



A Guide to Reporting GHG Emissions & Sustainability Goals

March 9, 2021

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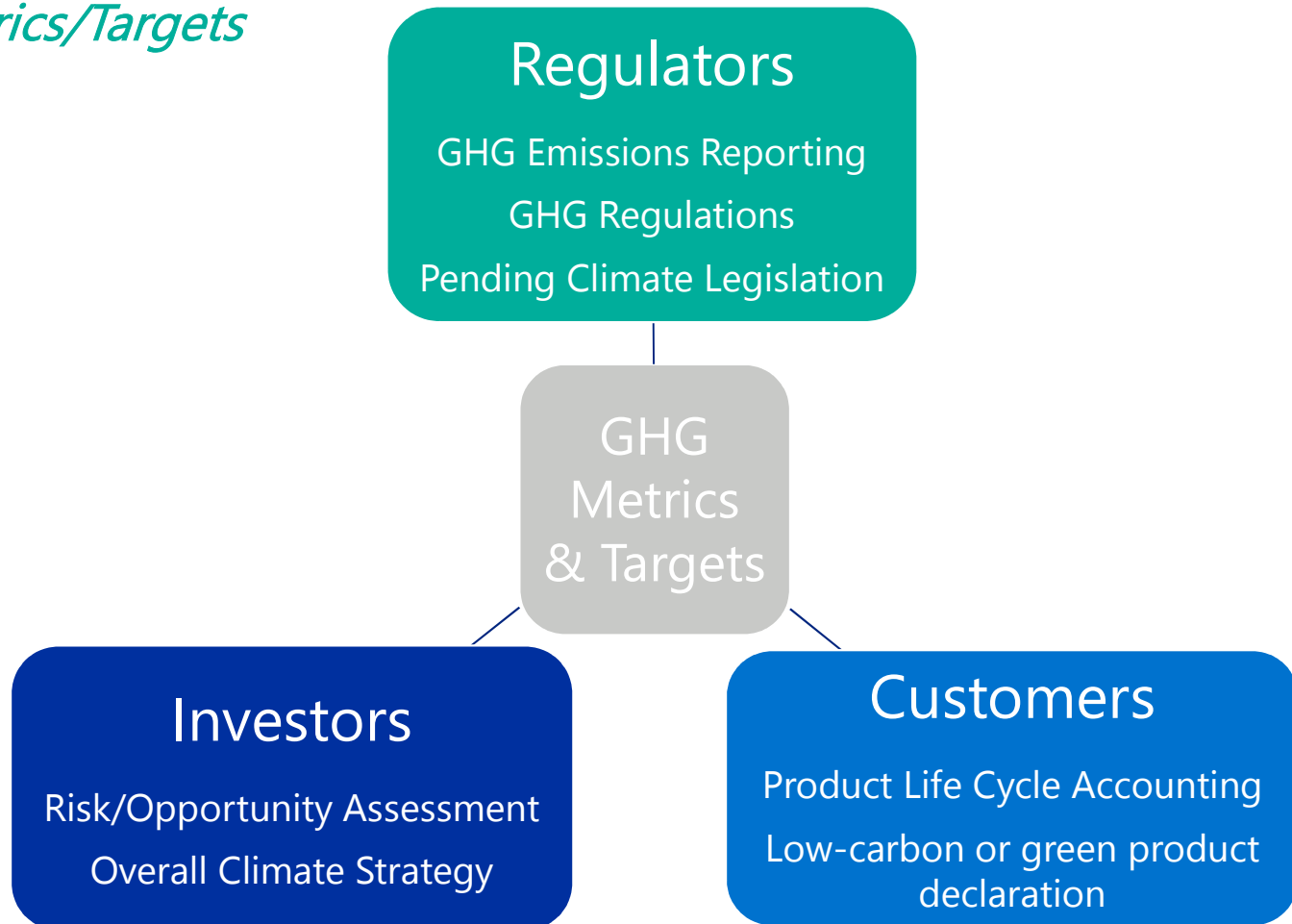
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Topic Overview

- ▶ **Current Drivers**
- ▶ **GHG Emissions Inventories for Sustainability Reporting**
 - Carbon Footprint Nuts & Bolts
 - Scope 1, 2 & 3 Emissions Quantification
 - Benchmarking Pitfalls
- ▶ **Sustainability Goals: GHG Reduction Target Setting**
 - Science-Based/Net-Zero Targets
 - Carbon Pricing Considerations

Drivers for GHG Emissions/Sustainability Reporting

Metrics/Targets



- ▶ Disclose organization's **governance** around climate-related risks and opportunities
- ▶ Disclose actual/potential impacts of climate-related risks and opportunities on organization's businesses and resilience of organization's **strategy** considering different scenarios (including 2°C or lower scenario)
- ▶ Describe how organization identifies and manages climate-related **risks**
- ▶ Disclose **metrics and targets** used to assess and manage climate-related risks and opportunities, where such information is material
 - Disclose S1, S2, and if appropriate, S3 GHG emissions.



What Biden's Sustainability Agenda Means for Business - HBR



- ▶ Biden EO sets goal of carbon-free power sector by 2035 and net-zero economy by 2050
- ▶ Climate regulation on the way (CLEAN Future Bill proposed 3/2/31)
- ▶ Investors will increasingly favor businesses taking climate action – delayed action considered a business risk
- ▶ Mandatory corporate disclosure on climate risk/GHG emissions
- ▶ Carbon pricing is in the pipeline
 - NAS proposes economy-wide carbon price starting at \$40/tCO₂ and rising by 5% annually
- ▶ Clean energy economy investments to increase
- ▶ Corporate climate advocacy will drive smooth transition to net-zero

Sources:

