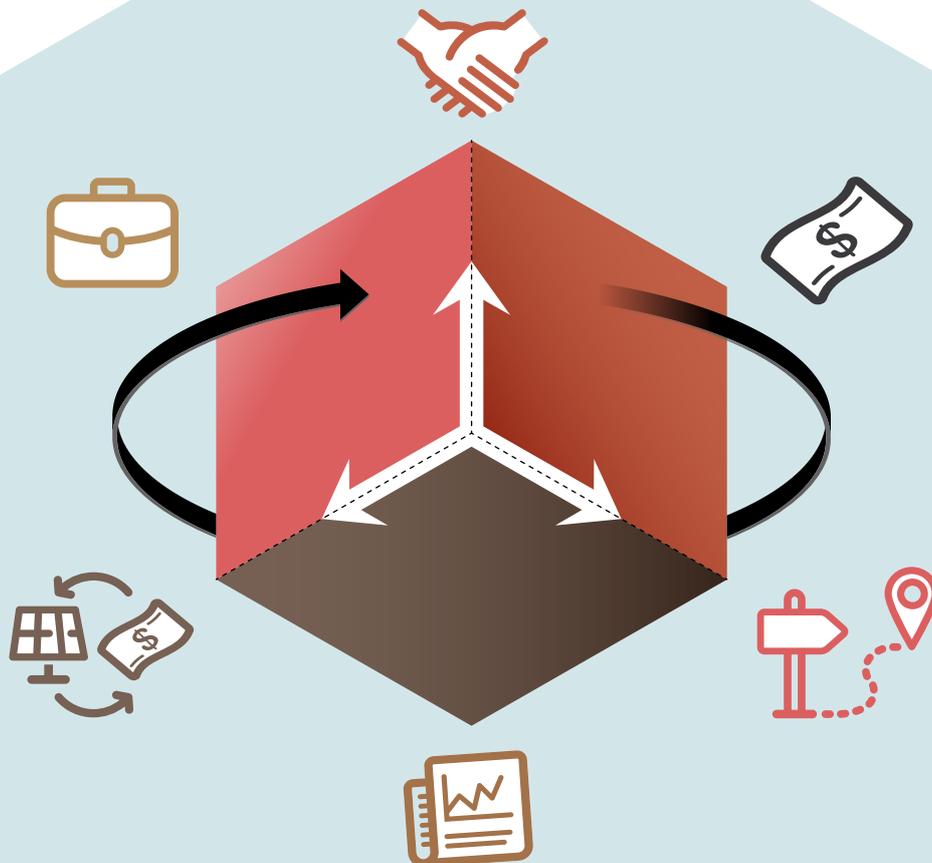


HOW-TO GUIDE TO CORPORATE INTERNAL CARBON PRICING

Four Dimensions to Best
Practice Approaches



December 2017

This report was prepared jointly under the Carbon Pricing Unlocked Partnership by Long Lam, Noémie Klein, Maurice Quant, and Maarten Neelis of Ecofys – A Navigant Company, and Grace Eddy and Daniela Saltzman of The Generation Foundation, in collaboration with Hannah Cushing and Nicolette Bartlett of CDP (formerly Carbon Disclosure Project).

We wish to thank everyone who offered their cooperation and insights during the development of this publication: Marie-Pierre Bousquet (Danone), Julien Colas (Entreprises pour l'Environnement), Anusha Jagannathan (Navigant), Joe Kruger (Resources for the Future), Richard van Lijssel (Darling Ingredients), Aditi Maheshwari (IFC), Carole de Montgolfier (Carrefour), Paulette van Ommen (DSM), Casey Pickett (Yale University), Kevin Rabinovitch (Mars), Paula Ruiz (Forética), Isabel Saldarriaga Arango (World Bank), Rasmus Valanko (WBCSD), Kathelijn van der Ven (Ecofys – A Navigant Company), Michel Washer (Solvay), Katherine West (Navigant), and Lindee Wong (Ecofys – A Navigant Company). In addition, we would like to thank everyone who provided feedback on the Consultation Draft of this guide that was published in September 2017.

We would also like to acknowledge the wealth of knowledge accumulated in other published resources and guides to internal carbon pricing, which have proven to be valuable input for this guide. These sources are listed in the Annex.

The views expressed in this report are those of the authors. We accept any errors in this document as our own.

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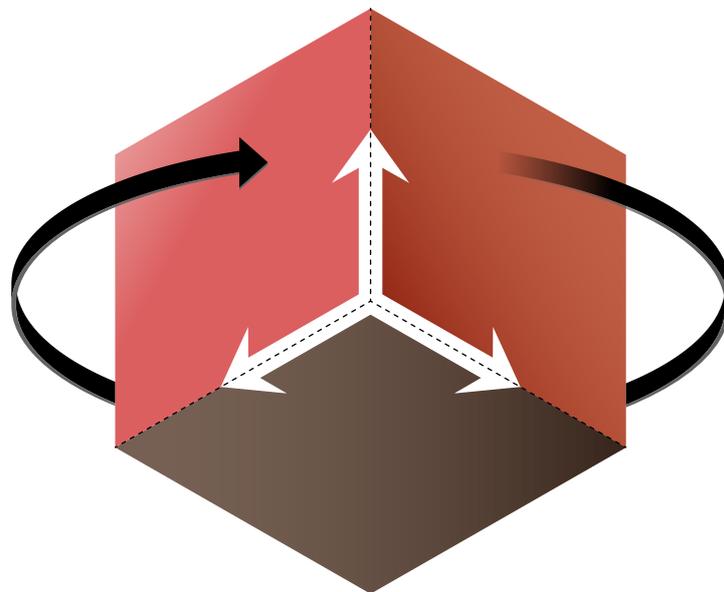
Attribution

Please cite the work as follows: Ecofys, The Generation Foundation and CDP, *How-to guide to corporate internal carbon pricing – Four dimensions to best practice approaches*, December 2017. Prepared under the Carbon Pricing Unlocked partnership between the Generation Foundation and Ecofys in collaboration with CDP.

Cover and interior design:
Meike Naumann Visuelle Kommunikation

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ABOUT US

About Ecofys

Ecofys, a Navigant company, is a leading international energy and climate consultancy focused on sustainable energy for everyone. Founded in 1984, the company is a trusted advisor to governments, corporations, NGOs, and energy providers worldwide. The team delivers powerful results in the energy and climate transition sectors. Working across the entire energy value chain, Ecofys develops innovative solutions and strategies to support its clients in enabling the energy transition and working through the challenges of climate change.

Carbon pricing forms part of Ecofys' core expertise: since its conception, we have advised the European Commission and other stakeholders on the design of the European Union Emissions Trading System, and we continue to provide analyses on the potential impacts of proposed design changes. Capturing the topic in its global scope, Ecofys has been assisting The World Bank in producing their annual flagship report *State and Trends of Carbon Pricing* over the past five years. We also work with the industry on compliance and internal carbon pricing strategies, and thereby provide a fully rounded perspective on carbon pricing that spans from policies and technological innovation, to impacts at the consumer level.



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About Generation Foundation

The Generation Foundation (the 'Foundation') was part of the original vision of Generation Investment Management LLP ('Generation') since the firm was founded in 2004. The Foundation was established alongside Generation in order to strengthen the case for Sustainable Capitalism. Our strategy in pursuit of this vision is to mobilise asset owners, asset managers, companies and other key participants in financial markets in support of the business case for Sustainable Capitalism. In our effort to accelerate the transition to a more sustainable form of capitalism, we primarily use a partnership model to collaborate with individuals, organisations and institutions across sectors and geographies and provide catalytic capital when appropriate. In addition, the Foundation publishes in-house research, gives select grants related to the field of Sustainable Capitalism, engages with our local communities and supports a gift matching programme for the employees of Generation. All of the activities of the Foundation, a not-for-profit entity, are funded by a distribution of Generation's annual profitability.



For more information, please contact
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About CDP

CDP is an international non-profit that drives companies and governments to reduce their greenhouse gas emissions, safeguard water resources and protect forests. Voted number one climate research provider by investors and working with institutional investors with assets of US\$100 trillion, we leverage investor and buyer power to motivate companies to disclose and manage their environmental impacts. Nearly 6,000 companies with some 60% of global market capitalization disclosed environmental data through CDP in 2016. This is in addition to the over 500 cities and 100 states and regions who disclosed, making CDP's platform one of the richest sources of information globally on how companies and governments are driving environmental change. CDP, formerly Carbon Disclosure Project, is a founding member of the We Mean Business Coalition. Please follow @CDP to find out more.



For more information, please contact
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About Carbon Pricing Unlocked

Today, over 40 national jurisdictions and about 25 cities, states, and regions are putting a price on carbon. Despite this global uptake, harmonisation of carbon pricing policies across different regions remains difficult. Furthermore, carbon prices are often too low to incentivise the investment necessary to decarbonise emissions-intensive value chains. At the end consumer level, the impact of carbon pricing is often insufficient to drive changes towards more low carbon consumption.

How can carbon pricing facilitate sustainable global economic growth? In order to find vital answers to this question, the Generation Foundation has teamed up with Ecofys in the Carbon Pricing Unlocked (CPU) research partnership. The research extends over three years from 2016 to 2019 and tackles carbon pricing from a new angle, exploring the role of carbon pricing along value chains up to the end consumers. The partnership aims to deliver quantified insights into the role carbon pricing can play in a 1.5°C future.

Ecofys is one of the pioneers in carbon pricing, and has worked on the topic for nearly two decades. The Generation Foundation is the advocacy initiative of Generation Investment Management LLP, which was co-founded by Al Gore and David Blood in 2004, and works on the decoupling of prosperity from resource-intensive growth. Combining in-depth expertise with a high-level stakeholder network, Ecofys and The Generation Foundation investigate how carbon pricing might be better integrated at an economic policy level in order to unlock its full mitigation potential.

For this second output under the CPU partnership, Ecofys and the Generation Foundation worked together with CDP (formerly the Carbon Disclosure Project).

Our partnership welcomes collaboration with interested parties. To receive news and updates about our project, please sign up at cpu@ecofys.com.

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EXECUTIVE SUMMARY: FOUR DIMENSIONS TO BEST PRACTICE INTERNAL CARBON PRICING

The Untapped Potential of Internal Carbon Pricing (ICP)

ICP is a multifaceted tool that can support companies in assessing climate-related risks and opportunities in the transition to a low-carbon economy. As countries move to implement measures that contribute to achieving the ambitions of the Paris Agreement, the business impact of this low-carbon transition will become more profound. ICP allows companies to identify and act on the risks and opportunities that accompany this transition, as also recommended by the Financial Stability Board Task Force on Climate-related Financial Disclosures (FSB-TCFD).¹ ICP gives risks and opportunities a monetary value, consolidating them into a uniform metric such as carbon costs or benefits.² This enables financial decision makers such as Chief Financial Officers to make the low-carbon transition an integral part of rational, economic decision making.

However, ICP is still not reaching enough companies and is not having enough impact as a tool to manage risks, seize opportunities, and drive down GHG emissions. The full potential of ICP is often not well understood or ICP is insufficiently embedded in the daily decision-making process. In addition, the implementation of the FSB-TCFD recommendations is still in its infancy.

Unlocking the Benefits of ICP through Best Practices

This guide aims to support a wider use of best practice approaches to ICP globally. It gives concrete, practical guidance for establishing appropriate ICP approaches that can help companies navigate through

the low-carbon transition. It complements existing ICP guides by providing a new way to frame ICP, combined with the latest practical insights and experiences gathered through interviews with leading companies in the food industry value chain. Since the greenhouse gas (GHG) emissions in the food industry are relatively dispersed compared to other value chains, this diversity captures many of the challenges that other companies face with ICP; the experience of the food industry is therefore relevant to all sectors.

Best practice approaches to ICP can be described as approaches that contribute to a journey of bringing a company's business strategy in line with the transition to a low-carbon economy. By using best practice approaches to ICP, companies can embed the trajectory of the low-carbon transition into their daily decision making, determine the most effective strategy in changing market environments, and stay ahead of the curve. The characteristics of a company that shape a best practice ICP approach include:

- » **Goals of the business strategy on climate change.** Being explicit on these goals helps inform the objectives that a company should target with ICP and the most appropriate ICP approach. The climate-related goals can be divided into:
 - › Demonstrating climate leadership by contributing a fair share of effort to achieving the climate change objectives set by the Paris Agreement
 - › Following the FSB-TCFD recommendations by building resilience against climate-related risks
 - › Capitalising on the low-carbon transition by seizing opportunities in a low-carbon future
- » **Company GHG emissions profile.** Understanding how GHG emissions are spread throughout the value chain and how each department can influence these emissions allows a company to determine where it should focus its efforts to achieve the greatest impact.

¹ FSB-TCFD, *Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures*, June 2017.
² For insight in how different stakeholders can use ICP, see the user matrix in CDP and WeMeanBusiness, *Carbon Pricing Corridors – The Market View*, May 2017.

- » **Company position and influence in the value chain.** Identifying a company's position in the value chain will determine the type of business decisions it is able to influence using ICP. A company can then decide whether ICP is the most appropriate tool to tackle GHG emissions in each part of the value chain.
- » **Company culture.** Understanding a company's culture, particularly its willingness to accept change, is essential in identifying the best way for ICP to be embedded in daily business decisions. It will help determine how closely the implementation should be monitored and how often it needs to be evaluated to ensure it is still achieving its objectives.

Depending on the company, ICP might not always be the best tool to bring business strategies in line with the low-carbon transition. ICP might have little impact in companies that have already decided on other specific actions they will take to meet low-carbon targets. ICP would also have no impact on GHG emissions that are not affected by financial incentives. However, as technology keeps improving and market dynamics continue evolving, ICP provides companies with a uniform monetary metric to align different low-carbon transition incentives and choose the most cost-effective measures to reduce their carbon footprint.

To support companies in developing or revising their ICP approach, this guide discusses four dimensions to design and four steps to establish a best practice ICP approach. The guide provides an overview of the information and process changes needed to establish an ICP approach in a best practice manner, suggests methods of collecting that information, and proposes strategies to implement the appropriate changes to business processes. The guide assumes that a company already has a reasonable understanding of its carbon footprint and overall climate-related objectives.

Four Dimensions to Design a Best Practice ICP

A four-dimensional framework (4D framework) was developed to support the implementation of best practice approaches to ICP. The 4D framework presented in Figure 1 provides companies with a structure to align their existing ICP approach to best practices or establish a best practice ICP approach from the outset, as described in Table 1. A best practice ICP approach must have clear objectives and find the optimal combination between the four dimensions of ICP. This forms the 4D shape of the ICP approach.

The Height and Width dimensions—carbon price levels and GHG emissions coverage—constitute the carbon value that is to be used in business decisions. Companies commonly focus on these two parameters when designing an ICP approach. The design considerations are centred

FIGURE 1 Four dimensions of ICP

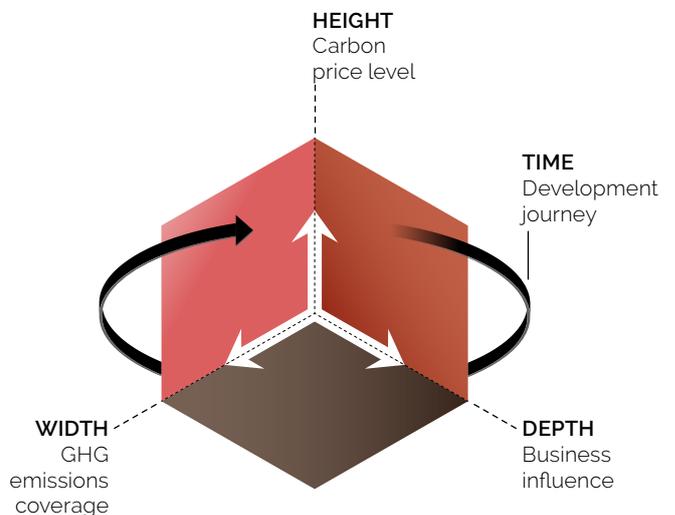


TABLE 1 Four dimensions and how to shape best practice ICP approaches

DIMENSION	ICP PARAMETER	BEST PRACTICE ICP APPROACH
Height	Price level per unit of GHG emitted (e.g. US\$/tCO ₂) that the company uses in business decisions	Rise to a carbon price capable of changing decisions in line with the ICP objectives
Width	The GHG emissions covered throughout the value chain by the ICP approach	Grow to cover all GHG emissions hotspots in the entire value chain that can be influenced
Depth	The level of influence the ICP approach has on the business decisions of a company and its value chain partners	Become increasingly influential to have a material impact on business decisions
Time	The development of the first three dimensions over time	Be evaluated regularly to bring the company's business strategy in line with a low-carbon economy

around how high the carbon price level should be, and how widely applied the ICP should be in the company across its GHG emissions. Combined, these two dimensions translate climate-related transition risks and opportunities into carbon costs or benefits.

