business solutions for a sustainable world

Emerging Practices in Internal Carbon Pricing: A Practical Guide

WBCSD Leadership Program 2015

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Foreword

"Nestlé is actively contributing to international efforts to reduce greenhouses gas emissions. As a member of the Caring for Climate initiative, we are supporting the Carbon Pricing Leadership Coalition and therefore the implementation of an internal carbon price. This report provides a pragmatic approach to implementing it in a company in order to foster rapid and sustainable change."

Duncan Pollard, Stakeholders Engagement in Sustainability, Nestlé

"Environmental protection is a major focus of Michelin's sustainable development policy, and as such the Group has set ambitions for reducing CO_2 emissions generated during product manufacturing and use. Michelin joined the Carbon Pricing Leadership Coalition because we believe that widespread implementation of internal carbon pricing could become a means for enabling businesses and consumers alike to understand the stakes involved in greenhouse gas mitigation and the prevention of environmental damage triggered by their excess. In a clear and constructive way, this report presents the challenges of internal carbon pricing and the approaches that are being deployed within companies."

Bertrand Bonhomme, Head of Sustainable Development, Michelin

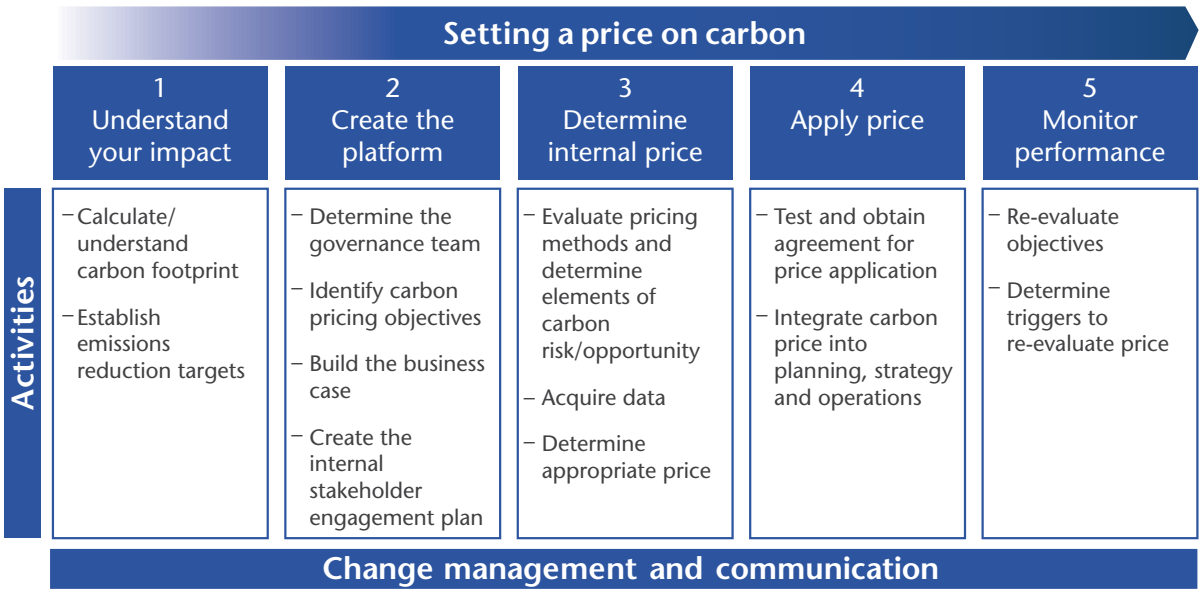
Executive Summary

Against the backdrop of increasing greenhouse gas (GHG) regulations, including carbon taxes, emissions trading schemes and emissions performance standards, an internal carbon price is emerging as a tool for companies to manage the risks and opportunities associated with their carbon footprint. The number of corporations disclosing to the Carbon Disclosure Project (CDP) that they use an internal price on carbon has nearly tripled from 150 companies to 437 in the past year. The question is not to know if an internal carbon price should be used or not, but how it can be effectively implemented. But how does one implement a price on carbon? According to the World Bank Group's 2015 report *State and Trends of Carbon Pricing*, the most common challenge of carbon pricing is a lack of common method or guidance to set carbon price.

This report addresses that challenge by presenting a synthesis of emerging carbon pricing practices and trends based on in-depth interviews with sustainability, GHG/climate and strategy managers in 14 companies;[1] literature reviews and analysis of publically available information; and, based on the emerging framework, a step-by-step process for implementing internal carbon pricing.

Companies are approaching carbon pricing in two distinct ways: one is to support strategic decision-making by setting a carbon "shadow price"; the other is to focus on reducing current emissions by charging a "carbon fee", a variant of shadow pricing.

This step-by-step guide to implementing an internal carbon price highlights and explains the following key elements:



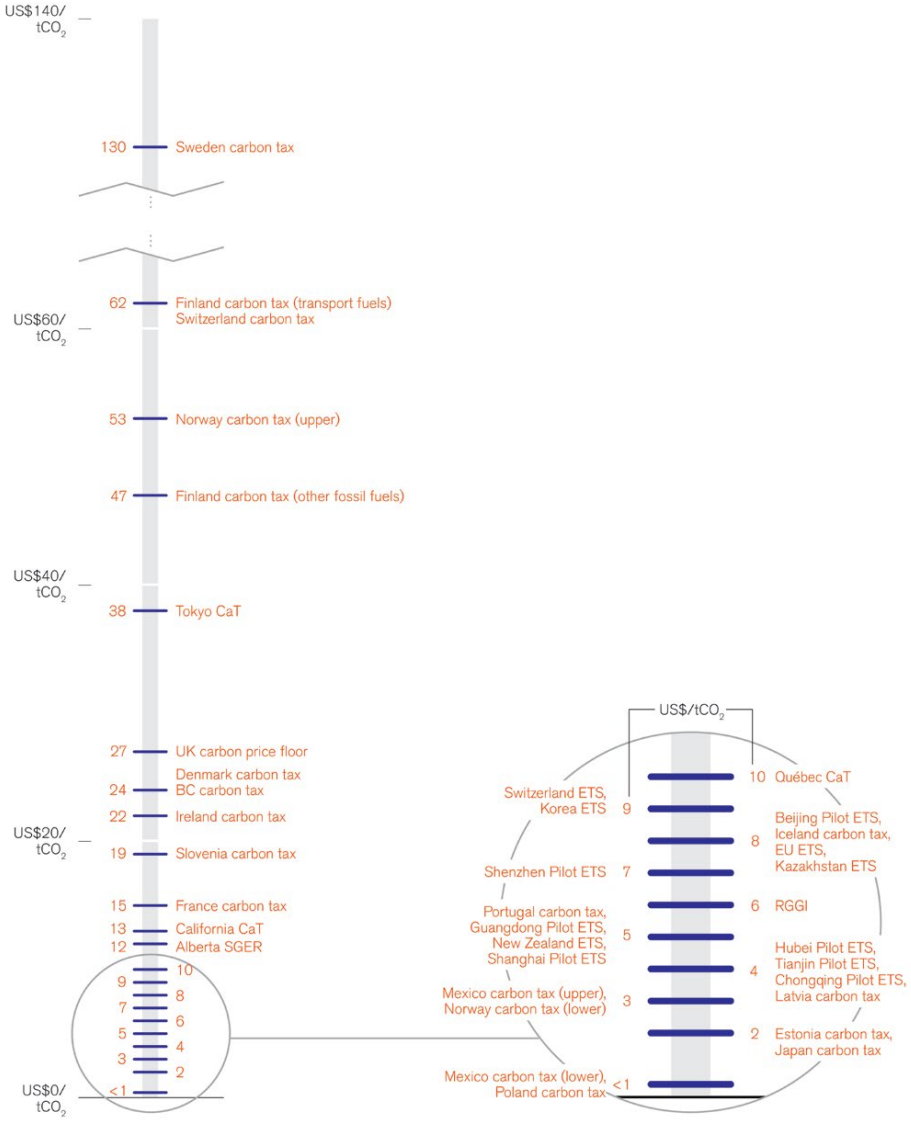
This guide can be applied to strategic decision-making or to reducing current emissions. It demonstrates the use of shadow pricing and carbon fees, highlighting the benefits, risks, barriers and key success factors, and providing practical examples of how to maximize the advantages they can offer.

