Clean Energy Innovation

Energy Technology Perspectives Special Report
Launch, 2 July 2020

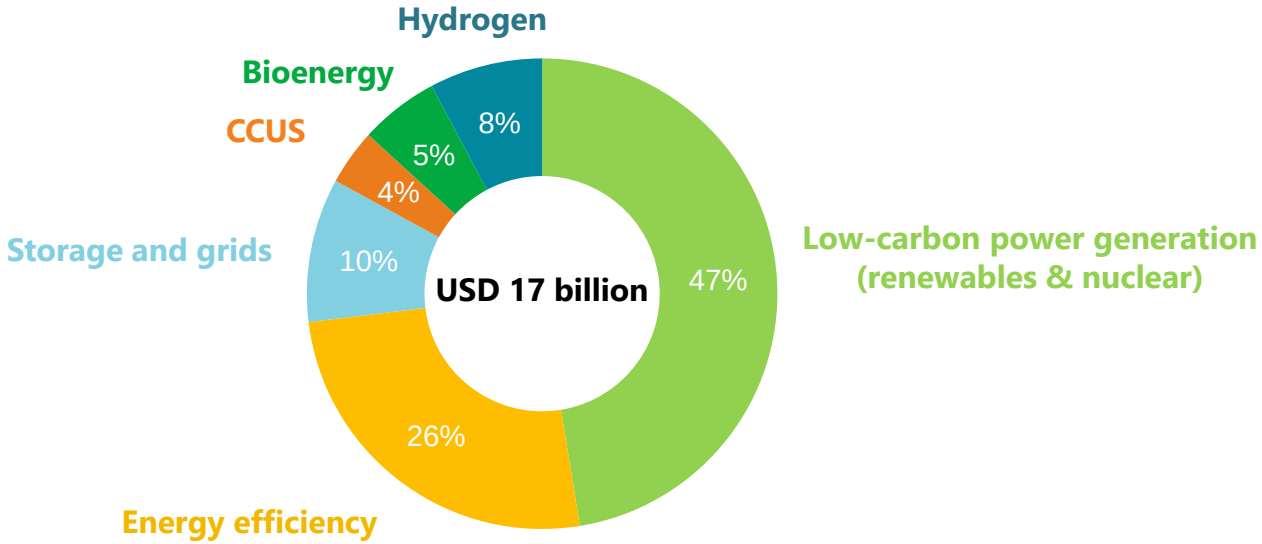
International Energy Agency

A disconnect between ambition and technology readiness

- A growing number of governments & companies are making ambitious pledges to reach net-zero emissions in coming decades. But achieving those goals & ensuring energy security is a big challenge.
- There is a gap between net-zero ambitions and the pace of technology progress, particularly in long-distance transport (ships, planes, trucks) and heavy industries (cement, chemicals, steel).
- Covid-19 presents a possible setback: an IEA survey of companies indicates likely cuts to R&D and demonstration of low-carbon technologies.
- Governments play a pivotal role in energy innovation: Covid-19 can be an opportunity to align R&D portfolios and technology with net-zero to reshape the future.

