BOSTON CONSULTING GROUP

Decarbonizing Chemicals Supply Chain

29 AUGUST 2024

SCIC
SINGAPORE CHEMICAL INDUSTRY COUNCIL

Changing sustainability dynamics enforce faster transformation

NGOs and consumers largely see Chemicals as part of the problem—not the solution

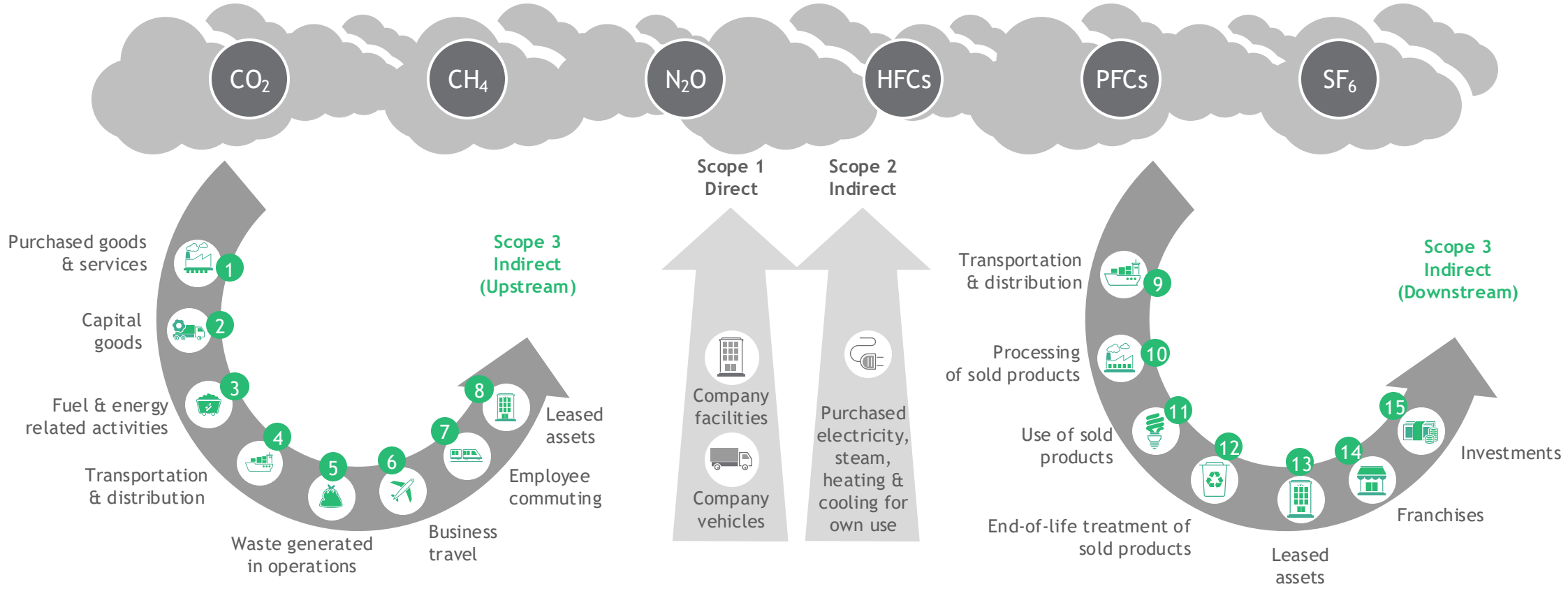
Chemicals as one of the most economically challenging sectors to decarbonize

20–30% of current chemicals business volume challenged/ at risk—already by 2030![1]

