



Tracking progress in the development and deployment of clean energy technology

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COP 23, 15 November 2017



The IEA works around the world to support an accelerated clean energy transitions that is

enabled by real-world SOLUTIONS

supported by ANALYSIS

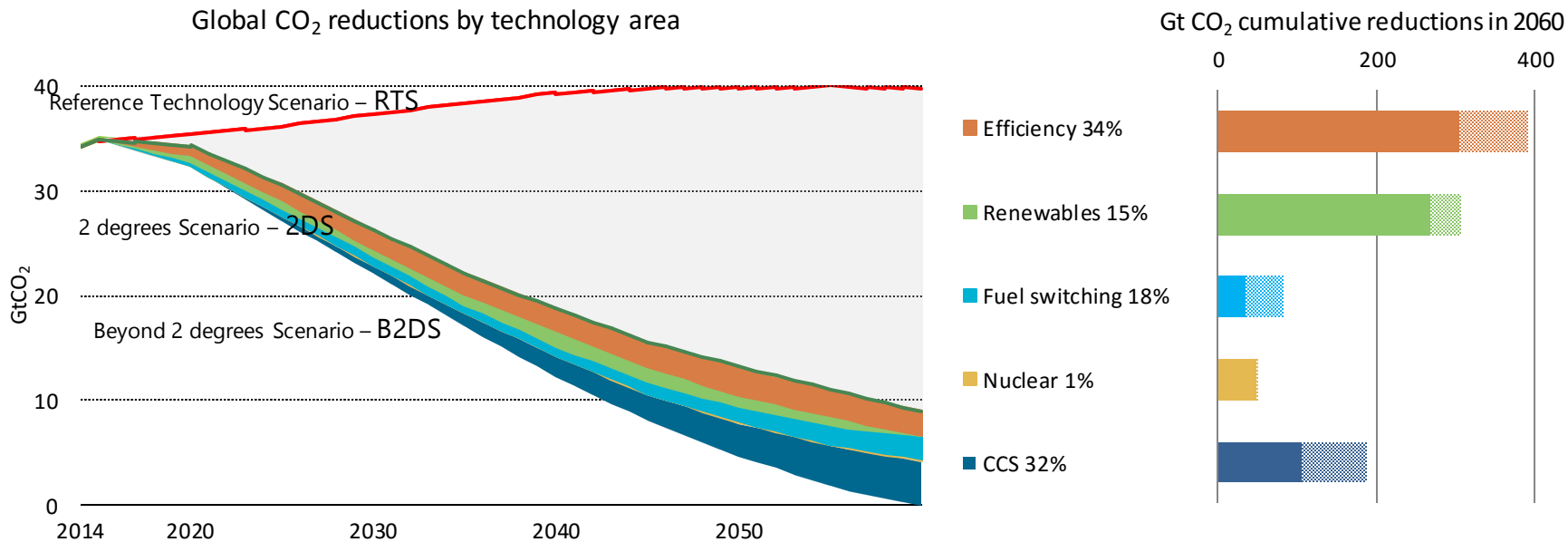
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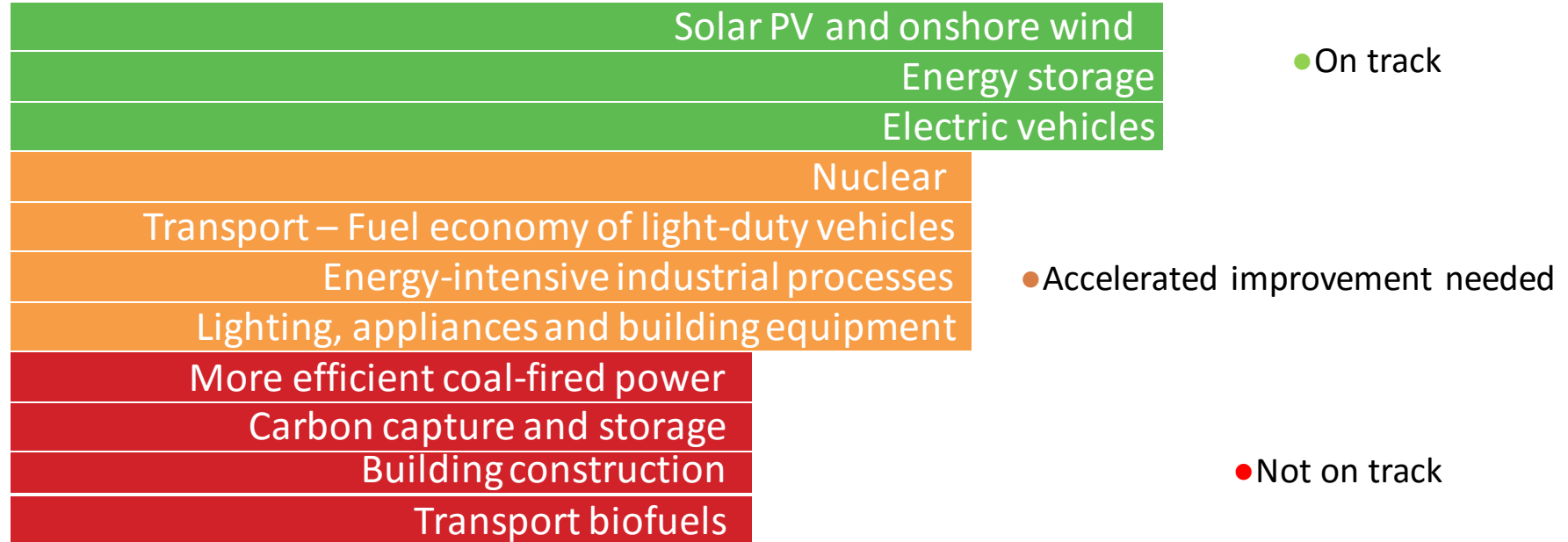
How far can technology take us?

