Realizing opportunities of a circular business model

A circular, usage based business model seems for many businesses a utopian vision. A vision which is hard to make concrete and economically viable. Which questions do we have to ask when building a case study?

See what counts.

dll financial solutions partner

Introduction

Interest in a new, sustainable and profitable business concept is on the rise. Known as the circular economy, it is about finding ways to obtain value out of materials and goods in existence, rather than solely extracting virgin raw materials to make new products in a linear fashion, known as 'take, make and waste'. There is potentially big money in this shift as well as it being a more sustainable model in terms of human health and the planet's eco-system. It could unleash as much as a trillion dollars a year in material cost savings, according to research[1] from the McKinsey consultancy and the Ellen MacArthur Foundation.

Well-known international companies such as DLL, Unilever, Apple, IBM, Royal DSM, Novartis, Cisco, Desso, Philips and Renault-Nissan are exploring and developing new circular business ideas.

DLL executed a study with business partners on the hurdles they face when trying to implement service based circular economy inititiatives.

This white paper is aimed at businesses who are interested in exploring what the circular economy and usage based business models might mean to them. It sets out to provide a brief introduction to the topic and then a set of practical views on how you can judge whether this is for you and how to start making the journey to new, circular business models.

"We are keen to encourage new sustainable models that marry profitability with environmental and social benefits"

Bill Stephenson
CEO DLL

This whitepaper is structured in 5 steps: visualized below. The purpose of this paper is to inspire you and funnel your thoughts. Each section contains a number of questions that trigger you to analyse your current activities.

Read
about the Circular Economy

Learn
about your company and partners awareness

Talk
about product redesign

Try
to come to a service model redesign

Test
how you can make this a profitable business model

1) Towards the Circular Economy, Volumes one, two and three.

Read about the circular economy

The circular economy's time has come for a number of reasons. First, there is a clear need to find ways to produce more goods for a growing world population without depleting the planet of its finite resources. Second, climate change, air pollution and species extinction raise the importance of making sure our imprint on the environment is as positive as possible.

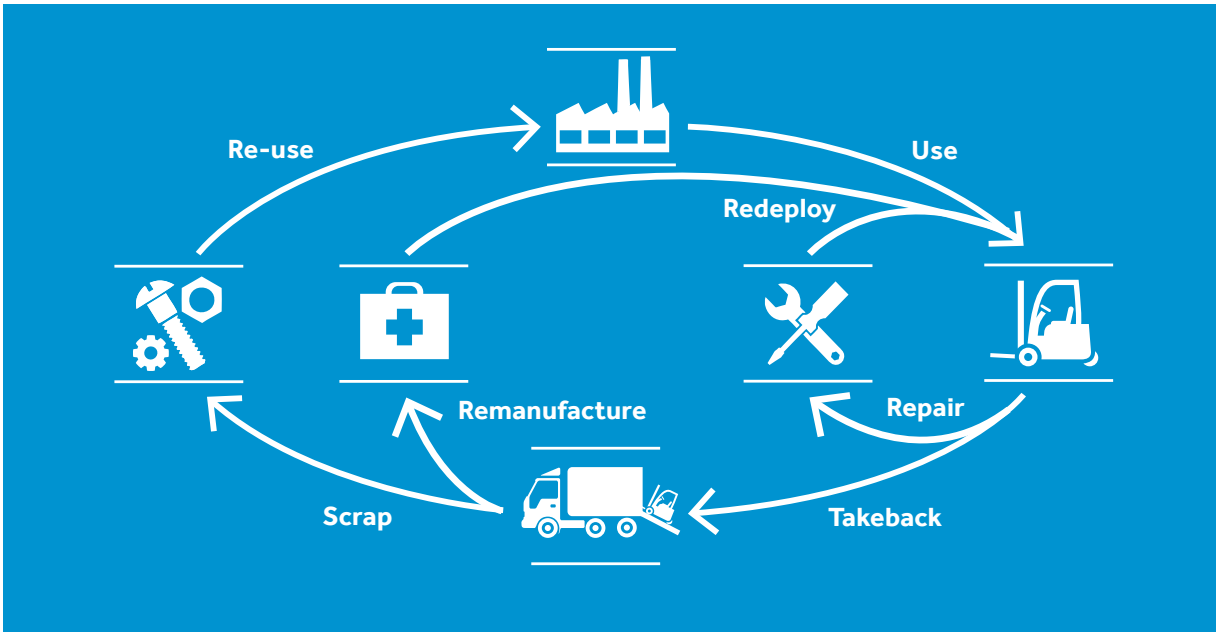
The circular economy concept, based on ecological business theories going back to the 1960s (see box on page 4), calls for a manufacturing model in which goods are made to be made again in a non-toxic closed loop system, powered as much as possible by renewable energy. All of which would help to reduce carbon emissions and ensure business has a positive impact on the environment.

> **"By 2050, the global population is expected to grow to a whopping 9.6 billion people. Our economy will double in size. You don't have to be an environmental scientist to envision the toll this kind of growth and increased consumption will take on our planet."**
>
> **Michael Dell**
> CEO Dell Computers

Inspired by nature, waste streams should be viewed not as problem to be disposed of – like in the linear economy – but as nutrients to make new goods either via the manufacturing (technical) sphere or through biodegrading back into the earth (biosphere).

Third, wasted resources mean potential value is being thrown away. Therefore, there are, many believe, significant business opportunities in becoming more attuned to the need to develop more than one life cycle for a product. At DLL, we are responding to a growing demand from our partners - manufacturers, dealers and end users – to develop together second and third product life cycles through repair, remanufacturing and recycling. This business model we refer to is Life Cycle Asset Management (LCAM).

In our business, financing during the whole technical lifecycle of a product helps our partners facilitate effective second and third life business propositions in varied industry sectors such as automotive, healthcare and agriculture.