1. Types of carbon pricing

1.1 External regulatory price

Carbon emission regulation began in the early 1990s, when Scandinavian countries implemented taxes on carbon dioxide and other greenhouse gas (GHG) emissions. Additional countries and sub-national jurisdictions instituted and began to enforce carbon taxes, cap and trade programs or emissions performance standards following the Rio Earth Summit in 1992.[2] The adoption of carbon pricing instruments through regulation to reduce GHG emissions has increased significantly in recent years. An external carbon price is in effect in 37 jurisdictions (see figure 1) which collectively account for 25% of the world's GHG emissions, although only 12% of global GHG emissions are actually subject to the carbon pricing stemming from these regulations.[4]

Figure 1: Prices of existing carbon pricing instruments[3]



The combined effect of these regulations has turned carbon into a cost for companies operating in the corresponding jurisdictions. For a given company, the cost borne depends on the geographic distribution of its operations and the degree to which its activities fall within the scope of regulations. The dispersion of regulated jurisdictions and multiple carbon pricing mechanisms employed create an inconsistent and non-comprehensive landscape, generating regulatory and financial risks for companies. Furthermore, as societal awareness of consumer products' and companies' carbon footprints increases, reputational risks are added to the mix.

Seventy-four countries, 23 sub-national jurisdictions, and more than 1,000 companies and investors expressed support for a price on carbon in advance of the 21st Conference of the Parties to the United Nations Framework Convention on Climate Change.[5] It is anticipated that carbon regulations will increase in the coming decades.[6] Companies therefore must determine the optimal approach to prepare for the potential financial implications.

Internal carbon pricing can be an effective means to address the risks—regulatory, reputational and financial—associated with external carbon prices.