Disclosure standards & taxonomy regulations are driving ESG compliant investment

1. Impact depends on portfolio

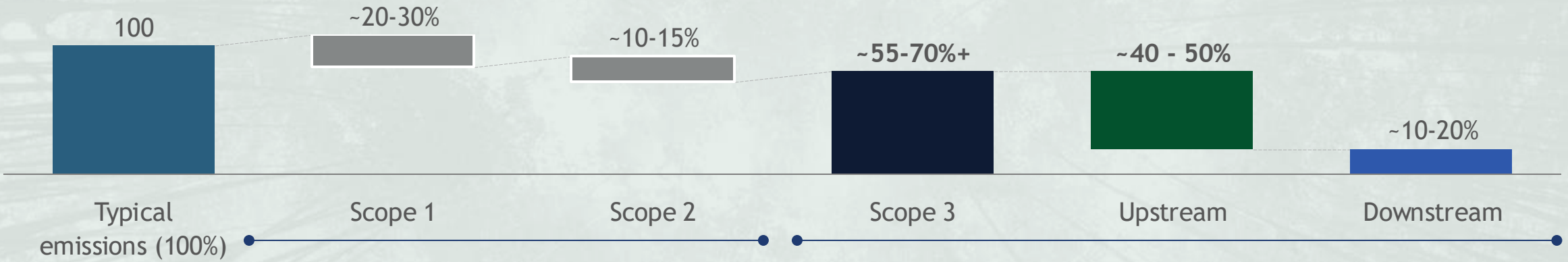
Emissions can be categorized as scope 1,2 & 3 depending on where they occur in a company's value chain



CO2, Carbon dioxide; CH4, methane; N2O, Nitrous oxide; HCFs, Hydrofluorocarbons; PFCs, Perfluorocarbons; SF6, Sulfur hexafluoride
Source: GHG Protocol

For most large companies, GHG emissions from the supply chain (upstream Scope 3) comprise the largest share of their total carbon footprint

