



World Energy Investment 2018

25 September 2018

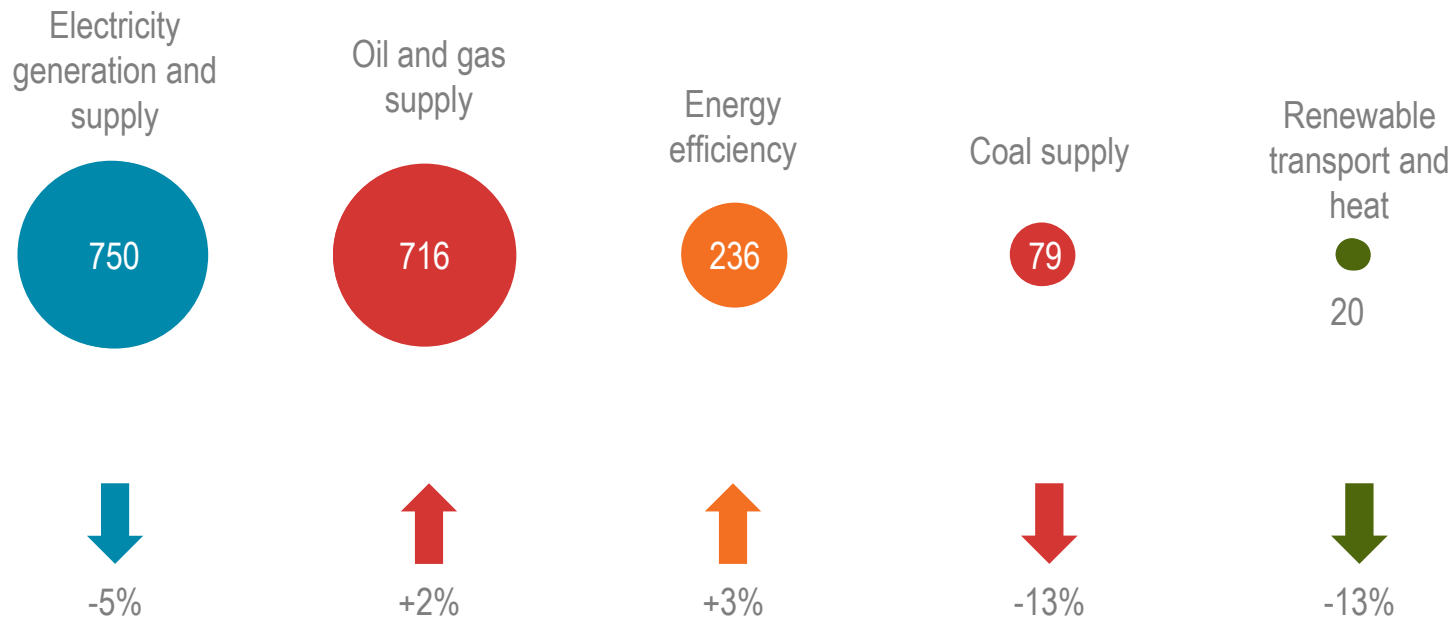
Alessandro Blasi and Michael Waldron, International Energy Agency



Global energy investment was USD 1.8 trillion in 2017, led by electricity



Global energy investment in 2017 (Billion USD)

