

RENEWABLE ENERGY

Medium-Term Market Report 2012

Medium-Term Renewable Energy Market Report 2012

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Market Trends and Projections to 2017

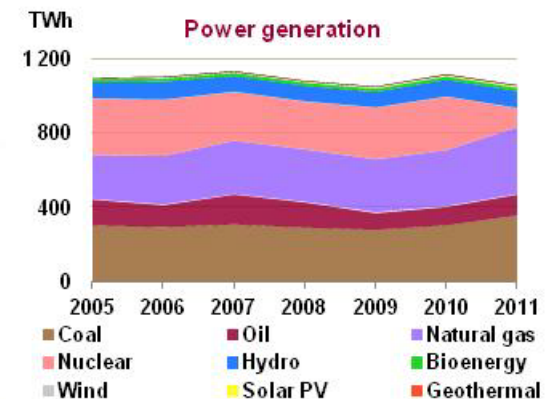
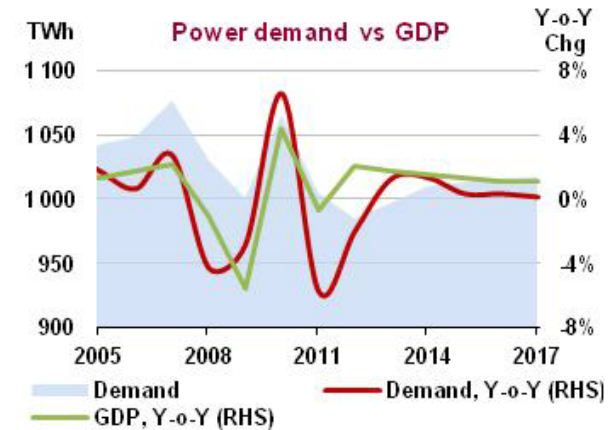
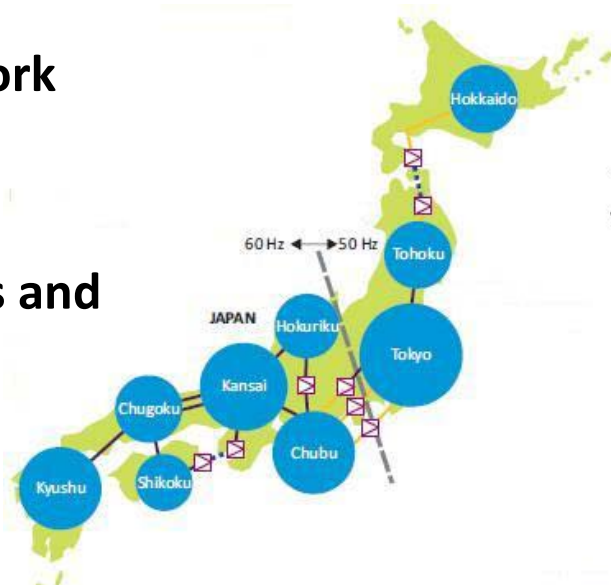
Objective and scope

- With the increasing role of a portfolio of maturing renewable technologies in the power mix...
- The IEA is publishing its first medium-term report focused on renewable energy
 - Bottom-up, global renewable *forecast* of renewable electricity capacity and generation over the next 5 years
 - Detailed analysis of 12 OECD countries + China, India, Brazil (~80% of world renewable electricity)
- For 2012 edition, focus on 8 technologies in power sector with some analysis on solar thermal heating
- Completes slate of IEA MT forecasts: oil, gas, coal
- Methodology consistent with other MT reports

Analytical framework – Japan example

■ Generation and capacity forecast based on -

- Power demand
- Power sector structure
- Grid and system integration
- Economic attractiveness
- Financing
- Policy framework robustness
- Identify drivers and challenges for renewable deployment

