

CIRCULAR LIGHTING TO PROTECT VALUE

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Lighting renovation - ©Signify

Francois Darsy is a trained engineer and expert in smart lighting. He is head of office and industry marketing at Signify France, formerly known as Philips Lighting. He is also president of the indoor lighting commission at the French Lighting Syndicate and of the joint commission put in place by the French Lighting Association and the Smart Building Alliance.

He is at the forefront of changes in the French lighting market as it moves to roll out new business models, particularly light-as-a-service, selling the function not the product.

He is a fervent advocate of an ambitious and planned policy for rapidly renovating existing installations in buildings.

Light has impacts that are environmental, economic, social and cultural. Our aim is develop solutions that align with actions worldwide to protect the climate and promote the circular economy, health, well-being, safety and security.

Lighting currently accounts for 14% of electricity use around the world, making it an issue of major concern. Designed with and for users, our products, systems and services contribute to boosting the environmental performance of buildings. LED lighting, which uses less electricity, can deliver energy savings of 50% to 90% compared to conventional lighting technologies.

To guarantee long-term performance in use, we now offer a circular lighting service where clients purchase lighting services for their premises rather than lamps and fittings. This focus on use over ownership delivers warranted performance in terms of lux output, electricity use, and availability. At the end of a contract, Signify is responsible for recovering products for reuse, reconditioning and recycling.

INTRODUCTION

Philips Lighting is now called Signify. This new name evokes the fact that lighting has become an intelligent language, providing connections and meaning.

Sustainability is key to everything we do. Our clients and employees expect us to work toward delivering positive impacts. Operational sustainability is what we aim for as we build our competitive advantage and our future.

This new identity is also closely tied in to the step-change in technology in the lighting market that is redefining how we will light the spaces where we live and work.

LED technology coupled with the Internet of things is delivering massive savings in terms of energy use, as much as 90%, as well as lifespans that far exceed those offered by conventional solutions.

These developments led Signify to pivot to a new of way of thinking about its offering: the company now offers a circular lighting service where clients buy a lighting service rather than lights.

Transitioning toward a new business model inevitably has far-reaching implications, requiring a change in our perspective on how we create value for our clients, on our offering of products and services, and on our relationships with our partners.

THE CIRCULAR ECONOMY: DO MORE WITH LESS

Humanity currently uses 1.6 times more resources than our planet can support. Every day sees 1,440 truckloads of plastic waste swept into our oceans. Today's linear model, extract-manufacture-use-discard, is broken and needs to change.

This is more than just a question of ethics. As a responsible company, doing more with less is a wholly rational attitude. While the world continues to overexploit its precious and finite resources, ever scarcer materials will become ever costlier and ever harder to find. We owe it to our clients, and to the wider world, to do better.

START BY REDUCING OUR WASTE

In the circular economy, the first thing that often comes to mind is improving how waste is managed. In 2016, we committed to zero waste to landfill or incineration at our production sites, a target we met at the end of 2020 as planned.

The next phase of our roadmap is now underway. Signify is committed to stripping out plastics from all its packaging by the end of 2021. This amounts to a saving of 2,500 metric tons of plastic every year. Using packaging that is recyclable and, crucially, more compact has another major advantage: it weighs less and is cheaper to ship, which cuts our transport and materials carbon footprint.

We have committed to doubling our earnings from circular products, systems and services by 2025 so that they account for 32 % of sales

REVOLUTIONIZING OUR PRODUCTS AND SERVICES OFFER

Switching from a linear model to a circular model implies a commitment to far-reaching change. The switch cannot be undertaken lightly, requiring a new way of thinking about our products, business models, and relationships with our ecosystem of partners and supply chain.

This transition is underway and we have committed to doubling our revenues from circular products, systems and services so that they account for 32% of sales by 2025.

PROTECT VALUE AND MINIMIZE WASTE

In the conventional linear model, customer-supplier relationships focus on one transaction: the product purchase. Value for money becomes central to this relationship. Structurally, pressure on product prices forces companies to optimize their product, which can lead to lower performance and — often — downgraded durability, in the case when it is not directly perceived and valued by the market. Customers essentially invest on the

basis of the value they perceive, but suppliers have trouble leveraging value from the durability of a product or service. Additionally, this durability is often simply a promise, the transaction and the transfer of product ownership imposing little or no obligation on the supplier in terms of long-term real-life performance and costs. While reparability, reliability and even recycling are all aspects that are rarely valued.

