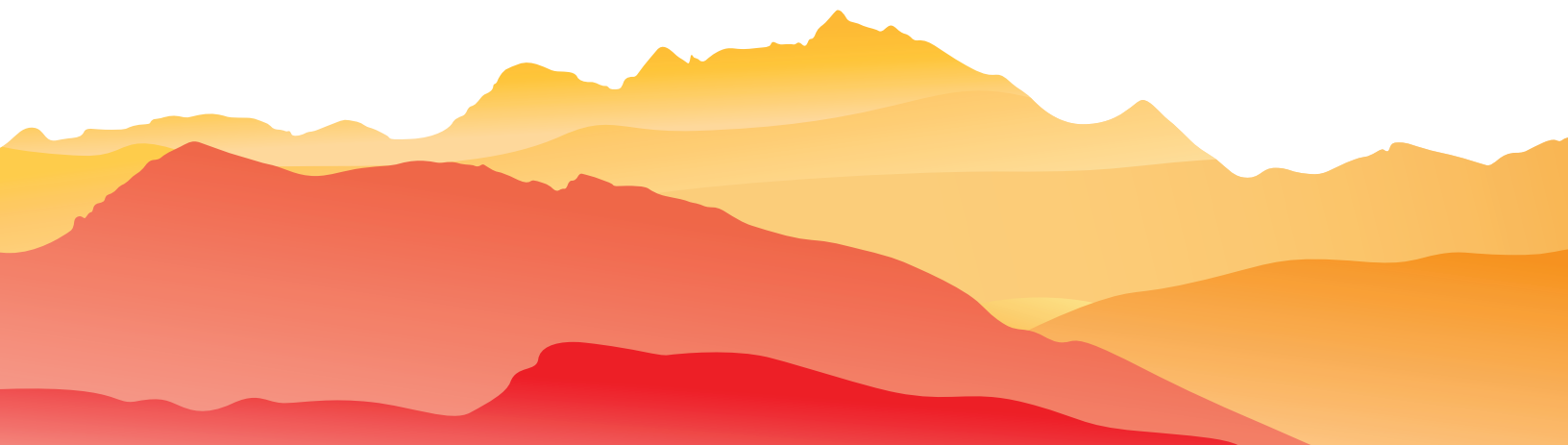




# How to accelerate sustainability and inclusion through a rapid innovation methodology





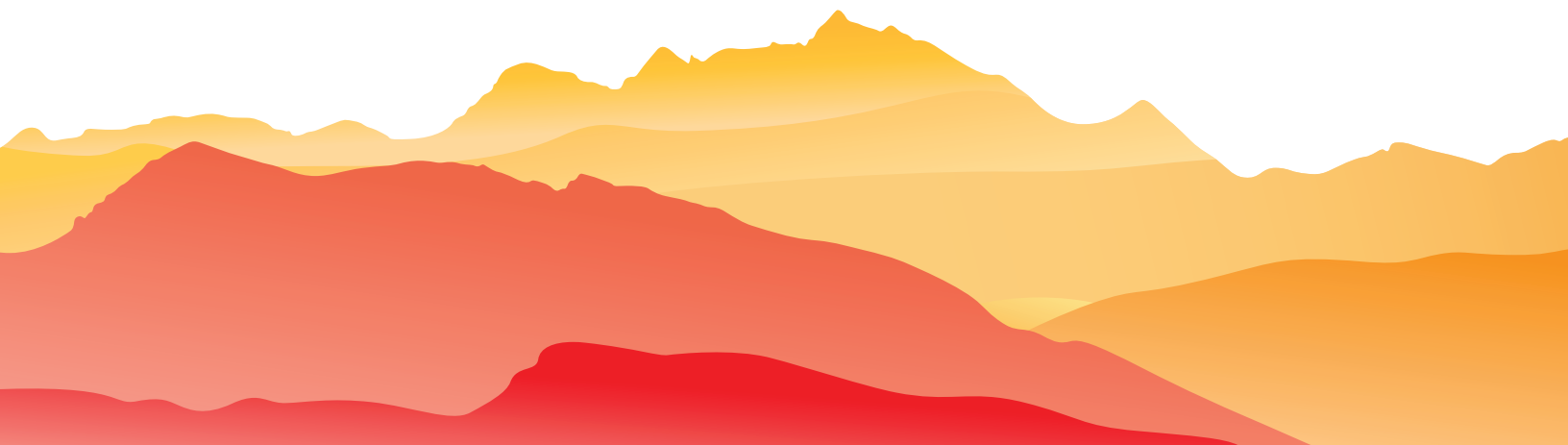
**Daniel Chartier**, Innovation Research Lead, Sustainability

