

Circular Innovation Toolkit

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Background

We are faced with an overwhelming number of environmental, social and economic challenges as a result of the 'take-make-use-waste' paradigm that is embedded in many societies and economies today. Across the globe, there is now a growing interest and momentum to transition away from this linear economic system to one that is more circular.

"The circular economy is an economic system where waste is designed out, everything is used at its highest possible value for as long as possible and natural systems are regenerated. The concept of circularity closely mimics nature, where there is no waste: all materials have value and are used to sustain life in a myriad of ways." ([Circle Economy](#))

In order to accelerate the transition to a circular economy, we believe innovation has a key role to play. To move away from business-as-usual, we need to create products, services, systems and business models that enable a circular economy.

We created this toolkit as a practical resource to help people kick-start their circular innovation journey. Originally, this toolkit was published for our flagship initiative, the [Circular Campus Programme](#), but over the years the content has evolved and now we want the toolkit to be accessible to anyone who wants to find innovative and sustainable solutions to waste challenges that exist within their local context.

This toolkit was prepared by [Circular Cities Asia](#). We are a social enterprise whose mission is to build a community that accelerates circular economy innovation.

How to Use This Toolkit

The toolkit is divided into two parts: the Problem Phase and Ideation Phase.

Under each phase you'll find different sections to work through. Each section begins with an introduction to set the context of why this step in the circular innovation process is important. Next you'll find a suggested framework/tool that you can use to reflect, brainstorm, analyse, assess, or document your progress, based on where you are in the innovation journey. Also included are a list of steps for you to follow, which serve as a guide to help you work through each section.

For those who are interested in diving deeper, you can check out the additional resources provided under each section.



Before you get started with the toolkit, don't forget to:

- Check out this [introduction to the circular economy](#) by the Ellen MacArthur Foundation**
- Read this [paper on accelerating the circular economy transition](#) by the World Economic Forum**

Overview of Our Innovation Approach

Circular Innovation Map

The Circular Innovation Map lays out the journey of a new business — from figuring out a problem worth solving to finding a product-market fit. The framework can be traversed in multiple ways and will likely require the business to go through some iterations until they reach the ultimate goal: providing a product or service that customers are willing to pay for to solve their problem.

Here are the key stages of the Circular Innovation Map:

A Problem Discovery	B Ideating Solutions	C Prototyping	D Market Accepted Solution
A1 Identify problems worth solving	B1 Idea generation	C1 Determine product strategy	D1 Produce-sell-measure the solution
A2 Prepare problem statement	B2 Design concepts	C2 Building the core solution	D2 Identify repeatable paying customers
A3 Authenticate desirability of problem	B3 Authenticate viability of concepts	C3 Authenticate feasibility of solution	D3 Authenticate product-market fit

Overview of Our Innovation Approach

This toolkit will focus on the first two stages of the circular innovation map: **Problem Discovery and Ideating Solutions**

Problem Discovery is about framing a problem and its scope. In this stage you'll identify a problem within your local context and conduct research to better understand the key stakeholders, processes and waste involved, gather meaningful data from potential customers/users about their pain points, and then interpret your findings to figure out if it's a problem worth solving.

Ideating Solutions focuses on the 'what if' or 'what could be the future'. In this stage you'll come up with potential solutions using an ideation process that includes brainstorming, conceptualising circular ideas and making the business case for your circular solution to be implemented.

This toolkit and the accompanying workshops will guide you through the process of identifying issues within your local context related to resource waste (food, water, energy, materials, the built environment, etc.), and coming up with circular ideas to solve these problems. The methodology for this toolkit is centred on circular economy principles and the lean innovation model. It features our proprietary circular innovation tools and other industry-recognised resources. Anyone who completes the toolkit will build skills in life cycle thinking, circular design and social entrepreneurship.

Problem Phase



Part One: Problem Discovery

This phase is about exploring a number of different problems, digging deep to understand them and then narrowing down which ones you'd like to create solutions for. Before jumping into solutioning, take the time to investigate the challenges you're interested in addressing. The problem discovery phase is an iterative process that you may go through several times before finding a validated problem that needs to be solved.

The iterative loop consists of the following steps:

1.



Identifying problems worth solving

2.



Mapping out the life cycle

3.



Constructing a problem statement and value hypothesis

4.



Validating the hypothesis with target customers/users

Identify Problems Worth Solving

What problems exist within your local context?

