



RENEWABLE ENERGY SOLUTIONS
FOR THE MEDITERRANEAN



*Ministero degli Affari Esteri
e della Cooperazione Internazionale*



RENEWABLE ENERGY SOLUTIONS FOR AFRICA

La geopolitica delle rinnovabili



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Il ruolo delle energie rinnovabili: opportunità di crescita globale ed investimenti nelle economie emergenti

*Ministero degli Affari Esteri e della Cooperazione Internazionale
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Renewables 2017

From Medium Term Market Report





Policy support & technology progress continue to drive robust growth in renewables:

- Policies creating new markets
- Industry delivering technology improvements and cost reductions
- Arrival of “giant” emerging economies

Solar PV grew faster than any other form of generating capacity and broke new records in 2016, led by China

- PV capacity 1st time grew faster than any other fuel, including coal
- Chinese market equal half of global demand while 6 out of 10 PV cells are manufactured by Chinese firms- some of them 5 GW/year: China determines global demand, supply and prices of solar pv!



Competitive auctions are seeing record-low prices for wind & solar resulting from 3 factors:

- More competition through actions
- Innovation and cost reductions all along the supply chain
- Expanding into markets with better RE sources

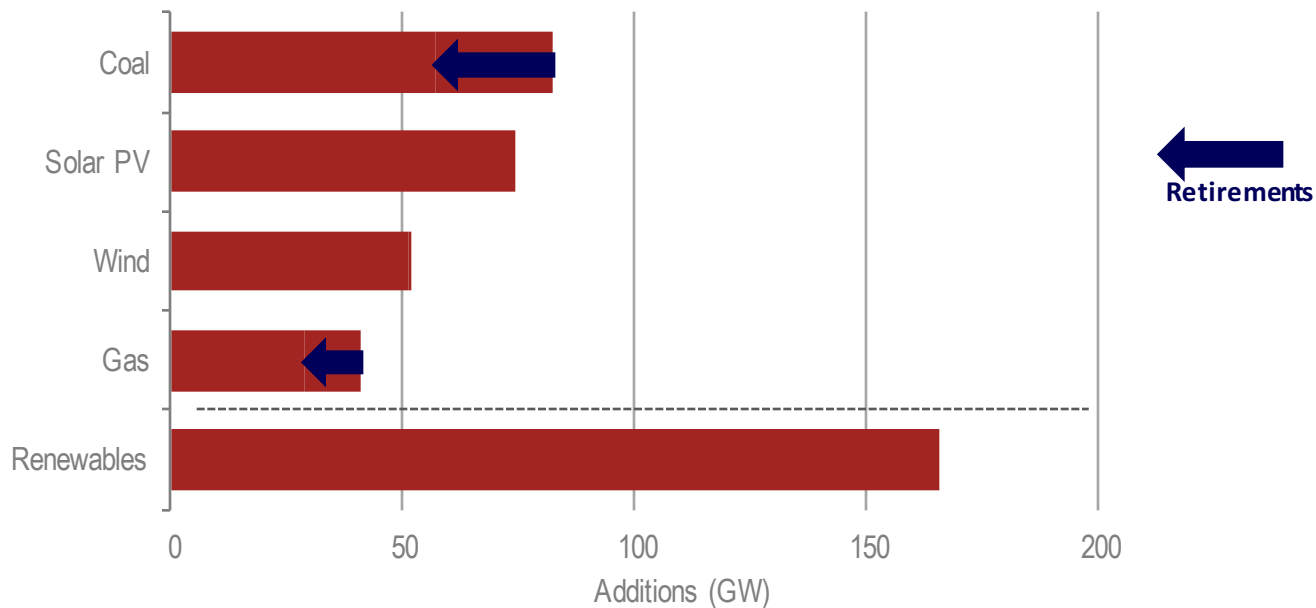
Prospects for renewables underpinned by need to **address core energy challenges**

