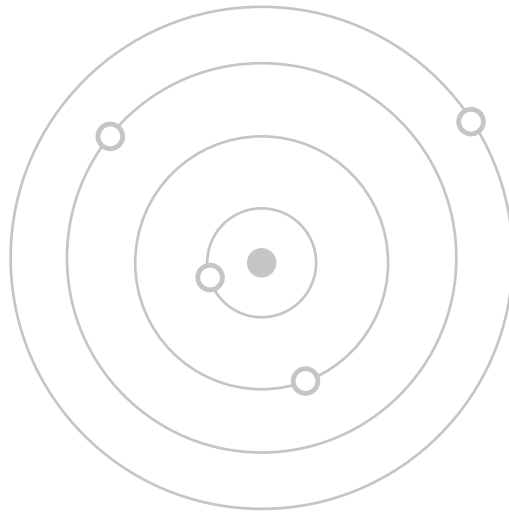


Circular  
Design

Creating  
sustainability

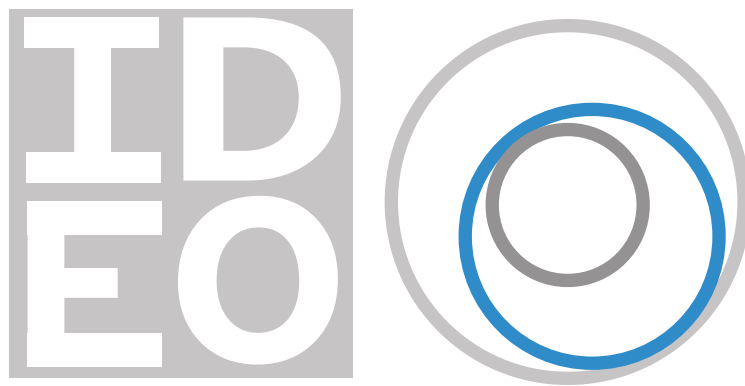
# What

Is Circular Design



Have you ever asked yourself how much waste are you emulating every year? In our society today, we are learning to waste less through smart shopping of our groceries, watching our carbon footprint, as well as trying to consume less electricity. Those are important features none the less, however a wave of designers and I have begun to identify that although the problems we pointed out could be solved by our own moderation, our species as a whole lack the efficiency capable of accurately predicting the amount that we should or should not consume. This issue amplifies itself when dealing with corporations because of how it's fundamentally structured.

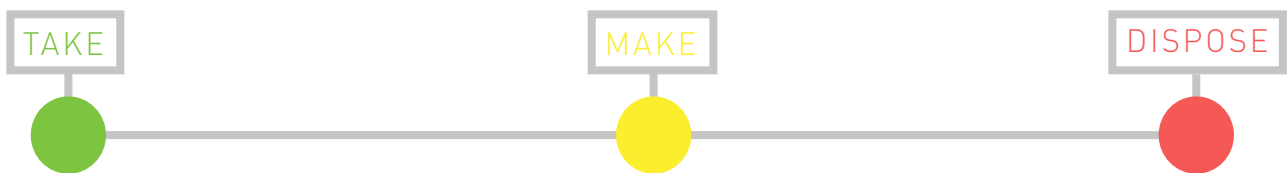
# What Is Circular Design



IDEO and Ellen MacArther Foundation have been working on a new process for design thinking which they refer to as Circular Economy Design. This method taps into a new wave of emerging businesses that functions along the line of restorative and regenerative approaches in order to make their product more sustainable. The fundamental idea of this pattern of design thinking is trying to lean away from the traditional linear method of “take, make, dispose” and adapt it into a multi-functional (or circular) pattern which allows a product to live on even after its primary function through refurnishing, re-use, recycle, and rebuild.

# What Is Circular Design

## Traditional Linear Method:



## Problems Associated with Linear Method:

One of the primary goals of circular economy design is to aim at reusing materials by restoring or adapting them to new use instead of throwing them in a junk yard. This idea came forth through the realization that we should adapt nature's method of production since human is the only species on this planet that generates waste. By analyzing the biological cycle and the technological cycle, we can identify how to adapt the model into our current design pattern.