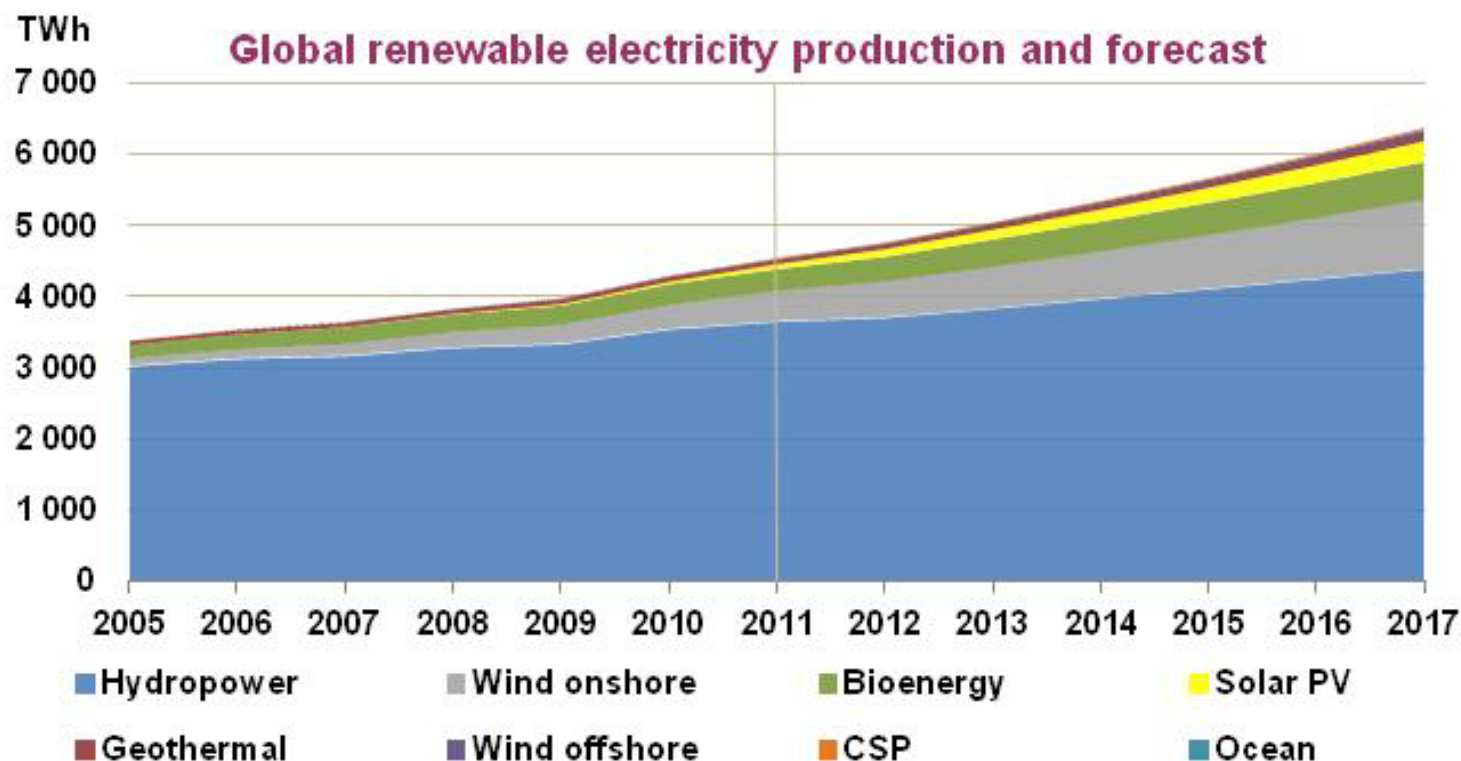


Key trends

- **As the portfolio of renewable technologies matures, global renewable power generation is forecast to increase 40% over 2011-17**
- **This projected growth represents an acceleration versus the previous period**
- **Renewable deployment is projected to spread out geographically, with increased activity in emerging markets**
 - **New deployment opportunities are spurring economies of scale in some renewable technologies, creating a virtuous cycle of improved global competition and cost reductions**

