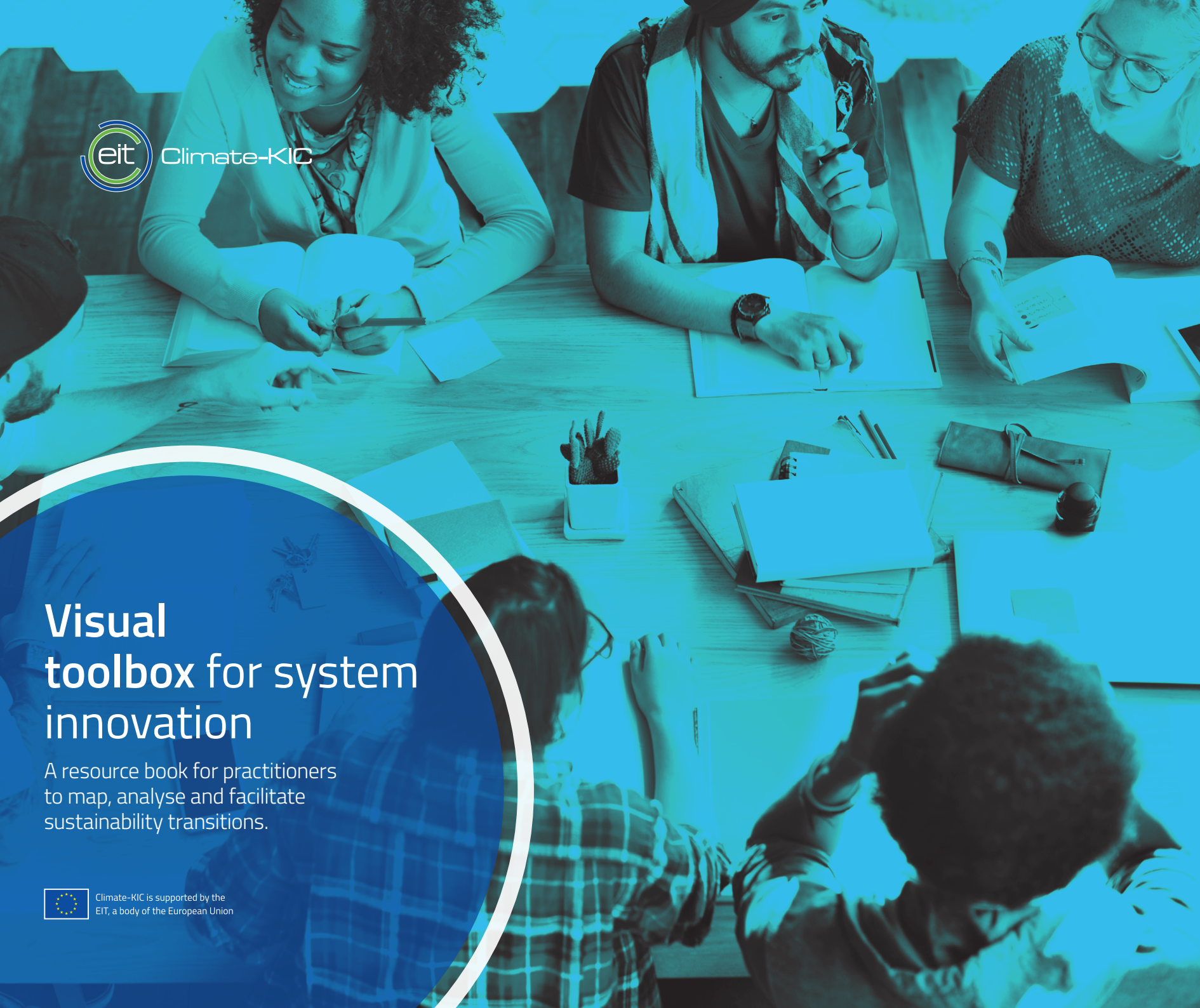

Climate-KIC

Visual toolbox for system innovation

A resource book for practitioners to map, analyse and facilitate sustainability transitions.

Climate-KIC is supported by the EIT, a body of the European Union

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Editor
Cristian Matti

Author
Javier de Vicente, System innovation consultant and facilitator

Illustrations
Javier de Vicente

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Why this book?

The idea of system innovation has been widely diffused in academia and business to refer to major transformation in national and regional economies through technological breakthroughs, reorganizations of industries and the implications of a globalised economy. In the field of climate change, this concept has been deeply applied through the study of socio-technical transition by a number of expert organisations such as the Knowledge Network for System Innovations and Transitions (KSI), the Dutch Research Institute for Transitions (Drift) and the STEPS Centre of the University of Sussex - (Social, Technological and Environmental Pathways to Sustainability). The more practical application of sociotechnical transition, known as transition management, has also been developed by practitioner-based organisations such as Smart CSOs and Forum for the Future.

The Climate-KIC has widely applied elements of system innovation and transition management by combining other general project and innovation management elements. Pioneers into Practice, the Innovator Catalyst and summer schools are some of the key education programmes that have adopted this approach for years. That experience has revealed the difficulties of applying the theories and perspectives to day-to-day practice in certain projects. Practitioners demand adaptable and flexible tools and methods that are easy to transfer to their challenges and problems.

At the same time, throughout these years of intense training, the use of co-operative learning methods, peer-to-peer activities and modular formats have arisen to be as highly valued by skilled participants who are demanding new learning methods in which experts and mentors are liberated to work more horizontally with practitioners and problem owners. All these experiences have been the inspiration for this book which aims to play a key part in improving the development, the skills and the application of support system innovation in the field of climate change at both, individual professional level and organizational level.

Cristian Matti
Transitions Hub - Climate-KIC &
Utrecht University *

* Learning and Knowledge Manager at Transition Hub and researcher at the Copernicus Institute of Sustainable Development - Utrecht University.

Content

1- What is this book about?

The book is a collection of ready-to-implement tools to structure and manage the challenges and exploit opportunities of sustainability innovations and transitions. The goal is twofold: improving the understanding of a challenge by going deeper, broader and by improving the quality of the discussions and conversations around the problem among participants. It means to put the focus not only on the problem solving process but also on the learning process while designing and implementing solutions. The tools are presented in a simple and visual approach with the purpose of supporting practitioners' every-day work on climate change, transition and system innovation.

The toolbox is rooted in a modular structure, built upon four modules that account for the main steps in the system innovation process before getting into the prototyping phase. That is: stakeholder management, multi-level perspective, visioning and backcasting and niche management. This structure is meant to facilitate the problem-solving process by setting out a pathway in the always blurred, uncertain and fuzzy process for system innovation. In addition to these modules, a standalone tool has been added to help users define the real problem they are facing.

The four modules holding the tools feed into a multidisciplinary setting, including transitions management but also practical elements from innovation management, systemic thinking, design thinking and project management. Based on this structure, the learning approach is based on the assertion "learning by doing through the application of tools on the users' cases".

In this regard, the toolbox is designed to help pick out those tools that best adapt to the practitioners' needs and background. The design of the tools has been sculpted around four features to maximise the learning experience under this approach:

Flexible. The book is designed for you to pick out the tools that best fit your challenge and then you can adapt those you chose to your own context. To make it easy to find the most proper tool, a variety of alternatives with different levels of complexity have been designed.

Standalone. The tools have been conceived to work individually and as a full suite. That means, you can single out one tool and apply it to your project, whether you are going to use more tools or not. Regardless of this capacity to be applied in a standalone way, it is highly advisable to conceive a pathway to follow within your innovation project including a coherent set of tools.

Visual. Most of the tools have been designed as visual devices to spark creativity, systemic and lateral thinking. The book is not illustrated to make it pretty. The pictures have a clear purpose and shouldn´t be skipped. It may take you time to feel comfortable with the visual metaphors proposed, but these techniques will help your non-linear and creative thinking (you just might need to practise a bit).

Systemic. The toolbox aims for a systemic understanding of problems and challenges. Therefore, you can expect this type of conceptualisation underlying every tool instead of a linear process of reasoning. This is why all the tools have been designed to be used in multidisciplinary and even multicultural frameworks, and to factor-in data and inputs from the context surrounding the project.

This book was developed simultaneously with eLearning material based on the main elements of flipped and seamless learning. In that sense, the tools are presented to facilitate a learning process where different types of activities, at different times and with multiple resources can be applied. The tools are also designed to support project management, organisational change and capacity building process for organisations or multi-stakeholder project set ups. Thus, group work, project development and peer-to-peer interactions are included as key elements for this flexible and tailored approach for practitioners.

2- How to use this book?

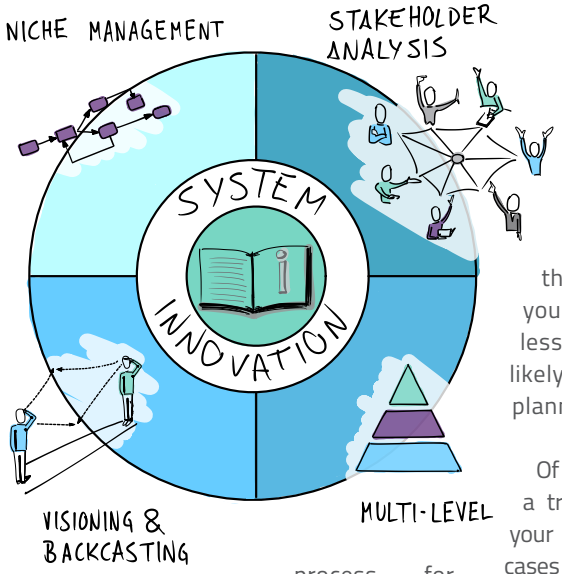
There are two important perspectives about how to use this book. First, is the use of the set of tools as a coherent sequence to support a system project management process or a training event. The second refers to the use of each single tool in whatever context you may need them.

As explained in the previous section, the book is built upon four modules accounting for a suggested pathway for system innovation (not including the prototyping phase): stakeholder management, visioning and backcasting, multi-level perspective and niche management. A kick-off tool has also been added to better define the system challenge (find out more in the box).

With this structure in mind there are two main ways of using this book. The first and simplest way is just to go for one specific tool you need in a certain moment of your project. Since the tools are designed as standalone devices, you may want to use one of them to work out a specific problem you are dealing with. For instance, you might only need to map out your stakeholders or to run a backcasting workshop. If that were the case, you would-n´t need to go through any sequence of tools but simply use the most relevant one.

The second way of using the toolbox is to be applied when you have a system project or a training workshop ahead of you. In those cases, you may opt for designing a comprehensive innovation route, starting with the problem definition and then going through the four modules. According to the challenge you face, the background and experience of the team and the context you are in; just pick out some of the tools from each module and build your own pathway for innovation.

You might think the toolbox suggests a kind of lineal



process for system innovation, but it doesn't. First of all, you don't need to cover all of the four modules if you think you don't need to at this stage of you project. Secondly, and more importantly, this is a systemic process to deal with systemic problems, even though you may design an initial process made up of five tools going through the suggested pathway. In this regard, most of the tools are to be applied once in a while during the project lifetime and many times there will be more than one tool in use at the same time. These feedback loops and parallel pathways characterise the real application of the toolbox to your project. Throughout these non-linear steps you will obtain invaluable lessons that will more than likely modify the previously planned pathway.

Of course, if you embark on a training workshop where your time, resources and real cases are very fixed, you might want go for a more linear process, just to get participants acquainted with the use of the tools.

1. Stating the Problem.

It is often noticeable that the main issue for a project team is to nail down and define the real problem and challenge. This is especially relevant in system contexts in which wicked problems are difficult to pin down and when we run the risk of finding the right solution for the wrong problem. Therefore, this tool is aimed to reframe the problem by helping practitioners to better spot what the right problem is and to nail it down at the same time as keeping a systemic perspective.

2. Stakeholder analysis.

Working with stakeholders is probably one of the commonalities in systemic projects and one of the first conditions. In this regard the toolbox covers three steps of this work with stakeholders: identifying, characterising and depicting relationships. Depending on time availability it can be useful to work with one tool from each category. Bear in mind that the stakeholder engagement phase is left out. For that reason, you may consider including a role game or similar activity to somehow engage your stakeholders with the conversation. The World Café, open spaces, roundtables or Fishbowl techniques can be applied for such a task.

3. Multilevel Perspective.

With the support of the stakeholders it comes to deeply understanding the system in which your project is embedded, how it works and how it has evolved. In this regard, two types of tools have been included so far: one devoted to describe the dynamics (from past time to present time) of the system and another to describe a static picture of the current system or status quo. Whereas the static vision provides a comprehensive picture of the way the mainstream system works, the dynamic approach can help to understand how the system got to the current stage. You may start with the static perspective and then move onto the dynamic tool or the other way around. This is the type of flexibility to keep in mind when applying tools.

4. Visioning and Backcasting.

Foresight is at the very core of any disruptive and system innovation. By envisioning the future, your team will be able to step backwards, identify what changes would be necessary and then go forward again; setting an agenda of actions. This backcasting process is easily understandable but hard to put into practice, due to the counter-intuitiveness of starting in the future and

moving backwards. You can find tools with different levels of complexity so that you can select the tool you feel most comfortable working with.

5. Niche Management.

Under the label of niche management, the last module included in the toolbox addresses the issue of how to get lessons out of the project management process and how to apply those lessons to enhance the process. The goal is to include a new dimension in the project management process, emphasizing how an on-going learning and reflection process can move the innovation idea forward.

As to the use of each tool, as mentioned before, the focus of these tools is on the problem solving and on the learning process. The tools are not designed to be perfectly filled out and to represent a nice drawing but to think differently of new ways in tackling the problem, based on a systemic perspective and to learn from that process. Bearing that in mind, don't forget that:

You may feel like adapting the tool to your specific needs and context (background, culture...). If so, please, feel free to remove, modify or add new elements to the canvas. The only element to keep at the forefront of your mind is; keep the systemic perspective.

It is essential that you spend time in the debrief step after applying each tool. This debrief is to help you better understand the outcomes you got and how to apply them on your challenge, but also to give you some specific time and space to reflect on the lessons about the process, and your performance as a team. Therefore, don't skip or underestimate the value of a good debrief. Instead always try to break it up into two blocks: one devoted to the outcomes and the other to the process, its lessons and the consequences for the team.

Now you are ready for making the most of the toolbox. Decide what to start with and give it a try. Enjoy the experience and let your creativity out.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Concept
Product
Marketing
IDEAS
Design
Brands
SEO!
SALES
OK!
Yes!
customers communication
content

1

Stakeholder management

Innovating with people instead of for the people

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Stakeholder **management**

Stakeholder management has been largely used in many different disciplines from market research, policy making and product design, among others. This participatory approach allows for the involvement of affected people and organisations during decision making processes, providing solutions with a higher level of certainty, credibility and feeling of ownership.

Whereas market research or the most recent approach of user-centred design, put the focus on the person as an individual customer or user: social problems require a slightly different perspective, taking into account opinions coming from organisations, social groups etc. Meaning, the focus is put on the people, as an organised society, rather than people as a group of independent individuals.

When it comes to system innovation or socio-technical transitions, the process entails both, technology and society, and the way in which society uses technology. That means the context becomes more complex and a systemic perspective must be adopted. It is essential to understand and map out the dynamic process of innovation as a collective action in which many stakeholders, playing different roles, have a key influence on the process and the yielded outcomes.

Therefore, the socio-technical approach to stakeholders is based on the recognition of the existence of a system of stakeholders in which each project/problem/challenge is embedded. This system forms a tangible network in which nodes account for the stakeholders, and links or ties account for established relations between actors. As a consequence of these relationships and individual features, the network evolves and emergent behaviours surface influencing or even leading the innovation process. This systemic and dynamic character provides part of the uncertainty and complexity inherently linked to socio-technical transition processes.

What is stakeholder management?

The stakeholder management process is made up of two phases with different steps in each. First, STAKEHOLDER NETWORK ANALYSIS, is aimed at understanding the network before working with it. That is, understanding the components (stakeholders), their behaviours and relationships and the network performance.

Second phase, STAKEHOLDER NETWORK ENGAGEMENT, is the process of carrying out the engagement itself, with the envisaged activities involving actors throughout the whole process of transition.

One of the main differences that stands out in the socio-technical transition approach from others perspectives is the dynamic character of the analysis. Socio-technical transition is an on-going and living process, the participants in such a process and their roles should be analysed more than once: at the beginning of the process, during the process and at the end of the process.

Why involve stakeholders?

By involving stakeholders in the process of defining the problem, ideating and developing solutions you get a number of benefits:

- Enrich the knowledge, experience and perspectives around the

> "Participatory planning is a form of planning which implies the association and union of as many points of view as possible, in order to identify the best possible solution in terms of plans, projects or strategies. It is therefore essential to bring together actors representing different skills, knowledge bases, experiences and backgrounds."
>
> Jeff Bishop -BDOR Limited Bristol UK

table, this maximizes the probabilities of success.

- Reduce the number and the severity of conflicts between different involved or affected parts.

- Diminish the chances for absent stakeholders to spoil the process.

- Build a sense of ownership and belonging to the process, to the objectives, to the solutions proposed and even to the network of stakeholders, as if it were a community.

- Outcomes are more accepted and tend to be more sustainable.

- Due to the "multiplier" effect of the network, outcomes can easily trigger system changes

Stakeholder Network Analysis

Identifying actors

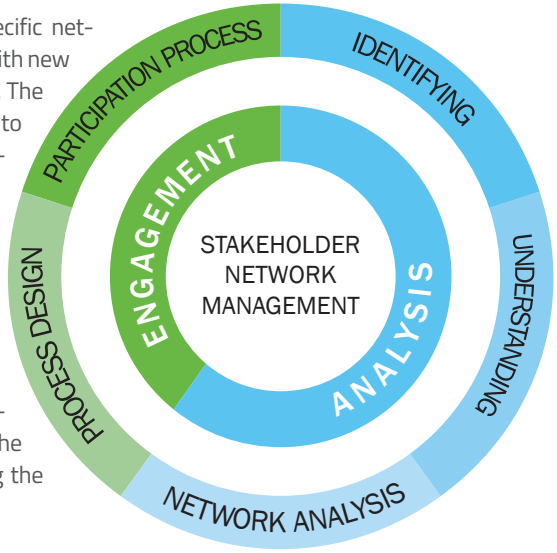
The first step is to identify who will take part, due to their closeness to the project, their interest, their relevance, etc. At this stage, an actor can be either a person or an institution, and although major representatives of different sectors and categories should be on board, this step has to be as broad as possible.

Understanding actors

The second step is gaining a deeper understanding of the stakeholders. It is time to know their expectations, their explicit and implicit assumptions, what worries them, what keep them awake at night, their drivers, their knowledge and resources, etc. This step is largely used in design as a key part of the service and/or product design. In sociotechnical transitions this step is aimed to categorise stakeholders according to their own features and their influence on the innovation process in terms of interests, resources, etc.

Analysing networks

The third and more comprehensive step is to analyse and characterise the stakeholder network. As a result of relationships between actors, a specific network emerges along with new behaviours and trends. The goal of this step is to analyse the role of different stakeholders within the network and how those roles affect the way the network performs. This analysis comprises quantitative and qualitative approaches to unfold the information underlying the network.



Stakeholder Network Engagement

Process design

Before starting any participatory process it is essential to make some decisions about the process and its context. In this sense it is important to design a process that meets participants' expectations without getting lost in an endless sequence of workshops, discussions and useless conclusions.
This design has to feed into the stakeholder analysis conclu-

sions and, based on that, lay down solid geographical and temporal boundaries to the process, as well as clear rules for the decision-making procedures. The goals, scope of actors, timing, types of participation, etc. are among those decisions to be made at the start of the process. At the same time, the information that will be needed during the process must be envisaged at this stage. Both qualitative and quantitative data must be prepared in advance to be available as an input for the stakeholders taking part.

Eventually, the time comes to decide the method or methods to be applied. There are myriads of methods that might be applied. Among them the World Café, Fish Bowl, Charretes, Appreciative Inquiry, Focus Groups, Daydream sessions, etc.

Participation process

This phase is the real and final step of the whole process of Stakeholder Network Engagement: work together with stakeholders throughout the system innovation or transition process.

As mentioned before, during this process it is advisable to review the stakeholder analysis, checking if either new actors have joined the network, or the role of current stakeholders has significantly shifted.

An essential feature of the whole cycle of Stakeholder Network Engagement is its temporary nature. As explained in previous paragraphs, the composition of the stakeholder network can vary as the process goes forward. Sometimes new actors join the network while others just leave the network because of a lack of interest or because they are no longer affected by the project. Other times, the role of one actor changes dramatically and becomes in irrelevant, or emerges as an essential hub in the new configuration. All of these situations force managers to carry out this cycle of activities, time and again, throughout the process lifetime.

> An essential feature of the whole cycle of Stakeholder Network Management is its temporary nature. This means you will have to carry out the actor analysis time throughout the project lifetime.

Tool 1
Pentagonal problem

Stating the problem

Making your problem tangible is the first step in looking for a solution. Before working on an in-depth understanding of a problem or challenge, and the search for solutions, it is necessary to have a clear description of such a problem. if you understand the problem, you can start building solutions.

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Pentagonal **problem**

What it is

Pentagonal Problem is a visual tool to help teams nail down the problem, identify its different components and details, getting to a common ground for future actions.

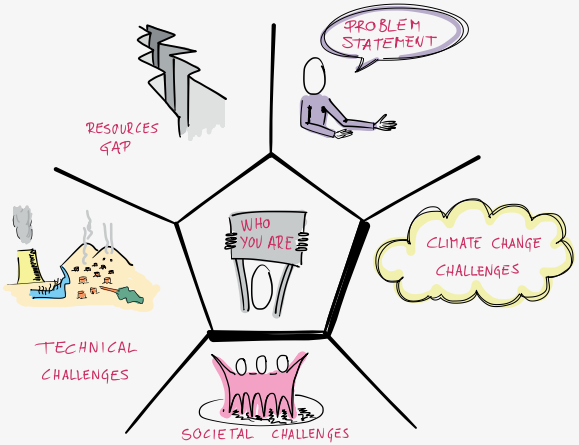
When to use

Whenever you face a complex problem, with multiple sides, perspectives and nuances that make it difficult to define it in a single sentence or paragraph. Challenges related to climate change are a clear example of these kind of problems.

Why it is useful

System innovation entails a completely different approach in the way we define and address problems. Problems are no longer simple or isolated. Instead, they can affect a myriad of stakeholders with different perceptions and interests, they are cross-sectoral, long-term, and interconnected with the ecosystem and societal structures.

In this context we need more comprehensive tools to better define, state and understand current problems. Pentagonal problem is a tool that starts with your own perspective of the problem, and helps you to deepen your understanding by including different aspects of it. Using this tool, you will be better prepared to look for system solutions.



HOW MANY	From 1 person to groups of 10 people.
HOW LONG	40-60 min.
DIFFICULTY	Low.
WHAT YOU GET	A comprehensive and visual depiction of the main systemic components of your problem.
WHAT YOU NEED	A basic idea of the problem you face and an open mind to see how the context affects such a problem and conversely how the challenge affects the context.
WHAT IS NEXT	You can go on with the stakeholder analysis or go for the System analysis if you prefer diving deeper in your comprehension of the context surrounding the challenge.

Steps

STEP 1. Define yourself

Draw a large pentagon in the middle of a big piece of paper and start by defining yourself. The pentagon accounts for yourself (as an individual or team). Take into account that the same problem is perceived in different ways and shapes by different actors, therefore it is essential to start by defining yourself. Are you a company? A government? A user association? Are you leading the search for a solution?

This definition will provide the context for the rest of the exercise, therefore spend time on defining in a clear way who you are. Be as specific as possible. If there are different perceptions within the same group/organisation, please reflect all of them on different post-its. Once you have depicted yourself, it is time to define the problem through five different "faces".

STEP 2. The basic statement

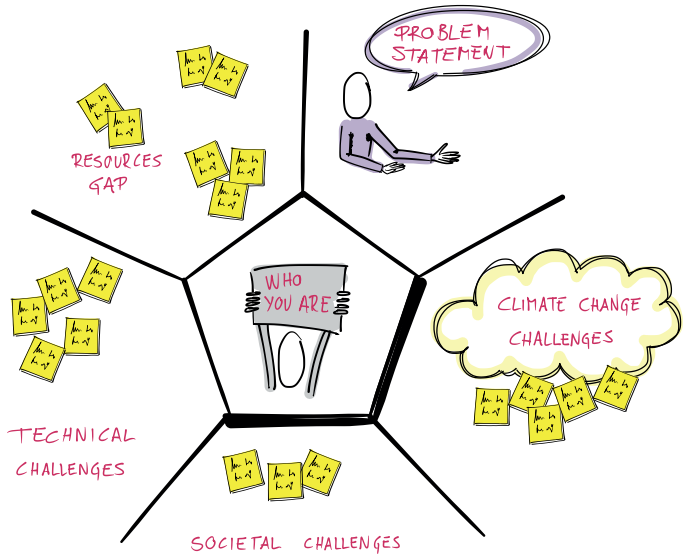
First of all, try to describe the problem in one single sentence or short paragraph. Try to be conversational. The goal here is to describe the overall problem or challenge you are facing as if you were in a conversation with other colleagues. Avoid any piece of information that is not necessary to understand the "big picture" problem. Leave out the details and nuances, they will be placed in other "faces".

STEP 3. The climate change challenges

Now it is time to specify the climate change related challenges that your problem is tackling. Pay attention to the problems with CO2 emissions, water scarcity or whatever they are. Use post-it notes and write down one idea (climate change issue or challenge) per sticky note. Bear in mind that it is only about climate change. In the case of many participants you can make clusters with the notes and identify the main clouds of climate change problems.

STEP 4. The technical challenges

You are probably thinking about technical solutions for your problem, or you may be a technical entrepreneur. If that is the case, this is your time. Approach the problem as a lack of solution: what are the technical challenges you are resolving? Where are the technological/technical bottlenecks you have to overcome or have to get around? Where is the technical basis for your potential solution? Is there any other experiment you can build on? Are any other sectors tackling the same problem and applying some solutions?
Again, write down one idea per post-it and place them on the canvas. If necessary, cluster the notes and identify the main clouds of technical problems.



STEP 5. The social challenges

Now it is time to think of society and how it is affected by the problem, or, conversely, how society impacts the problem. Is societal behaviour worsening the problem or it is getting it better? What are the societal challenges underlying your project? What is the main expected or needed change? What are the visible bottlenecks? Are there any specific groups especially affected by the problem or having a significant effect on it? Are there any institutions or organisations playing a significant role? What direction are the regulations pushing towards?
Using post-its, write down as many ideas as possible to get the most

https://learning.climate-kic.org/courses/system-innovation

Screenshot from online materials. System innovation and Climate Change eModule. Climate-KIC, 2016.

comprehensive picture. If necessary, cluster the notes and identify the main clouds of societal challenges.

STEP 6.
The Gaps

After describing four sides and nuances of your challenge, where could you spot the main gaps with respects to resources? Do you need some new technology? Do you have a lack of knowledge? Is it a matter of regulations? Identify the main gaps that need bridging to complete your project or to make a solution come to light. Write down one idea per post-it and place them on the canvas. If necessary cluster the notes and identify the main sources of gaps for your challenge.

STEP 7.
Debrief

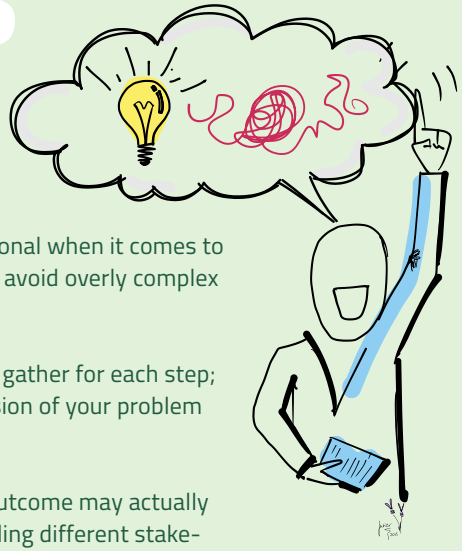
Once you have completed the pentagonal description of your project, go over the first problem statement and how it has been enriched with many nuances and inputs coming from very different sources. Do you think you got a thorough description of your challenge? Did you get a new understanding of your problem? In your description, do you feel you included more than necessary? Would it be possible and advisable to cut something out in order to better explain the problem? Or, do you think you are still leaving something out?

Do you think your challenge is a technical problem, a social problem, an environmental problem… or a mixture of them? Does one of the "faces" seem more important than the others?

Regarding the variety of inputs, do you consider it important to gather different perspectives about the challenge?

Now try to rephrase the problem statement taking into consideration all the inputs you obtained. Are you able to come to a consensus for the new definition? Is it easier or more difficult to broaden such a definition? Do you consider it is possible to get everybody committed with a new definition of the problem? Do you think changing the starting point, who you are and what your role is, would change the outcome as well?

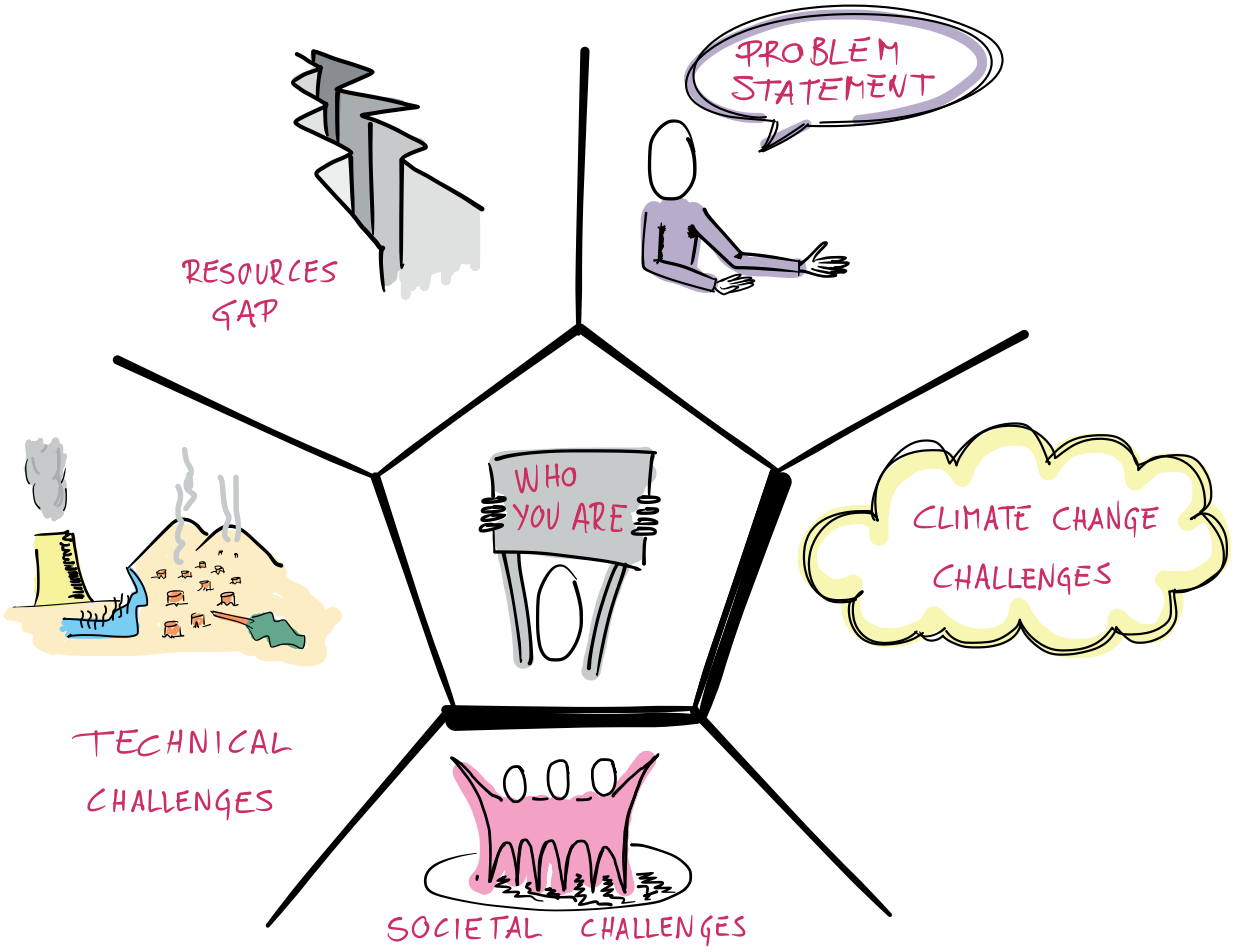
Tips



- Try to be conversational when it comes to defining the problem, avoid overly complex or 'wordy' sentences.
- The more ideas you gather for each step; the richer the final vision of your problem will be.
- In this regard, the outcome may actually be improved by including different stakeholders in the team.
- Time permitting, after filling in each cell, you can try to restate the central problem, taking into consideration the ideas on the post-its. This will give you a perspective of how the problem is changing as new inputs are included, and you will experience the difficulties of integrating different approaches and inputs.

Find out more

http://www.climate-kic.org/transitions-hub



De Vicente López, Javier and Matti, Cristian (2016) . Visual toolbox for system innovation. A resource book for practitioners to map, analyse and facilitate sustainability transitions. Transitions Hub series. Climate-KIC, Brussels 2016.

Tool 2
Actor tree

Stakeholder Analysis

The first step in stakeholder analysis is to identify and list any potential stakeholder affected by the challenge or with capacity to affect it.

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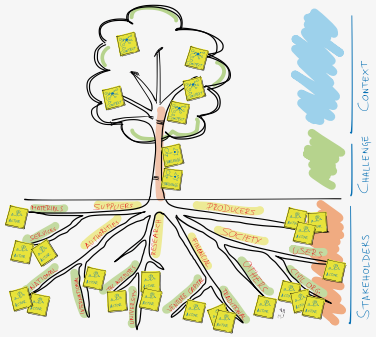
Actor **tree**



What it is

The Actor tree canvas is a visual tool that helps you identify, list and categorise the myriad of stakeholders around your project. Stakeholders are depicted as the roots of a tree that will feed and carry out the process of system innovation, represented by the crown of the tree. The trunk, in turn, accounts for your challenge.

When to use

When you are going to start a new project that you know affects or may be affected by a number of stakeholders and you are aware of the importance of their engagement. It should be done at the very beginning to allow you to include them (actually, some of them) throughout the project process.

Why it is useful

In an interconnected world, projects, services and products are no longer standalone outcomes but are strongly tied to a network of stakeholders, whether they are potential customers, clients. competitors, allies, etc. There is a lot of evidence that engaging that network in your project from the very beginning, leads to better outcomes; it keeps the project from derailing and builds a sense of ownership and belonging, not only to the outcome but also the process.

For this process to succeed, the first and crucial step is to identify the cohort of stakeholders you will potentially engage.

HOW MANY	From 1 person to groups of 10 people.
HOW LONG	40-60 min.
DIFFICULTY	Low.
WHAT YOU GET	A categorized list of the main stakeholders for your challenge.
WHAT YOU NEED	A deep knowledge of the challenge and its context in terms of actors and institutions playing any kind of role or being potentially affected by the project. Essential: an open mind to engage/empathise with actors with opposite interests to ours. The Pentagonal problem can provide useful inputs for this tool.
WHAT IS NEXT	After having a list of stakeholders you will need to know them better: their needs, expectations and possible reactions. You also need to map them out to make their stances and relations clear. Consequently, you can go on with the stakeholder analysis tools such as the enlarged empathy map or the actors map.

Steps

STEP 1. The challenge and the context

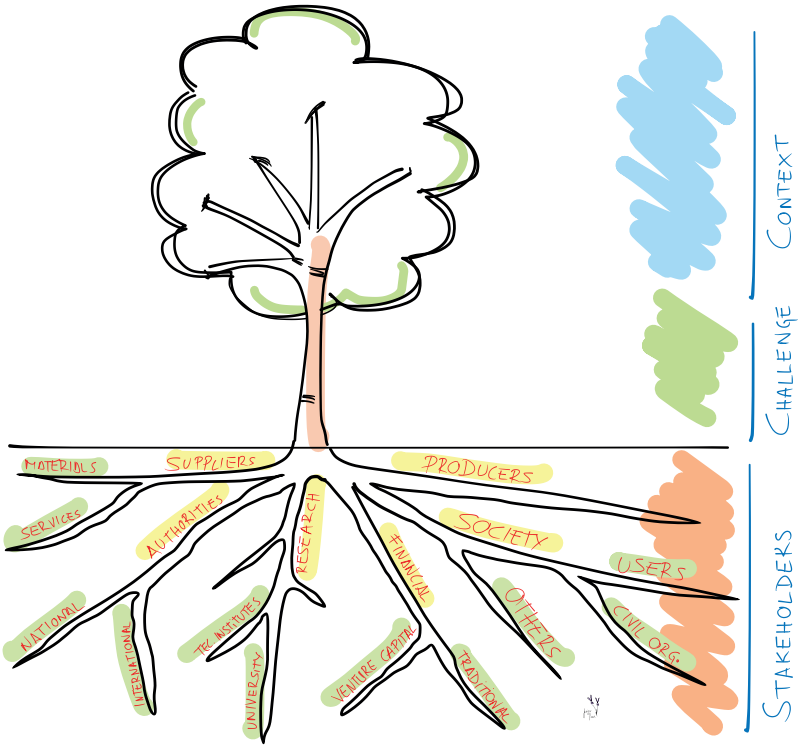
Take a big piece of paper and draw the tree canvas. As explained before, the roots account for the network of stakeholders, the trunk for the challenge and the crown for the context in which your challenge is embedded. The starting point for this tool is to nail down the challenge or project you have, and the context around it. First, write down a brief description of the challenge on one or more sticky notes and put it on the trunk. Bear in mind the rule of thumb: one idea per post-it. As you probably saw with the Pentagonal problem, there are a variety of approaches and perspectives about your project, depending on who is looking at it. If you are using the tool in a diverse team, try to include as many perspectives as possible to broaden the problem definition. Finally, when all the definitions are on the canvas, try to come to a consensus and write a single statement for the problem.