The Depth dimension—influence on business decisions—subsequently shapes the impact the ICP approach can have on the company’s business decisions. The ICP approach needs to be embedded in a clear mechanism of change, which details how the ICP approach is expected to have an impact on decision making. This mechanism encompasses the ICP approach’s design (i.e., the level of importance of ICP in business decisions) and implementation (i.e., how well ICP is embedded and enforced in the decision-making process).

The Time dimension—the development journey of the ICP approach—characterises the impact the ICP approach could be over time in shaping the business. The Time dimension applies to the other three dimensions and describes how each of these could develop over time and be adjusted to ensure that the ICP approach continues to meet its objectives. For example, an ICP approach with a low price, covering all GHG emissions throughout the value chain, and embedded into the daily decisions may have a low impact at the outset. However, if it contributes to a positive company culture towards addressing climate change, it will allow the company to strengthen the ICP approach over time and thereby increase its impact.

Design choices for each dimension affect each other.

For example, an ICP approach designed to cover the entire carbon footprint of a company risks increasing the complexity and administrative burden of the approach, lowering its acceptability and thus influence in the company. This could result in lengthy discussions to convince decision makers to apply ICP. Trying to perfect the ICP design along all dimensions from the start can therefore slow down implementation. Instead, most companies interviewed for this guide indicated that it is better to keep the ICP approach simple at the start, and embed it in the daily decision-making process through learning-by-doing. A best practice approach would be to start with a manageable approach, and build on experience to expand the ICP approach over time to help align the business with the transition to a low-carbon economy.

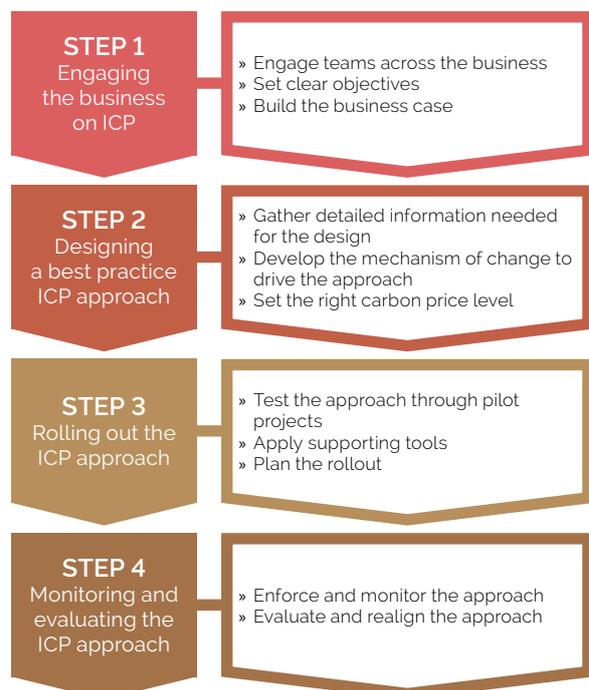
The optimal combination of the four dimensions will vary for each company. Companies differ in their climate-related goals, GHG emissions profile, position

and influence in the value chain, and culture. Thus, the progress of each dimension towards best practice depends on how aligned a company’s business strategy is with the transition to a low-carbon economy. Various business circumstances and the availability of resources also affect the optimal 4D shape of an ICP approach. This means that 4D shapes of ICP approaches with identical carbon prices, covering the same scope of emissions, and having the same level of influence in business decisions can differ between companies, for example, if they operate in different sectors or markets.

Four Steps to Establish a Best Practice ICP

This how-to guide builds on the traditional process steps of change management, presented through the lens of the 4D framework. The four steps and the sub-steps discussed in the guide are summarised in Figure 2. Each sub-step is illustrated by a practical example from a leader in the food industry value chain, but the approaches are also applicable to other sectors. This guide includes experiences and insights from companies in different parts of the food industry value chain, including Carrefour, Danone, Darling Ingredients, DSM, Mars, and Solvay.

FIGURE 2 Steps and sub-steps to establish a best practice ICP approach



Towards Best Practice ICP Approaches: Mapping the Four Dimensions to the Four Steps

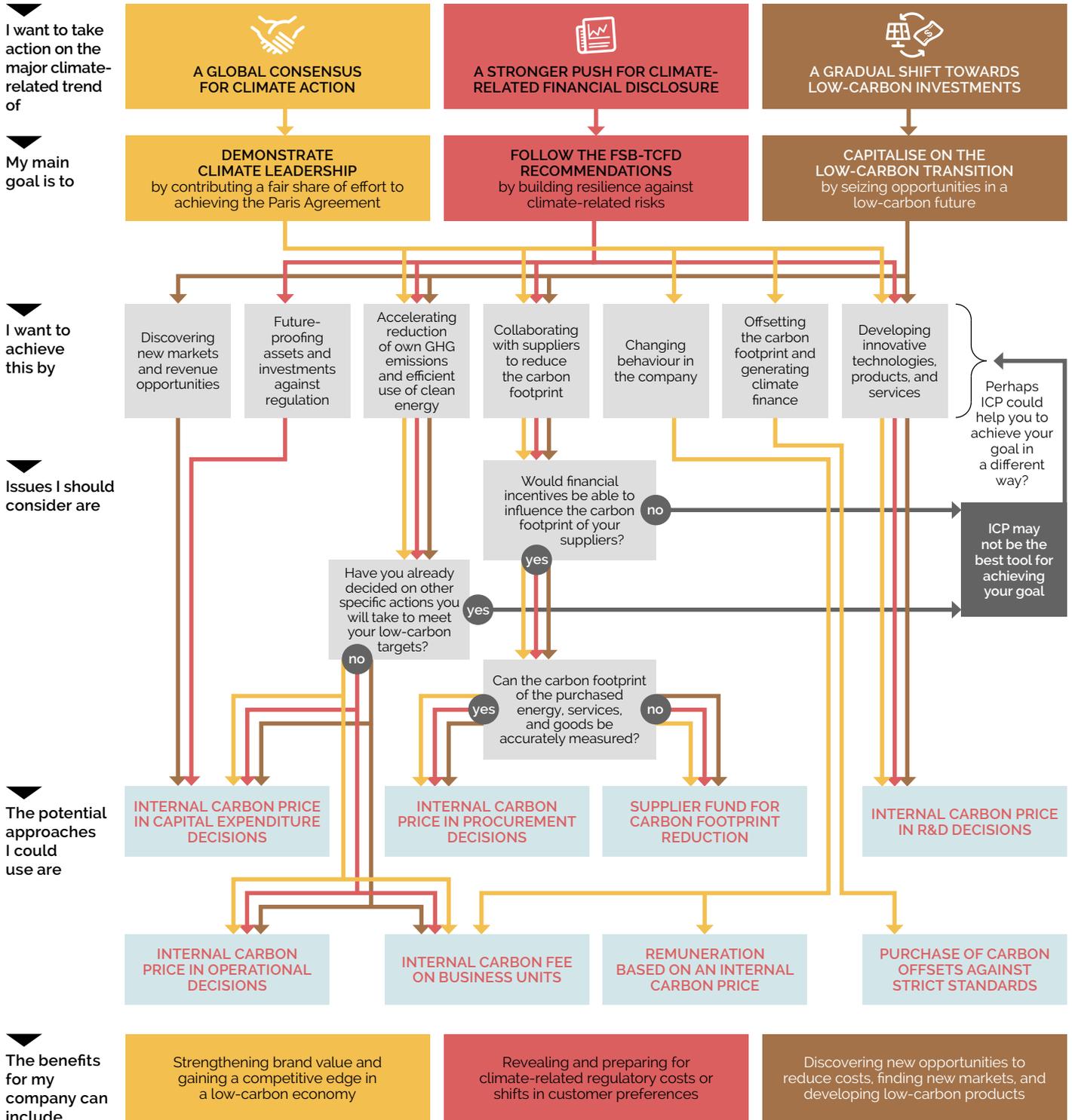
By applying the 4D framework throughout the four steps, the guide identifies concrete actions for establishing a best practice ICP approach. These actions are summarised in Figure 3.

Establishing a best practice ICP approach is a dynamic and iterative process. The toolbox presented in Figure 4 helps structure the thinking on the design of a best practice ICP approach. By going through the flow diagram, companies can identify the ICP approaches that could be relevant for them. It summarizes the different possibilities that ICP companies can consider when establishing and expanding their ICP approach using the 4D framework. Multiple approaches might be suitable.

FIGURE 3 Summary of how the four dimensions can steer the process of establishing an ICP approach towards best practices

	HEIGHT Carbon price level	WIDTH GHG emissions coverage	DEPTH Business influence	TIME Development journey
STEP 1 Engaging the business on ICP	Set clear objectives that the carbon price levels should achieve	Involve relevant departments and value chain partners that ICP could affect	Create buy-in early on with the board and relevant departments	Design a plan to align the business strategy with the transition to a low-carbon economy via ICP
STEP 2 Designing a best practice ICP approach	Determine price level(s) needed to achieve the objectives	Determine the GHG emissions that the ICP approach will cover	Determine the mechanism of change and influence the approach will have in decisions	Map out how the other three dimensions could develop over time
STEP 3 Rolling out the ICP approach	Make the rationale behind the carbon price level(s) and how to use them clear	Test the ICP approach with different departments the approach will apply to	Determine how the approach will be rolled out internally to increase its uptake and acceptability	Find the right timing and make an implementation plan to increase and maintain uptake over time
STEP 4 Monitoring and evaluating the ICP approach	Evaluate whether the carbon price level is still able to achieve its objectives	Determine whether the coverage of GHG emissions should be changed to ensure the approach continues to achieve its objectives	Assess how to improve the ICP approach to become increasingly influential to materially change business decisions	Monitor how the ICP approach impacts company decisions and development over time

FIGURE 4 The ICP toolbox to determine potential ICP approaches a company can use



PREFACE

The global Paris Agreement has propelled climate change to the top of the agenda for policymakers, companies, consumers, and investors. In December 2015, world leaders agreed to limit global warming to well below 2°C. This is what scientists deem necessary to prevent catastrophic climate change. Each country put forward plans detailing how they intend to contribute to the ambitions of the Paris Agreement.

Over 40 national and 25 subnational jurisdictions, representing about a quarter of global GHG emissions, are putting a price on carbon. Three quarter of the GHG emissions covered by mandatory carbon prices are priced below US\$10/tCO₂e.

World Bank, Ecofys and Vivid Economics, *State and Trends of Carbon Pricing 2017*, November 2017.

At the national and subnational level there is strong momentum for the implementation of carbon pricing policies to contribute to achieving the Paris Agreement goals. Ideally, such mandatory carbon prices would cover greenhouse gas (GHG) emissions across the entire value chain and would be sufficiently high to enable ambitious emission reductions by influencing a company's decision-making process. However, most current mandatory carbon prices are too low and the value chain coverage is insufficient to incentivise companies to align their business with the low-carbon transition.

Almost 1,400 companies—including more than 100 Fortune Global 500 companies with collective annual revenues of about US\$7 trillion—disclosed in 2017 that they are currently using ICP or are planning to do so within the next two years.

CDP, *Putting a price on carbon – Integrating climate risk into business planning*, October 2017.

Internal carbon pricing (ICP) is a powerful tool to bridge the gap in terms of both price and scope. It also helps assess climate-related risks and opportunities resulting from the transition to a low-carbon economy.

ICP links a monetary value to a carbon footprint, allowing companies to assess the financial impact of the low-carbon transition. It allows companies to act on revealed risks and opportunities by consolidating them into a uniform metric that is incorporated into business decisions. This is in line with the Financial Stability Board Task Force on Climate-related Financial Disclosures' (FSB-TCFD's) recommendations to companies to disclose their climate-related risks and opportunities, as well as the approach taken to managing these risks.³

However, ICP is still not reaching enough companies and is not having enough impact as a tool to manage risks, seize opportunities, and drive down GHG emissions. Traditionally, many companies use ICP to determine their current and future carbon costs. Some companies are starting to use it to meet the FSB-TCFD recommendations. However, many companies do not sufficiently understand ICP and do not know which approach is best suited to help their business prepare for the low-carbon transition. Some want to use ICP, but face resistance or practical issues when implementing it, while others only implement it in a limited part of the business, or do not sufficiently enforce it.

This guide aims to support a wider use of best practice approaches to ICP globally using practical examples from the food industry value chain, which contain approaches that are also applicable to other sectors. The guide gives concrete, practical guidance for establishing appropriate ICP approaches that can help companies navigate the low-carbon transition. Ultimately, a best practice ICP approach should allow a company to mitigate its climate-related risks and reveal opportunities to grow its revenue while contributing its fair share of effort to the goals of the Paris Agreement. This guide is intended for companies that already have a reasonable understanding of its carbon footprint and overall climate-related objectives,⁴ and builds on existing ICP guides (see Annex).

³ FSB-TCFD, *Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures*, June 2017.

⁴ For companies that are still struggling to understand their GHG emissions profile, various resources are available to help them get to grips with their climate impacts such as GHG Protocol (<http://www.ghgprotocol.org/>), ISO/TS 14067 (<https://www.iso.org/standard/59521.html>), or PAS 2050 (<http://www.bsigroup.com/PAS2050>).

HOW TO USE THIS GUIDE

This guide explains how a company can design and implement a best practice internal carbon pricing (ICP) approach.⁵ Such an approach is defined as one that contributes to a journey of bringing a company's business strategy in line with the transition to a low-carbon economy. Targeting those looking to implement an ICP approach within their company or to evaluate their current ICP approach, this guide provides practical insights in the form of four dimensions to design a best practice ICP approach and a four-step process to establish this approach.

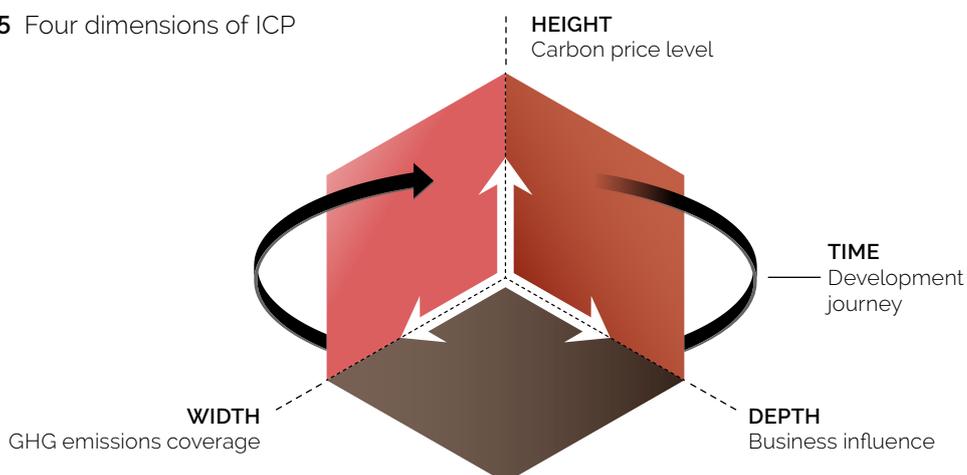
Four Dimensions to Design a Best Practice ICP

The guide is centred around a new, four-dimensional framework (4D framework) for ICP approaches consisting of: Height (carbon price level), Width (GHG emissions coverage), Depth (business influence) and Time (development journey), as presented in Figure 5. To change business decisions and enable a company to embark and stay on this journey, a best practice ICP approach should have clear business objectives and optimise the combination of the four dimensions of ICP:

- » **Height:** Price level per unit of GHG emitted that the company uses in business decisions, rising to a price capable of changing decisions in line with the ICP objectives.
- » **Width:** The GHG emissions covered by the ICP approach throughout the value chain, growing to cover all GHG emissions hotspots in the entire value chain that can be influenced by ICP.
- » **Depth:** The level of influence the ICP approach has on the decisions of a company and its value chain partners, becoming increasingly influential to have a material impact on decisions.
- » **Time:** The development of the first three dimensions over time, including regular evaluation of the approach to bring the company's business strategy in line with the transition to a low-carbon economy.

