



A Value Manager's Take on Disruption: The Energy Transition

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Causeway Capital Management LLC
11111 Santa Monica Blvd., 15th floor
Los Angeles, CA 90025
www.causewaycap.com

Agenda

1. Why Now?
2. The Energy Transition Landscape
3. Value Investing Opportunities

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1. Why Now?

Net Zero Policy Commitments Are Accelerating

“BY EARLY NEXT YEAR, COUNTRIES REPRESENTING MORE THAN 65% OF GLOBAL CARBON-DIOXIDE EMISSIONS...WILL HAVE MADE AMBITIOUS COMMITMENTS TO CARBON NEUTRALITY” – UN SECRETARY GENERAL ANTONIO GUTERRES, 12/2/2020

1997: Kyoto Protocol

2015: Paris Climate Agreement

2019: UK targets net zero emissions by 2050

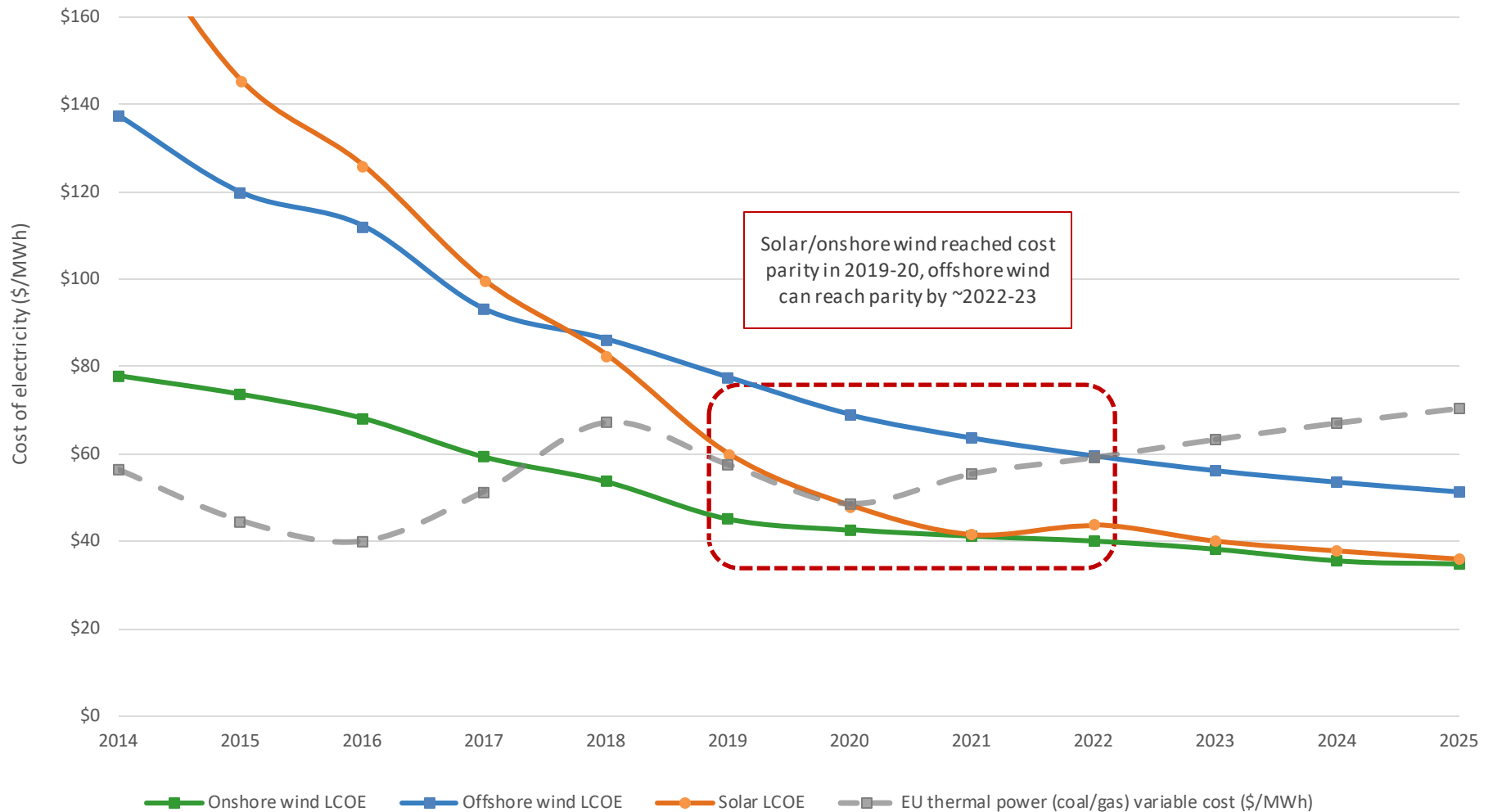
2020:

- EU targets 2050 net zero
- China targets 2060 net zero
- Japan targets 2050 net zero
- South Korea targets 2050 net zero

2021: Biden administration expected to target 2050 net zero in the US

Renewables Are Now Cheaper Than Fossil Fuels

SOLAR & WIND CAN NOW CAPTURE LEADING SHARE OF NEW POWER CAPACITY INVESTMENT WITHOUT HELP FROM SUBSIDIES



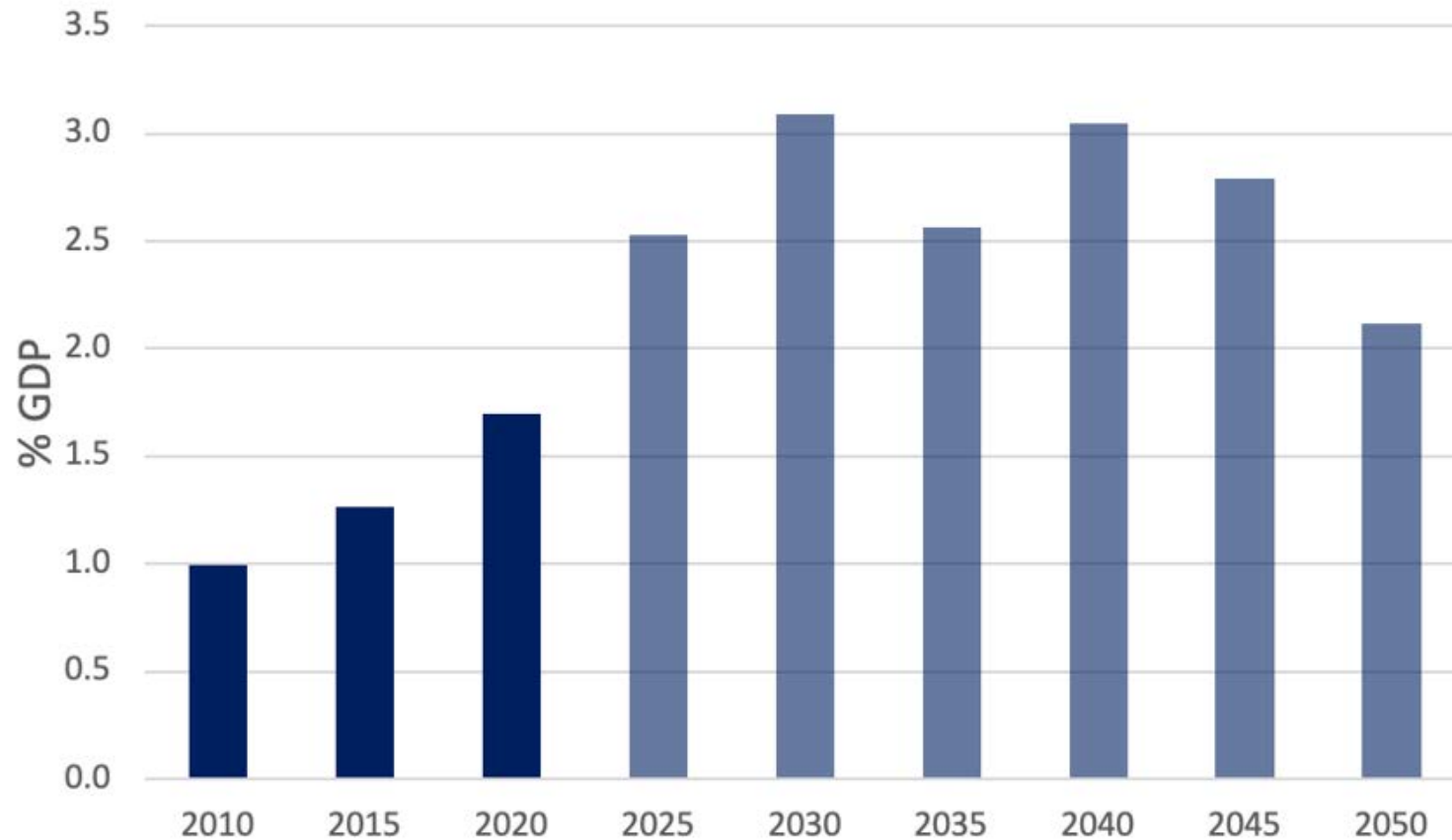
Note: LCOE is "levelized cost of electricity", an all-in measure of variable cost and discounted upfront capital cost; EU thermal power costs based on local feedstock forward curves and assumes \$5/ton per annum carbon emissions trading system (ETS) inflation

