TPT Transition Plan Taskforce

Sector Summary

APRIL 2024

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Purpose

This document provides an overview of transition plan guidance for 30 financial and real economy sectors. It is a practical guide to give preparers and users of transition plans a glance of key information and guidance sources for each sector. Each of the 30 sectors in this guide has a short 'Sector Summary'. This summary includes the sector's recognised decarbonisation levers, metrics & targets, and key sources of guidance for a transition plan in that sector. All information within the Sector Summary was drawn from existing guidance sources.

Seven sectors in this document do not have a Sector Summary as coverage of this guidance is provided via deep-dive guidance produced by the Transition Plan Taskforce (TPT). These sectors are: Asset Managers, Asset Owners, Banks, Electric Utilities & Power Generators, Food & Beverage, Metals & Mining, and Oil & Gas.

This document was written by the TPT Secretariat. Each 'Sector Summary' was reviewed by users and preparers of sustainability disclosures from that sector, including financial institutions, corporates, civil society, academic experts, and government officials.

The sector classification used aligns with existing standards. For real-economy sectors, the guidance uses the SASB Sustainability Industry Classification System (SICS), as used by the ISSB. For financial sectors, the guidance uses the sector classification used by the Taskforce on Climate-related Financial Disclosure (TCFD) and the Glasgow Financial Alliance for Net Zero (GFANZ).

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Members of the TPT Steering Group and Delivery Group are listed on the TPT website.

The TPT would also like to thank the members of the TPT Secretariat Sector Guidance team:

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About the TPT

The United Kingdom (UK) has set itself ambitious and legally binding targets to cut greenhouse gas (GHG) emissions to net zero by 2050, with binding interim targets. The UK has also pledged at UN climate negotiations to cut emissions by at least 68% by 2030.[1]

In October 2021, the UK government published the Greening Finance Roadmap, signalling that it intends to strengthen new and existing sustainability reporting requirements for companies, including publication of climate transition plans.

At COP26, the UK Chancellor further committed to work towards the UK becoming the world's first Net Zero-aligned Financial Centre and ensuring that financial flows shift towards supporting a net zero economy. The Chancellor also set out that the UK will move towards making publication of transition plans mandatory.

The Transition Plan Taskforce (TPT) was launched by HM Treasury in March 2022 with a mandate to bring together leaders from industry, academia, and regulators to develop good practice for transition plan disclosures for finance and the real economy. In addition, the TPT has been tasked to engage with non-UK governments and regulatory networks to support conversations on how to build common baselines and principles for transition planning. This has included the Financial Stability Board (FSB), the International Organization of Securities Commissions (IOSCO) and the Network for Greening the Financial System (NGFS), as well as the G7, G20, UNFCCC, and the Coalition of Finance Ministers for Climate Action. The TPT's Disclosure Framework complements, and builds on, the ISSB's final Standards IFRS S1[2] and S2[3] and draws on GFANZ's framework and guidance for credible, comprehensive, and comparable net zero transition planning.

In the 2023 Green Finance Strategy, the UK government committed to consult on introducing requirements for the UK's largest companies to disclose their transition plans if they have them.[4] In addition, the Financial Conduct Authority (FCA) has signalled its intention to consult on strengthening requirements for transition plan disclosures in line with the TPT Disclosure Framework, alongside its consultation on implementing UK-endorsed ISSB Standards.[5]

In January 2024 the TPT's mandate was extended to 31 July 2024, with the possibility of a further 3-month extension in order to contribute to the work of the new Transition Finance Market Review.

1. See UK Climate Change Act 2008 and the UK's Nationally Determined Contribution, as updated September 2022
2. International Financial Reporting Standards (IFRS), IFRS S1 General Requirements for Disclosure of Sustainability-related Financial Information, 2023.
3. International Financial Reporting Standards (IFRS), IFRS S2 Climate-related Disclosures, 2023.
4. UK government, Mobilising green investment: 2023 green finance strategy, 2023
5. Financial Conduct Authority (FCA), Primary Market Bulletin 45, 2023

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The TPT's Sector Guidance

In October 2023, the TPT published the final Disclosure Framework and a suite of Implementation Guidance. Preparers of transition plans should first read these products.

The TPT's Terms of Reference also gave the TPT a mandate to produce sectoral guidance for both financial sector and real economy companies. To deliver this the TPT has published two types of sector guidance to complement the TPT Disclosure Framework: the TPT Sector Summary (this document) and the TPT Sector Deep Dives.

The TPT Sector Summary was published online in October 2023 and was open for comment until 24 November 2023. This Guidance provides a high-level overview of decarbonisation levers and metrics & targets for an extensive number of financial and real economy sectors, leveraging existing third-party guidance. This document is the final version of this Guidance.

The TPT Sector Deep Dive Guidance provides sector-specific guidance for preparers to interpret the Disclosure Framework for a small number of sectors. In its Status Update in July 2023, the TPT confirmed these sectors as:

- Asset Managers;
- Asset Owners;
- Banks;
- Electric Utilities & Power Generators;
- Food & Beverage;
- Metals & Mining; and
- Oil & Gas.

These sectors were chosen given each sector's greenhouse gas emissions, its need for (or its provision of) transition finance in the UK context, and the quality of existing guidance available in the market. In making its selection the TPT sought to identify sectors for which additional guidance would be beneficial in kick- starting transition plan disclosures, while also identifying opportunities to leverage existing sectoral guidance and consolidate it into the context of the Disclosure Framework.

In November 2023, the TPT published the Sector Deep Dive Guidance for consultation. The consultation ran until 29 December 2023. The final versions of the Sector Deep Dive Guidance were published in April 2024.

The materials produced by the TPT reflect a synthesis of best practice at the time of publication. They do not constitute financial, legal, or other professional advice and should not be relied upon as such. Nothing in the Sector Summary is intended to override, substitute, or alter existing legal or regulatory requirements, including, without limitation, duties of the entity's directors and senior managers, and the entity's constitutional documents. Nothing in Sector Summary should be understood to require the disclosure of commercially sensitive information.

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How this Guidance fits within the suite of TPT Guidance

In October 2023, the TPT published its final Disclosure Framework, as part of a wider suite of Implementation Guidance, including:

- guidance to help preparers explore the disclosure recommendations, including case studies;
- guidance on the transition planning cycle, including case studies;
- technical mapping to the final Climate-Related Disclosures standard (IFRS S2) issued by the International Sustainability Standards Board (ISSB) and the TCFD's Recommendation and Guidance;
- a comparison of the TPT Disclosure Framework to the European Sustainability Reporting Standards (ESRS); and
- Legal considerations for preparers of transition plans using the TPT Disclosure Framework.

On 9 April 2024, the TPT published the suite of final Sector Deep Dive Guidance alongside:

- Opportunities and challenges relating to the use of private sector transition plans in emerging markets and developing economies; and
- the final Transition Planning Cycle Guidance document which includes new content on adaptation.

The TPT Working Groups on Adaptation, Just Transition and Nature, and the TPT Advisory Group on SMEs, also published advisory papers on 9 April 2024. These papers are independent of the core suite of TPT documents:

- Building Climate-ready Transition Plans: Including adaptation and resilience for comprehensive Transition Planning approaches, an advisory paper from the TPT Adaptation Working Group;
- The Future of Nature in Transition Planning, an advisory paper from the TPT Nature Working Group;
- Putting people at the heart of transition plans: key steps and metrics for issuers, an advisory paper from the Just Transition Working Group; and
- Considerations on SMEs and transition plans, an advisory paper from the SME Advisory Group.

The Disclosure Framework contains the foundational disclosure recommendations which apply to all sectors. It is designed to complement, and build on, the ISSB's final Standards IFRS S1[6] and S2,[7] as well as drawing on GFANZ's framework and guidance for credible, comprehensive, and comparable net zero transition planning and uses the same core components and structure. This means that the TPT Framework and GFANZ are both part of an aligned, consistent effort to support the development of private sector transition plans.

Preparers should first read the Disclosure Framework to understand the TPT's key concepts.

6. International Financial Reporting Standards (IFRS), IFRS S1 General Requirements for Disclosure of Sustainability-related Financial Information, 2023
7. International Financial Reporting Standards (IFRS), IFRS S2 Climate-related Disclosures, 2023

Photo Andrew Coelho, Unsplash.com

Figure 1: The TPT Disclosure Framework.

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The TPT's Sector Summary complements the TPT Disclosure Framework and supports preparers and users to navigate transition plans across the economy. Each of the 30 sectors in the guidance has a short 'Sector Summary', which includes an overview of the sector's decarbonisation levers, metrics & targets, and key sources of guidance for a transition plan in that sector.

All information within the Sector Summary was drawn from existing third-party guidance and was reviewed by users and preparers of sustainability disclosures from that sector, including financial institutions, corporates, civil society, and academia.

The hierarchy of TPT guidance within the overall transition plan disclosures landscape is set out in Figure 2. In jurisdictions where ISSB Standards are to be adopted, preparers will likely begin by consulting IFRS S1[8] and S2[9] for wider climate and sustainability disclosures. IFRS S2 contains disclosure requirements relevant to transition planning. The TPT Disclosure Framework then complements, and builds on, ISSB. The TPT's suite of Implementation Guidance, as well as transition plan guidance materials published by GFANZ, may further help preparers develop their plans.

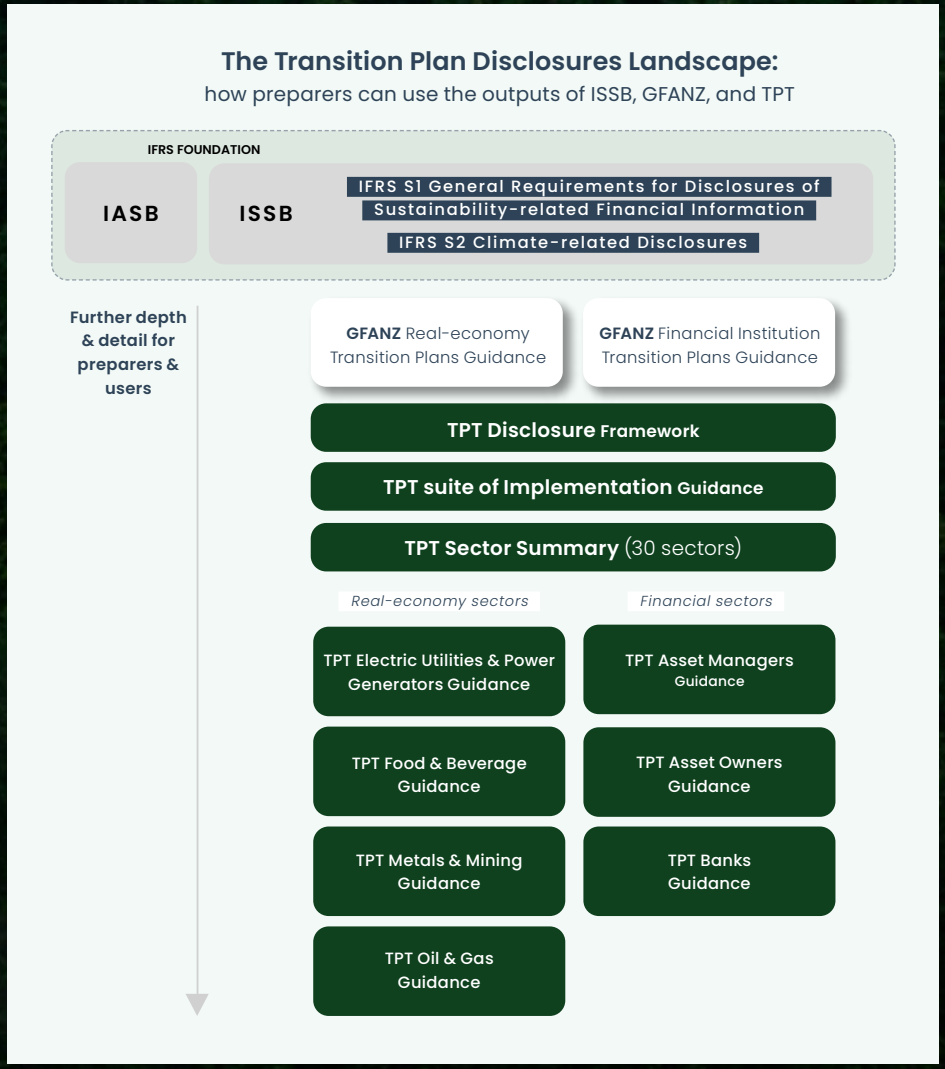

Figure 2: The Transition Plan Disclosures Landscape

8. International Financial Reporting Standards (IFRS), IFRS S1 General Requirements for Disclosure of Sustainability-related Financial Information, 2023
9. International Financial Reporting Standards (IFRS), IFRS S2 Climate-related Disclosures, 2023

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Sector Classification

The TPT's Sector Guidance is comprised of the TPT Sector Deep Dive Guidance and the TPT Sector Summary. This suite of sector guidance covers an extensive number of industries, using the SASB SICS system for real economy sectors, and the categorisation set out by the TCFD and GFANZ for financial sectors.

For real economy sectors, the SASB SICS was adopted to enable alignment with the ISSB Standards, which organises its IFRS S2 industry-based guidance according to the SASB SICS. The industry-based guidance associated with IFRS S2 is published in separate industry-based volumes, labelled as Volumes 1–68 of the *Industry-based Guidance on implementing Climate-related Disclosures.*[10]
The SASB SICS includes 11 sectors and 77 industries. The TPT Sector Guidance provides coverage of 67 of the SASB SICS industries across the Sector Summary Guidance and seven pieces of Deep Dive Guidance. In developing its Sector Guidance, the TPT aggregated the industries into sub-sectors where it was deemed that this level of granularity better reflected existing guidance available and the emissions impact of the industries.

For financial sectors, the TPT uses the categorisation set out by the TCFD and GFANZ.

Entities should use the TPT's Sector Guidance as appropriate to their specific business model. Entities whose operations are integrated horizontally across industries, or vertically through the value chain, may use more than one piece of TPT Sector Guidance. A mapping of the TPT Sector Guidance to the SASB SICS can be found within **Appendix 1: Mapping of TPT Sector Guidance to the SASB SICS.**

10. International Financial Reporting Standards (IFRS), IFRS S2: Industry-based Guidance on implementing Climate-related Disclosures, 2023

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Using the TPT Sector Summary

The TPT Disclosure Framework applies three guiding principles of **Ambition, Action,** and **Accountability.** The Framework is organised across five Elements, as shown in Figure 1, which are consistent with the transition planning components proposed by GFANZ in its guidance.

The TPT's Sector Summary complements the TPT Disclosure Framework and supports preparers and users to navigate transition plans across the economy.

Each of the sectors in the guidance has a short 'Sector Summary', which includes an overview of the sector's decarbonisation levers, metrics & targets, and key sources of guidance for a transition plan in that sector.

All information within the Sector Summary was drawn from existing third-party guidance and was reviewed by users and preparers of sustainability disclosures from that sector, including financial institutions, corporates, civil society, and academia.

The decarbonisation levers included within the Sector Summary may inform an entity's disclosures within the Implementation Strategy and Engagement Strategy elements of the TPT Disclosure Framework, which underpin the **Action** principle.

The metrics and targets included within the Sector Summary may inform an entity's disclosures within the Metrics & Targets element of the TPT Disclosure Framework, comprising part of the **Accountability** principle.

The key sources of guidance listed that were used in the development of the Sector Summary are listed within each sector. An entity in the sector may consider these resources when developing its transition plan.

The information included within the Sector Summary is not intended to be comprehensive. An entity may consider disclosing other information where deemed material to the decisions of primary users of the entity's general purpose financial reports.

CONSUMER GOODS

Apparel, Accessories & Footwear

Consumer Discretionary Products

Consumer Goods Retail

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Apparel, Accessories & Footwear

Apparel, Accessories & Footwear: Entities involved in the design, manufacturing, wholesaling and retailing of various products, including adult and children's clothing, handbags, jewellery, watches, and footwear. Products are manufactured primarily by vendors in emerging markets, thereby allowing entities in the industry to focus on design, wholesaling, marketing, supply chain management and retail activities.

Photo Roberto Sorin, Pexels

Recognised decarbonisation levers	Governance, engagement, business and operational metrics and targets	GHG metrics and targets
1. **Improve material mixes and reduce manufacturing emissions:**[1,3,4,6,11] • reduce the amount of material in a given product (e.g. fewer grams of cotton per t-shirt); • replace a material with a lower GHG emissions alternative (e.g. virgin polyester with rPoly from bottles or textiles); • shift materials sourcing from higher carbon sources to lower ones (e.g. polyester made with renewable energy, leather sourced from lower-impact ranches); • design products for longer life; • invest in innovative low-GHG emissions materials (e.g. recycled/plant-based leather and lab-grown alternatives); • minimise manufacturing waste by elevating designer education and employing modernised cutting machines; and	• raw materials sourcing: (1) amount of priority raw materials purchased, by material, and (2) amount of each priority raw material that is certified to a third-party environmental or social standard, by standard;[5] • number of (1) Tier 1 suppliers and (2) suppliers beyond Tier 1;[5] • percentage of suppliers, by spend or emissions, that have a Science Based Target;[7] • water footprint of new products sold;[11] • metrics and targets to reduce overproduction;[6] • percentage reduction in e-commerce returns;[6] • recycled content in corrugated boxes;[6] • recycled content in polybags;[6] • water consumption by material category;[9] • water scarcity by material category.[9]	• GHG emissions by product type (e.g. apparel, home textiles and footwear) and material category (e.g. synthetic, animal, plant-based and cellulosic);[9] • relevant Scope 3 categories may include: category 1 purchased goods and services, and category 11 use of sold products;[7] and • forest, land and agriculture (FLAG) metrics and targets (emissions from land use change and land management, and carbon removals and storage).[8]

- procure zero GHG emissions electricity and support decarbonisation of the grid.

2. **Enhance recyclability and boost recycling rates:**[1,8,11,12]

- adopt more circular models (e.g. clothes rental, repair, and resale);
- reduce packaging and utilise low-GHG emissions packaging materials;
- bolster recycling initiatives and collection points;
- minimise incineration without recovery and landfill, driving the industry towards a closed-loop-recycling (CLR) operating model; and
- collaborate with downstream partners to foster innovations in chemical recycling of long-chain polymers.

3. **Electrify fleet and promote low-emissions fuels for last-mile delivery:**[2,3,6]

- increase electric vehicle use between warehouses and delivery, supplemented with shared charging infrastructures; and
- optimise routes with EV charging redesign and enhanced driver training.

4. **Decarbonise the supply chain:**[4,6,11]

- procure recycled or certified lower GHG emissions raw materials (e.g. leather, polyester and cotton); and
- engage with suppliers and introduce clauses in contracts on land management emissions (e.g. from soil degradation linked to cotton cultivation) and land-use change emissions (deforestation linked with leather).

Apparel, Accessories & Footwear resources

1. British Fashion Council, The Circular Fashion Ecosystem: Blueprint for the Future, 2021.
2. British Retail Consortium, Cutting Carbon in the Final Mile, 2022.
3. Ellen MacArthur Foundation, A new textiles economy: Redesigning fashion's future, 2017.
4. Environmental Audit Committee, UK Parliament, Fixing Fashion: Clothing Consumption and Sustainability, 2019.
5. International Financial Reporting Standards (IFRS), IFRS S2: Industry-based Guidance on implementing Climate-related Disclosures: Volume 1 – Apparel, Accessories & Footwear, 2023.
6. McKinsey & Company, Fashion on Climate, 2020.
7. Science Based Targets initiative (SBTi), Apparel and Footwear Sector: Science-Based Targets Guidance, 2022.
8. Science Based Targets initiative (SBTi), Forest, Land and Agriculture Science-Based Target-setting Guidance: Version 1.1, 2022.
9. Textile Exchange, Climate+ Dashboard, website as of 2024.
10. United Nations Framework Convention on Climate Change and Partnership for Sustainable Textiles, Fashion Industry Charter for Climate Action: Playbook for Climate Action, 2020.
11. WRAP, Textiles 2030 Roadmap, 2021.

Consumer Discretionary Products

Consumer Discretionary Products: Entities in the Appliance Manufacturing, Building Products & Furnishings, and Household & Personal Products industries.

- **Appliance Manufacturing** Entities involved in the design and manufacturing of household appliances and hand tools. The industry sells and manufactures products around the world, primarily selling products to consumers through retail locations.
- **Building Products & Furnishings** Entities involved in the design and manufacturing of home improvement products, home and office furnishings, and structural wood building materials. The industry's products include flooring, ceiling tiles, home and office furniture and fixtures, wood trusses, plywood, panelling, and lumber.
- **Household & Personal Products** Entities that manufacture a wide range of goods for personal and commercial consumption, including cosmetics, household and industrial cleaning supplies, soaps and detergents, sanitary paper products, household batteries, razors, and kitchen utensils. Household and personal products companies operate globally and typically sell their products to mass merchants, grocery stores, membership club stores, drug stores, high-frequency stores, distributors, and e-commerce retailers.

Photo Avery Klein, Unsplash.com

Recognised decarbonisation levers	Governance, engagement, business and operational metrics and targets	GHG metrics and targets

1. **Enhance energy efficiency and electrify manufacturing processes:**[3,8]
• reduce energy consumption in both the production and use phases of products (e.g. reducing consumption or reducing standby power in household appliances);
• transition to renewable electricity sources; and
• switch to electric-powered machinery; and adopt more energy-efficient machinery.
	• product lifecycle environmental impacts: percentage of eligible products by revenue certified to an energy efficiency certification;[5]
	• product lifecycle environmental impacts: percentage of eligible products by revenue certified to an environmental product lifecycle standard;[5]
	• percentage of total sales are attributable to commodities linked to climate change risks (e.g. timber, cotton, leather, soy, palm oil);[3,8]
	• percentage deforestation-linked primary commodities sourced as deforestation & conversion free (by volume);[3,8]
		• as Consumer Discretionary Products is a heterogeneous sector, different emission intensity metrics will be applicable to different activities of the entities (e.g. buildings (gCO_2e/m^2), and logistics (gCO_2e/tonne-km);[2,8]
		• scope 1 HFC emissions in tCO_2e (e.g. from refrigerants and aerosols);[2] and
		• relevant Scope 3 categories may include:
		  ○ category 1: purchased goods and services;
		  ○ category 4: upstream transportation and distribution;

2. **Improve material mixes:**[3,8]

- prioritise the use of materials with a lower carbon footprint (e.g. sustainably sourced wood for furniture and building materials);
- streamline manufacturing processes to minimise waste (e.g. CNC machines in furniture production);
- reduce product volume and weight (e.g. compact, and multi-use household appliances or modular furniture designs); and
- reduce the use of hazardous chemicals.

3. **Electrify fleet & promote low-emissions fuels for last-mile delivery:**[3,8]

- increase electric vehicles, including for transport between warehouses and product delivery;
- support the development of shared charging infrastructure;
- advocate for the widespread adoption of cost, low-GHG emissions fuels; and
- optimise routes, taking into account EV charging infrastructure.

4. **Promote circular product design & waste management:**[3,6,7]

- increase the use of recyclable and recycled materials;
- improve product design for easy disassembly;
- increase waste recycling rates;
- minimise incineration without recovery and landfill disposal, steering the industry towards a more closed-loop model; and
- collaborate with downstream and upstream partners to boost innovations in recycling or repurposing of product components.

