PACE

PLATFORM FOR ACCELERATING
THE CIRCULAR ECONOMY

CIRCULAR VALUE CREATION

Lessons from the
Capital Equipment Coalition

Davos, January 2019

EXECUTIVE SUMMARY

Capital equipment represents a broad group of products, from servers to medical scanners and ships. This varied product group plays an essential role in meeting a wide set of societal needs.

The Capital Equipment Coalition is a group of nine forward-thinking businesses that have committed to applying circular economy principles to preserve and recover value across the lifecycles of their respective products. Since the group's formation in January 2018, its members have shared and discussed approaches to implementing these principles that may be useful to other capital equipment companies. This document describes some of those learnings. It focuses on the two areas prioritized by the Coalition in 2018: 1) establishing the business case for implementing circular economy projects and business models, and 2) the organizational changes required to successfully implement these projects and models.

In each of the areas prioritized, the Coalition identified consistent themes and frameworks that have proven valuable in implementing circular economy business models at capital equipment companies:

- A business case to realize circular opportunities may be one in which the financial case is clear and aligns with traditional rules for financial investment; one in which there is a clear business value, but with insufficient ROI or cost parity for traditional investment; or one for which uncertainty may require scenario modeling to demonstrate value. It can be useful to draw from a range of circular business drivers, such as access to new markets, future-proofing the business, and triggering innovation capacity, in order to demonstrate the business benefits of a circular business model and thus gain organizational support and investment.

- In order to successfully implement the changes required to institute circular business models and initiatives, it is essential that a compelling narrative is developed. This story helps the employees in the organization to understand the bigger picture and how it connects to their business, and to support the changes required, both in the affected departments and at an individual level. The departments most impacted will vary, but they will frequently include product development, supply chain management, and customer-facing functions such as sales and marketing.

  Networks of ambassadors, particularly at the leadership level, can help to raise awareness and build support. Formal training and awareness campaigns have also been leveraged with good results. Many existing circular economy and organizational change frameworks, some of which are referenced in this document, can facilitate these efforts.

Looking ahead, the Capital Equipment Coalition looks forward to building on these shared learnings, continuing to exchange insights to facilitate each member's efforts and accelerating our collective implementation of a circular economy.

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THE CIRCULAR ECONOMY

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1. CONTEXT & INTRODUCTION

1.1 WHY IT IS ESSENTIAL TO ADOPT CIRCULAR STRATEGIES IN CAPITAL EQUIPMENT

Capital equipment represents a broad group of physical hardware products as diverse as servers, medical scanners, and ships. These products enable us to meet a wide range of societal needs while also expanding what we can achieve in areas such as connectivity, healthcare and logistics. The manufacture of this equipment, however, uses 6 billion tonnes of raw materials globally per year[1]. It is therefore essential to optimize capital equipment stocks and their use through circular strategies.

1.2 THE CAPITAL EQUIPMENT COALITION

The Capital Equipment Coalition is a group of nine leading companies from multiple industries that have committed to driving action to preserve and recover value from capital equipment. When the Capital Equipment Coalition was established and announced in January 2018 at Davos, members put forward a bold pledge document specifying measurable ambitions to preserve and recover value from capital equipment. Over the past year, Coalition members have gathered to exchange best available practices and discuss market barriers.

The Capital Equipment Coalition was initiated as part of the Platform for Accelerating the Circular Economy (PACE). PACE is a public-private collaboration co-chaired by the CEO of Philips and the heads of the Global Environment Facility and UN Environment, currently hosted by the World Economic Forum. The World Resources Institute, Ellen MacArthur Foundation, Accenture Strategy, Circle Economy, and the International Resource Panel are involved as knowledge partners.

PACE aims to create systems change at speed and scale via three strategic pillars:

- **Projects**: to drive projects by fostering public-private partnerships, tailored to different national contexts

- **Learnings**: to capture and disseminate learnings to help scale

- **Leadership**: to leverage global leadership to drive action at project level and to promote the adoption of key learnings

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1. Circularity Gap Report 2019, by Circle Economy

2. LEARNINGS

2.1 COLLABORATING AS A COALITION

Despite differences in products and business models, all Coalition member companies share a strong ambition to increase circularity. To help each company progress toward this goal, the Coalition has employed multiple mechanisms to choose areas of focus and to learn collectively and from one another.

To kick off our collaboration and find the areas where we could learn the most from one other, we applied the Organizational Health Index Model from McKinsey & Company.[2] This model has nine organizational outcomes: direction, innovation & learning, leadership, coordination & control, capabilities, motivation, work environment, accountability and external orientation. The research shows that 70 percent of large company transformations fail. The ones that do succeed have a basic level of "fitness" on all dimensions and excel in the 3-4 focal areas most important to their business, market sector and/or particular transformation.

With the aid of a questionnaire developed by the Coalition, we identified both our good practices and our challenges. We found that our examples of good practice were primarily grouped around three focal areas:

- **Direction** (e.g. starting with a clear vision for the company, integral program-based approach from pilots to scale-up, choosing specific focus areas to start)

- **Leadership and accountability** (e.g. consciously starting with top-level engagement, designing a clear governance structure with smart targets)

- **Culture and capabilities** (e.g. holding multidisciplinary brainstorming sessions, co-creation with suppliers, developing capabilities for designing circular solutions)

Challenges centered around the same focal areas, suggesting these were of particular importance for capital equipment companies wanting to embark on a circular journey.

To provide further focus for our group, we chose two topics to examine in detail in 2018:

1. **Circular Business Cases**. In the areas of direction and accountability, we felt it important to sharpen frameworks for decision making. This ranges from how to value individual trade-in deals for large equipment to how to prioritize (circular) projects or programs based on value assessment.

2. **Organizational Change**. In the areas of direction, culture and capabilities, we face similar challenges in 'embedding circular thinking into the DNA of our company,' for example tailoring the narrative for specific functions or roles in our companies and providing customized training for the relevant groups.

To share and discuss best available practices, Circle Economy facilitated workshop sessions on a rotational basis at different members' operational sites. This field visit approach allows members to see different circular economy applications in action. We apply Chatham House rules, and Circle Economy ensures meetings are prepared, structured and run in a pre-competitive and collaborative manner and are in accordance with competition law.

2. McKinsey & Company, "Organizational Health Index." Accessed December 14, 2018. https://www.mckinsey.com/solutions/orgsolutions/overview/organizational-health-index

2.2 BUILDING THE BUSINESS CASE FOR A CIRCULAR PROJECT

The adoption of circular principles and projects will depend on our ability to develop clear business cases. Service models, extending product use, and capturing the residual value of capital goods by reusing, remanufacturing and recycling all serve as examples of the types of opportunities that can demonstrate traditional financial success, depending on the circumstances. Regardless of the type of project, the Coalition identified three broad sets of circumstances that may describe the business case for a circular initiative or business model:

1. **Clear and positive financial business case**: In some cases, the business case may align cleanly with traditional financial evaluation methods (e.g., return on investment (ROI), net present value (NPV), payback periods) with a positive result. In these cases, decision-making may be relatively straightforward.

2. **Clear business value, but with insufficient ROI or below current cost parity**: In other cases, investments may require an exception to be made, for example by allowing for a lower ROI or different thresholds, such as evaluating longer-term financial returns by taking into account an extended product lifetime. Using a customer lifetime value approach opens the doors for additional investment in a closed-loop solution. As the customer extends their commitment to the supplier, so the business model moves to recurring margins, creating a more attractive and predictable cash flow.

