EPFL

CSAW

Climate & Sustainability Action Week

Theme: Circular Economy

Pilot Edition

February 18th - 20th, 27th & 28th

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Introduction

The world is facing a global climate crisis that compromises human and economic development, and enhances disparities and injustice among societies and individuals. The overexploitation of natural resources and the ever-increasing anthropocentric greenhouse gases emissions are in part due to our “take, make, use, dispose” linear economy.

About 45% of global CO2 emissions come from the production and consumption of goods and services (the remaining 55% of the CO2 emissions stem from fossil fuel production and consumption) (Ellen Mac Arthur Foundation, 2019).

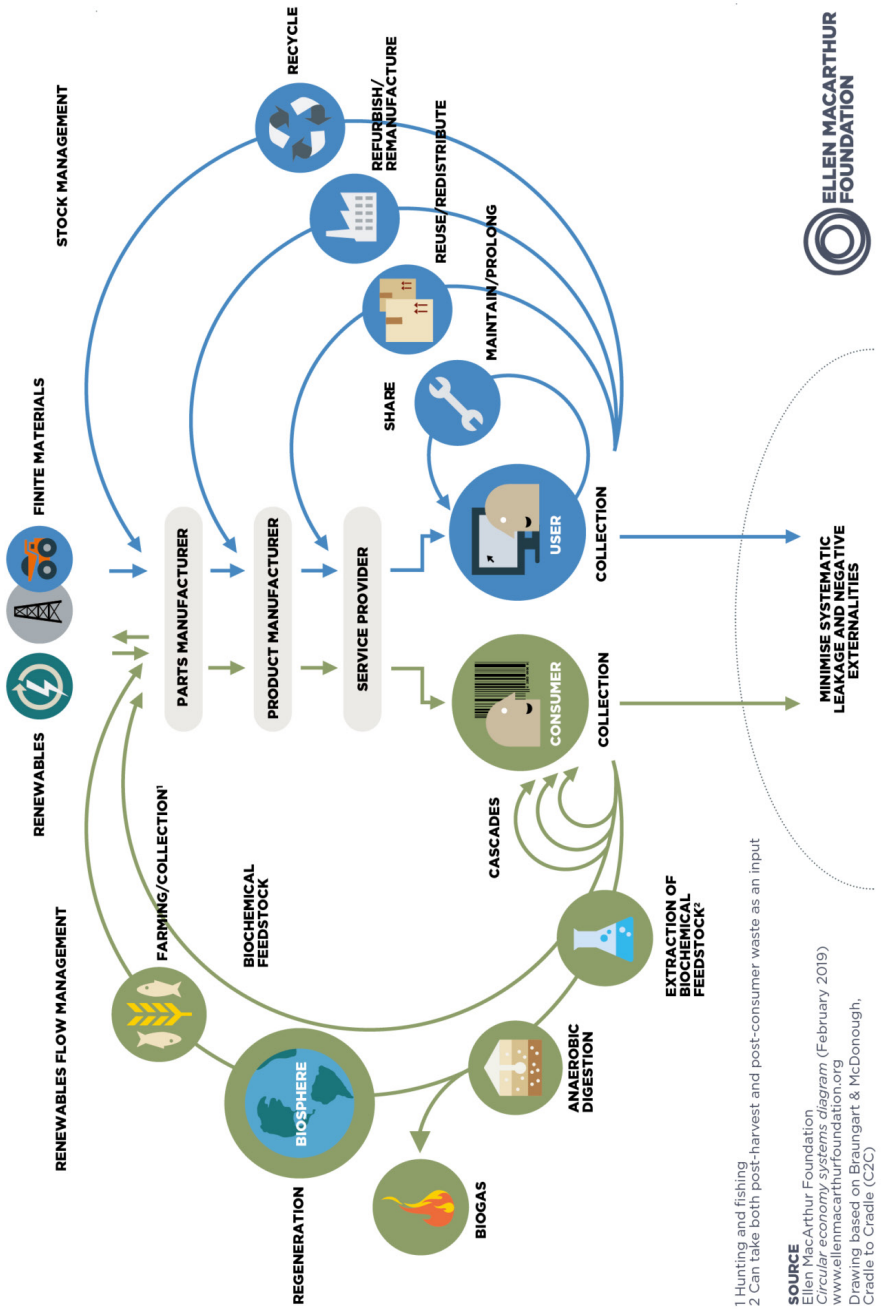
How can we transform the way we make and use products and services to drastically reduce emissions?

How can we overcome the social and environmental issues while at the same time creating a regenerative economy?

A circular economy may be part of the answer. This approach aims to radically limit the extraction of raw materials and the production of waste and pollution by closing the material and energy loops. It redefines growth and progress through the creative integration of industrial and natural systems.

To go further:

- Circular Economy on page 70



Contact

Key contact points

- Michka, as coordinator: on Telegram, michka.melo@epfl.ch
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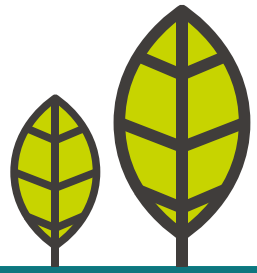
The blue underlined sections are either hyperlinks or link to other pages in this booklet.



Key communication channels

For the big sessions with invited speakers:

- **Zoom - Room 1** https://epfl.zoom.us/j/85443585090

Whenever we are only the CSAW crew & teams:

- **Zoom - Room 2** https://epfl.zoom.us/j/85387840738

For teamwork and staying in touch with your team facilitator:

- **Discord ("CSAW pilot")** https://discord.gg/E6dY5ST4Kb

For keeping in touch:

- **Telegram ("CSAW February 2021")** https://t.me/joinchat/SeLrU18md89uX651

Backup plan if you get lost: Send a message on the Telegram group!

To contact a specific person, check the list of "members" in the CSAW February 2021 group, click on the person you want to talk with and choose "message".

For the brainstorming sessions:

- Mural

For sharing files:

- Google Drive ("CSAW pilot")

For videos:

- SWITCHtube ("CSAW")

Vision

Problem

Mobilization around climate issues is insufficient, and even for the people who are already mobilised, this doesn't translate sufficiently into concrete projects within EPFL.

Vision

CSAW aims to transfer knowledge about climate and sustainability in a good atmosphere, in order to inspire the emergence of concrete projects and to have a radiant impact on the EPFL community.

Mission

1. To transfer knowledge related to CSAW's theme in a rigorous, participative and holistic manner.
2. To create an atmosphere conducive to meetings, to form motivated teams and to share opinions
3. To facilitate the development of concrete projects in connection with EPFL institutions
4. To engage the EPFL community to redefine the role of the engineer, scientist and architect and to mobilise around climate issues.

Impact

CSAW
Climate & Sustainability Action Week

Short Term

Theoretical Knowledge

- Circular Economy
- Sustainability
- Wicked Problem

Ambitious and Motivated Network

Practical Skills

- Creativity
- Stakeholder Analysis
- Prototyping
- Interdisciplinary Teamwork
- Design Process

Long Term

BA / MA / Masterthesis Project
Association Project
Start-up Creation
Personal Evolution

CSAW Mindset

Defer judgement
CSAW is judgement-free so you can freely share your ideas!

Encourage wild ideas
Be creative! You never know where an idea might lead you

Go for quantity
More ideas lead to more potential for innovative interventions

Build on the ideas of others
This helps to create new perspectives and insights

Fail early and often
Failure and feedback lead to improvement

Stay on topic
Don't diverge too much from the task at hand.

Be visual
So you can quickly communicate your ideas

Participate actively
This will increase the richness of your CSAW experience.

Ask questions
Dig deeper and uncover meaningful interventions.

Be an awesome teammate
Be encouraging, constructive and adaptable.

Hacking the hackathon

Coming up with project ideas in 5 days, might sound familiar to those of you who have heard of, or participated in, hackathons.

CSAW is however different from a traditional hackathon in several ways.

Care about the problem, not the solution

We understand that the sustainability-related problems we are tackling are complex, if not wicked. We therefore want to dedicate a strong share of our time during CSAW to understanding these problems from multiple perspectives.

We are convinced that a better understanding of the problem will give rise to more relevant action.

There are no solutions, just interventions

Wicked problems cannot be solved. They evolve into different problems when we act upon them. We can only aim at intervening in the system in the best possible way. Also, it is virtually impossible for one project to solve a sustainability issue on its own.

