

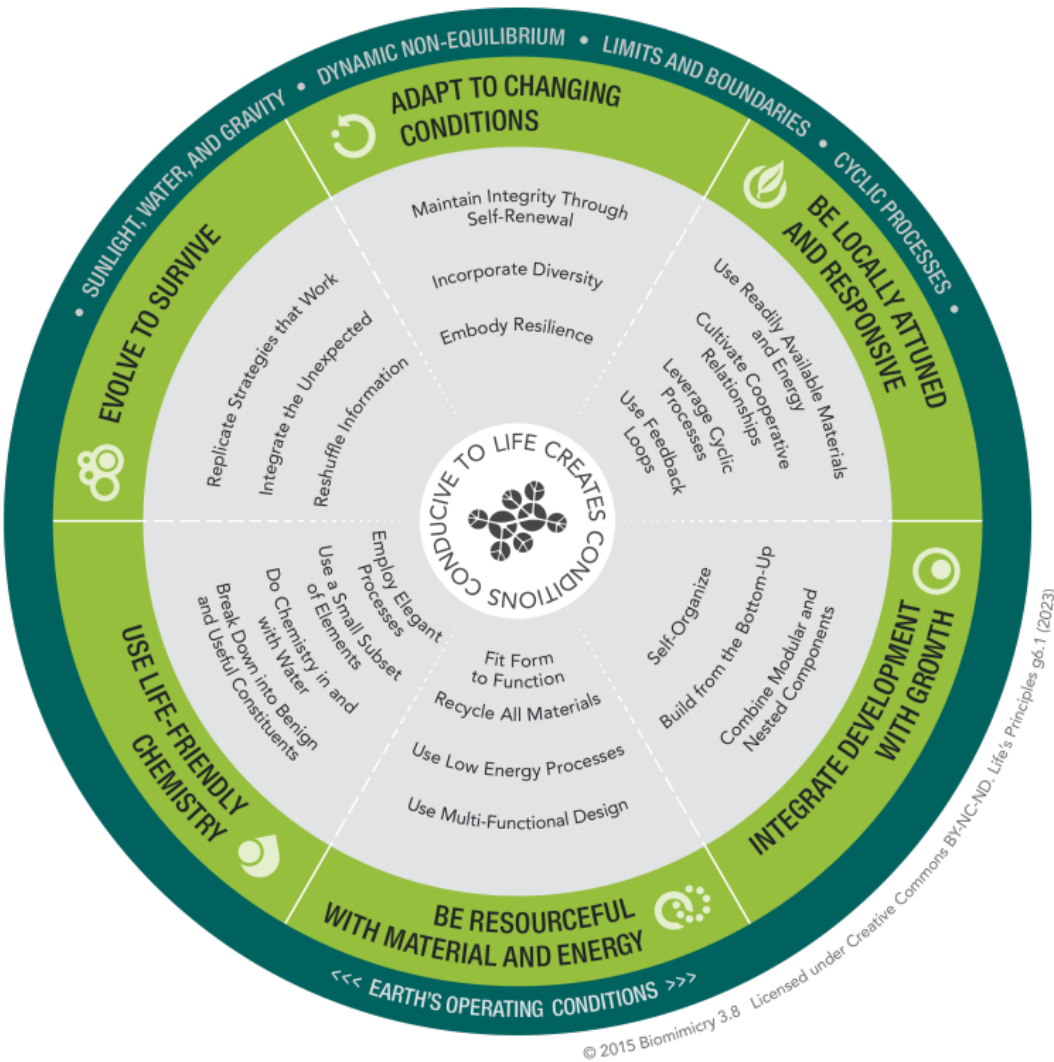
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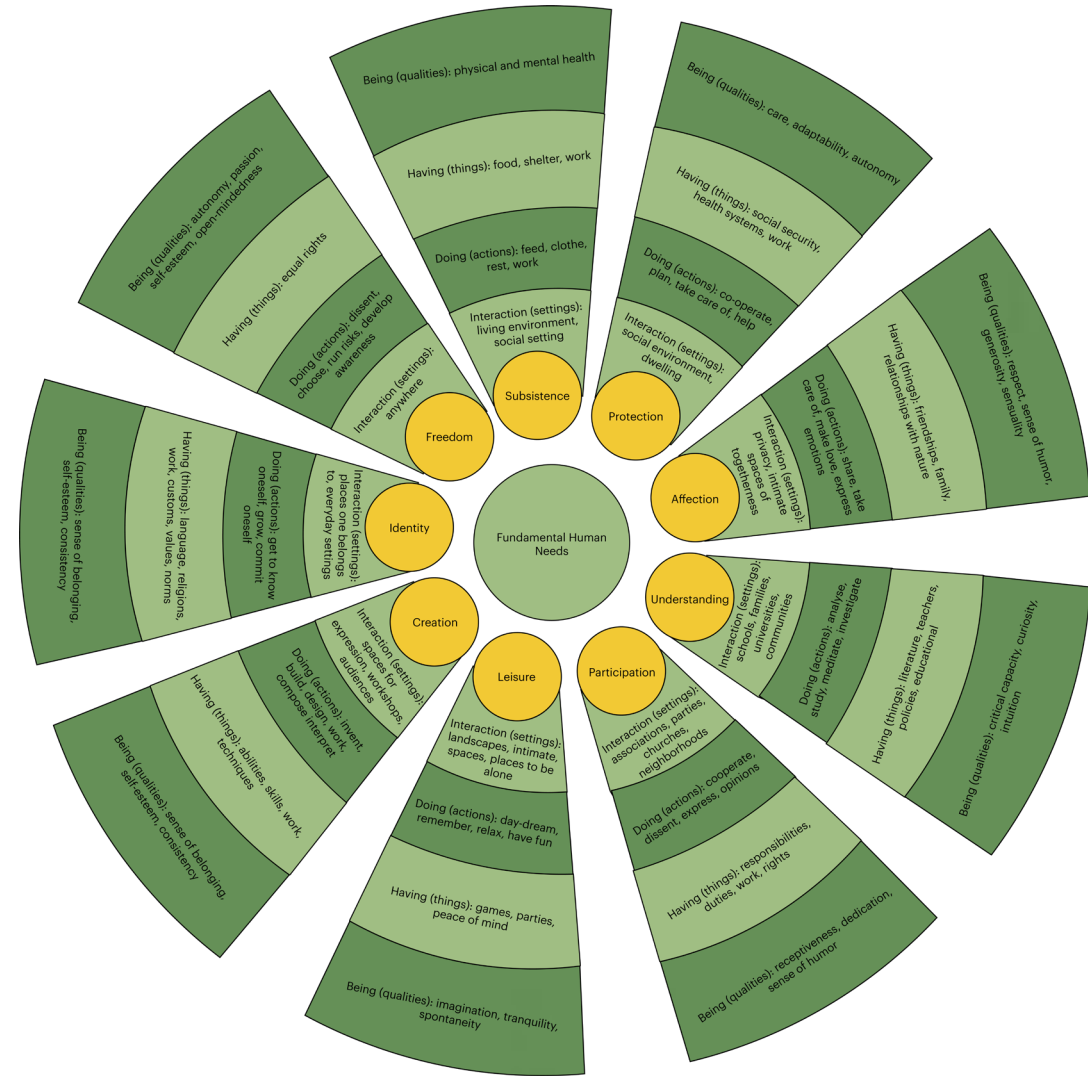


# Appendix B - Expanded Figures

## Appendix B1 - Biomimicry's Life Principles



## Appendix B2 - Max-Neef's Fundamental Human Needs



# Appendix C - Results Internal Expert Interviews

## Appendix C1 - Interview Guide

Table C1. Interview guide for IN10's experts

Main themes	Probes
Introduction	Welcome Small introduction to project Ask permission for recording
General Questions	How many years have you been working as a service designer/strategist, and how long at IN10?  What is typically your role in the design process?
Design Approaches	Can you give me an overview of the different design approaches you use and for which problems? It would be helpful if you could draw or plot them on paper. (Categories of problems could be specific, moderate, or abstract).
Starting Point	Walk me through the process leading up to the starting point of a project. How do you determine the starting and end points?  How do you handle situations where a client presents a big, vague problem or has a broad ambition without a specific starting point? Can you explain the steps you take in these cases?
Problem/Solution Exploration	How do you deal with ambiguity or uncertainty during the process? Please explain the steps you take.
Decision-Making	How are decisions typically made throughout the design process?  Who has the final say, and how does this differ from group decisions?  How do you steer the group toward a specific direction or influence decisions?
Activities and Tools	What are the requirements of a tool or method to be adopted by you?  Are there specific tools or methods you find helpful?
Closing Question	Is there anything else you want to share or discuss that we have not covered in this interview?