**Debra Slapak**, Senior Director, Innovation Strategic Initiatives

**Rita Stern**, Product Designer Lead

The authors are grateful to the Iron Mountain Sustainability team, including Erin Gately and Jen Grimaudo.

This paper introduces an inclusive, research-driven rapid learn-and-pivot methodology to help CIOs, CTOs, and product development teams integrate sustainability and inclusion into their development processes.





# Executive summary

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Enterprise leaders are shifting their cultures and processes to take a longer-term view of what matters most: our people and our planet. A [Gartner, Inc. survey<sup>1</sup>](#) of CEOs and senior executives finds, “For the first time ever, CEOs place environmental sustainability in their top 10 priorities.” After decades of refining strategies that drive growth and profitability—often with minimal focus on environmental sustainability—many organizations are discovering that stepping up efforts in this area pays big dividends. Among the potential benefits is achieving their traditional objectives by attracting the best talent and more loyal customers, partners, and other stakeholders.

Such shifts are not easy. Just as the old ways of thinking

no longer suffice, the old methods of generating innovation no longer deliver against the range of values that leaders, consumers, business partners, shareholders, and employees expect.

How do you approach wide-scale change? Whether in small steps or large strides, organizations can retrofit existing products and practices and design new products and services with sustainable practices at their core. Here, we provide background on the challenges of achieving sustainability goals and propose a practical methodology for solving these challenges in an inclusive, stakeholder-centric, rapid-iteration approach.

## Emphasis on “cycle”

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Building sustainable products doesn’t mean altering the traditional product lifecycle, although it does shift the focus and layer in some complexity to accommodate sustainability. Every team involved in the solution lifecycle must consider more variables, factoring in the environmental and human impact of the offerings they’re developing.

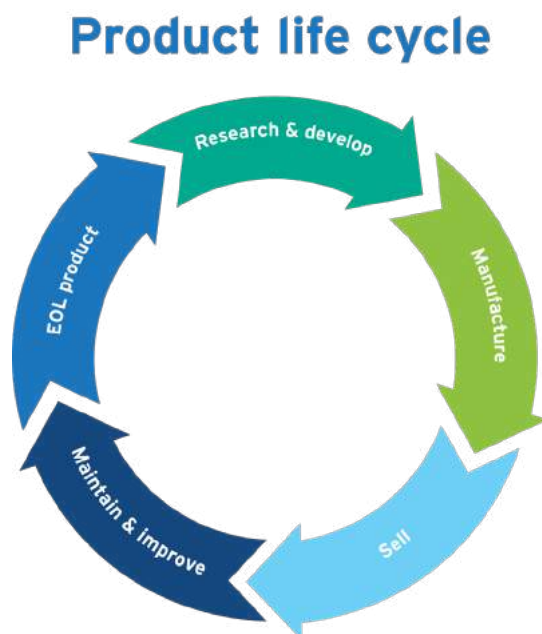
Will the methods and materials they’re using lower their environmental footprint? Will their processes contribute to a circular economy in which materials and products stay in use as long as possible and then are broken down to be reused in new products or elsewhere?

Will their products and services accommodate different perspectives, values, capabilities, and needs? How will they get to those kinds of outcomes?

Two of the biggest challenges to building sustainable products and services are reducing the greenhouse gas emissions associated with their production and delivery and ensuring that they can recycle physical products into new products. Product design teams must reduce emissions and design physical products so that they become the source material for the latest version of their

product or a new product altogether—or even some other organization’s product.

