Tracking progress in the development and deployment of clean energy technology

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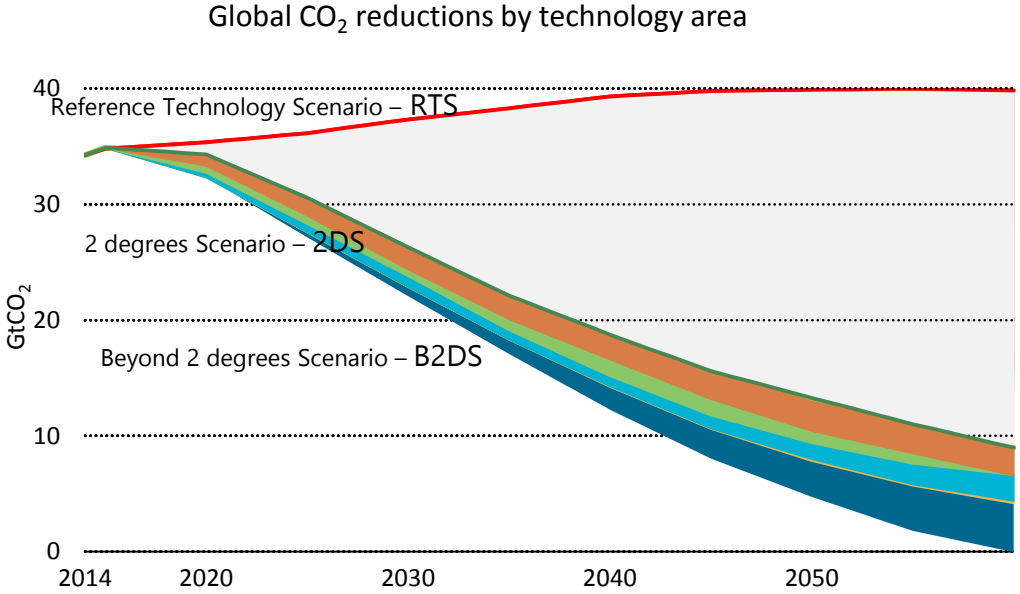
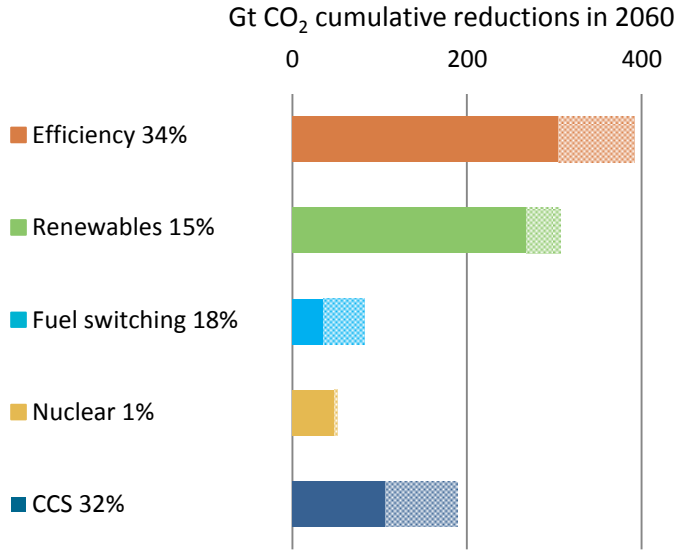
How far can technology take us?