# Appendix C2 - Clusters



## Design Process

### Starting point

**Sprint 0**

**Interpreting the question**

**Showing the approach in the sales process**

### Dealing with the design challenge

**Presenting information clearly**

**Guiding clients to the real problem**

**Guiding from appearance to the real issue**

**problem framing workshop**

**Defining the problem**

**Making and verifying assumptions**

### Design sprint

Different types of design sprints

Design sprints are not standardized

Flexible to make adjustments

A service blueprint can be a

Suitable for a reasonably defined challenge

The direction of the problem is decided by the client

## Designer

### Role of the designer

Organizing information

Taking the client along

Responsible for the concept

Responsible for user insights

Conducting research

Asking guiding questions

Defining the project scope

Substitutive role

Facilitator

Understanding the problem

### Decision-making

Exerting influence on decisions

Providing strong arguments

Product owner

Changing with vocal strength

### Role of the client

Determine voting rights

Clients view from their own expertise

The product owner needs to understand our approach

The product owner should be able to make decisive decisions

The product owner must be able to bear the responsibility

## Design Resources

### Design principles

Co-creation

Holistic approach

User-centered

### Research (generating insights)

Anthropological research

Desk research

Visual methodologies

Interviews with end users

### User testing

Minimal Viable Concept

Testing the prototype

### Design tools

Sketching

Stakeholder maps

Customer journey

Roadmap

Trend research

User stories

### Requirements design tools

Gaining insights

Examples available

Scientific basis

Fun to use

Visualizing

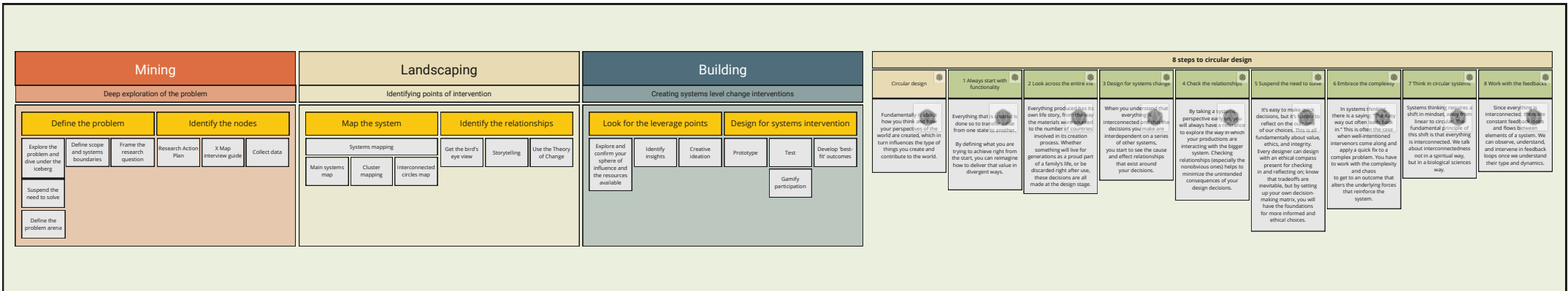
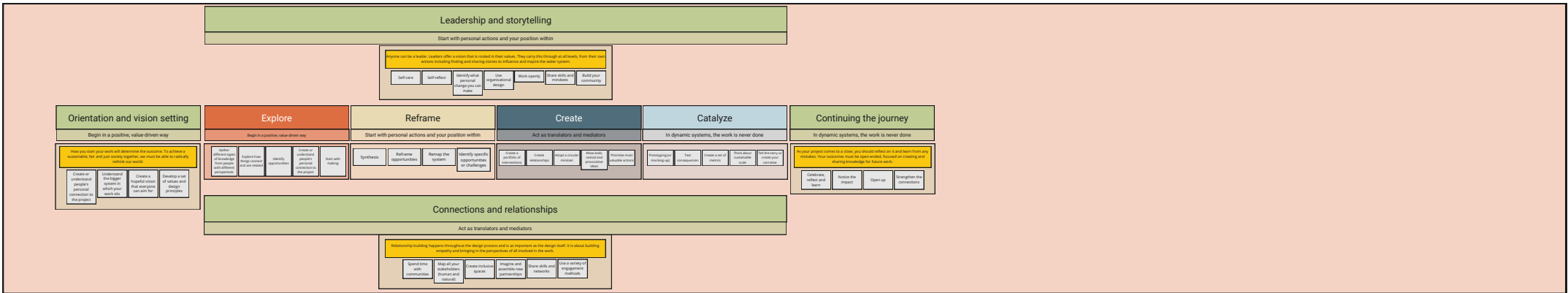
Adopting an active attitude

## Appendix D - Comparative Factor Overview



# 1. Observe and interpret the system

<p><b>Decide what is in the system</b></p>	<p><b>Map the system</b></p>	<p><b>Ensure inclusive representation</b></p>	<p><b>“You can’t design the strategy until you understand the complexity of the system.”</b></p> <p>Chris Grantham, IDEO Alum (former Executive Director, Circular Economy)</p>	<p><b>“There are no separate systems. The world is a continuum. There is no single, legitimate boundary to draw around a system. We have to invent boundaries for clarity and sanity; and boundaries can produce problems when we forget that we’ve artificially created them. Where to draw a boundary around a system depends on the purpose of the discussion—the questions we want to ask.”</b></p> <p>Donella Meadows, environmental scientist and systems thinker</p>
<p>Drawing boundaries around a system from the outset simplifies management, facilitates mapping, and allows flexibility in determining the system's scope based on the inquiry or design brief.</p>	<p>Identify clusters of key actors within the system - their circular economy readiness and the interactions between these key actors.</p>	<p>Include diverse perspectives - whether local business, citizens, or users - within the systems mapping process to create visibility of needs, interests, challenges, and hopes at the outset.</p>		





## 2. Envision circular futures

<p>Imagine a desirable circular future</p>	<p>'What if' questions</p>	<p>Convey the future</p>	<p>Question and test the concept</p>	<p>"Designers come with a creative mindset and are natural storytellers – through narrative creation and visualisation they can help motivate others to take action."</p> <p>Jamie Bates, Global Design Leader, Unilever</p>
<p>Use visualisation methods with a group of actors to imagine a future system or ecosystem embodying the circular economy principles of eliminate, circulate, regenerate.</p>	<p>Useful prompts for engaging our imagination and unlocking possibility.</p>	<p>Collectively explore what's transformative about those circular economy visualisations, conveying in particular how the system works at different scales and for every individual and organisation. It's important that there's a shared sense of mission or purpose, beyond the few leading the initiative.</p>	<p>Creating models and artefacts, stories or experiences enable us to play out unfamiliar scenarios, to spot opportunities, obstacles, and pitfalls we may otherwise miss and force decisions about what to do next.</p>	<p>"Designers need to bring circular economy visions to life in a way visions typically aren't. They should be more emotional and more engaging."</p> <p>Chris Grantham, IDEO Alum (former Executive Director, Circular</p> <p>"Defining what is valuable to an organisation is really the starting point. What are we chasing? What organisations are chasing is entangled in how we understand value, and what is of 'value'."</p>

**Orientation and vision setting.** How you start your work will determine the outcome. To achieve a sustainable, fair and just society together, we must be able to radically rethink our world.

Complex environmental and social challenges are not static: they can't simply be 'fixed'. Rather than seeing your work as a 'problem and solution', you should start with a hopeful vision of what you want to achieve, and develop a clear mission from that. It is important to begin your project in a positive, values-driven way. Making sure these are shared across partners is crucial. Spending time with team members and stakeholders at the outset to build trust allows you to collectively return to these values throughout the process.

Create or understand people's personal connection to the project	Understand the bigger system in which your work sits	Create a hopeful vision that everyone can aim for	Develop a set of values and design principles
Ask 'why are we all here?' and allow the answers to drive the project.	Consider the history, the societal values and assumptions of the system in which you are working.	Do so in clearly defined and shared terms and language.	To guide your work or reframe how you see the work.
Spend time with team members and stakeholders at the outset to build trust.	Complex environmental and societal challenges are not static: they can't simply be 'fixed'.	And collectively return to these values throughout the process.	

