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American Chemical Society

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Science-Based Carbon Reduction Targets:
An Entry Ticket to Carbon-Based Business Benefits

Valerie Patrick
President and Founder, Fulcrum Connection LLC
Bryan Tweedy
Manager, Office of Career and Professional Resources, American Chemical Society

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Science-Based Carbon Reduction Targets: An Entry Ticket to Carbon-Based Business Benefits

Dr. Valerie Patrick, President of Fulcrum Connection LLC

About the Presenter

Valerie.Patrick@FulcrumConnection.com

Bucknell University
B.S., Chemical Engineering

California Institute of Technology
M.S. and Ph.D., Chemical Engineering

Business Impacts: RISK, REWARD, REPUTATION
How would you rate your knowledge of climate change?

- Little to no knowledge
- Below average knowledge
- Average knowledge
- Above average knowledge
- Expert Knowledge

Learning Objectives

1: Organizational Motivations
2: Types of Carbon Reduction Goals
3: Science-Based Approaches
New ACS Short-Course

Introduction to the Science and Business Impact of Climate Change

Module 1: Climate Change Science
Module 2: Climate Change Impacts
Module 3: Carbon Accounting
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Course Details

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Climatology is Newer than Chemistry

Claude Lorius surrounded by penguins, near the Dumont d’Urville station

Source: https://news.cnrs.fr/articles/claude-lorius-a-life-on-the-ice
Select the response that best describes your current place of employment:

- Industry or For-Profit
- NGO or Not-For-Profit
- Government
- Academia (professors, grad students)
- Other (undergrads, retirees, etc.)

Motivation

- Identify operational inefficiencies to achieve cost savings and stimulate innovation
- Help minimize risks associated with GHG and prepare for potential future regulation
- Shareholder pressure: 475 institutional investors require companies to report through CDP annually and there were 67 shareholder resolutions filed in the U.S. and Canada in 2009
- Competitive advantage and benchmarking on GHG emissions is becoming increasingly important
- Desire to have a positive environmental impact and support employee motivation and recruitment

Global 100 Image: https://aegee.blogactiv.eu/2013/01/29/umicore-most-sustainable-corporation-2013/
### Type of Carbon Reduction Goal

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Absolute Target</th>
<th>Intensity Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Integrity</td>
<td>Ensures a specified quantity of GHG reductions to the atmosphere</td>
<td>No guarantee that there will be fewer GHG emissions to the atmosphere – absolute emissions may rise even if intensity goes down (and output increases).</td>
</tr>
<tr>
<td>Metric Definition</td>
<td>Not applicable.</td>
<td>May be difficult to define a single common business metric for a company with diverse operations. If a monetary variable is used for the business metric (e.g., dollars of revenue), then it should be adjusted for changes in product.</td>
</tr>
<tr>
<td>Confidentiality</td>
<td>Not applicable – no business metric assigned to target.</td>
<td>May be an issue – data on the business metric needs to be reported.</td>
</tr>
<tr>
<td>Effects from Base Year Recalculations</td>
<td>Add complexity to tracking progress over time (e.g., for significant structural changes to organization).</td>
<td>GHG fluctuations due to product changes usually are not required (and may be part of reduction strategy).</td>
</tr>
<tr>
<td>Relation to Organic Growth or Decline</td>
<td>Recognizes reduction of GHGs from decreased production (organic decline).</td>
<td>Reflects GHG Improvements independent of organic growth or decline.</td>
</tr>
<tr>
<td>Comparisons of GHG Intensity/ Efficiency</td>
<td>Does not allow for comparison of GHG performance between companies.</td>
<td>Comparison of GHG performance between companies is possible and may be increased.</td>
</tr>
</tbody>
</table>


### Example Carbon Reduction Goals

How would you rate your organization’s commitment to reducing greenhouse gas emissions?

- Little to no commitment
- Below average commitment
- Average commitment
- Above average commitment
- Exemplary commitment

Source: https://www.epa.gov/climateleadership
EPA Corporate GHG Goal Evaluation Model

EPA Corporate GHG Goal Evaluation Model

The EPA Corporate GHG Goal Evaluation Model provides companies with a transparent and publicly available benchmarking resource to help evaluate and establish new or existing GHG goals that go beyond "business as usual" for their individual sectors. Download the model below (note that users must first download the Free Analytica Player, which allows viewing and running of existing models) and use the accompanying documents for additional information, including a user’s manual and methodology overview.