- percentage of biodegradable, compostable, recyclable, or reusable packaging;[9]
- percentage of recycled or sustainably sourced materials in packaging;[9]
- percentage of post-consumer recycled materials in packaging[4]
- annual production;[5]
- area of manufacturing facilities;[7]
- energy management in manufacturing: (1) total energy consumed, (2) percentage grid electricity and (3) percentage renewable;[6]
- product lifecycle environmental impacts: (1) weight of end-of-life material recovered, (2) percentage of recovered materials recycled;[6]
- wood supply chain management: (1) total weight of wood fibre materials purchased, (2) percentage from third party certified forestlands, (3) percentage by standard and (4) percentage certified to other wood fibre standards, (5) percentage by standard;[6]
- water management: (1) total water withdrawn, (2) total water consumed; percentage of each in regions with High or Extremely High Baseline Water Stress;[7]
- environmental & social impacts of palm oil supply chain: (1) amount of palm oil sourced, (2) percentage certified through the Roundtable on Sustainable Palm Oil (RSPO) supply chains as (a) Identity Preserved, (b) Segregated, (c) Mass Balance or (d) Book & Claim.[7]

  - category 9: downstream transportation and distribution;
  - category 11: use of sold products; and
  - category 12: end-of-life treatment of sold products.[3]

5. Decarbonise the supply chain:[3] • procure less carbon-intensive products and engage with upstream partners to decarbonise; • incorporate low-GHG emissions clauses in contracts; and • fund material innovation and validation studies.		

Consumer Discretionary Products resources

1. Assessing Low Carbon Transition Initiative (ACT), ACT Generic Methodology, 2023.
2. CDP, CDP Climate Change 2023 Reporting Guidance, 2023.
3. The Consumer Goods Forum & Accenture, Net Zero Playbook for Consumer Industries, 2022.
4. EY Parthenon, How meeting sustainability goals can be wrapped into packaging, 2022.
5. Global Canopy, Forest 500: Company Selection Methodology 2022, 2022.
6. International Financial Reporting Standards (IFRS), IFRS S2: Industry-based Guidance on implementing Climate-related Disclosures: Volume 2 – Appliance Manufacturing, 2023.
7. International Financial Reporting Standards (IFRS), IFRS S2: Industry-based Guidance on implementing Climate-related Disclosures: Volume 3 – Building Products & Furnishings, 2023.
8. International Financial Reporting Standards (IFRS), IFRS S2: Industry-based Guidance on implementing Climate-related Disclosures: Volume 5 – Household & Personal Products, 2023.
9. Make UK and Inspired PLC, Manufacturing Sector Net Zero Roadmap, 2022.
10. WRAP, Carbon Waste and Resources Metric, 2021.
11. WWF, WWF Basket: Outcomes & Measures, 2023.

Consumer Goods Retail

Consumer Goods Retail: Entities in the E-Commerce and Multiline and Speciality Retailers & Distributors industries.

- **E-Commerce** Entities that provide an online marketplace for other firms or individuals to sell their goods and services, as well as retailers and wholesalers that provide an exclusively web-based platform for consumers to buy goods and services.
- **Multiline and Speciality Retailers & Distributors** Entities in a variety of retailing categories such as department stores, mass merchants, home products stores, and warehouse clubs, as well as a smaller segment of distributors like electronics wholesalers and automotive wholesalers.

Photo Adobe Stock

Recognised decarbonisation levers	Governance, engagement, business and operational metrics and targets	GHG metrics and targets
1. **Enhance energy efficiency and electrify processes**[1] • optimise operational efficiency and total consumption (transport, fuels, buildings, operations, logistics, IT infrastructure); • transition to the use of renewable energy sources; • electrify heating and cooling systems; and • convert to refrigeration systems with lower GWP (Global Warming Potential) refrigerants. 2. **Transform to low-GHG emissions logistics**[1,2] • reduce freight transport demand (e.g. by restructuring supply chains or standardising modules); • improve asset utilisation in the existing freight network (e.g. via load optimisation); • improve fleet energy efficiency (e.g. by changes to driving behaviour, fleet operation and maintenance);	• hardware, infrastructure, energy & water management: (1) total energy consumed, (2) percentage grid electricity and (3) percentage renewable;[4,5] • hardware, infrastructure, energy & water management: (1) total water withdrawn, and (2) total water consumed; percentage of each in regions with High or Extremely High Baseline Water Stress;[4] • proportion of low-GHG emissions vehicles in total vehicle fleet;[2] • total fuel consumed for transport and percentage from zero-emissions fuels;[2] • percentage deforestation-linked primary commodities sourced as deforestation and conversion free (by volume); • percentage of suppliers, by spend or emissions, that have science-based targets in place;[2]	• As Consumer Goods Retail is a heterogeneous sector, different emission intensity metrics are applicable to different activities of the entity for example[1,2] o buildings (gCO2/m2); and o logistics (gCO2e/tonne.km); and o refrigerants (gCO2e leaked/kg refrigerant in cold equipment). • relevant Scope 3 categories may include: o category 1: purchased goods and services o category 4: upstream transportation and distribution o category 9: downstream transportation and distribution o category 10: processing of sold products o category 11: use of sold products; and o category 12: end-of-life treatment of sold products.[2]

- increase the use of low-GHG emissions fuels for HGVs;
- shift to low-GHG emissions and electric LCVs
- optimise route and loads; and
- implement modal shifts (e.g. from air freight to rail or sea).

3. Prioritise sustainable sourcing[1,2]

- increase the share of certified and traceable raw materials (e.g. timber products, cotton);
- assess and support suppliers in reducing product emissions (e.g. using a Supplier Code of Conduct); and
- prioritise the use of materials and inputs with a lower carbon footprint (e.g. sustainably sourced wood or organic cotton for in-house brands).

4. Implement circular practices and reduce waste[1,2,6]

- increase the use of recyclable and recycled materials;
- improve product design for easy disassembly;
- reduce product volume and weight;
- increase waste recycling rates;
- reduce the volume of non-recyclable materials/ products; and
- collaborate with upstream and downstream partners to boost innovations in recycling or repurposing product components;

5. Drive low-GHG emission consumer choices[1,2]

- run consumer engagement campaigns to increase awareness and preference for low-GHG emissions and sustainable products;
- educate consumers on the environmental impact of their purchases; and
- highlight and promote eco-friendly product alternatives in stores and on online platforms.

- percentage of packaging that is recyclable;[6]
- percentage reduction in packaging by weight and unit;[6]
- percentage of recycled or sustainably sourced materials in packaging;[6]
- percentage of post-consumer recycled materials in packaging;[3]
- product packaging & distribution: total greenhouse gas (GHG) footprint of product shipments;[4]
- (1) number and (2) total area of: (a) retail locations, and (b) distribution centres;[5]
- proportion of lights using LEDs across all buildings;[2]
- energy consumption per unit of floor space;[2] and
- total refrigerant leakage.[2]

Consumer Goods Retail resources

1. Assessing Low Carbon Transition (ACT) Initiative, Retail methodology, 2019.
2. British Retail Consortium (BRC), Climate Action Roadmap, website as of 2024.
3. EY Parthenon, How meeting sustainability goals can be wrapped into packaging, 2022.
4. International Financial Reporting Standards (IFRS), IFRS S2: Industry-based Guidance on implementing Climate-related Disclosures: Volume 4 – E-Commerce, 2023.
5. International Financial Reporting Standards (IFRS), IFRS S2: Industry-based Guidance on implementing Climate-related Disclosures: Volume 6 – Multiline and Speciality Retailers & Distributors, 2023.
6. WRAP, Carbon Waste and Resources Metric, 2021.
7. WWF, WWF Basket: Outcomes & Measures, 2023.

EXTRACTIVES & MINERAL PROCESSING

Construction Materials

Iron & Steel Producers

Metals & Mining

Oil & Gas

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Construction Materials

Construction Materials: Entities that have global operations and produce construction materials for sale to construction firms or wholesale distributors. These primarily include cement and aggregates, but also glass, plastic materials, insulation, bricks, and roofing material. Materials producers operate their own quarries, mining crushed stone or sand and gravel. They may also purchase raw materials from the mining and petroleum industries.

Photo Unsplash.com

Recognised decarbonisation levers	Governance, engagement, business and operational metrics and targets	GHG metrics and targets
1. Cement and concrete[2,4,5,7,8,9,10,11] • improve energy efficiency (e.g. with long dry-process kilns retrofitting in cement); • switch to low/near-zero GHG emissions fuel to power the production process, including potential innovations like kiln electrification; • reduce the clinker-to-cement ratio by substituting clinker with other sources (e.g. fly ash, metal slag, or calcine clay); • use alternative binding materials in cement production; • educate consumers to reduce waste (e.g. on-site bagging and mixing of cement, efficiency in design and construction); • facilitate increased use of wastes and by-products as low-emission fuels and raw materials, as well as increased reuse of concrete and use of demolished concrete; and	• air emissions of the following pollutants: (1) NOx (excluding N_2O), (2) SOx, (3) particulate matter (PM10), (4) dioxins/furans, (5) volatile organic compounds (VOCs), (6) polycyclic aromatic hydrocarbons (PAHs) and (7) heavy metals;[7] • energy management: (1) total energy consumed (2) percentage grid electricity (3) percentage alternative (4) percentage renewable;[7] • water management: (1) total water withdrawn, (2) total water consumed; percentage of each in regions with High or Extremely High Baseline Water Stress;[7] • waste management: amount of waste generated, percentage hazardous and percentage recycled;[7] and • product innovation: percentage of products that qualify for credits in sustainable building design and construction certifications; total addressable market and share of market for products that reduce energy, water or material impacts during usage or production.[7]	• gross global Scope 1 emissions, percentage covered under emissions limiting regulations;[7] • Scope 1 and 2 intensity of each product (tCO_2/t);[2,5] • Scope 3 target that covers at least 95% of direct and electricity related emissions from purchased raw material;[1,2,9] • GHG emissions from transportation of materials and finished products;[1] • cement: gross GHG emissions from waste-derived fuels in clinker production;[2,5] and • cement: the Science Based Targets initiative (SBTi) recommends that near-term targets for cement include a Scope 3 target that covers at least Scope 3 category 3 “Fuel- and energy-related emissions not included in Scope 1 or Scope 2”, on a cradle-to-gate basis.[11]

- engage with stakeholders to develop, de-risk and deploy the technology and infrastructure created by carbon capture utilisation and storage (CCUS).

2. Glass[1,12]

- increase glass recycling to improve the supply of recycled glass (cullet) for the production of new glass products;
- increase adoption of the most effective existing energy-efficiency technologies and practices;
- use of low/near-zero GHG emissions energy sources in glass manufacturing;
- increase the use of low/near-zero GHG emissions glass products by removing barriers to adoption and creating market pull; and
- shift to sustainable transportation of raw material and final product.

3. Plastic materials[4,12]

- manage demand for plastic products (e.g. greater materials efficiency, and materials substitution);
- incremental efficiency improvement in existing steam cracking processes;
- decarbonise production process through: CCUS for pyrolysis furnaces; switch to a low/near-zero GHG emissions energy source for heat generation; use of high-temperature electric furnaces and/or adoption of electrochemical processes; and
- switch to renewable feedstock.

4. Ceramics, including bricks[3]

- deploy efficiency measures such as heat recovery;
- fuel substitution from coal or natural gas to zero emissions hydrogen or electrification;

- on-site generation and procurement of zero emissions electricity; and
- research, development and deployment of material substitution techniques and CCUS that can be applied to small-scale sites to reduce process emissions.

5. **Shift to bio-based building materials:**[12]

- substitute conventional materials with bio-based materials, including timber, bamboo and biomass;
- support sustainable forest management and afforestation practices;
- enhance material recovery from forest-by products and wood manufacturing;
- replace petrochemical-based glues and coatings; and
- collaborate to address social acceptance and regulatory barriers.

Construction Materials resources

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4. Energy Transition Commission, Mission Possible sectoral focus: plastics, 2019.
5. Global Cement and Concrete Association (GCCA), Concrete Future – The GCCA 2050 Cement and Concrete Industry Roadmap for Net Zero Concrete, 2022
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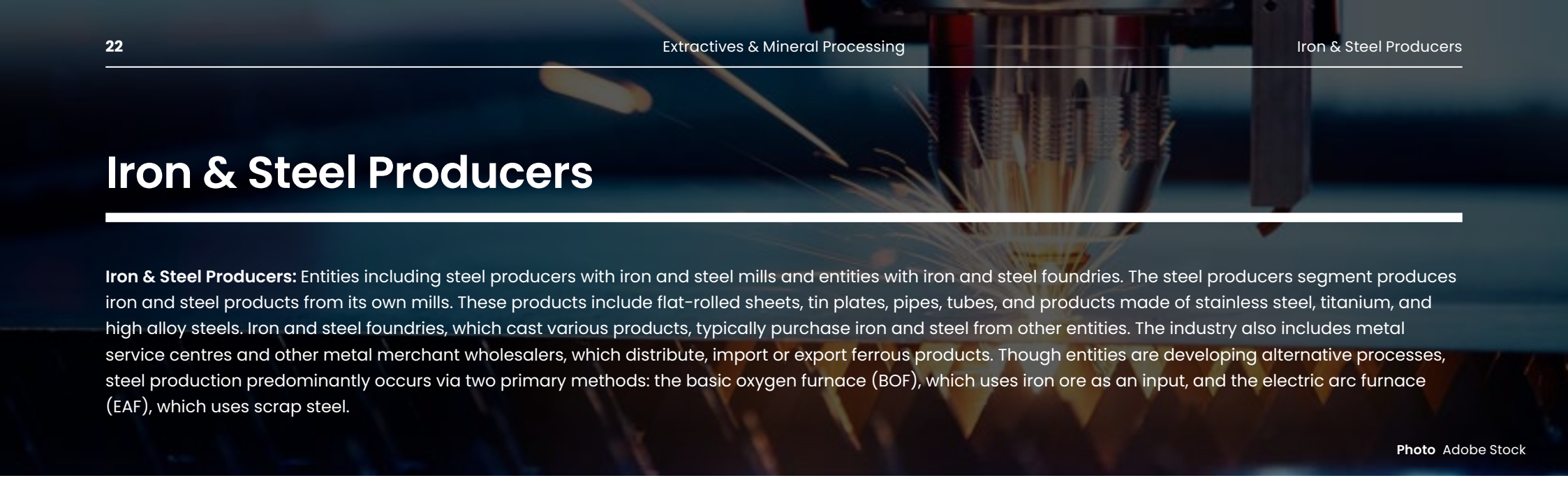

Iron & Steel Producers

Iron & Steel Producers: Entities including steel producers with iron and steel mills and entities with iron and steel foundries. The steel producers segment produces iron and steel products from its own mills. These products include flat-rolled sheets, tin plates, pipes, tubes, and products made of stainless steel, titanium, and high alloy steels. Iron and steel foundries, which cast various products, typically purchase iron and steel from other entities. The industry also includes metal service centres and other metal merchant wholesalers, which distribute, import or export ferrous products. Though entities are developing alternative processes, steel production predominantly occurs via two primary methods: the basic oxygen furnace (BOF), which uses iron ore as an input, and the electric arc furnace (EAF), which uses scrap steel.

Photo Adobe Stock

Recognised decarbonisation levers	Governance, engagement, business and operational metrics and targets	GHG metrics and targets
1. **Increase energy efficiency and material efficiency to production routes**[5,6,8,9] • implement the best available techniques for energy efficiency (e.g. coke dry quenching); • material recirculation strategies for better collection and recycling of end-of-life steel; • increase the utilisation and lifetime of steel through durable product design; and • reduce steel losses in fabrication and minimise steel use in end products. 2. **Scale up secondary steel production**[5,6,8,9] • increase the share of scrap-based steel based on the scrap-EAF production route; and • enhance the quality and efficiency of steel recycling to increase the percentage of high-quality steel derived from recycled materials.	• energy management: (1) total energy consumed, (2) percentage grid electricity and (3) percentage renewable;[7] • fuel management: (1) total fuel consumed, (2) percentage coal, (3) percentage natural gas and (4) percentage renewable;[7] • water management: (1) total water withdrawn, (2) total water consumed; percentage of each in regions with High or Extremely High Baseline Water Stress • by steel production route: total consumption, scrap consumption, production and capacity[1,2,3] • current and targeted production capacity equipped with CCUS;[1] and • number of plants where CCUS is expected to be used and the expected capture rate of GHG emissions;[1].	• gross global Scope 1 emissions, percentage covered under emissions-limiting regulations[7] • Scope 1 and 2 emissions per unit of crude steel produced (tCO_2e/t steel);[1,2,3,11] • current and projected Scope 1, 2, and 3 GHG emissions by plant;[2,3] • emissions intensity by production route (Scope 1, 2, and 3 emissions per unit of output);[2,3,8] • projected reduction in Scope 1, 2, and 3 GHG emissions due technology changes at asset, production route, and corporate levels (tCO_2e and tCO_2e per unit of output);[7] • target boundary: the Science Based Targets initiative (SBTi) states that steelmakers should include all emissions within their iron and steel core boundary in targets. This includes emissions from sold intermediate products like surplus coke under Scope 3 category 10 processing of sold products.[10]

3. Develop and scale near zero emission production technologies[5,6,8,9] • transition from the blast furnace-basic oxygen furnace (BF-BOF) method to the direct reduced iron-electric arc furnace (DRI-EAF) process; • replace natural gas with green hydrogen in the DRI-EAF process, as the quantity of green hydrogen increases; • implement carbon capture, utilisation, and storage (CCUS) technologies for fossil fuel-based production assets; and • invest in R&D to explore new methods of low/near-zero GHG emissions steel production. **4. Engage to reduce upstream emissions[8]** • use engagement and procurement to drive reductions in methane emissions from metallurgical coal and natural gas production; and • use engagement and procurement to drive reduced GHG emissions from iron ore mining and transportation.		• SBTi state that iron and steelmakers must set targets covering Scope 3 category 3 fuel and energy-related emissions.[10]

Iron & Steel resources

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2. CDP Global, Climate Change 2023 Reporting Guidance, 2023
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Metals & Mining

Photo Dim Hou, Unsplash.com

The TPT Metals & Mining Guidance adds further depth and detail for preparers of transition plans that operate in the Metals & Mining sector.

Oil & Gas

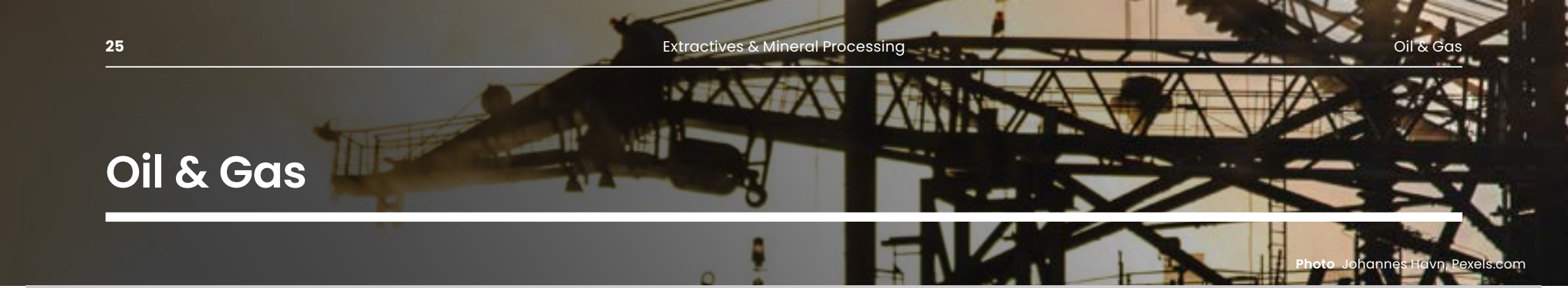
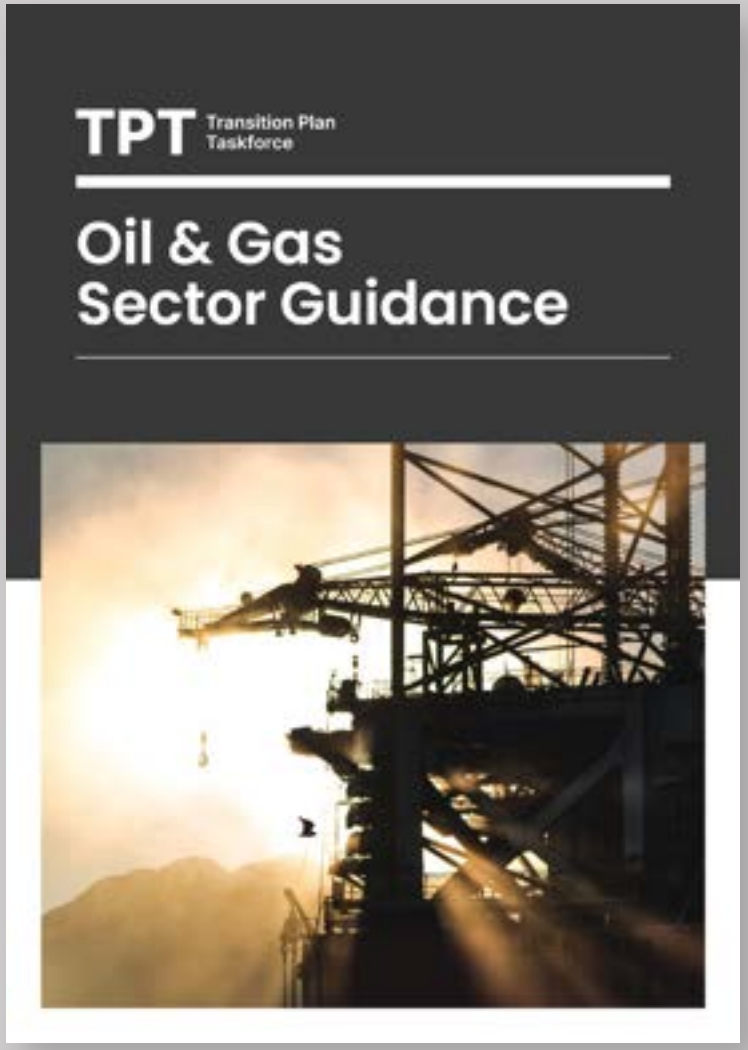


Photo Johannes Havn, Pexels.com

The TPT Oil & Gas Guidance adds further depth and detail for preparers of transition plans that operate in the Oil & Gas sector.