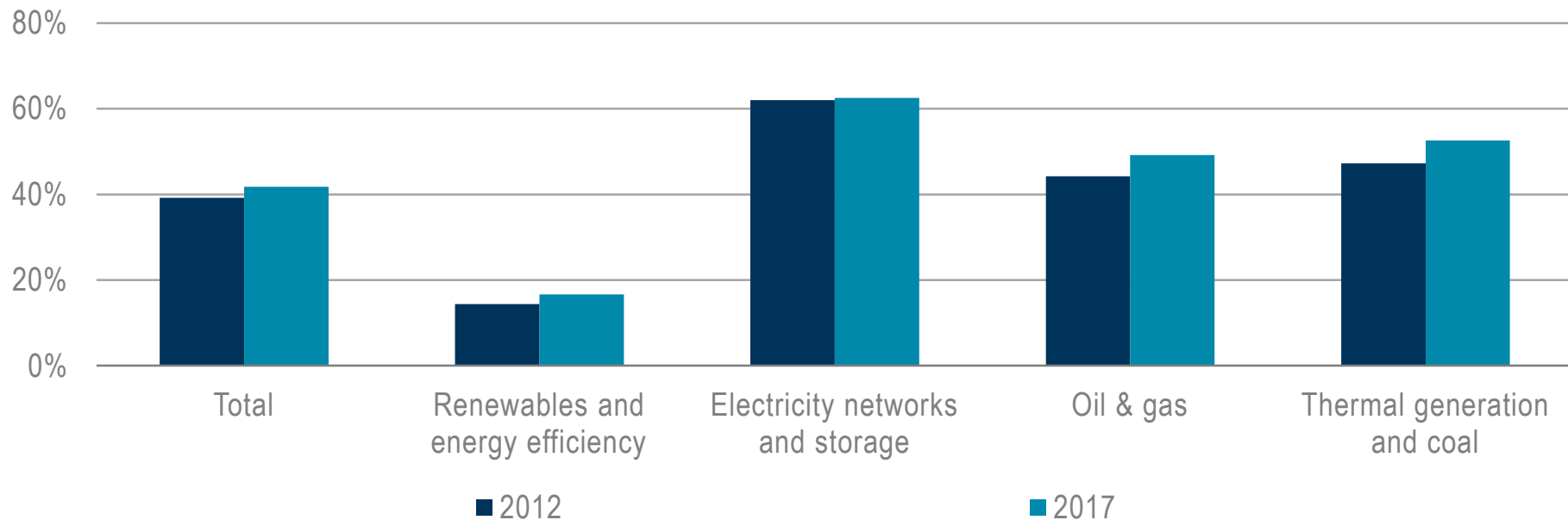


For the 3rd consecutive year energy investment declined in 2017, by 2%, due to less power generation investment, lower costs and continued prudence in the oil and gas sector. Energy efficiency was a lone growth area.

The share of state-backed energy investment has edged up



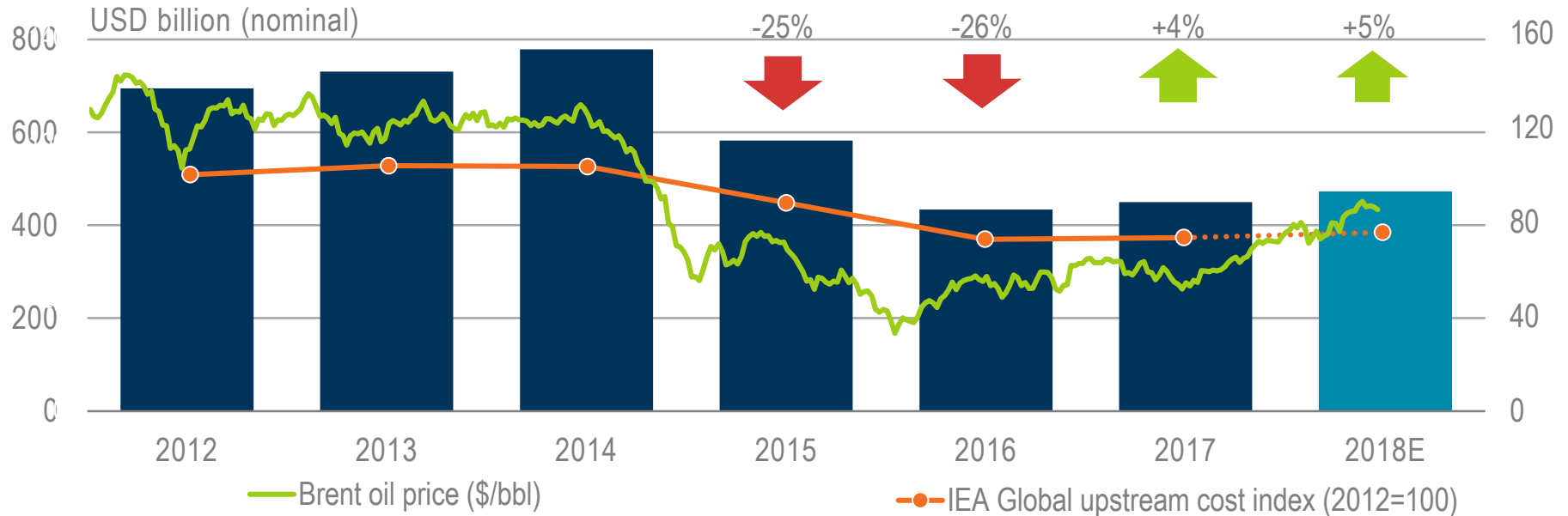
The share of government/SOEs ownership in energy investment by sector, 2012-17



Despite a growing role for clean energy investment, which is led by private investment, the share of energy investment from NOCs and state-owned thermal power rose by more over the past five years.