R&D spending on net-zero emissions priorities is not sufficient

Global public low-carbon energy R&D allocated to specific technology areas, 2019

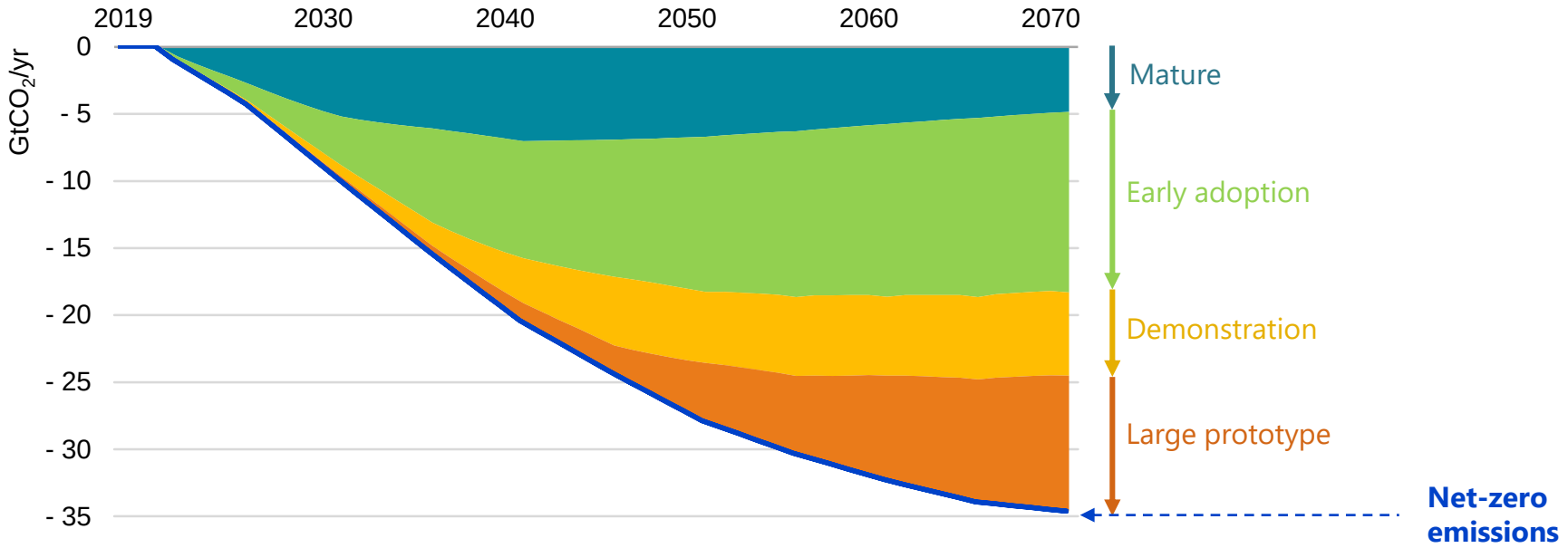


Note: total public R&D for low-carbon energy technologies is USD 25 billion

Today, only around one quarter of public R&D spending applied to low-carbon energy technologies is for electrification, CCUS, bioenergy and hydrogen, the key areas for reaching net-zero emissions.

Net-zero emissions is not viable without a lot more innovation

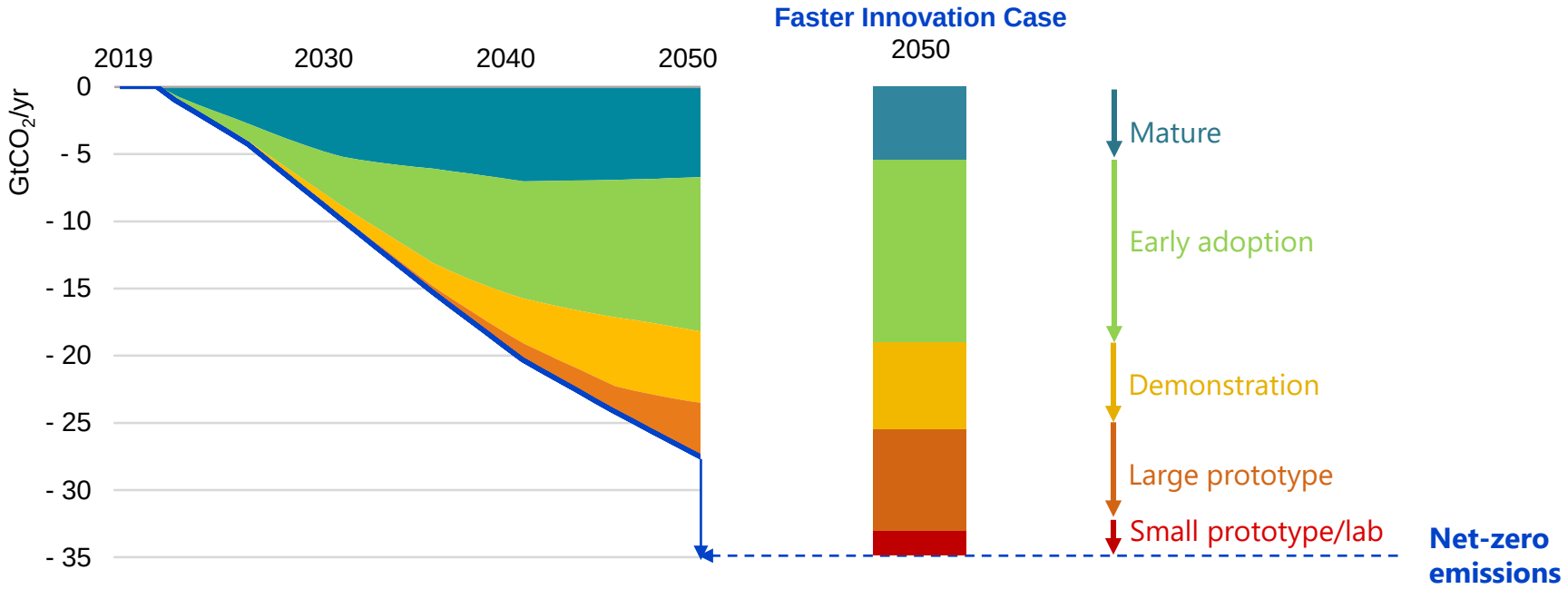
Global CO_2 emissions reductions in the Sustainable Development Scenario, relative to baseline trends



Technologies at prototype or demonstration stage today contribute almost 35% of the emissions reductions to 2070; a further 40% comes from technologies that are at early stages of adoption.