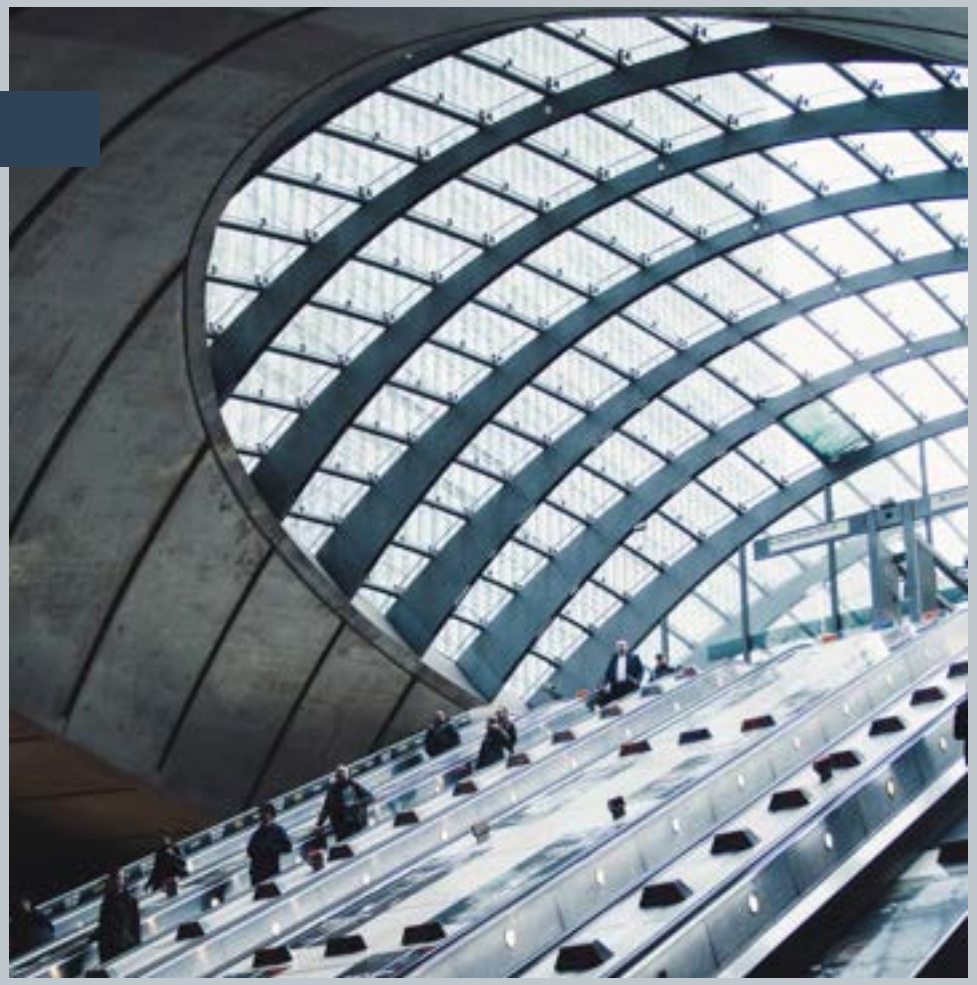
FINANCIAL SERVICES

Asset Managers

Asset Owners

Banks

Insurance (Underwriting)



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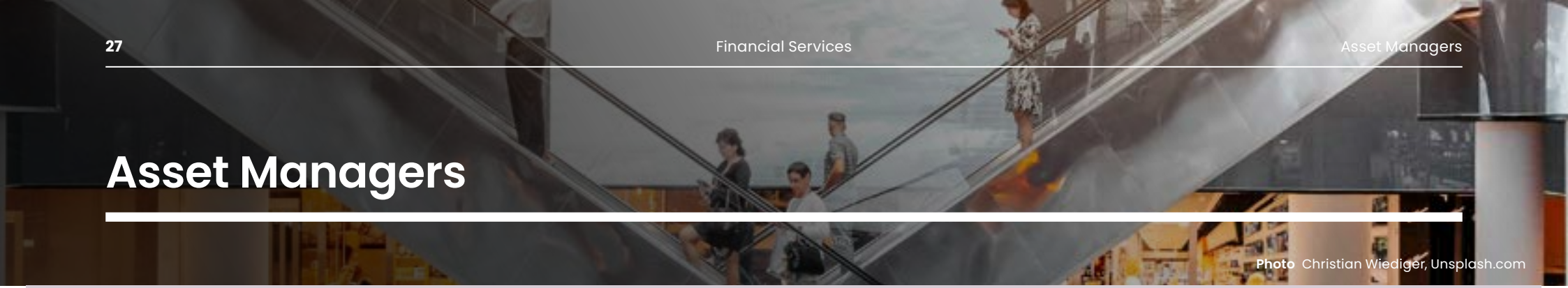
Asset Managers



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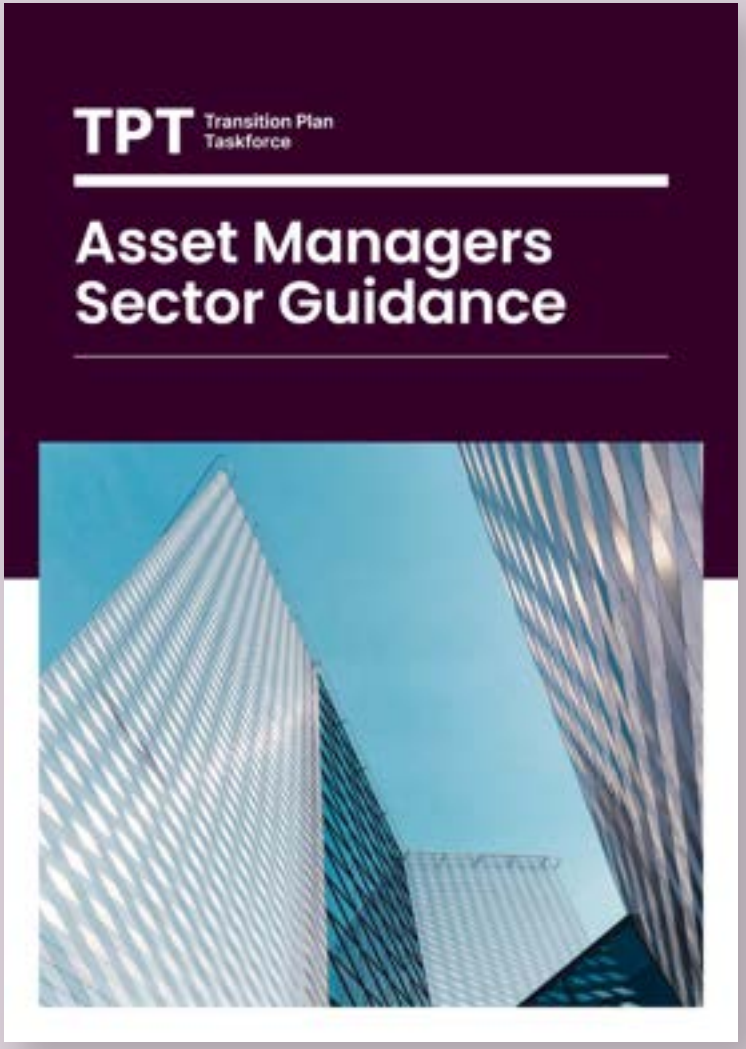
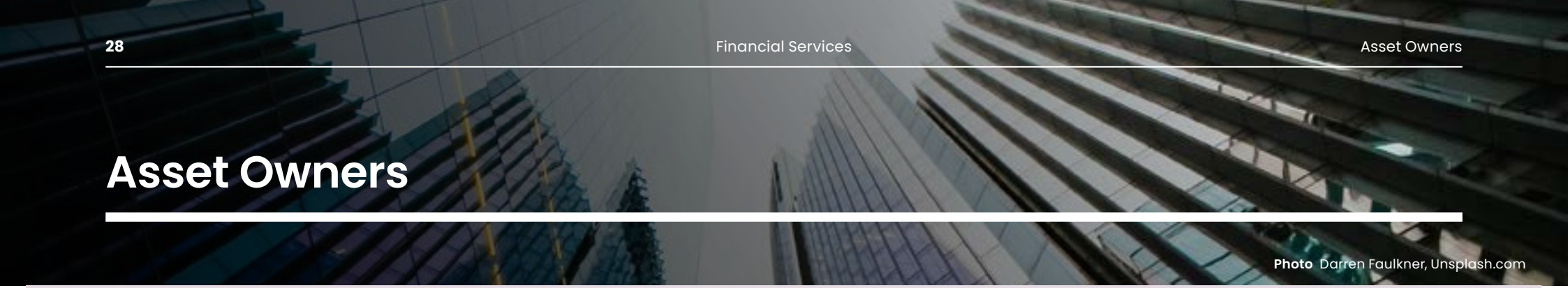
The TPT Asset Managers Guidance adds further depth and detail for preparers of transition plans that operate in the Asset Management sector.



Asset Owners



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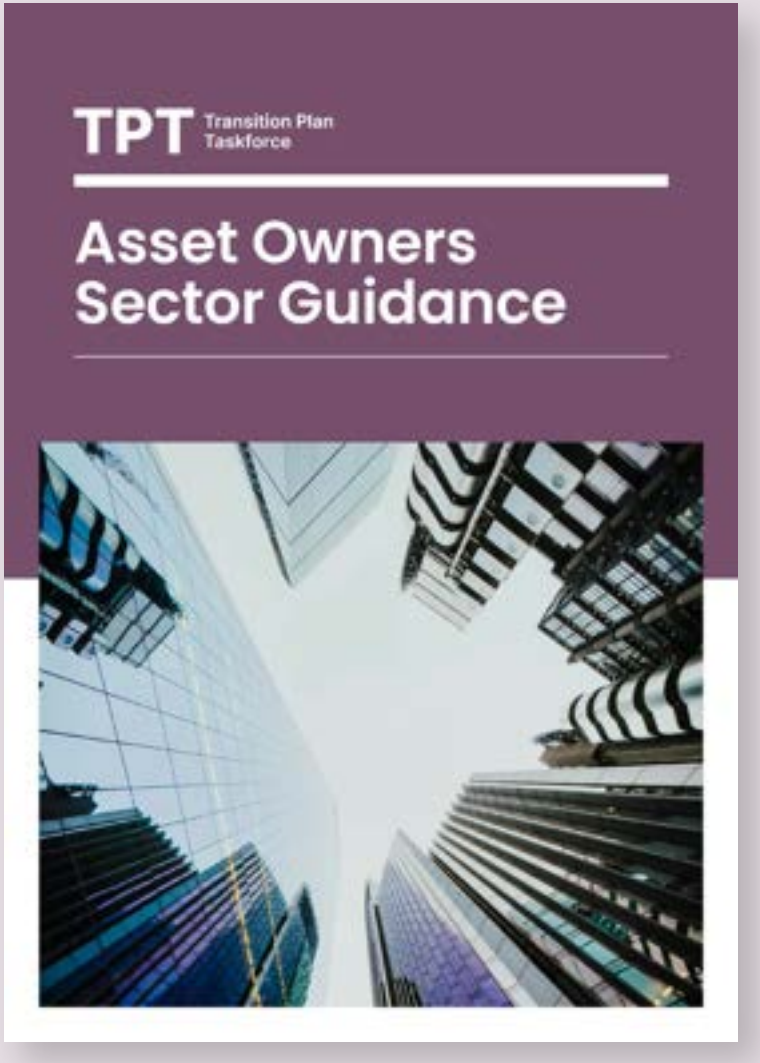
The TPT Asset Owners Guidance adds further depth and detail for preparers of transition plans that operate in the Asset Owner sector.



Banks

Photo Jeffrey Blum, Unsplash.com

The TPT Banks Guidance adds further depth and detail for preparers of transition plans that operate in the Banking sector.

Insurance

Insurance: This sub-sector covers insurers and re-insurers. The insurance industry provides both traditional and non-traditional insurance-related products. Traditional policy lines include property, life, casualty, and reinsurance. Non-traditional products include annuities, alternative risk transfers, and financial guarantees. Please note that an insurer's investment activities are not covered within this Sector Summary, as these have been considered within the **TPT Asset Owner's Guidance.**

Photo Fred Moon, Unsplash.com

Recognised decarbonisation levers	Governance, engagement, business and operational metrics & targets	GHG metrics and targets
1. Policies and conditions for priority sectors and activities:[4,5,12,13,14,17] • implement policies and conditions for (re)insurance associated with high GHG impact sectors (e.g. thermal coal, oil and gas, and deforestation); • introduce guidelines for (re)insurance associated with sectors deemed to have high climate-related risks (physical and transition risks); and • set standards and conditions for ongoing business engagement, ensuring alignment with climate objectives. **2. Claims management:**[11,13,14,18] • increase the proportion of claims management suppliers (i.e. suppliers that assess damages and repair/replace items) with approved science-based targets or credible transition plans; • encourage suppliers to repair, instead of replace, claims for damage to items that do not present safety concerns; and	• net premium written related to energy efficiency and low carbon technology;[7] • number of (re)insurance business lines with specific net-zero objectives as part of their strategy;[5] • amount, number, or proportion of products and services that are aligned to the net-zero transition plan;[5] • percentage of company aware of the organisation's net-zero transition ambition, strategy, and priorities;[5] • number of training sessions completed by employees, board members, and management with specific responsibilities in the net-zero transition plan;[5] • number or proportion of individuals, including at senior levels, with remuneration linked to progress against and achievement of targets;[5]	• the (re)insurer's own Scope 1 and 2 emissions and any other relevant Scope 3 emissions;[9] • absolute emissions (Scope 1 and 2 combined) associated with its re(insurance) portfolios. If it serves the (re)insurer's business goals, report Scope 1 and 2 emissions separately;[9,16] • absolute insurance-associated emissions: the share of an insured's absolute emissions that is associated with the (re)insurer's underwriting portfolio (tCO_2e);[9] • separate disclosure of absolute emissions for statutory or compulsory classes of (re)insurance, and non-statutory classes of business in insurance-associated emissions inventories;[9] • separate disclosure of aggregated absolute insurance-associated emissions by relevant lines of business, where the re(insurer) is unable to negotiate specific terms and/or rates as a result of government-based insurance schemes in place;[9]

- enhance efficiency of suppliers' processes (e.g. using 3D scanning and other advances to create image of damage on site).

3. **Amending and introducing products and services:**[2,3,13,14,15,17,18]

- underwrite and offer (re)insurance for low/near-zero GHG emissions infrastructure, technologies, services, and nature-based solutions;
- de-risk investments in the scaling of newer, less market-proven, climate solutions;
- develop and use models that account for climate risk in the pricing and underwriting of polices;
- introduce climate-related covenants into insurance contracts;
- support the technical and business model risks associated with the transition to a net-zero economy;
- develop specific products to insure natural assets, including nature-based solutions; and
- support nature-based flood and weather defences to help prevention as a claims management strategy.

4. **Engagement with clients and customers:** [2,4,5,9,13,18]

- share climate-risk data with customers to help them to understand their climate-related risks and opportunities;
- help clients and customers to understand, prevent, and reduce climate change-related risks through their expertise in risk research and analytics, natural catastrophe risk models, and loss prevention measures; and
- engage with clients in risk-based discussions on their decarbonisation pathways.

- portfolio coverage approach (PCA): the share of clients in a (re-)insurer's portfolio who have set their own science-based targets;[6,10,11,12,13,17]
- the alignment of clients in a (re-)insurer's portfolio to temperature outcomes;[1,6,10,11,13]
- the alignment of clients in a (re-)insurer's portfolio to a scenario pathway;[6]
- number of engagement activities with commercial clients to support efforts to (1) develop and implement credible transition plans, (2) mitigate and manage possible transition risks, and (3) strengthen their individual efforts to lower GHG emissions;[17]
- number of client engagements where the client's net-zero relevant information was requested, and proportion of requests that information was provided;[17]
- number of clients that have set specific carbon reduction objectives (e.g. transportation/fleet-related emissions, methane emissions, emissions associated with Scope 2 energy consumption, and overall net-zero or other transition commitments);[17]
- percentage change of clients, or absolute, who report and/or improve reporting of Scope 1 and 2, and potentially Scope 3, emissions data for their own operations;[17]
- number of engagement programmes / campaigns where information about road transportation-related GHGs is shared with clients / policyholders, along with possible measures to reduce individual policyholder transportation-related emissions;[17]
- exposure to carbon-related assets, as a percentage of underwriting activity;[1]

- the percentage of total (re)insurance portfolios covered in insurance-associated emissions inventories;[9]
- separate disclosure of insurance-associated emissions by public and private companies;9
- separate disclosure of insurance-associated emissions by client-reported and (re) insurer estimated or proxy emissions;[9]
- separate disclosure of insurance-associated emissions by direct insurance and facultative reinsurance;[9]
- relative insurance-associated emissions: absolute insurance-associated emissions divided by a monetary unit reflecting the insurer's size of business expressed in tCO_2e/£M or (re)insurer's revenue, or total gross written premium, or other (re-)insurance exposure measure;[9,16]
- economic emissions intensity – (re)insured's absolute emissions divided by a monetary unit reflecting the insured's size of business, expressed in tCO_2e/£M of insured's revenue or asset value;[9,16]
- physical emissions intensity – (re)insured's absolute emissions divided by a physical output value, expressed in tCO_2e/unit (e.g. tCO_2e/MWh for power utilities, tCO_2e/m^2 for real estate, or tCO_2e/tonne of steel produced for steel companies);[9]
- weighted average carbon intensity (WACI) – average economic emission intensity, weighted by premium expressed in tCO_2e/£M of (re) insured's revenue (a physical WACI could also be calculated);[9,16] and
- if a (re)insurer chooses to report emission removals or avoided emissions, report absolute emission removals or avoided emissions separately from its Scope 1, 2 and 3 inventories.[9]

	• aggregated risk exposure to weather-related catastrophes of its property business (i.e. annual aggregated expected losses from weather-related catastrophes), by relevant jurisdiction;[1] • amount, number, or proportion of portfolio covered by key policies and conditions on topics such as coal, oil and gas, and deforestation;[5] • amount, number, or proportion, of clients or portfolio companies included in climate-related engagement activities (by portfolio, by topic/ theme, by type of company, etc.);[5] and • percentage of climate-related engagements that led to a material positive change such as increase in verification of net zero targets.[5]	

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FOOD & BEVERAGE

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Food & Beverage

Food & Beverage

Photo Red Zeppelin, Unsplash.com

The TPT Food & Beverage Guidance adds further depth and detail for preparers of transition plans that operate in the Food & Beverage sector.

HEALTH CARE

Health Care Retail

Health Care Providers

Medical Equipment & Supplies

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Health Care Retail

Health Care Retail: Entities in the Drug Retailers and Health Care Distributors industries.

- **Drug Retailers:** Entities that operate retail pharmacies and distribution centres that supply retail stores, which may be company-owned or franchised. Large entities source drugs and other merchandise through wholesalers and distributors. The majority of Drug Retailers' revenues are derived from consumer sales of prescription and over-the-counter pharmaceutical products.
- **Health Care Distributors:** Entities that purchase, inventory, and sell pharmaceutical products and medical equipment to hospitals, pharmacies, and physicians.

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Recognised decarbonisation levers	Governance, engagement, business and operational metrics and targets	GHG metrics and targets
1. **Powering facilities with low-GHG emissions energy:**[1,2,3,4,9] • switch to zero-GHG emissions electricity (e.g. onsite projects, renewable energy certificates, or power-purchase agreements); • shift to zero-GHG emissions heat sources for operations (e.g. heat pumps); and • invest in advanced energy management systems to optimise energy use across facilities. 2. **Investment in low-GHG emissions buildings and infrastructure:**[1,2,3,4,9] • plan, design, and refurbish facilities to ensure that space utilisation is maximised; • improve roofing and insulations across all buildings; • upgrade lighting in across all buildings and real estate to LED lighting;	• energy management: (1) total energy consumed, (2) percentage grid electricity and (3) percentage renewable;[5] • fleet fuel management: payload fuel economy;[6] and • percentage of transportation suppliers with science-based targets and/or providing green transportation solutions.[8]	As retail is a heterogeneous sector, different emission intensity metrics are applicable to the different activities of an entity,for example:[4] • buildings (gCO_2/m^2); • logistics (gCO_2e/tonne/km); and • refrigerants (gCO_2e leaked/kg refrigerant in cold equipment). Relevant Scope 3 categories may include Category 1: Purchased goods and services; Category 4: Upstream transportation and distribution.[3,8]

- reduce emissions in the cold chain (e.g. by replacing with lower GHG emissions alternative refrigerants, reducing leaks through monitoring and efficiency and optimising cooling requirements);
- introduce low carbon heating solutions (e.g. heat pumps); and
- invest in or lease low-GHG emissions buildings and infrastructure.

3. **Transitioning to zero emissions, sustainable travel and transport:**[1,2,3,4,9]

- reduce air freight and shift to use of sea, road, and rail freights;
- reduce unnecessary journeys; and
- incentivise staff to use electric vehicles.

4. **Implementing circular health care and sustainable health care waste management:**[3,8,9]

- new material strategies such as materials being non-toxic, reusable, recycled and recyclable, durable, low-GHG emissions, and renewable;
- systematic redesign of supply chains and healthcare delivery. Such as redesigning business planning and shifting to a 'product-as-a-service' approach; and
- alternatives to incineration for health care waste treatment.

5. **Incentivising low-GHG emissions pharmaceuticals, substituting high-emissions products with more sustainable alternatives:**[3,8,9]

- optimise the overall quantity of products manufactured and purchased, for example working with the value chain to ensure they are prescribed and utilised as effectively and efficiently as possible; and
- develop package-less solutions and segregation (for safe collection, sterilisation for reuse, and/or recycling).

Health Care Retail resources

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9. The Health Policy Partnership, Decarbonising Healthcare: A discussion paper, 2022

Health Care Providers

Health Care Providers: Entities in the Health Care Delivery and Managed Care industries.

- **Health Care Delivery** Entities that own and manage hospitals, clinics and other health care-related facilities. Entities provide a range of services, including inpatient and outpatient care, surgery, mental health, rehabilitation, and clinical laboratory services.
- **Managed Care** Entities that offer health insurance products for individual, commercial, Medicare, and Medicaid members. Companies also provide administrative services and network access for self-funded insurance plans and manage pharmacy benefits.

Photo Hal Gatewood, Unsplash.com

Recognised decarbonisation levers	Governance, engagement, business and operational metrics and targets	GHG metrics and targets
1. **Promote preventative healthcare and optimise efficient care pathways:**[6,12] • educate patients about health and wellness and other preventive healthcare measures to reduce hospital visits and the need for treatments; and • optimise care pathways (e.g. digital services, telemedicine solutions) to streamline services and minimise patient emissions. 2. **Transition to renewable energy and adopt low-GHG emissions infrastructure:**[2,4,6,7,10] • replace fossil fuel heating with low-GHG emissions alternatives (e.g. heat pumps); • improve roofing and insulations across all buildings; • upgrade lighting across all buildings and real estate to LED lighting; and • invest in zero emissions buildings and infrastructure.	• energy management: (1) total energy consumed, (2) percentage grid electricity and (3) percentage renewable;[8] • total amount of medical waste, percentage (a) incinerated, (b) recycled or treated, and (c) landfilled in tonnes;[8] and • total amount of: (1) hazardous and (2) non-hazardous pharmaceutical waste, percentage (a) incinerated, (b) recycled or treated and (c) landfilled.[8]	• key emissions within patient care settings are likely to come from buildings, fleets and anaesthetic gases and should be included in an entity's Scope 1, 2 and 3 inventory as appropriate;[12] • Scope 3 Category 1: Purchased goods and services and Scope 3: Category 7: Employee commuting may be relevant;[12] • emissions per inpatient Finished Admission Episode (kg CO_2e/ FAE).[14]

3. **Adopt sustainable medical equipment and products and increase circularity:**[2,4,5,6,7,10]

- reduction of the size of product packaging, optimised design and replace with lower carbon materials;
- increasing energy efficiency and circularity in healthcare machinery and equipment; and
- streamline packaging with low-GHG emissions materials and reduce overall use.

4. **Reduce healthcare provider's fleet emissions:**[2,4,5,6,7,10]

- reduce air freight and shift to use of sea, road, and rail freights;
- electrify or shift to other low-GHG emissions vehicle fleets; and
- incentivise staff to use electric vehicles or active forms of travel, such as cycling and walking.