Once the problem is defined, write down any features of the context that you consider significant for the stakeholder identification and put them all together on the crown of the tree. Ask yourself questions similar to the following to see what to include: Are governments relevant to the problem? Are there any other experiences you can build on? Are there little known but promising experiments? Is the problem you face affecting any particular group the most? Are there any organisations occupying the current market? the Pentagonal problem outcome can feed the crown with valuable inputs.

STEP 2. Chunking down into categories

With the challenge and the context in mind, the following step is to identify categories and subcategories of actors clearly represented in the system around your challenge. Draw a new root for each category you identify, and a new root branch for each subcategory.

> In an interconnected world, projects, services and products are no longer standalone outcomes but are strongly tied to a network of stakeholders.




The European 2 degree target
Car manufacturing processes
Research into hydrogen fuel cells
Government incentives
New car materials
Car sharing economy
Open source developers
City infrastructures
https://learning.climate-kic.org/courses/system-innovation
Screenshot from online materials. System innovation and Climate Change eModule. Climate-KIC, 2016.

You can use the following list as an inspiration for your own categorisation: Researcher (private, public, university, company), Financial (private, public, social...) , Users, Producers, Suppliers, Owners, Authorities (supra-national, national, regional, local), NGOs, Interest Groups, etc. In addition to the suggested subcategories inside brackets, you may think of different sectors, company sizes or ownerships, localisation, etc. as properties to further subdivide your categories.

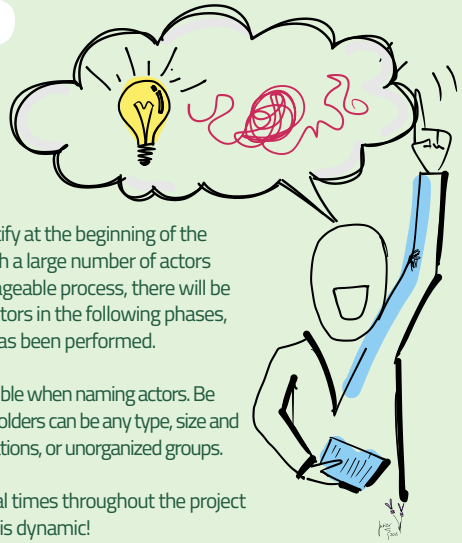
STEP 3. Closing gaps

To finalise the tree, look for those hidden stakeholders: outsiders, groups barely organized and with no skills for self-organization, minorities, etc. If you consider they might come in relevant, factor them into the list and future network. It doesn't matter if you are not sure about their future involvement, given that you will have the opportunity to decide later on.

STEP 5. Debrief

Spend some minutes on reflecting about the outcome you obtained. Some of the questions you might ask are the following: Do you think you have spotted many or few stakeholders? Did you find it difficult to come to a consensus regarding the stakeholders to factor in? Do any of the branches look more relevant than the others, with many more stakeholders? If so, does it reflect the real world or is it a possible bias due to the team background? Do any of the roots have very few stakeholders, even though you are aware that there must be many more? Were there any stakeholders belonging to different roots at the same time? If so, what did you decide? Did you put them in several roots? Does the big picture of the tree with the context, the challenge and the stakeholders, help you to better understand the problem?

Tips



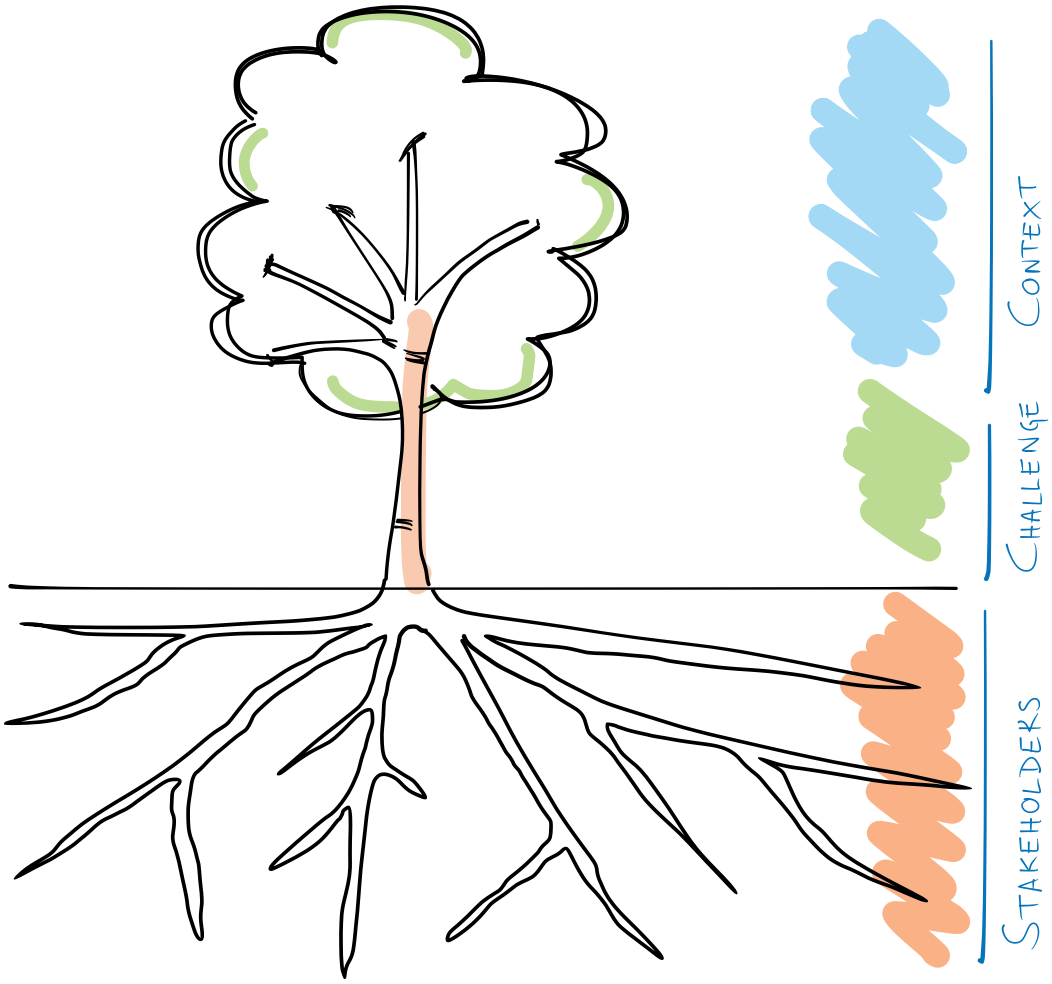
- The more actors you identify at the beginning of the process, the better. Although a large number of actors might end up as an unmanageable process, there will be opportunities to filter out actors in the following phases, after an in-depth analysis has been performed.
- Try to be as specific as possible when naming actors. Be aware of the fact that stakeholders can be any type, size and capacity: individuals, organizations, or unorganized groups.
- Repeat the process several times throughout the project lifetime, an actors' network is dynamic!
- Don't fall into the temptation of NOT mapping those stakeholders who apparently are less important: outsiders and surrounding stakeholders. They might not look so important, but they can definitely give you the out-of-the-box approach you need later on and can play a key role, especially in the beginning of the process.
- Be aware of hidden stakeholders. They are usually well known by some of the players but not so much by the public. Not involving them right from the beginning could jeopardise the project in subsequent phases.
- Where the stakeholders are not organised, a strategy to get them to assert their stake is to include them and to help them to self-organise.

Find out more

http://www.climate-kic.org/transitions-hub

Actor tree

The Canvas



De Vicente López, Javier and Matti, Cristian (2016) . Visual toolbox for system innovation. A resource book for practitioners to map, analyse and facilitate sustainability transitions. Transitions Hub series. Climate-KIC, Brussels 2016.

Climate-KIC

Tool 3
Enlarged empathy map

Stakeholder Analysis

Understanding actors. The Enlarged empathy map is a quick and visual tool of the well-known technique called “Personas” and allows you to explore and infer the drivers, fears, concerns, etc. that fuel each stakeholder.

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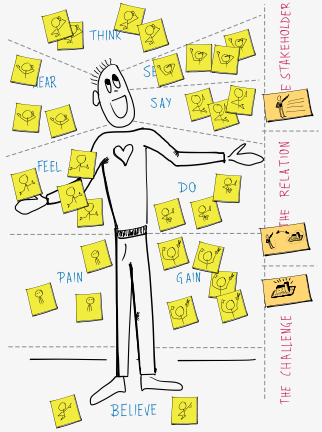
Enlarged **empathy map**



What it is

The Enlarged empathy map is a visual tool that allows you to build a stakeholder profile by quickly browsing the sources of information you have close at hand. The empathy map is intended for you to put yourself into a stakeholder's shoes and thereby see the challenge from a different perspective. It is based on the Empathy Map developed by Scott Matthews of XPLANE and the variation **Enhanced Empathy Map** from the Visual Innovation Accelerator.

When to use

When you have carried out an identification of your potential stakeholders and want to know more about them and don't have the time or the resources to carry out in-depth market research. It is a tool to apply only with those stakeholders who you think you are going to engage with the process, whether it is a project, a product development or whatever.

Why it is useful

The main value of this tool is how quickly you can get a clear and pretty accurate profile of a stakeholder. By doing that you will be in a better condition to decide whether to invite them to participate or not.

HOW MANY	From 1 person to groups of 10 people.
HOW LONG	30-45 min.
DIFFICULTY	Medium.
WHAT YOU GET	A visual depiction of your stakeholder profile: their main needs, drivers and expectations, as well as their behaviour and sources of information. (this tool is for ONE stakeholder, in-depth)
WHAT YOU NEED	Sources of information about the stakeholder. It can be the internet, newspapers, journals, documentaries, etc. In a training session it is crucial to provide participants with the material needed.
WHAT IS NEXT	You may want to find out more about stakeholders' relations, the balance of forces, potential allies, etc. To do so, move on to the stakeholder map or to the stakeholder universe.

Steps

STEP 1.
Sketch out the canvas

Take a large piece of paper and draw a large version of the canvas in which your specific stakeholder is depicted. As you can see, there are nine different areas you need to work on in order to describe the stakeholder: Thinking, Seeing, Hearing, Saying, Feeling, Doing, Believing, Pains and Gains.

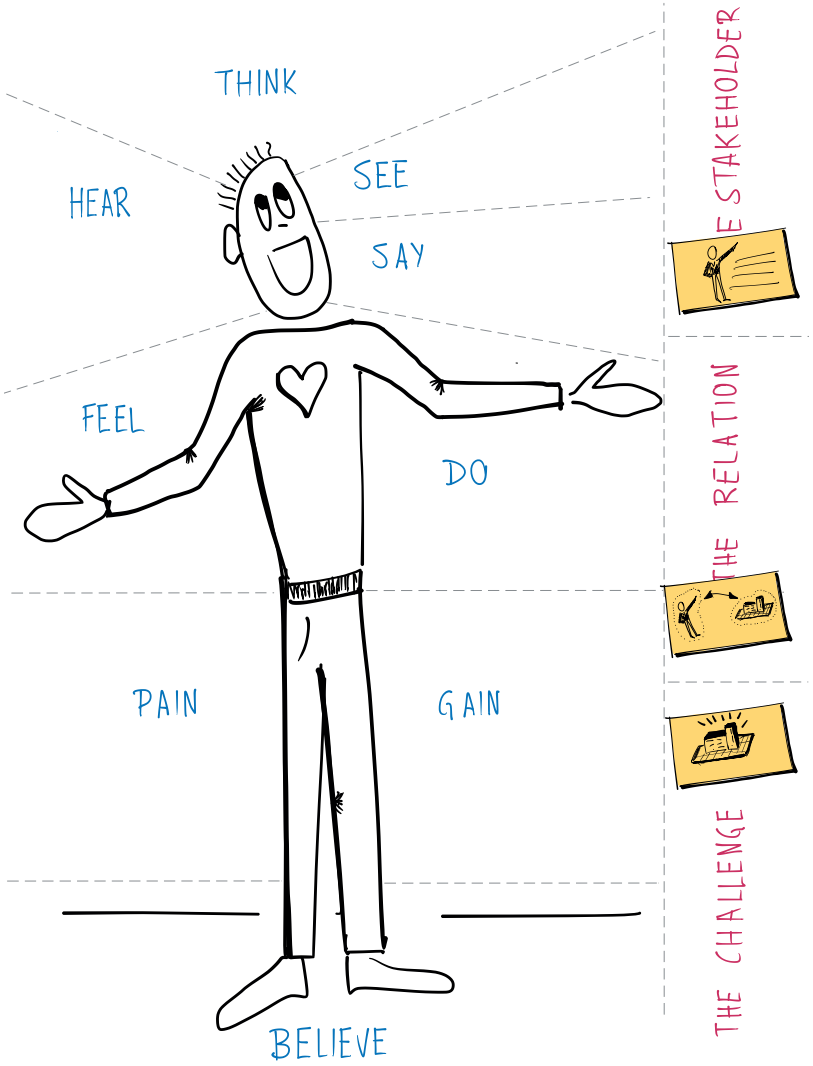
STEP 2.
Setting the scene

Once the canvas is on a wall, write down the name and a short description of the specific stakeholder to be described and put it on the upper right-hand side of the canvas.

Then, pay attention to the challenge you are working on. It might be a project or a problem you are trying to find a solution for, or it might be a product or service you are designing or reshaping. If you used the Pentagonal problem tool, its problem statement can serve you as input. Write the problem down on a post-it and put it on the lower right-hand side of the canvas.

Finally, look at the stakeholder and how he/she relates to the challenge. Is she a prospect, a client, a user of your service/product? Is she affected by your project? Or, can she affect the process of developing a new solution? If so, in which way? Describe this relation on a post-it and place it between the stakeholder and challenge description. These three notes will provide the context for the rest of the tool.

By applying the enlarged map, you will be in a better condition to decide whether to invite a stakeholder to participate or not.



STEP 3. Thinking and responding

Next, the group starts trying to fill out those nine areas by responding on sticky cards to the questions linked to them. In the following paragraphs you can find a list of questions that you can use as a guideline to find your answers. Please, remember to write only one answer per post-it. Use others' creativity to feed yours, if any other answers elicit new ideas, just write them down and put them on the canvas.

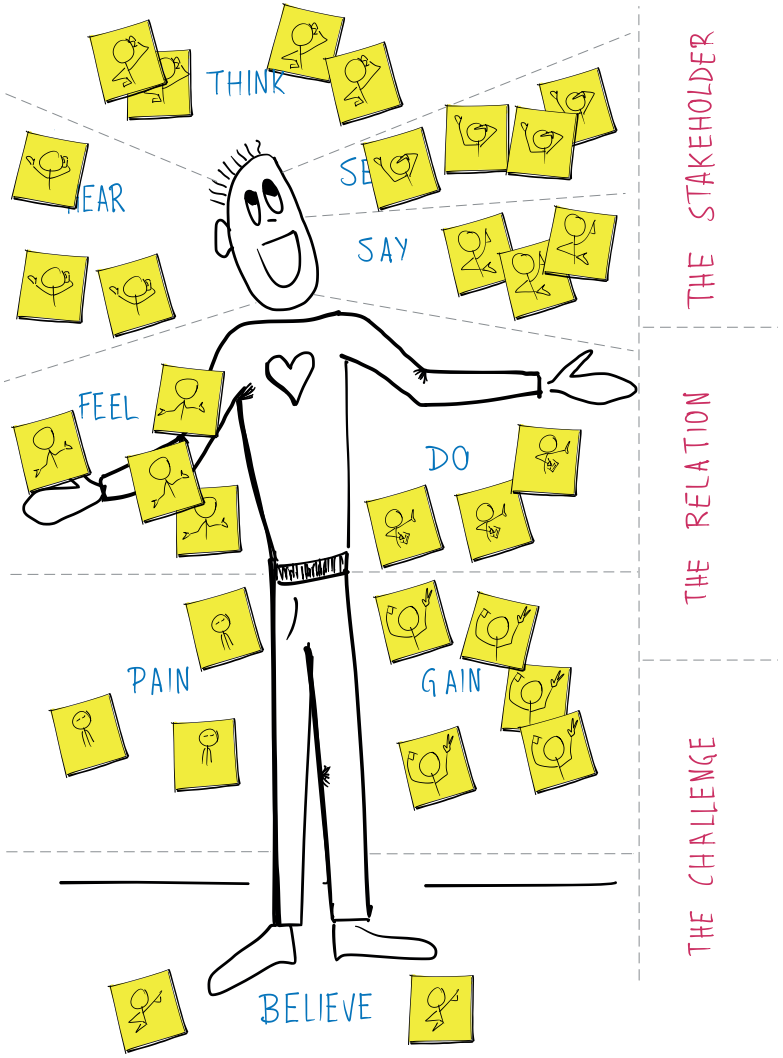
THINK (brain)
"What does he really care about?", "What is her endgame/deep belief?", "What do they think about the challenge and the current market solution?", "How do they think about their fears and hopes?"

SEE (eyes)
"What do they see when they face the problem/challenge in their daily life?", "What TV programs does she watch?", "What is the context/environment they see around them?", "What technology/solutions does the market offer?", "What does a typical day look like in their world?"...

HEAR (ears)
"What do their friends/boss/relatives... say?", "What influencers do they follow and what do they say?", "Who does he really listen to?", (radio, forums, social media...), "What do they hear when other people use the same technology or face the same problem?", "Is she following the big players?"

SAY (mouth)
"What does she say regarding the challenge in a conversation?", "Is he inspired by an inspirational idea when talking about the problem?", "What do they say when using the current technology?", "What opinions do they state about innovative solutions?"

FEEL (heart)
"What do they feel when using the technology, whether in private or public?", "What are his feelings regarding the players in the market and society, related to the challenge?"



DO (arms/hands)
"What is their attitude in public when it comes to interacting with the technology or problem?, "What is her behaviour when using the current solutions?", "Is he trying to do anything to defy or modify the status quo?"

PAIN (back)
"What are the barriers they face in their day-to-day life?", "What are their pain points when using the current solution?", "What are their concerns about new solutions and future changes?"

GAIN (legs)
"What do they really want from the technology?", "What are her actual needs?", "How do they measure success?" "What are his expectations regarding the problem in terms of solutions and general environment?"

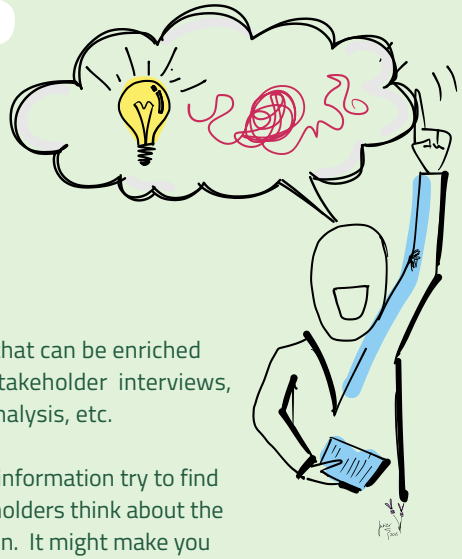
BELIEVE (feet)
"What do they actually believe?", "What are their thoughts rooted in?", "What are their implicit and explicit assumptions about the challenge? (technology, how society reacts…)"

When you look at the completed canvas, spend some minutes reflecting on the process and the outcome.

Regarding the outcome: Do you think you got a comprehensive and in-depth picture of your stakeholder? Did you gain new insights? Have your initial ideas and assumptions changed as a consequence of the exercise? Do you feel there are still some gaps of information? If so, what? Where would you think you can find the data necessary to fill those gaps?

As to the process, think about how you felt as an individual and as a group while trying to find out and infer the stakeholder's features. What difficulties did you come across? Do you think you needed more sources of information than those provided? Did any conflicts arise between group members about some specific answers? Did you all have a similar approach in the way you interpreted the stakeholder's attitude and perspective? How did you deal with those conflicts?

Tips



- This is a technique that can be enriched with others such as stakeholder interviews, shadowing, market analysis, etc.

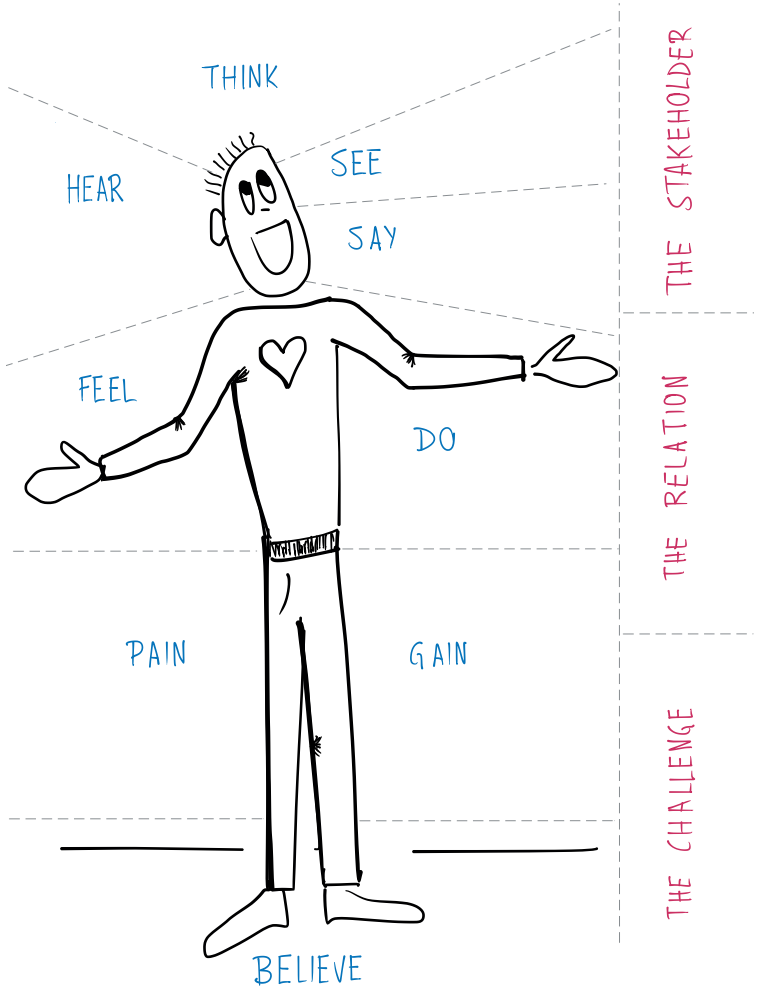
- When searching for information try to find out what other stakeholders think about the one you are working on. It might make you change your opinion and answers.

- If there are opposite answers in some areas, keep them on the canvas, bear in mind human complexity and the fact that sometimes both answers might be right under specific circumstances.

Find out more

http://www.climate-kic.org/transitions-hub

Enlarged empathy map



De Vicente López, Javier and Matti, Cristian (2016) .Visual toolbox for system innovation. A resource book for practitioners to map, analyse and facilitate sustainability transitions. Transition hub series. Climate KIC, Brussels 2016.

Tool 4
Credential cards

Stakeholder Analysis
Understanding actors. The Credential Cards tool aims to characterise stakeholders' stances and relation to the challenge.

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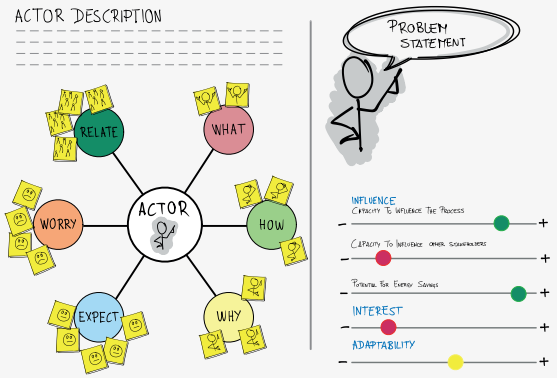
Credential **cards**



What it is

The Credential cards is a tool to characterise a stakeholder's stance about the challenge and more specifically how they relate to that challenge. That is, how they are influenced by the problem and the future solution and how they can influence the process of developing the new solution. The tool is made up of four components: (1) Actor Description, (2) Problem Statement, (3) Stakeholder Wheel and (4) Stakeholder Equaliser.

When to use

When you have completed the identification of stakeholders for your project and, if needed, the Enlarged empathy map for some of them, you will want to explore more in-depth how they relate to the challenge. Unlike the Enlarged empathy map, the Credential cards put the focus on the stakeholder's behaviour and relation with the project, including the current status quo. It is interesting to use it when you don't have the resources or the time to carry out a network analysis by using, for example, the Stakeholders Universe tool.

Why it is useful

The Credential card provides a vision of stakeholders centred on their relations to other project components which allows you to infer their reactions if the project starts. It might be seen as a tool that gathers some of the qualities from the Enlarged empathy map and from the Stakeholder Maps. It is a good exercise to do before deciding whether to invite or not a stakeholder to take part actively in the project process.

HOW MANY	From 1 person to groups of 10 people.
HOW LONG	40-90 min.
DIFFICULTY	Medium.
WHAT YOU GET	A comprehensive and visual depiction of how the stakeholder relates to the project and its context.
WHAT YOU NEED	This tool requires good knowledge of the actors involved and especially how their actions or behaviour are related to the project. In training environments, it is crucial for the trainer to provide sources of information.
WHAT IS NEXT	After gathering a set of Credential cards for different stakeholders, you may want to go with Stakeholder Universe to go deeper into their relations and how they can have a significant influence on the project process. Stakeholder Map is another alternative not as comprehensive but relatively easier to take.

Steps

STEP 1. Setting the scene

Before starting with the tool, clearly define the challenge or the problem you are facing. You can resort to the Pentagonal problem outcome or any other tool you have used to narrow down the challenge. Right after that, define who you are and your role regarding the project. Perhaps, you are the project manager, the promoter, a facilitator, etc. In any event, the team has to have a clear idea of their role in the project. These two elements don't belong to the canvas as such, but they make up the starting point and the perspective for the tool.

Therefore, with both elements in mind, take a large piece of paper and draw the canvas as it is in the example below.

STEP 2. Stakeholder description

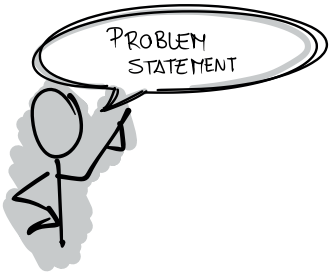
Describe briefly the stakeholder you are going to analyse: write their name, describe in which category it falls, and briefly include any important features you think are noteworthy. You might use the same categories you have previously used to identify and list the actors.

STEP 3. Problem statement

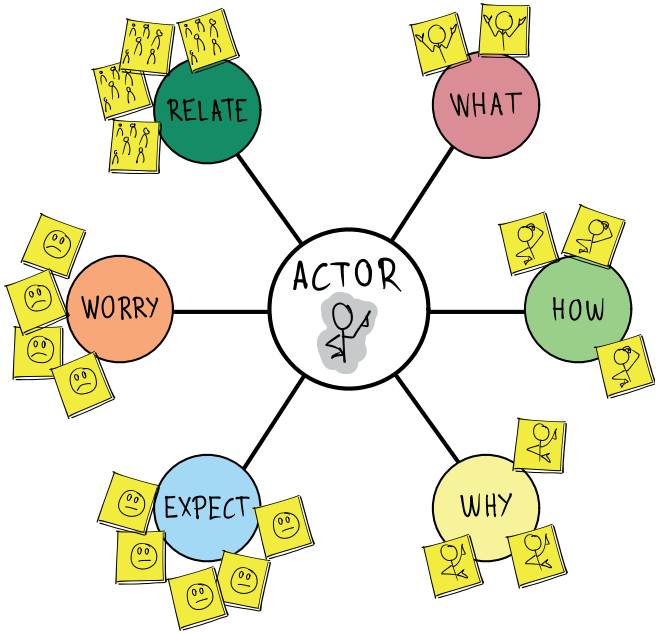
Paraphrase the problem or the challenge you, and as a team, are addressing but from the stakeholder's perspective. You need to picture what their perspective is, what their vision looks like, what their link to the project is and what they are really concerned about. The statement should be written in first person just as if he/she were claiming it.

STEP 4. Stakeholder wheel

The wheel is the deepest part of the Credential card and it will take you longer to work on. It is aimed to unfold the stakeholder's stance with regard to the challenge you are tackling. It is aimed to help you describe what the stakeholder's expectations are on the project, relationships with other stakeholders, with the current solution for the problem you are tackling, their needs, etc.



ACTOR DESCRIPTION



Defining a reginal policy for biomass management. Public participation workshop. Castellón, 2015 (Spain). http://goo.gl/Q8vzeH

Decide on which element of the wheel you are going to start with: "What", "How", "Why", "Expectations", "Worries" or "Relations". Then take your time to individually write down as many ideas as possible, answering the question in play. After five or ten minutes, all the members explain, out loud, their ideas and put their post-it around the element. It is important to generate discussion to unfold any nuance or detail that might stay hidden or unknown. If new answers are triggered during the discussion just write them down and put them on the canvas. After completing one element, move forward to the next one and repeat the process.

WHAT.
What does the stakeholder actually do?
It accounts for the activities the stakeholders carry out as long as they are related to the project or challenge you are facing.

HOW.
How does the stakeholder do what she does?
Describe how the actors carry out the activities listed before.

WHY.
Why do actors do what they do and in what way? Dive into the reasons underlying stakeholder's behaviour. Don't settle for the first reason that comes out.

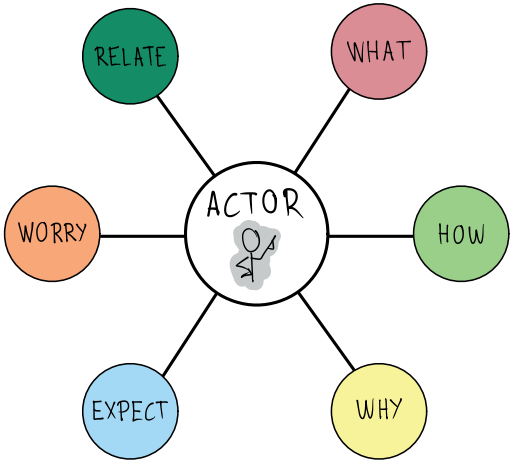
EXPECT.
What would they expect from an alternative solution? Underneath the stakeholders' reasons, it is possible to find out what they expect from any solution to their needs related to the project.

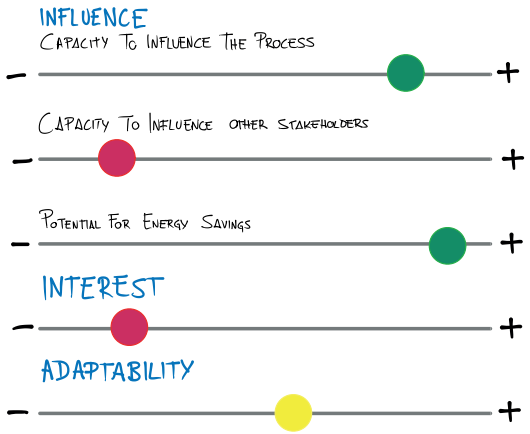
WORRY.
What are stakeholders concerned about?
These concerns can drive their future decisions more than expectations; not addressing them could derail any attempt of innovation.

RELATE.
Who is each stakeholder related to?
In a systemic vision, relationships are as important as stakeholders themselves. They can lead actors to change their minds regarding the challenge or adopt a stance different from what they are expected to.

STEP 5.
Stakeholder Equalizer

This tool is intended to make a first assessment of the actor's behaviour with regard to the system they all make up and the






EMPATHY
BUSINESS SKILLS
SEEING OPPORTUNITIES
NETWORKING
PERSUASION
Public THINKING (together)
FINDING SOLUTIONS
EMOTIONAL PERCEPTION
SECURITY ABOUT MY KNOWLEDGE
LEADERSHIP
Listen Carfully

potential role they can play in the future. To do that, three attributes are assessed: Influence, Interest and Adaptability. Assessing them is not an exact science, therefore pay attention to the definitions and the questions below, as a means to estimate where they are placed.

INFLUENCE

It accounts for their ability to influence both the process and/or other stakeholders. The bigger the ability to affect others' perceptions or the process itself, the higher their relevance for the process is. If useful, you can break it down into different variables.

INTEREST

Do stakeholders have a large or small interest in the project? Are they indifferent to your project? What is their level of engagement, involvement, closeness or even commitment?

ADAPTABILITY

What is the likelihood for them to change their position throughout the process? Do they have a lot of interests in the current status quo and will they strive to preserve it? Or would they be open to a major change?

STEP 4. Debrief

Once you have completed the Credential Cards, spend time reflecting on the outcome and the process of filling it out. Use the following questions to spark reflection.

Did you get new and better insights into your stakeholders? Do you think you are in a better condition to predict their future stance about the project? Are you able to decide whether to invite them or not to the project process? Do you think there is still something important left? Would you include any other piece of information you consider essential at this stage of the project?

Did you experience any difficulties while filling out the canvas? Are any of the elements more difficult or easier than others? Was it easy to put yourself in a stakeholder's shoes? Did you have different points of view when it came to describing stakeholders' perspectives? If so, how did you sort it out?

Tips

- It is essential to carry out this canvas with a collaborative approach. Try to maximize the diversity of your team members. The higher the diversity, the higher the chances to come up with a closer vision to the actor's perspective.

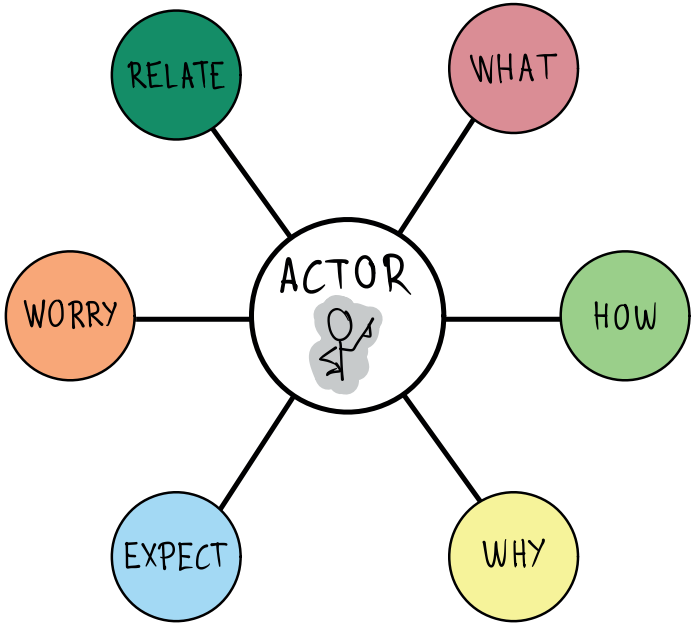
- The team has to decide how deep and broad it wants to go when answering the questions. It has to be a compromise between the amount of information gathered and the time available.

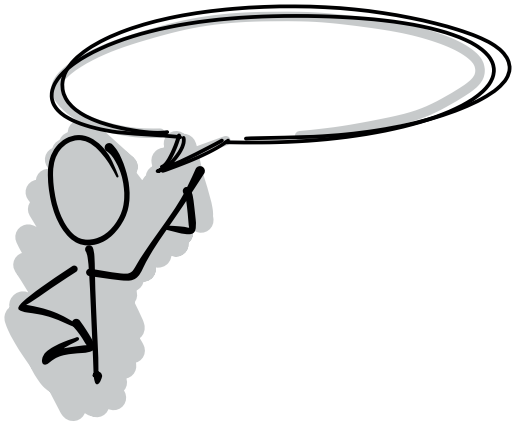
Find out more

http://www.climate-kic.org/transitions-hub

The Canvas

ACTOR DESCRIPTION





INFLUENCE

CAPACITY TO INFLUENCE THE PROCESS

\- +

CAPACITY TO INFLUENCE OTHER STAKEHOLDERS

\- +

OTHER...

\- +

INTEREST

\- +

ADAPTABILITY

\- +

De Vicente López, Javier and Matti, Cristian (2016) . Visual toolbox for system innovation. A resource book for practitioners to map, analyse and facilitate sustainability transitions. Transitions Hub series. Climate-KIC, Brussels 2016.