A great starting point for problem identification is to reflect on your own experiences. Think about times when you noticed an inefficient process or thought to yourself, “wow, that’s a lot of waste!” or “it’s a shame that...” These are all potential problems that could be solved. And if you’ve observed or experienced the same problem more than once, it’s likely that others have observed or experienced them too.



SUGGESTED FRAMEWORK/TOOL



Problem Discovery Worksheet

This worksheet includes prompts and questions that will help you reflect on your experiences and observations of problems in your local context. You’ll brainstorm a list of problems that could be solved and then choose a few to investigate further.



Steps for Identifying Problems Worth Solving

1. Answer the reflection questions on the Problem Discovery Worksheet.
2. Choose at least two problems related to resource waste (food, water, energy, materials, or the built environment) to investigate further.
3. Conduct secondary research to better understand the problems you identified (e.g. search library resources, reports, articles or websites).
4. Write down your findings in the Problem Discovery Worksheet.

Identify Problems Worth Solving



Other Helpful Resources

Design Thinking: Understanding the Problem by Makesense Philippines

- These worksheets give a quick introduction to the design thinking methodology and include canvases to help you better understand your target customer/user and the root causes of the problem.

Wicked Questions 101 by Makesense Philippines

- This resource includes additional questions to challenge your assumptions and help you look at problems with a systemic lens.

Solutions Benchmarking by Makesense Philippines

- This benchmarking tool will help you map out and better understand the existing and competing solutions for the problem you identified.



TIP: Keep an open and curious mind throughout the problem discovery phase.



TIP: Avoid jumping to the solution before you truly understand the problem.

Map Out the Life Cycle

Who and what is involved?

To determine whether a problem is worth solving, it's important to look at the full life cycle of the product or service you've identified as problematic — from sourcing materials, to processing and manufacturing, use and end of use.

All of the activities involved in creating a product or service for customers/users is referred to as the **value chain**. Take a deeper look at the value chain of the problematic product, service or system you identified to figure out the key stakeholders, processes and waste involved.



SUGGESTED FRAMEWORK/TOOL



Life Cycle Assessment

You'll map out the full life cycle of the problematic product, service or system you identified. Completing the assessment will help you narrow down which parts of the problem you'd like to investigate further and focus on moving forward.



Steps for Mapping Out the Life Cycle

1. Decide which problematic product, service or system you'd like to assess.
2. Identify the activities involved at each stage of the life cycle, the inputs and resources required to conduct these activities, and the key stakeholders involved.
3. Identify the waste created at each stage of the life cycle, list the reasons why the waste is being created, and reflect on the ecological, social and economic impacts of the waste.
4. Identify the specific challenges for each stage of the life cycle that makes/would make it difficult to intervene and prioritise the stages of the life cycle that you think have the highest potential or opportunity for innovative solutions.

Map Out the Life Cycle



Other Helpful Resources

Systems Thinking and The Iceberg Model by JustLead Washington

- This systems thinking tool will deepen your understanding of the patterns and trends of the problem you identified, the key stakeholders, and the underlying structures of the systems involved.

Ecosystem Mapping by Makesense Philippines

- This framework will help you map out the different stakeholders and actors that influence the issue, the existing relationship dynamics, and what the ideal relationship dynamics would be.



TIP: Taking a life cycle approach during the problem discovery phase can help you look beyond the surface level of a problem and instead dig deeper to understand the underlying complexities.



TIP: Talk to as many different people as possible to get an understanding of the value chain and problems that stakeholders face. Don't jump into solutioning just yet.

Construct a Value Hypothesis



What is the value of solving the problem you identified?

Any new innovation or intervention has to deliver a “job” to a customer/user. This is also referred to as the “job to be done”. Based on the problem you identified, what is the job that your target customers/users want to get done?

To figure this out, begin by writing a **value hypothesis**. Hypothesise how your target customer/user will respond to the product, service or process improvement you’re proposing to them.

This hypothesis will help you identify assumptions that you’ll need to validate and help you pinpoint the job to be done.

SUGGESTED FRAMEWORK/TOOL



Hypothesis-Building Worksheet

This worksheet will guide you in writing a problem statement and a value hypothesis that you’ll test. Writing a clear hypothesis is just as important for innovation as it is for research projects. A value hypothesis helps frame your problem validation process so you can gain clarity on the following questions: *Does the customer/user have the problem you’re trying to solve? Have you identified the right group of people as the target customers/users? Will they respond in the way that you think they will?*

Construct a Value Hypothesis



Steps for Constructing a Value Hypothesis

1. Write a problem statement in the form of a “How might we...” question.
2. Brainstorm the actions you’d like the target customers/users to take once they’ve been offered a solution to their waste problem.
3. Based on your Problem Discovery Worksheet, Life Cycle Assessment and your brainstorming, fill out the value hypothesis template:

If we offer (target customers/users) an alternative to (problem), then they will (respond in a certain way).