We are working together, not competing

The goal of CSAW is not to have teams compete against each other for the first prize. During the whole week, we will investigate how the different projects interconnect together and to the existing initiatives and stakeholders to act upon the problem. As we can be smarter together, CSAW also aims to offer collective experiences exploring better ways to work together.

As no single project will solve a complex sustainability issue, it is important to see how to connect to a growing web of projects, and to be aware of other running initiatives to address these issues more effectively together.

To go further: What is a wicked problem.

Timetable

- Plenary activity
- Input sessions
- Team work session

	Thursday Feb 18th	Friday Feb 19th	Saturday Feb 20th
8:30		Check IN	Check IN
	Opening	Team Work 1: Problem ideation (What if..) - Divergence	Fireside chat: The limits of Circular Econnomy Philippe Bihouix
	Keynote Prof. Julia Steinberger	Campfire storytime: From idea to reality CE Entrepreneurs	Team Work 4: MixMatch & Debrief
	Get to know each other	Teamsharing	
13:30	Circular Economy 101	Team Work 2: Problem framing - „How might we?“	Pretotyping Workshop
		Discuss first findings	
	Pannel: CE & Engineering Prof. Corentin Fivet, Dr. Ivan Kantor & Dr. Amaël Cohades	Team Work 3: Cicular design - Ideate interventions	Feedback Session
	Collective problem mapping		End part 1: First CSAW map
	Check OUT	Check OUT	Check OUT

	Saturday Feb 27th	Sunday Feb 28th
8:30	Check IN	Check IN
	Ask me anything: Laurent Maeder	CSAW mapping
	Start part 2: CSAW map	Team Work 7: Finalize Pretotype
	Team Work 5: Pretotype	
13:30	Alumni expert feedback EPFL Alumni	Team Work 8: Prepare Presentation
	Team Work 6: Integrate Feedback	Presentations of Teamprojects & Open Space Technology
	Feedback Session	Celebration
	Check OUT	

Day 1: Understand

Thursday February 18th

1

Opening

Intention:

Kick-off CSAW and get oriented

Speaker

Prof. Gisou van der Goot

Vice President Responsible Transformation (EPFL - VPT)

Prof. van der Goot is the Vice President for Responsible Transformation that leads the reinforcement of values such as inclusion and sustainability throughout EPFL. She is the previous Dean of the School of Life Sciences (EPFL-SV) and Head of the Laboratory of Cell and Membrane Biology.

Keynote

1

Intention:

Create a common understanding of the big picture of sustainability challenges and the need for an economic paradigm shift.

Speaker

Prof. Julia Steinberger

Professor on societal issues related to the impact of climate change at the Institute of Geography and Sustainability, UNIL

Julia's work examines the interconnections between the use of biophysical resources (energy, emissions) and societal performance, focusing on human well-being. Julia is also a lead author of the IPCC Working Group 3, the principal investigator of the research project "Living Well Within Limits" and the co-leader of the new UNIL-EPFL research center CLIMACT.

Get to know each other

1

Intention:

Get to know each other better by sharing your personal learning goals for CSAW.

Instructions:

1. Introduce yourselves! *Tip:* try out the “roundtable” to facilitate the introductions round for your team found in Teamwork Tools on Page 58.
2. Assess your knowledge based on the CSAW learning outcomes that were developed by the CSAW Co-creators (in the table to the right).

Research shows that we learn better when we dedicate time to reflect on our learning and set personal learning goals. Setting your personal learning goal and reflecting on your learning during CSAW will help you make your learning intentional, and more clearly identify exactly what you have learnt.

Learning Outcome	New	Needs work	Strong	Not important
Apply a sustainability centered design process				
Define and explain a wicked problem holistically with multiple perspectives.				
Define the relevant stakeholders and explore their needs through empirical data collection.				
Explore innovative and sustainable interventions through ideation techniques.				
Design a pretotype to validate a selected intervention.				
Demonstrate a capacity for creativity.				
Take account of the social, human and environmental dimensions of the engineering profession.				
Work efficiently and inclusively in an interdisciplinary team.				

1

1

Instructions (continued):

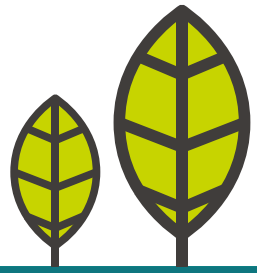
3. Individually answer the questions below:

What would you like to learn during CSAW?

How do you expect to develop this during CSAW? Are there any specific things you can do to ensure you do actually improve in this area?

4. Discuss in your team your learning goal and the specific things you have identified which can help you reach that.

What do they think might facilitate/hinder you in achieving this learning goal during CSAW?



Circular economy 101: Collective mapping

1

Intention:

Understand what circular economy is, including its principles, benefits, opportunities and challenges

Instructions:

We will explore several resources related to circular economy, and map our collective understanding of what circular economy is (or is not).

To go further:

- Circular Economy on page 70
- The method will be inspired from affinity mapping and the KPUU framework.

Panel CE & Engineering

Intention:

Learn how EPFL engineers can contribute to a transition to circular economy and what challenges, opportunities and limits exist in three engineering domains.

The three guest speakers will respond to the same three questions namely: 1) Can you give an example of a circular economy project you are working on? 2) What opportunities, challenges and limits of circular economy do you see in your domain? 3) In your opinion, how can engineers contribute to the transition to a circular economy?

Speakers

"What inspires me to contribute to a circular economy"

Dr. Amaël Cohades

CEO of CompPair Technologies & previous postdoctoral research scientist at the Laboratory for Processing of Advanced Composites

Contributing to accelerating circular economy in the composite **material** market

"The following paradox: human beings are able to live 80 years, but most consumer goods last only a few years. Inspired by nature, we bring solutions to extend the lifetime of composite materials, and ease their end of life management."

Prof. Corentin Fivet

Head of the Structural Xploration Lab

Contributing to accelerating circular economy in the **construction** sector

"The Reuse paradigm unlocks new realms of sustainability; a lot has to be (re-)discovered to enable it."

Dr. Ivan Kantor

Postdoctoral researcher scientist at the Industrial Process and Energy Systems Engineering and HES-SO Valais & Executive Director at the Engineering and Sustainability Lab (HES-SO/EPFL joint research group)

Contributing to accelerating circular economy in the industrial and energy sector

"A circular economy is simply required for the continued existence of humans on this planet."

Collective Problem Mapping

Intention:

Collectively create a map of problems which can (and cannot) be addressed by circular economy, and identify how these problems are interconnected.

Instructions:

1. We will identify the problems revolving around circular economy, based on what has been harvested earlier in the day.
2. In subgroups, we will dig deeper into the roots of some of these problems, by analysing their causes and the worldviews causing them to arise. This step will be inspired from the causal layered analysis method.
3. We will see how these problems are interconnected, at the problem, cause or worldview level, through affinity mapping.

To go further:

- Affinity mapping
- Causal layered analysis

Check Out

Intention:

Share feedback and impressions from the day.

Day 2: Define

Friday February 19th

Check In

Intention:

Get warmed up to start Day 2 and start reflecting on the limits of circular economy.

Teamwork 1: What if...?

Intention:

Explore and mine the systems related to design problems in a creative way! *Tip: Don't rush to the solutions!*

Instructions:

You will use 'What if…?' questions to explore and reframe design problems that circular economy strategies could potentially address.

Activity description is given on the next page.

1. Create ‘What if…?’ questions, 3 per participant -> post them on a white board.
2. Generate answers (What would be the effects of this? What would this mean for the way we live, society, the planet?) -> post them linked to the related question.

Examples of ‘What if…’ questions:

What if...we sold services instead of products?

What if...we no longer could use scarce materials?

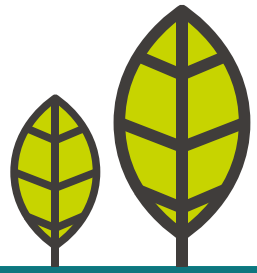
What if...all construction sites had to be circular?

- Break & export white board -

3. Take a step back and organise the problems (eg. extent vs. severity chart)
4. Collectively harvest design **problem statements** to work on further

Tips: Think of the scope of the problem: not too broad, not too narrow

To go further: Problem Framing on page 72



Campfire storytime: From CE idea to reality

Intention:

Get inspired by stories of projects that went from idea to reality, get a glimpse of the diversity of societal needs addressed and what the application of circular economy principles look like in practice.

