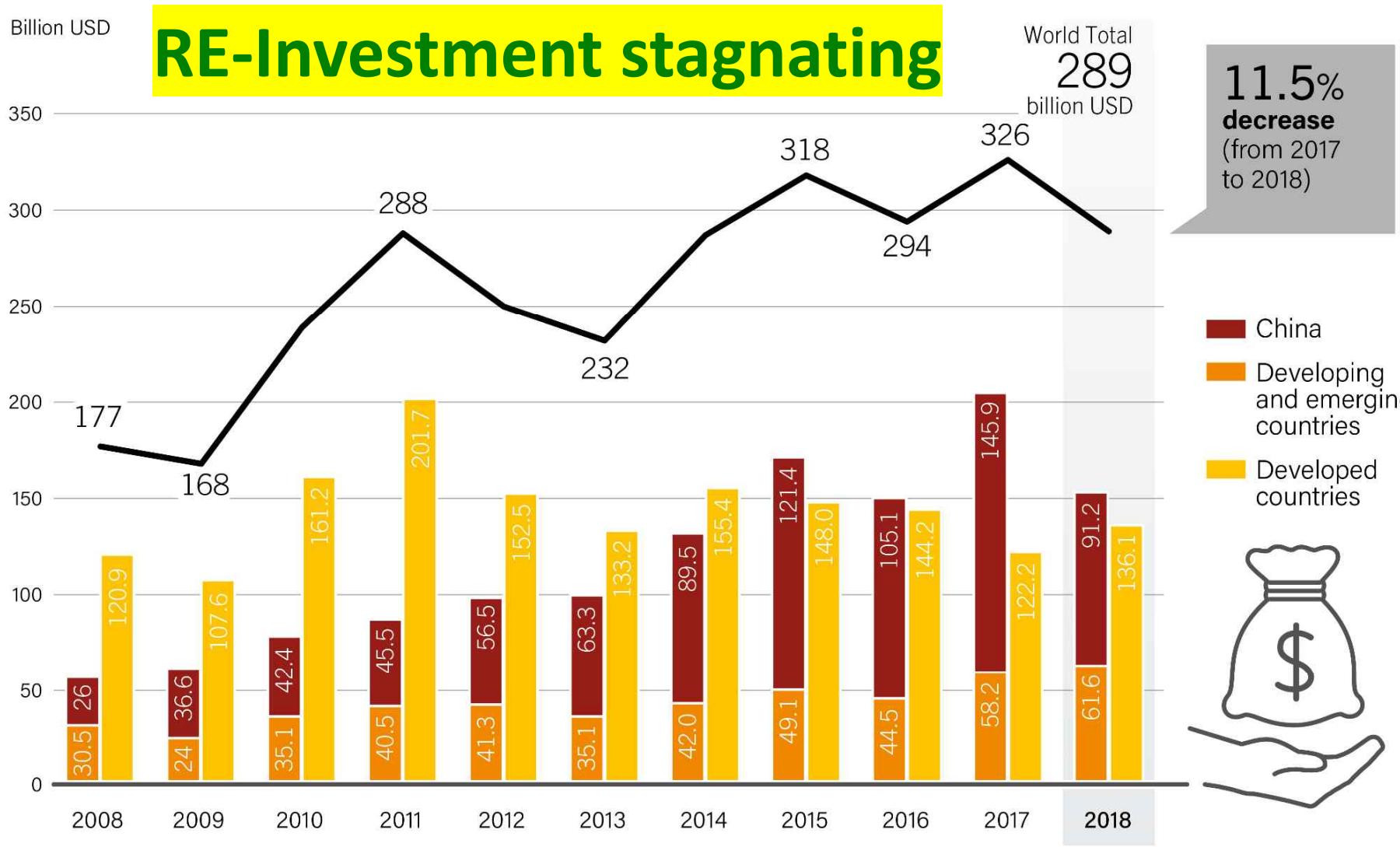
III. Targets and frameworks for 2030

IV. Long-term strategy: Climate-neutral 2050

C. Opportunities ahead



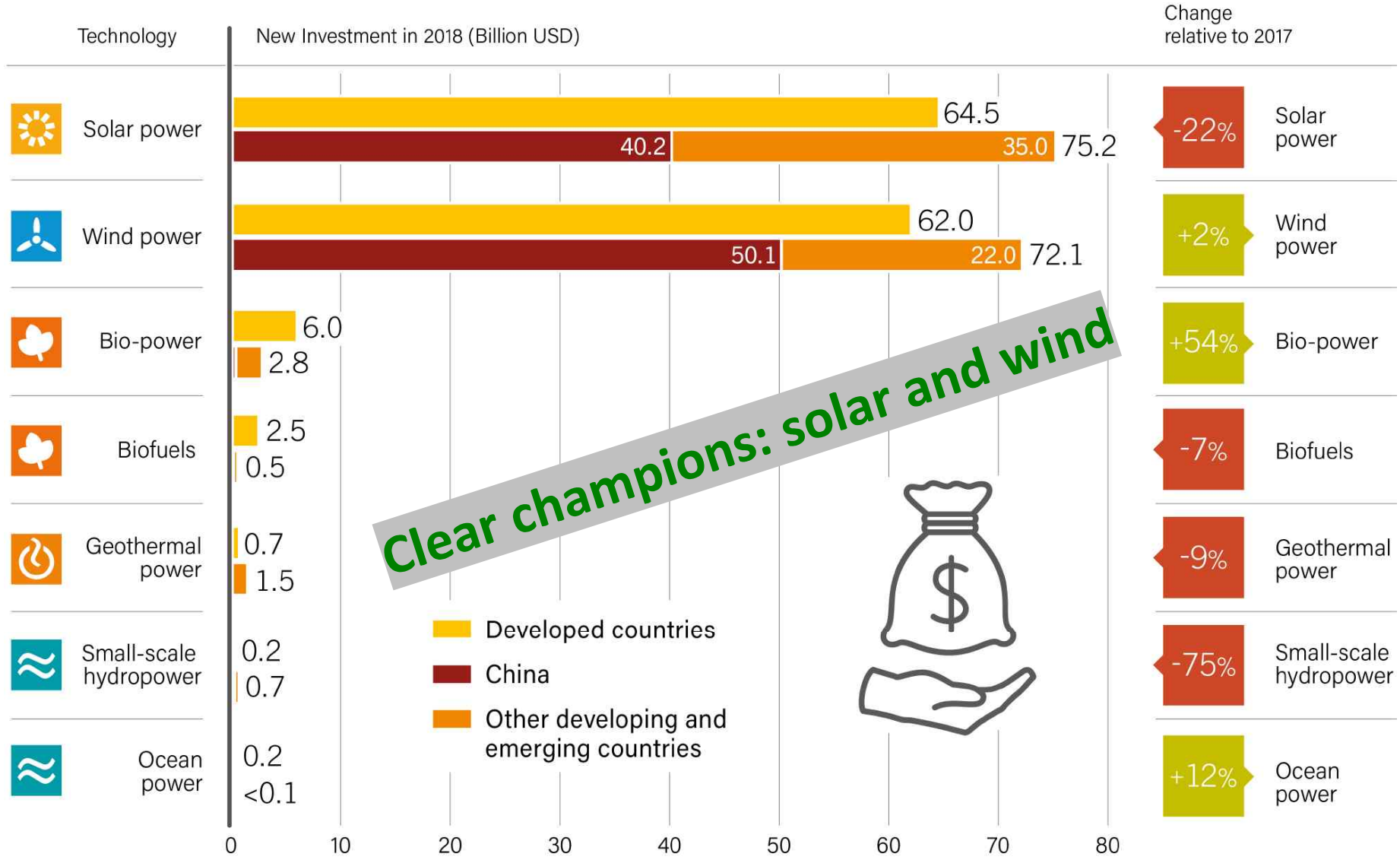
Global New Investment in Renewable Power and Fuels in Developed, Emerging and Developing Countries, 2008-2018



Note: Figure does not include investment in hydropower projects larger than 50 MW. Investment totals have been rounded to nearest billion. Data for previous years have been revised since the publication of the *Global Trends in Renewable Energy Investment 2018* report. See BNEF for data methodology and regional groupings.

Source: BNEF.

Global New Investment in Renewable Energy by Technology in Developed, Emerging and Developing Countries, 2018



Note: Total values include estimates for undisclosed deals as well as estimates for small distributed capacity and corporate and government R&D.

Source: BNEF.

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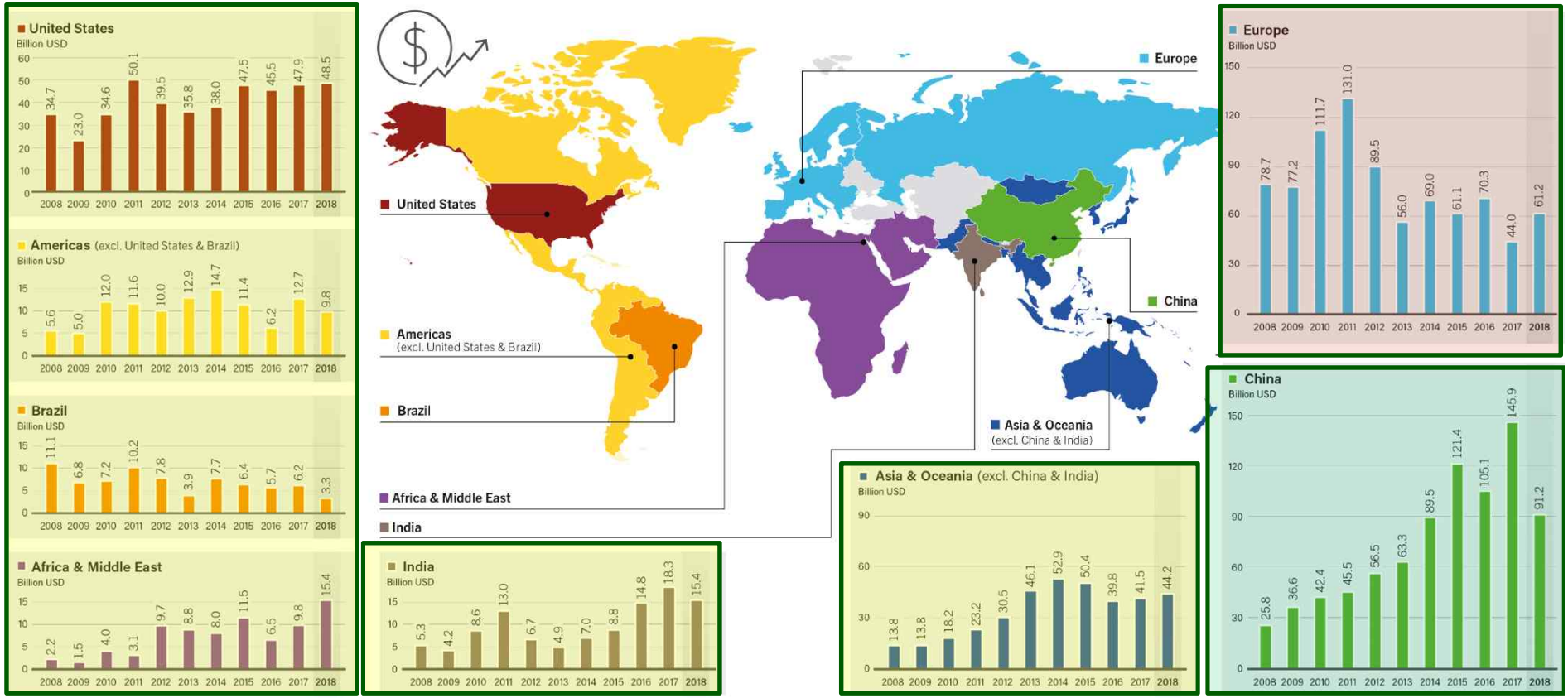
Regional Differences

