An 8% reduction in 2015 global energy investment results from a $200 billion decline in fossil fuels, while the share of renewables, networks and efficiency expands.
Energy efficiency and low fossil fuel prices

The three best selling vehicles in North America in 2015

Appliance standards lock in efficiency improvements despite declining electricity prices
Europe, North America and China dominate global investment in building efficiency

Investment in energy efficiency in buildings by region

Better insulation, efficient heating systems and cogeneration deliver energy savings and air quality benefits

© OECD/IEA 2016
Unprecedented wave of investment cuts in the upstream oil and gas industry

Cost deflation, efficiency improvements and reduced activity levels might lead for the first time to a three consecutive years of investment decline
US shale leveraged business model increases investment volatility

Bond spreads vs. Oil prices, Jun 2014 – Aug 2016

Debt costs soared for leveraged US shale companies as oil prices fell, resulting in bankruptcies; more resilient operators, with the majority of production, now remain...
Infrastructure costs favour coal power over gas in Asian energy importers

Coal and gas-fired power investment in Asian markets (2015)

Asian markets comprised 85% of global coal power investment, while N. America and Middle East, with robust infrastructure, favoured gas for new fossil fuel power.
LNG investment about to fall from historical peak

LNG terminals investment

Given the sharp fall of investment and increasing reluctance for new long term contracts LNG might be heading towards a new boom and bust cycle
Renewables investment buys much more electricity

Global renewable power investment

USD 2015 billion

Generation from investment in capacity

TWh

Investment from renewables-based capacity more than covers 2015 global electricity growth. Wind leads, surging 35% in 2015 on economics and record offshore growth.
Renewable costs: technology, financing and location

Wind and solar PV average investment costs and PPA prices in the United States

- Utility scale solar PV, capital costs
- Onshore wind, capital costs
- Utility scale solar PV, contracted PPA prices
- Wind, contracted PPA prices

© OECD/IEA 2016
The so called “Decentralized” solar PV

The majority of solar investment is utility scale
Capital light digital solutions can reduce the physical investment need

Demand response in capacity markets

Decentralised storage substituting for transmission upgrades, New York

Consumer owned batteries aggregated for frequency control, Germany

Electric cars as a flexible grid resource, London
Global nuclear investment is driven by China and Russia

- China: a new reactor every quarter
- Rosatom: 9 reactors under construction in Russia with vertical integration
- Technology + construction + finance agreements in Vietnam, Turkey, Belarus, Egypt etc

- Are the financing packages sustainable at 50 $/barrel?

In Europe and the US new construction failed to compensate for decommissionings

© OECD/IEA 2016
Low cost of capital can benefit nuclear as well.
Decentralised and centralised electrification in India

Network Investment in India, 2000-15

<table>
<thead>
<tr>
<th>Year</th>
<th>Distribution CAPEX</th>
<th>Transmission CAPEX</th>
<th>Networks line length</th>
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<td>8,300,000</td>
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</tr>
</tbody>
</table>
Quantitative easing raises the value of network assets

Despite attractive valuations, physical investment is stagnating.

Electricity networks investment per total network length, 2010-15

Most renewable deployment is integrated into a legacy network.
Quantitative easing and the cost of infrastructure finance

The first negative interest rate corporate bond by Deutsche Bahn following a series of low WACC energy infrastructure deals
Thank you