To understand how organizations can move forward more quickly to meet their sustainability goals, let’s look at the challenges in creating sustainable products and some emissions basics.



<sup>1</sup>Gartner. Raskino, Mark, Moyer, Kristin, and Smith, Stephen. “2022 CEO Survey - The Year Perspectives Change.” Published 12 April 2022.

# Roadblocks to sustainable products

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Implementing sustainability in existing and new products may often be impeded by the types of roadblocks listed here:

## Sustainability roadblocks

### > Existing products

- > Not economically feasible
- > Change isn't fast enough
- > Communication and goals

### > New products

- > Lack of knowledge
- > Lack of understanding
- > Requirements lack sustainability goals

## Existing products

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When a product is in the market, product teams can't just shut it down and redesign it so that it causes less pollution, debris, landfill, and so on. In this "existing products" scenario, product teams are churning out updates and have conflicts: Can the pricing model support the additional costs of decreasing the carbon footprint or designing a mostly plastic product to eliminate metal screws, for example? How much change can these teams make between shrinking product release cycles? How much change is enough? These challenges are compounded when leaders don't consistently communicate why sustainability is critical and what the goals are over time.

Product teams may have executives saying, "We're going to do what's right and lower our emissions. Meanwhile, another says, "We have to hit the numbers this quarter!" which can translate to: "We need that update/new version now!"

# New products

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When new products are being designed and developed, a lack of sustainability requirements is one of the biggest challenges.

For example, too often, emissions requirements aren't stated for manufacturing, total product lifetime, or anywhere between. When the requirements don't exist, the product teams will not focus on that while trying to meet the stated requirements. A lack of understanding

about what product teams need to accomplish often combines with a lack of knowledge about how to achieve it.

While goals are the executive team's responsibility, product teams can benefit from increasing their understanding of greenhouse gas emissions and circular economy principles.

# Greenhouse gas emissions basics

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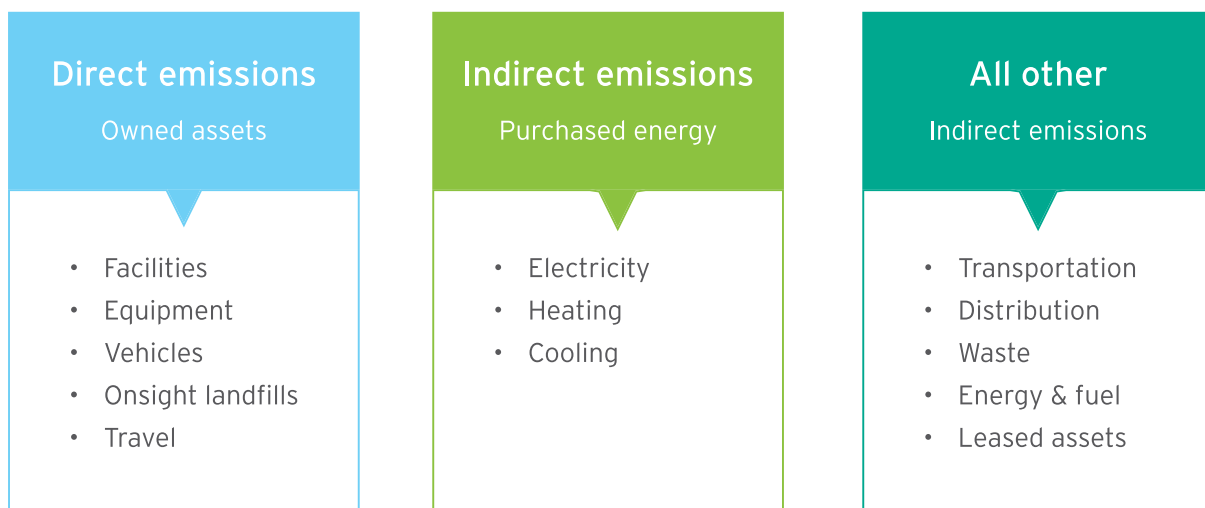
Greenhouse gases (GHG) trap heat in the atmosphere, causing climate change and impacting the environment and health of humans and other living species.