<p>Humans' aversion to change means that people often opt out of participating in the positive changes they want to see. Culminating ignorance towards change is manifested in major global issues that we're experiencing now. From climate crisis to poverty and the global shift to the political right, all of these changes have collateral problems, like the refugee crises and political apathy. But the future is not defined and the choice to not actively participate in change is, unto itself, an act of change - one that reaffirms the status quo.</p>	<p><b>Asks questions</b></p> <p>Spark the mind, set up a frame of reference, and then provide the opportunity for seeing something differently. It is to prove someone is right or wrong. It's about creating the right level of curiosity so that, even if someone is wrong, they feel good about the new knowledge they receive.</p>	<p><b>Design the experience</b></p> <p>The way a room is set up and the position of the presenter both convey meaning to the participants. Simple spatial decisions will trigger different responses in the people you are working with.</p>	<p><b>Make it fun</b></p> <p>Fun can be embodied in a little light humor and also through the selection of experiences and activities that people are invited to participate in. Also games are a useful mechanism for creating fun and playful experiences that ignite change.</p>	<p><b>Tell stories</b></p> <p>Good stories can trigger all sorts of emotions, like empathy and even anger, which are powerful tools to illustrate the point in different ways.</p>	<p><b>Admit what you don't know</b></p> <p>It can help get them filled quickly. Someone else might have the answer, or get inspired to find the answer, and share it with everyone else. A lack of knowledge about something can be more interesting than an overabundance of knowledge, as it drives curiosity and the desire to learn more.</p>	<p><b>Co-create, don't dictate</b></p> <p>Co-creation allows for an open equal space to be developed. And participants are more likely to respond to complexity and let creativity flow.</p>
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# 3. Create the conditions for collaboration

Bring key actors to a shared mindset	Share project ownership, benefits and risks	Define the roles of each other	Raise awareness of scale and context	Open up knowledge and advance learning	
Facilitate shared experiences to help create personal connections and build long-term relationships as well as overcome barriers.	Evaluate the system's potential, emphasizing complementary roles for mutual and overall benefit. Shared risks and thorough exploration of the value ecosystem are crucial for aligning every element with the long-term vision of circular and disruptive innovations.	In a multi-actor collaboration, it's important to identify each actor's strengths and leverage their unique abilities in the project context. Make each actor accountable for their contribution.	Choose a project scale that aligns with the operational pace and circular readiness of actors/organizations, considering diverse contexts such as cultural variations, standards, and regulations across regions.	The acceleration of the transition to a circular economy includes avoiding duplication and reinventing the wheel constantly.	Make knowledge, including partial systems maps, publicly available for others to learn from and build on. By opening up information to peers within and beyond your network, it seeds an ecosystem of reciprocity and an understanding that 'the more you put in, the more you get out'.

<p>Understand the types of people that need to be involved in designing for sustainability.</p>	Core roles in a design team				Some projects may include people who can span different roles, while others may need experts to focus on a single area.			
	<p><b>Systems thinker</b></p> <p>Systems thinkers look at problems holistically, seeing multiple causes and effects, and brings in different perspectives, rather than working with prior assumptions from a siloed viewpoint.</p> <p>Seeing how everything is connected interdependent and circular.</p> <p>Finding the root of the problem.</p> <p>Bringing together new perspectives and marginalised voices.</p> <p>Holding the fullest complexity and expanding the brief.</p> <p>Connecting to and learning from nature.</p>	<p><b>Leader and storyteller</b></p> <p>Successful projects are led by those able to envisage a hopeful and imaginative outcome.</p> <p>Encourage people to think more broadly and more hopefully.</p> <p>Their work is value-led, persuasive and tenacious.</p> <p>Their stories are heavily evidence-based.</p> <p>They introduce new approaches to monitor and quantify outcomes &gt; they redefine what is deemed valuable.</p>	<p><b>Designer and maker</b></p> <p>Designers are using their skills to understand different motivations and create things that people want to use or be part of.</p> <p>They are making things tangible and visible to raise awareness, attract people towards them and inspire others to act.</p> <p>Designing and making things that encourage more sustainable behavior.</p> <p>Designing the context which frames how decisions are made.</p>	<p><b>Connector and convener</b></p> <p>Seeing and making connections is a core part of acting systemically, be they connections between people, ideas, objects or processes.</p> <p>Connecting different interventions at different levels</p> <p>Connecting partners to create greater ambition or market demand.</p> <p>Connecting people with shared goals, designing the platforms that bring them together from which further innovations can emerge.</p>	<p><b>The new role of the designer</b></p> <p>Designers will see how everything is connected and how their design intervention will put a different set of relationships into motions. Rather than just seeing these as 'externalities' at worst, or 'unintended consequences' at best, designers are designing for this wider ripple effect. They are making this ripple effect visible and sharing the wider value that it creates.</p>	<p><b>The new role of the designer</b></p> <p>Designers will be taking a more radical and intentional stance on what new systems need to be for, rather than acting as neutral facilitators of user needs. That is not to say that they won't be working with what currently exists.</p>	<p><b>The new role of the designer</b></p> <p>Designers - particularly commercial ones - will be working on a 'twin-track', designing immediate and incremental outputs to build trust and goodwill while raising imagination and awareness of the possibility of alternatives. Commissioners will be asking for this 'double brief'.</p>	<p><b>The new role of the designer</b></p> <p>Designers will be holding their design briefs in a broader way, applying their skills, not to a fully defined, closed system, but to a longer-term process of organic change. They recognize that the design and the world design back. The 'end form' of the design is less important than the way in which it encourages conditions for intentional emergence, the object will be the temporary 'thing' that are needed to support transition. Designers will be engaged in unbuilding old systems and old assumptions at the same time as assembling. The intention will be to see how resources (people, expertise, materials) can be repurposed, sorted, re-used, regenerated, and to understand the emotional change associated with that.</p>
	<p><b>Roles in the process</b></p> <p>Through observing designers working to shift systems, we can see that they are finding different positions from which to act. These allow them to put new approaches into practice.</p>	<p><b>Visionary propositioner</b></p> <p>Someone who, through their practice is exemplifying the different philosophy behind a new system. They find ways to create evidence-based research to develop new forms of ways of knowing which they keep waiting in the wings until the right opportunities and partnerships present themselves to create tangible demonstrations of what is possible.</p>	<p><b>New system entrepreneur</b></p> <p>Someone who has formally dug down into the roots of his current market moment in the current, and then creates a product or service that embodies that deeper change and that people can start buying and using now.</p>	<p><b>Pro-activists</b></p> <p>Someone who poses questions about what might be possible, loosens up the current system and creates spaces for imagination and co-design and then places it in the hands of others who can take it forward and build on and enact it.</p>	<p><b>Coaching consultant</b></p> <p>Someone who plays the 'double brief' with a client, coaching them to use design to understand and reframe their current problems while also lifting their eyes to their potential new roles and values from which more radical interventions can come. Who can take into account two extreme views and create a third one into a pathway forward.</p>	<p><b>Intention weavers</b></p> <p>Someone who uses their role as design commissioners of co-venturer organisations and people across the system, across and beyond design, with a similar alternative intention of shared interest in the benefits of a new system, and build interdependencies between them.</p>		

<p><b>Systems thinker</b></p> <p>Identify and understand these relationships as part of the exploration of the larger systems at play.</p> <p>Explore all the parts that make up the whole and identify where the crossover connections are.</p> <p>Every system is like a Matryoshka doll, made up of smaller and smaller parts within a larger whole. &gt;&gt; Seeing things in this way helps to create a more flexible view of the world and the way it works.</p>	<p>The world's beautifully complex and chaotic interconnected systems are all working harmoniously together, behind the scenes, to create the world as you understand it. These interconnected systems are often invisible to most people though.</p> <p>Every system is made up of nodes and networks, connected in multifaceted ways. In systems thinking, we explore all the parts that make up the whole and identify where the crossover connections are. It's often the connection points that present the most opportunity for making change - these will form the basis for our intervention points.</p>	<p><b>Facilitating during the ideation phase</b></p> <p>Many people experience many neurological barriers when trying to develop truly unique and interesting ideas. These rules are guidelines to bust past those barriers, to help frame the process and to provide helpful reminders of how to overcome the natural desire we have to get jump to the solutions as quickly as possible.</p>	<p><b>Problem hold their own solutions</b></p> <p>Ideation is about learning to love, explore an idea, intimate with the details of the problem. Since everything is interconnected, every problem will hold its own solution in you understand the issue well enough.</p>	<p><b>Push through the frothy stuff</b></p> <p>The first few ideas are usually the most obvious ones, and we often get too attached to them.</p>	<p><b>Define a function and objective</b></p> <p>Everything that exists has a primary function. In defining a function, you are setting the framework through which you can then explore divergent ways of achieving delivery and that same function. &gt;&gt; Starting with the function helps everyone to get on the same page in what you are seeking to achieve.</p>	<p><b>Find your own process</b></p> <p>There is no one way to be creative. Some people like to write, draw, speak, sing, you name it. There are so many different ways of exploring ideas and their potential. Also, I always seek out other's perspectives on ideas to help build the ideas' resilience and robustness.</p>	<p><b>Have an ideas bank</b></p> <p>Collect ideas, inspiration, opportunities and possibilities. Store them away in an 'ideas bank' in your brain (and write them down somewhere if you'd like), and one day, they will pop back up, connect, and help you generate new ideas!</p>
			<p><b>Sift through ideas</b></p> <p>There is no wrong or right idea; there are best fits and impractical or unachievable ideas, but all ideas have value. &gt;&gt; We need to be able to sift through them to find the best ones for the problem arena we are seeking to intervene in.</p>	<p><b>Be empathetic</b></p> <p>Empathy is a visceral feeling that is shared between two people, based on a collective understanding of the experience of pain and other strong personal emotions. Develop an empathetic ability that you can use to understand the motivations, actions, and desires of humans outside of your own lens of understanding.</p>	<p><b>Use the pop and bounce</b></p> <p>Ideas rattling around in your head are worthless until you put them into the world and get feedback. I call this the pop and bounce - you share ideas with others, see if they pop, and bounce them back and forth until they get to that point that they are bouncing.</p>	<p><b>Adopt a do philosophy</b></p> <p>Ideas don't really do much good until you put them into action, and nothing makes sense until you try it. So, test, experiment, explore and iterate. Rapid prototype your ideas, and get feedback that you can use to evolve them.</p>	<p><b>Embrace the messiness</b></p> <p>Creativity is chaotic and yes, in many cases very messy! It's easy to fall into the trap of wanting neat, tidy, easy-to-find solutions, but problem sets are complex and the process of feeling your way through them is often just as messy. Once you get over the need to solve the problem in a clean way, you will free up your creative mind to explore the endless possibilities in a dynamic and playful way.</p>