The Height and Width of an ICP approach form the carbon value that must be considered in business decisions. The Depth shapes the impact that the ICP approach could have on a company's business decisions. The Time dimension characterises the impact of the ICP approach in shaping decisions over time. This 4D framework provides companies with a structure to design a best practice ICP approach or to revise an existing approach.

FIGURE 5 Four dimensions of ICP



⁵ While this guide does not focus on governments or the financial sector, decision makers from these sectors can also use lessons from this guide to establish their ICP approach.

Four-Step Structure to Establish a Best Practice ICP

This how-to guide divides the traditional process steps of change management into four steps (Figure 6) to illustrate how these four dimensions can be embedded in an ICP approach.

FIGURE 6 Structure of the how-to guide



Each of the guide's four steps can be read as a standalone text and are divided into sub-steps. Each step begins with an overview of the sub-steps and explains how the sub-steps contribute to establishing a best practice approach. The sub-steps consist of the following sections:

- » **Why:** rationale for the sub-step
- » **How:** practical actions to implement the sub-step
- » **Outcomes in the 4D framework:** results of these actions
- » **Practical example:** how companies have applied this step in a best practice way, primarily focusing on companies in the food industry value chain (see Box 1)

In Step 1, buy-in should be secured from senior management for ICP, relevant departments affected by ICP should be involved, and the ICP governance team should set the objectives for ICP. The ICP approach should then be worked out in more detail in Step 2, where the approach is designed. Step 3 is rolling out the ICP approach, which should be followed in Step 4 by a process to monitor and evaluate the approach.

This guide does not aim to recommend ICP for every company. It is recognised that ICP might not be the right tool for every company or help every company to bring business strategy in line with the transition to a low-carbon economy. This could be the case if the company already has decided on other specific actions to take to meet its low-carbon targets. ICP would also have no impact on GHG emissions that are not affected by financial incentives. However, in a carbon-constrained world where technology keeps improving and market dynamics continue evolving, ICP provides companies with a uniform monetary metric to align different low-carbon transition incentives and choose the most cost-effective measures to reduce their carbon footprint.

BOX 1 Using practical examples from the food industry value chain

This guide uses examples from the food industry value chain to present best practice approaches for ICP. However, the lessons gleaned from research into this sector are also relevant to other industries. The food industry value chain is one of the most complex in terms of realising GHG emission reductions through mandatory carbon pricing. Emissions are relatively dispersed compared to other value chains.⁶ Therefore, ICP has great potential to achieve GHG emission reductions in this value chain. Furthermore, the diversity of the food industry value chain makes it an excellent case to illustrate the variety of challenges and opportunities for ICP in all sectors. Evidence-based information in this research comes from structured, first-hand company interviews combined with publicly available information, such as public company responses to the annual CDP enquiry on ICP. Eight companies from different parts of the food industry value chain have contributed to this research through interviews, including the six listed below.

CARREFOUR	Carrefour is a global leader and the reference in food retail. It is a multi-local, multi-format and omni-channel retail group.
DARLING INGREDIENTS	Darling Ingredients is a global leader in creating sustainable food, feed, and fuel solutions from organic by-products.
MARS	Mars is a global business with six distinct and different businesses: Petcare, Chocolate, Wrigley, Food, Drinks and Symbioscience.
DANONE	Danone is a world-leading food company built on four business lines: Fresh Dairy Products, Waters, Early Life Nutrition, and Medical Nutrition.
ROYAL DSM	Royal DSM is a global, science-based company active in health, nutrition, and materials.
SOLVAY	Solvay is a multi-specialty chemical company, committed to developing chemistry that addresses key societal challenges.

STEP 1: ENGAGING THE BUSINESS ON ICP

STEP 1 Engaging the business on ICP

- » Engage teams across the business
- » Set clear objectives
- » Build the business case

The first step is to gather support and convince others in the company of the business case for setting up an ICP approach. This will require showing the board and departments how ICP can help the company in the transition towards a low-carbon economy. Because every company is different, the business case for ICP will vary as well. These differences will also influence the design and implementation of the ICP approach.

It is important to map out the company's characteristics through engagement with different teams across the business and value chain partners. Relevant company characteristics that shape a best practice ICP approach are:

- » **Goals of the business strategy on climate change.** These will inform the objectives targeted by the ICP approach. These, in turn, will help determine the carbon price level capable of driving the company to reduce its carbon footprint.
- » **Company GHG emissions profile.** It is important for the company to understand how GHG emissions are spread throughout the value chain and how each department within the company can influence these emissions. A comprehensive understanding allows the company to focus its efforts to achieve the greatest impact, and helps determine how it can grow its ICP approach to cover all GHG emissions hotspots in the entire value chain.
- » **Company position and influence in the value chain.** The company's position in the value chain will determine the type of business decisions it is able to

influence using ICP. This will allow the company to decide whether ICP is the most appropriate tool to tackle GHG emissions in each part of the value chain, as well as how the ICP approach can be increasingly influential in business decisions over time.

- » **Company culture.** Understanding the company's culture, particularly the willingness to accept change, is essential to identifying the best way for ICP to be embedded in daily business decisions. Culture is reflected by the organisational structure; the internal processes on budgeting, investments, and research and development (R&D); and the long-term vision. Characterising the culture will help determine how closely the implementation should be monitored and how often the ICP approach needs to be evaluated to ensure it is still achieving its objectives.

Engaging the business with ICP from the beginning helps to reveal any concerns or practical issues early on. These concerns or issues can then be taken into account when setting objectives and developing the business case for the ICP approach. Engaging the business with ICP will also facilitate the smooth execution of Steps 2 to 4 (the design, rollout, and monitoring and evaluation of the ICP approach) in the process. Any practical concerns on ICP should be considered from the outset in the design in Step 2 or during the rollout in Step 3, making it more likely that the board approves the approach and the relevant teams to apply it in the business.

The sub-steps below provide guidance on engagement with the business on ICP, and in how it can support the development of an ICP best practice approach.

ENGAGE TEAMS ACROSS THE BUSINESS

Why?

ICP is generally not considered business-critical by company stakeholders. Some board members or departments can be resistant if it is seen as disruptive or as a burden. **Early engagement of various teams across the business can help:**

- » Build understanding of ICP and its ability in incentivising low-carbon decisions
- » Gather insights necessary to design an ICP approach that fits with the decision-making process and is aligned with the company's strategy
- » Create ownership of the ICP approach from senior management and across departments

How?

Set up a governance team made up of people with various competencies from key departments. The ICP governance team will be responsible for the design, rollout, and review of the ICP approach. It should include members from the sustainability team (where applicable), the finance department, and technical departments that could be most affected by ICP. The governance team should seek to understand the challenges with ICP across these departments and how acceptability can be improved.

Seek support from the board at an early stage of developing the business case. In particular, the governance team should aim to get support from the Chief Financial Officer (CFO) and other finance and strategy directors within the company. This can help improve the likelihood of board approval and successful implementation of the ICP approach.

Connect to value chain partners to understand the potential value chain implications of introducing ICP and discuss ways of collaborating to reduce the carbon footprint using ICP.

Learn from peers who are already using ICP⁷ and are willing to share their experiences through direct contact, knowledge platforms,⁸ or webinars.⁹ This can help the governance team understand how other companies have dealt with building acceptance for ICP in their company.

Outcomes in the 4D Framework:

Engaging teams across the business will help:

HEIGHT

Test the board's comfort with different carbon price levels, and determine whether they have appetite for a complex, tailored model, or a simpler, single-price approach. Having this information is key in defining if the ICP approach should have a price differentiated by type of business decision, time horizon, and/or region.

WIDTH

Identify the types of decisions and scope of GHG emissions that are applicable to ICP, and how emissions profile of the whole value chain might develop in the future. This can improve awareness of how ICP can help drive down these emissions.

DEPTH

Understand the decision-making processes within the company, gauge the acceptability of ICP in different departments, and identify any potential issues and how these can be overcome, e.g. use workshops to teach employees how to use ICP.

TIME

Develop a realistic plan for the design and implementation of the ICP approach, such that it fits with the company's strategy, culture and infrastructure. Consider how these might change over time, and create a plan for regular evaluation of the approach's effectiveness.

Practical Example

At Carrefour, the Corporate Social Responsibility (CSR) team and the General Secretary presented initial ideas for ICP directly to the Chief Executive Officer (CEO) to secure early support from top management. The CSR team involved two other departments—investments and asset management—from the outset to work out the approach. This governance committee ensured that top management remained up-to-

date on the progress. They also reached out to other teams across 10 different countries to find an ICP approach suitable for all countries. The country teams remained involved in all stages of the ICP development, which took about a year, and eventually became ambassadors for ICP within Carrefour. Early support from top management and country teams was crucial to the smooth rollout of ICP and its inclusion in the regular investment decision-making process.

7 Refer to the CDP database for companies that have implemented ICP within their business. <https://www.cdp.net/en/research>

8 CDP will launch a carbon pricing knowledge-sharing webpage on its website in Winter 2018.

9 Refer to <https://www.carbonpricingleadership.org/new-page/> for the webinar series from the Carbon Pricing Leadership Coalition (CPLC), Yale University, and the World Economic Forum (WEF).

SET CLEAR OBJECTIVES

Why?

Having clear objectives for its ICP approach supports the company in making design choices that will allow the ICP approach to become more effective. Objectives can help determine how the carbon price level should be set, the type of business decisions it should apply to, and the parts of the business that could be affected.

How?

Determine the overarching goals that ICP should help achieve. Companies that implement ICP do so for a variety of reasons. In most cases, their goals fall into one of the three following categories (see Figure 7):

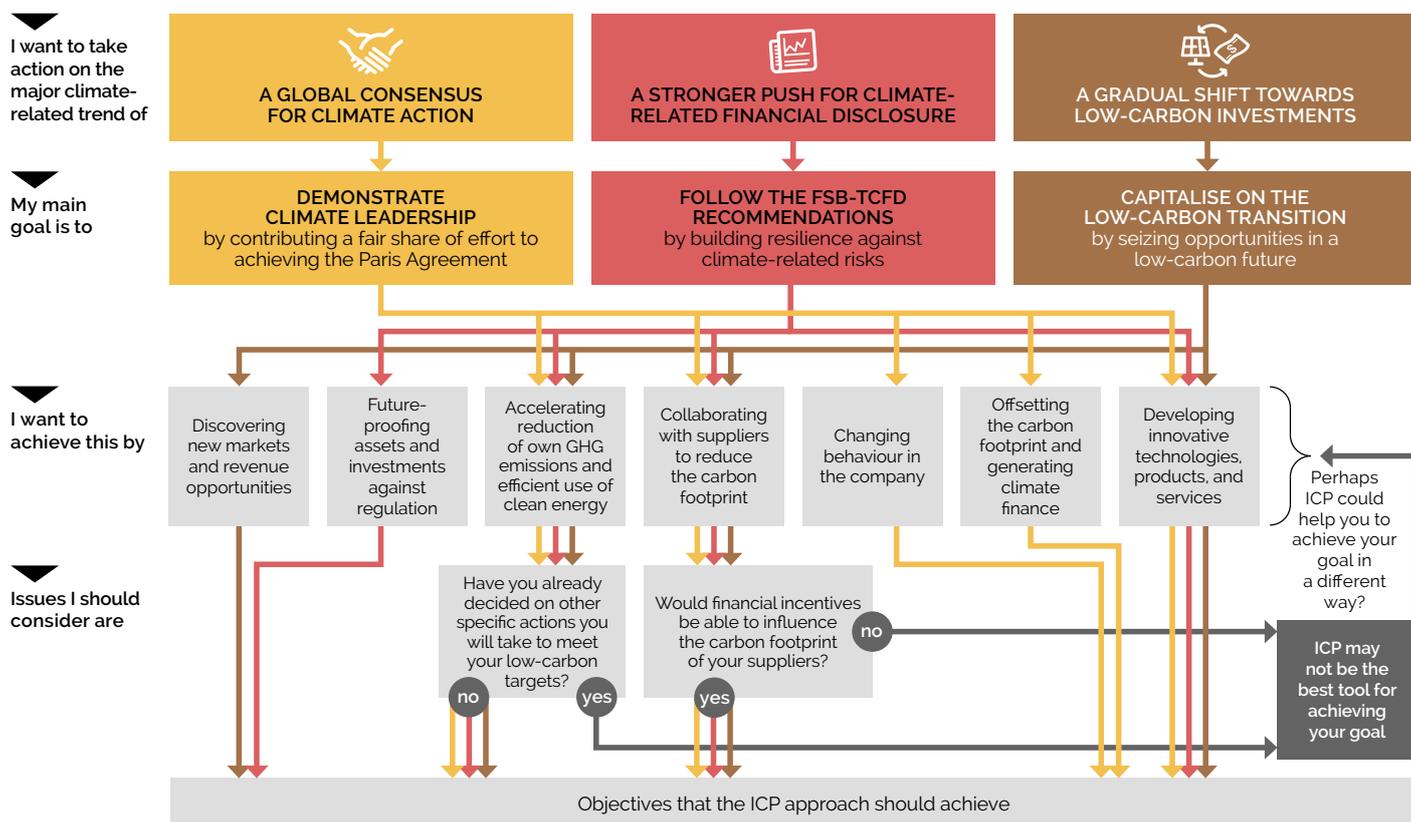
- » Demonstrate climate leadership by contributing their fair share of effort to achieving the climate change objectives set by the Paris Agreement
- » Follow the FSB-TCFD recommendations¹⁰ by building resilience against climate-related risks
- » Capitalise on the low-carbon transition by seizing the opportunities in a low-carbon future

Break down these overarching goals into operational objectives.

A company can achieve the goals in different ways. These can be translated into the objectives for the ICP approach, which could include:

1. **Discovering new markets and revenue opportunities** that could arise from the transition to a low-carbon economy, such as an improved competitive position for low-carbon products, increased demand for products that enable GHG emission reductions, or selling emissions units in an emissions trading system (ETS).
2. **Future-proofing assets and investments against regulation** in different decarbonisation scenarios, which should include a scenario assuming the successful implementation of the Paris Agreement, to meet its fiduciary duty and shareholder demands.¹¹
3. **Accelerating the reduction of the company's GHG emissions and efficient use of clean energy** by improving the business case for energy efficiency, renewable energy and emission reduction projects.

FIGURE 7 Determining the ICP objectives based on the company's climate-related goals



10 FSB-TCFD, *Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures*, June 2017.
 11 PRI, UNEP FI and The Generation Foundation, *Fiduciary Duty in the 21st century*, Country Roadmaps, 2017.

4. **Collaborating with suppliers to reduce the carbon footprint** by financially incentivising or supporting measures to reduce GHG emissions from suppliers or purchasing goods that can make the company's operations more efficient.
5. **Changing behaviour in the company** to raise awareness of climate change and influence decision-makers to embed the climate change perspective in their everyday thinking.
6. **Offsetting the carbon footprint and generating climate finance** to meet a GHG reduction or carbon neutrality target and contribute to achieving the ambitions of the Paris Agreement.
7. **Developing innovative technologies, products, and services** that allow the company to thrive in a low-carbon future by improving the business case for R&D of new, low-carbon products.

Consider if ICP is the right tool to help the company meet these objectives.

Other company policies that affect the carbon footprint could already be in place, and for some companies there may be more effective ways to achieve their objectives. The governance team should map out these different methods and compare the effectiveness of ICP to these methods in terms of: GHG emissions impact, administrative burden, alignment with the overall company strategy, and resource burden to setup the approach. This can be performed for each individual objective or across all relevant objectives.