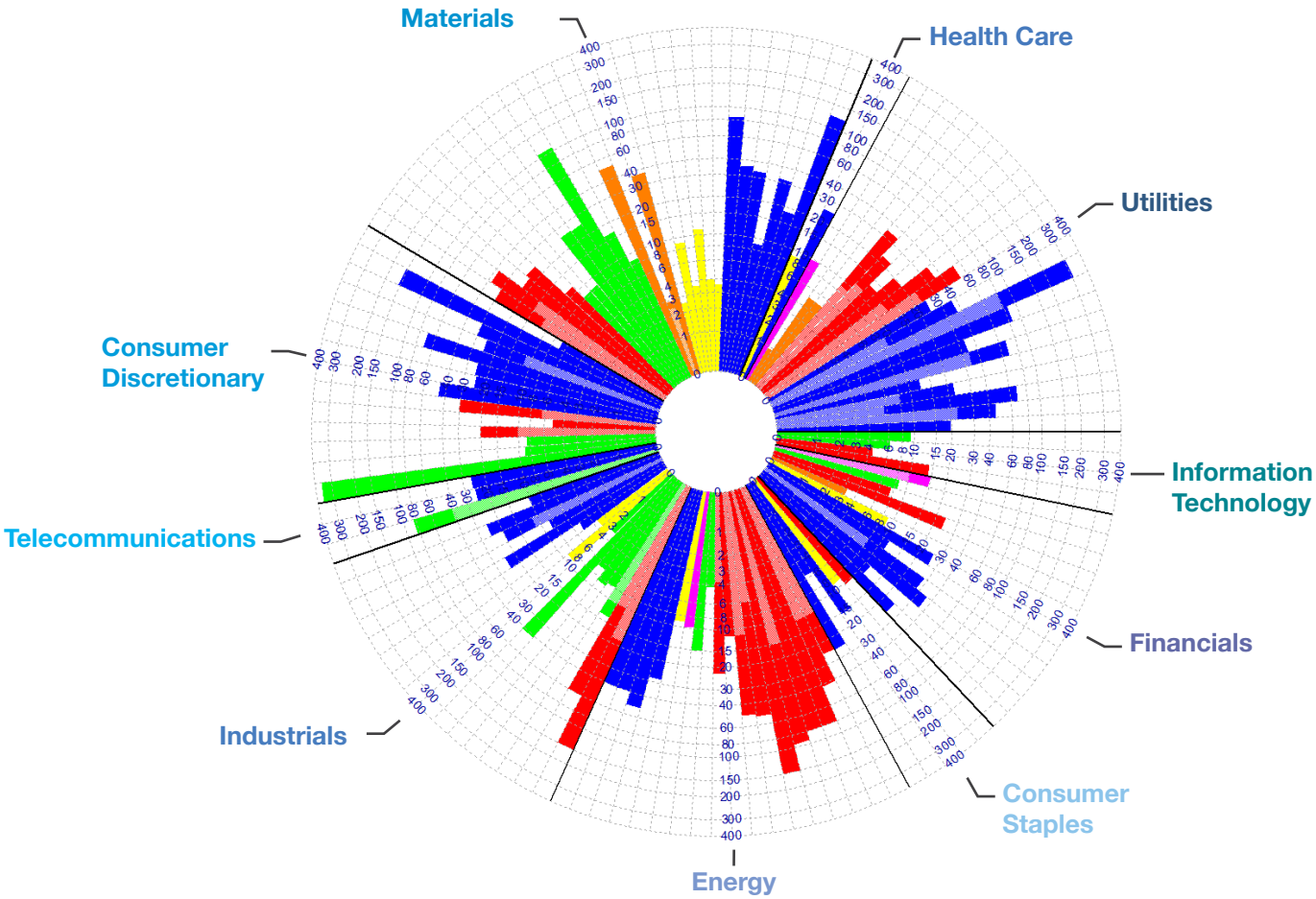
1.2 Internal voluntary carbon price

An internal carbon price is a voluntary method for companies to internalize the economic cost of their GHG emissions, even if some or all of their operations are not currently subject to external carbon regulations. If carbon emissions have a potential cost to the company in the future, putting a price on carbon internally is a means of managing that cost. This practice is referred to as "shadow carbon pricing", or "the voluntary use of a notional market price (a "shadow" price) for carbon in internal corporate financial analysis and decision-making processes."[7]

The number of corporations disclosing to the CDP that they use an internal price on carbon has tripled in one year,[8] likely due to growing consensus that external carbon pricing mechanisms will continue to proliferate and carbon prices will impact future markets.

Internal carbon prices, as reported in 2015 by corporations to the CDP, fall within a wide range from US$ 0.01 to US$ 360 per metric ton.[9] As shown in figure 2, average internal carbon prices vary by industry. This finding highlights the probability of divergent approaches, such as those highlighted in this study, being employed within companies to evaluate the cost of carbon.

Figure 2: Internal carbon price in US$ per metric ton by sector



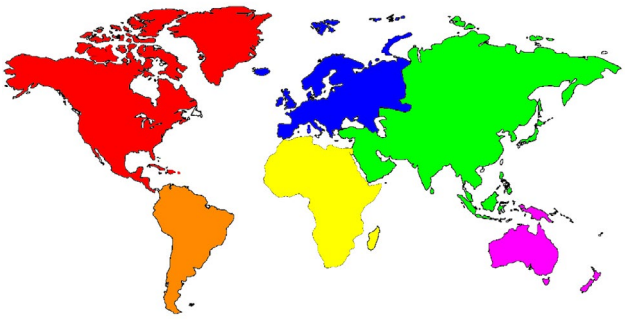
LEGEND:

Bar: price practiced by a single company

Bar color: geographical region of the company

Shaded bar: minimum price

Solid bar: maximum price



2. Approaches to internal carbon pricing

Carbon pricing is being approached in two distinct ways: one is by setting a carbon "shadow price" to support strategic decision-making; the other, a variant of shadow pricing, is by charging a carbon "fee" as an incentive to reduce current GHG emissions.

Based on interviews for this study, a parallel survey conducted under the auspices of the WBCSD[10] and on public disclosures submitted to the CDP[11,12,13,14] a pattern is emerging in internal carbon pricing practices. Companies closer to the beginning of the value chain—materials, energy and utility companies—are tending to place carbon pricing squarely within their strategic planning process, driven by corporate strategists and linked to the risk management process. The industrial sector is more focused on pure risk management. Still, many companies across these four sectors—40% in this study sample—focus their carbon pricing directly on capital investment decision-making, independent of corporate strategic or risk management processes.

Companies providing information technology or financial services, because they are comparatively less energy-intensive, often opt for a carbon-fee approach coupled with carbon offsetting,[15] towards a "zero emission" goal. Interestingly, nearly half of the financial service companies reviewed are moving beyond their own footprint and incorporating shadow pricing into their portfolio decision-making. In the middle are the consumer staples and consumer discretionary sectors: companies in these sectors typically begin by focusing on projects requiring capital investment for activities or operations that generate or will generate Scope 1 or 2 CO_2 emissions.[16]

Shadow pricing and the carbon fee variant, as currently practiced by the companies interviewed in the study, are explained in the following sections, along with the benefits, risks, enablers, barriers and key success factors that were observed.

2.1 Shadow pricing applied to decision-making

For a company looking at shadow pricing as a tool, the challenging questions are: what price(s), for which activities within the company, how far into the future, and will it create value? However an individual company may tackle these questions, current practices indicate that shadow pricing is being used to make three types of decisions:

1. Projects requiring capital investment
2. Risk management
3. Strategic planning.

Capital investment projects as a starting point

A common starting point is to focus on capital investment projects involving an increase in GHG emissions, change in energy source or improving energy efficiency. A shadow price is figured into the calculations for determining return on investment or net present value. A single value may be used or a range of values by type of project or by geographical region, the latter being relevant when a company has operations in one or more countries with a regulated CO_2 market or a tax on energy or CO_2.

This study showed that many companies begin using a carbon price this way, without necessarily linking their capital project decisions to strategic planning or risk management. This approach can be applied to existing sites directly under the company's control, aimed at reducing existing Scope 1 and 2 CO_2 emissions, or for projects involving new sites or operations, aimed at avoiding CO_2 emissions in the future.

Risk management and strategic planning approaches

CO_2 emissions are already a regulatory and financial risk for many companies, whether through the costs of cap and trade, taxes or penalties for exceeding thresholds. Such competitive risks are drawing ever greater attention from institutional investors, for example the 304 investors supporting the CDP's "Carbon Action" initiative urging corporate-level carbon management and energy-efficiency initiatives and targeting more than 1,300 companies in 17 "high-emitting" industries.[17] Lastly, a company's carbon footprint can carry a reputational risk, especially in the eyes of local communities and stakeholders in terms of the company's license to operate.

"Increasingly, external expectations and public policy are creating a new framework for decision-making: more carbon taxes, more regulatory requirements across the globe and greater demands for reporting."

Jean-Philippe Hermine,
Vice-President for Strategic Environmental Planning,
Renault,
Leadership Program interview, October 2015

For all these reasons, CO_2 emissions are being incorporated into corporate-level risk analysis by determining scenarios, undertaking forecasting and conducting sensitivity analyses where uncertainty prevails. Typically, the starting point is to build scenarios based on existing external carbon prices (cap and trade, taxes, penalties). Such scenarios can be adapted by geographic region, taking into account the current and future regulatory contexts.

"It's very difficult to predict the future, obviously, but we need to look at the probabilities. With external carbon prices, it's only a matter of time."

