CEM8 Scene Setter: Tracking Progress and Identifying Further Opportunities

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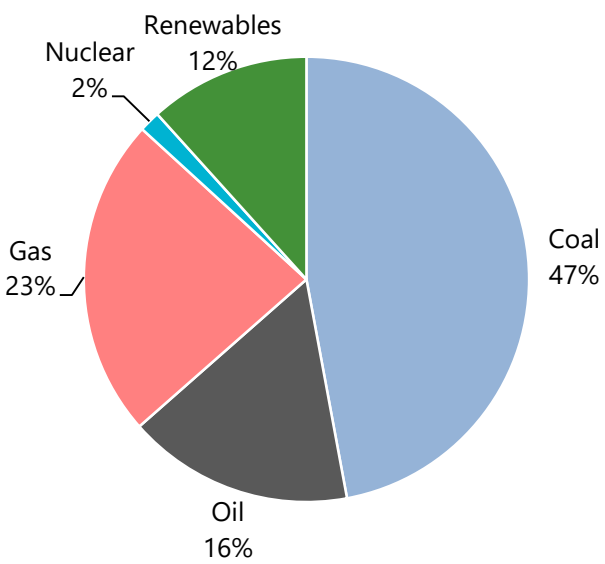
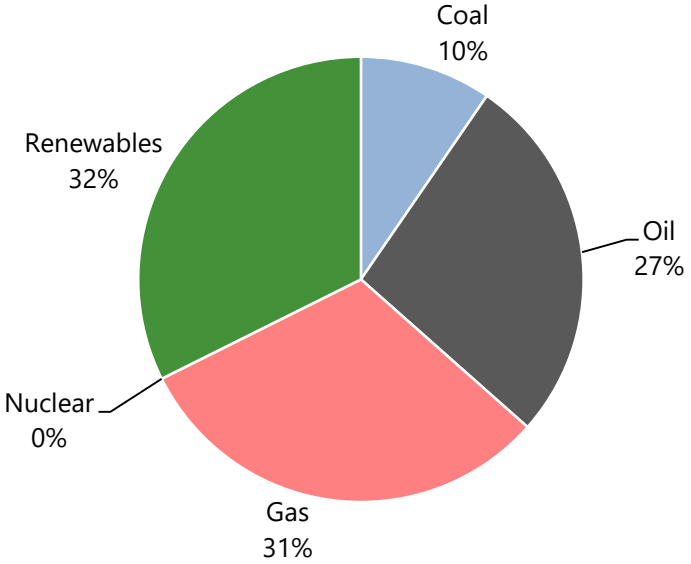
IEA