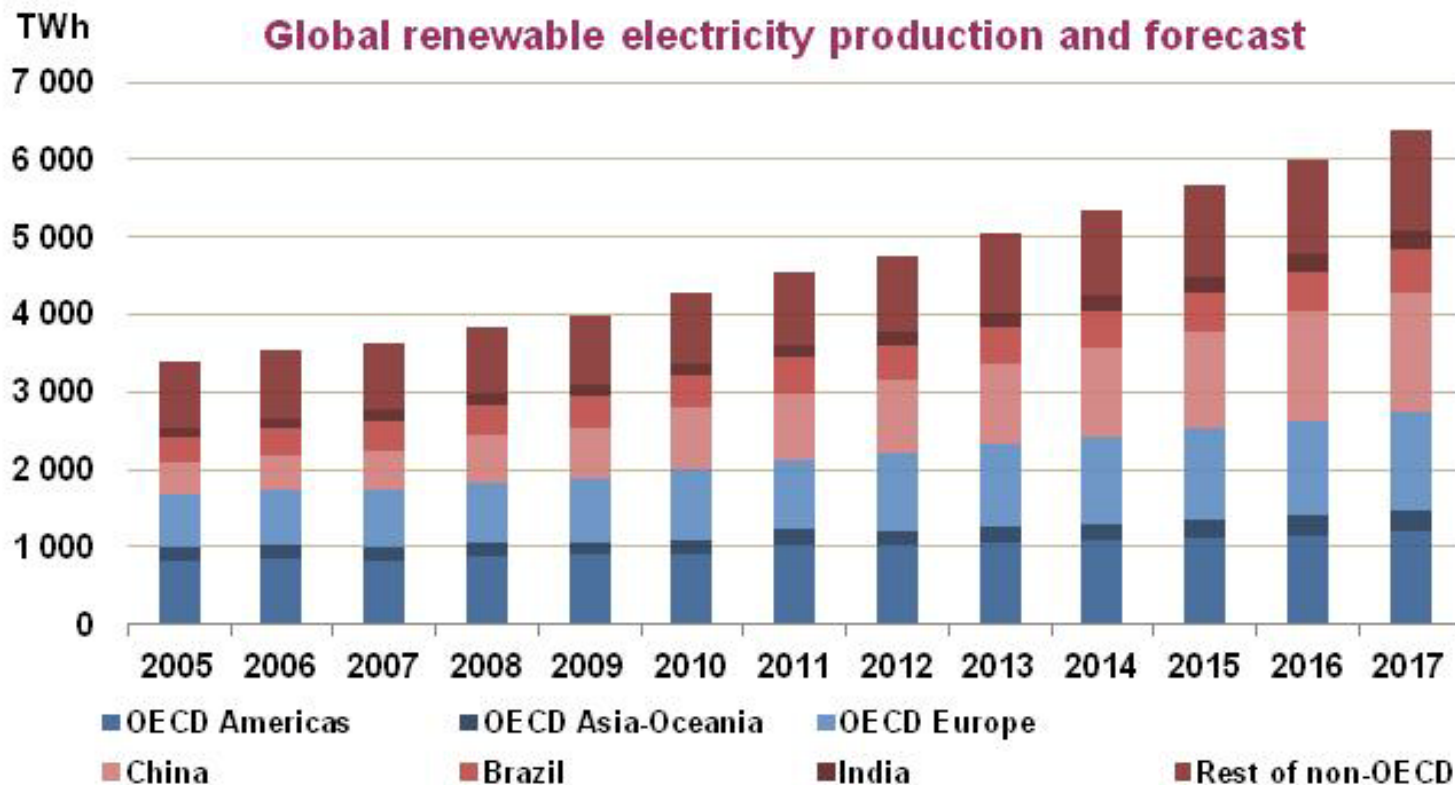
Growth in renewable power is forecast to accelerate

- Hydropower remains the main renewable power source (+3.1% p.a.)
- Non-hydro renewable sources grow at double-digit annual percentage rates (+14.3% p.a.)