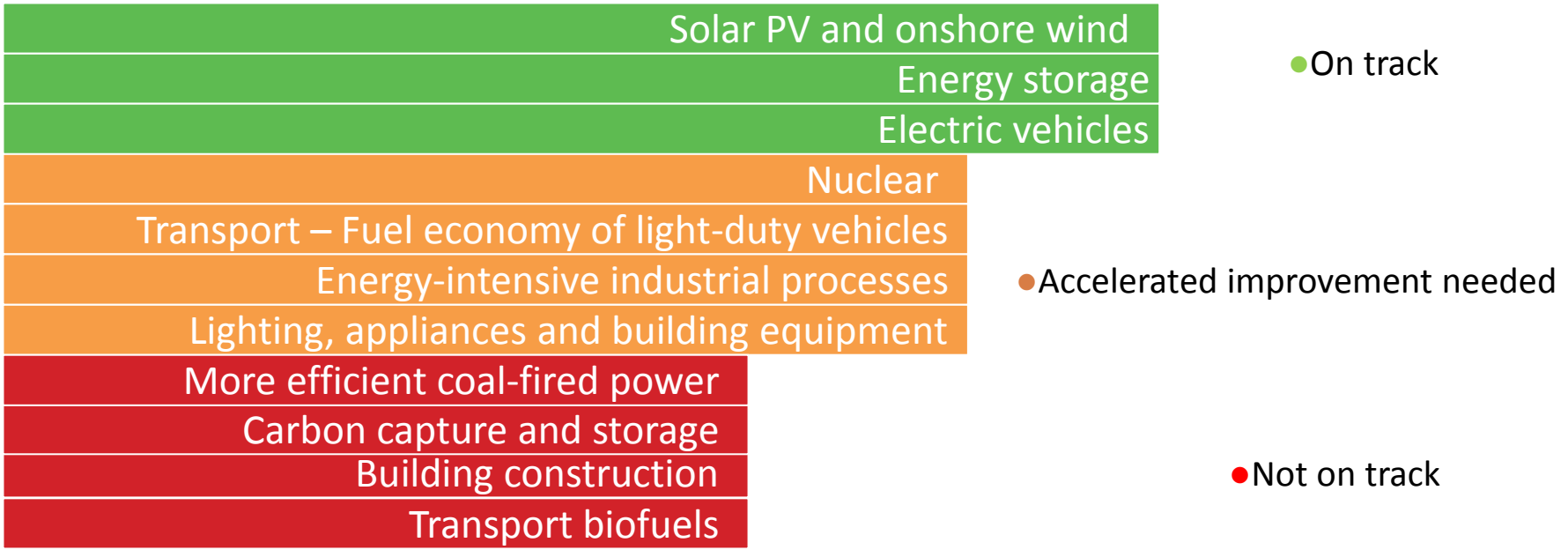
Technology area contribution to global cumulative CO_2 reductions





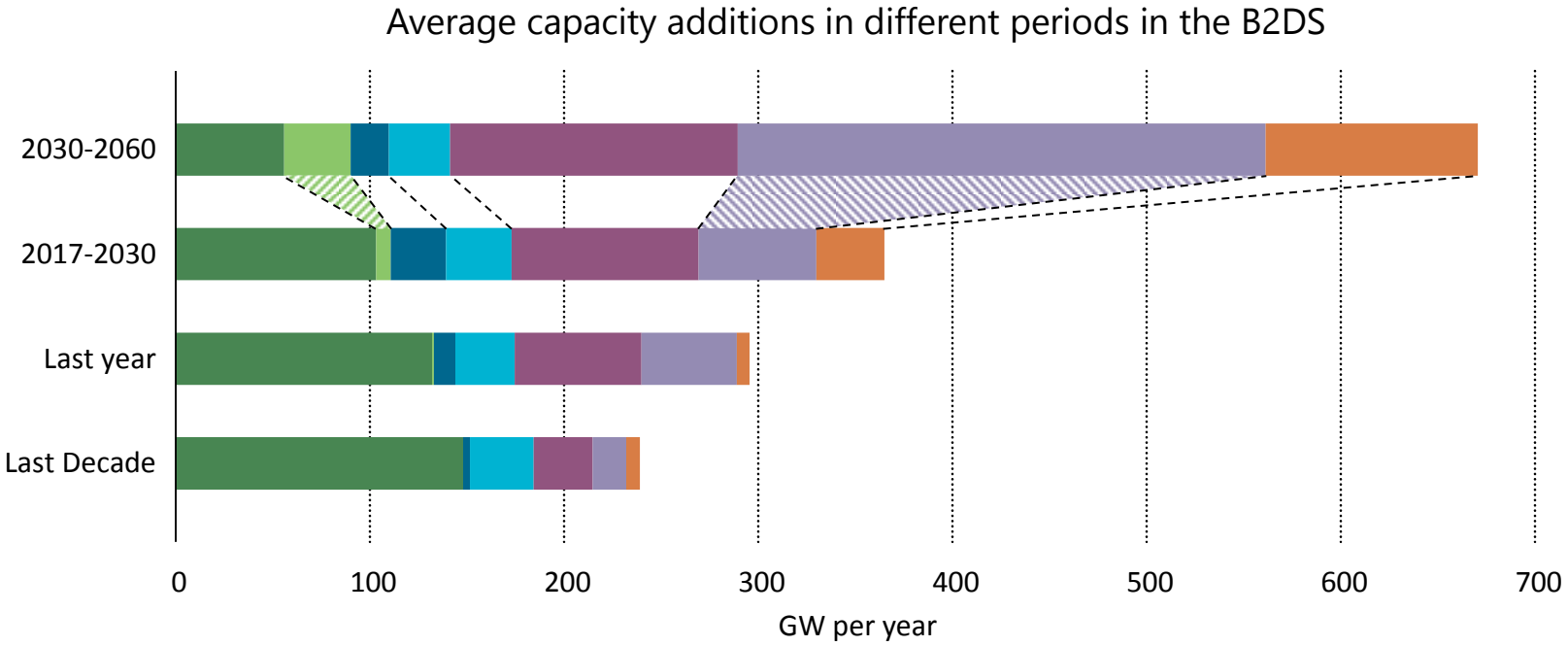
Pushing energy technology to achieve carbon neutrality by 2060 could meet the mid-point of the range of ambitions expressed in Paris.