Source: https://www.epa.gov/climateleadership/epa-corporate-ghg-goal-evaluation-model

Custom Target Approaches
Components of a Science-Based Target Approach

### Carbon Budget
- **2°C carbon budget (1,010 Gt CO₂)**

### Emissions Scenario
- IPCC 4th Assessment Report (A – 450 ppm CO₂e)
- IPCC 5th Assessment Report (Overshoot < 0.4 W/m²)
- IPCC 5th Assessment Report (RCP 2.6)
- International Energy Agency 2DS (ETP 2016)

### Allocation Approach
- Convergence of Physical Intensity (e.g. SDA)
- Contraction of Economic Intensity
- Contraction of Absolute Emissions


---

Benefits of a Science-Based Target Approach

<table>
<thead>
<tr>
<th>Opportunity</th>
<th>Incremental Targets</th>
<th>Science-Based Targets (SBTs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Build Business Resilience and Increase Competitiveness</td>
<td>A reduction in GHG emissions often corresponds to decreased costs and an increase in companies’ operational efficiency.</td>
<td>Incremental targets may limit companies to only going after the “low hanging fruit.” Methods to set SBTs challenge business to re-align with the low-carbon economy, capitalizing on a range of opportunities beyond cost-savings.</td>
</tr>
<tr>
<td>Drive Innovation and Transform Business Practices</td>
<td>Setting targets can inspire companies and supply chain actors to discover new novel solutions and product offerings. Because targets are near-term and not a “stretch”, companies may not be pushed to transform business practices.</td>
<td>Because SBTs include a long-term vision, companies can think beyond the near-term, common solutions for GHG emissions reductions. New technologies and financing options can be developed in a corporate environment that prioritize preparing for a low-carbon economy.</td>
</tr>
<tr>
<td>Build Credibility and Reputation</td>
<td>Companies transparent in their GHG reduction efforts garner reputational credibility by demonstrating their commitment to addressing climate change. However, investors and other stakeholders are now demanding targets based on external, science-driven projections, which could put these companies at risk.</td>
<td>SBTs have higher credibility with stakeholders. Science is requiring companies to increase their level of ambition.</td>
</tr>
<tr>
<td>Influence and Prepare for Shifts in Public Policy</td>
<td>Incremental targets send a signal to policy makers that companies take climate change seriously.</td>
<td>SBTs help companies adapt to changing policies and send a stronger signal to policymakers, allowing companies to better influence policy decisions.</td>
</tr>
</tbody>
</table>

# Example Science-Based Target Approaches

<table>
<thead>
<tr>
<th>Method</th>
<th>Allocation Approach</th>
<th>Sectors</th>
<th>Target Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolute Emissions Contraction</td>
<td>Contraction of Absolute Emissions</td>
<td>Depends on Emissions Scenario</td>
<td>Absolute</td>
</tr>
<tr>
<td>Corporate Financing Approach to Climate-stabilizing Targets (C-FACT)</td>
<td>Contraction of Emissions Intensity</td>
<td>Depends on Emissions Scenario</td>
<td>Absolute and Economic Intensity</td>
</tr>
<tr>
<td>Climate Stabilization Intensity Targets (CSI)</td>
<td>Contraction of Emissions Intensity</td>
<td>Depends on Emissions Scenario</td>
<td>Economic Intensity</td>
</tr>
<tr>
<td>Context-based Carbon Metric (CSO)</td>
<td>Contraction of Emissions Intensity</td>
<td>Depends on Emissions Scenario</td>
<td>Economic Intensity</td>
</tr>
<tr>
<td>Greenhouse Gas Emissions per Value Added (GEVA)</td>
<td>Contraction of Emissions Intensity</td>
<td>Depends on Emissions Scenario</td>
<td>Economic Intensity</td>
</tr>
<tr>
<td>Sectoral Decarbonization Approach (SDA)</td>
<td>Convergence of Emissions Intensity</td>
<td>Various and 1 sector covering miscellaneous manufacturing</td>
<td>Physical Intensity and Absolute</td>
</tr>
<tr>
<td>3% Solution</td>
<td>Contraction of Absolute Emissions</td>
<td>Various</td>
<td>Absolute</td>
</tr>
</tbody>
</table>


## SDA

**Sector Scope**


![Fulcrum Connection Logo](image)

**Time for Questions!**

412-742-9675

Valerie.Patrick@FulcrumConnection.com

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