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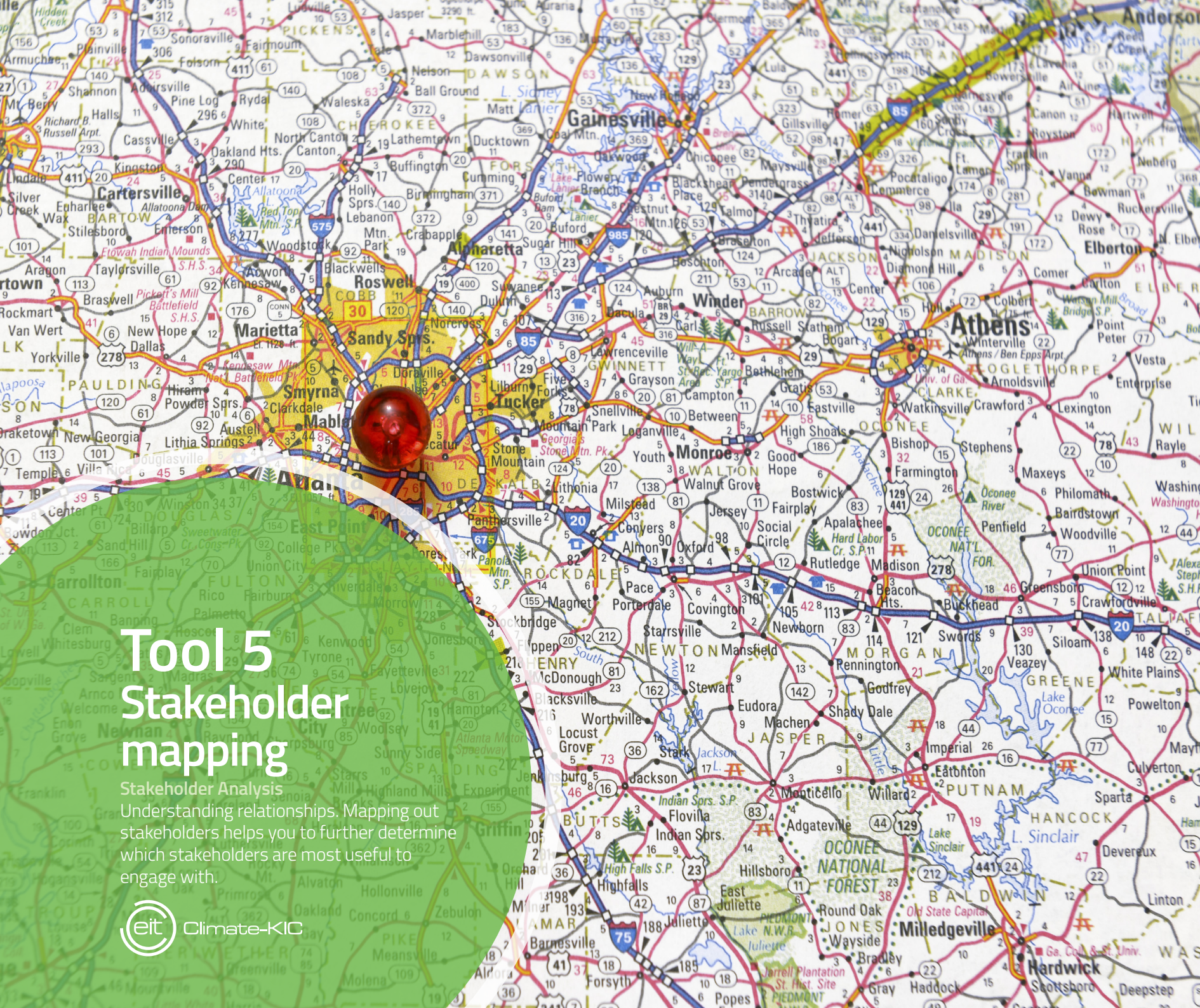
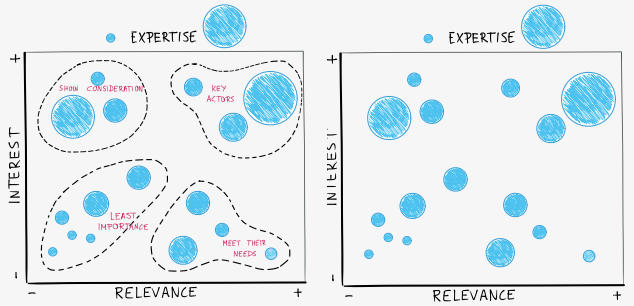

Tool 5
Stakeholder mapping
Stakeholder Analysis
Understanding relationships. Mapping out stakeholders helps you to further determine which stakeholders are most useful to engage with.
eit Climate-KIC

Stakeholder **mapping**



What it is

Mapping stakeholders is a visual exercise and analysis tool. Individual stakeholders are rated on two or three key attributes (eg; influence and expertise) and then mapped onto a graph, to see differences and to find affinity groups or conflictive relationships.
Depending on the stage of stakeholder engagement you are in, different combinations of attributes will be useful, yielding different answers. The most commonly used criteria are Influence, Necessity or Urgency, Relevance, Interest, Attitude, Adaptation or Resistance to Change and Expertise.

When to use

When you have already identified and characterised your stakeholders (at least most of them) and need to prioritise whom you want engage with your project in a long-term relation as well as to decide the best level of engagement for each. Do you need to keep them informed or invite them to take part actively in the project decision board?

Why it is useful

With a simple graph you can see where stakeholders stand when evaluated against the same key criteria and compared to each other. At the same time, it helps you visualise the complex interplay of relationships which can derail your project.

By doing that you can make better decisions about the correct strategies to engage each participant.

HOW MANY	From 1 person to groups of 10 people.
HOW LONG	40-180 min.
DIFFICULTY	Medium-High.
WHAT YOU GET	A visual map with the differences between actors in behaviour, role and attitude to the challenge, as well as the power relationships amongst them. As a result, you can come up with different engagement strategies to apply depending on the specific stakeholder. These strategies are the practical outcome derived from the maps.
WHAT YOU NEED	A basic idea of the problem you face and an open mind to see how the context affects such a problem and conversely how the challenge affects the context.
WHAT IS NEXT	After mapping out your stakeholder network you may want to go deeper and perform an in-depth network analysis. If that is the case then go for the Stakeholder Universe. If not, you can write out your engagement strategies and put them into practice by launching your participation process.

Steps

In the following sections, some of the most useful stakeholder maps are shown and explained. But before getting there, a definition of the criteria used to build the maps is necessary.

INFLUENCE

Ability of the actors to influence, modify or drive your initiative or other stakeholders. How much can they influence other stakeholders or even the process itself? Who do they influence? Investors, competitors, NGOs, consumers, manufacturers, researchers... What is the source of such an influence? Authority, Hierarchy, Resources, Relationships...? In some contexts this influence can come from their potential to impact on the current regime if adopting small changes.

NECESSITY OR URGENCY

Is this actor someone who could derail or delegitimise the process if they were not included in the engagement - regardless of their stance or interest in the project? What is the urgency she has for the process to be launched? Are the processes and their requirements time-sensitive for the stakeholder?

RELEVANCE

Combination of Influence and Necessity results in the Relevance of the s takeholder. It can give you a first approximation of those stakeholders to engage with.

INTEREST

"How willing is the stakeholder to engage? Do stakeholders have a large or small interest in the project? Is their position one of indifference to your project? What is their level of engagement, involvement, closeness or even commitment? In this category the expectations of the stakeholders regarding the challenge are included.

ATTITUDE

"Regardless of their willingness to engage, their stance towards the transition process may be in favor, against or indifferent. Will they support the project or program? Will they be neutral? Are they expected to fight against it?

ADAPTATION OR RESISTANCE TO CHANGE

How adaptable or resistant is the stakeholder to the changes? What is the likelihood for them to change their position throughout the process? In case of lock-ins, what are the factors causing such path dependence? What is their willingness and capacity to learn from other stakeholders?

EXPERTISE

Does the stakeholder have information, counsel, or expertise on the issue that could be helpful to the process? What resources are they providing to the current system (whether it is the regime or the niche)? Money, knowledge, materials, products, services...?

With a simple graph you can see where stakeholders stand when evaluated against the same key criteria and compared to each other.

Green skills for boosting transition in water management Innovator Catalyst series. The Climate-KIC. Valencia, 2014 (Spain). https://goo.gl/llq0oS

MAP 1.
Relevance Map

MAPPING STAKEHOLDERS OUT

This is one of the simplest maps and can be used as a starting point for the map analysis. As explained above, the relevance is a criteria made up of the influence and necessity combination.

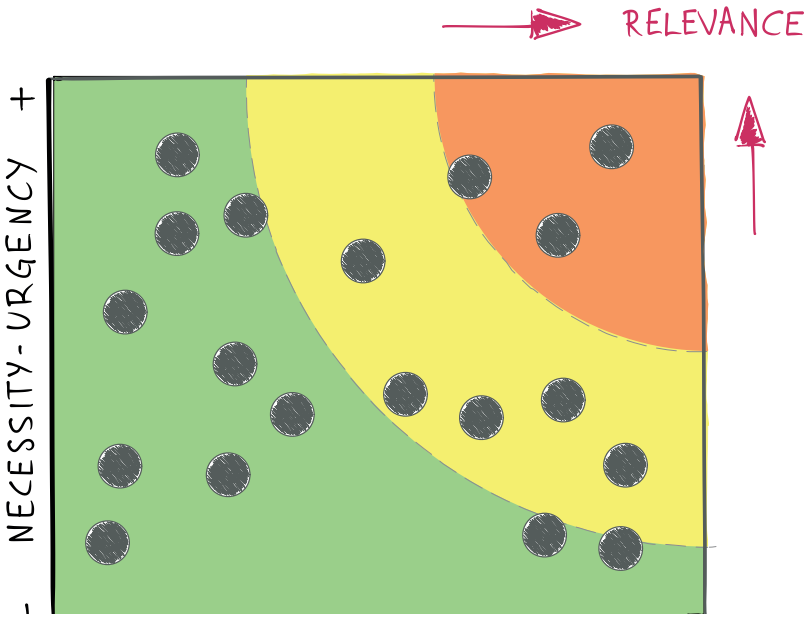
Therefore, draw a quadrant using two axis labelled "low:– –" to "high: ++" and add "Influence to the X-axis and Necessity/Urgency to the Y-axis. Now start discussing where each stakeholder falls in, by comparing both attributes and then plot them out on the quadrant.

MAPPING STAKEHOLDERS OUT

Once you have plotted the stakeholders, you need to analyse the map. The most relevant actors will be those closest to the upper right-hand side of the map, holding both, a high influence and high necessity. Conversely the lower left-hand side shows the least relevant actors. Therefore, as you can see in the picture, three main areas can be identified, showing different degrees of relevance. Actors falling into the red area can be considered as key in terms of relevance and should be included in any further analysis or engagement process. Stakeholders in the yellow area should be taken into consideration and enrich the list of stakeholders to be included in more in-depth analysis.

Regarding stakeholders plotted on the green area, it doesn't mean you should not include them in further analysis or in your process, but rather you can put them lower down on your priority list. In any event, remember that throughout the project lifetime, the stakeholders' relevance may change, therefore always keep them in mind.

> Three main areas can be identified, showing different degrees of relevance.



MAP 2. Relevance - Interest - Expertise

MAPPING STAKEHOLDERS OUT

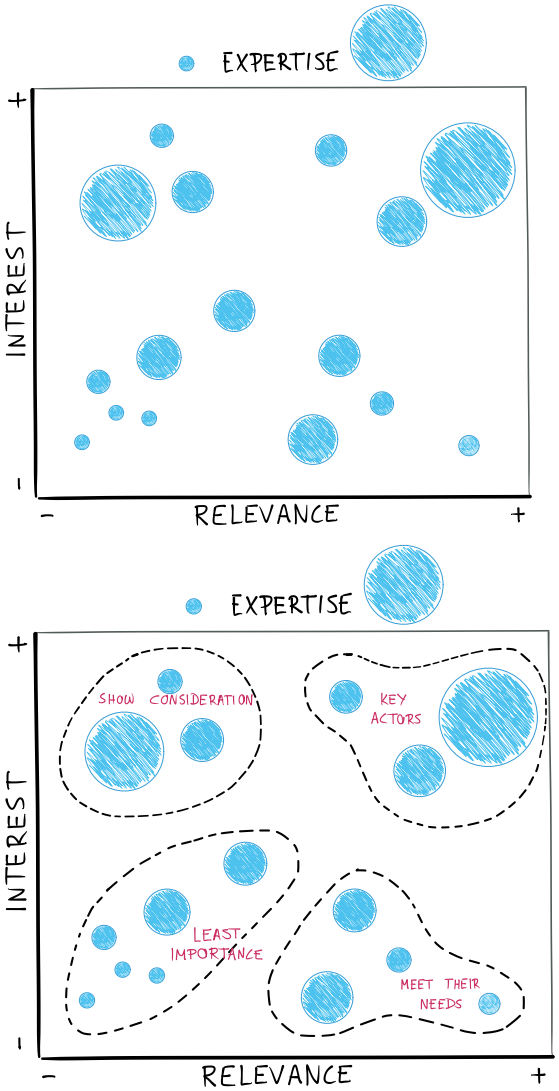
This is a threefold criteria map and thus a bit more complicated than the Relevance Map. Indeed, you will need to first complete the relevance map, so that you can classify actors according to it. Draw the Relevance/Expertise/Interest Matrix in which the vertical axis accounts for the interest and the horizontal for the relevance.

From the Relevance Map pick out actors with medium to high relevance (red and yellow areas) and use them to map the Expertise/Relevance matrix. Actors falling into the green area, shouldn't be ruled out of the process, but included in further analysis to make a decision about their engagement in time and the way they engage.

Now, place actors according to the combination of their attributes, as in the picture. The expertise is included in the matrix in differing plot size. The more expertise an actor has, the bigger the size of its plot. Thereby you get to compare stakeholders one to another using the three criteria.

ANALYSING THE MAP

Similarly to the relevance map, different areas can be set apart giving you some insights in the strategy you can adopt with actors falling into them. With actors showing little or no interest for the project but that are highly relevant for it, you should meet their needs, but no further engagement is necessary since they are not interested. Conversely if an actor shows a high interest for the project, despite his low relevance, you should think about engaging them. This engagement becomes mandatory when they are also relevant. This combination of high interest and high relevance will show you the key actors you have to engage with for the project. The fourth area is located in the lower left-hand side of the map, where actors are located with little rele-



vance and interest. Of course you don't have to forget them, but they are not as important as the others.

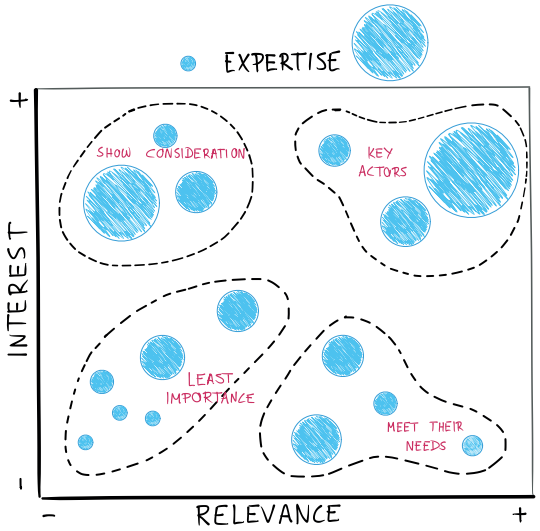
Above this first analysis, you have to assess the influence of the expertise in it. Generally speaking, actors with high expertise should be engaged in the process as long as their relevance is medium to high or their interest is high, despite the relevance. In other cases, informing them or communicating with them is enough. If the information taps into their interest, they might ask to join the process.

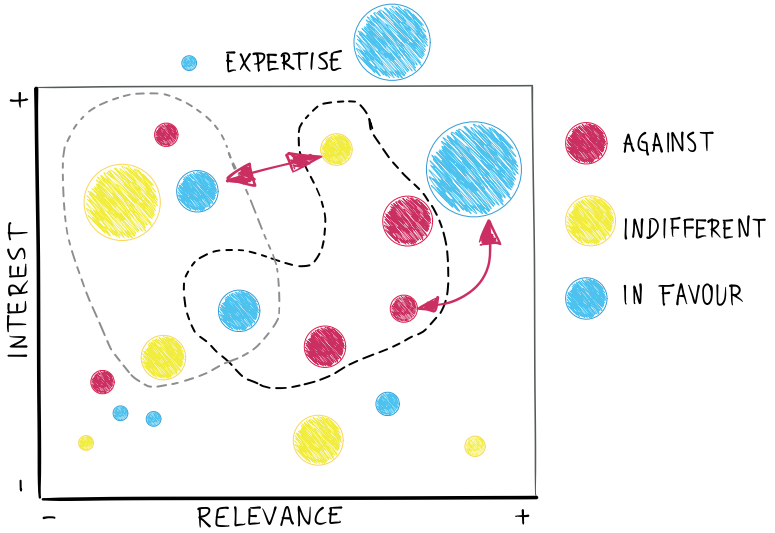
GOING DEEPER

Regardless of the different areas of influence, clusters of interest and conflicts can be depicted on the matrix. Gathering information from the stakeholders on the map you can identify those relations that are more evident or relevant and draw them on the map as well. By doing that, you can see if it is worth engaging an actor with no relevance or interest, but with expertise and a conflict with some key actor. At the same time we could identify a stakeholder acting as a link between two clusters which would turn him into a key stakeholder for the process, regardless of his relevance, interest or even expertise.

Another approach is to differentiate actors considering their attitude to the project. This new layer of information can help to understand some of the conflicts, or the creation of clusters of interest. In any event it will enrich the map with valuable information for the phase of strategy design.

> Generally speaking, actors with high expertise should be engaged in the process as long as their relevance is medium to high or their interest is high, despite having low relevance.





Green skills for boosting transition in water management Innovator Catalyst series. The Climate-KIC. Valencia, 2014 (Spain). https://goo.gl/llq0oS

MAP 3. Relevance - Adaptation

MAPPING STAKEHOLDERS OUT

The Influence/Adaptation Map helps you to foresee the likelihood of changing opinions and stances amongst different stakeholders and to estimate the potential impact that such a change could cause on the process. By doing that, managers will get an idea of potential conflicts in the future, due to changes in stakeholders.

Draw the matrix in which the vertical axis accounts for Adaptation (remember, the complete description of this attribute comprises not only how open to change the actor is, but the causes underlying potential lock-ins). The horizontal axis represents the level of Relevance according to the previous step and maps.

From the Relevance Matrix, pick out actors with medium to high relevance (red and yellow areas) and use them to map out the current matrix.

ANALYSING THE MAP

Four different and relevant areas to make further decisions about the stakeholders' engagement, can be identified on the map.

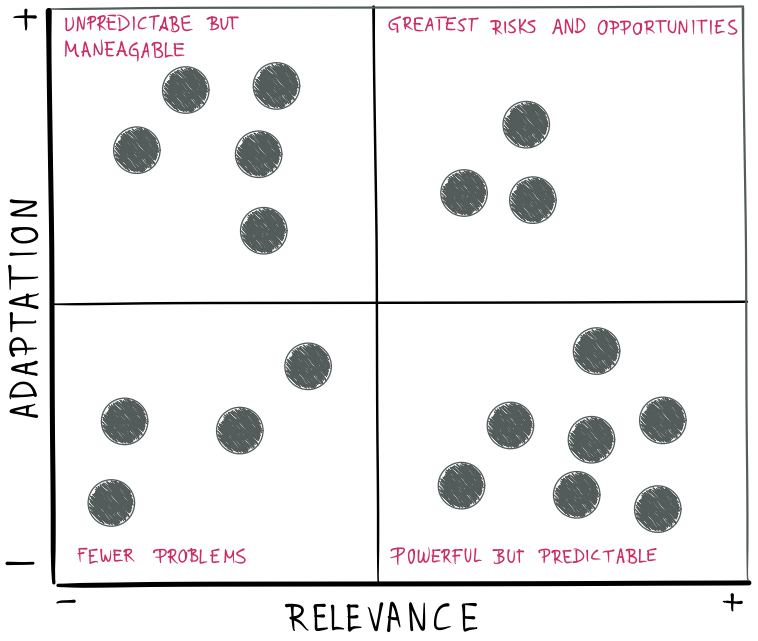
Actors with high relevance and adaptation are critical. On the one hand they account for the most riskiest situations due to their relevance, but also for the most important sources of opportunities.

Actors highly relevant but barely adaptable, (high resistance to change), have a very predictable behaviour. Therefore, once the first assessment is done, we can be pretty sure that the selected strategy will be the same over the process.

Actors with high odds of changing are utterly unpredictable. However, in the case of little relevance they are pretty manageable. That means that the project team must be flexible enough to naturally factor in these changes.

Finally, the fewest problems will come from stakeholders with low relevance and low probability of change. The strategy will be just to keep an eye on them to be sure they remain the same in terms of relevance and/or adaptability.

Actors with high relevance and adaptation are critical. On the one hand they account for the most riskiest situations due to their relevance, but also for the most important sources of opportunities.



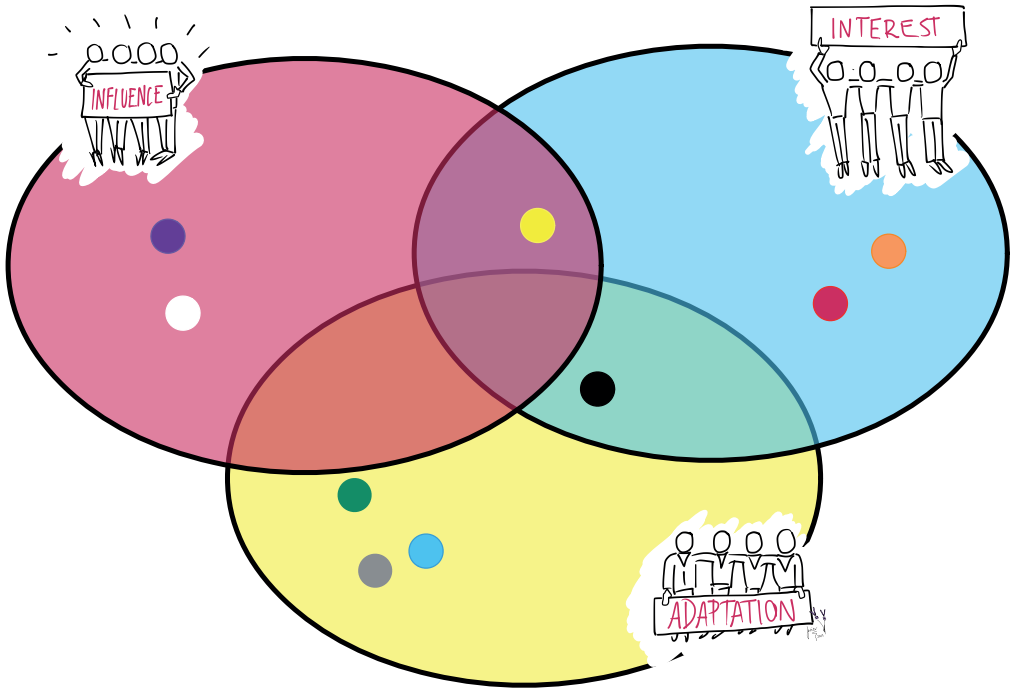
MAP 4. Interest - Influence - Adaptation

MAPPING STAKEHOLDERS OUT

This last map is based on the Venn diagram of Mitchell, et al. (1997) and substitutes Interest and Adaptation for Urgency and Legitimacy, to better fit to the system innovation approach. Therefore, drawing the three ellipsis for each of them is accounting for Influence, Interest and Adaptation, respectively.

Let's say you start with Influence. Pick out stakeholders with a high or medium level of interest in the project. Now plot them on the red ellipsis with the following criteria: (1) If the stakeholder has a low interest and a low adaptation, then plot them in any region of the red ellipsis except those shared with the blue or yellow figures. Please notice that there is no difference between high or medium influence within this area. (2) If the stakeholder has a medium or high interest and a low adaptation, then plot them on the shared area for the red and blue ellipsis (3) Conversely, if the stakeholder has a medium or high adaptation and a low interest, plot them in the shared area for red and yellow ellipsis. (4) Finally plot in the area shared by the three ellipsis those actors with a medium or high degree for the three attributes.

Once you have finished this step you can move to the adaptation. In this case just check if there is a stakeholder with medium or high power still not included in the map and plot if necessary. For that, apply the same reasoning as before. The last step is to check if there are still some actors with medium or high interest out of the map and include them, following the same process.



ANALYSING THE MAP

By overlapping the stakeholders who present medium or high degrees of each attribute, you will be able to identify the predominant roles for each one of them, which in return, will allow you to define and adopt an appropriate strategy. **(1)** First you can identify your agents of change in those with a medium or high degree of the three key criteria. You should definitely engage them from the very beginning.

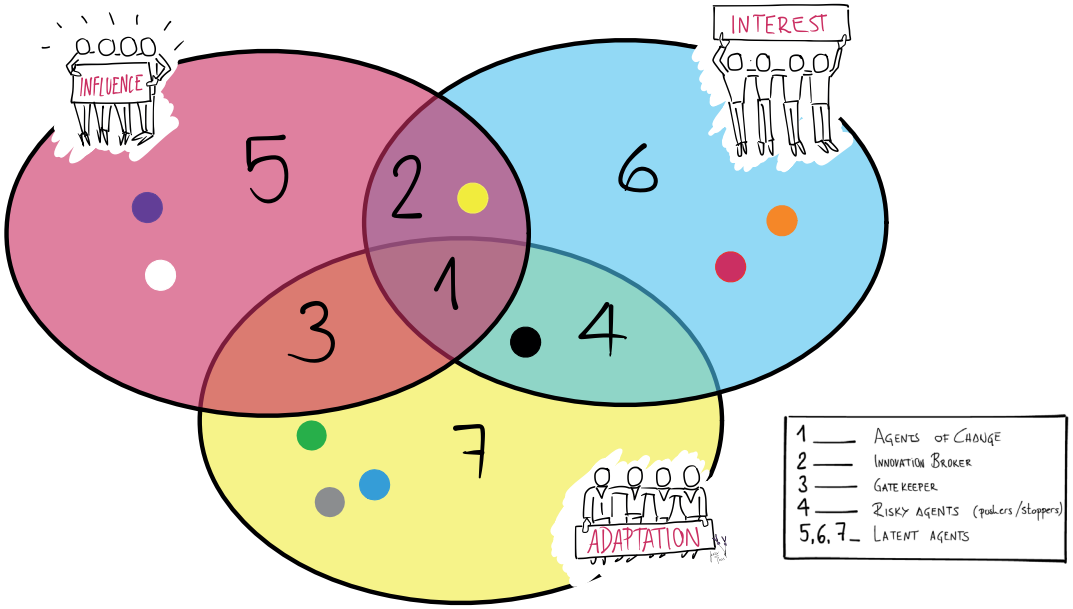
(2) Stakeholders with influence and interest can act as innovation brokers, a kind of ambassadors for your innovation. Again, try to engage them right now. **(3)** Gatekeepers are those actors with high influence and high probabilities of changing their stances. They can move from being in favour to being against the project, therefore keep an eye on them. **(4)** The risky agents, those who might act as stoppers or pushers, are those who have medium/high interest and medium/high probabilities to change. In this case, due to their interest, it is probable they will actively back your project, or the opposite. On account of that, and the possibility for their opinion to change, it is crucial to take care of them.

Finally, stakeholders with only one of the criteria falling in the mid or high part of the scale, **(5,6,7)** should be considered as latent. At this precise moment they are not as important as the others, but their stance might change at any moment

AFTER MAPPING STEP. LAYING OUT STRATEGIES

The natural step after mapping out the stakeholders is to come up with an engagement strategy for each of them. Of course, this is the most difficult step, but also the most valuable and the underlying reason for mapping them out. Therefore, try to do it, even if you don't have the perfect strategy right now.

First of all, summarize the outcomes of your maps by including them in a table with the attribute assessment for each stakeholder (low-medium-high level of...). Then, write down the strategy you drew from each map according to the stakeholder's position on the map



(Key actor, meet their needs, keep them informed...).
Now it is time for filling in information about the stakeholders that you consider important but is not reflected on the maps. Think about any particular circumstance that might make their future involvement difficult. For instance, you might have found out that you do not know enough yet about specific actors that you have identified. This could, for example, result in efforts to learn more about these actors and use a cautious strategy with them. Write down this new data in the 'observations' cells

Once the main features have been discovered and summarised, discuss the best strategy or set of strategies that should be applied to each stakeholder.

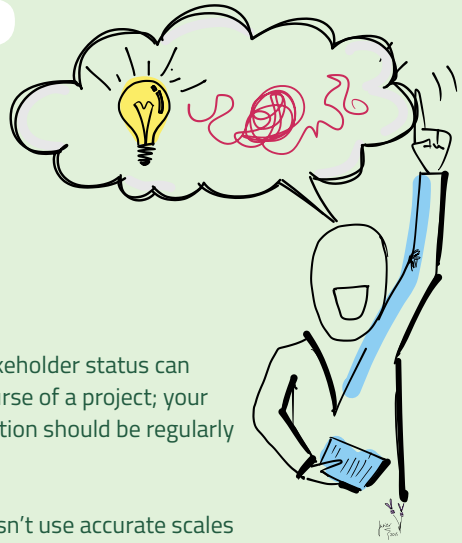
FINAL STEP. Debrief

After completing the tool, spend some time reflecting on the outcome and the process.

Do you feel you culminated with a good prioritization of your stakeholders? Were you able to set out different engagement strategies based on the maps? If you did more than one map, what did you find the most useful? And the most difficult? Did you find any contradictions between maps? If so, how did you solve them? Do you think the outcome is worth the time you spent mapping the actors out?

		ACTOR 1	ACTOR 2...	ACTOR n
RELEVANCE	Influence	I	I	I
	Interest	I	I	I
EXPERTISE	Contribution	I	I	I
	Legitimacy	I	I	I
	Attitude	I	I	I
	Adaptation	I	I	I
MAP ANALYSYS	MAP 1	I	I	I
	MAP 2	I	I	I
OBSERVATIONS	MAP 3	I	I	I

Tips



- Remember that stakeholder status can change during the course of a project; your analysis and prioritisation should be regularly updated.

- Mapping actors doesn't use accurate scales for estimating the value of each criterion. Therefore, avoid being dragged into endless discussions about the exact position of each stakeholder on the map. The big picture you obtain and the relative positions between actors are more relevant than the exact location of each one.

Find out more

http://www.climate-kic.org/transitions-hub

Tool 6
Stakeholder universe

Stakeholder Analysis

Understanding relationships. Stakeholder universe is a static depiction of the stakeholders and the dynamics of relations amongst them, as well as how they relate to the project/challenge.

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Stakeholder **universe**

What it is

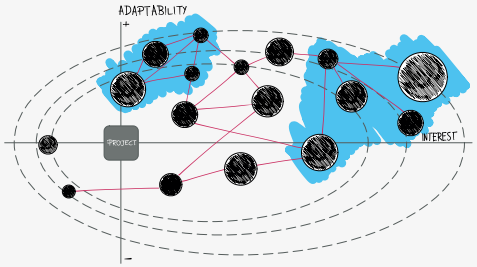
Stakeholder universe is a quick visual network analysis tool in which your challenge is in the very core of where the stakeholders revolve. The focus is on the connections among actors and how these connections work and might evolve; affecting the system innovation you are planning.

When to use

Whenever you have a collection of stakeholders somehow related to your project, you should carry out an analysis of such a network to understand how it works and how it can influence the process of the project. It should be done in the early stages of the project and after identifying and characterizing your main stakeholders. As any other dynamic system, actors networks evolve. Therefore, you should repeat the building process every now and then and whenever you know the current situation has varied.

Why it is useful

From a systemic approach, the most important step when studying stakeholders is to map out the relations among them, and analyse the network they form. Stakeholders surrounding your project are not a collection of individuals with standalone behaviors, resources and capacities to influence the project. Rather, they are a functional system in which emergent behaviours not previously expected or foreseen from an individualistic perspective, can surface. Mapping out an actor network can reveal potential connections and collaborations as well as patterns of connection/disconnection, flows of knowledge and resources which, in return, can be seen as flows of power.



HOW MANY	From 1 person to groups of 7 people.
HOW LONG	60-90 min.
DIFFICULTY	Medium-High.
WHAT YOU GET	A comprehensive and visual depiction of stakeholder network built according to their stance on the project and the relationships between actors. Thereby you get a formidable insight into the network performance now and over time, identifying patterns of connection and resources flows.
WHAT YOU NEED	You should carry out a network analysis after having identified and characterised your stakeholder environment. You will need to gather information about how they relate to each other and how fluxes or resources, ideas or anything pertinent work.
WHAT IS NEXT	After completing the Stakeholder universe you are ready to go for the stakeholder engagement phase by drawing up your participation plan. Nevertheless you might want to go deeper in your understanding of the network performance and potential evolution. If that is the case you can opt to do a metric analysis of the network, studying its connections, distribution and segmentation variables.

Steps

STEP 1.
The canvas

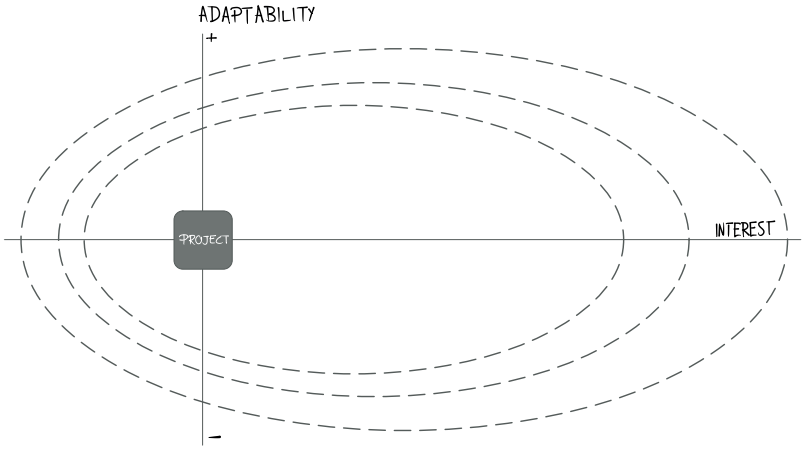
Start by sketching out the universe canvas. The canvas depicts a solar system with the challenge as the main star and actors as planets moving around the star. Draw your project (or challenge) as the core of the system but not necessarily at the centre of it. After drawing the project star, trace out a vertical and a horizontal axis, crossing each other through the star. The horizontal axis accounts for the interest or affinity for the project. The closer to the project a stakeholder is depicted the higher his affinity to the project is. The vertical axis represents the likelihood of an actor to change her mind regarding the challenge throughout the process. Actors above the horizontal axis will be inclined to move their own stances. Accordingly, actors placed underneath the X-axis are not expected to change their minds. Then you can add some orbits around the star and the canvas will be finished.

STEP 2.
Mapping out actors

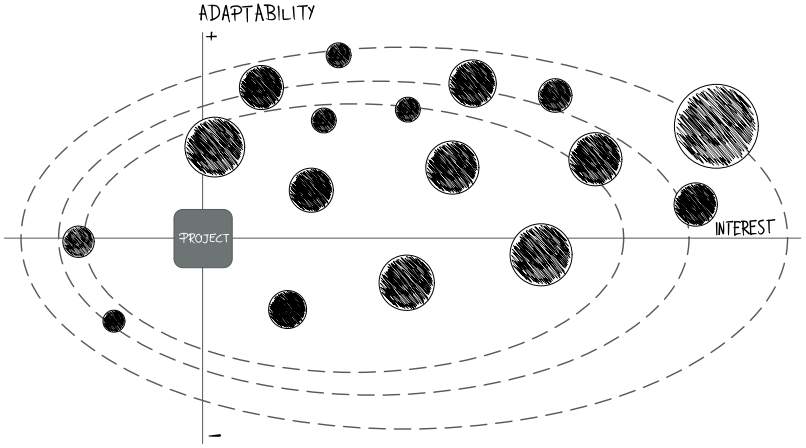
After sketching the canvas, map out actors according to their relevance and interest to the project as well as their adaptability over time. The size accounts for their relevance: the X distance for their affinity to the project and Y positive or negative sign for their adaptability to changes. Remember that relevance comprises more than one mere attribute and accounts for their capacity to influence either the process or other actors, their urgency or necessity and any other particular attribute linked to the challenge. According to these attributes, decide the size of the actor's planet.

While positioning the stakeholders, bear in mind to place closer those actors with stronger and closer relationships. Perhaps they usually work together, or one is a supplier or a distributor of the other, etc. Additionally, increase the distance between them as their actual collaboration or relationships decrease.

STEP 1.



STEP 2.



STEP 3.
Connections

Once stakeholders are mapped out, it is time for depicting relationships between stakeholders. Draw lines linking those actors with any kind of connection. These relations are usually bidirectional, that is the stream of information, resources or anything relevant, flows in both directions, although it might occurs in an asymmetric way. That is, the rate of information exchange it is not the same in both directions. Actually in some cases the flow of resources or information can flow only in one specific direction.