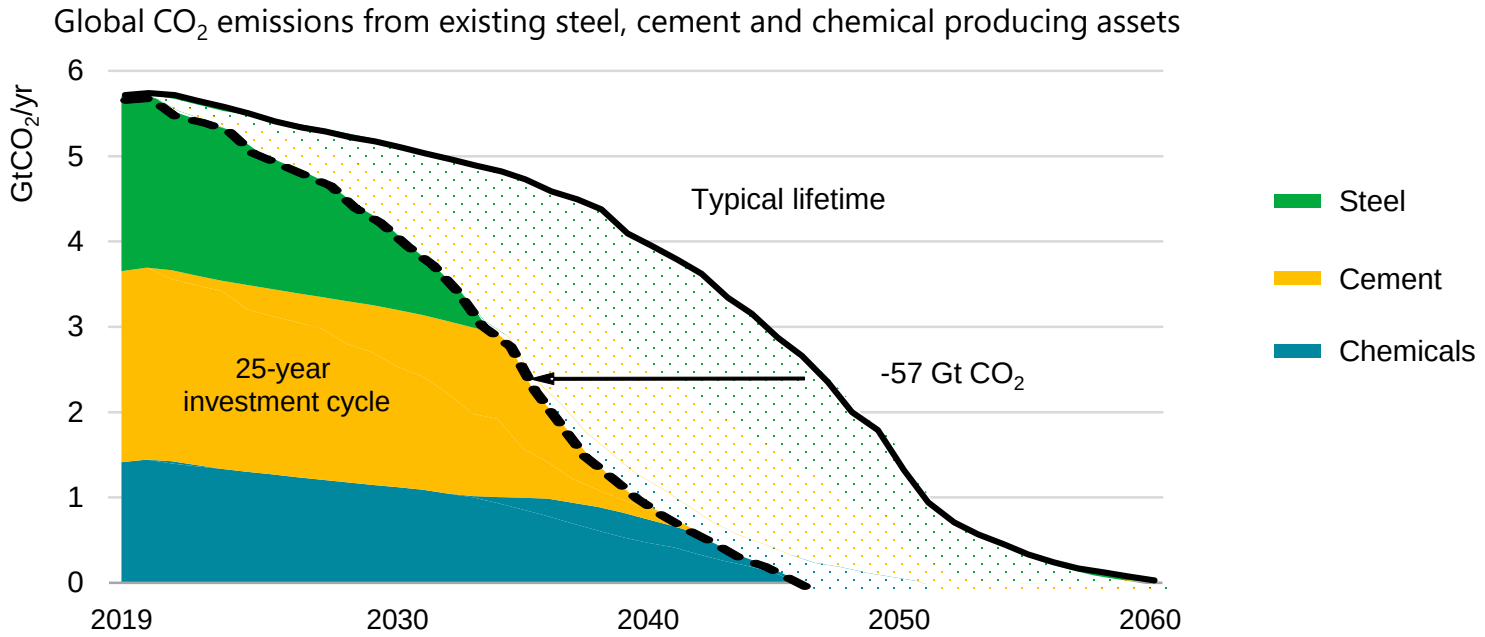
Net-zero emissions is not viable without a lot more innovation

Global CO_2 emissions reductions in the Sustainable Development Scenario, relative to baseline trends



Rapidly commercialising today's newest & most promising technologies would help save enough CO_2 emissions to reach net-zero by 2050. Lack of policy support could delay achieving net-zero emissions.

A once-in-a-generation opportunity to reshape the future



Key technologies such as hydrogen and CCUS need to become commercially available by 2030 in different applications in heavy industry to take advantage of the next refurbishment cycle.

Five key principles to fast-track clean energy innovation

1. Prioritise, track and adjust.

2. Raise public R&D and market-led private innovation.

3. Address all links in the value chain.

4. Build enabling infrastructure.

5. Work globally for regional success.

The five key innovation principles will be presented to the IEA Clean Energy Transition Summit on 9 July 2020.