

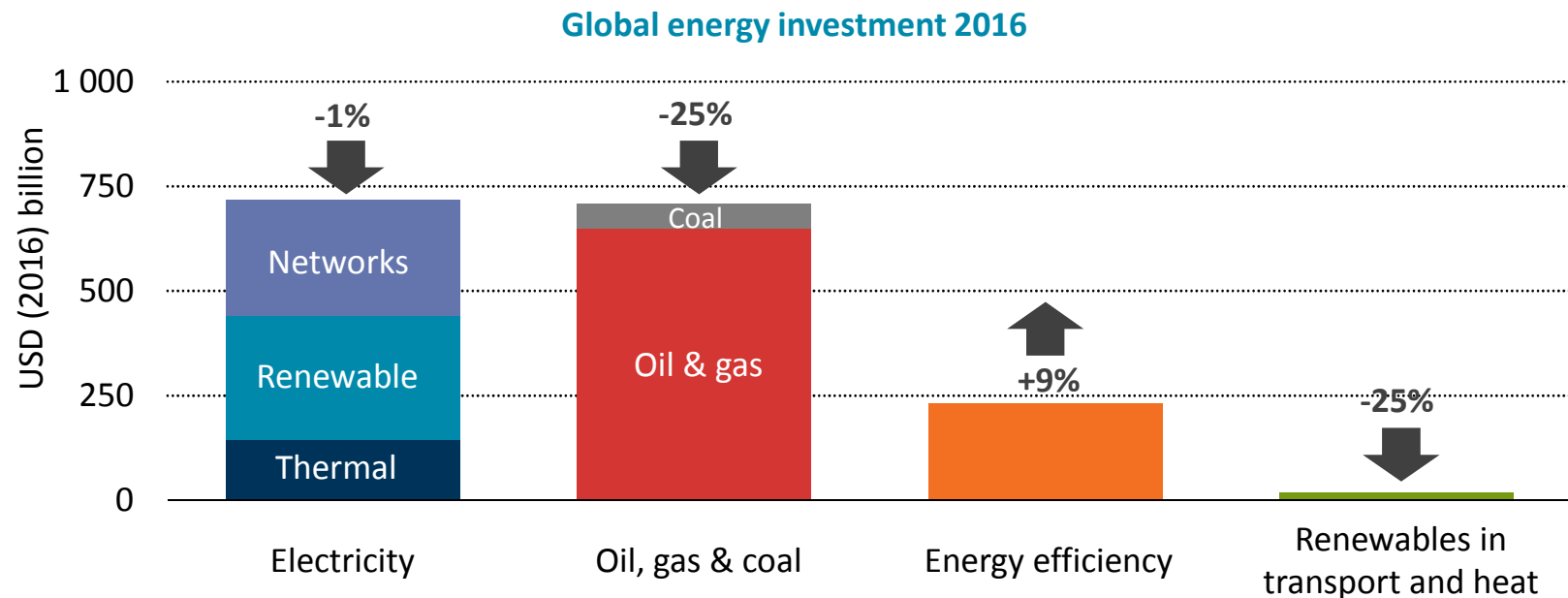
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8th SOME-IEA Dialogue IEA Update/briefing

Kieran Clarke and Matthew Wittenstein, IEA
Energy Sector Group Brown Bag, 20 July 2017