<https://hbr.org/2021/03/what-bidens-sustainability-agenda-means-for-business>

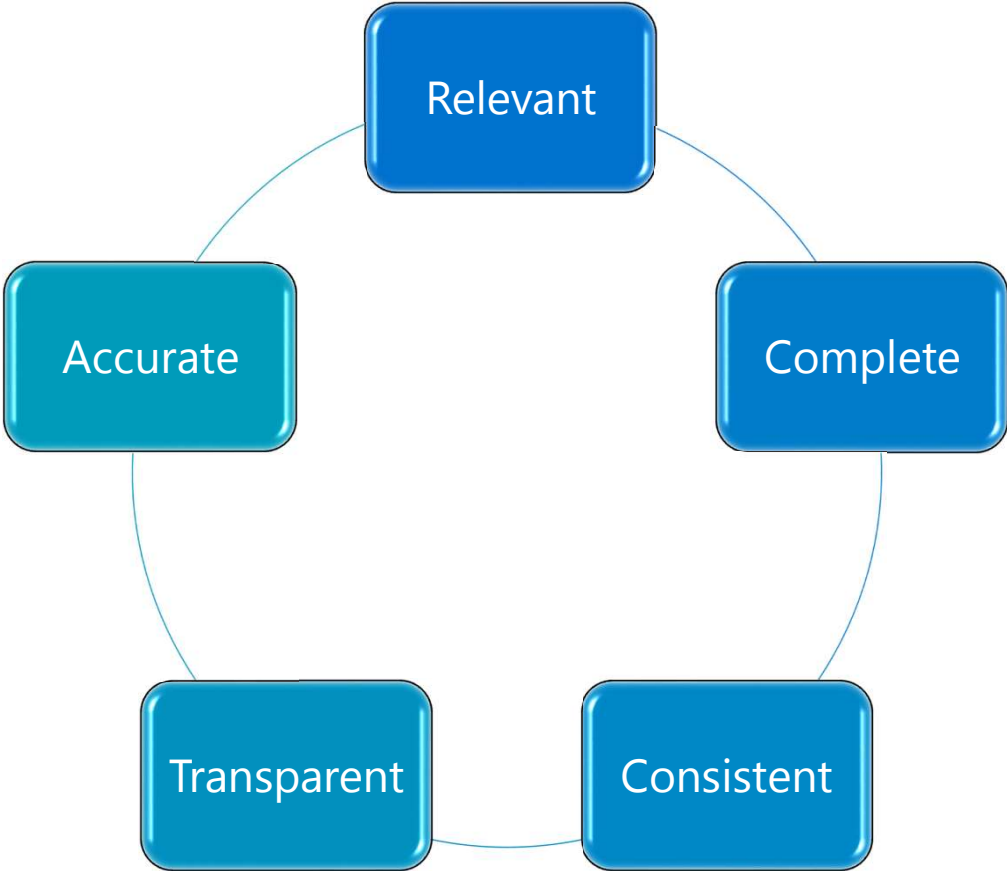
National Academy of Sciences/Engineering/Medicine 2021 Study: Accelerating Decarbonization of US Energy System

<https://www.nap.edu/catalog/25932/accelerating-decarbonization-of-the-us-energy-system>

GHG Emissions Inventories for Sustainability Reporting

GHG Accounting and Reporting Principles

WRI/WBSCD GHG Protocol Corporate Accounting & Reporting Standard



Accounting Attributes Unpacked

▶ Relevant

- Contains the data that matters most to your business and stakeholders (internal & external)

▶ Complete

- Footprint includes all emissions that are relevant and material; any exclusions are justifiable and documented

▶ Consistent

- Calculation methods and approaches are the same year-over-year to ensure apples-to-apples comparison; baseline emissions are recalculated as needed

▶ Transparent

- All inputs, assumptions, exclusions, etc. are clearly documented to establish a credible audit trail

▶ Accurate

- Uncertainties in quantification are reduced to the maximum possible extent to serve decision-making needs and objectives

Current Status of GHG Accounting at Many Facilities

- ▶ Regulatory reporting aimed at developing future regulation – cap and trade or carbon tax
- ▶ 40 CFR Part 98 : GHG Mandatory Reporting Rule (MRR)
 - MRR Reporting began in 2010/2011
 - Limited scope of emission sources (e.g., 25,000 MT CO₂e threshold for most subparts, all direct sources not covered)
 - Outdated GWP (IPCC, AR4)
 - Outdated emission factors for certain sectors
 - Potentially limited accuracy (e.g., Subpart C options)



GHG Corporate Footprint Nuts and Bolts

Step 1: Establish Inventory Boundaries

- ▶ Organizational Boundaries
 - Equity Share
 - Control (Financial or Operational)
- ▶ Operational Boundaries
 - Include Scope 1 and Scope 2
 - Decide whether to include relevant Scope 3 categories