# 4. Build circular design capabilities

<h3>Redefine the role designers play</h3>	<h3>Analyze the skills gap</h3>	<h3>Design learning opportunities to bridge the gap</h3>	<h3>Connect circular design skills across the organisation</h3>
<p>Reimagine designers' roles beyond traditional brief responses to actively shaping future design briefs. Integrate strategic and systemic capacities into design roles from the start, fostering a cross-functional presence of design competencies across various business functions.</p>	<p>Regularly map circular design knowledge and skills throughout the organization, extending beyond design and innovation functions to include leadership. Identify existing competencies and analyze gaps. Determine the necessary knowledge and skills to build capabilities for circular economy projects. Leverage existing design skills for circular outcomes and develop additional competencies as needed. Repeat this exercise as circular economy maturity progresses.</p>	<p>Design learning opportunities to support individuals in the circular economy journey, covering mindset development, knowledge acquisition, staying updated on policy and regulation, practicing tools and frameworks, and effectively communicating the value of circular products and services to clients or customers.</p>	<p>Establish cross-disciplinary circular economy task forces or clusters within the organization. Assemble leaders with circular design expertise to collaboratively enhance innovation capacity. This approach fosters interconnected, synergistic, and strategic innovation, shifting design from a siloed function to an embedded, upstream influence in decision-making.</p>

### Ways of working

<h4>Divergent and convergent thinking</h4> <p>Dedicates time to clearly understand the context in which you are working before seeking a solution. It gives you the space and confidence to challenge your brief.</p>	<h4>Zooming in and out</h4> <p>Being able to switch between a focus on the micro and the macro from your project to the wider or broader which it sits, from the present to the future, from your personal role to the wider system, seeing the wider consequences - both positive and negative - that your work sets in motion.</p>
<h4>Disrupting and remaking</h4> <p>Digging down to the root cause of a problem - which is something within the 'invisible' structure of governance, regulations, deeply held assumptions or beliefs - is a critical part of the design process. With this insight, you can consider what you could make a product, service, place or other (intervention) that could disrupt the problem and create the necessary change.</p>	<h4>Resourcing 'invisible' activity</h4> <p>The connections and relationships and the leader and storytelling that sit around a project are as important as the design project itself. Through projects, designers can move towards their bigger vision, while recognizing that problems are never fixed, that work is an evolving process that also needs connecting with other similar initiatives to bring about a movement for change.</p>

### System thinking

Systems thinking is a comprehensive approach that considers not only the individual elements involved in a project but also how these elements interrelate, how the system changes over time, and how it relates to its wider environment.

They understand that systems are dynamic and uncontrollable so any intervention will set off another train of interactions which could - with intention or facilitation - positively reinforce the system as a whole.

Requires us to consider the relationships between the elements of our system (for example, people, organisations, governments) and how they will continue to function over time.

Designers must consider how their work will stand the test of time and what capacity it has to evolve, implementing a great solution at the wrong time and place will cause it to fail. The outcomes will depend upon myriad factors.

It looks at problems historically, seeing multiple causes and effects, and brings in different perspectives, rather than working with prior assumptions from a siloed viewpoint.

As designers, we must reflect on our own position, and actively draw in perspectives that are different from ours, including those which have historically been marginalised.

New design capacities	Integrative thinking	Abductive reasoning	Perspective-taking	Propositionality	Reflexivity	Synthesis through making
<p>When designers work on systems, they are not applying human-centred methods to solve system problems. They are drawing on a more fundamental understanding of the system and using that to create new solutions in complex, dynamic environments. Designing the future is a creative and experimental process for anyone who wants to move from system thinking to system innovation.</p>	<p>The ability to hold and negotiate between opposing constraints or points of view, and generate a new model that transcends both.</p>	<p>Discovering what could be. This is inductive logic. Designers adopt a form of abductive reasoning that allows them to focus energy on the possible and the promising, rather than the right or the certain.</p>	<p>The ability to move beyond the subjective and objective. Abductive turn depends on the capacity for design and non-conformity that allows designers to focus energy on the possible and the promising, rather than the right or the certain.</p>	<p>Making propositions of how the future could be, with its clarity depends on the capacity for design and non-conformity that allows designers to focus energy on the possible and the promising, rather than the right or the certain.</p>	<p>The ability to reflect in action. Designers do this through constant learning and improving over time. The designer has a view on the world that is not fixed but evolves as they learn from the system and respond to the back loop by changing your representation of the situation.</p>	<p>The ability to take in diverse information, be challenged by it, synthesise it and give form and expression to your new understanding.</p>

<h3>Adopt a Problem Mindset</h3> <p>Problems are opportunities</p> <p>Suspending the need to solve</p> <p>Busting through our brain glitches</p> <p>Getting over the status quo bias</p>	<h3>Adopt a systems mindset</h3> <p>Don't get stuck in the details when you could be looking at the entire picture — this is the power of designing within a systems mindset.</p> <p>A systems mindset enables you to meet the design's functional needs, while also understanding the greater context of how the decisions you make fit within systems — from the supply chain impacts, through to the cultural implications of what you are creating.</p>	<h3>Learn from nature</h3> <p>We have managed to design many of our systems to be so industrially removed from this simple fact that we have forgotten how to learn from nature, and to discover how the planet solves problems so efficiently and beautifully.</p> <p>If everything comes from nature, then it must also go back to nature.</p>	<h3>Be constantly curious</h3> <p>Explore the way nature solves problems in your everyday life as you are constantly interacting with all manner of nature's things, from plants to weather systems.</p>
<p>When you break it down and look at it in more detail, &gt;&gt;&gt; problem has an opportunity for change locked within it. &gt;&gt;&gt; Learning to love the exploration of a problem arena helps you to shift to a solutions mindset and to define the problem you want to make change within.</p> <p>Many rush to solve complex problems with the same thinking that led to them in the first place and rush to slap a solution on it. While it may be aspirational, it is simply not an effective approach.</p> <p>Experience is everything</p> <p>The most used thinking paths reinforce the same paths. Dominant experiences that reinforce how we expect the world to occur. Experience can quickly become a feedback loop that reinforces itself. Which can lead to negative bias (where we can't help but focus more on the glass being half empty than half full) and beyond.</p>	<p>Bias. We all have them. They are the thinking flaws that impede rational judgement and distort our perspectives. Cognitive biases are socially constructed issues that live deep within our minds to help us connect with other humans and survive the world. They range from choice paralysis (where too many options render us unable to make a choice), to confirmation bias (where we seek out information that affirms what we already believe), loss aversion (where loss has a bigger neurological load than a gain, so we avoid it more actively), to negativity bias (where we can't help but focus more on the glass being half empty than half full) and beyond.</p>	<p>Challenging the status quo faces roadblocks due to the status quo bias; implementing change against familiarity triggers cognitive biases, making research crucial for creative change, activating empathy, and enhancing multidimensional perspectives.</p>	<p>This is so critical to understanding and working within the world in more productive ways. By seeing these natural, social and industrial systems, you get a more refined perspective of how the world works and how the things that we do impact on these systems around us.</p>

