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Developing Domestic Energy Infra at Scale Amid Constraints

Discussion Materials



Federal Reserve
Bank of Dallas

November 13, 2024

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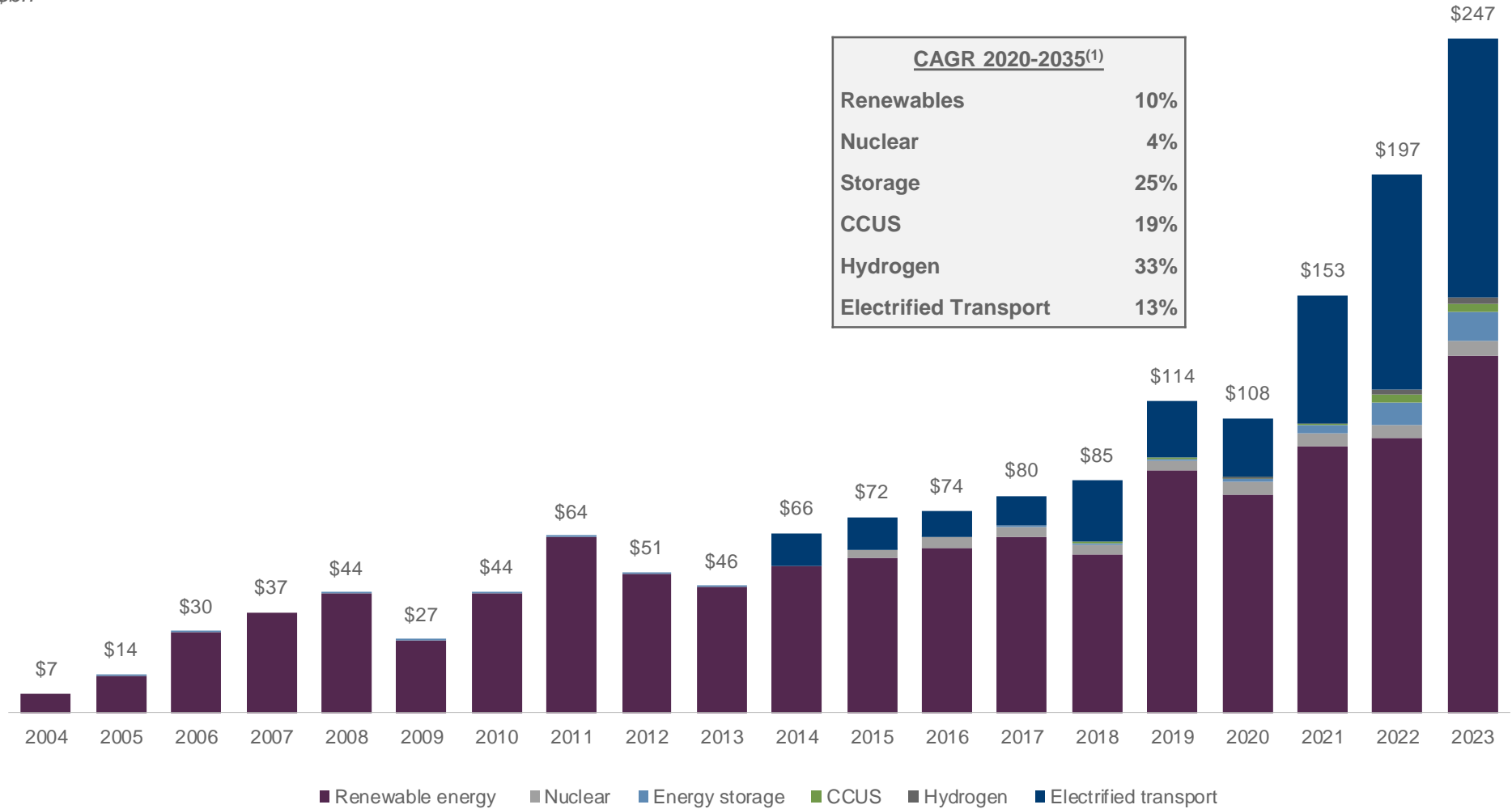
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U.S. Energy Transition Investment 2004-2023

\$bn



According to DNV, investment in new solar PV installations now exceeds investment in all other new generation technologies combined.

Source: BloombergNEF.
 (1) Growth rates are global.