5. **Implement sustainable waste management practices:**[2,4,5,6,7,10,13]

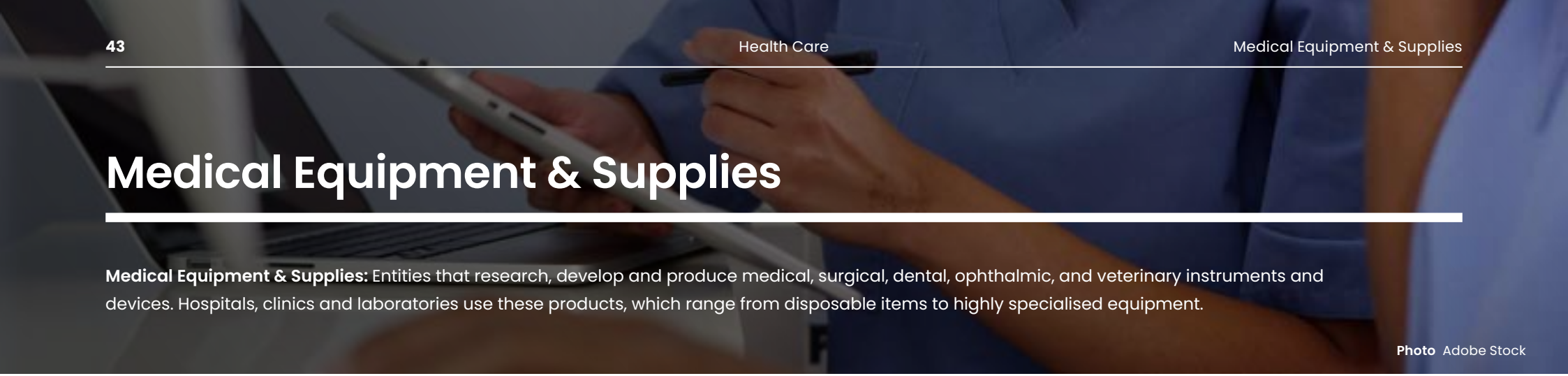
- implement strategies to minimise medical and pharmaceutical waste; and
- partner with suppliers for reduced and recyclable packaging.

6. **Engage suppliers to reduce emissions:**[6,10,12]

- develop common supplier standards around emissions disclosure and target setting;
- fund green tech research and development (e.g. medical technology); and
- include sustainability as a criterion in purchasing decisions (e.g. for products and foods).

Health Care Providers resources

1. AstraZeneca, Sustainability Data Summary 2021, 2021
2. Arup & Health Care Without Harm, Designing a net zero roadmap for healthcare: Technical methodology and guidance, 2021
3. Arup & Health Care Without Harm, Health Care's Climate Footprint: How the health sector contributes to the global climate crisis and opportunities for action, 2019
4. Arup & Health Care Without Harm, Global Road Map for Health Care Decarbonization: A navigational tool for achieving zero emissions with climate resilience and health equity, 2021
5. Arup, Health Care's Climate Footprint: How the health sector contributes to the global climate crisis and opportunities for action, 2019
6. Global Green and Healthy Hospitals, A Comprehensive Environmental Health Agenda for Hospitals and Health Systems Around the World, 2011
7. Health Care Without Harm, Global Road Map for Health Care Decarbonisation, 2021
8. International Financial Reporting Standards (IFRS), IFRS S2: Industry-based Guidance on implementing Climate-related Disclosures: Volume 28 – Health Care Delivery, 2023
9. International Financial Reporting Standards (IFRS), IFRS S2: Industry-based Guidance on implementing Climate-related Disclosures: Volume 30 – Managed Care, 2023
10. National Health Service (NHS), Delivering a 'Net Zero' National Health Service, 2020
11. Sustainable Markets Initiative, Decarbonising Healthcare Supply Chains: Recommendations on how to drive emissions reductions across healthcare supply chains, 2022.
12. Sustainable Markets Initiative, Decarbonising Patient Care Pathways: How choices in patient care can drive reductions in carbon emissions, 2022.
13. The Chartered Institute of Procurement and Supply Link, The eight levers to cut healthcare supply chain emissions, 2022
14. Tennison et al., Health care's response to climate change: a carbon footprint assessment of the NHS in England Supplementary appendix, 2021



Medical Equipment & Supplies

Medical Equipment & Supplies: Entities that research, develop and produce medical, surgical, dental, ophthalmic, and veterinary instruments and devices. Hospitals, clinics and laboratories use these products, which range from disposable items to highly specialised equipment.

Photo Adobe Stock

Recognised decarbonisation levers	Governance, engagement, business and operational metrics and targets	GHG metrics and targets
1. **Energy consumption from renewables or other zero-GHG emissions sources:**[1,3,7] • use renewable electricity, either generated on-site (e.g. solar panels, wind turbines) or procured from third-party providers to power manufacturing, R&D, and other facilities; • shift to zero-GHG emissions heat sources for operations, e.g. heat pumps; and • invest in advanced energy management systems to optimise energy use across facilities. 2. **Investment in low-GHG emissions buildings and infrastructure:**[1,3,7] • design and construct facilities with a focus on energy efficiency and sustainability, such as green roofs, optimised insulation, and passive heating/cooling;	• total amount of products accepted for take-back and reused, recycled or donated, broken down by: (1) devices and equipment and (2) supplies;[2,4] • energy management: (1) total energy consumed, (2) percentage grid electricity and (3) percentage renewable;[2,4,7,9] • percentage purchased goods and services supplied by companies performing carbon disclosures with a science-based target for emissions reduction;[2,7,8] and • percentage of transportation suppliers with science-based targets and/or providing green transportation solutions.[8]	Relevant Scope 3 categories may include: • Category 1: Purchased goods and services;[3] • Category 4: Upstream transportation and distribution;[3] • Category 9: Downstream transportation and distribution;[3] • Category 11: Use of sold products;[3] and • Category 12: End-of-life treatment of sold products.[3]

- integrate low-GHG emissions construction materials, emphasising recyclability and low embodied carbon; and
- prioritise green building certifications, such as LEED or BREEAM, for new constructions and renovations.

3. **Implement circular health care and sustainable health care waste management:**[1, 3, 5, 7, 8, 9]

- minimise single-use items and emphasise reusability, repairing, remanufacturing, and recovering of materials (e.g. surgical instruments);
- work on waste reduction initiatives, focusing on both pre-consumer (manufacturing waste) and post-consumer (end-user) waste; and
- invest in R&D for biodegradable or compostable alternatives for traditionally non-recyclable components.

4. **Engage suppliers to reduce emissions:**[8,9]

- develop common supplier standards around emissions disclosure and target setting;
- procure low/zero GHG emissions transportation solutions; and
- include sustainability as a criterion in purchasing and coverage decisions.

Medical Equipment & Supplies resources

1. Arup & Health Care Without Harm, Health Care's Climate Footprint: How the health sector contributes to the global climate crisis and opportunities for action, 2019
2. AstraZeneca, Sustainability Data Summary 2021, 2021
3. Boston Consulting Group (BCG), MedTech's Green Moment Is Here, 2023.
4. International Financial Reporting Standards (IFRS), IFRS S2: Industry-based Guidance on implementing Climate-related Disclosures: Volume 31 – Medical Equipment & Supplies, 2023.
5. International Society for Pharmaceutical Engineering (ISPE), Sustainability: Toward Zero Carbon in the Pharmaceutical Industry, 2020.
6. McKinsey & Company, Accelerating the transition to net zero in life sciences, 2023.
7. Sustainable Markets Initiative, Decarbonising Healthcare Supply Chains: Recommendations on how to drive emissions reductions across healthcare supply chains, 2022.
8. Sustainable Markets Initiative, Joint Supplier Targets, 2023.
9. Rizan et al., The carbon footprint of products used in five common surgical operations: identifying contributing products and processes, 2023.

INFRASTRUCTURE

Electric Utilities & Power Generators

Gas Utilities & Distributors

Water Utilities & Services

Engineering & Construction Services

Real Estate

Waste Management

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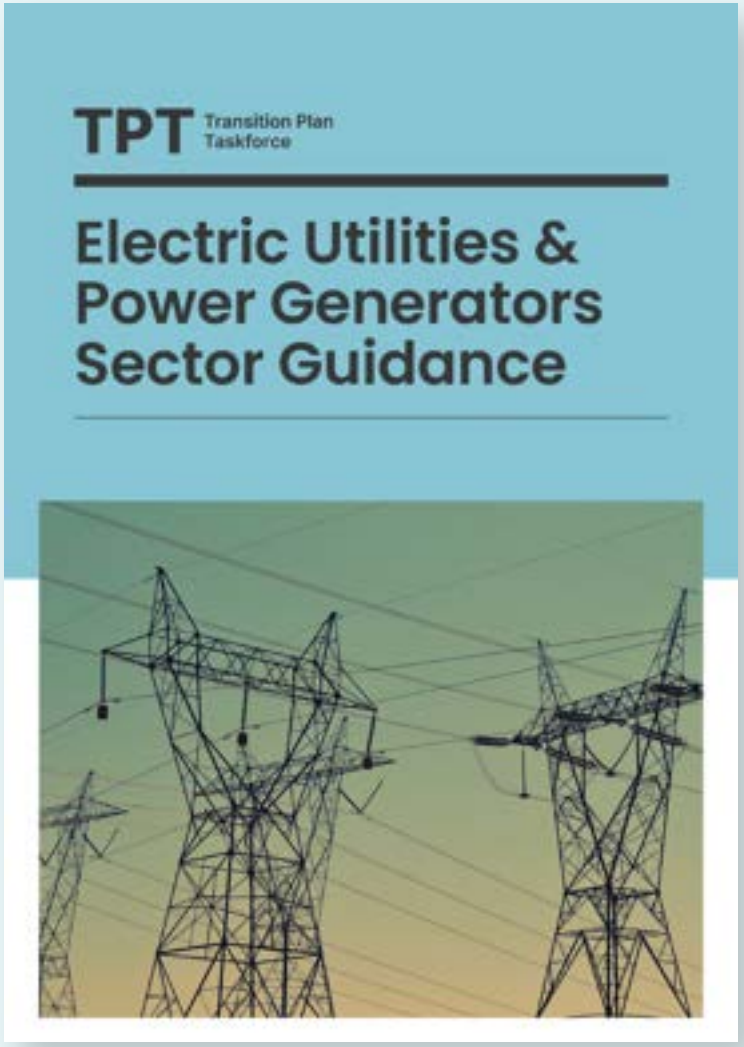
Electric Utilities & Power Generators

Photo Fre Sonneveld, Unsplash.com

The TPT Electric Utilities & Power Generators Guidance adds further depth and detail for preparers of transition plans that operate in the Electric Utilities & Power Generators sector.



Gas Utilities & Distributors

Gas Utilities & Distributors: Includes gas distribution and marketing entities. Gas distribution involves operating local, low-pressure pipes to transfer natural gas from larger transmission pipes to end users. Gas marketing companies are gas brokers that aggregate natural gas into quantities that fit the needs of their different customers and then deliver it, generally through other entities' transmission and distribution lines. A relatively smaller portion of this industry is involved in propane gas distribution. Both types of gas are used for heating and cooking by residential, commercial and industrial customers.

Photo Adobe Stock

Recognised decarbonisation levers	Governance, engagement, business and operational metrics and targets	GHG metrics and targets
1. Advance methane management[1,5,8] • implement regular and advanced leak detection technologies (e.g. drones or infrared cameras) to rapidly identify and address leakage driven methane emissions; • upgrade older pipelines and infrastructure with materials resistant to corrosion and leaks; and • educate and train employees on best practices to prevent and manage methane leaks. **2. Strengthen demand-side management:**[1,3,5] • establish energy efficiency programs targeting residential and business customer energy use (e.g. smart meters and demand response systems); • support fuel switching for customers, such as transitioning from gas boilers to electric heat pumps or hybrid solutions combining electric heat pumps with gas appliances;	• sales of sustainable fuels (e.g. e-fuels, 2nd/3rd generation biofuels) and/or sustainable gases (e.g. renewable natural gas);[1] • end-use efficiency: customer gas savings from efficiency measures, by market;[8] • integrity of gas delivery infrastructure: number of (1) reportable pipeline incidents, (2) corrective actions received and (3) violations of pipeline safety statutes;[8] • integrity of gas delivery infrastructure: percentage of distribution pipeline that is (1) cast or wrought iron and (2) unprotected steel;[8] • integrity of gas delivery infrastructure: percentage of gas (1) transmission and (2) distribution pipelines inspected;[8] • number of: (1) residential, (2) commercial, and (3) industrial customers served;[7]	• Scope 3 category 3 purchased goods and services will be relevant to account for upstream emissions associated with sold gas;[7] • Scope 3 category 11 use of sold products will be relevant to account for emissions associated with combustion of sold gas by customers;[3,7] • methane emissions and an absolute methane emissions reduction target;[8] • methane emissions at an individual asset level;[8] • methane intensity and intensity target (using an appropriate denominator (e.g. transmitted gas or distributed gas);[3,8] and • the maturity level of its methane reporting per the Oil and Gas Methane Reporting Framework.[8]

- provision of green tariffs to residential and business customers; and
- engage in advocacy and policy dialogues for enabling policies and renewable heat standards to accelerate demand-side management.

3. **Increasing provision of low-GHG emissions gases and heat:**[1,3,5]

- upgrade pipeline infrastructure to allow replacement of natural gas with RNG and/or green hydrogen;
- integrate targeted electrification of heating, e.g. integrating heat pumps and geothermal systems within the network; and
- market low-GHG emissions gases or other low-GHG emissions energy (e.g. renewable electricity).

4. **Invest in carbon capture, utilisation and storage (CCUS) technologies:**[1,4,5]

- repurpose pipelines and storage assets for carbon transportation, storage and delivery.

- amount of natural gas delivered to: (1) residential customers, (2) commercial customers, (3) industrial customers, and (4) transferred to a third party;[7] and
- length of gas (1) transmission and (2) distribution pipelines.[7]

Gas Utilities & Distributors resources

1. Assessing low-Carbon Transition Initiative (ACT), Oil & Gas methodology, 2021.
2. CDP, Climate Change Reporting Guidance 2023, 2023.
3. The Institutional Investors Group on Climate Change (IIGCC) and Climate Action 100+ (CA100+), Global Sector Strategies: Investor Interventions to Accelerate Net Zero Electric Utilities, 2021.
4. International Energy Agency (IEA), Technology Perspectives 2020: Special Report on Carbon Capture Utilisation and Storage: CCUS in clean energy transitions, 2020.
5. International Energy Agency (IEA), The Oil and Gas Industry in Net Zero Transitions, 2023.
6. International Financial Reporting Standards (IFRS), IFRS S2: Industry-based Guidance on implementing Climate-related Disclosures: Volume 34 – Gas Utilities & Distributors, 2023.
7. World Business Council for Sustainable Development (WBCSD), Setting science-based targets: A guide for electric utilities, 2020.
8. The Oil and Gas Methane Partnership (OGMP), The Oil & Gas Methane Partnership Reporting Framework 2.0, 2023.

Water Utilities & Services

Water Utilities & Services: Entities that own and operate water supply and wastewater treatment systems (generally structured as regulated utility businesses), or provide operational and other specialised water services to system owners (usually market-based operations). Water supply systems include the sourcing, treatment and distribution of water to residences, businesses, and other entities such as governments. Wastewater systems collect and treat wastewater, including sewage, greywater, industrial waste fluids, and stormwater runoff, before discharging the resulting effluent back into the environment. Please note, this summary is primarily applicable to water utilities. Water services companies may support utilities in implementing the decarbonisation levers.

Photo Water Matheo, Unsplash.com

Recognised decarbonisation levers	Governance, engagement, business and operational metrics and targets	GHG metrics and targets
1. **Maximising energy efficiency:**[6,8] • identify and deliver energy efficiency opportunities (e.g. upgrading to more efficient pumps and motors, insulate pipes and buildings, and use of smart metering). 2. **Support renewable deployment:**[8] • construction of renewables on-site for own use and export; • power purchase agreements for renewables; and • co-location of hydrogen production at wastewater treatment sites to utilise oxygen by-product in aerate activated sludge processes.	• energy management: (1) total energy consumed, (2) percentage grid electricity and (3) percentage renewable;[4] • distribution network efficiency: water main replacement rate;[4] • distribution network efficiency: volume of non-revenue real water losses;[4] • end-use efficiency: customer water savings from efficiency measures, by market;[4] • water supply resilience: total water sourced from regions with High or Extremely High Baseline Water Stress; percentage purchased from a third party;[4] • water supply resilience: volume of recycled water delivered to customers;[4]	• outsourced core activity emissions should be captured under relevant Scope 3 category;[8] • GHG emissions from use of chemicals;[7] • GHG emissions from waste generated in operations from both water and wastewater sludge;[7] • GHG emissions associated with transport, treatment and disposal under Scope 1 or relevant Scope 3 category;[7] • GHG emissions from fuel and energy-related activities;[7] and • total quantity of GHG emissions for all capital projects undertaken.[7]

3. **Strengthen demand-side management:**[3,5,8]

- support introduction of mandatory water labelling;
- encourage customers to reduce water demand; and
- manage leakage and outage.

4. **Resource recovery and export:**[8]

- use of biogas for heat generation;
- upgrading biogas to biomethane and exporting or injecting into gas grid; and
- nutrient recovery (e.g. recycled sludge or phosphate for fertilisers, bioplastic, construction materials).

5. **Reducing process emissions:**[1,8]

- increase monitoring and modelling of process emissions to inform operational adjustments;
- where feasible, upgrade to advanced anaerobic digestion; and
- develop alternative treatment methods (e.g. pyrolysis or gasification).

6. **Scale nature-based solutions:**[1,8]

- plant trees and restore degraded peatlands and grasslands on owned land; and
- using nature-based solutions to support resilience (e.g. to improve source water quality and address flood risk).

- network resiliency and impacts of climate change: Wastewater treatment capacity located in 100-year flood zones;[4]
- network resiliency and impacts of climate change: (1) number and (2) volume of sanitary sewer overflows (SSO) and (3) percentage of volume recovered;[4]
- network resiliency and impacts of climate change: (1) number of unplanned service disruptions and (2) customers affected, each by duration category;4
- number of: (1) residential, (2) commercial, and (3) industrial customers served, by service provided;[4]
- total water sourced, percentage by source type;4
- total water delivered to: (1) residential, (2) commercial, (3) industrial, and (4) all other customers;[4]
- average volume of wastewater treated per day, by (1) sanitary sewer, (2) stormwater, and (3) combined sewer;[4]
- length of (1) water mains and (2) sewer pipe;[4]
- customer water savings from efficiency measures, by market;[4]
- total water sourced from regions with High or Extremely High Baseline Water Stress; percentage purchased from a third party;[2,4]
- volume of recycled water delivered to customers;[4] and
- leakage reduction target.[5]

Water Utilities & Services resources

1. Boston Consulting Group, Nature-Based Solutions to the Water Crisis (BCG), 2023
2. CDP, CDP Water Security 2023 Reporting Guidance, 2023.
3. The Department for Environment, Food and Rural Affairs (DEFRA), Policy paper: Drought: Managing Water Supply, 2021.
4. International Financial Reporting Standards (IFRS), IFRS S2: Industry-based Guidance on implementing Climate-related Disclosures: Volume 39 – Water Utilities & Services, 2023.
5. The Water Services Regulation Authority (Ofwat), Leakage in the water industry - Ofwat, 2022.
6. The Water Services Regulation Authority (Ofwat), Consultation on regulatory reporting for 2022-23: Responses document, 2023.
7. The Water Services Regulation Authority (Ofwat), Net Zero Principles Position Paper, 2022.
8. Water UK, Net Zero 2030 Routemap, 2020.

Engineering & Construction Services

Engineering & Construction Services: Entities that provide engineering, construction, design, consulting, contracting, and other related services that support various building and infrastructure projects. The industry is primarily made up of four major segments: engineering services, infrastructure construction, non-residential building construction, and building subcontractors and construction-related professional services.

- The infrastructure construction segment includes entities that design or build infrastructure projects such as power plants, dams, oil and gas pipelines, refineries, highways, bridges, tunnels, railways, ports, airports, waste treatment plants, water networks and stadiums.
- The non-residential building construction segment includes entities that design or build industrial and commercial facilities such as factories, warehouses, data centres, offices, hotels, hospitals, universities and retail spaces such as shopping centres.
- The engineering services segment includes entities that provide specialised architectural and engineering services such as design and development of feasibility studies for many of the project types listed above.
- The building subcontractors and other construction-related professional services segment includes smaller entities that provide ancillary services such as carpentry, electrical, plumbing, painting, waterproofing, landscaping, interior design and building inspection.

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Recognised decarbonisation levers	Governance, engagement, business and operational metrics and targets	GHG metrics and targets
1. **Prioritise design and specification of built assets to have low/near-zero GHG materials:**[1,2,4,6] • provide new buildings which are zero-carbon ready (e.g. highly energy efficient and resilient buildings that can rely on energy that can be fully decarbonised such as electricity or district energy); • retrofit existing buildings with fabric improvements and offer retrofit services (e.g. insulation, double glazing);	• number of (1) commissioned projects certified to a third-party multi-attribute sustainability standard and (2) active projects seeking such certification;[5] • amount of backlog for (1) hydrocarbon- related projects and (2) renewable energy projects;[5] • amount of backlog cancellations associated with hydrocarbon-related projects;[5] • amount of backlog for non-energy projects associated with climate change mitigation;[5]	• embodied GHG emissions intensity of new buildings;[1] • operational/use-phase GHG emissions intensity of new buildings;[1,2] and • operational/use-phase GHG emissions intensity of renovated buildings.[1,2]

- incorporate future circularity (design for deconstruction and reuse, use longer life materials); and
- select refrigeration and heating, ventilation and air conditioning (HVAC) systems that utilise low-global warming potential refrigerants.

2. **Implement energy-efficient and renewable solutions at construction site:**[1,7]

- utilise on-site renewable energy (e.g. solar-powered equipment);
- invest in energy-efficient, fossil fuel-free construction equipment and machinery; and
- promote the use of energy storage solutions, like batteries, to optimise renewable energy use on-site.

3. **Reduce embodied carbon and other value chain emissions:**[1,4,6,7]

- utilise lower-GHG emissions construction materials (e.g. cement, steel, aluminium, ceramics, plastics) and encourage upstream partners to adopt green practices;
- support the manufacturing of low-GHG emissions transport modalities or infrastructure;
- design with resource efficiency/maximum resource effectiveness to reduce waste and over-use;
- responsible use of renewable and biogenic materials; and
- recover and reuse cities' waste materials (i.e. Urban Mining), such as concrete, bricks, steel reinforcements, roofing materials, etc.

- number of instances of non-compliance with environmental permits, standards, and regulations;[5]
- amount of defect- and safety-related rework costs;[5]
- total amount of monetary losses as a result of legal proceedings associated with defect- and safety-related incidents;[5]
- primary energy demand of new buildings;[3]
- low-GHG emissions buildings share;[1]
- percentage of projects that achieve net zero embodied carbon;[7] and
- percentage of projects that have publicly shared their embodied carbon material specifications and lifecycle assessment data.[7]

Engineering & Construction Services resources

1. Assessing Low Carbon Transition Initiative (ACT), Building Construction, 2022.
2. Climate Bonds Initiative (CBI), Buildings Criteria 2.1, 2023.
3. EU Taxonomy, Construction and real estate activities, website as of 2024.
4. International Energy Agency (IEA), Buildings, 2023.
5. International Financial Reporting Standards (IFRS), IFRS S2: Industry-based Guidance on implementing Climate-related Disclosures: Volume 33 – Engineering & Construction Services, 2023.
6. ShareAction, Decarbonising Real Estate: Foundations for Success, 2021.
7. World Green Buildings Council, Bringing Embodied Carbon Upfront: Coordinated action for the building and construction sector to tackle embodied carbon, 2019.

