The context

- Today’s investments lock in patterns of consumption, fuel use & emissions for long into the future
- Capital costs to produce energy have doubled since 2000
- Investment surge to meet rising Asian demand, but shale in US & renewables in Europe also show dynamic growth
- Difficult task for investors to navigate policy & market uncertainty
  - Geopolitical concerns a reminder of risks to reliable supply
  - Disconnect between climate change goals & the necessary actions
  - High oil prices & persistent regional price variations for gas & power
- Growing public pressure on energy & environmental issues
After the rapid rise in investment in the 2000s, a pause

$1.6 trillion was invested in 2013 to provide consumers with energy, a figure that has more than doubled in real terms since 2000
Renewables come of age, but fossil fuel investment still dominant

Investment in renewables rose from $60 billion in 2000 to a high point approaching $300 billion in 2011, before falling back since
Running fast to stand still

Investment in energy supply, 2014-2035

Total: $40.2 trillion

To maintain production at today’s levels

59%

To meet rising demand

41%

Over 80% of upstream oil & gas investment offsets output declines at today's fields: one-third of power generation investment is to replace plants that retire
A step-change on efficiency

**Investment in energy efficiency, 2014-2035**

Total: $8 trillion

- **Households**: 51%
- **Businesses**: 38%
- **Govts**: 11%

*Increasing annual efficiency spending from $130 billion today to $550 billion by 2035 will require new models & sources of financing, from banks & capital markets*
States hold many of the cards

Ownership of worldwide power generation capacity & oil and gas reserves

Alongside investment by the private sector, the objectives, corporate culture & financing of state-owned companies are critical to future energy investment flows
Governments, not market signals, are driving power sector investment

Power sector investment, 2014-2035

- Transmission and distribution
- Renewables and nuclear
- Fossil fuels

With current market designs, competitive parts of markets require less than $1 trillion of cumulative investment to 2035 out of total power sector needs of $16.4 trillion
Will Europe keep the lights on?

- Over the past decade, four-fifths of investment in European power generation went to renewables, 60% just to wind and solar PV.

- Europe needs to invest $2.2 trillion (2nd largest after China) to 2035 to replace ageing infrastructure & meet decarbonisation goals.

- Current overcapacity offers some breathing space, but 100 GW of new thermal plants is needed before 2025 to safeguard reliability.

- This investment won’t happen with current market rules: wholesale power prices are 20% (or 20$/MWh) below cost-recovery levels.

- Higher wholesale prices could increase end-user bills, adding to the strain on households & on competitiveness of EU industry.
Middle East investment is critical to the global oil outlook.

Once the current rise in non-OPEC supply runs out of steam, a shortfall in Middle East investment would lead to volatile markets & prices $15/barrel higher in 2025.
Over $700 billion invested in LNG infrastructure helps to globalise gas markets, but the high cost of transporting gas dampens importers’ hopes for much cheaper gas.
A new investment landscape for a 2 °C world

Efficiency spending is $6 trillion higher & the composition of supply investment changes: CCS is widely deployed, $300 billion of fossil fuel investment is left stranded.
Committing capital in a fast-changing energy world

- The role of governments in energy markets is on the rise, while private investors are wary of political and regulatory risks.

- Energy investments are moving to areas with high up-front costs, complicating the task of securing finance.

- Without reform to power markets, the reliability of Europe’s electricity supply is under threat.

- Investment in gas rises almost everywhere, but meeting future growth in oil demand depends heavily on the Middle East.

- Credible policy & pricing signals, plus new financing vehicles, are essential to re-direct capital flows towards a 2 °C target.