

Mega trends in Energy Transition

Policy, Technology, Company strategies, Finance

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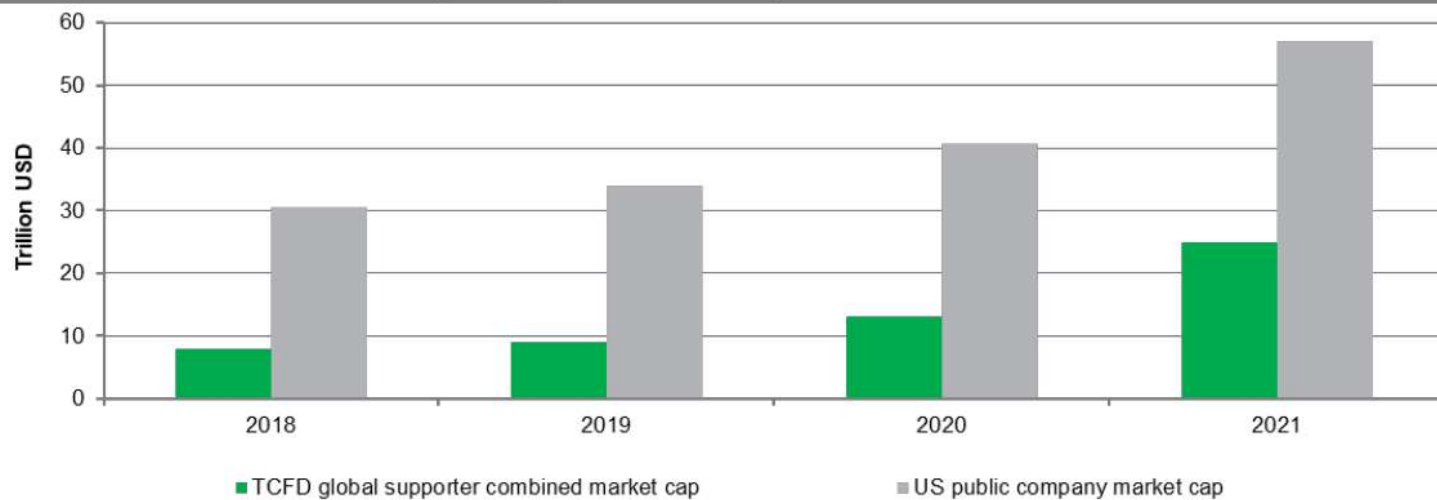
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8 June 2022

1. **Climate:** Pressure for climate-related financial risk disclosure increases

Focus on climate-related financial risk reporting has reached **record levels in 2021**; SEC proposal seeks standardization in firms' mandated emissions reporting

Global TCFD covered market cap vs. US public market cap



Note: US public company market cap for 2021 reflects estimate.
Source: IHS Markit, World Bank, Task Force on Climate-Related Financial Disclosures (TCFD)

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On 21 March, 2022 the US Securities and Exchange Commission (SEC) published its long-awaited proposals for the types and standards for publicly listed firms to report emissions stemming both from a company's own operations (Scopes 1 and 2) as well as touching on those indirect emissions emanating from the other portions of a supply chain (Scope 3) for certain sectors

Glasgow Financial Alliance for Net Zero:
Total of 300 members with > \$130 trillion in assets under management (AUM)

