

Net Zero Playbook



From the Science Group CTO Forum

Amcor Global Flexibles | Bayer Crop Science | Mars Incorporated | PepsiCo Inc. |
Solvay SA | Stepan Company | The Procter and Gamble Company

Science Group is an international, science-led services and product development organization comprising three operating divisions: R&D Consultancy; Regulatory & Compliance; and Frontier Smart Technologies.

Science Group's CTO Forum was established to facilitate knowledge transfer between those leading the research and innovation organization of major international companies. It tackles issues of material interest to R&D leadership with the goal of sharing insights and of developing actionable tools and methods that can be put to practice within the R&D function and so help companies tackle key challenges ahead.

To create these outputs, Science Group participates in (and facilitates) the Forum regularly consulting with senior executives of the participating companies, drawing on its own wide base of knowledge and experience, and undertaking its own research.

Science Group is grateful for the cooperation, support and insight provided by the members of the CTO Forum:

- **Jason Keiper** – Vice President and Chief Technology and Sustainability Officer, Stepan Company
- **Maria Velissariou** – Global Corporate R&D Vice President & Chief Science Officer, Mars, Incorporated.
- **Nicolas Cudré-Mauroux** – Chief Technology Officer, Solvay SA
- **René Lammers** – Executive Vice President & Chief Science Officer, PepsiCo Inc.
- **Robert Reiter** – Head of Research & Development, Crop Science Division, Bayer
- **Victor Aguilar** – Chief Research, Development and Innovation Officer, The Procter and Gamble Company
- **William Jackson** – Chief Technology Officer, Amcor Global Flexibles

Science Group is represented by

- **Caroline Potter** – VP Sustainability, Sagentia Innovation
- **Dan Edwards** – Group Managing Director, Science Group Plc
- **Michael Zeitlyn** – President Advisory Service, Science Group Plc

Using this Playbook

This Playbook has been developed to help R&D leadership tackle the challenge of reducing carbon.

The **Introduction and Orientation section** of the Playbook describes the challenges faced by R&D and introduces the 'Net Zero Maturity Model'. A simple visualization and diagnostic tool, it plots R&D's journey towards actioning net zero. The Model helps to identify areas that may require attention and points to the relevant 'Plays' and 'Principles' that are found in the body of the Playbook that may help the company realize its net zero ambition.

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Blue Chips have made public their net zero commitments. Implementation is now in full swing – but the journey will be tough. This Net Zero Playbook offers senior leadership a head start with a distillation of the principles and practices conceived and trialled amongst Science Group and the CTOs of Solvay, P&G, Amcor, PepsiCo, Mars, Stepan and Bayer Crop Science.”

– Dan Edwards - Group Managing Director, Science Group Plc.

The content is organized into three Plays:



Play 1 - **Commit:** Chief Technology Office or Chief Science Officer (CTO/CSO) working with peers outside of R&D (internally and externally)



Play 2 - **Plan:** CTO/CSO working with the R&D leadership team



Play 3 - **Do:** R&D leadership working with the R&D team, leadership in other internal business functions, and external partners.

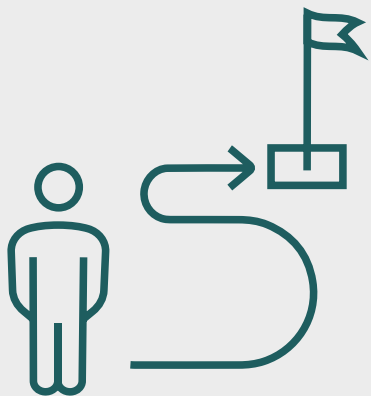
Introduction and Orientation

Your organization is on a journey towards net zero

You are in good company. Alongside leading businesses in all sectors, we are facing up to the realities of implementing greenhouse gas emissions reduction and of innovating to create products that serve the carbon reduction needs of customers.

R&D will make a significant contribution to progress, and will need principles and tools to address the challenge.

Let this Playbook help...