Population growth, married with economic development, also means more people worldwide rising up to join the middle classes. The global management consultancy McKinsey estimates that annual consumption in the emerging markets will increase to $30 trillion by 2025 up from $12 trillion in 2010, and account for nearly 50 percent of the world's total, up from 32 percent in 2010[1].

"In the circular economy, one person's waste automatically becomes another person's resource: not only is this economy based on recovery and re-use, but also and even more significant, it allows for re-creation of the economy."

Antoine Frérot
CEO Veolia Environnement

"In a circular economy, the goal for consumables is to use nontoxic and pure components, so they can eventually be returned to the biosphere, where they could have a replenishing effect. The goal for durable components (metals and most plastics, for instance) is to reuse or upgrade them for other productive applications through as many cycles as possible."

If this new world appeals to you and you'd like to explore further, you'll need to consider how circular businesses work best.

The next chapter will provide you with insights in who you need to have on board in your own company as well as within your entire supply chain.

Circular thinking

There are a number of key thinkers in this space that offer complementary theories on how to develop the circular economy. Here is a short summary[2]:

Regenerative design
US professor John T. Lyle in the 1970s set students the task of creating a society in which "daily activities were based on the value of living within the limits of available renewable resources without environmental degradation."

Performance economy
Swiss architect and industrial analyst Walter Stahel co-authored a report, The Potential for Substituting Manpower for Energy for the EU Commission in 1976, in which the authors set out the vision of an economy working in loops with a positive impact on job creation, economic competitiveness, resource savings, and waste prevention.

Cradle to Cradle
US architect William McDonough and German chemist Michael Braungart published their influential book, Cradle to Cradle – Remaking the Way We Make Things (Vintage, 2009), which explained their vision for manufacturing. Materials are to be recycled or reused in a closed loop with waste being seen as nutrients for the technical or biological spheres.

It places a great emphasis on ensuring materials are composed of healthy elements, so the process of recycling or upcycling is positive to human health and the environment.

Industrial ecology
The study of material and energy flows through industrial systems with its international society headed by Professor Roland Clift at the Centre for Environmental Strategy at the University of Surrey. It aims to eliminate waste as a concept and see it as an input.

Biomimicry
Innovation Inspired by Nature, pioneered by biologist Janine Benyus, author of Biomimicry: it studies natures' best ideas for potential imitation in product design such as learning from the way the fins of humpback whales work to inspire improved design for wind turbines[3].

1) mckinsey.com/insights/strategy/winning_the_30_trillion_decathlon_going_for_gold_in_emerging_markets

2) Towards the Circular Economy, Volume One, Ellen MacArthur Foundation & McKinsey, pp. 26-27.

3) biomimicry.net/about/biomimicry/case-examples/energy/

Learn about your company's readiness

You need to understand who your stakeholders are and how they fit into the whole picture.

To help the process, stakeholders can be divided into internal and external stakeholders. Internal stakeholders: direct ones such as shareholders and managers and indirect ones such as suppliers; and into external stakeholders such as governments (see box).

Internal stakeholders

Direct influencers

- Management, owner/shareholder/HQ, sustainability, facilities, marketing, sales, production, R&D, finance, services, IT, HR.

Indirect influencers

- Suppliers, design companies, customers, service providers, consultants, banks, leasing companies, branch organizations, C2C/CE experts.

External stakeholders

Institutional influencers

- Government, European and local regulatory bodies, tax bodies and accounting regulators.

It's important to understand where they stand on your circular business ideas.

For example, does your finance director support a pay-by-performance model or does (s)he expect the business to account for the sale of the whole product? Or if you design a circular process around components used in your products, you need to make sure your sales teams buy into the concept and encourage customers to trade in your products at the end of the first life cycle.

Internal stakeholders

When looking at the direct influencers,ask yourself if the circular business model is an ambition of one or more individuals (you?) or if it is largely supported by the company?

Are you still in the phase of informing the group on what the subject is all about and searching for the benefits or is that clear to all stakeholders?

The opinions of the various disciplines within your company, could be an indication of how your customers are going to look at your idea. If you involve various internal stakeholders to comment on your business proposition, you will have a better understanding of how your customer is going to look at it.

Determine the role of the internal stakeholders. Who are the decision makers? Who has a strong influence on the decision? Who will design and built the circular business proposition? Who needs to explain it to customers? And who is going to finally deliver and operate the service? Suggestion is to make a stakeholder map in which you display the functions and names, impact on the circular business model and their current awareness and attitude.

It's worth asking the view of your indirect influencers like your competitors, customers, suppliers, service providers and policy makers, on the circular economy.

Competitors

Your competitors might be publicising what they're doing in terms of the circular economy. Some of this might be exaggerated. But it is worth knowing what they are claiming. Talk to trend watchers or study key figures and spokespersons in your industry.

Customers

How much do your customers know about it? There will be different views about sustainability and CSR goals. Ask them specifically what they know about the circular economy.

Suppliers

Are your suppliers of raw materials, parts, components or completed products working on designs for re-use? Can you support their initiatives? Can you influence them to transit with you towards the circular economy. As they might need to change their processes and sourcing policies as well as provide greater detail on the chemical make-up of their materials?

"Developing a service is one thing. Delivering it over the years to come is the main difficulty. All these new partnerships and dependencies require businesses to carefully consider their contractual relationships. "

Rob van den Heuvel
SVP Asset Management DLL

Service providers

You will need to make an inventory of all the service providers who are involved in the delivery and usage of your product to the end users such as purchases, finance or leasing, installation, training, repairs and maintenance. Will they positively or negatively influence your circular goals?

External stakeholders

Government and other legislators

Ensure that you know of all relevant legal or regulatory requirements of relevance to your circular plans. Are there any specific rules, for example, in relation to product liability, product disposal, parts recycling, and materials usage?