Sources: Bloomberg New Energy Finance (BNEF), FactSet, CCM estimates

Energy Transition Investments Are Additive to Economic Growth

THE EUROPEAN GREEN DEAL SET OUT A BLUEPRINT FOR AMBITIOUS INVESTMENTS DRIVING A MEANINGFUL CONTRIBUTION TO GDP

EU Energy System Investment, % of GDP



Excluding transport; mix scenario shown achieves 55% greenhouse gas reduction by 2030

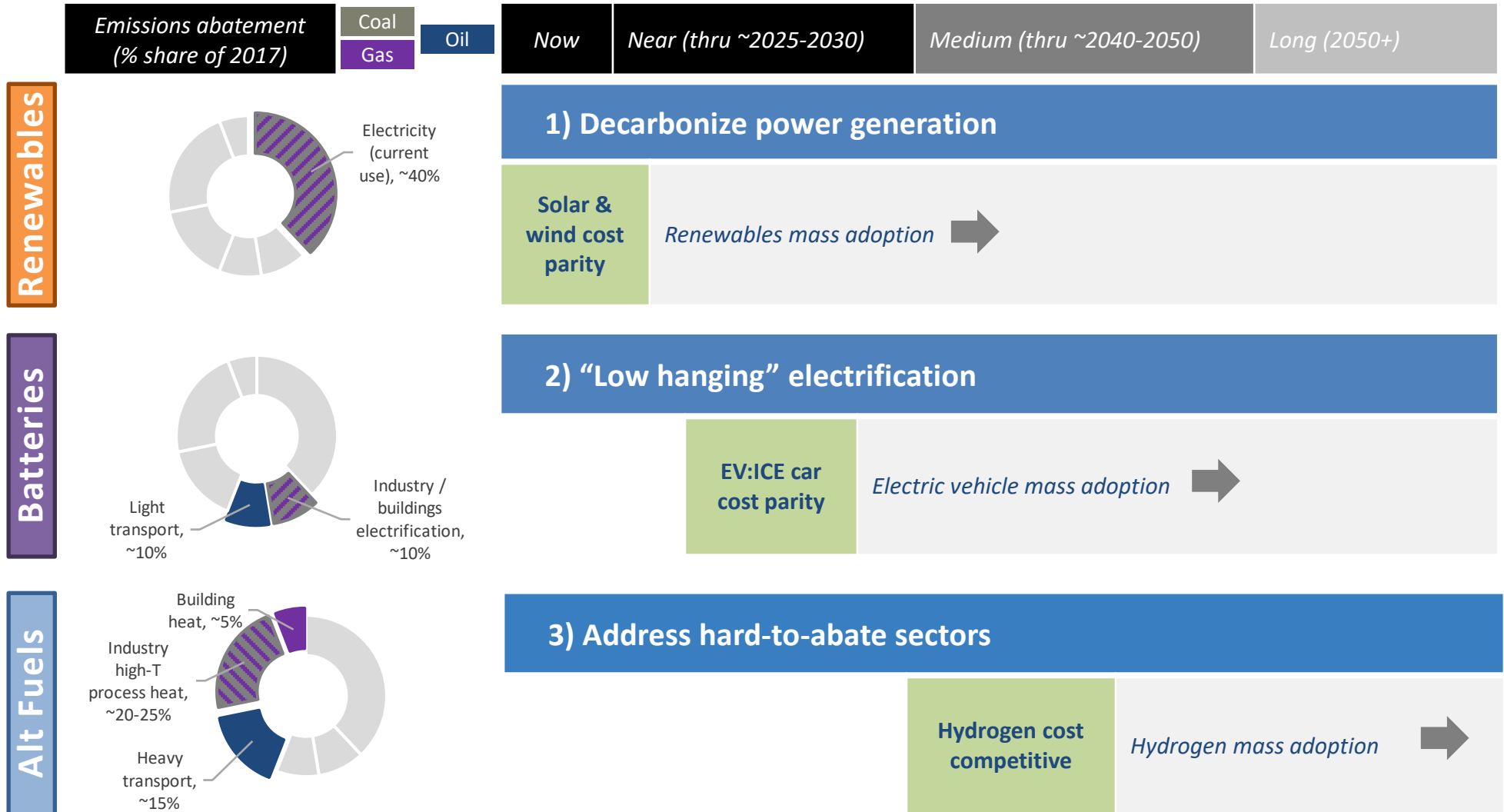
Sources: European Union Impact Assessment (September 2020)

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2. The Energy Transition Landscape

The Energy Transition: How Do We Get to Net-Zero?