Tax Credits & Policy Support

Tax credits and grants under IIJA and IRA were designed to add as much as \$1.6 trillion of capital support

Clean Energy Incentives

- Infrastructure Investment and Jobs Act (IIJA) \$1.2 T
 - **EV Infrastructure:** Funding for a national EV charger network
 - **Grid Modernization:** Investments in resilient and smart electrical grids
 - **Clean Energy R&D:** Increased funding for renewable energy technology research
 - **Climate Resilience:** Projects to enhance climate-related disaster resilience
 - **Hydrogen Development:** Support for hydrogen technology advancements
- Inflation Reduction Act (IRA) \$400 bn
 - **Extended Tax Credits:** Enhanced credits for solar, wind and other renewables
 - **Electric Vehicle Tax Credit:** Expanded credits for electric vehicle purchases and manufacturing
 - **Investment/Production Tax Credits:** Increased rates for solar and renewable energy production
 - **Carbon Capture Incentives:** Significant credits for carbon capture technology
 - **Energy Efficiency:** Tax credits for energy-efficient home upgrades
 - **Support for Low-Income Communities:** Incentives to improve clean energy access for disadvantaged areas

Pre-IRA	New Under IRA
30C	Alternative fuel vehicle refueling property credit (30% of depreciable costs with prevailing wage & apprenticeship)
45Q	Credit for carbon oxide sequestration* (\$85/t for sequestration; \$60/t for EOR)
48C	Advanced energy project credit (\$4bn in credits allocated in March 2024; remaining \$6bn under review)
45U	Zero-emission nuclear power production credit (\$15/MWh)
45V	Clean hydrogen production tax credit* (Up to \$3/kg)
45W	Credit for qualified commercial clean vehicles (30% of basis for ZEVs >7 tons; 15% for ZEVs <7 tons)
45X	Advanced manufacturing production credit*
45D, 45Y	Clean electricity production tax credit (\$30/MWh to 2034)
45Z	Clean fuel production credit (\$1.75/gal)

Source: Congressional Budget Office, U.S. Department of Transportation PHMSA, Legal Information Institute, "26 U.S. Code § 6417 – Elective payment of applicable credits."
 * Direct payments for these credits are available to taxable entities for five years.