GHG emissions breakdown for a typical large company – *varies by industry*

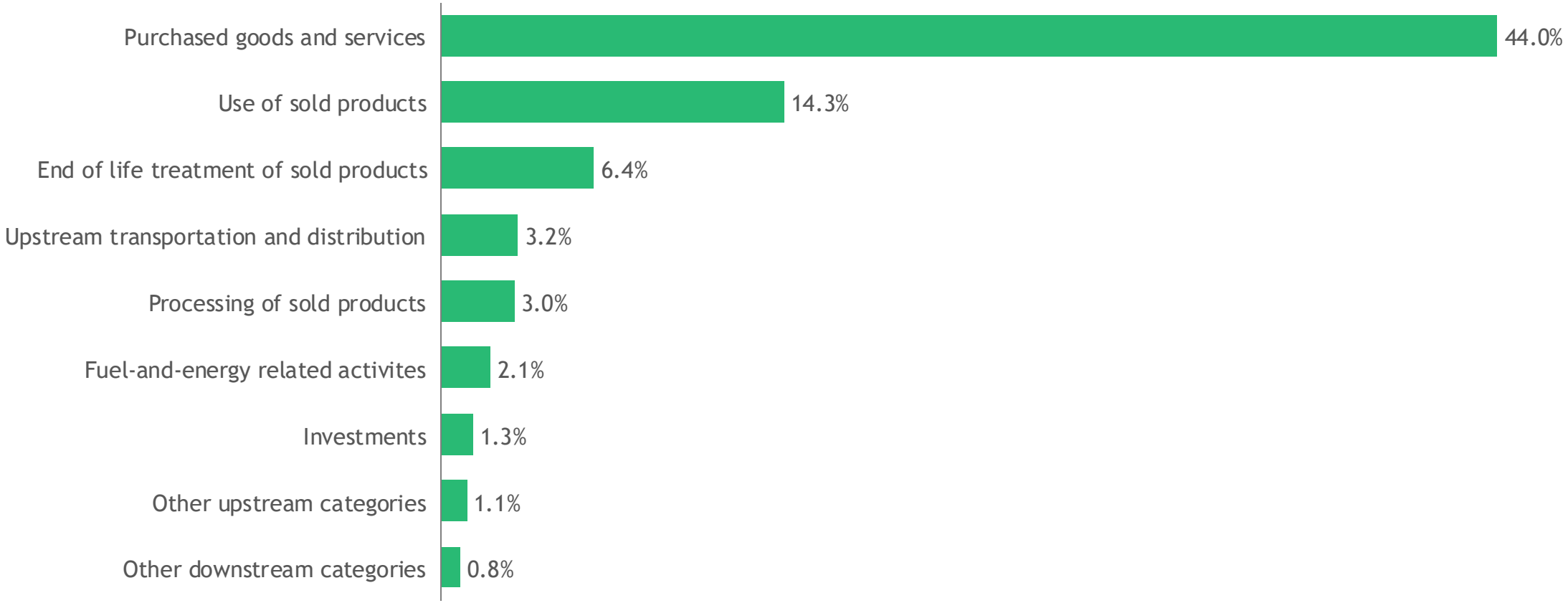


Despite the greater emission contributions from Scope 3, most corporate sustainability efforts have focused on Scopes 1 & 2 – until now

Within Scope 3, most emissions stem from upstream - requires influencing 1,000s of suppliers

