

The Philips logo is displayed in a white rounded rectangle at the top left of the page. The background of the entire page is a photograph of a modern, dimly lit parking garage with a white SUV parked on the left and a person in a light-colored suit walking away in the center. The ceiling features recessed lighting fixtures.

PHILIPS

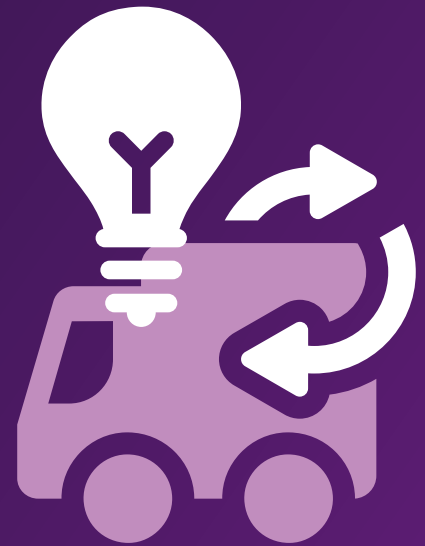
Managed Services

Circular lighting

Reverse logistics

Reverse logistics in the circular economy

Along with design, collaboration, and business models, reverse logistics plays a critical role in the circular economy. This white paper examines the Reverse Logistics Maturity Model and its application in the lighting industry. It also describes how Philips Lighting handles reverse logistics and how the company determines what to do with luminaires that have been returned. Also included are details on the importance of collaboration and a number of tips to ensure your reverse logistics is a success.



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1 Reverse logistics in a circular economy

A growing number of companies are working on creating circular products. But developing circular business models involves more than just a smart product design. It is also important to consider how a product is returned to the manufacturer at the end of its life cycle for reuse, so that no raw materials are wasted. This process is called ‘reverse logistics’.

What is circular?

The phrase circular economy is being used more and more often. But what does it mean? A definition that is often used around the world is the one from the Ellen MacArthur Foundation, which was established in 2010 to promote the transition to a global circular economy:

“**A circular economy is one that is restorative and regenerative by design, and which aims to keep products, components and materials at their highest utility and value at all times, distinguishing between technical and biological cycles.”**

(www.ellenmacarthurfoundation.org)

According to the above definition, a circular economy has a great capacity for regeneration, and its main objective is to make optimal use of products, components and materials, letting them keep their value. In other words, a circular economy is a closed feedback loop in which there is no waste (www.biobasedeconomy.nl). Finding the best way to set up such a closed loop is the foundation of reverse logistics.

A distinction is made between circular systems with a biological and a technical cycle of materials. In a biological cycle, residue materials are safely returned to nature after they have been used. In a technical cycle, products and parts are designed to be suitable for reuse (www.mvonderland.nl). To be able to sustain this last process, reverse logistics are essential.

Why circular?

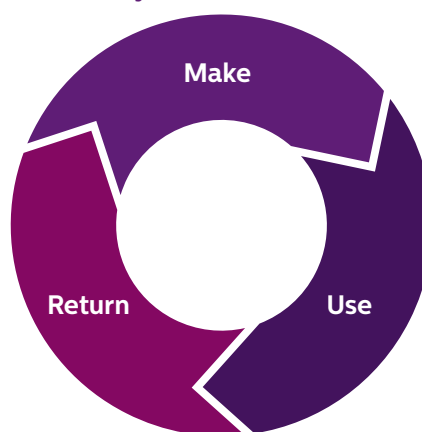
The current, linear method of production is using up raw materials and produces ever more waste. This is exhausting the planet’s resources. As a result, an increasing number of people are realizing that we need a non-linear economy.

The world’s growing population is raising demand for raw materials and energy, while the availability of natural resources and fossil fuels is diminishing. We are seeing a worldwide growth of the middle class, which is estimated to include another three billion people in the next two decades (Ernst & Young, 2014, Driving growth – Middle class growth in emerging markets). Simply using up less raw materials is not enough. In addition, resource scarcity is driving up prices, which slows down the economy.

