The Inevitable Policy Response Forecast Policy Scenario 2023 (IPR FPS 2023)

Sector Capex and trends for FPS 2023: input to company analysis

October 2023

INEVITABLE POLICY RESPONSE

IPR was commissioned by the PRI[1] and is supported by world class research partners and leading philanthropies, financial institutions, & NGOs

1. Principles for Responsible Investment
2. The conclusions of the report are solely those of Energy Transition Advisers and Theia Finance Labs

Commissioned by PRI

In 2018, the Inevitable Policy Response was commissioned by PRI to advance the finance industry's knowledge of climate transition risk & support investor efforts to incorporate climate risk & opportunities in portfolio assessment

A Climate Research Consortium

This report was produced by Energy Transition Advisers and Theia Finance Labs[2]

NGO partners include Carbon Tracker, Climate Bonds & Planet Tracker

Strategic Partners

In 2021, leading financial institutions joined the IPR as Strategic Partners to provide more in-depth industry input, and to further strengthen its relevance to the financial industry

Core philanthropic support

The IPR is funded in part by the Gordon and Betty Moore Foundation through The Finance Hub, which was created to advance sustainable finance, and the ClimateWorks Foundation striving to innovate and accelerate climate solutions at scale

IPR has developed global, policy-based forecasts of forceful policy responses to climate change and implications for energy, agriculture and land use

Please see the IPR Home Page for further details

Scenario	Policy Forecast Details	Open Access Database
IPR 2023 Forecast Policy Scenario (FPS) • Models impact of forecasted policies on the real economy	IPR FPS 2023 Summary Report IPR 2023 Policy Forecast IPR FPS 2023 Detailed Energy Results IPR FPS 2023 Detailed Land Use and Nature Results IPR 2023 Bioenergy Report	IPR FPS 2023 Value Drivers IPR Scenario Explorer
IPR 1.5°C Required Policy Scenario (RPS) • Required policies to align to a **1.5°C objective** building on the IEA's Net Zero scenario and deepening analysis on policy, land use, emerging economies and value drivers	IPR 1.5°C RPS Energy and Land Use System Results including Policy Details	IPR RPS 2021 Value Drivers
IPR Forecast Policy Scenario + Nature (FPS + Nature) • First integrated climate and nature scenario for use by investors	IPR 2022 FPS + Nature detailed results	IPR FPS + Nature Value Drivers

IPR has published a set of publicly available outputs from the FPS and 1.5°C RPS that offer significant granularity at the sector/country level, allowing investors to assess their own climate risk across 4,000+ variables

Disclaimer: This is not intended to constitute policy advice, financial advice or any specific advice.

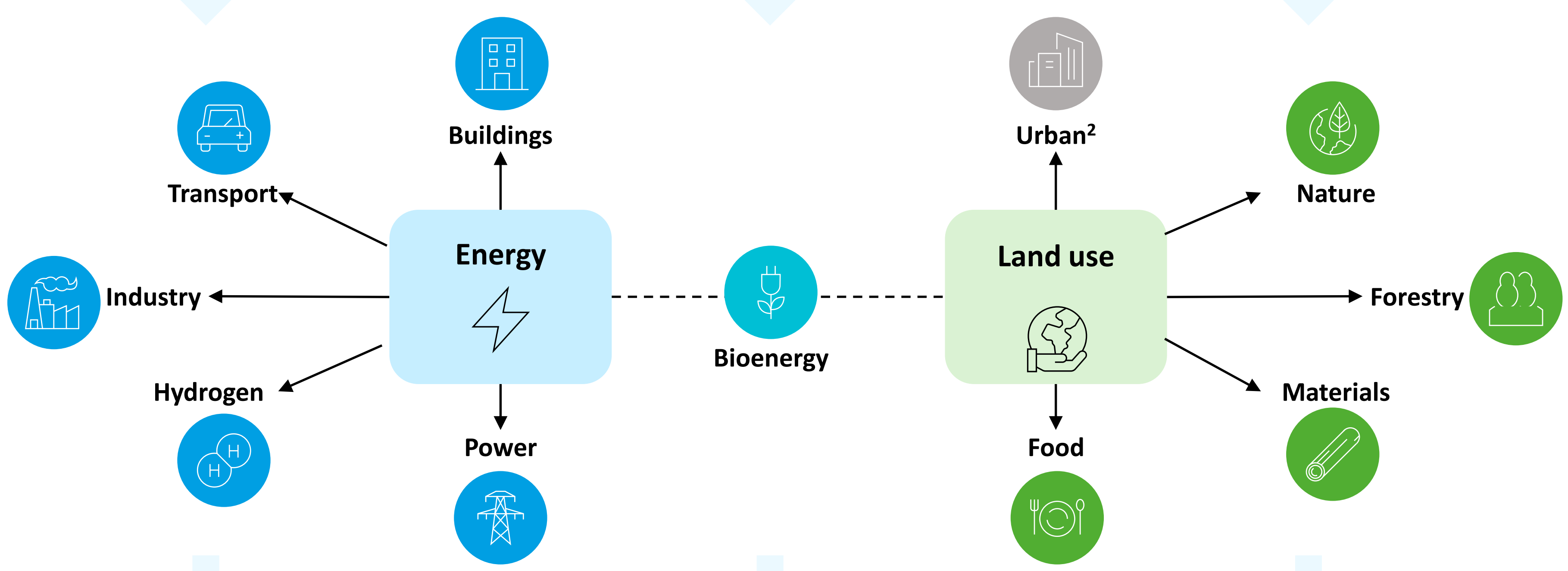
IPR offers a range of applications to help financial institutions navigate the climate transition

Policy Forecast

IPR produces **>300 high-conviction policy forecasts** covering 21 countries and 10 policy areas across energy and land use

Policy forecasts feed into a fully **integrated climate and nature scenario model** that elicits the impact of the forecasted policies on the energy, land use, and nature systems up to 2050, tracing detailed effects on all emitting sectors[1]

Modeling



Value drivers

IPR's integrated scenario model outputs detail value drivers across energy and land use. See Value Driver Visualizer

Applications

Fitch Ratings, Morningstar Sustainalytics, Paris Agreement Capital Transition Assessment (PACTA), Planetrics, *tilt* (Climate data for SMEs)