As you learned there are a lot of people to take on board when you want to implement a circular business model. Hopefully this supplies you with enough thought starters to reach out to the most relevant stakeholders.

However thinking circular means rethinking everything about product design. The following section provides some basic introductory thoughts into how you could go about this.

Talk about product design

Simplicity in design works best in circular economics. As assets need to be repaired, refurbished and disassembled in a cost effective way.

A student at the Polytechnic University of Delft, for example, found that it took 45 minutes to access the essential parts of a coffee machine, making regular servicing costly and difficult to justify from a return on investment point of view. Clearly, designing things with assembly and disassembly in mind, should be essential for designers when developing products for the circular economy. We list below the essential elements of design for maintenance and repair, one part of the circular model.

Essential elements of design for maintenance and repair[1]

- Easy access
- Mounting
- Handling and interchangeability of parts
- Simple fault diagnostics
- Technician safety
- Quick access to diagnostic and lubrication points
- Reduction in number of electrical connections
- Simplicity of final adjustments

When you have your design primed for circularity, there are four areas you could consider looking into, with regards to the design of your products. We identified:

- maintenance
- reuse and redistribution
- refurbishment and remanufacturing
- recycling

Your designers will be able to consider which parts might be relevant for your product lines.

Maintenance (usage model): Whilst in use, goods are maintained usually by the producer, the most efficient way to keep products and materials operating at peak performance.

Reuse and redistribution: A second life market through reuse and redistribution extends a product's lifetime extensively.

Here there must be a demand or a secondary market for such products. Ultimately, the customer must see value in the quality and price of second life products. Customers might be attracted to these goods because they trust in their technical performance. Some suppliers are reluctant to enter into these markets out of fear of cannibalising new product lines.

Refurbishment and remanufacture: Office copier companies, for example, take back, extract and reuse their machinery parts. These parts can be used in new machines, partial restorations, or as part of an improvement to the aesthetics of the product.

Recycling of materials such as iron, wood, glass, paper, textiles and to some extent electronics. At the highest level, goods are upcycled with the extracted resources retaining as much of their purity and quality as possible. They can be used to make the same or different products. The same purity and quality is not retained in the case of downcycling and it will, therefore, have a lower value purpose.

Aside from design, it's worth thinking about being active in the second and third life markets of products. Traders and resellers are probably benefitting from these business streams and the manufacturer is best placed to take a more leading role in this market. The next chapters will focus on the influencers of your products lifecycle.

1) Maintainability Engineering by Alex Hammond Babb, David J. Smith (Hardback, 1973)

Looking at your product or service, does it fit the latest design trends? Ask a panel of current customers how they feel about your product. Does it create added value for them when your product is more or less fashionable?

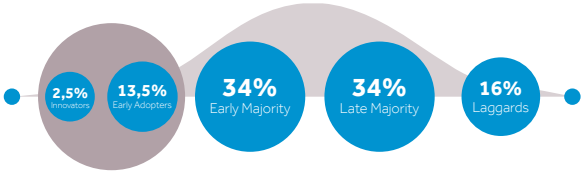
What does influence the life-cycle of my product?

When redesigning a product for a circular economy it is critical to know what determines its economical and useful life. In the coming chapters three influences are identified to get you started to think in lifecycles: fashion, politics and innovation. These influences seem pretty obvious, however product designers often fail to match all lifecycles. This is understandable because they are often faced with design challenges that aim to maximize profits around a single design parameter.

The most successful products in a circular economy are those that are designed to be easily refurbished or upgraded when faced with: technical decay, new fashion trends, new legislation or new technology.

How does fashion influence my design?

The look and feel of an airplane, train, forklift or even treadmill in a gym might not be your first thought when you think of design for fashion. However, these products also can appear obsolete when they are in fact still performing optimally. Modular design of "covers" around industrial products can be an effective tool to keep their look and feel appealing to the users.
For example, take a look at the Technogym website to see how they extend the lifecycle of their fitness equipment. Not only wear and tear parts are refurbished, also covers can be replaced to fit design changes.



How do politics influence my design?

Subsidies, rules, regulations and incentives are used all over the globe to influence the decision making process of product users. Electric cars in the Netherlands are in more demand than other European countries because of taxation advantages for lease drivers. In the second hand market these incentives are less and these vehicles do not command a premium price. The result is that electric cars depreciate quite fast compared to similar diesel and gas cars. In such a market it would be beneficial if original battery packs could be recycled and replaced with new, thereby enhancing the vehicle's value and longevity in the second life market.
The electric motor could even be refurbished and reused in a new leased car allowing the provider and end user to take maximum advantage of appropriate tax incentives.

Another example is from Schmitz Cargobull, a German trailer manufacturer, who sees many of its second hand trailers being used by Russian transporters. In Russia, different rules and regulations apply, which create a need for modifications to the trailer design. Schmitz therefore created a post market upgrade kit, which modifies their standard trailers that readily accommodates cross border transportation and sale of their trailers in the secondary market.

In the world of ergonomic officer furniture, the Dutch manufacturer BMA Ergonomics takes its old chairs back for a reasonable price when its new chairs are installed. The old products are then 'up-cycled' with new parts and sold into a vintage market in Finland. In this way, a healthy new business was created. So, from a design perspective it is important to be able to up-cycle the product without huge costs in labour and materials.

Refurbishment and remanufacturing[1]

To make this option viable, the technology must be able to extract components without damage; second, the product should be made up (at least partly) of standardized and interchangeable parts; third, the cost of up-cycling needs to be relatively low compared to reuse; fourth, the product technology standard, the composition of its containing parts and the parts performance should be stable over more than one product life cycle; and fifth, there is a positive cost-revenue balance regarding refurbishment or remanufacturing as opposed to disposal options.