In every sector, we see products that are less and less durable and only diminish trust in the brands that sell them. Turning the market dynamic around and moving away from this race to the bottom is an end in itself. For a business like Signify, which sells the world's finest lighting brands such as Philips, this is a major challenge in its quest to protect the value of its market.

A major disruptive technology in the lighting market is revolutionizing the structure of the market and the way that we will consume light. The transition to LED can deliver in-use energy savings of up to 90% along with far longer lifespans. The energy savings are massive. Lighting's share of global electricity use fell from 19% in 2006, prior to the market's transition, to 14% in 2018, and should continue to decline to 8% by 2030. All of this is despite a forecast 35% increase in the number of lighting points in use between 2006 and 2030, as a result of the growing global population, rise in middle classes and ongoing urban expansion. Gains in lifespans are also promising, signifying a shift from a market for consumables, where lamps have to be changed regularly, to a market for investment goods where LED fittings have operational lifespans of up to 20 years, or longer if designed properly.

In this new paradigm, creation of value is inextricably linked to the phase when the product is in use. A product that lasts longer and uses less will be an excellent investment.

The circularity of our offering is essential for a transition toward a circular economy model. There are two areas where major change has to occur:

- **Product design:** the aim is no longer to make a product that is "not too costly" and therefore easier to sell, but one optimized to minimize the amount of value destroyed. In practice, this means products with sustainability designed in, making them traceable, repairable, reconditionable, recyclable or upgradeable so that their energy efficiency can be enhanced or they can be adapted to enable associated uses and services such as connectivity.
- **Business model:** moving from a transactional relationship to a contractual relationship with a performance commitment. The product is no longer central to the relationship; the quality of the service provided is what defines client satisfaction. In practice, a client purchases a light level (in lux), a rate of availability for the fittings and a guarantee covering energy use. This is a model for the long-term, currently 10 years, and it requires an ecosystem of financial partners, installers, maintainers, recyclers, etc.

SUSTAINABLE PRODUCT DESIGN

Over the past few years, we have developed a sustainable product design program intended to protect value and avoid waste. Environmental lifecycle analysis, as per the ISO 14040 standard, shows that the impact of a lighting product occurs predominantly during use, meaning that the most efficient strategy for protecting resources is to:

- minimize impact during periods the product is in use via lower energy consumption;
- increase time in use by maximizing the product’s lifespan, reparability and upgradeability.

Our circular portfolio is divided into three categories: lighting fixtures, circular components and smart systems.

- **Circular light fittings** are lights that consume significant less energy than market average, are easy to repair, maintain and update. They are also connectable, offering total traceability throughout their lifecycle. Their specifications include end-of-life planning via reuse, reconditioning or recycling.
- **Circular components** are interchangeable and include parts that can be recycled, particularly electronic drivers and LEDs. Their specifications stipulate lifespans and failure rates that meet the most rigorous standards on the market.
- **Smart systems** constantly monitor light fittings and allow preventive maintenance by predicting when and where maintenance is needed. This helps to cut costs,



Repairable & upgradable product: Philips PacificLED - ©Signify

outages and labor time. These systems make it possible to understand how lighting is used in practice and to adapt uses during the life of the product. For example, by adapting lighting levels and management modes to constantly optimize comfort and energy savings.

It is essential to design products that generate a minimum of waste and that can be improved, maintained, reused, restored or recycled.