- Air pollution still a major problem – millions premature deaths
- Universal access to modern energy remains a distant goal- 1.2 billions no electricity access, 2.7 billions no clean cooking
- Current climate pledges fall short of meeting mitigation goals

2016 Renewables hitting new records driven by solar PV



Power capacity additions by fuel 2016

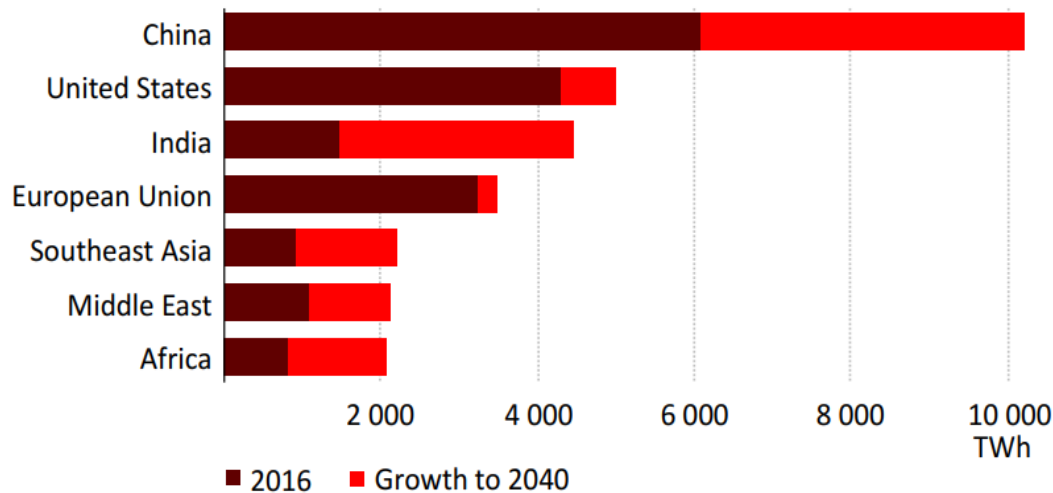


**Renewables breaking an all-time record accounting for two thirds of global net capacity additions;
For the first time solar PV becoming the global leader in net capacity growth**