Global New Investment in Renewable Power and Fuels, by Country or Region, 2008-2018



Note: Data are in current USD and include government and corporate research and development (R&D).

Source: BNEF.

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Total capacity or generation **(end 2018)**

	1	2	3	4	5
POWER					
Renewable power capacity (including hydropower)	**China**	United States	Brazil	India	Germany
Renewable power capacity (not including hydropower)	**China**	United States	Germany	India	Japan
Renewable power capacity *per capita* (not including hydropower)[3]	**Iceland**	Denmark	Germany/Sweden		Finland
Bio-power generation	**China**	United States	Brazil	Germany	India
Bio-power capacity	**China**	United States	Brazil	India	Germany
Geothermal power capacity	**United States**	Indonesia	Philippines	Turkey	New Zealand
Hydropower capacity[4]	**China**	Brazil	Canada	United States	Russian Federation
Hydropower generation[4]	**China**	Canada	Brazil	United States	Russian Federation
Solar PV capacity	**China**	United States	Japan	Germany	India
Solar PV capacity *per capita*	**Germany**	Australia	Japan	Belgium	Italy
Concentrating solar thermal power (CSP) capacity	**Spain**	United States	South Africa	Morocco	India
Wind power capacity	**China**	United States	Germany	India	Spain
Wind power capacity *per capita*	**Denmark**	Ireland	Germany	Sweden	Portugal
HEAT					
Solar water heating collector capacity[5]	**China**	United States	Turkey	Germany	Brazil
Solar water heating collector capacity *per capita*	**Barbados**	Austria	Cyprus	Israel	Greece
Geothermal heat output[6]	**China**	Turkey	Iceland	Japan	Hungary

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Annual Investment, Additions, Production **(2018)**

Annual Investment / Net Capacity Additions / Production in 2018

	1	2	3	4	5
Investment in renewable power and fuels (not including hydropower over 50 MW)	**China**	United States	Japan	India	Australia
Investment in renewable power and fuels per unit GDP[1]	**Palau**	Djibouti	Morocco	Iceland/Serbia	
Geothermal power capacity	**Turkey**	Indonesia	United States	Iceland	New Zealand
Hydropower capacity	**China**	Brazil	Pakistan	Turkey	Angola
Solar PV capacity	**China**	India[2]/United States		Japan	Australia
Concentrating solar thermal power (CSP) capacity	**China/Morocco**		South Africa	Saudi Arabia	–
Wind power capacity	**China**	United States	Germany	India	Brazil
Solar water heating capacity	**China**	Turkey	India	Brazil	United States
Biodiesel production	**United States**	Brazil	Indonesia	Germany	Argentina
Ethanol production	**United States**	Brazil	China	Canada	Thailand

REN21 RENEWABLES 2019 GLOBAL STATUS REPORT

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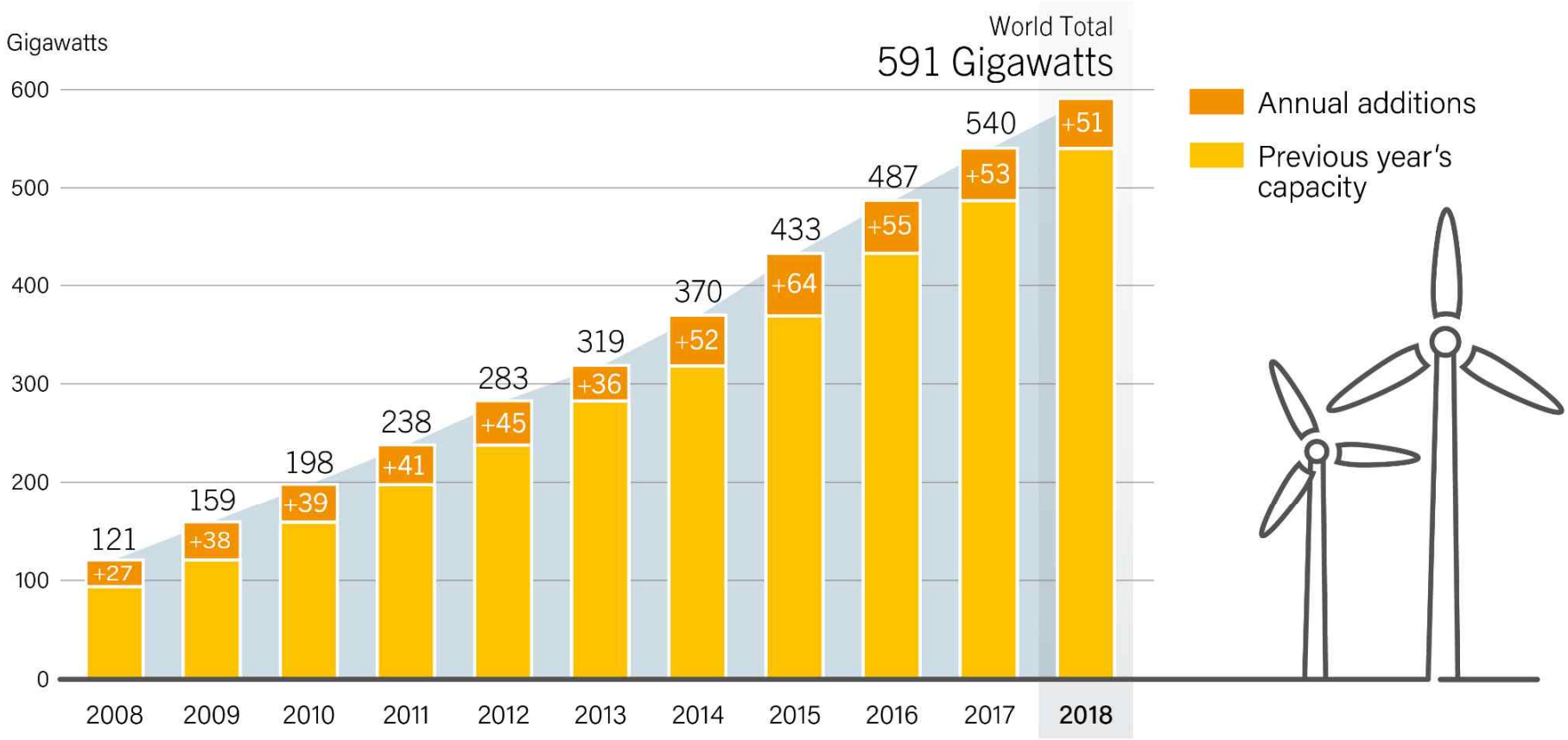
591 GW of **Windpower** installed

51 GW in 2018

Wind Power Global Capacity and Annual Additions, 2008-2018



REN21 RENEWABLES 2019 GLOBAL STATUS REPORT

Source: GWEC.

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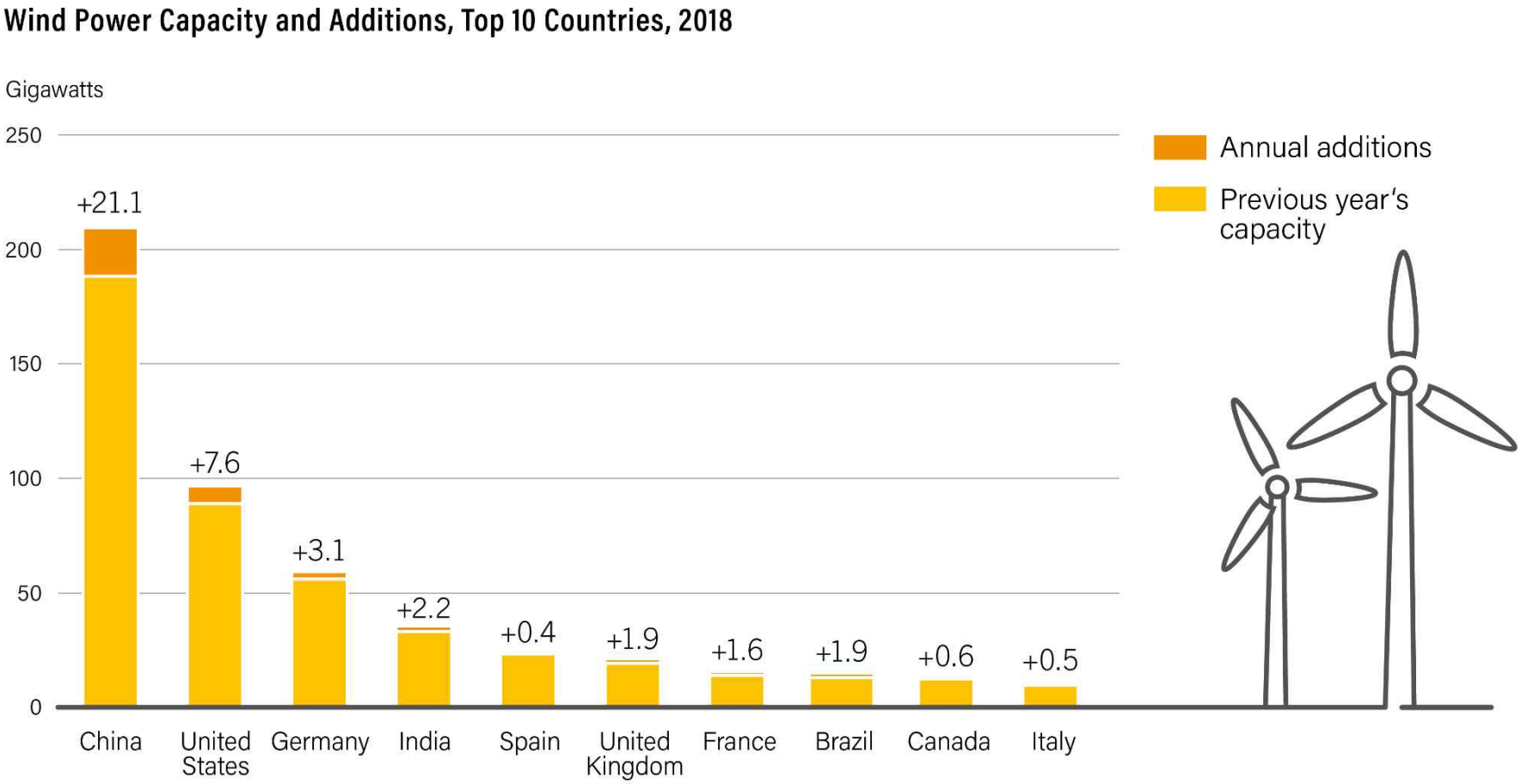
Wind: China leading by far



Note: Additions are net of decommissioning.