4. Based on your value hypothesis, write out the variables you’ll be testing in the validation stage.
5. Write out what the ‘job to be done’ would be if the hypothesis was validated.



Other Helpful Resources

The Lean Startup Methodology by Eric Ries

- Learn about this scientific approach to innovation and some of the lean startup principles from Eric Ries’s book, [The Lean Startup](#) (which we also highly recommend).

Clay Christensen’s Jobs To Be Done Innovation Theory Challenges Common Innovation And Marketing Methods by Denise Lee Yohn

- This article gives an overview of the Jobs To Be Done (JTBD) framework, which can help you better understand customers and their motivations for adopting a new product or service.

Validate Your Value Hypothesis

Is the problem you identified really a problem that needs to be solved?

Validation is the process of gathering information from your target customers/users to determine whether they actually experience the problem you identified, and if so, is it worth solving?

Your value hypothesis can be validated in various ways, such as interviews with key stakeholders or speaking with experts in the field. You can also have conversations with people who have previously tried or are currently working to solve this problem.

During the validation process, it's important to speak with multiple stakeholders and subject matter experts to ensure that you understand the context and problem better.

SUGGESTED FRAMEWORKS/ TOOLS



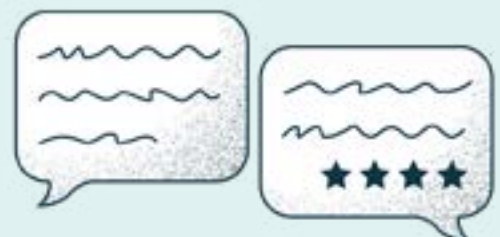
Problem Validation Questions

Before reaching out to stakeholders and conducting interviews, it's important to be prepared with questions that will help guide the conversation. These questions can be used for surveys and interviews.



Problem Validation Analysis

Another key component of validation is analysing the responses you received to determine whether your value hypothesis is validated or not.

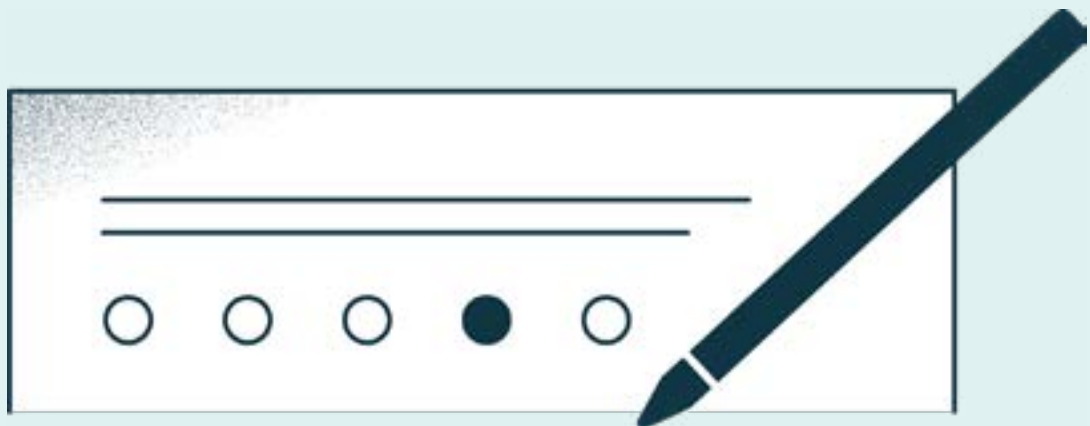


Validate Your Value Hypothesis



Steps for Validating Your Hypothesis

1. Decide on the questions you're going to put in the survey or ask during the interview.
2. Prepare the survey (on Google Forms, Typeform, Survey Monkey, etc.).
3. Write a cover email that briefly explains why you're reaching out to them (to understand a particular resource waste issue), and the time frame in which you need the answers by.
4. Reach out to the key stakeholders you identified and send the survey or ask if they are willing to meet with you/your team.
5. Record their responses to the questions in the table template provided. If you conduct an interview, make sure to take notes during or after each conversation, if you're not able to record the interview.
6. Analyse the responses you received.
7. Go back to the Life Cycle Assessment Worksheet and add any activities, stakeholders or information about waste that were mentioned during the conversations that aren't in your assessment.
8. Reflect on your analysis. Was your hypothesis validated? Do you need to refine the hypothesis? Are there other stakeholders that you need to speak with?