Outcomes in the 4D Framework:

Setting clear objectives for the ICP approach (Figure 7) and understanding what influences them will help:

HEIGHT

Determine the carbon price level and the required level of complexity. For example, with *Future-proofing assets and investments against regulation*, multiple carbon prices might be needed to reflect the expected mandatory carbon price of the different regions that the company operates in. With *Developing innovative technologies, products, and services*, to stay ahead of the market, the company may use a higher carbon price that external regulation could impose in the long-term.

WIDTH

Sketch out the scope of emissions that ICP should cover, which ideally should be tied to the GHG emissions hotspots of a company's value chain. For example, with *Accelerating the reduction of own GHG emissions and efficient use of clean energy*, ICP should focus on a company's direct emissions and energy use. With *Collaborating with suppliers to reduce the carbon footprint*, ICP should cover the upstream emissions.

DEPTH

Identify the most-affected departments and involve them in the ICP design process to increase its acceptability. For example, with *Collaborating with suppliers to reduce the carbon footprint*, discussions are needed with the procurement and operational departments as well as suppliers. With *Developing innovative technologies, products, and services*, the strategy and R&D departments should be consulted.

TIME

Develop a plan to grow the ICP approach such that it continues to achieve its objectives. The objectives should inform an evaluation plan and performance indicators.

Practical Example

Since the run-up to the Paris climate conference in 2015, Mars has been actively investigating ICP as one of the ways to drive GHG emission reductions and meet its emission targets. The sustainability team listed the different objectives that ICP could achieve and found that for Mars, ICP was generally never the best approach for specific objectives such as driving energy efficiency and setting aside funds for investment, but rather it was the second or third best. The only exception was the objective of preparing for potential mandatory carbon pricing regulations, where ICP was ranked as the best

approach. However, the main advantage of ICP is its ability to simultaneously drive multiple objectives. For example, changing the hurdle rate of energy efficiency investments does not necessarily motivate the procurement of renewable energy, while ICP would be capable of incentivising both. At this time, Mars found that an ICP would not have substantially contributed to its climate performance as it already had various policies in place or planned to manage its emissions in different parts of the value chain as part of its Sustainable in a Generation Plan. Mars will continue to assess how and when ICP could contribute to its efforts.

BUILD THE BUSINESS CASE

Why?

Building a strong business case for ICP is crucial to secure buy-in from the board and teams across the company. The business case for ICP shows the benefits and opportunities that ICP can bring to the company. Adequate framing will strengthen the business case, supported with evidence of how ICP could be beneficial for the business. Building a business case that resonates with relevant decision makers and departments is an iterative process.

How?

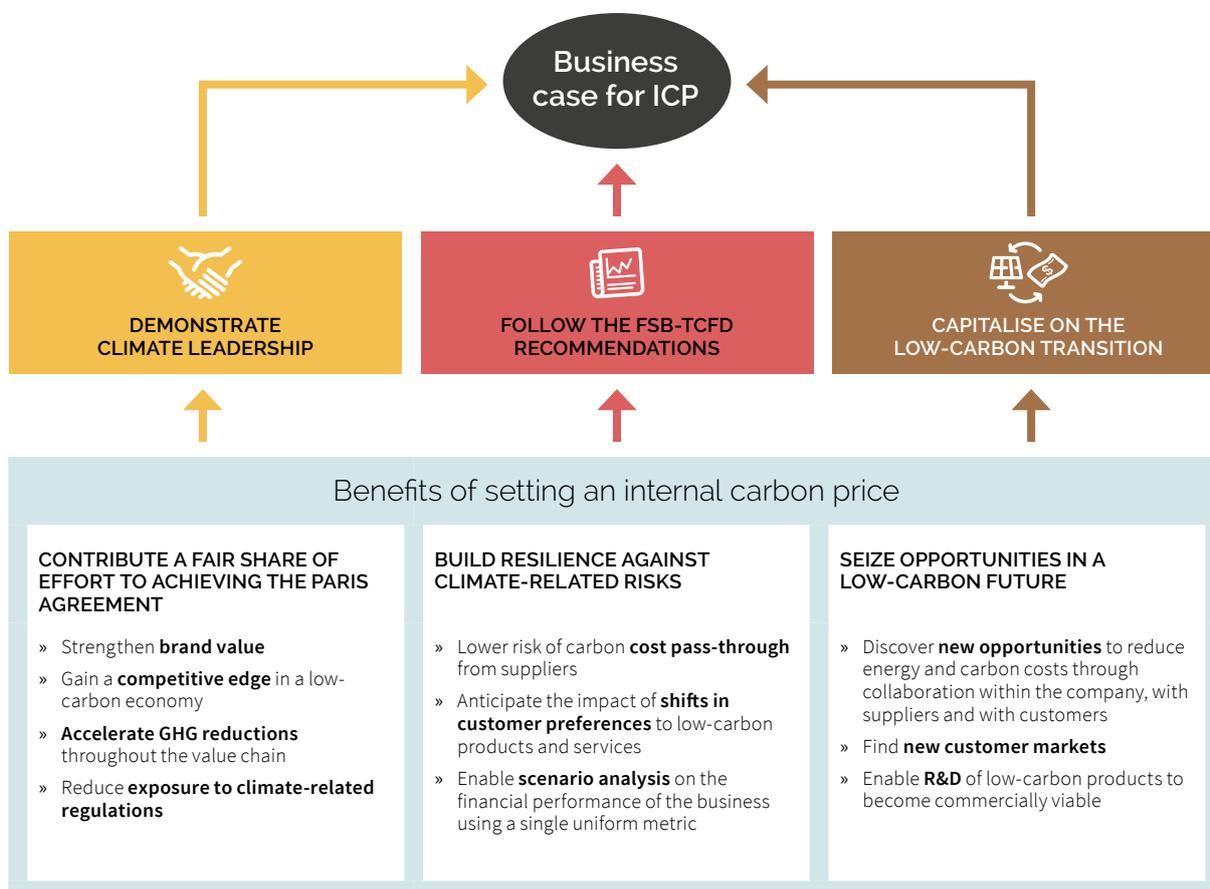
Identify the benefits of ICP for its set objectives.

Figure 8 gives an example of some of the cases that can be made for ICP as a method of achieving business objectives.

Build up the evidence base around the benefits of ICP tailored to its objectives. This could include testing the influence of a carbon price on past decisions and evaluating how it could have affected the bottom line. Compiling other companies' achievements that have been enabled through ICP, particularly from companies in the same sector, also helps strengthen the evidence base. Such information can be obtained from knowledge platforms¹² and webinars¹³.

Iterate with teams across the business to refine the business case. The business case may need to be developed before reaching out to some departments. The input from these departments can subsequently be used to refine the business case.

FIGURE 8 Benefits of using an ICP approach



¹² CDP will launch a carbon pricing knowledge-sharing webpage on its website in Winter 2018.

¹³ Refer to <https://www.carbonpricingleadership.org/new-page/> for the webinar series from the CPLC, Yale University, and the WEF.

Create a balanced narrative around ICP and communicate this clearly. The business case and potential impacts of the ICP approach should be laid out in an accessible narrative. Anecdotal support gathered through engaging the business on ICP—from board members and teams across the company—will further support the business case. The business case should also acknowledge the challenges ICP might represent and consider how these can be addressed.

Outcomes in the 4D Framework:

Building the business case for ICP will help:

HEIGHT

Create understanding for the price level that the governance team will choose for the ICP approach design in the next step. A stronger business case will increase the likelihood that the board and relevant departments will understand the need for the chosen price level.

WIDTH

Determine the scope of GHG emissions and type of business decisions the ICP approach should cover to yield the largest benefits to the company. The business case should be tailored to these emissions.

DEPTH

Strengthen the support of the board and teams across the business to increase the uptake of ICP in the decision-making process. With a compelling business case, ICP will not be seen as just an additional financial and administrative burden, but as a tool that can positively influence the company from various angles.

TIME

Identify the design choices for the first three dimensions that are justifiable from the start. This helps distinguish the elements of the business case that need further evidence before allowing the ICP approach to grow and maximise its impact, and to continue to meet its objectives.

Practical Example

At DSM, building the evidence base for the business case for ICP began several years ago. The company showed its employees the reality of the effects of climate change through conversations, lectures and meetings, which led to employees who were committed to finding solutions to reduce GHG emissions. This, among other efforts, led to the company's business controllers coming together with the sustainability team to look for ways to include environmental externalities with financials, and testing the price levels that would have led to changes in previous investment decisions. In the run-up to the Paris Climate Change Conference in 2015, the sustainability team started looking at different initiatives

and commitments to future-proof their company and enable it to thrive in a low-carbon future; of these initiatives, ICP was prioritised. From the outset, the CFO was enthusiastic about having a tool to take sustainability considerations into account in decision-making, and understood that integrating it into financials could be powerful. From exposure to regular internal and external communication by DSM about the importance of carbon pricing, a growing number of employees at DSM recognise the benefits that ICP can bring. These factors helped fast-track the implementation of ICP to less than a year. The test cases from the finance team formed the basis for the €50/tCO₂e carbon price, which is used by DSM for investment decisions.

STEP 2: DESIGNING A BEST PRACTICE ICP APPROACH

STEP 2 Designing a best practice ICP approach

- » Gather detailed information needed for the design
- » Develop the mechanism of change to drive the approach
- » Set the right carbon price level

In this second step, the ICP governance team can use the 4D framework to structure the detailed design of the ICP approach in a best practice way.

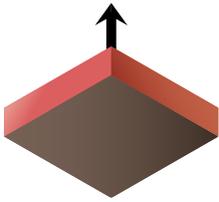
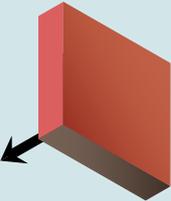
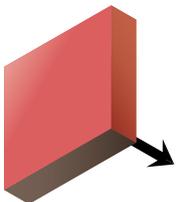
The four dimensions help the ICP governance team make explicit decisions on design parameters that determine the impact ICP should have on business decisions. These are decisions that drive the business towards contributing its fair share of effort to the global decarbonisation challenge, lowering climate-related risks and seizing opportunities in the low-carbon transition.

Together, the Height, Width and Depth dimensions of ICP design determine the impact that the ICP approach is expected to have on day-to-day business decisions, affecting the current and future carbon footprint of a company's value chain. The carbon value—the climate-related cost or benefit—is calculated by multiplying the internal carbon price level with the GHG emissions associated with a business decision, i.e., the Height and Width dimensions. This monetisation allows these emissions to be considered in a company's rational financial decision-making. In practice, this can be done via two distinct mechanisms. With a shadow price mechanism, an ICP can be used in, for example, the investment calculations, but no actual financial flows are generated. A shadow price is most commonly used in capital expenditure (CAPEX)

decisions. With an internal carbon fee mechanism, the ICP approach does result in actual financial flows by internally imposing a fee on GHG emissions. Companies generally apply this to operational decisions. The revenues from the fee can be used to establish a low-carbon fund or redistributed in the company. The impact of the ICP approach depends on the mechanism chosen, the type of decision it applies to and the level of influence ICP has compared to other decision factors, i.e., the Depth dimension.

The Time dimension—the development journey—characterises the impact the ICP approach could have over time in shaping the business. The design choices for each dimension affect each other, and trying to perfect the design along all dimensions from the start could slow down the implementation. Instead, most companies interviewed for this guide indicated that it is better to keep the ICP approach simple at the start, and embed it in the daily decision-making process through learning-by-doing. A best practice approach should find the optimal combination along the four dimensions. This forms the 4D shape of the ICP approach. Table 2 illustrates how an ICP approach can evolve over time. A best practice approach should start with a manageable approach, and build on experience to expand ICP over time to help align the business with the transition to a low-carbon economy.

TABLE 2 Illustrative examples of ICP shapes and how the Height, Width and Depth dimensions can develop over time

DIFFERENT ICP SHAPES	ILLUSTRATIVE EXAMPLE OF HOW THE ICP APPROACH CAN DEVELOP OVER TIME
<p>Height: Low price</p> <p>Width: Large coverage</p> <p>Depth: Strong influence</p> 	<p>A company could start with a low price to minimise the impact on its competitive position or enable departments to familiarize themselves with ICP. The low financial impact on each department may lead to higher acceptability within the company—an important pre-requisite for success. As ICP becomes more accepted in the company, the price could gradually increase to enhance its impact on business decisions.</p>
<p>Height: High price</p> <p>Width: Small coverage</p> <p>Depth: Strong influence</p> 	<p>A company could initially apply a high price to only a small part of the business, for instance, investment decisions in a particular country or business area. Possible reasons to do so could include limiting the initial impact on the business while getting used to ICP, lack of data available for the other GHG emissions, or limited expectations of climate regulation to be implemented in some jurisdictions in which the company operates. When the above circumstances change, the company could decide to expand the coverage of ICP to have a larger impact on the company's business strategy.</p>
<p>Height: High price</p> <p>Width: Large coverage</p> <p>Depth: Weak influence</p> 	<p>A company could decide to test how a high price would affect its whole value chain, either as part of the scenario analysis as recommended by the FSB-TCFD or a voluntary initiative in the company. The results could be used to inform the company's overall strategy, without these calculations affecting specific decisions. As low-carbon scenarios become more likely or the company becomes more familiar with ICP, it can increase the influence of ICP by making it a mandatory factor in business decisions.</p>

ICP approaches come in different shapes and will be unique for each company. Each company has different characteristics and circumstances. The assessment of an ICP approach along each dimension should therefore be considered relative to the level needed to bring the company's business strategy in line with the transition to a low-carbon economy. This means that the 4D shapes of ICP approaches with identical carbon prices, covering the same scope of emissions, and having the same level of influence in business decisions can differ between companies, for example, if they operate in different sectors or markets. Furthermore, a given company can have multiple ICP approaches with different 4D shapes, each designed to achieve a specific climate-related objective. Each approach can be implemented at a different pace within the organisation, with the combination of approaches determining its impact over time.

The design of an effective ICP approach will require detailed information on the company's characteristics. After engaging the business on ICP in Step 1, the governance team should have insight on the initial concerns and issues related to ICP, understand what would work from the start and how the ICP can be expanded in the future. This will form the basis for gathering additional information needed to develop the mechanism of change, for instance, the role of the ICP approach in influencing decisions, and the carbon price level(s) to choose, as described further in this step.

The development of an ICP approach is a dynamic and iterative process. When rolling out the approach in Step 3 or evaluating the approach in Step 4, new issues may arise that require adjusting the design along the four dimensions.

The sub-steps below detail different options to design a best practice ICP approach.

GATHER DETAILED INFORMATION NEEDED FOR THE DESIGN

Why?

Developing an ICP approach with real impact and a clear mechanism of change is only possible if the ICP governance team (see Step 1) starts the detailed ICP design with comprehensive information on:

- » The GHG emissions profile of the value chain
- » The drivers and actors that together are responsible for the GHG emissions in the value chain
- » The type of business decisions that influence this GHG profile and the departments and staff members making and influencing these decisions
- » Existing initiatives and approaches that influence value chain GHG emissions

How?

Building on data and information already gathered in Step 1, determine the detailed GHG emissions in the value chain. In many companies, this information is already gathered using reporting protocols.¹⁴ These typically distinguish between emissions directly under the company's own control (Scope 1), the company's energy purchases (Scope 2), and further emissions up- and downstream in the value chain (Scope 3). Gathering this information will reveal how the GHG emissions are divided over these scopes and reveal which sources are responsible for a large share of emissions in the value chain, i.e., the GHG emissions hotspots. It will also help identify where further data gathering on emissions is needed. This will deliver insights to logically focus the ICP approach.

Develop a detailed understanding of the drivers and actors responsible for these emissions. Only a part of the GHG emissions in the value chain come from a company's operations (Scope 1 emissions). The remainder of the value chain GHG emissions are often emitted by a large number of value chain partners. Gathering information on these partners will help shape an ICP approach to one that can actually influence decisions. Relevant information includes the sectors that the value chain partners are active in, the key drivers that determine their emissions, their competitive position, and the type of relationship the

company has with the value chain partners. Further engagement with these partners could be needed to understand the value chain GHG emissions better.