Speakers

What title and possibly subtitle would you give your story if it was written in a book?

Dr. Rodrigo Fernandez

Co-founder of Terrabloc

Terrabloc produces bricks from excavation waste. It thus reinvents an ancestral technique - raw earth construction - by applying the principles of circular economy to the construction sector.

REDISCOVERING EARTH: pragmatic ways of reducing the environmental footprint of the construction sector

Quentin Mateus

Coordinator of the “Enquêtes du low-tech lab”

The “Enquêtes du low-tech lab” consists of a series of ethnographic surveys of organizations that we find inspiring and coherent in their way of making more low-tech lifestyles, consumption and production accessible to the greatest number.

Testimony from an engineer: how to trust feelings and go from designing the latest high-tech gadgets, to conducting inquiries on low-tech innovations and their organizational models?

Dr. Simon Meister & Dr. Camille Wolf

Co-founders of Lowimpact food

Lowimpact food revalorizes co-products of different local beer and fruit juice producers through the breeding of edible insects. Its mission is to inspire Swiss residents to participate in the ecological transition through their food choices. Lowimpact food was incubated at the UNIL Hub Entrepreneuriat & Innovation and the Impact Hub Lausanne Circular Economy Transition. They are currently at Innosuisse for initial coaching.

A swarm of ideas: Delightful disgust of tomorrow's food.

Jeannette Morath

Founder and CEO of reCIRCLE

reCIRCLE replaces single-use packaging with reusable and more ecological packaging. Thanks to the „lunchbox as a service", thousands of disposable containers are saved every day. Around 1,360 restaurants (including EPFL restaurants!) are already part of the nationwide network.

Swimming against the current: Or the fun to change the standard of packaging

Odile Rosset

Director Carton plein

Since 2012, the Parisian association Carton plein has been reusing thousands of used cardboard boxes and carrying out hundreds of moves... only by bicycle and with people in highly vulnerable situations (without housing, without qualifications, without sufficient income, etc).

Inventons des activités adaptées aux personnes en situation de précarité, en oeuvrant pour la transition écologique

Dr. Ajay Patil

Founder of REMRETEch and scientific collaborator at EPFL

REMRETEch (Rare Earth Metals Recycling Technologies) uses a groundbreaking recycling technology enabling the recovery of rare earth metals from electronic waste. The project won the Switzerland Innovation Tech4Impact Initiative.

From highly technical process research to implementable business model: A tale of circular economic solution for critical metals supply

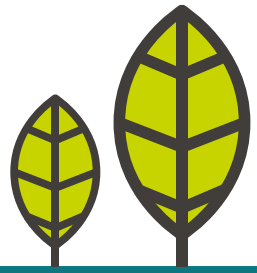
Instructions:

Instructions: We will use the Collective Story Harvest method to learn from the experiences shared.

1. Decide before the session amongst yourselves who will take which listening perspective (each student chooses one perspective):

- **Narrative:** The thread of the story – people, events, stages. You might also harvest facts, emotions and values that are part of the story, etc.
- **Turning points:** What are the pivotal moments or breakthrough moments in this story? What can we learn from them?
- **Parallels:** What can we learn from the story for our own system and for other contexts? What did we learn that we can apply to our own context?
- **Questions:** What questions arise from this story that we could use in our own work?
- **Synchronicity & Magic:** What happened during this story that pointed to synchronicity and the magic in the middle?
- **Overcoming barriers:** What barriers were encountered in this story and what can we learn from them?
- **Collaborations:** What can we learn from this story about the importance of relationships and how we can work effectively as partners or step into partnership?

2. While the storyteller tells his/her story, harvest the key learning from the listening perspective you chose.



3. At the end of the storytelling, share with the rest of the group what you have harvested.

The listening perspective I will be taking is:

Scribble space for your notes...

2

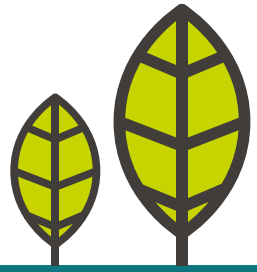
Team Sharing

Intention:

Share and cross pollinate learnings from your campfire storytime session.

Instructions:

Each project team gathers to share with their teammates what they learned from their campfire storytime session.



Teamwork 2: How Might We tackle the problem?

Intention:

Collectively identify paths of action to tackle the problem.

Instructions:

Based on the previous outcomes:

1. Rephrase the challenge you're facing: *OUR CHALLENGE IS…*
2. Sketch the **system nodes and relations**
3. Enrich your reflections and the system with the following questions
   - *What are the root causes of your challenge? (5 Whys?)*
   - *What assets might be built on?*
   - *What do your stakeholders want more generally (beyond our specific initiative)?*
4. From your reflexions, frame several "How Might We" questions.
5. Going back to your system(s), look and highlight key **leverage points**.
6. Select the few most interesting and helpful frames to guide your work.

To go further:

- More information and a tool for How Might We questions
- Problem Framing on page 72

Discuss First Findings

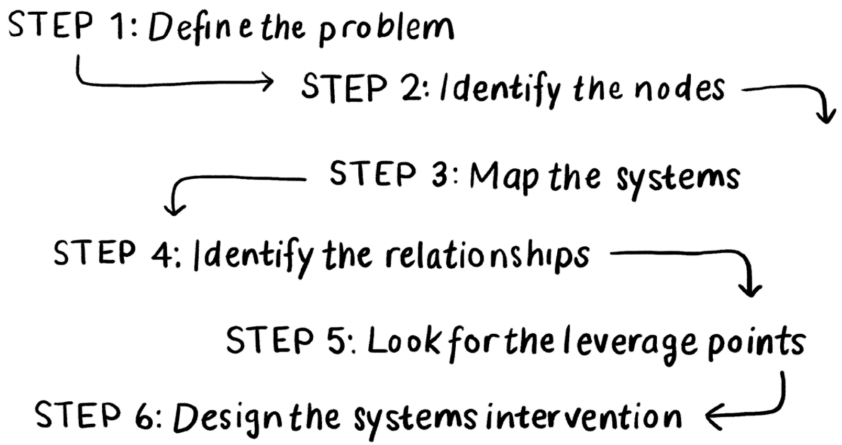
Intention:

Learn about the ideas of other teams thus far.

Teamwork 3: Circular Design - Ideate Interventions

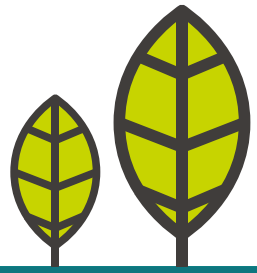
Intention:

Collectively define intervention ideas responding to the How Might We questions.



From: The Disruptive Design Method Handbook by Leyla Acaroglu

(with the link: https://www.leylaacaroglu.com/handbooks/disruptive-design-handbook-e-book)



LINEAR LIFE CYCLE STAGES

EVERYTHING PRODUCED GOES THROUGH THESE FIVE MAIN LIFE CYCLE STAGES

By understanding first what every product goes through across its entire life cycle, you can then move onto uncover the opportunities for re-designing for a circular delivery model.

1 RESOURCE EXTRACTION

Everything comes from nature. List all the raw materials, how they are extracted and where they come from.

2 MANUFACTURING

The manufacturing or raw materials into usable ones, and of all industrial goods.

3 TRANSPORTATION & PACKAGING

Across the life cycle, all goods are packaged and transported many times to get to market.

4 USE

Looking at all the potential use case scenarios that the product is likely to have.

5 END OF LIFE

Recycling, reuse, landfill, incineration, resold, escaping into nature?

DISRUPT DESIGN
www.disruptdesign.co

Instructions:

Based on previous outcomes Teamwork 2 on page 31 and Challenge related systems:

Refresh your brain! Keep in mind the different design strategies that can lead to circularity.

1. Generate Insights / Ideas of interventions (5-7 per person)
2. Cluster and select some interventions proposal

- BREAK -

3. Sketch the **Life Cycle of your intervention** or the one related to it - identify connections with the circular economy theme
4. Change your perspective! Create an empathy map of the intervention with the higher potential
5. Before the end, summarize your interventions in the following format:

Problem	Intervention
-	-
-	-
-	-
-	-

To go further:

- Places to intervene in a system
- Circular Design Resources
- Empathy Map

Check Out

Intention:

Share impressions from the day and reflect on learnings.