Lower upstream spending could lead to tighter markets

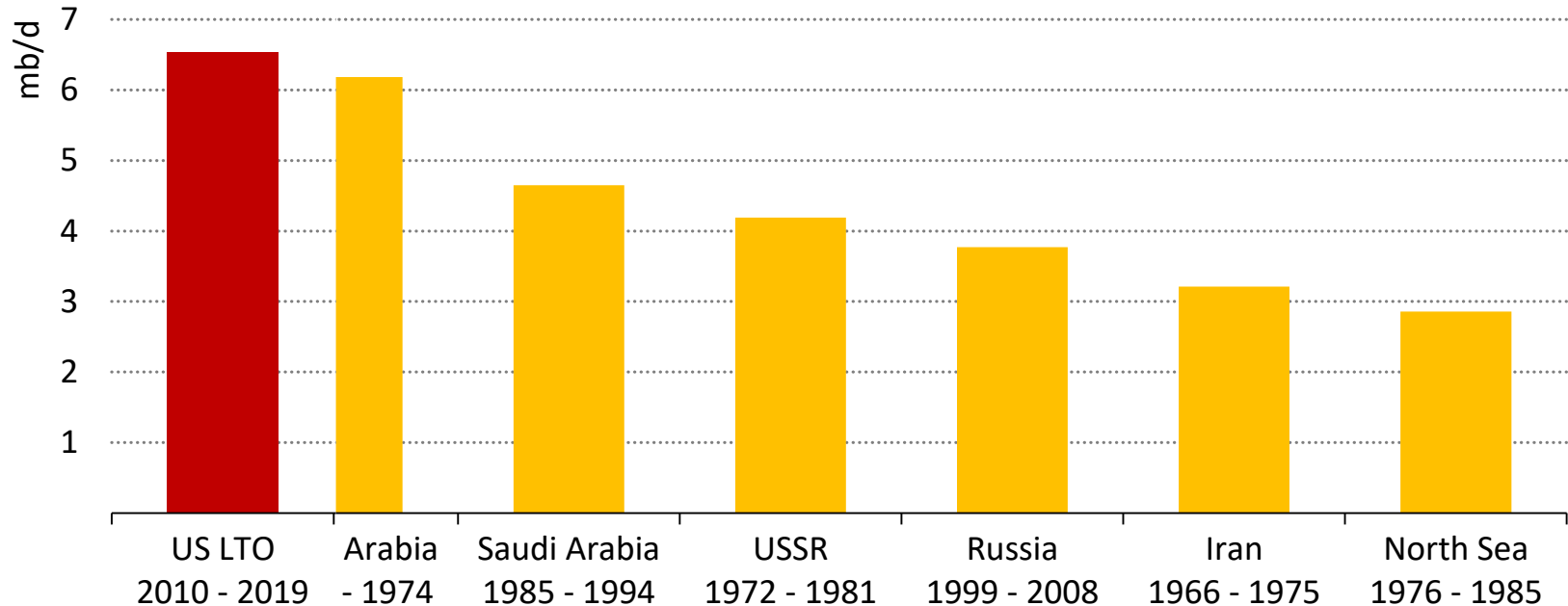
Global oil and gas upstream capital spending 2012-18



Outside US shale, upstream investment continue to recovery very modestly with companies able to keep costs under control.

The extraordinary growth of US tight oil

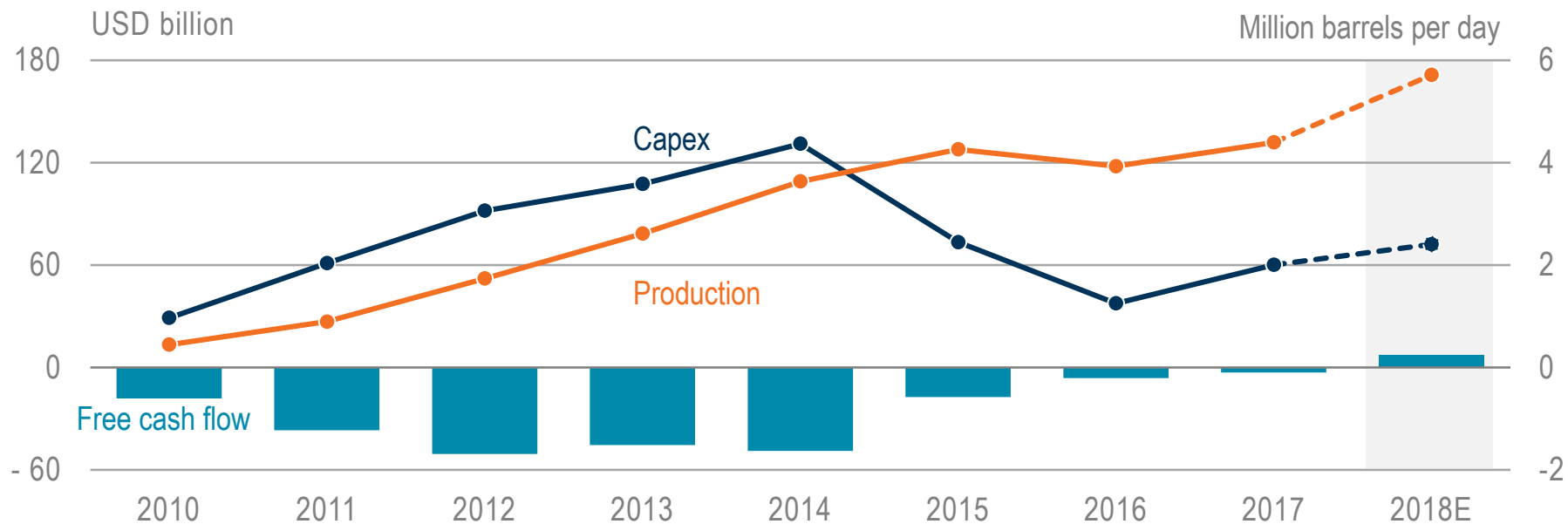
Largest production increases in the oil history



Differently from all other regions, US shale oil growth results from technological and market progress rather than the discovery and deployment of huge oil resources