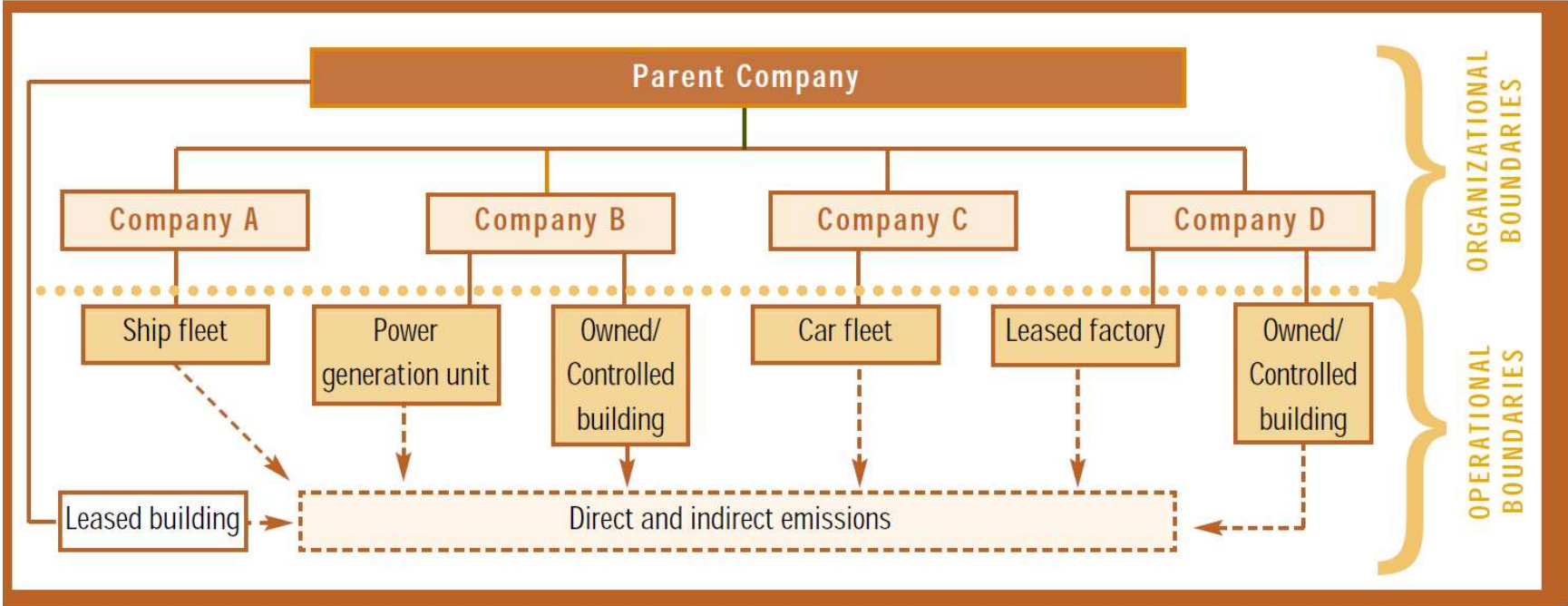
GHG Corporate Footprint Nuts and Bolts

Organizational Boundaries

Consolidation approach	Description
Equity share	Under the equity share approach, a company accounts for GHG emissions from operations according to its share of equity in the operation. The equity share reflects economic interest, which is the extent of rights a company has to the risks and rewards flowing from an operation.
Financial control	Under the financial control approach, a company accounts for 100 percent of the GHG emissions over which it has financial control. It does not account for GHG emissions from operations in which it owns an interest but does not have financial control.
Operational control	Under the operational control approach, a company accounts for 100 percent of the GHG emissions over which it has operational control. It does not account for GHG emissions from operations in which it owns an interest but does not have operational control.

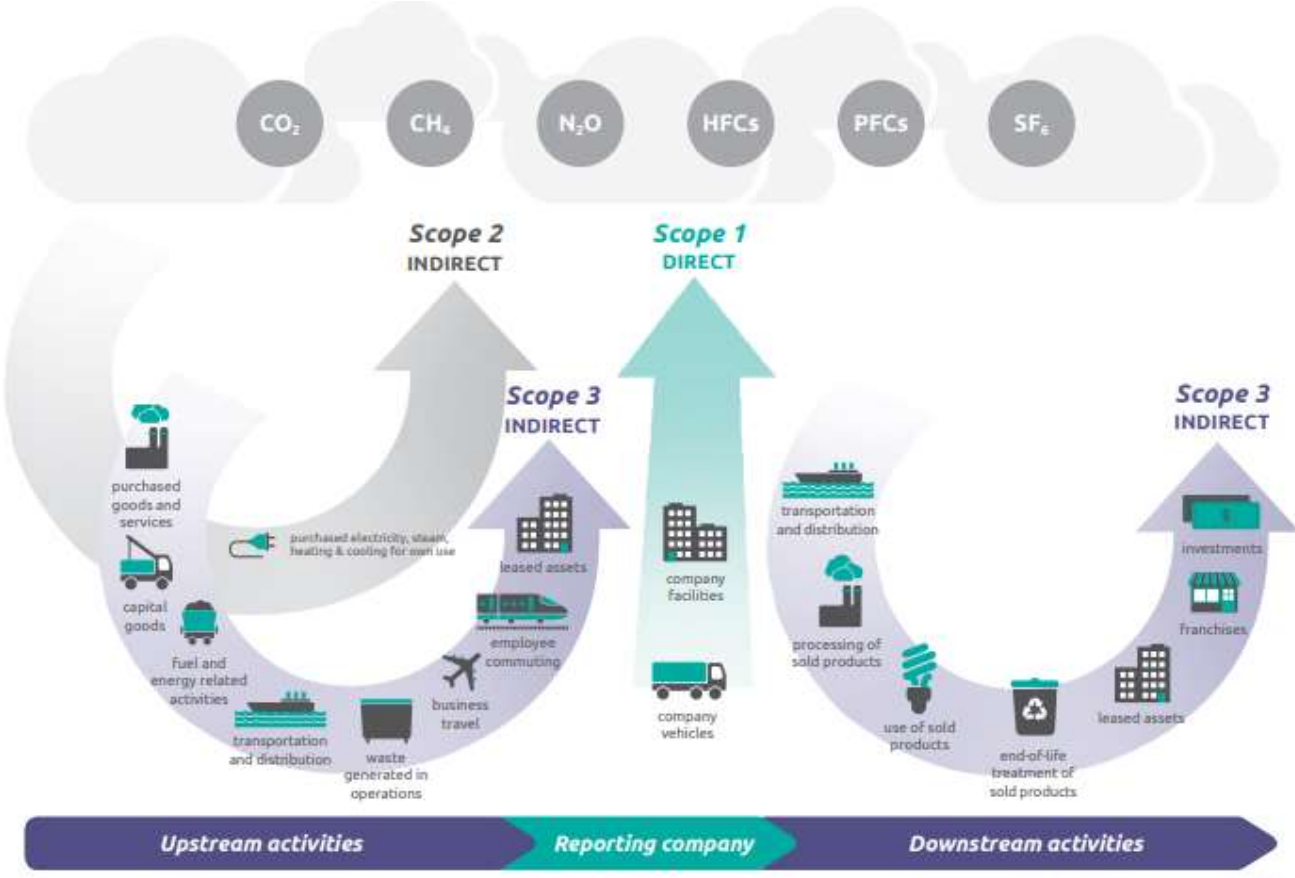
Source: https://ghgprotocol.org/sites/default/files/standards/Corporate-Value-Chain-Accounting-Reporting-Standard_041613_2.pdf