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.

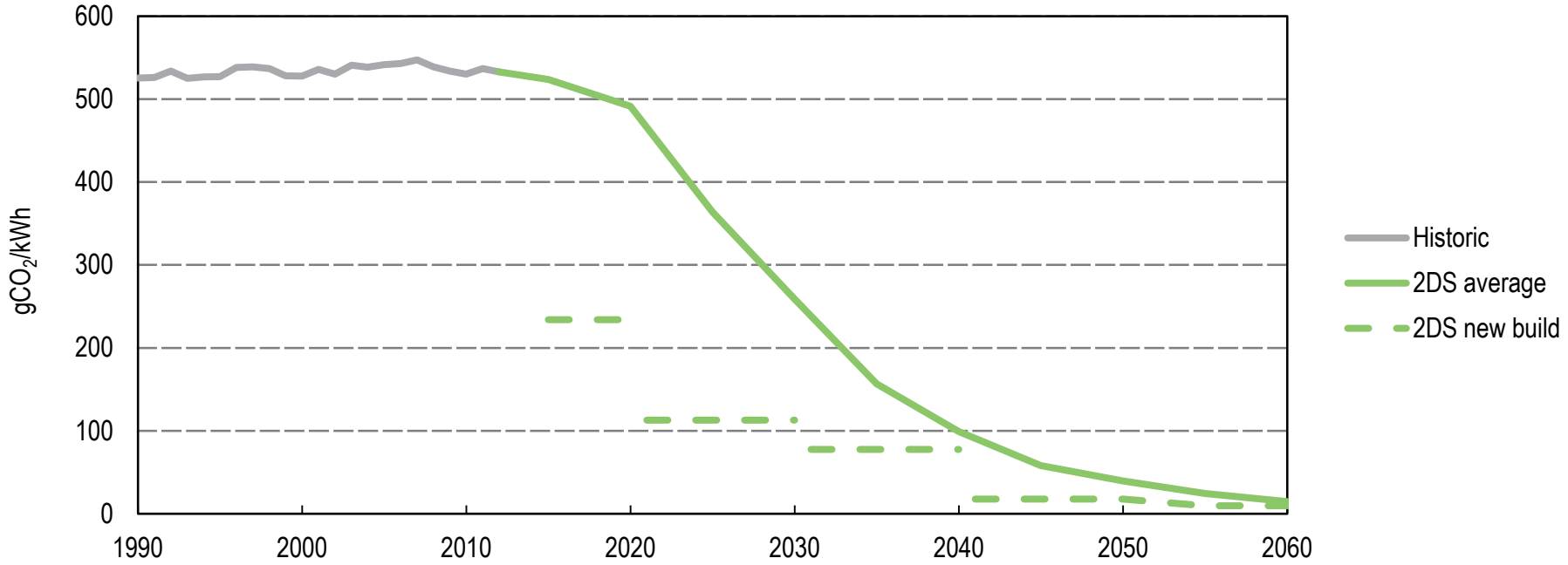
Can we push up the low-carbon power deployment pace?