1. IPR also develops a '1.5°C Required Policy Scenario'(1.5°C RPS) building on the IEA NZE by deepening analysis on policy, land use, emerging economies, NETs and value drivers. The RPS scenario is also run through the model and can be used by those looking to align to 1.5°C. 2. Urban areas are not modelled in detail in IPR

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The Value Drivers Database Explained

The IPR Value Drivers database is the one of the largest and most comprehensive in the world enabling direct input into investor valuation models

- Driven by the Forecasts, FPS derives Data outputs :
  - All major jurisdictions covered
  - Annualised data
  - Emissions by GHG type
  - Investment by technology type by jurisdiction by sector
  - Power Demand by fuel type by jurisdiction
  - All major sectors covered
  - Huge Land Use component
  - Price data derived
- Unique data points
- Designed in collaboration with IPR Strategic Partners and research partners
- Will facilitate opportunity to build new wave of product
- Hundreds of thousands of data points

Jurisdiction: 21 world regions including 12 G20 countries*

- **Countries:** Australia, Brazil, Canada, China, India, Indonesia, Japan, Russia, South Africa, South Korea, United Kingdom, United States
- **Composite regions:** Central and South America, Eastern Europe, Eurasia, Gulf Cooperation Council, Middle East and North Africa, South Asia, South East Asia and Oceania, Sub-Saharan Africa, Western Europe

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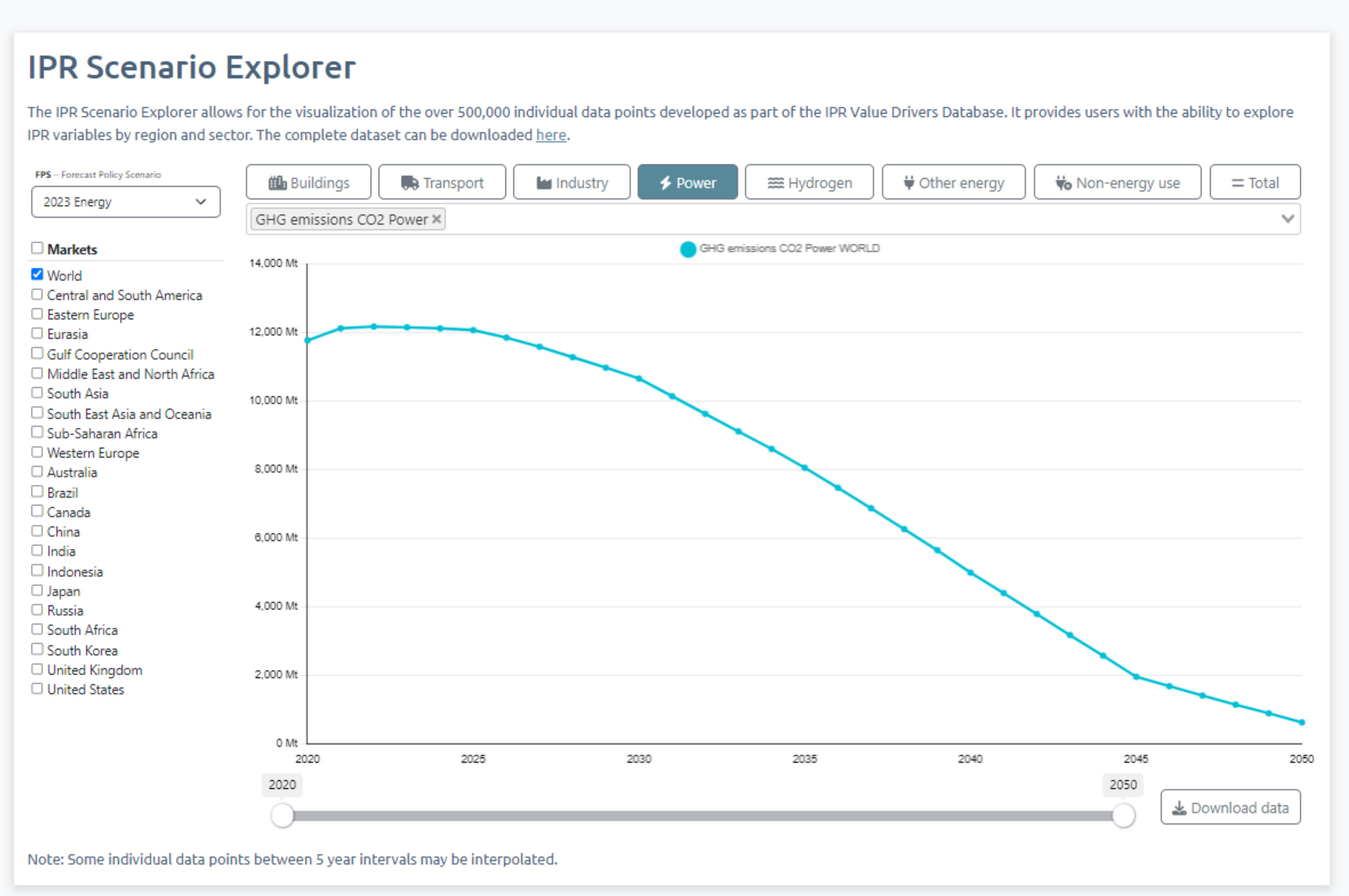
IPR Data Visualiser allows comprehensive analysis