The energy landscape has shifted since the inaugural CEM in 2010

Shares in *growth* in world energy demand



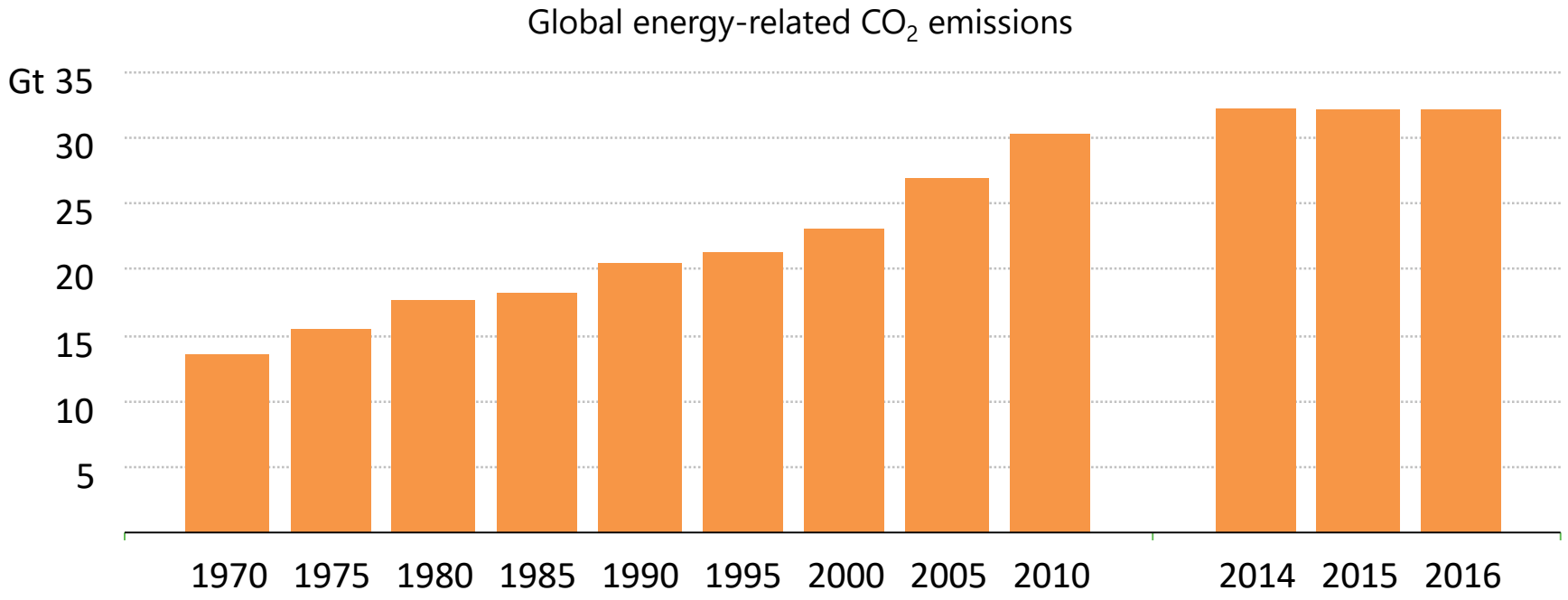
2000-2010



2010-2016

Since 2010, efficiency measures have slowed down growth in global energy consumption . Renewables and natural gas account for almost two-thirds of the growth.

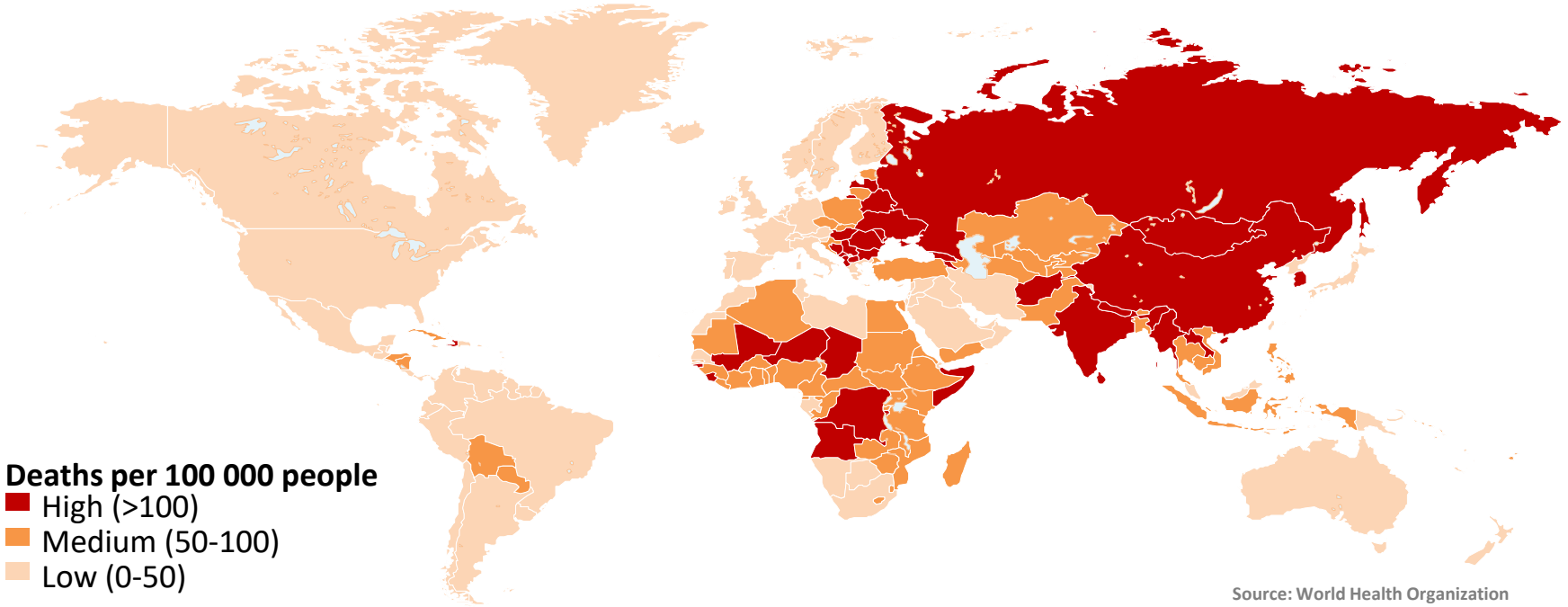
Global CO_2 emissions flat for 3 years – an emerging trend?