Organizational and Operational Boundaries



Source: <https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf>

GHG Protocol Scopes & Emissions Across the Value Chain



Source: https://ghgprotocol.org/sites/default/files/standards/Corporate-Value-Chain-Accounting-Reporting-Standard_041613_2.pdf

Overview of Scopes

<i>Emissions type</i>	<i>Scope</i>	<i>Definition</i>	<i>Examples</i>
Direct emissions	Scope 1	Emissions from operations that are owned or controlled by the reporting company	Emissions from combustion in owned or controlled boilers, furnaces, vehicles, etc.; emissions from chemical production in owned or controlled process equipment
	Scope 2	Emissions from the generation of purchased or acquired electricity, steam, heating, or cooling consumed by the reporting company	Use of purchased electricity, steam, heating, or cooling
Indirect emissions	Scope 3	All indirect emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions	Production of purchased products, transportation of purchased products, or use of sold products

Source: https://ghgprotocol.org/sites/default/files/standards/Corporate-Value-Chain-Accounting-Reporting-Standard_041613_2.pdf

GHG Corporate Footprint Nuts and Bolts

Scope 3 Value Chain Accounting

▶ Scope 3 Categories

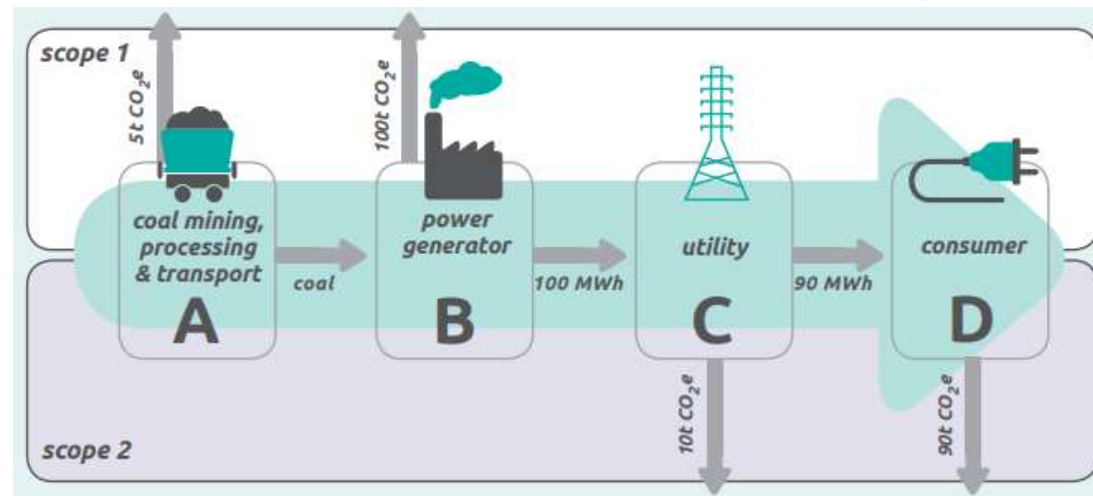
- ▶ Purchased goods and services
- ▶ Capital goods
- ▶ Fuel and energy-related activities
- ▶ Upstream transportation/distribution
- ▶ Waste generated in operations
- ▶ Business travel
- ▶ Employee commuting
- ▶ Upstream leased assets
- ▶ Downstream transportation/distribution
- ▶ Processing of sold products
- ▶ Use of sold products
- ▶ End-of-life treatment of sold products
- ▶ Downstream leased assets
- ▶ Franchises
- ▶ Investments

▶ Scope 3 Reporting

- Reported separately from S1/S2, by category
- Exclude biogenic CO₂ emissions (report separately), GHG trades/allowances
- Justify excluded categories

Source: https://ghgprotocol.org/sites/default/files/standards/Corporate-Value-Chain-Accounting-Reporting-Standard_041613_2.pdf

Example: Emissions Across an Electricity Value Chain



- ▶ **Company A:** Directly emits 5 MT CO₂e per year from its operations and sells coal to Company B
- ▶ **Company B:** Generates 100 MWh of electricity and directly emits 100 MT CO₂e per year and sells power to utility Company C
- ▶ **Company C:** Consumes 10 MWh (~10 MT CO₂e) to operate its T & D system; delivering the remaining 90 MWh to end user Company D
- ▶ **Company D:** Consumes 90 MWh (~90 MT CO₂e).

Adapted from: https://ghgprotocol.org/sites/default/files/standards/Corporate-Value-Chain-Accounting-Reporting-Standard_041613_2.pdf

Example: Emissions Accounting Breakdown (CO₂e)

Reporting Company	Operations	Scope 1	Scope 2	Scope 3
Company A	Coal Mining, Processing & Transport	5 MT	0 (unless electricity used during operations)	100 MT (from combustion of coal sold to B)
Company B	Power Generation	100 MT	0	5 MT (from extraction, processing, transport of coal consumed by B)
Company C	Utility – Power Distribution	0 (unless SF ₆ is released from T & D system)	10 MT (from generation of electricity purchased & consumed by C)	0.5 MT (from extraction, processing, transport of coal consumed by C) 94.5 MT (from generation of electricity sold to D)
Company D	End User/ Consumer	0	90 MT (from generation of electricity consumed by D)	4.5 MT (from extraction, processing, transport of coal used in electricity consumed by D) 10.5 MT (from T & D system losses)

Adapted from: https://ghgprotocol.org/sites/default/files/standards/Corporate-Value-Chain-Accounting-Reporting-Standard_041613_2.pdf