Validate Your Value Hypothesis



Other Helpful Resources

4 Questions to Ask About Problem Validation by Jake Moody, IDEA: Northeastern's Venture Accelerator

- This article outlines the importance of problem validation before moving onto the ideation stage. A recommended read to prepare you for conversations with target customers/users.

Value Proposition Canvas by Strategyzer

- This canvas can be used to organise your findings and insights from speaking with your target customers/users.

Value Proposition Canvas Explained by Strategyzer

- After watching this video you'll gain a better understanding of how to precisely define your customer profiles, visualise the value you create and achieve product-market fit.



TIP: If you don't feel that you have a sufficient amount of quality responses then work at another angle to find the data (e.g. conduct more secondary research). Finding solutions in uncertain environments is one of the top skills needed for entrepreneurship!



TIP: Empathize with the target customers/users you speak with. Get to know the problem from their perspective.



TIP: Remember the iterative loop. Do you need to refine your hypothesis? What has your validation process taught you about the problem you identified?

Milestones Completed by the End of Part One:

- Identify problems that exist within your local context
- Map out the key stakeholders, processes and waste involved
- Construct your value hypothesis
- Start the validation process by speaking with target customers/users
- If necessary, refine the hypothesis or the customers/users before you move on to ideation



Ideation Phase



Ideation Phase

Circular Innovation Map

Here’s another look at the Circular Innovation Map, which lays out the journey of a new business — from figuring out a problem worth solving to finding product-market fit.

The key stages for circular innovation include:

A Problem Discovery	B Ideating Solutions	C Prototyping	D Market Accepted Solution
A1 Identify problems worth solving	B1 Idea generation	C1 Determine product strategy	D1 Produce-sell-measure the solution
A2 Prepare problem statement	B2 Design concepts	C2 Building the core solution	D2 Identify repeatable paying customers
A3 Authenticate desirability of problem	B3 Authenticate viability of concepts	C3 Authenticate feasibility of solution	D3 Authenticate product-market fit

In this part of the toolkit, we’ll focus on **Ideating Solutions**.

Part Two: Ideating Solutions

It's time to take all of the inspiration and knowledge you gained from the problem phase and find a circular solution that could be implemented in your local context. This phase will use the problem you've validated as a starting point to ideate and design solutions.

First you'll learn about circular design strategies and get inspired by businesses that are implementing these strategies. Next, you'll brainstorm and generate as many ideas as possible. After synthesising the ideas, you will choose a circular idea that you'd like to develop further. And lastly, you'll make the business case for your circular solution by preparing a business model canvas.



Get Inspired by Circular Design Strategies



Uncover opportunities to design circular solutions

The concept of circular design is increasingly gaining momentum — more and more businesses, designers and innovators are putting circular economy principles into practice. Instead of perpetuating the linear ‘take-make-use-waste’ economy, we encourage you to start thinking about the types of solutions that can help transition us toward a circular economy.

This part of the innovation process is about getting inspiration from existing businesses that are implementing circular design strategies in their product or service offerings.

SUGGESTED FRAMEWORK/TOOL



Circular Design Assessment

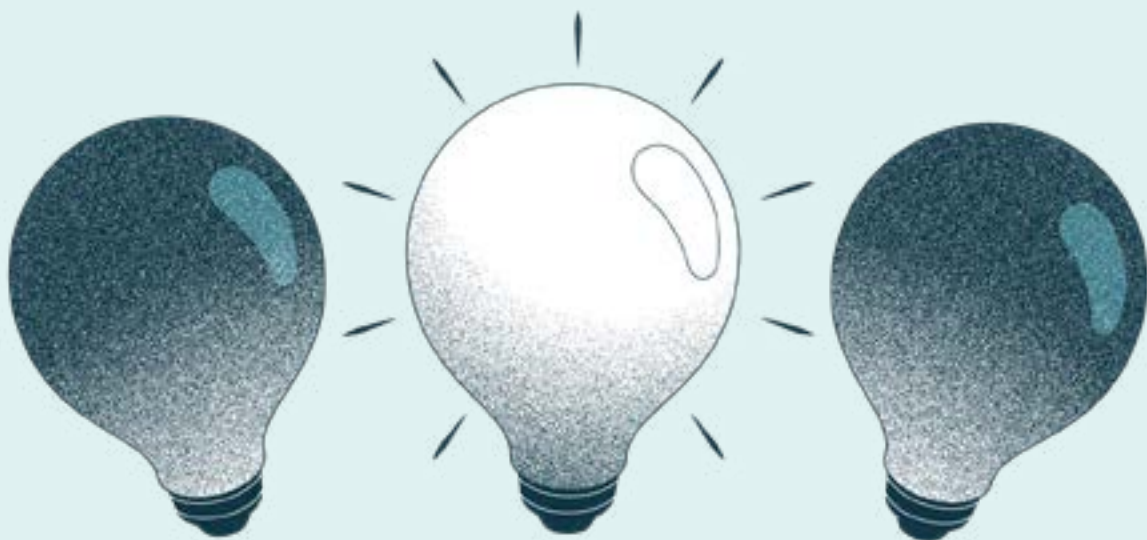
Use this worksheet to assess which circular design strategies could be used to address the linearities of the problematic product, service or system you have identified. After assessing which ones could be used, there is space to brainstorm how you might implement the strategies.