# 5. Rewrite the rules

<p>Translate the circular economy principles</p>	<p>Audit existing portfolio projects</p>	<p>Engage with practitioners</p>	<p><i>“As designers, if we understand what influences regulations we can contribute to change the rules. Our main skill is creativity and we should not limit ourselves about how we execute it.”</i></p> <p>Helle Ullerup, Senior Service Designer, Philips</p>
<p>Internal: Translate into organizational design guidelines. External: Consider local, national, or international regulations when developing these principles.</p>	<p>Internal: Analyse the organisation's existing portfolios to create a baseline understanding of how the current offering supports the circular vision and strategic goals. External: Explore external CE practices for inspiration, fostering discussion and action to adapt principles to diverse contexts.</p>	<p>Internal: Involve practitioners at all levels, raise awareness, support creativity in applying principles, and provide necessary tools for seamless adoption. External: Engage policymakers at various levels, participating in design-led coalitions. Stay informed about policy changes to influence regulatory conditions for design.</p>	

<p><b>People and planet centred</b></p> <p>Focusing on the shared benefits of all living things.</p>	<p><b>Zooming in and out</b></p> <p>From the micro to macro, from root cause to hopeful vision, from the present to the future, from the personal to the wider system.</p>	<p><b>Testing and growing ideas</b></p> <p>Making things to see how they work and help more things emerge.</p>
<p><b>Inclusive and welcoming difference</b></p> <p>Creating safe, shared spaces and language to bring in multiple and marginalised perspectives.</p>	<p><b>Collaborating and connecting</b></p> <p>Seeing a project as one element in a wider movement for change.</p>	<p><b>Circular and regenerative</b></p> <p>Focus on existing assets - physical and social - and how we can re-use, nurture and grow these.</p>

<p><b>Individual to collective or shared</b></p> <p>From user centred to collective or shared</p>	<p><b>From person to relationship</b></p> <p>From person to relationship</p>	<p><b>From facilitation to empowerment</b></p> <p>From facilitation to empowerment</p>
<p><b>Agile to transformative</b></p> <p>Design research to alternative intelligence</p>	<p><b>From business to grassroots</b></p> <p>From business to grassroots</p>	<p><b>From quick wins to slow experiments</b></p> <p>From quick wins to slow experiments</p>
<p><b>Static solutions to dynamic conditions</b></p> <p>Designing for dynamic conditions</p>	<p><b>From a prototype to a system</b></p> <p>From a prototype to a system</p>	<p><b>From a prototype to a system</b></p> <p>From a prototype to a system</p>

<p><b>Principles of system-shifting design</b></p> <p>Designers see what they are creating as one part of a bigger system...</p>	<p><b>Starting from a different place</b></p> <p>Finding ways to access different philosophies, sources of knowledge...</p>	<p><b>Designing from a collective viewpoint</b></p> <p>The starting point from any design work comes from a peer-to-peer...</p>	<p><b>Taking a stand</b></p> <p>Implicating themselves, holding on to the radical point of view...</p>	<p><b>Using their design skills proportionally to bring the potential system into being</b></p> <p>Focusing on the potential the problems inherent to the system...</p>	<p><b>Designing-in-action</b></p> <p>Engaging with the multiplicity of a changing system in real-time...</p>
<p><b>Considering it an unfolding and generative process</b></p> <p>Which continues over the time period as they evolve and improve...</p>	<p><b>Tending to the collective</b></p> <p>Designing in more interdependence, more contingency, making the collective stronger...</p>	<p><b>Investing in a longer time-horizon</b></p> <p>Building the capacity for an ongoing development process</p>	<p><b>Building a new set of system values into their designs from the beginning</b></p> <p>These values underpin the generation systems: regenerative, extractive, decolonial, more-than-human, circular, relational, etc.</p>	<p><b>Collaborating with other disciplines</b></p> <p>Working with people who also offer on how things happen: e.g. activists, journalists and narrative builders, ecologists, artists, entrepreneurs, philosophers.</p>	<p><b>Seeking shift and depth, not scale</b></p> <p>Scale is not always a means of changing systems. In fact, many innovations get co-opted before they can change the systems they are intended to change.</p>

<p><b>Everything is connected</b></p> <p>Schools taught most of us to think in structured, linear reductionist ways. This is incredibly useful for retaining core knowledge, but less useful for learning how to operate in constantly evolving, complex systems.</p>	<p><b>Change is constant</b></p> <p>Humans often only notice change when we don't like the direction the shift is going in, thus, we have all sorts of cognitive biases that reduce our ability to see where the change is coming from and where it is going.</p>	<p><b>The future is undefined</b></p> <p>Humans' aversion to change means that people often opt out of participating in the positive changes they want to see. Remember this: the future is not defined.</p>	<p><b>All change should be sustainable</b></p> <p>Sustainability is an incredibly misunderstood word and concept. All misconceptions aside, sustainability describes an aspiration for maximizing the benefits of the social, economic, and environmental systems that influence our lives on Earth. It's a mental framework for understanding how the decisions we make today have impacts on the rest of the world, now and in the future.</p> <p>At its core, sustainability is the pursuit to learn how to make the future the kind of place we want to live in (and are able to live in); it's about equity, equality, and creativity.</p>	<p><b>Challenge is part of reward</b></p> <p>We first must address the underlying elements that make up a problem rather than just tweaking the edges and softening the symptoms.</p> <p>We need to embrace complexity, challenges, tension and the discomfort of not knowing the correct answer right away. Known as "Suspending the need to solve" &gt; keep us deep in the problem exploration phase.</p>	<p><b>Change is iterative</b></p> <p>Most human-designed processes are very linear; they go from one state to another in a straight line that flows from start to finish. But nothing in nature is like that (and yes, we are part of nature). Thus, we need to embrace a circular, iterative, dynamic approach to the way we explore and intervene in the systems that play in the world around us.</p>	<p><b>A manifesto for designed systems change</b></p> <p>Everything that has naturally evolved from this planet is part of a beautiful web of complex, interconnected, circular regenerative systems, including every single human.</p> <p>As it stands, our landfills overflow and our oceans become increasingly saturated with plastic pollution because of linear design and reactive thinking.</p> <p>Nearly everything we humans have created to meet our needs and advance our lives are based on systems of extraction and waste, in the name of "convenience", profit, and short-sighted strategy.</p> <p>We exploit nature and human labor to compulsively produce more useless things, despite the fact that we decrease over time, intentionally making things no longer "usable", and ultimately designing for disposability.</p> <p>Now, with global problems rising, we must acknowledge the result of this flawed trajectory: complex interconnected systems that nature has evolved to be regenerative and circular. In order to sustain life on Earth and maximize the success of all species.</p> <p>We begin by embracing systems change and embracing the circular systems-based design tools to help us do so. This happens because despite our best efforts, humans have not been successful at fully replicating the complexity of the natural systems that provide food, air and water for life.</p> <p>Our challenge is to develop systems that meet our needs and that are regenerative to us and the planet, that take and give at the same time. This is circular systems design and is the way we can meet our needs without doing more harm.</p> <p>We thus have a built-in biological imperative to create things that meet our needs, while also regenerating the natural systems that sustain us all.</p> <p>This is the greatest issue - and opportunity - of our time. How do we design a world that works better for all of us?</p>
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# 6. Develop tools to design and evaluate

<p>Identify the tools needed to support better decision making</p>		<p>Screen existing tools</p>	<p>Ensure tools are fit for purpose</p>	<p>KVIs (Key Value Indicators)</p>
<p>Assess the impact of design decisions and help designers (stakeholders and consumers) make choices based on available information rather than waiting for the perfect dataset.</p>	<p>Monitor and evaluate the implementation of circular initiatives and progress towards strategic goals. Design indicators that measure progress on the creation of the enabling conditions, as well as the outcome to inform the way forward.</p>	<p>Avoid duplication by screening for tools that already exist across the circular design landscape.</p>	<p>Ensure tools align with agreed circular principles, prioritize regenerative outcomes, and consider long-term impacts. Share circular design tools to benefit the broader ecosystem.</p>	<p>What if instead of keeping track of progress against KPIs (Key Performance Indicators), highly useful for the linear economy, we redesigned this metric? For example, KVIs, standing for Key Value Indicators, which would reflect whether or not an organisation is delivering towards the circular future they envision.</p>