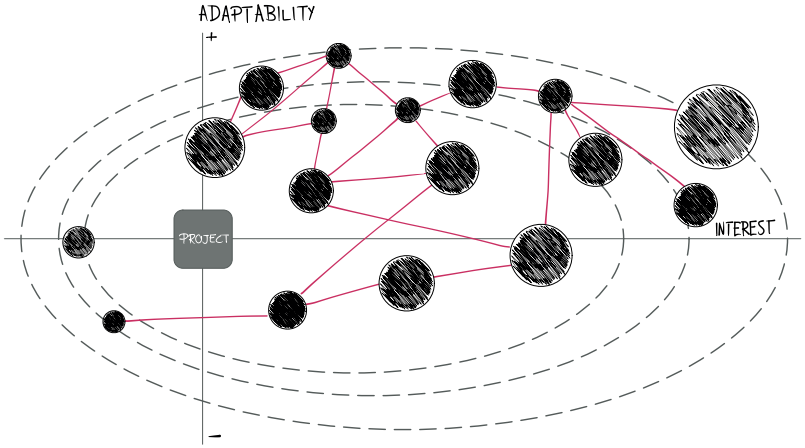
The first time you map out the network you should depict any kind of relationship without differences, depending on the type of flow (what flows and how). For the following analysis you may want to be more specific and include more information in the network. For instance, you might want to sketch out the fluxes of resources (money or others). If that were the case, you would connect stakeholders with some exchange of such resources using arrows and different thicknesses to differentiate the type of exchange (big/small, unidirectional/ bidirectional…)

Some of the questions you might want to answer by means of the network are: Who shares ideas/ resources with whom?; Who tries/is good at solving problems?; Who has the connections or the expertise; Who is looking for access to expertise?; Who has collaborative capacity?; What is the ease of knowledge flow?; What is the decision-making and task flow?; Who holds the Innovation potential?; etc.

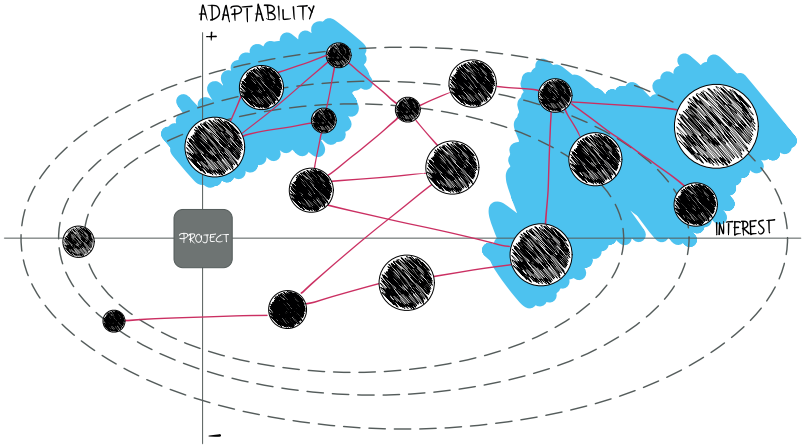
STEP 4.
Clusters

Spot potential clusters of interest. Beyond the relationships themselves, identifying clusters of interest results in a crucial point to envisage future alliances and behaviours. This is one of the emergent behaviours you can expect from a network. Clusters of interest can turn out as a super-powerful actor of large relevance and subsequent capacity to affect the rest of the network and the progress of the innovation process.

STEP 3.



STEP 4.



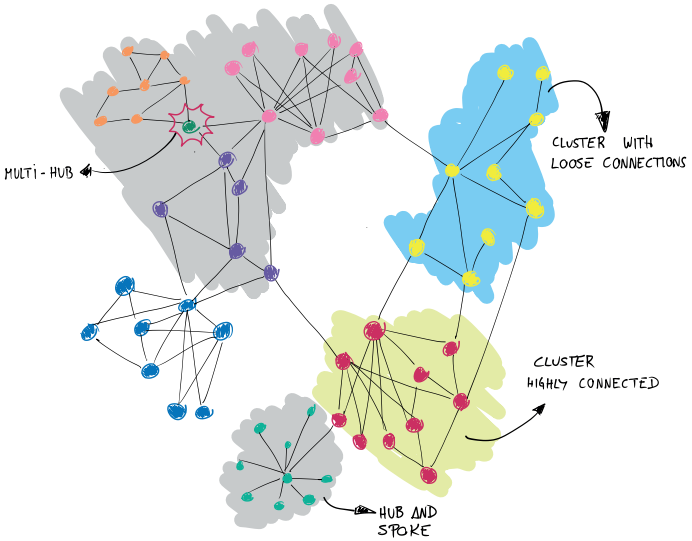
STEP 5. Analysis of the network

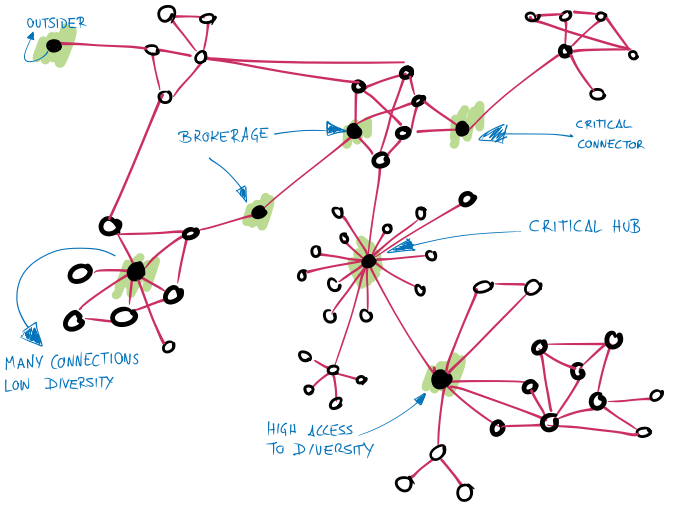
The goal of this tool is not the depiction of the network itself, but rather its interpretation and the conclusions that can be drawn. The shape of the network and the configuration of stakeholders provide lots of information about future roles, behaviours, etc.

First, look at the whole network and its components. Look for patterns such as clusters or hubs. Look at the density of interaction, the average degree of separation within groups and the cross-group connectivity. Highly connected networks usually tend to perform better than those with loose connections. The analysis of the structure is good for group comparison within the network and for tracking changes in a network over time. The structure reflects how the network performs, which reveals how the connections work and evolve.

Try to identify these patterns (or any other) in your network and make them explicit in the network by drawing their limits. Use post-its to label them and describe their main features.

Now pay attention to the position of each stakeholder in the network so as to understand their role in how the network functions and how the resources flow. Actors linking different clusters, play a key role as brokers and have the capacity to boost collaborations. Similarly, actors linking the network with an isolated cluster or another part of the network by themselves are actually gatekeepers and might spoil any further collaboration. Going a little bit deeper, look at the picture and notice how important the diversity of connections is when it comes to accessing others' ideas or resources. That means, stakeholders with the most connections are not necessarily the most influential. Another important role is how those stakeholders connect the network with nearby actors, since they can draw new ideas and resources to the network. Now, look at the stakeholder labelled





Stakeholder management workshop. Innovation Building Block series. The Climate-KIC. Frankfurt, 2015 (Germany). http://goo.gl/MTSuTW

Stakeholder management workshop. Innovation Building Block series. The Climate-KIC. Frankfurt, 2015 (Germany). http://goo.gl/MTSuTW

as "critical hub". This stakeholder is at the centre of a star acting as the only connection between the network and many lonely stakeholders. This is a typical shape you come across in many networks. If this actor fails, an important part and resource chain of the network might fall apart. Hence the importance of spotting these nodes as soon as possible and coming up with an appropriate strategy.

Again, use a post-it to name the actors and describe their role. If you have sketched out specific connections, for instance, the flow of knowledge, then be more specific when describing stakeholders' roles. Example: The university of Carleton is the only provider of a new technology needed to turn biomass into diesel.

STEP 6. Debrief

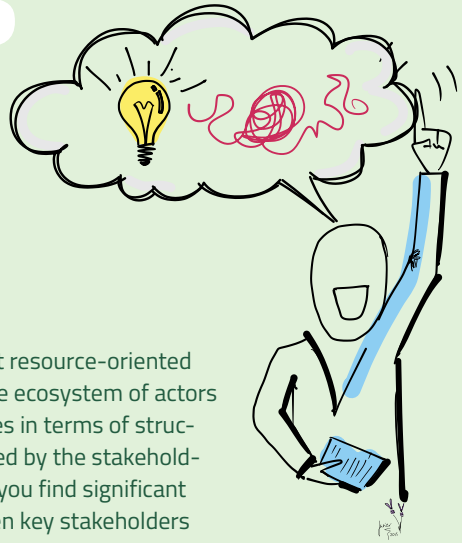
When the network is finished, reflect on the new insights gained through the analysis of the network and the particularities of the process.

Did you find any clear patterns in the structure of the network? If so, what is the explanation in terms of relations between actors? How can they affect the performance of the network? Did you find any critical and unexpected stakeholders or critical links?

Did you try to map out a topic-oriented network in which links accounts for specific resources? Did you find differences between different networks? How difficult was it to build up and analyse the network?

The goal of this tool is not the depiction of the network itself, but rather its interpretation and the conclusions that can be drawn.

Tips



- Try building different resource-oriented networks for the same ecosystem of actors and see the differences in terms of structure and the role played by the stakeholders. Chances are that you find significant differences, and hidden key stakeholders can emerge.

- Bear in mind that the quantity of connections is usually less important than the quality of those connections. The diversity and the exclusivity of the links count much more.

- Stakeholders networks are living, breathing entities, therefore remember to build up your network once in a while. Then keep track of the changes and adapt your strategy accordingly.

Find out more

http://www.climate-kic.org/transitions-hub

2 Multi-level perspective

A Multi-level perspective helps you to look at and gain insights into the context of an innovation project or system. It can give you a better understanding of the relationships between the project and any other factor or element surrounding it.

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Multi-level **perspective**

Green skills for boosting transition in water management Innovator Catalyst series. The Climate- KIC. Valencia, 2014 (Spain). https://goo.gl/llq0oS

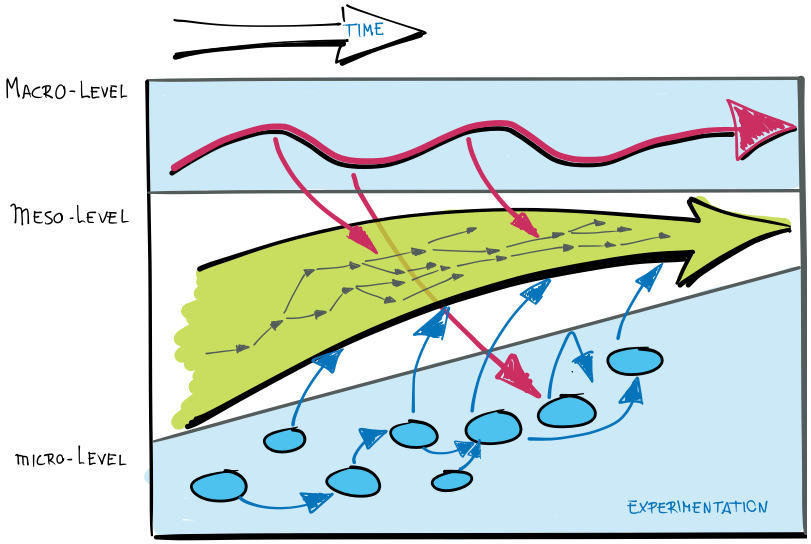
The Multi-level perspective (MLP) is an analytical approach to describe processes of innovation and transitions in socio-technical systems. It can be used to better understand the relevant context of system innovation projects.

To describe socio-technical systems and how transformative change takes place, the MLP breaks down the system into three levels: macro (landscape), meso (regimes) and micro (niches of innovation). The interplay between them, and within them, trigger non-linear changes in the systems. As a consequence of these changes; the transition happens.

Regimes represent the current socio-economic systems, made up of social, technical, political and financial components. The co-evolution of the regime results in the current status quo. This evolution is affected by feedback loops coming from the macro-level (exogenous forces) and grassroots innovation (micro-level), resulting in different trajectories for change.

Components of a sociotechnical system:

- Landscape (macro-level)
- Regimes (meso-level)
- Niches (micro-level)
- Feedback loops between all levels



Macro-level: Landscapes. Exogenous, autonomous, long-term trends and crises (demographic, environmental, macro-economic, macro-political, ...)

Meso-level: Regimes. Established, mainstream practices, structures and culture (rules and regulation, infrastructure, economic structures, technological lock-ins, incumbent stakeholders, behaviour, ...)

Micro-level: Niches. The 'incubation rooms' for radical innovations, shielding them from the mainstream. Niches could take the form of innovation projects or experiments in small-scale 'places' that are deviant from business as usual...

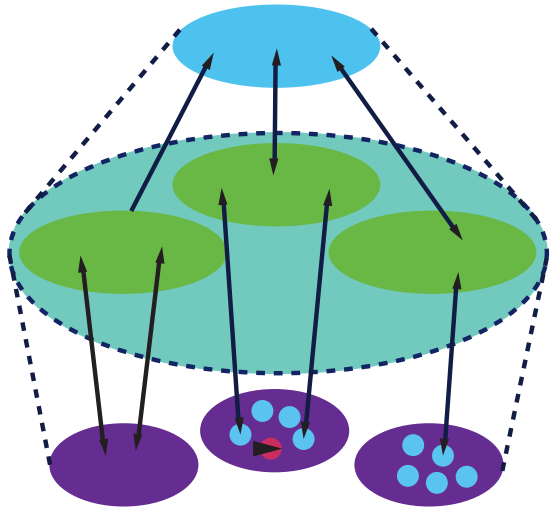


Figure: Multiple levels as a nested hierarchy. Adapted from Rip and Kemp, 1998 and Geels, 2002.

Macro-level. Landscape

Landscape can be seen as a source of drivers for transformative change in the long term.

It depicts exogenous, long-term and autonomous trends and major crises. At the same time, some of them can be a consequence of the long-term society behaviour (i.e. demography). Landscape developments are sources of pressure for change onto regimes and may end up as drivers for a major change. It represents a set of guiding principles to action.
Four sources of pressure stand out:

- Factors that do not change or change slowly, such as the climate.
- Long-term developments: industrialisation, urbanisation, demography, macro-economy, climate change, geopolitics, raw material stocks…
- Rapid and unexpected events / shocks such as a tsunami or an earthquake.
- Overarching world views, values and paradigms.

Landscape developments cannot directly be influenced. A way of dealing with them is to relate to them by using parameters within the system that can be influenced (directly or indirectly). For example, we can fight climate change (primary objective) via changing the energy system or transport system. These measures also have direct effects not linked to climate change (additional benefits that come on the way to the main objective):

Policies to reduce air pollution in cities, increasing life quality and reducing hospital bills. Electric transport initiatives could be related to that, and are 'sold' to the public as noise reduction/ cost savings (daily life benefit for individuals), but it is a milestone on the way to your big target: fight global warming.

Zero energy houses: in the end, owners/ renters save money. In times of financial crisis this is a compelling additional benefit that ultimately is a key step to main goal of fighting climate change.

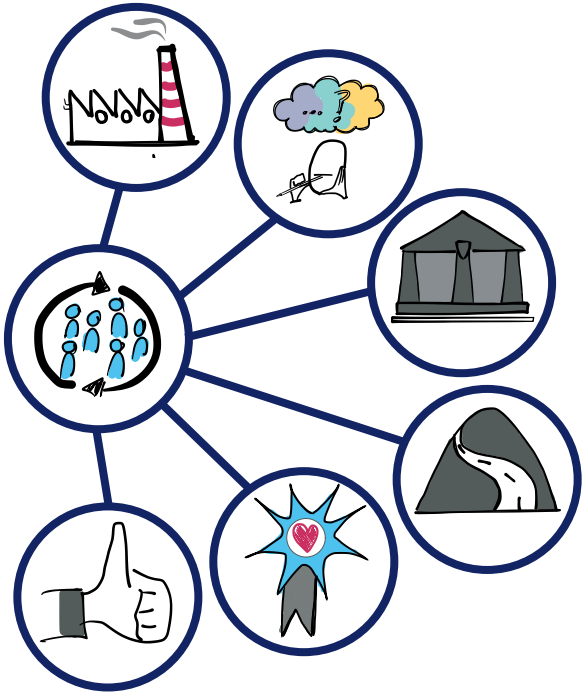
Meso-level. Regime

Regimes account for the current status quo, the social and economic system we perceive, and lead to self-stabilisation and optimisation.

Regimes are made up of current stakeholders, who hold a certain position or have power and interests in maintaining the status quo, the mainstream technology and knowledge. It is the way the stakeholders organize, the way they use resources, technology and knowledge and shape the current system in which we are embedded. As a result, the system is organized around different dimensions such as regulations, institutions (political, financial, social…), user behaviours and cultural values (i.e. the way we perceive and value cars).

All of these components have co-evolved for years in an incremental and steady way. As a consequence, the system usually tends to self-stabilise and some dimensions can act as actual barriers against novelty and radical innovation.

Different regimes co-exist at the same time, interacting with each other and with a similar context at the macro-level. For example: the mobility system, energy system, building system and healthcare system all have to deal with demographic developments and trends like urbanisation.



Socio-technical regimes are multi-dimensional. Depending on the sector, the number and type of dimensions can vary:

- Industry structures.
- Knowledge.
- Institutions, regulations.
- Mainstream technology and infrastructures.
- Actor configuration.
- Cultural values.
- Markets and dominant user practices.

An inventory of related innovation projects is useful as you can learn a lot from 'fellow' innovators, e.g. about regime barriers, such as cultural barriers, routines, innovative approaches and so on. Fellow innovators may also become fellow-lobbyers and activists for regime change.

Niches of innovation

At the micro-level, experiments and innovation projects takes place. It is the level of grassroots innovation and bottom-up initiatives, as well as the origin of radical changes and alternatives for the dominant system.

Niches can be understood as partly-protected spaces where radical innovation can take place with exemptions from the regular market rules, regulations and other pressures coming from regime dimensions.

Universities, R&D departments and the military are typical niches of innovation, but they can flourish anywhere. Some of the sectors in which radical innovation may happen are social and economic systems. New ways of consumption are being promoted from civil society organizations/NGOs, etc and are gaining momentum in the mainstream at local or regional level. At the same time, experiments for micro-financing and new business models are surfacing worldwide: PV systems in rural areas, consumers as energy producers, low-carbon lifestyles, boom in vintage/second hand products, free cycling, car-sharing...

However, to break through the regime, Niches have impediments. Niches, by definition are outliers, they do not have popular acceptance. They have low levels of organization and have weak/narrow networks. Nascent niches are not very stable and lack the power to influence fundamental changes at the meso-level. Many niches may be a a concerted effort/retaliation against regime barriers: punk, hippy communes, tattoos, private liberal/religious schools, etc. that may one day become mainstream as in the case of hippies and punks.

Multi-level perspective

Tool 7
The context map

Tool 8
Trajectories of change

Tool 9
Flourishing multi-level

Tool 10
Fishing for barriers

Tool 7
The context map

Systemic perspective

A project is not an island in an ocean. It exists in a specific location with a defined environment and within a broader system made up of stakeholders, competitors, regulations, institutions, etc. The Context map is a straightforward tool that helps you understand and analyse the external macro-environment around your project, business or challenge.

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The context **map**

What it is

The Context Map is a visual tool for system analysis, based on the well-known technique PEST1 (Aguilar, 1967). It has been adapted to the system innovation context by increasing and modifying the factors included in PEST and focusing on trends as potential drivers for change, in addition to the factors characterising the system. The tool provides a soft approach to the threefold layer structure that is the base for the Multi-level perspective theory.

When to use

At the beginning of the project, when you need to get a quick idea about the system around the challenge and how it works. It should be done before making key decisions about the project, in order to spot threats and opportunities that might dramatically change your initial plans.

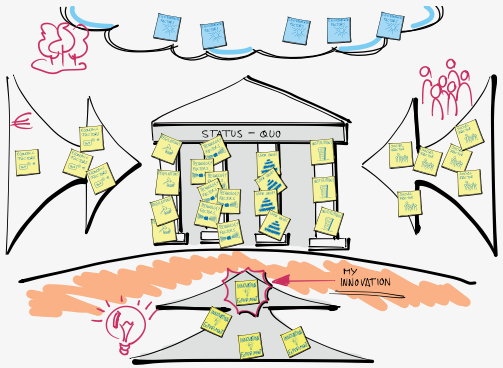
Why it is useful

One of the most important advantages of the Context Map is its simplicity. In contrast to the Flourishing multi-level, you don't need an in-depth understanding of system innovation or sociotechnical transitions.

The Context map helps you to understand how the system around your challenge works and consequently to spot opportunities or significant threats for your project. It gives you an idea about the current state and the direction of change within your project environment. It helps you to avoid being trapped by your unconscious assumptions when you enter a new country, region, or market.

Overall, the Context Map broadens your scope and increases your awareness of the all-embracing context, which puts you in a better position to make better decisions, adopt a strategy or navigate through the system.

PEST is an analysis tool widely used in project management to analyse the Political, Economic, Socio-Cultural, and Technological changes in a business environment.



HOW MANY	From 1 person to groups of 10 people.
HOW LONG	40-60 min.
DIFFICULTY	Low- Medium.
WHAT YOU GET	A quick, visually appealing and comprehensive picture of the factors influencing and creating the system in which your project is embedded.
WHAT YOU NEED	A clear idea of the socioeconomic framework that your project sits within, as well as the environmental context.
WHAT IS NEXT	Equipped with the overall picture of the system, you may want to go for a deeper and more comprehensive understanding of that system by carrying out a proper Multi-Level Perspective analysis. If so, then go with the Flourishing MLP tool. If not, you can start planning future steps by envisioning what the system may look like in 10 or 20 years' time. Then you can see how to fit your innovation within the vision.

Steps

STEP 1.
The canvas

First of all, take a large piece of paper and draw the canvas. As you see in the model, the canvas is made up of four parts.

The main system, what you might call the dominant market or status quo, takes up the centre of the canvas, it is depicted by a classical building with four columns supporting the building. These columns stand for regulations, the dominant technology, the network of institutions and the social values.

On both sides of this building there are two mega-trends also belonging to the status quo and with huge influence in its dynamics: social and economic (factors and trends).

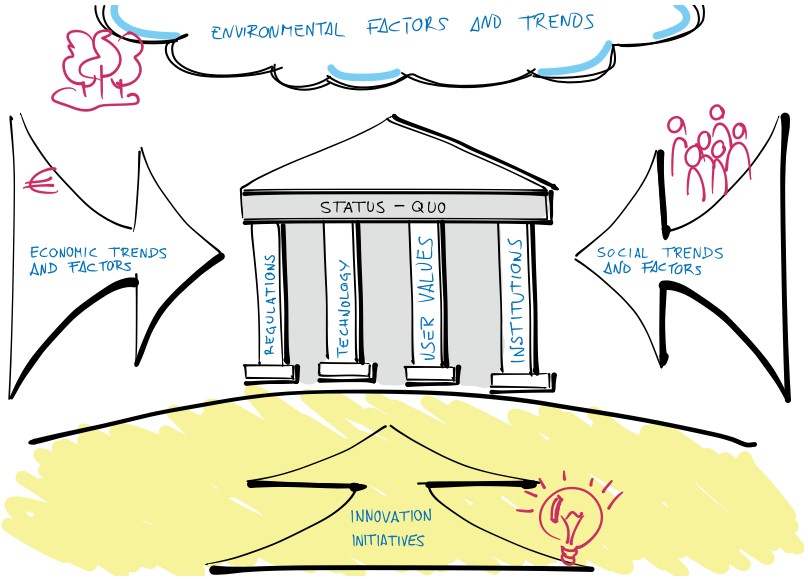
Innovations are at the bottom of the canvas and are depicted by the large arrow pointing upwards, to the dominant market.

The last part is the environment. It occupies the upper side of the canvas and is represented by a big cloud.

STEP 2.
The starting point

Before starting with the canvas, you need to define a clear statement for your challenge. Is it an innovation (technological, social, economic)? Is it a project? Is it the development of a new product or service? If you used the Pentagonal problem or any other similar tool you can resort to their outcomes to clearly define the challenge.

Your project is located in a specific place. Whether it is a city, a region or even a country; environmental and geographical conditions will have an effect on your challenge. Therefore, after defining your challenge, you should spend some time discussing where the project is located and what the geographical and environmental limits are. Of course, you may think there are no boundaries for the environmental factors but you have to pin them down to be able to keep the analysis in a clear and manageable framework.
Bear in mind both elements (the challenge and the system boundaries) for the rest of the steps, they will serve as a criterion to decide whether a concrete factor is relevant for your project, or not.



STEP 3. Innovation initiatives

The large arrow pointing upwards accounts for the innovations in the process of breaking into the market. Individually, identify cutting-edge projects and experiments with the potential for breakthroughs. Use one post-it for each initiative and put them on the canvas. While explaining them, new ideas can emerge. If so, write them down on another sticky note and place them on the arrow.

These initiatives may come from an university running an experiment, a start-up developing a new technology, a civil organization developing new ways for collaborative consumption,

Train the Trainers event. Training coaches for the Pioneers into Practice programme. Utrecht, 2015 (The Netherlands)

from a large company R&D department, etc. These projects should be relevant for your own project, perhaps potential allies or competitors. Bear in mind that by monitoring new technologies and innovations, you will be able to capitalise more on changes.

Your project is likely to be one of these innovations. If that is the case place a post-it with it on the tip of the arrow.

The next step is to characterise the status quo. That is the current social and economic system, dominated by mainstream technologies, established institutions, rules and regulations, powerful players, etc. At the same time, there are socio-economic mega-trends within the system. All of these components relate to each other, combining to create the dynamic system we call status quo. This dynamic evolution tends to stay in the same direction, keeping new innovations out of the system and acting as real barriers for innovation. However, some elements might act as drivers for change and innovation. Think of a new trend in market consumption (green consumers), a new trend for a greener policies including new regulations, etc.

Let's start with the building and identifying elements for the four columns: Technology, Regulations, User values and Institutions. Work individually for 10 minutes identifying as many elements as you can and then start a group discussion as you put your ideas on the canvas.

TECHNOLOGY.

Technology accounts for those factors and events that characterise the technological landscape in your system or status quo. Technology is constantly evolving and it is essential to have an up to date picture of it. Think of dominant technologies you need to compete for the same space in the market/society. At the same time, think of those trends and established innovations that can pose new opportunities.

REGULATIONS.

Current regulations establish the rules for the status quo performance, including trading, technological norms, competition, environmental, etc. Newcomers and new innovations might not fit within the current regulation framework, which means that rules would be acting as barriers for those innovations. If that is the case, you may need a kind of protection or lobby for your innovation to succeed. At the same time, some regulations or recent changes might be opportunities for your project. Identify those regulatory factors relevant for your innovation whether they are considered as barriers or opportunities.

USER VALUES.

The range of social values provide the basis for what is right and what is not, shaping business behaviour. These values encompass, among others, cultural understanding of different technologies, and even the social ethical framework, which can be determining for your innovation to be adopted.

INSTITUTIONS.

The current and relevant players in your system are organised in a way that affects how the system as a whole works. That means you should fit within this institutional interplay or be able to change it, if you want your innovation to break into the market. Therefore, try to identify those institutions, big players, as well as any explicit or implicit cluster characterising the system and potentially affecting your innovation.

> The effects of the environmental factors and trends on the status quo, may act as barriers or drivers for change and more specifically for your innovation project.

STEP 4. Economic and social trends

Social/financial factors and trends are two of the most powerful elements within the status quo. They both pervade the other components of the system becoming key

drivers for its dynamics. In this step you are to work on them, identifying as many relevant factors as possible for your project.

ECONOMIC

Factors such as access to credit, inflation rates, consumer confidence, economic growth, etc. can make a big difference in the way a system works and how your project can fit within such a system. Business models, including those new approaches emerging in the market, can also be relevant for the future of your innovation.

SOCIAL

The second mega-trend is made up of the social and cultural conditions which take place in the dominant market. Customer habits and assumptions can keep your innovation off the market for years. For this tool you don't need to conduct a market research study, but pay attention to those factors that can impact your project opportunities: social perception of technologies, lifestyle trends, consumer habits, etc.

STEP 5.
The environment

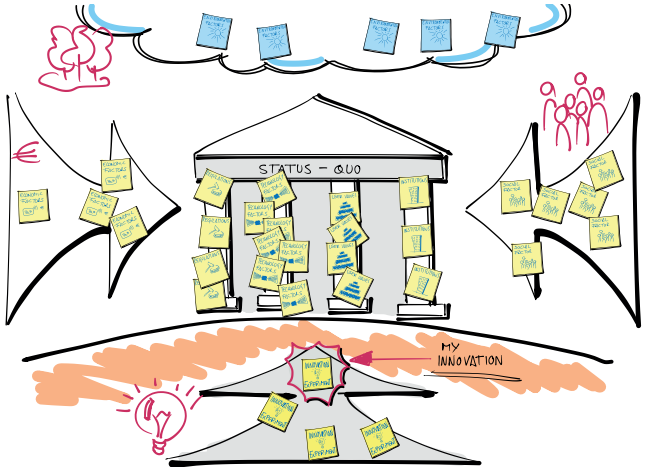
All businesses impact their environment and are impacted by it. The impacts coming from the environment are linked to the geographical context. Therefore, start by identifying the environmental factors on your innovation or on the status quo. These factors may act as barriers or drivers for change and more specifically for your innovation project. For instance, a water scarcity might be a great opportunity for your innovation to enter the market, or climate change might deplete the performance of your innovation because of heat waves or other force majeure/natural disasters/ large unforeseen societal changes. Conversely, identify how your innovation may impact the environment either negatively or positively. Again, these effects could work in favour of your innovation (your innovation could reduce the negative effects on the environment compared to the dominant technology) or as barrier to it.

STEP 6.
Debrief

After filling out the canvas reflect on the big picture that has arisen and try to come up with the main drivers and barriers for your project innovation, corresponding to the system features you identified.

Which status quo factors are affecting your innovation the most? In which way? Can you see evident strategies to get around the barriers and harness the potential opportunities? Is the environment a constraint or a driver for your project? Have you identified the big players and organisations you will have to compete with? Do you think society is ready for the change you propose with your innovation? Why?

These are some of the questions that can guide you to start reflection and closure discussions.



Find out more

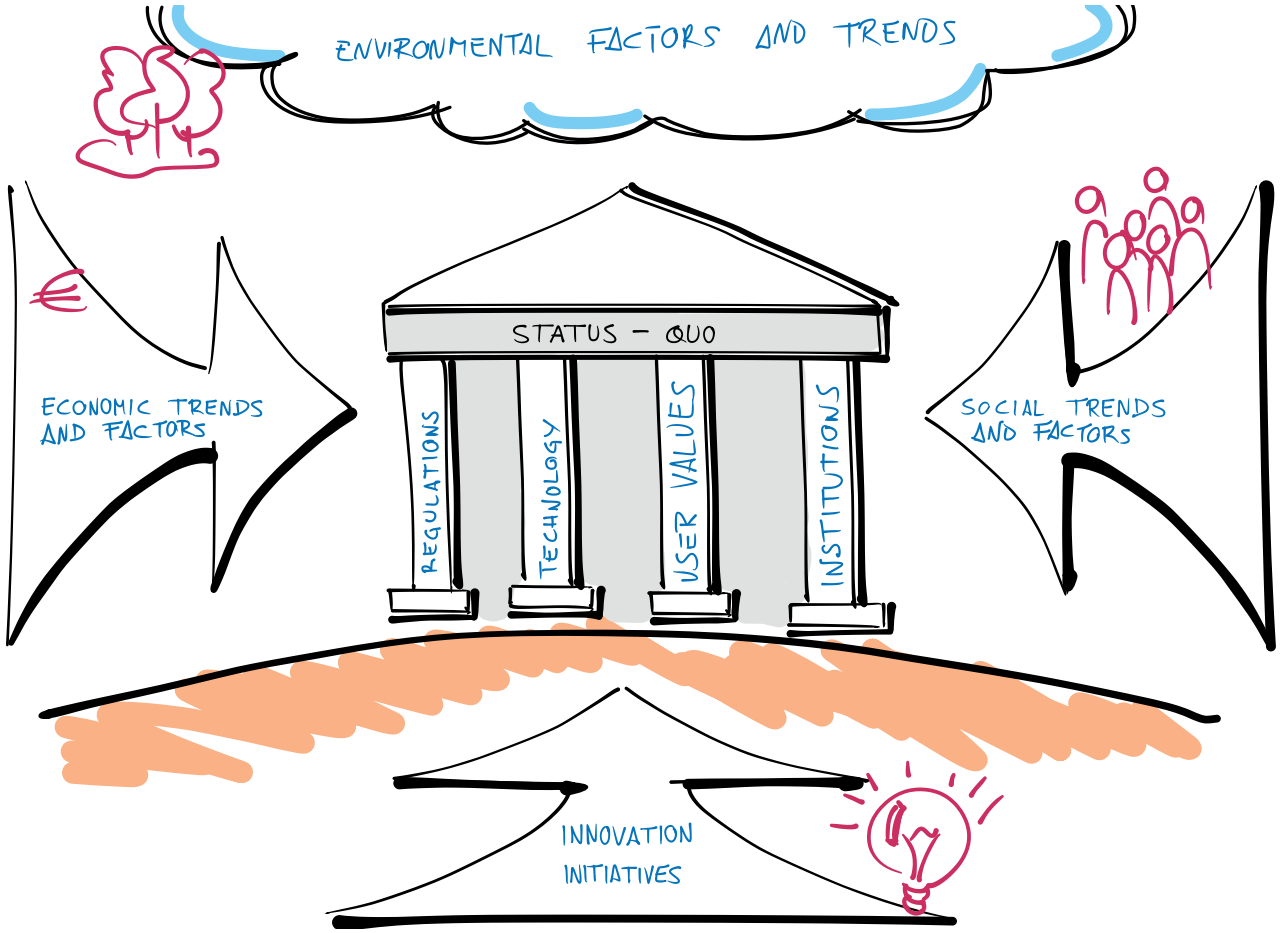
http://www.climate-kic.org/transitions-hub

https://learning.climate-kic.org/courses/system-innovation

Screenshot from online materials. System innovation and Climate Change eModule. Climate-KIC, 2016.

The context map

The Canvas



De Vicente López, Javier and Matti, Cristian (2016) . Visual toolbox for system innovation. A resource book for practitioners to map, analyse and facilitate sustainability transitions. Transitions Hub series. Climate-KIC, Brussels 2016.

Climate-KIC

Tool 8
Trajectories of change

Multi-level perspective

Trajectories of change looks at how a system evolves and where innovation comes from. It can help you to understand sources of resistance and resilience to changes in your system and the diversity of alternatives co-evolving at the same time in different trajectories.

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Trajectories of **change**

What it is

Trajectories of change is a visual tool to depict how the system, or meso-level in which your challenge is embedded in, has evolved over time. This system evolves and changes as a consequence of incremental innovations and the effects coming from the other two levels, macro and micro. In this sense, Trajectories of change focuses on the horizontal evolution (temporal) of the system as a consequence of vertical relationships between levels and within them.

When to use

Whenever you need to know and analyse the evolution of the system over time, and the factors underlying such an evolution, in order to better understand the current dominant solutions that you probably want to change.

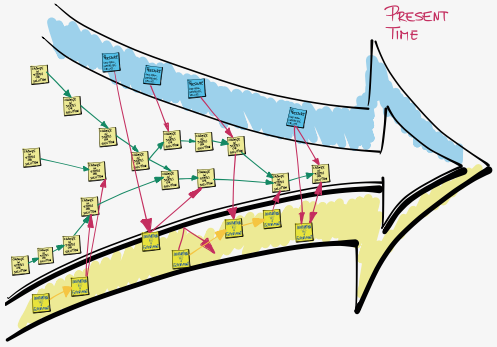
Why it is useful

By depicting a time line of changes happening in the three levels across time, you will gain insight into the dynamics of your system. You will learn the type of factors that traditionally have lead the system to change and how it reacts to that change:

· Where the roots for innovation came from.

· The resistance and resilience of your system against the transformative change.

· The diversity of alternatives co-evolving at the same time in different trajectories.
With this new knowledge you will be better prepared to come up with a strategy for your own innovation to elicit a transformative change in the system.



HOW MANY	From 1 person to groups of 10 people.
HOW LONG	60-120 min. Depending on how deep and far you go with data collection and analysis.
DIFFICULTY	Medium-High.
WHAT YOU GET	A comprehensive and visual depiction of the main systemic components of your problem.
WHAT YOU NEED	You need a clear picture of the system in which your challenge is embedded, as well as significant sources of information to dig deeper into the past and see how and why solutions changed over time.
WHAT IS NEXT	Once you get the pathway that led your system to the current status quo, you may want to break down such a status quo into its different constituents. It will give you an accurate and fixed picture of the current system. You can go for either the Context map or the Flourishing multi-level canvas.

Steps

STEP 1.
Drawing the canvas

Take a large piece of paper and sketch out a large version of the canvas. The big arrow depicts the evolution of the whole system including the three levels (macro/meso/micro), encompassing changes happened and relations or feedback loops between levels.