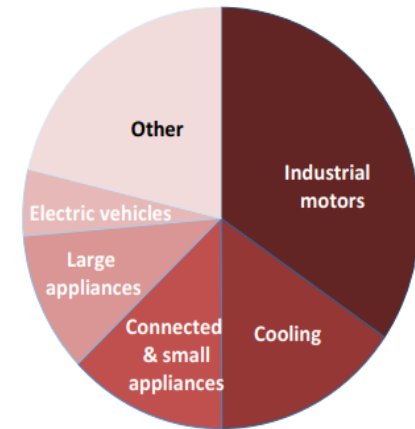
The future is electrifying



Electricity generation by selected region



Sources of global electricity demand growth



Source: World Energy Outlook 2017

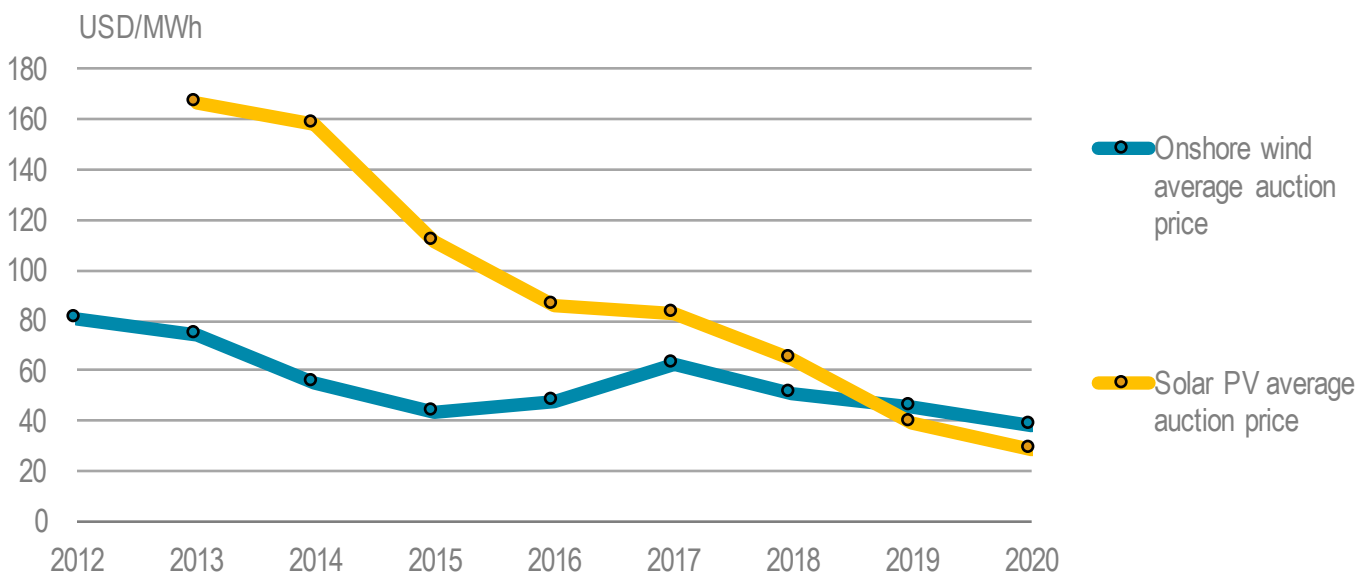
India adds the equivalent of today's European Union to its electricity generation by 2040, while China adds the equivalent of today's United States