GHG Corporate Footprint Nuts and Bolts

Scope 3 Product Life Cycle Accounting

- ▶ Business Goal of Product LCA
 - Climate change management (identify market risks/opportunities)
 - Performance tracking (efficiency improvements, GHG reductions)
 - Supplier/customer stewardship
 - Product differentiation (competitive advantage, brand image, corporate reputation)
- ▶ Similar data required for S3 value chain and product LCA – develop in parallel

Source: https://ghgprotocol.org/sites/default/files/standards/Product-Life-Cycle-Accounting-Reporting-Standard_041613.pdf

GHG Corporate Footprint Nuts and Bolts

Step 2: Establish a Baseline Year

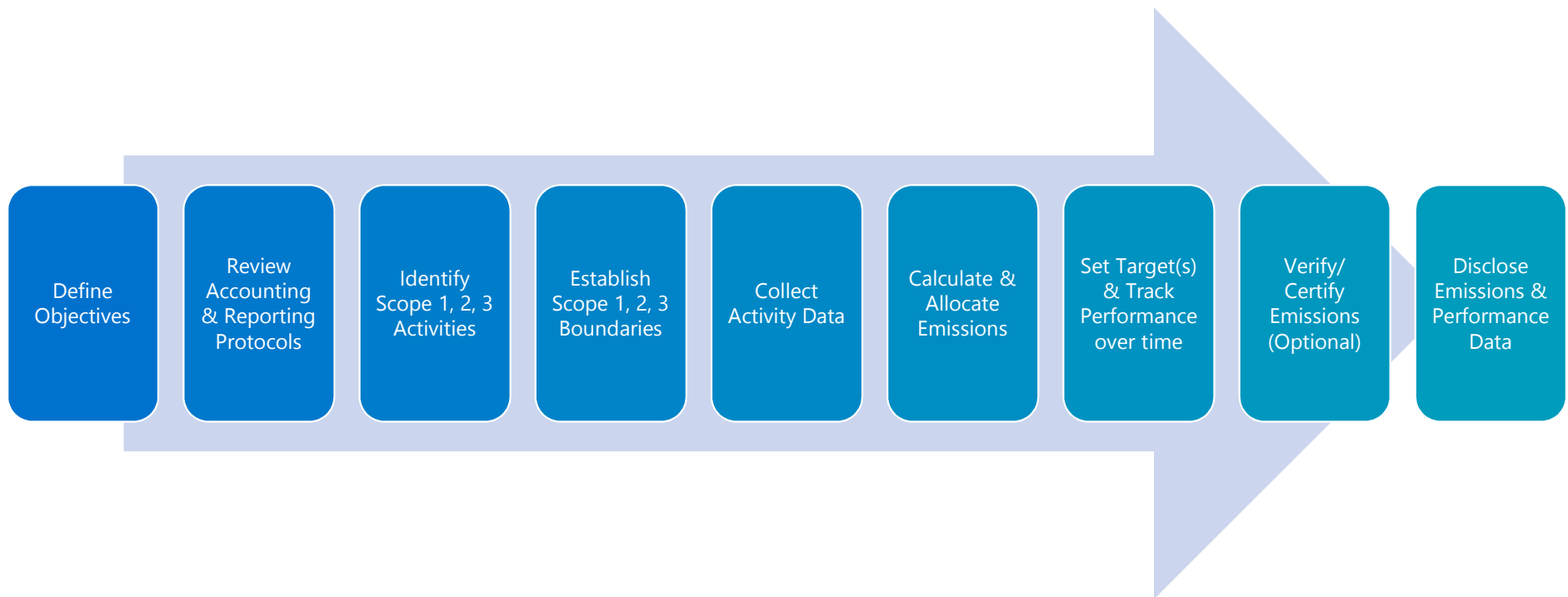
- ▶ Specify reason for choosing particular year
- ▶ Develop baseline year emissions recalculation policy
 - Mergers/acquisitions/divestments
 - Change in calculation methodology
 - Improvement in accuracy of emission factors
 - Correction of significant errors
- ▶ Recalculate baseline year emissions when significant changes in company structure or inventory methodology occur
 - “significant” not defined by GHG Protocol Standard, but may be by other reporting programs

GHG Corporate Footprint Nuts and Bolts

Step 3: Identify and Calculate Emissions

- ▶ Identify GHG emission sources
- ▶ Select calculational approach
 - Cross-sector tools for common sources (stationary combustion, mobile sources, refrigerant use, etc.)
 - Industry sector-specific tools, Part 98 subparts
- ▶ Collect activity data (can be challenging)
- ▶ Develop calculations
- ▶ Roll up to corporate level
- ▶ Assess materiality

Emissions Accounting & Performance Tracking Steps



Adapted from: https://ghgprotocol.org/sites/default/files/standards/Corporate-Value-Chain-Accounting-Reporting-Standard_041613_2.pdf

Benchmarking Pitfalls

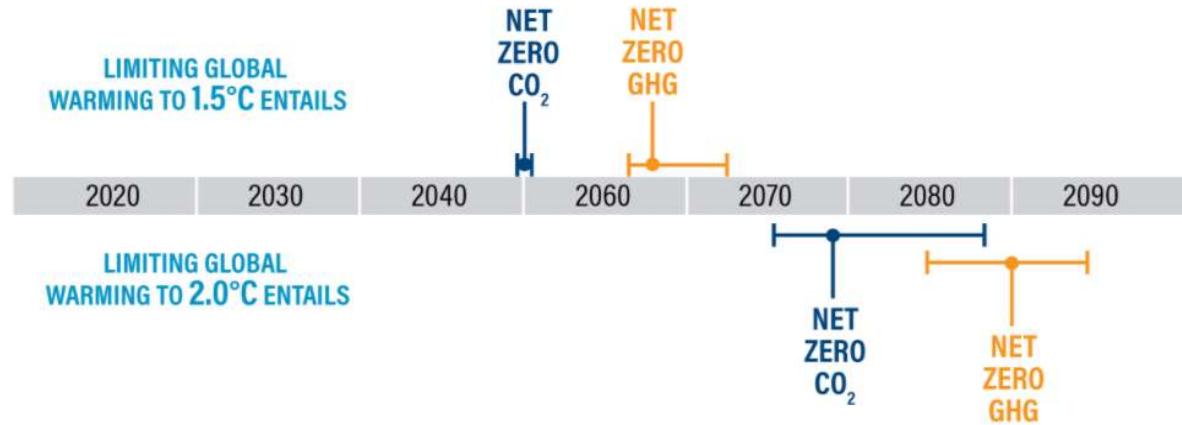
- ▶ EPA's FLIGHT data is readily available, but is only a subset of S1 sources and allows reporters to choose from various calculation methods
- ▶ Numerous globally-used disclosure programs result in a distinct lack of standardization in reporting (with disparities in emission factors, GWPs, calculation methods, scope boundaries, intensity metrics, etc.)
- ▶ Industry-specific initiatives, protocols, and standards contribute to additional variation in disclosures
- ▶ Transparency in individual reports/disclosures also fluctuates widely