The US LTO journey towards a financially sustainable business

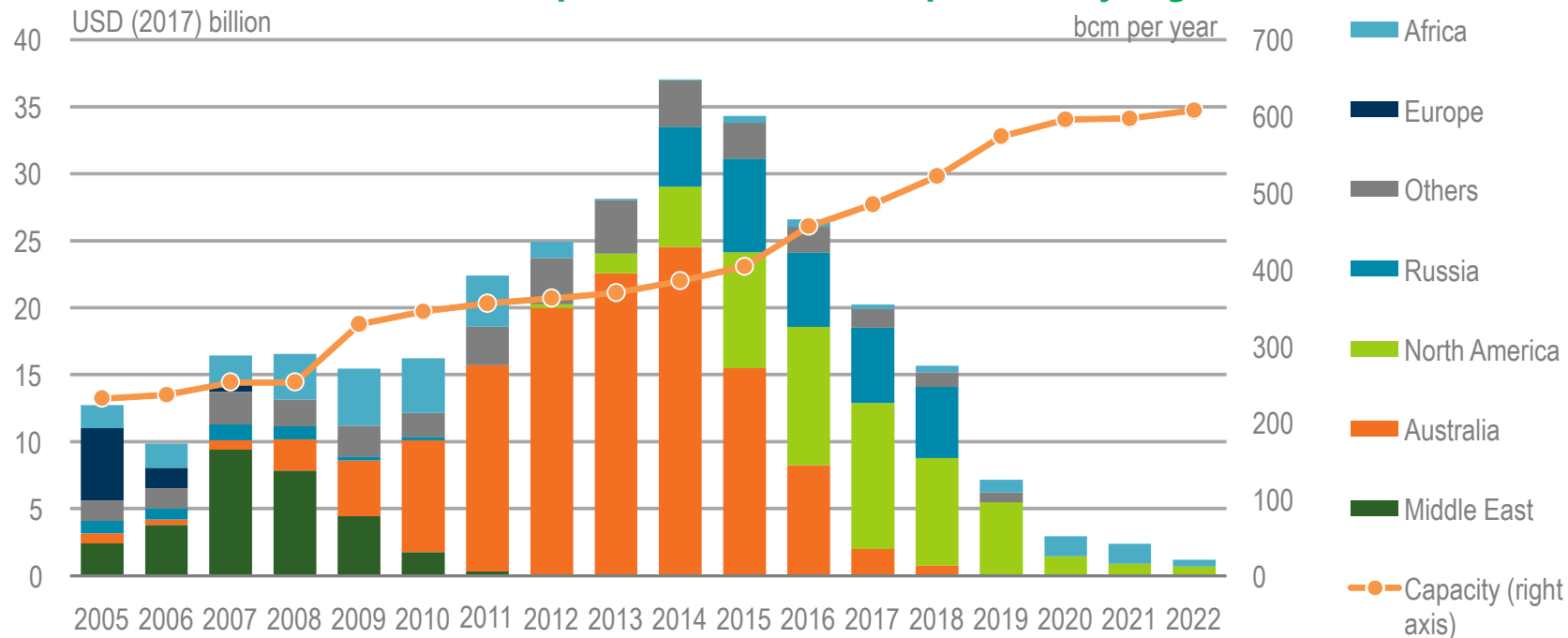
US LTO production, capital investment and free cash flow



IEA estimates that US LTO sector is on track in 2018 to generate positive free cash flow for the first time ever, but downside risks remain.

The second wave of LNG investment comes to an end

World LNG liquefaction investment per country/region

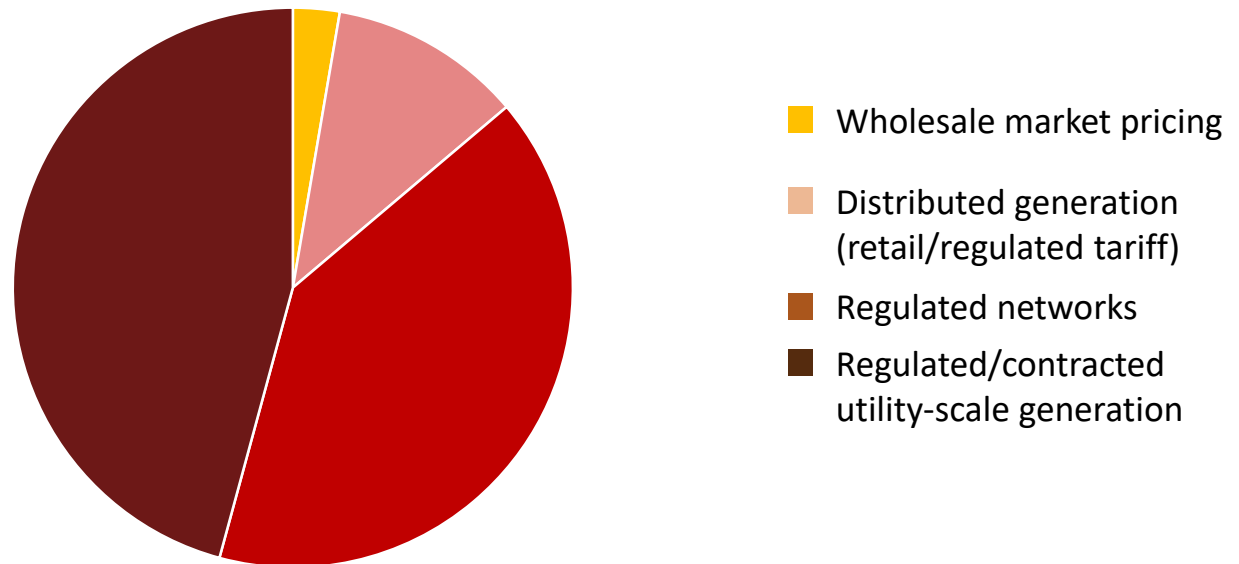


Note: The investment estimates correspond to the actual capital spending in the year that it occurs and are calculated considering 49 projects sanctioned since 2000 up to June 2018.