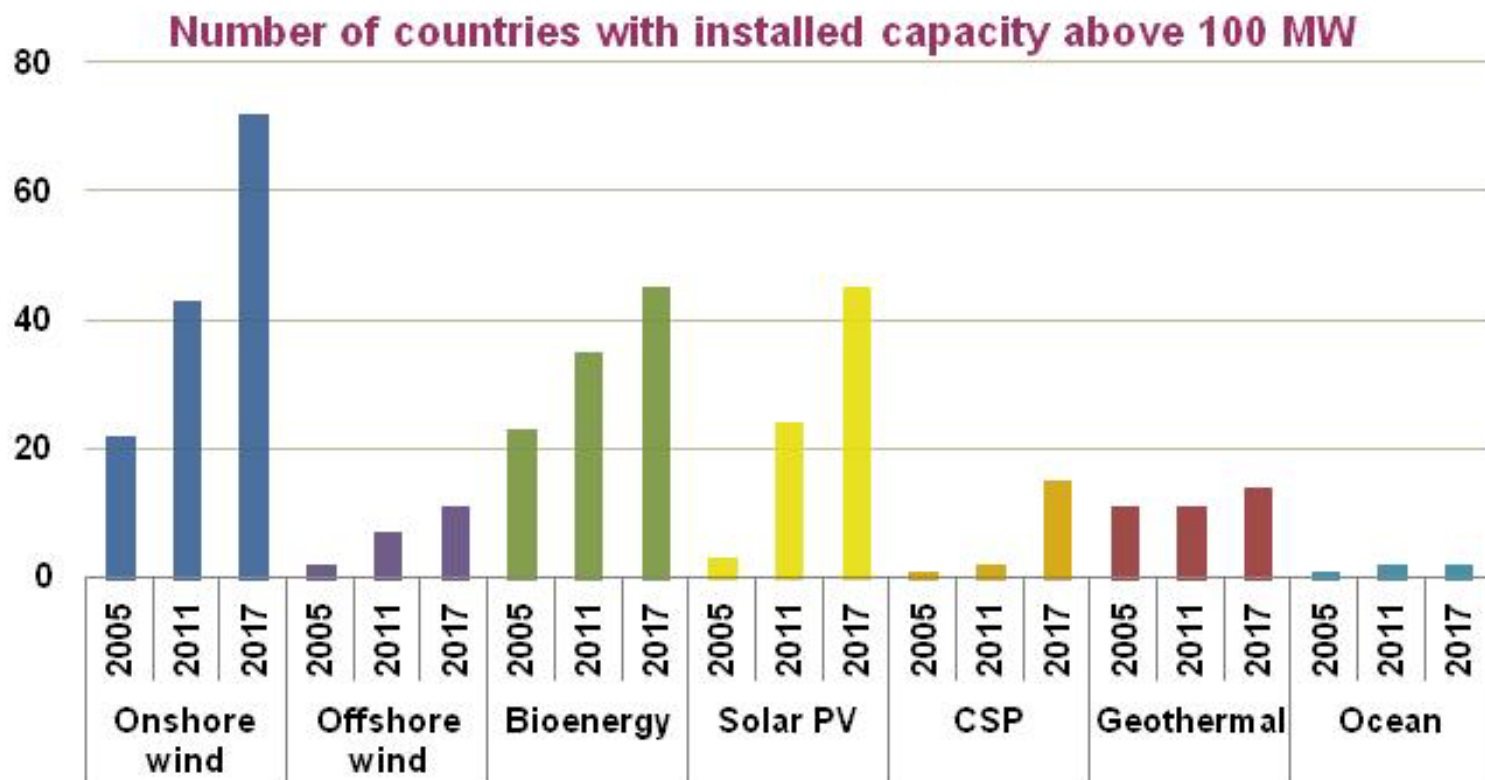
Growth is led by non-OECD countries

- Non-OECD accounts for two-thirds of the overall growth
 - China, Brazil, India lead; others grow significantly as well
- OECD growth still largely driven by Europe but Americas and Asia-Oceania make significant contributions