Global energy investment fell 12% in 2016, a second consecutive year of decline

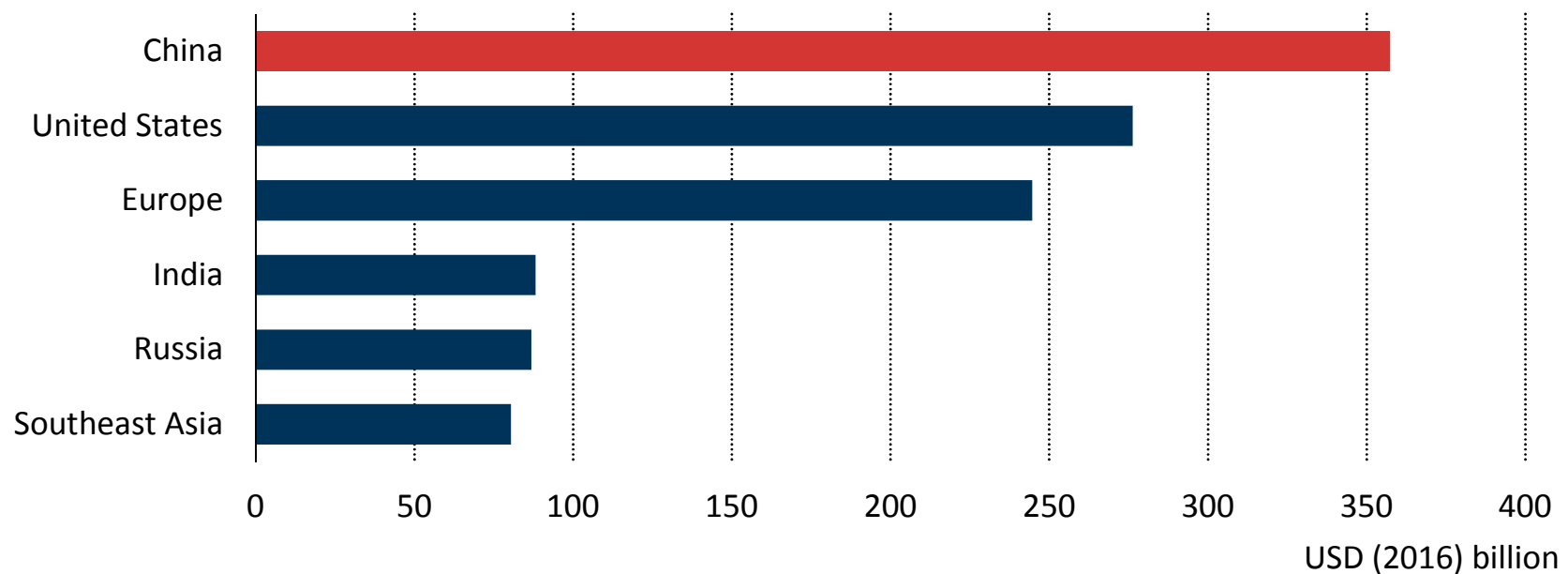


Total energy investment was \$1.7 trillion in 2016. Electricity sector investment overtook oil and gas for the first time, while energy efficiency was the biggest growth sector.

China remains the first destination of energy investment in 2016



Energy investment in selected markets, 2016

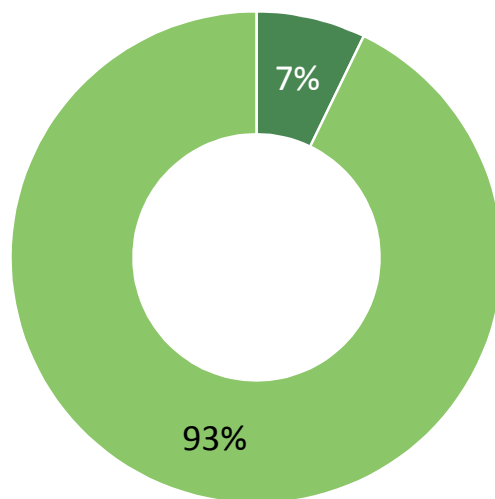


China represented 21% of global energy investment, supported by electricity supply and networks; despite a sharp decline in oil and gas, the US total share rose significantly.

The role of state actors in energy investments has increased

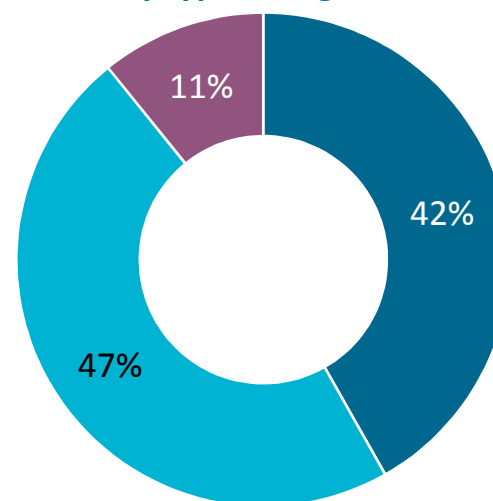


Sources of finance for 2016 energy investments
by financing mechanism



- Project finance
- Balance sheet

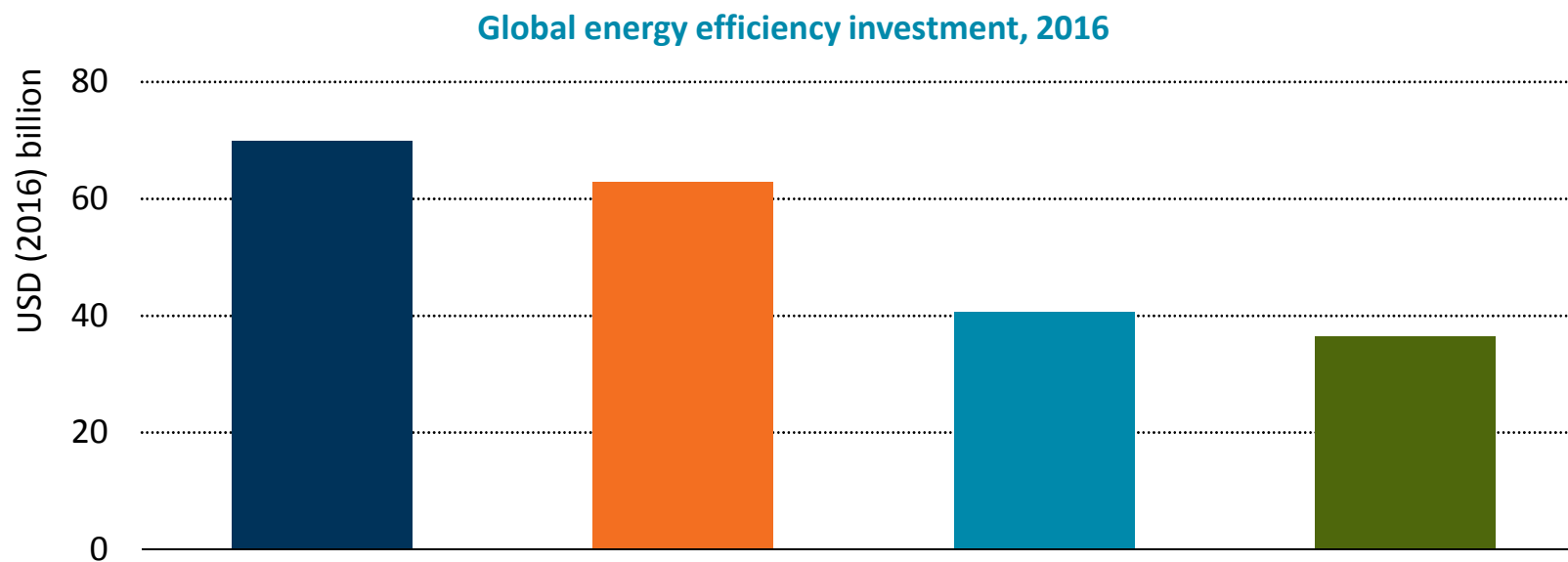
Ownership of 2016 energy investments
by type of organisation