   Other factors for consideration in the business case may include:
   • Risk management/resilience
   • Customer value and retention, which may translate into increased sales
   • Legal compliance (current or future state)
   • Access to new markets
   • Progress toward other goals (e.g. carbon emission reductions)

3. **Dealing with uncertainty**: If the situation is more complex, the use of scenario modeling by testing sensitivity to parameters like price variations or material scarcity may provide compelling reasons to change to alternative sources or materials, or to redesign using less material. It may be worth considering hedging the financial risk of rising material prices.

   In order to ensure the cost remains at parity or better, the strategic business case must be evaluated on a regular basis to account for updated material value parameters.

   Accounting standards can be complex and can have an impact on topics like treating expenses as OPEX versus CAPEX or reporting lease agreements or financial hedging instruments. A multidisciplinary circular economy team must involve financial support from the initial stages of building the business case.

2.3 CIRCULAR VALUE DRIVERS FOR CLOSING THE LOOP

The circular value driver framework highlights seven key considerations that member organizations take into account when developing circular business proposals.
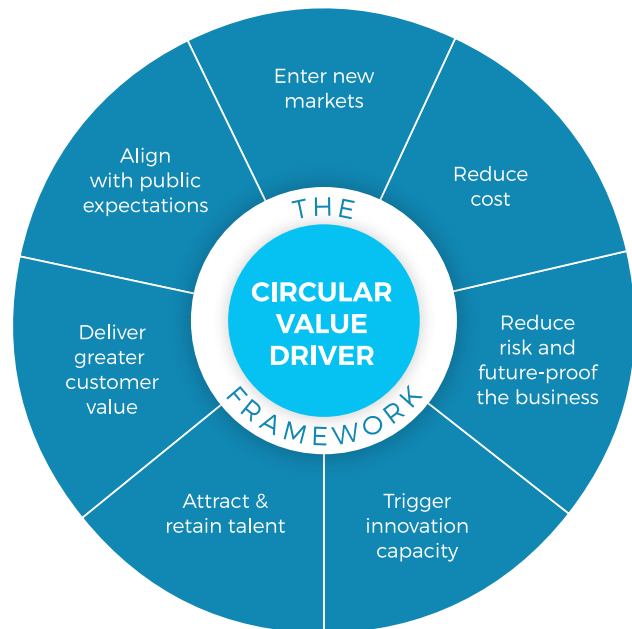
1. **Enter new markets or increase market share**

   Circular business models emphasize the need to maintain original product function as much as possible. Remanufacturing, refurbishment, and recycling extend the product lifecycle and provide an alternative to new products for customers, potentially expanding the range of customer segments able to access the product and/or the service it provides. Circular business models can also expand markets by sparking innovation in the way businesses meet customer demand. This can change how products are designed. For example, as-a-service models can both grow the use of remanufactured equipment and stimulate changes in product design by putting manufacturers in the role of owner instead of seller.

2. **Reduce cost**

   Emphasis on reusing products, components and materials through producer-managed closed-loop programs contributes directly to bottom-line performance.

DEEPDIVE ON NEW MARKETS:

Refurbished and remanufactured price points

A critical success factor of a circular economy model is the positioning of the sale price point in the marketing of refurbished or remanufactured products. These products complement the sale of new products, and having a dedicated sales channel opens up the possibilities of sales to new customers and creates brand identities that do not compete with or undermine new capital equipment sales.

When a producer remanufactures or refurbishes their own product, they can leverage existing manufacturing processes, skills and knowledge for new products with a clear knowledge of the cost base and sales demand. This presents an opportunity for good margins and enables an outlet for manufacturers to market products that are returned to them at any stage in the product's lifecycle, thus preserving product and material value.

PACE

3. Reduce risk and future-proof the business

Reduced need for virgin materials and resources will result in less supplier dependency and a reduced risk of rising and volatile prices for materials used in products. Treating existing products and components as an alternate source of supply can also moderate risks and the associated costs arising from supply chain disruptions and long lead times. Being prepared for future customer demand for circular products and services will also increase the chances of winning business.

4. Trigger innovation capacity

By specifically focusing on driving value through circular business models (e.g., increased reuse of materials, repair/ refurbishment opportunities, feedback loops, and value retention), companies and their partners can trigger creative new ideas for how to design products and/or business models.

DEEPDIVE ON INNOVATION + REDUCED RISK:

Decreased Lead Times

Within the context of Capital Equipment, a business is often confronted with fast-changing customer demands, unclear product specifications and continuous technology developments. This can necessitate rapid design changes, which can cause strain on the business and its supply chain. For example, order commitments with suppliers might be unmet, delivery time to customers might be delayed, and material investments might be lost.

Adopting a circular model and reusing products, parts, components and materials offers the opportunity to create more capacity, increase supply chain flexibility, and reduce investments, thus allowing a business to meet its lead times even in the face of challenging market demands.

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5. Attract and retain talent

A strong circular economy program helps companies to attract and retain talent, inspiring employees to work for a company across roles and departments with a sense of purpose. Research consistently shows that younger talent in particular considers purpose-driven companies with sustainability initiatives to be more attractive places to work and they are therefore less likely to leave.[3]

6. Deliver greater customer value

Greater circularity can build a strong relationship with customers. Solutions that extend lifecycles while providing upgrades help customers avoid disruptions. Managing the customer relationship throughout the full lifecycle also builds trust: strong take-back programs offer greater security and peace of mind at equipment end-of-life. As the partnership and the trust grow, it will also open up more opportunities to collaborate and drive mutually beneficial outcomes over the long term.

7. Align with public expectations

Businesses are facing increasing expectations from the public in respect of environmental impacts. Adopting sustainable circular economy strategies and practices provides a business-driven mechanism for reducing the use of natural resources (e.g. virgin materials, energy) and for increasing the use of renewable inputs (e.g. renewable energy, recycled materials). Such practices likely also contribute to mitigating climate change by reducing carbon emissions, whether operationally or in product use.

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3. See, for example, the 2016 Cone Communications Millennial Employee Engagement Study.

2.4 ORGANIZATIONAL CHANGE

Once a feasible business model is identified, the organization must institute the necessary organizational changes to successfully implement it. This is particularly true for circular business models that require a significant change in one or more parts of the organization, such as creating product-as-a-service offerings or building new reverse supply chains.

The Organizational Health Index Model from McKinsey, as described in section 2.1, describes elements that help organizations build the capacity for change. Coalition members identified "direction" and "capabilities" as particularly important to the implementation of circular business models in their respective organizations. To help address these challenges, the Coalition developed the **Organizational Change Framework for Circularity**, shown below.

The framework highlights the need to provide direction and build capacity for change at multiple levels within an organization. It starts by linking the planned changes to the need to implement a circular economy globally. This provides a narrative connecting the company-level opportunities with the big picture. Capacity building then starts by building and leveraging a network of ambassadors throughout the company who raise awareness in key departments and relate the company-wide narrative to their own specific activities and incentives. This is particularly important for departments that have to revisit their processes and/or build new narratives and offerings for their partners, clients and stakeholders. Lastly, true change only takes effect if individuals within the affected departments understand the implications of the required organizational change for their daily work. This may require additional training and support.