Get Inspired by Circular Design Strategies



Steps for Uncovering Circular Design Opportunities

1. Review the **Circular Design Strategies Wheel** and **Circular Cities Asia's Innovation Framework** for examples of existing circular innovations.
2. Reflect back on the Life Cycle Assessment you completed during the problem discovery phase.
3. Use the Circular Design Assessment worksheet to assess which circular design strategies could be used along each stage of the life cycle of the problematic product, service or system you identified.
4. In the worksheet, brainstorm how you might implement the circular design strategies into a solution for the problem you identified.
5. After completing this initial brainstorm, research additional circular businesses and design strategies that can inspire you for your next brainstorming session(s).



Get Inspired by Circular Design Strategies



Other Helpful Resources

Mix Your Strategies Circulator Tool by EIT RawMaterials

- This tool gives an overview of the different circular economy strategies that can be used in a circular business model. You can also browse through case studies of businesses that have integrated one or more of the strategies.

Circular Strategies Scanner by CIRCit Nord

- The framework outlines a range of circular strategies that you can explore and use. Details about the framework can be found in this [paper by Fenna Blomsma et al.](#)



TIP: To start, design your solution with one or two circular economy strategies. By integrating one strategy from the beginning, your solution is already circular. Don't feel pressured to integrate all strategies at once. Over time you can develop the circular design of your business.



TIP: Think about the circular value you could create for the broader urban context. For inspiration, check out the [Circular Economy Guidebook for Cities.](#)

Generate Ideas For Circular Solutions



Brainstorm ways to solve the problem you identified

At this stage, don't worry so much about coming up with the 'perfect' idea. We encourage you to brainstorm as many ideas as you can for the resource waste problem you identified. Get creative and write down all potential solutions you have floating around in your head (even the ones that are seemingly impossible)!

One of the most common ways to generate ideas is to have a team brainstorming session. This way, you can share your ideas with others, get feedback, and also gain inspiration from ideas that others present. During idea generation, it's important to stay divergent and imaginative, favouring the flow of ideas. After you and your team have brainstormed a wide range of ideas, you'll then narrow down which solution you'd like to pursue and develop further.

SUGGESTED FRAMEWORK/TOOL



Brainstorming Ideas Worksheet

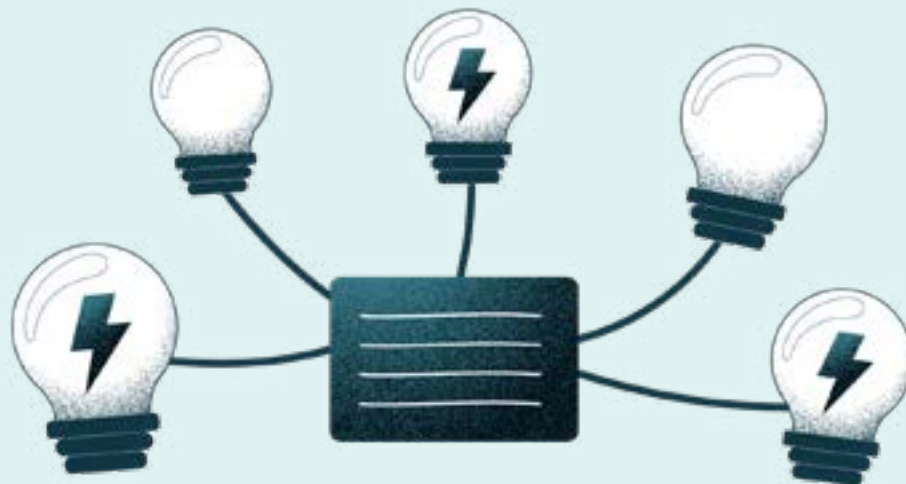
This worksheet includes prompts for brainstorming circular ideas that can help solve the resource waste problem you identified.