Instructions: *Learning Challenge*

Carving out time to reflect on what you have learnt and how you learnt it can help you make sense of the many things that are happening during CSAW.

1. Identify one thing you have learnt since the start of CSAW.
2. Find or create **one artefact** that relates to what you have learnt. An artefact can be anything that represents what you have learnt (e.g. a quick recording, photo, meeting minutes, a mindmap from a brainstorm, diagram or sketch). Be creative!
3. Write **one or two sentences** describing how a specific activity or session helped you to learn this.
4. **Share** your learning with the CSAW group!

Scribble space for your notes...

Day 3: Ideate & Design

Friday February 19th

Check In

Intention:

Get warmed up to start Day 3 and start reflecting on the limits of circular economy.

Fireside chat: The limits of circular economy

Intention:

Gain a critical view of circular economy and be aware of its limits.

Speaker

Philippe Bihouix

Managing Director of AREP, co-founder of the Institut Momentum, engineer, specialist in the depletion of mineral resources, author among other of the books „L'âge des low tech, vers une civilisation techniquement soutenable" & "Le bonheur était pour demain: Les rêveries d'un ingénieur solitaire" and the article "les limites de l'économie circulaire".

What do you wish all students understood about sustainability?

"I wish all students understand the materiality of consumption and recycling, the limits of circular economy concept, the need for an approach in innovation broader than pure technology, including human behaviour and cultural change."

Teamwork 4: Mix & Match

Intention:

Share intervention ideas and discoveries between teams to get inspired by others.

Instructions:

Phase 1 (40 minutes on the basis of 4 people per breakout room)

1. Start from your intervention idea formulated as problem/intervention
2. Individually present to members of other teams your problem/intervention (2 minutes)
3. Gather feedback from the audience using the mix&match template (8 minutes, see next page for template)
4. Move to the next presenter

Phase 2 (15 minutes)

1. Debrief with your team on the basis of what each team member gathered from the different mix&match sessions

3

What was convincing and could be saved?

What might be improved and how?

3

As a user, would you adopt it? If not, what would make you change your mind?

Do you have another way of solving it? If so, how?

Pretotyping Workshop

Intention:

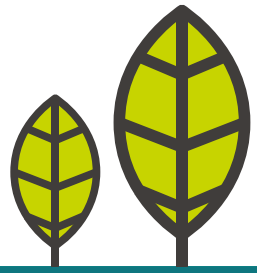
Bring your ideas into reality through pretotyping.

Instructions:

1. Map a 'typical' day in the life of your intervention: What happens? When? How? Who is involved? (Template on page 42)
2. Identify at least 3 key touchpoints in the day that need to work to make your intervention a success
3. For each touchpoint, list the most critical assumptions* you are making
4. Imagine different ways to test these assumptions
5. Do it! ;)

**An assumption is a thing that is accepted as true or as certain to happen, without proof*

To go further: Pretotyping on page 78



Who is involved?

What happens?

What are your most critical assumptions?
An assumption is a thing that is accepted as true or as certain to happen, without proof

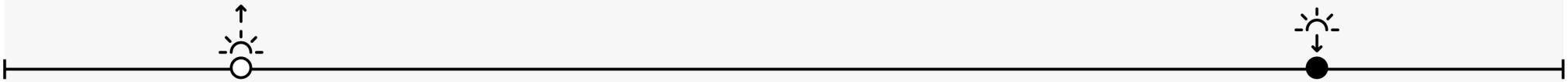
How could you test these assumptions tomorrow?

3

24 hours in the life of .....

Map ‘typical’ 24 hours in the life of your solution:

What happens? When? How? Who is involved? (Touchpoints)



Feedback Session

Intention:

Collect external feedback on your ideas so that you can iterate.

To go further: Feedback Grid from the Enterprise Design Thinking Toolkit.

CSAW Map - Part 1

Intention:

Map the projects and link them to each other, to the initiatives presented during the week and other external projects, in order to visualize how they assemble into a more effective answer to the complex issues we are tackling.

Instructions:

We will interconnect each team's intervention idea with the ones from other teams, as well as relevant existing stakeholders and initiatives presented (or not) during the week.

To go further:

- Affinity mapping
- Mapping on page 76

Check Out

Intention:

Share impressions thus far, reflect on learnings and think about any remaining circular economy questions.

Instructions:

Collectively in groups we will answer the following questions:

1. What are the main take-aways you have learnt thus far? How did you learn this?
2. What questions do you still have about Circular Economy?

Scribble space for your notes...

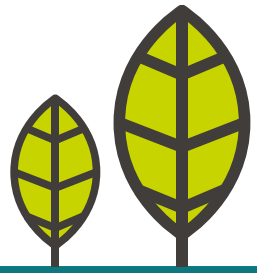
Between CSAW sessions

Questions to think about over the next week:

- What do I/we really know about the problem, the context, and the users?
- What other solutions already exist?
- What is my/our personal value proposition?
- What needs to be created from scratch?
- What can be replicated or scaled in my/our intervention?

Scribble space for your notes...

Scribble space for your notes...



Day 4: Refine & Test

Saturday February 27th

Check In

Intention:

Get warmed up to start Part 2 by refocusing on what you want to learn.

Instructions: *Team Learning Challenge*

1. **Discuss** with your team: What is something that you are motivated to learn in the last 2 days of CSAW? How will you learn this?
2. Make a **short (30-60 second) video** as a team describing what you want to learn - you can record this any way you like.
3. **Share** your learning with the CSAW Telegram group!

Scribble space for your notes...

Ask me anything

Intention:

Get answers to circular economy questions that have come up over the last few days while working on your project.

Speaker

Laurent Maeder

Co-lead business lab Circular Economy Transition

Laurent has 25 years expertise in the field of sustainable innovation and sustainable development in textile and various industries across Europe and Asia. He has been a circular economy practitioner for more than 10 years and has contributed to Circular Economy Switzerland which aims to act as a catalyst for a new Swiss-wide circular economy movement with various projects and events. Laurent also teaches Circular Economy at the Sustainability Management School in Gland.

What do you wish all students understood about circular economy?

"Circular economy requires a change at all levels; from product design to distribution and consumption, and from governance and business models to people's mindset. From an Era of technological and economical performance to an Era of a triple bottom line - profit, planet, people."

CSAW Mapping - Part 2

Intention:

Map the projects and link them to each other, to the initiatives presented during the week and other external projects, in order to visualize how they assemble into a more effective answer to the complex issues we are tackling.

Instructions:

We will build upon our first version of the CSAW map, and continue weaving each of our projects together and to relevant stakeholders and initiatives.

A graphic facilitator will support us in this task. She will graphically synthesize what we share into a map as we discuss.

To go further:

- Affinity mapping
- Graphic recording
- Mapping on page 76

Teamwork 5: Pretotype

Intention:

Time for you and your team to further develop your pretotype.

To go further: Pretotyping on page 78

Alumni expert feedback

Intention:

Get feedback from EPFL Alumni with relevant expertise to help you iterate and improve your project.

Speakers

What recommendation would you give to EPFL students who want to do a Circular Economy project?

Alexandre Bouchet

Environmental Analyst, EA - Environmental Action

MSc Energy Management & Sustainability (2017)

"Circular Economy should not become an excuse to avoid questioning our lifestyles."

Fanny Brenet

Founder, Entreprendre Transition

MSc Bioengineering (2018)

"All future entrepreneurs must take into account the socio-environmental context in which their project will have to fit, from the very beginning of its conception. Otherwise, we will only be repeating the mistakes of the past. It is time to adopt a systemic approach!"

Vincent Carel

Multi-task employee, Kompotoi

MSc Environmental Science and Engineering (2016)

"Keep it simple!"

Prof. Darya Gerasimenko

Professor of sustainable development and lecturer at Samara University and University of St. Gallen

Circular Economy Postdoc, Institute of Technology and Public Policy (2016-2019)

"The circular economy is about building trust within your circular economy innovation ecosystem to experience new levels of interconnectedness and the value of it."

Dr. Cecilia Matasci

Research Scientist, Empa

PhD at the Laboratory of Environmental and Urban Economics (2012)

"System thinking should be at the core of each project."