Net-Zero Banking Alliance:
53 banks from 27 countries with \$37 trillion AUM

Net Zero Asset Managers Alliance:
128 signatories with \$43 trillion AUM

Net-Zero Asset Owner Alliance:
Over 50 institutional investors

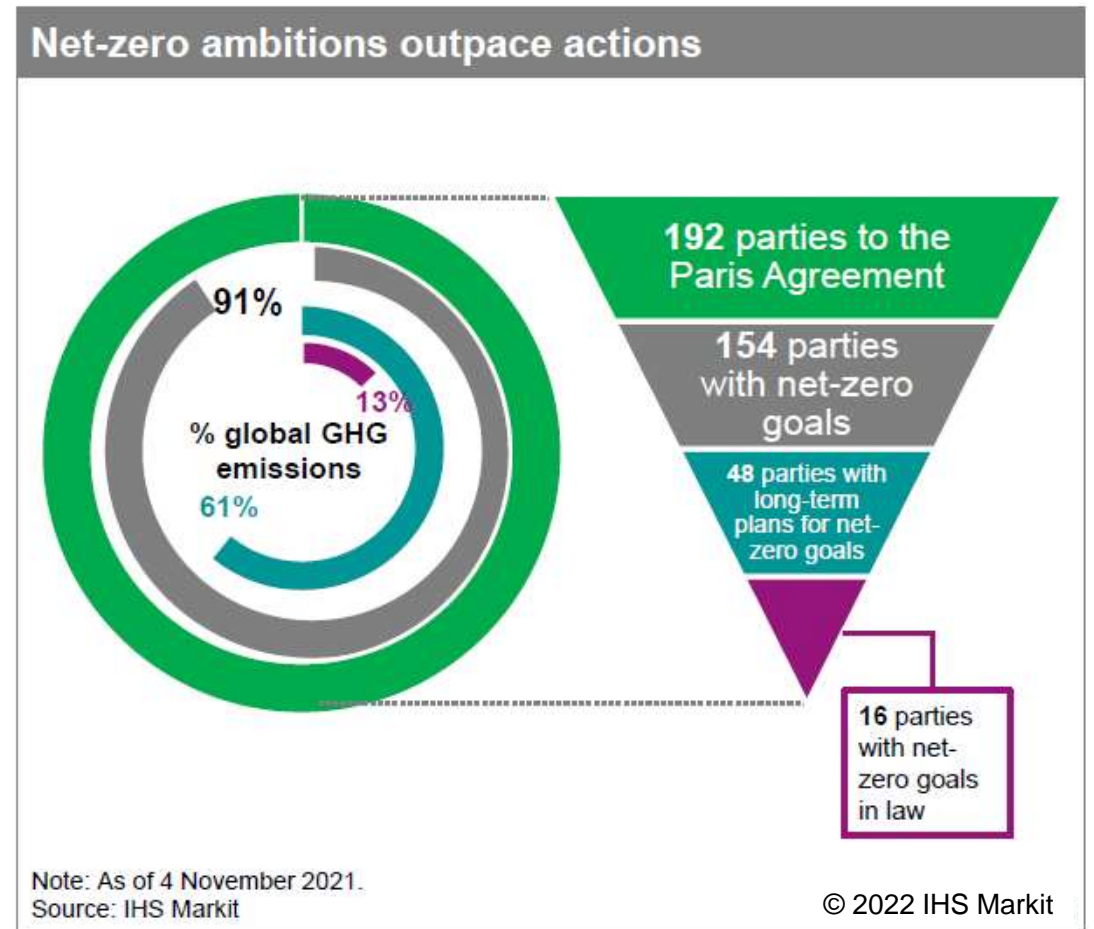
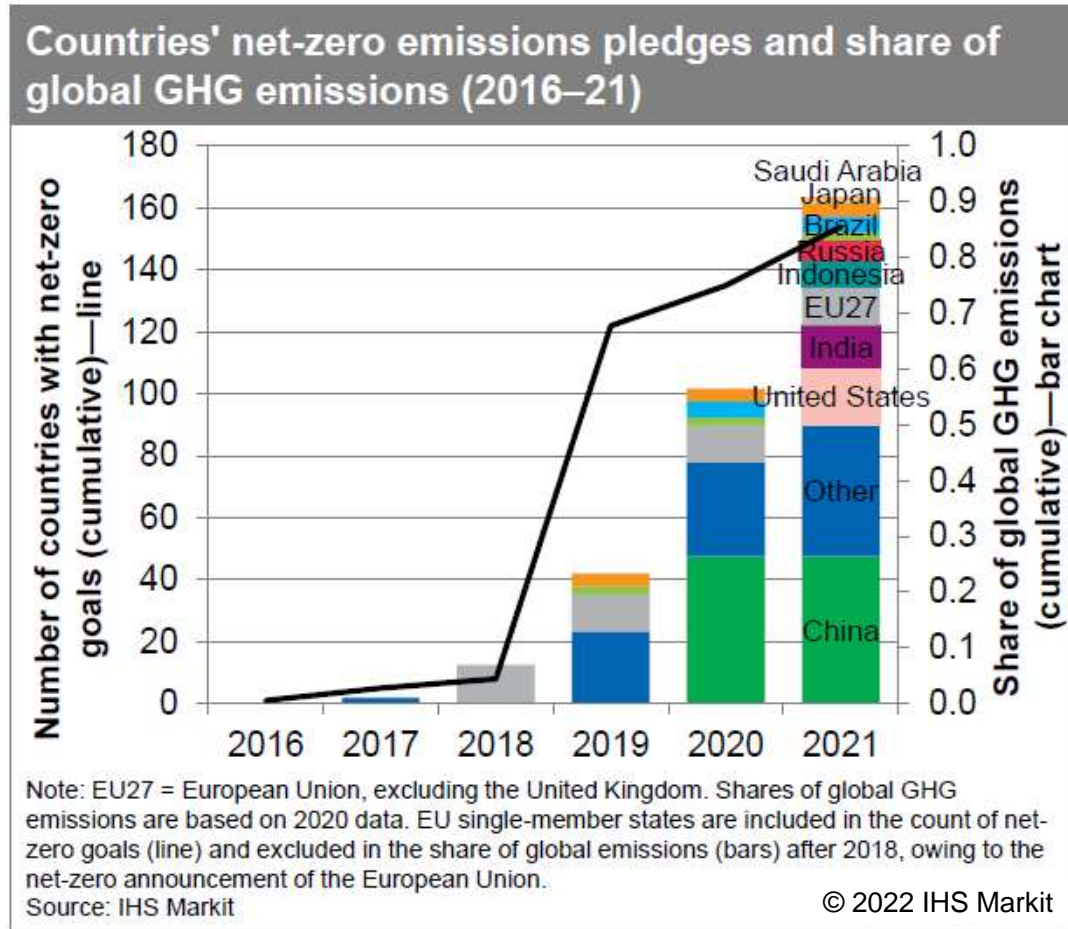
Net-Zero Insurance Alliance:
All eight founding members with individual 2025 targets