Understand how business decisions can influence the value chain GHG emissions profile. This includes developing a detailed understanding of which departments and staff members are taking and influencing these decisions. ICP approaches can influence decisions in CAPEX, mergers and acquisitions (M&A), operations, procurement, R&D, sales, and remuneration. Building on the work in Step 1, the ICP governance team needs to make a detailed overview of the main decision types that influence the different sources of GHG emissions in the company and the decision-making process. This includes understand the decision approval procedure, the actors involved, the frequency these decisions are made, and the tools used to make these decisions and record them.

Combine the above insights into rough calculations on the carbon value and relate this to other key financial indicators. The governance team can combine information on emissions, actors, and decisions to come to a first-order estimate of the impact of ICP. By using different carbon prices, a range of carbon values associated with each decision can be calculated. By relating these carbon values to relevant financial indicators, the financial impact of ICP for each decision can be determined under different carbon price scenarios. Examples of such back-of-the-envelope calculations which can be made at this stage include:

- » The carbon value of a company's upstream Scope 3 emissions relative to the total value of the procurement decision
- » The carbon value of a company's full carbon footprint relative to the overall operational costs, profit margins, and turnover of the company
- » The carbon value of a company's downstream Scope 3 emissions or the avoided emissions¹⁵ of products, relative to the product price and the price of competing products

¹⁴ For more information, see for example GHG Protocol (<http://www.ghgprotocol.org/>), ISO/TS 14067 (<https://www.iso.org/standard/59521.html>), or PAS 2050 (<http://www.bsigroup.com/PAS2050>).

¹⁵ Ecofys, *Emission Reductions Beyond a Company's Own Operation Facilities and Supply Chains*, 2013, Ecofys, <http://www.ecofys.com/en/project/accounting-and-reporting-avoided-emissions-along-the-value-chain/>.

These indicators provide important insights to support the further design of the mechanism of change in the next sub-step. This mechanism of change describes the way in which the ICP approach is expected to have an impact on day-to-day business decisions.

Determine emissions sources already covered by other initiatives and approaches such as existing external regulations or internal approaches and strategies to influence value chain GHG emissions. Examples include a mandatory phase-out of certain polluting technologies, an existing mandatory carbon tax or ETS that would make an ICP approach redundant, or an existing 100% renewable electricity strategy that will be implemented using other approaches. This could result in certain emissions being excluded from the scope of an ICP approach or, alternatively, the existing approach could be replaced or enhanced by the chosen ICP approach. After going through this process, the ICP governance team will be positioned to make an informed choice regarding the scope of the ICP approach, both in terms of its Width (which emissions to cover) and Depth (which decisions to influence).

Outcomes in the 4D Framework:

Gathering detailed information on value chain GHG emissions, the actors responsible for these emissions, and the company decision framework will:

HEIGHT

Provide detailed insights on the financial impact of different carbon price levels on different parts of the value chain, and therefore the likelihood that ICP will influence the decisions that have an impact on emissions.

WIDTH

Help develop an understanding of the origin (by scope and sector) of GHG emissions in the value chain, and the actors and drivers that can influence these emissions both now and in the future.

DEPTH

Provide detailed understanding of the influence that different departments have on various parts of emissions from the value chain.

TIME

Support the development of a realistic timeline for introducing ICP, by highlighting possible data gaps or the lack of an appropriate internal governance structure. The company can then make a plan to address these issues and how the ICP approach could develop over time when these issues are resolved.

Practical example

To decide which GHG emissions to cover in its ICP approach, a large supermarket chain began by examining its carbon footprint to better understand the sources of its GHG emissions. The analysis showed that about 60% of GHG emissions in the value chain came from supplied goods and about 40% from the transportation and use of the supplied goods; emissions from energy and electricity consumption were small compared to these upstream and downstream emissions. Therefore, to increase impact of the ICP approach, the company considered including

Scope 3 upstream and downstream emissions. However, the company eventually decided to include only Scope 1 and 2 emissions, due to a lack of specific data on the GHG emissions from suppliers and the degree to which these suppliers could be influenced. The company is considering including Scope 3 emissions when more detailed data is available on supplier emissions. This would enable the company to grow its coverage and have a more meaningful contribution to the underlying objective of the company's ICP approach: contributing its fair share to the Paris Agreement climate goal.

DEVELOP THE MECHANISM OF CHANGE TO DRIVE THE APPROACH

Why?

A best practice ICP approach is one that can eventually change day-to-day business decisions to mitigate climate change related risks, seize the opportunities of the low-carbon transition, and/or drive down GHG emissions. For ICP to stimulate changes in business decisions that contribute to the identified ICP operational objectives, the approach must be embedded in a clear mechanism of change. This means detailing how the ICP approach is expected to have an impact on decision making (Depth dimension).

How?

Decide on the mechanism the ICP will use to stimulate changes in business decisions. ICP monetises the environmental externality of GHG emissions, thereby allowing these emissions to be considered in rational financial decision-making. ICP aims to provide a clear financial advantage to activities that lower the carbon footprint of a company. In practice, the mechanism of change behind the ICP approach can be implemented in two distinct ways (see Figure 9):

- Shadow pricing mechanisms: such mechanisms generally embed a carbon price in the overall calculations for potential investments or climate risk analyses, but do not result in actual financial flows or monetary transfers.** This approach thus attaches a hypothetical cost of carbon emissions to better understand how pricing GHG emissions affects the business case of projects.¹⁶ This includes mapping potential financial risks related to climate change or estimating the potential impact of a carbon price on prices of products under development. Given that a shadow price does not lead to actual financial flows, its impact will depend on the way it is used. When combined with strong enforceable decision-making criteria, it can have a significant impact. For example, an investment board could be mandated to oppose investments that do not pass certain criteria such as a low carbon cost relative to the expected revenues when applying a certain shadow price. However, when used more informatively, it is likely to have a weak influence on emissions. For example, a shadow price could be used to map the potential financial impacts of climate change risks by applying a price to the company's value chain emissions, without any guidance on how this information will be used in the company's decision-making. Additional safeguard mechanisms such as stronger enforcement may be needed to ensure that shadow pricing can change business decisions.

FIGURE 9 Depth dimension to internal carbon pricing

		SHADOW PRICING	INTERNAL CARBON FEE
<div style="background-color: #c0504d; color: white; padding: 10px; text-align: center;"> Strong influence </div>	Collected fees used for climate action or rewarding low-carbon decisions		✓
	Passing criterion in business decisions	✓	✓
	Embedded in overall cost calculations as a financial indicator	✓	✓
	Included qualitatively in the decision-making process	✓	
	<div style="background-color: #c0504d; color: white; padding: 10px; text-align: center;"> Weak influence </div>	Tracking compliance prices without directly affecting business decisions	✓

2. Internal carbon fee mechanisms: these mechanisms go a step further than shadow pricing by creating financial flows. An example is charging business units or departments for the GHG emissions associated with their energy use. This affects their actual profit and loss statement, thereby directly steering the operational business decisions of these business units towards lower emissions choices. A variant of this is an internal cap-and-trade system, where the cap is set by the company's GHG reduction target and different departments can trade either freely obtained or purchased emissions allowances.¹⁷ An internal carbon fee mechanism can be used to generate revenues for a fund to support low-carbon action. It is typically more complex to implement, because it involves changes to the financial accounting of departments (see Box 2). If designed well, it can have a more direct impact than shadow pricing by creating a direct financial incentive for employees to make low-carbon decisions.

Link the mechanism of change to concrete business decisions to finalise the coverage of the ICP approach. The shadow price or internal fee mechanism needs to be linked to a selection of concrete business decisions that the ICP approach is trying to influence. This defines the Width dimension, that is, the GHG emissions the ICP approach will influence. Applying the ICP approach early in the decision-making process will increase its impact.

To lower the administrative burden, companies could focus the ICP approach on GHG emissions hotspots. This could be translated to applying ICP to decisions that are above a certain monetary value or to decisions with associated GHG emissions higher than a specific level. The section after Step 2 gives practical examples of ICP approaches embedded in a clear mechanism of change.

Outcomes in the 4D Framework:

Developing the mechanism of change behind the ICP approach will:

HEIGHT

Describe the impact different carbon prices will have on the decisions that ICP is trying to influence relative to other important financial decision parameters.

WIDTH

Detail the value chain GHG emissions the ICP approach is expected to influence and the decisions through which this will take place.

DEPTH

Summarise how decisions are expected to change as a result of the ICP approach.

TIME

Inform how the ICP approach could develop in the future to increase its influence to have a material impact on decisions.

Practical example

When designing their ICP approach in 2015, Carrefour considered the implementation of a shadow price or carbon fee, and evaluated which business decisions this should apply to. The governance team decided to first use a shadow price on CAPEX decisions in store assets and subsequently think about further expanding ICP in a step-by-step approach. Carrefour decided to first consider ICP for the GHG emissions it could influence directly, that is, its Scope 1 and 2 emissions. With 90% of these emissions coming from

its stores, this became the focus of its ICP approach. This also helped change the mindset in the company to include the cost of carbon as an integral part of decision-making. Carrefour's next step is to consider whether to apply ICP to investment decisions on other assets in the company as well. Possible directions to expand the ICP approach could be to introduce a carbon fee if there is a need for a stronger emission reduction incentive, or to apply ICP in procurement decisions if more accurate emissions data from suppliers becomes available.

¹⁷ See <http://carbonpricingdashboard.worldbank.org/what-carbon-pricing> for an explanation how a cap-and-trade system works.

SET THE RIGHT CARBON PRICE LEVEL

Why?

A best practice approach, based on an underlying mechanism of change, should use carbon prices that provide a meaningful incentive to achieve the ICP's objectives. The carbon price level is often used as an indicator for the ambition level of a company's ICP approach.

How?

Determine the form of the carbon price. The ICP governance team should decide whether a single carbon price will be used throughout the company or that different prices will be applicable. This will be a trade-off between simplicity and lower administrative burden on the one hand, and accuracy on the other hand. The choice should be informed by the insights obtained through engaging with the business on ICP (Step 1). The choices to make are:

1. Uniform or differentiated carbon prices

- › **Uniform price:** a price that is used throughout the company independent of the geography, subsidiary, or type of decision
- › **Differentiated price:** a price that varies by region, subsidiary, type of decision, or future scenario

2. Static or evolving carbon prices

- › **Static price:** a price that is static throughout time
- › **Evolving price:** a price that varies depending on the moment the decision is made or the time horizon of the decision, with the price generally increasing over time

Choose the most suitable method to set the carbon price level. Table 3 includes examples of different price setting approaches companies can use; they can also use a combination of these approaches. When choosing the price level(s) to use, the governance team should consider the form of carbon price decided above.

Different factors determine which method is most suitable:

1. The **objectives** of the ICP approach as set in Step 1 are the most important factors. A high price might be more suitable for a company looking to accelerate its GHG emissions reduction and meet ambitious low-carbon targets, such as science-based targets,¹⁸ compared to a company only looking to future-proof its company against near-term regulation.

2. The **type of decisions** the ICP approach should influence and the mechanisms of change behind the ICP approach developed in the previous sub-step. A company can choose to have different carbon prices depending on the type of business decisions the price should influence.
3. The **specifics of the company** such as the GHG productivity, i.e., the ratio between the economic value created and GHG emissions along each stage in the value chain, and the resulting responsiveness to carbon prices.¹⁹ Companies selling goods or services that have a low value per unit of GHG emitted might need a lower price to induce the required change within the company, compared to companies with a high value creation per unit of GHG emitted.
4. The **resources and time** a company can or is willing to invest in setting the price and implementing the approach.

Outcomes in the 4D Framework:

The right price level(s) for the ICP approach will:

HEIGHT

Set a carbon value that will affect the business decisions that the ICP approach is trying to influence.

WIDTH

Be either the same for all value chain GHG emissions targeted or be differentiated by type of emissions.

DEPTH

Determine the magnitude of the carbon value compared to other indicators such as procurement cost, energy costs, return on investment (ROI), for each of the decisions influenced by the ICP approach, thereby shaping the final impact of the ICP approach.

TIME

Be based on informed choices whether it should be static or evolving (increasing over time).

¹⁸ For a step-by-step guide on setting science-based targets, see <http://sciencebasedtargets.org/step-by-step-guide/>.

¹⁹ For more information, see The Generation Foundation and Ecofys, *Impacts of a Global Carbon Price on Consumption and Value Creation*, November 2016.

TABLE 3 Different approaches to setting the carbon price of an ICP approach (Height dimension)

PRICE SETTING APPROACH	CONSIDERATIONS	EXAMPLES OF RESOURCES
Based on external resources such as price projections from climate-related regulation (e.g., the expected future ETS or carbon tax price and/or implicit carbon price) ²⁰ or the social cost of carbon. ²¹	<p>This approach is most suitable for companies with objectives that depend on external policy or market developments, e.g., future-proofing assets and investments against regulations or discovering new markets and revenue opportunities.</p> <p>The resources needed for this approach are relatively small as the largest effort is in choosing which information sources to use. However, there is less certainty in whether this will result in evolving the company so that it thrives in a low-carbon economy, as it is not based on internal considerations.</p>	The High-Level Commission on Carbon Prices report shows that carbon prices need to be US\$50-\$100/tCO ₂ e by 2030 to meet the Paris Agreement. ²² Other resources include the Carbon Pricing Corridor Initiative ²³ , IEA scenarios ²⁴ or price projections from market analysts.
Based on a benchmark against peers by looking at carbon prices set by other companies within its own sector.	<p>This approach is most suitable for companies with an objective to stay ahead of the competition by using a price higher than their peers. Compared to their competitors, this would improve their business case for developing new innovative products and services or future-proofing assets and investments against regulation.</p> <p>The resources needed for this approach are relatively small as the largest effort is in choosing which peers to benchmark against. However, there is less certainty in whether the price levels will allow the company reach its objectives, as every company is different.</p>	CDP's annual carbon pricing report ²⁵ provides an overview of the publicly disclosed internal carbon prices used by companies, presented by region and sector.
Based on internal consultation to arrive at a price to be material enough to change business decisions and behaviour.	<p>This approach is most suitable for companies with an objective for ICP to have a material impact on business decisions, e.g., accelerating reduction of GHG emissions in the value chain, or changing behaviour within the company.</p> <p>This approach requires more resources and time to assess different price levels and their impacts, but makes it more likely that ICP will affect business decisions. However, there is less certainty on whether the price be high enough to allow the company to thrive in a low-carbon economy.</p>	Companies can use business decisions that they took in the past to determine the carbon price levels that would have affected these decisions, and assess how these would have affected the bottom line.
Based on technical analyses of the required measures to achieve the targets on reducing its carbon footprint and the associated investments needed.	<p>This approach is most suitable for companies that want to use ICP to meet certain low-carbon targets through accelerating the reduction of GHG emissions in the value chain and offsetting the emissions it cannot reduce cost-effectively.</p> <p>This approach requires the largest effort, with a detailed assessment of the cost of potential measures along the company's entire carbon footprint to meet its targets. However, it provides more certainty that it will achieve its objectives.</p>	The carbon price can be set by constructing a marginal abatement cost curve, essentially dividing the required emissions reductions by the costs of the measures. ²⁶

Practical Example

Carrefour used a two-step methodology to define the carbon price of its ICP approach based on technical analyses (see Table 3). The first step focused on the GHG reduction target of the entire company—a reduction of 40% by 2025 and 70% by 2050 compared to 2010 levels. Carrefour determined the total emissions savings required and the CAPEX that are needed per technology. The resulting carbon price was a company-wide price, excluding any national circumstances. In the

second step, the carbon price was tailored to account for national circumstances, and is referred to as the “total cost of ownership” approach. The defined price makes the total cost of ownership of low-carbon technologies over the average amortisation period competitive against legacy technologies. This resulted in a price range of €20-70/tCO₂ per country. Factors that influence the country-specific price include the leakage rate of refrigerants, the carbon intensity of the country, CAPEX requirements, and electricity costs.

20 Implicit carbon prices include energy taxes, renewable energy support tariffs, removal of fossil fuel subsidies, costs of complying with GHG emissions standards, and energy efficiency certificate trading.