Mark Weick,
Director of Sustainability,
The Dow Chemical Company,
Leadership Program interview, September 2015

Many companies reported that "doing the numbers is easy". The real challenge is to use the information on trends in the relevant business units or departments. This is where carbon pricing enters into corporate strategic planning.

Companies that view shadow pricing through a risk management lens, versus those that view it through a strategic planning lens, are

doing exactly the same thing: viewing carbon emissions as relevant to decision-making over the long term. Figure 3 illustrates how shadow pricing drives decisions, whether from a strategy or a risk management perspective. Decisions on capital investments can be outcomes of strategic planning or risk management, or can be made independently.

The key to success in carbon price forecasting and scenario modeling is internal collaboration. All the companies interviewed for this study using shadow pricing for risk management and/or strategic planning confirmed that their decision-making involves multi-disciplinary/multi-business unit expertise.

When implemented, shadow pricing is a cross-cutting tool bringing together different divisions of a company into a common dialogue and approach.

"To manage […] regulatory risks and their financial implications, we incorporate a carbon price into our capital and risk decision processes. Carbon pricing is integrated at multiple levels of decision-making, ranging from annual operating budgets developed at the site level, to corporate decision-making over large capital investments."

Teck Resources Limited[18]

Figure 3: How shadow pricing is driving decision-making

The benefits, risks, enablers and barriers of shadow pricing are summarized below.

Benefits

Treats carbon as a risk or cost like any other when making decisions with long-term ramifications

A way to develop a **competitive advantage** and to hedge against future costs of both energy & CO_2

Risks

Placing too low a value on carbon emissions and, therefore, reaping no advantage, for example, by excluding costs that have been taken into account by competitors in a more rigorous analysis

Poor implementation of shadow pricing or lack of consistent application

Enablers

External—**Coherent public policies** on energy pricing, research and development, and foreign trade

Internal—**CEO and board of directors support**

Internal—**Reliable shadow pricing information and trends analysis**

Barriers

External—**Not enough countries with an external price on carbon;** slow or no decision-making at country and worldwide levels on the broadening and harmonizing of external carbon pricing

External—**Insufficient and costly access to renewable energy** along with volatility in fuel prices[19] that together pose a threat to energy security and business continuity

External and internal—**Major investments in research and development** may be required to achieve breakthroughs in energy efficiency

Internal—**Resistance from business units** that are more carbon intensive and potentially at risk of losing their long-term strategic interest

The key to success in shadow pricing is first and foremost **managing change** within the organization. Putting a value on carbon can be a major shift from "business as usual". It is a concept that can be foreign to professionals in engineering, finance and project management who have not had previous exposure to climate change risks and opportunities.

"Change management is our biggest challenge. It will take time for people to understand the carbon pricing approach and to incorporate it into the business operations."

Paul Netter,
Industry Environment Specialist,
Group EHS Division, Saint-Gobain,
Leadership Program interview, July 2015

2.2 Carbon fee as an incentive to reduce emissions

An internal carbon price can be used not only to assess risk and drive decision-making, but also to achieve emissions reduction targets in current operations. Emissions reduction projects are pursued to improve the bottom line by cutting costs and therefore can have a direct financial benefit. Energy efficiency projects requiring longer payback periods, however, may be rejected in favor of other projects with shorter payback periods or those more strategic to core business (e.g. new products, production capacity increase, etc.). Carbon reduction initiatives may also come with additional costs, such as performing technical studies, purchasing renewable certificates, switching to a less carbon intensive but more expensive fuel, etc.

To change the comparative cost basis, companies may opt to implement an internal carbon fee to accelerate or enlarge the scope of emission reduction efforts. This fee can be charged to the business groups responsible for emitting carbon. The fee itself serves as an incentive to reduce or offset emissions within a given business group. Resulting funds can then be attributed to projects that may not otherwise be affordable or adopted, or invested externally in carbon credits.

"The decision to redistribute the internal carbon fee to award the best reduction projects was driven by the intention to generate more ownership in the business units."

Emmanuel Martinez,
Director, Corporate Environment,
Société Générale,
Leadership Program interview, September 2015

The reasons to adopt a carbon fee can vary, including cost cutting, reducing environmental impact, seeking innovation to make a difference[20] or creating ownership for climate mitigation. The benefits of implementing a carbon fee are three-fold: in the practical application, behavioral changes and achieving results.

The following challenges must be addressed:

- Creating a centrally managed system that will collect and redistribute the fee;
- Determining how to integrate external regulatory prices;
- Setting the correct price to balance charges and incentives necessary to achieve the targets;
- Addressing fiscal issues that can arise with internal money transfers.

If the challenges can be managed, applying an internal carbon fee can contribute to increased competiveness. Companies that have taken strategic steps to reduce emissions will be less affected by regulatory pricing than competitors who have not taken steps to manage emission levels.

Carbon fee		
Practical	**Behavioral**	**Results-oriented**
Charging the business unit according to their respective impact and therefore engaging them by impacting their profit & loss statement	Generating fresh, new ideas about reducing energy use and promoting behavioral changes	Encouraging reduction where it is most cost effective and therefore increase competiveness
Generating an internal revenue stream that can finance capital projects or emissions reduction initiatives and carbon offsetting	Demonstrating leadership in managing climate change	Proactively reducing the risk associated with a higher cost of carbon by reducing the emissions

2.3 Carbon fee and shadow price: Complementary approaches

An internal carbon fee[21] differs from a shadow carbon price by the fact that it involves **money transfer** within the organization. Its objective is to proactively incentivize emissions reduction projects for current operations. Identifying potential risks and opportunities to make sound strategic decisions is not necessarily an outcome of the carbon fee mechanism. It therefore has a more direct approach and impact on **operations** compared to a more strategic shadow pricing approach. Correspondingly, a striking difference in carbon prices has been observed, as depicted in figure 4.

The shadow price is aimed at future challenges by incentivizing emissions reductions through major capital projects, whereas carbon fees are more oriented towards driving energy-efficiency improvements to existing facilities or business activities. Figure 5 illustrates the different aspects of an internal carbon price used as a risk/strategy tool (shadow price) or as a project incentive (carbon fee).