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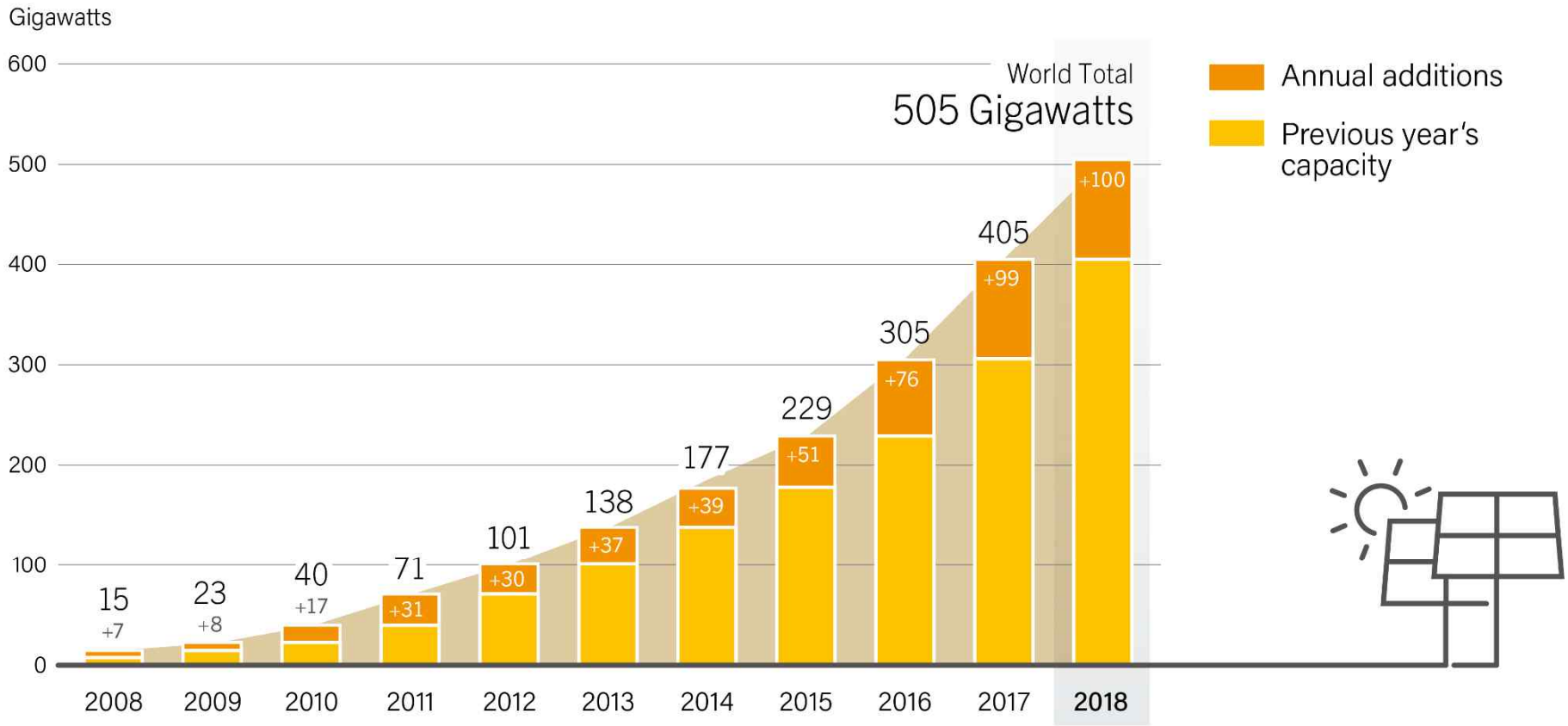
505 GW of **Solar PV** installed

100 GW in 2018

Solar PV Global Capacity and Annual Additions, 2008-2018



Note: Data are provided in direct current (DC).
Totals may not add up due to rounding.

Source: Becquerel Institute and IEA PVPS.

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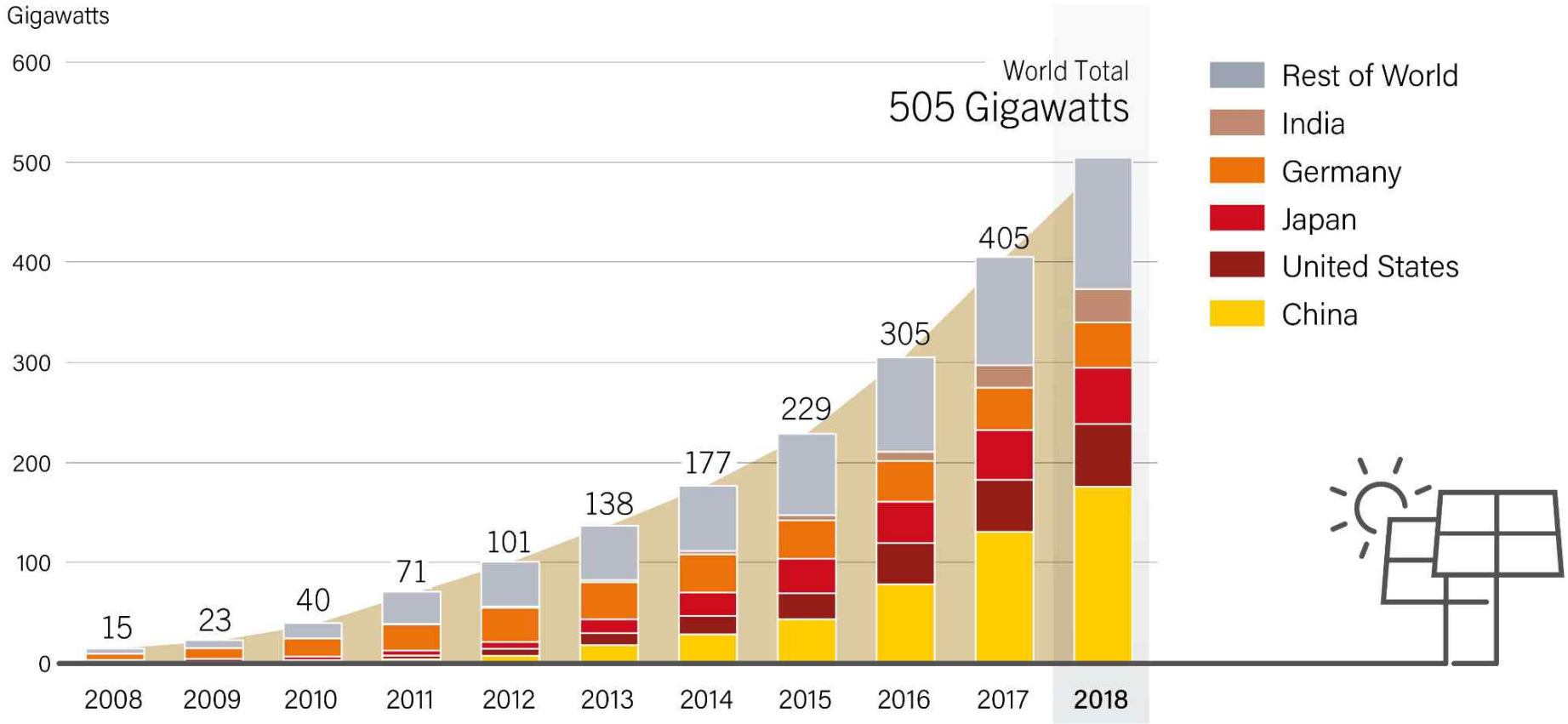
PV: China leading the way

Solar PV Global Capacity, by Country and Region, 2008-2018



Note: Data are provided in direct current (DC).