21 Carbon Brief, *The Social Cost of Carbon*, February 2017, <https://www.carbonbrief.org/qa-social-cost-carbon>.

22 CPLC, *Report of the High-Level Commission on Carbon Prices*, 2017.

23 CDP and WeMeanBusiness, *Carbon Pricing Corridors – The Market View*, May 2017.

24 For example, IEA, *Energy Technology Perspectives*, 2017, <http://www.iea.org/etp/>.

25 CDP, *Putting a price on carbon – Integrating climate risk into business planning*, October 2017.

26 For more information on finding the right carbon price through a technical analysis, see for example Microsoft, *The Microsoft carbon fee: theory & practice*, December 2013.

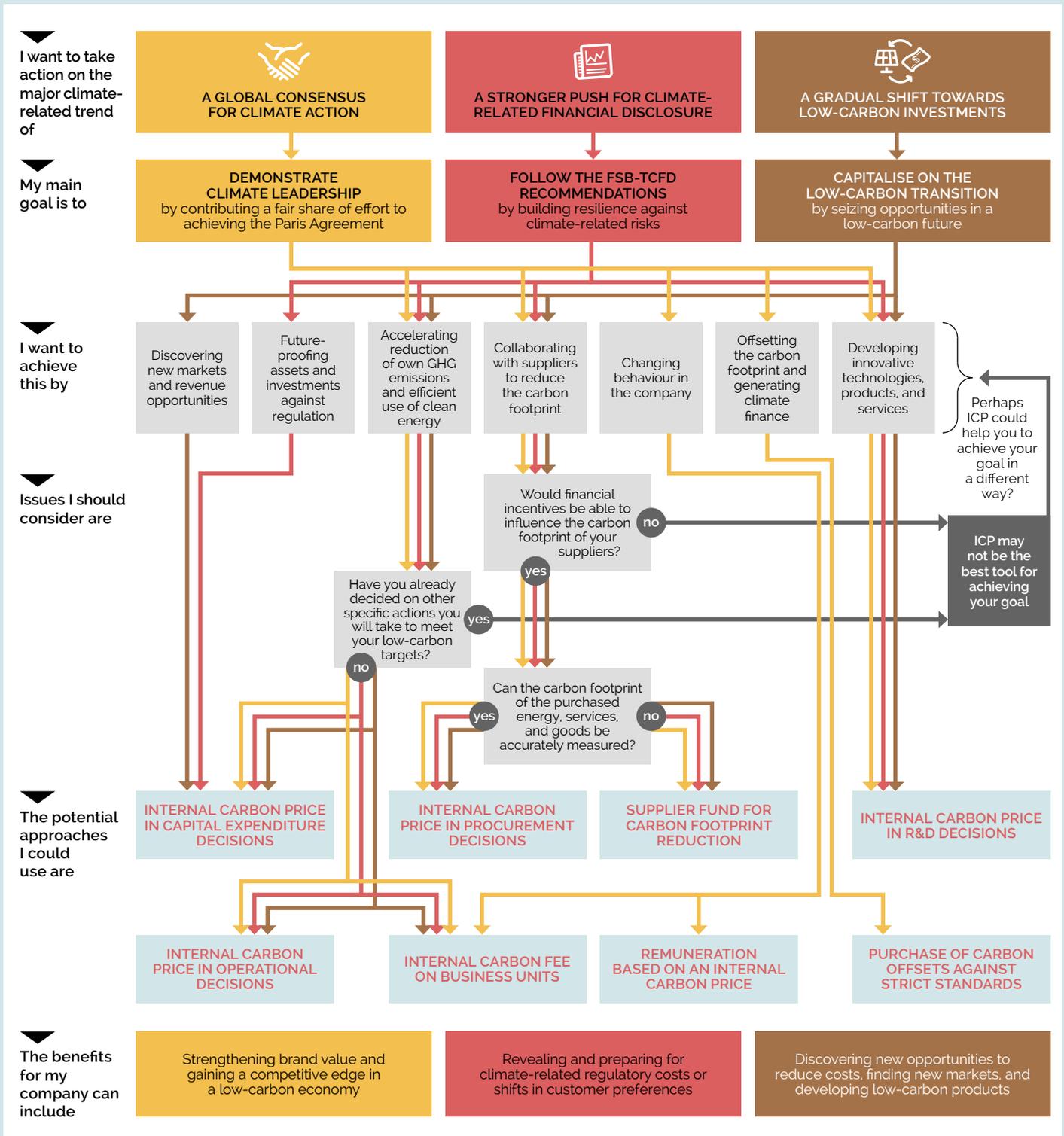
PRACTICAL EXAMPLES OF ICP APPROACHES

As design choices for each dimension affect each other, a best practice approach aims to find the optimal combination between the four dimensions.

Figure 10 combines the key design elements of Steps 1 and 2 to arrive at ICP approaches that a company could consider to achieve certain goals and objectives. This

section provides practical examples of ICP approaches that induce changes towards a low-carbon business strategy. While the examples illustrate ICP approaches in the food industry value chain, these examples are also relevant to other sectors.

FIGURE 10 The ICP toolbox to determine potential ICP approaches a company can use



Internal carbon pricing in capital expenditure decisions

Companies can use ICP to evaluate investment projects on the risks of climate-related regulatory costs, the cost savings potential and their commercial viability in new markets. Applying a shadow price to the carbon footprint in ROI calculations improves the business case for low-carbon investments. The effect could be optimised by striking a balance between the threshold from which ICP applies and the associated administrative burden, giving ICP at least the same importance as other key decision factors. It is also important to include ICP early in the investment decision-making process. ICP can be applied to a range of decisions, from small investment decisions on production sites to M&A decisions to determine the potential climate-related liabilities or assets of the target company. Examples of business cases that are strengthened by ICP include:

- » Projects that reduce steam or electricity consumption to meet the company's climate targets, while saving on future energy and climate-related costs
- » The acquisition of companies that make bio-based packaging material, allowing the company to diversify its production portfolio and reduce its exposure to future climate-related regulatory costs in the upstream segment of its value chain
- » Production lines that process animal fat waste and used cooking oil into biodiesel, enabling consumers to reduce their climate-related liabilities with this renewable fuel

Tetra Pak, a multinational food packaging and processing company, uses a shadow price for investment decisions to reduce its carbon footprint while growing its business.²⁷ Tetra Pak monetises the climate impact of its investments using the life cycle GHG emissions associated with the investment (i.e. Scope 1, 2 and 3 emissions) and the carbon price in the EU ETS. The carbon price is updated twice a year, and a floor price of €10/tCO₂e is used. The shadow price is applied to all investments globally, with the resulting climate impact, expressed in Euros, taken into account as a parameter in investment decisions.

Internal carbon pricing in procurement decisions

Companies can use ICP to assess supplier contracts on climate-related cost pass-through risks and the cost savings potential of purchasing goods and services with a lower carbon footprint. Applying a shadow price to the carbon footprint of purchased goods and services could push suppliers towards more low-carbon operations and/or shift procurement towards low-carbon suppliers. The impact could be optimised by giving ICP at least the same importance as other key decision factors. Using ICP in this way could support the case to purchase, for example:

- » Potatoes with a lower moisture content, which require less heat during the drying process, lowering GHG emissions to meet climate targets while simultaneously reducing energy costs
- » Sugar produced using renewable heat or electricity instead of energy from fossil fuels

Danone started using ICP as a tool to meet its climate target of carbon neutrality by 2050. It primarily uses ICP to compare the carbon costs or savings of different GHG emission reduction projects in CAPEX decisions. Since Danone's targets include Scope 3 emissions, ICP is applied to all GHG emissions associated with a CAPEX decision, including the procurement of energy and materials used for the project. Danone is also considering the use of ICP in procurement decisions of existing assets, to find alternative sourcing options and strategies for energy and materials in a world where carbon pricing regulations continue to develop and grow.

Supplier fund for carbon footprint reduction

Alternatively, companies can use ICP to set up a fund to support suppliers that are taking measures to manage their climate-related risks and seize cost saving opportunities, thereby strengthening the climate resilience of their supply chain. A carbon price could be used to determine the size of the fund based on the carbon footprint of the company or supply chain, or the support given to the supplier based on GHG emission reductions. The impact will mainly depend on the size of the fund, and the degree to which the fund is

promoted to suppliers. A supplier fund can be combined with other ICP approaches, for example, filling the fund with revenue from an internal carbon fee. The fund can be established by one company to support its own suppliers, or a group of companies to support a sector. Examples of such funds include:

- » A global fund to improve the climate resilience of coffee farmers
- » A fund to target methane emission reductions in the dairy supply chain

In December 2015, Ben & Jerry's, an international ice cream company, instituted an internal carbon fee of US\$10/tCO₂e for its GHG emissions from farm to landfill. The company pays the fee itself, and the funds support GHG reduction initiatives along its value chain. This includes working with farmers to implement strategies to reduce their carbon footprint, such as manure separators which reduce methane emissions while turning manure into bedding for cows. Other measures include solar panels at the Vermont ice cream factory and electric vehicles charging stations at its facilities.²⁸

Internal carbon pricing in R&D Decisions

Companies can use ICP to evaluate R&D proposals on the risks of climate-related regulatory costs, the cost savings potential and their commercial viability in a low-carbon future. A shadow price on the expected carbon footprint of new products and services could drive R&D decisions or allocate R&D budgets towards low-carbon innovation. The impact could be optimised by including ICP early on in R&D decisions. Example technologies where ICP could support the R&D investment decision include:

- » Advanced evaporation technologies that use less energy
- » Bio-based bottles from biomass waste materials
- » Technology to increase the shelf-life of milk without refrigeration

Saint-Gobain, a multinational materials manufacturer, uses ICP for all its corporate activities across more than 60 countries. The company uses two different carbon prices for its financial decision-making process. One carbon price is applied to CAPEX projects for large investments. The other carbon price, which is higher than that used for CAPEX decisions, is

used to drive investments in R&D of low-carbon breakthrough technologies. Saint-Gobain believes that a higher carbon price on its R&D decisions will be instrumental in increasing its market share in energy-saving products.²⁹

Internal carbon pricing in operational decisions

Companies can use ICP to reveal hidden climate-related costs and opportunities by applying a shadow price to the carbon footprint of their assets. The impact could be optimised by giving ICP at least the same importance as other key decision factors. Using ICP in this way could strengthen the business case for introducing, for example:

- » Efficiency measures in food processing operations to reduce energy costs
- » Low-carbon packaging materials to reduce upstream exposure to carbon costs
- » Improved warehouse management to reduce costs in food distribution logistics

Owens Corning, a global building materials manufacturer, uses ICP to help frame climate-related challenges and opportunities in monetary terms.³⁰ By using a shadow price on Scope 1, 2 and 3 emissions, Owens Corning can consider the impact of carbon costs on its operations and supply chain if a price is put on carbon where there is none yet. For this analysis, carbon prices of US\$10/tCO₂e and US\$60/tCO₂e are used to inform internal decision making and risk analyses.

Internal carbon fee on business units

Companies can go a step further by using ICP to charge internal departments or business units for their carbon footprint with an actual fee, thereby directly affecting their profit and loss accounts. By giving ICP a real value, business units fully integrate the value of GHG emissions in the process of optimizing their financial performance. The revenues from the fee could be used in various ways as described in Box 2. Box 2 also highlights potential challenges with administering the fee, which need to be addressed to optimize the impact of this ICP approach. Decisions which could be influenced by this approach to ICP include:

28 CDP, *Climate Change 2016 Information Request - Unilever plc*, 2016.

29 CDP, *Embedding a carbon price into business strategy*, September 2016.

30 CDP, *Climate Change 2016 Information Request - Owens Corning*, 2016.

- » Finding solutions to save energy in the short term through improved production planning
- » Purchasing office supplies with a lower carbon footprint
- » Choosing a different mode of freight transport for goods



Viña Concha y Toro, one of the largest wine producers in Latin-America, charges each business unit a price of US\$1/tCO₂e. The GHG emissions coverage includes the entire value chain of Viña Concha y Toro's products, i.e. from producing grapes in the vineyards to delivery of the wine bottles to the customer. The contributions made by each business unit flow into a carbon fund that is used to develop emission reduction projects. Every business unit can suggest projects to be financed through the fund, which are then assessed by the company's sustainability committee. The ICP approach has been implemented to support the company's objective of reducing its carbon footprint by 15% by 2020.³¹

Remuneration based on an internal carbon price

A company can use ICP to provide individual employees with a financial incentive to make decisions that reduce the carbon footprint by applying a shadow price on GHG emissions or the emission reductions associated with the decisions made by the employee. The impact could be optimised by educating employees on the actions they can take to increase their remuneration. Ways in which ICP could stimulate low-carbon behaviour and decision-making by employees include:

- » Linking managers' bonus payments to the energy consumption of their business units
- » Charging or rewarding employees based on the mode of transport taken for business travel or commuting



In 2008, Danone set targets to reduce its GHG emissions by 30% between 2008 and 2012.³² To enable Danone to achieve these targets, part of

the strategy linked 30% of every plant manager's bonus to the carbon reductions achieved. This approach contributed to Danone achieving a 42% GHG emission reduction in 2012. Currently, the achievement of GHG emission reduction targets is one of the factors that determine the bonus payments of C-suite executives and managers. This linkage incentivises the alignment of management behaviour with the company's climate change strategy.³³

Purchase of carbon offsets against strict standards

Companies can also use ICP to determine the budget that is reserved for purchasing carbon credits against strict environmental standards.³⁴ These credits can be used to offset their carbon footprint if it is more cost-effective than reducing their value chain GHG emissions. Companies can purchase offsets from an overall company budget or charge this to each department or business unit based on their carbon footprint. The latter would have a similar impact as an internal carbon fee, allowing units to fully integrate the carbon value in their decision-making. The funds could be used to offset, for example:

- » Energy-related emissions
- » The carbon footprint from supplying farms
- » GHG emissions from the distribution of products



A large supermarket chain has been offsetting its carbon emissions for several years to become carbon neutral. The retailer pursued an approach to select offset credits from projects that guaranteed positive impacts to the environment, local economy, and communities. This resulted in an offset portfolio with domestic projects as well as projects from developing countries. Since the retailer also faces carbon pricing from domestic regulation, the internal carbon costs of its GHG emissions is based on the sum of the mandatory price and the offset credit price, which is about US\$150/tCO₂e. This is also the shadow price used for investment decisions.

31 CPLC, *2016-2017 Carbon Pricing Leadership Report*, 2017.

32 Danone, *Toward a circular economy in food*, 2016, <http://downtoearth.danone.com/2016/02/29/toward-a-circular-economy-in-food/>.

33 CDP, *CDP company database*, 2016, <https://www.cdp.net/en/companies>.

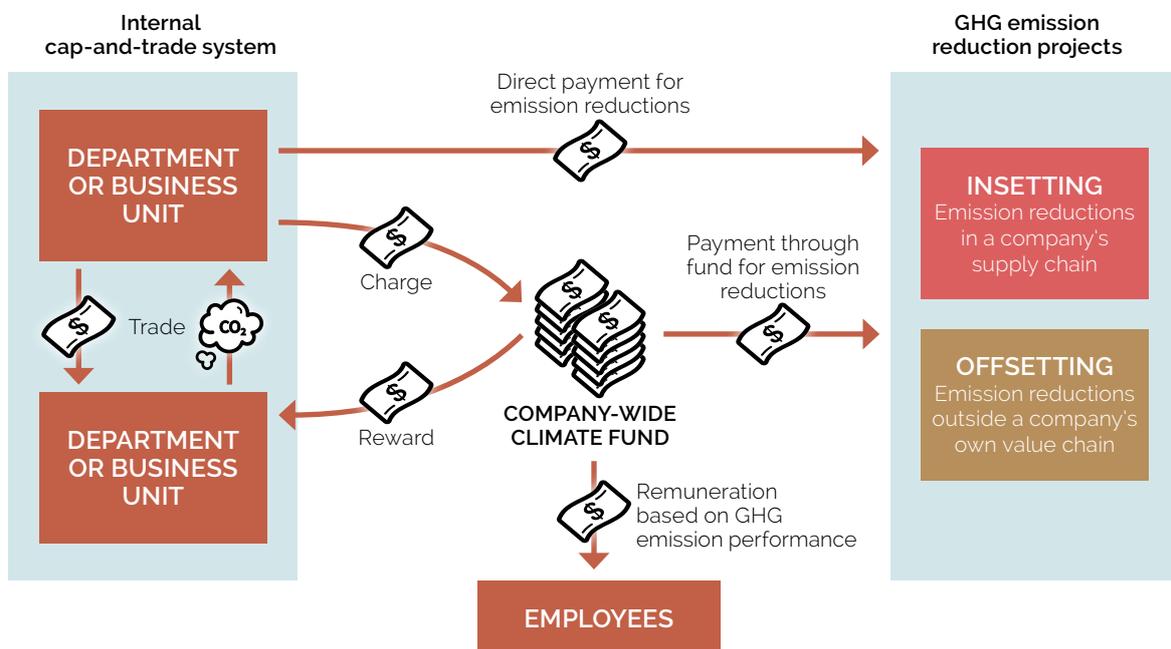
34 For more information about strict environmental standards for offsets, see <http://www.icroa.org/The-ICROA-Code-of-Best-Practice>.