Sustainability Goals: GHG Reduction Target Setting

Global GHG Reduction Targets

- ▶ Paris Agreement temperature goal: limit warming to below 2°C, ideally below 1.5 °C
- ▶ Timeline to achieve:

Global timeline to reach net-zero emissions



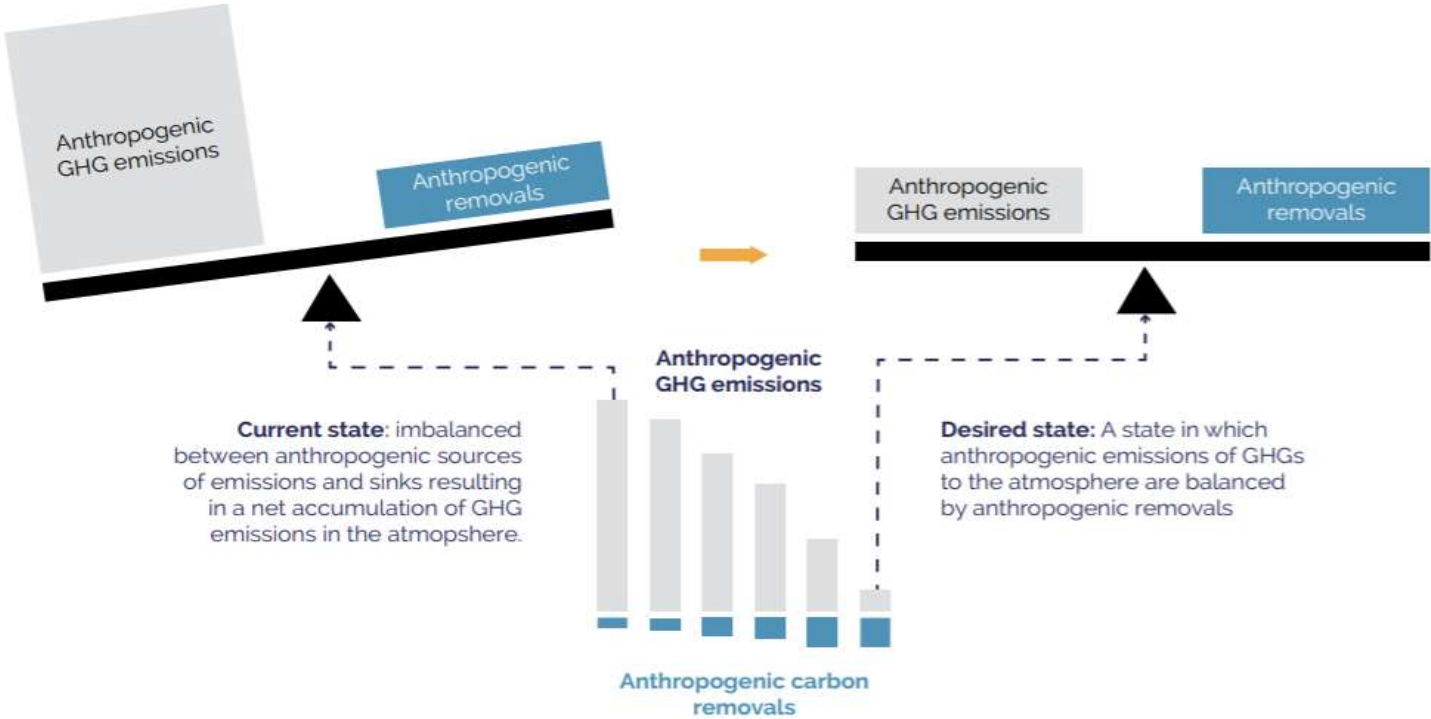
Source: IPCC Special Report on Global Warming of 1.5°C

Setting a Corporate GHG Reduction Target

Net Zero and/or Science-Based Targets

- ▶ Current corporate net zero targets **inconsistent**
 - Emission sources/activities included
 - Target timelines
 - Companies' approaches to achieving targets
- ▶ What does **"net zero"** mean at a corporate level?
 - *"To achieve a scale of value-chain emission reductions consistent with the depth of abatement achieved in pathways that limit warming to 1.5°C with no or limited overshoot and;*
 - *To neutralize the impact of any source of residual emissions that remains unfeasible to be eliminated by permanently removing an equivalent amount of atmospheric carbon dioxide. "*

What does "Net Zero" mean?