Greenhouse gases are emitted when burning fuels such as coal, oil, and natural gas, as well as solid waste, trees, and other plant materials. GHG also are created from chemical reactions in some manufacturing processes, such as concrete production.

three basic categories, represented as Scope 1, 2, and 3 emissions, as shown in the following figure. The figure also shows some examples of activities that produce GHG. Scope 1 emissions are created at your facilities; Scope 2 emissions are created in providing power for your facilities; and Scope 3 emissions are created by your value chain—your suppliers and emission from the products you produce.

**Greenhouse Gas Protocol, United Nations Intergovernmental Panel on Climate Change**, and other organizations generally group GHG emissions into

## Carbon emissions basics



Emissions occur throughout the value chain of a product to the responsible disposition at the end of life.

### Scope 1: direct emissions

Emissions from an organization's manufacturing and operational processes. If an organization owns a fleet of trucks running on diesel power, the emissions from those trucks are part of an organization's Scope 1 emissions.

If a manufacturing process emits GHG, the emissions are driven by the company's decisions and direct actions, so that's part of their Scope 1 emissions as well. If a company produces gas-powered lawn mowers, any emissions from the manufacturing or assembly processes count as part of their Scope 1 emissions. Companies that put their mind to the problem are usually moderately successful in reducing Scope 1 emissions to as little as 1-2% of their total emissions.

### Scope 2: indirect emissions (purchased energy)

These emissions are from electric-powered lighting, heating, and cooling. Generating that power creates emissions that organizations have to control. How can they do that? The fixes are 1) reducing the amount of electricity they use, 2) migrating to renewable energy sources, and 3) migrating to energy sources that are less greenhouse gas-intensive to get these emission levels down to 1-2% of their overall emissions. A few options are available:

- Set up solar or wind power generators (Wave, hydro, or others work, too, but are far less common).
- Contract with a power distributor to purchase renewable power to cover usage, but understand that once the power is in the grid there's no difference between dirty or renewable energy. The power distributor can't send greener energy to one manufacturing plant and dirty energy to a plant down the street.

- Purchase certified Renewable Energy Credits (REC) or a local equivalent.

Many companies that supply power will do a low- or no-cost energy audit to help their customers use power more efficiently.

### Scope 3: all other indirect emissions

These are other value chain emissions, including the Scope 1 and 2 emissions from the companies with which that company is doing business and other indirect activities that do not fit into a company's scope 1 and 2 emissions. Let's say that one of your suppliers is a company that distributes your products for you. They're not building anything, but they're burning fuel, using electricity in their offices, and so on. These activities are in service of your account, so they contribute to your upstream emissions. Likewise, a parts supplier's Scope 1 and 2 emissions are a manufacturer's Scope 3 emissions.

Or, if employees travel for business or commute to an office, these would be considered indirect activities-for which your company is still responsible.

Organizations must choose suppliers carefully to ensure they do everything possible to reduce emissions and consider other indirect activities that leave a greenhouse gas footprint.

# Honest sustainability

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Organizations also have to beware of “greenwashing.” Greenwashing involves making an unsubstantiated claim that could lead consumers to believe that a company’s products are environmentally friendly or have a more significant positive environmental impact than they do.

Let’s take this example: There are several ways to report emissions, and we must be careful to understand which are appropriate. If you’re making a statement about a reduction in total emissions, then the value should be in tons of GHG, not on a per-unit basis. If you’re describing improvements your company has made on a particular product or in manufacturing, values “per square foot” or “per dollar [or other currency] of revenue” may be appropriate. Both are essential for internal

improvements. Where you have to be careful is when a company reports only a “per \$ [or other currency]” or “per unit” value because that could obscure the fact that their total emissions have increased.

Greenwashing is often unintentional, which is why companies must ensure they educate anyone who might be communicating about the sustainable attributes of products or services. Enterprises also need to have processes to review external statements for any instances of greenwashing. There is increasing interest and action from regulators on the topic as well, which means that companies that engage in greenwashing could face fines and/or penalties in addition to reputational damage.

## Reduction and avoidance of GHG

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Two other important definitions are *reduction* and *avoidance*. Organizations have to do both to succeed.