Technology area contribution to global cumulative CO₂ reductions



Pushing energy technology to achieve carbon neutrality by 2060 could meet the mid-point of the range of ambitions expressed in Paris.

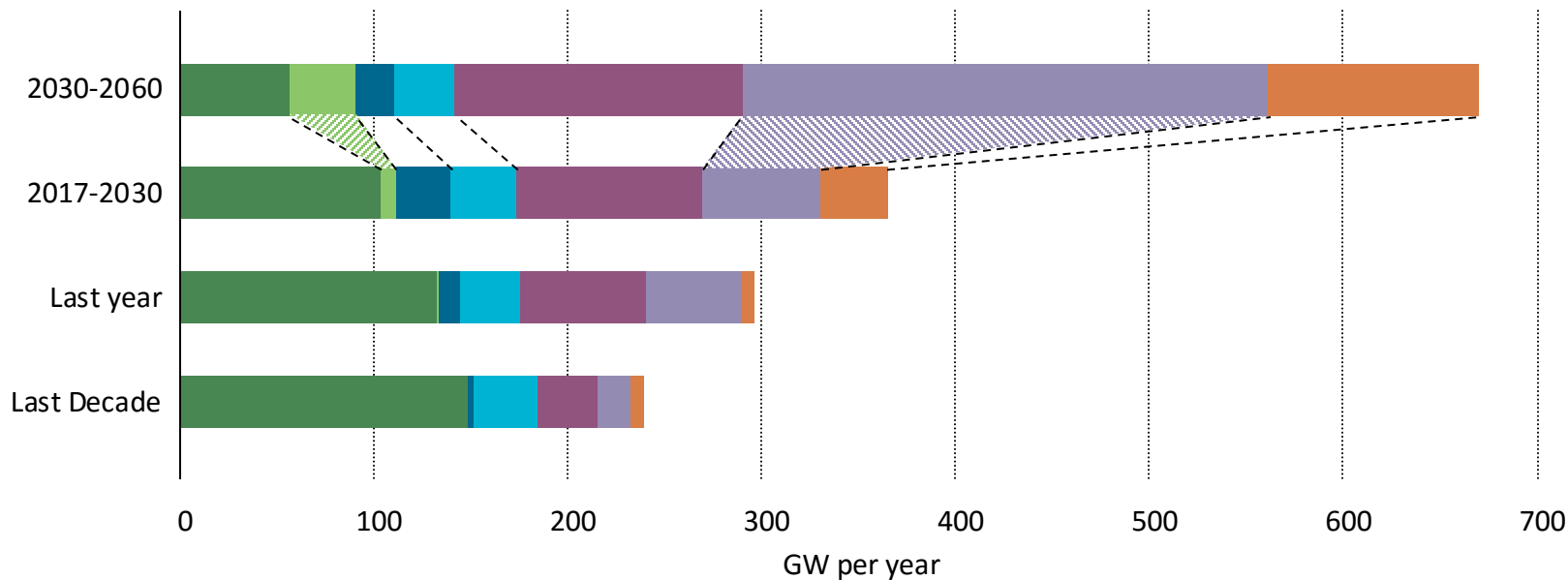
The potential of clean energy technology remains under-utilised



Recent progress in some clean energy areas is promising, but many technologies still need a strong push to achieve their full potential and deliver a sustainable energy future.