https://ipr.transitionmonitor.com/scenario-explorer/



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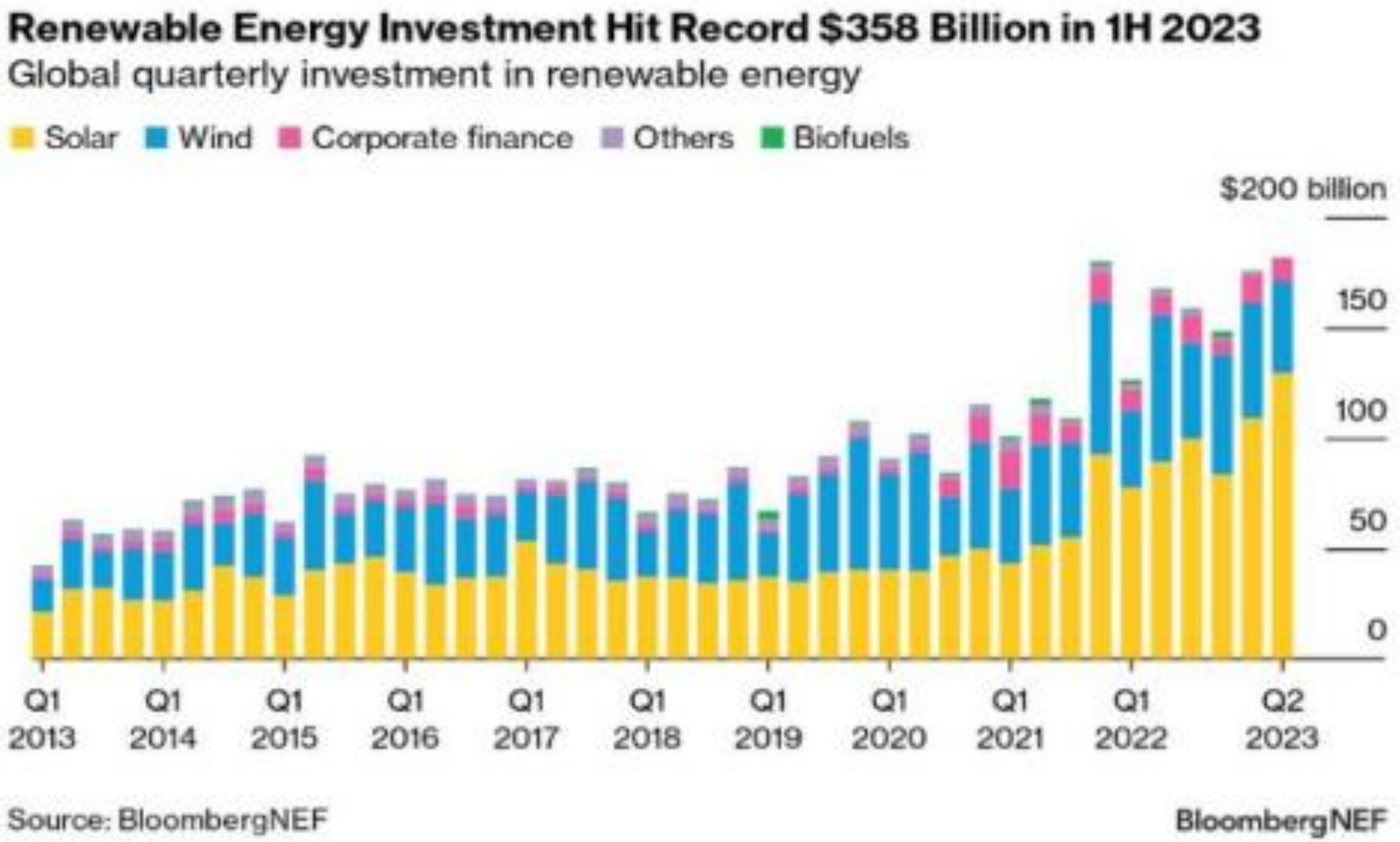
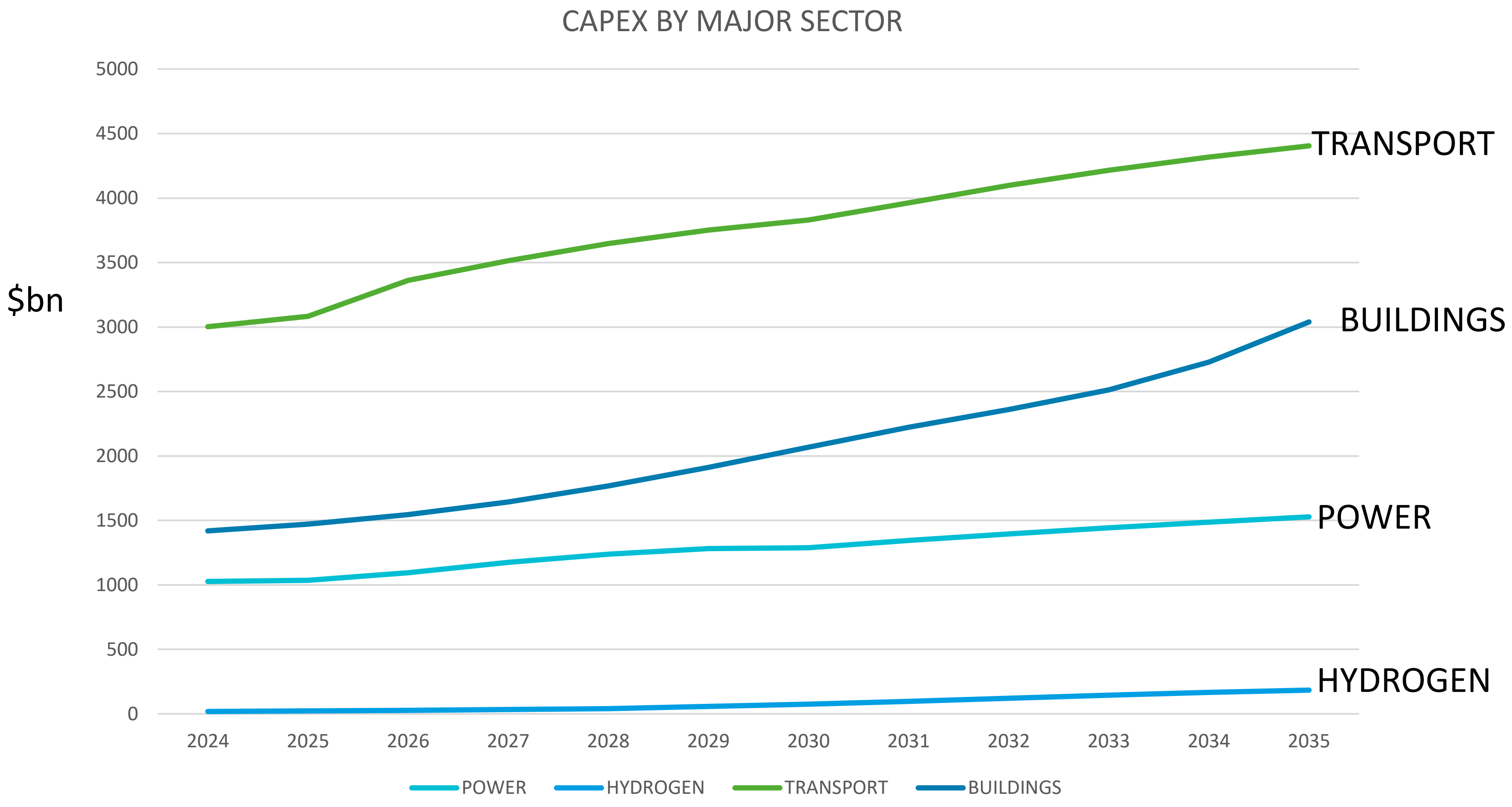
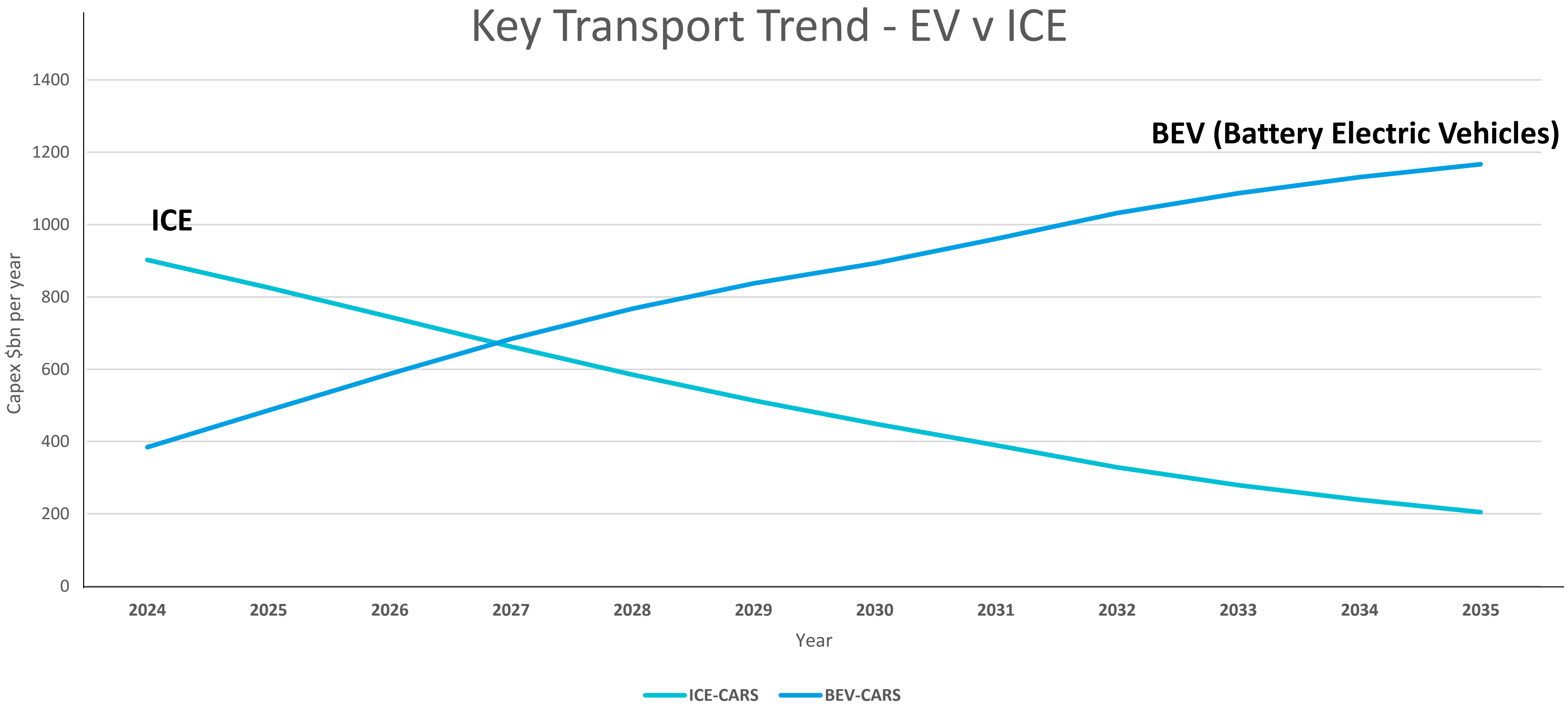
Market Capex to date - Context