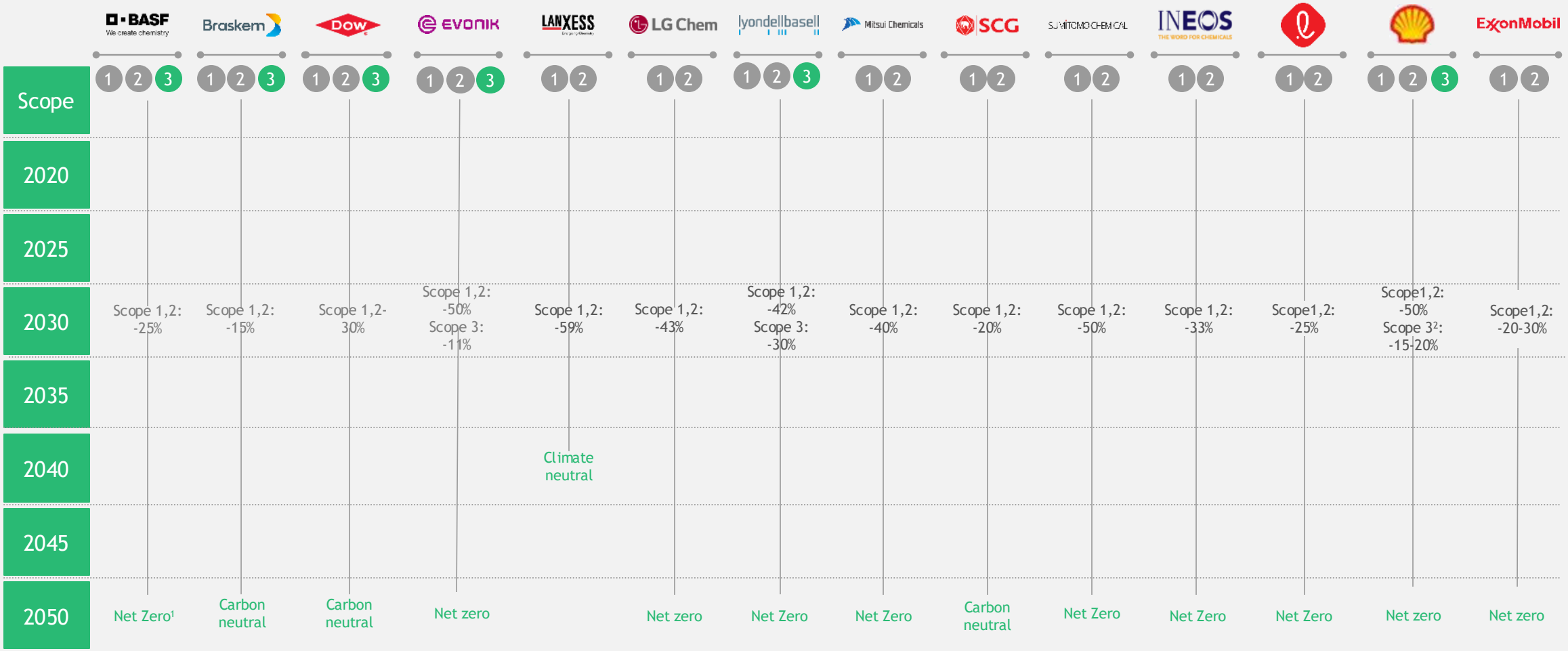
Source: BCG

Majority of scope 3 emissions for chemicals industry comes from purchased goods and services and the use of sold products



Source: CDP scope 3 report by sectors

Most chemicals companies have set scope 1 and 2 emissions targets in the short-term only focusing on scope 3 in the long-term given challenges



1. BASF only includes category 3.1 'Purchase of raw materials' in scope 3 emissions target 2. Exxon only include category 3.11 (use of oil products) in scope 3 targets Source: company reports

Industry leaders have clear sustainable procurement strategies to drive scope 3 emissions reductions

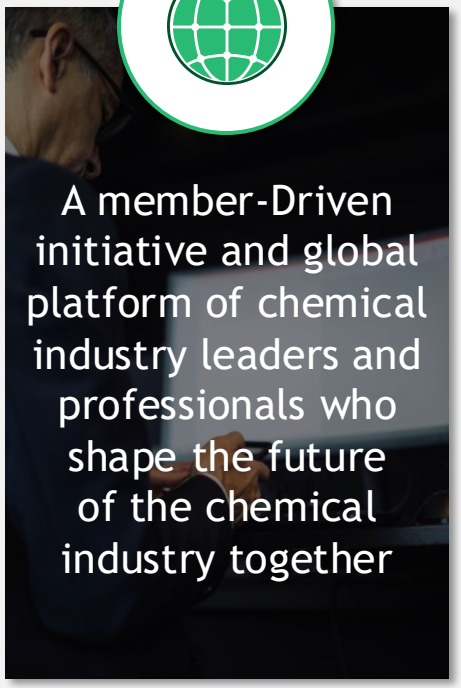
	Sustainable procurement strategy	Value created
BASF We create chemistry	• Engaged raw material suppliers in CO_2 mgmt. program: – Phase 1: transparency of CO_2 emissions – Phase 2: identified levers, target to reduce GHG emissions	• Covered 85% of relevant spend (direct suppliers) with sustainability evaluation in 2021 (target 90% by 2025) • Had 74% of suppliers improve their sustainability performance in 2021 (target 80% by 2025)
DOW	• Engaged suppliers to increase ESG transparency • Improved by innovation and digitalization to low carbon, circular, recyclable products, services, and next-gen technology	• Optimized transportation (NAMR): est. 8,000 tCO_2e reduction • Material swapped with industry partner: est. 9,100 tCO_2e reduction
EASTMAN	• Became a member of Together for Sustainability (TfS)—the chemical initiative for sustainable supply chain • Assessed supply base using the TfS assessment	• Invited 435 suppliers to participate in TfS assessments; 174 of them completed the assessment and obtained the score
BAYER	• Developed indicators to monitor progress in sustainability • Ensured strategically important suppliers have a better rating (say at least 45 of 100) in an audit result	• Assessed 802 suppliers on sustainability in 2021 • Audited 77 suppliers on sustainability in 2021

Source: Company websites, BCG case experience

TOGETHER FOR SUSTAINABILITY

Several industry leaders are members of TfS[1]

Founded by CPOs of member companies, TfS[1] delivers the de facto global standard for ESG performance of chemical supply chains



TfS[1] member companies

AdvanSix, AkzoNobel, Archroma, Arkema, azelis, BASF, Bayer, Brenntag, CABB, Chemours, Clariant, Corteva, covestro, Croda, Dow, DSM, Eastman, Evonik, Henkel, ICL, iff, Kraton, Lanxess, Lenzing, lyondellbasell, Merck, OMV, Semperit, Sennics, Solvay, syngenta, UPM, Wacker, Wanhua