Figure 4: Differences in carbon values set as a shadow price versus a fee[22]

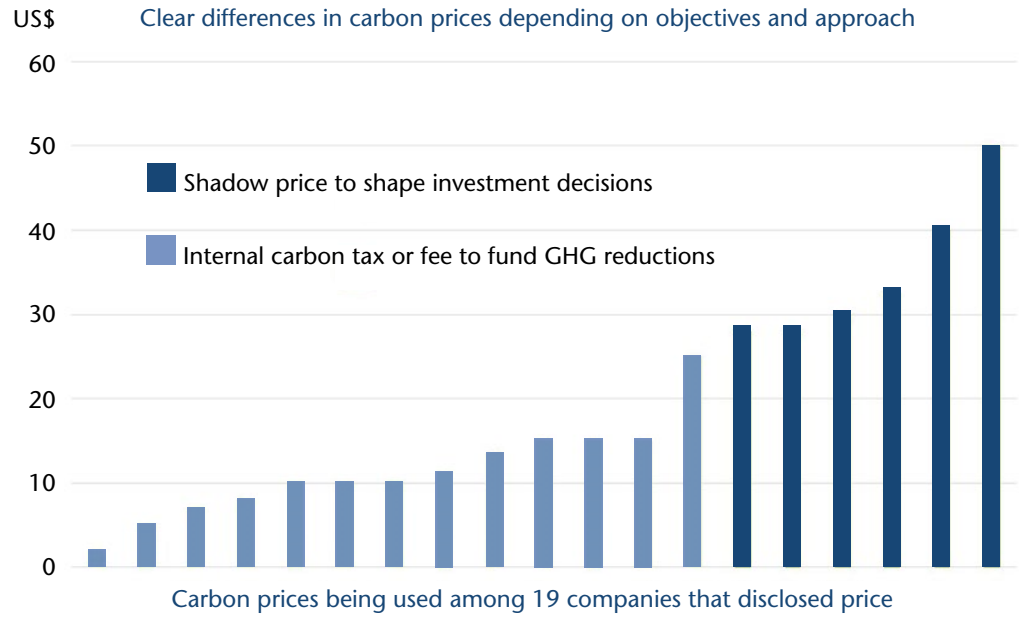
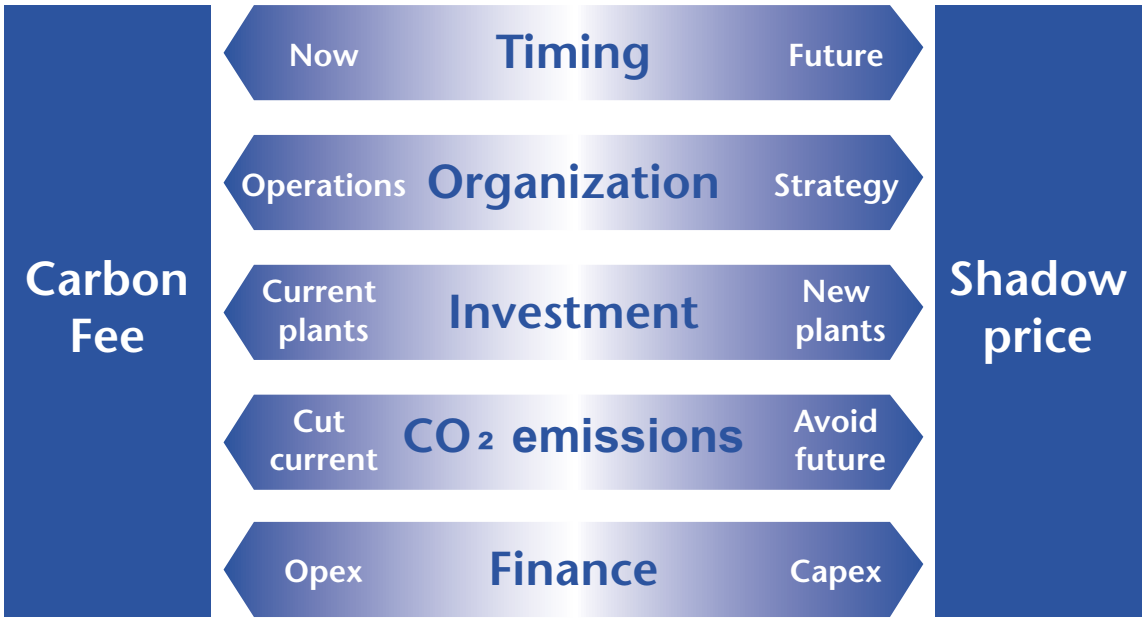


Figure 5: Carbon fee and shadow price in practice



In contrast to a carbon fee, value created through shadow pricing may not materialize for years. Whether or not a company has formulated long-term goals to be achieved through shadow pricing, the motivation in the short term is oriented toward the same outcomes as for a carbon fee system:

- **Promoting awareness** within the company about the future cost of carbon;
- Fostering strong **corporate responsibility** values internally and enhancing corporate image externally;
- Achieving **carbon reductions**, whether to meet voluntary or regulatory thresholds;
- **Reducing the cost** of energy consumption.

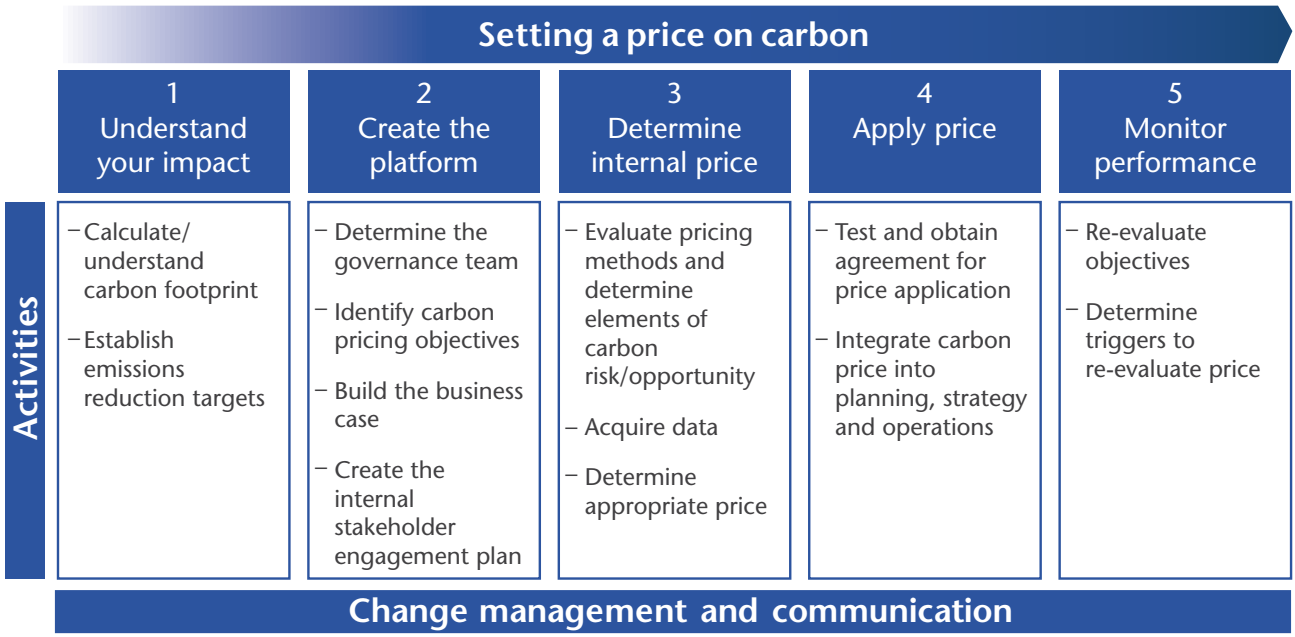
"We want to be part of this movement. We cannot be bystanders. We must act in a way that is consistent with our strategy of sustainable habitat."