- Government/SOEs
- Private sector
- Households, communities and self-consumption

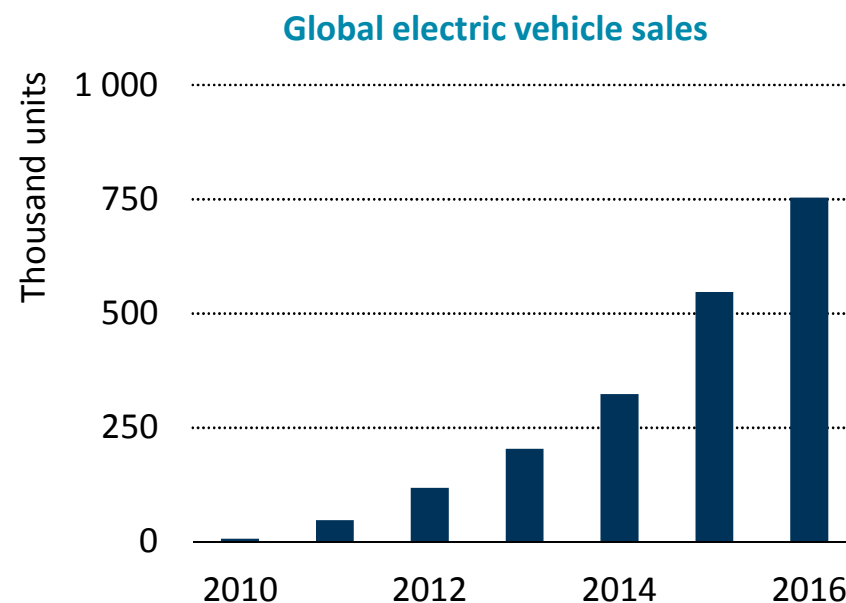
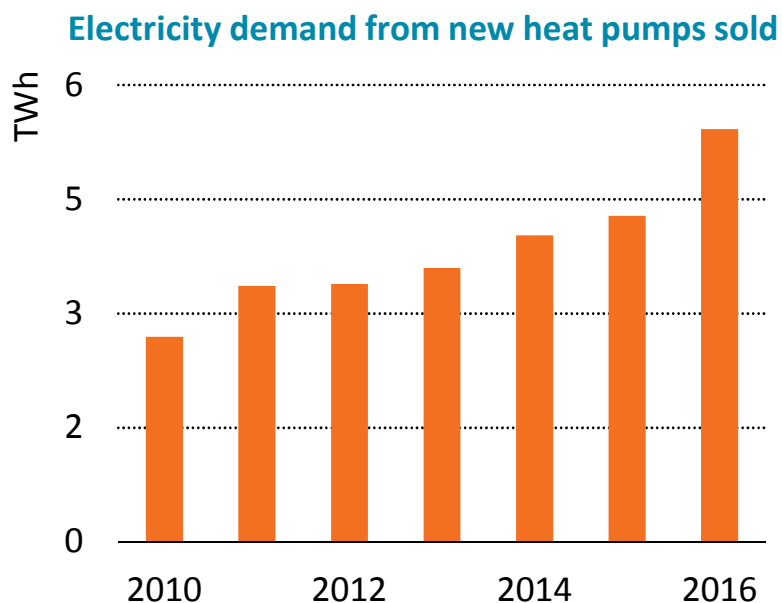
The share of state actors in total energy investment reached 42% in 2016, largely thanks to state-owned enterprises in electricity sector investment, notably in China, and NOCs in upstream oil & gas

Europe leads efficiency spending but China is set to overtake it by 2018



Policy continues to underpin efficiency spending, especially in buildings insulation, heating systems and home appliances. Much of the growth in transport efficiency spending is in electric vehicles.