Reduction is reducing the amount of GHG an organization emits. If a product emits a thousand tons of GHG per month and is no longer produced, the result is GHG reduction.

If a second, lower-emission product is introduced by that same organization to eventually replace the first product and the two products are produced in parallel, there are no savings. The organization will have increased its total

GHG emissions. Savings occur when the first product in this scenario is shut down.

Avoidance is another essential part of the overall picture. It’s where teams make sound decisions regarding the environment to emit as little GHG as possible. Deciding to manufacture a product that generates no GHG emissions is better than using a method that produces 100 tons of GHG emissions. But making this decision cannot be considered an emissions reduction. It must count as avoidance.

### Reduction and avoidance

#### Reduction

- Need to improve existing products to **reduce** the amount of emissions
- Total GHG emissions must be lower

#### Avoidance

- Make good decisions on new designs to create the minimal amount of emissions
- No new GHG emissions



Addressing reduction and avoidance requires innovation. When we make decisions about product design and manufacturing, we have to ask ourselves what we're sourcing as raw materials or components, how they're produced and assembled, and what's left at the end of life that can be reused.

Organizations also must understand how to market responsibly, ensuring that the savings they expect from

their decisions are actually savings-not fewer additions to the emissions problem.

If you don't keep these separate, greenwashing comes into play.

## Circular economy basics

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A circular economy is one in which "waste is eliminated, resources are circulated, and nature is regenerated," according to the [Ellen MacArthur Foundation](#)<sup>2</sup>. With this definition in mind, we can consider the lifespan of a product in terms of using the materials discarded at the end-of-life to create new versions of the same product or entirely new products. Where traditional product life spans go from production to use and disposal, a circular economy lifespan goes from production to use, to reuse, recycle, and production. The recycle step breaks down the remaining materials at end-of-life to make new basic materials organizations can use to create the next generation of products, creating a circle with little or no waste materials going into landfills.

Common concepts in a circular economy include:

> **Closed loop** - where materials at the end-of-life are used to make new instances of the same product

- > **Open loop** - materials at the end-of-life are used to make different products
- > **Zero waste** - the efficient use of circular economy methods to eliminate all waste that would be incinerated without energy recovery or sent to a landfill
- > **Linear economy** - the most common model currently used, based on a process where resources are extracted and products are created and then discarded after use.

<sup>2</sup>Ellen MacArthur Foundation. "What is a Circular Economy?" retrieved January 31, 2023.

# Innovation approach and process

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We're demonstrating through our research and development work that a dedicated Innovation team can quickly produce more sustainable designs for existing and new product development.