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

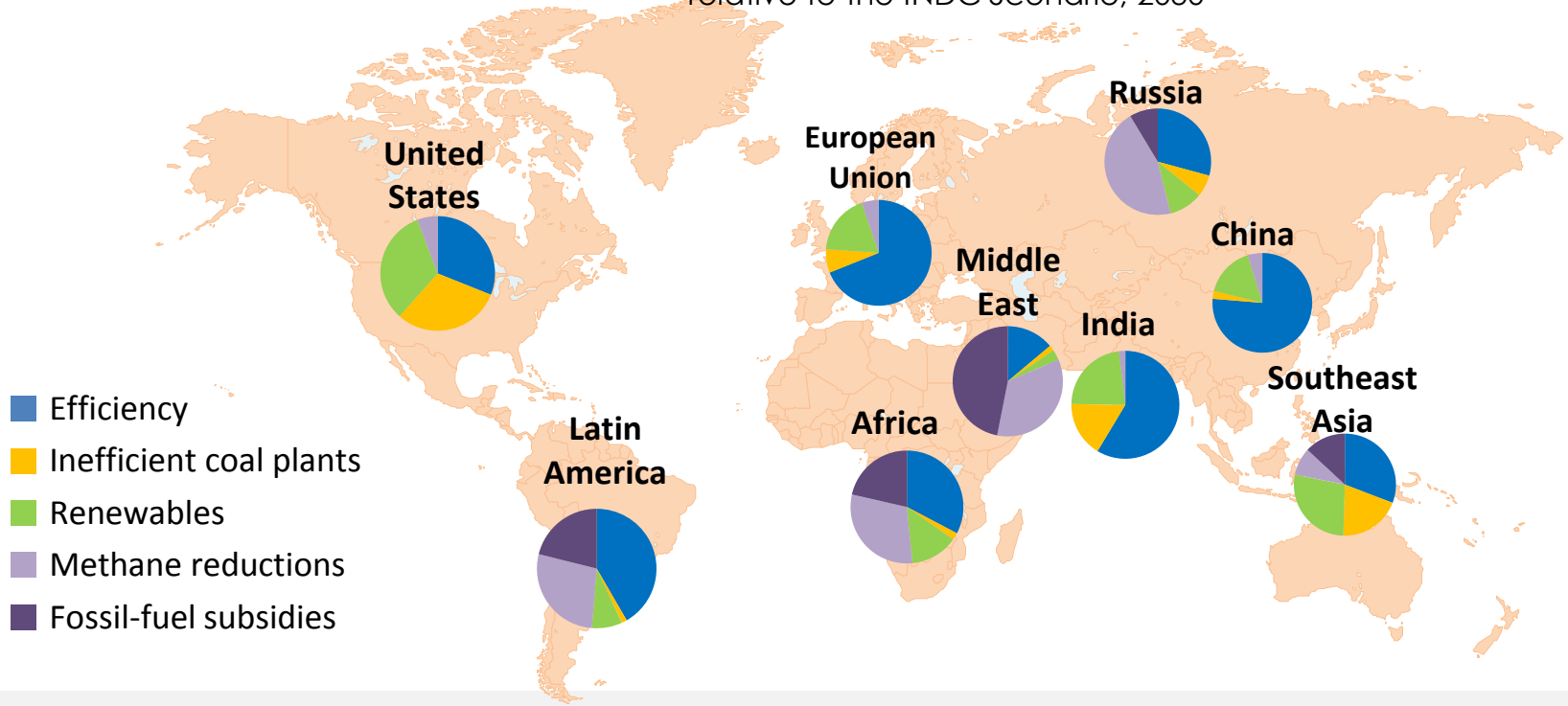
Global fleet average and new-build plants emissions intensity of power generation in IEA scenarios



The average carbon intensity of new power capacity needs be at around 100 grammes of CO_2 per kilowatt hour (gCO_2/kWh) in 2025 and close to zero gCO_2/kWh by 2050, requiring further steep reduction.