Generate Ideas For Circular Solutions



Steps for Brainstorming

1. Review your problem statement and answers from the Circular Design Assessment you completed.
2. Start with an individual ideation session using the Brainstorming Ideas Worksheet and prepare to share your ideas with your team members.
3. Gather as a group (either in-person or virtually) and share all of your ideas on a large piece of paper, whiteboard, or collaboration board (e.g. Google Jamboard, Miro, Mural). Remember: go for quantity over quality at this stage.
4. Have each member present their ideas in short turns without getting into too many details of the idea.
5. Add any new ideas that team members formulated during the session.
6. Identify which ideas are similar and cluster them into groups.
7. Think about which clusters you can combine with other clusters. Identify where there are novel combinations.
8. Narrow down which idea your team would like to pursue. Which idea has the highest potential to help solve the problem you identified? Is it scalable and circular? Does it make sense for your local context?



Generate Ideas For Circular Solutions



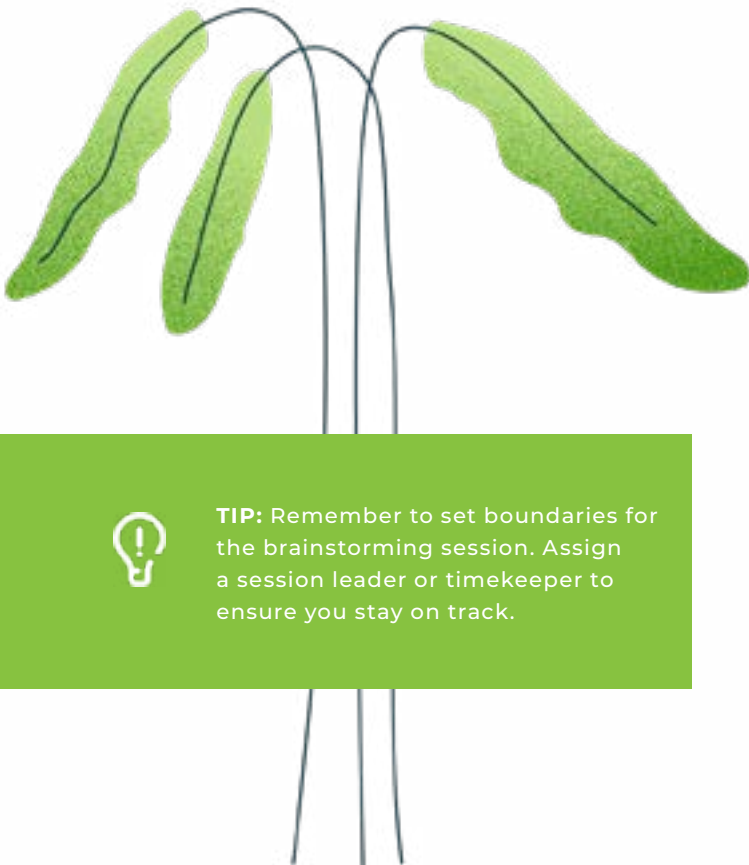
Other Helpful Resources

Ocean of Opportunities from the Visual Toolbox for System Innovation by Climate-KIC

- To find windows of opportunity, you can use this ideation tool to assess the different solutions on the market and where there are gaps you can fill.

Solution Conceptualization: First Concept by Makesense Philippines

- To lay out the initial concept and understand the value of your solution, answer these guiding questions and fill out the canvas.



TIP: Remember to set boundaries for the brainstorming session. Assign a session leader or timekeeper to ensure you stay on track.



TIP: Make the most of all the different skills, ideas and perspectives of the people on your team. Ensure that you set up an environment where everyone can voice their ideas.



TIP: “The best way to have a good idea is to have a lot of ideas.”

- Linus Pauling

Prepare Your Business Model Canvas



Map out the building blocks to bring your circular solution to life

After narrowing down the circular solution you'd like to pursue, the next step is to think about how the innovation can translate into a business. A circular business rethinks how to deliver value and generates revenues by implementing the principles of a circular economy on a practical level. Instead of following the linear business-as-usual model, you have the opportunity to build a business that can create positive ecological, social and economic outcomes.