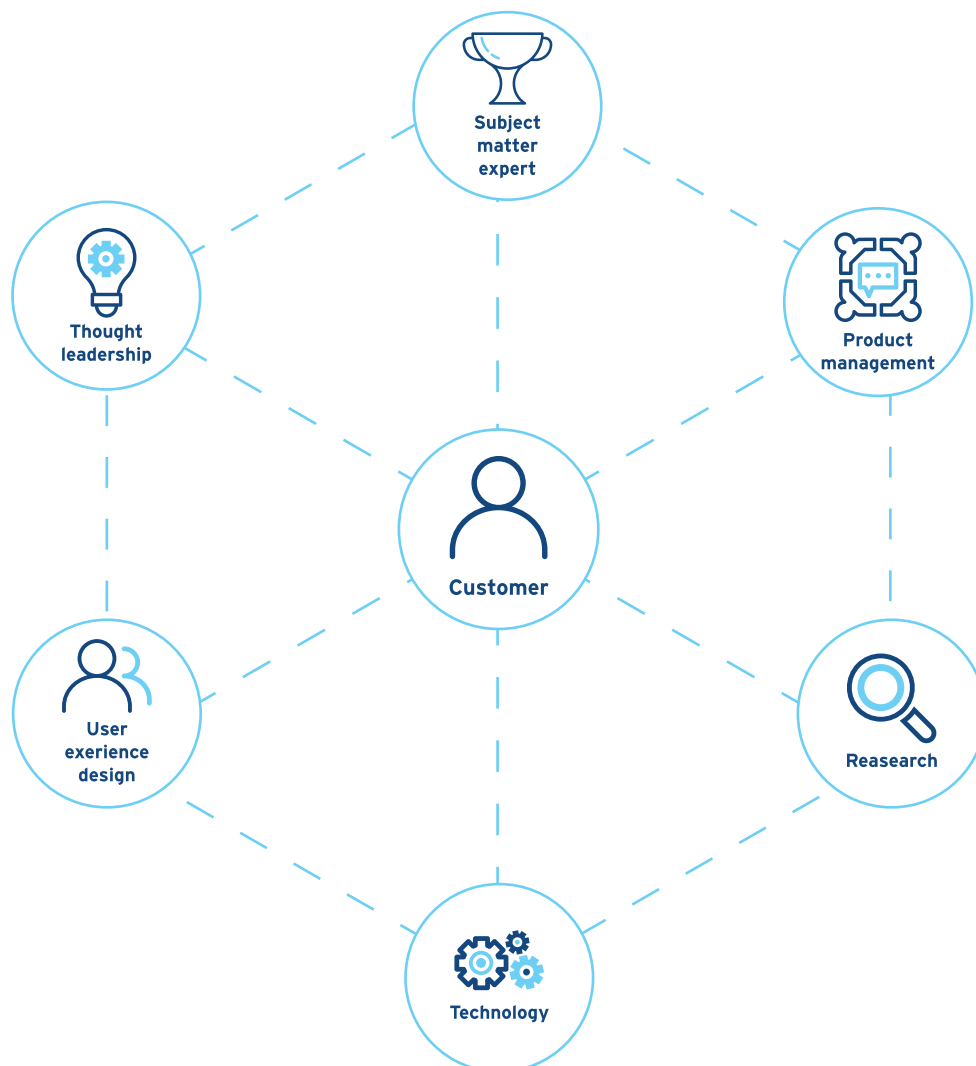
We've created an interdisciplinary team based on key capabilities such as a subject matter expert, product strategy, research, technology, user experience design, and thought leadership, with the customer's needs and goals at the core of everything we do.

Our team can identify potential new go-to-market opportunities using trend and exploratory research, including market and customer needs analysis. Once

we've identified those opportunities, we have the technical capabilities to build our proofs-of-concept. User experience design skills enable intuitive use, while thought leadership stories explain the value of our latest innovations.

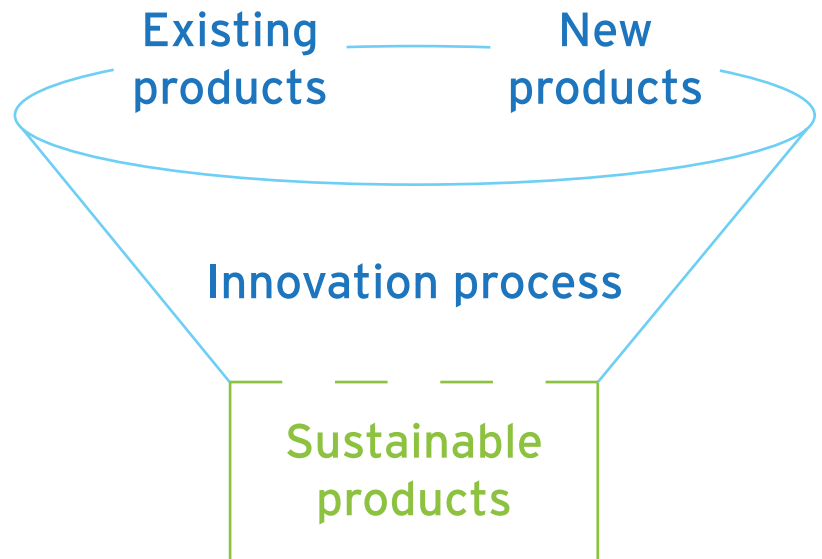
Promoting sustainability is an underlying theme integrated into our phased innovation approach. We drive existing and new product concepts through an innovation funnel and use a rapid learn-and-pivot methodology to implement proofs-of-concept and prepare to scale for production.