Tools for system-shifting design

<p><b>Life Cycle Mapping</b></p> <p>A discovery tool that helps you make more detailed design decisions on cause and effect.</p> <p>The goal is to get a more comprehensive understanding of the entire life of the product and then use this to compare different functional deliveries for design changes that result in more effective products that have considered the full life cycle impacts.</p>	<p><b>Systems Mapping</b></p> <p>A way finding rather than a technical approach to understanding what is going on in a complex system.</p> <p>Its an excellent tool for really establishing the core function of a system or product.</p>	<p><b>Cluster Maps</b></p> <p>These types of analog maps (or 'brain dump' map) are the best starter map, and one you can do anywhere on any topic and get to new insights very quickly. In a cluster map, we throw a topic, question, or problem arena down in the middle of a page, and then free associate nodes. The messier the better.</p>	<p><b>Interconnected Circles Maps</b></p> <p>The objective is to tease out the relationships between significant elements or agents within the system. The shape allows you to see the most dominant relationships between recurring feedback loops.</p> <p>Start by defining what you want to explore and then identifying as many of the main elements or agents within that system dynamics as you can.</p>	<p><b>Causality Maps</b></p> <p>These are more 'basic' maps where you are teasing the refined aspects of your system and looking at the cause and effect relationships between key elements. Essentially identify the feedback loops that reinforce, maintain or disrupt the system.</p> <p>The main question is what is causing X to do Y? And how is the systems reinforced or maintained?</p>	<p><b>Product Service Mapping</b></p> <p>Exploring how to transform a linear product or service into a circular one requires the practitioner to conceptualize the entire life experience of the transition from linear to circular.</p> <p>This mapping helps you to envision the steps of service delivery and design the entire system around the product.</p>	<p><b>Service delivery map</b></p> <p>Allows you to share your concept and then get feedback on the user experience from potential stakeholders. Do a quick sketch of the flow that a user would experience and the way the product moves through the system. What are the main components or elements that are needed to facilitate the functional delivery of the product within the service, and how are the materials recaptured and maintained within the system?</p>

# Appendix E - Prototype 3 Presentation Slide Deck

## The Circular Future Session

Ft. the Rotterdampas case study

Conceptualizing the circular economy

1. Understanding our current economic system
2. Exploring the living ecosystem vision

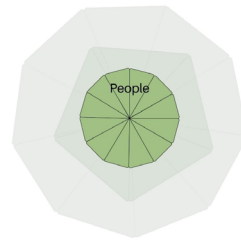
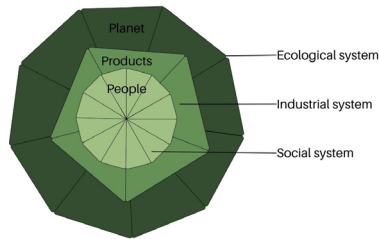
The Rotterdampas case

1. Actor Map
2. Wider Lens

## Building blocks

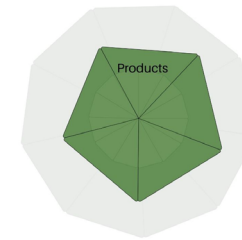
Of the economy

### The systems of the economy



### The social system

Human interactions, rituals, and behaviors collectively shape the invisible rules and structures that constitute the social system.



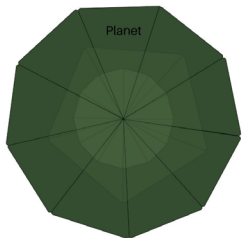
### The industrial system

Emerges from human needs and desires, encompassing everything we produce to fulfill them using natural resources.



### The ecological system

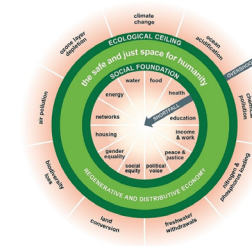
Provides vital natural services such as clean air, water, and food, supporting the social and industrial systems.



## Fundamental flaws

Of our current economic system

### The Doughnut model

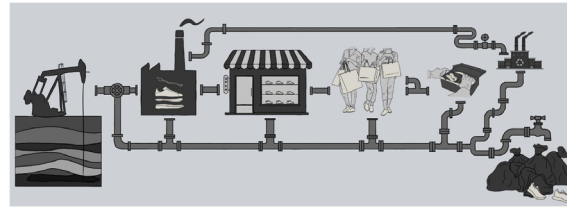


- Exceeding planetary boundaries
- Rising social inequality

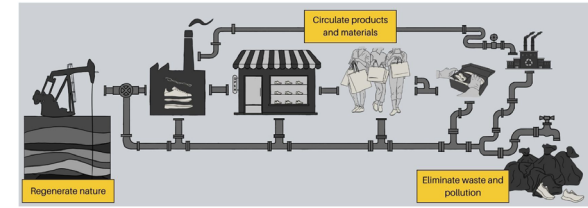
# Vision

Of the circular economy

Techno-centric view



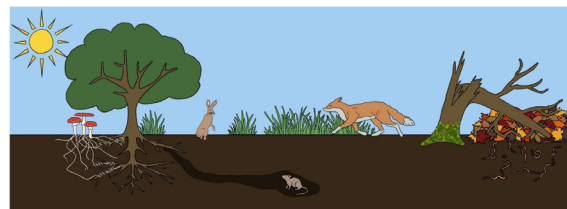
Techno-centric view



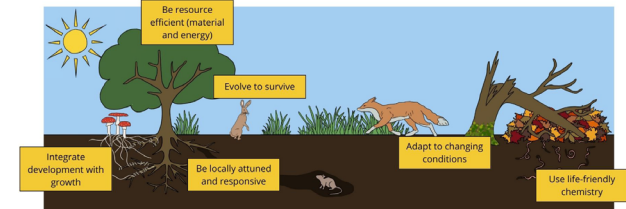
## Shortcomings

- Overreliance on technology - neglecting social, cultural and systemic factors
- Neglect of community-based initiatives and informal economies.
- Lacking diversity in solutions

Living ecosystem view



Living ecosystem view



## Characteristics

- **Aspire to fit on this planet**  
Restore the human-nature connection.
- **Adopt Life's principles**  
Innovate by learning from nature as a model, mentor, and measure.
- **Reconceptualize human well-being**  
From individual happiness to the focus on a meaningful and fulfilling life.
- **Advocate for distribution and inclusivity**  
Fair distribution maximizes the benefits of a circular system.

## Wider Lens

Nature and social lenses

Nature lens



Social lens



Wat als  
Je zou kunnen  
zorgen voor meer  
biodiversiteit?

**NK  
TEGELWIPPEN**

Het NK tegelwippen is een initiatief om (tuin)tegels te vervangen door groenvoorzieningen.

Wat als  
Je meerdere  
functies zou  
kunnen  
combineren in één  
oplossing?

**FIXMAS**

Fixmas is een digitaal platform dat gebruikers bewust maakt van de consumptiecultuur en helpt bij productreparaties met duizenden handleidingen.

Wat als  
Je de kennis over  
circulariteit bij  
mensen zou  
kunnen vergroten?

**circulaire kennis**

Het digitale platform is opgericht om te voorzien in de behoefte aan objectieve informatie, kennisontwikkeling en kennisdeling over e-waste en batterijen.

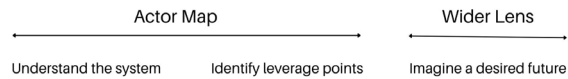


Gezonde snacks worden gemaakt van reststromen uit de vollegrondsgroenteteelt, met als doel de voedselketen van teler tot consument eerlijker en efficiënter te maken.

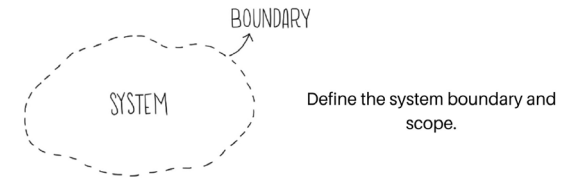
# The Rotterdam case

How can we encourage pass-holders of the Rotterdam case to engage in sustainable activities?

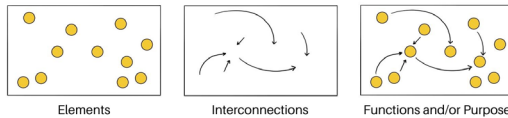
- Understand the system**  
Frame it, listen to it and make sense of it.
- Identify leverage points**  
Define the places in the system where there is an opportunity for change.
- Imagine a desired future**  
Co-create a vision of a desired future



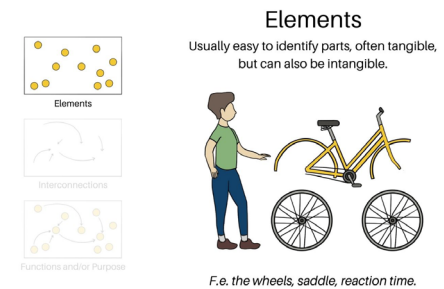
Every system is like a Matryoshka doll, made up of smaller and smaller parts within a larger whole.



## System components

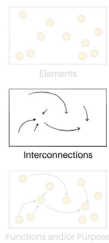


A person and a bicycle create a transportation system, which neither can achieve alone.