Electrification of transport and heat is progressing

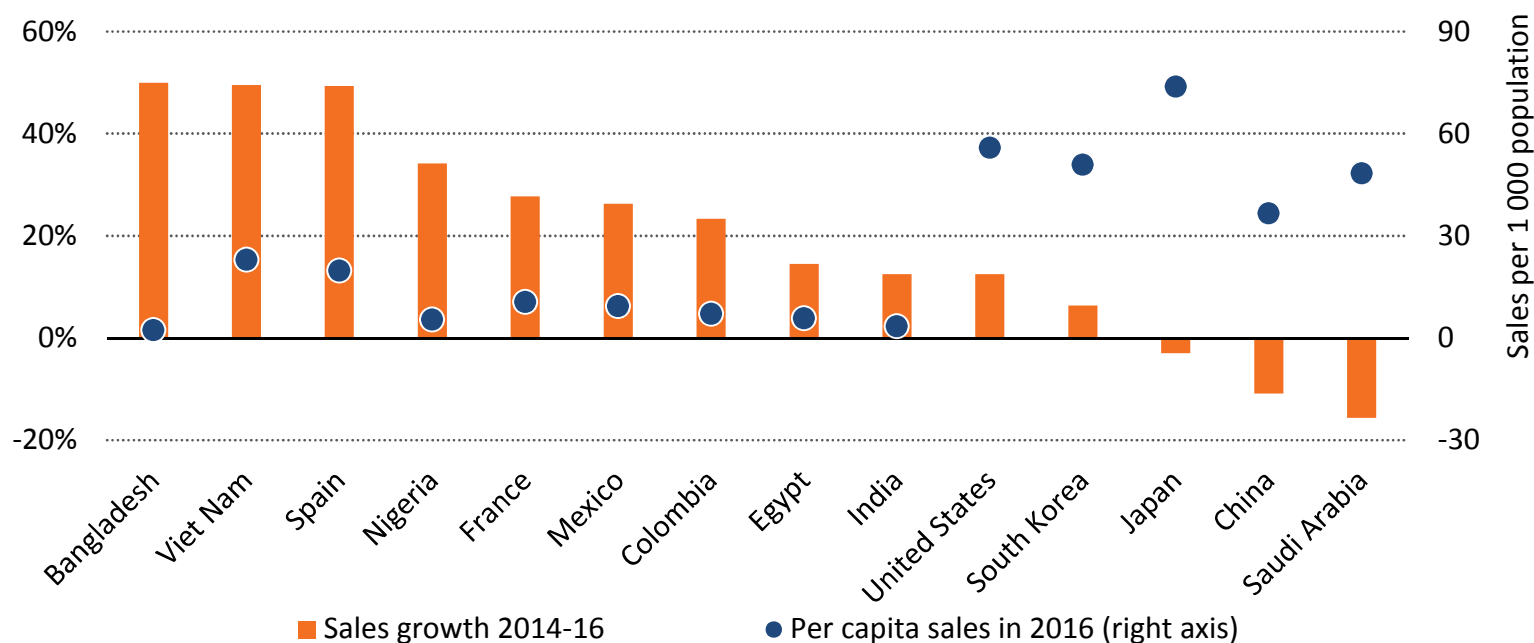


Electric vehicle (EV) sales grew 38% in 2016, bring and, at \$6 billion, now represent 10% of all transport efficiency spending. Another \$6 billion was spent globally on EV charging stations.

Growing electricity demand for space cooling



Air conditioner sales growth and per capita sales in selected markets

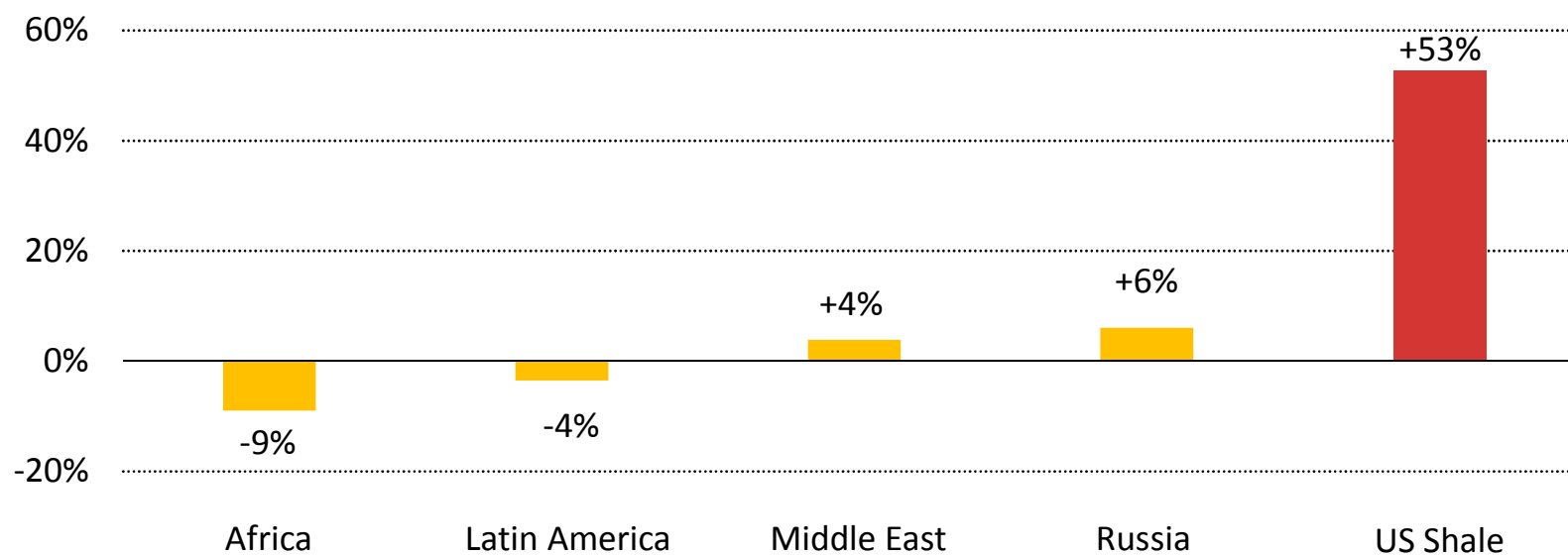


Sales of air conditioners are growing strongly in countries with low rates of market penetration, while sales are falling in the major markets China and Saudi Arabia, due to market saturation.