Source: <https://sciencebasedtargets.org/resources/legacy/2020/09/foundations-for-net-zero-full-paper.pdf>

Setting a Corporate GHG Reduction Target

Mitigation Tactics

- ▶ Abatement: reduction or elimination of S1/S2/S3 emissions within the value chain (e.g., electrification of processes that require relatively low-temperature heat)
- ▶ Neutralization: removal and/or sequestration of CO₂ from the atmosphere to counterbalance emissions within the value chain that are not abated
- ▶ Compensation: offsetting of emissions within the value chain with reductions that occur outside of the value chain (e.g., purchase carbon credits)

Setting a Corporate GHG Reduction Target

General Steps per GHG Protocol Corporate Standard

- ▶ Obtain senior management commitment
- ▶ Decide on target type
 - Absolute target (ex. 50% reduction from 2005 levels by 2030)
 - Intensity target (ex. Reduce CO₂ emissions/kWh sold to XX)
- ▶ Decide on target boundary – which GHGs? S1/S2/S3? Geographic boundaries? Corporate-wide or per business unit?
- ▶ Determine target base year and completion date

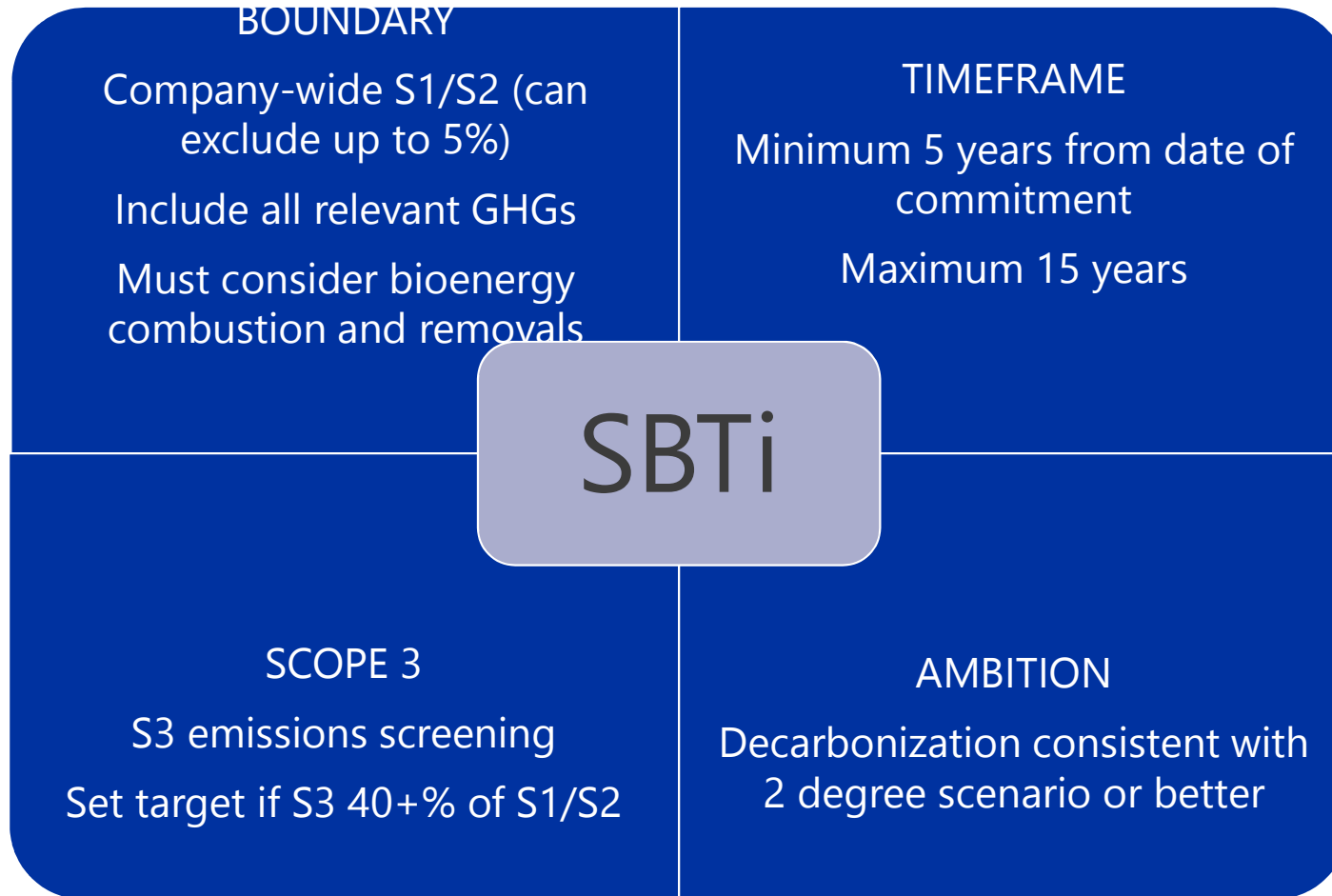
Steps to Setting Net Zero Targets Now

- ▶ Step 1: Develop comprehensive baseline emissions inventory
- ▶ Step 2: Identify mitigation strategies (commercially available and emerging technologies) for each emissions source category
 - Perform peer benchmarking to identify competitor practices
 - Review various decarbonization studies for understanding of low carbon economy transition
 - Obtain stakeholder input on business priorities and anticipated market changes
- ▶ Step 3: Rank mitigation strategies
 - Timeframe for implementation
 - Estimated reduction achievable
 - Cost of implementation (consider carbon pricing)

Steps to Setting Net Zero Targets Now

- ▶ Step 4: Calculate intermediate targets based on mitigation strategy review
 - What emission sources are material to your carbon footprint?
 - What % reduction can be achieved with abatement measures identified for these sources?
 - Should any abatement measures be eliminated based on cost?
 - What is limit of existing technology? (i.e., new baseline once existing abatement measures implemented)
 - How can the remaining emissions be compensated/offset or neutralized/eliminated?
- ▶ Step 5: Set ultimate net zero goal, taking into account timeframe for emerging technologies/cost considerations
 - Requires forecasting of emerging technology advancement
 - Could inform company strategy
- ▶ Step 6: Set up tools to track progress towards goals and periodically revisit/revise mitigation strategies as technology, policy, business priorities evolve

Setting a Corporate GHG Reduction Target



Source: <https://sciencebasedtargets.org/resources/legacy/2017/04/SBTi-manual.pdf>