BOX 2 Different ways to implement an internal carbon fee and distribute the revenues

An internal carbon fee can be implemented in various ways, as illustrated in Figure 11. The most common approach is to directly charge departments or business units a fixed price for their GHG emissions, similar to a tax. Another approach is to operate an internal cap-and-trade system, where each department or business unit has a GHG emissions budget with the flexibility to trade parts of their budget for money with other departments.³⁵ Part of this system could allow departments to purchase additional emissions for a certain fee, or compensate the excess emissions with GHG emission reductions elsewhere in the world, such as through offsets.

The resulting payments from the carbon fee could flow into a company-wide climate fund. These can be used to reward departments that perform well and make the carbon fee revenue neutral. Alternatively, the funds could be used to remunerate employees who meet their GHG emission reduction targets or support GHG emission reduction projects. In the latter case, the climate fund could be used to financially support GHG emission reduction projects within a company's own supply chain—also known as insetting—or be used to support emission reductions outside a company's own value chain, either through directly investing in projects or purchasing offset credits. As the company reduces its carbon footprint, the climate fund could also reduce in size. This would lower the ability of the company to support further GHG emission reductions in the value chain. Solutions include increasing the carbon fee or setting aside a fixed amount for the climate fund.

FIGURE 11 Examples of ways an internal carbon fee could work



When introducing a carbon fee, particularly with a company-wide climate fund, the accounting department should be closely involved as it concerns company cashflow. Issues will need to be resolved including: the administration of the carbon fee, the accounting of the fund on the balance sheet and in the year-over-year budgeting, tax rules regarding transfer of money across borders in case of multinationals with international departments, and the monitoring of fund spending. Many issues will depend on the business environment of the company, but companies can learn from other organisations that have or are testing an internal carbon fee.³⁶

³⁵ Akhurst et al., *Greenhouse Gas Emissions Trading in BP*, Energy Policy 31, 2003.

³⁶ Microsoft, *The Microsoft Carbon Fee: Theory & Practice*, December 2013, or, Yale University, *Yale University's Carbon Charge: Preliminary Results from Learning by Doing*, October 2016.

Table 4 provides an overview of the various ICP approaches that can be used to address different scopes of GHG emissions for different climate-related goals. As the use of ICP matures and evolves, other

types of ICP approaches that companies use may arise that are not listed in Table 4, such as ICP in marketing and product decisions.

TABLE 4 Overview of various ICP approaches that can be used for different climate-related goals and scope of GHG emissions

<p>Overview of different ICP approaches that can be used for different goals and scopes of GHG emissions</p>	<p>Demonstrate climate leadership by contributing a fair share of effort to achieving the Paris agreement</p> <p>Strengthening brand value and gaining a competitive edge in a low-carbon economy</p>	<p>Follow the FSB-TCFD recommendations by building resilience against climate-related risks</p> <p>Revealing and preparing for climate-related regulatory costs or shifts in customer preferences</p>	<p>Capitalise on the low carbon transition by seizing the opportunities of a low-carbon future</p> <p>Discovering new opportunities to reduce costs, finding new markets, and developing low-carbon products</p>
<p>Own GHG emissions and from energy consumption ● (Scope 1 and 2 emissions)</p>	<ul style="list-style-type: none"> ● ICP in capital expenditure decisions ● ICP in operational decisions ● ICP in procurement decisions ● Internal carbon fee on business units ● ICP in R&D decisions ● Purchase of offsets against strict standards ● Remuneration based on an ICP 	<ul style="list-style-type: none"> ● ICP in capital expenditure decisions ● ICP in operational decisions ● ICP in procurement decisions ● Internal carbon fee on business units ● ICP in R&D decisions 	<ul style="list-style-type: none"> ● ICP in capital expenditure decisions ● ICP in operational decisions ● ICP in procurement decisions ● Internal carbon fee on business units ● ICP in R&D decisions
<p>Embedded GHG emissions from purchased goods and services ▲ (Scope 3 upstream emissions)</p>	<ul style="list-style-type: none"> ▲ ICP in capital expenditure decisions ▲ ICP in operational decisions ▲ ICP in procurement decisions ▲ Internal carbon fee on business units ▲ ICP in R&D decisions ▲ Purchase of offsets against strict standards ▲ Supplier fund for carbon footprint reduction ▲ Remuneration based on an ICP 	<ul style="list-style-type: none"> ▲ ICP in capital expenditure decisions ▲ ICP in operational decisions ▲ ICP in procurement decisions ▲ Internal carbon fee on business units ▲ ICP in R&D decisions ▲ Supplier fund for carbon footprint reduction 	<ul style="list-style-type: none"> ▲ ICP in capital expenditure decisions ▲ ICP in operational decisions ▲ ICP in procurement decisions ▲ Internal carbon fee on business units ▲ ICP in R&D decisions ▲ Supplier fund for carbon footprint reduction
<p>GHG emissions from product use ▼ (Scope 3 downstream and avoided emissions)</p>	<ul style="list-style-type: none"> ▼ ICP in capital expenditure decisions ▼ ICP in operational decisions ▼ Internal carbon fee on business units ▼ ICP in R&D decisions ▼ Purchase of offsets against strict standards 	<ul style="list-style-type: none"> ▼ ICP in capital expenditure decisions ▼ ICP in operational decisions ▼ Internal carbon fee on business units ▼ ICP in R&D decisions 	<ul style="list-style-type: none"> ▼ ICP in capital expenditure decisions ▼ ICP in operational decisions ▼ Internal carbon fee on business units ▼ ICP in R&D decisions

STEP 3 – ROLLING OUT THE ICP APPROACH



The third step is to test and roll out the ICP approach that has been designed. It is important to test the ICP approach in pilot projects before a company-wide rollout. The pilots not only serve as a testing ground to address new issues and concerns before full implementation, but more importantly, the pilots showcase the ICP approach to the board. Without board-level support and approval, it is not possible to roll out ICP effectively.

The experience from testing the ICP approach can be used to develop tools to support implementation. Supporting tools include documentation to demonstrate the business case, guidance materials, and calculation tools for using ICP in business decisions. Since every company is different, the successes and issues experienced in these pilots are also different. The ICP governance team can use this experience to develop concrete guidance material on how to apply ICP in decisions. This includes sharing the successes and issues, how these issues can be overcome, and case studies to highlight how ICP impacted specific decisions made by departments.

The pilot projects can also be used to inform the planning for rolling out the ICP approach. Some issues and concerns identified in Step 1 (engaging the business with ICP) could be addressed in pilot projects. This can then inform the further planning of the ICP rollout. These issues could range from practical questions on when ICP should be applied and the methodology to use, to general concerns about the impact of ICP on the company's competitive position. A clear communication and implementation plan can address these issues, thereby increasing the acceptability of the ICP approach.

The various sub-steps for rolling out the ICP approach can show that further iterations are needed on the ICP design. The testing phase and development of tools can show, for example, that the design of the ICP approach is too complex to be used efficiently in daily decision-making or that it does not influence any business decisions in practice. In this situation, the ICP governance team should return to Step 2 to reconsider elements of the design. A tested design and well-prepared plan for rolling out the ICP approach can make monitoring and enforcement of ICP easier in Step 4. Furthermore, the evaluation in Step 4 can yield feedback on how to improve the supporting tools and communication of ICP in the company.

The sub-steps below provide guidance on how to test and roll out the ICP approach while adhering to best practices.

TEST THE APPROACH THROUGH PILOT PROJECTS

Why?

Pilot projects can test whether the designed ICP approach works as intended and how it fits with the market circumstances that the company is operating in. Pilot projects can help identify practical issues and concerns that may arise during full implementation, and gauge the acceptability of including ICP in business decision making.

How?

Involve senior management in choosing the pilot projects. Board members generally want to see the approach working before approving a wider rollout. By involving them in selecting pilot projects, this testing phase can focus on the results needed for approval. Figure 12 shows different ways to pilot the ICP approach. It is important to involve (a selection of) the departments that would have to apply ICP on a regular basis.

Provide guidance and supporting tools for targeted feedback. The guidance material can steer the testers to provide feedback on specific design elements as well as test whether the tools that support the rollout work as intended (see sub-step "Apply supporting tools").

Amend the ICP approach design if needed based on feedback. This would increase the acceptability of the ICP approach and create a sense of ownership among the testers.

Outcomes in the 4D Framework:

Testing the approach through piloting will help:

HEIGHT

Test which price levels lead to the desired influence in decision-making within the company and the acceptability of the selected form of pricing (uniform versus differentiated, static versus evolutionary pricing). If a company chooses to apply ICP to different decisions, the pilot can, for example, be used to test whether different prices are needed for different types of decisions.

WIDTH

Understand the possible GHG emissions coverage. The pilot could show which departments are more sceptical towards ICP than others, or that more data is needed to use ICP to address and influence specific sources of emissions. This could lead to a decision to implement ICP only in a part of the company from the beginning.

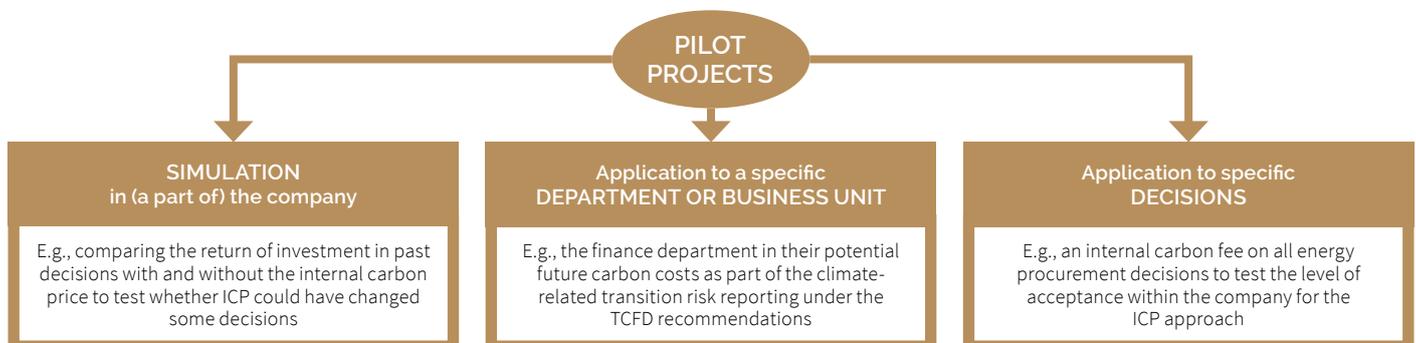
DEPTH

Test the degree of influence that decision makers are willing to accept and the influence the ICP approach will have in practice. This could inform the actions needed to increase acceptability and uptake of the ICP approach.

TIME

Adjust the ICP implementation plan and the elements to introduce at a later stage once the business has a better grasp of how to use ICP.

FIGURE 12 Different ways to pilot the ICP approach



Practical Example

A large supermarket chain is currently piloting a shadow price on investment decisions. Simple calculation tools were provided to different departments. The company found that each department has a different decision-making process and that the ICP approach could not be applied to all departments

in the same way. The departments that were most successful in applying ICP were those that integrated the tool with existing processes. For others, ICP was seen as red tape, as it did not have any impact in the final investment decision. The company found that a high price is important for ICP to be relevant; it is using a carbon price of about US\$150/tCO₂e in further testing.

APPLY SUPPORTING TOOLS

Why?

Various tools can assist relevant departments in applying the ICP approach. These tools will help the governance team address questions that many people within the company have regarding the reasons for implementation of ICP and the application of ICP in practice.

How?

Develop different tools to minimise the administrative burden of applying ICP. There are different tools which companies can develop and use, including:

- » **Carbon footprint calculation tools.** These tools help the user determine the carbon footprint associated with his or her decision. Generally, these contain a large database of GHG emission factors associated with specific activities, technologies, and measures. The carbon footprint covered by ICP is multiplied by the carbon price to determine the carbon value to include in the decision. If the ICP approach has multiple carbon prices, a more advanced tool is needed to specify carbon prices or compare them for scenario analysis.
- » **Financial decision models.** These allow the carbon value to be directly accounted for in decision making, by adding an extra line in the financial calculation tool that specifies the carbon value.
- » **Guidance material.** The guidance material specifies the decisions that ICP should be applied to, how to apply ICP, and how to use the calculation tools. The guidance material can be developed based on experience from the pilot projects or could make use of similar material from other organisations.³⁷
- » **Communication tools to inform employees internally about the ICP approach.** These include webinars, workshops, and newsletters. Webinars and workshops are a good platform to interactively explain how to use ICP, and to address participants'

questions and concerns. Regular articles in internal newsletters or communication platforms will show that ICP is high on the company's agenda. Such articles can also be used to continue highlighting the benefits of ICP, which can be derived from the arguments presented in "Build the Business Case" in Step 1, supplemented with experience from the pilots.

Outcomes in the 4D framework:

Developing tools to support the implementation of the ICP approach will help:

HEIGHT

Show the impact of the carbon price on the financial performance of specific decisions. The tools should include the reasoning behind the price levels. The tools will help decision makers understand how the carbon price level can affect their decisions.

WIDTH

Apply ICP to the right decisions with the correct emissions data. The calculation tools and guidance material should contain detailed instructions on how to determine the carbon footprint related to certain business decisions. It will also allow the governance team to discover data gaps.

DEPTH

Enhance the uptake of the ICP approach by reducing the administrative burden and providing concrete guidance on its use. In particular, interactive webinars and workshops help departments feel supported in using the ICP approach, increasing the likelihood that they will take ICP seriously.

TIME

Accelerate the acceptability and uptake of the ICP approach to build a foundation for expanding the approach in the future.

Practical Example

Solvay developed a sustainability tool that helps the company identify how to monetise the environmental footprint of its product portfolio, Sustainability Portfolio Management.³⁸ This tool monetises the GHG emissions impact of the entire value chain of a product, using a shadow price of €75/tCO₂. This resulting value is combined with other monetised

environmental factors such as air pollution and water, and compared to the annual sales revenue of a specific product. The tool allows Solvay to map out its product portfolio against the carbon cost risks of production compared to the expected market demand. The resulting heat map is used as input into every strategic business review, steering business decisions towards choices with less environmental impact.

³⁷ For insights in guidance material, see Microsoft, *The Microsoft Carbon Fee: Theory & Practice*, December 2013, or, Yale University, *Yale University's Carbon Charge: Preliminary Results from Learning by Doing*, October 2016.

³⁸ Solvay, *Sustainable Portfolio Management Guide*, 2017.

PLAN THE ROLLOUT

Why?

A well-timed rollout can increase the likelihood of the ICP approach being successfully implemented and applied. Careful timing can lead to greater acceptance internally, lower the risk of delays, and reach more people internally to make them aware of the introduction of the ICP approach.

How?

Plan the rollout in detail. Figure 13 shows several key considerations when planning the rollout, following board approval of the ICP approach.

Rollout the ICP approach with board involvement.

The rollout should be announced by board members to emphasize the importance of the ICP approach. The ICP governance team is responsible for finding the right timing for the rollout to be announced and communicating it company-wide, making use of the communications tools identified in the previous step. As employees learn about the ICP approach, it is important that the governance team is available to answer any questions which may arise.