Audit for one is audit for all—helps organizations expedite the supplier assessment process

1. TfS is Together for Sustainability initiative
Source: TfS organization website, BCG case experience

“To do list” for sustainable procurement & supply chains

Create transparency

Quantify baseline across all scopes Identify products with highest footprint Exchange data with suppliers

Set ambitious targets

Create targets based on

- Science
- Levers
- Economics (abatement curve)
- Peers
- B2B Customers

Bring down own footprint[1]

Increase efficiency Switch to lower emission tech Increase use of renewable power Switch fuel sources Employ circularity Capture/Offset

Design for Co_2

Research new designs Reduce parts Seek secondary or new materials Optimize supply chain

Engage suppliers

Reflect goals in category strategies Define & prioritize category- & supplier-specific levers Push reduction initiatives with suppliers & x-fct. teams

Build ecosystems

Catalyze sector initiatives Earn certifications Lead buying groups

7 Enable your Organization

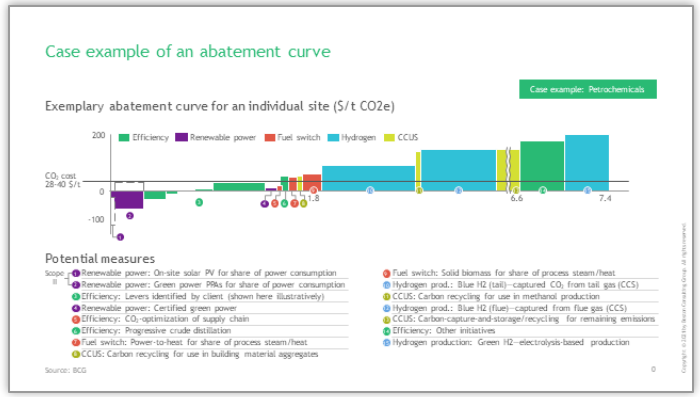
CO_2 governance and steering | Public facing communication | Go-to-market communication | Embed new process into op model

1. Primarily Scope 1&2 emissions for owned manufacturing facilities, warehouses, etc.; framework can be utilized for Scope 3 emissions from outsourced or contract manufacturing

Source: BCG analysis

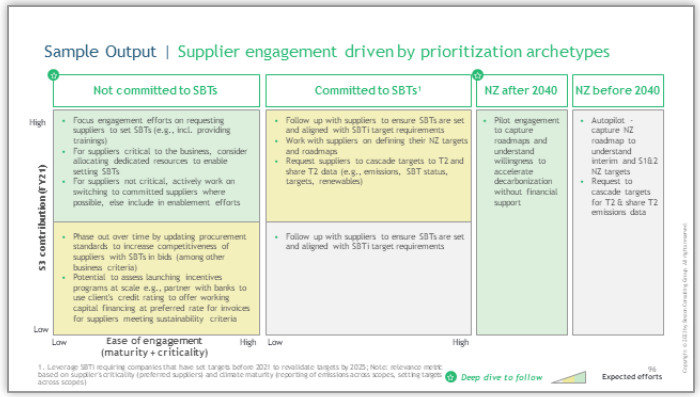
MACC curve and supplier segmentation are critical tools to support effective engagement with value chain

Abatement curves



- Identify hotspots driving largest share of emissions across the business
- Contextualize overall expected cost and identify where to prioritize (e.g. which levers or supplier switches to pursue first)
- Understand highest-impact emissions reduction levers in hotspots to inform supply chain engagement