STEP 2.
The starting point

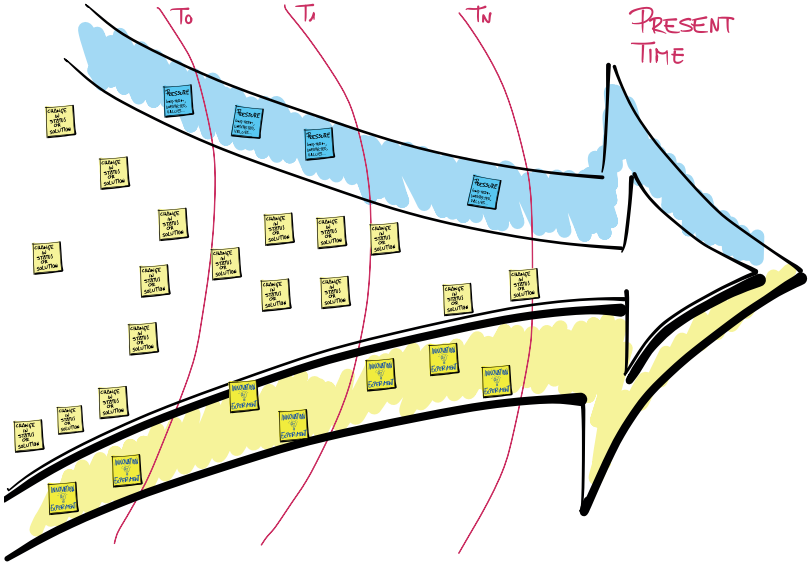
Before starting with the elements of the canvas it is essential to have a clear idea about what your challenge is about and the system in which it is embedded. Is it about food, energy, building, water, mobility…? Whatever it is, make it as specific as possible before starting on the canvas. For example, if the challenge is mobility, specify if it is about mobility in cities or at a different scale. You need to provide enough context to the challenge and the system because it has probably changed so much over decades that now it would hardly be recognizable. For instance, mobility in cities might have morphed into sustainable mobility with solutions and approaches miles apart from those 40 years ago.

Once you have singled out the specific topic and system, go backwards and pick out a date in the past. If possible a relevant date, maybe because a major change came about then, maybe because you have enough data, etc. This relevant date in the past, along with the system in which your challenge is embedded, will make up your starting point.

STEP 3. Identifying novelties and changes

From that date in the past, start moving forward to the present moment and identify any of the following events:

1. Any novelty, breakthrough and experiment at the micro-level, that was significant for the system at a certain moment. They could be a technological innovation, new financial arrangements, different social organisations, new business models, etc. Remember that the micro-level is somehow protected from



the standard regulations of the market. At this step, don't pay any heed to the effect that those innovations have been caused on the meso-level. You might even identify innovations that didn't cause any impact on the meso-level in the long run. In either case, you will go through cause-effect relations in the next step.

2. Any relevant change in the system (the meso-level, the current market/society, the regime) over time. These changes form the dominant solution at any moment of the temporal sequence. Indeed, the sequence of changes will define the dominant trajectory as time passes by. The rate of these changes is usually incremental, yet every now and then a breakthrough can appear, causing a complete transformation of the system. Chances are, that you are thinking of technological innovations that changed the system to a certain extent, but don't forget that changes

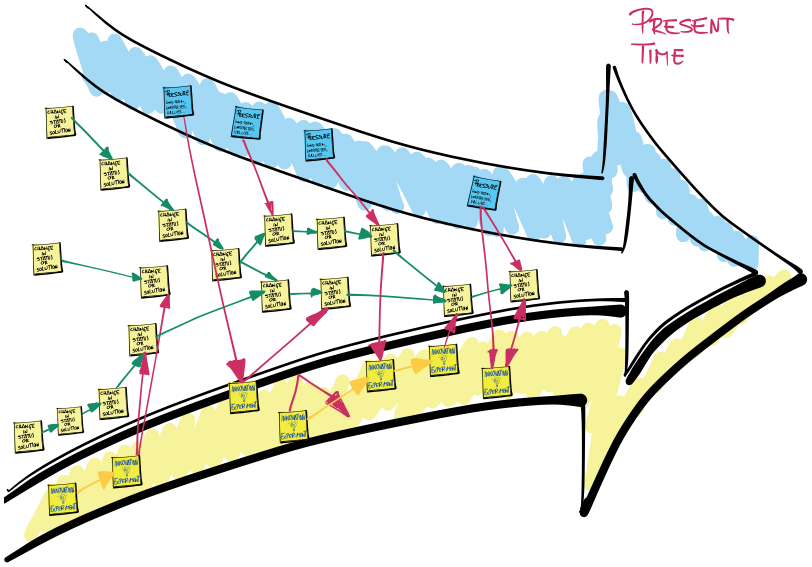
can also be on infrastructures, knowledge, industrial capacity, regulations and policy, etc. For instance, the Kyoto Protocol is a regulatory change affecting many different regimes (energy, mobility…). You can use the list of regime domains as guidance to identify the relevant changes that occurred in your system.

3. Events related to long-term developments or a crisis at the macro-level. They could be an event related to the social awareness and mental framework, an unexpected event such as an economic crisis, etc. Just bear in mind that the event must be relevant to your challenge and system. Beyond the overused example of climate change, the first Iraq War accelerated the development of GPS technology. Initially designed for military use, it ended up pervading the civil society and significantly changed the navigation solutions in the mobility system.
As you identify any event, write it down on a post-it note and try to put it on the canvas according to the timeline. You may want to spend time discussing the relevance of some events to decide whether include it or not. However you can leave this discussion for the next step in which the connections will come to light and you will be able to decide which events to rule out.

STEP 4. Identifying relations and trajectories

After identifying the events, you need to relate them to each other, as if it were the game "joining the dots", draw an arrow linking those events that are related to each other. Bear in mind that these relations can be within the same level and between levels:

- Changes in the meso-level can happen as a consequence of incremental innovation within the system (green arrows in the figure), these can be a result of an innovation or breakthrough coming from the micro-level (in read arrows going up from the niches to the system) or as a consequence of pressures coming from the macro-level.
- By the same token, innovations in the micro-level can evolve or feed into each other (yellow arrows in the figure) and occasionally scale-up to the meso-level triggering a change (red arrows from micro to meso-level). Some of the questions you may ask are: Are some experiments related? Did one of them build on another? Did they learn from each other? Did some niches develop into a network? Are some niche innovations breaking into the meso-level and influencing new changes?
- In return, long-term developments in the macro-level can pressure the meso-level or even the micro-level bringing about significant changes (red arrows from macro to meso and micro-level). It is noticeable that sometimes a ripple effect can be identified. That is, pressures coming from the macro-lev-

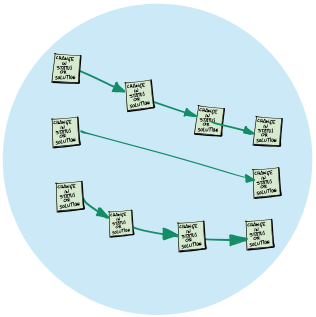


el can cause some changes in the meso-level that open a window of opportunity for innovations to jump from micro-level to meso-level.

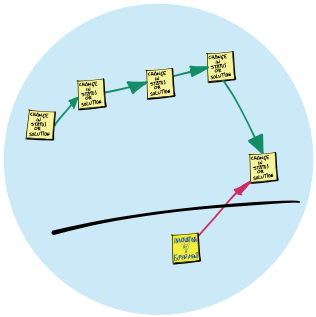
▪ Although influences between developments within the macro-level or from the micro or meso-level to that macro-level also exist, it is more difficult to pin them down at any specific moment. Rather, they are usually a consequence of accumulative effects. However, if you feel that some of these relations can be clearly spotted, just do it.

▪ Underscore milestones, junction/splitting (bifurcation) points, moments in which niche-innovations radically changed the system. Your whole system will be defined by the collection of changes and relationships. Both are responsible for analysing the current status quo and identifying the possibilities of transformative change for your challenge.

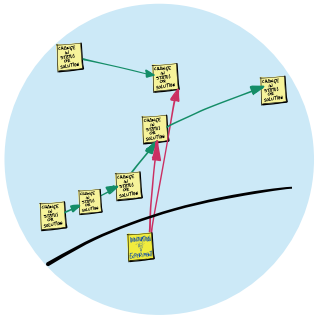
▪ Notice that you can come across some of the following trajectories:



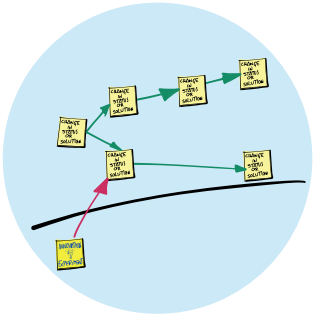
- Different solutions (trajectory) co-existing in the system (meso-level) at the same time. For instance, steam cars, electric cars and gas cars were developed at the same time and those three were in the market simultaneously for a time.



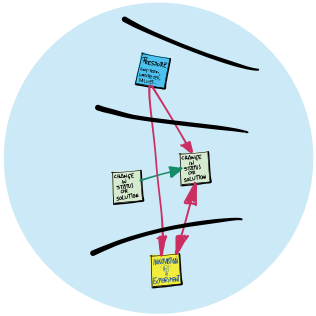
- Bifurcation: For the same reasons, some points show bifurcations, putting on the table different and alternative solutions that emerged at some shared starting point.



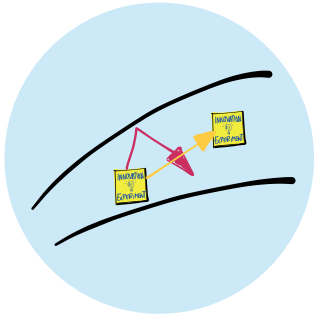
- Similarly, sometimes in the regime a trajectory dies at a certain point. Imagine two alternative solutions coexisting in the market. At a certain moment, a new novelty can provoke the one of these solutions to take advantage of it, adapt and evolve; while the other is not able to adapt. The first solution will probably take over the market and the second will end up disappearing.



- Changes of direction: As a consequence of an innovation (usually coming from niche) the meso-level changes direction; addressing new solutions, structures, etc.



- An experiment or innovation cannot always break into the meso-level and cause a change. Sometimes the innovation is abandoned or ends up evolving or feeding another innovation.



- Sometimes loops and bidirectional relations can appear. For instance, the climate change caused governments to sign the Kyoto protocol which, in return, caused changes in regulations opening a window of opportunity for new technologies, which forced more changes in the system, etc.

Boosting sustainable economy in rural areas. Innovator Catalyst series. The Climate-KIC. Budapest, 2015 (Hungary). http://goo.gl/iufdY4

STEP 5.
Debrief

Based on the outcomes, reflect on the changes so far in your system and how experiments or niche innovations have been able (or not) to affect the current status quo.

What changes have driven the evolution of your system so far? Technological, financial, social...?

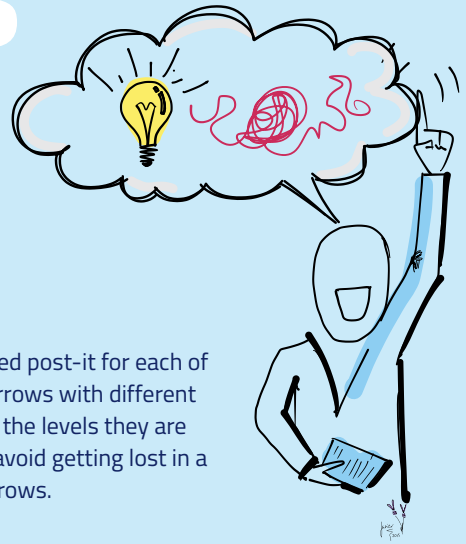
Discuss the effect of long-term pressure on the mainstream system and the other way around. What do you think the effect of the meso-level on the macro-level has been? Do you think the system presents resistance to change? Does it look like it has a strong path dependence?

Have there been active and effective grassroots innovations in the past? What are pressures or tensions within the regime, making the current system unstable and creating 'windows of opportunity' for experiments and niche innovations?

What type of pressure or radical innovation would need to occur for a transformative change to happen? If you have an innovation (whether it is technological, economic or social), what strategies could you use to take advantage of potential windows of opportunity?

What changes have driven the evolution of your system so far? Technological, financial, social...? What do you think the effect of the meso-level on the macro- level has been?

Tips

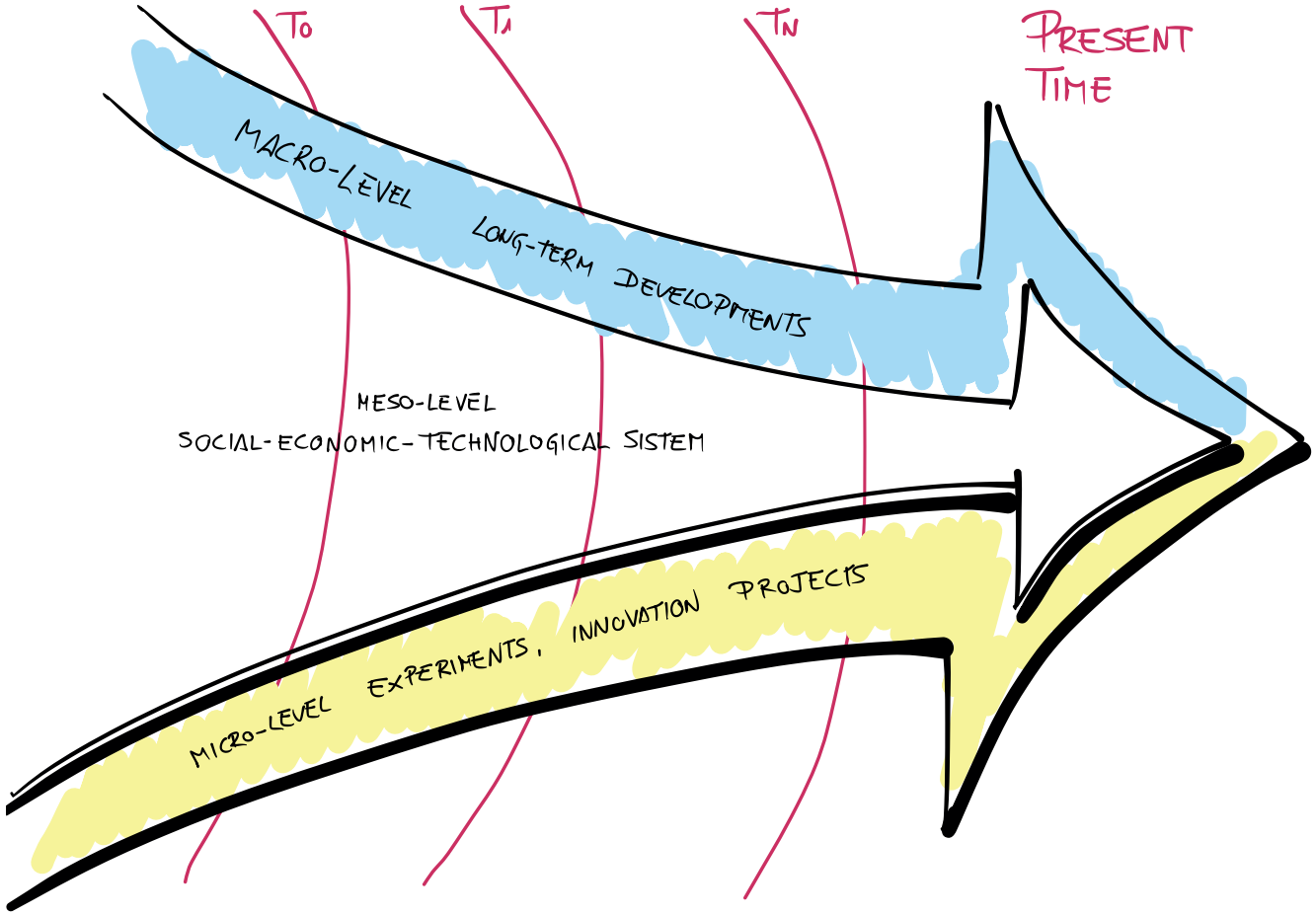


- Use different coloured post-it for each of the levels and draw arrows with different colours depending on the levels they are linking. It will help to avoid getting lost in a sea of post-its and arrows.

Find out more

http://www.climate-kic.org/transitions-hub

The Canvas



De Vicente López, Javier and Matti, Cristian (2016) . Visual toolbox for system innovation. A resource book for practitioners to map, analyse and facilitate sustainability transitions. Transitions Hub series. Climate-KIC, Brussels 2016.

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Tool 9
Flourishing multi-level

Multilevel perspective

An organic metaphor. Imagine the MLP as a daisy competing with other seeds to flourish and simultaneously coping with the pressure of the climate and weather. Flourishing multi- level gives a visual metaphor of the complex interplay of relations between the components in the three levels that make up a socio-technical system.

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Flourishing **multi-level**

What it is

Flourishing multi-level is a descriptive and analytical tool that provides you with a visual metaphor featuring a combination of a static picture of the current components and a description of the dynamics in the system that your challenge is embedded in.

When to use

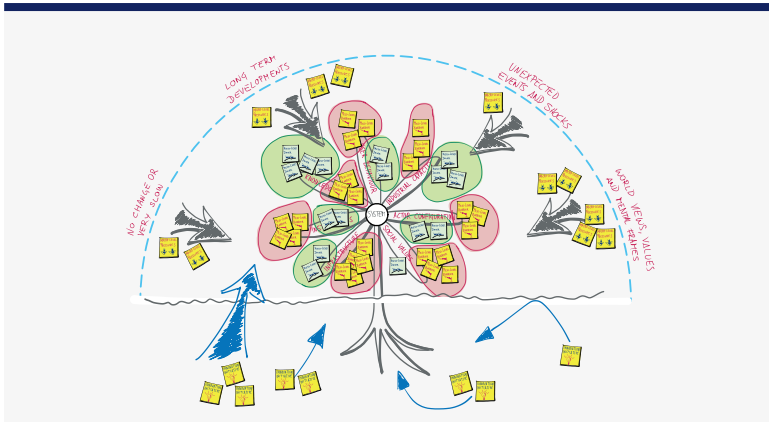
When you need a thorough insight of the system which you aspire to break into. This is a simple tool you should use for a deep understanding of current components of the system, how they are interwoven and how they impact your project plan. It should always be used before making decisions for the future of the project.

Why it is useful

First of all, it gives you a simple depiction of the highly complex and somehow counterintuitive socio-technical system made up of the micro, meso and macro-level.

Moreover, it helps and guides you in the process of identifying multi-level components, the interplay among them and the way they might affect your challenge. On the other hand, it gives you an overall picture of the system making further analysis easier.

This tool will help you to position your innovation projects in the broader context of different societal 'layers' that are important for your innovation, as well as understanding what the different layers could mean for your case.



HOW MANY	From 1 person to groups of 10 people.
HOW LONG	90-120 min.
DIFFICULTY	Medium-High.
WHAT YOU GET	An all-embracing and visual identification of the elements that make up the complex system of three levels in which your project is embedded, as well as the interplay amongst them.
WHAT YOU NEED	An in-depth understanding of the complex system around your project, comprising the dominant market or system, the collection of innovation initiatives bubbling up in parallel to that system, and the main trends and pressures from the overarching level.
WHAT IS NEXT	With this comprehensive picture you can work on planning the future for your innovation. If so, you can start with the visioning and backcasting tools, before making a plan. Alternatively, you may want to go deeper in your understanding of the barriers and opportunities for your innovation. Then you can go for the Fishing for barriers tool.

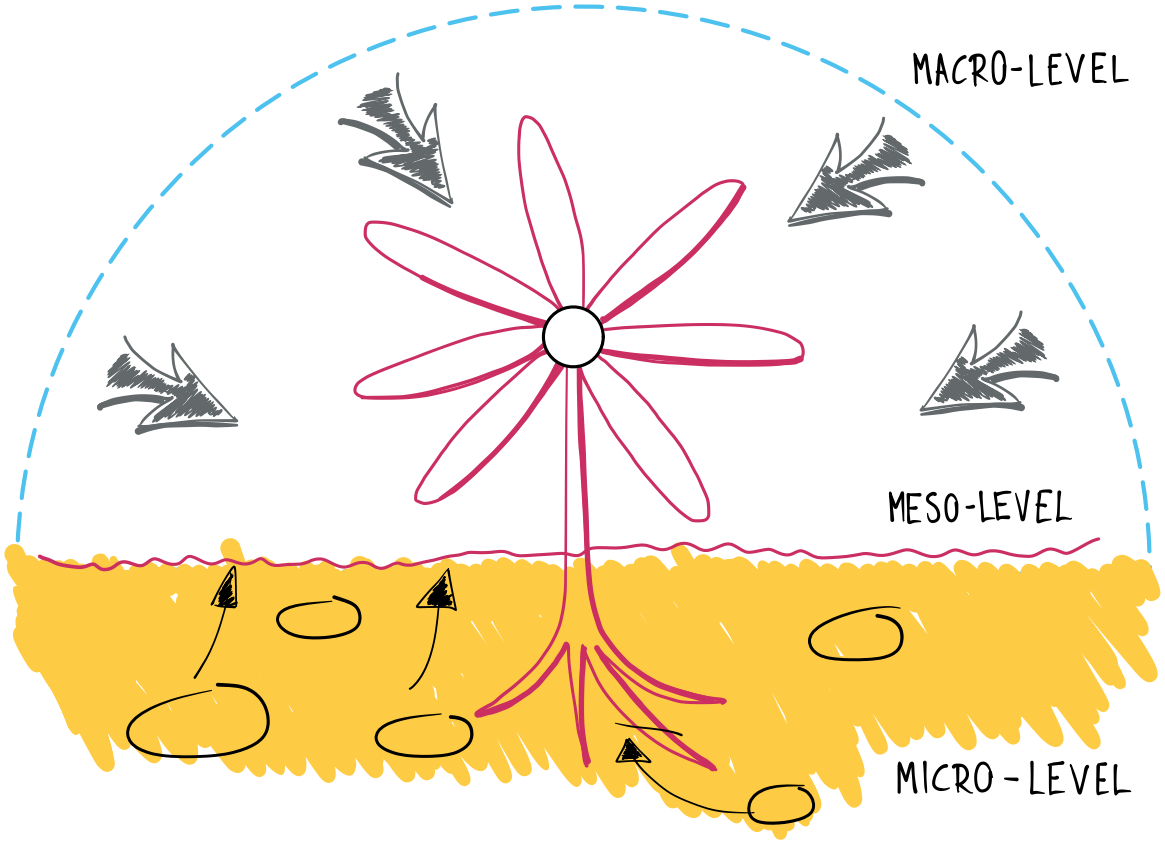
Steps

STEP 1. Define your system and yourself

Sketch out a large version of the canvas on a piece of paper. The daisy accounts for the meso-level with its petals (meso-level dimensions) exposed to the sky (macro-level) and the roots in the soil, which accounts for the micro-level. You can draw six or seven petals, depending on the number of relevant dimensions you have previously identified for your system. In any event, leave enough space to include any other dimension you can identify throughout the exercise.

Once you have the canvas, the first step is to identify the system your project is in. It is essential to be as specific as possible. If your project is about biomass energy, your system might be the green energy in cities. Of course your project may touch more than one system (forestry, land management, city energy...). If that is the case you can include them all, but bear in mind that the more systems you include the more complex the outcome. In any event you can always settle on including only one system, but factor in elements coming from the others.

Before starting with the canvas, another definition is needed: yourself. Depending on your role and/or your challenge, your starting point might be the micro-level (niche) or the meso-level (regime). It will be relevant to put your focus especially on that level and how it relates to the others. Nevertheless, whatever your level is, it will be essential to know all the levels and the feedback loops between them.



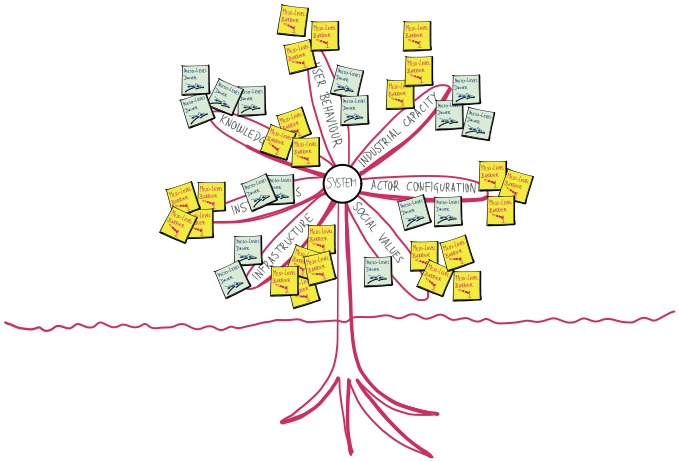
STEP 2.
The Meso-Level

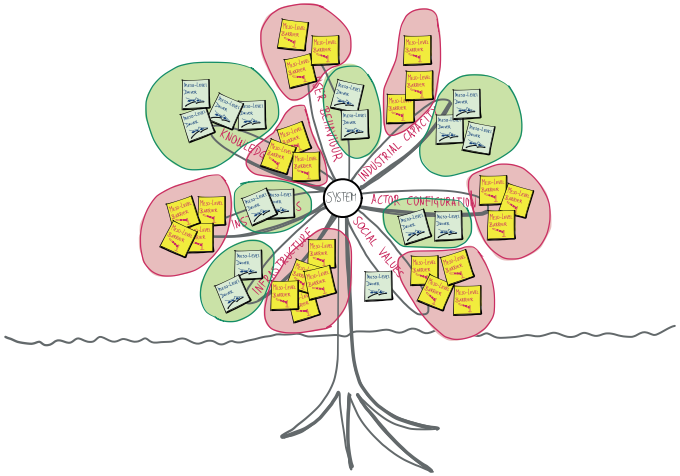
Fill out the canvas: Let's start at the meso-level, more specifically, by identifying the relevant dimensions that characterise your dominant system or meso-level. You can use the list in the example to get some guidance to identify those dimensions or domains, but bear in mind that such dimensions can and will vary in your particular case.

Then, for each dimension write down the elements that are relevant for your challenge. This is not a hypothetical exercise but rather a description of your system. Try thinking of those elements in different dimensions that can be acting as BARRIERS for radical change (e.g.: your innovation) , causing lock-ins. For instance: an existing regulation, a dominant technology, a big and well established competitor, etc. Besides that, other constituents may act as opportunities and drivers for change. Think of potential partners, allied players, business angels, etc. Eventually, you may identify other elements characterising the meso-level, yet you don't have a clear idea about their influence on your project.

To take this step, spend 5 or 10 minutes working individually and writing down one element per post-it. Try to be as concrete as possible, mentioning specific institutions, regulations, describing behaviours, etc. Examples: fossil fuel infrastructure, technologies, actors, powerful energy companies, EU-energy policy, low level of awareness, etc. Then, as a group, discuss the elements and put as many ideas as possible on the canvas. Don't reject any idea at this stage of the dynamics. As you put the elements on their respective petals (dimensions) try to form clusters of barriers and clusters of drivers. It will help you in the forthcoming analysis.

> Flourishing Multi-Level gives you a simple depiction of the highly complex and somehow counterintuitive socio-technical system made up of the micro, meso and macro-level.

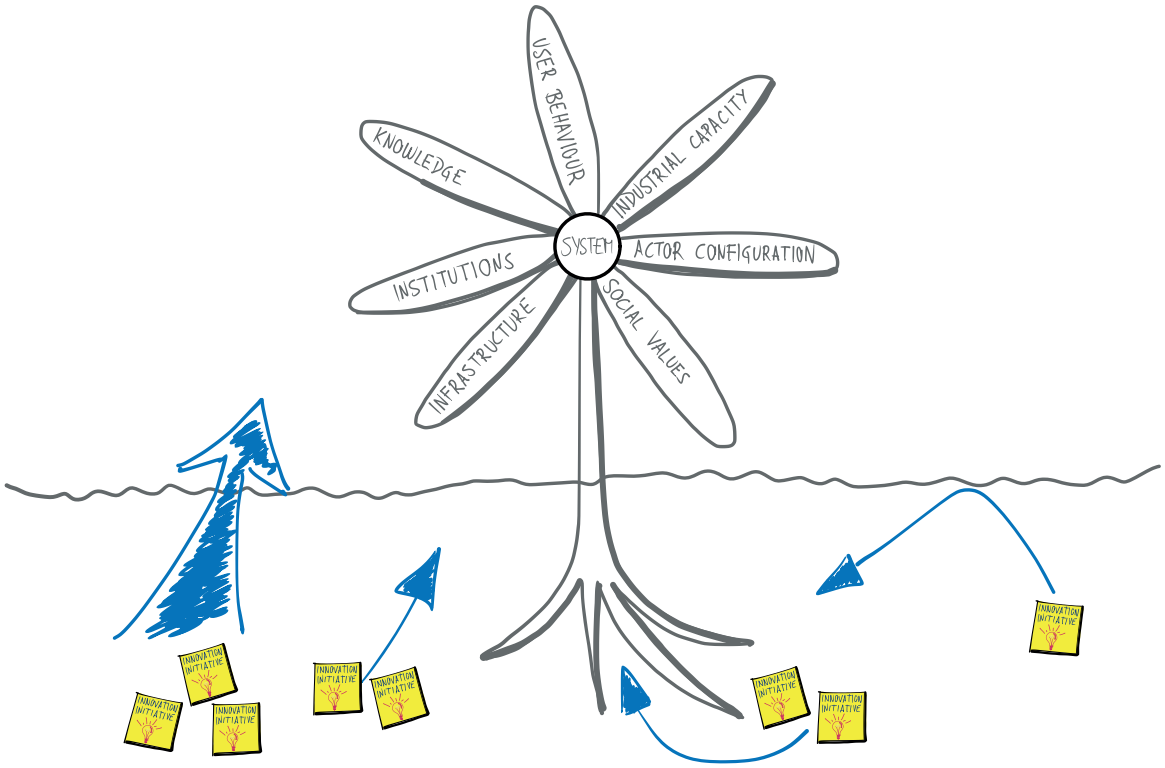




STEP 3.
The Micro-Level

In the soil under the daisy there are plenty of seeds ready to scale up and tap into the mainstream meso-level. Identify and write down experiments or other innovation projects that could be important for your challenge. They represent the OPPORTUNITIES for CHANGE.

Depict potential allied actors or initiatives; use arrows to depict the impact these experimentsare causing on the meso-level, according to their maturity and momentum.



Look for experiments related to yours and which synergies might arise from them.

Depict potential allied actors or initiatives, whether they are in your same field or in another, but related one. Use arrows to depict the impact these experiments are causing on the meso-level, according to their maturity and momentum.

Similarly to the meso-level, there may be potential barriers or hurdles for your innovation in the niches for innovation or micro-level. Pay attention to those experiments and initiatives that might compete with yours, or even block the development of your project.

As in the step 1, spend 5 to 10 minutes working individually and then go for a plenary or group round.

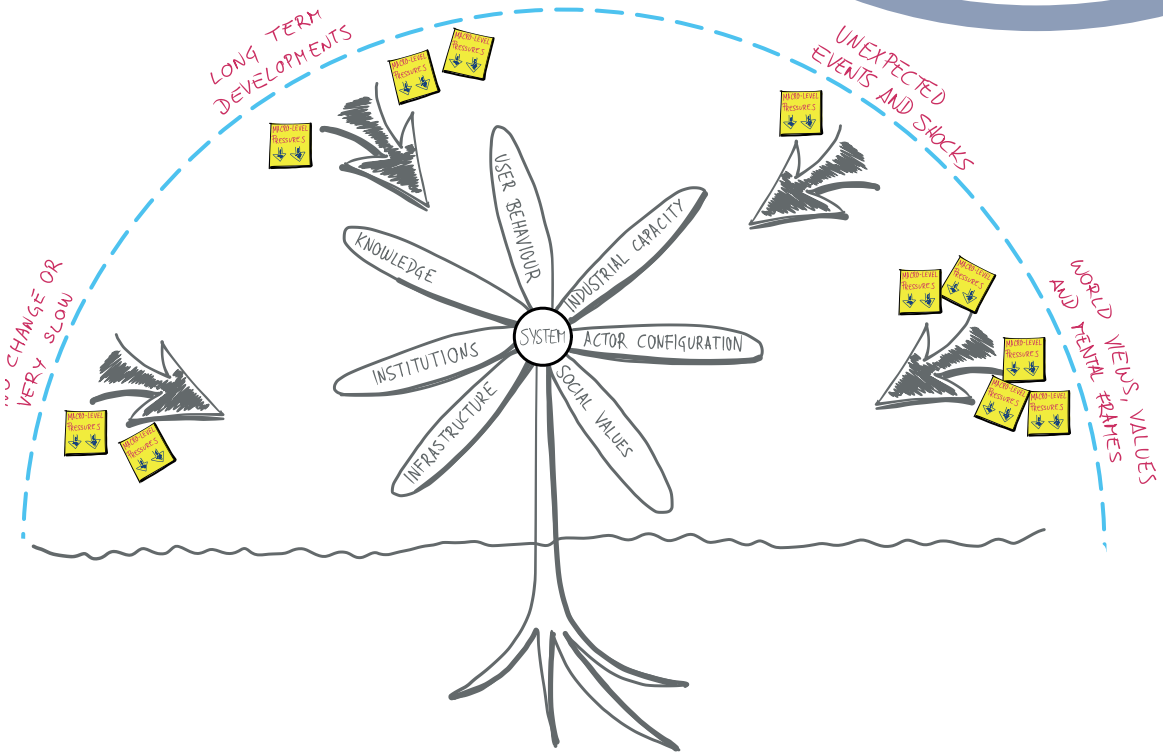
Introduction to transition management. Short course. The Climate-KIC. Zurich, 2015. (Switzerland). http://goo.gl/DtLLRn

Boosting sustainable economy in rural areas. Innovator Catalyst series. The Climate-KIC. Budapest, 2015 (Hungary). http://goo.gl/iufdY4

STEP 4.
The Macro-level

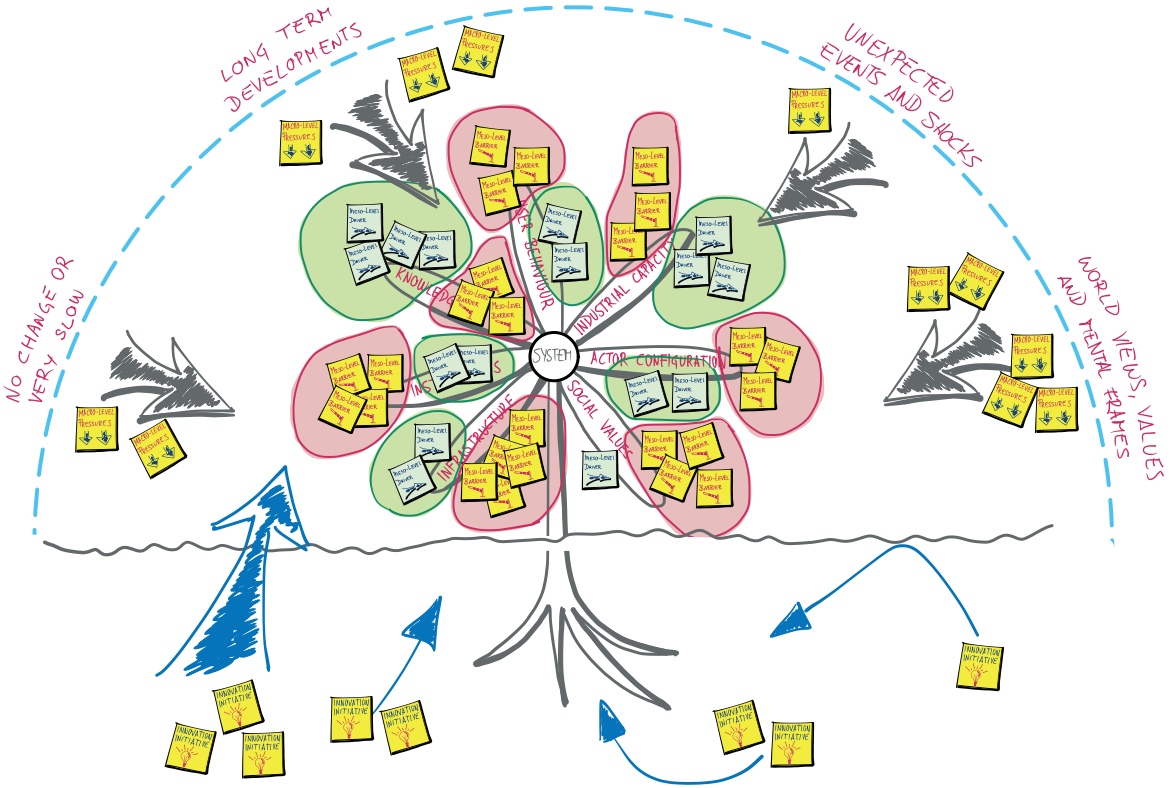
The last part of the canvas is the sky, accounting for the macro-level. Think about the main developments, trends and crises that characterise the macro-level at this moment. These factors mainly work as DRIVERS for change and innovation; putting pressure on the meso-level: Climate change, economic growth, increasing/decreasing prices, financial crisis, etc. In any case, bear in mind that these factors might also act as a barrier or a hurdle for your specific innovation.

With the same dynamics as in the earlier steps, spend 5 to 10 minutes writing down as many factors as you can think of and then work in a group putting your ideas on the canvas and discussing them.