© IEA 2017

Competition driving costs down



Announced wind and solar PV average auction prices by commissioning date

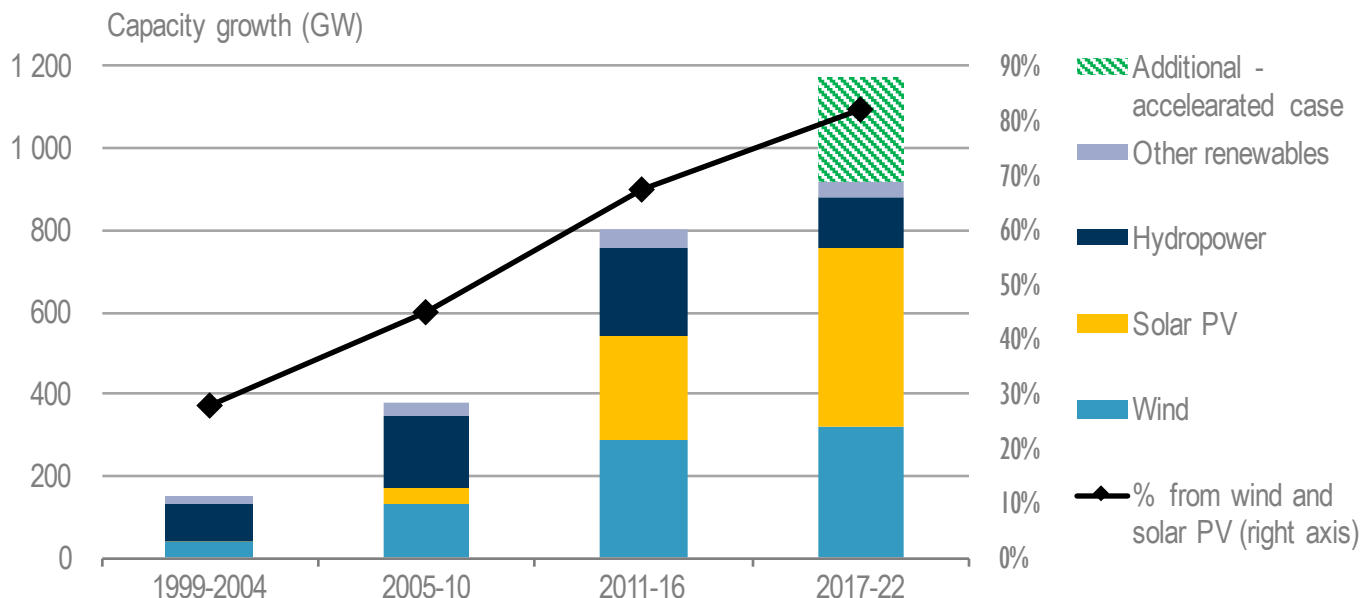


**Price discovery through competitive auctions effectively reduces costs along the entire value chain;
Auctions with long-term contracts will drive almost half of new capacity growth over 2017-22**

Renewables growth more dependent on wind and solar



Renewable electricity capacity growth by technology

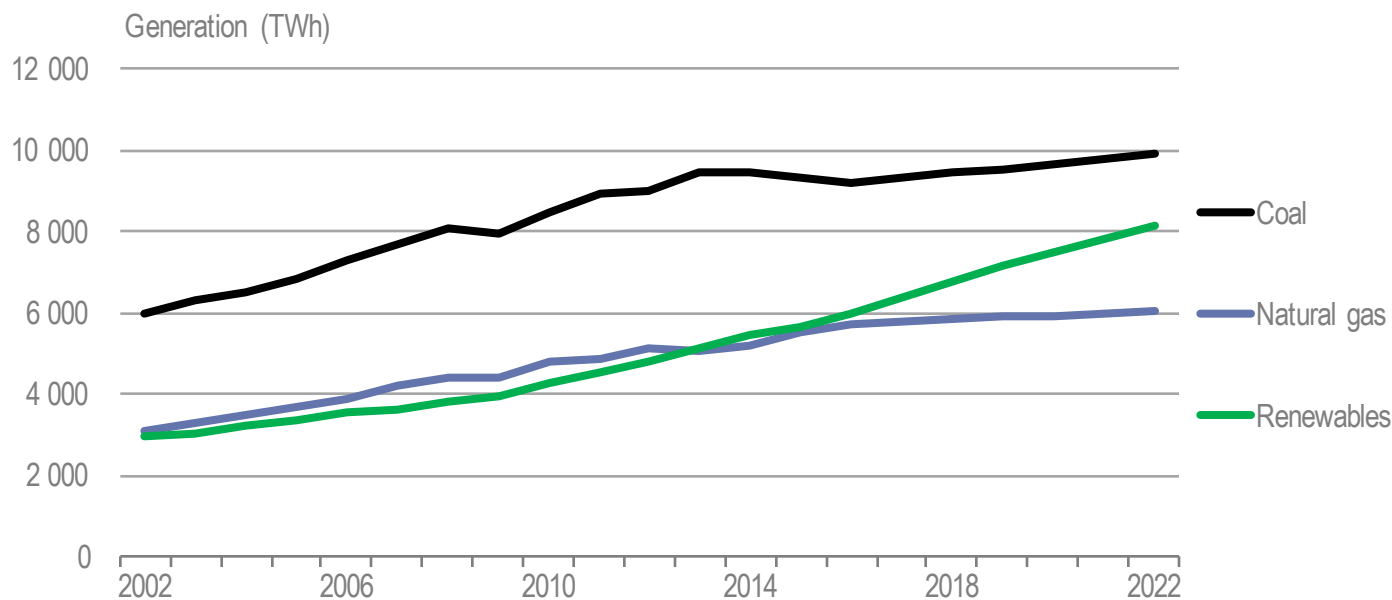


Solar PV enters a new era, becoming the undisputed leader in renewable power capacity growth; PV also accounts for 60% of the upside potential in the accelerated case