Net Zero Financial Service Providers Alliance:
17 founding member organizations

Net Zero Investment Consultants Initiative:
12 founding investment consultant firms

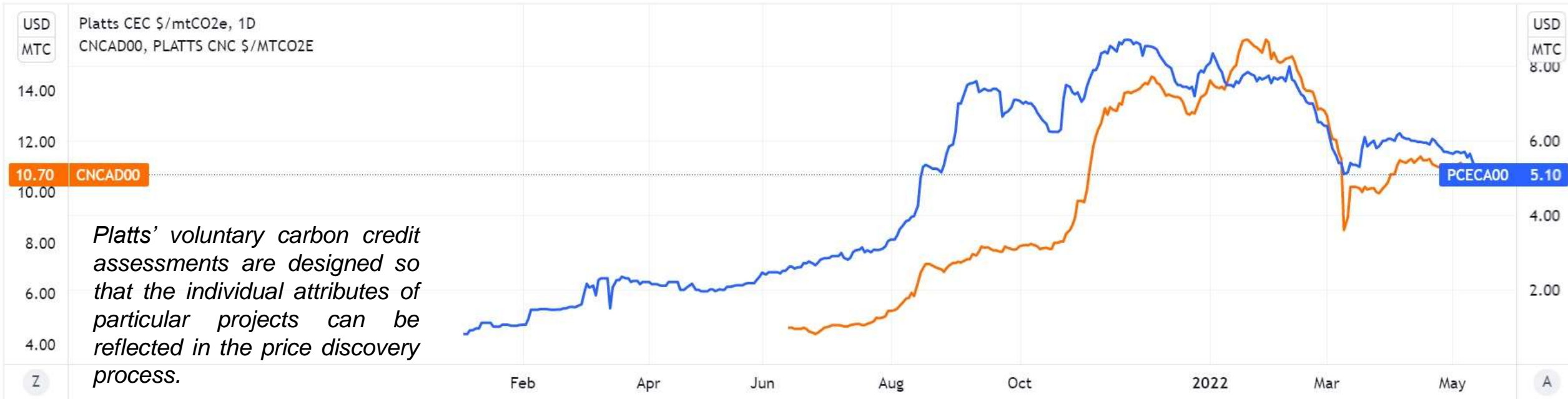
2. Net-zero: Leap forward in net-zero emissions targets by countries

Top 3 emitters – China, the US and India – announced net zero targets in 2021; *Approximately 90% of global greenhouse gas (GHG) emissions covered by net-zero pledges, but with different strength and timing*



3. **Carbon prices:** Article 6 agreement is the most significant outcome of COP26 which will govern global carbon markets

Voluntary carbon markets are set to grow dramatically with investment expected to **exceed \$100 bn by 2050**.