There are often markets for both new and refurbished or remanufactured goods. Take the healthcare sector for example. Academic hospitals and clinics utilise their large budgets to purchase the latest technology, especially if this enhances their research. While regional hospitals, whose patients need standard diagnostic and operating procedures, aim to reduce costs. Therefore, they look for reliable products that do what they need without extras. They're willing to buy a six year old refurbished imaging machine, for example, that comes in at 75 percent of the price when new. But in this refurbished market, the supplier must also guarantee the product.

Recycling

Designers building products for a recycling loop, need to ensure the materials are as far as possible made of non-toxic elements, that they can be disassembled whilst retaining their original purity, and have a minimum number of recyclable parts and maximum amount of recycled materials.
How do you know if you're product is suitable for refurbishment or remanufacturing product? There are some simple questions to ask to find out:

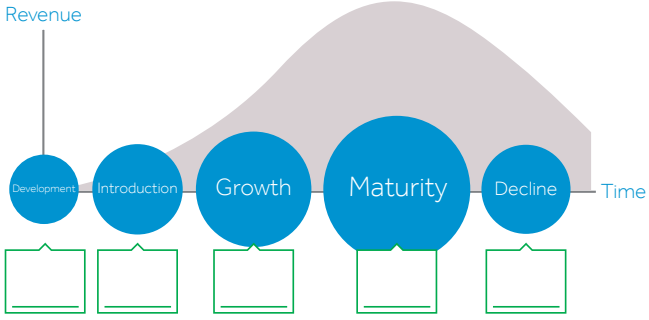
How long is the first life cycle?

All products have a general use period, so you need to check how long your customer is generally using a product or component. In the case of the German trailer manufacturer, Schmitz Cargobull, the life of a trailer was around 12 years. Through its development of refurbishment second and third life production lines, it has extended its life to 15 to 20 years.

Beyond that, it developed a scrapping network to ensure some of the parts were reused in producing new trailers. These included steel, aluminium, circuit boards, callipers and tires. And Swiss bag manufacturer Freitag started buying the trailer curtains and using the material to make fashionable bags.

Can components be reused?

The parts and components that make up a product can in theory all be replaced. In the case of a car, for example, each piece has its own technical, fashion, aesthetic and political lifecycle. The overall value of the car is the sum of the lifecycle value of all these parts. When product components are 'backward compatible' it means earlier versions of each bit can be used to make new products. Components with a slow innovation cycle such as batteries, engine parts and shock absorbers can, for instance, be more easily reused in new cars. They're not seen as fashion items and therefore the end user is less likely to worry about them being reused in this way.



1) Roadmap to Remanufacturing, Mare Advies, October 2013.

Does remanufacturing require a lot of technical effort?

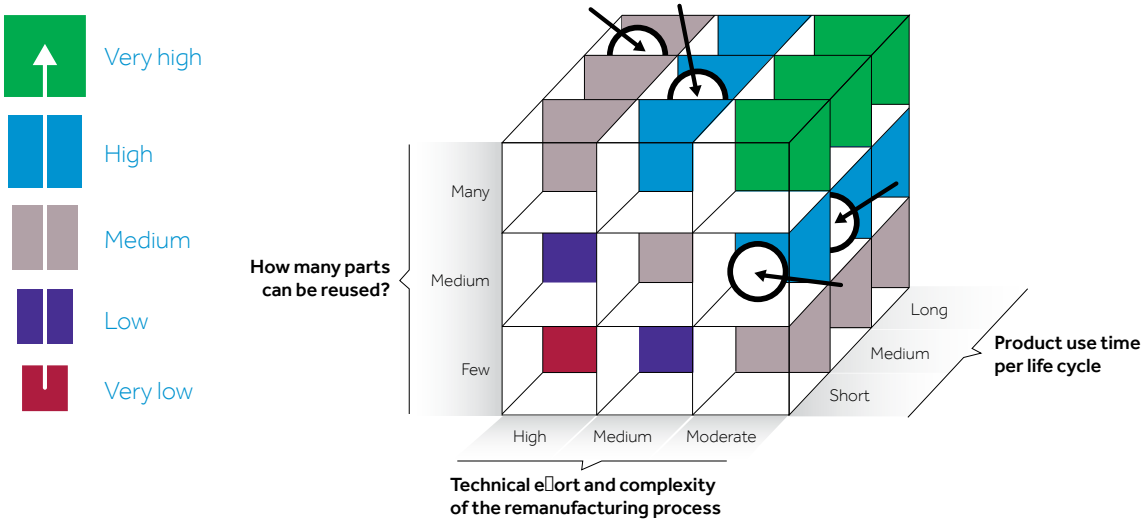
Simple design can make it easier to change parts and components for refurbishment or remanufacture. Take the car as an example again. Tyres, lightbulbs and the battery can be changed in less than half an hour.

However, changes in other parts like the gearbox, interior or rear window requires more knowledge and time. This can be improved by designing a greater number of either less advanced or modular products and components that can be replaced more easily.

Questions to ask when designing for refurbishment and remanufacturing

- How long do the different components last? Can some be used in second and third life iterations?
- Can you upgrade or downgrade any of the components in order to better match the overall product lifecycle?
- How many components could you theoretically have reused in your latest product? If this number is low, was this a deliberate choice, or was it an unforeseen consequence of other design changes?
- Could you make certain parts of your product simpler or from the same materials in order to reduce complexity in service and maintenance?

A products readiness for remanufacturing



Try to build a service based business model

Developing a service-based model could help you differentiate your offering. Here are five steps to developing an effective service-performance model. To set one up, you may need creative input from internal and external sources.

1st, get customer insights.

Good analysis should be based not just on data but on carefully studying customers habits, culture, the social context and their motivations. To gain these insights, invite some of your customers to take part in the design process of your potential service.

2nd, get a wide range of people to brainstorm ideas.