Pierre Hébert,
Chief Economist, Corporate Planning,
Saint-Gobain,
Leadership Program interview, July 2015

3. How to implement carbon pricing

Based on interviews with companies and collective experience, below is a simple, five-step approach to setting a price on carbon, as shown in figure 6.

Figure 6: Setting a price on carbon



1
Understand your impact

A recent UN study showed seven paths that leaders can take to create a model for greater impact and value creation. The first path is realism and context: "it was clear that companies taking the most ambitious action on sustainability were also the most realistic about the scale of the challenge".[23] It is fitting that the first step to putting a price on carbon is to understand your organization's impact.

Calculate/understand carbon footprint

Your organization may already be calculating its carbon footprint, but for those just starting to quantify impacts there are credible tools[24] to help.

Establish emissions reduction targets

More organizations are developing robust carbon goals, and internal carbon pricing programs can be the key driver to achieving them. Forty-three percent (43%) of Fortune 500 companies have a GHG target, a renewable energy target, an energy efficiency target, or some combination.[25] Here are some questions to ask when you are creating or updating your goals:

Are we doing enough?

There is an emerging trend for corporations to set science-based goals that are grounded in climate change projections. The CDP lists more than 30 companies from around the world that have set GHG reduction targets within the 2°C context,[26,27] and there are an increasing number of resources available to help set such goals, like the Science Based Targets Initiative.[28]

What is feasible?

When setting goals, it is critical to meet with key stakeholders to understand emissions performance drivers, and ongoing or planned initiatives to reduce emissions. Engaging management on the ground will allow you to set achievable organizational targets and additional specific operational targets that can be owned by the source stream.

What are peers doing?

Finally, it is also important to look at what peers are doing to understand:

- Goal categories (total emissions, emissions by scope, energy efficiency, renewable energy, etc.);
- Goal types (i.e. intensity versus absolute);
- Goal term—period of duration.

2
Create the platform

Implementing an internal price on carbon throughout your organization is no small task. A Harvard Business School study found that 70% of large-scale change programs do not meet their goals.[29] Successful implementation thus requires a carefully designed platform.

Determine the governance team

When creating a governance team that will be responsible for the implementation, consider two aspects: support from executives and support from those most affected. During interviews, many organizations cited executive support as critical to implementing a price on carbon. Additionally, it is important to create a cross-functional team of representatives that extends beyond environmental, health, and safety (EHS) organizations to include the departments or units most affected by an internal carbon price.

Identify carbon pricing objectives

Objectives typically shape carbon pricing programs. For example, if the objective is to reduce supply chain risks, that program may look quite different than one focused on capital investment, carbon abatement options or diversifying product offerings. Common carbon pricing objectives include:

- Driving behavior change, spurring innovation, seizing market opportunities;
- Diverting funds to invest in low-carbon assets; reaching GHG emissions reduction goals;
- Reducing investment risks, enhancing brands, increasing competiveness.

"[Internal] carbon pricing should be just one tool among others for building a climate change strategy. The whole picture needs to be clear before carbon pricing can be put to effective use. Otherwise, it will be very hard for people to understand why it is being applied."

Jorge Soto,
Director of Sustainable Development,
Braskem,
Leadership Program interview, July 2015

Build the business case

The business case for internal carbon pricing depends on your company's carbon risks and its strategy to address climate change. Interviews uncovered a common challenge: convincing stakeholders of the potential value in carbon pricing. One approach to creating a business case is by taking a stakeholder-based viewpoint:

- Identify stakeholders that may be impacted by the carbon price;
- Create an impact map (or list of activities and outcomes that will result from a price on carbon);
- Gather data to simulate the outcomes of an internal price;
- Measure the outcomes.

As financial institutions are increasingly integrating carbon shadow pricing into investment risk analysis, satisfying investor concern can help determine the business case. Oil and gas companies, for example, consistently use shadow pricing to assess capital investments.[30]

Create an internal stakeholder engagement plan

A stakeholder engagement plan should be developed to gather feedback on the business case and management commitment to move forward with implementation.

For organizations that have not yet established corporate strategies for their carbon footprints or to manage climate change impacts, promoting the benefits of internal carbon pricing is likely to be more challenging. Getting CFO buy-in can be a critical step to achieving success, regardless of the internal carbon pricing objectives.

"The fact that the new model was keeping the money inside the company rather than to be used for offsetting was an easy sale to the CFO."

Emmanuel Martinez,
Director of Environment,
Société Générale,
Leadership Program interview, September 2015

An internal carbon fee is likely to require more stakeholder engagement than strategic efforts to screen capital investments as it impacts a broader range of employees, each of whom can potentially play a role.[31]

3
Determine internal price

How do you know you have set the right price? Three factors should be considered:

- **Context**—The carbon price reflects unique market conditions and risks faced by the organization.
- **Data limitations**—The ability to quantify attributes of an internal price is dependent on the availability of internal and external data.
- **Reliance on key assumptions**—Incorporating different market, risk and other elements into a price requires making a number of assumptions about relationships and impacts.

Evaluate pricing methods and determine elements of carbon risk/opportunity for inclusion

Your governance team must agree on which pricing method(s) to include (i.e. carbon fee, shadow price, etc.) and the processes used to calculate, submit, review and verify carbon prices. Research shows that some organizations are using multiple methods. Additionally, organizations may choose to attribute different values for each pricing method based on their defined objectives.

"The average Capex calculated among hundreds of projects in the company is in the range of 500 euros per metric ton of CO_2e saved annually. So if the objective is to cut 100,000 metric tons of CO_2/year with Capex projects, we know that we must anticipate a 50 million euro capital expenditure to address it. Therefore, if we want to fund those projects with a carbon fee, the price is determined by dividing it by the total CO_2 emissions charged internally."