Supplier segmentation

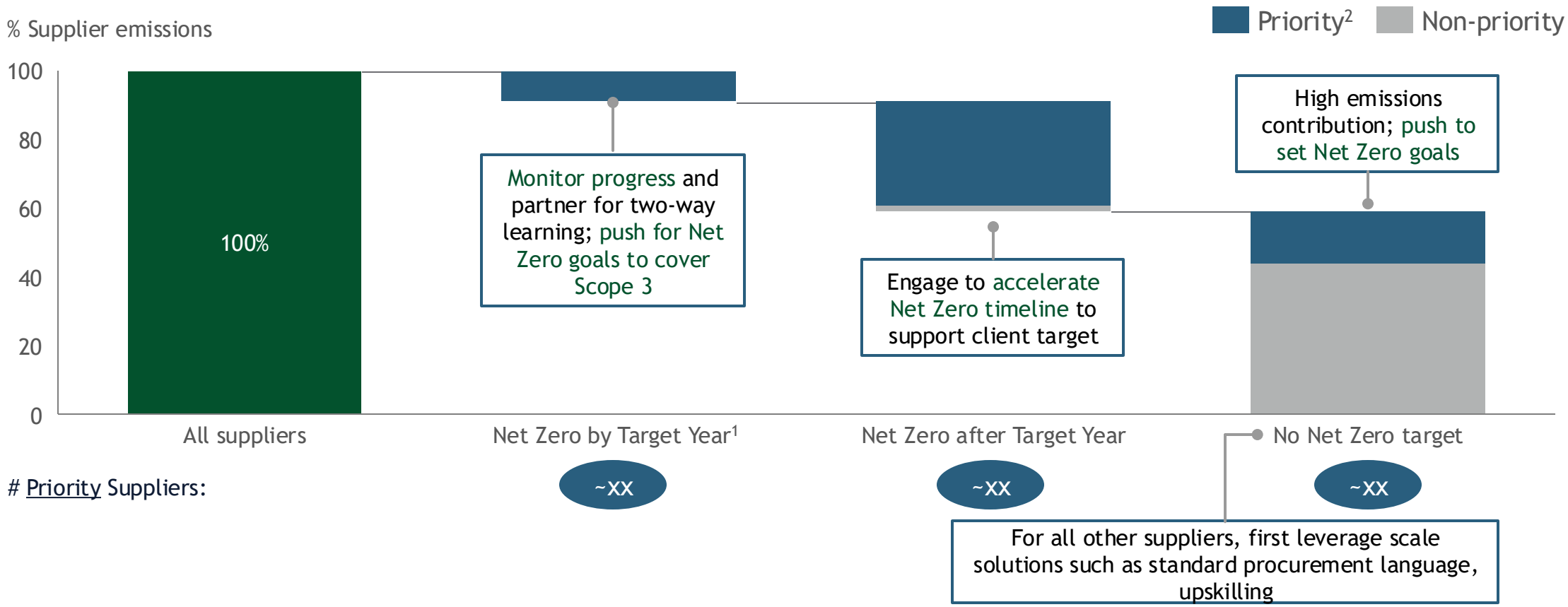


- Identify top suppliers driving emissions to focus engagement, and understand their starting point
- Develop relevant engagement tactics for key suppliers
- Identify timelines for engagement (e.g. aligned with key contract renewals)
- Prioritize where to embed climate in procurement process/prioritize internal resources

