Didier Houssin
Director, Sustainable Energy Policy and Technology
International Energy Agency
Session 1, 25 February 2015
Strong momentum for renewable electricity

Global renewable electricity production, historical and projected

Renewable electricity projected to scale up by 45% from 2013 to 2020
Renewable investment costs falling

With scale up of deployment and learning, investment costs of most dynamic technologies (solar PV and onshore wind) continue to fall

Large scale wind and solar now increasingly competitive
Cost of capital becomes the main component of cost as the weighted average cost of capital rises.

Market and regulatory measures can influence weighted average cost of capital and improve competitiveness.
Increasing examples of cost competitive wind and PV

Transition to new cost competitive era for renewables where good resource and appropriate policy and regulatory framework are in place.
Even with lower oil and gas prices, renewable electricity can be price competitive

Weighted average annual renewable investment costs, historical and projected

Note: LCOE for OCGT is calculated using a 15% capacity factor and 7% discount rate; LCOE for CCGT is calculated using a 65% capacity factor and 7% discount rate
Other technologies growing slowly

- Progress with newer technologies falling behind expectations
- Continuing support for market development and R,D and D needed to reduce costs and mature next tranche of technologies
Large-scale integration accomplished today, but more to come

Note: ERCOT = Electricity Reliability Council of Texas, United States
Three pillars of system transformation

Technology spread

Geographic spread

Design of power plants

System friendly VRE

Investments

Operations
Transformation depends on context

- **Stable Power Systems**
  - Little general investment need short term

- **Dynamic Power Systems**
  - Large general investment need short term

- Economic impacts stemming from displacing existing assets
- Maximise the contribution from existing flexible assets

- Possible easier cost-effective generation growth and grid integration
- Opportunity to design a flexible system around a low-C generation mix

* Compound annual average growth rate 2012-20, slow <2%, dynamic ≥2%; region average used where country data unavailable

This map is without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.
Renewable heat can be a cost-competitive option but not given sufficient attention

- Renewable heat economic where resource and market conditions right
- Broader adoption and higher priority for support policies for renewable heat needed, integrated with energy efficiency measures

Countries with targets and support policies for renewable heat

This map is without prejudice to the status of or sovereignty over any territory to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.
Biofuels production growing slowly

- Forecast biofuel production is falling short of targets in the 2 DS, as policy support in established markets (US, EU) under review
- Continuing sustainability concerns over conventional biofuels
- Slow progress in deployment of advanced biofuels but several plants currently being commissioned
- Without significant improvements of the policy framework for advanced biofuels and continuing R,D&D, future for advanced biofuels in jeopardy
Impact of lower oil prices varies strongly by sector

Conventional biofuels attractiveness determined by blending requirements and agricultural fundamentals, in part influenced by oil prices

For advanced biofuels, at a much more nascent level of development and with weaker policy support, lower oil prices may delay or lead to cancelled projects

In heating sector, renewable options (e.g. biomass) remain cost-competitive for building space heating in many cases, unless oil prices continue to decrease substantially

- Current developments may, however, delay investment decisions by private households as well as industry stakeholders.
Concluding remarks

Electricity

- Renewables including wind and solar PV are increasingly competitive, even in a lower fossil price regime
- High levels of financial support no longer required if appropriate market and regulatory framework in place
- Policies should focus on creating the right market and regulatory frameworks
- Electricity market designs sub-optimal today for low-carbon generation
Concluding remarks (2)

Heat
- RE heat can be a cost-competitive option but not given sufficient policy attention

Transport
- Policy uncertainty constraining conventional and advanced biofuels development

New Technologies
- Continuing support for market development and R,D and D needed to reduce costs and mature next tranche of technologies