Consider to involve marketers, engineers, managers, frontline staff as well as customers. Make sure you have designers who understand how to gain insights from different user perspectives.

3rd, understand the user.

Every service, coupled to performance, will follow a three step development cycle: the pre-service period (connecting to the user and his/her needed performance), the actual service period (customers experience the performance) and the subsequent post-service period (where the after use responsibility counts). Just like a good stage play or movie, the performance should maintain a sense of expectation without strain for the user. The service events need to be executed with an eye on the expectations of the customer. Be aware that many customers do not take into account or are not aware of all parameters that setup a hassle free service.

4th, make sure your customers know about the added services,

though avoid shouting too loudly about it. A simple act of a mechanic, shaking the hand of a customer when the car is maintained can make a difference. For example when Philips started offering its service of providing light to its customers, it was able to show them how much energy was being conserved. These type of tangible facts around your service make it clear to the customer that "something is done". Also be clear on what your service is not going to deliver. Noting down in a contract of brochure what will not be delivered, can be more insightful and important than creating long lists of items included in your offering

5th, maintain a sharp eye for detail.

The customer might see, hear, smell, touch and taste the provided services and performance. You, as the provider, should understand these experiences in all senses. You can learn to deliver services at the right time by understanding of what is required from your products and services.

What is **the service-based model** all about?

The circular economy aims to eradicate waste systematically through "the various life cycles and uses of products and their components."

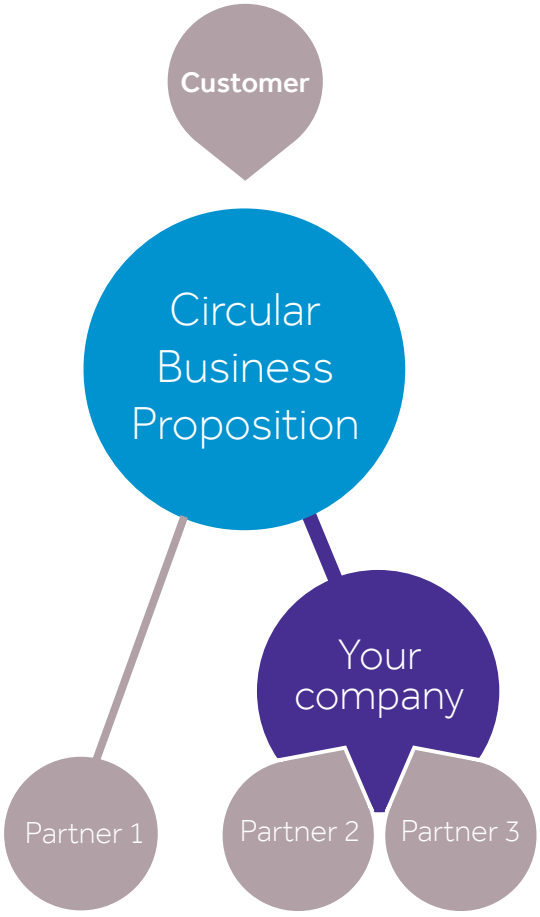
Manufacturers operating in a circular business model might need to differentiate their reuse strategies between the consumable and durable parts of their products.

For durable products, manufacturers and dealers will find that a service model works best, in which goods are leased or rented out to customers and end users, rather than sold outright. In this way, producers, working in some cases with distributors and dealers, are able to maintain control over the material flow. They are responsible and rewarded for ensuring the products can be recycled, reused or remanufactured when they have completed the first life cycle. Customers, on the other hand, get the full use of the product when they need it, in the knowledge that it will be returned later in a sustainable way.

The McKinsey report[1] recognises this sales model shift: "Since restoration is the default assumption in a circular economy, the role of consumer is replaced by that of user." This requires a new mind set. In the current system, the goal is to sell a product. "In a circular economy, the aspiration might be to rent it out to ensure that its materials were returned for reuse. When products must be sold, companies would create incentives to guarantee their return and reuse."

Service based business would include such approaches as pay per use and pay for performance agreements, collective ownership and sharing of resources, and a growing focus and attention to services.

Another example[2] is global office machines company Ricoh, which has designed its GreenLine brand of office copiers and printers for reusability and to minimize the use of virgin materials. Products returning from their leasing contracts are inspected, dismantled, and taken through an extensive refurbishing process that includes replacing components and updating software before the machines reenter the market. Ricoh "harvests" the materials it cannot reuse for recycling to make new components.



1) Nguyen, H, Stuchtey, M., & Zils, M., Remaking the industrial economy, McKinsey Quarterly, February 2014.

2) Nguyen, H, Stuchtey, M., & Zils, M., Remaking the industrial economy, McKinsey Quarterly, February 2014.

Dutch manufacturer Philips now rents out light as a service known as 'Pay-per-lux', rather than as something to be bought and sold. CEO Frans van Houten explains the shift in an interview with McKinsey:

In one contract with the city of Buenos Aires, Philips was asked to replace most of the 125,000 street-lights with LED luminaries over the following three years. This kind of service-based approach leads, says van Houten, to efficiencies and innovation. "The benefits are substantial: the energy savings are anywhere from 50 to 70 percent, depending on the installation, so customers can pay us out of the savings for the light output." With five times the lifetime of normal lights, the LED technology enables Philips to achieve "much lower maintenance and operating costs".

Leasing relationships have also been adopted in Philips Healthcare business, where it takes back medical equipment and upgrades it, refurbishes it and sends it on to other customers. "This is already a €200 million business for us," said van Houten.

"For business customers, we therefore now sell lighting as a service: customers only pay us for the light, and we take care of the technology risk and the investment. In many cases, we also take the equipment back when it's the right moment to recycle the materials or upgrade them for reuse."[1]

Frans van Houten

Philips

If this approach interests you, it is worth now looking into the following sections which explore in more detail how you can develop your own circular businesses.