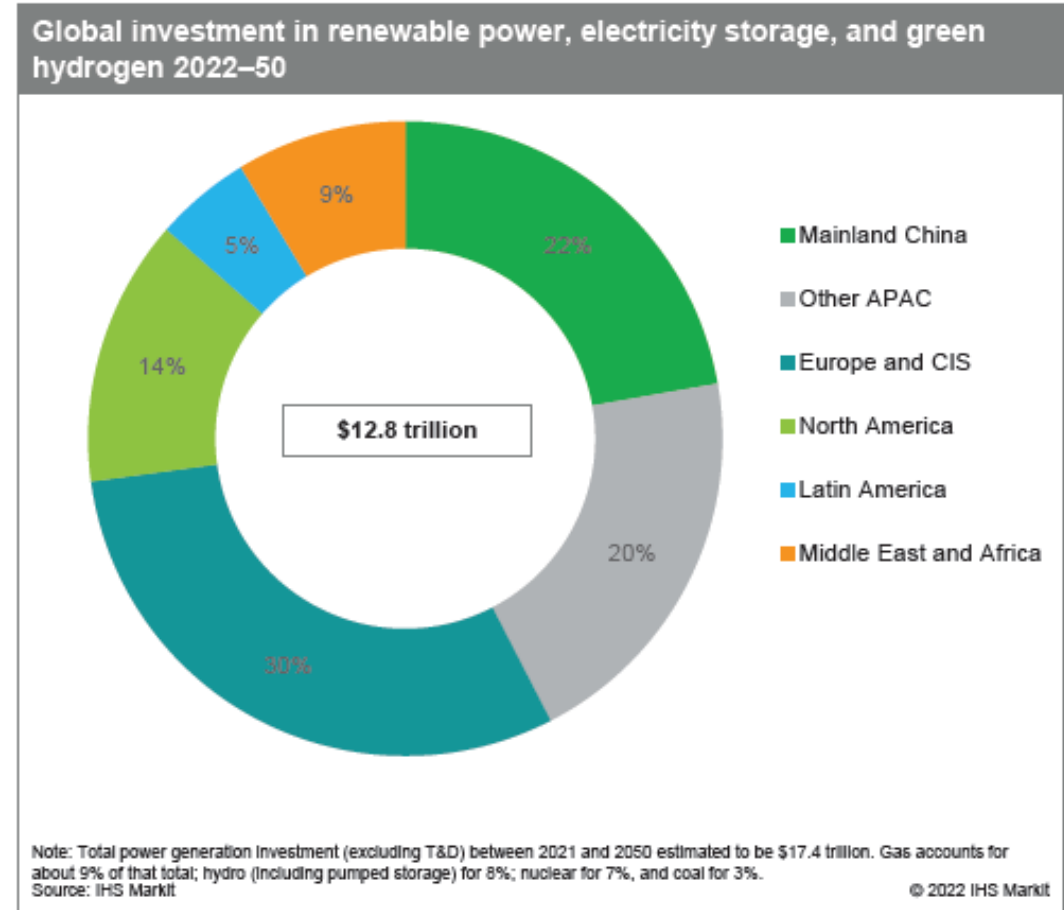
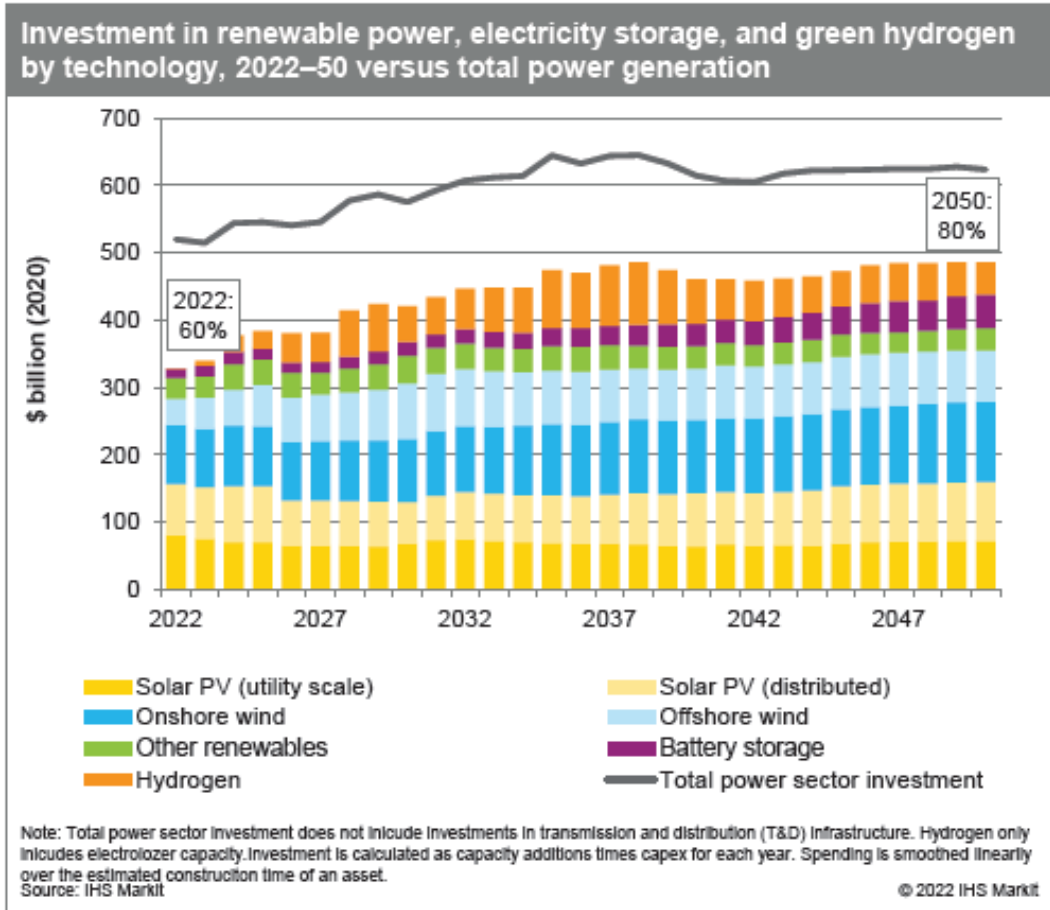
TradingView