Real Estate

Real Estate: Entities in the Home Builders, Real Estate, and Real Estate Services industries.

- **Home Builders** Entities that develop new homes and develop residential communities. Development efforts generally include the acquisition of land, site preparation, the construction of homes, and home sales.
- **Real Estate** Entities that own, develop and generally operate income-producing real estate assets. Entities in this industry are commonly structured as real estate investment trusts and operate in a wide range of real estate industry segments, including residential, retail, office, health care, industrial, and hotel properties.
- **Real Estate Services** Entities that provide a range of services to real estate owners, tenants, investors, and developers. Primary services include property management, brokerage, appraisal, and information services for real estate owners. Property management services may include leasing, tenant relations, building maintenance, and building security.

Photo Unsplash.com

Recognised decarbonisation levers	Governance, engagement, business and operational metrics and targets	GHG metrics and targets

1. **Reduce emissions from space heating and cooling:**[4,8,13]
• install heat pumps and other technologies to decarbonise heating (e.g. district heating, solar thermal heaters); and
• deploy efficient air conditioning units and support innovative air conditioning technologies (e.g. equipped for demand response and with low-global warming potential refrigerants).
2. **Improve the energy performance of building envelopes and other efficiency measures:**[4,8,10,13]
• retrofit existing buildings with fabric improvements and offer retrofit services (e.g. insulation, double glazing);
	Homebuilders:
	• number of (1) lots and (2) homes delivered on redevelopment sites;[5]
	• number of (1) lots and (2) homes delivered in regions with High or Extremely High Baseline Water Stress;[5]
	• total amount of monetary losses as a result of legal proceedings associated with environmental regulations;[5]
	• number of homes that obtained a certified residential energy efficiency rating and average rating;[5]
	• percentage of installed water fixtures certified to a water efficiency standard;[5]
		General:
		• GHG emissions intensity of portfolio ($kgCO_2e/m^2$ or tCO_2e/m^2);[1,2,9,10]
		Homebuilders:[8,10]
		• For construction services:
		  • Category 1: Purchased goods and services;
		  • Category 3: Fuel and energy related activities;
		  • Category 4: Upstream transportation and distribution;
		  • Category 5: Waste generated in operations.

- support energy performance standards;
- provide new buildings which are zero-carbon ready (e.g. highly energy efficient and resilient buildings that can rely on energy that can be fully decarbonised such as electricity or district energy); and
- utilise LED lighting.

3. **Use zero-carbon electricity and support grid and transport decarbonisation:**[4, 13]

- install onsite renewable energy (e.g. rooftop solar) and storage;
- integrate electric vehicle charging points and design new buildings with public transport links;
- purchase zero-carbon electricity that is additional and time-matched; and
- participate in demand response programs (e.g. through smart air conditioning).

4. **Reduce embodied carbon and other value chain emissions**[4,9,10,13]

- procure for low/near-zero GHG construction materials, technologies, and services;
- design with resource efficiency / maximum resource effectiveness to reduce waste and over-use;

- number of homes delivered certified to a third-party multi-attribute green building standard;[5] and
- number of lots located in 100-year flood zones.[5]

Real Estate:

- primary energy demand for residential and non-residential buildings;[1,3]
- energy consumption data coverage as a percentage of total floor area, by property sector;[6]
- total energy consumed by portfolio area with data coverage, percentage grid electricity and percentage renewable, by property sector;[6]
- like-for-like percentage change in energy consumption for the portfolio area with data coverage, by property sector;[6]
- percentage of eligible portfolio that has an energy rating and is energy intensity is an important metric of consumption to allow comparability against benchmarks;[6]
- percentage of eligible portfolio that (1) has an energy rating and is certified to a global certification standard (e.g. ENERGY STAR, LEED, BREEAM), or regional certification standard (e.g. Australia's Green Star, Germany's DGNB or Singapore's Green Mark) by property sector;[6]
- water withdrawal data coverage as a percentage of total floor area and floor area in regions with High or Extremely High Baseline Water Stress, by property sector;[6]
- (1) total water withdrawn by portfolio area with data coverage and (2) percentage in regions with High or Extremely High Baseline Water Stress, by property sector;[6]
- like-for-like percentage change in water withdrawn for portfolio area with data coverage, by property sector;[6]

- For developer activities:
  - Category 2: Capital goods;
  - Category 11: Use of sold products;
  - Category 12: end-of-life treatment of sold products.

Real Estate:[8, 11]

- For owner-occupier services:
  - Category 2: Capital goods.
- For owner-lessor activities:
  - Category 2: Capital goods;
  - Category 13: Downstream leased assets.
- For tenant activities:
  - Category 13: Downstream leased assets.

Real Estate Services:[8, 11]

- For property managers:
  - Category 11: Use of sold products (or Category 13: Downstream leased assets).

• prioritise the use of low/near-zero GHG materials and responsible use of renewable & biogenic materials; and • incorporate future circularity (design for deconstruction and reuse, use longer life materials).	• percentage of new leases that contain a cost recovery clause for resource efficiency-related capital improvements and associated leased floor area, by property sector;[6] • percentage of tenants that are separately metered or sub metered for grid electricity consumption and water withdrawals, by property sector;[6] and • area of properties located in 100-year flood zones, by property sector.[6] **Real Estate Services:** • (1) floor area and (2) number of buildings under management provided with energy and sustainability services.[7] and • (1) floor area and (2) number of buildings under management that obtained an energy rating.[7]	

Real Estate resources

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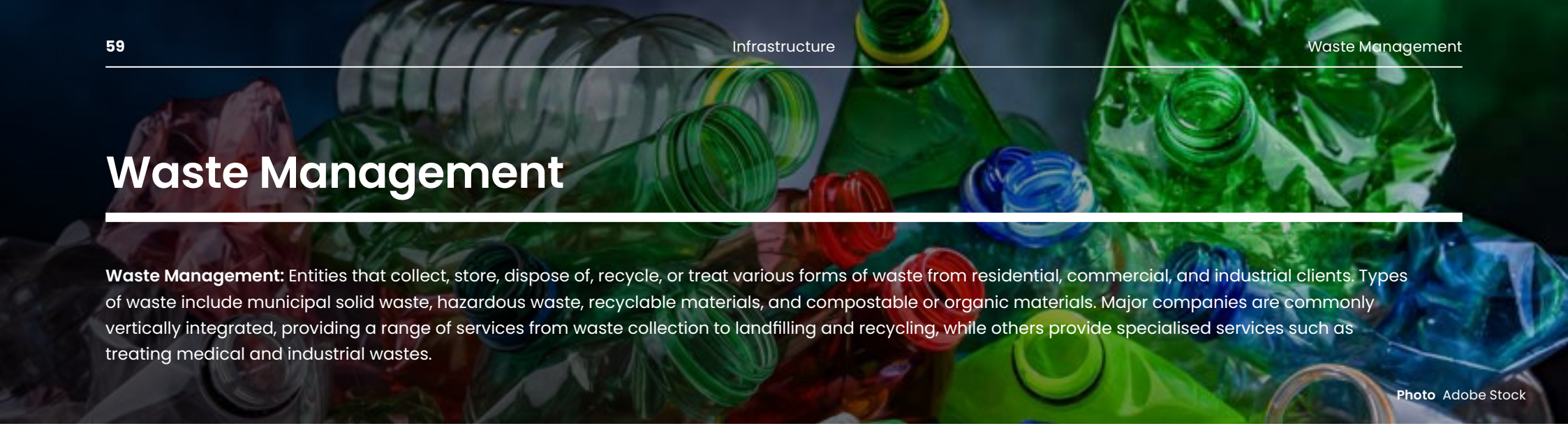
4. International Financial Reporting Standards (IFRS), IFRS S2: Industry-based Guidance on implementing Climate-related Disclosures: Volume 36 – Home Builders, 2023.
5. International Financial Reporting Standards (IFRS), IFRS S2: Industry-based Guidance on implementing Climate-related Disclosures: Volume 36 – Real Estate, 2023.
6. International Financial Reporting Standards (IFRS), IFRS S2: Industry-based Guidance on implementing Climate-related Disclosures: Volume 37 – Real Estate Services, 2023.
7. McKinsey & Company, Building value by decarbonizing the built environment, 2023.
8. Science Based Targets Initiative (SBTi), Buildings Sector Science Based Target Setting Guidance [Draft], 2023.
9. ShareAction, Decarbonising Real Estate: Foundations for Success, 2021.
10. The UK Green Building Council, Guide to Scope 3 Reporting in Commercial Real Estate, 2019.
11. The UK Green Building Council, Renewable Energy Procurement, 2023.
12. The UK Green Building Council, Whole Life Carbon Roadmap, 2021.



Waste Management

Waste Management: Entities that collect, store, dispose of, recycle, or treat various forms of waste from residential, commercial, and industrial clients. Types of waste include municipal solid waste, hazardous waste, recyclable materials, and compostable or organic materials. Major companies are commonly vertically integrated, providing a range of services from waste collection to landfilling and recycling, while others provide specialised services such as treating medical and industrial wastes.

Photo Adobe Stock

Recognised decarbonisation levers	Governance, engagement, business and operational metrics and targets	GHG metrics and targets
1. **Promote reuse and minimise landfill waste:**[1,5] • increase the range and volume of materials diverted from landfills, with a focus on integrating such activities within the local economy; • divert and recover items from landfill for reuse, particularly targeting the significant volume of household waste arriving at recycling centres; and • expand and optimise operations of waste recycling centres to reclaim and renew household items through repair and upcycling, thereby preventing resource wastage. 2. **Reduce GHG emissions related to collection and transport of waste:**[1,3,6] • reduce fuel consumption of vehicle fleet; • increase fuel efficiency; • change to low-GHG emissions or renewable fuels; and • optimise vehicle routes to reduce fuel consumption.	• (1) total landfill gas generated, (2) percentage flared and (3) percentage used for energy;[6] • fleet fuel management: (1) fleet fuel consumed, (2) percentage natural gas and (3) percentage renewable;[6] • fleet fuel management; percentage of alternative fuel vehicles in fleet;[6] • number of customers by category: (1) municipal, (2) commercial, (3) industrial, (4) residential, and (5) other;[6] • vehicle fleet size;[6] • number of: (1) landfills, (2) transfer stations, (3) recycling centres, (4) composting centres, (5) incinerators, and (6) all other facilities;[6] • total amount of materials managed, by customer category: (1) municipal, (2) commercial, (3) industrial, (4) residential, and (5) other;[6] • percentage of customers receiving recycling and composting services by customer type;[6]	• (1) gross global Scope 1 emissions (tCO_2e), percentage covered under (2) emissions-limiting regulations and (3) emissions-reporting regulations;[6] • total methane emissions;[1,2] and • landfill gas generated per metric ton of waste processed.[8]

3. **Reduce GHG emissions of recycling & processing infrastructure:**[1,3]

- increase the energy efficiency of processes; and
- change to low-GHG emissions or renewable energy type processing technologies.

4. **Reduce GHG emissions in final disposal of waste:**[2,3]

- limit emissions from incineration (without energy capture);
- minimise fossil incineration input;
- develop and deploy carbon capture, utilisation and storage (CCUS) in waste incineration installations; and
- optimise the efficiency of incineration.

5. **Limit GHG emissions from Energy from Waste (EfW):**[1,2,3,4]

- optimise efficiency of EfW process;
- increase bottom ash recovery;
- reduce plastics/fossil waste in EfW; and
- develop and deploy CCUS in EfW installations.

6. **Limit methane emissions from landfill waste:**[1,2,3]

- improve methane capture rate and utilisation (e.g. to create electricity, heat, fuel or chemical compounds);
- ensure methane oxidation;
- divert all organic waste from landfill to recycling, energy production through composting, anaerobic digestion and EfW; and
- separate woody waste and send to EfW or composting plant.

- amount of waste collected, percentage recovered through recycling;[6]
- landfill gas capture rate;[1]
- biodegradable municipal waste to landfill;[2]
- waste incinerated (including EfW);[2] and
- operational and planned EfW capacity.[2]

Waste Management resources

1. Climate Bond Initiative (CBI), Waste Management Criteria: The Climate Bonds Standard & Certification Scheme's Waste Management Criteria, 2022.
2. Climate Change Committee (CCC), CCC Monitoring Framework – Assessing UK progress in reducing emissions – 10. Waste, 2022.
3. Environmental Services Association (ESA), A net-zero greenhouse gas emissions strategy for the UK recycling and waste sector, 2022.
4. European Suppliers of Waste-to-Energy Technology (ESWET), Waste-to-Energy 2050: Clean technologies for sustainable waste management, 2020.
5. Green Alliance, Completing the Circle: Creating effective UK markets for recovered resources, 2018.
6. International Financial Reporting Standards (IFRS), IFRS S2: Industry-based Guidance on implementing Climate-related Disclosures: Volume 38 – Waste Management, 2023.

RENEWABLE RESOURCES & ALTERNATIVE ENERGY

Biofuels

Fuel Cells & Industrial Batteries

Solar Technology & Project Developers

Wind Technology & Project Developers

Forestry & Paper

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Biofuels

Biofuels: Entities that produce biofuels and process raw materials for production. Biofuels are manufactured using organic feedstocks and are used primarily as transportation fuels. Entities typically source feedstocks, which include food, oil crops, and animal products, from agricultural product distributors. Ethanol and biodiesel are the most widely produced biofuels, while other types include biogas, biohydrogen, and synthetic biofuels, produced from a variety of organic feedstocks.

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Recognised decarbonisation levers	Governance, engagement, business and operational metrics and targets	GHG metrics and targets
1. **Increasing biofuels supply and feedstock diversification:**[1,2,4,5] • increase biofuel production and provide supply to sectors with limited near-term decarbonisation options such as shipping and aviation; and • diversify feedstock supply to avoid competing with food production, including second-generation biofuels (e.g. agricultural and forestry residues, municipal waste), third-generation biofuels (e.g. produced from microalgae), and fourth-generation biofuels (e.g. produced on non-arable land). 2. **Support research and development (R&D) and commercialisation of advanced biofuel technologies:**[3,4,5] • support R&D and commercialisation of second, third or fourth generation feedstocks; and • support R&D and commercialisation of advanced biofuel production pathways, including pathways (e.g. bio-Fischer-Tropsch) to convert woody and grassy biomass to liquid biomass.	• water management in manufacturing: (1) total water withdrawn, (2) total water consumed; percentage of each in regions with High or Extremely High Baseline Water Stress;[5] • water management in manufacturing: number of incidents of non-compliance associated with water quality permits, standards and regulations;[5] • sourcing & environmental impacts of feedstock production: percentage of biofuel production third-party certified to an environmental sustainability standard;[5,6] • biofuel production capacity;[5] and • production of: (1) renewable fuel, (2) advanced biofuel, (3) biodiesel, and (4) cellulosic biofuel;[5] • amount of feedstock consumed in production;[5] • volume and percentage of biofuel production and/or consumption that is third-party certified;[1] and • volume and percentage of biofuel production and/or consumption that is derived from palm oil.[1]	• lifecycle emissions balance: lifecycle GHG emissions, by biofuel type (renewable biofuel, advanced biofuel, biodiesel, cellulosic biofuel);[6] • lifecycle assessment should include feedstock production, processing, biofuel/bioenergy-production, storage and blending, intermediate and final transportation;[2] and • biogenic carbon data should be incorporated into Scope 1, 2 and 3 inventory.[1]

3. **Engage with supply chain to build sustainable access to biofuel feedstocks:**[1,5]

- enhance land productivity and soil carbon (e.g. through intercropping and growing crops on marginal lands);
- promote sustainable agricultural practices including water management, soil health preservation and reducing the use of synthetic fertilisers and pesticides;
- improve waste and residue collection systems, particularly woody residues from agriculture and forestry; and
- implement performance-based supplier sustainability frameworks, including to eliminate any land use change in supply chain.

4. **Increased use of carbon capture, utilisation, and storage (CCUS):**[4,5]

- work with value chain partners to develop bioenergy with carbon capture and storage from sustainable feedstocks; and
- capturing carbon from biofuel production, (e.g. from ethanol fermentation and bio-based Fischer-Tropsch production). This may be used in other industries (e.g. food and drink), or permanently stored.

Biofuels resources

1. CDP, CDP Technical Note: Biofuels, 2023
2. Climate Bonds Initiative (CBI), The Bioenergy Criteria: Climate Bonds Standard, 2022
3. International Energy Agency (IEA), Energy Technology Perspectives 2023, 2023
4. International Energy Agency (IEA), Biofuels, 2023.
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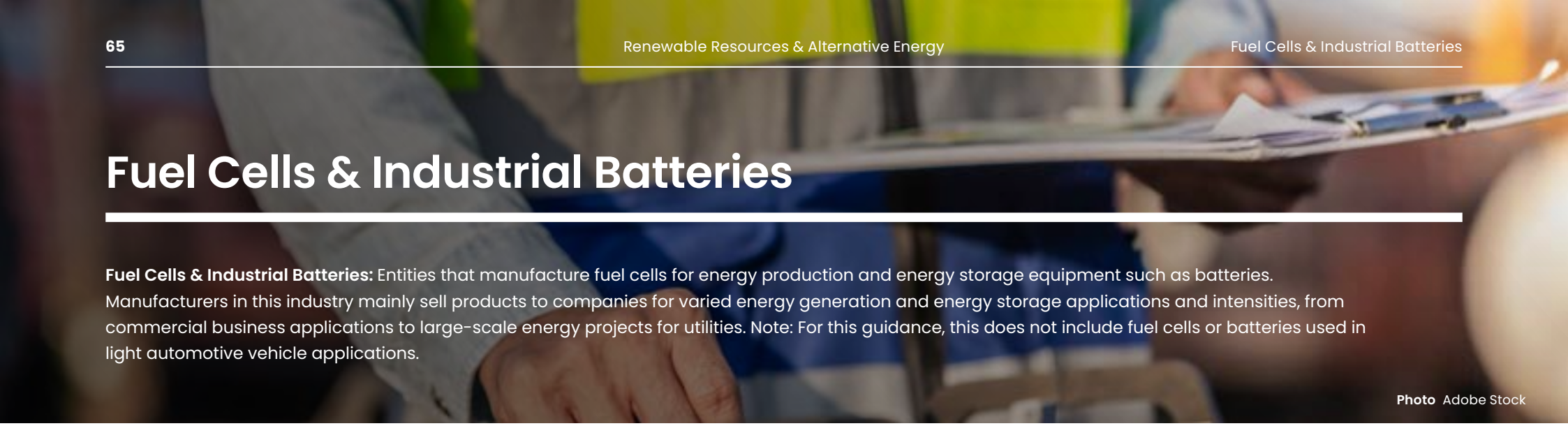

Fuel Cells & Industrial Batteries

Fuel Cells & Industrial Batteries: Entities that manufacture fuel cells for energy production and energy storage equipment such as batteries. Manufacturers in this industry mainly sell products to companies for varied energy generation and energy storage applications and intensities, from commercial business applications to large-scale energy projects for utilities. Note: For this guidance, this does not include fuel cells or batteries used in light automotive vehicle applications.

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Recognised decarbonisation levers	Governance, engagement, business and operational metrics and targets	GHG metrics and targets

1. **Scale mass manufacture of fuel cells and industrial battery technologies:**[2,3,4]
• increase manufacturing capacity, utilisation rates, and support installation of fuel cells and industrial batteries.
2. **Reduce GHG emissions intensity of manufacturing process:**[2,4]
• purchase, or onsite generation of, zero-carbon electricity;
• electrification of low-to-medium heating applications; and
• conduct energy efficiency audits.
3. **Decarbonise supply chains:**[4,7]
• engage with supply chain partners to reduce upstream emissions associated with mining and processing of materials; and
• encourage the recycling of batteries and fuel cell components to reduce the need for raw material extraction.
	• total energy consumed
	  • percentage grid electricity
	  • percentage renewable;[5]
	• average storage capacity of batteries, by product application and technology type (specific energy);[5]
	• average energy efficiency of fuel cells as electrical efficiency and thermal efficiency, by product application and technology type;[5]
	• average battery efficiency as coulombic efficiency, by product application and technology type;[5]
	• average operating lifetime of fuel cells, by product application and technology type;[5]
	• average operating lifetime of batteries by product application and technology type;[5]
	• percentage of products sold that are recyclable or reusable;[5]
	• weight of end-of-life material recovered, percentage recycled;[5] and
		• Scope 1 emissions from the manufacturing of fuel cell batteries (e.g. from natural gas);[4]
		• Scope 1 emissions from the transportation within entity operations (e.g. movement of materials on-site using entity vehicles);[4] and
		• Scope 3 emissions intensity of key procured materials (e.g. steel, aluminium, copper, nickel, lithium, graphite), considering mining and processing.[4]

4. **Minimising product lifecycle impacts through innovation in product design and business practices:**[4]

- encourage the use of responsible mining practices for raw materials (e.g. nickel, steel, cobalt);
- procure recycled material and integrate circular economy into product design;
- support battery energy storage solutions (BESS) solutions to replace diesel or gas generators; and
- incorporate sustainable design in projects. (e.g. land use optimisation, habitat conservation, water consumption).

5. **Support Emerging Battery Technology:**[6]

- invest in research and development (R&D) to enhance the cycle life and energy density of batteries (e.g. flow batteries); and
- collaborate with innovators and other industries for shared R&D and technology integration.

- batteries sold (units, and total storage capacity of batteries / energy production capacity of fuel cells).[5]

Fuel Cells & Industrial Batteries resources

1. Climate Bonds Initiative (CBI), Electricity Grids and Storage Criteria, 2021
2. International Energy Agency (IEA), Batteries and hydrogen technology: keys for a clean energy future, 2020
3. International Energy Agency (IEA), Grid-scale Storage, 2022.
4. International Energy Agency (IEA), Energy Technology Perspectives 2023, 2023.
5. International Financial Reporting Standards (IFRS), IFRS S2: Industry-based Guidance on implementing Climate-related Disclosures: Volume 42 – Fuel Cells & Industrial Batteries, 2023.
6. McKinsey & Company, Enabling renewable energy with battery energy storage systems, 2023.

Solar Technology & Project Developers

Solar Technology & Project Developers: Entities that manufacture solar energy equipment, including solar photovoltaic (PV) modules, polysilicon feedstock, solar thermal electricity-generation systems, solar inverters, and other related components. Companies may also develop, build, and manage solar energy projects and offer financing or maintenance services to customers.

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Recognised decarbonisation levers	Governance, engagement, business and operational metrics and targets	GHG metrics and targets
1. **Scale mass manufacture of solar PV technologies:**[3, 4] • increase manufacturing capacity, utilisation, and support installation of solar PV technologies; and • develop innovative cell designs and advanced materials that can improve the conversion efficiency of solar panels. 2. **Reduce GHG emissions intensity of manufacturing process:**[3, 4, 5] • purchase, or onsite generation of, zero-carbon electricity; • site new manufacturing facilities to access affordable, zero-carbon electricity generation; and • electrification of low-to-medium heating applications.	• energy management in manufacturing: (1) total energy consumed, (2) percentage grid electricity, (3) percentage renewable;[6] • water management in manufacturing: (1) total water withdrawn, (2) total water consumed; percentage of each in regions with High or Extremely High Baseline Water Stress;[6] • total capacity of photovoltaic (PV) solar modules produced;[6] • total capacity of completed solar energy systems;[6] and • total project development assets.[6]	• Scope 1 and 2 emissions from manufacturing per segment;[5] • Scope 1 and 2 emissions intensity from manufacturing per segment (e.g. polysilicon, wafers, cells, modules);[5] and • Scope 3 emissions intensity of key procured materials (e.g. copper, silicon, steel, aluminium, glass, plastic, cement), considering both mining and processing.[3]

3. **Decarbonise value chains:**[3, 4, 5]

- work with suppliers on climate information collection, engagement and incentivisation of best practice, and collaboration for innovative new productions; and practice, and collaboration for innovative new productions; and
- provide financial incentives (e.g. purchase agreements or green premiums), to scale and secure supply of low-GHG emissions materials (e.g. copper and aluminium); and
- procure raw materials from recycled solar PV waste streams.