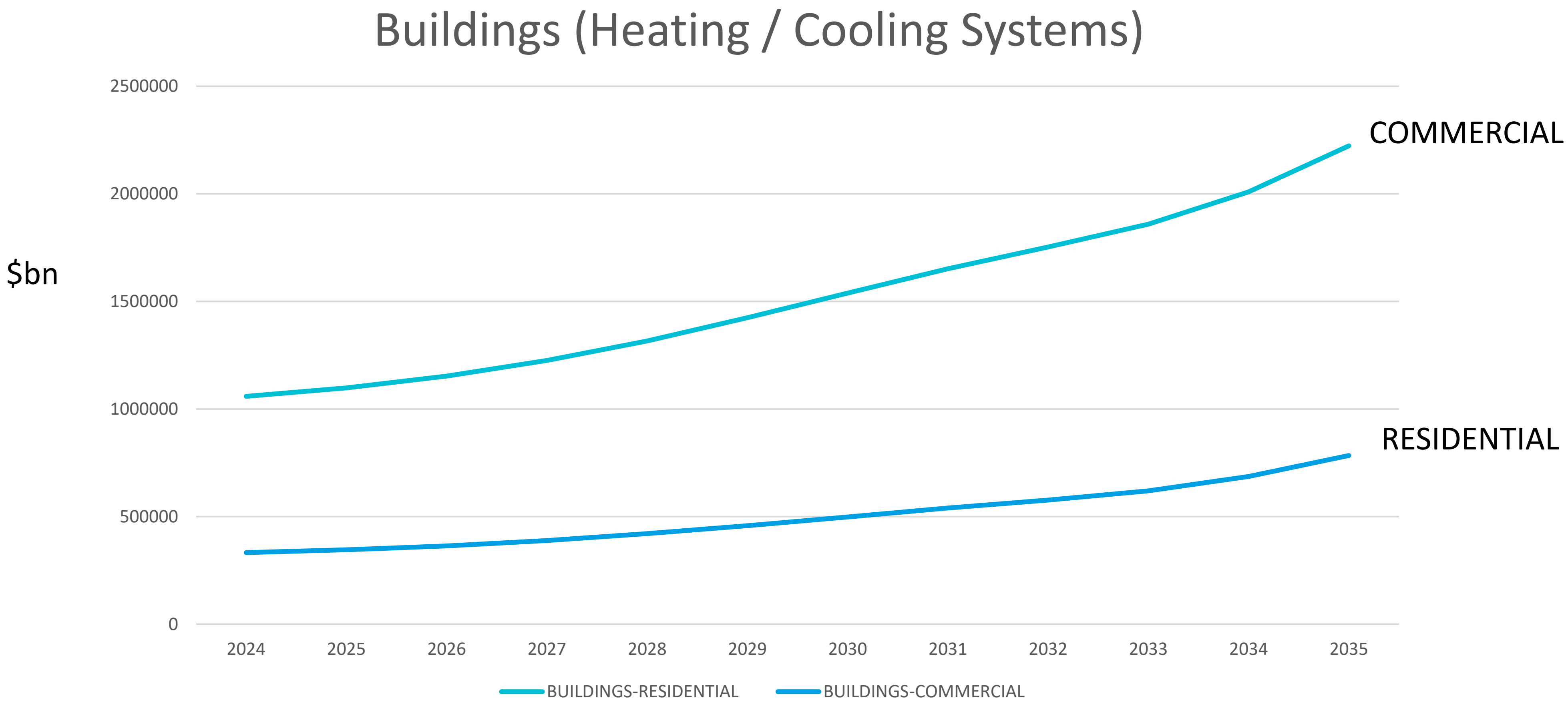
CAPEX – Where will the money flow by 2035 (12 years)?