As we continue to take resources, use them, and then dispose them without considering the consequences that would occur in the near future, we are not being forward thinking and us designers are to blame because we failed to find an alternative solution which could ultimately benefit the dispose phase on the product's life cycle. Issues that arise if this model were to continue:

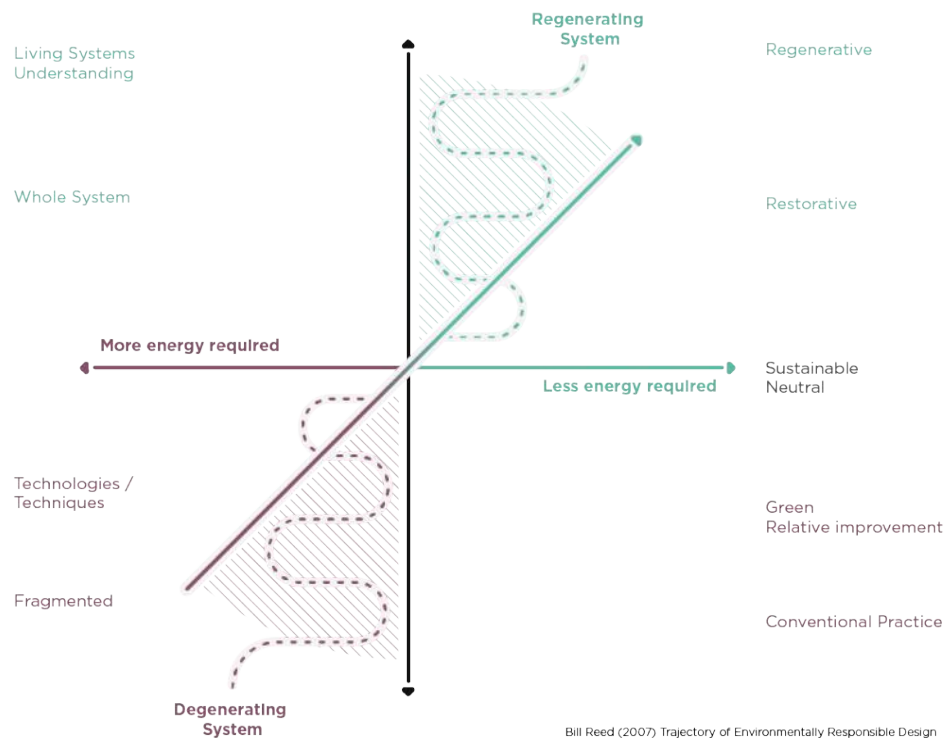
- Resource drainage.
- Pollution and lack of control
- Increase in prices as companies lack resources to make products
- Space has been a rising issue, with more waste it also means less space.

## Recent Trends Leaning Away from Linear Method:

In recent times, business from all across the world has begun to investigate the advantages of leaning away from the linear approach through creating business models that allow the products that they create to be self-sustainable. This means that the product's purpose would not cease to exist after its primary use and would be continuously in a cycle of regeneration.

# What Is Circular Design

## Regenerative Thinking



### Problems Associated with Linear Method:

Under this method of design process, the ideal product should be able to not only sustain its product life cycle, but capable of having multiple product cycles. By allowing a product to have multiple purposes, organizations and corporations would not only be providing a product but services as well. In recent times, Tesla has been adapting this model into their business strategies (with their cars being able to act as a tool of transportation when the user needs and when they are not using it, the self-driving option will allow a fleet of Tesla cars to serve as a method for the user to make money and the car to serve society instead of sitting there as a hunk of metal.) and we are beginning to see a major shift in how other businesses will adapt into this new process.

Creating value for every player in your wider ecosystem will help that system thrive in the long term. Nurturing the people (think users, employees or partners) and natural systems that directly draw from or support your organisation can be a source of growth, creativity, and innovation. For example, creating a local production network provides economic support to your surrounding area, which could in turn give the community the wealth and ability to buy your product or service. Given that we are ultimately trying to create a more regenerative approach, the model of circular economy takes a page from how nature interacts with their elements.

# What Is Circular Design

## The Circular Economy

One of the primary goals of circular economy design is to aim at reusing materials by restoring or adapting them to new you instead of throwing them in a junk yard. This idea came forth through the realization that we should adapt nature's method of production since human is the only species on this planet that generates waste. By analyzing the biological cycle and the technological cycle, we can identify how to adapt the model into our current design pattern. Circular design encourages the designers to identify the problem and ask "how might nature solve this problem?" In order to identify how to solve these problems, we can take a look at current businesses that are doing well adapting into this type of model.