Note: The International Civil Aviation Organization has created the Carbon Offsetting and Reduction Scheme for International Aviation – or CORSIA – to cap international aviation emissions from 2021. While airlines are expected to invest in other emissions-reducing options, the expectation is that most of this will be accomplished through the purchase of voluntary carbon credits. S&P Global Platts provides a robust and independent daily price assessment and market commentary for the CORSIA-eligible carbon credit market. Platts publishes a daily price for CORSIA-eligible credits in dollars per metric ton of carbon dioxide equivalent (\$/ mtCO_{2e}) and represents five lots of 1,000 CO_{2e} units each.

Platts has launched a daily price assessment that reflects the most competitive Nature-Based Carbon Credits in dollars per metric ton of carbon dioxide equivalent (\$/mtCO_{2e}) and Euros per metric ton of carbon dioxide equivalent (Eur/mtCO_{2e}). The Platts CNC reflects value at 16:30 London time and represents five lots of 1,000 CO_{2e} units each. Platts reflects credits from nature-based projects that carry standard Sustainable Development Goal (SDG) co-benefits (i.e. Climate Action) certified by the following groups: The Gold Standard, Climate Action Reserve (CAR), Verified Carbon Standard (VCS), Architecture for REDD+ Transactions, and American Carbon Registry (ACR). Both Avoidance/Reduction Nature-Based Carbon Credits (i.e. avoided de-forestation, REDD+) and Removal Carbon Credits (i.e. soil sequestration, reforestation/afforestation) can be used in the assessment of the Platts CNC.