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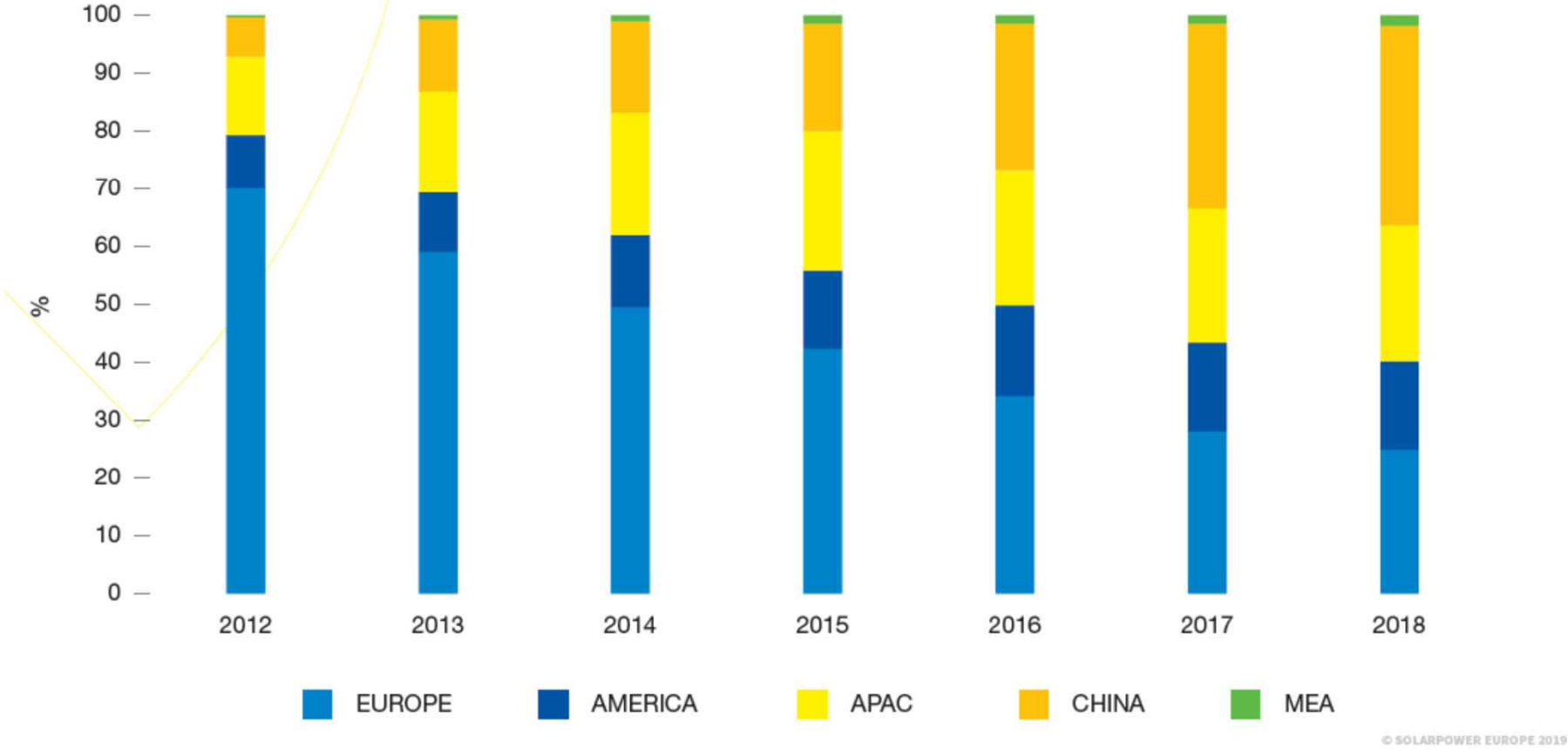
PV-Markets: From Europe to APAC and America

FIGURE 9 GLOBAL TOTAL SOLAR PV INSTALLED CAPACITY SHARES 2012-2018



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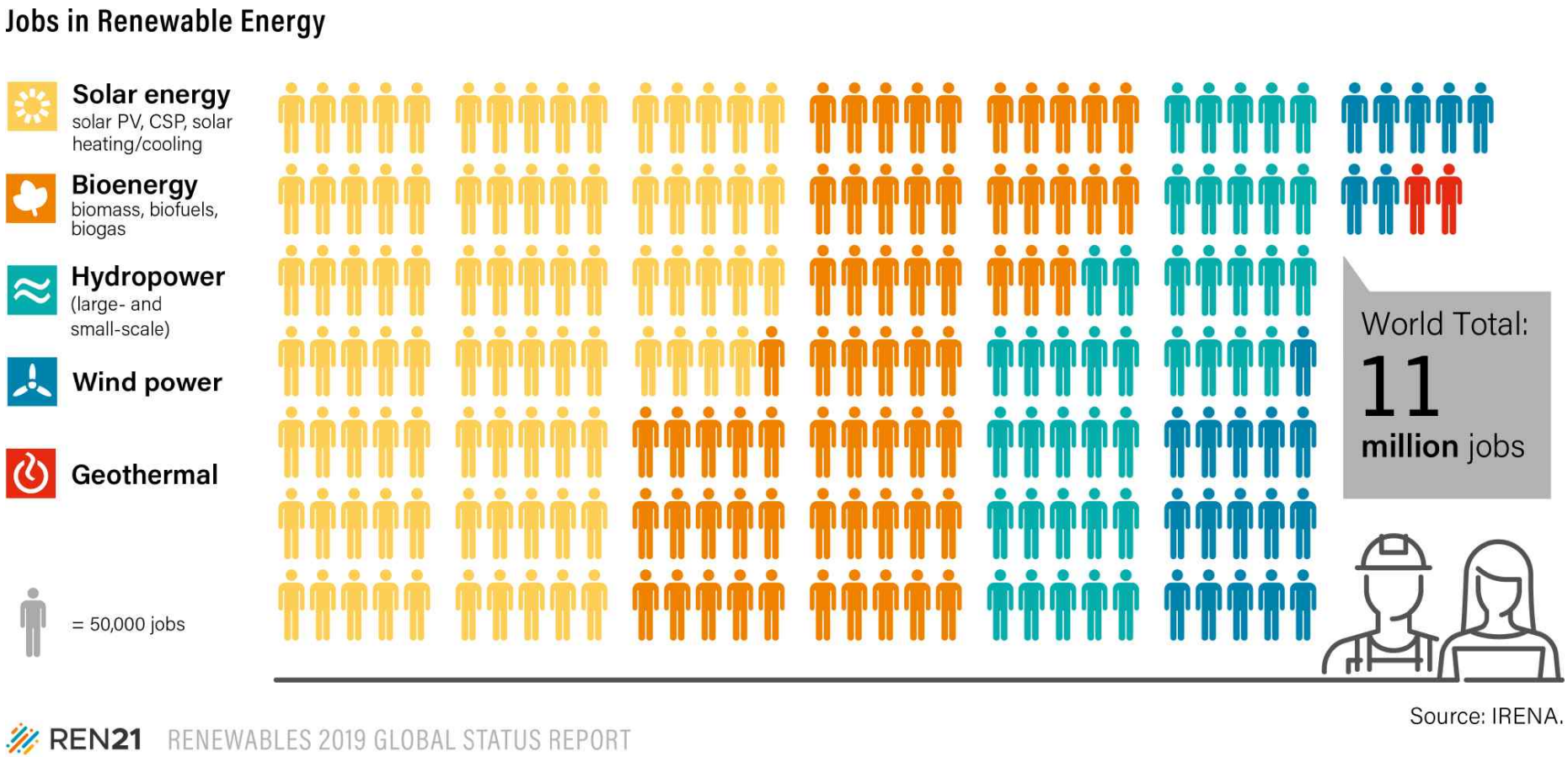
11 million jobs in Renewables … and growing



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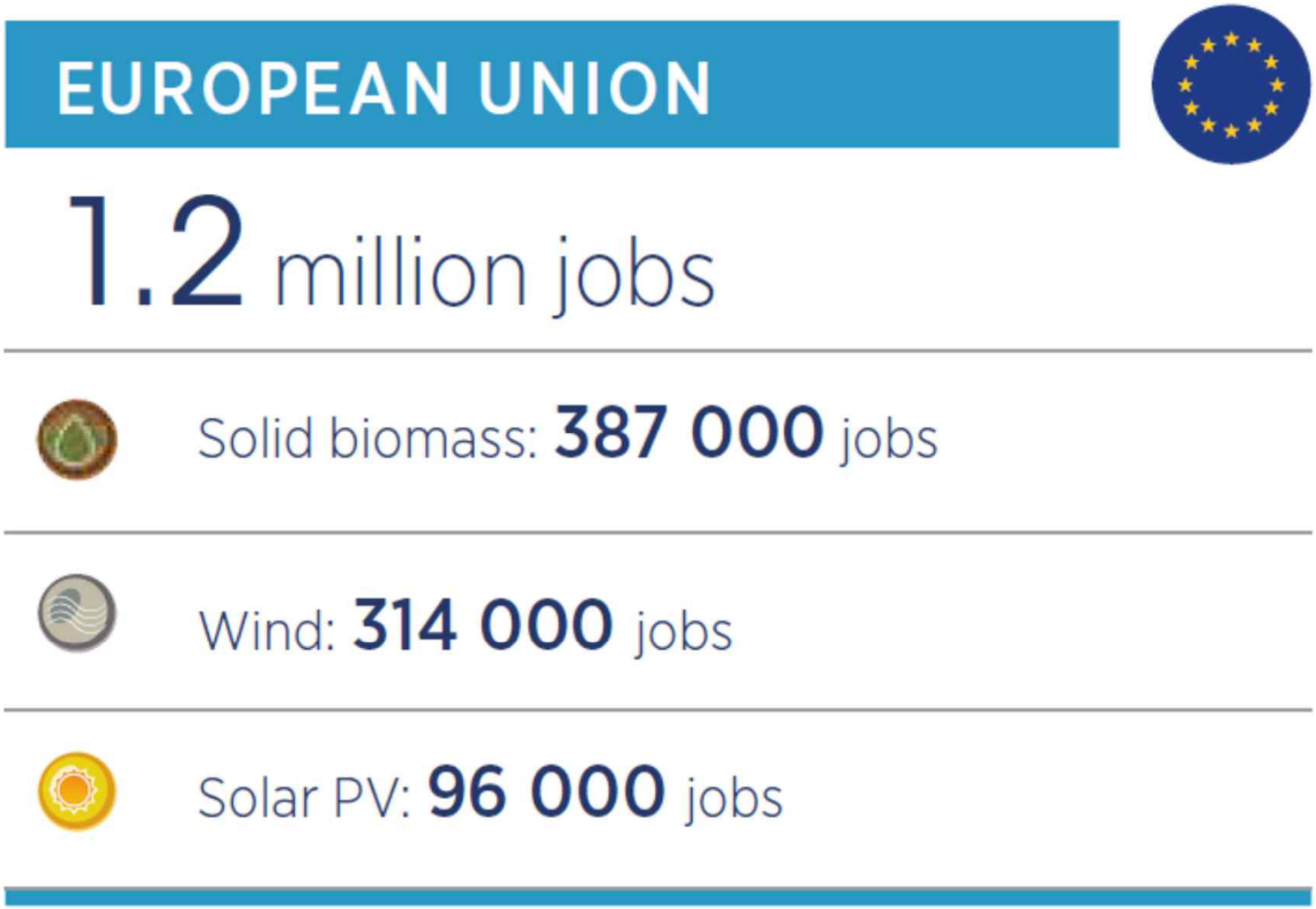