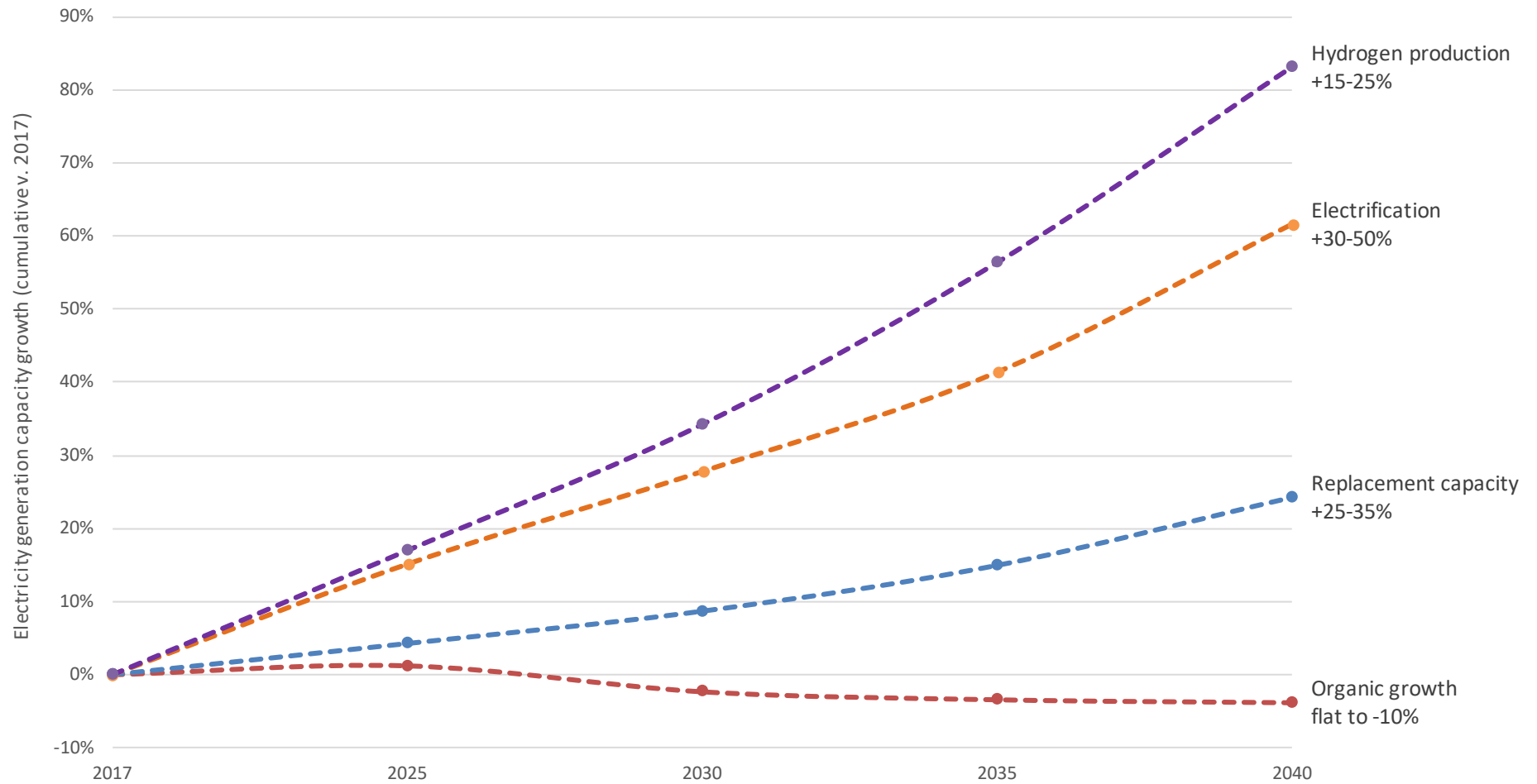
RENEWABLES, LITHIUM-ION BATTERIES AND HYDROGEN MUST DEVELOP/SCALE IN TANDEM TO ENABLE FULL ADOPTION AND DE-CARBONIZATION



Sources: BP Statistical Review of World Energy, Causeway

Robust Long-term Growth Runway for Renewables

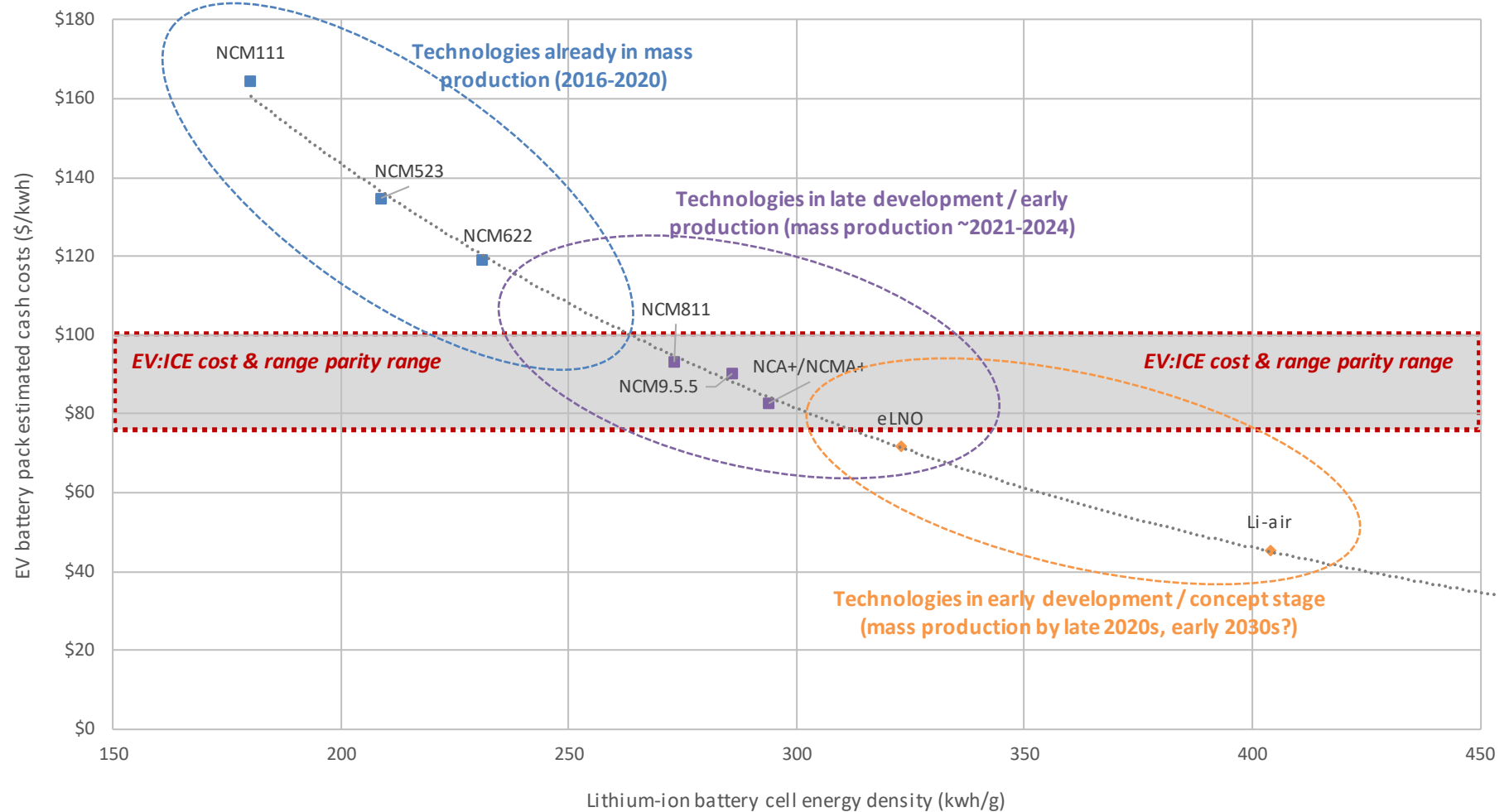
MULTIPLE SECULAR TAILWINDS DRIVE INCREMENTAL ELECTRICITY CAPACITY GROWTH



Sources: IEA World Energy Outlook, Hydrogen Council, CCM estimates

Lithium-ion Batteries Near Tipping Point for EV Mass Adoption

ELECTRIC VEHICLES CAN REACH COST PARITY WITH ICE CARS BY ~2023-2024, ENABLING RAPID ADOPTION AND SUPPLY CHAIN SCALING



Note: EV battery pack cost estimates based on 2020 commodity prices and ~\$20-25/kwh non-cost of goods sold costs. EV:ICE cost parity range based on ~\$5-6k average internal combustion engine cost and 60-70kwh battery size offering comparable driving range