CAPEX – Where will the money flow?

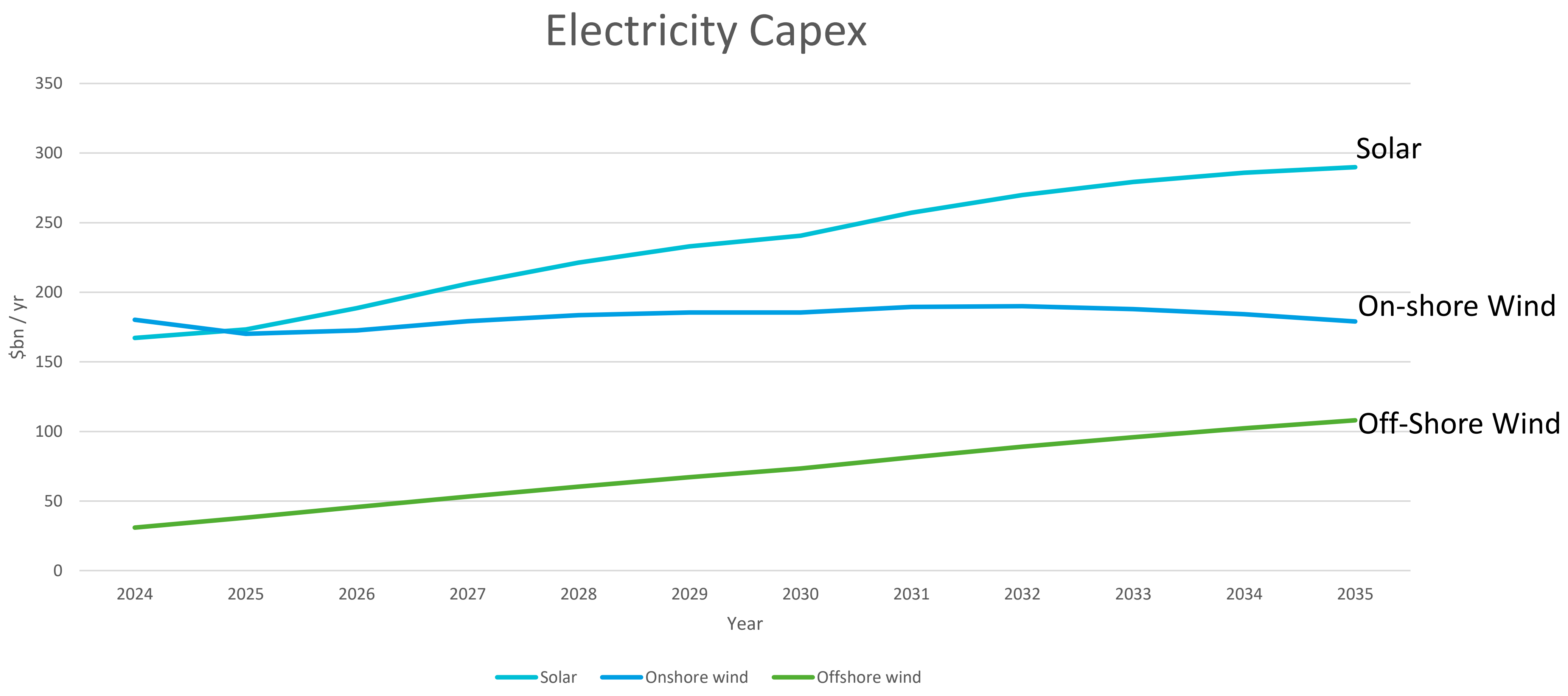


CAPEX – Where will the money flow?



CAPEX – Where will the money flow?

$bn



Why transport is now so critical

- The largest sector source of capex demand
- A key policy test between EU and China
- Policy has done enough and competition is taking over as a driver of change
- High oil prices making EV economics favourable
- EV progress has consistently exceeded IPR forecasts
- There will be significant competition from Chinese EV producers for other auto majors. Reading the EU policy response will be key.

Which other sectors and sub-sectors will be of interest?