Interact Industry - ©Signify- Pilkington

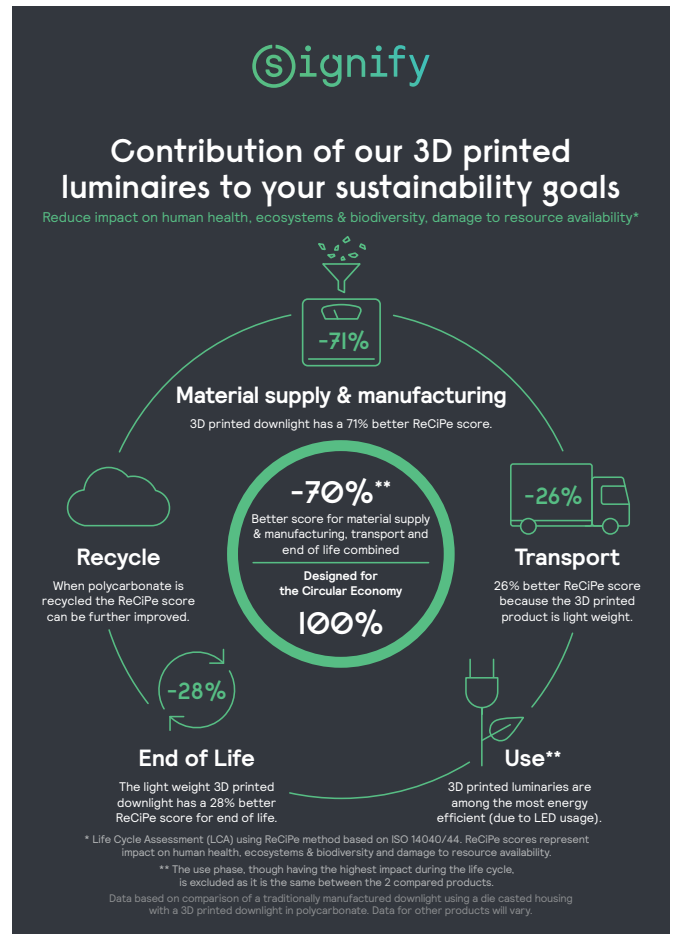
3D PRINTING, AN INNOVATION ACCELERATING TRANSITION

One example of this commitment is the launch of new generations of light fittings designed for a circular economy. Our 3D-printed fittings are an excellent illustration.

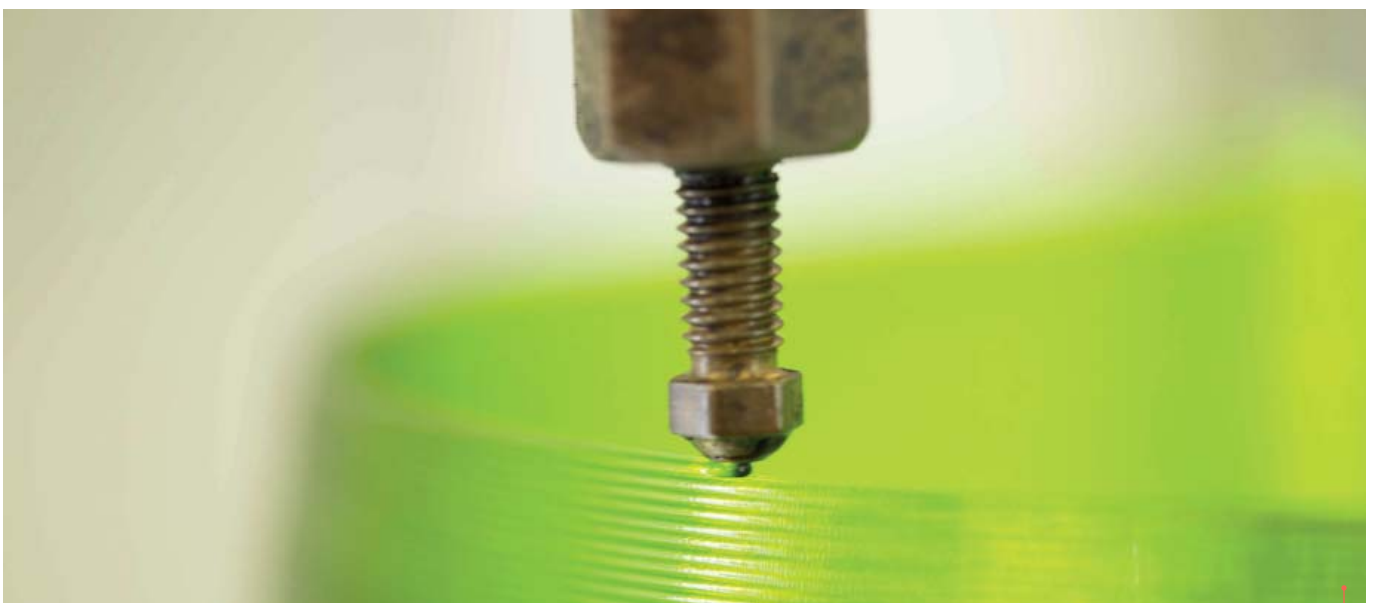
3D printing is a powerful tool that helps us to design and manufacture custom products for every client. The fittings are designed to be modular and parts for 3D-printed light fittings are less numerous, less complex, single material, and lighter in weight. By varying materials, shapes, appearance, transparency and texture, our designers offer a virtually unlimited variety of models. Modularity makes it possible to change the apparent design of a product during its lifecycle in response to new needs expressed by clients. Instead of replacing the entire fitting, modules can be swapped or added, helping to protect value and avoid waste. Close examination of lifecycles shows that a 3D-printed light fitting has an environmental footprint up to 70% lower in terms of materials, manufacture and logistics than its conventional equivalent.

