Context

- Climate change is slipping down the policy agenda, even as the scientific evidence continues to accumulate.
- Energy sector accounts for two-thirds of greenhouse gas emissions.
- Mixed news on energy trends:
  - Price dynamics between gas and coal support emissions reductions in some regions, but impede them in others.
  - Renewables are on the rise, but investment slowed in 2012.
  - Efficiency policies are gaining momentum in many countries.
  - Nuclear is facing challenges and CCS still remains distant.
CO₂ emissions grew by 1.4% to reach 31.6 Gt in 2012, but trends vary by country
The two largest emitters make encouraging steps toward decarbonisation...

**CO₂ emissions per unit of electricity generation**

**United States**

- 2003: 600 gCO₂/kWh
- 2006: 550 gCO₂/kWh
- 2009: 500 gCO₂/kWh
- 2012: 450 gCO₂/kWh

**China**

- 2003: 900 gCO₂/kWh
- 2006: 850 gCO₂/kWh
- 2009: 800 gCO₂/kWh
- 2012: 750 gCO₂/kWh

**In 2012, total CO₂ emissions in the US were back at the level of the mid-1990s, while total CO₂ emissions growth in China was one of the lowest in the last decade.**
...but the world is still moving in the wrong direction

Global energy-related CO₂ emissions

CO₂ emissions trends point to a long-term temperature increase of up to 5.3 °C
National efforts in this decade need to buy time for an international agreement, expected to come into force in 2020.

Measures to 2020 should meet key criteria:

- No harm to countries’ economic growth
- Significant near-term emissions reductions
- Reliance only on existing technologies and proven policies
- Significant national benefits other than climate change mitigation

Our 4-for-2 °C Scenario proposes four measures that meet these criteria.
Four measures can stop emissions growth by 2020 at no net economic cost, reducing emissions by 3.1 Gt, 80% of the savings required for a 2 °C path.
Measure 1: Improve energy efficiency

Emissions savings in the 4-for-2 °C Scenario, 2020

Energy efficiency reduces emissions by 1.5 Gt, led by minimum energy performance standards – additional investment is more than offset by fuel bill savings
Measure 2: Limit the use of inefficient coal power plants

Change in electricity demand & coal-fired electricity generation from the least-efficient plants, 2020

Energy efficiency and reducing the role of the least-efficient coal power plants have important co-benefits for local air pollution
Measure 3: Reduce methane releases into the atmosphere

Methane emissions from the upstream oil and gas industry, 2020

In 2010, global methane releases were 1.1 Gt CO$_2$-eq; halving the level in 2020 adds around 0.5% to cumulative upstream investment.
Measure 4: Partial removal of fossil-fuel subsidies

Savings in the 4-for-2 °C Scenario: 360 Mt

- Middle East 54%
- Africa 15%
- Latin America 11%
- Russia 7%
- Other 14%

Fossil-fuel subsidies in 2011 were equivalent to an incentive of $110 per tonne of CO₂
The energy sector needs to adapt to climate change

The energy sector needs to increase its resilience to the physical impacts of climate change
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Some fossil-fuel reserves may remain underground

Potential CO₂ emissions from proven fossil-fuel reserves to 2050

On today’s trends, half of the proven fossil-fuel reserves would be left undeveloped to 2050 – stronger climate action would increase the share
Under a 2 °C path, total net revenues for new power plants are $3 trillion higher – CCS is an effective protection strategy for fossil fuel assets.
Key messages

- Despite encouraging steps in some countries, global emissions keep rising and the scientific evidence of climate change increases.

- Early national action is required while negotiating towards a global deal in Paris in 2015 that then comes into force by 2020.

- Four measures can stop emissions growth by 2020 and keep the 2°C target alive, without harming economic growth.

- There is a need for parallel action to deploy critical low-carbon technologies at scale after 2020, including CCS.

- The energy sector must adapt to climate change, both in the resilience of its existing assets and in future investment decisions.
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MAP

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World Energy Outlook Special Report