- Power is jurisdictional and highly regulated and utility returns will return to historical levels eventually but not before significant opportunities in some states and countries.
- Picking early leaders in heavy industry such as Steel and Cement could be advantageous
- Venture capital into leading NETS technologies such as DACCS seem a sure long term investment
- Difficult to see how forestry can't succeed in achieving major growth

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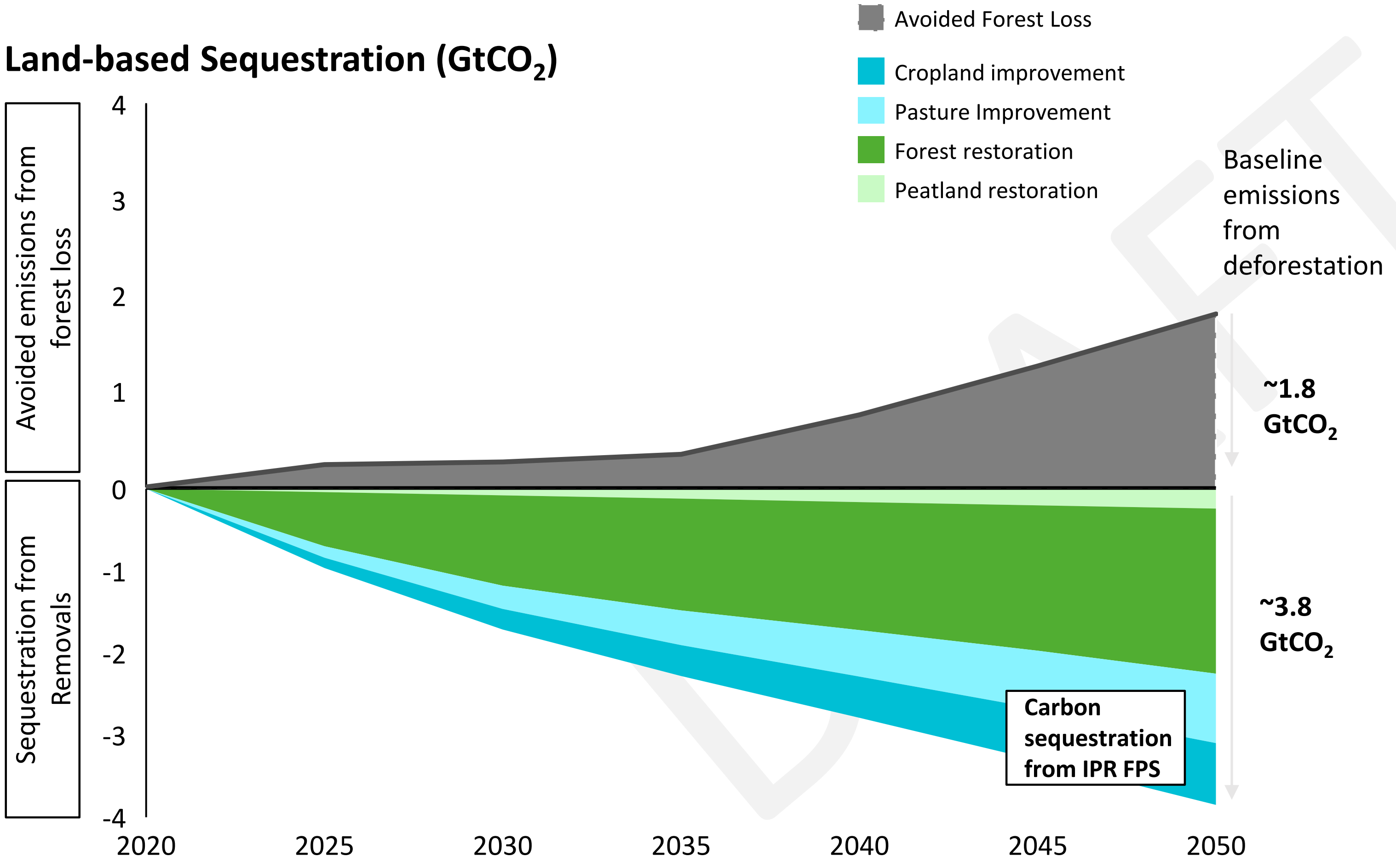
By 2050, action to halt deforestation reduces emissions by 1.8 $GtCO_2$/yr, while other policy and market incentives helps capture an additional ~3.8 $GtCO_2$/yr

Land-based Sequestration ($GtCO_2$)



Land protection reaches 30% of national land area by 2035 in North America and China, and by 2030 in Europe.

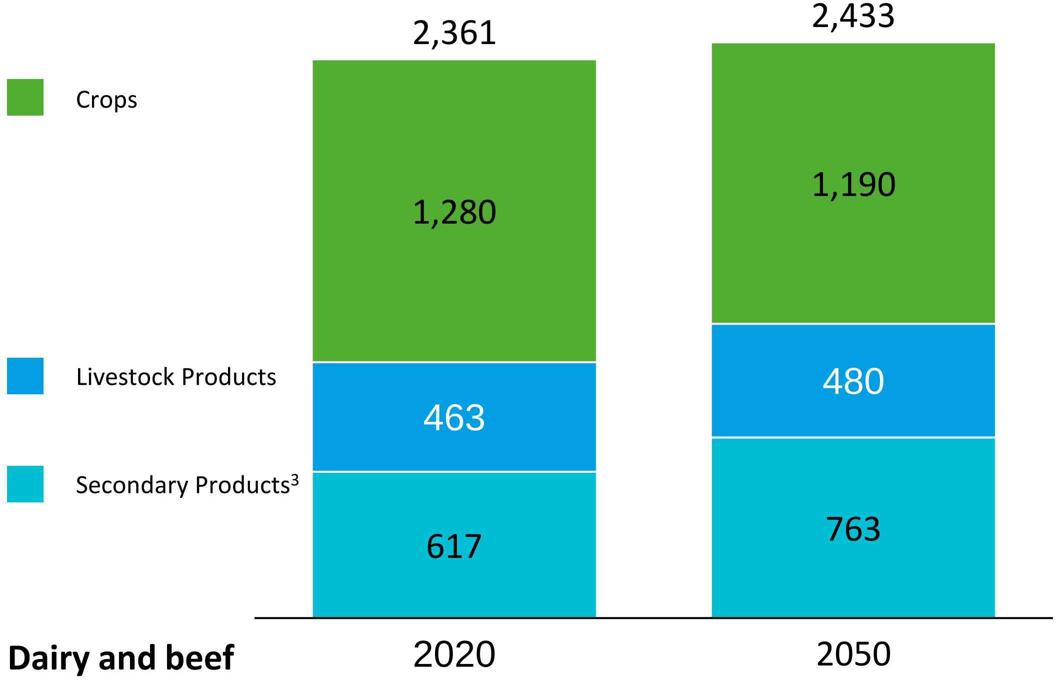
Globally, an additional 980Mha of natural vegetation is protected by 2050, stabilising biodiversity intactness to 2020 levels.