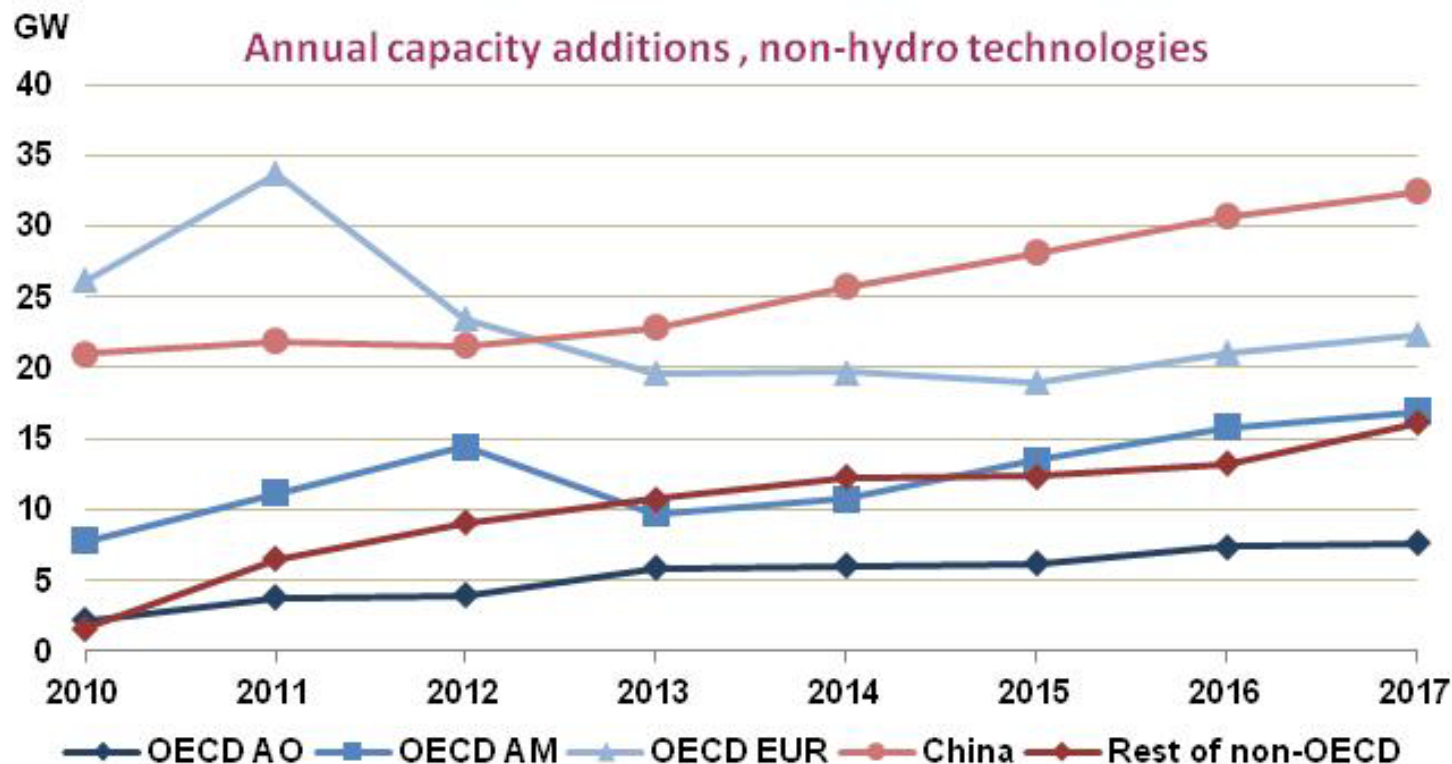
Non-hydro technology deployment spreads out

- Number of countries with cumulative capacity larger than 100MW (can cover consumption of 100k households) increases significantly
- Growth areas include Asia, Africa, Latin America and the Middle East



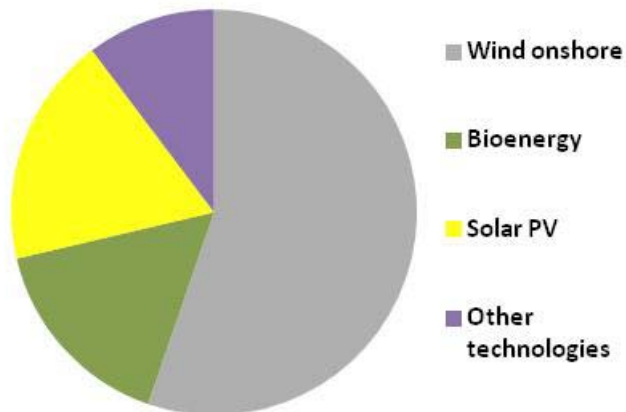
Annual growth patterns for non-hydro technologies vary significantly