IEA analysis shows that global CO_2 emissions remained flat in 2016 for the third year in a row, even though the global economy grew, led by emission declines in the US & China

Air pollution is a universal problem, especially in emerging economies

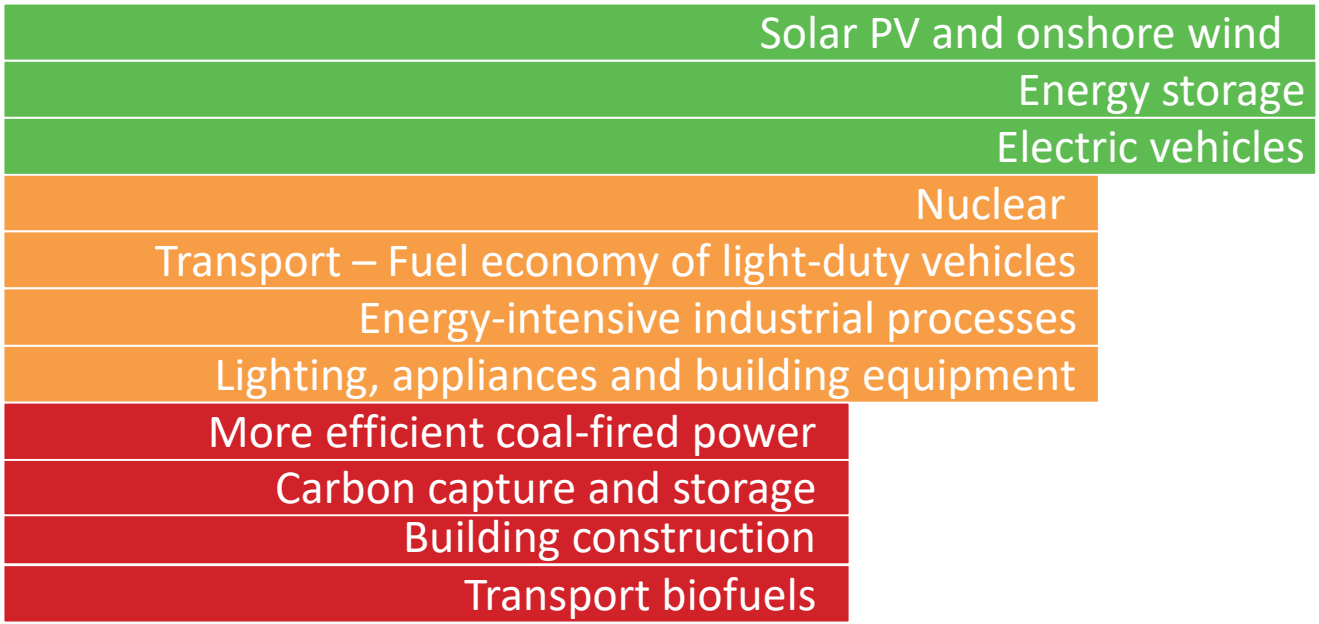
Premature deaths due to air pollution



Source: World Health Organization

6.5 million premature deaths every year are caused by pollution from power plants, factories, cars and trucks globally. Air pollution related health risks are largest in cities around the world.