Source: IRENA – Renewable Energy and Jobs, Annual Review 2019

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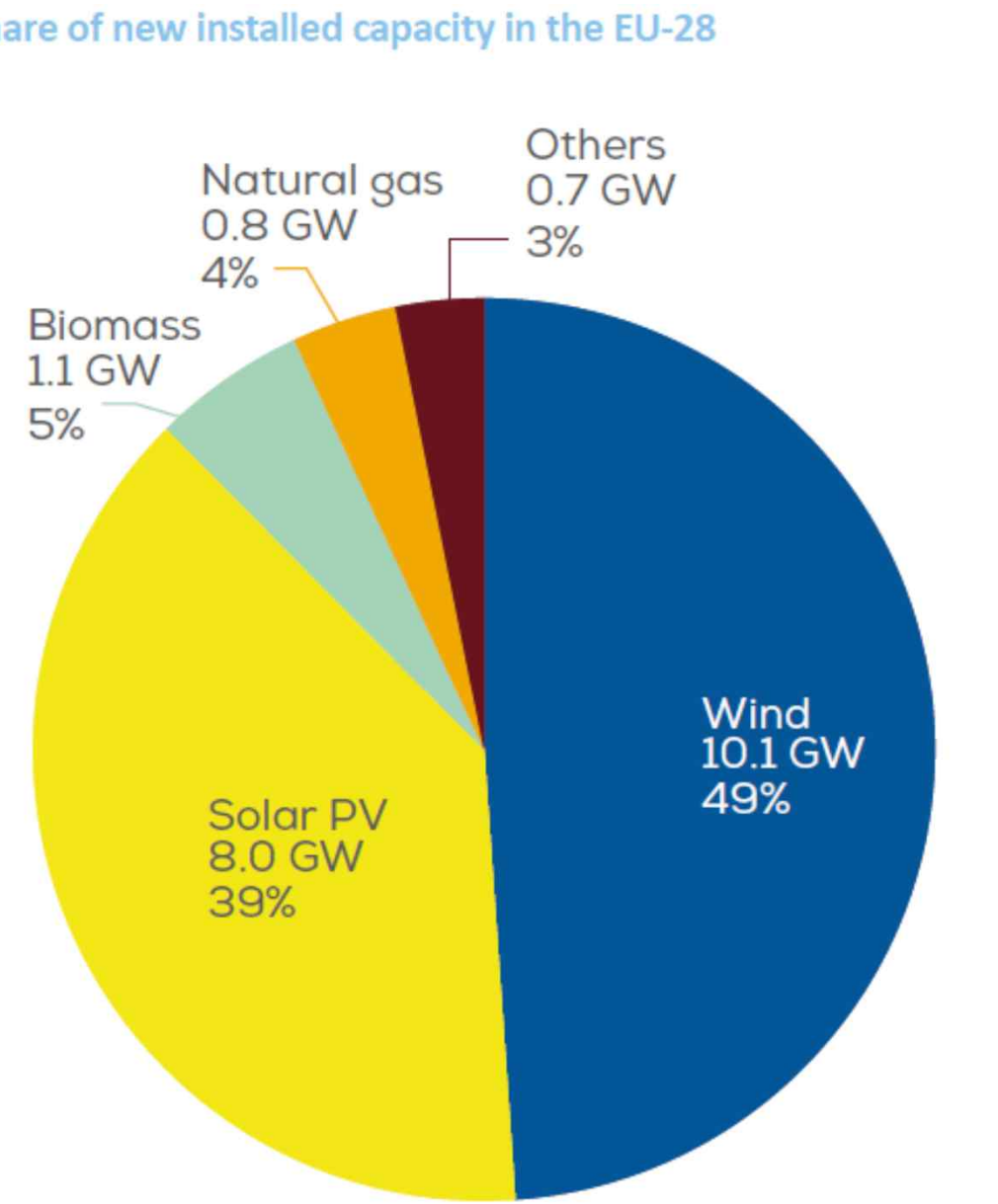
New Power Capacity in Europe:

Renewables and

– nearly –

nothing else



Source: Platts, SolarPowerEurope, WindEurope

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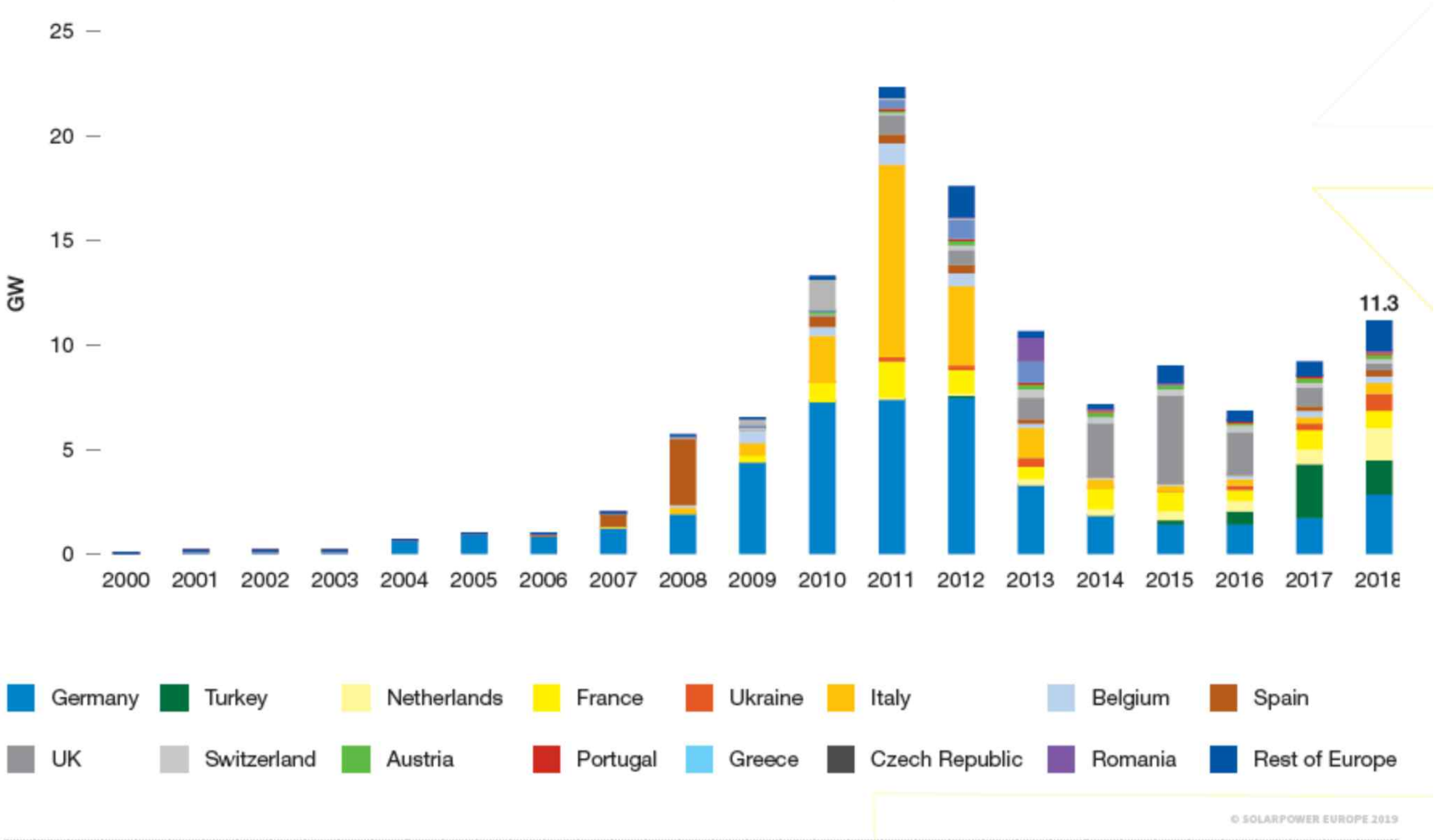
PV-Markets in Europe: Stabilizing

FIGURE 32 EUROPEAN ANNUAL SOLAR PV INSTALLED CAPACITY 2000-2018



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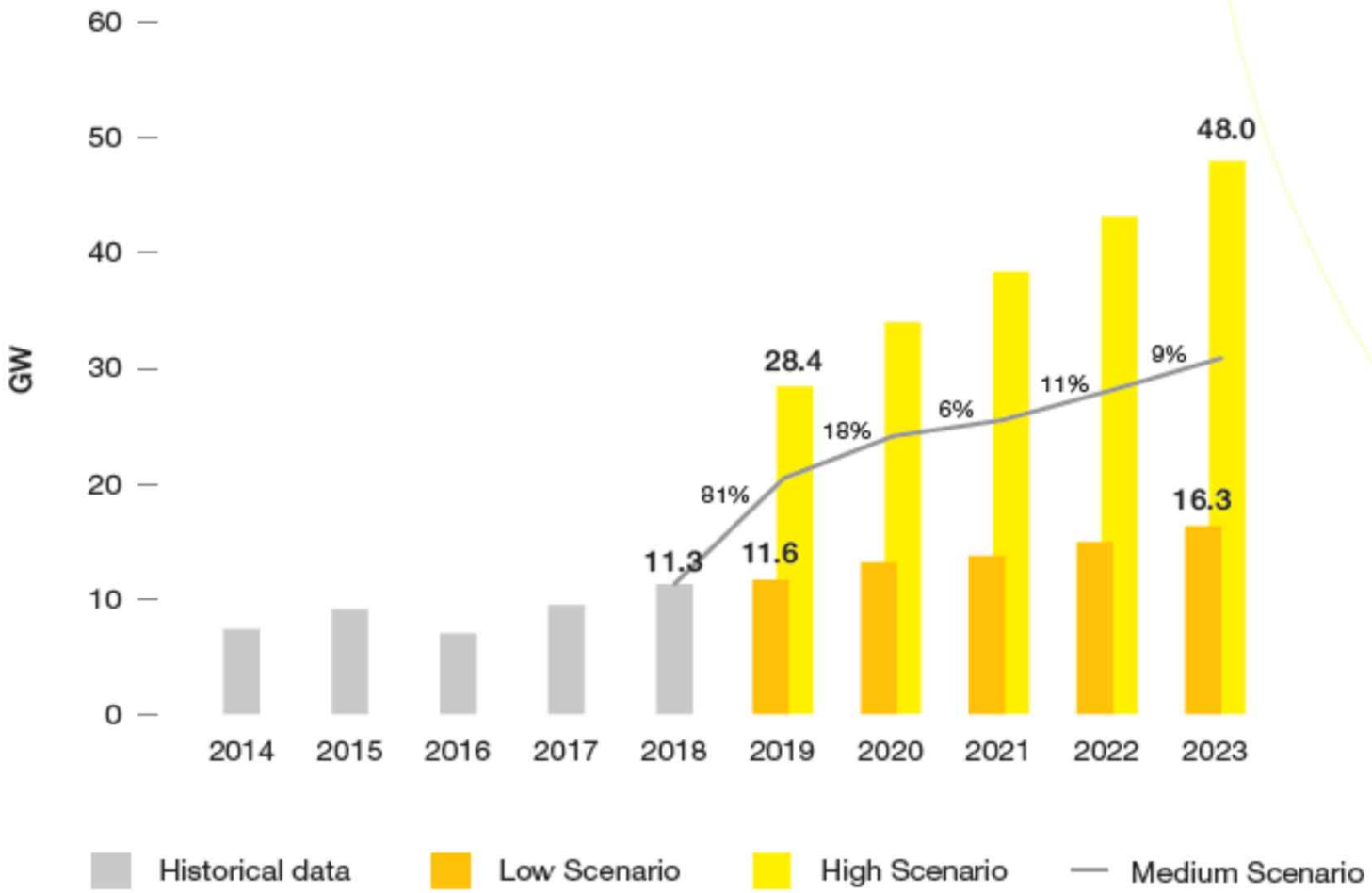
PV (Europe): >30 GWa by 2023