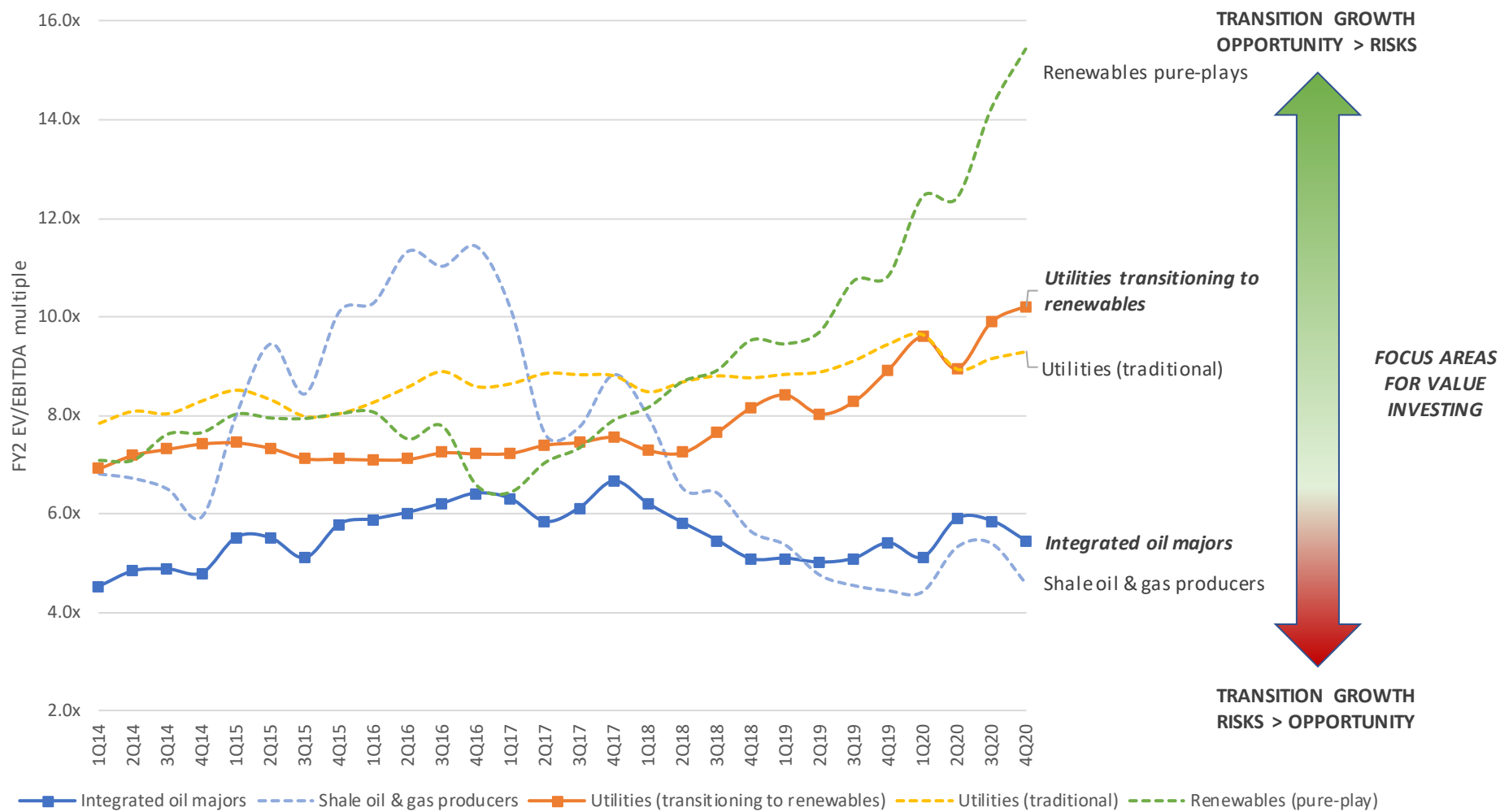
Sources: Bernstein, CCM estimates

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3. Value Investing Opportunities

Investing in the Energy Transition with a Value Lens

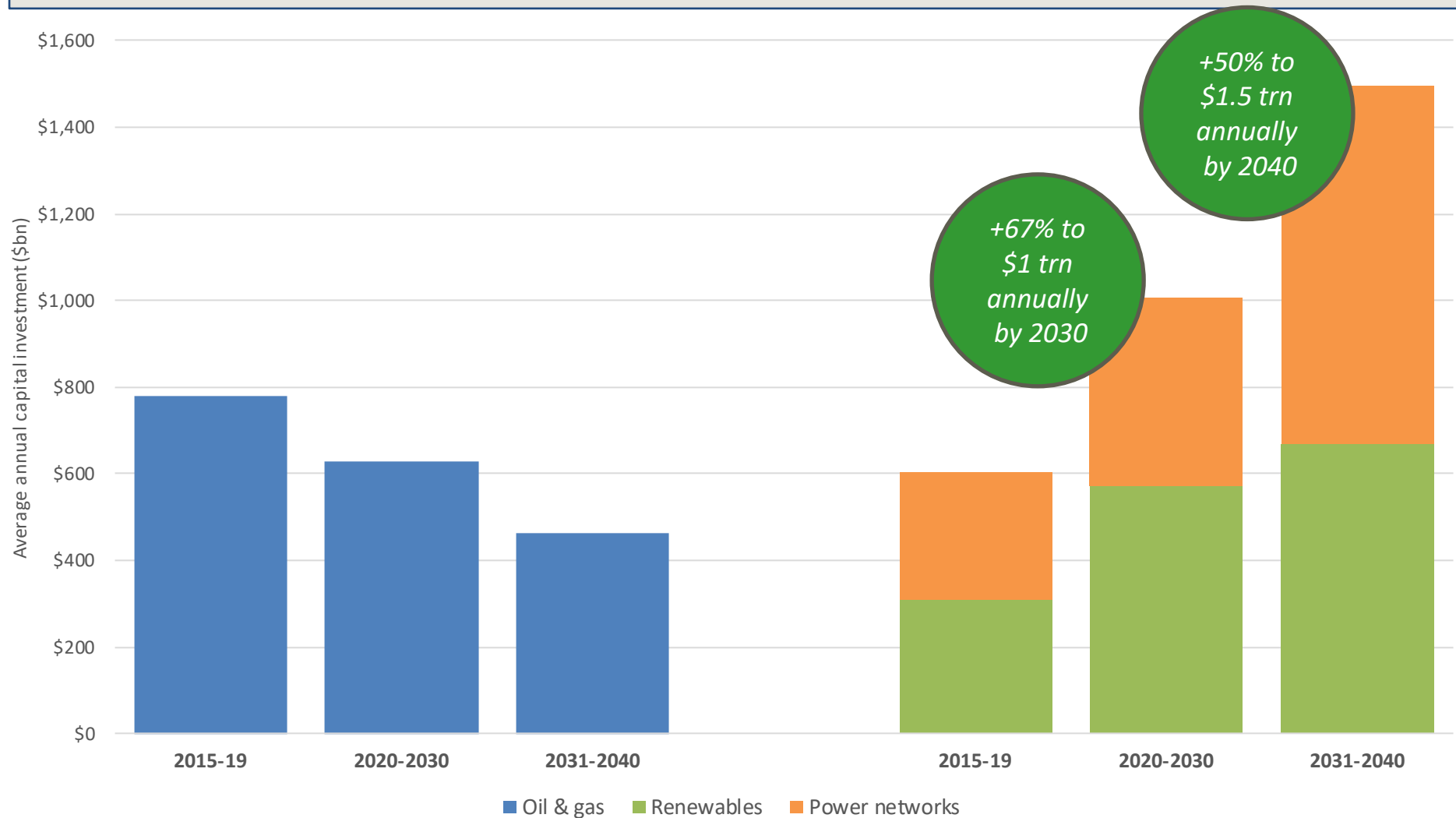
EARLY-STAGE PORTFOLIO TRANSITIONS TOWARDS RENEWABLES IN UTILITIES AND ENERGY OFFER THE MOST COMPELLING VALUE OPPORTUNITIES