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 CEM and MI further accelerate progress?

Observations:

- Multiple areas moving forward well aligned with some CEM work streams
- **Nevertheless critical to ensure continued focus on appropriate policies**

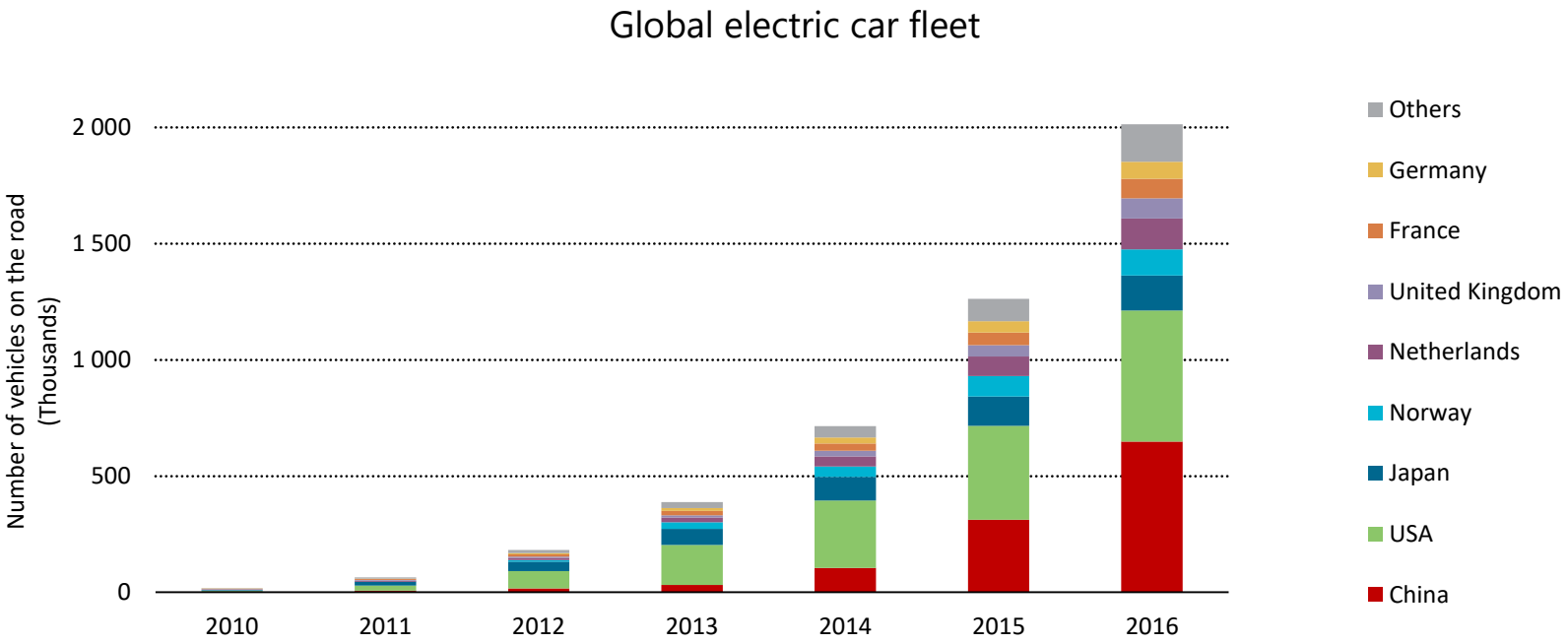
- Some CEM workstream actions in these areas
- **Opportunity for CEM to consider what activities and policies could help push these technologies to "green"**

- No or limited CEM activity
- **Opportunity for CEM to consider launching initiatives and catalysing targeted support**