Linear economy



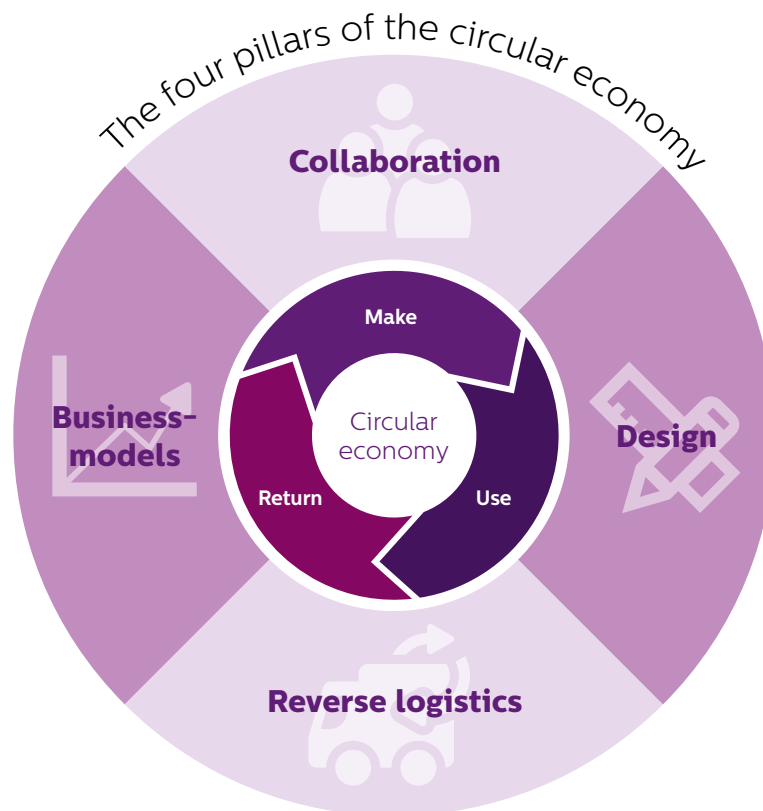
Circular economy



The relationship between reverse logistics and the circular economy

In the publication *Waste Not, Want Not: Capturing the Value of the Circular Economy through Reverse Logistics* by the Ellen MacArthur Foundation, created together with Cranfield University and Deutsche Post DHL, reverse logistics is listed as one of the major building blocks of the circular economy.

A well-organized logistics process tracks where products are; optimizes product, material and waste-processing streams; and makes sure that products' residual value is maintained. The testing, sorting, renewal, recycling and redistribution of products is also part of reverse logistics. Reverse logistics is one of the four pillars of the circular economy. The other three pillars are design, business models and collaboration.



The concept of reserve logistics is one of the four pillars of the circular economy. The other three pillars are business models, collaboration and design.

2 Reverse logistics

The website circulatenews.org uses the following definition of reverse logistics:

“Reverse logistics is the process of moving goods from their point of consumption to a consolidation point for the purpose of capturing value or proper disposal. It encompasses the collection of goods, transportation to a central location, and sorting according to ultimate destination, e.g., remanufacturing, refurbishing, reusing or recycling. By closing the loop of product lifecycles, reverse logistics plays an important role in the transition to a circular economy.”

This definition identifies a number of points:

- Reverse logistics is the process of transporting products from the consumer back to a point where these products' value can be reclaimed or where the products are readied for reuse in the right way.
- The products are transported to a central place where they are repaired, refurbished, reused or recycled.
- As reverse logistics helps to close the life cycle of a product, it plays a major role in the transition to a circular economy.

Reverse Logistics Maturity Model

In the publication *Waste Not, Want Not* from the Ellen MacArthur Foundation, the *Reverse Logistics Maturity Model* (RLMM) is introduced. This model helps companies to evaluate their reverse logistics and distinguishes three parts: front end, engine and back end. The model assesses these parts by looking at several dimensions (strategic, tactical and performance). Evaluating a company on the three points outlined shows how mature that company is when it comes to reverse logistics.

1 Front end

The “front end” is comprised of the logistical processes and networks. Does a company collect used products at all, and how is this process integrated in its operations? Are the logistics fully planned and monitored, or not?

2 Engine

The “engine” refers to the reclaiming and re-valuing of returned products. This includes stock management and raw-materials assessment. Here, the question is again whether the process of re-valuing is part of the business model or whether it is done ad hoc.

3 Back end

The “back end” refers to the release of the updated products back onto the market. This involves questions like: How well does a company know the market and the prices for its own products? Are there sufficient possibilities for sales?



The Reverse Logistics Maturity Model distinguishes three kinds of reverse logistics, based on product type:

Low value extended producer responsibility

This model applies to mass-produced products that are distributed via retail. Such products have a low residual value. Examples are: car tires and pallets. These products are best reclaimed in large volumes and in a maximally standardized way. If the logistics and processing of such products is centralized as much as possible, it creates advantages of scale and the process becomes profitable. It is also important that consumers are encouraged to return the products.

Service parts logistics

This model applies to products with a high residual value, which are not easily returned. Examples are: car parts and machine parts. The best way to collect these parts is to immediately offer replacement units, for example via a service partner like a garage (for car parts). For such products, the ability to monitor them remotely is a very promising, so that it is known in advance when the parts are due to be replaced.