Matthew Reali

Co-founder & CEO, Ponera Group

MSc Mechanical Engineering (2014)

"Circular Economies can enable huge efficiency gains and sustainable processes, but also represent a disruptive way of doing things with underlying hurdles. Leverage the energy that this additional sense of purpose provides to persevere and overcome your challenges."

Anne Verniquet

Consultant & Business Development at Sofies

Executive MBA (EPFL and HEC Lausanne, 2013)

"Eco-design from the start for Circularity!"

Instructions:

- Decide who in your team will present the project. (Multiple presenters are alowed)
- Think of which aspects of your project you would like to receive feedback on (e.g. where you have the most doubts or where your reflections are still immature).
- Present your project. Make sure you cover the key elements: why, how, what, for whom.

Teamwork 6: Integrate Feedback

Intention:

Refine your ideas by integrating feedback.

To go further:

- Feedback Grid from the Enterprise Design Thinking Toolkit.
- „Pretotyping“ on page 78

Feedback Session

Intention:

Collect more external feedback on your ideas so that you can iterate.

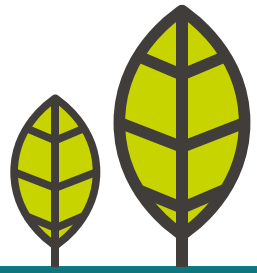
To go further:

- Feedback Grid from the Enterprise Design Thinking Toolkit.
- Pretotyping on page 78

Check Out

Intention:

Share impressions and reflect on the day.



Day 5: Share

Sunday February 28th

Check In

Intention:

Get warmed up for the final stretch!

CSAW Map - Part 3

Intention:

Map the projects and link them to each other, to the initiatives presented during the week and other external projects, in order to visualize how they assemble into a more effective answer to the complex issues we are tackling.

Instructions:

We will build upon our second version of the CSAW map, and continue weaving each of our projects together and to relevant stakeholders and initiatives.
A graphic facilitator will support us in this task. She will graphically synthesize what we share into a map as we discuss.

To go further:

- Affinity mapping
- Graphic recording
- Mapping on page 76

Teamwork 7:
Finalize Pretotype

Intention:

Develop the final iteration and put finishing touches on your pretotype.

Instructions:

Of course CSAW is too short... but keep in mind, this is only the beginning! Whatever you come up with by the end of the day can become a longer-term project through academic, entrepreneurial and association projects, with additional support from EPFL.

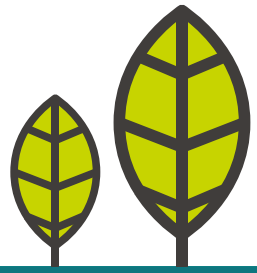
The „Project Brief Template“ on page 80 gives you the key elements to focus on for finalizing your pretotype (you can go further if you have the time).

If you have to prioritize your actions in the little time left, make sure that you focus on **what would make the project ready to continue in the long-term after CSAW.**

If you are having a hard time: don’t forget to check the Teamwork Tools on page 58 too.

And most importantly, enjoy!

To go further: Pretotyping on page 78



Teamwork 8:
Prepare Presentation

Intention:

Get ready to showcase your ideas and pretotype.

Instructions:

You can draw on the Project Brief Template on page 80

Presentations of Team Projects

Intention:

Showcase your ideas to the CSAW cohort and invited guests.

Celebration

Intention:

Celebrate your ideas, your creativity and finishing CSAW!

Instructions:

Wait and see! It‘s a surprise…

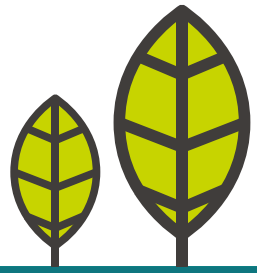
5

Teamwork Tools

Working collectively brings together a diverse range of experiences and skills. It has great benefits for tackling complex problems as diversity is well known to lead to a wider range of interventions.

During CSAW you will see that each of your teammates brings their own experience, skills and ideas. This will be valuable when brainstorming possible interventions and developing your chosen option.

Checklist for working virtually with your group	✔
Establish principle lines of communication for your group (Discord, Telegram, etc.) so that your team knows how to stay in touch.	
Exchange telephone numbers just in case you have technical difficulties (e.g. bad internet connection).	
Set up a shared drive (Google Drive, SWITCH Drive, etc.) so that you know how to quickly and easily share and access information.	
Set up other collaborative platforms you plan to use for sharing ideas (e.g. Mural or Stormboard) or taking decisions (e.g. Framavox).	



Characteristics of strong teams

Common goal - There is agreement on the end goal and the process to get there.

Organization - Each team member is aware of their role and responsibilities in the team.

Group awareness - Each team member acts respectfully and supportively with the awareness that their words and actions impact other members.

Connect and communicate - Team members can share their ideas and navigate group challenges in a space of non-judgement.

Cohesion - The team works smoothly and effectively, team members are self-motivated and share the workload fairly.

Working with diversity

Diversity fosters creativity and innovation.

Tips for harnessing the diversity of your team:

- Get to know the strengths of your team members and find out what your teammates want to work out and skills they want to build.
- Create an inclusive and accepting atmosphere where everyone feels respected.
- Be flexible and adapt to the different needs of your teammates.

Team roles

Being conscious of different perspectives can improve the functioning of your team. It can be helpful to adopt different perspectives and roles, and circulate the roles among your team.

Try exploring the some of the following roles in your team:

Initiator - Propose and explore possibilities, alternatives and new ideas.

Challenger - Constructively questions ideas and decisions by playing the 'devil's advocate'.

Searcher - Identifies what information is already known, and what is needed and seeks information to fill those gaps.

Clarifier - Asks questions to clarify ideas and establish a mutual understanding within the group.

Supporter - Supports recommendations and ideas of team members by looking for the value and benefit of their suggestions.

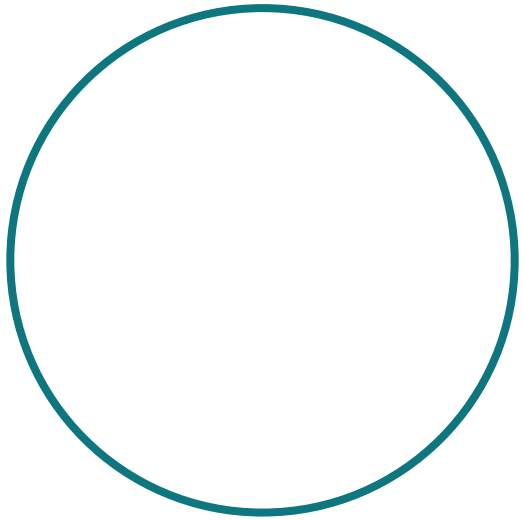
Harmonizer - observes and reports on the dynamics of the group, and helps maintain a respectful and open minded atmosphere.

Here are some other ways to define roles in your team.

Virtual Team Meetings and Roundtable

Explore using the "roundtable" below to give all members in your team the chance to share their ideas and inputs. This can help during introductions and feedback rounds in your team.

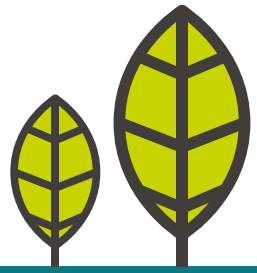
1. Write the names of each of your teammates around the circle below. Do this with your team to make sure that you all have the names written in the same order.
2. Speak in the order you appear around the roundtable. Make sure you give each member a fair share of the collective speaking time.



Things to test for your meetings

- Clarify the objectives and what you want to achieve for each meeting.
- Assign a facilitator to make sure you reach your objectives. The role of a facilitator is to clarify the objectives, ensure each teammate has the chance to share their inputs, and make sure the meeting environment is respectful.
- Assign a timekeeper to keep track of progress and make sure you stay on time.
- Use the roundtable to make sure each team member can share their ideas.
- Divide the work and clarify what are the next steps and who is going to do what.
- Note down big decisions your team takes related to the objectives of the meeting.

Here are some guides to group work and improving your team's communication.



Manage your time

Being in a team does not mean you have to work together 100% of the time. Splitting up tasks can reduce workload and efficiently use the time available.

Task What is the task?	**Time** How much time is available?	**Who** Who is responsible?	**Result** What is the expected result?	**Deadline** When should it be finished?
		Example....		
Researching circular economy	*1 day*	*All team members (individually)*	*Collected resources & shared via Google Drive*	*Tuesday at 15:00*

From: ACIDE, Atelier Créatif Interdisciplinaire.