1) Fleming, T., & Zils, M, Toward a circular economy: Philips CEO Frans van Houten, February 2014.

New routes to market

Circular business models change the routes to the market and the channel partners you work with – the people that connect your products to the end users. Shaping the right relationships with your channel partners and end users will determine the success of your circular economy business.

Indirect circular route to market

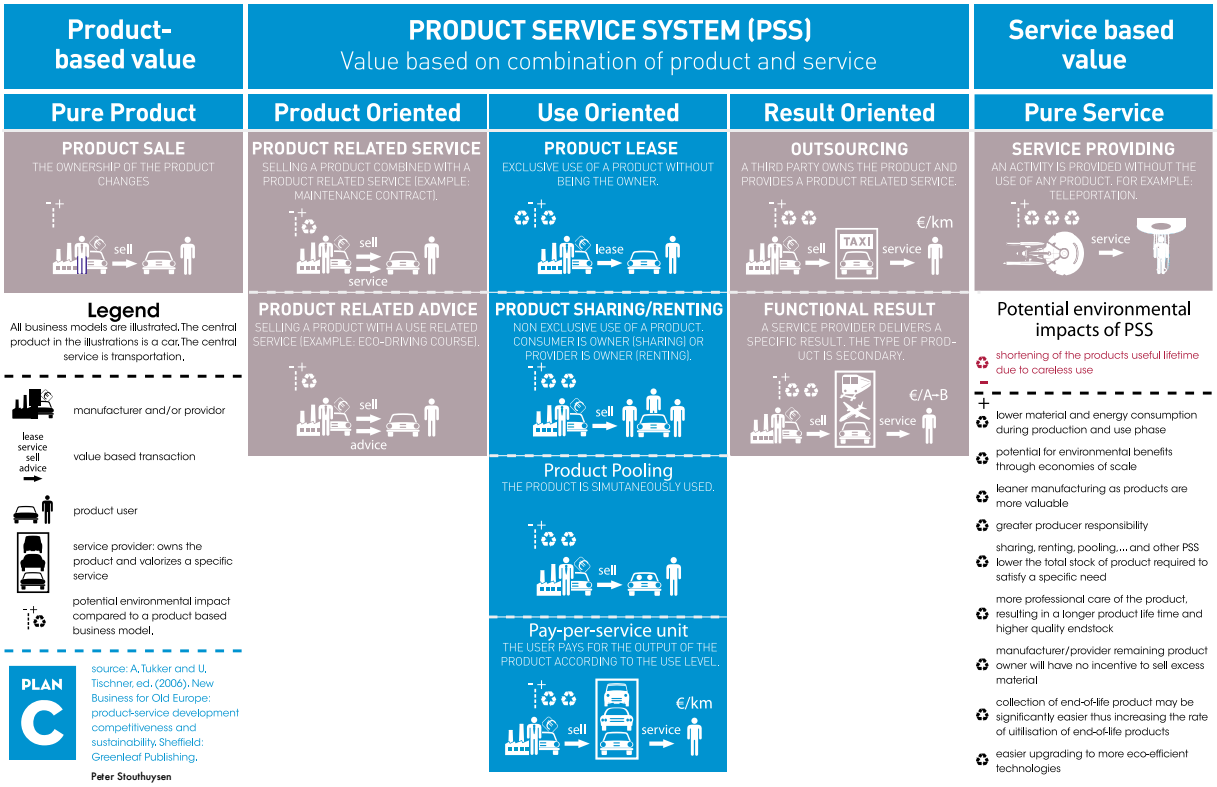
First, you need to convince your channel partners, distributors, dealers or resellers about the viability of your new ideas or products and then to provide them with the tools needed to present this to the end-users. If your channel partners don't like the idea, they won't sell it and may even (directly or indirectly) hamper your efforts. On the other hand, if you can convince them, you will have a powerful channel to help your program succeed. Co-operation is key to success.

Direct linear route to market

When you have immediate control over how your products and services are offered to customers, and how they are advised on their benefits, you can directly pilot your proposition in a certain region, segment or product range. Be sure to properly educate your sales force and make sure your incentives to sell a service are in place.

Most companies have a mix of direct sales to end users and indirect sales via distributors and dealers, for example to customers in international markets. This allows them to test concepts in their various channels.

In the table below, you find inspiration for a range of different product service systems you can develop for your customers.



Test how to make this profitable

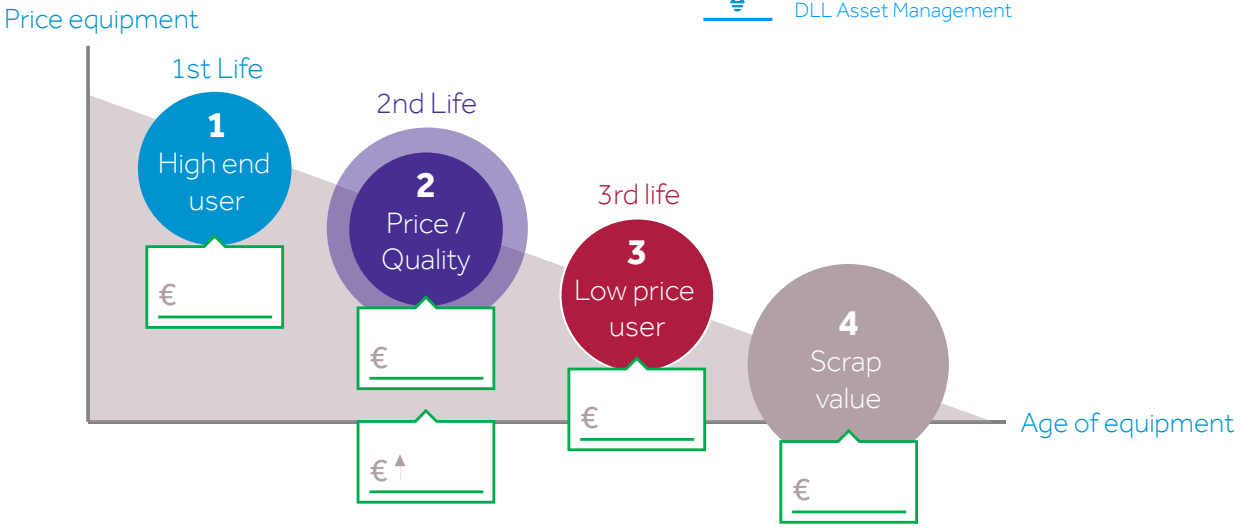
Getting the financial numbers right is crucial for circular business models. This section aims to provide some quick guidance to the basics.