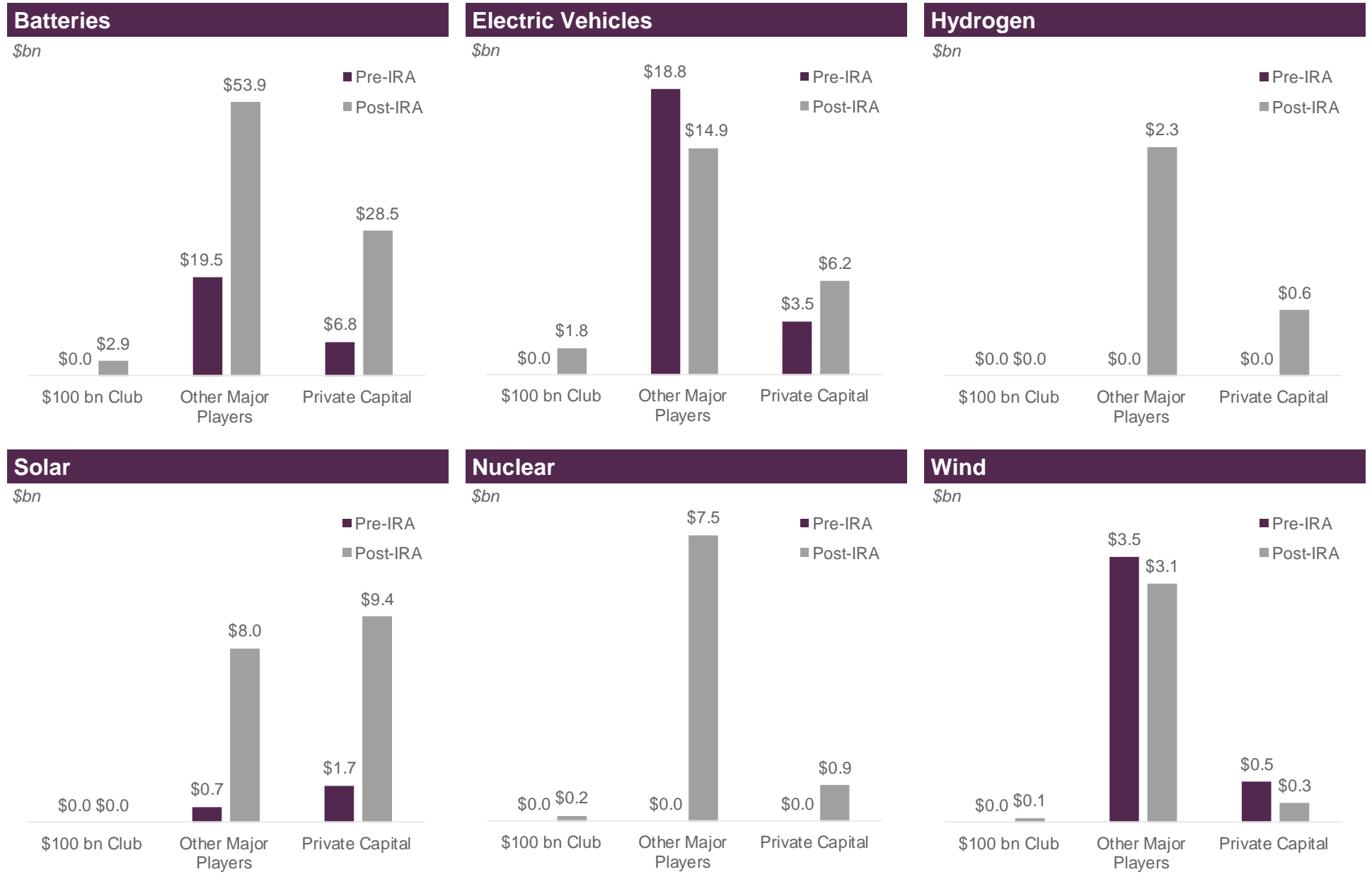
IRA Tax Incentives by Sector

The IRA was intended to incentivize investments across several industries, not just energy



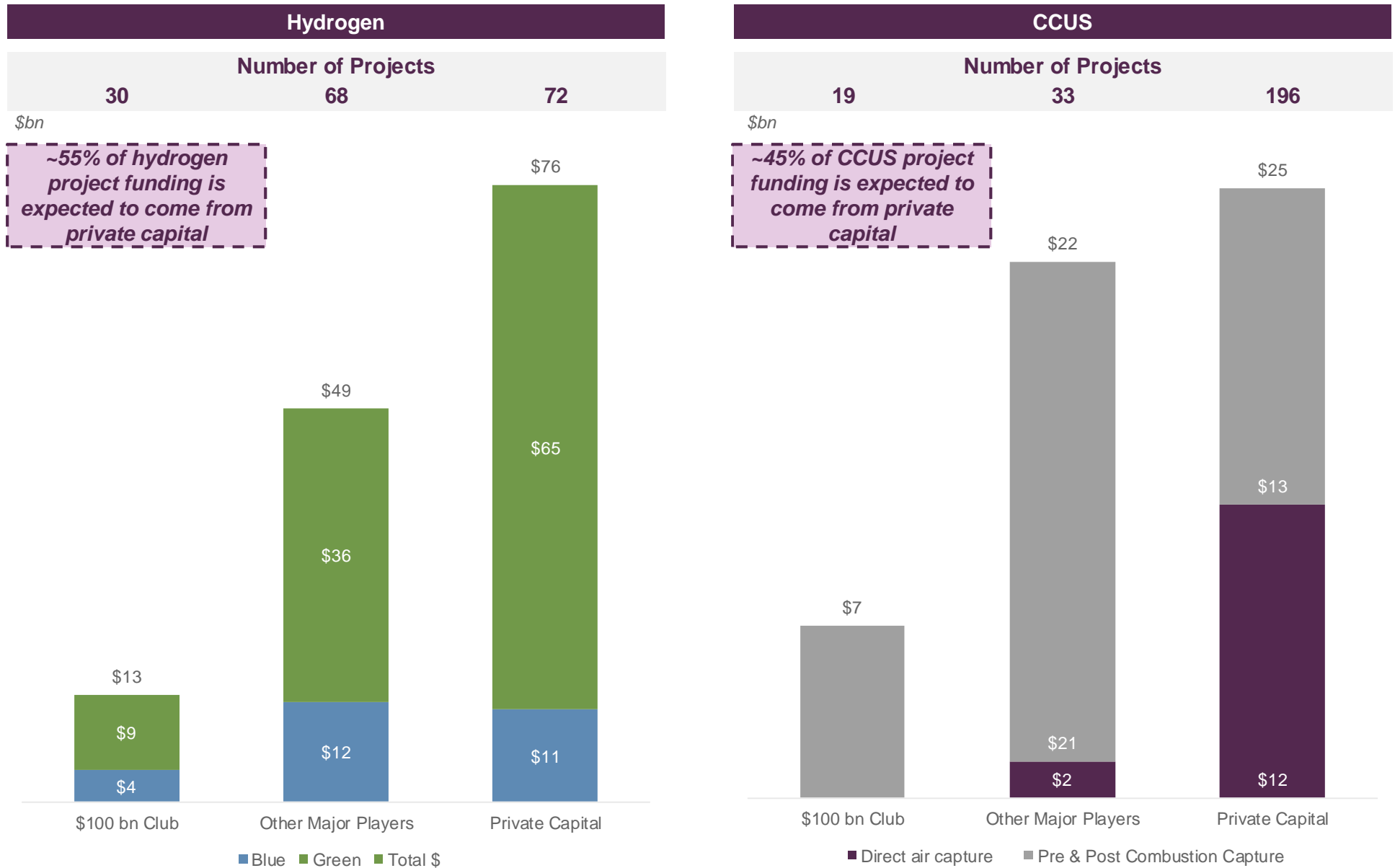
Goldman Sachs estimates that the IRA will catalyze \$3 trillion in investment over the next decade.