## Innovation team



# An innovation approach

A dedicated innovation team can quickly produce more sustainable designs for existing and new product development.



Our learn-and-pivot methodology is based on **Compassion-Driven Innovation: 12 Steps for Breakthrough Success**<sup>3</sup> co-written by two of our team members. In this four-phase methodology, we accelerate learning by including internal and external experts-

especially customers and potential customers-so that we can proceed to proofs-of-concept more quickly with fewer resources and less risk. Sustainability is the foundation of every project we consider.

## Innovation phase 1: include

The first step in our methodology is to include diverse subject-matter experts from various disciplines and conduct preliminary state-of-the-art research on the potential project. In this phase, we determine alignment with strategic themes and conduct research such as internal conversations, external discovery, academic review, and community research to recommend whether to proceed to more in-depth discovery.

Some questions we ask about sustainability and society in this early research phase are:

- > What are the sustainability considerations related to this area?
- > What is the state of the art for circular practices in this area?

- > What are the known social impacts?
- > Is energy consumption related to the area of research?
- > How can a solution or process related to this area reduce waste, lower energy consumption, or cut emissions?
- > How might it impact societal considerations? For example, can it improve the user's life? Might it take away or shift jobs? How can we be sure that it is non-discriminatory?
- > How can it help customers achieve their environmental, social, and governance (ESG) goals?

<sup>3</sup>Reineke, Nicole, Debra Slapak, and Hanna Yehuda. "Compassion-Driven Innovation: 12 Steps for Breakthrough Success. Business Expert Press." 2023.

As we move through this phase, we produce artifacts (documents, drawings, recordings, and the like) that summarize our findings and provide sufficient information to determine what to do: move forward to the next phase, shelve the project permanently (icebox it), or put it into the backlog for additional resources to be assigned. Key artifacts from Phase 1 are:

- > **Summary report** - initial investigation summary and recommendation on whether the findings support further investment. This will include identifying a

narrowing or segmentation of the project in alignment with strategic goals.

- > **Repository of market and technology research** - information used to establish current industry best practices and advanced thinking in this area
- > **Proto-relationships & proto-journey maps** - sketches of known relationships and descriptions of persona buying behaviors.

## Innovation phase 2: discover

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In this stage, we uncover, analyze, and prioritize buyers' and users' most important problems. We use exploratory research to ask non-leading questions to determine the challenges that require innovation—which we define as solutions—such as products or services that connect with a customer problem in a meaningful way. From this research, we understand more clearly how to use more precise language to communicate the problems and needs of buyers and users.

From a sustainability perspective, we consider the following:

- > What are the customer's ESG goals?
- > How important is it to the customer that this solution contributes to their ESG Goals?
- > How could a solution in this area help them meet their ESG goals?
- > How would they want to quantify improvement?

The artifacts from Phase 2 provide information about whether to proceed to the next phase, where significantly more investment is required. The artifacts produced are:

- > **Summary report** - the findings, challenge maps, and results from non-leading interviews—with recommendations on scope refinement, establishing a different research set, or ice-boxing the current research without the intention of moving forward.
- > **Journey maps and updated personas** - a refined understanding of the customer journey and personas based on in-depth discussions with individuals.
- > **Challenge maps are** an overlay of the high-level journey with the largest challenges and friction points to solve.

# Innovation phase 3: enlighten

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Responding to buyers' and users' challenges with proposed solutions is the work we do in Phase 3. We ensure that we fully understand the challenges to be solved within the context of what we could deliver to solve them in a given timeframe. Then we craft stories about how the buyers' and users' work can be eased by these solutions and give these individuals the opportunity to "edit" the story by providing feedback on the proposed solution.

In this phase, our sustainability focus is on answering questions about how to design a product or process to reduce waste, lower energy consumption, or cut emissions. We also consider potential social impact. These are example questions:

- Does the proposed solution reduce GHG emissions or other toxic materials currently used? Considerations may include reduced shipping, switching to environment-friendly materials, etc.
- Does it require powering new equipment (computers, scanners, trucks, lifts, etc.)? Does the equipment run on electricity or other power sources? Is the electricity from a renewable source?
- What is the societal impact of the proposed solution (jobs, pollution, discrimination)? How could you measure it?
- How can it help customers achieve their environmental, social, and governance (ESG) goals?
- Are special conditions or controls required (for example, climate-controlled storage, shipping methods, or special packaging)?