STEP 5.
Completing the canvas

Once the elements for your Multi-Level have been decided, try to identify and sketch the interplay between, and within levels. Draw arrows from one level to another when a direct effect can be described. Do the same for those relations within the same level: you can identify clusters of interest, initiatives that are somehow related, etc. Remember that the system is not a collection of elements but rather a dynamic set of elements, and the interplay between them.



STEP 6.
Debrief

Equipped with the new picture, reflect on the general system in which you are embedded and how its components and dynamics can affect your innovation, its maturity and scaling-up process. Try to set out a pathway of relations for your innovation to flourish under these conditions. You may want to use the following questions to spark for your discussion

Do you think the system is ready for change and innovation? Have you been able to identify some lock-ins that keep the system trapped in the dominant solution or paradigm? Have you identified specific barriers for your innovation in the meso-level? If you needed to design a strategy for scaling-up your innovation would you say you can draw on potential allied stakeholders in the meso-level? How could you overcome the identified barriers for your innovation? Do you think the system would vary significantly if you shifted the geographical location or boundaries? What are the pressures from the macro-level like? Are they causing a real impact on the meso-level? What impacts? Can you see a window of opportunity for your innovation? If so, what causes are underlying such an opportunity window?

> Do you think the system is ready for change and innovation? Have you been able to identify some lock-ins that keep the system trapped in the dominant solution/ paradigm?

Tips

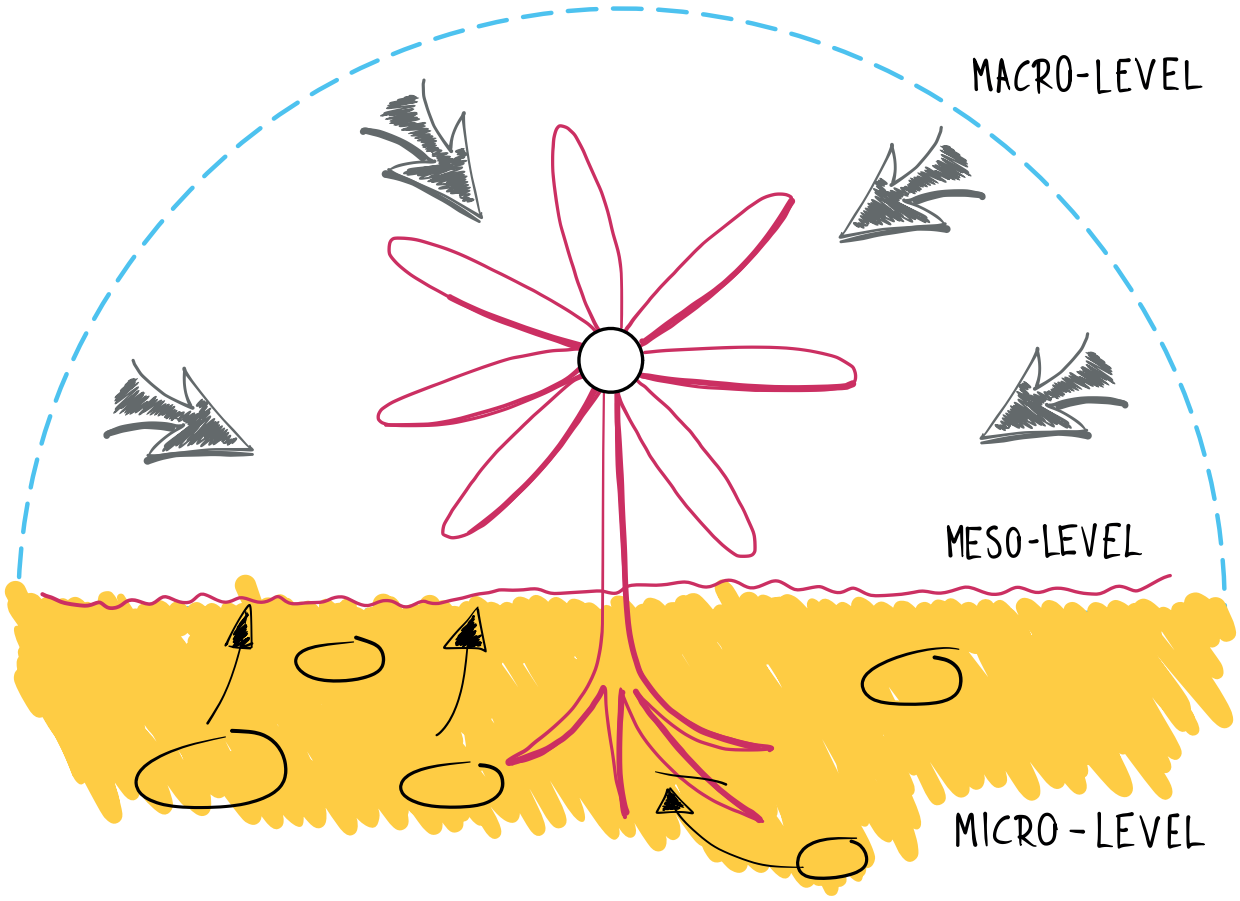
- When identifying constituents from the meso-level, bear in mind the geographical boundaries you have for your project and think of barriers and drivers for your innovation.
- While working on the micro-level, look around your project sector and look for those initiatives that might feed yours in some aspects you didn't consider before. For instance, a new collaborative consumption initiative, a micro-funding project, etc.
- Likewise think about other projects you can learn from.

Find out more

http://www.climate-kic.org/transitions-hub

Flourishing multi-level

The Canvas



De Vicente López, Javier and Matti, Cristian (2016) . Visual toolbox for system innovation. A resource book for practitioners to map, analyse and facilitate sustainability transitions. Transitions Hub series. Climate-KIC, Brussels 2016.

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Tool 10
Fishing for barriers

Finding out the way

Finding out the way to complete your project calls for you to identify the big barriers that the project is facing and chunk them down into more concrete causes and manageable problems.

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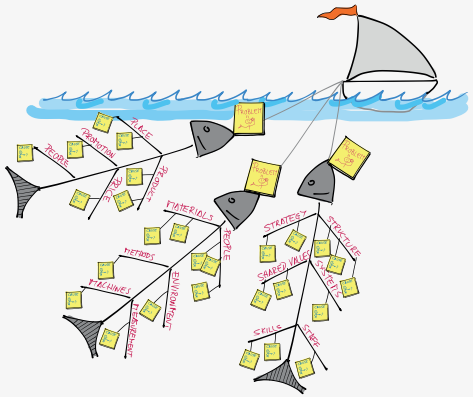
Fishing for **barriers**



HOW MANY	From 1 person to groups of 8 people.
HOW LONG	40-60 min.
DIFFICULTY	Medium-High.
WHAT YOU GET	A thorough graph with a categorized list of barriers (problems and their causes) for your innovation (project, challenge...) as well as the relations between them.
WHAT YOU NEED	You need a description of your big problems coupled with a fuzzy idea of the solution you set out and the system in which you are embedded (stakeholders, technologies, regulations...)
WHAT IS NEXT	After getting a breakdown of the problems as well as of their causes, you are ready to move forward and start exploring the pathway for the future. You may want to go for visioning and backcasting tools, or you could opt for drawing up an action plan for solutions stemming from the list of problems.

What it is

Fishing for barriers is a visual tool that helps you to identify the main bottlenecks blocking the success of your project, as well as their roots, by breaking them down into smaller pieces and problems. The tool grew out of mixing the the Shikawa diagrams (Kaoru Ishikawa, 1968) and the speed boat (Luke Hohmann, 2006).

When to use

When you are analysing the system around your project.

Why it is useful

Despite its simplicity, the tool helps you to systematically identify the main barriers for your project, in a way that can lead you to find out hidden and unknown problems. With these new insights you will be better equipped to steer the project towards success.

The tool also helps you to prioritize those problems that are urgent and therefore provides you with a short-term strategy that might prevent your project from derailing.

Finally, the tool fosters the stakeholder integration, integrating different perspectives and expectations under the same structure, which will give you a richer vision of the range of problems affecting your project.

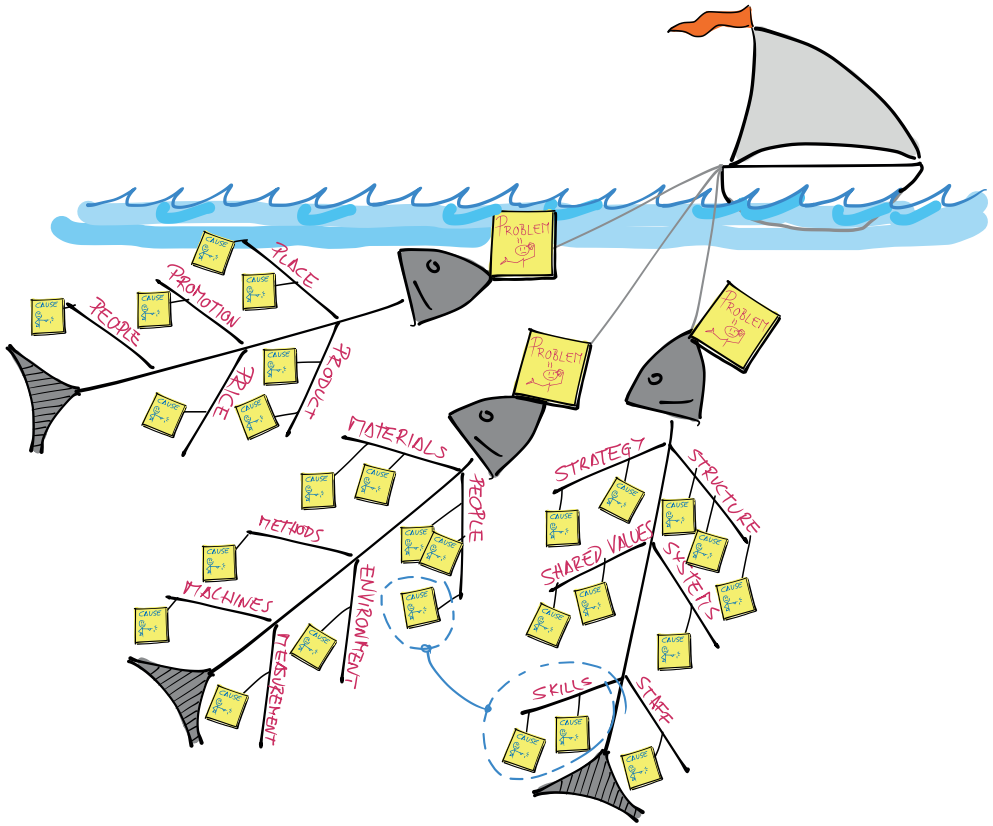
Steps

STEP 1.
Define yourself

Take a large piece of paper and sketch out the fishing canvas. The boat represents your project trying to move forward. In this case, it is trying to scale up and break into the dominant system to elicit a transformative change. The fish account for types of barriers hindering the performance of the project. Moreover, the heads of the fish account for one big problem you are facing. For instance, a weak network with other potential partners, high competition from the dominant system, lack of fitting with the current market, etc. Then it comes to the fishbone. The fishbone accounts for those problems and causes making up the main barrier. For instance there might be infrastructure causes underlying the lack of market fit, but also user habits, different regulations, etc. Each of these categories would account for one of the branches of the fishbone.

STEP 2.
Brainstorm problems

The first step is to run a traditional brainstorming session to come up with as many problems as possible. First, spend some minutes to individually think of the problems you think you are facing. Then write them down on post-its (one problem each) and start a round of explanations in which everybody introduces and explains their ideas, putting them on a wall. After introducing all the problems, start a discussion making clusters, and three or four problems as the most important for the project. In the process you may want to rephrase some problems to better explain a specific category or cluster.



Green skills for boosting transition in water management Innovator Catalyst series. The Climate-KIC. Valencia, 2014 (Spain). https://goo.gl/llq0oS

Green skills for boosting transition in water management Innovator Catalyst series. The Climate KIC. Valencia, 2014 (Spain). https://goo.gl/llq0oS

STEP 3.
Fishing

Draw a fish for each problem you have decided to work on (remember to limit this number to three or four problems only), put the post-it with the problem on the head of the fish and start chunking down the problem. You can do that by asking yourselves the question WHY is something happening? Write down the answer and stick it on one of the fishbone branches. To carry out this process you count on two alternatives:

First alternative

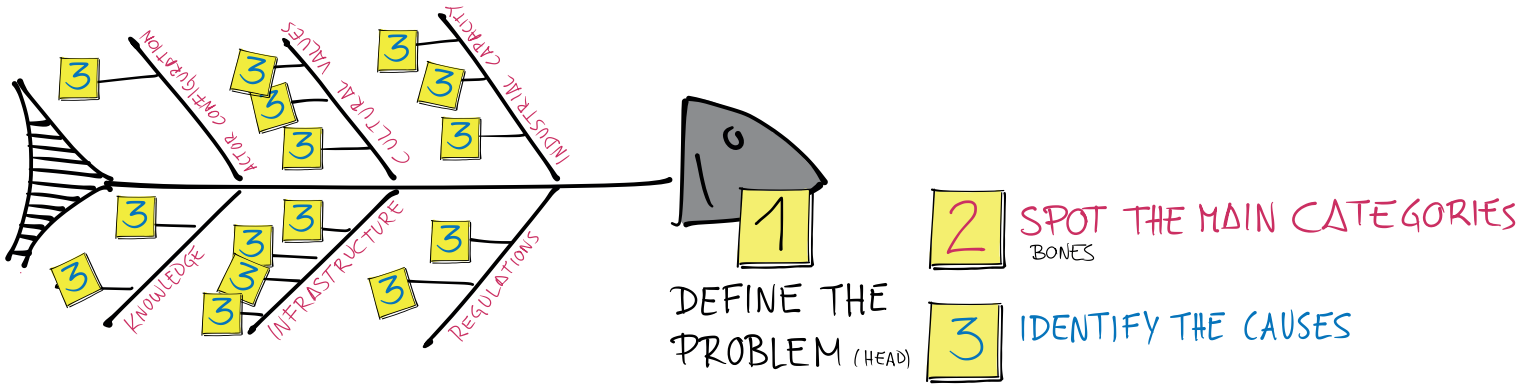
To consider the big barrier, decide those categories of causes you think are underlying the barrier and that you want to dive into. For instance, if your barrier has to do with the dominant system and the difficulties to break into it, you could use the meso-level domains (see the Flourishing multi-level tool) as categories: infrastructure, institutions, knowledge, user behaviours, cultural values, industrial capacity and actor configuration. Alternatively, you could go for something less systemic and include categories such as the place, the price, the type of product, communication issues etc. If this is the case (that your barrier is more specific and limited), then you might use a project oriented categorisation: material, people, methods, machines, measurements, etc.

After deciding the categories, draw a branch accounting for each category and then start identifying causes under each fishbone branch. Write one cause on one post-it and place them on the fishbone.

Second alternative

The second alternative starts the other way around. That is, you first brainstorm the causes beneath the barrier. You need to write down one idea per post-it and then make clusters of ideas along the fishbone. Each cluster will account for one branch in the fishbone. The second part in this alternative is to label each category or branch, according to the ideas within the cluster.

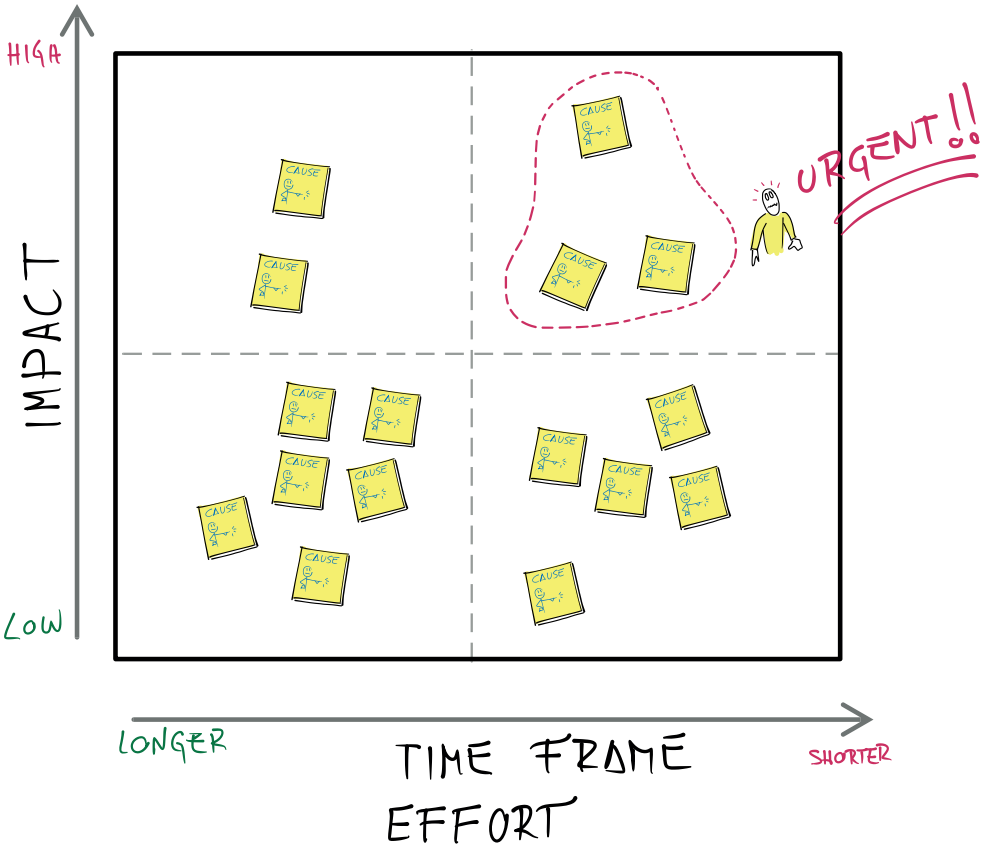
Either alternative is perfectly good and it will depend on your starting point to pick out one or the other. If you don't have an in-depth knowledge of the system, the first alternative can guide you in the process of systematically scanning the possible causes behind the barrier. Conversely, if you have in-depth knowledge of the system and the project, then you could feel the first alternative is limiting you. Then go for the second alternative.



Pioneers into Practice Programme. The Climate-KIC. Valencia, 2014 (Spain).

STEP 4.
Prioritizing

The last step of the tool is to prioritise the problems you need to sort out in the short term. To do that you can use any method you know, ranging from a simple dot voting to a multi-criteria process. One alternative at the half way point between the mentioned options is to assess each cause according to its impact on the project and the time frame for those impacts (see the figure). Then, those causes/problems falling on the short term and high impact quadrant will be the most urgent for you to start taking action against.



To prioritise, you can use any method you know, ranging from a simple dot voting to a multi-criteria process.

STEP 5.
Debrief

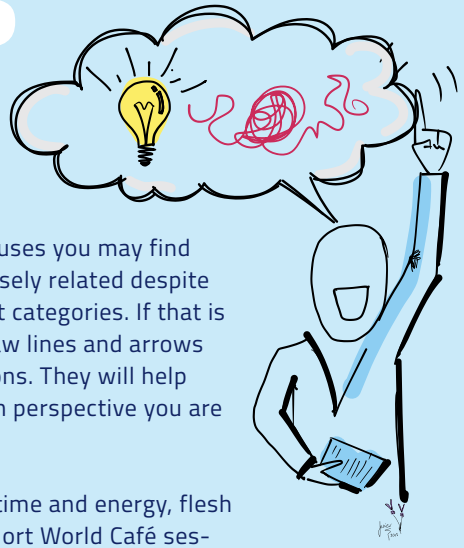
You gathered a comprehensive list of problems holding back your project progression; now spend some time reflecting on the outcomes you obtained and the process used to get them.

Do you think you have a clearer idea about the barriers you are about to face? Did you find something new or unexpected about your project and the system? Is there any domain or category the importance of which outweighs the others? Did you use the same categories for all the barriers? Why? Do you think the main barriers are related to your own performance as a project team or come from outside, from the dominant system? Do you think other projects around yours are facing the same type of barriers? Do you feel you can solve these problems alone or with a lineal approach? Or do you think you will need a kind of system perspective?

Did you find the process of filling up the canvas difficult? If so, which part? Did you find anything missing? What? Was the prioritisation step easy to take or was there a lot of discussion before decisions were made? What would you make different in this tool?

Do you think other projects around yours are facing the same type of barriers?
Do you feel you can solve these problems alone or with a lineal approach?

Tips



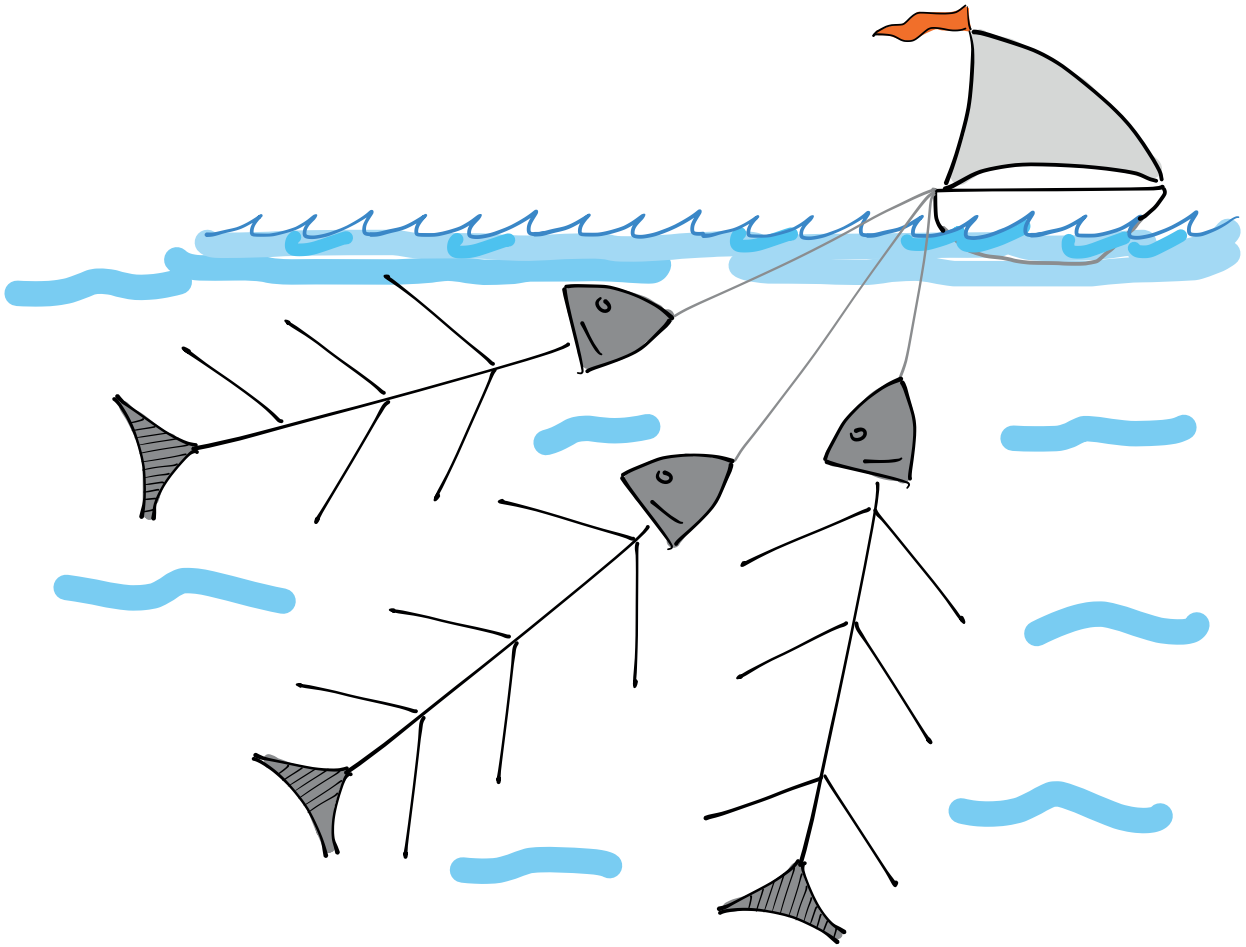
- While thinking of causes you may find some of them are closely related despite belonging to different categories. If that is the case, post-it, draw lines and arrows depicting such relations. They will help you to get the system perspective you are looking for.

- If you have enough time and energy, flesh out the tool with a short World Café session to brainstorm solutions. If you have identified urgent causes, split the team into one mini-group per cause. Each group will work on ideating solutions for each cause. Then start different rounds of discussion following the world cafe rules until everybody has worked on all the causes. To find out more about the World Café procedure visit http://www.theworldcafe.com

Find out more

http://www.climate-kic.org/transitions-hub

The Canvas



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3

Visioning and backcasting the future

Envisioning the desired future and learning from that future becomes necessary when it comes to system innovation.

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Visioning

What is visioning?

VISIONING is about picturing the desirable future and describing what it might look like.

To plan the future, you need to imagine how it might look. There are lots of ways you could do this. Forecasting is one of the most well-known techniques, massively used in strategic planning. It involves looking at the data you have and current trends you can see today. Using that information, you can predict what the future might look like. But, since we cannot foresee the future, we must plan for multiple contingencies. The Future Scenarios technique involves creating alternative futures based on the trends you see, or decisions being made today. Both Forecasting and Future Scenarios can provide useful insights into possible futures.

> Because predictable doesn't mean desirable, sometimes you need a more radical approach. Visioning helps you see possibilities you didn't know were there before. Consequently you will be able to move forward to a system innovation perspective.

However, because predictable doesn't mean desirable, sometimes you need a more radical approach. An approach which isn't based on what you can see today. By looking beyond what you see today, Visioning helps you see possibilities you didn't know were there before. Consequently, you will be able to move forward to a system innovation perspective.

Visioning is a foresight method that attempts to create a feasible and desirable future scenario in which current problems are solved. Visioning answers the question WHAT... What is my desired future? What does it look like?

Why visioning?

System innovations are designed to bring about a fundamental and radical change in the way societal functions are performed.

By building a clear long-term vision of the future you aim for, you will avoid falling into obvious thought patterns and becoming ensnared by existing structures.

What does a vision look like?

A vision is not a daydreaming outcome* in which an ideal but utterly unrealistic and impossible future is described. Instead, a vision has to be credible, practical and feasible enough so as to be useful.

Radical innovation idea.
A radical idea/innovation should underpin your vision. Without a radical innovation, visioning is not necessary and you could opt for doing foresight scenarios or developing exploratory scenarios.

Socio-technical.
Since you aspire to elicit a transformative change in the system, your vision has to comprise both technical and social elements.

Medium-term to long-term horizon.
The time scope has to be long enough for innovation to grow and take over but short enough to be feasible and credible. 10

* although "dream-sessions" are used as one of the techniques to help you come up with a new vision.

to 20 years is a commonly used time-frame.

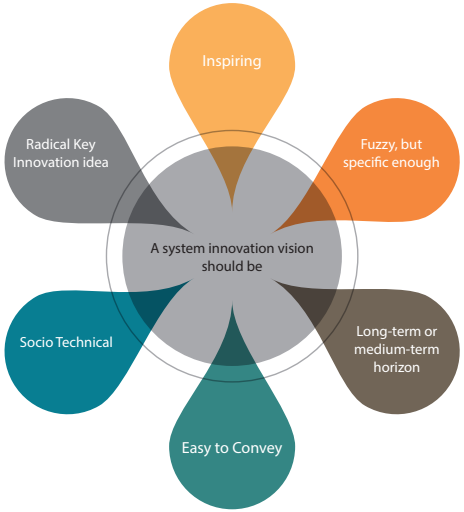
Inspiring
A vision should inspire others to follow and to adopt it as their own vision.

Easy to convey
If you want to inspire others, your message has to be simple and clear.

Fuzzy but specific enough.
A vision of a future in which unknown technologies are probably involved has to be fuzzy. Yet it should be specific enough to allow for actionable plans and events.

How to build a vision?

Trends, statistics or expert knowledge can be used to build out a vision. Yet since it has to be comprehensive and disruptive, more open and participatory approaches are used. Storytelling-based techniques, such as dream-sessions are becoming more and more common.



On May 25, 1961, the U.S. president John F. Kennedy stood before Congress and proposed that "this nation should commit itself to achieving the goal, before this decade is out, of landing a man on the Moon and returning him safely to the Earth".

It is probably an archetype of a vision. It may not be socio-technical, but it is absolutely radical, with a 10-year time horizon, utterly inspiring and completely easy to convey. He didn't explain how to achieve the goal but the vision set a pathway for that vision.

3 Visioning and backcasting the future

Tool 11
Ocean of opportunities

Tool 12
Visual story

Tool 13
Future radars

Tool 14
Socio-technical roadmap

Backcasting

What is backcasting?

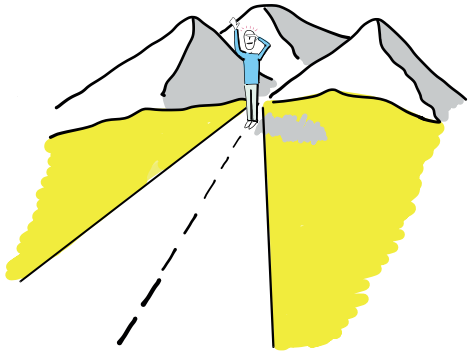
Backcasting is a technique that makes you look back from a future scenario, identifying and assessing changes and actions for that future to come true. It allows managers to make a plan and set an agenda for change by exploring the feasibility and implications of achieving certain changes. Backcasting is mainly used in policy making, strategic planning, resource management and corporate culture, especially when dealing with complex systems such as social or environmental.

Backcasting answers the question HOW... How can I achieve my envisioned FUTURE?

Why do backcasting?

As you have seen in the visioning section, when we are dealing with complex systems, forecasting methods are not enough. We first need to envision the future we aspire to achieve, regardless of the current trends and system stages. Then, the question is: What is needed to achieve such a future? The context for that question is a complex system and so is the answer. It can entail new technologies, new political or economic frameworks, significant changes in actor configuration, cultural and formal rules, etc. But most importantly, it can comprise more than one alternative, sometimes interwoven. Thus, we need a tool to pin down those changes and to asses them in terms of feasibility, control, impact, effort, etc.
Therefore, backcasting allows organisations to consider what actions, policies and programs are needed today that will connect the future to the present. In other words, what actions have to be taken to achieve the future. Some of the advantages of using backcasting instead of other foresight techniques are:

- Backcasting reminds participants that the future is not linear, and can have many alternative outcomes depending on decisions made and the impact of external events on an organisation.



- It prevents managers from developing strategies that just solve the problems that we perceive today with the solutions we have at hand.

- Backcasting keeps plans off extrapolating present conditions.

- It is a quick and visual tool

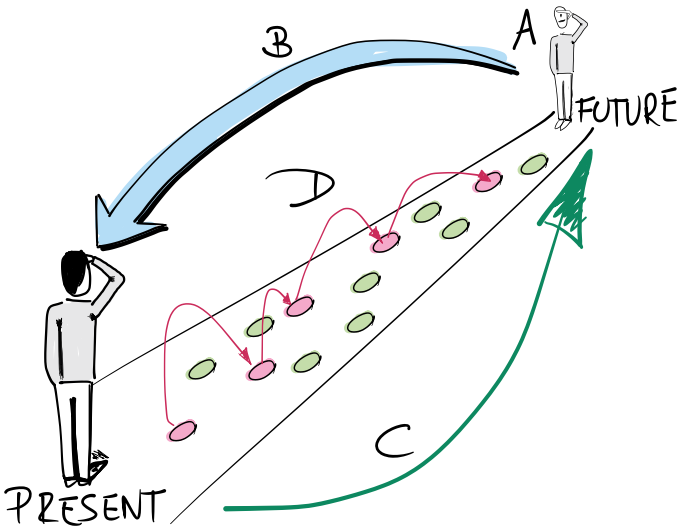
How to do backcasting

Awareness

Backcasting starts with a twofold understanding of your problem. On the one hand you need to start with a specific vision of the future scenario you want to achieve. For such a scenario you may use the visioning technique, fulfilling the six features a system innovation vision should have. The second element of this starting point is your current state, the present time. You have to be aware of the system in which you are, as well as of the problem or challenge you are facing. You can resort to the Pentagonal problem tool, the Context map or the Flourishing multi-level tool to get more awareness.

Backwards

Now you have to put yourself in the envisioned future. Imagine that vision has been achieved and then think back from the future to the present conditions. In the process, identify



necessary changes for filling the gap between the vision and the present time. There will be many changes and some of those you spot will elicit more and more changes. In the picture you can see these changes as the green and red dots.

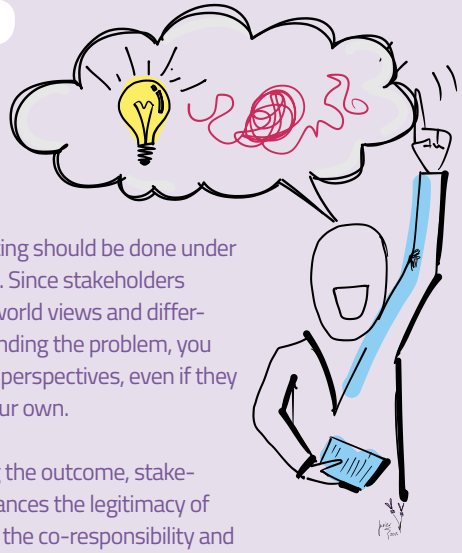
Create solutions

Once in the present time, backcasting takes you to the future moving forward and deciding the actions to be carried out for the changes happen. As you move forward to the future you need to analyse the feasibility for the changes to come true and the actions needed for that to happen. Given that you begin with the end in mind, foster more creative solutions and see the connections and consequences of those solutions.

Decide on priorities

The final outcome is to set your own strategy for change, based on those actions you consider as a priority. In this regard your criteria as a specific stakeholder will guide your decisions about priorities.

Tips



- Visioning and backcasting should be done under a participatory approach. Since stakeholders have radically different world views and different frames for understanding the problem, you should incorporate their perspectives, even if they are wildly different to your own.

- In addition to enriching the outcome, stakeholder participation enhances the legitimacy of that outcome, increases the co-responsibility and broadens the reflexivity scope.

- In this regard, visioning and backcasting should be updated regularly, given that constraints and resources (including knowledge and perspectives) change all the time. Consequently, a learning and reflecting process should accompany these tools.

- As a consequence of the different stakeholders' perspectives, they all have their own priorities and agendas. Involving them in the backcasting process will allow you to draw more than one plan from the same process.

- In complex and wicked problems, as sustainability is, the problem definition might come to focus after adopting a future vision. In such cases, the vision is the seed for the challenge and not a consequence of it.

Tool 11
Ocean of opportunities

Ideation
Looking at the future

Climate-KIC

Ocean of **opportunities**

What it is

Ocean of opportunities is an ideation tool aimed at identifying gaps in the market that might become windows of opportunity. It frames the current solutions by two main features or dimensions and helps you to map out the range of current solutions within such variables. E.g.: the mobility system is bound by use (individual/collective) and access (private/public).

The tool is inspired in the Growth-Share Matrix (Henderson, 1973), the Blue Ocean Strategy (Kim and Mauborgn, 2005) ,and the White Spots (Carleton et al, 2013).

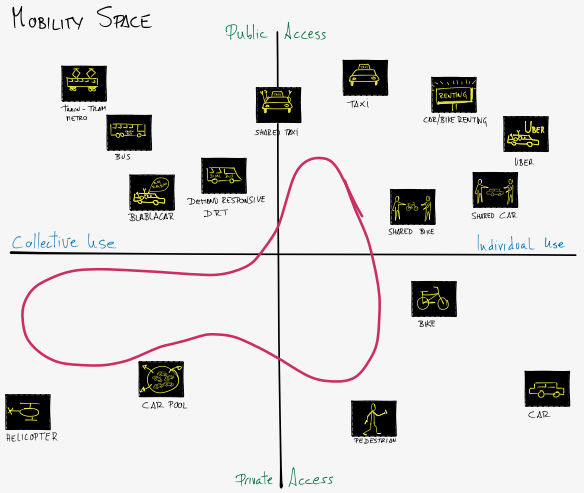
When to use

When you have to imagine radical innovations or alternative solutions for a current problem and need a hand with the ideation process.

Why it is useful

Visioning requires a lot of creative thought and energy so sometimes it's helpful to warm up first. Ocean of Opportunities is one of the many tools and activities you could use to do this. Compared with other ideation tools it first guides you to discover gaps in the market, and then gives you the opportunity of centring in on those gaps to imagine new ideas and solutions.

At the same time, since the dominant system (market) is depicted by means of two of its dimensions, you can find out which system's dimensions are relevant when it comes to designing solutions.



HOW MANY	From 1 person to groups of 10 people.
HOW LONG	30-40 min.
DIFFICULTY	Low.
WHAT YOU GET	A visual map of the current technologies and solutions for your challenge, mapped out according to a couple of variables. As a consequence, you can spot the spaces for those variables with no solution in the market. Those spaces might provide a window of opportunity to your project.
WHAT IS NEXT	
WHAT YOU NEED	A basic idea of your challenge and the current solutions.
	Now you can move on to envisioning a future in which the solution comes from some of those empty solution spaces you spotted.