THE
ORGANISATIONAL CHANGE FRAMEWORK
FOR CIRCULARITY

BIG PICTURE

COMPANY

LEADERS & NETWORK

DEPARTMENT

INDIVIDUALS
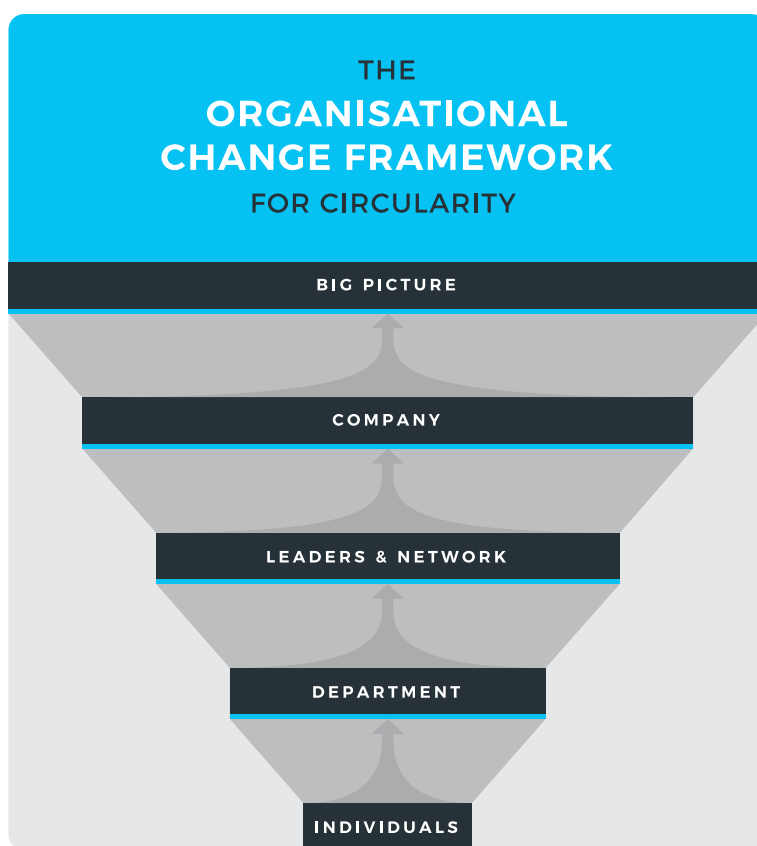
The following sections describe in more detail the different elements of the framework and provide concrete examples. The goal of these explanations is to help change agents to structure the change needed to implement their own circular business models.

2.4.1 AWARENESS OF THE BIG PICTURE: WHY IS THE CIRCULAR ECONOMY IMPORTANT?

A shift to circular economy business models requires more than the implementation of new processes and activities. It also requires a new way of identifying value and cooperation within the value chain, and a corresponding change in organizational culture. Developing a compelling narrative that convinces employees of the necessity for change and inspires them to be part of it is a powerful and important starting point in the organizational transition to circular business models.

This "big picture" narrative does not need to be developed by the company itself. Several organizations have already developed compelling stories and frameworks that can be used to underline both the necessity for change and the steps that can or must be taken. One of the most frequently cited is the 'butterfly diagram' developed by the Ellen MacArthur Foundation, which offers a visual depiction of what multiple value chains can look like when they are designed to be circular. Other frameworks, however, can also be leveraged. For example, the UN Sustainable Development Goals (SDGs) include multiple goals – such as sustainable cities (11), sustainable consumption and production (12), and climate change (13) – which a circular approach can help companies to achieve.[4]

2.4.2 COMPANY-LEVEL TRANSLATION: HOW DOES IT APPLY TO MY BUSINESS?

At company level, the "big picture" must be translated so that it is clear how it is relevant and how it helps the company drive its own goals forward, both from a sustainability and a business perspective. This will stimulate discussion and storytelling as well as provide momentum for action.

Good practices shared by members of the Coalition highlight several themes:

- It is important to connect the circular approach to what has already been done, reframing and building on existing practices that contribute to the new circular model.

- Integration of circular ambitions in the company strategy and roadmap will help to frame ambition levels, actions, and timelines, and provide increased momentum for action.

- Reinforcement of messages by senior managers as well as key influencers and leaders within the network will strengthen their impact. The quote shown from Philips' CEO (blog) provides one example.

> "Like all major transitions in human history, the shift from a linear to a circular economy will be a tumultuous one. It will feature heroes and pioneers, naysayers and obstacles, and moments of victory and doubt. If we persevere, however, we will put our economy back on a path of growth and sustainability. Perhaps five hundred years from now, people will look back and say it was the Circular Economy Revolution that ushered in a new era of wisdom and prosperity."
>
> **- Frans van Houten, CEO Philips**

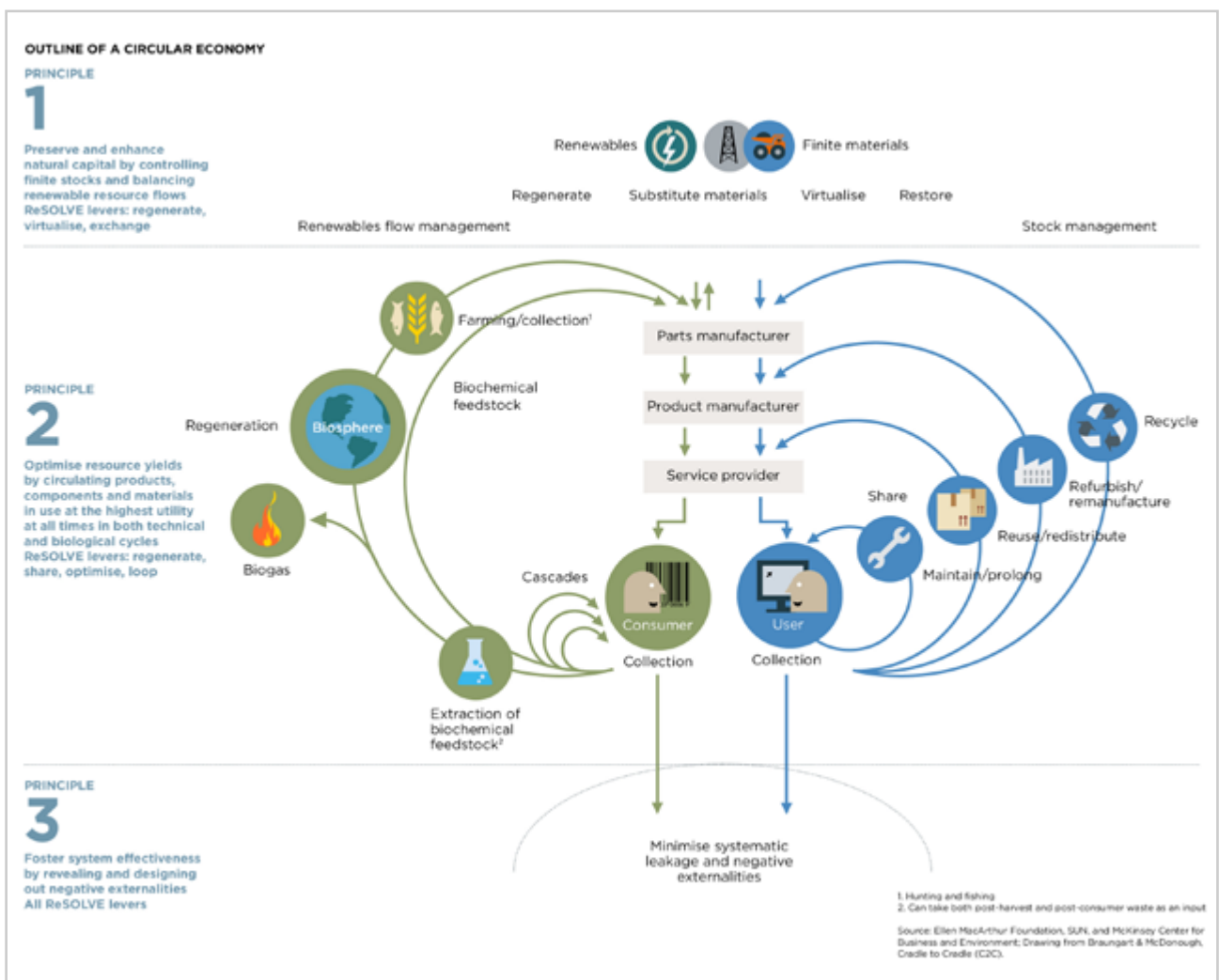4. United Nations, "Circular Economy for the SDGs: From Concept to Practice General Assembly and ECOSOC Joint Meeting Draft Concept and Programme for the joint meeting of the Economic and Financial (Second Committee) of the 73rd UN General Assembly and the UN Economic and Social Council." Accessed Dec. 16, 2018.
https://www.un.org/ecosoc/sites/www.un.org.ecosoc/files/files/en/2018doc/Concept%20Note.pdf