A two-speed world oil market



Change in Upstream investment, 2017 vs 2016

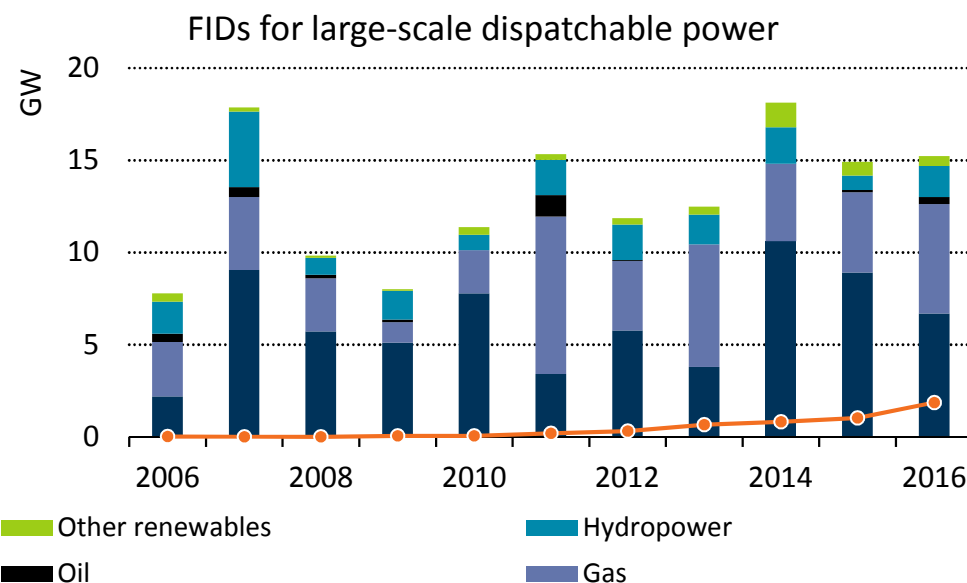
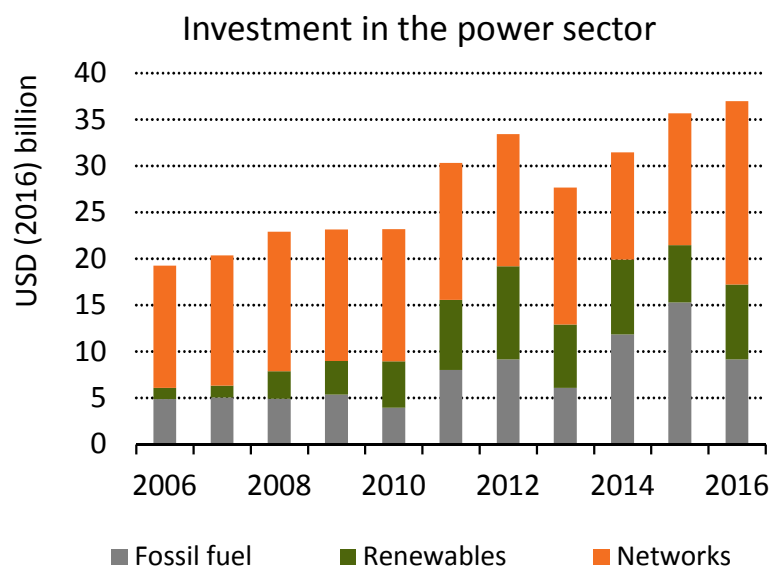


After two years of unprecedented decline, global upstream investment is expected to stabilize in 2017, but downside risks remain