Renewables closing the gap with coal



Electricity generation by fuel

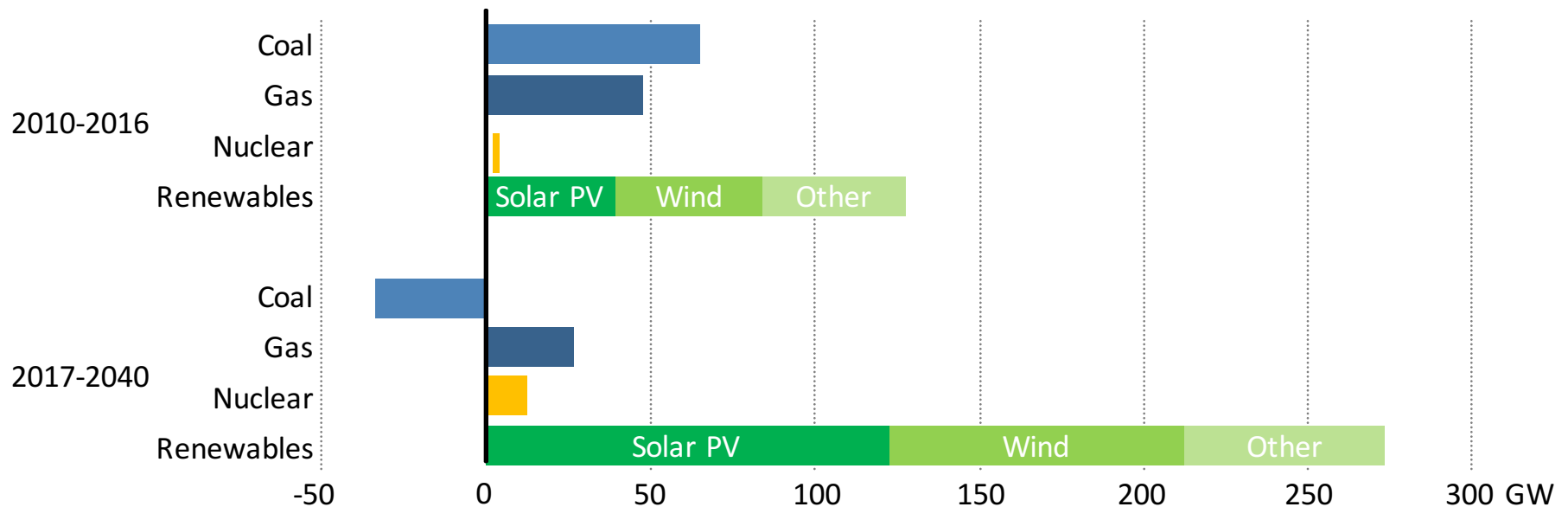


Renewable generation to expand by over a third with its share increasing from 24% in 2016 to 30% in 2022, rapidly closing the gap with coal

Solar PV forges ahead in the global power mix



Global average **annual net capacity additions** by type in
the Sustainable Development Scenario