The first step is to recognize that we are on a journey towards net zero

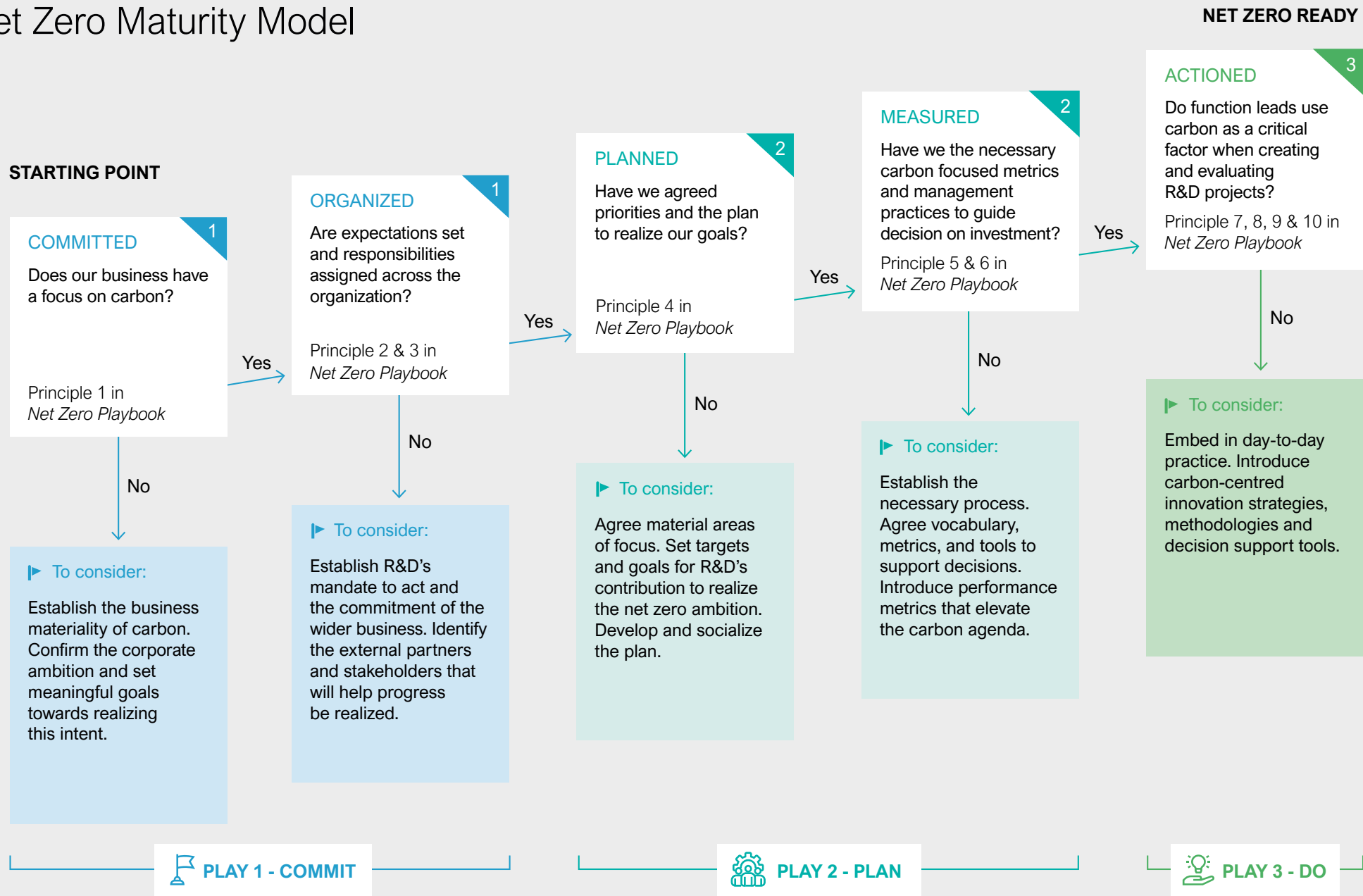
Business faces a climate imperative. As nations commit to reducing their GHG emissions, companies also must take appropriate steps. Promises, plans and actions are being scrutinized and companies need to be confident in their strategy and their ability to deliver meaningful change.

The first step is to recognize “the journey” towards net zero and to understand where on that path the company is. Companies must lay down the foundation that allows R&D and other functions to prioritize the carbon agenda. Business functions can then evolve their thinking and practices to make them compatible with a net zero outcome. There are several steps in this journey and viewed from R&D’s perspective, the ‘Net Zero Maturity Model’ charts the forward path.

The maturity model is presented as a linear progression of dependent steps. Best practice would have the corporate foundations laid before other departments act to any significant degree. However, in practice few companies will be starting from an entirely clean sheet and many will be progressing on several fronts simultaneously and not always in the prescribed sequence. Companies have to be pragmatic but to realize the necessary scale of change, obvious ‘gaps’ in the upstream portion of the journey need to be ‘backfilled’.

The Net Zero Maturity Model serves as a simple ‘diagnostic’ tool. Although it can be used to appraise the whole company, some companies may need to consider looking through the lens of specific business units, or regions. Company structure, culture, and ways of working all influence the operation of the organization and carbon maturity may vary across the business.