Task	**Time**	**Who**	**Result**	**Deadline**

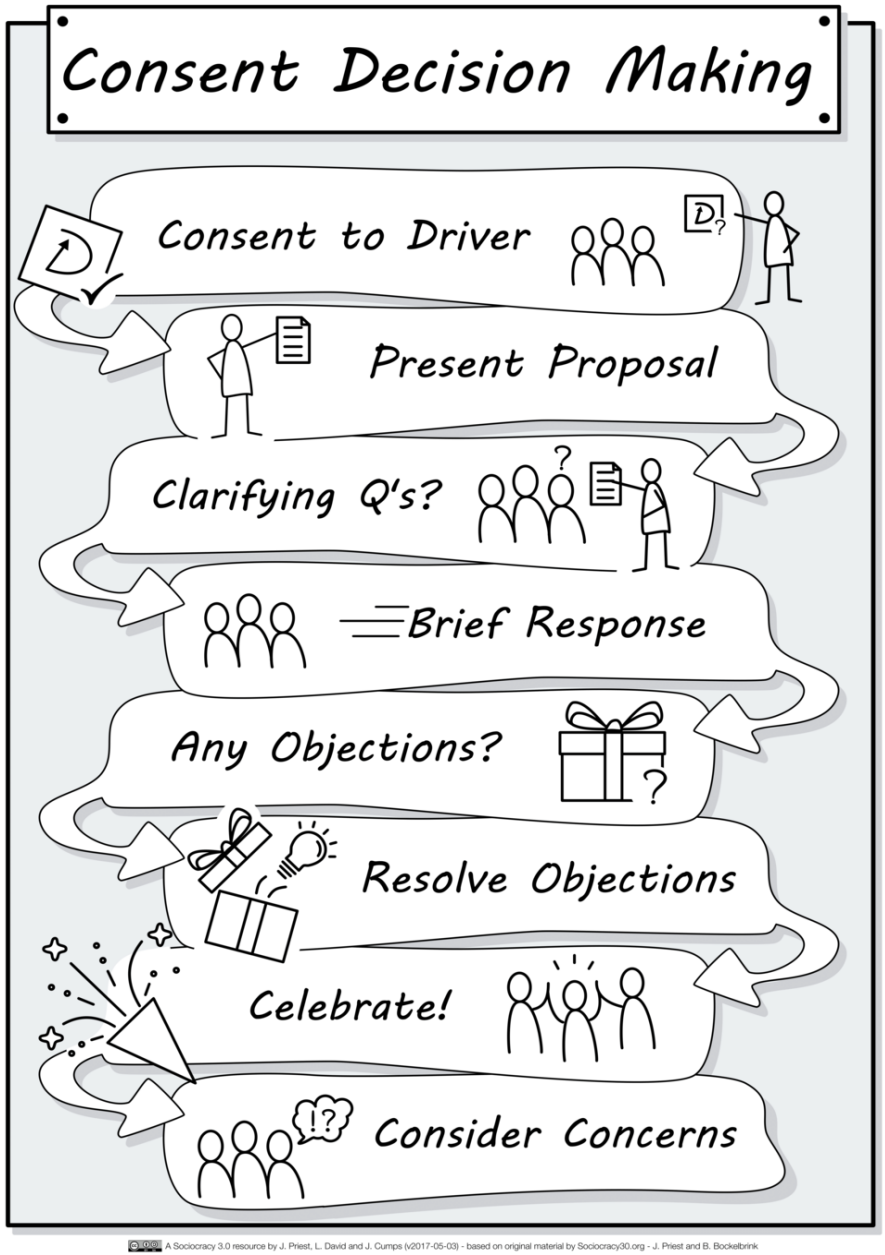
Taking decisions in your team

The Decider App may help you define which decision making process you need at this stage through a few yes\no questions.

The Sociocracy 3.0 decision making process is most useful when you need to make big decisions that have an important

impact on all members of your team. It allows all members of your team to contribute to the decision. Not all decisions need to be taken with a collective decision making process.

Need a tool to take decisions online? Try Framavox.



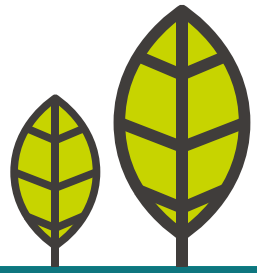
Sociocracy 3.0 Decision Making Process

Communicating in your team

How we communicate impacts how a team functions. Embracing open, inclusive, non-judgemental and clear communication can really help your team flourish.

Keep in mind these points during your team meetings:

- Participate as much as you can, that way the whole group will benefit.
- Be mindful of differences in language and culture and help others to join in and understand.
- Don't assume others know acronyms, jargon or slang, or that they will participate at the same speed you do.
- Listen to, and respect all points of view, even if they are very different to your own.
- Inquire rather than debate and seek to understand others rather than persuade.
- Question assumptions, especially your own.
- Try taking a different point of view than you are used to, or take a few risks with what you are contributing.
- Listen actively and with empathy.
- Remember to enjoy yourself!



Active listening helps us to fully comprehend what someone is saying. Practice listening fully and respectfully. Defer your judgments, avoid interrupting and don't assume that you already know the answer. Hold space for the speaker and allow yourself to be curious about what they are trying to communicate. Be open, honest and empathetic in how you respond.

Nonviolent Communication is a method to re-frame our communication to move away from taking things personally and reacting instinctively (e.g. defending, judging, withdrawing or attacking) and move towards honestly communicating what we perceive, feel and need.

When communicating try to be mindful of:

Observing the concrete actions that affect your well-being, be specific about the action (e.g. When I see/hear/notice....).

Expressing how you feel in relation to what you have observed (e.g. I feel....). Here is a feelings & needs inventory that might help you point at what you are feeling.

Connect your feelings to your need or value that creates that feeling (e.g ....because I need/value...). Here is a feelings & needs inventory that might help you point at what your needs are.

Request actions in a clear, positive and concrete way to improve your well-being (Would you be willing to...?).

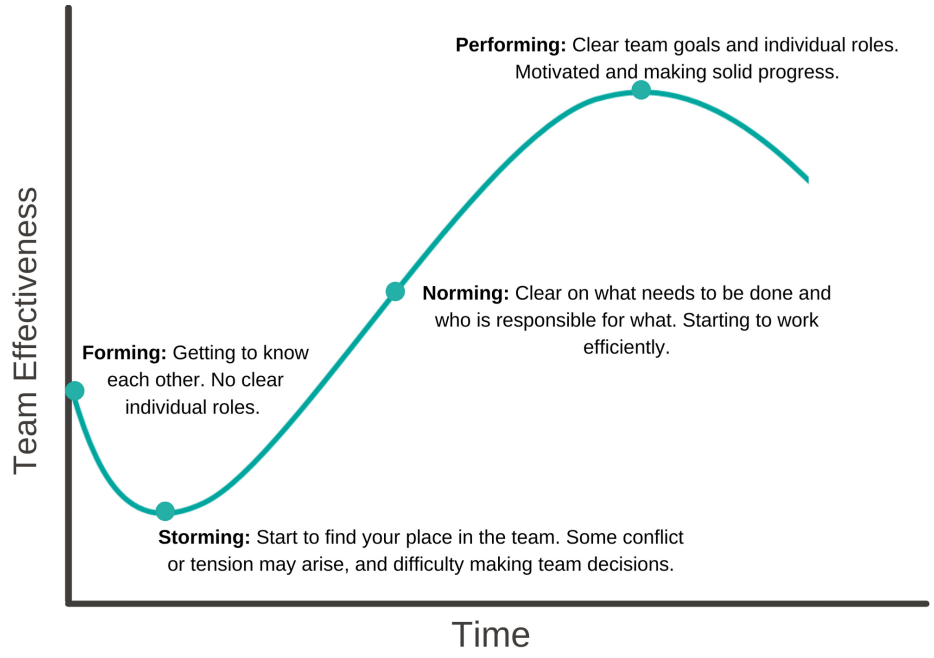
More information here.

Managing conflict and differences

- Recognize that conflict and tension is a normal phase in forming a new team. You can find out more on the phases of team development here and how to navigate them here.
- Refocus on the objectives of the team and the purpose of a meeting or interaction.
- Use nonviolent communication to communicate your feelings and needs (see the next page).
- Brainstorm possible ways to navigate the problem.
- Be prepared to find a compromise in order to move forward for the good of your team.