Advanced industrial products

This model is suitable for complex products with a high residual value which are not usually returned. These are usually products that are crucial for business processes. Examples are: ICT products and medical equipment. Such products often contain sensitive information or dangerous raw materials, which is why it is best to pick them up individually. Also, these products would immediately need to be replaced by a new or other product when they are picked up. For these products, it is important that their condition is monitored while they are being used, to assess when replacement is necessary. As these are complex products, it is best to have them repaired, updated or processed by the manufacturing company itself.

3 Reverse logistics and Circular lighting

For its Circular lighting concept, Philips has also reviewed its reverse logistics and made adjustments. Philips will modify, upgrade or process luminaires that are sent back by the client itself. To this end, it has developed a number of scenarios, which are discussed in more detail below.

In all scenarios, partners in the fields of servicing, logistics and waste processing play an important part. The reverse logistics strategy of Philips Circular lighting is based on four “circles”:



Service



Renovation



Reclaiming parts



Recycling

There is also a fifth, undesirable option: waste disposal/incineration.

To determine which of these five options is chosen at the end of a contract, Philips applies two concepts: material residual value and product residual value.

Material residual value

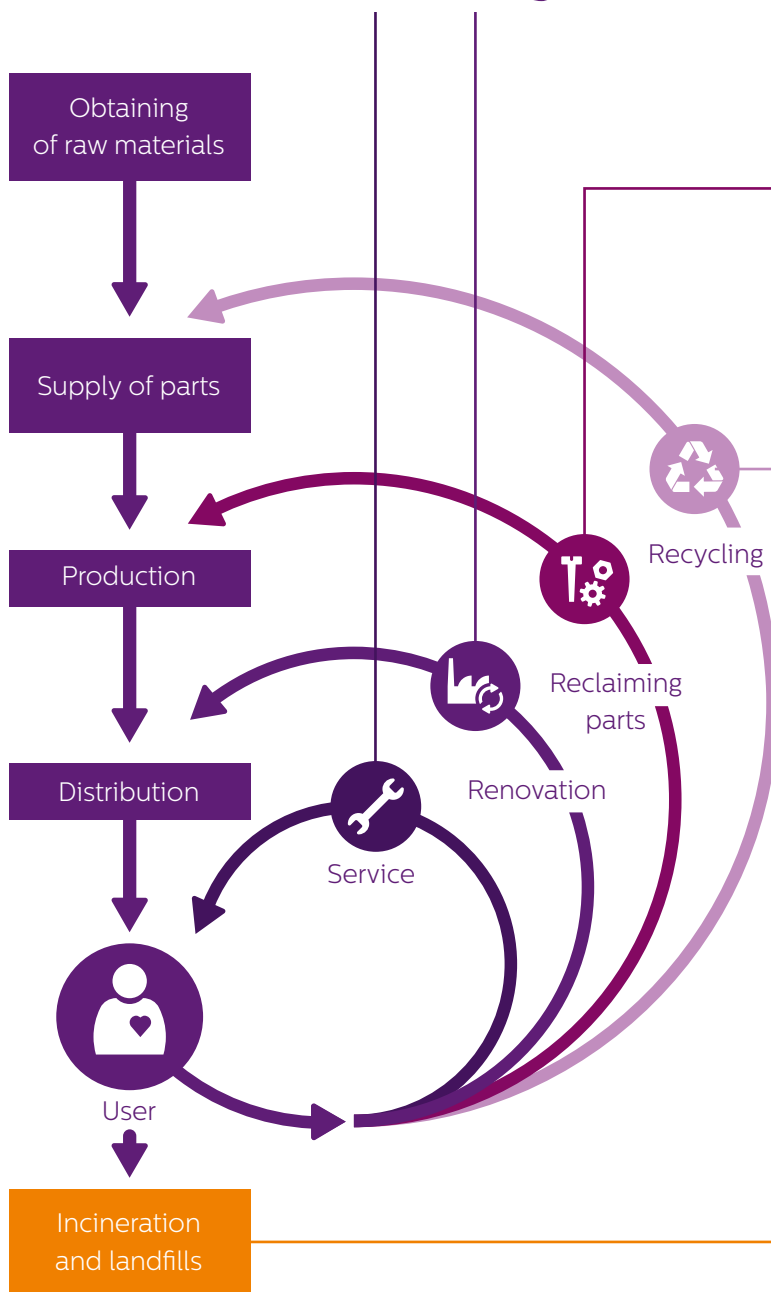
Material residual value (MRV) refers to the value of individual materials in luminaires after the usage period. As Philips already takes into account the modularity and recyclability of a luminaire in the design phase, the materials used do not lose their value. As a result, there is no difference in value between a “new” material and a material that has already been used in luminaires several times.