Spending peaked in 2014 at \$35 bn and has been declining ever since

Global power sector investment by main remuneration model

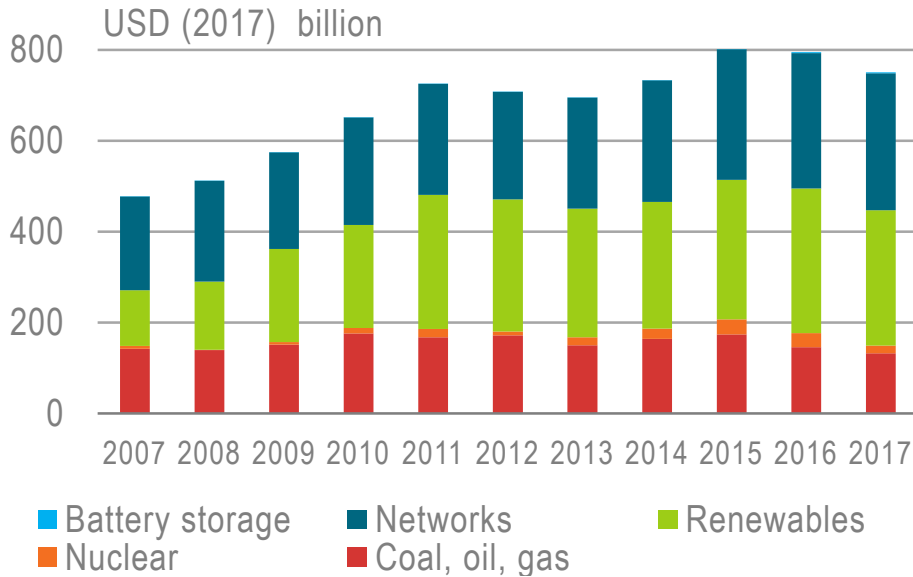
Total power sector investment in 2017: USD 750 billion



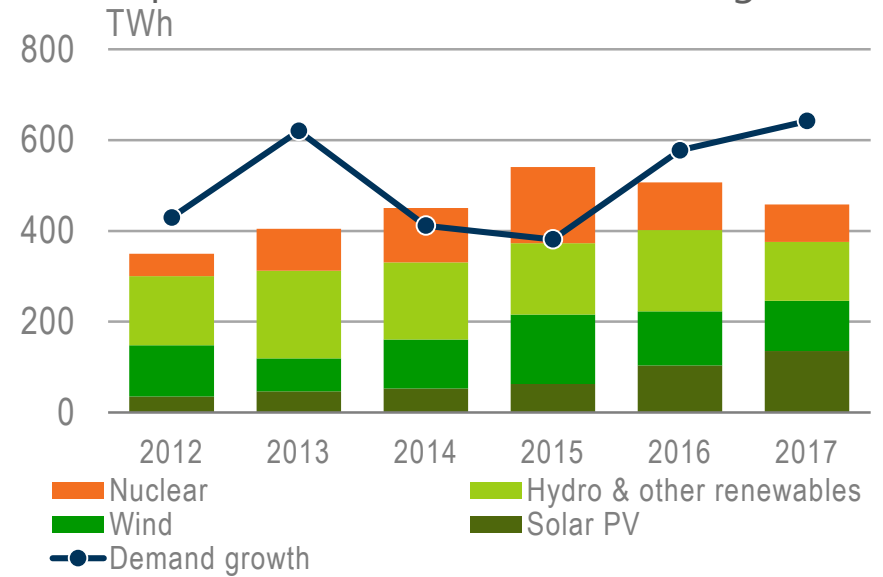
Over 95% of power sector investments rely on regulation or contracts beyond short-term wholesale markets for their main remuneration, as regulators pursue adequacy and environmental aims.