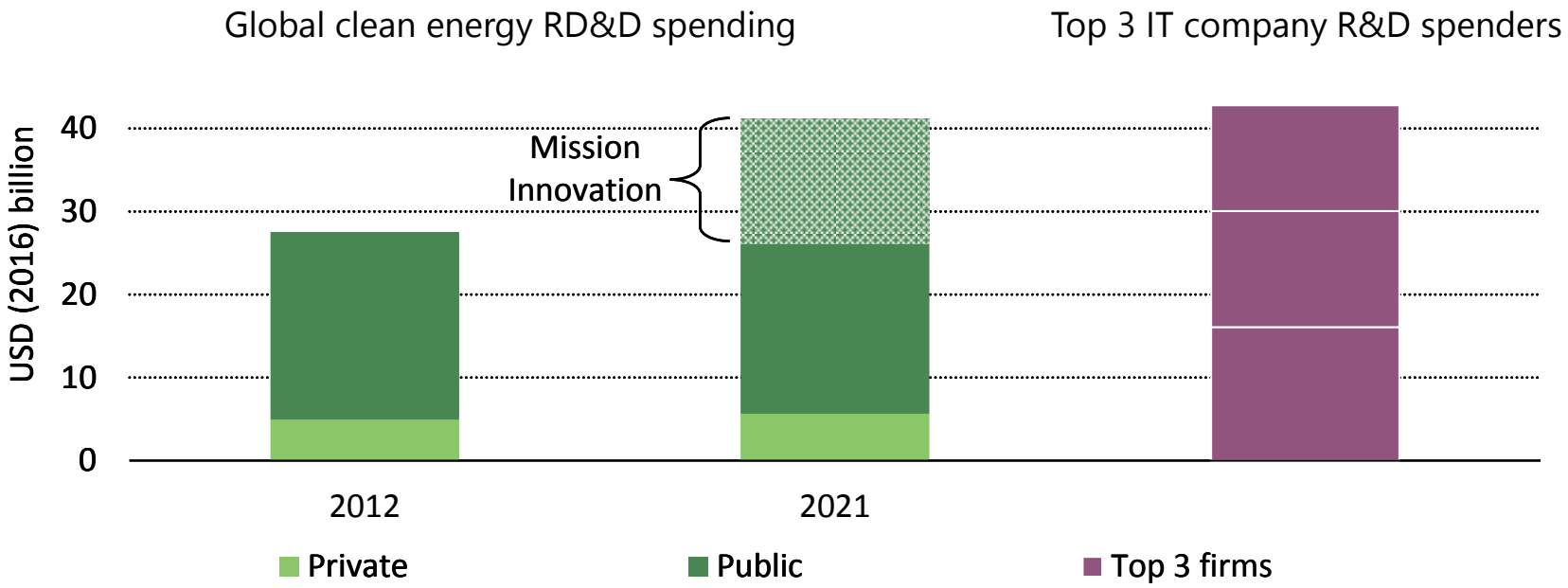
Local opportunities: Bridging strategy varies across regions

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

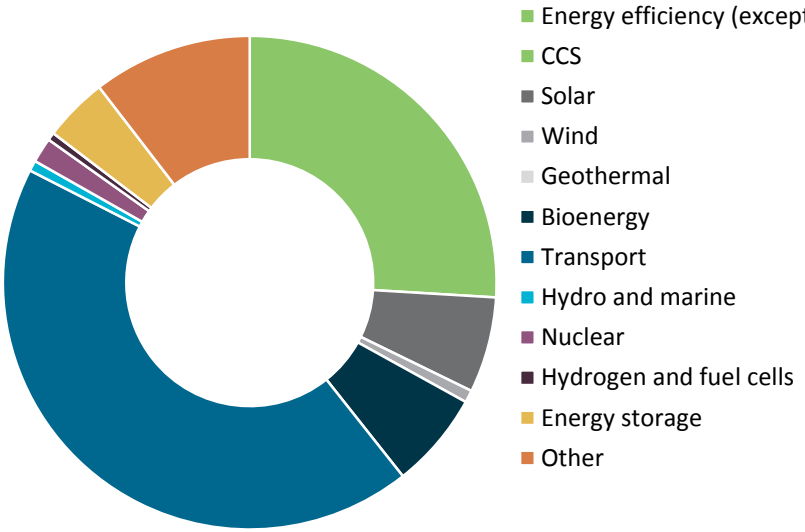
Measuring long term technology development: RD&D spending