- Using tangible examples from inside or outside the organization and encouraging storytelling helps to bring the subject to life and provide inspiration and shared ownership.

- Examples should also highlight challenges and how they can be overcome.

- It is important to keep messaging simple and to use common terminology and a variety of channels for communication, constantly considering the different interests and language of various stakeholder groups. Examples range from formal training to intranet communications and twitter feeds, and from a network of leaders to chat groups and videos.

Many companies in the Coalition have developed their own communications tools and visuals to show how circularity applies in their respective businesses, drawing from publicly available frameworks. A few examples are shown below. These materials translate generic information into something more tangible for the organization, showing how circular solutions (such as reducing waste and promoting reuse, remanufacturing and recycling) enhance their company's business proposition.

Examples of company vizualizations of the Circular Economy System

Ellen MacArthur Foundation

PACE

ASML

ASML's circular economy approach

Field upgrades of ASML systems

MINING / MATERIALS MANUFACTURING — PARTS SUPPLY — ASML MANUFACTURING — CUSTOMERS

Refurbishment of ASML systems

Remanufacturing parts ('As-new' program)

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

Dell

Raw Materials
· Responsible, sustainable sourcing
· Prioritization of regenerative resources
· Ethical extraction

Part Manufacturers
· Sustainable, thoughtful design
· Prioritization of reusable materials
· Collaborative approaches

Product Manufacturers
· Use of renewable energy
· Standardization and modular designs
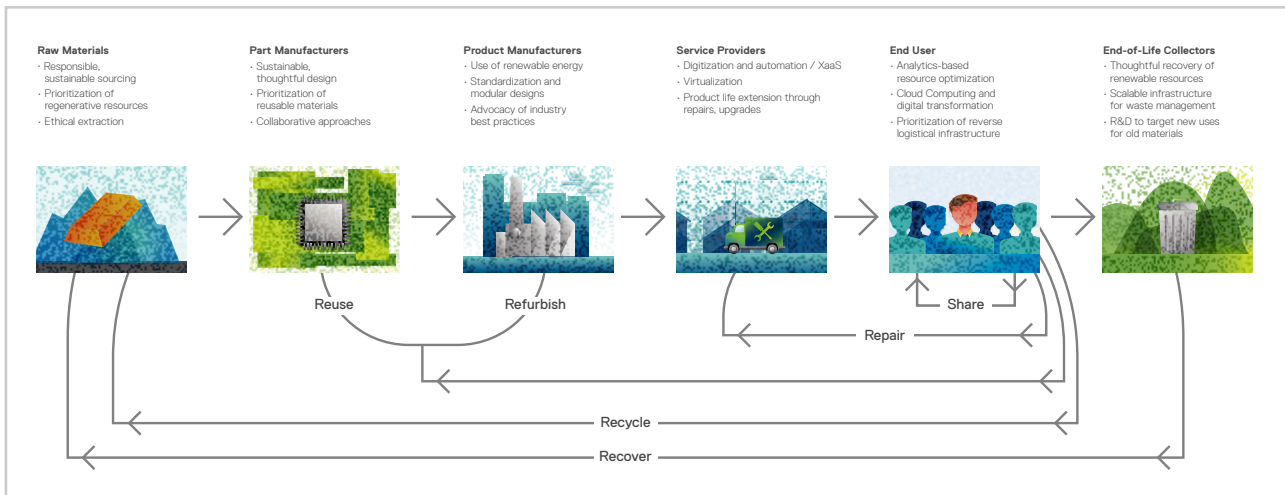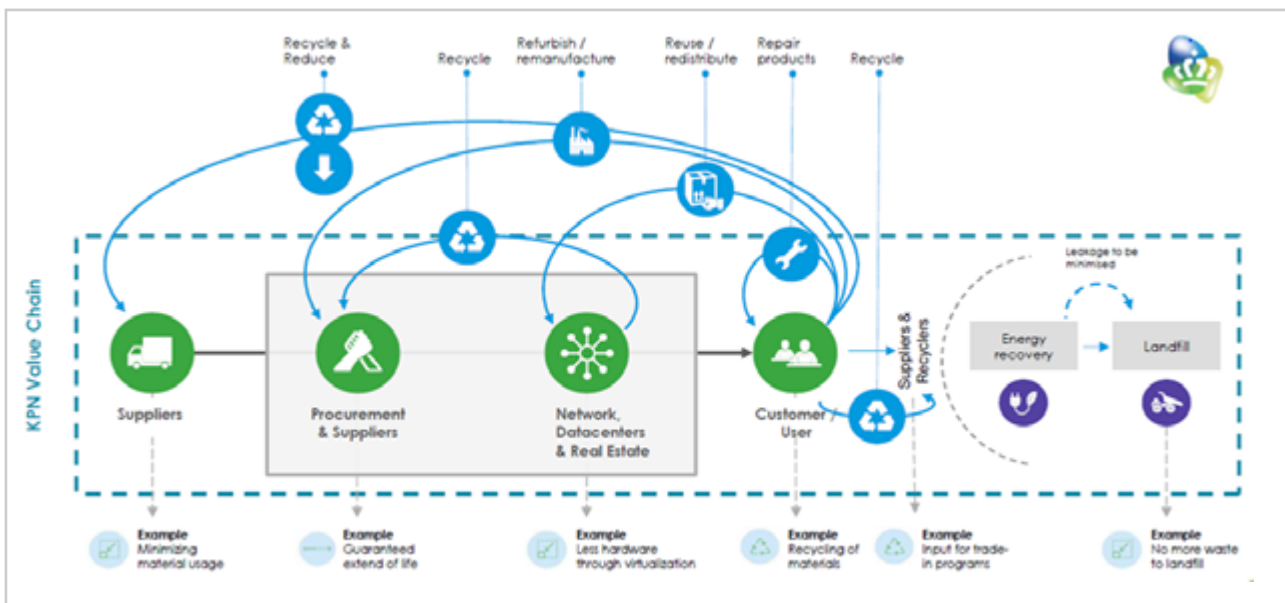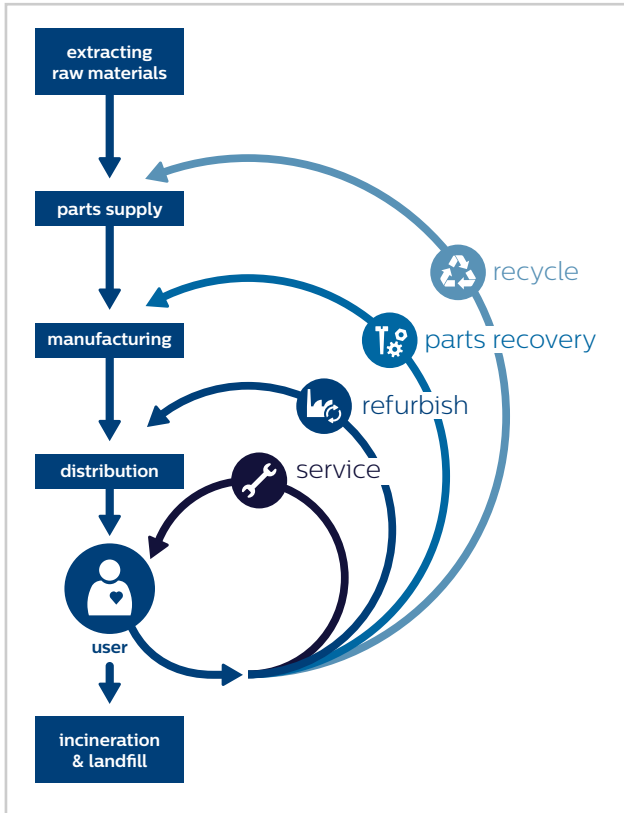· Advocacy of industry best practices