Product residual value

Product residual value (PRV) refers to the value that remains after a defect has been identified in a product. The product residual value, therefore, may change as a consequence of maintenance and repair.



The circular economy



Service

If the MRV is unchanged and the PRV can be increased, then the service option is preferred. This may involve changing a cable in a luminaire or cleaning the product. Philips works with several partners to this end.

Renovation

If the MRV is unchanged in the PRV can be increased by adding new parts, then the renovation option is preferred. This is the case if a service round alone will not be enough. In these cases, one of Philips' partners can install a new component. If that doesn't work, the service partner will install a new luminaire and the defective luminaire will be returned to Philips, where it will be repaired and readied for reuse.

Reclaiming parts

If the MRV is unchanged and the PRV cannot be increased (but parts can still be reused), then the option to reclaim components is preferred. If faulty luminaires are returned to the factory and specialists decide that it is no longer possible to repair the luminaire, all useful parts are reclaimed and used for repairs in other luminaires. Whatever parts are left after that are shipped to one of Philips' recycling partners.

Recycling

If the MRV is unchanged, the PRV cannot be increased and there are no parts left for reuse, the luminaire is processed by a recycling company.

Waste and incineration

If the MRV has changed and the PRV cannot be increased, disposing of the product is the only option left. This only occurs in incidental cases, for example if luminaires have been irreparably damaged by fire or during transport.


4 The importance of collaboration


In a circular economy, it is vitally important to collaborate with other parties. For example, for the logistics, Philips Lighting works together with logistics company DHL. They are responsible for optimizing the (often small) stream of luminaires that are returned to Philips. They also make sure that the transport is as efficient and environmentally friendly as possible.


To service and maintain the luminaires, Philips collaborates with selected local installers. These installers have good, long-term relationships with their customers, they know what their clients' needs and special wishes are, and they also know everything about the Philips luminaires.

Finally, Philips works together with recycling and waste-processing companies to organize, separate and recycle its material streams as efficiently as possible.


5 Tips for organizing reverse logistics


 Check whether the existing logistical processes can be used for reverse logistics. For example, think about delivery services that can also pick up goods.

 It is often difficult to create enough scale for reverse logistics. One solution can be to collaborate with other parties, including competitors. It is easier to work together with competitors on reverse logistics, because there are less sensitivities in play than with "normal" logistics.

 Get the users involved. For example, give them a discount when they return products or make it easier to get a new item for a returned product.

Another option is to work with rental contracts (pay-per-use), so that the user is no longer the owner of the product and is contractually bound to return the product at the end of the usage contract.

 Use new technologies, like track-and-trace for products, so that it is always clear where they are and what their condition is. Using this information, a company can determine exactly what kind of logistics and reuse are most interesting.

 Ask help from (local) government agencies. They often have ambitious circular objectives and can offer help in the form of advice, but perhaps also subsidies.

6 More than reverse logistics

Well organized and optimally functional reverse logistics are extremely important to any company that wants to become circular, but every circular model must begin with the first phase: the product design (see the white paper on circular design, available at philips.nl/circularlighting).

A product with circular design and optimally organized reverse logistics, however, also demands a new and different kind of business model, in which the central focus is often not the purchase price but the costs across the total life span. See the white paper on business models, available at: philips.com/circularlighting



Sources

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Ernst & Young, 2014

Waste Not, Want Not. Capturing the Value of the Circular Economy through Reverse Logistics.
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www.plan-c.eu/nl

Philips Circular lighting

Philips Lighting takes sustainability very seriously. This is why we developed Philips Circular lighting. Philips Circular lighting is an approach that applies the “make, use, return” circular economy principles to the lighting industry. Lighting is designed to use resources in a smarter and more efficient way, building in traceability, serviceability, refurbishment and upgrade options, parts harvesting and recycling of used materials.

Philips Circular lighting contributes to your corporate sustainability ambitions. We provide guaranteed lighting performance with regard to energy, light level and uptime, while owning the reuse, refurbishing or recycling loop to ensure you get maximum value from the lighting system.

With a cradle-to-cradle mentality, we offer a sustainable service option allowing you to pay for the light you use, rather than an upfront investment in the materials. By minimizing materials waste and reducing the environmental impact, we create an ecosystem that extends the life of our lighting products and provides a better future for the next generation.

Questions? Suggestions?

Feel free to contact us at anytime - we look forward to hearing from you.