## Interconnections

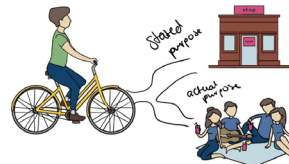
Relationships involving physical or intangible flows bind the elements through information, energy, or resource exchanges.



F.e. brakes slow or stop the bicycle, and pedaling propels the bike.

## Function and/or Purpose

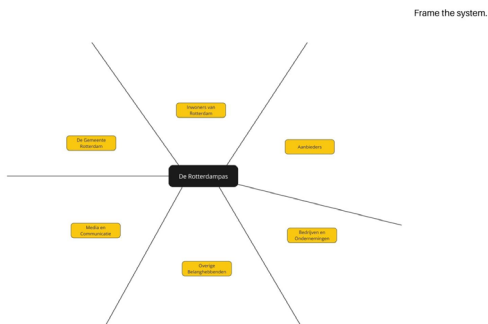
Its intended goal or role is often understood from how it behaves, which might not always match the intentions of the individual parts.



F.e. observation shows transportation purposes may differ; for instance, a rider's leisurely park route suggests leisure, not transport.

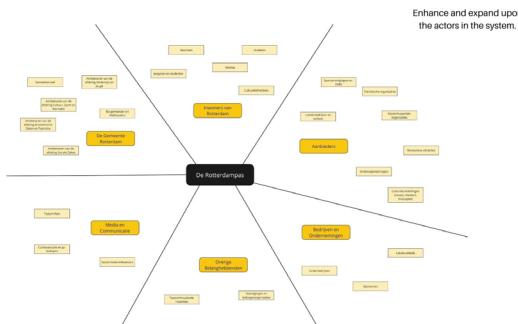
## Actor Map

Understand the system and identify leverage points



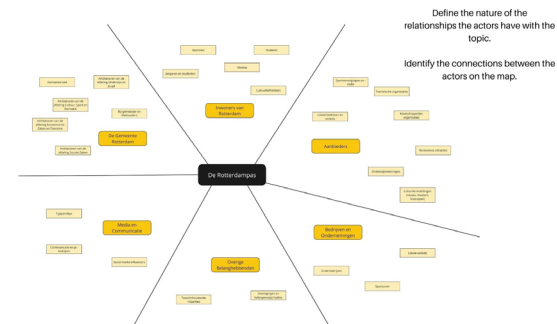
Frame the system.

Prepare



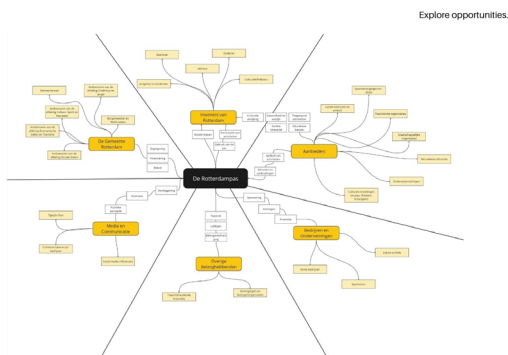
Enhance and expand upon the actors in the system.

Prepare



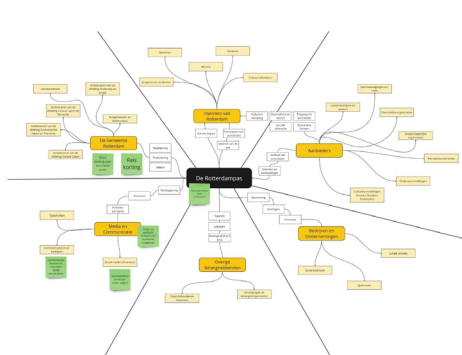
Define the nature of the relationships the actors have with the topic.  
Identify the connections between the actors on the map.

Facilitate



Explore opportunities.

Facilitate



Facilitate



## Appendix F - Approved Project Brief

# IDE Master Graduation

## Project team, Procedural checks and personal Project brief

This document contains the agreements made between student and supervisory team about the student's IDE Master Graduation Project. This document can also include the involvement of an external organisation, however, it does not cover any legal employment relationship that the student and the client (might) agree upon. Next to that, this document facilitates the required procedural checks. In this document:

- The student defines the team, what he/she is going to do/deliver and how that will come about.
- SSC E&SA (Shared Service Center, Education & Student Affairs) reports on the student's registration and study progress.
- IDE's Board of Examiners confirms if the student is allowed to start the Graduation Project.

**USE ADOBE ACROBAT READER TO OPEN, EDIT AND SAVE THIS DOCUMENT**

Download again and reopen in case you tried other software, such as Preview (Mac) or a webbrowser.

**STUDENT DATA & MASTER PROGRAMME**

Save this form according to the format "IDE Master Graduation Project Brief\_familyname\_firstname\_studentnumber\_dd-mm-yyyy". Complete all blue parts of the form and include the approved Project Brief in your Graduation Report as Appendix 1!

family name	Hutter	Your master programme (only select the options that apply to you):	
initials	CFM given name Carlijn	IDE master(s):	<input type="radio"/> IPD <input type="radio"/> Dfl <input checked="" type="radio"/> SPD
student number	4552032	2 <sup>nd</sup> non-IDE master:	
street & no.		individual programme:	- - (give date of approval)
zipcode & city		honours programme:	<input type="text" value="Honours Programme Master"/>
country		specialisation / annotation:	<input type="text" value="Medisign"/>
phone			<input type="text" value="Tech. in Sustainable Design"/>
email			<input type="text" value="Entrepreneurship"/>

**SUPERVISORY TEAM \*\***

Fill in the required data for the supervisory team members. Please check the instructions on the right!

** chair	Peter Lloyd	dept. / section:	DOS/MOD
** mentor	Margreet Beets	dept. / section:	DOS/MCR
2 <sup>nd</sup> mentor			
organisation:			
city:		country:	

Chair should request the IDE Board of Examiners for approval of a non-IDE mentor, including a motivation letter and c.v.

- 1 Second mentor only applies in case the assignment is hosted by an external organisation.

comments (optional) Supervisors are from the same Section: DOS/Creative Processes. Together the supervisors provide specialist expertise for this project.

- 1 Ensure a heterogeneous team. In case you wish to include two team members from the same section, please explain why.

**Personal Project Brief - IDE Master Graduation**

**Sustainable Service Strategies for Identifying Environmental Barriers** project title

Please state the title of your graduation project (above) and the start date and end date (below). Keep the title compact and simple. Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.

start date 30 - 10 - 2023 end date 05 - 04 - 2024

**INTRODUCTION \*\***

Please describe, the context of your project, and address the main stakeholders (interests) within this context in a concise yet complete manner. Who are involved, what do they value and how do they currently operate within the given context? What are the main opportunities and limitations you are currently aware of (cultural- and social norms, resources (time, money,...), technology, ...).

Human-centered design (HCD) places human needs at the core of the design process, leading to improved lives and business opportunities. However, this approach often overlooks and exceeds environmental resources (Borthwick et al., 2022). These consequences, including climate change, biodiversity loss, and environmental pollution, have pushed us to a critical point of unsustainability (Marsden & Kejrival, 2022). Public awareness, legislative changes, and the UN's Sustainable Development Goals force businesses to rethink and act upon their societal responsibilities. To remain relevant, any business must see the sustainability transition as a strategic battle that must be won. Nevertheless, translating ambition into action is complex and complicated by a widely accepted view that mainly focuses on reducing carbon emissions when addressing climate change, also known as "the carbon tunnel vision," as illustrated in Figure 1, which does not encompass the full scope of this transition (Deivanayagam & Osborne, 2023, p. 2). To break free, we must shift our current human-centered thinking by adopting a more planet-centric approach (Palacin & Ylivainio, 2022).

Using this mindset in a service design context may be very impactful since services represent a large share of added value in the economies of developed countries (Sierra-Pérez et al., 2021). It, therefore, has the potential to address environmental sustainability and contribute as a strategic tool in climate action design (Jung & Meijia, 2023). One company that wants to contribute to this development is IN10, a design and innovation agency primarily serving organizations in the healthcare, culture, and (semi-)government sectors. Besides their expertise in digital design, they facilitate co-creation sessions for clients to develop future-oriented and user-focused service solutions (IN10, 2023). Currently, IN10 is refining its market position with ten principles for positive change, partly in response to the expected client demand for climate-focused solutions. However, as pointed out by Palacin and Ylivainio, IN10 recognizes that their current design approach and toolkit are insufficient to deal with today's environmental challenges.