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

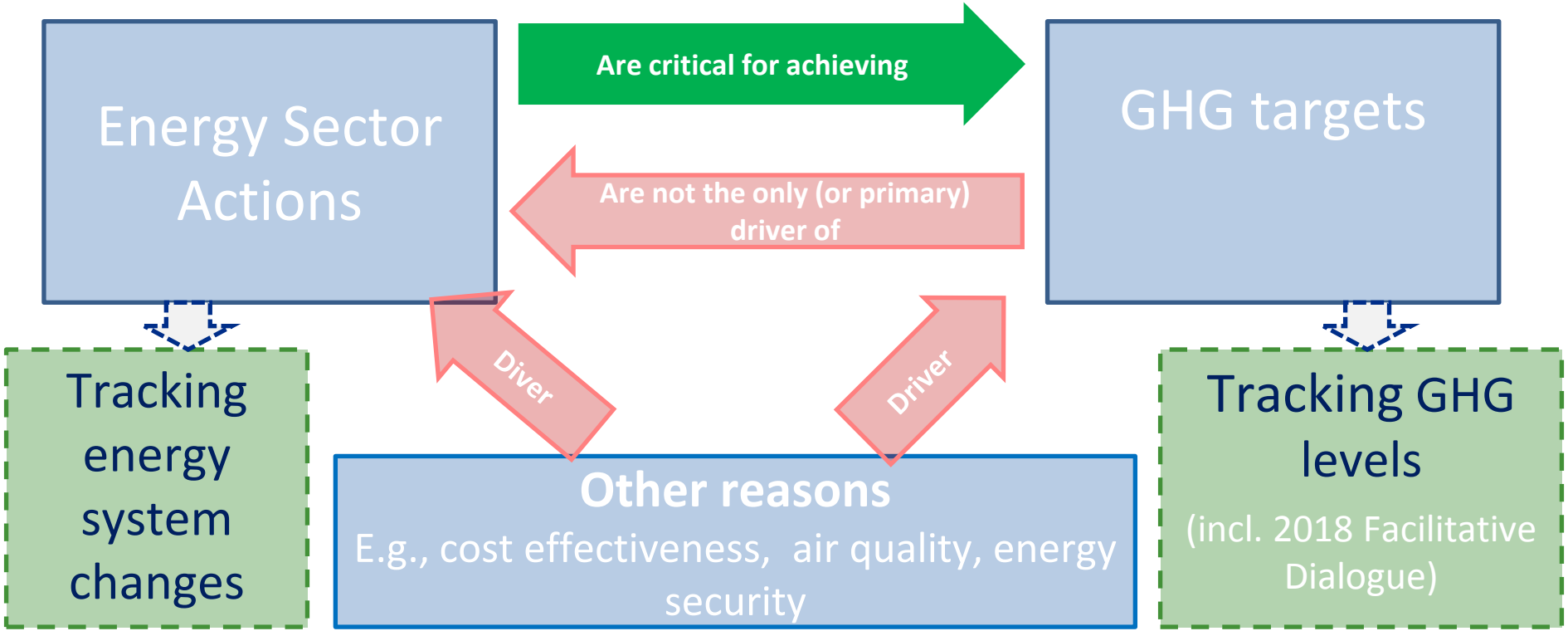
Venture Capital investment breakdown for 2016



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.

Tracking clean energy progress: Variety of objectives driving GHG outcomes



Conclusions

- 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

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