Can we push up the low-carbon power deployment pace?

Average capacity additions in different periods in the B2DS

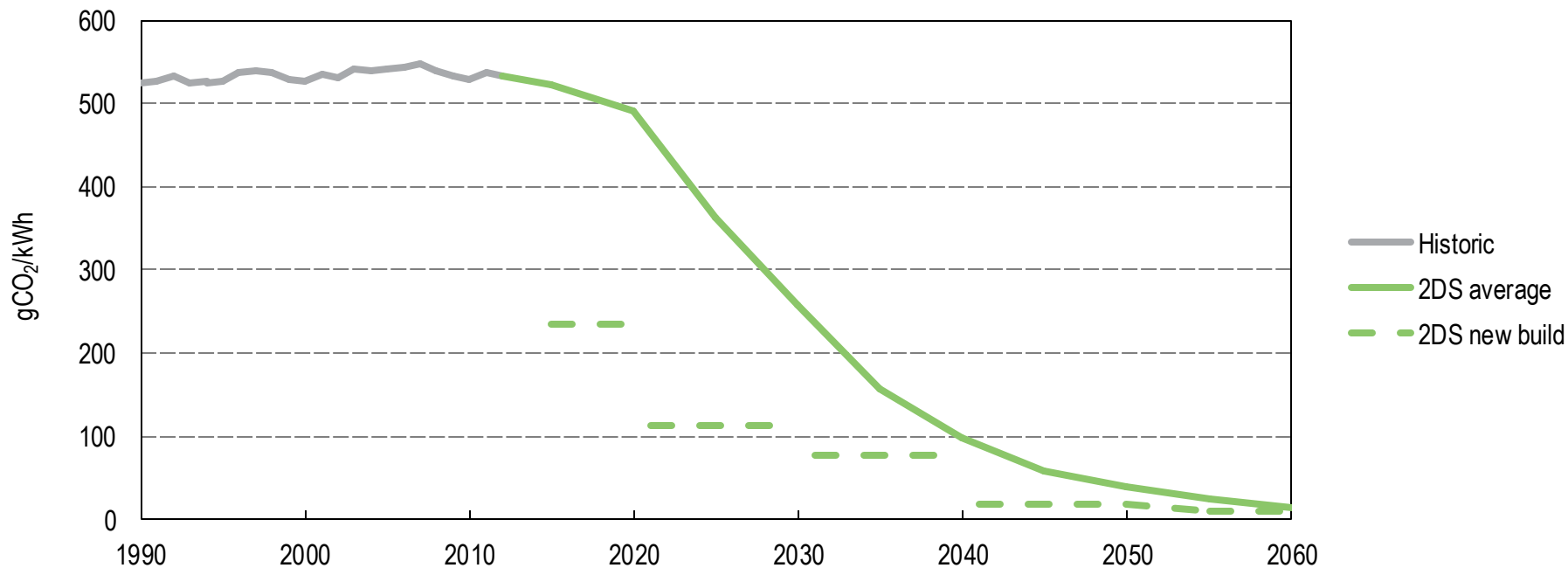


Recent successes in solar and wind will have to be extended to all low-carbon solutions, and brought to a scale never experienced before.