Service Providers
· Digitization and automation / XaaS
· Virtualization
· Product life extension through repairs, upgrades

End User
· Analytics-based resource optimization
· Cloud Computing and digital transformation
· Prioritization of reverse logistical infrastructure

End-of-Life Collectors
· Thoughtful recovery of renewable resources
· Scalable infrastructure for waste management
· R&D to target new uses for old materials

Reuse — Refurbish — Share — Repair — Recycle — Recover

KPN

Recycle & Reduce — Recycle — Refurbish / remanufacture — Reuse / redistribute — Repair products — Recycle

KPN Value Chain

Suppliers — Procurement & Suppliers — Network, Datacenters & Real Estate — Customer User — Suppliers & Recyclers

Leakage to be minimised

Energy recovery → Landfill

Example: Minimizing material usage

Example: Guaranteed extend of life

Example: Less hardware through virtualization

Example: Recycling of materials

Example: Input for trade-in programs

Example: No more waste to landfill

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PLATFORM FOR ACCELERATING THE CIRCULAR ECONOMY

13

Philips

Vanderlande

2.4.3 NETWORK OF INTERNAL CHANGE LEADERS: CONNECTING THE DOTS

A network of leaders ('ambassadors') is essential to effectively convey the company's circular narrative and to create organizational change at scale. These advocates should represent functions from across the organization and be given specific recognition from the top levels to enhance their impact and to truly integrate the changes into their respective functions. Several members of the Coalition have built or are in the process of building these networks.

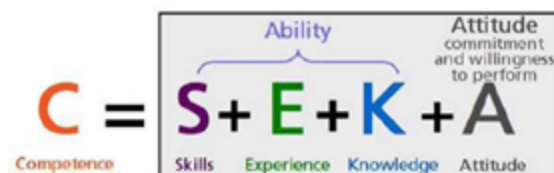**CISCO CASE STUDY: CIRCULAR ECONOMY EXECUTIVE CHANGE NETWORK**

In 2018, Cisco inaugurated a Circular Economy Executive Change Network. Sponsored by Cisco's Executive Sponsor for Circular Economy and run by the team driving Cisco's circular economy strategy and transformation, the Network brings together a community of ten senior executives who lead functions that are critical to the success of the circular economy at Cisco. Having been set up to be purposefully different in tone and structure from the more traditional governance structures that are also in place, the Change Network meets every other month to ideate around particularly challenging areas and where alignment is required. Members are also asked to serve as circular economy advocates, driving behavioral change and innovation. While still early in its tenure, the group has already demonstrated a high level of cross-functional collaboration and alignment, and has successfully grown the number and breadth of individuals involved in the core team's circular economy work.

The central sustainability function can strengthen these ambassadors by providing concrete guidance and creating a network effect, for example organizing meet-ups, trainings, and events. A good first step is to connect them to external resources such as those offered by TU Delft, the Ellen MacArthur Foundation, and the Circle Lab.

2.4.4 FUNCTIONAL LEVEL: WHAT DOES THIS MEAN FOR MY DEPARTMENT?

To make the corporate vision of circularity relevant for the people making the operational changes required, it is crucial that the company vision is again translated to the more granular functional level. Employees want to understand what it means for them and how they can contribute. Looking at this through the lens of competence (e.g. in the example shown), it is particularly important to address both ability and attitude.

Employees can be actively supported to acquire the functionally-specific knowledge and skills required to realize the circular company vision, such as through function-specific trainings and training on change management and systems thinking. However, it is also crucial to complement this with a focus on building willingness to take an active role in transforming the organization, e.g. by making new connections and challenging established ways of thinking and working.

$$C = S + E + K + A$$

Competence = Skills + Experience + Knowledge + Attitude

Ability: Skills, Experience, Knowledge

Attitude: commitment and willingness to perform

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Three particularly important functions that need to be addressed are product development, supply chain management & reverse logistics, and customer-facing functions. These will be discussed in more detail below.

2.4.4.1 PRODUCT DEVELOPMENT

The development and design of products for a circular economy provides real opportunities to capture value from what may otherwise be treated as waste. To realize this value, designers must design using a systems perspective, i.e. considering the entire lifecycle of products and their components. They may be aided by tools and approaches such as:

- Design guides for eco-design, circularity, and/or sustainability incorporated within existing product development frameworks

- Tools such as lifecycle assessment (LCA), material impact databases, and material passports to improve decision-making at multiple stages along the product lifecycle

- Incorporation of lifecycle impacts and circularity into the business model used to commercialize the product

- Documentation and sharing of good practices, so that teams that have not yet instituted the changes can more easily achieve buy-in and scale success

Partnerships with academia and other external coalition groups will also help to accelerate action and the application of the best and latest practices in product development for circular economy.


VANDERLANDE CASE STUDY: BLUEVEYOR

Goal

- Develop a conveyor based on cradle-to-cradle principles and eliminating waste

- Ensure all materials can be reused at the end of their life and remanufactured into the same product without any loss of quality

- Design for ease of assembly and disassembly

- Eliminate materials that accumulate in the biosphere or lead to negative health effects, such as those on the *Cradle to Cradle Certified*™ Banned List of Chemicals

Lessons learned

- It is important to identify challenges early and to have a clear business case

- A multi-stakeholder approach is essential

- A successful project provides a good foundation for future product development, whilst also building competencies and encouraging new ways of working

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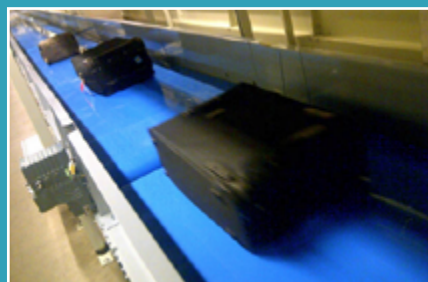
2.4.4.2 SUPPLY CHAIN MANAGEMENT & REVERSE LOGISTICS

The supply chain management (SCM) function plays an important role in implementing circular economy principles since it controls material flows and serves as the interface with parties both upstream and downstream in the value chain.