- China becomes deployment leader
- OECD Europe deployment growth slows
- OECD Americas growth reflects US policy uncertainties

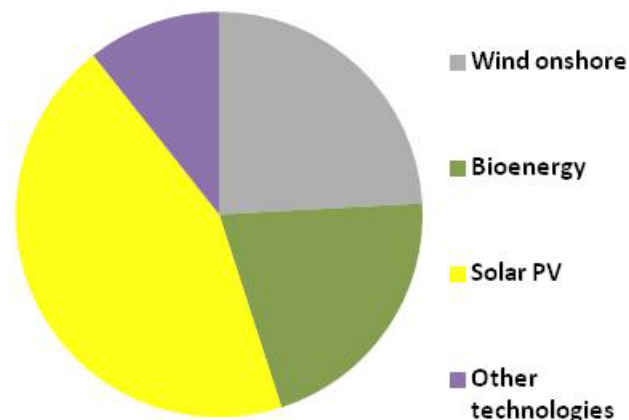


Generation additions over 2011-17 differ across regions and technology portfolios

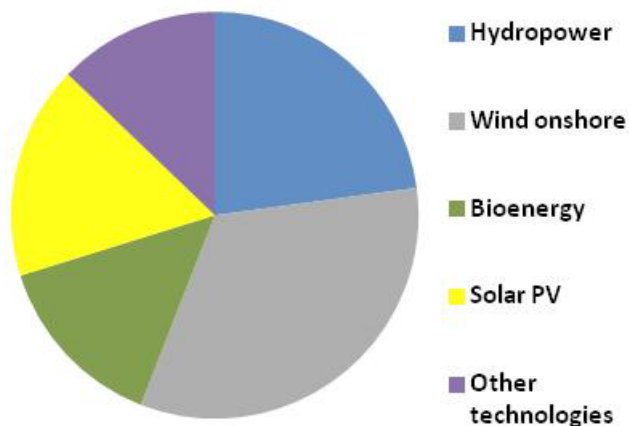
OECD Americas (+179 TWh)



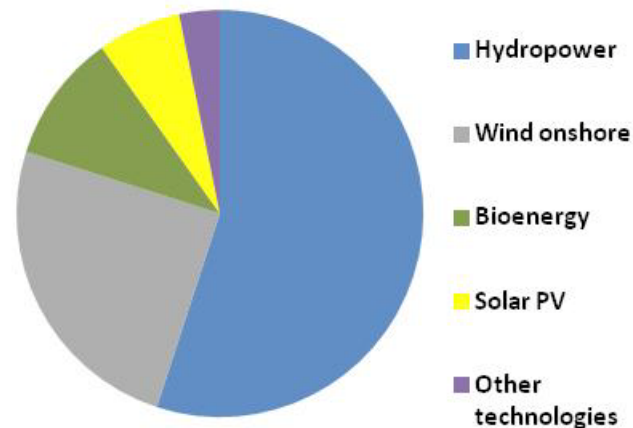
OECD Asia-Oceania (+77 TWh)



OECD Europe (+365 TWh)



Non-OECD (+1 220 TWh)