Net Zero Maturity Model





R&D leaders are well equipped to navigate the technical complexities of net zero

In companies yet to establish a corporate mandate for carbon reduction, R&D may need to take the initiative. Of all business functions R&D may be best placed to provoke the discussion and implement the changes that will create the momentum for carbon reduction. R&D leadership is well positioned to provide informed scientific perspective on what is a complex technical issue. R&D leadership can act as a change agent and may expect to make the early headway that provides the evidence needed by the CEO and wider business executive. R&D can make a significant contribution to realizing the corporate ambition for carbon reduction. But to achieve what's possible it will require the cooperation of other business functions and external partners.

From here...

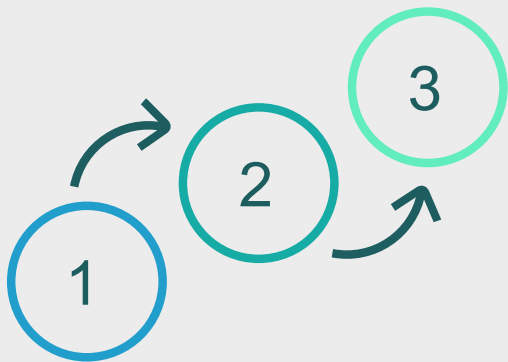
From here we will describe the principles and realities of delivering net zero over the coming years. This Playbook and the principles highlighted are intentionally focused on realizing progress towards net zero. Business practice though will demand companies also continue to make progress on other sustainability goals such as plastic waste, biodiversity, water etc. Sometimes what is the right course of action for climate change may be at odds with realizing progress on another sustainability issue. Companies will need to acknowledge and manage these trade-offs and may for given geographies, markets or categories decide that net zero goals are trumped by another sustainability goal, but overall companies will need to deliver substantive progress on GHG reduction.



Overall, the Playbook spotlights 10 key principles. Companies that embrace and embed those principles that resonate with their business will be more likely to realize their net zero ambitions.

Principles in Overview

Ten key principles across the three plays



Play 1 - COMMIT

Make carbon reduction a core value and an unambiguous point of focus with identified goals and responsibilities

1. Learn to articulate carbon and other sustainability themes as distinct but related issues
2. Have an explicit mandate for R&D (and other science and technology functions) on carbon reduction
3. Recognize where external partnership is a prerequisite for success on carbon reduction



Play 2 - PLAN

Make carbon reduction a central tenet of R&D planning and performance measurement

4. Don't trust to luck; plan from where and by when R&D effort will yield carbon reduction
5. Assess the 'carbon health' of R&D's portfolio to make sure it is fit for purpose and aligned to carbon reduction
6. Expect 'the carbon impact' to be part of any conversation on innovation



Play 3 - DO

Make carbon reduction an essential consideration in mainstream innovation practice

7. Start with the customers, products and/or brands with an affinity for net zero messaging to build early momentum
8. Realize the market value of a climate-friendly product
9. Find the synergies and flywheels; where innovating to serve the needs of the market creates opportunity to reduce carbon
10. Consider trading-off on price and/or performance where a reduced carbon product would enable a bigger win for the business

Play 1 – COMMIT

Key Principles



1. Learn to articulate carbon and other sustainability themes as distinct but related issues

Acknowledge that carbon is one of several sustainability issues, provoke a discussion on when carbon does and doesn't 'trump' other sustainability goals.

Carbon must be separated from other sustainability issues to create the focus needed to drive change. The actions needed to serve one sustainability goal can be detrimental to progress on another, and circumspect of the risks.

Companies need explicit and unambiguous carbon reduction goals (including clarity on the need to act on scope 1, 2 and 3), a clear strategy, and well-defined metrics. A focus on carbon does not lessen the importance of other sustainability ambitions and carbon may not always be deemed the priority. However, by prioritizing other areas progress on carbon reduction may be compromised. R&D should provoke a discussion on when, where, and why carbon is and is not the primary concern.



2. Have an explicit mandate for R&D (and other science and technology functions) on carbon reduction

Consider the impact and timing of R&D versus other functions and make metrics and incentives carbon centric.

Achieving net zero is a business wide endeavor with different functions each taking a share of the GHG reduction load. Companies must ensure that it is not viewed as someone else's responsibility. R&D's contribution is likely to be significant, but its effort must be reserved to help realize the carbon gains that other parts of the business can't so readily achieve.

It should leverage and build on the contribution of other functions. R&D is not always the only or best way to progress the agenda and its resources should be used intelligently as part of a coherent and coordinated business-wide effort. Defined responsibilities and clear expectations need to be coupled with relevant incentives and metrics. Companies must include measures that reward and facilitate business-wide support to carbon reduction initiatives to fully realize the opportunity and avoid conflicting initiatives.