The power sector is becoming more capital intensive

Global power sector investment



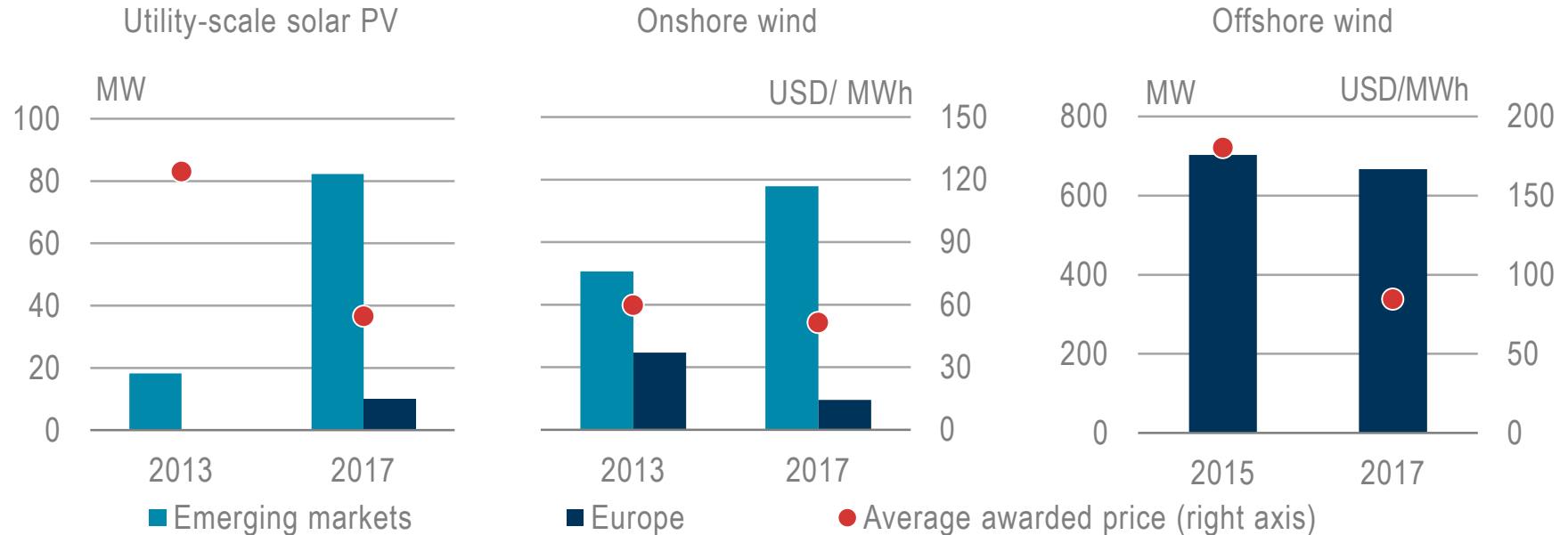
Expected generation from low-carbon power investments vs demand growth



Electricity investment has shifted towards renewables, networks and flexibility. Yet expected output from low-carbon power investments fell 10% in 2017 and did not keep pace with demand growth.

Tenders have facilitated economies of scale for renewables

Average size of awarded projects in solar PV and wind auctions

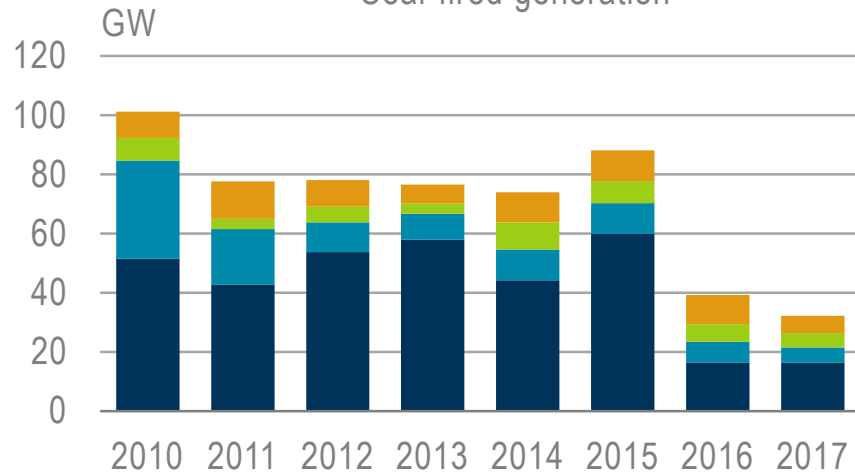


In emerging economies the average size of awarded solar PV projects rose by 3.5 times while that of onshore wind rose by half over 2013-17. In Europe, tendered large projects are mainly in offshore wind.

Thermal power FIDs continued to decline

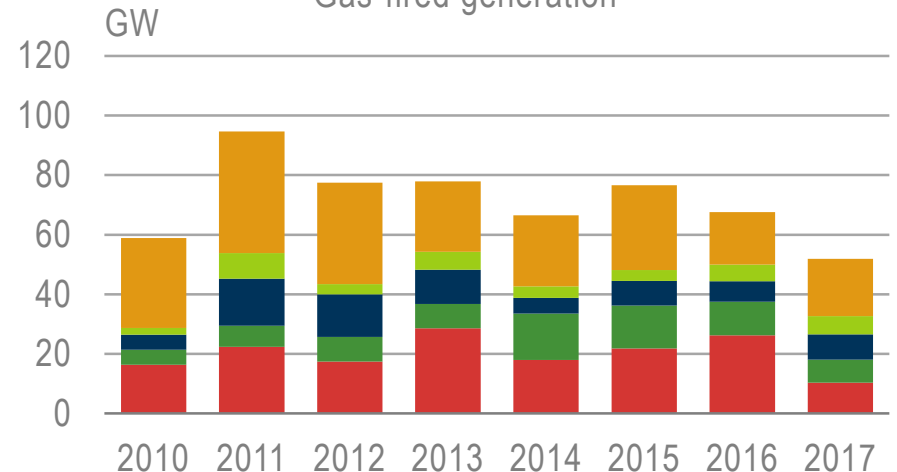
Thermal generation capacity subject to a FID by plant type