●Not on track ●Accelerated improvement needed ●On track

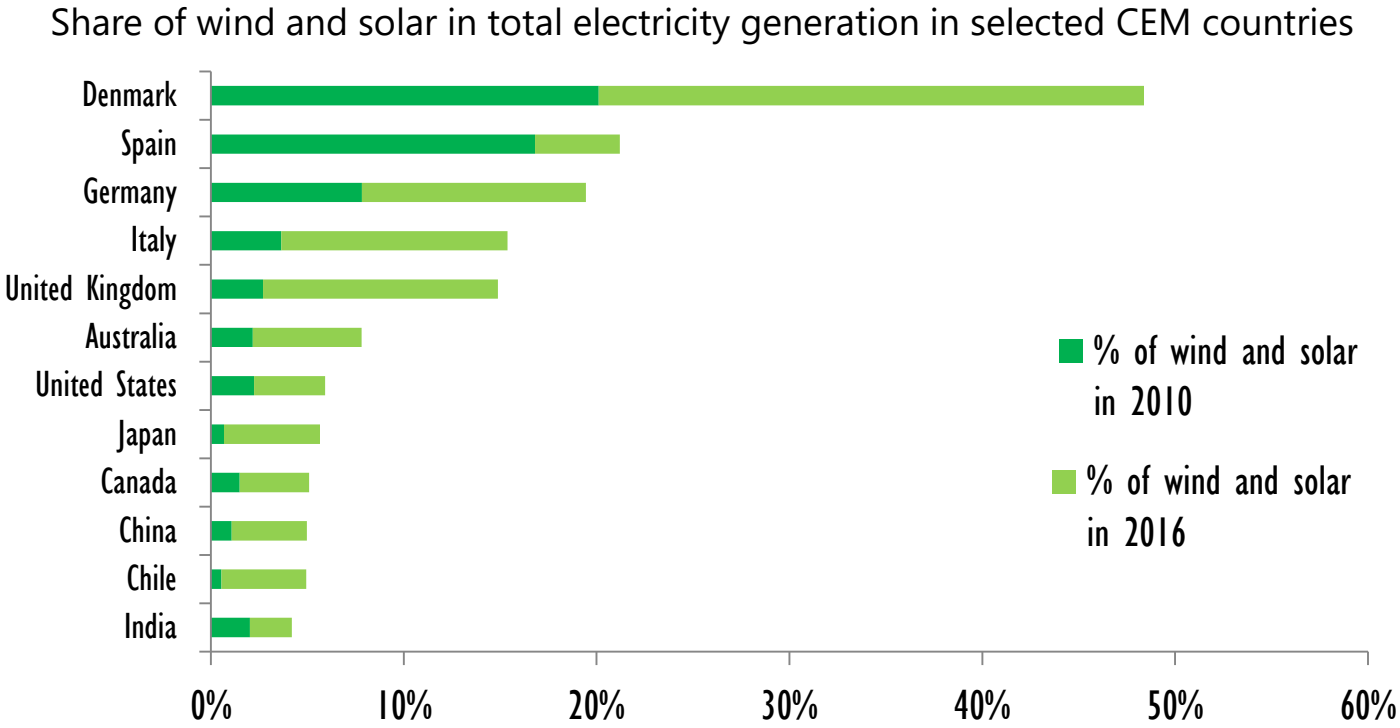
On-track (green) technologies have had range of CEM and MI focus; orange technologies have had some CEM focus, but not fully leveraging key policy opportunities; red technologies have some new MI focus, but none from CEM.

On-track: Electric mobility is breaking records, but policy support remains critical



The global electric car fleet passed 2 million last year, but sales growth slipped from 70% in 2015 to 40% in 2016, suggesting the boom may not last without sustained policy support