Make carbon reduction a core value and an unambiguous point of focus with clearly identified goals and responsibilities



3. Recognize where external partnership is a prerequisite for success on carbon reduction

Decide where the company can act alone and where it must act with others outside the organization if it is to make meaningful progress.

Substantive progress on carbon reduction may require the wider support and participation of customers, suppliers, regulators, other stakeholders and even competitors. The company must assess and decide where collaboration and external engagement

provide the best route to make meaningful and lasting progress: external partners will need to be engaged, aligned and opportunities found to share the burden and gains associated with carbon reduction.

Play 2 – PLAN

Key Principles



4. Don't trust to luck; plan from where and by when R&D effort will yield carbon reduction

Make smart bets; commit R&D to battlegrounds (e.g., categories etc.) with the potential to yield carbon reduction at the scale needed by the business and/or its customers.

R&D needs to account for how it will realize the scale of carbon reduction required of it by the company within a target timeframe. It must identify the battlegrounds (specific categories, markets, brands, customers etc.) that are likely to yield meaningful reduction and over what timeframe the business can be expected to reap the benefit of these advances. Invest resources accordingly.

R&D also should consider the types of innovation that will be required to capture this opportunity. It needs to consider the merit of concentrating on a few big bets versus accumulating the net yield of many smaller successes. The time and risk profile of these strategies differ so R&D leadership must balance the portfolio to align to the strategy and goals. As it evaluates different options it should also consider the extent to which progress will need third party involvement and as appropriate consider the merit of pre-competitive industry-wide collaboration.



5. Assess the 'carbon health' of R&D's portfolio to make sure it is fit for purpose and aligned to carbon reduction

Make carbon impact a standard lens through which to view the R&D portfolio. Be prepared to rebalance investment to stay on the correct carbon reduction trajectory.

Success on net zero will be realized by the net impact of the portfolio, not the win or loss associated to an individual project. Evaluate the portfolio from a carbon reduction perspective as well as by other conventional metrics and be prepared to adjust investment to achieve appropriate balance. As carbon data becomes more readily available expect to routinely forecast the likely impact of the R&D portfolio on the GHG emissions associated with future business activity.

Make carbon reduction a central tenet of R&D planning and performance measurement



6. Expect 'the carbon impact' to be part of any conversation on innovation

Make carbon a hurdle for all innovation projects alongside strategic fit and commercial return and don't let data be a barrier.

Carbon is currently too often treated as an afterthought; to move the needle towards net zero the estimated carbon impact of proposed new products or other innovations must be viewed as a hurdle in the same way that price and performance already are.

Companies will need to remain pragmatic; perhaps setting different levels of hurdle for different parts of the business and at times making exceptions after considering the wider business case. The accurate calculation of carbon impact can be difficult, R&D will need to get comfortable with the idea of working with the available data, accepting approximations, and using what data there is to provoke discussion. Currently data used to estimate carbon impact often lacks quality. It will get better. In the meantime, R&D should trade accuracy for speed, leveraging value from the conversations data concerns provoke.

Play 3 – DO

Key Principles



7. Start with the customers, products and/or brands with an affinity for net zero messaging to build early momentum

Capitalize on the brands, customers, and products with an affinity for net zero messaging as these will likely gain traction and more likely to support premium pricing.

Screen brands, customer segments, and innovation platforms to reveal where there is an overlap (or not) with the equity of net zero – ‘not all brands are created equal’ and not all customers are ready to transition. By selecting those which resonate with a climate-friendly message, companies are more likely to succeed and thereby create early momentum in the market.

They are also more likely to do so without the need for compromise on price. As companies look to realize this opportunity, they should also re-examine current products and past innovation, looking at them through the carbon reduction lens. Carbon impact is a new measure of performance that may have been previously overlooked and a fresh look may reveal hidden gems.



8. Realize the market value of a climate-friendly product

Expect that the customer will have to ‘pay’ for the benefit of reduced carbon products and learn how to make the case.

Miracle innovations are not the norm; if the carbon reduction benefits the customer, the business must be confident in marketing either a premium (price) for the net zero upgrade, or a product that legitimately trades-away performance.

Where regulation and standards favor or require carbon reduced products, the market will likely accept price or performance compromise and companies should scan the horizon to detect these opportunities. In the absence of regulations or standards, companies need to consider how different customers, brands, markets, and product use cases resonate with climate-friendly messaging. These opportunities should be found and leveraged.