Setting a Corporate GHG Reduction Target

Science Based Targets (SBTi) Target Setting Approaches

- ▶ Absolute Emissions Contraction:
 - % reduction in absolute emissions required is applied to all companies equally
 - Target overall reduction in amount of absolute GHG emitted by target year relative to base year
- ▶ Sectoral Decarbonization Approach (SDA):
 - Global carbon budget is divided by sector
 - SDA sets intensity targets (i.e., tonne CO₂e per tonne of product produced) for given sector; recommended for energy-intensive sectors
- ▶ Economic Intensity Contraction:
 - Carbon budget equated to global GDP
 - Company's share of emissions determined by gross profit ; target is intensity reduction of tCO₂e/\$ value added

Source: <https://sciencebasedtargets.org/resources/legacy/2017/04/SBTi-manual.pdf>

Setting a Corporate GHG Reduction Target

Net Zero Targets - Areas for further development

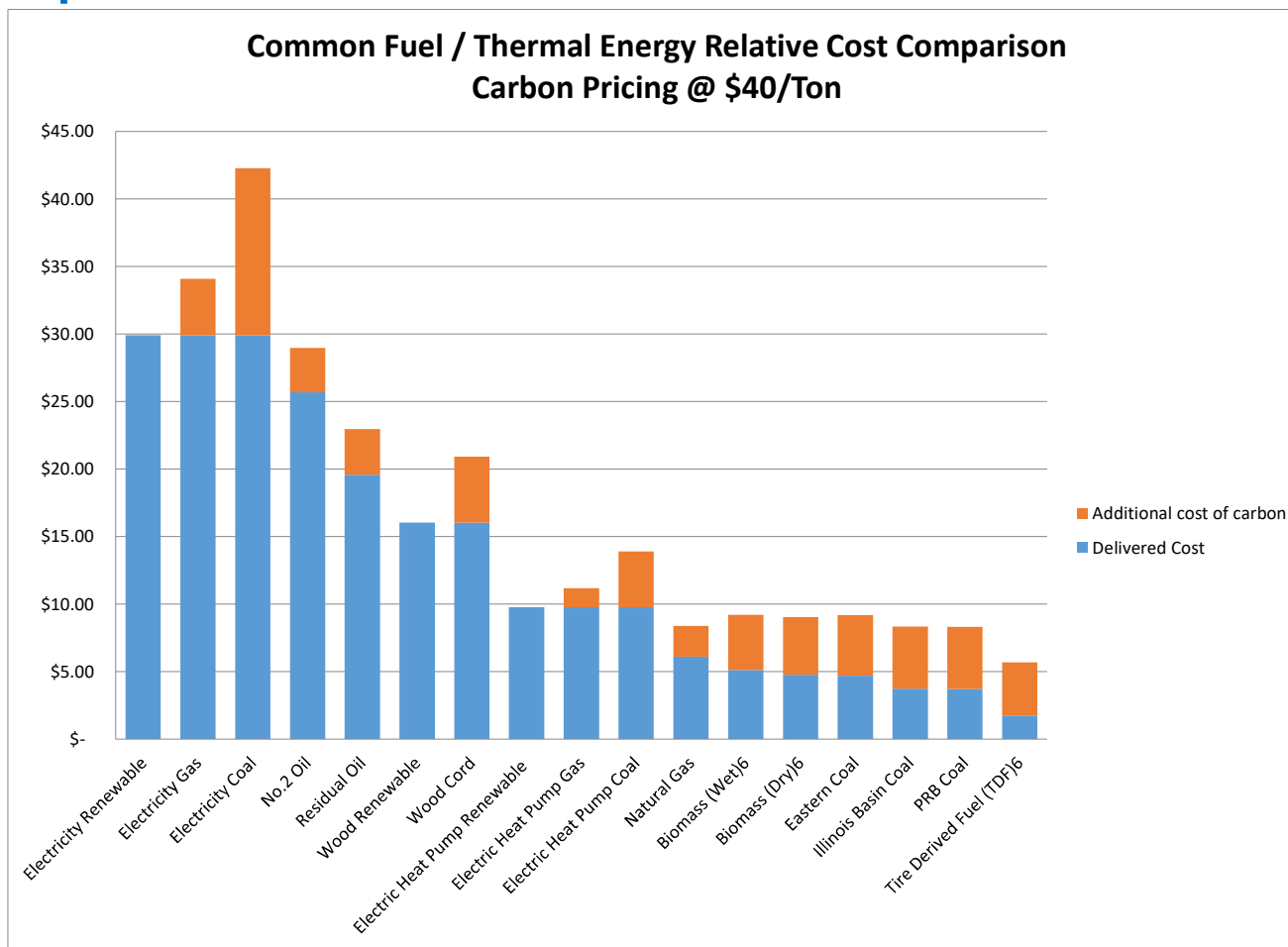
- ▶ CDP/SBTi working to develop standard practice for setting corporate net zero goals
- ▶ Areas for further development:
 - Standard criteria for setting science-based net-zero target in corporate sector;
 - Validation protocol; and
 - Detailed guidance for setting targets and making credible claims



Applying Internal Carbon Pricing to Mitigation Assessment

- ▶ Companies set internal charge on amount of CO₂ emitted from assets/investment projects
- ▶ Provides insight on potential risks and opportunities associated with transition to low-carbon economy
- ▶ Provides incentive to drive energy efficiencies, reduce costs and guide capital investment decisions
- ▶ Internal carbon pricing varies from a few dollars to over \$100/MT CO₂
- ▶ One source estimates that companies need to set price at \$40-\$80/MT in 2020 and between \$50-\$100/MT by 2030 to reduce emissions in line with Paris Agreement*

Example Carbon Cost Evaluation



Source: CIBO Internal Work in Progress

Questions

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Webinar Series: Essential Tools for Navigating Climate Commitments

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- Part 1 Mar 16, 2021
- Part 2 Apr 14, 2021
- Part 3 May 13, 2021
- Part 4 Jun 15, 2021
- Part 5 Jul 14, 2021



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