Brazil and Indonesia end effective deforestation by 2030 (each country contributes 25% of C02 emissions from land use change), with global deforestation ending by 2035.

1. The reference scenario projects the land use change we would expect to see without NBS policies that conserve forest land, improve practices to optimize sequestration, and create new ecosystems. These values represent the difference in removals and reduction between the FPS 2023 scenario and this reference scenario, as a baseline.
2. Ecosystems described here refer to major land-based and carbon-rich ecosystems (e.g. forests, peatland, mangroves, pastureland)

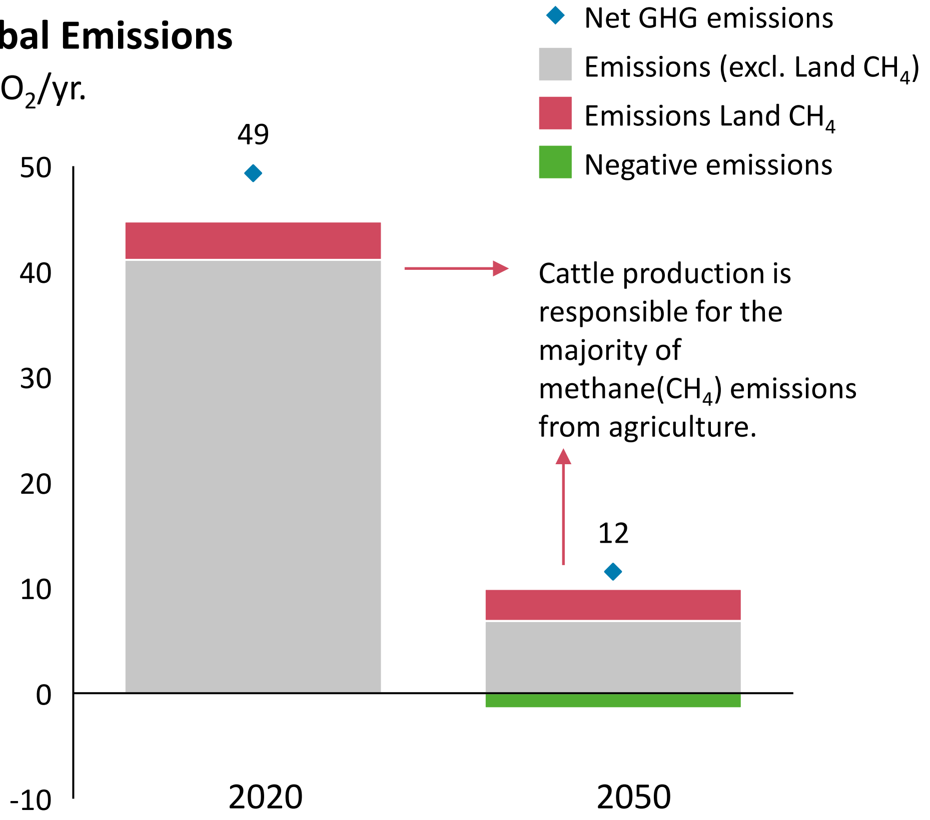
End of deforestation does not translate into end of beef supply chain emissions. Remaining at current levels, these grow from 5 to ~20% of global emissions by 2050

Global Caloric Intake[4]
Kcal/capita/day



Dairy and beef consumption, %
~12% (2020) **~10%** (2050)

Global Emissions
Gt CO_2/yr.

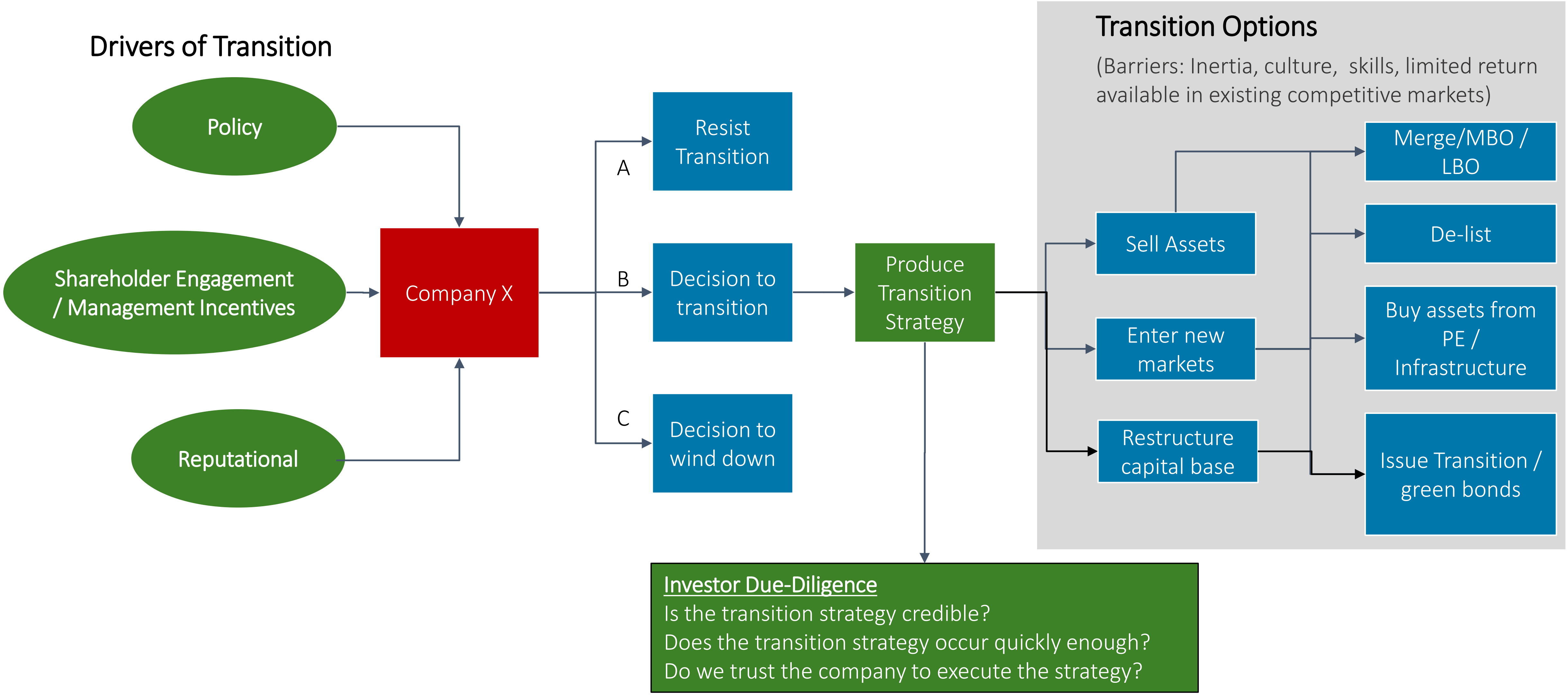


Dairy and beef as share of total global emissions[2], %
~5% (2020) **~20%** (2050)