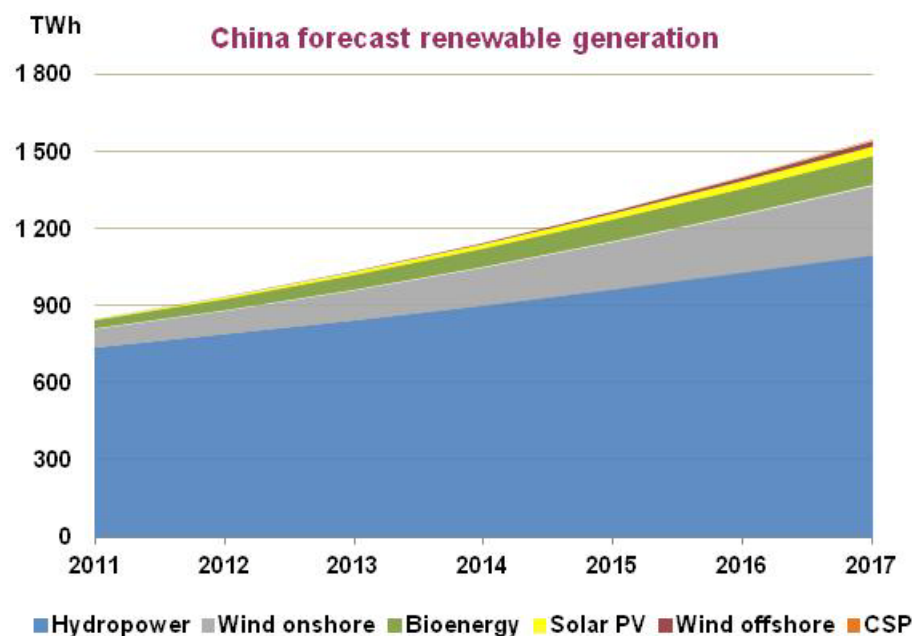
China accounts for 40% of global renewable generation growth

■ Drivers:

- Growing energy needs
- Diversification
- Government targets
- Ample low-cost finance
- Robust manufacturing

■ Challenges:

- Pricing framework
- Priority dispatch
- Grid upgrades
- Prohibitive licensing for small-scale systems



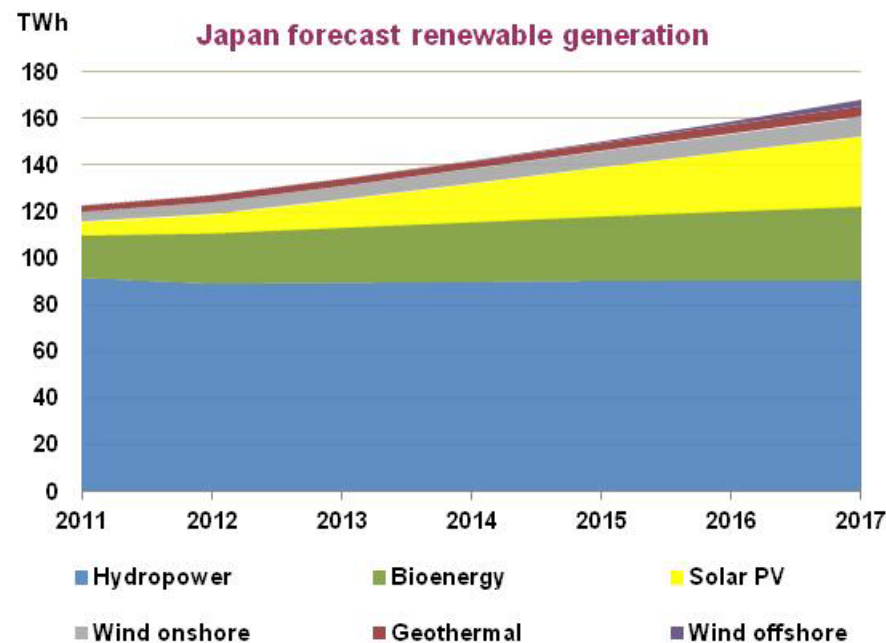
Japan grows strongly under uncertain nuclear situation and new feed-in tariff policy

■ Drivers:

- Uncertainties about nuclear restart
- New feed-in tariffs
- Good match of solar PV for shaving peak load

■ Challenges:

- Power system fragmentation
- Relatively high capital costs of renewable energy
- Location of wind and geothermal resources far from demand centres