4. **Minimising product lifecycle impacts through innovation in product design and business practices:**[3, 5]

- extend the operational lifetime of solar panels through robust design and regular maintenance to reduce material usage and cost per unit of electricity generated;
- promote standardisation of materials and components across developers and manufacturers to reduce costs and the footprint of supply; and
- incorporate sustainable design and construction practices in solar project development, considering factors such as land use optimisation, habitat conservation, minimising water consumption during construction and operation, and utilising environmentally friendly installation techniques.

5. **Support grid integration and flexibility:**[1, 2]

- implementation of solar with smart grid technologies and energy storage systems, to enhance the flexibility and reliability of solar power; and
- support development of solar technologies that support storage and flexibility (e.g. concentrated solar power).

Solar Technology & Project Developers resources

1. Breakthrough Energy, Embracing Innovation: Transforming the Grid for a Sustainable Future, 2023.
2. Breakthrough Energy, The transmission challenge ahead, 2023.
3. International Energy Agency (IEA), Energy Technology Perspectives 2023, 2023
4. International Energy Agency (IEA), Solar PV- Fuels & Technologies, 2023.
5. International Energy Agency (IEA), Special Report on Solar PV Global Supply Chains, 2022.
6. International Financial Reporting Standards (IFRS), IFRS S2: Industry-based Guidance on implementing Climate-related Disclosures: Volume 44 – Solar Technology & Project Developers, 2023.

Wind Technology & Project Developers

Wind Technology & Project Developers: Entities that manufacture wind turbines, blades, towers, and other components of wind power systems. Companies that develop, build, and manage wind energy projects are also included within the scope of this industry. Manufacturers may also offer post-sale maintenance and support services. Turbines can be installed onshore or offshore, which can cause differences in wind-generating capacity and create challenges in project development for each type of installation.

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Recognised decarbonisation levers	Governance, engagement, business and operational metrics and targets	GHG metrics and targets
1. **Scale mass manufacture of onshore and offshore wind technologies:**[2] • increase manufacturing capacity, utilisation, and support installation of onshore and offshore technologies; • develop floating offshore wind to open new areas of development; and • enhancements in aerodynamics, blade design, and turbine control systems. 2. **Reduce GHG emissions intensity of manufacturing process:**[1,2] • purchase, or onsite generation, of zero-carbon electricity; • site new manufacturing facilities to access affordable, zero-carbon electricity generation; and • electrification of low-to-medium heating applications.	• materials efficiency: top five materials consumed, by weight;[4] • materials efficiency: average top head mass per turbine capacity, by wind turbine class;[4] • number of delivered wind turbines, by wind turbine class;[4] • aggregate capacity of delivered wind turbines, by wind turbine class;[4] • amount of turbine backlog;[4] and • aggregate capacity of turbine backlog.[4]	• Scope 3 emissions intensity of key procured materials (e.g. copper, nickel, neodymium, manganese, steel, cement, glass), considering both mining and processing.[3]

3. **Decarbonise supply chains:**[2]

- work with suppliers on climate information collection, engagement and incentivisation of best practice, and collaboration for innovative new productions; and
- provide financial incentives (e.g. purchase agreements or green premiums), to scale and secure supply of low-GHG emissions materials (e.g. copper and steel); and
- procure raw materials from recycled solar PV waste streams.

4. **Minimising product lifecycle impacts through innovation in product design and business practices:**[2,5]

- use design to support recyclability of turbine blades and support development of new recycling techniques including solvolysis and pyrolysis;
- extend the operational lifetime of wind turbines through robust design and regular maintenance to reduce material usage and cost per unit of electricity generated;
- promote standardisation of materials and components across developers and manufacturers to reduce costs and the footprint of supply; and
- incorporate sustainable design and construction practices in wind project development, considering factors such as land use optimisation, habitat conservation, minimising water consumption during construction and operation, and utilising environmentally friendly installation techniques.

5. **Support grid integration and flexibility:**[1,2]

- focus on strengthening grid infrastructure and optimising wind energy integration into the power system; and

• implementation of wind with smart grid technologies and energy storage systems, to enhance the flexibility and reliability of wind power.		

Wind Technology & Project Developers resources

1. Breakthrough Energy, Embracing Innovation: Transforming the Grid for a Sustainable Future, 2023.
2. International Energy Association (IEA), Energy Technology Perspectives 2023, 2023.
3. International Energy Agency (IEA), Wind, 2023.
4. International Financial Reporting Standards (IFRS), IFRS S2: Industry-based Guidance on implementing Climate-related Disclosures: Volume 45 – Wind Technology & Project Developers, 2023.
5. Wind Europe, Accelerating Wind Turbine Blade Circularity, 2020.

Forestry & Paper

Forestry & Paper: Entities in the Forestry Management and Pulp & Paper industries.

- **Forestry Management** Entities that own and/or manage natural and planted forestry lands and timber tracts, or operate non-retail tree nurseries and rubber plantations. The industry conducts its operations on lands that can be company-owned or leased from public or private landowners. Companies typically sell timber to wood product manufacturers, pulp and paper producers, energy producers, and a variety of other customers.
- **Pulp & Paper Products** Entities that manufacture a range of wood pulp and paper products, including pulp fibre, paper packaging and sanitary paper, office paper, newsprint, and paper for industrial applications. Entities in the industry typically function as business-to-business entities and may have operations in multiple countries.

Photo JJ Ying, Unsplash.com

Recognised decarbonisation levers	Governance, engagement, business and operational metrics and targets	GHG metrics and targets
1. **End deforestation and land degradation, whilst sustainably restoring forests:**[1,3,4] • implement sustainable logging practices; • implement sustainable management, including to limit risks of fires, maintain ecosystem services and maintain carbon stocks; • monitor and control illegal logging (e.g. via satellites and AI technologies); • collaborate with local communities to ensure sustainable forest management; • reforestation or afforestation on degraded and deforested forest land implement supply chain traceability, monitoring, reporting and verification to protect natural forests and natural ecosystems (e.g. peatlands); and	**Forestry Management:** • ecosystem services & impacts: area of forestland certified to a third-party forest management standard, percentage certified to each standard;[7] • ecosystem services & impacts: area of forestland with protected conservation status;[7] • ecosystem services & impacts: area of forestland in endangered species habitat;[7] • area of forestland owned, leased, and/or managed by the entity;[7] • aggregate standing timber inventory;[7] and • timber harvest volume.[7]	Account for land management and land use change, CO_2 removals and storage, and biogenic products in line with GHG Protocol Land Sector and Removal guidance.[5] **Forestry Management:** 1. emissions intensity of timber and wood fibre (tCO_2e/m^3) solid under bark.[10] **Pulp & Paper Products :** 1. gross global Scope 1 emissions (CO_2e);[8] 2. pulp activity: emissions intensity of produced air-dry pulp production (tCO_2e/t);[1] 3. paper and board activity: emissions intensity of paper and board production (tCO_2e/t);[1] and 4. upstream emissions intensity of purchased timber and wood fibre, pulp or paper and board.[1]

- increase share of virgin fibres from certified sustainably management forests.

2. **Reduce energy-related emissions through zero emissions electricity and biofuels:**[1,3,6,10]

- implement on-site renewable generation and procure zero-carbon electricity;
- utilise high temperature heat pumps, electric boilers, solar thermal energy and biogas to replace fossil fuel heat; and
- utilise by-products (bark, black liquor, pulp rejects, sludges) and sustainably sourced biofuels to displace fossil fuels in heat in production processes.

3. **Improve operational efficiency:**[1,2,3,6,10]

- improve energy efficiency through on-site heat recovery and combined heat and power; and
- adopt best available techniques (e.g. drying technologies, enzymatic pre-treatment and flash condensing with steam).

4. **Grow the circular bioeconomy and substitute GHG intensive materials:**[1,2,3,6,10]

- increase the use of recovered fibres;
- engage with other sectors to improve waste stream collection;
- increasing the uptake of wood-based materials in traditional markets (e.g. engineered wood products in construction sector);
- bring wood-based materials to new markets (e.g. wood-based fibres to fashion industry);
- provision of carbon dioxide removal services in collaboration with other sectors, including biochar and bio-energy and carbon capture and storage.

Pulp & Paper Products:

- energy management: (1) total energy consumed; (2) percentage grid electricity; (3) percentage from biomass; (4) percentage from other renewable energy; and (5) total self-generated energy;[8]
- share of consumed heat and steam produced with low-GHG emissions technology;[1]
- water management: (1) total water withdrawn; (2) total water consumed; percentage of each in regions with High or Extremely High Baseline Water Stress;[8]
- supply chain management: percentage of wood fibre sourced from (1) third-party certified forestlands and percentage to each standard and (2) meeting other fibre sourcing standards and percentage to each standard;[8]
- supply chain management: amount of recycled and recovered fibre procured;[8]
- share of recovered fibres in total fibres;[2] and
- total wood fibre sourced.[8]

Forestry & Paper resources

1. Assessing low-Carbon Transition (ACT), Pulp & Paper methodology, 2021.
2. Confederation of European Paper Industries (CEPI), The Forest Fibre Industry. 2050 Roadmap to a low-carbon bio-economy, 2011.
3. Dylan et al., Decarbonizing the pulp and paper industry: A critical and systematic review of sociotechnical developments and policy options, Renewable and Sustainable Energy Reviews, 2022
4. Global Canopy, Forest 500: Company Assessment Methodology 2022, 2022.
5. Greenhouse Gas Protocol (GHG Protocol), Land Sector and Removals Guidance (Draft for Pilot Testing and Review), 2022.
6. International Energy Agency (IEA), Pulp and Paper, 2023.
7. International Financial Reporting Standards (IFRS), IFRS S2: Industry-based Guidance on implementing Climate-related Disclosures: Volume 41 – Forestry Management, 2023.
8. International Financial Reporting Standards (IFRS), IFRS S2: Industry-based Guidance on implementing Climate-related Disclosures: Volume 43 – Pulp & Paper Products, 2023.
9. Science Based Targets Initiative (SBTI), Forest, Land and Agriculture Science Based Target Setting Guidance, 2023.
10. The World Business Council for Sustainable Development (WBCSD), Forest Sector Net Zero Roadmap – Phase 1: Enabling the transition to a net-zero economy, 2021.

RESOURCE TRANSFORMATION

Industrials

Chemicals

Photo Isis Franca, Unsplash.com

Industrials

Industrials: Entities in the Aerospace & Defence, Containers & Packaging, Electric & Electronic Equipment and Industrial Machinery & Goods industries.

- **Aerospace & Defence:** Entities that manufacture commercial aircraft, aircraft parts, aerospace and defence products, as well as defence prime contractors.
- **Containers & Packaging:** Entities that convert raw materials including metal, plastic, paper, and glass into semi-finished or finished packaging products. Entities produce a wide range of products, including corrugated cardboard packaging, food and beverage containers, bottles for household products, aluminium cans, steel drums, and other forms of packaging.
- **Electrical & Electronic Equipment:** Entities that develop and manufacture a broad range of electric components including power generation equipment, energy transformers, electric motors, switchboards, automation equipment, heating and cooling equipment, lighting, and transmission cables.
- **Industrial Machinery & Goods:** Entities that manufacture equipment for a variety of industries including construction, agriculture, energy, utility, mining, manufacturing, automotive and transportation. Products include engines, earth-moving equipment, trucks, tractors, ships, industrial pumps, locomotives, and turbines.

Photo Pavel Neznanov, Unsplash.com

Recognised decarbonisation levers	Governance, engagement, business and operational metrics and targets	GHG metrics and targets
1. **Reduce emissions from manufacturing through efficiency and electrification:**[1,3,9] • switch to zero-carbon electricity supply and support development of zero carbon electricity infrastructure; • electrify light-to-medium process heat and cooling (e.g. through heat pumps, electric boilers and induction heaters); • utilise low-carbon fuels or carbon capture, utilisation, and storage (CCUS) technologies for high emission-process heat; and	**Aerospace & Defence:** • energy management: (1) total energy consumed, (2) percentage of grid electricity, and (3) percentage renewable;[5] and • fuel economy in use-phase: revenue from alternative energy-related products;[5] **Containers & Packaging:** • energy management: (1) total energy consumed, (2) percentage grid electricity, (3) percentage renewable, and (4) total self-generated energy;[6]	• Scope 1 and 2 emissions (tCO2e) per million USD in revenue;[10] and • relevant Scope 3 categories may include: category 1, purchased goods and services; and category 11, use of sold products.[10] **Containers & Packaging:** • gross global Scope 1 emissions, percentage covered under emissions-limiting regulations.[6]

- improve process efficiency (e.g. through adopting more efficient equipment or reducing waste).

2. **Enabling decarbonisation through digital solutions, e.g. smart technologies:**[9]

- leverage smart technologies for better product design, fabrication strategies, and predictive maintenance; and
- use digital tools (e.g., AI and IoT solutions) to reduce life-cycle emissions, enable end-of-life reuse, and increase manufacturing yields.

3. **Reduce emissions from raw materials and adopt circular product strategies:**[1,3,9]

- procure low-emissions key materials and engage with suppliers (e.g. aluminium or steel);
- utilise design to substitute GHG intensive materials or use secondary/recycled content; and
- adopt sustainable design to enable product re-use and repair (e.g. through modularity).

4. **Stimulate demand for low emission solutions:**[1,2,3,9]

- provide products that improve efficiency, for example:
  - for Aerospace & Defence: advanced aerodynamics, lightweight materials for better fuel efficiency;
  - for Electrical & Electronic Equipment: energy-efficient components and design that reduces use-phase emissions;
  - for Industrial Machinery & Goods: high efficiency machinery and motors that reduce use-phase emissions or enable switch to cleaner energy source (e.g. diesel to electricity);

- water management: (1) total water withdrawn, (2) total water consumed; percentage of each in regions with High or Extremely High Baseline Water Stress;[6]
- water management: number of incidents of non-compliance associated with water quality permits, standards and regulations;[6]
- waste management: amount of waste generated, percentage hazardous and percentage recycled;[6]
- supply chain management: total wood fibre procured; percentage from certified sources;[6]
- supply chain management: total aluminium purchased; percentage from certified sources;[6] and
- percentage of production as: (1) paper/wood, (2) glass, (3) metal, and (4) plastic.[8]

Electrical & Electronic Equipment:

- energy management: (1) total energy consumed, (2) percentage grid electricity, and (3) percentage renewable;[7]
- product lifecycle management: percentage of products by revenue that contain IEC 62474 declarable substances;[7] and
- product lifecycle management: percentage of eligible products, by revenue, certified to an energy efficiency certification.[7]

Industrial Machinery & Goods:

- energy management: (1) total energy consumed, (2) percentage grid electricity, and (3) percentage renewable;[8]
- fuel economy in use-phase: sales-weighted fleet fuel efficiency for medium- and heavy-duty vehicles;[10]
- fuel economy in use-phase: sales-weighted fuel efficiency for non-road equipment;[8]

• collaborate on standards for energy efficient and/or low-carbon products; and • engage with customers to increase uptake of energy efficient and low-carbon products. **5. Increase investment in R&D and demonstration of low emissions technologies:**[1,2,3,9] • Aerospace & Defence: hybrid-electric propulsion systems and sustainable aviation fuel infrastructure, and advanced aircraft configurations; • Containers and Packaging: biodegradable or compostable packaging solutions; • Electrical & Electronic Equipment: e-waste recycling; and • Industrial Machinery & Goods: alternative process heat production (e.g. radio frequency heating, electromagnetic heating and infrared heating).	• fuel economy and emissions in use-phase: sales-weighted fuel efficiency for stationary generators;[8] and • sales-weighted emissions of the following pollutants: (1) nitrogen oxides (NOx) and (2) particulate matter (PM) for: (a) marine diesel engines, (b) locomotive diesel engines, (c) on-road medium- and heavy-duty engines, and (d) other non-road diesel engines.[8]	

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2. EY, How can sustainability take flight in aerospace defense?, 2023.
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4. International Financial Reporting Standards (IFRS), IFRS S2: Industry-based Guidance on implementing Climate-related Disclosures: Volume 46 – Aerospace & Defence, 2023.
5. International Financial Reporting Standards (IFRS), IFRS S2: Industry-based Guidance on implementing Climate-related Disclosures: Volume 48 – Containers & Packaging, 2023.
6. International Financial Reporting Standards (IFRS), IFRS S2: Industry-based Guidance on implementing Climate-related Disclosures: Volume 49 – Electrical & Electronic Equipment, 2023.
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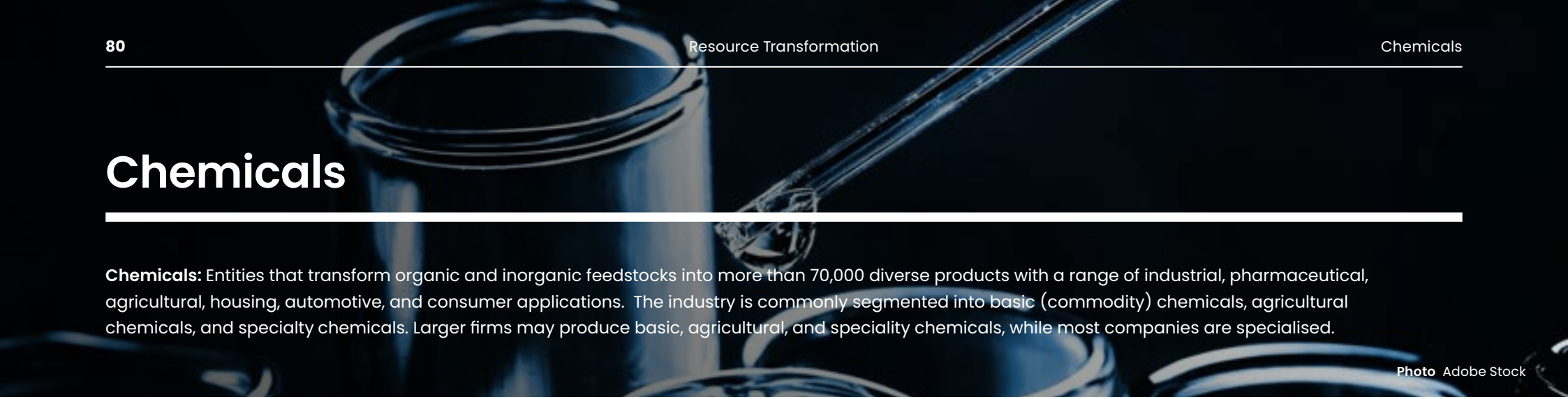

Chemicals

Chemicals: Entities that transform organic and inorganic feedstocks into more than 70,000 diverse products with a range of industrial, pharmaceutical, agricultural, housing, automotive, and consumer applications. The industry is commonly segmented into basic (commodity) chemicals, agricultural chemicals, and specialty chemicals. Larger firms may produce basic, agricultural, and speciality chemicals, while most companies are specialised.

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Recognised decarbonisation levers	Governance, engagement, business and operational metrics and targets	GHG metrics and targets
1. **Replacing fossil fuel feedstocks, for example with:**[1,5,8,9] • green hydrogen for ammonia and methanol; • green methanol for high-value chemicals (HVCs); and • bio-sourced material for HVCs, considering any trade-offs around energy use requirements, lifecycle impacts and land-use. 2. **Increase zero GHG emissions energy use and energy efficiency:**[1,4,5,7,8,9] • implementing energy efficiency and best available techniques to reduce emissions; • electrification of processes; and • use of renewable energy for heat, steam and electricity.	• energy management: (1) total energy consumed, (2) percentage grid electricity, (3) percentage renewable, and (4) total self-generated energy;[6] • water management: (1) total water withdrawn, (2) total water consumed; percentage of each in regions with High or Extremely High Baseline Water Stress;[6] • water management: number of incidents of non-compliance associated with water quality permits, standards and regulations;[6] • percentage of primary resource from which chemical feedstocks derive (e.g. oil, natural gas, coal, biomass, waste);[2] • percentage of ammonia or methanol produced with electrolysis-based hydrogen, and the share that comes from low-GHG emissions electricity sources;[1]	• gross global Scope 1 emissions (tCO_2e), including the percentage covered under emissions-limiting regulations (tCO_2e);[6] and • primary chemical production: tCO_2e/t primary chemical;[1,3] and • Scope 3 categories accounting for a large share of total Scope 3 emissions may include: category 1 purchased goods and services, category 11 use of sold products; category 12 end-of-life treatment of sold products.[11]

3. Adopt carbon capture, utilisation and storage (CCUS):[4,7,9] • use of captured carbon as a feedstock (e.g. in urea or methanol production) and used for durable products; and • use of CCUS for process and energy emissions. **4. Implement circularity strategies:**[7] • increasing re-usability of plastics; • increase mechanical recycling; • increase chemical recycling. **5. Accelerate sale of low-GHG emissions products that enable a decarbonised economy, including:**[4,5,8] • green ammonia (e.g. for fertilisers, shipping or as a hydrogen carrier); and • materials that enable energy efficiency improvements (e.g. in buildings and transport). **6. Reduce downstream Scope 3 emissions associated with fertilisers and plastics:**[7] • replace single-use plastics with re-usable products; and • produce slow-release fertilisers and inhibitors.	• percentage of petrochemical-based products produced with bio-based feedstock, and share of feedstock that is sustainably sourced;[1] • percentage of ethylene, propylene and benzene/ toluene/xylene (BTX) produced from methanol-to-olefins and methanol-to-aromatics processes;[1] • percentage of procurement spend or Scope 3 emissions that supplier engagement strategy has been applied to;[1] and • capture rate, transport and storage leakage rates for CCUS.[3]	

Chemicals resources

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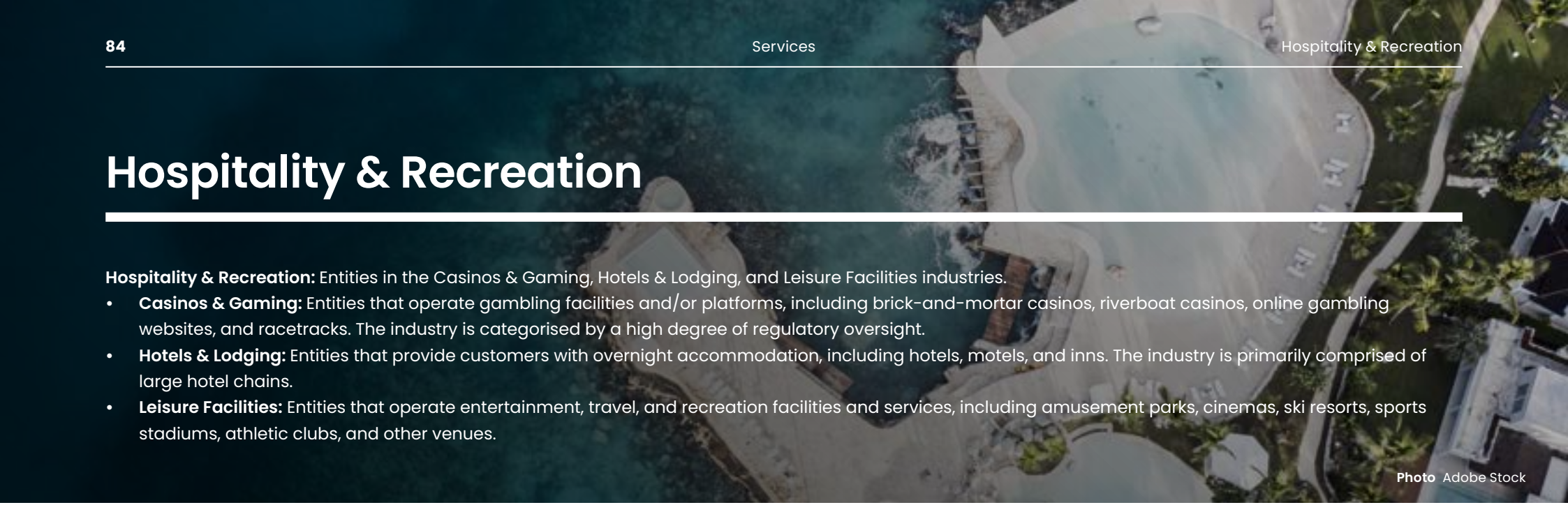
SERVICES

Hospitality & Recreation

Photo Williamen de Vasconcellos, Unsplash.com

Hospitality & Recreation



Hospitality & Recreation: Entities in the Casinos & Gaming, Hotels & Lodging, and Leisure Facilities industries.