Make carbon reduction an essential consideration in mainstream innovation practice



9. Find the synergies and flywheels; where innovating to serve the needs of the market creates opportunity to reduce carbon

Engineer opportunities to serve conventional market needs in ways that serendipitously deliver carbon reduction.

Serving market need remains the business imperative. Although carbon reduction is not normally a primary value parameter, R&D teams should find opportunities whereby solving the customer’s primary need can be re-engineered to simultaneously deliver a carbon reduction benefit.

Innovators need to systematically ‘challenge’ how and where they can create synergies between key innovation platforms and carbon reduction and upweight the effort to realize these opportunities.



10. Consider trading-off on price and/or performance where a reduced carbon product would enable a bigger win for the business

Take risks that might sacrifice price or other conventional value parameters in anticipation of demand shifting to climate-friendly solutions.

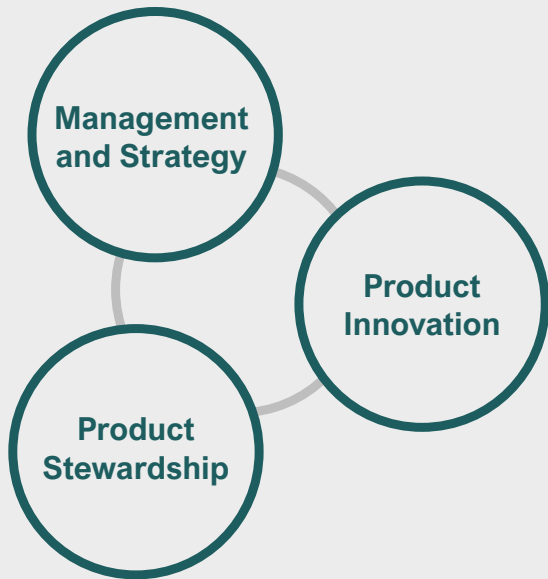
As focus on reduced carbon products sharpens there will be opportunity to realize bigger wins even though it may come at a short-term cost. Companies must be prepared to take the hit on margin to win on share and profit and/or to take a leadership position in fast growing market spaces.

In time carbon impact is likely to emerge as a significant value parameter; R&D must consider if, where and when there is need to reframe the value proposition and even reimagine their business model to realize this opportunity. Recognize that carbon-unfriendly products run the risk of losing market share in the medium-term and, as and where reduced carbon becomes a hygiene factor, companies must expect to make strategic trade-offs with an eye to staying in the game or to mitigate the risk of loss. If you do not assess the downside risk of no change, you may come unstuck.

Conclusions

Recommending 3 areas to focus on

Consider where your organization is on its net zero journey and how management practice might need to evolve. Expect to improve the quality of the conversation on carbon reduction and other sustainability issues. As you look at realizing your carbon ambition we recommend you consider three activities:



Management and Strategy

The focus on carbon reduction will continue to increase in the years ahead. There will be difficult challenges but also opportunity to be grasped. 'Carbon impact' must become a central consideration in day-to-day management thinking, and be embedded in organizational culture. Leaders will need to be articulate in the language of its practice, clear as to their mandate for action, and expect to collaborate internally and externally to realize the ambition. The strategy and planning process must tackle carbon reduction goals with metrics in place to help maintain the correct trajectory. The 'climate clock' is ticking and trusting to luck is not an option. Confronted with many possible battlegrounds, companies will need to analyze their options and invest dollars on the areas likely to give carbon return on investment. They will also need to look beyond the success of individual projects and consider the net impact of their portfolio.

Identify the best investment bets for carbon reduction and use tools to quantify and track the net contribution of your portfolio to greenhouse gas reduction.

Product Innovation

To achieve their net zero ambition, companies will need to ground their aspiration in mainstream activities. Product innovation teams must consider the carbon implication from the outset. Where possible they should look for opportunity to realize value from reduced carbon solutions. Although there may be occasions when companies have to consider accepting a short-term trade-off to realize a carbon reduction, in the medium term carbon reduction will benefit all parties.

Introduce process to make carbon a key consideration for innovation, provide tools that help to reveal opportunities to reduce carbon and benefit the customer, and be open to strategic plays that will deliver carbon reduction and business value.

Product Stewardship

Emerging regulation, evolving standards, NGO advocacy, increasing stakeholder scrutiny, and the growing significance of ESG reporting are factors that compound the pressure on product companies. Businesses will need to look at their supply chain and consider the risks and opportunities ahead. Some challenges may require industry members to work together to achieve necessary change. No industry is immune, companies must apply sustainable principles and ensure claims are founded on robust evidence.

Consider the implications of current and future regulation, standards, and practices and work with internal and external parties towards science based commercially astute solutions.

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