4. **Increased capex for renewables, storage, green hydrogen:** ~\$440 bn p.a. investments globally, 20% point increase in proportion of total power generation

Total renewable power, storage, green hydrogen investment reaches **\$12.8 trillion** between 2022-50



5. **Hydrogen** is becoming integral to the global 2050 vision

Multiple Hydrogen-related *policy documents* explaining governments' strategic intentions and specific measures to support projects

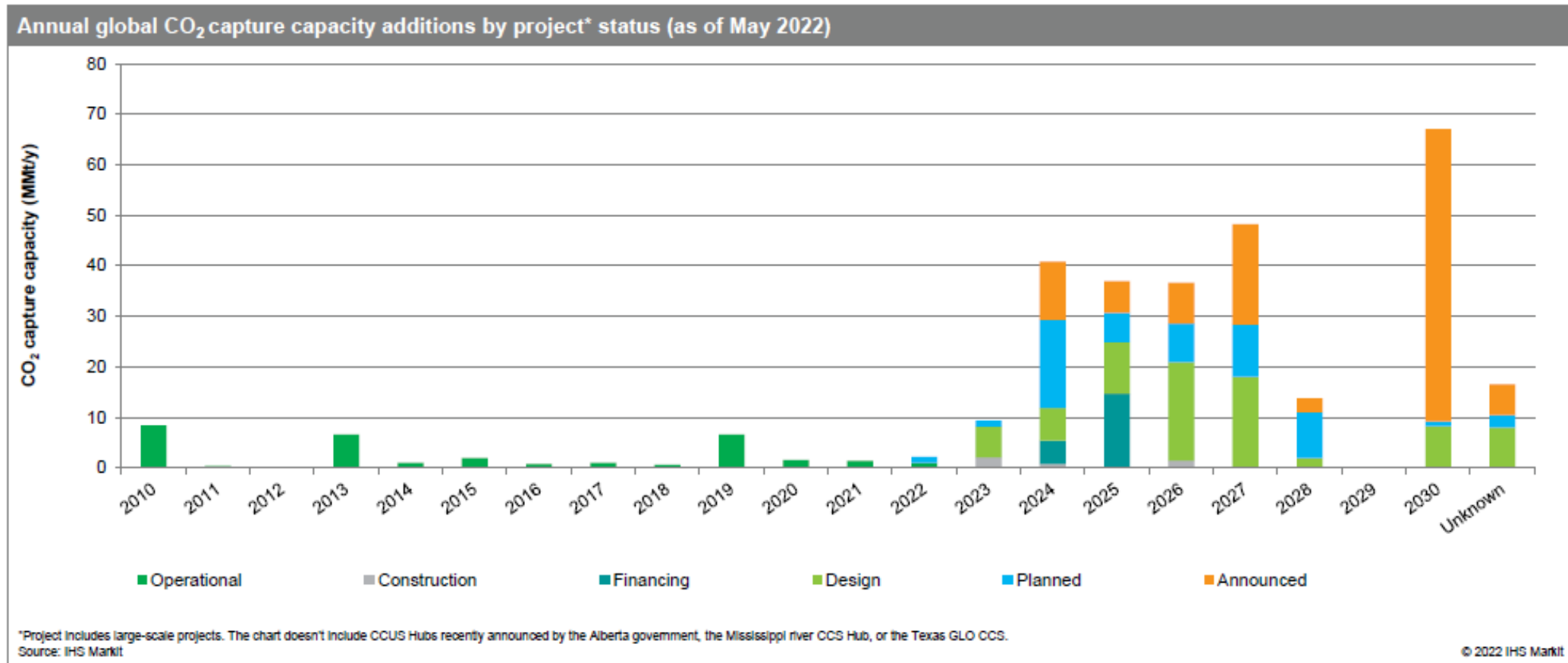
Recent policy announcements concerning hydrogen supply and including opportunities for multiple hydrogen end-uses					
	Economy-wide (transport/ industry/ energy)	Transport-focused	Import	Export	Self-sufficient [#]
Asia-Pacific	Australia, Japan, New Zealand, South Korea	China	Japan, South Korea	Australia, Brunei, New Zealand	China, India
Europe / MENA	France, Germany, Netherlands	Norway	Germany, Netherlands, Italy	Norway, Portugal, Spain, Saudi Arabia	France
Americas	Canada	California, Brazil		Canada, Chile	California

[#]importing or exporting hydrogen is not mentioned within government strategies
Source: IHS Markit