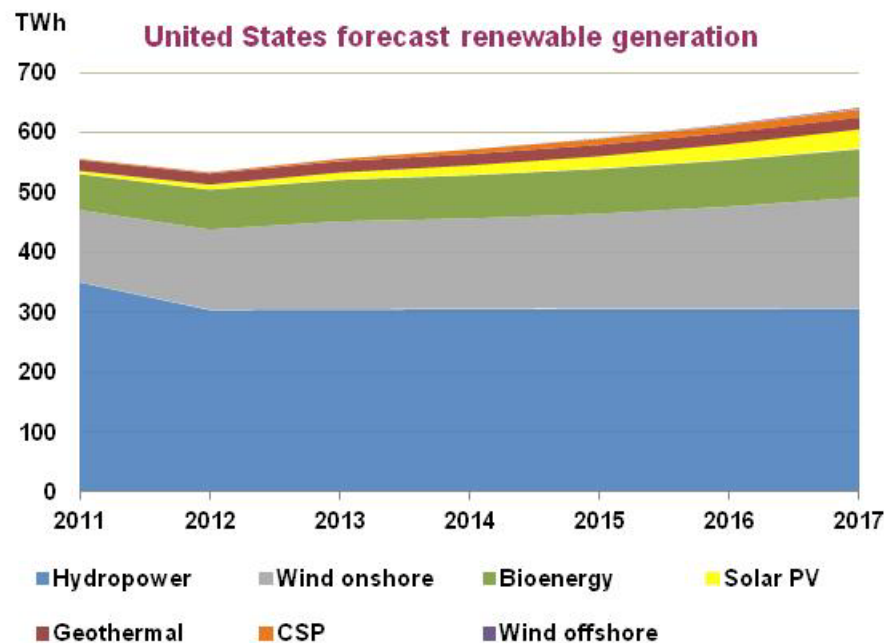
State mandates drive the US picture but uncertainties persist over some federal policies

■ Drivers:

- State level RPSs
- Federal incentives levels
- Ample grid capacity
- Innovative financing

■ Challenges:

- Duration and certainty of federal incentives
- Competition with natural gas
- Cost and availability of tax equity finance



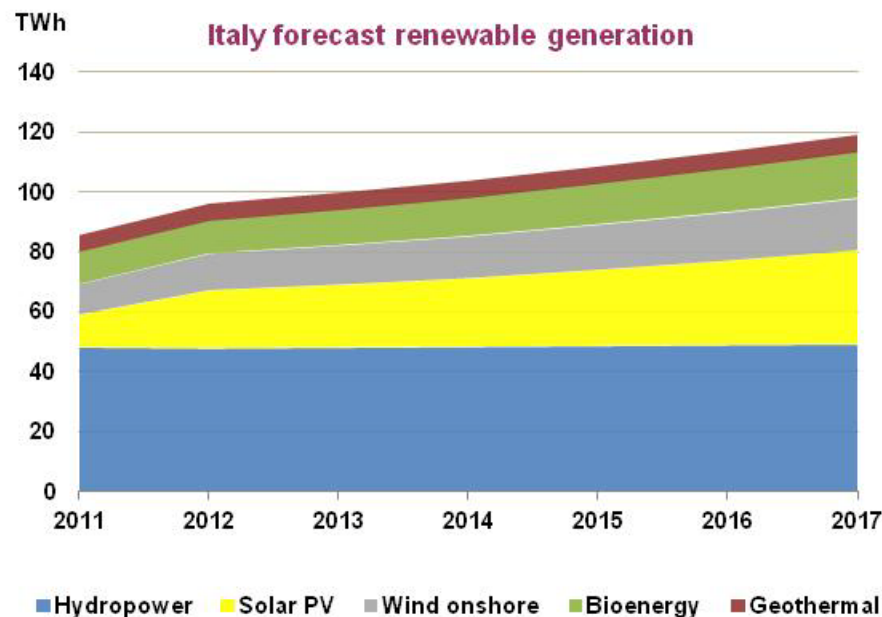
In Italy weakening economy and rising financing costs weigh upon deployment

■ Drivers:

- Policy commitment to renewable deployment
- Increase of targets
- Improved renewable competitiveness in good resource areas

■ Challenges:

- Policy costs for solar PV
- Overcapacity of power system
- Cost and availability of finance
- Grid upgrades



Investment in renewable electricity

- **Annual investment topped USD 250 billion in 2011**
 - Most recent quarterly data suggest some slowing
- **Economic and credit risks weigh on medium-term picture**
 - European bank project finance and utility finance more strained
- **Other sources/structures of finance play increasing role**
 - Development banks
 - New institutional and non-traditional corporate investors
 - Smaller scale financial innovation for small distributed capacity
- **Ultimately, cost and availability of financing to depend most on prevailing policy and technology environments**