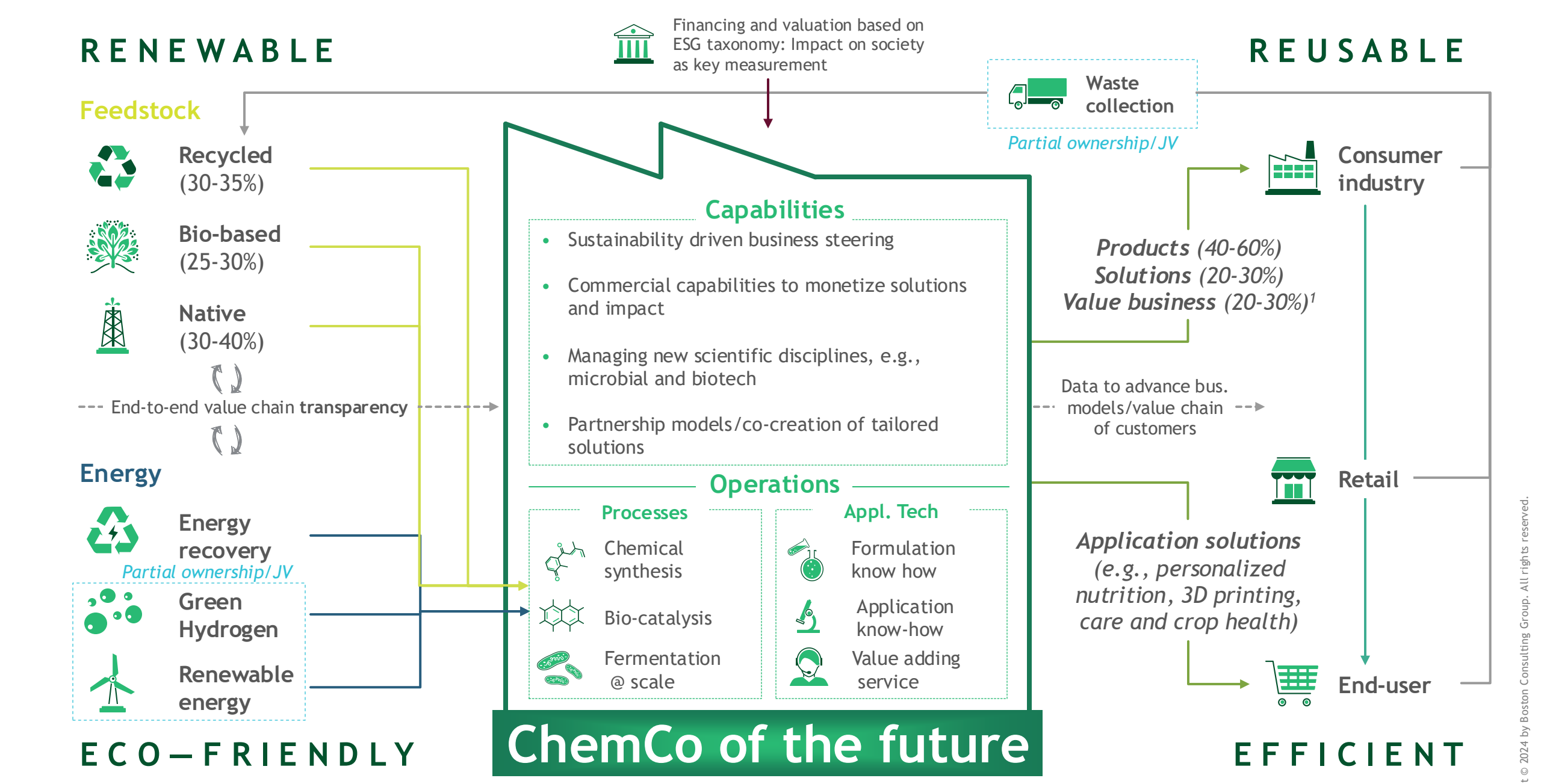
Supplier prioritization | Identify set of suppliers to prioritize for first wave of active engagement, driving majority of supplier emissions

Illustrative

Distribution of priority suppliers for active engagement



1. Net-Zero as defined by reporting company-may not cover 90% reduction across all three scopes 2. High-impact defined as contributing >5kt CO2e to emissions footprint



1. Lower volume but higher value offering though selling defined output at customer level (output guarantee)

Source: BCG

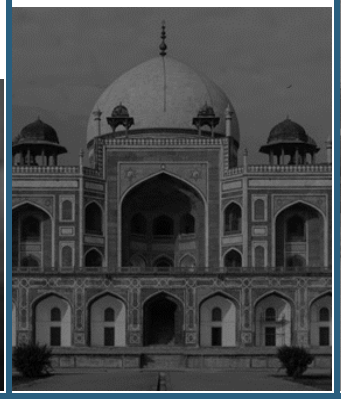
Those who act early will experience 5-15 years of competitive advantage