### OUTLINE OF A CIRCULAR ECONOMY

#### PRINCIPLE

1

Preserve and enhance natural capital by controlling finite stocks and balancing renewable resource flows  
ReSOLVE levers: regenerate, virtualise, exchange

Renewables flow management



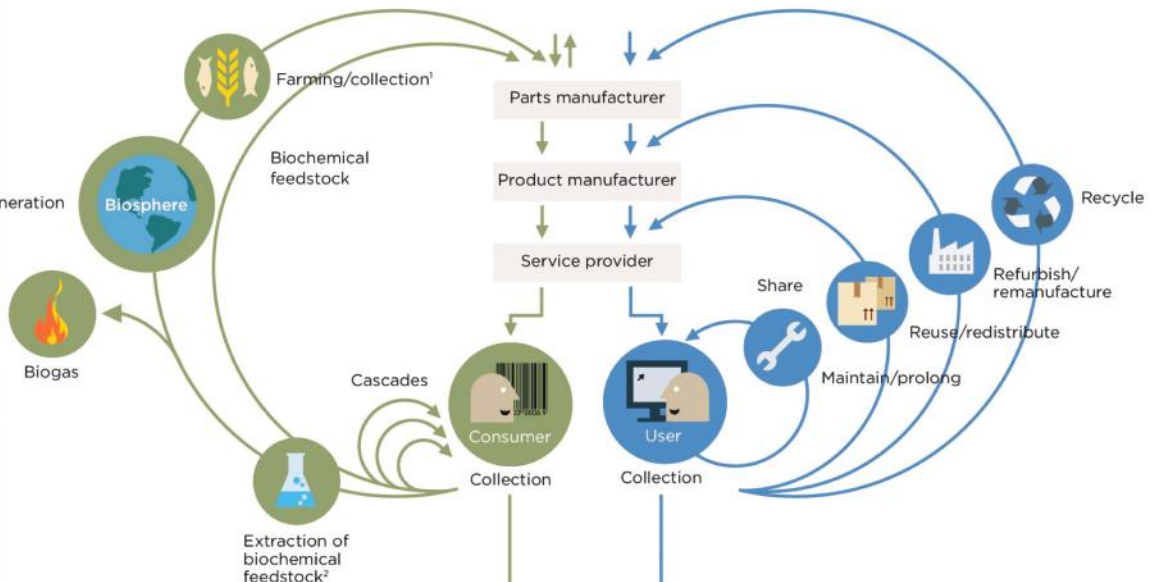
Stock management

#### PRINCIPLE

2

Optimise resource yields by circulating products, components and materials in use at the highest utility at all times in both technical and biological cycles  
ReSOLVE levers: regenerate, share, optimise, loop

Regeneration



#### PRINCIPLE

3

Foster system effectiveness by revealing and designing out negative externalities  
All ReSOLVE levers

Minimise systematic leakage and negative externalities

1. Hunting and fishing  
2. Can take both post-harvest and post-consumer waste as an input  
Source: Ellen MacArthur Foundation, SUN, and McKinsey Center for Business and Environment; Drawing from Braungart & McDonough, Cradle to Cradle (C2C).