Sources: FactSet, Causeway

Energy Investments Shifting Sharply to Power Infrastructure

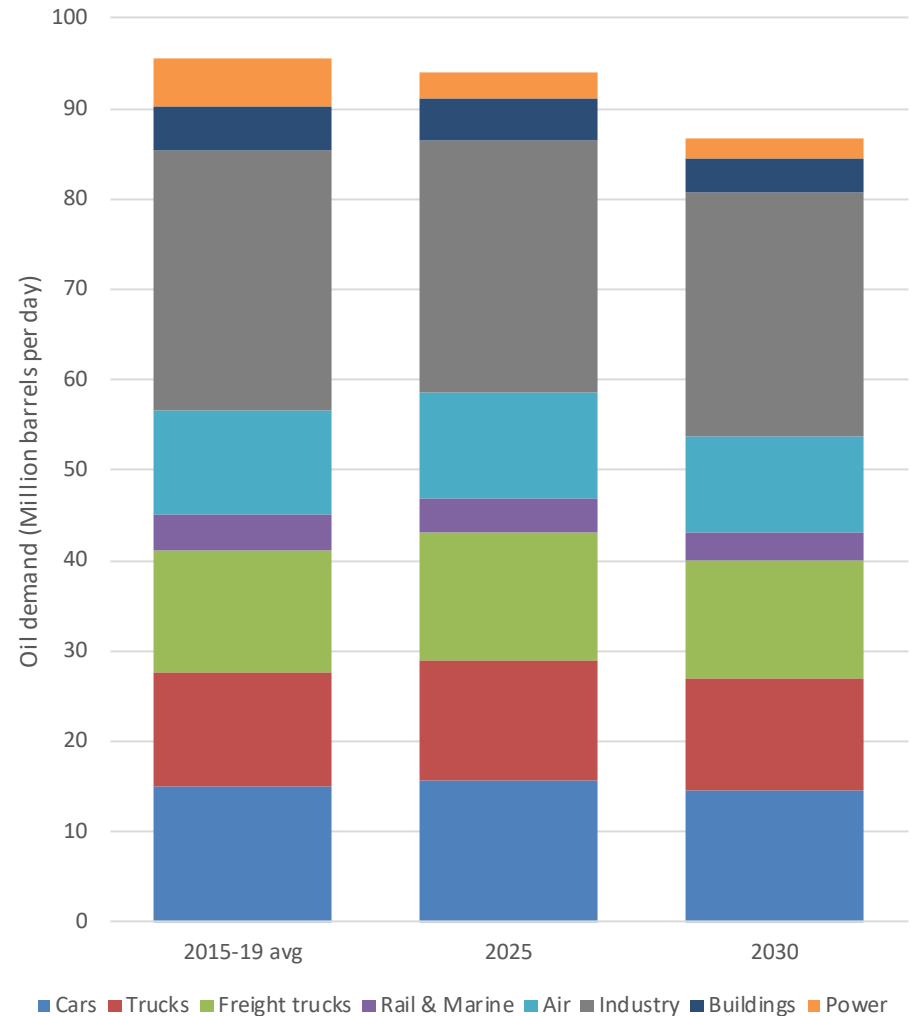
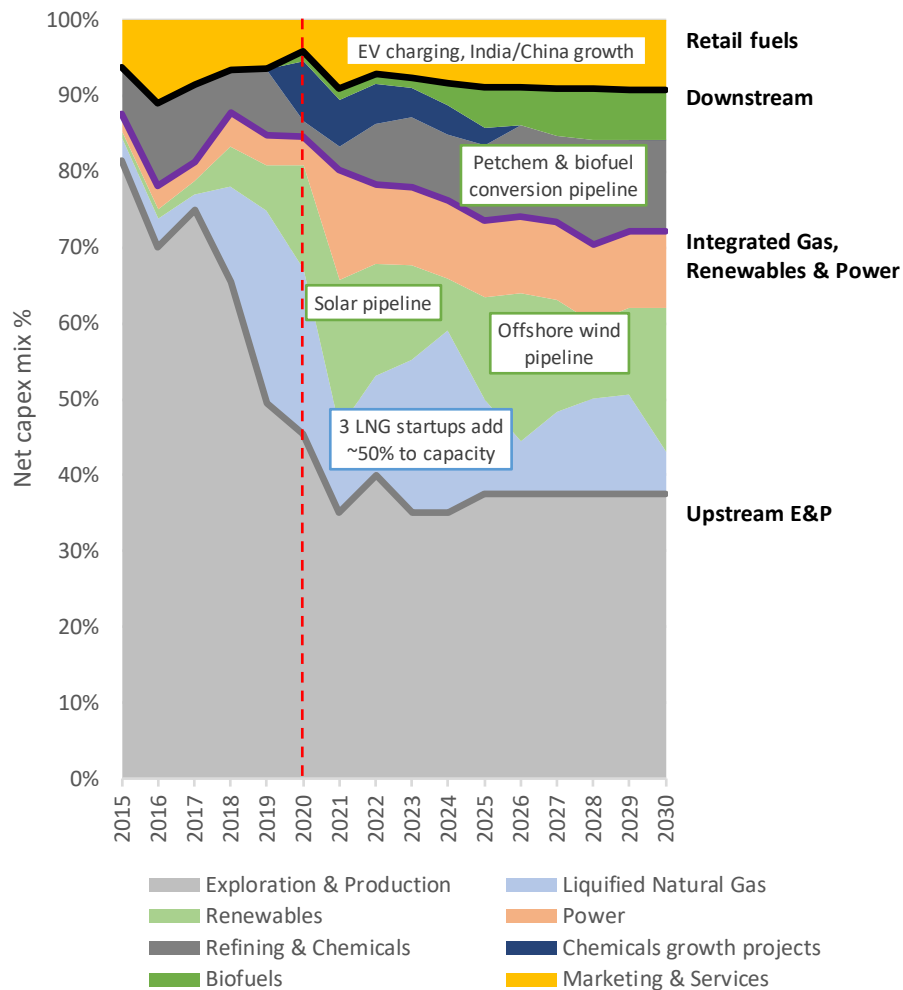
CAPITAL INVESTMENT REQUIREMENT INCREASES RAPIDLY ACROSS RENEWABLES AND POWER NETWORKS