Drive Consumption decision

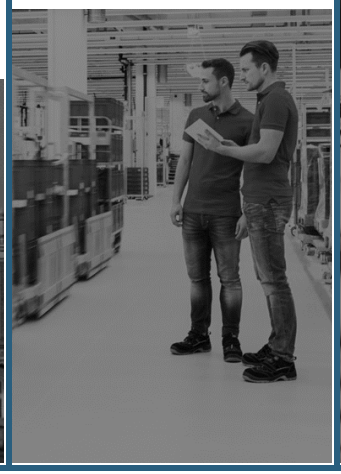
Fuel market Expansion, new Business fields

Increase Employer attractiveness

Reduce Disruption from regulators or competitors

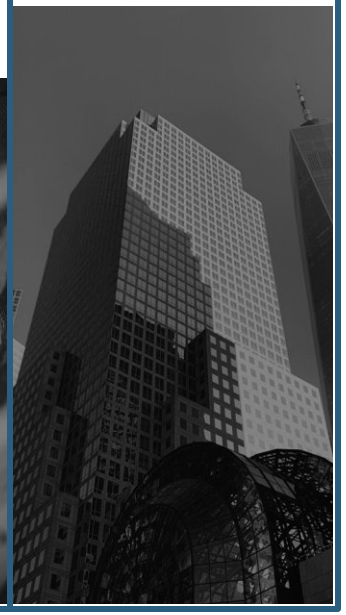


Lowers operational cost



Lower cost of capital, better financing access

Drive higher Market valuations



BCG's references in advancing the world to a sustainable place

Consulting for
Corporations

Selected examples

BOREALIS Keep Discovering
REPSOL
ExxonMobil Chemical
SEKISUI
Ørsted
OMV
indigo
AngloAmerican
sasol

120+ climate strategy projects across sectors (scope 1, 2, 3)

600+ TSI sustainability projects

50+ circular economy projects across sectors and value chains

Partnerships with
Government & associations

WORLD ECONOMIC FORUM
wbcsd
WWF
COP 26 GLASGOW UNITED NATIONS CLIMATE CHANGE CONFERENCE
B20
OGCI OIL AND GAS CLIMATE INITIATIVE
ELLEN MACARTHUR FOUNDATION
ALLIANCE TO END PLASTIC WASTE
FACTOR10
BDI
CEMBUREAU The European Cement Association
value balancing alliance

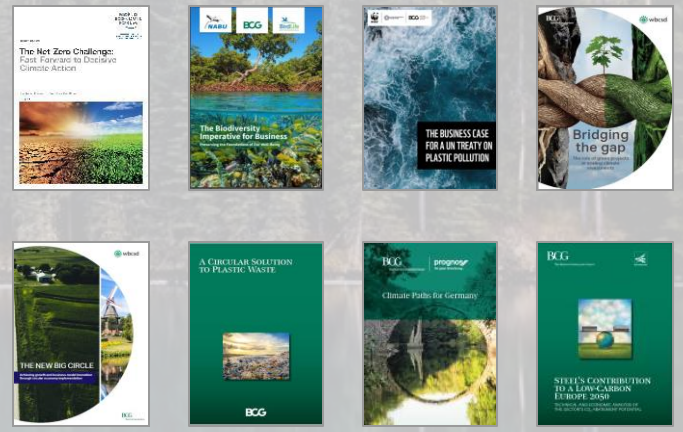
10+ net-zero country roadmaps

15+ sector roadmaps

+5 national/regional waste systems and CE policies designed

Partnerships with lead associations on most urgent sustainability topics

Independent
Thought leadership



20+ thought leadership reports on addressing climate and circular challenge

Experts and trusted partner to government committees and coalitions

Catalyst for cross-sector for partnership mobilization

Source: BCG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