Steps

STEP 1. Draw the canvas and pick out variables

The tool is designed as a 2x2 matrix in which two system dimensions are depicted by the axes and the solutions are scattered in the defined space. Therefore, draw the canvas with the matrix and select two features from your dominant system (meso-level, regime) that are characterising the solutions in the market. For instance, if your project is about mobility solutions, you might want to try with the access to the mobility solution (public-private) and the way of using those solutions (individual-collective).

STEP 2. Define extreme values

Define the extreme values of each axis. If possible, avoid quantitative scales and go for qualitative endpoints. You may think of conceptual or provocative values such as "factual/perceived", "fossil fuel/renewable energy", "Affordable/expensive", etc. In any case, avoid using judgements as categories, such as "better" or "negative". Once endpoints are defined, place examples of businesses in each matrix's corner of the matrix. In case you cannot identify those "extreme businesses" try a different set of endpoints or a different combination of features.

STEP 3. Define extreme values

Look for the current solutions accounting for combinations of two values of the variables. Plot as many examples as you can picture. When you finish, what you get is a map of the full ocean of solutions in the dominant system.

STEP 4. Define extreme values

Identify blank gaps where no solutions have been developed, they represent windows for innovation. Run a brainstorming session about the kind of service/business that could be created within that combina-

Green skills for boosting transition in water management Innovator Catalyst series. The Climate-KIC. Valencia, 2014 (Spain). https://goo.gl/llq0oS

tion of variables and offered to the market. Use post-its to put on the empty space as many solutions as possible. Then you can start an open discussion to distil them down: Is it a disruptive innovation? Does it look feasible, affordable, etc.? Would it make a long-term impact on the regime? After that you will get a short list of potential innovations for your project.

STEP 5. Try it out with different variables

Try a different pair of features and look for new windows of opportunity. This process can be iterated as many times as dimensions/features you consider relevant for your system. By doing that, not only new windows of opportunity will arise but also you will be able to assess the importance of such features in terms of relevance for the system performance.

STEP 6. Debrief

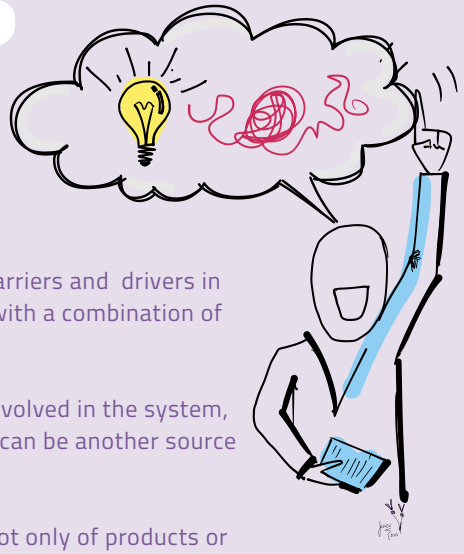
After a couple of iterations with different variables for the axes, take a step back and reflect on the outcomes and the process.

Did you find it difficult to come up with different variables for the axes? Did you feel comfortable using qualitative scales instead of quantitative ones? Is there any variable which stands out from the average? Were they all relevant for the system?

Did you find many opportunities or was it a difficult process? Would those opportunities for innovation be able to transform the system? Do they entail concepts such as actors' involvement, social value, co-creation, etc.? Did you find any significant differences in the maps between iterations? Did you find out new ideas when the axes were changed?

> Try a different pair of features and look for new windows of opportunity.

Tips

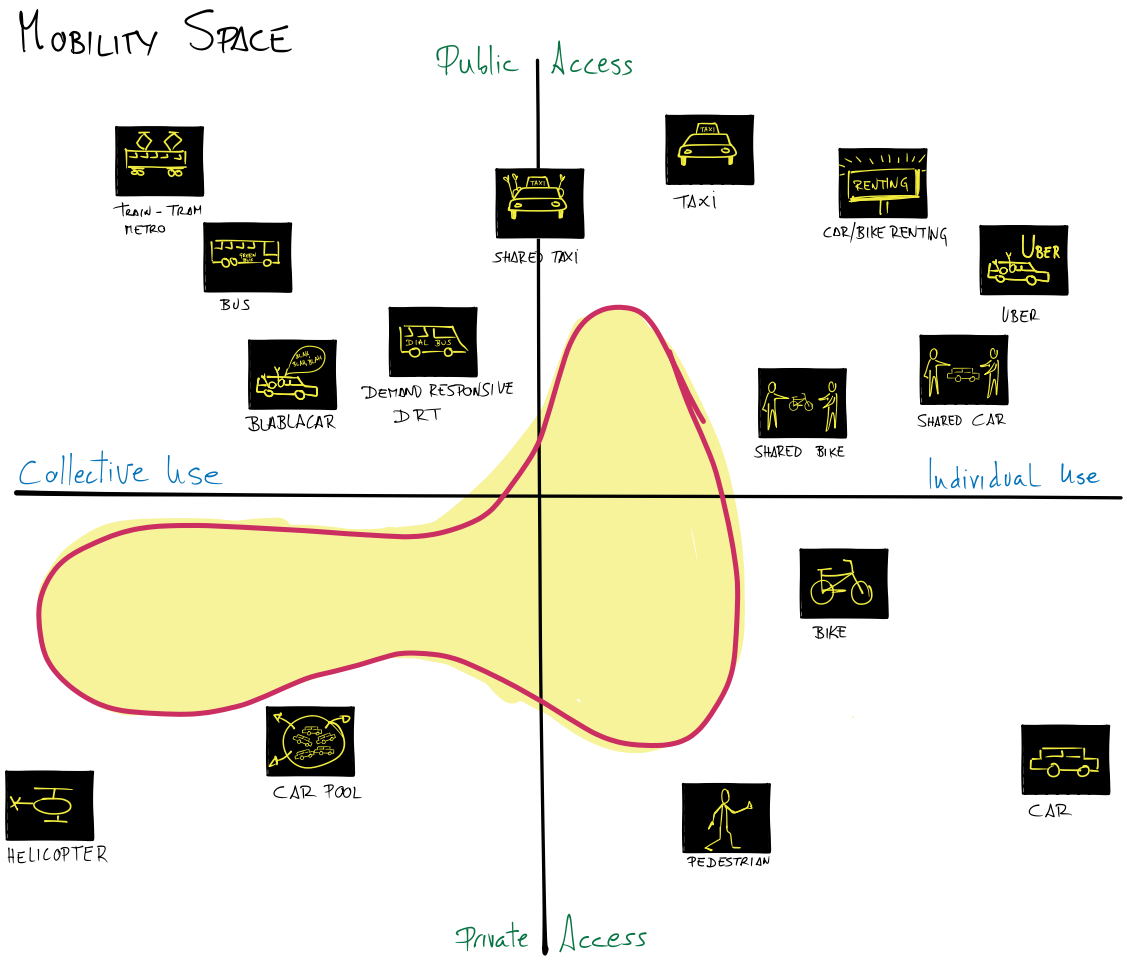


- Identify the main barriers and drivers in your regime and try with a combination of them for the axes.
- The stakeholders involved in the system, or the role they play, can be another source for axes definition
- Think of services, not only of products or business-as-usual as fillers of your matrix.
- Use arrows to depict evolutions or services taking up more than one quadrant.

Find out more

http://www.climate-kic.org/transitions-hub

The Canvas



De Vicente López, Javier and Matti, Cristian (2016) . Visual toolbox for system innovation. A resource book for practitioners to map, analyse and facilitate sustainability transitions. Transitions Hub series. Climate-KIC, Brussels 2016.

Tool 12
Visual story

Visioning

Learning from the future. Visual Story is a visioning method which encourages you to suspend disbelief and imagine a future so brilliant that your success is on media front pages everywhere.

eit Climate-KIC

Visual **story**

What it is

The Visual story is a visual tool that helps you to imagine and describe the ideal future that would happen as a consequence of succeeding in your project. This tool is built on the Cover Story, developed by the visual meetings company The Grove (Macanufo et al. 2010). The objective of the tool is to suspend all disbelief and envision a future state that is so stellar that it landed the project/group challenge on the cover of the media. To do that, this activity challenges you to describe, with words and pictures, the successful future outcome and the process to reach it.

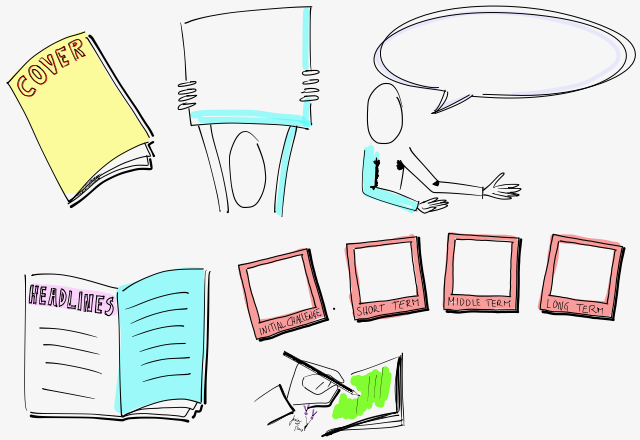
When to use

We will usually use visioning right after defining the problem or the challenge you are facing and before starting any specific project. This is the moment to build a common vision about the desired future for the challenge you have just defined (buildings, energy, food, mobility…) in an appealing and visual way.
After envisioning the future you can start conceiving projects, but it shouldn't be done before.

Why it is useful

Storytelling driven techniques are taking over more and more visioning workshops, due to their simplicity and their capacity to introduce disruptive ideas absolutely disconnected from the present time. In this regard, the Visual story follows these features, making the process of disruptive thinking more accessible and easy.

Since it suspends all connections with the present time, it facilitates the process for disruptive thinking which can lead to radical innovation. The price for that creativity is that neither feasibility nor probability are included as criteria to build the vision. As a consequence before building plans and projects on your vision you should go for a backcasting process which will root your process in the real world.



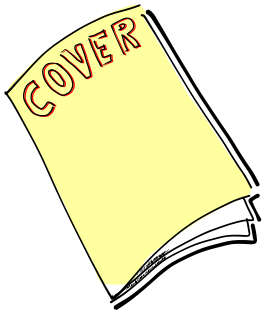
HOW MANY	From 2 to 5 people.
HOW LONG	60-90 min.
DIFFICULTY	Low.
WHAT YOU GET	A visual story of the future you can imagine.
WHAT IS NEXT	An idea about the new future you would like to achieve as a consequence of your project succeed.
WHAT YOU NEED	After envisioning your future you will need to build the pathway from the present time to that future. Hence you can go for any of the backcasting tools.

The Canvas

The canvas is made up of six parts, each one describes a different aspect of the future or the process to achieve it.

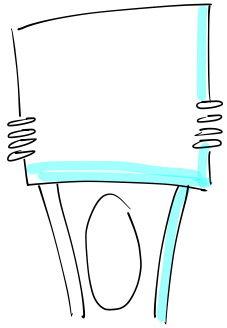
COVER

"Cover" tells the great story of your success. It should represent what the cover of main papers are saying about your story. How they describe it, what the headlines would be. This cover should convey a message both APPEALING and EASY TO CONVEY.



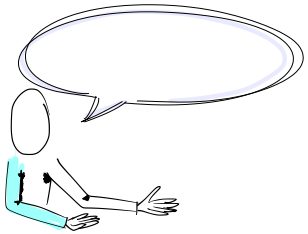
RADICAL IDEAS

"Radical Ideas" documents initial ideas for the project that drove you to this shiny future. That is, the ideas underlying the RADICAL INNOVATION. What ideas fuelled the process? Where did they come from?



QUOTES

Write down any quotation that someone in the future might be saying about your project, your innovations and your success. "Quotes" can be from anyone as long as they're related to the story. Quotes should be INSPIRING

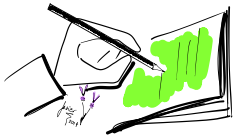


HEADLINES

"Headlines" convey the substance of the cover story. It is something other than the mere cover. It must be FUZZY but SPECIFIC enough to be turn into an agenda. Some description of the process and/or the outcome.

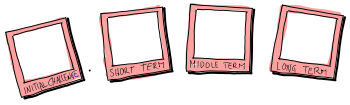
STACK OF PAPERS

"Stack of papers" reveals the background stories behind the history of your success. Pitfalls, drawbacks, milestones, new alliances...



IMAGES

"Images" stand for the initial challenge and the changes achieved in the SHORT, MIDDLE and LONG TERM. Draw some pictures depicting your achievements or milestones.



Steps

STEP 1. Define yourself and draw the canvas

This is the future, you managed to pull off for your challenge. Before starting to imagine that future, define who you are and the role you played during the process to reach the future and your 'new/adapted' role in this new future. If you are in a real project, then adopt your own roles as different stakeholders. If you are working in a training session or with no stakeholders involved, then pretend each of you are different stakeholders and play their role. This pretending game will enrich the perspectives when it comes to envisioning the future.

After adopting your respective roles, take a large piece of paper and draw the canvas with its six different sections

STEP 2. Imagine the future

Envision the future. Imagine that you are 20 years from now (or the interval you decide). What does your sustainable future look like? Depending on the challenge: Where do people live, what does it look like? How do they move, make transactions, spend their days, what does the environment look like? What social/technical options are available? Which technology is needed? How does it affect culture and the structure of society? What are important trends, and events? Could we make the future vision even more sustainable? That's visioning. Spend a few minutes to imagine individually and then start a brainstorm.

In this step, suspend all judgement and simply let your ideas flow freely. You can use post-its to write down as many ideas as you all can, describing what the future looks like. As you explain and discuss ideas, put them on a wall; make clusters and include new ideas arising throughout the discussion. Some ideas will be about technology, others regarding regulations, new ways of consumption, infrastructures, etc. After 30 or 40 minutes of discussion, a more concrete vision of the future should be emerging. It is time for you to pick out those most representative ideas for the future you, collectively, have built.

STEP 3. Fill out the canvas

Use the canvas to turn your ideas about the future into pictures, words and stories. Try to imagine what will be said about your challenge when it is achieved. The canvas will help you to narrow down the fuzzy vision you probably built in the previous step. Remember that your vision should be credible but also radical, easy to convey and inspiring, fuzzy but specific enough to be agenda permitting. Finally, it should be based on radical innovation in the medium-term to long-term horizon, encompassing both technology and society.

STEP 4. Debrief

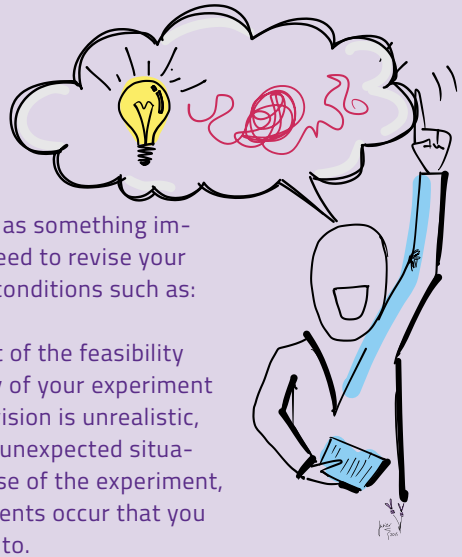
Now, with your new future in your pocket, spend some time reflecting on the outcome and the process.

Was it easy to detach from current trends and for putting your brain in a disruptive mode? Was it specific enough? Do you think it will be achievable? Was the discussion biased towards some approach or stakeholder's perspective? Do you think some perspectives were missed in the process? Did you spot the exact system "failure" that needs to be solved? Did you find many different alternatives for the future in which the problem is resolved? While you were working on the vision, did you find it easier to think about new technologies or any other dimension of the system such as new use habits, new infrastructures, new ways or social organisations, etc.? Why do you think there was a bias?

> This is the future you managed to pull off for your challenge.

Pioneers into Practice Programme. The Climate-KIC. Valencia, 2014 (Spain).

Tips



- Visioning should be a participatory tool in which a large diversity of stakeholders ensures a richer and broader vision. Therefore, consider inviting other stakeholders outside of the project or just playing different roles yourselves if you are in a training session.

In formulating the vision, you could consider:

- Other relevant experiments
- How you will link your experiment to general trends and pressures coming from the macro-level (windows of opportunity?)
- Structural bottlenecks that explain why the goal has not yet been accomplished.
- Don't give up too soon.

Don't use the vision as something immutable. You may need to revise your vision, under some conditions such as:

- An assessment of the feasibility and acceptability of your experiment shows that the vision is unrealistic,
- You encounter unexpected situations in the course of the experiment,
- New developments occur that you need to respond to.

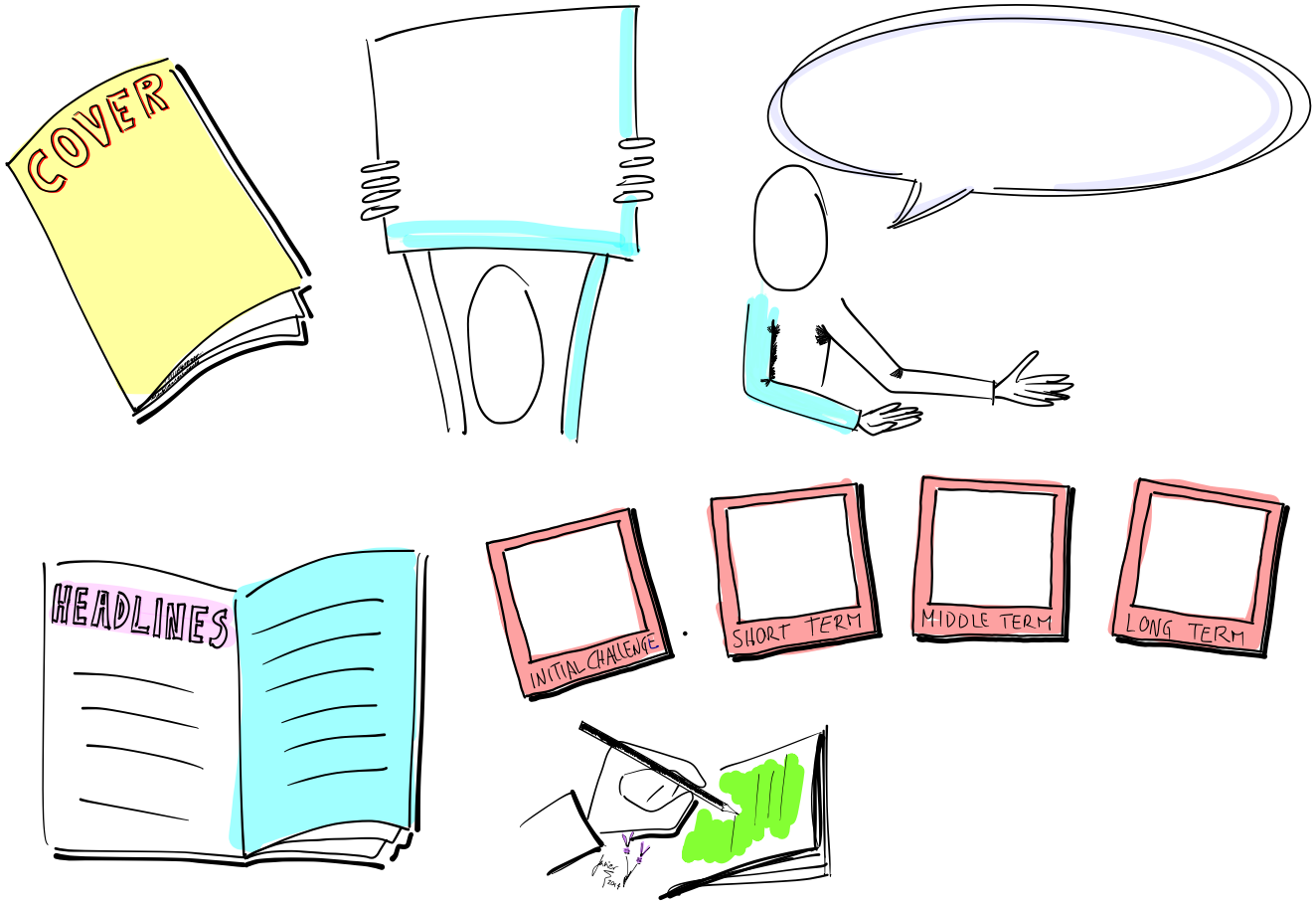
You have to put yourselves into that future and to describe it using present and past tenses.
Be creative from the very beginning and dare to draw your own version of the canvas. Remember the sections you should cover, but make up your own design, add new sections, etc.

Find more here

http://www.climate-kic.org/transitions-hub

Pioneers
into Practice
Programme.
The Climate-KIC.
Valencia, 2014
(Spain).

The Canvas



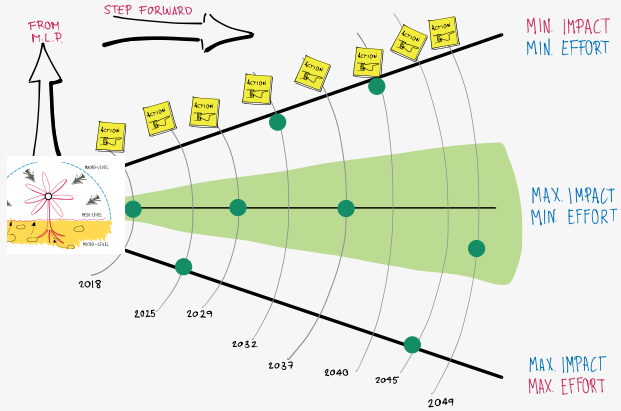
De Vicente López, Javier and Matti, Cristian (2016) . Visual toolbox for system innovation. A resource book for practitioners to map, analyse and facilitate sustainability transitions. Transitions Hub series. Climate-KIC, Brussels 2016.

Tool 13
Future radars

Backcasting
Guiding from the future

eit Climate-KIC

Future **radars**



What it is

Future radars is a backcasting method which uses time travel and a little imagination. First, travel forward in time to your ideal future. Then look back on your path to success. How did you get here? Next, return to the present day. Use your new understanding of the future to plan your path to success. These different perspectives can help you to evaluate the feasibility of your ideal future and the actions needed to get there.

When to use

When you have a long-term and complex challenge, the pathway of which is full of uncertainties and possibilities as a consequence of the systemic context (multiple stakeholders interwoven with each other, and a context also interplaying with them). Under these conditions, traditional planning can lead to your project derailing very quickly due to competitors, unexpected risks or changes not happening.

Why it is useful

By applying this tool you can plan actions equipped with a global overview of the milestones to achieve, coupled with their feasibility and the influence you can put on them to happen. This pathway of milestones allows you to elaborate a more reliable plan including alternatives in the case of unforeseen events.

HOW MANY	From 1 person to groups of 8 people.
HOW LONG	60-90 min.
DIFFICULTY	Medium- Low.
WHAT YOU GET	A characterised collection of changes and actions that will lead you to achieve the envisioned future from the present time.
WHAT YOU NEED	A clear description of your challenge, your current state, and the vision of the future.
WHAT IS NEXT	After applying the tools, you can opt for action planning which also includes an ongoing process for learning throughout the project lifetime. If that is the case, then you may want to run the niche management tools in addition to other more traditional planning tools.

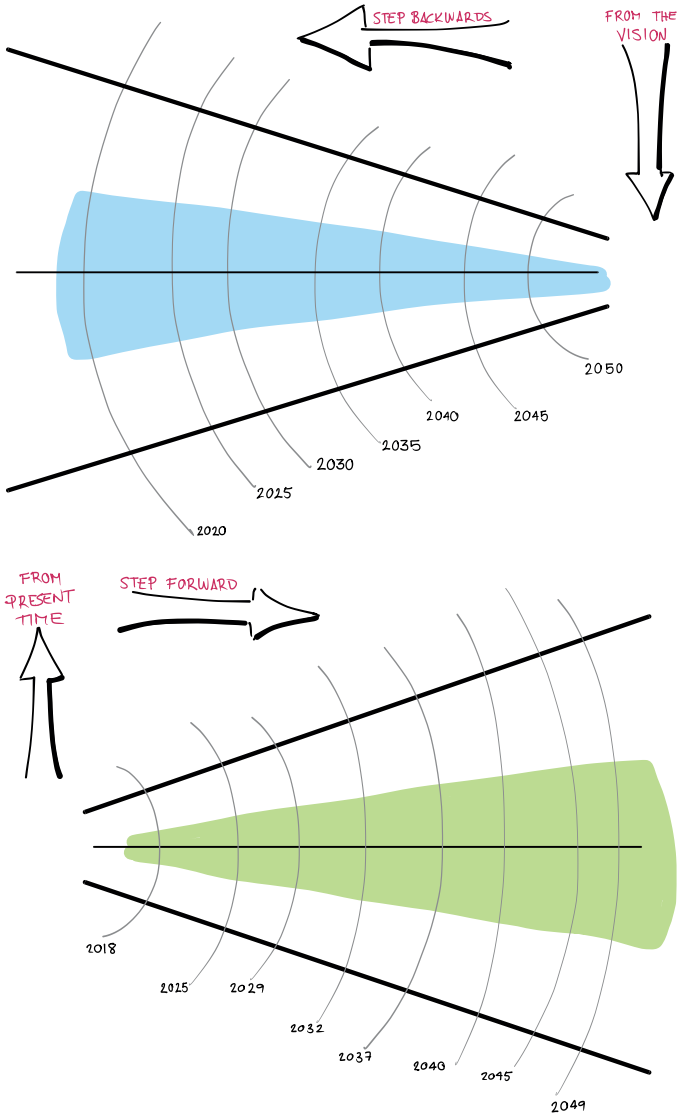
Steps

STEP 1. The canvas and your challenge

The Future Radars canvas is made up of two parts: the radar for changes and the radar for actions.

The radar for changes looks at the present time from the envisioned future. The radar is depicted by a cone whose narrow extreme is at the future time and from that point it broadens as we move to the present time. The goal of this cone is for you to identify changes necessary to achieve the envisioned future and place them on the cone. The width of the radar accounts for the potential number of changes that can drive the system to the vision. The farther the vision is from the time you are looking from, the broader the collection of potential innovations and changes that can lead to the same vision.

The radar for actions is the second part of the tool which mirrors the first radar by looking at the future from the present time. In this case the cone is reversed; the tip of cone is the current moment. This radar is intended for you to place the actions you will carry out to achieve the changes you spotted within the same radar. Therefore you will have a clearer idea about short-term actions, whereas the actions in the long-term will remain fuzzy. That is why the cone opens towards the future, widening the set of possible actions for the same change to happen.
The first step before you start filling out the canvas is to define your starting and ending points. That means: define the vision of the future you aspire to and the the system in which your challenge is embedded. You might want to use the outcomes from the MLP tools and the Cover story tool. With those starting and ending points you can draw your own time scale using vertical lines going across the two cones.



Defining a reginal policy for biomass management. Public participation workshop. Castellón, 2015 (Spain). http://goo.gl/Q8vzeH


WATER HUBS
2015
2020
2025
2030
2035
Changes
2016

STEP 2.
Move backwards

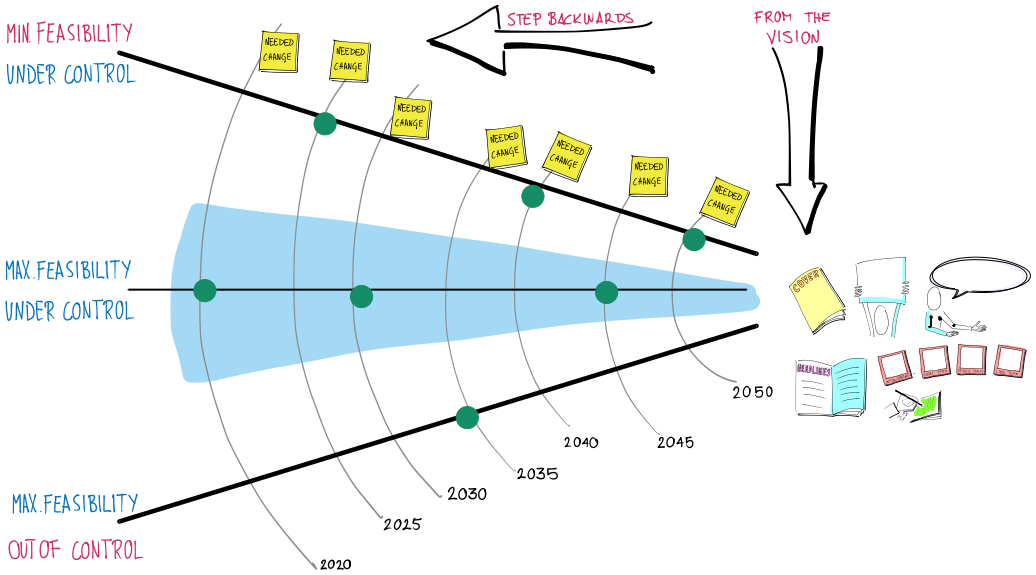
Put yourself in your vision. Imagine your 'preferred future' actually happened and now your vision accounts for the real world. With that image in your mind, start moving backwards towards the present time and identify what changes should have happened to reach the desired future. Spend 10 minutes individually to brainstorm as many changes as you can imagine. They could be: new knowledge, financial arrangements, new technologies, new political or economic frameworks, significant changes in actor configuration, cultural and formal conventions, changes in routines, rules, culture, infrastructure, etc.

Write down those changes on sticky notes (one idea per post-it) and then collectively discuss the suitability of each idea, pick out as many as you want and place them along the time scale. This is another important point. Spend some time to discuss the chronology of the changes. This chronology, along with the discussion about the suitability of your ideas, can spark off your creativity, giving you new ideas and how changes can come to light.

STEP 3.
Assess the changes

After brainstorming and collecting all the ideas, it is time for judgement to come into play. Evaluate each change according to the feasibility and the control you might have over the process for that change to happen. Do you think the change is feasible? (notice: we are not talking about probability, but feasibility)? Do you think and feel you can influence the process to trigger that change? If the change is barely feasible and out of your control, just rule it out and go to the next item. It is not worth spending valuable time discussing intractable/unsolvable topics. The ideal situation is when the change is feasible and you have some kind of control over the process. If that is the case put a sticky dot in the central part of the cone (bluish in the picture). Changes in this central part of the cone will be the most important for your action plan.

Then put a sticky dot in the lower side of the cone for those changes that are feasible but out of your control. You may be interested in them, but since they are out of your control, your strategy might be only to monitor those changes. Conversely, put a sticky dot on the upper side of the cone if the change is barely feasible, yet you might have an influence on the process. Think deeply about the items and spend time on them but only if you find pertinent synergies with your main interests.



STEP 4. Starting and ending points

Now you move to the radar for actions. Put yourself in the present, looking at the future you can see the chain of changes you have identified. The underlying idea for this step is to identify those actions that can lead to changes coming about. Therefore, spend around 10 minutes to brainstorm individually as many actions as you can think of. It is up to you, as a team, if you only centre in on the feasible changes that are somehow under your control, or embrace all the identified changes regardless of the assessment you did.

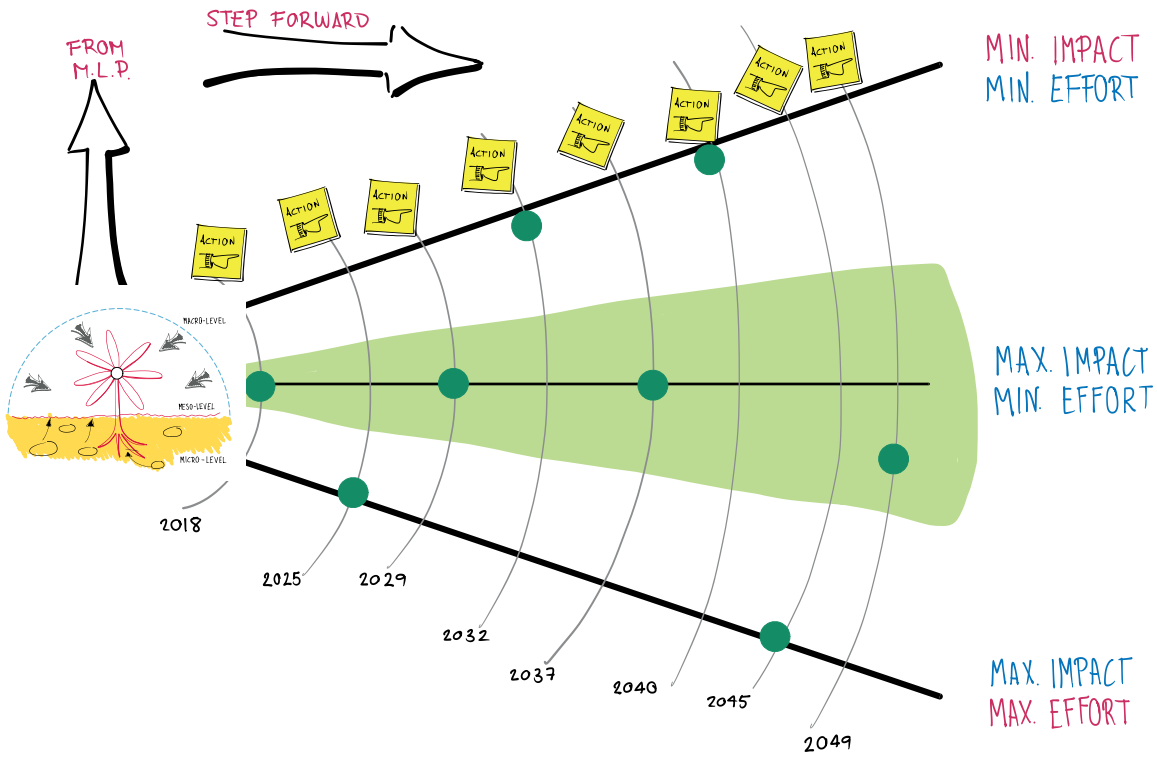
After brainstorming, discuss the suitable actions and then put them on the radar making a timeline.

STEP 5. Assess the actions

After the brainstorm step, move on to assessing the actions you identified. Use forecasting or your own experience to evaluate each action according to the impact they will cause on the system to trigger the change and the effort it will take you to carry it out.

Similarly to the changes, actions with maximum effort and minimum impact will be discarded. Conversely, actions with the maximum impact and the minimum effort will take up the centre of the cone (greenish in the picture) becoming crucial for your future strategy. Use the upper and lower part of the cone to assess the rest of the actions according to the scale in the canvas.

After assessing all the actions try to come up with a line of actions following the assessment and your role as a stakeholder. This line of actions should be one of the main inputs for your future action plan.



STEP 6.
Debrief

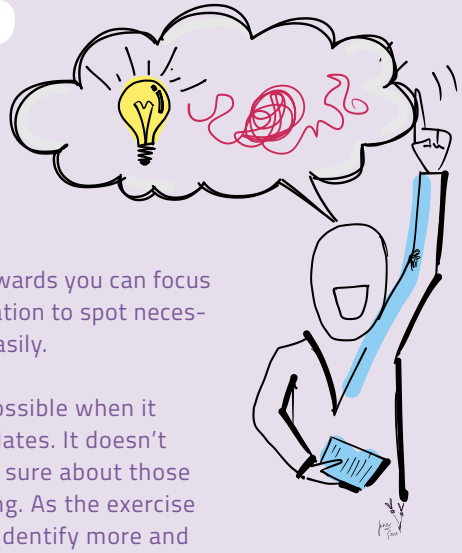
After having worked on the two radars of the canvas, reflect in groups about the process and the future steps. The following questions can guide you to a fruitful discussion and reflection.

What was the process like? Was it counterintuitive to start thinking from the future backwards to the present time? Do you think it hindered you to be more creative or, to the contrary, did it help you to spark your lateral and more creative thinking? Did you find out something new and unexpected in the pathway of changes from the present time to the future? Do you think you are now better equipped to plan? Would you have used other criteria to assess changes and actions? If so, which criteria?
Do you think you can draw up a strategy for action based on the second radar? Is the prioritisation you did a good starting point for action planning? Why? If the answer is yes, you may want to spend more time drawing up a draft version of that strategy.

Having been equipped with this new outcome, what do you think the next step should be? Do you think this process should be repeated once in a while throughout the project life time? Why?

By applying this tool, you can plan actions equipped with a global overview of the milestones to achieve, coupled with their feasibility and the influence you can put on them to happen.

Tips



- When moving backwards you can focus on barriers for innovation to spot necessary changes more easily.