First, it's important to understand the economic lifecycle of your products from a financial perspective. In some cases, you can slow down the process of product depreciation by creating longer lifecycles and more profitable service based business models. The four questions set out below, suggest how you can understand the economic lifecycle of a product.

How to visualize your product's economic lifecycle

What is...?

1. The investment price.
2. The second hand value at the point in time most users sell it.
3. The third life value (the lowest value where you find people trading your product for).
4. Scrap value.



If the economic depreciation of your product is very steep or flat this most probably has other reasons than the pure technical depreciation of the products due to wear and tear. (On page 8 you find suggestions how to influence this)

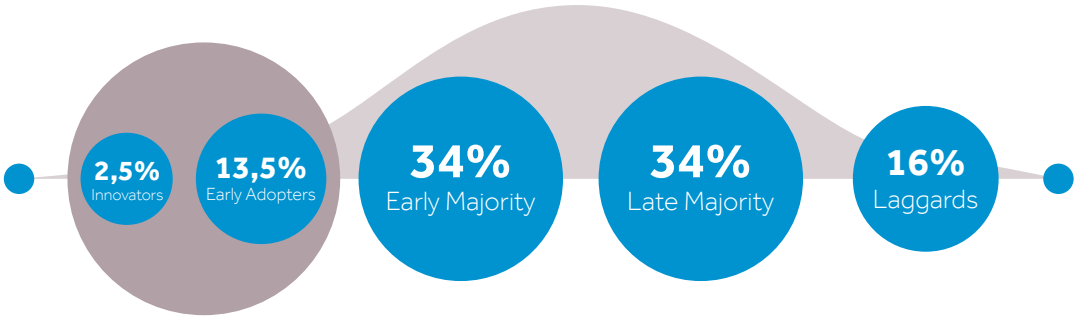
How do I move from a product to a service?

Performance based contracts have many different delivery models. It depends on the level of service a customer wants to outsource and the level of risk you can manage as a company.

"The scrap value of any asset can be estimated by multiplying its gross weight times the actual trading prices[1] for it's containing metals. But be aware to deduct transportation and disassembly costs "

Gertjan Oosting
DLL Asset Management

1) Visit London Metal Exchange (LME) for more details



How do you calculate total costs of ownership?

Generally this calculation is presented as a price per month or per quarter or per year.

Look at the following areas:

1. Determine the usage period in which you want to depreciate your product.
2. The investment price.
3. The interest rate you pay your bank.
4. The total number of scheduled services (parts and labor) that will be required by the product based on the usage period for a particular application.

In this model, the customer does not take into account his own management time, maintenance, unexpected breakdown and operational costs as taxes, insurance and inspections. All the risks relating to the functioning of the products are left to the knowledge of operator and the owner.

How do you calculate total costs of usage?

Generally this calculation is presented as a price per hour, kilometer, mile, print or scan.

For the product you want to evaluate, you need to find the following additional information:

- A usage indicator that reflects the usage for this product in the defined period.
- The residual value (second life prices of your product at the end of the defined period)
- Taxes, periodic fees (including insurances) related to the usage of the product.
- The service and maintenance costs for your product during the defined usage period, including unforeseen costs.
- Software licenses needed to monitor or manage the product.
- Running costs.

Recalculate the payment per month including the second life residual value. Add up all the costs during the period of usage and divide these costs by the number of months that the customer plans to use the product. Add the two costs per month and divide them by the expected usage of the product per month. In this model you take on risks normally absorbed by customers. You need to ask such questions as: at what price can I resell this product? Do prices of labor increase during the period? Is 'wear and tear' properly calculated, and is your second or third life product as good as you expected it to be?

How do you calculate total costs of service?

Generally this calculation is presented as a subscription, license or service. Find the following additional information and add it to the data collected for the total cost of usage calculation:

Recalculate the payment per month including the second life residual value. Add up all the costs during the period of usage including the elements above and divide these costs by the number of months that the customer plans to use the product. On top of that, make provision for upgrades.

Calculate the percentage difference between the total costs of service and the total costs of ownership of your products. If this is a low percentage, then your product is less risky to sell per use than products with a high percentage of usage costs.

When you have finished your calculations, summarize your findings. Be aware that calculating services is an extensive exercise. In addition to that, building the right contract and selling the calculated service is difficult and requires diligence. Generally speaking, customers are often not adept at calculating the total cost of ownership of your products, so you will have to help educate them on the different aspects required for this calculation such as scheduled and unscheduled services.

How to avoid unprofitable customers

Whatever service based business model you are going to develop, you have to protect yourself against the risk of some customers mistreating products whilst in use and causing damage.

Here are some suggestions:
- Have a clear agreement, which includes one on how the product is being used and maintained.
- Include rules on the additional charges that will be incurred by customers if the product is being used longer than expected, gets damaged or is lost.
- Monitor the product during usage and inspect regularly.
- Adjust your offering when you experience things you did not predict. You are developing a new product so you don't know everything in advance.
- Offer incentives for 'good husbandry' during usage.
- Consider using technology to monitor your products location and usage.