- **Casinos & Gaming:** Entities that operate gambling facilities and/or platforms, including brick-and-mortar casinos, riverboat casinos, online gambling websites, and racetracks. The industry is categorised by a high degree of regulatory oversight.
- **Hotels & Lodging:** Entities that provide customers with overnight accommodation, including hotels, motels, and inns. The industry is primarily comprised of large hotel chains.
- **Leisure Facilities:** Entities that operate entertainment, travel, and recreation facilities and services, including amusement parks, cinemas, ski resorts, sports stadiums, athletic clubs, and other venues.

Photo Adobe Stock

Recognised decarbonisation levers:	Governance, engagement, business and operational metrics and targets	GHG metrics and targets
1. **Transition to renewable energy to power properties and facilities:**[6,7,8] • shift to renewable energy sources (e.g. on-site solar panels, wind turbines, or through purchasing agreements); and • in high-rise buildings, prioritise purchasing of renewable energy (Renewable Energy Certificates (RECs). 2. **Increase efficiency and electrification of operations, technologies, and furniture, fittings and equipment (FF&E):**[2,6] • implement advanced energy management systems (e.g. optimise lighting, heating, and cooling based on occupancy);	**Casinos & Gambling:** • energy management: (1) total energy consumed, (2) percentage grid electricity, and (3) percentage renewable.[3] **Hotels & Lodging:** • energy management: (1) total energy consumed, (2) percentage grid electricity, and (3) percentage renewable;[4] • water management: (1) total water withdrawn, (2) total water consumed;[4] • percentage of each in regions with High or Extremely High Baseline Water Stress;[4] and • climate change adaptation: number of lodging facilities located in 100-year flood zones.[4]	• hotels and lodging: Scope 1 and 2, as well as emissions directly related to building if not included, emissions intensity ($kgCO_2e/SqM$);[9] • tour operators, online travel agencies and travel agencies: tCO_2e per full-time equivalent or per revenue generated;[8] • emissions from franchises should be disclosed under Scope 3, Category 14;[7] and • Scope 1, 2 and 3 targets may be set or disaggregated by the following activities (given abatement of emissions will be more difficult for some activities): (1) online travel agencies and travel agencies; (2) accommodation, in-destination activities; (3) aviation and cruise.[8]

- adopt efficient technologies in new builds and retrofits (e.g. smart thermostats, energy-efficient gaming equipment, variable frequency drives, boiler/chiller upgrades, LED lighting);
- install low-flow faucets, showerheads, and toilets; and
- switch to low-GHG emissions heating sources (e.g. heat pumps).

3. **Reducing emissions associated with sourcing, procurement, leasing, wastage and disposal (e.g. building materials, transportation, food and beverages):**[6,7,8]

- partner with vendors utilising electric vehicles and optimise delivery routes (e.g. supplies, waste collection, etc.);
- source products sustainably (e.g. bedding, curtains, uniforms from eco-friendly materials); and
- in making procurement decisions, consider the impact of wastage and disposal (e.g. overstocking may lead to increased upstream emissions associated with food production and downstream with food waste).

4. **Supporting development of low/near-zero GHG buildings through purchase, leasing and franchising of buildings:**[6,7,8]

- utilise purchase, leasing and franchising processes to reduce operational emissions by focusing on energy-efficient building designs and retrofits;
- collaborate with industry peers and provide financing for low or near-zero GHG materials to reduce embodied emissions.

Leisure Facilities:

- energy management: (1) total energy consumed, (2) percentage grid electricity, and (3) percentage renewable.[5]

5. Implement circular strategies:[1,8]

- minimises single-use items across properties and facilities (e.g. toiletries, cutlery);
- procure packaging with recycled content and high reusability/recyclability; and
- reuse, repurposing or recycling large items (e.g. beds/mattresses), including during contracted refurbishments and retrofits.

6. Reduce transportation related emissions:[8]

- shift to electric vehicles and optimise routes for ground fleet;
- optimise itineraries in tours to enable customers to make more sustainable travel choices; and
- introduce sustainable product bundles and launch GHG emissions calculators.

Hospitality & Recreation resources

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5. International Financial Reporting Standards (IFRS), IFRS S2: Industry-based Guidance on implementing Climate-related Disclosures: Volume 53 – Leisure Facilities, 2023.
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8. World Travel & Tourism Council (WTTC), Driving Climate Action: A Net Zero Roadmap for Travel & Tourism: Proposing a new Target Framework for the Travel & Tourism Sector, 2021.
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TECHNOLOGY & COMMUNICATIONS

Technology

Internet Media and Services

Semiconductors

Telecommunications

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Technology

Technology: Entities in the Electronic Manufacturing Services & Original Design Manufacturing, Hardware, and Software & IT Services industries.

- **Electronic Manufacturing Services (EMS) & Original Design Manufacturing (ODM):** EMS entities provide assembly, logistics, and after-market services for original equipment manufacturers. ODM entities provide engineering and design services for original equipment manufacturers.
- **Hardware:** Entities that design and sell technology hardware products, including computers, consumer electronics, communications equipment, storage devices, components, and peripherals.
- **Software & IT Services:** Entities involved in the development and sales of applications software, infrastructure software, and middleware. The industry also includes IT services companies delivering specialised IT functions, such as consulting and outsourced services.

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Recognised decarbonisation levers	Governance, engagement, business and operational metrics and targets	GHG metrics and targets

1. **Enhance energy efficiency:**[7,9,11]
• implement energy efficiency measures across the industry's operations, including data centres, hardware, equipment;
• explore symbiotic relationships with other industries (e.g. sharing heat and optimising cooling);
• evaluate data centre location (e.g. to optimise access to low-GHG emissions energy); and
• conducting energy efficiency audits to identify opportunities for energy and cost savings.
	Electronic Manufacturing Services & Original Design Manufacturing:
	• water management: (1) total water withdrawn, (2) total water consumed; percentage of each in regions with High or Extremely High Baseline Water Stress;[3] and
	• product lifecycle management: weight of end-of-life products and e-waste recovered; percentage recycled.[3]
		• expected emissions reduction broken down by activity (e.g. user devices, data centres, mobile networks, fixed networks, enterprise networks) (tCO_2e);[9]
		• relevant Scope 3 categories may include:[7,9]
		  ○ category 1, purchased goods and services; and
		  ○ category 11, use of sold products.

2. **Procurement of low-GHG emissions energy:**[6,7,9,11]

- switch to low-GHG emissions electricity supply and support provision of 24/7 low-GHG emissions electricity.

3. **Engagement with value chain to reduce emissions:**[8,10]

- suppliers: procure lower emissions materials and collaborate with key suppliers on research and development; and
- customers: engage with consumers about energy efficient use of products and product reuse or disposal.

4. **Driving innovation & digital transformation to enable decarbonisation:**[1,2,6,7]

- driving innovation and digital technology to accelerate energy efficiencies across the economy, for example:
  - digitisation and Internet of Things networks for energy efficiency, the management of assets and enabling demand management;
  - smart inverters and smart meters to maintain grid stability; and
  - AI-based techniques to lead to precise forecasting of wind and solar production.

5. **Green product design:**[6,7,8]

- provision of products with lower energy use and circular design, including the design phase and build phase of products and packaging ; and
- empower consumers to make lower-carbon decisions (e.g. in relation to transport decisions).

Hardware:

- percentage of products by revenue that contain IEC 62474 declarable substances;[4]
- percentage of eligible products, by revenue, meeting the requirements for EPEAT registration or equivalent;[4]
- percentage of eligible products, by revenue, certified to an energy efficiency certification;[4] and
- weight of end-of-life products and e-waste recovered; percentage recycled.[4]

Software & IT Services:

- environmental footprint of hardware infrastructure: (1) total energy consumed, (2) percentage grid electricity, and (3) percentage renewable;[5]
- environmental footprint of hardware infrastructure: (1) total water withdrawn, (2) total water consumed; percentage of each in regions with High or Extremely High Baseline Water Stress;[5] and
- managing systematic risks from technology disruptions: number of (1) performance issues and (2) service disruptions; (3) total customer downtime.[5]

6. Reducing financed emissions and support climate innovation:[6,7,12] • reduce financed emissions by engaging with finance providers and adopting green financial products; and • financing climate innovation (e.g. low-carbon plastic and aluminium, or carbon dioxide removal).		

Technology resources

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3. International Financial Reporting Standards (IFRS), IFRS S2: Industry-based Guidance on implementing Climate-related Disclosures: Volume 54 – Electronic Manufacturing Services & Original Design Manufacturing, 2023.
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6. International Telecommunication Union (ITU) and World Benchmarking Alliance (WBA), Greening digital companies: Monitoring emissions and climate commitments, 2022.
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9. techUK, UK Data Centre Sector: Energy Routemap, 2019.
10. The Carbon Bankroll, The Climate Impact and Untapped Power of Corporate Cash, 2022.

Internet Media & Services

Internet Media and Services: Internet Media entities provide search engines and internet advertising channels, online gaming, and online communities (such as social networks), as well as content (such as educational, medical, health, sports, or news content). Internet-based Services segment includes entities sell services mainly through the Internet.

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Recognised decarbonisation levers	Governance, engagement, business and operational metrics and targets	GHG metrics and targets
1. **Increase energy efficiency:**[1,6,8] • implement energy efficiency plans, covering data centres, networks, buildings, and waste heat where relevant; and • reduce electricity consumption by conducting energy efficiency audits, identifying energy and cost saving opportunities across offices and facilities. 2. **Procurement of low-GHG emissions energy:**[1,2,5,10] • switch to low-GHG emissions electricity supply and support provision of 24/7 low-GHG electricity. 3. **Engage with supply chain:**[2,7] • engage suppliers on their emissions reduction related goals, and disclosure of information on emissions performance, business strategy, energy use, targets, and water management on an annual basis.	• environmental footprint of hardware infrastructure: (1) total energy consumed, (2) percentage grid electricity, and (3) percentage renewable;[4] • environmental footprint of hardware infrastructure: (1) total water withdrawn, (2) total water consumed; percentage of each in regions with High or Extremely High Baseline Water Stress;[4]	• expected emissions reduction broken down by activity (e.g. user devices, data centres, mobile networks, fixed networks, enterprise networks) (tCO_2e);[3,6]

4. Reducing financed emissions:[9] • reduce financed emissions by engaging with finance providers and adopting green financial products; and • financing climate innovation (e.g. carbon dioxide removal).		

Internet Media & Services resources

1. The Climate Drive, Optimize chiller efficiency with artificial intelligence, website as of 2024.
2. Global Enabling Sustainability Initiative (GeSI), Digital solutions for climate action: Using ICT to raise ambitions on climate action in low- and middle-income countries, 2020.
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7. Sustainable Energy For All (SEforALL), Empowering Consumers to Accelerate 24/7 Carbon-Free Energy, 2023.
8. techUK, UK Data Centre Sector: Energy Routemap, 2019.
9. The Carbon Bankroll, The Climate Impact and Untapped Power of Corporate Cash, 2022.

Semiconductors

Semiconductors: Entities that design or manufacture semiconductor devices, integrated circuits, their raw materials and components, or capital equipment. Some entities provide outsourced manufacturing, assembly, or other services for designers of semiconductor devices.

Recognised decarbonisation levers	Governance, engagement, business and operational metrics and targets	GHG metrics and targets
1. **Decrease energy consumption**[2,3,5] • upgrade and replace tools with more energy-efficient options; • implement smart control systems to enable coupling and regulation of facilities and tools; and • encourage equipment engineers to focus on tool-fleet energy consumption during process recipe optimisation and offer incentives for creating energy-efficient recipes. • [REPURPOSING FABS] 2. **Optimise energy supply:**[3] • pursue efficiency improvements and switch to alternative fuels (e.g. biogas, green hydrogen) in fab-owned fossil fuel power plants; • purchase new off-grid energy from renewable power sources; • install on-site renewable energy power sources; and • consider access to renewable energy as a factor in deciding the location of new fabs.	• energy management in manufacturing: (1) total energy consumed, (2) percentage grid electricity, (3) percentage renewable;[2] • water management: (1) total water withdrawn, (2) total water consumed; percentage of each in regions with High or Extremely High Baseline Water Stress;[2] • product lifecycle management: percentage of products by revenue that contain IEC 62474 declarable substances;[2] • product lifecycle management: processor energy efficiency at a system-level for: (1) servers, (2) desktops, and (3) laptops;[2] • amount of hazardous waste from manufacturing, percentage recycled (various, by product category).[2]	• gross global Scope 1 emissions and the amount of total emissions from perfluorinated compounds (tCO_2e);[2] • Scope 1 emissions with high global-warming potential arising from process gases used during wafer etching, chamber cleaning, and other tasks, including PFCs, HFCs, NF3, and (tCO_2e);[2] • Scope 1 emissions arising from transfer fluids (tCO_2e);[1] • Relevant Scope 3 categories may include[1,6]: • Purchased goods and services (including from raw wafers, process gases, metals and water); • Capital goods; • Upstream and downstream transportation and distribution; and • Use of sold products.

3. **Reduce process-gas emissions:**[3]

- adjust process parameters, such as temperature and chamber pressure;
- explore the use of alternative chemistries with lower environmental impact;
- implement gas abatement systems, such as point-of-use (POU) systems, point-of-area (POA) systems, and central abatement systems, to address emissions from process gases; and
- capture unutilised process gases and by-products through methods such as membrane separation, cryogenic recovery, adsorption, and desorption for gas recycling.

4. **Implement green product strategy:**[3,5]

- develop processes and partnerships for the responsible handling, recycling, and recovery of semiconductor products at the end of their life cycle.

5. **Advance green design and low-power initiatives:**[3]

- invest in research and development to design chips that are more energy efficient during operation; and
- encourage the adoption of power management techniques and technologies that optimise energy usage in electronic system.

6. **Decarbonise supply chains:**[1]

- changing product and process design, engagement with high emitters, selective procurement and joint research and development with key suppliers.
- Key sources of upstream emissions: capital goods, including manufacturing tools and equipment; raw wafer production; process gas production including nitrogen, argon and perfluorocarbons; water; and metals mining and refining, particularly gold, aluminium and copper.

Semiconductors resources

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3. McKinsey & Company, Sustainability in semiconductor operations: Towards net-zero operations, 2022.
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6. SEMI, Semiconductor Climate Consortium, and Boston Consulting Group (BCG), Transparency, Ambition, and Collaboration: Advancing the Climate Agenda of the Semiconductor Value Chain, 2023.

Telecommunication Services

Telecommunications: Wireless and wireline telecommunications companies, as well as companies that provide cable and satellite services. The wireless services segment provides direct communication through radio-based cellular networks and operates and maintains the associated switching and transmission facilities. The wireline segment provides local and long-distance voice communication via the Public Switched Telephone Network. Wireline carriers also offer voice over internet protocol (VoIP) telephone, television, and broadband internet services over an expanding network of fibre optic cables. Cable providers distribute television programming from cable networks to subscribers. Satellite entities distribute TV programming through broadcasting satellites orbiting the earth or through ground stations.

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Recognised decarbonisation levers	Governance, engagement, business and operational metrics and targets	GHG metrics and targets
1. **Energy efficiency in network infrastructure:**[1,2,4] • implement energy-efficient technologies and practices in network infrastructure, including data centres, switching facilities, and transmission equipment; • optimise cooling systems and upgrade equipment to more energy-efficient models; and • embrace virtualisation and cloud technologies to optimise network capacity and reduce energy consumption. 2. **Renewable energy procurement:**[1,4,6,7] • switch to low-GHG emissions energy supply and support provision of 24/7 low-GHG energy.	• environmental footprint of operations: (1) total energy consumed, (2) percentage grid electricity, and (3) percentage renewable;[5] • managing systemic risks from technology disruptions: (1) system average interruption duration, (2) system average interruption frequency, and (3) customer average interruption duration.[5]	• emissions from different activities (e.g. data centres, mobile networks, fixed networks, enterprise networks);[9] • relevant Scope 3 categories may include:6,7,9 o category 1, purchased goods and services; o category 2, capital goods; and o category 11, use of sold products.

3. **Reduce emissions in the supply chain:**[1,3,6]
- adopt low GHG emissions clauses in contracts;
- work with service providers to rehabilitate land (e.g. after digging cabling);
- funding for upstream technological innovation (e.g. OEMs); and
- procure or support key suppliers in reducing GHG emissions associated with key materials (e.g. copper).

4. **Green product design and circular strategies**[1,4,5,6]
- provide remote equipment monitoring and diagnostics to help maintain third-party hardware (e.g. public sector customers);
- bundle offerings with green solutions (e.g. bundle services with renewable energy or collaborate with a connected device company to provide public transit route planning information); and
- work with downstream customers and industry to increase network equipment reuse and recycling, or shared technology standards that allow for software upgrades to extend equipment life.

Telecommunication Services resources

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5. Oliver Wyman, The Next Level Of Emission Reductions In Telecom Operators, 2021.
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TRANSPORTATION

Air Transportation

Automobiles

Marine Transportation

Land Transportation

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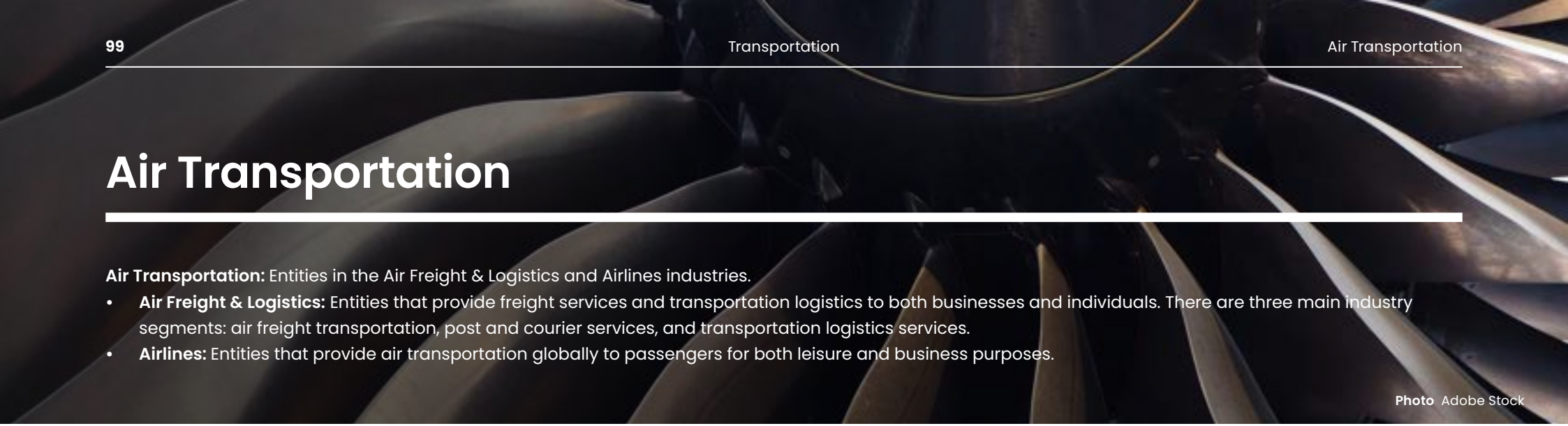

Air Transportation

Air Transportation: Entities in the Air Freight & Logistics and Airlines industries.

- **Air Freight & Logistics:** Entities that provide freight services and transportation logistics to both businesses and individuals. There are three main industry segments: air freight transportation, post and courier services, and transportation logistics services.
- **Airlines:** Entities that provide air transportation globally to passengers for both leisure and business purposes.

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Recognised decarbonisation levers	Governance, engagement, business and operational metrics and targets	GHG metrics and targets
1. **Drive long-term uptake of sustainable aviation fuels (SAFs), including interim focused actions:**[3,5,7,10,14] • procure and invest in bio-source SAFs, and emerging SAF technologies, including fuels derived from waste, biomass, agricultural residues, and power-to-liquids; (PtL) • show a strong commitment to R&D to advance SAF technologies to reduce the green premium and improve carbon efficiency; and • engage with policy makers to advocate for supportive policies and incentives for SAF adoption. 2. **Implement operational efficiencies & modernisation:**[1,4,10] • replace older aircraft or retrofit with newer, more fuel-efficient designs; • improve operations to carry more payload per flight;	• total fuel consumed, percentage alternative and percentage sustainable;[8,9] • available seat kilometres;[9] • passenger/air transport load factor;[8,9] • revenue passenger kilometres or revenue tonne kilometres;[8,9] • number of departures;[9] • average age of fleet;[9] • targets for future SAF use;[3,12] • quantity of neat SAF delivered by SAF type and/or used;[3,7,12] • total blended SAF delivered/used by SAF type;[7] • hybrid-electric/electric aircraft: total electricity charged and used for aircraft propulsion;[7] and • hydrogen aircraft: total hydrogen used, in mass per hydrogen type.[7]	• gross global scope 1 emissions;[8] • emissions intensity: gCO_2e per revenue tonne kilometre (gCO_2e/RTK) or per revenue passenger kilometre (gCO_2e/RPK);[2,3,7,13,14] • target boundary: SBTi recommend targets should be set on a well-to-wake basis;[11] • account for and reduce non-CO_2 induced effective radiative forcing effects to the extent feasible;[3,10,12] • locked-in emissions: fleet emissions expected in next 15 years from existing and planned fleet;[2] • lifecycle emissions factor per SAF type (LSf);[7] • total CO_2 reductions from SAF (tCO_2);[7] • total CO_2 removed/captured using carbon dioxide removal technologies (excluding Direct Air Capture used in relation to synthetic aviation fuels);[7]

- find optimal flight paths, altitude accuracy, and landing configurations;
- in-flight weight reduction with interior designs (e.g. seats, equipment, galleys); and
- efficient ground operations, including single- engine taxiing and using of electric or hydrogen-powered ground vehicles (e.g. shunters).