To go further: Videos (FR) from EPFL-CAPE on group work

- Tuckman's Model for Team Development
- Navigating interpersonal conflict
- Building a team that performs



Tuckman's Model for Team Development

Circular Economy

Foundational concepts (videos)

- A healthy economy should be designed to thrive, not grow | Kate Raworth
- Creating a Circular Economy | Kate Raworth
- Explaining the Circular Economy and How Society Can Rethink Progress
- Circular Economy Explained: What Is It & Why Is It Important?
- A flow of wealth or a wealth of flow
- Quelle économie circulaire? | Dominique Bourg, UniL

Reading

- Nine Rs
- Misconceptions about the circular economy

Circular Design

These tools can help you incorporate circular economy approaches in your design and ideas.

Get started

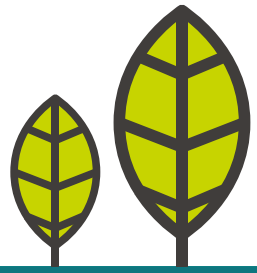
- Circular strategies cards
- Design play cards
- Circular business strategies

Formulate your ideas

- Circular value proposition canva
- Circular intervention canva

Assess and re-think

- Life cycle questions
- Circular system design conversation cards



Problem Framing

The Slow Elevator

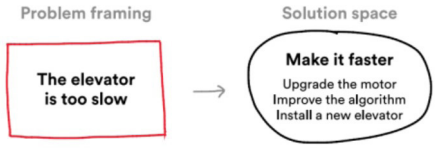
Direct extract from: Wedell-Wedellsborg, T. (2020). What's Your Problem? To solve the toughest problems, change the problems you solve. Boston, Harvard Business Review Press. HowtoReframe.com

You are the owner of an office building, and your tenants are complaining about the elevator. It's old and slow, and they have to wait a lot. Several tenants are threatening to break their leases if you don't fix the problem.

First of all, notice how this problem isn't presented to you neutrally. Like most of the problems we encounter in the real world, someone has already framed it for you: the problem is that the elevator is slow.

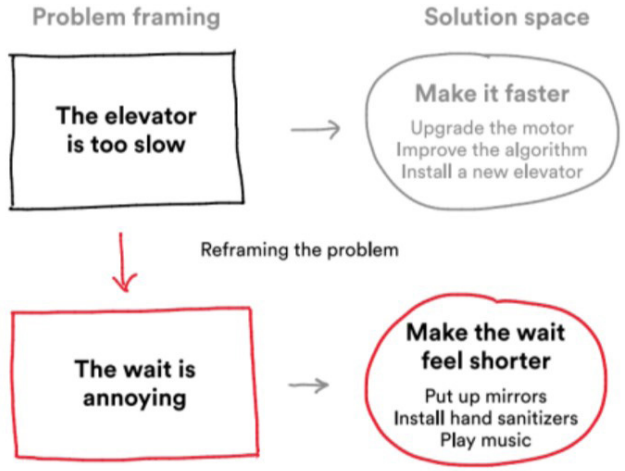
In our eagerness to find a solution, many of us don't notice how the problem is framed; we take it for granted. As a result, we start coming up with ideas for how to make the elevator faster: Could we upgrade the motor? Could we improve the algorithm? Do we need to install a new elevator?

These ideas fall into a solution space, that is, a cluster of solutions that share assumptions about what the problem is:



These solutions might work. However, if you pose this problem to building managers, they suggest a much more elegant solution: put up mirrors next to the elevator. This simple measure has proved effective in reducing complaints, because people tend to lose track of time when given something utterly fascinating to look at—namely themselves.

The mirror solution doesn't solve the stated problem: it doesn't make the elevator faster. Instead it proposes a different understanding—that is, it reframes the problem:



This is what reframing is about. At the heart of the method is a counterintuitive insight: sometimes, to solve a hard problem, you have to stop looking for solutions to it. Instead, you must turn your attention to the problem itself—not just to analyze it, but to shift the way you frame it.

What is problem framing

“The way you frame a problem determines which solutions you come up with.”

From: Wedell-Wedellsborg, T. (2020). Whats Your Problem? To solve the toughest problems, change the problems you solve. Harvard Business Review Press. HowtoReframe.com

“So many of us rush to solve complex problems with the same thinking that led to them in the first place.”

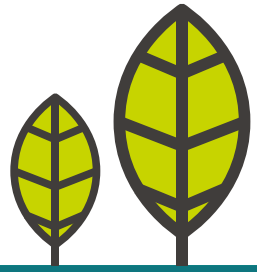
From: The Disruptive Design Method Handbook by Leyla Acaroglu

Having a linear and reductionist mindset results in one-dimensional perspectives of complex problems. This can limit our ability to see opportunities, and lead to ineffective and shallow ‘band-aid solutions’.

Reframing the problem and examining it from multiple perspectives can help you see new opportunities for intervention. It is important to do this before falling in love with one idea and developing a pretotype.

Analysing the causes, worldviews, metaphors and myths underlying a given problem is also critical to approach it in a fundamental way. Treating the symptoms often does not cure the disease… In this regard, the causal layered analysis is a powerful method.

In general, keeping the variety of leverage points you can use in a system is important when framing the problem you are trying to tackle.



Keep in mind that most of the problems you will be tackling are complex, even wicked problems. They often cannot be solved by one single project - if they can be solved at all.

Spend as much time as you can understanding the roots of the problem, to avoid falling into a solutionist approach, which might just make the problem change form, and not even start to solve it.

To go further:

- Framing what matters by FoAM
- Wicked problem definition on Wikipedia
- Wicked problems in design thinking (academic paper)
- Reframing Canvas - How to Reframe
- Core problem map

Mapping

Throughout CSAW, we invited you to be visual. Here are a few tools and tips about mapping and graphic recording.

Affinity mapping is a method that allows you to visualize how things relate to each other.

Here are some tips about graphic recording, a practice allowing you to synthesize discussions in a visual way.

You might be familiar with **mindmaps** already. Although it is a powerful and accessible way to map things, there are many other ways you can build a map.

You can design **flow diagrams**, well known to engineers such as this one, this one or this one.

You can also design (eco)**system** or **network maps**, such as this one, this one, this one, or this one. Here are some additional ideas for system mapping.

Circular relationship graphs (here and there) can also help you map how things relate to each other. Non circular ones are nice too.

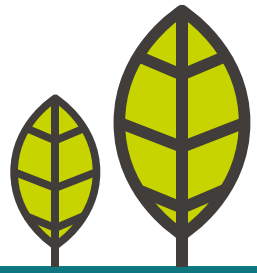
Onion diagrams (here and here) and Venn(-like) diagrams (here) allow you to map things by categories.

Additional inspiration can come from **indigenous mapping**, such as this one, or this physical one used by inuits.

You can also take broader visual inspiration here and here.

Prezi is a powerful mapping and presenting tool.

During CSAW, we will use Mural.



Pretotyping

What is pretotyping

"Pretotyping is a way to test an idea quickly and inexpensively by creating extremely simplified, mocked or virtual versions of that product to help validate the premise that '*If we build it, they will use it*'."

Savoia, A (2011). Pretotype It - Make sure you are building the right it before you build it right.

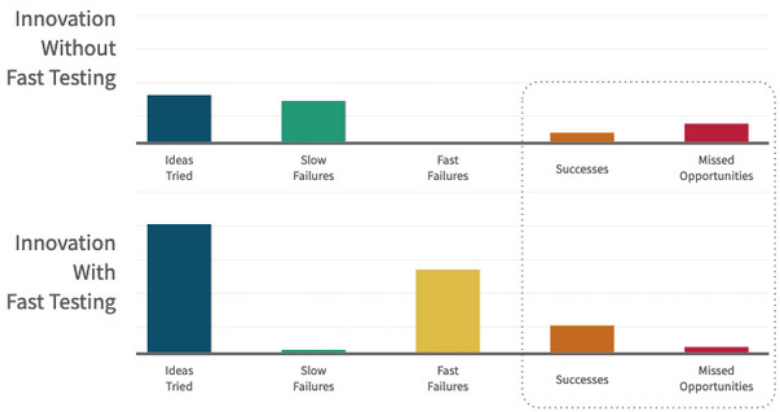
Pretotyping

- Would people be interested in it?
- Will people use it as expected?
- Will people continue to use it?