Making 'Take Back' a Success

In the circular economy, it is hard to ensure products flow back to you, so you can move to second and third life cycles.

Here are some pointers to getting this right:
Trade-ins: When selling a new product, the customer is offered a trade-in price for the redundant product. The trade-in price is often given as a discount on the new product sale.

Guaranteed repurchase price: At the moment of selling the new product, provide the customer with a guaranteed price at which you will repurchase it.

Leasing, instead of selling the product. Lease the product to the customer. The customer benefits from a payment spread over a defined term and low monthly costs. The lease agreement would be for a given time (usually three to five years) after which the product is returned by the customer.

Rental. The customer is given the right to use the product for a limited time, ranging from a day to one year. The customer never becomes the owner of the product but will use it and then return it at his convenience. Rentals normally include all maintenance and additional services such as insurance.

Pay per use. The customer is paying for the performance of the product. This provides her with flexibility so that she won't have to pay when not using the product. Typically the usage is estimated beforehand. The customer commits to a minimum usage and a minimum period of usage (usually some years). The final cost per month is flexible and dependent on usage.

Disposal/Scrapping. For products that do not have a high residual value, you could set up a disposal or scrapping service for the customer.

Getting ROI on the circular economy

Your activities in the circular economy should provide a sustainable cash flow, return on your investments and have the potential to provide you with income to sustain your business.

Project costs: Your circular business projects might require a considerable amount of time before they start making money. Who is going to lead the project and how much time can they spend on it? What product development costs do you estimate your company will incur? Is the new model going to be accepted by the market in the first month of introduction? Or are you going to use the new proposition for marketing purposes mainly?

Provision for the unexpected: Make a clear and honest overview of the amount you are expecting to invest. Don't be too overambitious on the financial benefits. Be critical with regards to product and organizational quality especially when you start providing services to your customers. Expect to encounter some hurdles in this process, which will be understood by early adopters of your circular services.

Opportunity costs: When you work on product development towards the circular economy, you cannot work on other items. This fact seems simple but it is often overlooked by creative people. Consider what the opportunity costs are.

Sales recognition and cash flow: Your new circular business product will move your company toward a more service based model. This will have an impact on the revenue recognition of these sales. When selling a product to your customers you generate an invoice for the full amount delivered. You have received the money upfront or you give your customers a 14 days payment term. When the invoice is generated (and the money received) your administration books the invoice as sales revenue. If you sell maintenance or other service contracts, you have either agreed on a prepaid price for a certain period, or more likely sent the customer's monthly or annual invoices.

New partnerships

You may need to build new partnerships to manage the new circular model and associated relationships.

But you get the following benefits:
- Obtain expertise and experience that you did not have yourself.
- Benefit from scale and volume that your business alone would not bring.
- Expand knowledge, which helps in your product and business model design.
- Bigger impact to the market if your partners help selling.
- Spread the risk, especially if you agree on risk and benefit pools or joint ventures.

Conclusion

More and more, business leaders recognise moving to the circular economy makes commercial sense as well as being the sustainable route forward. But as we have suggested in this paper, the journey is not an easy one. It is as if you are riding two horses and must eventually jump from the one to the other while moving at a fast gallop. The best approach is evolutionary, in which linear businesses gradually experiment and develop circular models.

You can see some frontrunners doing this today such as Philips, Royal DSM, Nike, Novartis and others. The best advice we can give to those early adaptors interested in this route is to begin the process in their businesses, no matter how small. This will start the thinking and research processes and through experience in pilots and new businesses, they will start to see what works and what doesn't in their areas.

Checklist to develop a circular business model

You've read
about the circular economy

Explore the pros and cons of building your own circular economy businesses.

You've learned
about your readiness for the circular economy & partner's awareness

Dig deeper into whether you can and should build profitable circular businesses and where your partners stand on the issue.

You've talked
about product design

Consider the design issues that underpin successful products that can be extended through more than one life cycle.

You've tried
to deliver a service model redesign

Look into the ways in which you can make the transition to a service model as opposed to 'asset owning', a prerequisite of strong circular economy business lines.

You've tested
how you make circular economy business profitable

Examine the ways in which you assess the financial viability of going circular.

Closing note

The circular economy

The traditional linear economy model is based on a take, make, dispose system where raw materials are extracted from the earth, assets are made, sold, and eventually discarded by the user to potentially end up in landfill or the incinerator. The circular economy model is aimed at keeping raw materials in closed loops. This model relies on usage rather than ownership of assets. It enables manufacturers to maintain more control of their assets throughout the technical cycle and o□ers the potential for product services to become an increasingly important profit center for manufacturers.

DLL Life Cycle Asset Management

DLL recognizes the opportunity to obtain value during the full technical life cycle of assets (Life Cycle Asset Management). This is accomplished by providing tailored financial solutions such as:

- Operational lease
- Fleet management
- Stock finance
- Second Life finance
- End-of-life treatment

These include repair, maintenance, refurbishment and remanufacturing services by DLL's manufacturing partners. This enables manufacturers, dealers, end-users and DLL to extract more value from the quality of the assets. In line with this strategy, DLL is developing a series of whitepapers:

- "Realising opportunities of a circular business model"
- "Complement new equipment sales with pre-owned assets"
- "Sustainable returns by recovering used assets"
- "Improving pre-owned solutions by understanding the buyer"

At DLL, it is our passion to find original, integrated solutions that help to resolve real-world challenges. We constantly think about how we can be a financial solutions partner every step along the way for the business we work with in order to help our customers to rethink how we use and get most out of our assets together.

Contact

Authors

Egbert de Jong, Frits Engelaer and Morice Mendoza

For more information

Please contact your DLL representative or
E lcam@dllgroup.com

Publication date

April 2015