Investment in Southeast Asia's electricity sector reached USD 35bn

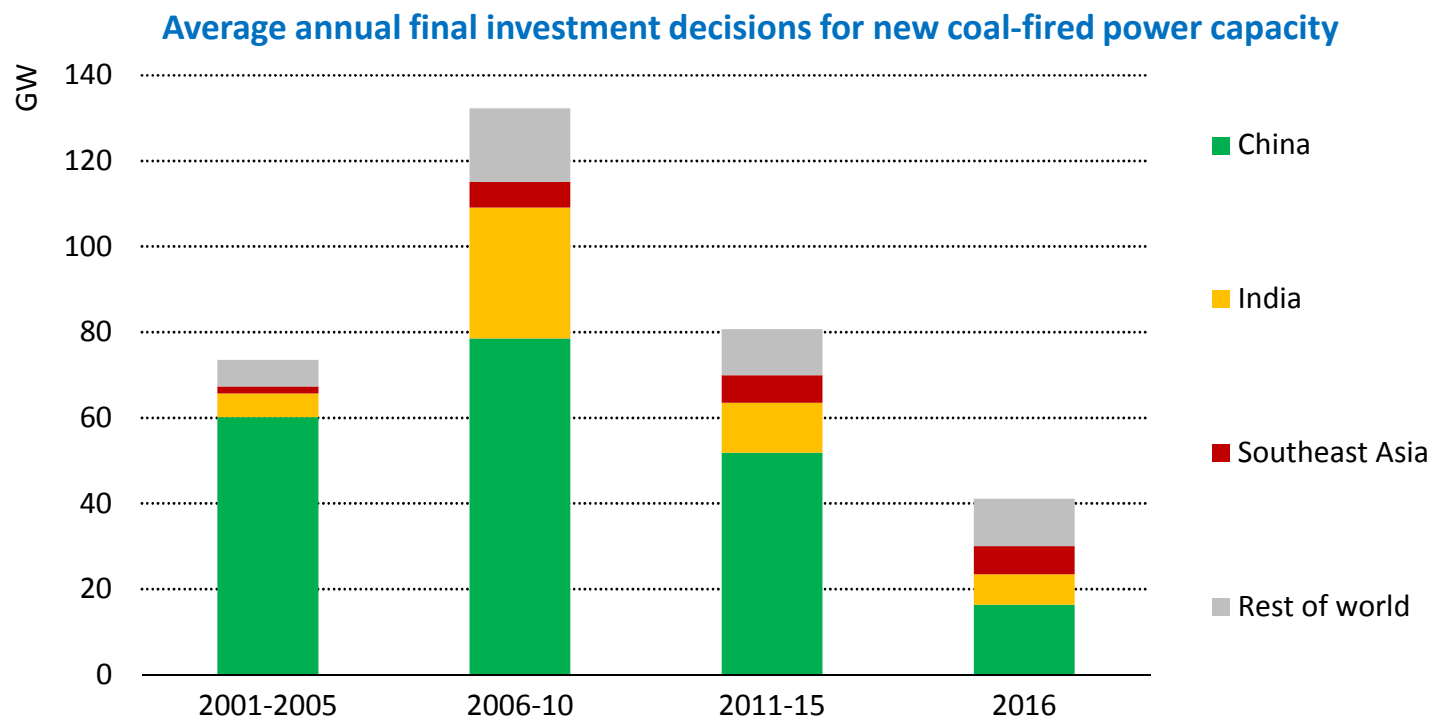


Investment in electricity sector and FIDs for large-scale dispatchable power



75% of the power sector investment went to renewables and networks while actual additions of wind and solar PV are dwarfed by the sanctioned large-scale dispatchable power which is mostly fossil-fuel based.

A wave of coal power investment is coming to a pause

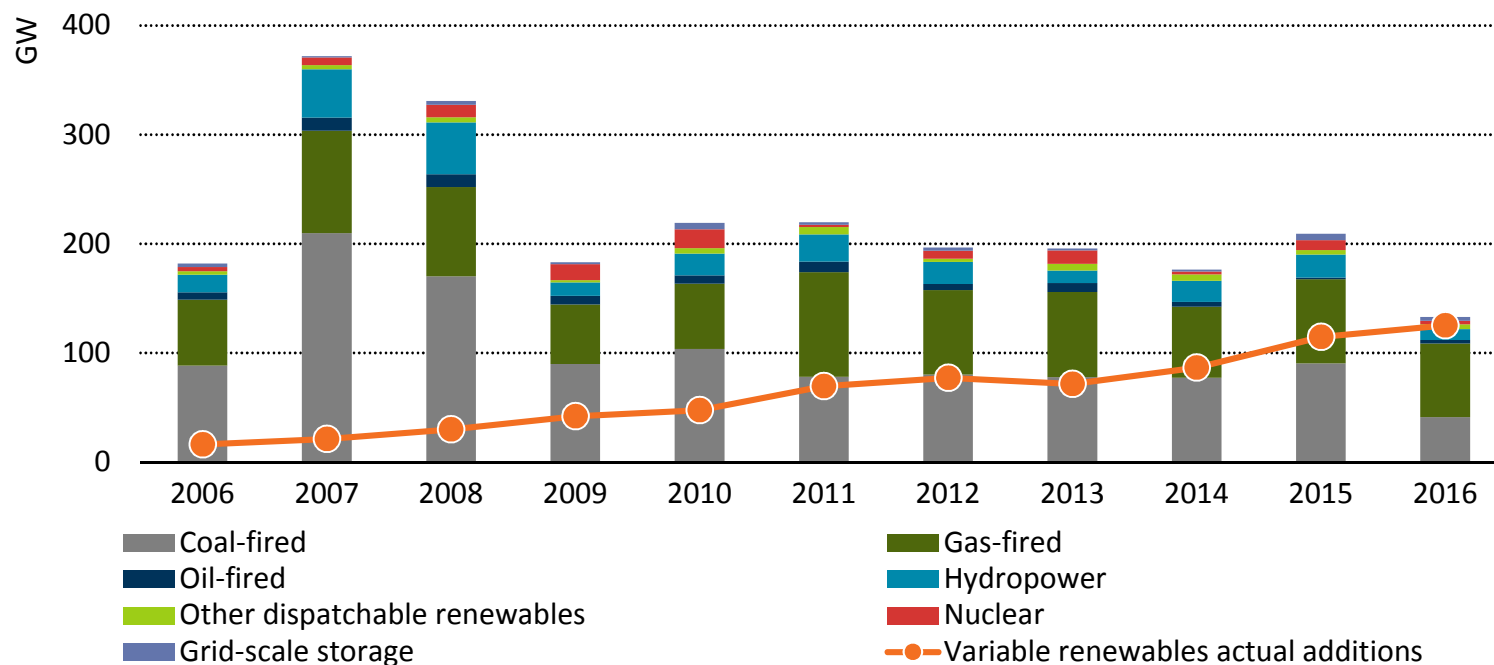


In 2016, sanctioning of new coal power fell to the lowest level in nearly 15 years, hampered by competition from renewables and environmental challenges. Gas power FIDs exceeded those for coal by over 1.5 times.