Source: IEA World Energy Outlook

Energy Majors Have Time to Diversify Portfolios

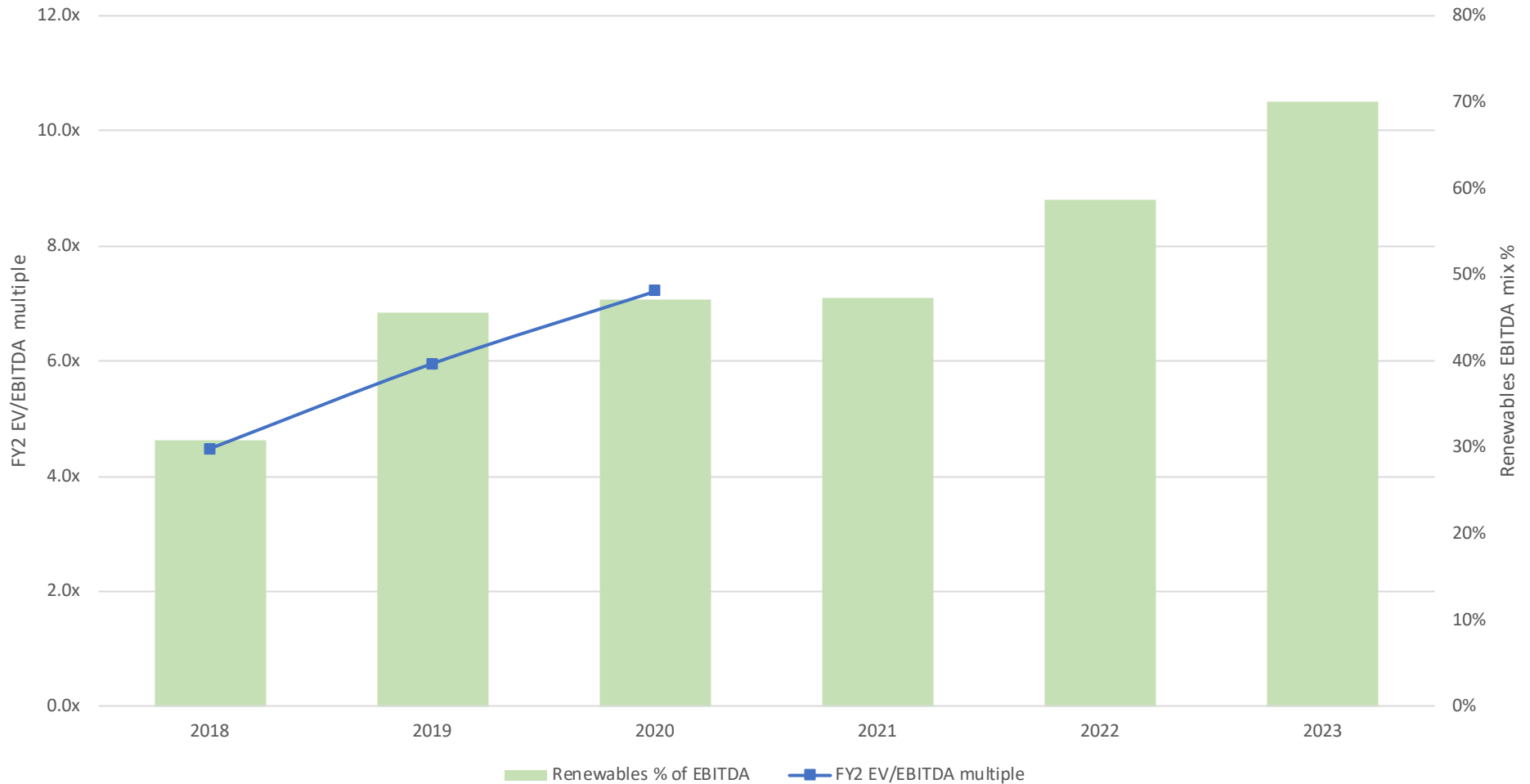
OIL REMAINS THE DOMINANT FUEL IN TRANSPORT AS SUBSTITUTION PROCESS HAS BEEN GRADUAL GIVEN SLOW VEHICLE FLEET CHURN



Sources: Company presentations, CCM estimates

Utilities in Early-Stage Transitions Still Present Value Opportunities

WE EXPECT THIS GERMAN UTILITY'S MULTIPLE RE-RATING TO CONTINUE AS PORTFOLIO TRANSFORMATION CONTINUES



Sources: FactSet, CCM estimates

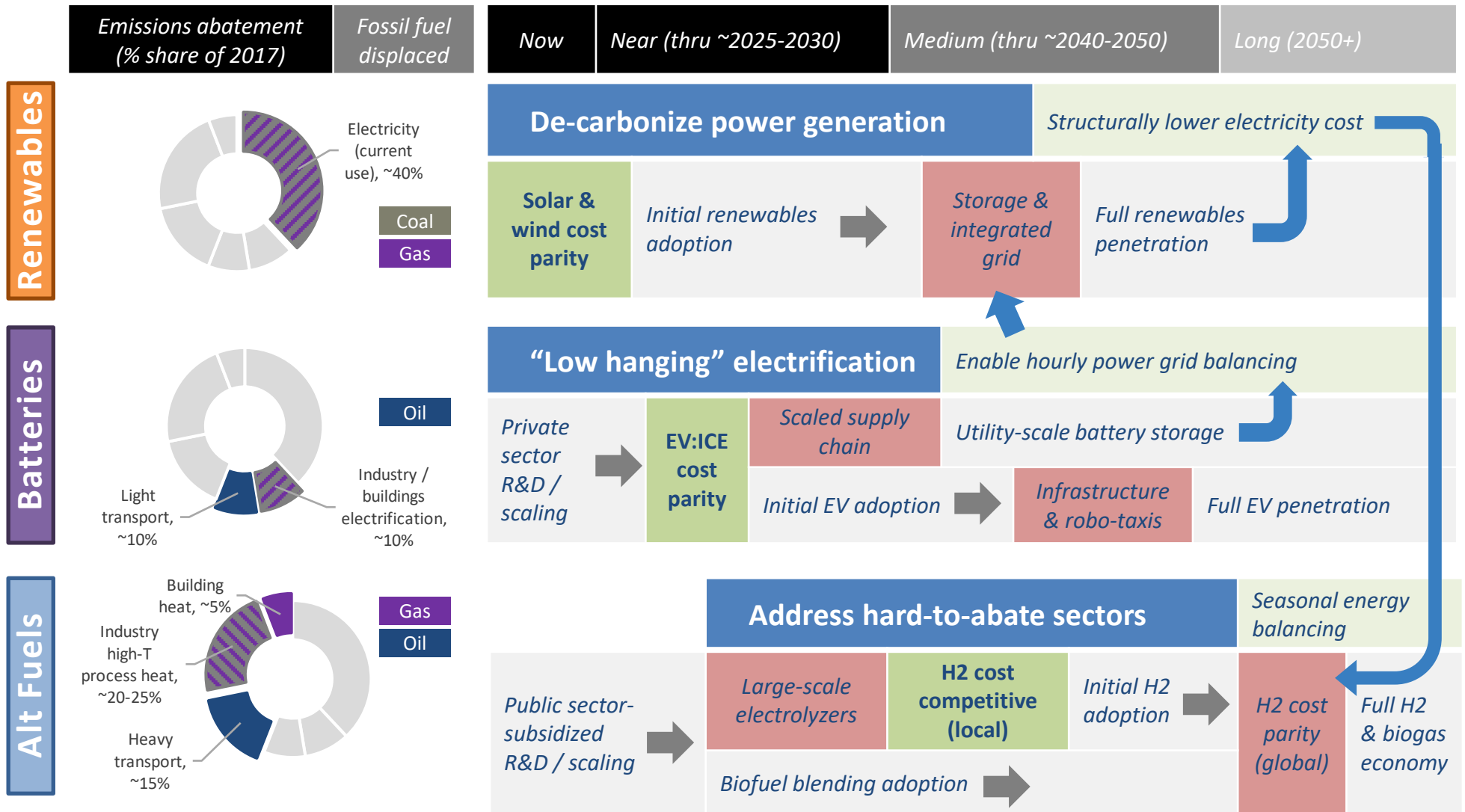
Conclusions

- Propelled by sustainable policy support and technological advances, the energy transition has reached a tipping point in renewables, and is heading towards cost parity in batteries
- As a value manager, we see compelling opportunities in energy majors focused on diversifying their portfolios away from fossil fuels, and utilities in the earlier stages of transitioning towards more renewables development
- We are also exploring risks and opportunities in other industries that will be impacted directly or indirectly by the energy transition:
 - Transportation
 - Materials
 - Capital Goods
 - Technology
 - Financials