This additive manufacturing method is flexible and sustainable, allowing us to manufacture on demand and close to where our clients are located, further reducing the carbon footprint of our transport operations. We also use a fully recyclable polycarbonate to minimize resource wastage. Almost every part of 3D-printed light fittings that we recover at the end of their lives are then recycled. It is even possible to print from materials such as discarded CDs that all too often end up in landfill.

3D light fittings can be made on demand to suit the tastes and preferences of each client, and delivered very rapidly, without in any way compromising performance or durability. We now have five 3D production facilities in operation around the world and an ever-larger portion of our ranges are 3D printed.



Lifecycle analysis using the ReCiPe method based on the ISO 14040-44 standard - ©Signify



3D printing of a light fitting - ©Signify



3D-printed light fitting made from recycled CDs - ©Signify

SERVICE IS CENTRAL TO VALUE IN USE

Having products that last longer and use less electricity is the first step, but to go all the way requires a commitment over the long term and the ability to provide warranted performance in use at all stages of the product lifecycle.

In-use performance and durability are more important than the actual fittings. Ultimately, our product is light itself. As the Dutch architect Thomas Rau said, “I’m interested in buying light not lamps.” Specifically, switching from supplying a product to performing a contracted service means this change of paradigm also shifts where the risks lie. The designer and manufacturer of a system are best-placed to anticipate how it will work, minimizing failures and optimizing long-term performance. It is natural that they assume risks relating to the use of their product and those relating to potential impacts on their client’s operations.

This has led Signify to pivot to a new way of thinking about its offering: we now offer a circular lighting service where clients no longer buy lights but a lighting service for their premises, delivering warranted long-term performance in terms of lux output, electricity use, availability, etc. Rather than becoming the owner of a lighting system, clients simply pay for the amount of light that they use.

Our innovations thus extend to include the business model. Our Light-as-a-Service (LaaS) offer covers the design, financing, installation and maintenance of lighting in a single contract. We deal with the lighting, leaving our clients completely free to concentrate on running their business.

At the end of a LaaS contract, the equipment can be returned to Signify. In this case, we are responsible for recovering value from end-of-contract products, primarily via reuse or recycling. Having originally designed the product and monitored its actual use throughout its in-service life, we have all the data we need to choose the best scenario for each product.

THE COVID-19 AND FINANCIAL CRISIS: DRIVING THE PACE OF TRANSITION

The transition toward this service-led model is occurring fairly rapidly as it has been shown to create value for all parties. In the case of renovation of an existing & conventional lighting system, the energy savings are always massive and often cover the entire cost of the lighting service. This delivers instant cost reductions with no upfront investment.

In order to deal with the current situation brought about by Covid-19, our clients need to optimize their expenses and ringfence their investment capacities. Lighting for buildings is a major cost to control, with significant potential for optimization if existing installations are out of date. In practice, around 80% of lighting needs renovation.

By offering a financing mechanism, LaaS makes it possible to renovate lighting without any investment and often leads to immediate reductions in running costs. This makes it a solution of particular interest in the current financial situation.

We estimate that for services contracts like LaaS in 2020, over 40 % of industrial lighting projects were financed via energy savings without any need for clients to make a front-end investment. And this is just the beginning.