A slowdown ahead in large-scale dispatchable power additions

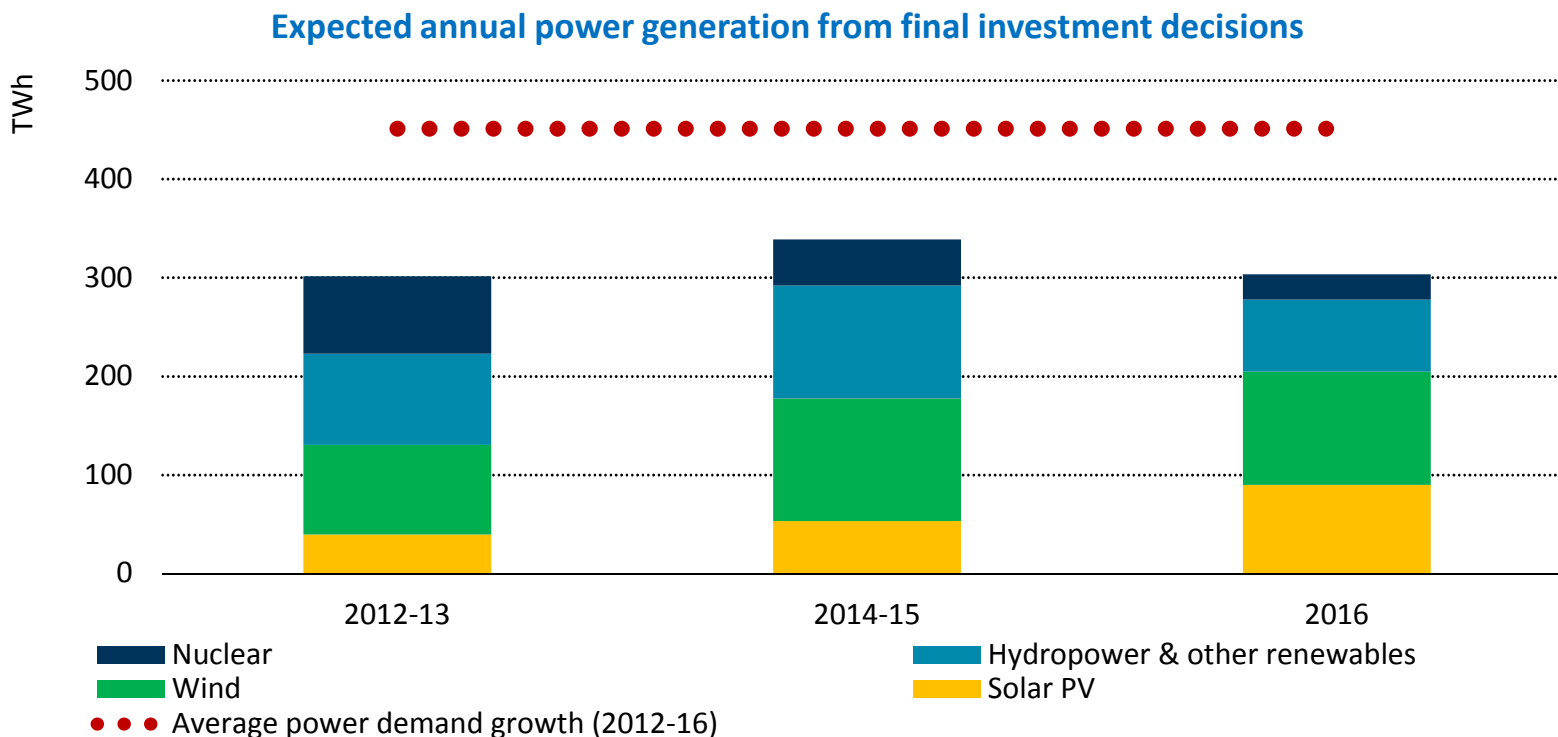


Global large-scale dispatchable power additions by FID year and variable renewable additions by commissioning year



The electricity sector is now investing in variable power at almost the same rate, in capacity terms, as it is sanctioning large-scale dispatchable generation and storage to be built in the years ahead.

Investment in clean power is not keeping pace with demand

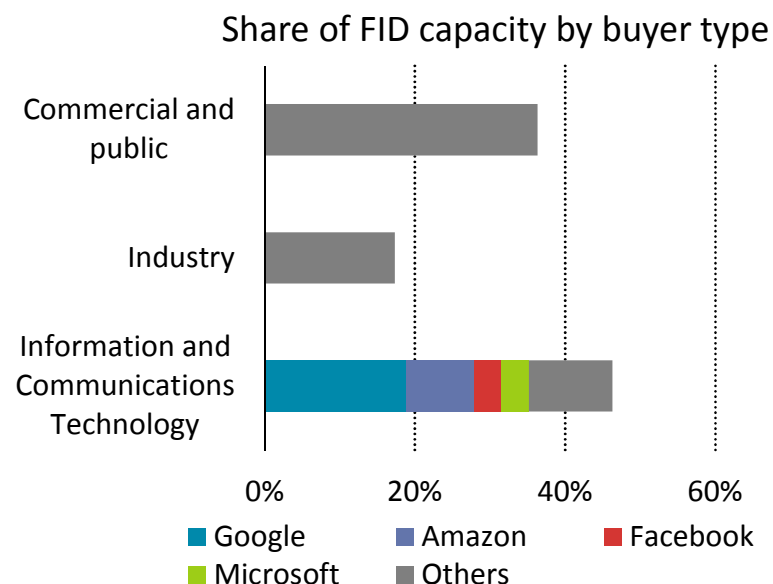
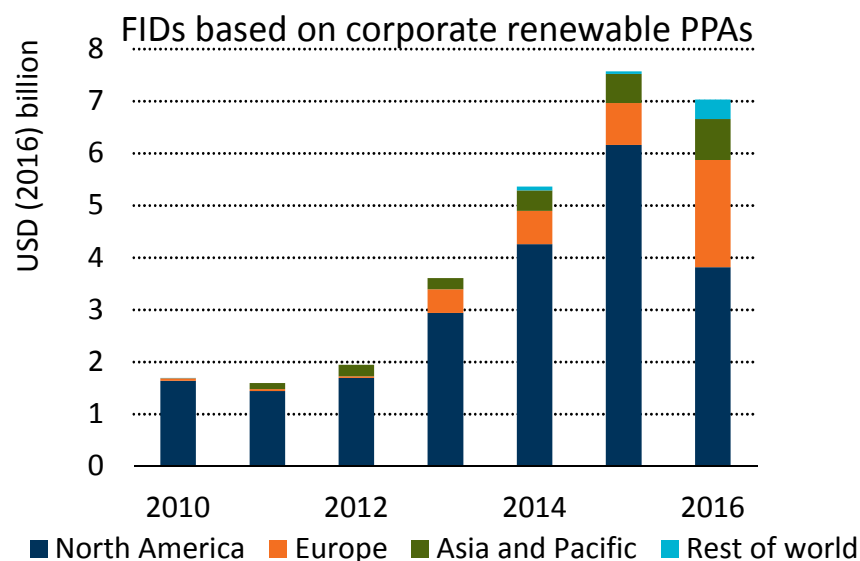