Appendix

Three Tipping Points Facilitate the Pace of Energy Transition

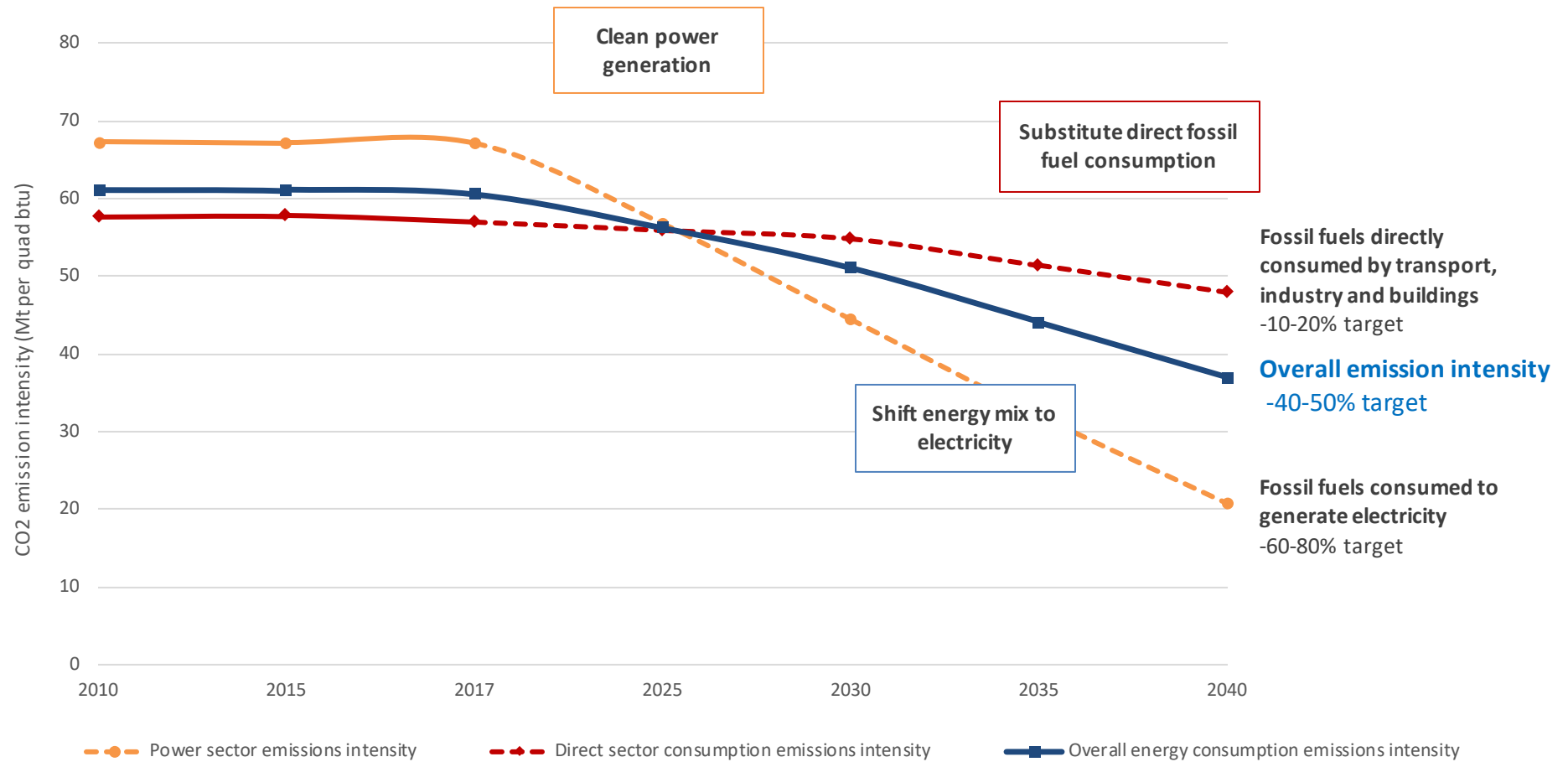
RENEWABLES, LITHIUM-ION BATTERIES AND HYDROGEN MUST DEVELOP/SCALE IN TANDEM TO ENABLE FULL ADOPTION AND DE-CARBONIZATION