Facing upstream: awareness building and formal training as well as quantitative scoring for suppliers can help procurement officers to expand their focus, for example by considering how choices relating to suppliers and manufacturing may impact costs, risks (e.g. supply chain disruption), and product lifecycles; the impacts of different material selection and usage; and the importance of assessing supplier performance on circularity. This can help supply chain managers to better balance technical and functional specifications in order to focus on circular design and to start a dialog with suppliers to improve circularity.
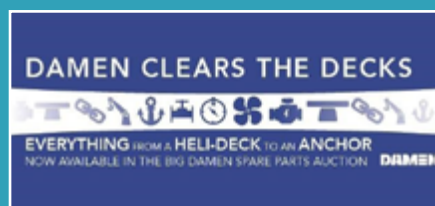
KPN CASE STUDY: CIRCULAR MANIFESTO

In 2017, KPN introduced a Circular Manifesto, asking major suppliers to work together with KPN on projects to design hardware so it lasts longer, it uses fewer virgin raw materials in production, and it is built in such a way that by 2025 close to 100% of its constituent parts and resources can be reused or recycled. Seven major KPN suppliers, including global network equipment manufacturers and recycling companies, signed the Manifesto in 2017; 18 had signed by the end of 2018. Product redesign, take-back programs and as-a-service models are typical subjects that were explored through joint thematic workshops with suppliers and other partners in the value chain.

Facing downstream: it is increasingly important to gain visibility of the install base at customer sites and to run sophisticated return logistics operations, as companies seek to take back and reuse more equipment as well as to strive for closed-loop recycling. Striving towards zero-waste also requires understanding and the incorporation of more information from reuse and recycling partners downstream. This information can be fed back into design as well as used to measure partner performance and evaluate material flows. Organizations may also find themselves seeking completely new partners, as the "waste" from one actor in a value chain can become the raw material for another.

DAMEN CASE STUDY: SELLING SURPLUS MATERIALS

To generate new ideas for circular initiatives, the Damen sustainability team held multiple workshops with members of the business units. In these meetings, participants were introduced to the SDGs and given examples of successful circular projects already being undertaken at Damen. Each business unit identified three concrete opportunities to be pursued. The first project that was completed focused on giving Damen's surplus materials a second life.

Working with an industrial auctioneer, the team held an auction to sell surplus material like pumps, propellers and even a complete helideck, providing customers with the opportunity to getthese parts at a relatively low price and ensuring that the material would be reused.

DAMEN CLEARS THE DECKS

EVERYTHING FROM A HELI-DECK TO AN ANCHOR
NOW AVAILABLE IN THE BIG DAMEN SPARE PARTS AUCTION   DAMEN

2.4.4.3 CUSTOMER-FACING FUNCTIONS

Awareness campaigns and training for customer-facing staff (e.g. Sales, Marketing) must emphasize the customer benefit and value that circular approaches provide, whilst at the same time addressing the way these business models align with existing or new sales models and incentives. This may require a broadening of scope for Marketing and Sales, to go beyond product features and quality and toward the long-term total value of customer collaboration.

Business development managers and key account managers who interact at the highest level of the customers' organizations are key partners in this effort and must be engaged. In addition, direct collaboration between circularity or sustainability colleagues from both the seller and the customer can play an important role in translating mutual benefits to their respective commercial colleagues, and potentially also in making policy decisions or setting goals that lead to specific outcomes. One simple support tool for customer-facing colleagues is an FAQ document that connects the organization's circular goals and principles with the broader business's strategic goals, pain points, and the desired outcomes for both the customer and the organization itself.

PHILIPS CASE STUDY: ALIGNING INFLUENCING PARTNERS

In 2018, the Philips sustainability team organized a workshop with sustainability professionals from customer and supply chain partners to identify key steps towards the joint vision of a sustainable healthcare system. The results are now used within the respective organizations to align the sustainability and commercial staff and to facilitate a translation into improved business relations.

2.4.5 MAKING IT STICK: HOW TO EMBED CIRCULARITY INTO PROCESS AND CULTURE

As with other acceleration programs, it is important that the momentum and content of progress is not lost, and that circular economy methodology is embedded into the day-to-day working of each team. The work needs to be kept alive and relevant in order to achieve meaningful organizational outcomes for circularity and to contribute to global sustainability goals.

Translating learnt skills and knowledge into practice and creating shared experiences builds additional competencies and networks of good practice that can drive further action. At the end of each learning cycle and at each level, requirements for the way of working should be captured to support continuous improvement cycles and learning loops. This includes embedding deliverables into the procedures and instructions for the team, setting and monitoring targets, and holding ongoing training and awareness programs and interactions with other stakeholders.

In addition, external collaboration and networking within the value chain, with external stakeholder groups, and with like-minded companies and coalition groups is of vital importance. It will enlarge the sphere of influence, motivate others to act, allow the sharing of good practice and ideas, and accelerate action. The circular economy journey cannot be taken in isolation and requires integration at every level, both inside the business and within the wider network. Promoting collaboration and integration of efforts will help to cascade and accelerate action.

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3. THE WAY FORWARD

The Capital Equipment Coalition aims to build on its first achievements into 2019 as an active coalition under the Platform for accelerating the Circular Economy. A key focus going forward will be placed on the exchange of specific insights that can facilitate rapid learning and accelerate the implementation of circular solutions.

We encourage businesses in the production and supply of capital equipment goods to embark on their own journeys towards the circular economy. This learning document is meant to provide guidance for practical implementation and a summary of topics to consider.

We invite companies in the Capital Equipment space to share with us their ideas on how to further build and disseminate the learnings and good practices and ways in which they might contribute to this. If you would like to discuss this further, please reach out to capitalequipment@circle-economy.com.

PLEDGES

This section presents the pledges made by 9 leading businesses at Davos in January 2018 and describes the progress companies have made on their pledge and what next steps they are taking.

ASML

CONTEXT

ASML believes a circular economy model is essential to ensuring the future success and competitiveness of the semiconductor equipment industry. We are keen to play our part and already have initiatives that contribute to a circular economy. As a result of our products' modular design we ensure products in use at our customers can be upgraded to a higher performance level thereby extending their useful life. After use in the most advanced chip factories we further extend the lifetime of our products by refurbishing systems and repurposing them for other customers and semiconductor environments. A well-maintained ASML lithography system has a useful life that is measured in decades and around 95% of systems produced by ASML over the lifetime of the company are still in use today. With regards to service and upgrade parts, we have started executing on initiatives to ensure modules can be restored and qualified to an as-new condition for re-use within our systems.

PLEDGE STATEMENT

Over the next years, in collaboration with our customers and suppliers, we aim to transform the re-use of parts used 'as-new' in our systems, from pilot to standard way of working and further develop opportunities, initially in our Mature Products & Services business. Hereby we expect a significant decrease in the waste generated in our value chain.

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PROGRESS MADE IN 2018

'As-new' Parts Re-use Program

In 2018, we continued the pilot project started in 2016 leading to a total waste reduction of more than 790 metric tons of materials (75% improvement compared to 2017). We also started the embedding of the re-use 'as-new' way of working into all primary processes of our organization and we strengthened the collaboration with our suppliers.

Mature Products & Services

The number of systems refurbished has increased with about 10% in 2018 compared to 2017 and we expect further growth in the next year. We also started investigating new initiatives:

- buy back of end of life systems from customers to harvest parts to be reused both for service and system refurbishments.
- shipment of systems and parts by sea instead of airplane and local repair of parts to reduce the CO_2 footprint associated with transport.

NEXT STEPS TOWARDS 2020

We have refreshed our Corporate Responsibility strategy and revised our priorities for the period 2019-2025. 'Circular economy' has been identified as one of the main priority areas for the next years and we shall focus on the following aspects:

- increase the number and scope of parts reused in the 'As-new' program
- continue to extend the lifetime of mature products through refurbishment and repair of parts
- reduce our total waste generated relative to revenue
- increase material recovery.