Coal-fired generation



■ China ■ India ■ Southeast Asia ■ Rest of world

Gas-fired generation

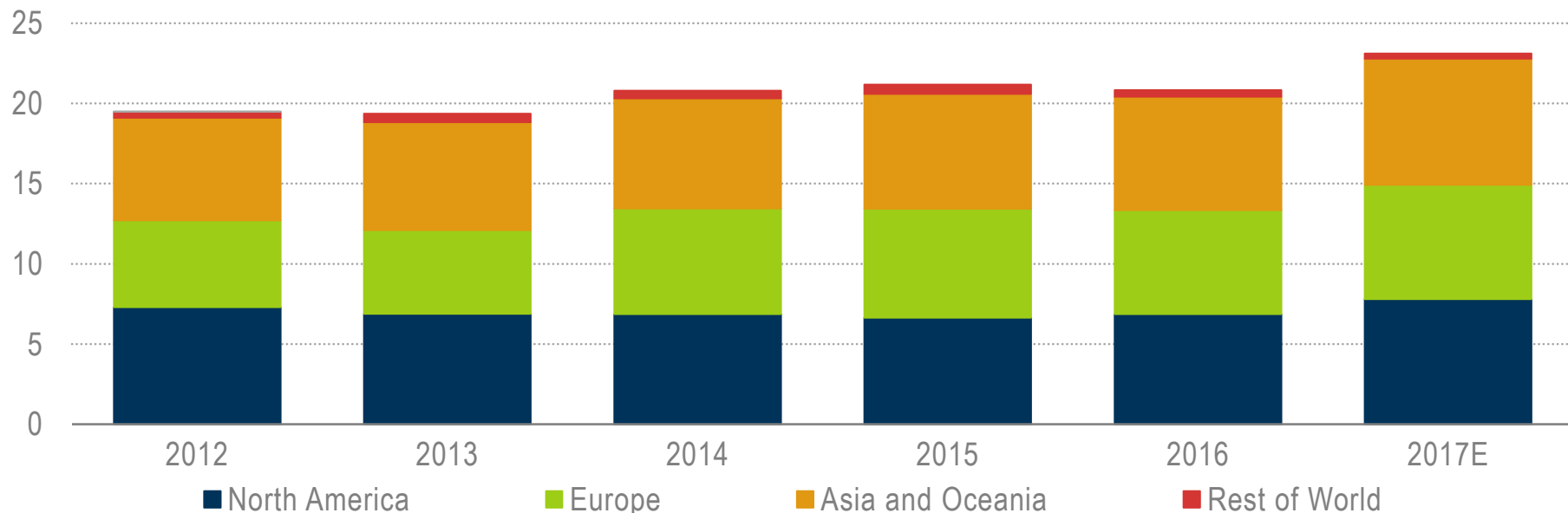


■ MENA ■ US ■ China ■ Southeast Asia ■ Rest of world

In 2017 newly sanctioned coal power fell 18% to a level one-third that of 2010, driven by a slowdown in China, India & SE Asia. Sanctioned gas power fell nearly 23%, due to the MENA region & the US.

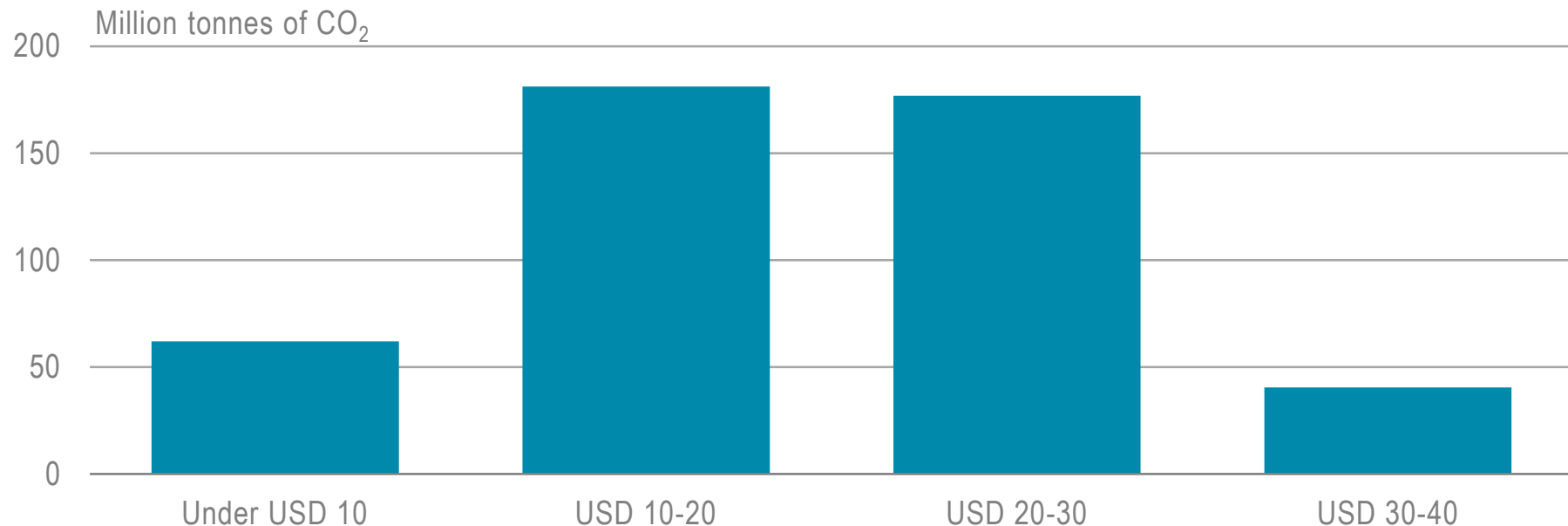
Clean energy R&D investment is finally on the rise...