Outcomes in the 4D Framework:

Planning the rollout will help:

HEIGHT

Inform relevant departments well in advance of the carbon price level(s) that will be implemented throughout the company. This allows them time to understand the rationale behind the carbon price level decision and prepare questions if needed.

WIDTH

Notify, in advance, all departments of the type of decisions ICP could apply, allowing them time to prepare the necessary resources to determine the carbon footprint covered under ICP in upcoming business decisions.

DEPTH

Give the relevant departments time to prepare and attend the workshop or webinars. These workshops or webinars allow departments to learn to use the approach through interactive sessions, which will make it more likely that they can apply ICP from the start themselves.

TIME

Show that ICP is a well thought-out tool, supported by the board, and that it can bring benefits to the business, thereby building acceptance and support in the company to expand ICP in the future.

FIGURE 13 Key considerations for planning the rollout



Practical Example

At DSM, the rollout of ICP went smoothly and received broad internal support. Since DSM actively informs its employees on climate change and carbon pricing, a growing number of employees at DSM acknowledge the benefits of ICP and have a general understanding of its use and importance. Leading up to the launch of its ICP approach, the Finance and Operations functions continued to raise awareness on ICP within DSM through interviews in the employee magazine and internal newsletters.

These efforts were supported by the CEO and CFO, who expressed their support for ICP and carbon pricing in general through both internal and external communication. The CEO of DSM co-chairs the High-Level Assembly of the Carbon Pricing Leadership Coalition and regularly gives media interviews about carbon pricing. The implementation of ICP was further supported by integrating it in existing processes and making it a mandatory factor in the financials for large investment decisions. This also helped ensure a pragmatic, simplified approach to successful implementation.

STEP 4: MONITORING AND EVALUATING THE ICP APPROACH



The fourth step is to monitor the implementation of the ICP approach and evaluate its performance as a tool to affect business decisions. To ensure that the ICP approach is being used to meet its objectives, the company should put a process in place to enforce its use and monitor how it is being used. The process should strike a balance between effectiveness and complexity; a rigid and cumbersome monitoring process may deter decision makers from using the ICP approach. However, overly simplistic monitoring may result in lack of support for the approach and inaccurate information on whether the approach is being used as intended.

The monitoring process should take the evaluation needs into account. When determining the monitoring process and key metrics to monitor, the data required to evaluate the ICP approach should be considered. While the monitoring and evaluation requirements depend on the objectives of ICP and the design of the approach, most requirements will include common monitoring metrics such as the administrative burden and the number of decisions that have used the ICP approach. Tailoring the monitoring system to the evaluation needs and integrating it into daily business could reduce the overall administrative burden, as limited effort would be required to collect additional

information for evaluation. This would also allow the evaluation to occur on a more regular basis, increasing confidence in the ICP approach's ability to keep meeting its objectives.

Monitoring and evaluation of the ICP approach is not the last step. The ICP approach should be readjusted periodically to remain relevant in the decision-making process and continue achieving its objectives. This readjustment should reflect both internal and external developments. Examples of these developments include: new technologies continuing to develop and old ones becoming cheaper, changing attitudes on the need to act on climate change, increasingly accurate data on GHG emissions, more stringent market circumstances, and the introduction of climate-related regulations. Such evolution calls for continued engagement with the business on carbon pricing, as presented in Step 1. This may lead to readjusting the design in Step 2 along the four dimensions, followed by testing and updating the supporting tools before rolling out the changes in Step 3.

The sub-steps below provide guidance on monitoring the use of the ICP approach and break down the evaluation questions to evaluate the ICP approach in a best practice way.

ENFORCE AND MONITOR THE ICP APPROACH

Why?

Enforcing and monitoring the ICP approach ensures that it is being used as intended in the company.

The monitoring system should set out the data that needs to be monitored (key performance indicators), the methodology used to monitor this data (who, when, with what tool), and the approach used to check and use this data.

How?

Establish company guidelines or directives on when to use ICP and how to use it. Including ICP in general guidelines or in company directives will give ICP an official status within the company. The guidelines should describe the type of business decisions that the ICP approach applies to and the use of ICP in such decisions.

Use soft, yet firm communication to encourage staff to use ICP. This may be more effective in ensuring staff follow the ICP guidelines proactively. Soft communication means using less harsh terms when asking staff to include ICP in their decision-making, which could have a greater impact in influencing behaviour compared to harsh communication.

Train staff to understand the requirements and guidelines on the better use of ICP. This will ensure efficient implementation of ICP and better monitoring documentation. The training could be held via webinars and in-person, and should train the representatives on how the ICP approach is beneficial for their business and how it should be implemented in daily decision-making processes. The training should cover the use of the supporting tools described in Step 3.

Develop and monitor key performance indicators (KPIs) that the ICP approach could be eventually be evaluated against. These indicators can include:

- » **Reduction in GHG emissions**, directly due to changing business decisions or indirectly due to making products that enable others to reduce their GHG emissions, i.e., avoided emissions
- » **Direct cost reductions** due to lower compliance costs for GHG emissions
- » **Indirect cost reductions** due to lower energy costs following the implementation of energy efficiency measures
- » **Carbon price used**, when ICP requires different carbon price levels to be used for different decisions
- » **Number of decisions** that have used ICP and number of decisions that have been affected by ICP
- » **Size of decisions affected** by ICP in terms of monetary value and the financial flows involved
- » **Type of decisions affected** by ICP, if ICP applies to different types of business decisions
- » **Change in revenue** through business expansions, for example, the increased share value or sales that were a result of business decisions affected by ICP
- » **Administrative costs** and efforts to roll out, enforce, and apply the ICP approach

Several of these indicators require the definition of a baseline scenario which reflects the situation in the absence of the ICP approach.

Find the most suitable approach to monitor these indicators; that is, who is responsible for monitoring the indicators, how they should monitor them and at what frequency, who should be informed of the value of the indicators, and who should check these values. This can include:

- » **Appointing representatives** who are in the ICP governance team or in the departments that apply the ICP approach. These representatives are responsible to monitor a given (set of) indicator(s). Their role is to provide updates and feedback to the governance team on the evolution of the indicators on a regular basis.
- » **Developing tools** to monitor the indicators; for example, loggers or tracker files to monitor GHG emissions and the monetary value associated with the implementation of the approach, a new module added to the environmental or risk management system, or revised financial models that explicitly record carbon value calculations. These tools should be integrated with the supporting tools developed in Step 3 as much as possible to minimise the monitoring costs.
- » **Setting simple procedures** explaining how often the indicators should be communicated to the governance team, what the governance team will check, how they will use the data, etc.
- » **Agreeing on a frequency** of monitoring and reporting; for example, monthly monitoring and reporting to the governance team and biannual reporting to the board.

Enable learning-by-doing. Instead of rigidly monitoring every relevant department's and employee's application of ICP, it could be better to implement monitoring gradually. This would reduce the burden on departments from the start and allow for a learning-by-doing process. Companies can, for example:

- » **Be open to answering any questions that employees may have.** Periodic touchpoints with and/or between the governance team could be arranged to facilitate these discussions, through, for example, town hall meetings, webinars and email updates with tips. This is especially important right after the ICP approach rollout, as most questions arise at the start and if these are not quickly addressed, most decision makers will start ignoring the ICP approach. Companies should leverage the capacity built during the pilot phase described in Step 3.
- » **Establish an initial simple feedback mechanism** to monitor success and crowd-source creative solutions by inviting decision makers to send feedback by email or an anonymous mailbox, learning from the pilot phase.
- » **Conduct regular internal audits** to ensure the ICP approach is being used effectively.

Outcomes in the 4D Framework:

Enforcing and monitoring the ICP will help:

HEIGHT

Understand how relevant departments and employees regard the carbon price level used, if the level influences decisions, and whether the price need to be amended to increase uptake and influence in decisions.

WIDTH

Determine the GHG emission reductions realised after implementing ICP and the role of ICP in addressing these emissions. This can contribute to discussions on whether to continue using ICP and expand it to other parts of the business.

DEPTH

Understand how ICP is accounted for in business decisions and if ICP has a concrete impact on these decisions.

TIME

Keep track of how the ICP approach functions in practice. This helps identify the dimensions of the approach which could or needs to improve to ensure it remains fit for the purpose.

Practical Example

Carrefour implements ICP on CAPEX decisions of store assets for every country. The ICP calculation was added as an additional criteria in the investment decision. Every country that puts forward an investment project must present its financial, technical, and economic aspect to an investment committee. This now must include the carbon cost component (presented separately), and must be embedded

as a cost component in the financial aspect. Since Carrefour involved representatives from different departments and countries from the start of the ICP development, applying ICP in investment decisions has become part of the regular process. The ICP governance team does not need to be actively involved in enforcing the ICP approach and now meets three times a year to discuss how the ICP approach has been working in the company.

EVALUATE AND REALIGN THE APPROACH

Why?

The approach should be evaluated periodically so that it remains fit for purpose and keeps steering the company towards a pathway to drive its business strategy in line with the transition to a low-carbon economy. Establishing an ICP approach is therefore a dynamic and iterative process.

How?

Determine when to conduct the evaluation. This can be periodic, or can occur if specific circumstances trigger the need for an evaluation, for example, if the mandatory carbon price in the jurisdictions that the company is active in becomes higher than the carbon price used in the ICP approach. Companies with relatively new approaches typically evaluate after 1-2 years, although an annual review is recommended to respond to rapidly changing business circumstances, while taking seasonal fluctuations into account.

Define the focus of the evaluation. Various tools can be used to help structure the evaluation and define the issues that the evaluation should focus on. Evaluation tools include an objective tree analysis and logical framework approach, which can help formulate specific questions to determine if changes due to the ICP approach are leading to the desired results. The monitoring process developed in the previous step should be structured to facilitate this evaluation.

Gather insights on ICP from different departments through annual surveys or interviews. General questions to consider when evaluating the ICP approach are shown in Table 5. These should be expanded with questions specific to the ICP approach, which could come from the evaluation tools discussed above.

TABLE 5 Examples of evaluation questions for the ICP approach

EVALUATION	QUESTIONS
Objectives	<ul style="list-style-type: none"> » How does the ICP approach satisfy the approach's objectives? » How does ICP compare to other tools in its capability to achieve ICP's objectives? » How can the ICP approach be amended if KPIs show that the achievements are not in line with the approach's objectives?
Impact (Height)	<ul style="list-style-type: none"> » What carbon price level is needed to continue meeting the ICP approach's objectives?
Impact (Width)	<ul style="list-style-type: none"> » How can the ICP approach be adjusted to keep addressing GHG emissions hotspots of the company, i.e., its own emissions and/or emissions along its value chain?
Impact (Depth)	<ul style="list-style-type: none"> » What type of decisions does the ICP approach need to influence to keep addressing GHG emissions hotspots in the value chain? » How can the ICP approach become increasingly embedded in the everyday operations of the company and more mainstream in the decision-making process? » Which decisions of the company or its value chain partners has ICP influenced so far?
Impact (Time)	<ul style="list-style-type: none"> » How does the plan to strengthen the ICP approach over time need to be realigned to reflect current circumstances in the company or external developments?
Administrative burden	<ul style="list-style-type: none"> » What is the administrative burden for the involved departments or employees and how does that weigh against the potential benefits of ICP? » What can be done to reduce the administrative burden? » Are there any other corporate climate tools possible that could reach the same goals but lead to less administrative burden? » How easy is the monitoring process?
Alignment with other policies	<ul style="list-style-type: none"> » How can the ICP approach remain consistent with other company policies and priorities?

Assess the KPIs and the results of internal interviews, surveys, and audits to understand the performance, acceptance, and uptake of the ICP approach in business operations, and if improvements are needed. At the beginning, it may not be possible to quantify its performance, as fewer KPIs may be recorded to reduce the burden on employees in the monitoring process. However, as the employees get used to the monitoring process, more KPIs can be monitored to allow for detailed quantitative performance analyses. These include using regression models to calculate the extent to which the ICP approach has contributed to achieving its objectives, and a cost-benefit analysis to determine how the administrative burden of using ICP weighs against the benefits it has brought.

Revise the ICP as needed and communicate the changes to the staff, building on the insights from Steps 1 through 3 of this guide.

Outcomes in the 4D Framework:

Evaluating and realigning the ICP approach will help:

HEIGHT

Assess whether the carbon price used is adequate to drive change and meet objectives, and determine whether it should be modified.

WIDTH

Determine if ICP results in the GHG emission reductions that were expected, and decide whether to change the scope of the approach.

DEPTH

Analyse whether ICP is the best approach to achieve the objectives set and revise the approach to maximise influence on business decisions.

TIME

Decide on the aspects of the ICP approach that need to be revised and when to optimise its impact over time on driving the company towards a business strategy that is in line with the transition to a low-carbon economy.

Practical Example

The current ICP approach of Danone was developed based on the previous ICP approach that was implemented from 2010 to 2012. Following the Paris Climate Change Conference in 2015, Danone decided to renew its focus on climate change by setting a target to become carbon neutral by 2050. Implementing ICP was one of its strategies to contribute to achieving this target. Danone subsequently evaluated and updated its old ICP approach to a carbon price level that was in line with its carbon neutrality target. Based on experience with its old approach, Danone also amended the ICP approach to ensure it would steer decisions towards the

most efficient GHG emissions reduction projects and that it was suitable for its subsidiaries to use. Furthermore, the evaluation looked at the parts of the organisation and the steps of the decision-making process which ICP could be applied to incentivise low-carbon decisions. This resulted in the current approach of using ICP in CAPEX decisions; Danone is also considering expanding ICP to procurement decisions. After one year of operating under this new approach, the ICP governance team is collecting feedback from different divisions in the company on its use of ICP. This will feed into the development of Danone's future corporate strategy on climate change.

LIST OF ABBREVIATIONS AND ACRONYMS

	°C	Degrees Celsius
	4D	Four Dimensional
C	CAPEX	Capital Expenditure
	CEO	Chief Executive Officer
	CFO	Chief Financial Officer
	CO₂	Carbon Dioxide
	CO₂e	Carbon Dioxide Equivalent
	CPLC	Carbon Pricing Leadership Coalition
	CPU	Carbon Pricing Unlocked
	CSR	Corporate Social Responsibility
E	ETS	Emissions Trading System
F	FSB-TCFD	Financial Stability Board Task Force on Climate-related Financial Disclosures
G	GHG	Greenhouse Gas
I	ICP	Internal Carbon Pricing
	IEA	International Energy Agency
K	KPI	Key Performance Indicator
M	M&A	Mergers and Acquisitions
R	R&D	Research and Development
	ROI	Return on Investment
U	US\$	United States Dollar
W	WEF	World Economic Forum

ANNEX

This guide takes its inspiration from a number of published resources and guides to ICP. These are listed here.

- » **CDP**, *Company Responses to Annual CDP Questionnaire on Climate Change, 2016*, <https://www.cdp.net/en/responses/>
- » **CDP**, *Embedding a Carbon Price into Business Strategy*, September 2016.
- » **EpE and I4CE**, *Internal Carbon Pricing – A Growing Corporate Practice*, November 2016.
- » **EY**, *Shifting the Carbon Pricing Debate*, December 2015.
- » **Microsoft**, *The Microsoft Carbon Fee: Theory & Practice*, December 2013.
- » **MIT Sloan School of Management**, *Designing an Internal Carbon Fee Program*, May 2015.
- » **RILA**, *Internal Financing Guide: Policies and Funds*, October 2016.
- » **UNGC, UNFCCC, and UNEP**, *Business Leadership Criteria on Carbon Pricing*, a Caring for Climate report, September 2014.
- » **UNGC, UNFCCC, UNEP, and WRI**, *Executive Guide to Carbon Pricing Leadership*, a Caring for Climate report, December 2015.
- » **WBCSD**, *Emerging Practices in Internal Carbon Pricing – A Practical Guide*, December 2015.
- » **Yale University**, *Yale University's Carbon Charge: Preliminary Results from Learning by Doing*, October 2016.

Ecofys, The Generation Foundation and CDP, *How-to guide to corporate internal carbon pricing – Four dimensions to best practice approaches*, December 2017. Prepared under the Carbon Pricing Unlocked partnership between the Generation Foundation and Ecofys in collaboration with CDP.

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