Indicators of energy system transformation: Power sector example



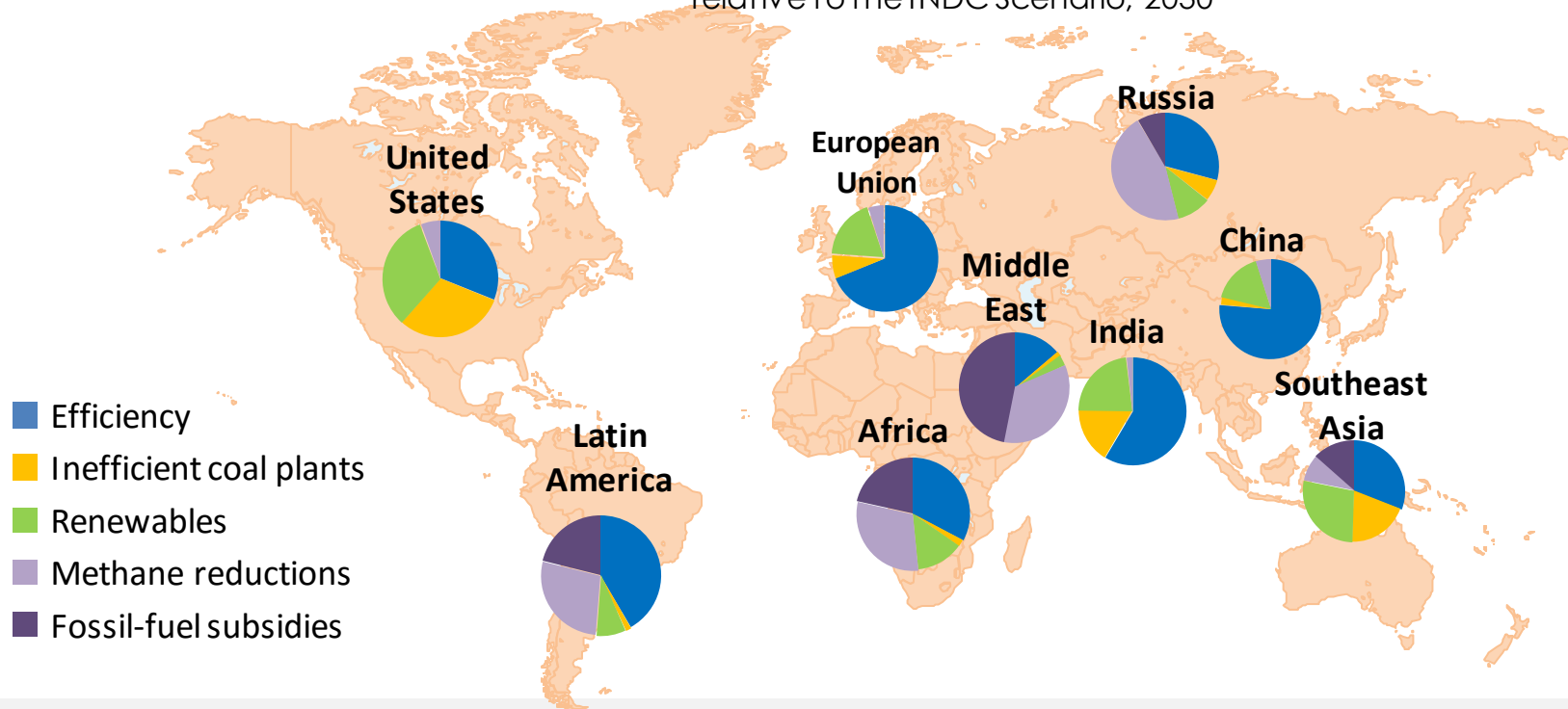
Global fleet average and new-build plants emissions intensity of power generation in IEA scenarios



The average carbon intensity of new power capacity needs be at around 100 grammes of CO₂ per kilowatt hour (gCO₂/kWh) in 2025 and close to zero gCO₂/kWh by 2050, requiring further steep reduction.