To help uncover what it takes to bring your circular innovation to market, we suggest using a business model canvas. It's a framework for laying out the key aspects of a business model and serves as a strategic guide for launching and operating your business. In these early stages, you'll list your assumptions and make informed guesses for each section. As your circular innovation develops, you'll update your canvas with more accurate information.

SUGGESTED FRAMEWORK/TOOL



Business Model Canvas

With a business model canvas, you can lay out and define the fundamental building blocks of your solution on one page. We've created a modified version of Alex Osterwalder's Business Model Canvas and added a few additional sections.

Prepare Your Business Model Canvas



Steps for Preparing Your Business Model Canvas

- 1. Problem** – Write the problem you identified and validated in the problem discovery phase.
- 2. Core Solution** – Describe the core solution you came up with to solve this problem.
- 3. Customer Segments** – These are the people, companies, organisations, etc. that you're targeting and creating value for. This includes paying customers and users of your product or service. Be sure to segment your customers based on similarities in demographics and psychographics.
- 4. Value Propositions** – A value proposition explains how your idea is unique or different from current solutions or competitors. If you're offering a new product or service, describe how it's circular, innovative and disruptive. If you're offering a product or service that already exists in the market, highlight the circular features and attributes that differentiate it from other solutions. Value propositions can either be quantitative (amount of waste diverted, cost savings from circular solution) or qualitative (customer experience or circular design).
- 5. Customer Relationships** – Write the touchpoints and types of relationships you'll establish with your customers/users. This informs how you'll interact with them throughout their journey with your business. Here are some different types of customer relationship models:
 - Personal assistance – Interact with customers directly, either in-person or through various channels (phone, email, etc.)
 - Self-service – Providing what the customer needs to help themselves while maintaining limited interaction with them
 - Automated services – Automated processes that help customers perform services themselves
 - Communities – Customers can help each other solve their problems via online or in-person communities
 - Co-creation – Providing customers/users opportunities to get involved with designing or developing a product or service

Prepare Your Business Model Canvas



Steps for Preparing Your Business Model Canvas

- 6. Channels** – Describe how you'll communicate with and reach out to your target customers/users. These interactions are key when it comes to communicating the value of your product or service. Channels can also be an avenue for customers to buy products or services and post-purchase engagement.
- 7. Key Activities** – List the key activities that need to be done in order to perform well and deliver value to customers/users.
- 8. Key Resources** – List the infrastructure, inputs and resources needed to carry out key activities in order to create and deliver value for your customers/users. Here are some key resources to consider:
 - Human (employees)
 - Financial (cash, lines of credit)
 - Intellectual (IP, patents, copyright, brand)
 - Physical (inventory, equipment, buildings)
- 9. Key Partnerships** – These are the partnerships with people, companies, organisations, etc. you'll need to leverage your business model. Think about who you need to partner with to obtain your key resources and to carry out key activities. Building and maintaining these external partnerships are important elements in building a business.
- 10. Cost Structure** – Identify the costs associated with operating your business model. Evaluate the cost of creating and delivering your value proposition, revenue streams, and maintaining customer relationships. Keep in mind that businesses can both be cost-driven (focused on minimizing costs whenever possible) and value-driven (focused on providing maximum value to the customer and regenerating natural systems).

Prepare Your Business Model Canvas



Steps for Preparing Your Business Model Canvas

11. Revenue Streams – Describe your revenue streams and which pricing mechanisms you will use. Are you following a transaction-based revenue model, where customers make one-time payments? Or are you following a recurring revenue model, where customers make continuous payments for ongoing services or post-sale services.

Here's a list of ways that businesses can generate revenue:

- Asset sales – Selling the rights of ownership for a product to a buyer
- Usage fee – Charging customers for the use of a product or service
- Subscription fee – Charging the customer for the use of a product or service regularly and consistently
- Lending/leasing/renting – Customer pays to get exclusive rights to use a product or service for a fixed period of time
- Licensing – Customer pays for permission to use intellectual property from the business
- Brokerage fees – Charge for your services as an intermediary between two or more parties
- Advertising – Charge companies, organisations, etc. to advertise a product, service or brand on your platforms

12. Circular Economy Strategies – Outline the circular economy strategies that will be integrated into your solution and business model. You may include one or more of these strategies on the [Circular Design Strategies Wheel](#).