Sources: BP Statistical Review of World Energy, Causeway

Power Sector Decarbonization is Critical to Reaching Climate Targets

LOWERING OVERALL CARBON INTENSITY REQUIRES POWER GENERATION TO SHIFT TO RENEWABLES, THEN ENERGY DEMAND TO SHIFT TO POWER

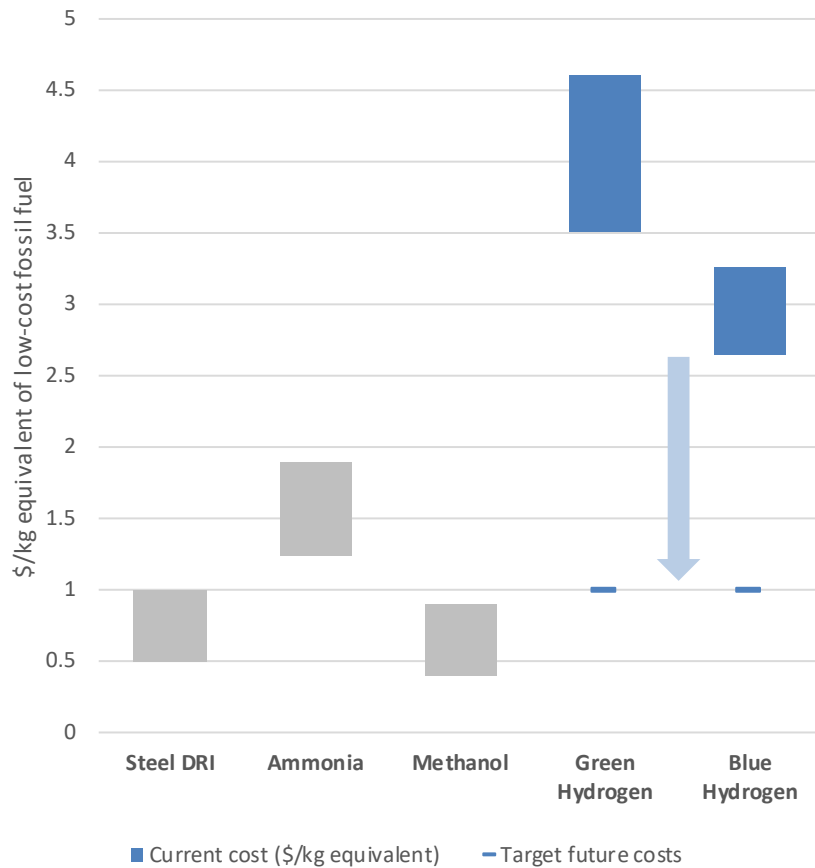


Sources: IEA World Energy Outlook, Hydrogen Council, CCM estimates

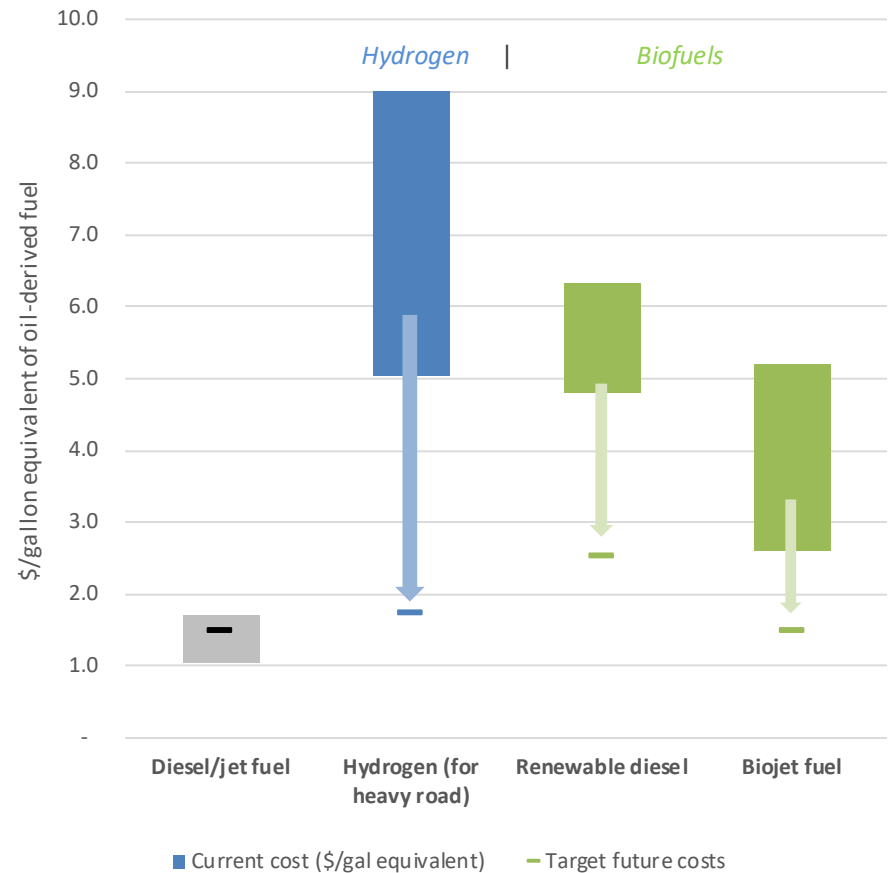
Hydrogen and Biofuels Will Take Time to Scale and Need Subsidy Support

HARD-TO-ABATE SECTORS WITHIN INDUSTRY AND TRANSPORTATION WILL REQUIRE EXTENDED POLICY SUPPORT ACROSS HYDROGEN AND BIOFUELS

Industry use of fossil fuels can be substituted for hydrogen eventually



Heavy transport modes can be addressed by a combination of H2 and biofuels

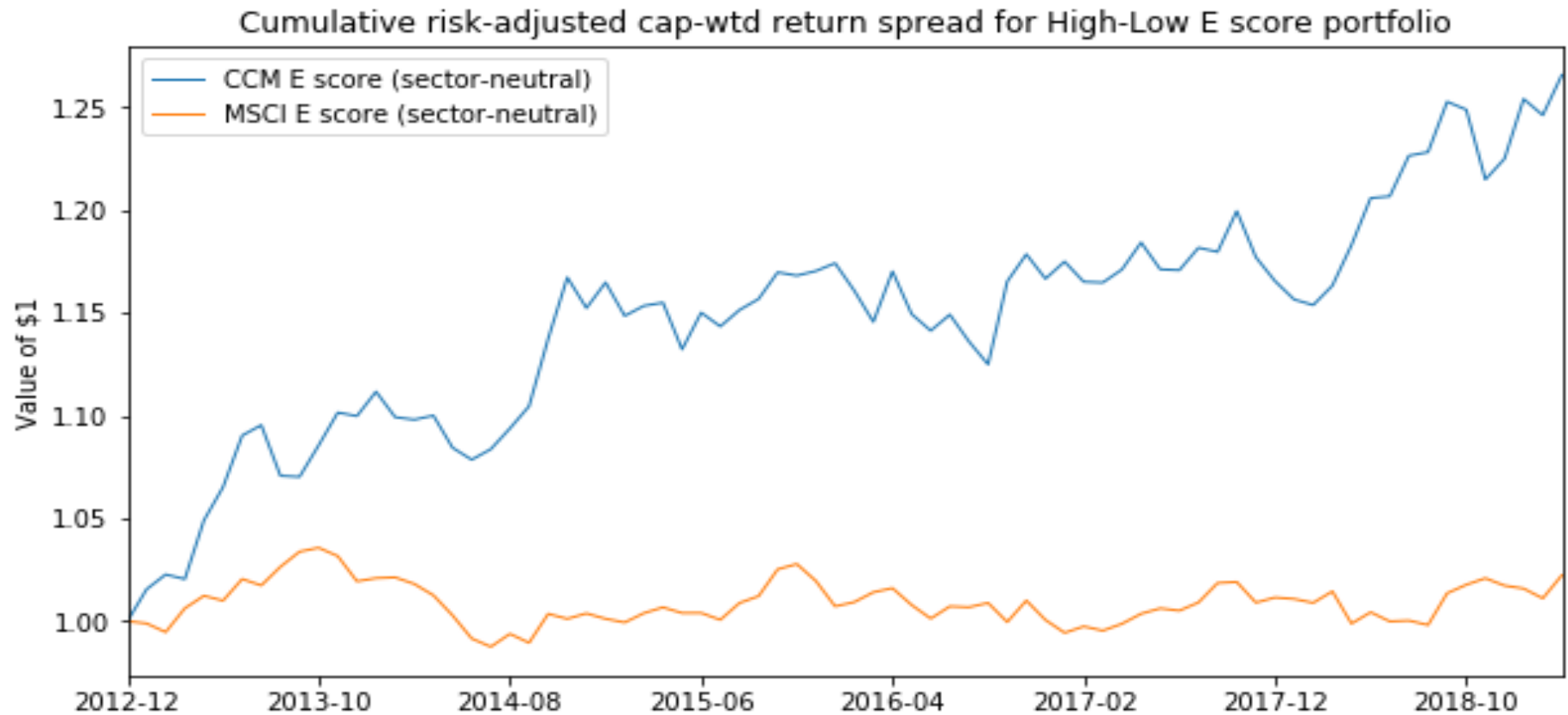


Note: Heavy transport fuel costs exclude midstream/distribution costs and reflect liquid H2 energy density, steel DRI stands for direct reduced iron process

Sources: US Department of Energy, UC Berkeley LBNL, Bloomberg New Energy Finance (BNEF), Hydrogen Council, CCM estimates

The 'E' in ESG is Already Discerning Relative Stock Performance

CAUSEWAY'S PROPRIETARY E-SCORE SHOWS OUTPERFORMANCE BETWEEN TOP/BOTTOM QUARTILE STOCKS OVER 2012-2018



See Important Disclosures for notes. Note that Causeway does not manage portfolios based solely on ESG scores.

Sources: FactSet, Causeway Analytics

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