Implementing NDCs will require an extraordinary effort encompassing the full spectrum of low-carbon technologies and will move us closer to 2°C.
Staying well below 2°C degrees: How Paris has changed the energy challenge

Paris Agreement: “Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels…”

Getting well below 2°C means tackling the emissions that remain in the 2DS
There is no “one-size fits all” solution but many similarities exist

Different regions have differing technology shares today and in 2050-2DS

National circumstances and resources will drive different technology portfolios and pathways

Energy Technology Perspectives 2016 Data visualisation: click here
The INDCs help continue to drive down commercially available clean energy technology costs, but greater emphasis on earlier stage developments is also needed to help meet climate goals.
Supporting Energy Innovation: The right policy at the right time

The right support depends on the maturity of the technology and the degree of market uptake.
International co-operation can drive innovation

- Acting together, governments and industry can make decarbonisation easier and even more affordable
- Clean Energy Ministerial, Mission: Innovation, Breakthrough Energy Coalition

COP 21 mobilised Non-State Actors to actively contribute to the climate solution

- Increased participation from Business, NGOs and Local Governments
- “Paris Pledge for Action” support to ensuring that the level of ambition set by the Paris Agreement is met or exceeded
The IEA’s Technology Collaboration Programmes (TCPs)

- Close to 6,000 experts
- More than 1,900 topics to date
- 310 public or private organisations
- 51 countries
- 39 TCPs
- 9 regional or international organisations

- A time-proven, flexible mechanism
- Created or discontinued according to energy policy challenges
- Currently 39 TCPs
  - Cross-cutting activities
  - Energy efficiency
  - Fossil fuels
  - Fusion power
  - Renewable energy and hydrogen

This map is without prejudice to the status of sovereignty over any territory, to the delimitation of international frontiers and boundaries, and to the name of any territory, city or area.
Created in 2010 as a forum for major economies and forward-leaning countries
Joint Launch Statement at COP21

Leaders of over **20 countries plus the European Union**, representing well over 80% of global clean energy R&D investments

Each country supporting a **doubling** of its clean **energy** R&D investments over next 5 years; see: [www.mission-innovation.net](http://www.mission-innovation.net)

Complemented by a private sector initiative, the **Breakthrough Energy Coalition**; see [www.breakthroughenergycoalition.com](http://www.breakthroughenergycoalition.com)
Innovation and Deployment – Essential Complements

Mission Innovation

Future Innovations
- Science
- Research
- Development
- Analysis

Clean Energy Ministerial

Deployment Now
- Policies
- Best Practices
- Capacity Building
- Prizes, Recognition

Tech Demos

Create New Ideas
- Improve Performance
- Reduce Cost
- Raise Awareness
- Facilitate Market Uptake
Supporting Energy Innovation Throughout the Entire Cycle

Mission Innovation

Technology Collaboration Programmes

Financial Institutions

Development Agencies

Clean Energy Ministerial

Breakthrough Energy Coalition

Technology development and demonstration

Niche markets

Achieving competitiveness

Mass market

1. Development and infrastructure planning
   - Prototype and demo stage
   - Fuel cells, 2nd generation biofuels, EV, CCS

2. Low cost
   - Solar PV, onshore wind, biomass power in some markets

3. Technology-neutral but declining support
   - Green certificates, GHG trading

4. Accelerate adoption by addressing market barriers
   - Building codes, efficiency standards, information campaigns

Mature technology
   - Energy efficiency, industrial cogeneration

© OECD/IEA 2016
Conclusions

- COP21 was historic and a catalyst for more innovation, research and investment in clean energy technologies

- 2015 saw progress in Solar PV, wind and electric vehicles, but others areas such as CCS and biofuels are lagging behind

- Acting together with industry, national and local governments can drive innovation through international co-operation

- Technology collaboration can help with addressing barriers/obstacles in low-carbon technology
Thank you

Peter Janoska
Analyst, Environment and Climate Change Unit
peter.janoska@iea.org