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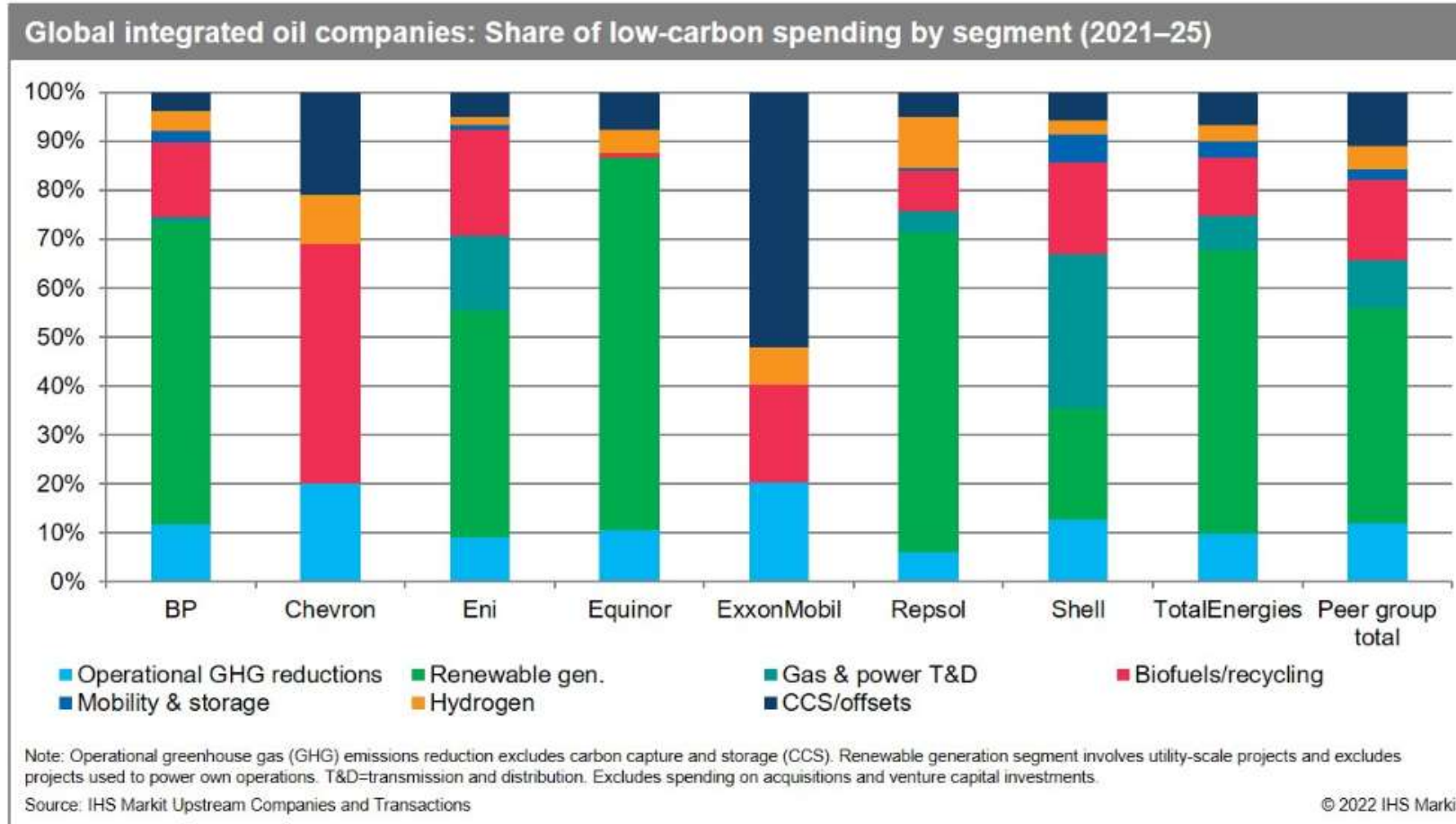
6. **Carbon Capture:** While material to meeting net-zero targets, >60% of global CCUS large-scale projects are still in early development

US continues to be the major CCUS project developer, with active use of CO₂ for EOR, robust tax incentives; CCU projects are key contributor to current operating capture capacity; CCS projects account for 15% of the current capacity



7. Low-carbon capex by companies reflect net-zero strategies: Varying strategies in low carbon spending by IOCs

While the proportion of hydrogen spending to renewable investments remains modest, new commitments are expected



8. **Green bonds:** Energy firms took on growing role as green bond issuers in 2021

Energy-related corporate issuance came from every corner of the globe US utilities like Dominion, Canadian fossil fuel leaders like Enbridge, Indian conglomerates like Adani and European IOCs like Repsol and Eni all issued green bonds during 2021