# What Is Circular Design

## Case Studies: Evocative Design

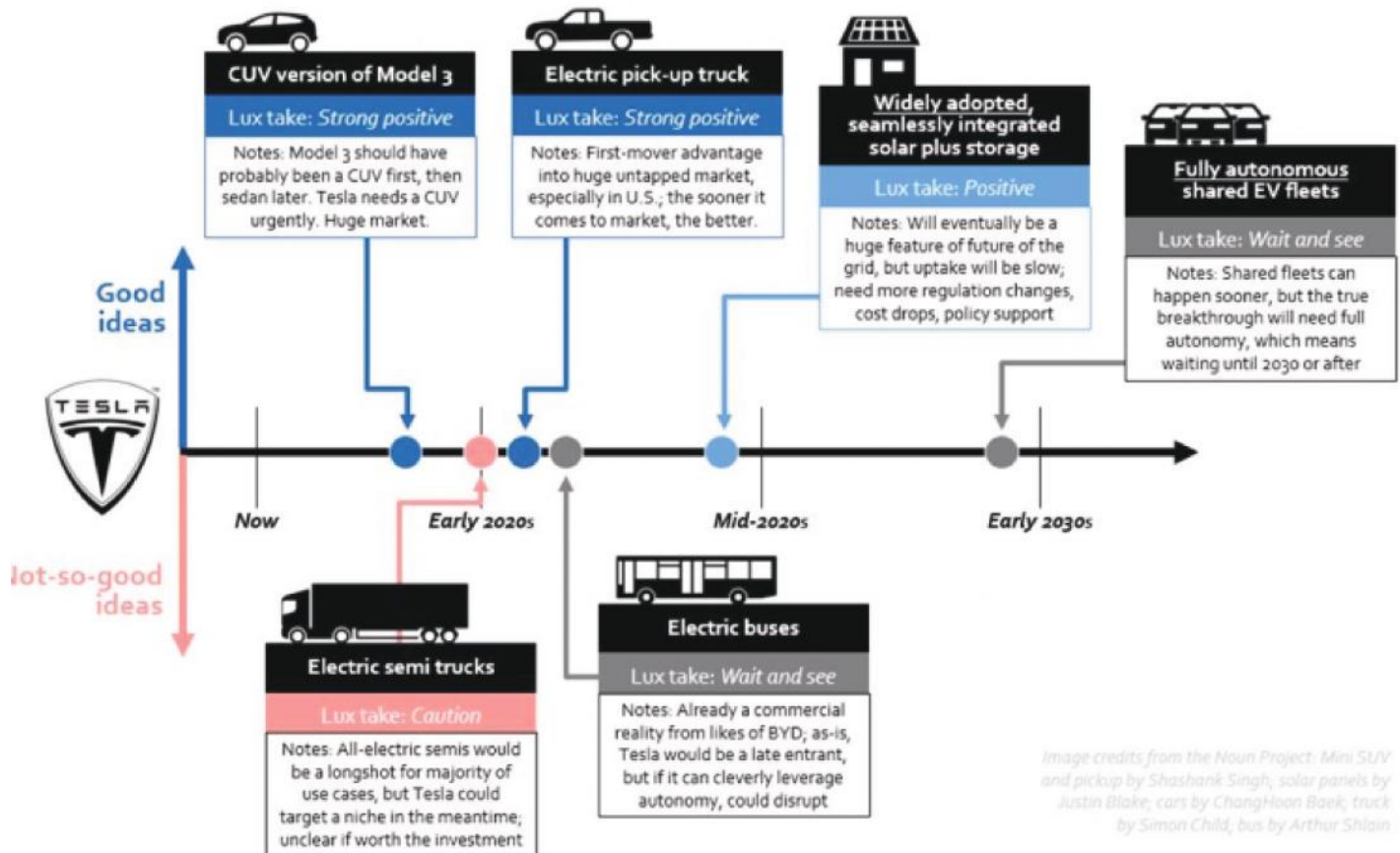


From finding materials, the design process, engineering the materials, and finally creating the products including the packaging materials, Ecovative Design has been much more than just a design company. They create their products as well as the science behind their products. In their mission statement, it states that their goal is to envision, develop, produce earth friendly materials. They adapted into the model of circular economy design quite literally by using a material known as mycelium which act has a form of glue that cant bind things together. From their own synethic MycoBoard-engineered wood to packaging materials such as MycoForm that actlike Styrofoam like materials which could help store packages.

Currently, their research and development team is working on a project titled MycoFlex which is a biopolymer material that is made entirely of mycelium. This substance could one day replace anything that is cushiony which before would require a long time to degenerate. Things such as shoe soles, seats cushions, yoga mats, etc. There are countless applications which this substance could be used for and when the product is done, the material goes back to nature. That is an example of a company utilizing one side of the circular economy diagram.

# What Is Circular Design

## Case Studies: Tesla Master Plan



In terms of technological development that has taken the circular approach, under guidance of CEO Elon Musk, Tesla Motors had devised a two part "Master Plan" which part one was written roughly ten years ago. The goal was simple, To create low volume car, which would necessarily be expensive, use that money to develop a medium volume car at a lower price, use that money to create an affordable, high volume car, and also provide solar power. However, as the company has reached it's last phase, they took the initiative to adapt the circular economy approach as their part two of the two part master plan. First, they plan on adapting solar energy and using that to harness renewable energy which could help reduce energy cost. SolarCity has been Tesla's testing ground as it's been powering their factories.

At the same time, they are taking advantage of integrating into autonomy technologies which allow the system to autopilot the vehicles. This exploration has already been in place by many companies however what is so unique about the autonomy technology is that it'll allow the vehicles to become a fleet for Tesla's role in the sharing economy. The purpose is instead of wasting spaces such as parking lots, it'll enable the car to help make money when you're not using it. Again, circular economy is about taking resources and either making them renewable, or giving them multiple purposes.