Prepare Your Business Model Canvas



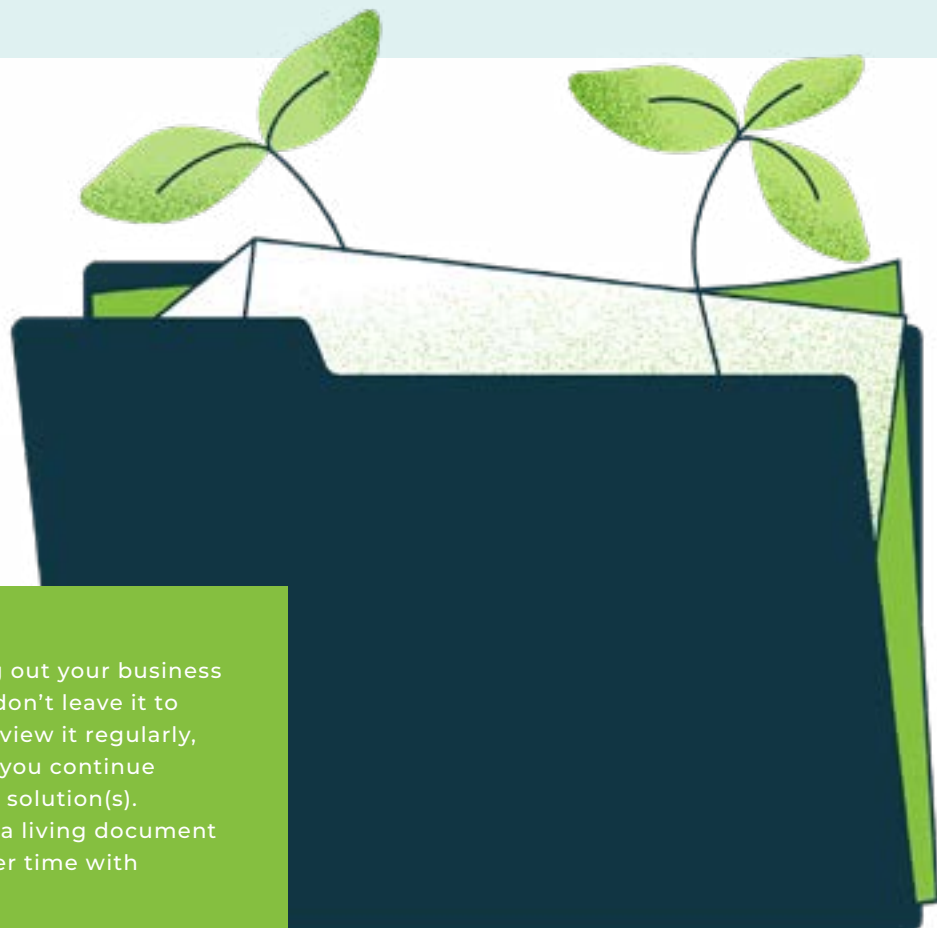
Other Helpful Resources

Business Model Canvas Video by Steve Blank

- In this video, you'll learn more about the different building blocks of the canvas and the process of mapping out a business model.

Circular Economy Business Models Explained by Board of Innovation

- This overview of circular economy business models will provide you with insight on the different types of circular business models you can create.



TIP: After filling out your business model canvas, don't leave it to collect dust. Review it regularly, and refine it as you continue to develop your solution(s). Remember, it's a living document that evolves over time with your business.

Milestones Completed by the End of Part Two:

- Learn about circular design strategies and get inspired by existing circular innovations
- Generate ideas for a circular solution
- Choose a circular idea to investigate further
- Prepare your business model canvas



Continuing the Innovation Journey



Your innovation journey doesn't stop at the ideation phase. After coming up with a circular solution for the problem you identified, you'll need to find out whether your proposed idea is viable, desirable and feasible.

Before you even begin building a minimum viable product (MVP) or prototype, it's important to validate the assumptions you've written down in your business model canvas. We've included additional resources below to get you started with the solution validation process.

While our toolkit ends here, we encourage you to continue on your circular innovation journey. To explore opportunities for ongoing support, contact the Circular Cities Asia team. We can help bridge connections with our network of innovators, industry experts and other entrepreneur support organisations.



Additional Resources

Solution Validation Example Questions by Board of Innovation

- Here is a list of questions you can adapt and use when interviewing target customers/users about your solution.

Test and Learn by Makesense Philippines

- This worksheet gives an overview of how to test your proposed solution and will help you establish concrete metrics to clarify whether a hypothesis is considered validated or not.

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