CISCO

CONTEXT

Network and Communication Equipment and Services: Cisco is the worldwide leader in IT. We help companies seize the opportunities of tomorrow by proving that amazing things can happen when you connect the previously unconnected. At Cisco, customers come first. We create long-lasting customer partnerships, identify customer needs, and provide solutions that create customer success. Cisco has been a sponsor of the circular economy since 2011.

PLEDGE STATEMENT

100% Product Return

- Provide product return pickup and transport at no cost for any customer worldwide upon request.

- Establish alternative commercial models that promote product return including: purchase trade-in, banked credit, leasing, and product-as-a-service.

- Offer comprehensive warranty, replacement, service and repair for all products to extend useful product lifetime and minimize obsolescence.

- Repurpose returned product, subsystems, components and commodities, including closed-loop return to new product manufacturing.

PROGRESS MADE IN 2018

In 2018, we expanded our circular economy program, driving circular advantage through key focus areas within our business. For example, our Circular Consumption pillar is focused on extending and expanding the full lifecycle of our hardware, and in so doing delivering greater value to our customers. Our Circular Design pillar is focused on improving our ability to repair and reuse that hardware over its lifetime, as well as reducing the use of virgin material and incorporating recycled content into new product manufacturing.

Our Circular Consumption strategy builds on current offerings to facilitate product takeback, including leasing, consumption-based billing, and our Migration Incentives Program for partner trade-in. Returned product is remanufactured and returned to service internally or sold through Cisco Refresh. We are also piloting a customer-centric, simplified returns process in specific countries using our Send IT Back app. Customers with Smart Net Total Care get comprehensive warranty, replacement, service and repair for all products to extend useful product lifetime and minimize obsolescence.

In 2018, we continued to advance our offerings, driving toward a seamless product return process for our partners and customers. We also continued our work to increase the reuse of returned products, subsystems, components, and commodities. More than 99% of equipment taken back is reused or recycled. For complete information about our product return, reuse, and recycling, see the environmental chapter in our 2018 CSR Report.

NEXT STEPS TOWARDS 2020

We are currently instituting a number of changes in our business as well as exploring pilots to test new approaches to improve product returns and product and component reuse. Ideas bearing good results will be implemented and scaled. We are also incorporating circular economy design requirements into new products with the aim of penetrating our entire product portfolio by 2025.

DAMEN

CONTEXT

As a family owned company Damen always takes a long-term view. This includes ensuring the well-being of our personnel, the maritime eco-system in which we operate and the world as a whole. Damen assumes the responsibility of developing and delivering solutions that add value to the maritime industry in a sustainable manner.

From its relatively humble roots as a shipbuilder, Damen has grown to become a total maritime service provider, supporting its clients throughout the entire lifecycle of their Damen products. Damen delivers standardized and tailored solutions for a wide range of maritime markets. This includes extensive operational support through the Damen Services department, complemented by a network of repair yards and Service Hubs spread around the globe.

Ships are in general characterized by long lifecycles as a result of high initial capital investment and limited series (or one-off production. By maintaining vessels and extending their lifetimes through conversions and refits, Damen increases the value of its clients' assets, while reducing the waste generated by its products. Furthermore, Damen always aims to increase the efficiency of its vessels, reducing the amount of parts and cutting emissions. Damen is conscious of opportunities to improve the sustainability of the processes and solutions it offers to the market. By showing the economic viability of sustainability, Damen contributes to moving towards a clean and circular industry.

PLEDGE STATEMENT

- Closing the loop on lifecycle support to our clients in 2025.

  – Digitalizing Damen-built vessels to gain insight in the full lifecycle of the vessel. This enables optimizing upgrades and future designs as well as the end user's operations.

  – Developing services to assure end-of-life requirements are carried out in a responsible and circular manner.

- Expanding the green passport services of our portfolio.

  – Investigating the possibility of making this standard for all Damen products.

- Material usage at our yards:

  – Sales of surplus equipment

  – Development of a waste-to-value programme

- Raising awareness of our employees by provision of group-wide e-learning on circular economy.

DELL TECHNOLOGIES

CONTEXT

The monumental changes in society and the environment are creating an opportunity to change the way we all work and live. And we have a choice: continue the status quo, or embrace a digital future and with it a commitment to do things in a sustainable way. Dell Technologies exists to create technologies that drive human progress. Through this we drive a positive social impact – with intention and purpose – and as a result we are building a better business in service of our customers. We recognize it's no longer enough to reduce our environmental footprint. We must innovate with renewable and sustainable materials, empower our supply chain and enable our customers to change the world.

PLEDGE STATEMENT

By 2020, Dell Technologies will close the loop on all used Dell equipment, including capital equipment that becomes available to us. 'Closing the loop' means we will actively take back equipment of any condition and will assume full control to ensure that all materials are repurposed in a responsible way.

PACE

PROGRESS MADE IN 2018

Where do we stand now?

- We continue to grow our use of recycled-content materials, standing now at a cumulative 73 million pounds used in products since 2013 with a goal of using 100 million pounds by 2020.

- We have scaled our closed-loop supply chain, recycling more than 21.5 million pounds of plastics recovered from e-waste back into new parts for new computers since 2014.

- We have also expanded our closed-loop efforts to trial the recycling of gold from e-waste back into new computers, launching the program in 2018.

- In 2018, we met our 2020 goal of recovering 2 billion pounds of used electronics.

NEXT STEPS TOWARDS 2020

We continue to work towards our 2020 goals for recycled content and product recovery maximizing the circularity of all Dell equipment that becomes available to us.

HP INC.

CONTEXT

HP creates technology that makes life better for everyone, everywhere. Through our portfolio of printers, PCs, mobile devices, solutions, and services, we engineer experiences that amaze. We are reinventing how products are designed, manufactured, used, and recovered as we shift our business model and operations toward a more efficient, circular and low-carbon economy.

PLEDGE STATEMENT

In 2018, HP will continue to transition our company and our customers to a circular "make, use, reuse" approach that seeks to close the loop for our products, including capital equipment such as our digital industrial printing presses. This commitment includes ongoing efforts to decouple business growth from consumption by developing solutions that reduce reliance on increasingly scarce raw materials.

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PROGRESS MADE IN 2018

In 2018, HP saved more than 800 tons[1] of metal and plastics through the extended take back of Spare parts, Supplies and used print presses. The weight of raw materials saved through the Indigo BID only (one of Indigo's core components) has more than doubled in the past 4 years. HP Indigo print presses contain more than 23% recycled metal[2]. Moreover, in 2018, HP used more than 50 tons of Recycled Plastic (RCP) in its Indigo Supplies.

The click-charge business model includes consumables used during printing in a cost-per-print fee. This creates an incentive to deliver consumables in the most resource-efficient way possible, resulting in an increased lifespan and waste reduction. All Indigo presses have control systems that collect Imaging Oil and reuse it in the press. In addition, HP's best-selling presses have a Regenerated Imaging Oil (RIO) system which further reduces waste oil by 20-50% on average[3]. Our inks have significantly increased in concentration, avoiding the transportation of more than 550 tons of ink supplies.

NEXT STEPS TOWARDS 2020

HP will continue accelerating its shift towards circular economy. We will focus on decoupling growth from consumption by developing solutions that keep products and materials in use at their higher state of value for the longest possible time.