1. Using GWP 100 emissions values
2. We use enteric fermentation as a proxy for methane emissions form ruminants, which account for 70%-80% of total methane emissions from agriculture. This excludes a portion of emissions from animal waste management. Total emissions from animal waste management (covering all livestock products, not just ruminants) account for only 5-15% of overall methane emissions from land.
3. Including sugars, alcohol, brans and other secondary products
4. Caloric intake is caloric demand net of food waste

Source: Springmann M, Wiebe K, Mason-D'Croz D, Sulser T, Rayner M, Scarborough P. Health and nutritional aspects of sustainable diet strategies and their association with environmental impacts: a global modelling analysis with country-level detail

The implications of company transition challenge



Outcomes for companies are driven by the IPR Forecast Policy levers* particularly the coal & ICE phase-out, carbon pricing & zero-carbon power

Company (anonymised)	Description	Coal phase-out	ICE sales bans	Carbon pricing	CCS and industry decarbonisation	Zero-carbon power	Energy efficiency	Land use-based greenhouse gas removal	Agriculture
A	**Utility (primarily renewable generation)**	✓	(✓)	✓	✗	✓	(✓)	✗	✗
B	**Utility (primarily coal generation)**	✓	(✓)	✓	✗	✓	(✓)	✗	✗
C	**Integrated Oil & Gas**	(✓)	✓	✓	✓	(✓)	(✓)	✗	✗

Indirect effect through demand for electricity

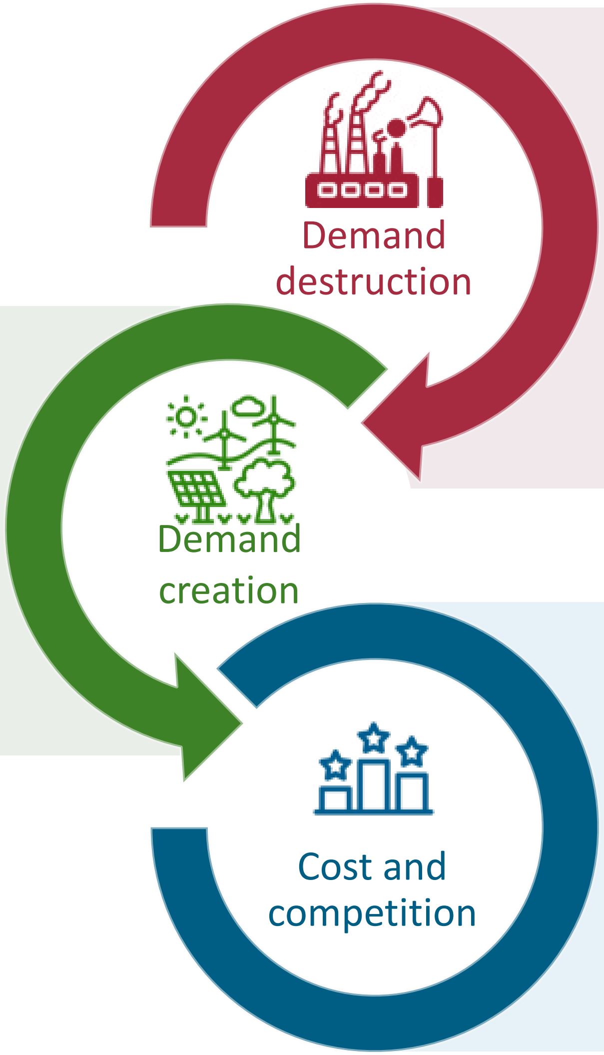
Indirect effect through demand for power

Indirect effect through demand for gas power

Indirect effect through demand

Note: Further information on the IPR Forecast Policy Levers can be found on the PRI website.
Source: Vivid Economics analysis

The value streams capture the dynamics of the transition, which affects production costs directly through carbon pricing & indirectly through demand changes



The demand destruction value stream captures the impact of the **contraction in demand for high emissions products** due to climate policy (such as ICEs and fossil fuels).

These impacts will depend on a company's sensitivity to falling **commodity prices and margins**, which will be tied to **production horizons and cost structures**

The demand creation value stream captures the effects of **increasing demand for low emissions products or inputs** (such as EVs, copper and renewable energy equipment).

These impacts will depend on **a company's current and future share of green markets,** and the extent of **overall market growth.**

Cost and competition captures the **carbon costs companies face directly from Scope 1 emissions,** and **indirectly through power prices**.

Impacts will depend on a company's **emissions intensity, abatement opportunities and capacity to pass through costs to consumers,** relative to competitors.*

Notes: * The cost pass through and competition elements also apply to costs from demand destruction and demand creation models.
Source: Vivid Economics

Applications of FPS and its Value Drivers

There have been some notable market applications of IPR FPS and its Value Drivers:

- Planetrics - McKinsey Sustainability
- Fitch - Climate Vulnerability Scores for Corporate Sectors
- Morningstar - Low Carbon Transition Ratings
- PACTA Transition Disruption Metric 
- Carbon Tracker Analysis
- CFTC
- Chevron – Climate Change Resilience Disclosures
- Tilt SME –
- Value drivers will assist future Index Creation and further ratings products

Disclaimer

This report has been created by Energy Transition Advisers and Theia Finance Labs (The Inevitable Policy Response Consortium). This report represents the Inevitable Policy Response's own selection of applicable data. The Inevitable Policy Response is solely responsible for, and this report represents, such scenario selection, all assumptions underlying such selection, and all resulting findings, and conclusions and decisions.

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