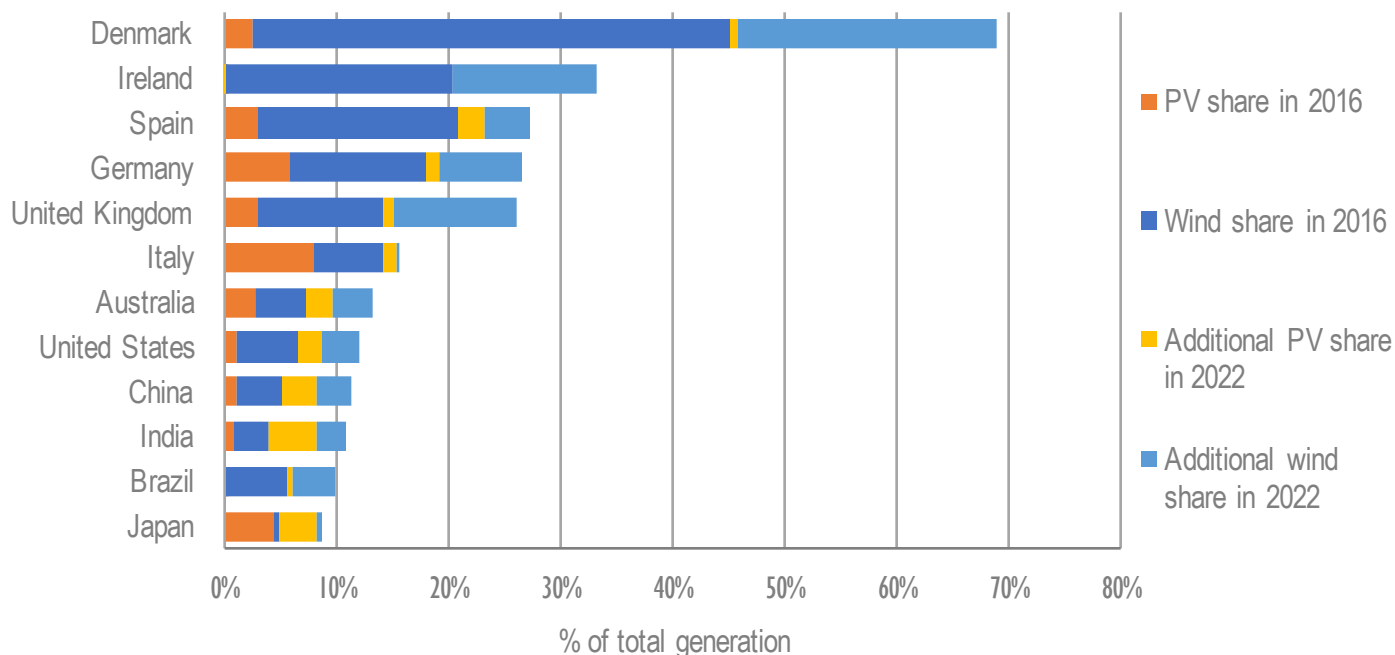


China, India & the US lead the charge for solar PV, while Europe is a frontrunner for onshore & offshore wind. Renewables deliver 63% of total world generation by 2040 in the SDS, requiring 12 USD trillion of cumulative investment

Wind and solar transforming power sector – system integration becomes key



VRE share in annual electricity generation 2016-22



More flexible power systems, adapted market design and policies will have to play a key role in integrating larger shares of wind and solar in a secure and cost-effective way

Need for system transformation

Policy and market framework

Level of VRE penetration

System-friendly VRE deployment



Distributed resources integration



System services



Generation time profile



Technology mix



Location



Integrated planning

Actions targeting VRE

Flexible resources *planning & investments*



Grids



Generation



Storage



Demand
shaping

System and market operation

Actions targeting overall system

A paradigm shift in policies From direct incentives to enabling frameworks

Past

Main Policy

Providing financial
support

Present and mid term future

Enabling policy and market
framework reducing
financing costs

Cost reduction via

- Technology development
- Scale up
- Learning

- Technology *innovation*
- Financial *innovation*
- New markets with best resources

Key characteristics of “Next-Generation Policies”

Level playing field

- Carbon pricing
- Phase out of fossil fuel subsidies

Regulation and market design

- Competition
- Predictable long-term income streams
- Short-term market value signals

System approach

- RE portfolio
- Energy System Integration

Concluding remarks

- **Renewables rise by 1,000 GW to 2022**, *equal to half of current total coal capacity*
- **Renewables generation exceeds 8,000 TWh by 2022**, *equal to total electricity consumption of China, India & Germany combined*
- **Solar PV enters a new era** leading the growth in renewables, *driven by a rapid expansion in deployment & manufacturing capacity in China*
- Despite rapid growth in EVs, **decarbonization of transport is a long way off**
 - ❑ Only 30% of electricity used by EVs is sourced from renewables
 - ❑ Advanced biofuels require specific incentives to bolster deployment
- **Policymakers have to turn their focus to system integration & expanding the use of renewables for heating & cooling**



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Grazie per l'attenzione



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