Total public spending on low-carbon energy technology RD&D (in billion USD)



Public spending on R&D for low-carbon technologies rose 13% to USD 22 billion in 2017 after several years of stagnation; however, this is just 0.1% of public spending in major countries.

Global potential for CO₂ capture and storage (or use) at low incentive levels

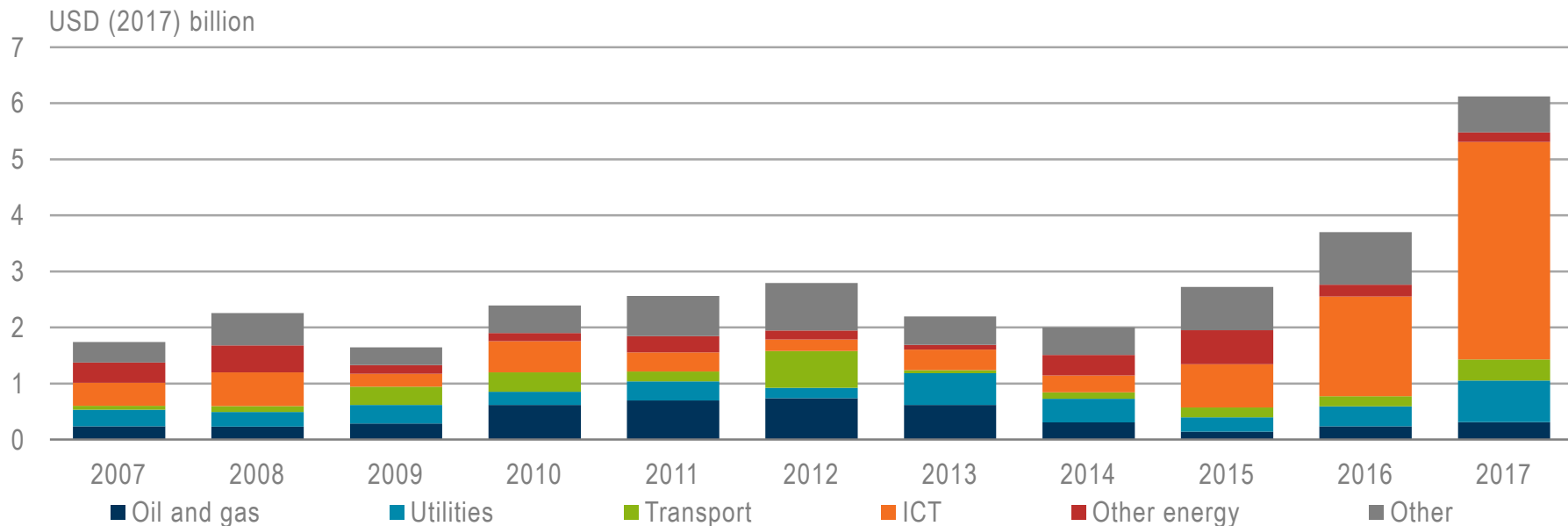


CCUS is vital to tackling climate change, but sustainable deployment needs investment in “low-hanging fruit” today; 450 million tonnes of CO₂ per year (equal to all emissions growth in 2017) can be captured and stored for USD 40/tonne.

Companies invest more in energy tech startups, led by ICT sector



Corporate investments in new energy technology companies, by sector of investing company



Corporate venture capital and growth equity for energy tech startups reached USD 6 billion in 2017; companies are taking strategic positions in a changing energy system, digital firms above all others.

- The share of state-backed energy investment has risen, with more dependence on SOEs across the energy system; policies play a growing role in driving private investment
- Electricity was the largest sector for the second year running, sustained by networks and renewables; but recent trends raise a risk of slowing low-carbon supply investment
- The oil and gas industry is shifting towards short-cycle projects and assets with rapidly declining production, potentially signaling market volatility ahead
- Government R&D funding has risen, but more public & private efforts are needed; scaling up private capital will be key for renewables, energy efficiency and CCUS
- Overall energy investments risk being insufficient for meeting energy security goals and are not spurring an acceleration in technologies needed for the clean energy transition