Decarbonisation scenarios and nuclear energy

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Global Energy Context

• The energy sector is the largest source of greenhouse gas emissions today, at around two-thirds of the global total
  - Energy is the largest source of air pollution and linked to 6.5 million premature deaths per year
  - Billions remain without basic energy services

• The global energy transition gained momentum in 2016
  - Global energy intensity fell by 2.1% in 2016, while efforts for fossil-fuel subsidy reform are spreading
  - Renewables supplied half of global electricity demand growth in 2016, and nuclear net capacity reached highest level since 1993, despite public concern after Fukushima accident & long-term liabilities

• There is no single story about the future of global energy; policies will determine where we go from here
IEA analysis for 2016 shows that global CO₂ emissions did not increase for the third consecutive year in a row, even though the global economy grew.
Energy Efficiency, Renewables, CCS & Nuclear are the largest decarbonization wedges

World energy-related CO₂ emissions abatement by scenario
Policy sets the course for the power mix …

Global electricity generation by fuel & scenario

Coal-fired generation sees the greatest variation across scenarios
Key public concerns include plant operation, decommissioning and waste management. By 2040, almost 200 reactors are retired, and the amount of spent fuel doubles.
Renewables & networks attract most investment in power

Cumulative power sector investment in the New Policies Scenario, 2016-2040

Global power sector $19.2 trillion

- Transmission & distribution 42%
- Fossil fuels 14%
- Nuclear 7%
- Wind 13%
- Solar 11%
- Hydro 9%
- Other renewables 4%

China
European Union
United States
India
Africa
Southeast Asia
Latin America
Middle East
Japan
Russia

Trillion dollars (2015)

Two-and-a-half times as much is invested in renewable technologies than that of fossil-fuel plants
A Well-Below 2 degree Scenario

**CO₂ emissions under NDC trends and to stay “well below 2°C”**

- **CO₂ emissions would need to fall to 1960 levels by 2050, with an economy that is more than 20 times larger;**

- **NDC trends**
  - Efficiency
  - Renewables
  - CCS
  - Fuel switching
  - Nuclear
  - Other

- **“Well below 2°C”**
Conclusions

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

• Nuclear power can play a role in energy security, climate and air pollution – but financing and public concerns remain an issue

• Markets are currently not sending the necessary signals to invest in new low-carbon capacity, including nuclear plants

• As nuclear power inherently works on long timelines, the industry requires policy makers to provide long-term guidance and stability

• With looming energy security & environmental challenges, international cooperation is more vital than ever

• The IEA is supporting the energy transition through in-depth analysis, pragmatic policy advice and technology collaboration