While the contribution of new solar PV and wind has grown nearly three-quarters in the past five years, FIDs for nuclear and hydropower have slowed. Clean power FIDs in 2016 generate at only two-thirds the level of power demand growth.

Corporations playing a growing role in renewables investment

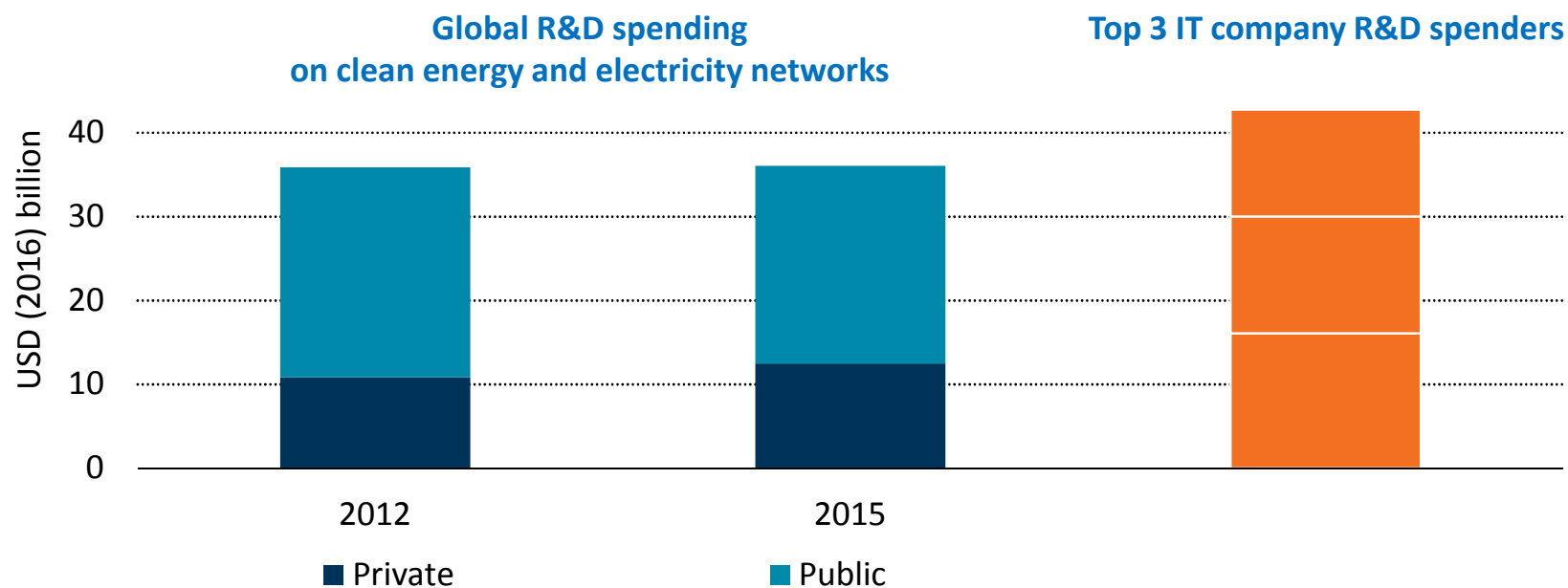


Final investment decisions based on corporate renewable PPAs by region and type of buyer



Corporate PPAs have accounted for the sanctioning of over USD 30 billion of new utility-scale renewables over the past decade, led by technology firms looking to hedge power price volatility, diversify supply and meet sustainability goals.

Global clean energy R&D funding needs a strong boost



We've tracked a steady \$37 billion/year of clean energy and electricity networks R&D spending, with room for growth from the private sector. As a share of GDP, China now spends most on energy R&D

Conclusions



- **Investment fell by 12% in 2016, a second consecutive year of decline, and electricity sector investment overtook oil, gas and coal investments combined**
- **An upswing of US shale investment is creating a two-speed oil market and triggering a rapid transformation of the oil and gas industry**
- **Although electricity investment remains robust, policies need to focus on maintaining supply adequacy, stimulating an acceleration of clean power and strengthening market signals for investment in flexibility**
- **The clean energy transition needs more R&D but energy R&D expenditures are stable; there is a lot of scope for increased spending on energy innovation by governments and, in particular, the private sector**
- **Investment decisions today will leave their mark on energy on energy infrastructure for decades to come; the IEA will continue to focus on investment as a cornerstone of a secure and sustainable energy system**