FIGURE 35 EUROPEAN ANNUAL SOLAR PV MARKET SCENARIOS 2019-2023



Source: Solar Power Europe 2019

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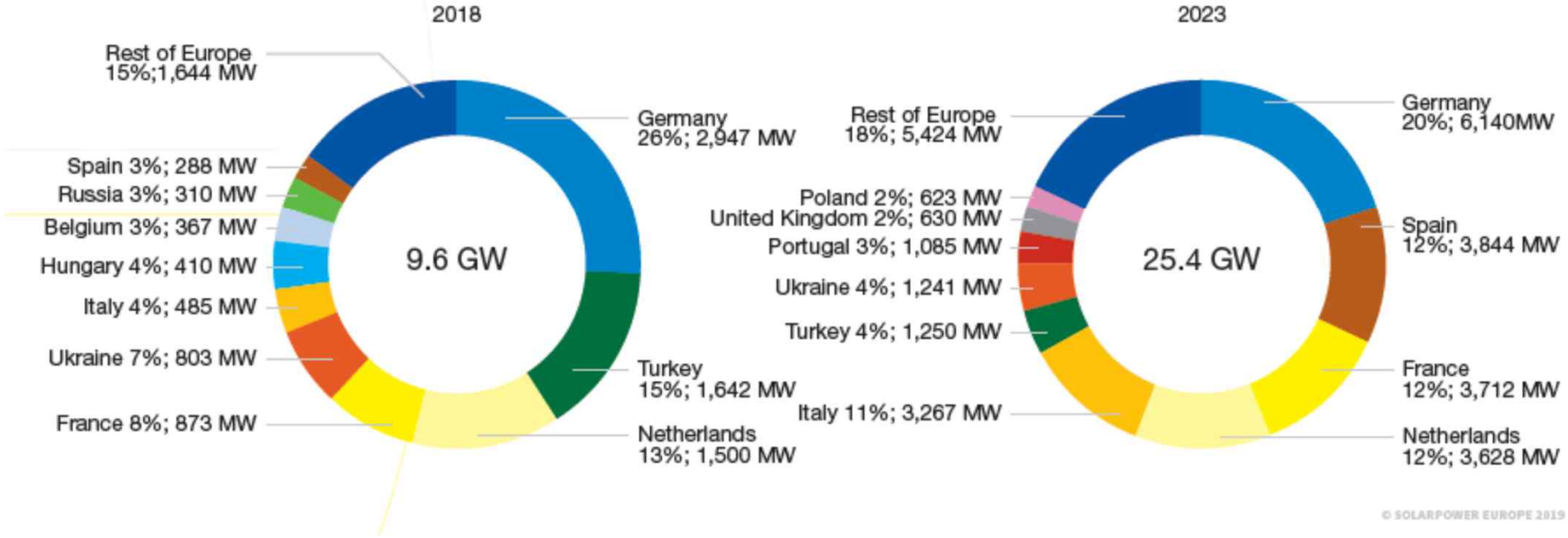
PV (Europe): More Markets Growing

FIGURE 38 CAPACITY ADDITIONS AND SHARES OF TOP 10 EUROPEAN SOLAR PV MARKETS IN 2018 AND 2023



Source: Solar Power Europe 2019

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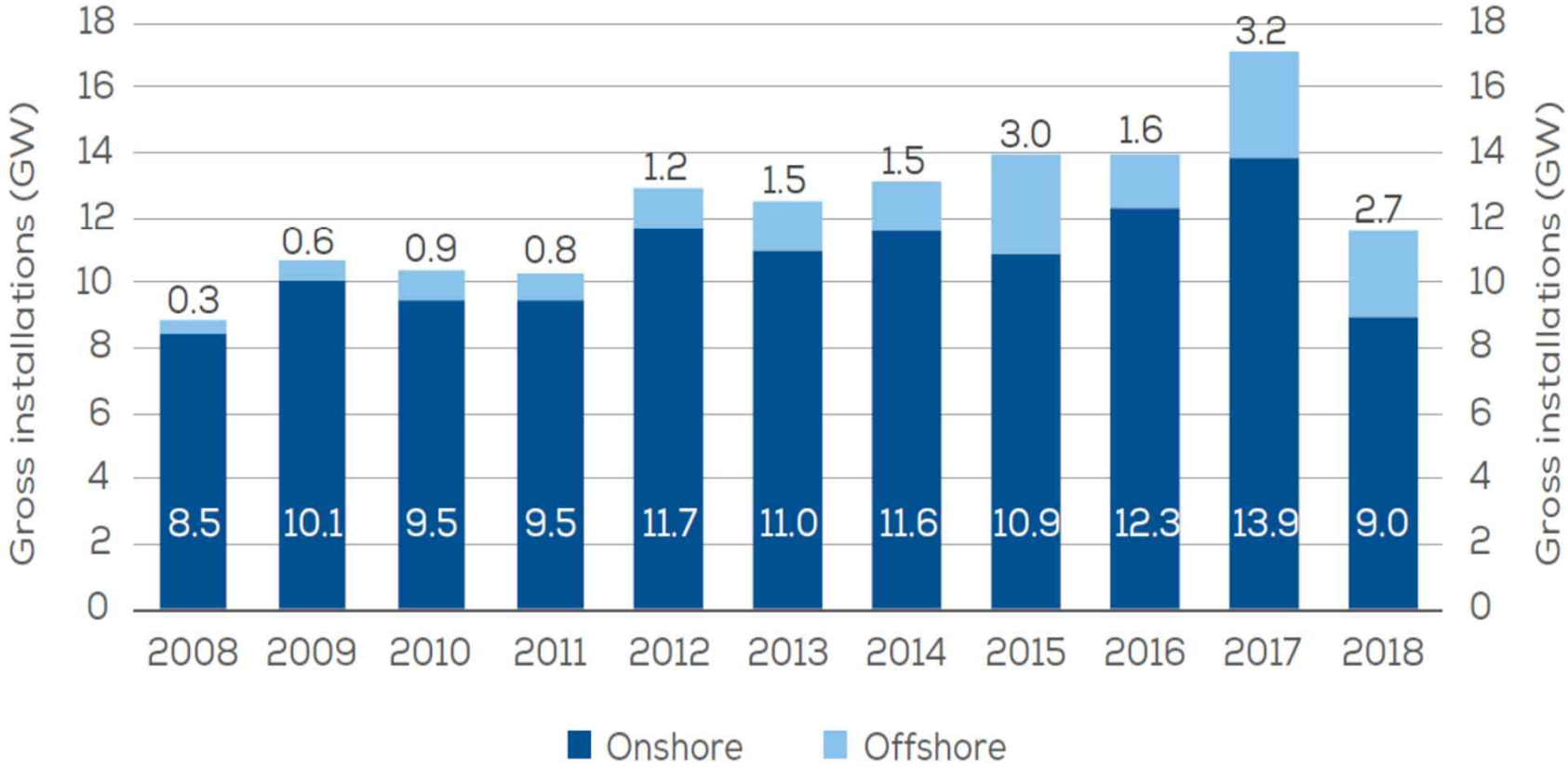
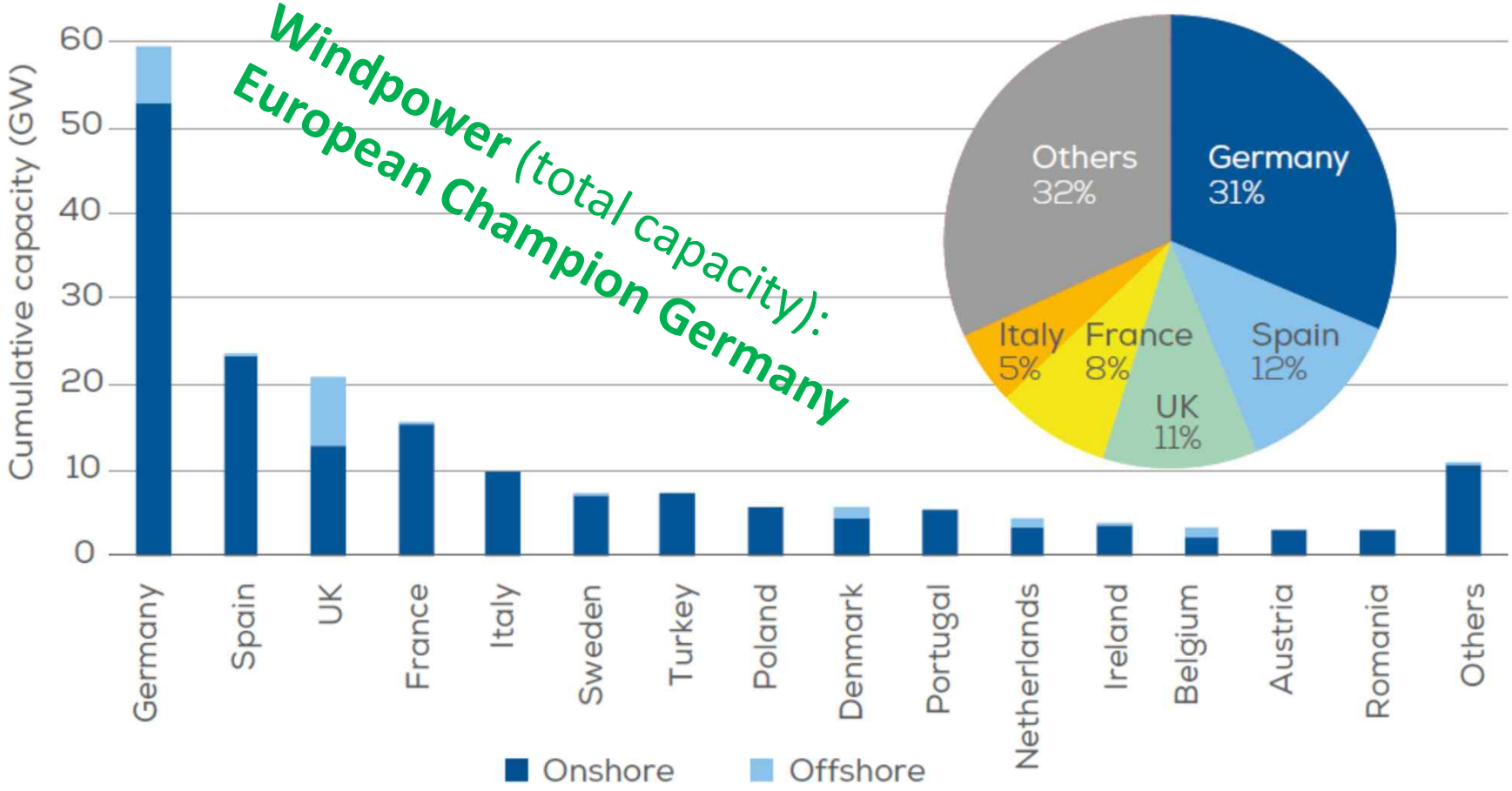
Windpower: Growth slowing down

