Side Event– Innovating for climate challenges

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The Present is Warmer than the Past
Difference from 1980-2015 annual mean, (°C)

Annual global temperature shift from average (1980-2015): Record warming years to right

NASA Earth Observatory/Joshua Stevens
On track for **2.5-3.3-4.4 °C** or more by 2100
In 80 years - Our grandchildren will experience 2100
A huge change in direction required
Plenty happening...

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**Onshore Wind Cost 1984 – 2014**

- 1984: £250
- 1990: £200
- 2000: £150
- 2004: £100
- 2014: £50

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**New Electricity Capacity in China, 2018**

- 53% of new capacity was from solar and wind.

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**Global Cumulative Storage Capacity Projected to 2040**

- Energy storage deployments doubled from 2017 to 2018 and are projected to double again in 2019.

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**India Times: The Times of India | The Economic Times**

**THE TIMES OF INDIA**

India aiming for all-electric car fleet by 2030, petrol and diesel to be tanked

Over the last five years, U.S. solar energy jobs have grown 6x faster than the overall economy.

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**Green Energy Progress**

How Do Projections Compare With Reality?

- **2000 Projection**
  - Worldwide wind capacity will reach 30 GW by 2010

- **Reality**
  - By 2018 that goal was exceeded by a factor of 20x
FIGURE 6. Annual Additions of Renewable Power Capacity, by Technology and Total, 2012-2018

Additions by technology (Gigawatts)

- Solar PV
- Wind power
- Hydropower
- Bio-power, geothermal, ocean power, CSP

Total additions (Gigawatts): 181

Note: Solar PV capacity data are provided in direct current (DC).

Source: See endnote 183 for this chapter.
... but off a small base

% share of primary energy consumption by renewables + nuclear over 25 years 1993-2018 just starting to increase

Derived from BP Energy Statistics 2019
Fossil reserves – huge temptation

Davidson et al. “New unabated coal...”, European climate.org/documents/nocoal2c.pdf
Perverse subsidies undermine the transition

Matsumura and Adam, "Fossil fuel consumption subsidies bounced back strongly in 2018, IEA, 13 June 2019
IISD Analysis: 10-30% subsidy swap from fossil fuels to renewables may help tip the balance

Figure 7. Average emission reduction from fossil fuel subsidy reform across 20 countries including a swap with 10 per cent savings invested in renewables and 20 per cent in energy efficiency

Source: Merrill et al., 2015; Merrill et al., 2017.
"A 100% Renewable Energy System is Cheaper than the Current Global Energy Supply Zero GHG Emissions from Power, Heat, Transport and Desalination Sectors is possible before 2050”

Existing renewable energy potential and technologies, including storage, is capable of generating a secure energy supply at every hour throughout the year. The sustainable energy system is more efficient and cost effective than the existing system, which is based primarily on fossil fuels and nuclear. A global renewable transition is the only sustainable option for the energy sector, and is compatible with the internationally adopted Paris Agreement. The energy transition is not a question of technical feasibility or economic viability, but one of political will.

(Recent 299 page global multi-sectoral geo-spatial global study at Finland’s LUT University, carried out by 14 energy scientists over 4.5 years.)
Large scale social innovation to grow political will:

• **Build leadership from business, governments, civil society** to deepen understanding
• **Support vigorous technical development**
• **Reshape market thrusts** (policies, incentives, support, infrastructure, regulations, focus, commitment)
• **Support** local especially vulnerable communities
• **Grow global collaboration** (support – developing countries; build commitment and leadership across developed world)
“I am counting on the private sector to drive success. Now is the time to mobilise the global business community as never before. The case is clear.... Huge opportunities ...”
We know what to do. The challenge is to create the conditions where it is done.