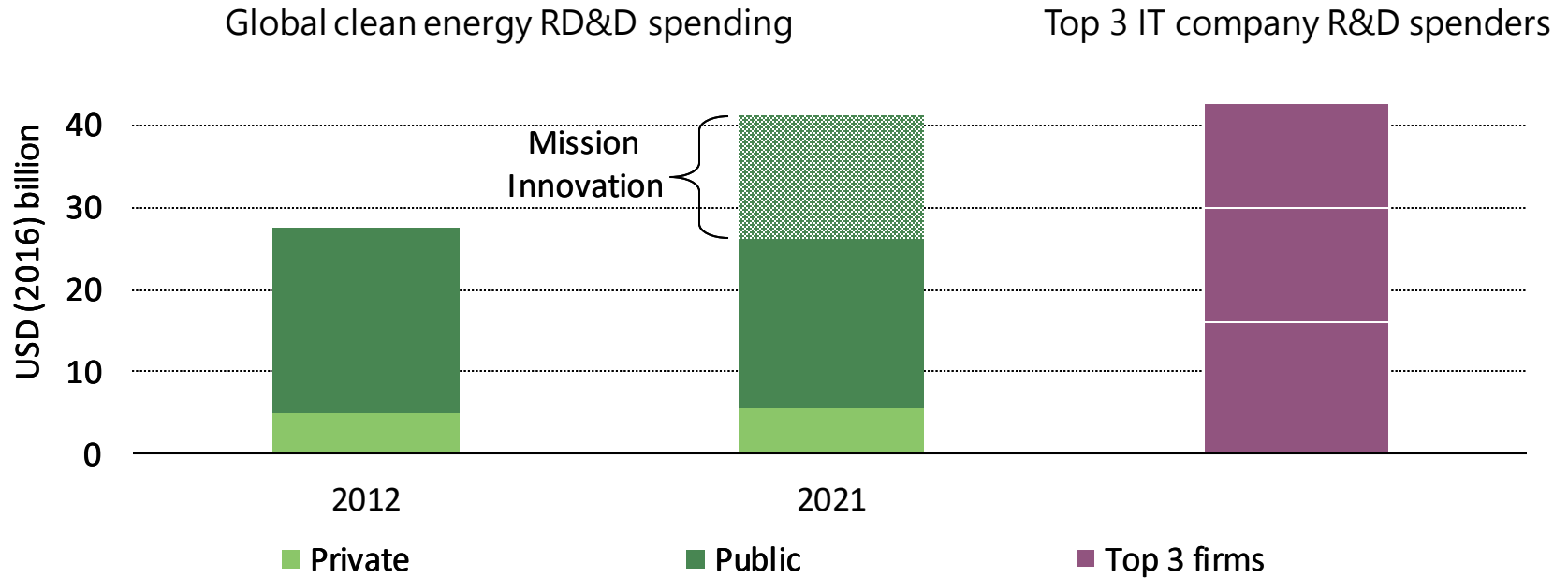
Local opportunities: Bridging strategy varies across regions

GHG emissions reduction by measure in the Bridge Scenario, relative to the INDC Scenario, 2030



**There is no “one-size fits all” solution that can meet all local requirements
National circumstances and resources will drive different technology portfolios and pathways**

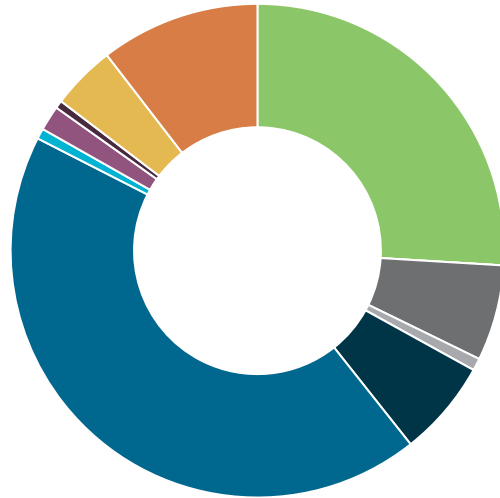
Measuring long term technology development: RD&D spending



Global RD&D spending plateaued at \$26 billion annually, coming mostly from governments. Global clean energy RD&D spending needs a strong boost.

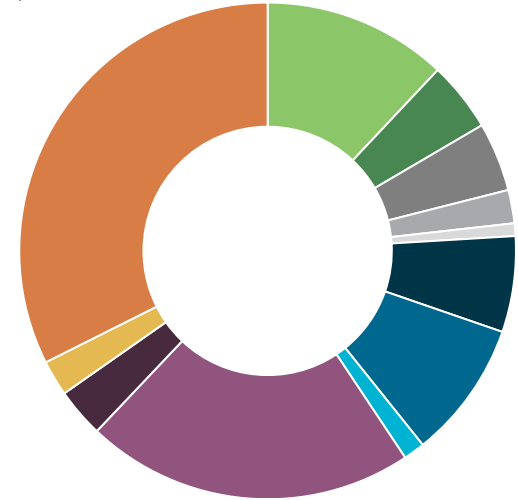
Tap all the potential: Complementary public and private RD&D is needed