Alain Leiser,
Corporate Energy Manager,
Nestlé,
September 2015

When determining the appropriate carbon price, it is important to include the most relevant elements of carbon risk/opportunity. Making the business case to senior management requires setting a price that is credible. Common elements include:

Price of voluntary carbon instruments	Mitigation price
Regulatory price	Revenue at risk price[33]
Prices used by peers and leaders	In-house projects price[34]
Social cost of carbon[32]	Other credible third party prices

Acquire data

Once your company has determined the areas of carbon risk/opportunity for inclusion, you can start to collect the required data. While primary data (such as Scope 1 and 2 emission levels) from your own operations is beneficial, using secondary research (such as probability of future regulation) and making assumptions are a critical part of gathering data. Determining each carbon price will require various inputs, for example:

Pricing element	Mitigation price of carbon	Regulatory price of carbon	Carbon offset price	Revenue impact of carbon	Social cost of carbon	Price of carbon for in-house projects
Examples of required data:	Quantity of Renewable Energy Credits (RECs) procured Geographic site of REC location Regional grid emissions factors Cost per REC	Selection of regulations for inclusion Probability of future regulation Exposure: revenue, capital location, etc.	Selection of offset prices Assigned weighing of offset prices	Number of stakeholders concerned about emissions (request for proposals, questionnaires, surveys, etc.) Revenue by customer Assumptions of customer tolerance thresholds Revenue loss percentage	Values calculated for use by the US federal government	Capital expenditures required per metric ton of CO2e saved annually Total scope 1 and 2 emissions Annual metric ton of CO2e to be saved

Determine appropriate price

Some organizations can have multiple objectives, particularly those with a majority of their operations in regulated carbon markets or when several carbon risks/opportunities are present. These organizations may consider performing scenario and sensitivity analysis by selecting the appropriate carbon prices to be applied in different situations. An aggregated price can also be determined if relevant.

Models can be easily updated to reflect significant changes (for example, a newly regulated market). Additional scenarios and/or sensitivity analysis can be performed to determine if the price is set high enough to materially affect investment decisions. The final price and associated weighting should be tied back to the organization's original objectives.

4
Apply price

Now that you have determined the appropriate price and pricing method, it is time to implement.

Test and obtain agreement for price application

Initially limiting implementation or conducting a pilot test allows carbon pricing concepts to be tested and revised before scaling the mechanism. Key considerations in determining pilot testing include:

- Support from the business unit leadership on the objective, the business case, pricing mechanism and price;
- Organizational willingness to change;
- Highest impact/risk areas;
- Resource availability;
- Data availability.

Integrate carbon price into planning, strategy and operations

Upon successfully completing a pilot, the lessons learned should be reviewed to create a rollout roadmap for the further integration of carbon pricing into planning, strategy and operations that includes:

- Scope of expansion
- Leadership responsibilities
- Execution plan.

Estimate the resources that should be devoted to training and communication to bring the pilot to scale. Finally, embedding internal carbon prices into existing corporate practices—particularly environmental impact assessment, decision gates for capital project review and approval, financial and risk analysis guidance—will ensure more robust and consistent implementation.

5
Monitor performance

Any significant organizational change must be monitored for effectiveness. Additionally, the price of carbon is dynamic and must be reviewed periodically.

Re-evaluate objectives

The governance team should meet periodically to evaluate the effectiveness of the carbon price, review the initial objectives against outcomes, and adjust or reset the objectives accordingly.

Determine triggers to re-evaluate price

Whether a pilot carbon price has been implemented for one business decision or applied across the organization, prices are contextual and can require a change. An organization may consider implementing various methods to review the price:

- **Periodic review**—for example, the governance team reviews the price annually and performs updated price scenario and sensitivity analysis;
- **Trigger point review**—the governance team pre-defines events that cause a review, such as:
  - Price inputs reach thresholds (REC prices, regulatory prices, etc.);
  - Regulatory or organizational changes (i.e. new regulation enacted in a certain region, organization moves into a new market).

The frequency with which internal carbon prices are assessed and updated should take into consideration the effort and cost of these actions, and weigh those against potential changes driven by cost modifications. Management may consider re-evaluating their carbon price objectives and performing updated scenario planning/price weighting to ensure the carbon price is updated as data, understanding and capabilities improve. Based on interviews with companies in the study, the timelines for reviewing and re-validating internal carbon prices varied from quarterly to every five years. A fluctuating internal carbon price that requires fluency in risk analysis to understand inhibits stakeholder buy-in. Companies with more mature internal carbon pricing programs, spanning more than a decade, have concluded that simplicity is an asset.

A Call to Action

Ask these questions

- **Q What is the impact of your company's energy use?**
- **Q What is the carbon footprint of your company's supply chain?**
- **Q What risks are inherent to your company's energy use and carbon emissions, both directly and indirectly through the supply chain?**
- **Q Does your company have targets for reducing its carbon emissions?**
- **Q Does the corporate strategy address climate change, energy or carbon emissions?**
- **Q Are environment, health and safety routinely factored into corporate decision-making?**

Recognize these drivers

1	**Emitting carbon will carry an increasing cost over time**
2	**Acting sooner rather than later will reduce the investments needed to manage emissions**
3	**Reducing emissions will present opportunities for companies at several levels**