Gross annual onshore and offshore wind installations in Europe



Source: WindEurope

Cumulative onshore and offshore installations by country

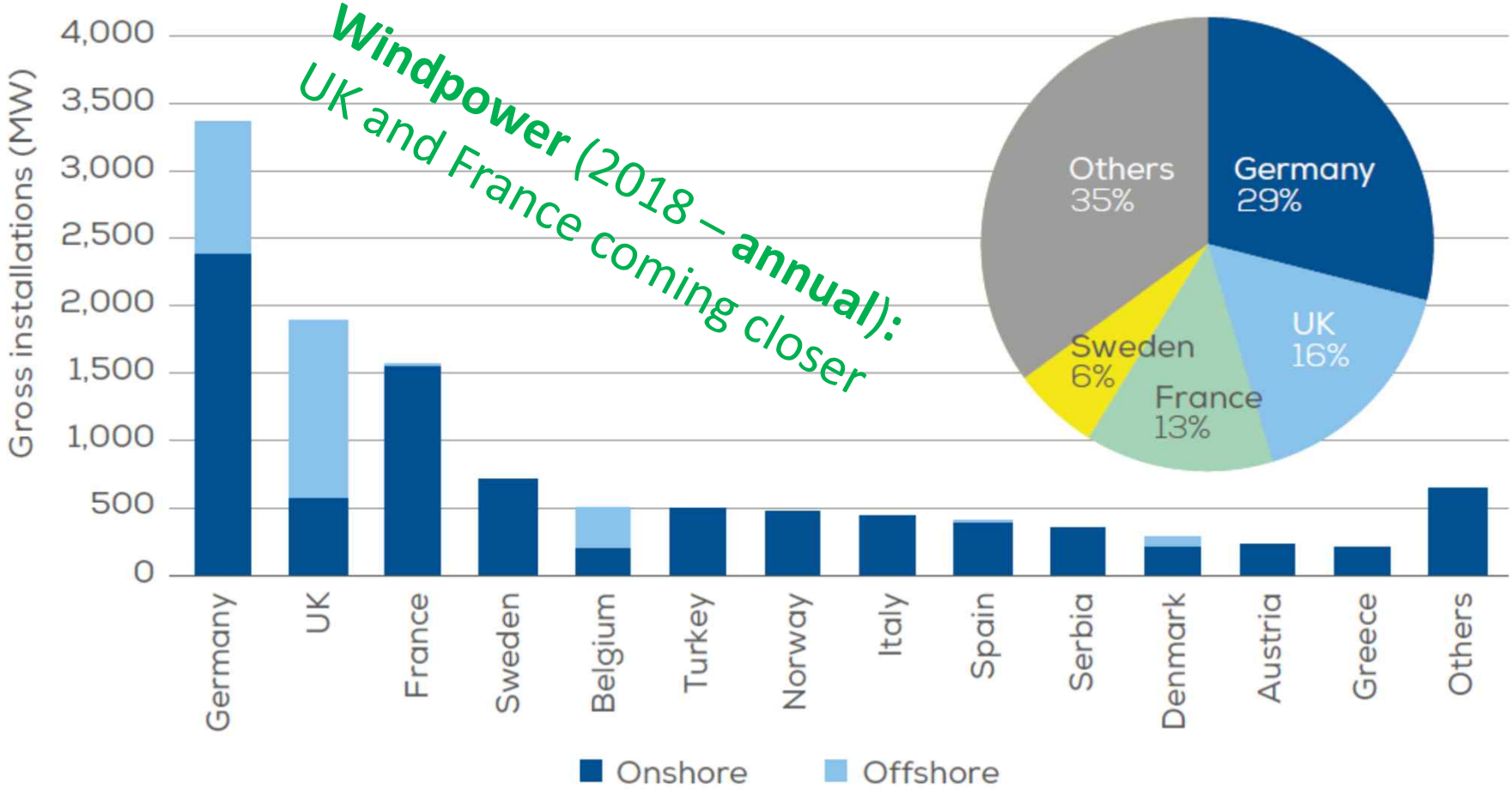


Offshore	6.4	-	8.2	-	-	0.2	-	-	1.3	-	1.1	-	1.2	-	-	0.1
Onshore	52.9	23.5	12.8	15.3	10.0	7.2	7.4	5.9	4.4	5.4	3.4	3.5	2.2	3.0	3.0	10.8
Total	**59.3**	**23.5**	**21.0**	**15.3**	**10.0**	**7.4**	**7.4**	**5.9**	**5.7**	**5.4**	**4.5**	**3.5**	**3.4**	**3.0**	**3.0**	**10.9**

Source: WindEurope

2018 gross annual onshore and offshore wind installations in Europe

Windpower (2018 – **annual**):
UK and France coming closer



Offshore	969	1,312	2	-	309	-	-	-	5	-	61	-	-	-
Onshore	2,402	589	1,563	717	204	497	480	452	392	356	220	230	207	706
Total	**3,371**	**1,901**	**1,565**	**717**	**513**	**497**	**480**	**452**	**397**	**356**	**281**	**230**	**207**	**706**

Source: WindEurope

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Europe's 2020 Targets & Framework

- At least **20% Renewable Energy** in GFEC
- Differentiated **binding national targets**
- Indicative trajectory for each MS
- At least 10% Renewables in transport (EU & MS)
- At least **20% Efficiency Increase**
- At least **20% (30%) GHG-Reduction**
- Legal framework to secure implementation:
  * National Renewable Energy Action Plans
  * Biannual reports
  * Cooperation mechanisms: MS sharing efforts
  * Infringement in case of non-compliance

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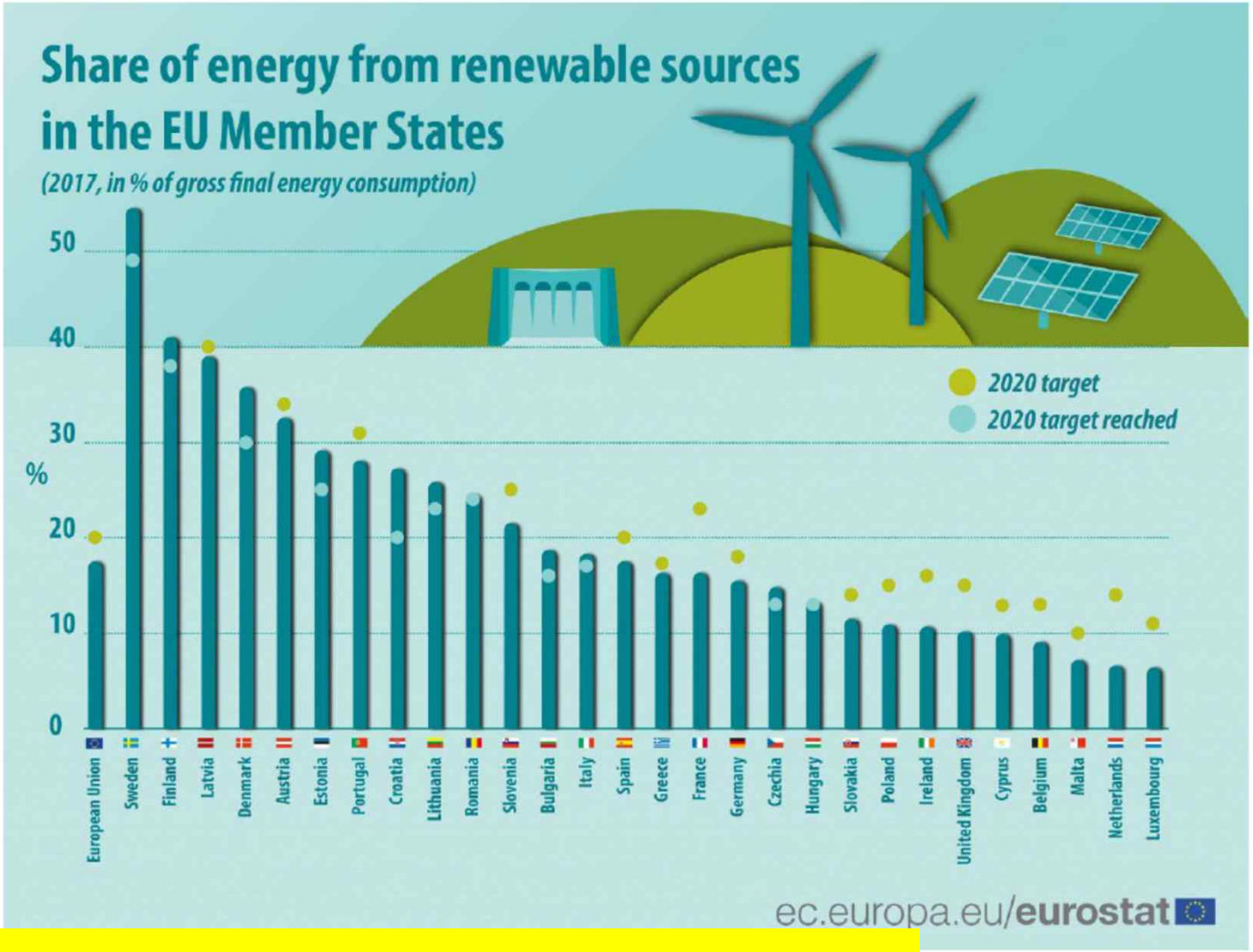
On track for the 2020-targets?