Venture Capital investment breakdown for 2016



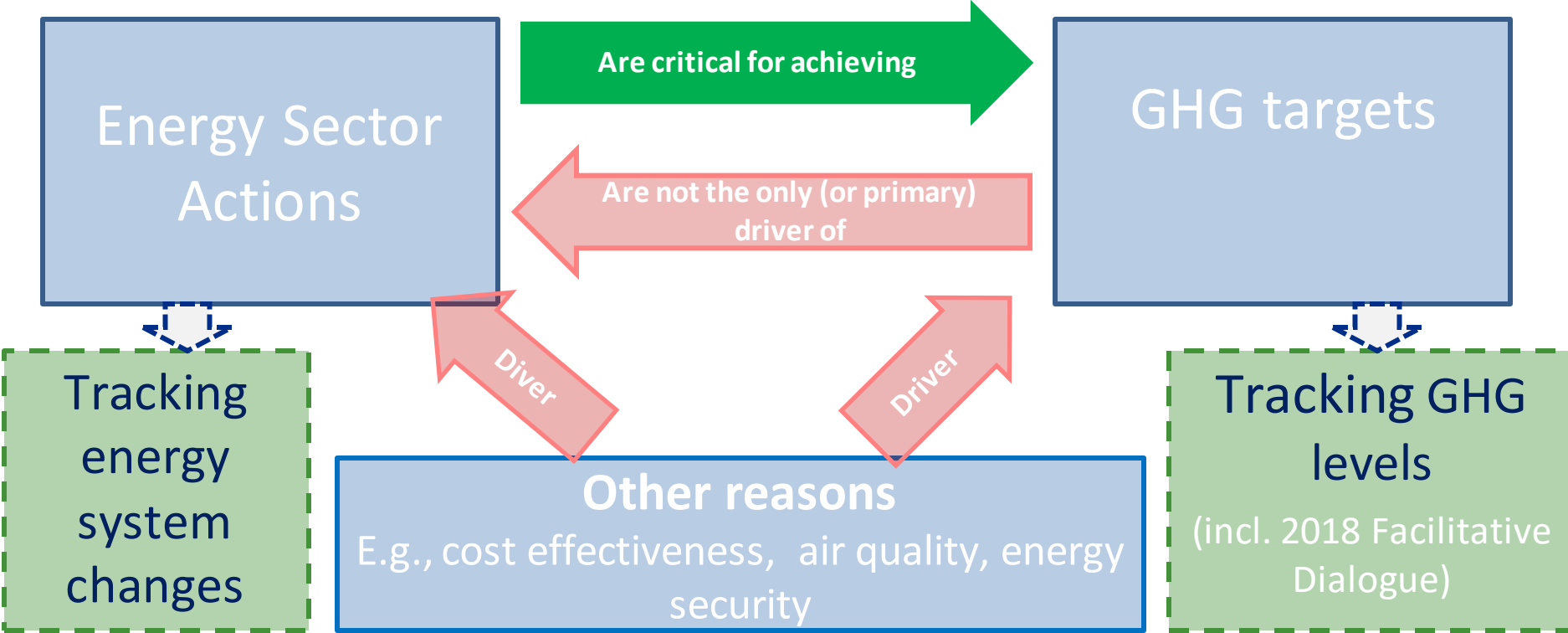
- Energy efficiency (except transport)
- CCS
- Solar
- Wind
- Geothermal
- Bioenergy
- Transport
- Hydro and marine
- Nuclear
- Hydrogen and fuel cells
- Energy storage
- Other

IEA member country spending in 2016



Public and private sector invest in different type of innovation.

Public spending supports technologies that are further from the market or have high development and demonstration costs, including nuclear, CCS and ocean energy.



- Early signs point to changes in energy trajectories, helped by policies and technologies, but progress is too slow
- Each country should define its own transition path and scale-up its RD&D and deployment support accordingly
- Energy metrics can help unpack what clean energy transition means and how it can be measured.
 - Tracking of forward-looking indicators of energy system transformation can help target both short- and long-term opportunities
 - Tracking RD&D actions is needed for longer-term low-carbon energy system transformation and innovation
 - In UNFCCC context can help inform assessments of **collective progress**, including for the 2018 facilitative dialogue and 2023 global stocktake

Explore the data behind *ETP*



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