Prototyping

- Can we build it?
- Will it work as expected?
- How quickly and cheaply can we build it?

Source: pretotyping.org



Why pretotype

"Pretotyping is the best way to make sure that the idea you want to build is The Right It before you invest what it takes to build It right."

Source: pretotyping.org

Here is a video introduction on why and how to pretotype.

Elements of pretotyping

1. **Key Assumptions -** What are the assumptions about your idea that, if false, means it's definitely not the right it?
2. **Type of pretotypes -** What type of pretotype will let you to isolate and test your key assumption(s)?
3. **Use case -** How many (and what kind of) users will do what with your pretotype? A solid hypothesis takes the guesswork and opinion out of testing
4. **Tests -** Put your pretotype into the real world, and see how people interact with it
5. **Lean approach -** Build, measure and learn. Refine your pretotype with your new data. If your hypotheses hold, decide what other situations you should test your pretotype in to get a complete picture.

Adapted from: pretotyping.org/methodology

Have some fun with pretotyping with this easy recipe for pâte à sel and short video (FR).

Project Brief Template

WHY?

Which problem are you addressing? Why does the problem exist? Why is it important to address this problem? What is your problem statement?

WHAT?

Describe your proposed intervention and its relation to Circular Economy. *Tip: add a diagram of your proposal & its intended purpose within a circular economy.*
What is the main objective of your intervention? What is the expected outcome / impact? What might be the unintended consequences (risks or benefits)?

HOW?

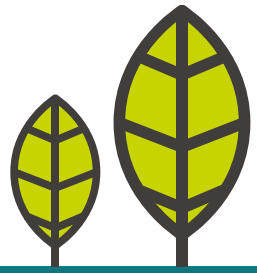
What scenario could bring this intervention idea to reality?
What would you need to pursue the development of the intervention - material, people, equipment, information, time, etc?

NEXT STEPS?

Which EPFL program(s) would be the most suited for supporting the further development of your project ? Semester project, Master project, MAKE, EPFL Changemakers, Act4Change lab, partnering with an association.

WHO?

Who are the team members? Who are the stakeholders (relevant existing initiatives, potential partners, customers, beneficiaries, providers, etc.)? How does your project relate to other projects within CSAW, EPFL and beyond?



My next step after CSAW is...

Stay engaged

If you are interested to become more engaged in sustainability, innovation or entrepreneurship check out the following student associations.

Sustainability

Engage in sustainability action and dialogues on campus with Unipoly, Zero Emission Group, Global Earth Horizon Talk, Agepoly and TREE. Explore opportunities for internships and projects in sustainable development in the Global South supported by Ingénieurs du Monde and EtuRESCIF.

agepoly

UNIPOLY ENSEMBLE POUR UNE ÉCOLOGIE ACTIVE

etuRESCIF
Réseau d'excellence des sciences de l'ingénieur de la Francophonie

GEHT
Global Earth Horizon Talk

Ingénieurs du Monde

ZERO EMISSION GROUP

Innovation

Get connected to innovators and industry to share ideas and build collaborations (STIL - Salon des Technologies et de l'Innovation de Lausanne, Innovation Forum, AESV - Association des Etudiants en Sciences de la Vie) and find internship and job opportunities (ForumEPFL).

Entrepreneurship

Develop your skills, experience and network to succeed as an entrepreneur (START Lausanne, Society of Managerial Engineering). Get inspired and find the support you need to develop your business ideas with the Entrepreneur Club or gain experience offering services to various clients with Junior Entreprise.

Prototyping

Realize your electronics, mechanics or robotics projects and build your hands-on practical experience with Robopoly and Octanis.

robopoly

octanis

To go further after CSAW

Pathways for projects	Interdisciplinary & Sustainability-related Academic Programs
Semester and Master Projects	Master in Energy Science and Technology
Prototype your product at **Student Kreativity and Innovation Lab (SKIL)**	Master in Sustainable Management and Technology (E4S)
Create and fund your interdisciplinary student-led project through **MAKE**	Minor in Energy
Turn your project into an innovative company through **EPFL Changemakers**	Minor in Engineering for Sustainability (starting in fall 2021)
Fund an on-campus demonstrator of your sustainable product or service through **Act for Change LAB**	Minor in Integrated Design, Architecture and Sustainability (IDEAS)
If you are looking for sustainable entrepreneurship, check out the opportunities at **Tech4Impact**	

Endword

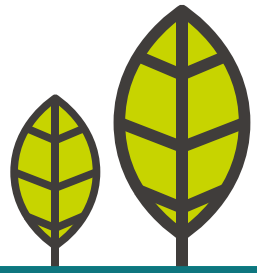
We would like to extend our sincere gratitude to all of the people who have made the CSAW dream into a reality!

First and foremost, thank you to both the VPE and EPFL Sustainability for supporting and sponsoring the co-creation and the pilot.

Thank you to the creative people that initiated and developed the CSAW concept.

The Steering Comittee members:

- Michka Mélo (VPE-DLL, CSAW Coordinator)
- Nicola Banwell (EPFL Sustainability)
- Samuel Cotture (ENAC-SKIL)
- Julien Delisle (VPE-DLL/Make)
- Eric Domon (EPFL Sustainability)
- Silvia Hostettler (EPFL Sustainability)
- Marc Laperrouza (CDH-CHIC)
- Marius Aeberli (EPFL+ECAL Lab)
- Gianluca Paglia (EPFL Sustainability)
- Alessandra Rojas (VPI-Tech4Impact)
- Melanie Studer (ENAC-Design Together)
- Pascal Vuilliomenet (VPE-DLL, VPI)



The wonderful co-creators:

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- Jean-André Davy-Guidicelli
- Christophe Deloose
- Marguerite Fauroux
- Daniel Gutierrez-Navarro
- Matthieu Jacobs
- Robin Leibundgut
- Anaël Perruchoud
- Diane Remmy
- Victor Rey
- Amara Slaymaker
- Marc Tognola de Quintana.

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We greatly appreciate all of the valuable inputs during CSAW from the speakers and contributors, including Agathe Loret, graphic facilitator from Think'n'link, who will transfrom what CSAW participants will imagine into clear and effective graphical deliverables..

This booklet has been written by many members of the co-creation team. It has been edited by Nicola Banwell, and designed by Robin Leibundgut.

We would like to acknowledge, with great gratitude, all of the partners who collaborated with us in realizing the pilot:

- FoAM (Maja Kuzmanovic and Nik Gaffney) for your valuable advice and training to the CSAW coordination team and co-creators.
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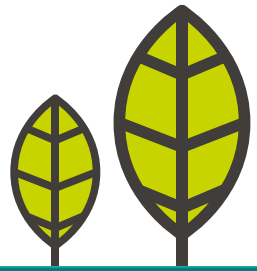
Last, but definitely not least, thank you to you, the participants, who shared in the experience of the first CSAW pilot!!

If you are interested in staying connected with CSAW follow us on Instagram (@csaw_epfl) or Facebook (Climate and Sustainability Action Week EPFL), or co-create the next edition with us by getting in touch through csaw@epfl.ch!



What is your own Endword?

Thursday Feb 18th	Friday Feb 19th	Saturday Feb 20th	Saturday Feb 27th	Sunday Feb 28th
8:30				
	Check IN	Check IN	Check IN	Check IN
Opening	**Team Work 1:** Problem ideation (What if..) - Divergence	Fireside chat: The limits of Circular Econnomy	Ask me anything	CSAW mapping
Keynote	Campfire storytime: From idea to reality	**Team Work 4:** MixMatch & Debrief	Start part 2: CSAW map	**Team Work 7:** Finalize Pretotype
Get to know each other	Teamsharing		**Team Work 5:** Pretotype	
13:30				
Circular Economy 101	**Team Work 2:** Problem framing - „How might we?“	Pretotyping Workshop	Alumni expert feedback	**Team Work 8:** Prepare Presentation
	Discuss first findings			
Pannel: Circular Economy & Engineering	**Team Work 3:** Cicular design - Ideate interventions		**Team Work 6:** Integrate Feedback	Presentations of Teamprojects & Open Space Technology
		Feedback Session		
Collective problem mapping		End part 1: First CSAW map	Feedback Session	Celebration
Check OUT	Check OUT	Check OUT	Check OUT	