This graduation project seeks to understand how nature can be considered a valuable and indispensable stakeholder in the service design process. However, aiming to 'do less harm' will be inconsequential when our economy remains rooted in the concept of perpetual growth within a finite world. Consequently, it becomes crucial to explore alternative and more regenerative approaches that present an opportunity for both the economy and the environment (Tewari, 2018). To narrow down the focus of this research, I will concentrate on the circular economy (CE), which already encompasses this idea (see Figure 2 in Howard et al., 2018, page 3). Additionally, it is worth noting that research on service design strategies aimed at reducing their environmental impact is currently limited (Sierra-Pérez et al., 2021). Therefore, the study will explore how principles of the circular economy can be integrated and translated into a practical tool to identify the environmental barriers within a service blueprint.

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introduction (continued): space for images

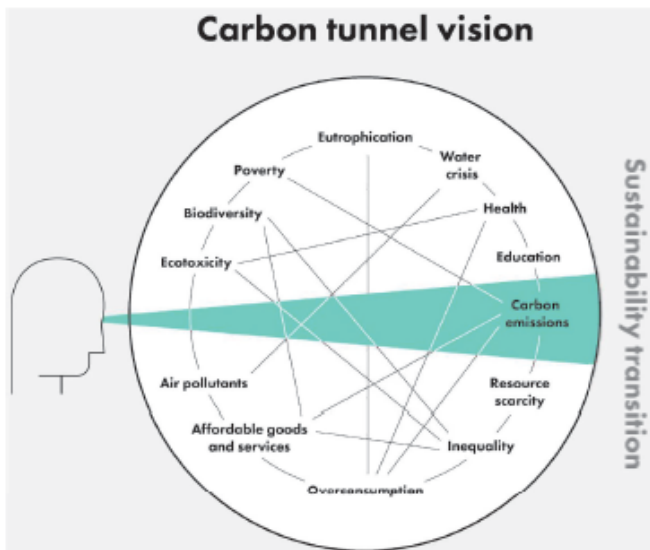


image / figure 1: The Carbon Tunnel Vision (Deivanayagam & Osborne, 2023)

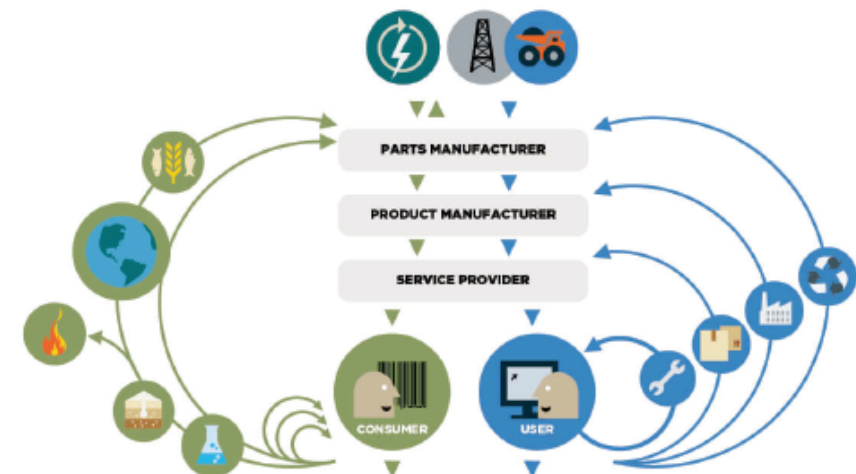


image / figure 2: CE framework (Howard et al., 2018, p. 3)

**PROBLEM DEFINITION \*\***

Limit and define the scope and solution space of your project to one that is manageable within one Master Graduation Project of 30 EC (= 20 full time weeks or 100 working days) and clearly indicate what issue(s) should be addressed in this project.

The project is scoped around IN10's design approach and will take the preparation and problem-identification stages of the service design process into account.

The following research questions are defined:

RQ1: What strategies can IN10 implement to effectively educate and engage its clients in recognizing nature as a valuable stakeholder and the relevance of the circular economy, thus fostering active participation in co-creation sessions?

RQ2: What are the primary criteria for identifying environmental pain points within a service blueprint, and how can they be integrated to offer a comprehensive overview?

Two case studies in different types of sectors will provide context and assess the applicability of the theoretical insights in practice. Following the analysis phase, I will decide whether to focus on both or delve deeper into one of them. The first case involves the Rotterdampass, a city pass that offers residents access to and discounts on various recreational and cultural activities. The second case concerns the healthcare organization Thebe, which primarily focuses on elderly home care.

**ASSIGNMENT \*\***

State in 2 or 3 sentences what you are going to research, design, create and / or generate, that will solve (part of) the issue(s) pointed out in "problem definition". Then illustrate this assignment by indicating what kind of solution you expect and / or aim to deliver, for instance: a product, a product-service combination, a strategy illustrated through product or product-service combination ideas, .... In case of a Specialisation and/or Annotation, make sure the assignment reflects this/these.

I will develop a strategy for IN10 to facilitate active participation in sustainability-focused co-creation sessions and create a practical tool for identifying environmental barriers within a service blueprint during these sessions.

The project will follow four steps.

Phase 1 – Exploration: Defining what tools/methods/frameworks can be used to: 1. consider nature a stakeholder, 2. educate the circular economy, and 3. find problem identification criteria by doing literature research and interviewing design and industry experts.

After phase 1, I will create an overview for the preparation and problem-identification stages.

Phase 2 – Analysis: Observing a co-creation session and looking at old-client cases to map IN10's service blueprint framework to get insights into their design approach. Moreover, I will analyze the effectiveness of the design criteria by using the two case studies. Phase 2 will result in a design goal with fitting requirements.

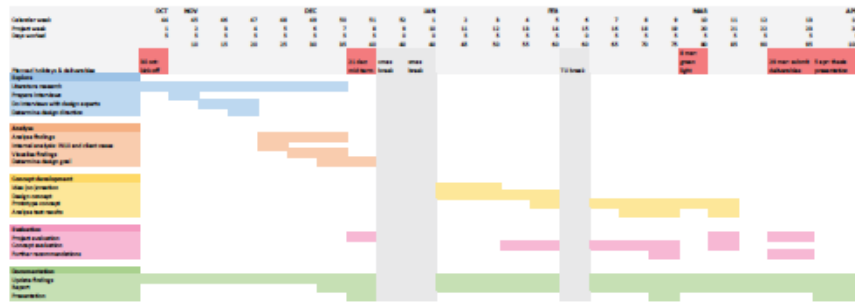
Phase 3 - Concept Development: I will design, prototype, and test the concept.

Phase 4 - Evaluation: I will assess its implementation and offer further recommendations.

**PLANNING AND APPROACH \*\***

Include a Gantt Chart (replace the example below - more examples can be found in Manual 2) that shows the different phases of your project, deliverables you have in mind, meetings, and how you plan to spend your time. Please note that all activities should fit within the given net time of 30 EC = 20 full time weeks or 100 working days, and your planning should include a kick-off meeting, mid-term meeting, green light meeting and graduation ceremony. Illustrate your Gantt Chart by, for instance, explaining your approach, and please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any, for instance because of holidays or parallel activities.

start date 30 - 10 - 2023 5 - 4 - 2024 end date



The different phases are color-coded in the Gantt chart.

I will work on my graduation project full-time. The top row lists holidays, which makes the total number of days worked still 100.

- Key dates:
- 30-10: Kick-off
  - 21-12: Mid-term
  - 08-03: Green light
  - 29-03: Deadline deliverables
  - 05-04: Thesis presentation

**MOTIVATION AND PERSONAL AMBITIONS**

Explain why you set up this project, what competences you want to prove and learn. For example: acquired competences from your MSc programme, the elective semester, extra-curricular activities (etc.) and point out the competences you have yet developed. Optionally, describe which personal learning ambitions you explicitly want to address in this project, on top of the learning objectives of the Graduation Project, such as: in depth knowledge a on specific subject, broadening your competences or experimenting with a specific tool and/or methodology, .... Stick to no more than five ambitions.

During my studies, I realized that designing physical products was not for me and discovered the potential for design in the bigger context, focusing on services and systems. I became interested in my role as a designer and how design theory and methodology could be used to develop sustainable strategies. I like to question the 'why' behind problems and explore how design can address social and environmental challenges to create a positive impact. Consequently, I tried to direct my master's projects toward healthcare and sustainability topics and selected sustainability courses during my exchange program at KTH in Stockholm.

This graduation project allows me to learn more about different (more nature-centered) design approaches and apply them in a practical use case, guiding service blueprints toward a more sustainable direction. Furthermore, I like to immerse myself in new domains and make them my own. This project offers me the chance to do precisely that.

My greatest challenge will be to manage this half-year project all by myself. I will need to create a realistic, executable plan and keep the focus on the research question and project output since I tend to wander off and explore related subjects as I get too curious and excited about the topic. Nevertheless, I look forward to doing this project at IN10 and discovering whether consultancy suits me.

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**FINAL COMMENTS**

In case your project brief needs final comments, please add any information you think is relevant.