Impact of IRA on Announced Infrastructure Investment



Source: Department of Energy.

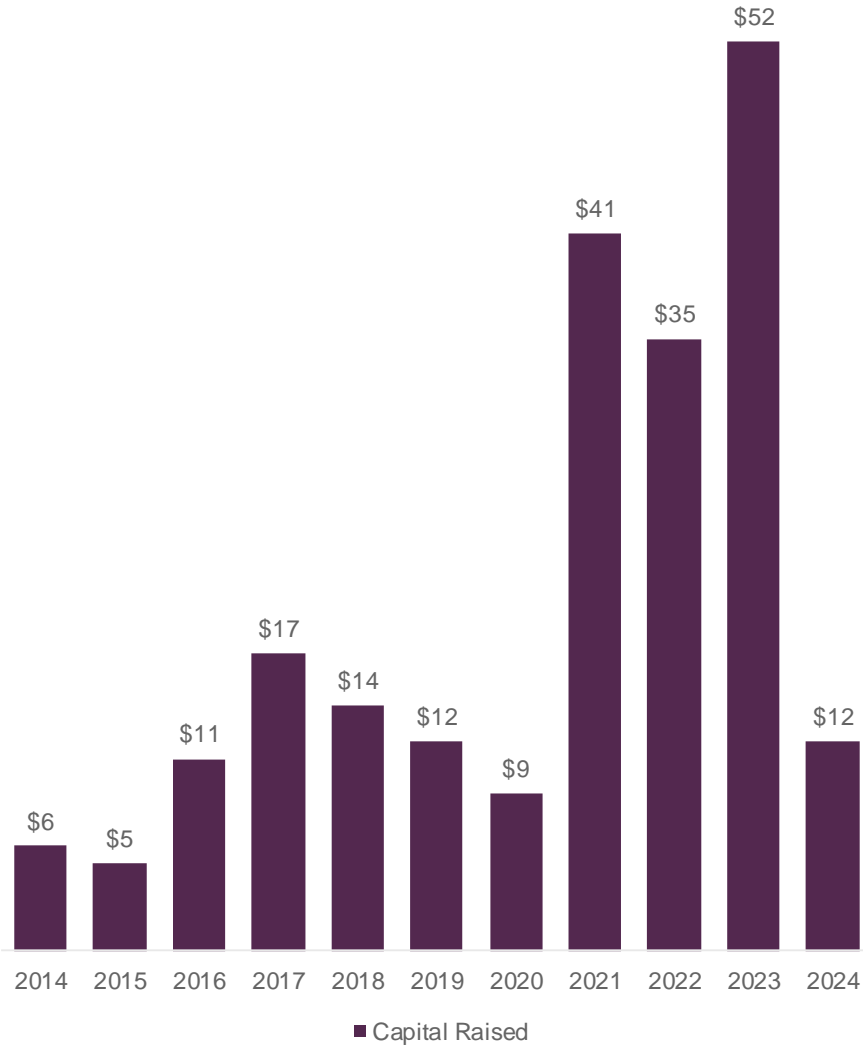
Hydrogen & CCUS Development Has Attracted the Attention of Private Capital