WORKING WITH THE SUPPORT OF AN ECOSYSTEM OF PARTNERS

Maximizing value involves minimizing risk. It is important to master all the skills involved in a turnkey lighting service designed for the long term, requiring specific know-how for:

- plan lighting design that meet the client's needs;
- installing the lighting system;
- creating a financing plan tailored to each client's profile;
- supervising the lighting system;
- operational maintenance;
- coordinating these functions.

Every client has a different environment, meaning that to be effective it is important to work with complementary partners and foster long-lasting synergies. This allows each partner to focus on their own added value, thereby minimizing costs and risks over time.

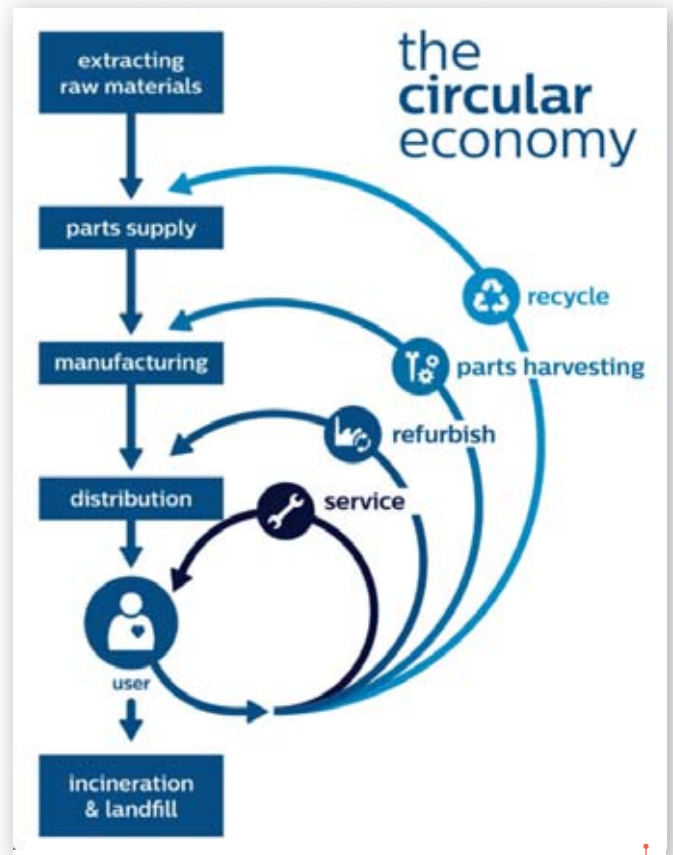
LESSONS & CONCLUSIONS

The transition to a circular economy must create value for our clients, partners and ourselves if it is to be genuinely sustainable in the long term. Our circular transition focus on a simple principle: minimizing the destruction of value at every stage.

Looking carefully at the butterfly diagram produced by the Ellen MacArthur Foundation, we note that the shorter the loop the greater the value retained. Keeping a light fitting operational for longer consumes less resources and energy than dismantling and reconditioning, and even less than partial recycling of the raw materials. In fact, recycling a light fitting destroys most of the value. The value of the raw material recovered via recycling represents just a few percent of the total value. Circular services are designed to extend lifespans, which means that it is in all parties' interests to use efficient products whose quality optimizes the efficiency and lifespan of a lighting installation.

This is a total change of paradigm from the linear transactional model. Cost and in-service performance become keystones of the client relationship. Uses may alter over the service life of the system, performance requirements too, but the service simply adapts.

The key to the sustainability of this business model is a commitment to the long term.



Circular economy (graphic from the Ellen McArthur Foundation) - ©Signify

This is why circular products, modular and upgradeable, make perfect sense. Items such as occupancy sensors can be used for other functions besides turning lights on and off to save energy: when connected, they provide a real-time record of how each space is used. This in turn identifies spaces that are under-used and are, as such, major sources of potential operational optimization. Transitioning to a service-led model opens the doors to new value streams that were undreamed of at the start. They are identified through client insights resulting from long-term service-led relationships.

This transition to a service-led model is similarly beneficial for the stability and long-term prospects of the provider, as it is able to better anticipate changing needs in its market.

Innovation is part of who we are. Our teams love to express their creativity and to experiment, to iterate and improve, and this is the approach that has allowed Signify to lead the lighting industry for over a century. The key to this transition lies in our capacity to innovate, not just in terms of products but also in relation to what our clients need and in the development of new circular business models.