# What Is Circular Design

## Building Block of Circular Economy

At the end of the day, companies need to build core competencies in circular design to facilitate product reuse, recycling and cascading. Circular product (and process) design requires advanced skills, information sets, and working methods. Areas important for economically successful circular design include: material selection, standardised components, designed-to-last products, design for easy end-of-life sorting, separation or reuse of products and materials, and design-for-manufacturing criteria that take into account possible useful applications of by-products and wastes.

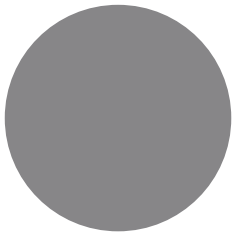
First of all, they will need to adapt a new business model. The shift to a circular economy requires innovative business models that either replace existing ones or seize new opportunities. Companies with significant market share and capabilities along several vertical steps of the linear value chain could play a major role in circular economy innovation and driving circularity into the mainstream by leveraging their scale and vertical integration.

For widespread reuse of materials and higher resource productivity to become commonplace, market mechanisms will have to play a dominant role, but they will benefit from the support of policy makers, educational institutions and popular opinion leaders. Examples of these enablers include:

- Collaboration
- Rethinking incentives
- Providing a suitable set of international environmental rules
- Leading by example and driving up scale fast
- Access to financing

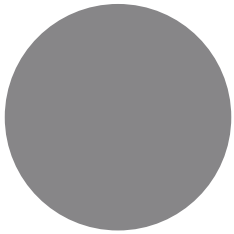
The role of design is beginning to change. Since design has always been about exploring new territories, we need to adapt a new mindset to reframe our own thinking in order to tackle on projects by adapting on circular design. To do so, it'll require the designer to keep looking closer but at the same time look outwards in order to identify things that could be potentially applicable to the design.

## Practise these Perspectives



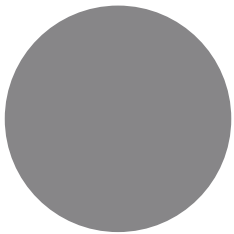
### Widen your user base.

When designing for circular economy, we must research and understand a large variety of user base. We need to be inclusive and take into account of how our design could potentially impact on places that we never could've imagined. Inclusive design is another driving force of future proofing design method that we would discuss in the future.



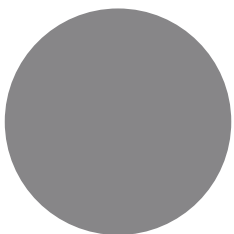
### Reimagine Viability

Like the examples from the case study shows that we need to create methods that are long lasting, materials that adds values in multiple ways. If we are to create a new juice, it also means we are making the box and the straw as well. It also means we have to make the box in a way that it serves mutiple purposes or at least recyclable as well as develop a straw that encompasses materials that allows it to be degradable.



### Design for Evolution

We need to design for the purpose of evolution. To have the mindset that the product and services can constantly evolve based on the feedbacks we get. We have to design to be adaptable so that it can be future proof in the sense that what ever we are creating have the ability to be long lasting but at the same time it shouldn't have a large foot print in the ecological system.



### Build a Narrative

Like anything that's long lasting, the narrative has to be strong not only for the primary purpose of the product or services but also the future development of who are we serving. These "stories" has to have the same influence all across the spectrum of users that might come across the product/services, so their overall experience is similar and can share a bond over the narrative.



# Circular Opportunities



Look for opportunities to become more circular. Answer each of the following questions. Remind yourself of what core needs your offering is solving

PROLONGING PRODUCT LIFE	N	Y	CONSIDERATIONS
Can you product become a service in some way?			
Can you make it easier for your users to repair it themselves?			
Can you design your product to be more modular so individual components can be upgraded or replaced easier?			
Can you provide a maintenance service to sustain the life of the product?			
Can you work directly with your manufacturer to restore your products after their first use cycle?			

PURPOSEFUL INPUTS & OUTPUTS	N	Y	CONSIDERATIONS
Can you utilise waste or recycled materials for your materials?			
Can any of your materials be sourced more locally?			
Can your production be more localised?			
Can you minimise the waste stream your product produces?			
Can your product contribute to the biocycle in some way?			

Design Process Guidelines from Ideo.