Energy Transition Fundraising Trends

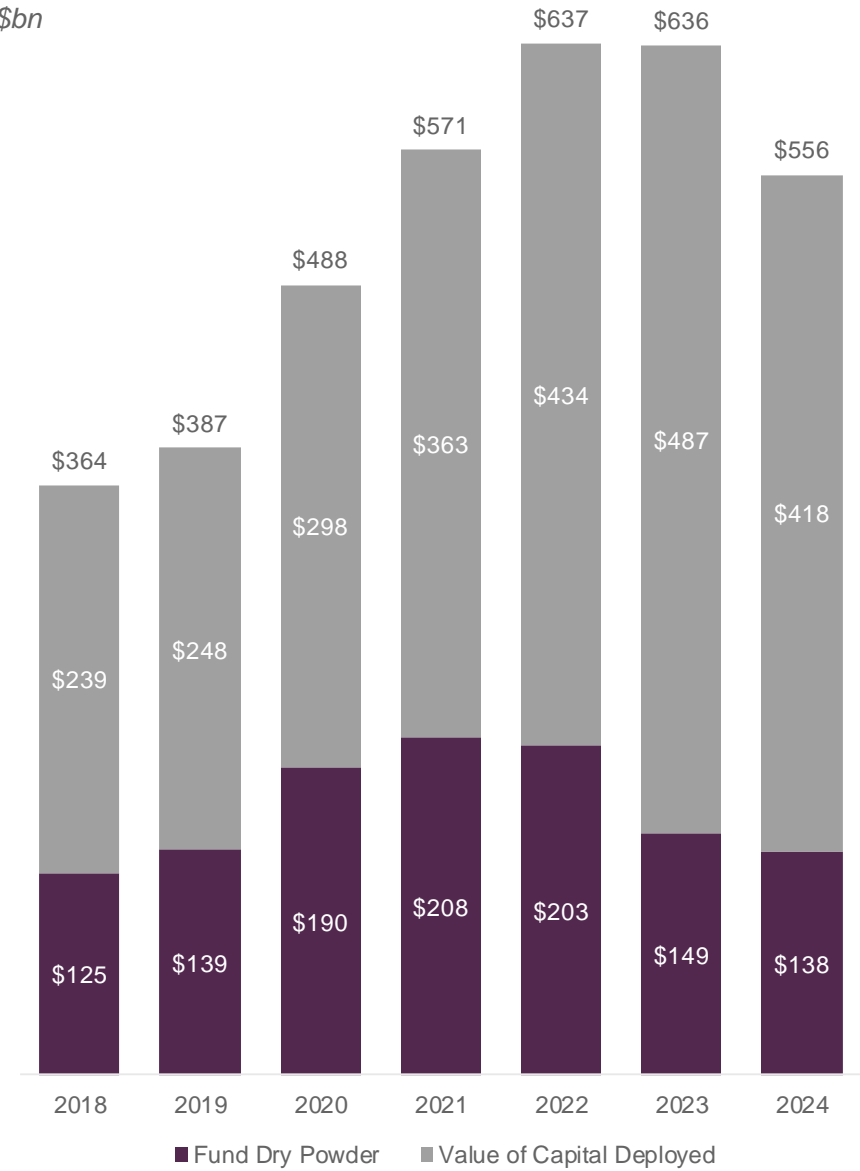
Energy Transition Infrastructure Fundraising

\$bn



Overall Energy Transition Fund Dry Powder

\$bn



Other Trends in Energy Transition Finance

- M&A

- ~\$80 billion in power asset and energy transition M&A across 540 deals through the first half of 2024
- From 2023, deal count has declined by 35%, but total deal value has stayed ahead of pace by ~\$5 billion
- Over 60% of transactions comprised wind, solar or portfolio sales

- Transferability & Alternatives to Tax Equity

- The IRA made 11 tax credits eligible for transferability, and the IRS finalized the rules for transferability in April of this year
- Although tax equity structures still account for the majority of tax deals (~\$20 billion per year), the new transferability rules should both expand the credit buyer pool and reduce the cost of credit transactions

- Tax Credit Insurance

- The insurance market has evolved to cover risks including recapture, credit transfer risk, and basis risk

Challenges & Considerations

- Regulatory
 - Permitting
 - Remaining IRS rulings
- Inflationary Pressures
 - Supply chain investment lag
 - Labor
- Access to & the Cost of Capital
 - Interest rate cycles vs. infrastructure cycle
 - Impact of quantitative tightening and reduced liquidity
- Capex – Opex Trade-Off
 - Are new business models needed?
- AI Driven Demand-Side Implications for Electrification