Act on these opportunities

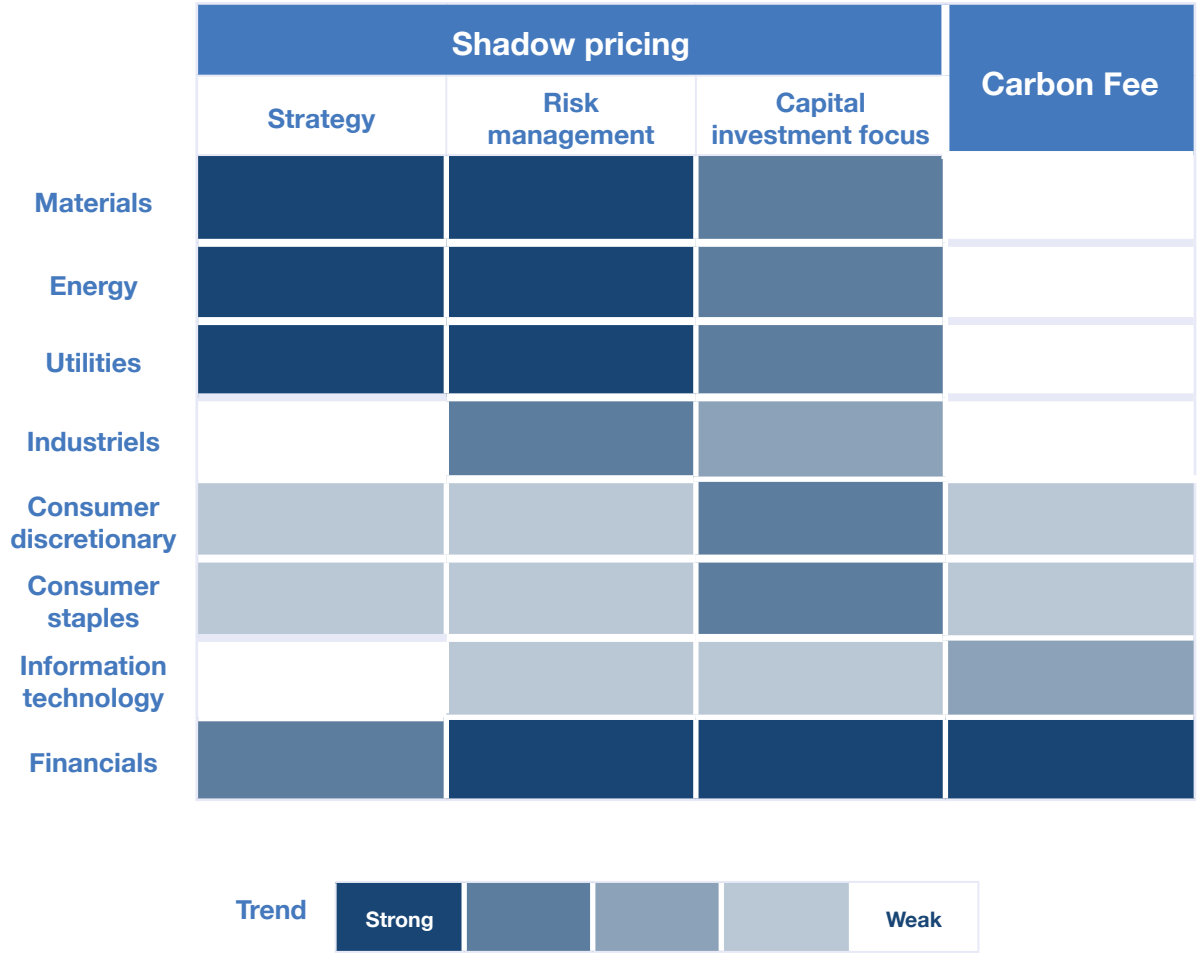
Reduce operational costs through energy efficiency

Create competitive advantage for existing products and services

Spur innovation for new, low-carbon products and services

Optimize upstream and downstream supply chains to adapt to a carbon-constrained world

See the approaches others are taking



Execute astutely

Set organizational objectives with appropriate governance structures

Gather the support of the business units and C-suite executives

Communicate to stakeholders simply and clearly

Establishing an internal carbon price can be a significant departure from “business as usual”, yet increasingly necessary to adapt to the changing global context.

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About the World Business Council for Sustainable Development (WBCSD)

The World Business Council for Sustainable Development (WBCSD), a CEO-led organization of some 200 forward-thinking global companies, is committed to galvanizing the global business community to create a sustainable future for business, society and the environment. Together with its members, the council applies its respected thought leadership and effective advocacy to generate constructive solutions and take shared action. Leveraging its strong relationships with stakeholders as the leading advocate for business, the council helps drive debate and policy change in favor of sustainable development solutions.

The WBCSD provides a forum for its member companies - who represent all business sectors, all continents and a combined revenue of more than $8.5 trillion, 19 million employees - to share best practices on sustainable development issues and to develop innovative tools that change the status quo. The council also benefits from a network of 70 national and regional business councils and partner organizations, a majority of which are based in developing countries.

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This report is the outcome of one of the WBCSD Leadership Program 2015 group projects as part of their learning journey. It does not represent a policy, a position or a recommendation of the WBCSD. The statements in this paper are solely the opinions of its authors and do not reflect their respective companies' views in any way.

Endnotes

1. These interviews were conducted under the WBCSD Leadership Program 2015 from July to October 2015 by the authors of this report and are herein referred to as "the study". The companies interviewed are listed in the acknowledgements.
2. Kennedy, K. et al., 2015.
3. Kossoy, A. et al., 2015.
4. Ibid.
5. The World Bank, 2014.
6. WBCSD Leadership Program, 2015.
7. Sustainable Prosperity, 2013.
8. Carbon Disclosure Project, 2015.
9. Ibid.
10. WBCSD Leadership Program, 2015.
11. Carbon Disclosure Project, 2015.
12. Carbon Disclosure Project North America, 2013.
13. Carbon Disclosure Project, 2014a.
14. Carbon Disclosure Project, 2014b.
15. Carbon offsetting involves the acquisition of carbon credits by a company, followed by the voluntary cancellation of these credits to compensate for carbon emissions generated by the company's direct or indirect activities.
16. "Scope 1" refers to greenhouse gas (GHG) emissions that are emitted directly from sources owned or controlled by a given company. "Scope 2" refers to GHG emissions emitted when generating the energy purchased by the company (electricity, steam, etc.). See World Resources Institute and World Business Council for Sustainable Development, 2004.
17. Carbon Disclosure Project, no date.
18. Teck Resources Limited, 2014.
19. For example, in North America the cost of natural gas over the last 10 years has fluctuated, upwards and downwards, by a factor of three. This price volatility represents an equivalent carbon price of more than US$ 100 per metric ton. See International Energy Agency, 2014.
20. DiCaprio, T.J., 2013.
21. Cloft, K. et al., 2015.
22. Caring for Climate Business Forum, 2015.
23. United Nations Global Compact, 2013.
24. The GHG Protocol Corporate Accounting and Reporting Standard (see World Resources Institute and World Business Council for Sustainable Development, 2004) and environmentally extended input-output (EEIO) analysis are two tools available to help organizations understand the footprint of their operations and the footprint of their value chain, respectively.
25. Ceres, 2015.
26. To prevent irreversible effects, global temperatures must not rise more than 2°C above pre-industrial levels. See Intergovernmental Panel on Climate Change, 2014.
27. GreenBiz, 2015.
28. Science Based Targets, 2015.
29. Kottner, J.P., 1996.
30. Sustainable Prosperity, 2013.
31. Cloft, K. et al., 2015.
32. An estimate of the economic damages associated with a small increase in carbon dioxide (CO_2) emissions.
33. An estimate of the revenue lost from customers due to a company's lack of reducing carbon emissions.
34. Expressed as the cost of carbon that must be applied in order to fund all in-house emissions reduction projects.

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