HP R&D and engineering will continue to increase supplies lifespan, saving transportation, metal and plastic waste.

We aim to increase the reuse of our spare parts in our press up to over 70% by 2019.

Our intention is to increase the BID return rate up to 80% in 2019.

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1. 2018 Raw materials savings estimation related to Spare parts take back and reuse program, BID take back and reuse program, Press dismantling program and Press reconditioning program.
2. Estimation based on the 10000 Indigo press metal composition and on metal recycled content market average (Source: WW LCA database EcoInvent 3.3)
3. Comparison versus Press without RIO system

KPN

CONTEXT

At KPN we make life more free, easy and more fun by connecting people. We are passionate about offering secure, reliable and future-proof networks and services, enabling people to be connected anytime, anywhere.

PLEDGE STATEMENT

KPN is implementing a program to further integrate circular economy principles within KPN to reach its ambition of having close to 100% circular operations by 2025. This ambition is in line with the Dutch government's ambition to reduce raw material use by 50% by 2030. For major parts of our business and throughout the lifecycle of our equipment and products we are looking for circular solutions, focusing on reducing the use of scarce virgin materials, optimizing and extending the lifetime of our products and ensuring a high-end second life. This will reduce residual waste to an absolute minimum in our operations. Our scope will include network equipment, office facilities and customer premise equipment.

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PROGRESS MADE IN 2018

We have built a roadmap to reach our ambition of having close to 100% circular operations by 2025. Our value chain impact improved through our procurement process which now includes requirements on circularity. In October 2017, KPN and seven suppliers signed the KPN Circular Manifesto. These agreements cover around 20% of the annual KPN expenditure on network equipment and hardware for the provision of services to customers. With another eleven suppliers joining in 2018, this percentage has risen to around 70% of the expenditure. This percentage is expected to continue to grow as other suppliers of KPN agree to cooperate with KPN in the pursuit of its circular ambitions. Around 73% of the weight of network equipment, materials and residual streams that are part of our 'downstream' value chain are re-used or recycled. We also aim to save energy and reduce our use of materials by replacing some of our hardware with software.

NEXT STEPS TOWARDS 2020

The goal of our circular manifesto is to ensure that the equipment we buy from our suppliers is designed in such a way that it can easily be separated in re-usable parts or recyclable materials. Gaining knowledge of which plastics can be recycled or separated is key to achieving this objective.

We use certified partners to improve waste treatment. Based on the information they provide, we expect to reduce the use of virgin materials in the future and replace them with products and materials designed to be recycled (i.e. with a lifecycle perspective in mind).

Our focus in 2019 with suppliers will be to re-design a number of key products. At the same time we will integrate the program further within our operations and increase our efforts to avoid incineration and landfill.

PHILIPS

CONTEXT

Royal Philips is a leading health technology company focused on improving people's health and enabling better outcomes across the health continuum, from healthy living and prevention to diagnosis, treatment and home care. As a leader in innovation, Philips takes an approach that integrates systems thinking and looks beyond the linear 'take, make, dispose' model to a circular model of regenerative product design, new business models, reverse logistics and enabling technologies. As part of its 'Healthy people, Sustainable planet' strategy, Philips has a target to generate 15% of total revenues from circular products and services by 2020. Over the last decade, Philips has returned some 7,000 tons of refurbished medical imaging equipment to the market and incorporated 6,000 tons of recycled plastics into its new consumer products.

PLEDGE STATEMENT

By 2020, Philips will close the loop on all large medical systems equipment that becomes available to us, and extend circular practices to all medical equipment by 2025. By 'closing the loop', we mean that we will actively pursue the trade-in of equipment such as MRI, CT and Cardiovascular systems and we will take full control to ensure that all traded-in materials are repurposed in a responsible way.

PACE

PROGRESS MADE IN 2018

In 2018 we successfully piloted our closing the loop approach in Italy and Greece. A key enabler for further roll-out has been the integration of trade-in functionality in the Philips customer relationship management IT tools, which were deployed to all our markets in 2018. To ensure appropriate progress tracking we established a dedicated circular economy performance indicator as part of the Philips Executive Committee dashboard.

NEXT STEPS TOWARDS 2020

By the end of 2020 we aim to have closed the loop on large medical equipment in all our markets. To achieve this target, we will actively drive trade-ins in markets where de-install, trade-in and reverse logistics capabilities are in place, and build these capabilities in countries that do not yet have them. We will seek cooperation with regulators to overcome trade-in barriers in the public sector, where these exist. In 2019 we will also establish guidelines and targets for new product development to further ensure that circular principles are taken into account from early innovation onwards.

VANDERLANDE

CONTEXT

Vanderlande is the global market leader for value-added logistic process automation at airports, and in the parcel market. The company is also a leading supplier of process automation solutions for warehouses. To minimize the ecological footprint of the company's and our customers' systems and maximize the effectiveness of its operations, Vanderlande utilizes a three-phase programme to support its interests. Each phase is an amalgamation of themes, ambitions, initiatives and a corresponding timeline. Themes include Cradle to Cradle® and circular economy principles aimed to offer truly circular services. With this in mind, it is already developing tangible prospects to upgrade products, facilitate refurbishments, offer leases on a pay-per-use basis, and explore other business models, as managed services. Vanderlande plans to progress steadily through each phase, and will gradually enhance the capabilities of all employees in realizing this common goal.

PLEDGE STATEMENT

By 2020 Vanderlande will successfully launch new solutions and services that fully close the loop by utilizing innovative business models, e.g. like the recently launched FLEET concept. We will report our progress on this journey based upon GRI reporting principles and to set our management goals and targets.

PACE

PROGRESS MADE IN 2018

Circular solutions were identified in Vanderlande's GRI sustainability report as the most important topic for both the future of the business and for its economic, environmental and social impact to sustainable development, creating a strong incentive for action. Acceleration of circular solutions requires the development of new business models and organizational change programmes. Convincing stakeholders of the need for change and creating the framework for circularity is challenging. The focus for 2018 has been to co-create circular business models with customers to ensure their acceptance in the market. After its successful launch, the first FLEET solution has been operational at Rotterdam The Hague Airport since November 2018. Reverse logistics and reuse programmes have continued to increase in scope. In 2018, production of products for our warehousing solutions used 457 tons of post-consumer recycled plastics.

NEXT STEPS TOWARDS 2020

Towards 2020 the next challenge is to use the learnings of FLEET to build alternative business proposals for the new FlexPick concept being launched into the E-Commerce market. Vanderlande will continue to embed new business models through a collaborative approach with key customers. Circular targets for promoting acceleration also include developing a key KPI for reporting, internal training on circular design, extending contracts on a pay per use basis and extending existing repair, reuse and recycling programmes.

LELY

CONTEXT

Lely is working towards a long-term, sustainable, enjoyable and profitable future in the agricultural sector. The company develops high-quality robots and data systems, which put the cow first, and are designed to improve animal welfare as well as the flexibility and productivity of dairy farms.

Lely is a leader in the worldwide sale and service of automated systems to successive generations of dairy farmers. Lely is continually inspiring its employees to offer customers innovative solutions, and act as trusted partners for long-term advice and support.

PLEDGE STATEMENT

For Lely the biggest impact we can create is by making the processes at our customers more circular. At Lely we aim at developing new a manure treatment system by 2025 that will nearly close the mineral loop at dairy farms and reduces the CO_2-eq emissions by 7% per cow.

Internally we have a program running in which we re-use, re-furbish, re-purpose and re-cycle our returned milking robots. By 2025 we will expand this program to all capital equipment which is returned to Lely.

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