On-track: Wind & solar transforming the power sector: system integration is key

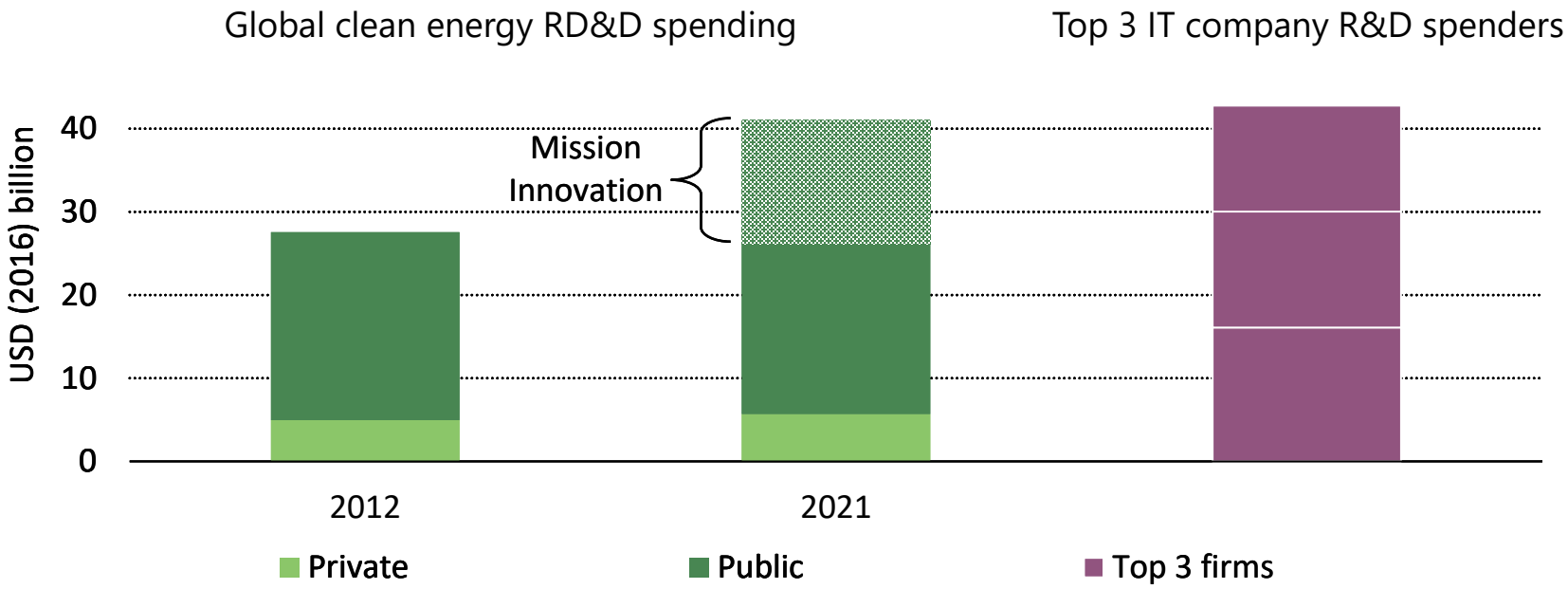


Better grids, more flexible power plants and storage & demand side response will be needed to integrate larger shares of wind & solar in a secure and cost-effective way

Not on- track : Carbon Capture, Utilization and storage

- CCUS has vital role in "all-the-above" clean energy solutions
  - *All credible pathways to a sustainable future include CCUS*
  - *Power sector has multiple de-carbonization pathways, many industrial sectors do not*
- CCUS is a reality
  - *20+ years of operational experience*
  - *17 large-scale CCUS projects across several industries throughout the world*
- But its deployment is slower than what is needed
  - *Holistic approach critical, including specific incentives and tailored policies*
  - *CCUS must be freed from being a "hostage of a global carbon price"*

Global clean energy RD&D spending needs a strong boost



Global RD&D spending in efficiency, renewables, nuclear and CCS plateaued at $26 billion annually, coming mostly from governments. Mission Innovation could provide a much needed boost.

Conclusions

- Accelerating technological progress strengthens economies, energy security and sustainability
- Policies and RD&D drive down costs and improve performance
- Clean energy technologies are progressing, but few on track
- Need to focus on all technologies; lack of progress on some puts even more pressure on others
- IEA is proud to host & support CEM Secretariat, and committed to help all CEM Members achieve their clean energy objectives