- What is the lifetime of the proposed solution? Is hardware being manufactured? Is it a data solution containing data that may need to outlive the hardware it runs on?

The artifacts we produce in this phase are more robust than in prior phases because of the increased resources and potential investment required as we move to the next phase. Following are examples:

- **Summary report** - findings with recommendations about scope refinement, establishing a different research set, or ice-boxing the current research
- **Research spike reports** - designed to resolve any new questions based on small-scale proofs-of-concept, if applicable
- **Interview reports** - from in-depth interviews conducted about the solution stories and messaging
- **Journey and workflow storyboards** - showing how challenges are addressed and work could get done with less friction
- **Solution requirement descriptions** - descriptions of what features, characteristics, or other elements are to be designed into the solution
- **Whitepaper** - describing the considerations and the resulting solution, if applicable
- **Protected intellectual property** - patent filings or other protections such as non-disclosure agreements or document labeling.

# Innovation phase 4: activate

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In this phase, the Innovation team partners with other organizational stakeholders to develop or build solution prototypes. We have engaged in customer interactions and internal reviews to ensure the viability of a recommended solution.

Key sustainability-related questions we address are the following:

- > Do the realities of production change the answers to the Phase 3 questions?
- > How do we measure the ESG impacts? What does our analysis show?
- > Is there a certification for ESG compliance for this project?
- > Do suppliers and vendors have ESG information on products that may be included in this solution?
- > Are the equipment and materials sustainably sourced from companies providing safe working conditions and living wages? How far back have we checked the value chain?
- > Can we design the product to be reused or refurbished at the end of life? Can we set up a system to recapture products at the end of life?
- > How can we minimize or avoid or minimize having materials left over at the end of life through material or process choices?
- > How can we build more durable products so there is less waste?

The artifacts we produce in Phase 4 to support a decision about whether to proceed to develop the initial solution offering include:

- > **Written report and executive presentation** - containing challenges, proposed solution descriptions, messaging, and financial information.
- > **Partnership with business financial representatives** - to identify likely financial models for revenue of the defined product.
- > **High-fidelity prototype** - a working solution (product or service).
- > **Proof-of-concept** - an experiment or pilot project that shows the feasibility of the proposed solution.
- > **Resource estimate** - for building and supporting the initial solution offering.

# Conclusion

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IDC finds<sup>4</sup> “that organizations want to work with like-minded technology vendors that demonstrate sustainable design capabilities, strong recycling networks, and secure and compliant decommissioning plans.”

To support our customers, partners, and internal Iron Mountain processes, our Innovation team includes the input of diverse team members, buyers, users, and

partners in designing, developing, and demonstrating the value of innovative business solutions. Our process includes questions and analysis that help drive positive environmental and social impact. Using our phased rapid learn-and-pivot methodology, we can discover and deliver innovative solutions that are both socially and environmentally conscious.

# Recommendations

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We recommend that every organization consider using a rapid learn-and-pivot methodology that considers sustainability and values inclusion as core elements of success.

1. Understand how the environmental impact is measured.
2. Identify your environmental sustainability goals.
3. Research your customers' challenges and needs, including sustainability considerations.
4. Adopt an agile methodology in which your teams talk with potential customers, analyze findings, and change course if needed before you ramp up resources to define a specific solution.
5. Develop messaging and a story to share with your customers to determine whether your planned solution solves their problem; then adjust the solution definition or do more research as needed. You may need a proof-of-concept or pilot to ensure you've gotten the solution right.
6. Iterate until you have reached a solution that works for your customer and is kinder to our planet and its people.

Click here for more information about how Iron Mountain can support your environmental sustainability, and governance goals.

<sup>4</sup>IDC. “Adopting Circular Economy Principles to Achieve Sustainability Goals” Retrieved February 28, 2023.



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