Source: https://ec.europa.eu/eurostat/statistics-explained/index.php/Renewable_energy_statistics

Targets likely to be missed!

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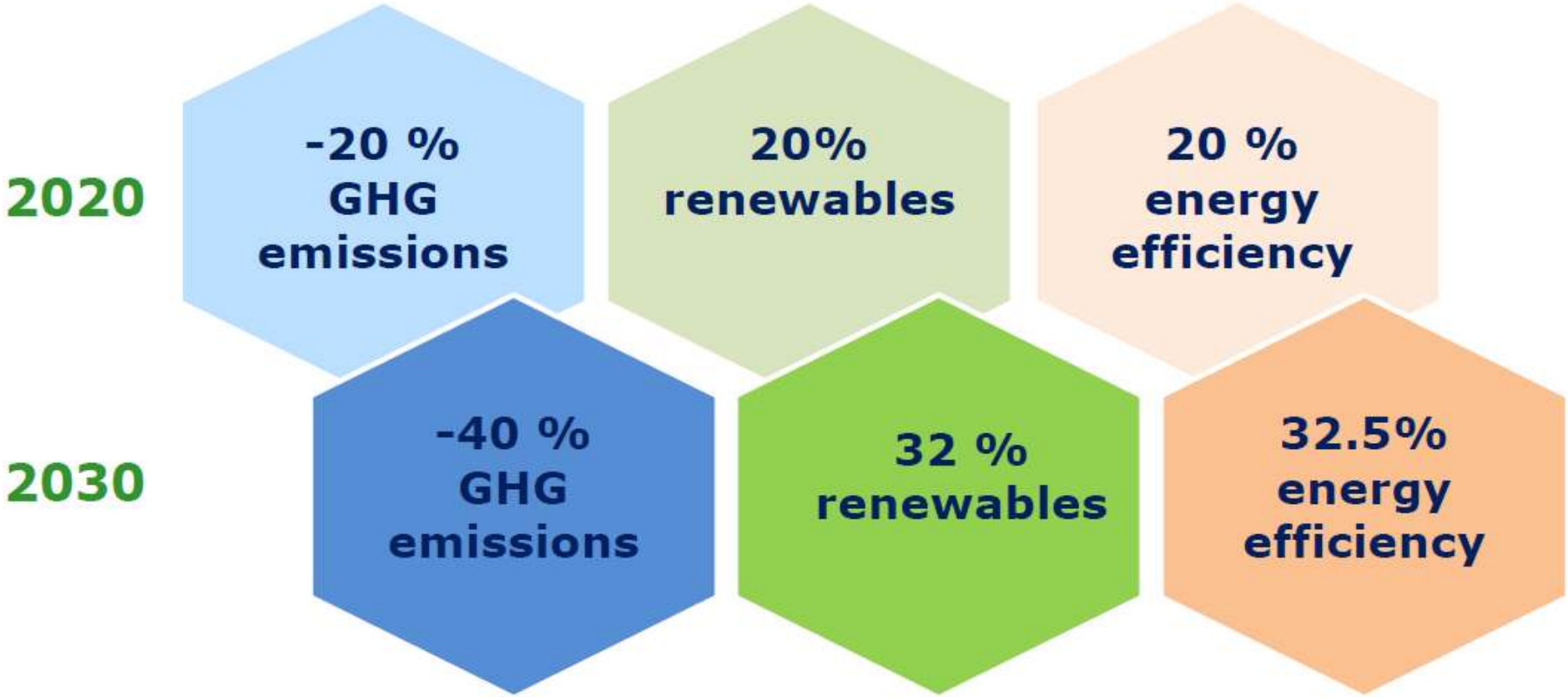
European climate and energy targets



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Clean Energy for all Europeans Package *("Winter Package")*

(11.2016 – 04.2019)

- Energy Performance of Buildings Directive (EPBD)
- Energy efficiency Directive (EED)
- Renewable Energy Directive (RED)
- Governance Regulation

Market Design Initiative (MDI):

- Electricity Market Regulation
- Electricity Market Directive
- Risk preparedness Regulation
- ACER Regulation

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Renewable Energies Directive (Recast) & Governance Regulation

- EU-binding **Renewables-target >32%** of GFEC (review 2023, indicative milestones, no binding national targets)
- **National Energy and Climate Plans** (NECP) - drafts by 2018, final 2019
- **Gap filler, One-stop-shops, Common rule book for support schemes**
- Indicative **Heating & Cooling target:** annual **increase of 1.3 pp**
- **Transport target 14%** (cap for G1-biofuels, food and crop based, gradual phase out of palm oil, sustainability criteria for biofuels)
- **Self-consumption and Renewable Energy Communities**

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Market Design Initiative (MDI)

- **Priority dispatch** and **exceptions from balancing responsibilities** for renewable power < 400 kW (as of 2026: 200 kW
- **Last curtailment** for renewable power
- Market based redispatch and system services
- Access for renewables to all markets segments (“as close to real time as possible”)
- **Cross-border cooperation** of TSOs and DSOs
- Limits to national capacity mechanisms
- **Citizens’ energy communities** have the right to produce, store, distribute and sell energy
- Active customers may produce, store or sell electricity (including through PPAs and with the help of aggregators)

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The Commission Draft

EUROPEAN
COMMISSION

Brussels, 28.11.2018
COM(2018) 773 final

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE EUROPEAN COUNCIL, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE, THE COMMITTEE OF THE REGIONS AND THE EUROPEAN INVESTMENT BANK

A Clean Planet for all
A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy

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The Portfolio of options: 8 Scenarios …

Long Term Strategy Options

	Electrification (ELEC)	Hydrogen (H2)	Power-to-X (P2X)	Energy Efficiency (EE)	Circular Economy (CIRC)	Combination (COMBO)	1.5°C Technical (1.5TECH)	1.5°C Sustainable Lifestyles (1.5LIFE)
Main Drivers	Electrification in all sectors	Hydrogen in industry, transport and buildings	E-fuels in industry, transport and buildings	Pursuing deep energy efficiency in all sectors	Increased resource and material efficiency	Cost-efficient combination of options from 2°C scenarios	Based on COMBO with more BECCS, CCS	Based on COMBO and CIRC with lifestyle changes
GHG target in 2050	-80% GHG (excluding sinks) ["well below 2°C" ambition]					-90% GHG (incl. sinks)	-100% GHG (incl. sinks) ["1.5°C" ambition]	
Major Common Assumptions	• Higher energy efficiency post 2030 • Deployment of sustainable, advanced biofuels • Moderate circular economy measures • Digitilisation					• Market coordination for infrastructure deployment • BECCS present only post-2050 in 2°C scenarios • Significant learning by doing for low carbon technologies • Significant improvements in the efficiency of the transport system.		
Power sector	Power is nearly decarbonised by 2050. Strong penetration of RES facilitated by system optimization (demand-side response, storage, interconnections, role of prosumers). Nuclear still plays a role in the power sector and CCS deployment faces limitations.							
Industry	Electrification of processes	Use of H2 in targeted applications	Use of e-gas in targeted applications	Reducing energy demand via Energy Efficiency	Higher recycling rates, material substitution, circular measures	Combination of most Cost-efficient options from "well below 2°C" scenarios with targeted application (excluding CIRC)	COMBO but stronger	CIRC+COMBO but stronger
Buildings	Increased deployment of heat pumps	Deployment of H2 for heating	Deployment of e-gas for heating	Increased renovation rates and depth	Sustainable buildings			CIRC+COMBO but stronger
Transport sector	Faster electrification for all transport modes	H2 deployment for HDVs and some for LDVs	E-fuels deployment for all modes	Increased modal shift	Mobility as a service			• CIRC+COMBO but stronger • Alternatives to air travel
Other Drivers		H2 in gas distribution grid	E-gas in gas distribution grid				Limited enhancement natural sink	• Dietary changes • Enhancement natural sink

Source: https://data.consilium.europa.eu/doc/document/ST-1-2019-INIT/en/pdf

- Only 2 scenarios close to -100% (→ 1.5° C ambition)
- NO 100% Renewables Scenario included

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Controversial Debate

- Presented as **EU's contribution to COP24** – instead of higher 2030 GHG-reduction target (29 November 2018)
- **Austria, Ireland, Lithuania, Luxemburg**
  - scenario for a 100% renewable energy future missing
  - ask to work on a 100% RE scenario for future drafts
- **European Parliament** (14 March 2019)
  - endorses objective and calls on Member States to commit to the required ambition
  - regrets absence of scenarios aiming at a time before 2050
  - calls for a highly energy-efficient and renewable-based energy system
  - asks for increasing GHG-reduction target to 55% by 2030
- **European Council** (14 March 2019)
  - emphasizes "*the importance of the EU submitting an ambitious long-term strategy by 2020 striving for climate neutrality in line with the Paris Agreement*".

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From Challenges to Opportunities

- Long-term **Decarbonisation Strategy**
  - to be agreed and decided in 2020
  - to include 100% Renewable energy scenarios
  - to include updated GHG reduction target for 2030 (-45% → -55%) and milestones before 2050
  - to look into earlier than 2050 achievement of #NetZero
  - to be important building block for upwards review of 2030 targets for Renewables and Energy Efficiency
  - to serve as input for review of NDC (UNFCCC)

- **Policies and measures** to still to be agreed and implemented to achieve #NetZero2050 … or more …

➢ ***Innovative industry and value creation***

➢ ***Multiple environmental and health benefits***

➢ ***2-3 million jobs by 2030 – distributed along the value chain and throughout Europe***

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100% RENEWABLES

Source: http://go100re.net/

Thanks you for listening

and

Leave a liveable planet to future generations!



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