3. **Invest in infrastructure & technological advancements:**[4,10]

- improve the electrical grid at airports to support high-powered charging required for potential electric/hybrid aviation; and
- collaborate with original equipment manufacturers on development of hydrogen-powered zero carbon emissions aircraft and associated infrastructure.

4. **Manage demand and shift consumer choice:**[3,4]

- shift consumer choice through GHG emissions information (e.g. to take optimum route) and through offering combined air and train tickets (e.g. for short onward connections); and
- shift freight to rail or zero emissions trucking, where possible.

- hybrid-electric/electric aircraft: total emissions from the electricity charged and used for aircraft propulsion (tCO_2e);[7] and
- hydrogen aircraft: GHG emissions from hydrogen use, per hydrogen type.[7]

Air Transportation resources

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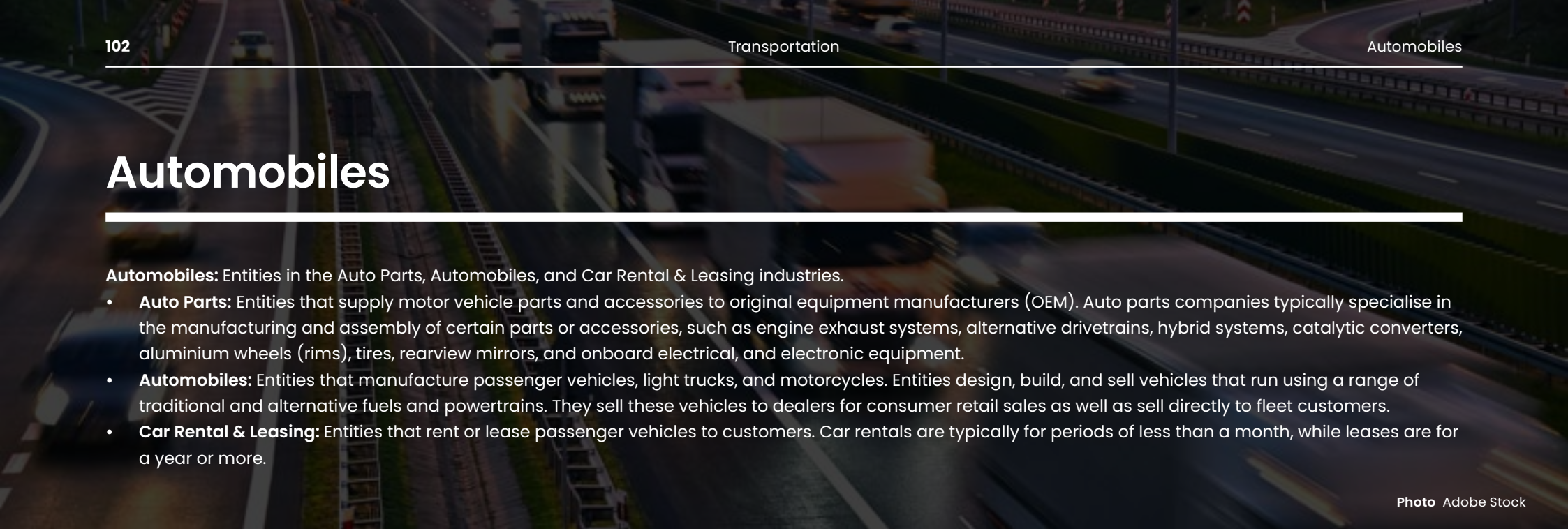

Automobiles

Automobiles: Entities in the Auto Parts, Automobiles, and Car Rental & Leasing industries.

- **Auto Parts:** Entities that supply motor vehicle parts and accessories to original equipment manufacturers (OEM). Auto parts companies typically specialise in the manufacturing and assembly of certain parts or accessories, such as engine exhaust systems, alternative drivetrains, hybrid systems, catalytic converters, aluminium wheels (rims), tires, rearview mirrors, and onboard electrical, and electronic equipment.
- **Automobiles:** Entities that manufacture passenger vehicles, light trucks, and motorcycles. Entities design, build, and sell vehicles that run using a range of traditional and alternative fuels and powertrains. They sell these vehicles to dealers for consumer retail sales as well as sell directly to fleet customers.
- **Car Rental & Leasing:** Entities that rent or lease passenger vehicles to customers. Car rentals are typically for periods of less than a month, while leases are for a year or more.

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Recognised decarbonisation levers	Governance, engagement, business and operational metrics and targets	GHG metrics and targets
1. **Scale the use of zero and low-GHG vehicles:**[1,3,4,9] • increase manufacturing of zero- and low-GHG emissions vehicles, including battery electric vehicle (BEV) and plug-in hybrid electric vehicle, and associated parts, including new drive trains; and • increase sale and rental of zero- and low-GHG emissions vehicles, e.g. through targeted marketing or vehicle financing. 2. **Advance infrastructure and technological development:**[1,2, 4, 5] • drive advancements in battery technology to improve energy density and charging speed for personal vehicles; and	**Auto Parts** • energy management: (1) total energy consumed, (2) percentage grid electricity, and (3) percentage renewable.[6] **Automobiles** • fuel use and use-phase emissions: sales-weighted average passenger fleet fuel economy, by region;[7] • fuel economy and use-phase emissions: number of (1) zero emission vehicles, (2) hybrid vehicles, and (3) plug-in hybrid vehicles sold;[7] • BEV or PHEV sales targets, including any disaggregation by geography or vehicle segment;[4]	• emissions reported should reflect real-world vehicle operation. Adjustment factors/formulas of the WLTP can be used if using a different standard;[1,4,9] • Scope 1 and 2 emissions intensity: gCO_2e/vehicle sold;[1,9] • Scope 3 emissions intensity for sold vehicle fleet: gCO_2e per passenger kilometre (gCO_2e.pkm) or metric tonne kilometres (gCO_2e.tk);[1,9] • target boundary: SBTi recommends that automakers targets should cover 100% of use-phase emissions on a well-to-wheel basis and cover entire sales portfolio;[1,9] and

- expand electric vehicle charging stations and related infrastructure.

3. **Work with suppliers to reduce emissions and build circularity:**[1,2]

- work with suppliers to reduce emissions from key materials (e.g. steel and aluminium) and increase supply of critical minerals;
- collaborate across the auto parts and automobile manufacturing to integrate sustainable components, such as efficient drivetrains, hybrid systems, and sustainable tires; and
- implement circular design in products and support recycling and reuse of batteries and other components.

4. **Increase operational and demand efficiency:**[1,4,5]

- explore and scale new business models (e.g. car sharing, autonomous driving, and ride-hailing); and
- utilise smart technologies and data analytics for real-time traffic adjustments and route optimisation.

5. **Promote renewable energy integration:**[1,4,5]

- encourage the installation of on-site renewable energy sources at car manufacturing hubs and rental stations; and
- procure zero-carbon electricity and heat.

6. **Shape urban mobility design:**[4]

- collaborate with urban planners to create cities designed for sustainable car usage, integrating efficient road networks and public transport systems.

- average lifetime of vehicles sold today;[1]
- percentage of sports utility vehicles in sold light duty vehicle fleet;[2] and
- targets for phase-out of new internal combustion engine cars and vans for leading markets and globally.[9]

Car Rental & Leasing

- fleet fuel-economy and utilisation: rental day-weighted average rental fleet fuel economy, by region;[8]
- fleet fuel-economy and utilisation: fleet utilisation rate;[8]
- average vehicle age;[8]
- total available rental days;[8] and
- average rental fleet size.[8]

- locked-in emissions: total cumulative fleet emissions from expected sales volumes in the next five years.[1]

Automobiles resources

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8. International Financial Reporting Standards (IFRS), IFRS S2: Industry-based Guidance on implementing Climate-related Disclosures: Volume 67 – Car Rental & Leasing, 2023.
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Marine Transportation

Marine transportation: Entities in the Cruise Lines and Marine Transportation industries.

- **Marine Transportation:** Entities that provide deep-sea, coastal and/or river-way freight shipping services. Key activities include transportation of containerised and bulk freight, including consumer goods and a wide range of commodities, and transportation of chemicals and petroleum products in tankers.
- **Cruise Lines:** Entities that provide passenger transportation and leisure entertainment, including deep sea cruises and river cruises.

Photo Ian Taylor, Unsplash.com

Recognised decarbonisation levers	Governance, engagement, business and operational metrics and targets	GHG metrics and targets
1. **Technological measures to reduce near-term emissions:**[1,2,3] • vessel maintenance measures that increase efficiency including hull and propeller roughness management; • implement slow steaming strategies to reduce fuel consumption where appropriate; and • retrofit vessels with energy-efficient technologies (e.g. hull redesigns, air lubrication systems, propulsion). 2. **Increase operational and demand efficiency:**[3,7] • adopt digital solutions for real-time navigation and route adjustments based on weather and sea current data; • energy and fuel management systems to identify optimisation; and	• percentage of low or zero-GHG capable vessels in the entity's current and planned fleet;[1] and • average fleet age and operational lifetime.[1] **Marine Transportation:** • total energy consumed; percentage heavy fuel oil and percentage renewable;[5] • average Energy Efficiency Design Index (EEDI) for new ships;[5] • total distance travelled by vessels;[5] • operating days;[5] • deadweight tonnage;[5] • number of vessels in total shipping fleet;[5] • number of vessel port calls;[5] • twenty-foot equivalent unit (TEU) capacity;[5]	• gross global Scope 1 emissions[4,5] • emissions intensity of fleet: gCO_2e per tonne-nautical mile (gCO_2e/tnm);[8] • target boundary: targets should be set on a well-to-wake basis;[1,6,8] and • locked-in emissions: fleet emissions expected in next 15 years from existing and planned fleet.[1]

- employ digital solutions for efficient loading and unloading of cargo to minimise vessel idle times.

3. **Scale the use near-zero / low-GHG emissions fuels and alternative propulsion technologies:**[1,2,3,7,10]

- invest in vessels capable of utilising low-GHG emission fuels and alternative propulsion technologies (e.g. hybrid vessels, wind, battery-power, etc.);
- use of sail or kite propulsion systems to assist in propulsion;
- use of low-GHG drop-in fuels (e.g. sustainably sourced biofuels);
- invest in near-zero GHG emissions fuels (e.g. green ammonia, green methanol, and zero-emission hydrogen);
- developing cost-sharing mechanisms, such as book and claim, that that enable cargo owners to pay a green premium to support scaling of low-emission fuels and ships; and
- develop ports with infrastructure supporting low-GHG emissions fuel refuelling (e.g. green methanol, hydrogen, and battery charging stations).

4. **Engage with value chain to encourage intermodal shift to low-GHG-intensive options for freight and passenger transport:**[1,2,3,4]

- work with value chain partners to develop intermodal transportation solutions that reduce emissions (e.g. rail transport from ports); and
- collaborate with partners to develop green shipping corridors to decarbonise key maritime routes and ports.

Cruise Lines:

- total energy consumed; percentage heavy fuel oil, percentage onshore power supply (OPS), and percentage renewable;[4]
- average Energy Efficiency Design Index (EEDI) for new ships;[4]
- available lower berth kilometres (ALB-KM);[4]
- average passenger cruise days (APCD);[4]
- cruise passengers;[4]
- number of shipboard employees;[4] and
- number of vessel port calls.[4]

5. Invest in human capital development:[1,7] • educate and train captains and crews on eco-navigation, maintenance of low-GHG emissions propulsion systems, and advanced route planning techniques.		

Marine Transportation resources

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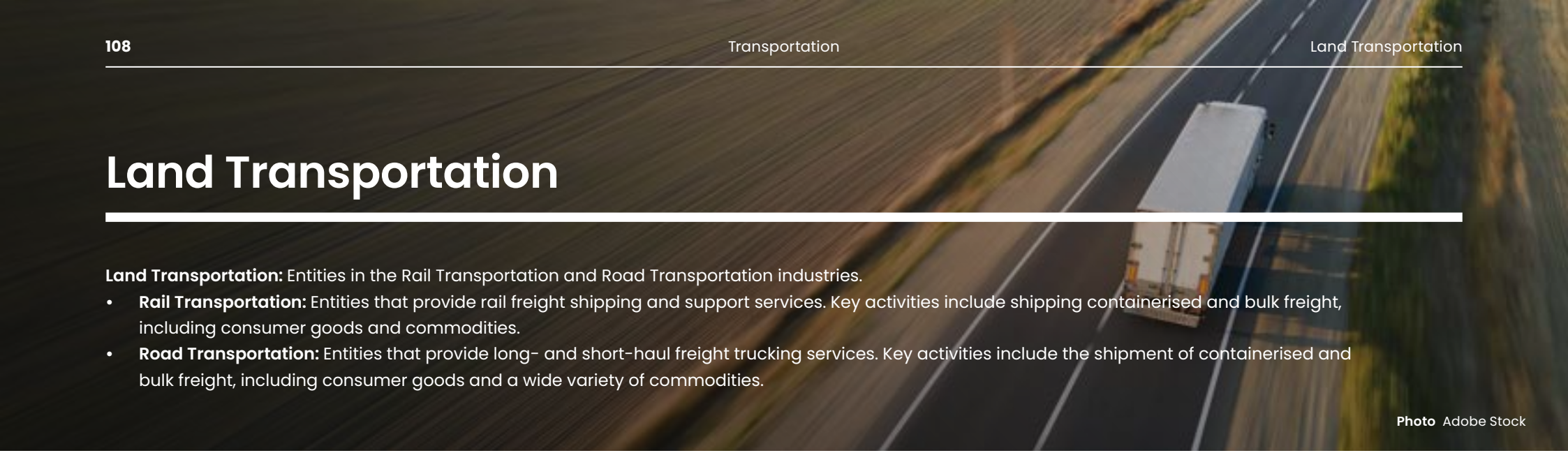

Land Transportation

Land Transportation: Entities in the Rail Transportation and Road Transportation industries.

- **Rail Transportation:** Entities that provide rail freight shipping and support services. Key activities include shipping containerised and bulk freight, including consumer goods and commodities.
- **Road Transportation:** Entities that provide long- and short-haul freight trucking services. Key activities include the shipment of containerised and bulk freight, including consumer goods and a wide variety of commodities.

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Recognised decarbonisation levers	Governance, engagement, business and operational metrics and targets	GHG metrics and targets
1. **Scale low and zero-GHG emissions trucks and electrification of rail transportation:**[1,2,3,4] • replace fleets with battery electric trucks and hydrogen electric trucks; • use of biofuel feedstocks in existing trucking fleets, derived from sustainable sources; • operate electric trains and reduce reliance on diesel; and • partnerships to reduce upfront costs (e.g. leasing models and batteries warranties); 2. **Enhance infrastructure and technological advancements:**[1,2,4,7,10,] • expand electric vehicle charging infrastructure (e.g. in depots) to support medium and long-haul segments or expand hydrogen refuelling infrastructure;	**Rail Transportation** • total fuel consumed, percentage renewable;[5] • number of carloads transported;[5] • number of intermodal units transported;[5] • track kilometres;[5] and • revenue tonne-kilometres.[5] **Road Transportation** • total fuel consumed, percentage natural gas and percentage renewable;[6] • revenue-tonne kilometres;[6] • load factor;[6] • air emissions of the following pollutants: • (1) NOx (excluding N_2O) and (2) particulate matter (PM10);[6] and • percentage of low or zero-GHG emissions vehicles out of total vehicles in the entity's fleet.[1]	• gross global Scope 1 emissions;[5,6] • emissions intensity: gCO2e per tonne-kilometre (gCO_2e/tk) for freight activity;[1,2,9] • target boundary: SBTi recommends targets should be set on a well-to-wheel basis;[10] • locked-in emissions: fleet emissions expected in next 15 years from existing and planned fleet;[1] and • GHG emissions of sub-contracted service providers and any GHG emissions performance requirements for sub-contracted service providers.[1]

- work with utilities and energy suppliers to support increased supply of electricity and zero-GHG emissions fuels (e.g. through committed offtake and long-term supply contracts); and
- transition railway lines from diesel propulsion to electricity-driven systems;

3. **Increase operational and demand efficiency:**[1,5,8]

- integration of smart technologies and data analytics to optimise route planning and reduce dead mileage;
- leverage digital solutions for real-time route adjustments to reduce carbon emissions; and
- encourage a modal shift from long-haul trucking to rail to utilise the efficiency of trains for freight movement.

4. **Promote renewable energy integration:**[1, 2,10]

- invest in renewable energy solutions for rail and road transportation, including the purchase of off-grid renewable power; and
- install on-site renewable energy power sources.

5. **Invest in human capital development:**[1]

- educate truck and train drivers and mechanics on eco-driving, maintenance of low-GHG emissions vehicles, and advanced route planning techniques.

Land Transportation resources

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Appendix: Mapping of TPT Sector Guidance to the SASB SICS

The below table maps the SASB SICS (at the Sector and Industry level) to the relevant TPT Sector Guidance, including the Sector Summary and Sector Deep Dive Guidance. The table also includes a mapping of the relevant IFRS S2 industry-based volume(s) (i.e. SICS Code) to the TPT Sector Guidance. The SASB SICS classification was used as it is the most widely used sector classification system, which is now used by IFRS.

Please note that the TPT Asset Owners Guidance is not included in the SASB SICS mapping, as the SASB SICS contains no clearly equivalent industry or sector. The TPT recognises the Asset Owners Guidance within the Financial Sector, in line with the classifications used by TCFD and GFANZ.

SICS Sector	SICS Industry	SICS Code	TPT Sector Guidance
Consumer Goods	Apparel, Accessories & Footwear	1 (CG-AA)	Sector Summary: Apparel, Accessories & Footwear
	Appliance Manufacturing	2 (CG-AM)	Sector Summary: Consumer Discretionary Products
	Building Products & Furnishings	3 (GC-BF)	
	Household & Personal Products	5 (CG-HP)	
	Toys & Sporting Goods	n/a	n/a
	Multiline and Speciality Retailers & Distributors	6 (CG-MR)	Sector Summary: Consumer Goods Retail
	E-Commerce	4 (CG-EC)	
Extractives & Mineral Processing	Construction Materials	8 (EM-CM)	Sector Summary: Construction Materials
	Iron & Steel Producers	9 (EM-IS)	Sector Summary: Iron & Steel Producers
	Coal Operations	7 (EM-CO)	Sector Deep Dive: Metals & Mining
	Metals & Mining	10 (EM-MM)	
	Oil & Gas - Exploration & Production	11 (EM-EP)	Sector Deep Dive: Oil & Gas
	Oil & Gas – Midstream	12 (EM-MD)	
	Oil & Gas - Refining & Marketing	13 (EM-RM)	
	Oil & Gas - Services	14 (EM-SV)	n/a

SICS Sector	SICS Industry	SICS Code	TPT Sector Guidance
Financials[1]	Asset Management & Custody Activities	15 (FN-AC)	Sector Deep Dive: Asset Managers
	Consumer Finance	n/a	n/a
	Commercial Banks	16 (FN-CB)	Sector Deep Dive: Banks
	Investment Banking & Brokerage	18 (FN-IB)	
	Mortgage Finance	19 (FN-MF)	
	Insurance	17 (FN-IN)	Sector Summary: Insurance
	Security & Commodity Exchanges	n/a	n/a
Food & Beverage	Agricultural Products	20 (FB-AG)	Sector Deep Dive: Food & Beverage
	Meat, Poultry & Dairy	23 (FB-MP)	
	Processed Foods	25 (FB-PF)	
	Alcoholic Beverages	21 (FB-AB)	
	Non-Alcoholic Beverages	24 (FB-NB)	
	Food Retailers & Distributors	22 (FB-FR)	
	Restaurants	26 (FB-RN)	
	Tobacco	n/a	n/a
Health Care	Biotechnology & Pharmaceuticals	n/a	n/a
	Drug Retailers	27 (HC-DR)	Sector Summary: Health Care Retail
	Health Care Distributors	29 (HC-DI)	
	Health Care Delivery	28 (HC-DY)	Sector Summary: Health Care Providers
	Managed Care	30 (HC-MC)	
	Medical Equipment & Supplies	31 (HC-MS)	Sector Summary: Medical Equipment & Supplies
Infrastructure	Electric Utilities & Power Generators	32 (IF-EU)	Sector Deep Dive: Electric Utilities & Power Generators
	Gas Utilities & Distributors	34 (IF-GU)	Sector Summary: Gas Utilities & Distributors
	Water Utilities & Services	39 (IF-WU)	Sector Summary: Water Utilities & Services
	Engineering & Construction Services	33 (IF-EN)	Sector Summary: Engineering & Construction Services
	Home Builders	35 (IF-HB)	Sector Summary: Real Estate
	Real Estate	36 (IF-RE)	
	Real Estate Services	37 (IF-RS)	
	Waste Management	38 (IF-WM)	Sector Summary: Waste Management

1. The TPT Asset Owners Guidance is not included in the mapping for the Financials Sector, as the SASB SICS contains no clearly equivalent industry or sector.

SICS Sector	SICS Industry	SICS Code	TPT Sector Guidance
Renewable Resources & Alternative Energy	Biofuels	40 (RR-BI)	Sector Summary: Biofuels
	Fuel Cells & Industrial Batteries	42 (RR-FC)	Sector Summary: Fuel Cells & Industrial Batteries
	Solar Technology & Project Developers	44 (RR-ST)	Sector Summary: Solar Technology & Project Developers
	Wind Technology & Project Developers	45 (RR-WT)	Sector Summary: Wind Technology & Project Developers
	Forestry Management	41 (RR-FM)	Sector Summary: Forestry & Paper
	Pulp & Paper Products	43 (RR-PP)	
Resource Transformation	Aerospace & Defence	46 (RT-AE)	Sector Summary: Industrials
	Containers & Packaging	48 (RT-CH)	
	Electrical & Electronic Equipment	49 (RT-EE)	
	Industrial Machinery & Goods	50 (RT-IG)	
	Chemicals	47 (RT-AE)	Sector Summary: Chemicals
Services	Advertising & Marketing	n/a	n/a
	Media & Entertainment	n/a	n/a
	Casinos & Gaming	51 (SV-CA)	Sector Summary: Hospitality & Recreation
	Hotels & Lodging	52 (SV-HL)	
	Leisure Facilities	53 (SV-LF)	
	Education	n/a	n/a
	Professional & Commercial Services	n/a	n/a
Technology & Communications	Electronic Manufacturing Services & Original Design Manufacturing	54 (TC-ES)	Sector Summary: Technology
	Hardware	55 (TC-ES)	
	Software & IT Services	58 (TC-SI)	
	Internet Media & Services	56 (TC-IM)	Sector Summary: Internet Media & Services
	Semiconductors	57 (TC-SC)	Sector Summary: Semiconductors
	Telecommunication Services	59 (TC-TL)	Sector Summary: Telecommunication Services

SICS Sector	SICS Industry	SICS Code	TPT Sector Guidance
Transportation	Air Freight & Logistics	60 (TR-AF)	Sector Summary: Air Transportation
	Airlines	61 (TR-AL)	
	Auto Parts	62 (TR-AP)	Sector Summary: Automobiles
	Automobiles	63 (TR-AU)	
	Car Rental & Leasing	64 (TR-CR)	
	Cruise Lines	65 (TR-CL)	Sector Summary: Marine Transportation
	Marine Transportation	66 (TR-MT)	
	Rail Transportation	67 (TR-RA)	Sector Summary: Land Transportation
	Road Transportation	68 (TR-RO)	

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