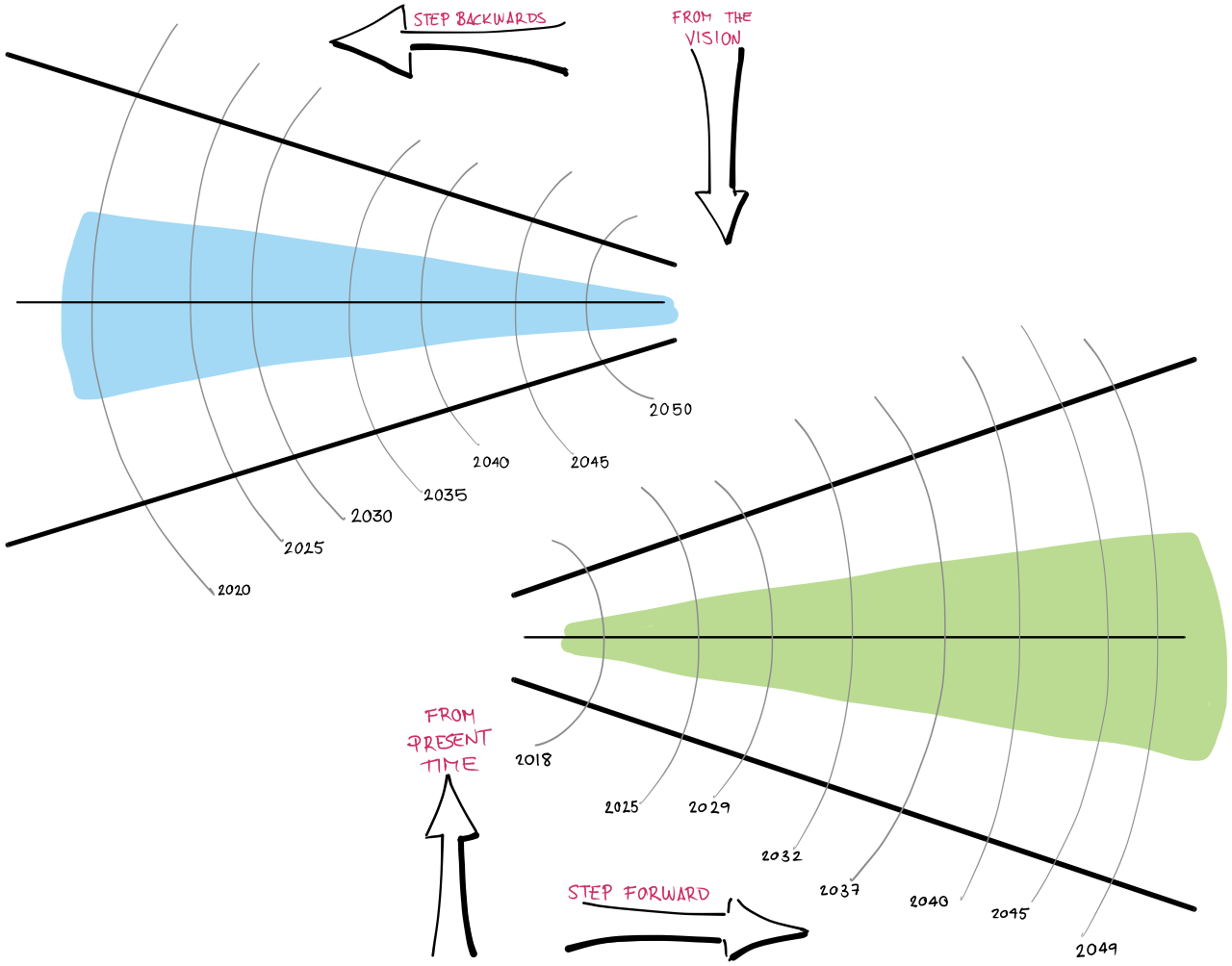
- Be as specific as possible when it comes to assigning dates. It doesn't matter if you are not sure about those dates at the beginning. As the exercise goes ahead and you identify more and more changes or activities, you will be able to give more consistency and coherence to the overall picture.

Find out more

http://www.climate-kic.org/transitions-hub

Defining a reginal policy for biomass management. Public participation workshop. Castellón, 2015 (Spain). http://goo.gl/Q8vzeH

The Canvas



De Vicente López, Javier and Matti, Cristian (2016) . Visual toolbox for system innovation. A resource book for practitioners to map, analyse and facilitate sustainability transitions. Transitions Hub series. Climate-KIC, Brussels 2016.

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Tool 14
Socio-technical roadmap

Backcasting
Mapping pathways from the future

Climate-KIC

Socio-technical **roadmap**

What it is

Socio-technological roadmap (STRM) is a collaborative backcasting tool for multiple stakeholders to plan together. After envisioning the desired future, stakeholders can jointly set out different pathways to bridge the gap between such a future and the present time.

Socio-technical roadmap is based on the technical roadmapping technique, largely used in industry to support technology strategy and planning.

When to use

As we saw in the radars tool, there are a variety of reasons why to use backcasting, depending on your specific role. Yet, generally speaking, STRM is to be applied whenever you are working with complex problems which also entail long-term goals and a high degree of uncertainty throughout the process.

This coupling of complexity and uncertainty will probably comprise breakdowns, breakthroughs, "wild card events" (events with low probability of occurrence but high impact) and sudden shocks in the economic, social and environmental spheres. Predicting the future under these conditions can be a daunting task full of alternatives and ambiguity. If you think about an environmental challenge or a project somehow related to the dynamics of global change, you will have one of these wicked problems.

In these cases, you should identify and analyse alternative pathways form the present time to the future, before getting into your action plan.

Why it is useful

Socio-technical roadmap helps you generate innovation pathways for the future based on chains of change. At the same time, it leads you to identify opportunities and risks in market, technologies and social environments. By doing that you can start identifying, prioritising and planning your future action as well as the resources and partners you will need. STRM provides you with a visual picture of the changes in the future, making it easier to come up with your action plan.

HOW MANY	From 1 person to groups of 6 people.
HOW LONG	90-150 min.
DIFFICULTY	Medium-High.
WHAT YOU GET	A set of pathways from the future to the present time and vice-versa, made up of changes and actions. As a result of them you can end up with a strategy for different stakeholders.
WHAT YOU NEED	A collaboratively built vision, a clear description of your current system and situation as well as sources of information about trends or even potential breakthroughs.
WHAT IS NEXT	After carrying out a backcasting exercise you are ready to move into action. You can opt for fine-tuning your action plan or getting right to the action. In both cases you should take a look at the system management or niche management project to develop a learning and reflection strategy for the project lifetime.

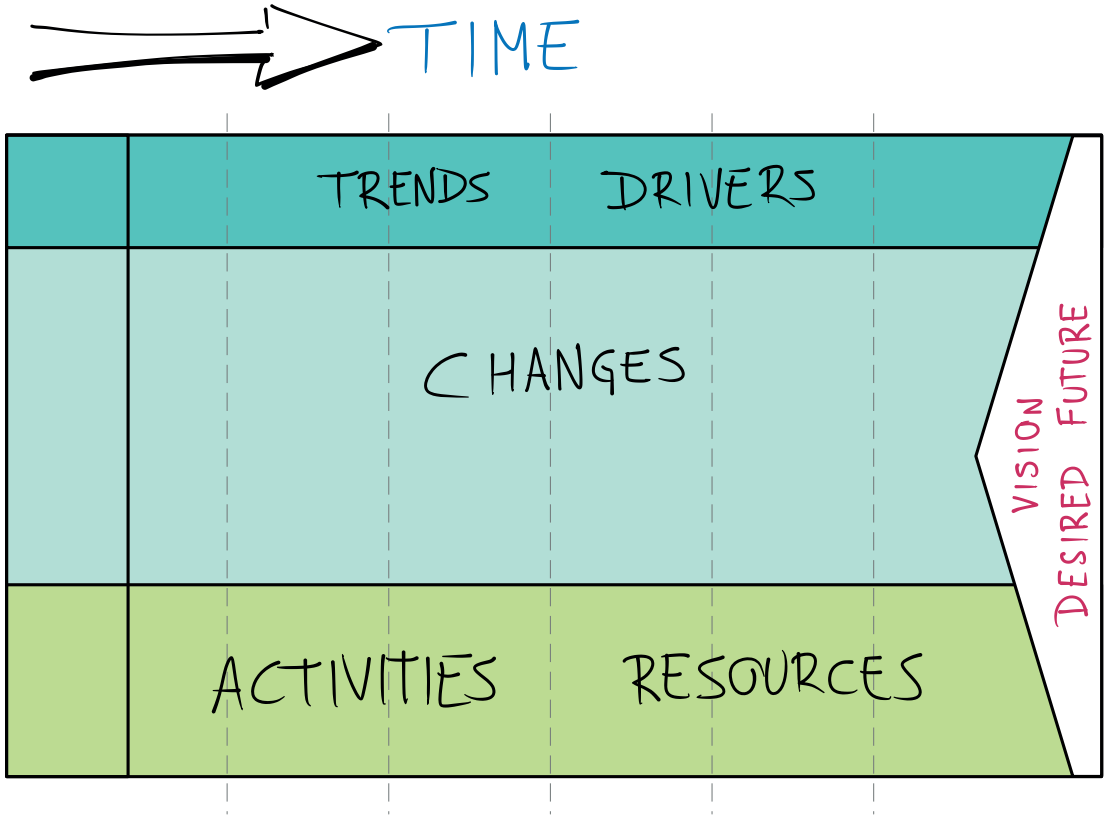
Steps

STEP 1.
The canvas

STRM canvas is made up of a main rectangle, in which the horizontal axis accounts for time, starting from the present at the left hand side, and ending with the future vision. The vertical axis accounts for the changes that should come about over time. This axis is broken down into three parts or rows. The upper row represents social and technical trends and drivers in the market, now and in the future. They depict the broad context exerting pressure on the market and might be identified as the macro-level of the complex system.

The middle part depicts main changes needing to happen for the vision to be reached. Those changes can be technological, in the physical infrastructure, in social habits, regulations, etc. This row mainly refers to the meso-level, but also includes changes in the micro-level. The lower segment ultimately accounts for the activities that different stakeholders have to carry out to bring changes about. These activities or resources that are needed, can be plotted in

Socio-technical roadmap helps you generate innovation pathways for the future based on chains of change. At the same time, it leads you to identify opportunities and risks in the market.



Stakeholder management workshop. Innovation Building Block series. The Climate- KIC. Frankfurt, 2015 (Germany). http://goo.gl/MTSuTW

both, the meso-level and the micro-level.

STEP 2.
Vision and Calendar

First of all, put your vision on the right hand side of the canvas and write down the date for such a vision. You might use the cover story if you have done it, or any other description of the vision. It is important to have it in mind while applying the tool. Once you place the vision with its date, draw a timescale in the horizontal axis drawing vertical lines every five or ten years. This scale will help you to place changes and activities.

STEP 3.
Stepping Backwards

Starting from your future vision, you are going to step backward. Therefore, place yourself in such a vision. Imagine you are in that future and then look at the most recent past and focus your attention in the middle part of the canvas, that is the "changes" part. The goal is for you to identify which changes must become real for the vision to happen. Try to imagine the last change just before achieving the complete vision in which you are right now. From that change on, imagine other changes that were necessary to happen before it. Each plotted change will trigger other earlier changes that were necessary to move the vision forward. Write down one change on one post-it and stick them on the canvas at the proper temporal distance. As you identify causal relations between changes, draw a line linking them to map out those relations. For instance in order for a new product to be adopted a new regulation may be necessary or a new infrastructure. In the same way for a new product to be developed, a new technology might be a necessary condition.

Step by step you will build a chain of changes with different pathways, alternatives and possibilities. These changes comprise any of the different components or dimensions of the market place from technical to social, as well as changes in trends or drivers: social habits, technologies, physical infrastructure, industrial capacity, products, services, regulations, institutions, etc. Throughout this process, different trajectories of change towards the vision will arise providing a scenario with a set of alternatives to reach the vision.

As you are working on this middle part, on identifying changes, you might also identify some social, economic or environmental trends or drivers that could be affecting the whole system included in your changes. For instance, you might identify that for some changes to happen, the economy needs a steady upward trend. If that is the case, write it down on a post-it, place it on the upper row at a proper time scale and then draw the relation between the trend and the change.

STEP 4.
Prioritising

If the backward process has been fruitful enough there will be quite a number of changes. Then, prioritize some of them as essential for the pathway(s) to be taken forward. You can prioritise changes within the same trajectory or not, but always keep in mind the

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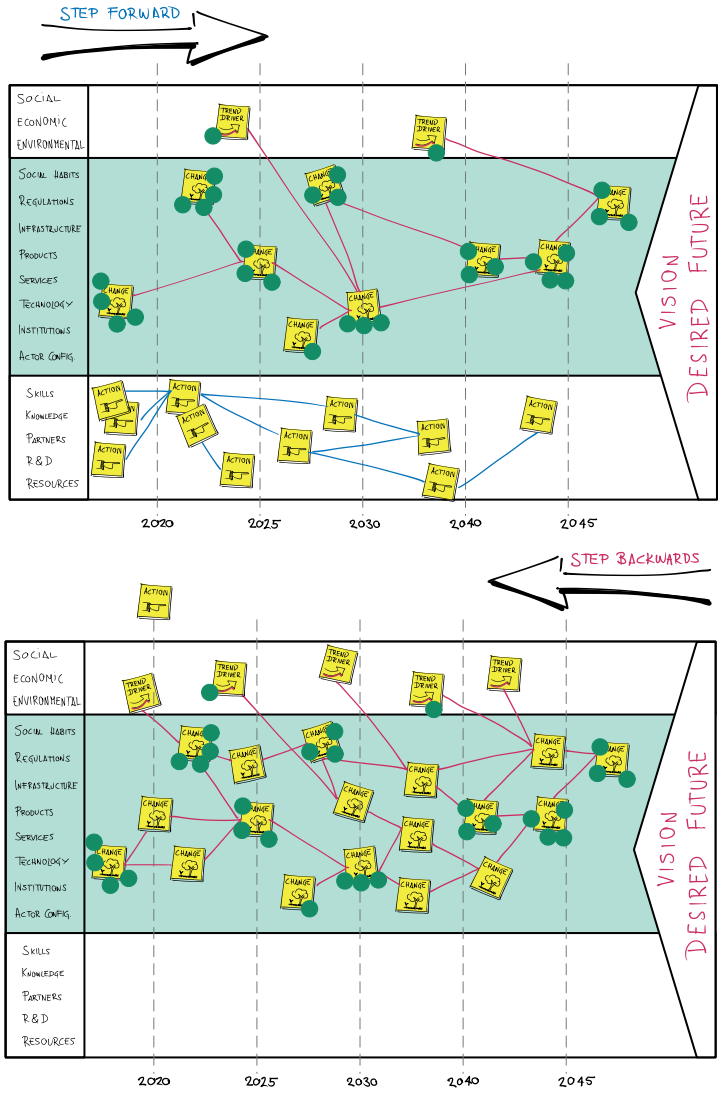


Train the Trainers event. Training coaches for the Pioneers into Practice programme. Utrecht, 2015 (The Netherlands)

causality relation between changes. Use sticky dots or any other system to vote and rank options. Whether it comes to the changes or their prioritisation, these steps are independent from your role as stakeholder. It doesn't matter if some of you are policy makers, technological suppliers or consumers; for the vision to be reached those changes have to happen.

STEP 5. Going Forward

With the chain of changes on the canvas it is time to identify activities and resources to bring about those changes. You can assume that it is not possible for one single stakeholder to handle all the changes; start by defining who you are and what your role and objectives are. Depending on that, you will focus on those changes that you might help to provoke. If there is more than one stakeholder in your team, then you can run this step several times identifying the forward pathway for each of them.

With your identity, role and objectives in mind, place yourself in the present time and step forward until the first change you have linked to your role. Then identify the activities to be carried out to bring about that change as well as the resources you will need.

These activities can entail running different experiments, conducting new R&D processes, adopting a new partnership policy between partners, gaining new skills, etc. As for the resources, these might be physical resources or others such as acquiring physical resources. You can run a fast-paced and short brainstorming session to identify these activities and resources. Then, pick out those you decide as the best, write down one per post-it and place them on the lower row of the canvas and in chronological order. Move forward to the next change you prioritised for your stakeholder role and proceed the same way. Again, it is important to map out relations between actions, given that they will comprise the foundations for strategy settings.

Bear in mind that the same activity can encompass more stakeholders than yourself. If that is the case, identify those stakeholders on a different post-it and put them next to the activities or resources.

Stay with the process until you reach the last change (under your influence) before reaching the vision. By this moment you should have a chain of resources and activities that leads you from the present moment to the vision. Remember that this chain is strictly related to one stakeholder. Therefore, if you might want to identify activities for other stakeholders you should repeat the process.

STEP 6. Allotting time frames

The last step is for you to start your action plan. Once you have your chain of actions you need to work allocating time frames for each of those actions. As if it were a gantt chart, draw a timeline for each activity paying attention to which activities should finish before starting others, which activities

> As you are working on the middle part, identifying changes, you might also identify some social, economic or environmental trends or drivers that could be affecting the whole system.

Stakeholder management workshop. Innovation Building Block series. The Climate-KIC. Frankfurt, 2015 (Germany). http://goo.gl/MTSuTW

might be carried out at the same time, etc. Don't spend too much time with the details, this is only the basis for action planning, not the plan as such.

STEP 7. Debrief

Once you have completed the canvas, spend time reflecting on the process and the outcome you got. Use the following questions as sparks for further discussion.

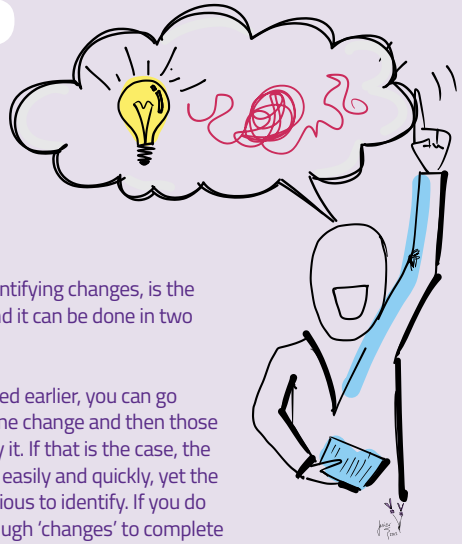
How did the process go? Did you find it clear, straightforward, difficult? Which parts were more difficult to carry out? What does the canvas look like? Does it look coherent, understandable, confusing...? Do you think there was something missing in the canvas? Would you add or leave anything out?

Did you find it difficult to spot the changes? Were there any discussions about the prioritisation? Do you think that prioritization of changes should be done differently according to each stakeholder? Or do you think it is independent from the stakeholders? Did you easily find the chain of cause-effect in changes? Were there any changes with no relation to others? If so, what do you think is the role of that change?

What are the biggest risks, and the biggest uncertainties you found? If you repeated the session on these issues in a half year, do you think there would be many differences? Why? Did you run the step forward for different stakeholders? If so, did you find out many differences? Did you find a lot of interdependencies between the activities and different stakeholders? If so, what do you think it means in terms of system analysis?

Do you think it would be necessary to do the process over once in a while throughout the project lifetime?

Tips



- Stepping backwards, identifying changes, is the key part of this process and it can be done in two different ways.

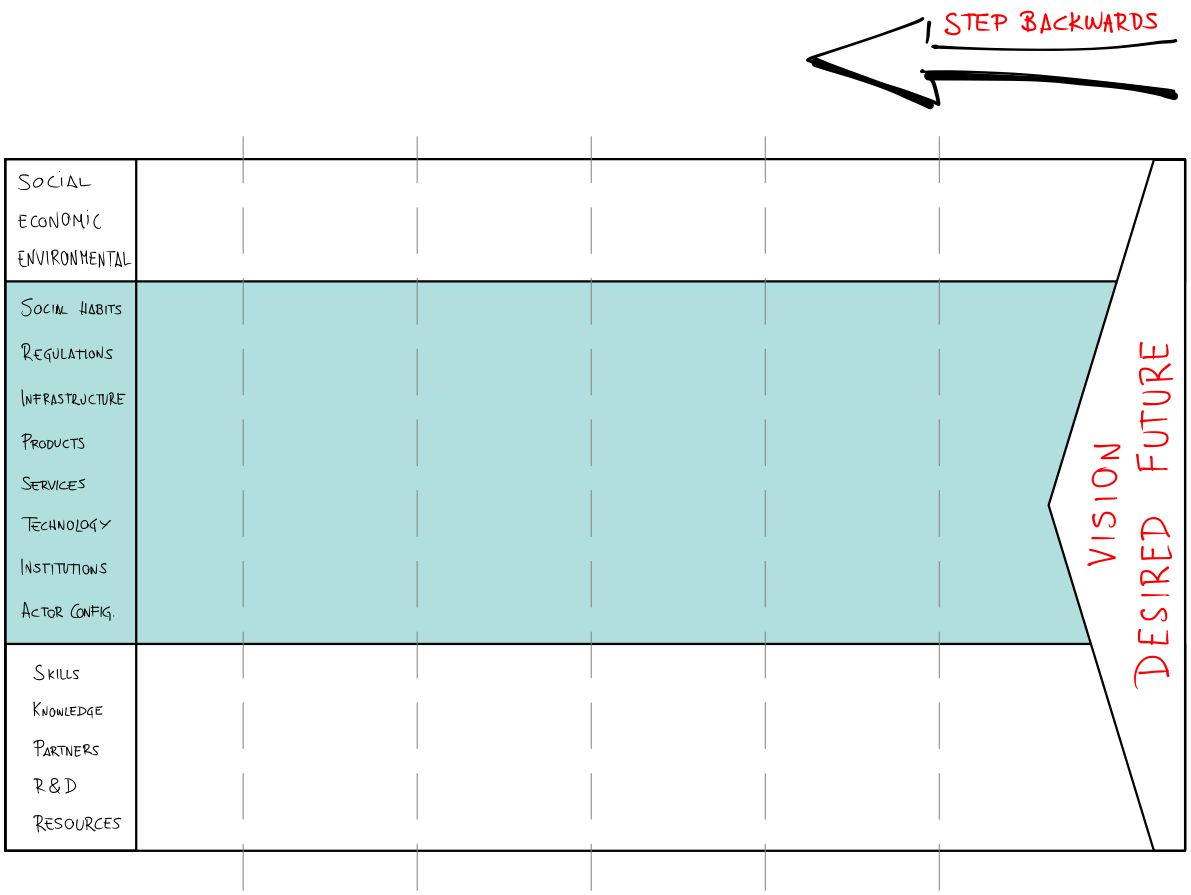
- First method: As described earlier, you can go step by step, identifying one change and then those previous ones triggered by it. If that is the case, the causality chain comes out easily and quickly, yet the changes cannot be so obvious to identify. If you do not feel that you have enough 'changes' to complete a timeline, then maybe you should try the second way of doing this exercise (below).

- Second method: Brainstorm individually or collectively: identify changes that need to happen for your preferred future to become reality. Don't fixate on the chronology or causal relationships; just get the changes on the canvas. Don't try to sequence the events first. It is essential that you "free flow" the changes needed as people place them on the canvas. Finally, put them in a logical order. In this non-linear generation of ideas, you will generate a lot more changes and find it more difficult to put them in order. However, this second way will give you a lot of ideas/changes to play with and you may unravel something hidden until now.

Find out more

http://www.climate-kic.org/transitions-hub

The Canvas



De Vicente López, Javier and Matti, Cristian (2016) . Visual toolbox for system innovation. A resource book for practitioners to map, analyse and facilitate sustainability transitions. Transitions Hub series. Climate-KIC, Brussels 2016.

Niche management

In the absence of any blueprints for guiding socio-technical transitions it is necessary to rely on a management strategy to ensure the quality and alignment of the process of leveraging the project from the experimentation level to the dominant system.

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Niche **management**

What is Niche management?

Socio-technical innovations change society and your project innovation could too. However, when your project is embedded in a system and is intended to trigger or to contribute to a transformative change in society, the classical project management tools are not enough to steer the project process. While an innovation project may be considered to be a successful standalone project, the project may not necessarily bring about changes in an entire system. For example, an energy efficient car component project may be innovative and successful, but it does not bring about a sustainable transport system.

This system transformation is not linear but rather characterised by a complex interplay between your project and the plethora of factors such as stakeholders, other projects, technologies, infrastructures, regulations, etc. Therefore we need new tools to make sure that the project goes forward in the right direction and takes advantage of the new knowledge acquired as a consequence of the process itself. Niche Management brings a combination of essential elements from traditional project management and more innovative approaches from Strategic niche management to help project managers to keep a project on track with societal change processes and embrace the actions needed to trigger transformational change.

Why is it useful?

Niche Management tools help you to position and develop your project in a strategic way, to contribute to the transition process for a wider goal. That is, Niche management can give you the right direction to take and the strategy to keep the project on track. At the same time some of the tools lead you to identify actions that can take your innovations from a project level to a core part of the larger system. Therefore, Niche management gives you strategies and suggested action lines.

How to apply it to your project?

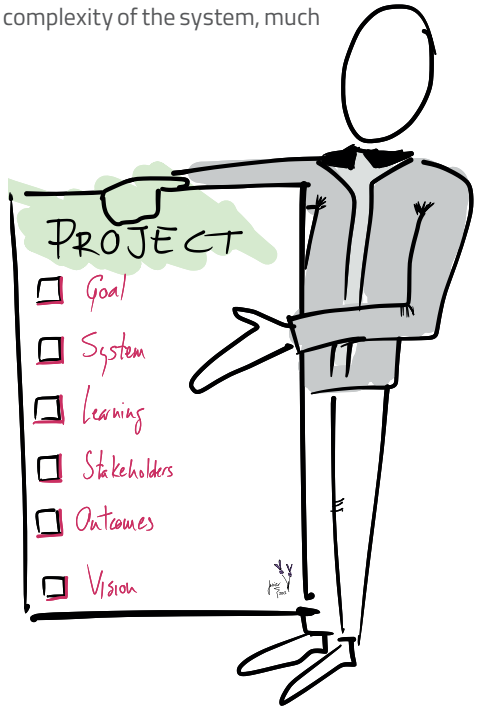
The 6-3-6 Model.

To be effective, societal change projects need a broad, long-term perspective. Otherwise the influences of the current environment can make the project become business-as-usual and conform to the environment. The project team needs to analyse the elements beyond the project itself in the wider system, and create a strategy to bring about societal change. The 6-3-6 Model is aimed/designed to bring essential elements of the Niche Management approach to a practice-oriented application.

The 6-3-6 Model explores the wider system via three topics: the project, the context in which it is embedded and the strategies to steer the process. In return, each component is broken down into different elements to be analysed: (1) Six elements for the project, (2) Three perspectives for the context and (3) Six strategies for the process.

6 Elements from the project

When it comes to systemic change, the project elements to consider differ from traditional project management. In this way, for instance, due to the long-term perspective and the complexity of the system, much



more effort on reflecting and learning has to be made. Consider the following questions as a hint of the project elements you should pay heed to. What's the wider goal for society? What system(s) is the project part of? What and how are you learning and sharing? How are you involving your stakeholders? Do all your outcomes relate to the overall goal? What's the project's overall vision? Based on that, the 6-3-6 Model uses these 6 elements for project analysis: (1) Goal, (2) Vision, (3) System, (4) Stakeholders, (5) Learning and (6) Outcomes.

Goal

In transition/system projects the goal is strongly linked to a societal challenge which goes beyond the project itself. In this regard, projects are often embedded in a wider programme whose goal might not be precisely defined at the beginning but clarified throughout the programme lifetime. It is essential to have in mind both elements; the societal challenge and the possibly fuzzy goal of the broader programme.

Vision

There is a shared and inspiring vision that transcends the project itself, affecting the entire sociotechnical system. This vision should have been co-created by a broad network of stakeholders and pervade the project approach.

System

In transition processes, the project looks around to understand itself as a node in a wider system. Project managers have to pay attention to the relations that the project has with other innovative experiences, and with the players in the dominant system to actually understand the process and evolution of their own projects.

Stakeholders and project consortium

In system projects, stakeholders and the relations amongst them are seen more as partners, with valuable knowledge and insights, that might improve the process and the outcomes. That means the work is somehow done from the outside to the inside, that is, the project is developed with active involvement of societal stakeholders. At the same time, participants in the project consortium should have some training, or indeed a designated person, to be able to infuse the transition perspective into planning activities and projects to make sure that the ideas do not get bogged down in business-as-usual.

Learning

Learning is of paramount importance in system and transition projects. Within transformative change processes you learn while you're doing, and do while you are learning. Managers are aware of knowledge gaps and consciously plan a strategy to keep an ongoing learning process, including a strategy to share and communicate new insights.

Outcomes

In transition projects, outcomes have to be linked to the societal challenge; they are shared and communicated to the network of stakeholders inside and outside the project.

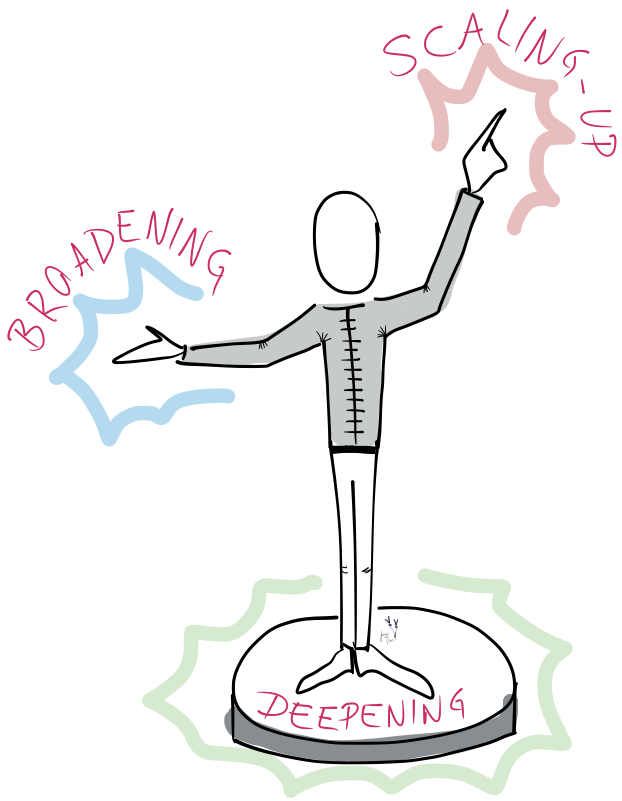
3 Perspectives from the context

As explained before, in a system project you need to analyse and learn from the relations between your project and the different components of the system in order to leverage your project from being an innovation experiment to becoming mainstream. Adopting this system perspective entails paying attention to the context around your project.

> Niche management can give you the right direction to take and the strategy to keep the project on track.

First, you have to go deeper into the new innovation you are developing. Then you have to see what is going on around you. That is, other innovative experiments bubbling up at the

micro-level. They might be replicated or connected with yours to gain influence and impact. Eventually, those radically new ideas set out by your project may get embedded into the dominant system, triggering the change you were looking for. Therefore, there are three perspectives to adopt so as to understand the context around your project: (1) Deepening, accounting for yourself, (2) Broadening, accounting for the other innovations and (3) Scaling-up, accounting for the way of getting the project embedded in the dominant system.



Deepening

Learning as much as possible from your project and innovation in the specific context. What is the radically new way of thinking, doing and/or organising that your project develops? What can be learned from the specific local context? How does the local context make the project distinctive?

Broadening

Replicating your project in other contexts and/or connecting it to other functions and/or with other innovation initiatives. What possible connections does the project have with other innovation projects or transition initiatives? In what other niches or domains could your project be repeated? What can be generalised about this project?

Scaling-up

Embedding the project in the dominant system. How can your activities be embedded in society and the dominant ways of doing things? What changes are necessary in the wider system to move your project into the mainstream?

6 Strategies for the process

The Process aspect of the 6-3-6 Model encourages you to reflect on your analysis of the project and context areas. Consider what actions you can take to make sure your project creates changes in the system and becomes mainstream, instead of being trapped by the business-as-usual approach. The answer to this question gives six different strategies managers can adopt to move the project forward in the system change direction.

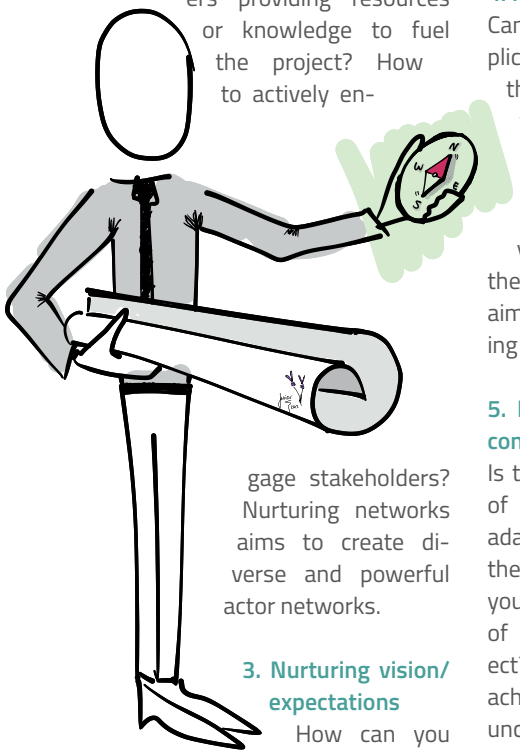
1. Shielding

Does your project need a tax exemption? A specific subsidy policy? Could it be necessary to move to another region in which the project is welcome? Shielding accounts for those strategies aimed at creation of a "protected space" to prevent projects from mainstream selection pressures and prema-

ture failure. Ways of shielding: financially, geographically, institutionally, socio-cognitively, politically, culturally, etc..

2. Nurturing networks

How can you reinforce and enrich your networks of stakeholders? Is it necessary to look for critical partners/stakeholders providing resources or knowledge to fuel the project? How to actively engage stakeholders? Nurturing networks aims to create diverse and powerful actor networks.



3. Nurturing vision/ expectations

How can you improve the quality of the vision? How to engage people with such a vision? How to leverage the vision to different networks? How to factor in others' expectations? Nurturing expectations; strategise how to articulate and negotiate expectations.

4. Nurturing learning

Can you improve or make explicit the learning process? Are there windows of opportunity to learn from other contexts or technologies? Is there, in the mainstream system, new trends from which you can draw lessons for the project? Nurturing learning aims to keep an on-going learning process.

5. Empowering by fitting and conforming

Is there any feature or process of your project that makes it adaptable and competitive in the current mainstream? Can you plan or foresee a window of opportunity for your project? This strategy helps you to achieve competitiveness within unchanged environments.

6. Empowering by stretching and transforming

Do you have opportunities to compete and transform the current system? Can you change the social system in certain extent and scale? Can you reach out to big players or lobbies? The stretching and transforming strategy aims at leveraging institutional reforms which change the system in favour of the niche innovation.

Niche management

Tool 15
Transition waves

Tool 16
Six systemic strenghts

Tool 15

Transition waves

Niche Management

Transition waves uses the 6 elements from the project and the 3 perspectives from the context to yield an image of the weaknesses and strengths of the current process management.

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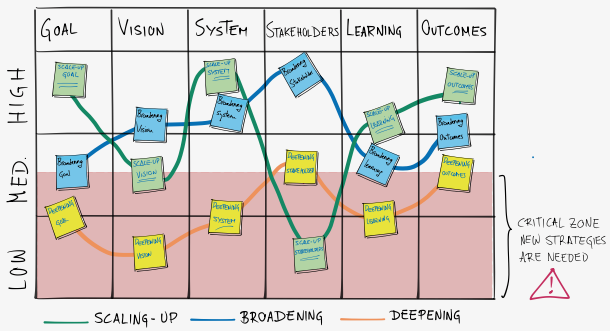
Transition **waves**



HOW MANY	From 1 person to groups of 6 people.
HOW LONG	60-120 min.
DIFFICULTY	Medium-High.
WHAT YOU GET	A straightforward and comprehensive graph of the main system perspectives in which your project elements are shown to be competitive enough or should be enhanced.
WHAT YOU NEED	A project document (either a proper document or a draft or a general idea) in which the six elements included in the tool are laid out, as well as a description of the system (micro, meso and macro-level) in which the project is built.
WHAT IS NEXT	With the graph in your hands, you are ready to go for strategy design. To do that you can opt for any tool at your disposal, and then adapt it to the six main niche management strategies. Alternatively you can go for the Six systemic strengths tool, especially designed for that.

What it is

Transition waves is a visual tool that helps you to check the strengths and weaknesses of your project with regard to the system approach. It sets each element of the project against the three perspectives of the context which emphasizes the weak points in which you can adopt different strategies.

When to use

Use Transition waves when you want to make sure your project keeps on the track of system innovation, preventing it from business-as-usual approaches. It can be applied to assess an ongoing project, both in terms of process and content, to reflect on the projects characteristics from a transition perspective, or to define actions that increase the potential of the project to contribute to a transition.

Why it is useful

Even though the Transitions waves method is surprisingly simple to use, it prompts deep thought on how your project is performing against the project and context elements from the 6-3-6 Model. It allows you to spot windows of opportunity for improvement in different areas or elements.

By combining the three curves in one graph you can also identify patterns in the weaknesses or strengths which may lead you to take advantage of synergies when it comes to strategising.

Steps

STEP 1. The canvas and the dynamics

The canvas

The canvas is a simple matrix in which the columns accounts for each one of the six project elements analysed: (1) Goal, (2) Vision, (3) System, (4) Stakeholders, (5) Learning process and (6) Outcomes. The three rows represent the level of performance of each of those areas when you compare them against the three perspectives of the context. These levels are consciously fuzzy and accounts for low, medium and high performance. In the depicted canvas we have emphasised the area taken up by the low level and the lower half side of the mid-level as the critical zone. This zone is highlighted to make managers to reflect on the areas falling in there. Depending on your projects and your specific levels of warning, you can opt to make this critical zone larger or smaller.

The dynamics

To apply the tool, you will start by singling out one of the three context perspectives: scaling-up, broadening, deepening. With that perspective in mind you will go through a questionnaire that will help you assess how the project elements fit within a system perspective. Your answers will be the base to assess that level of performance (or how well each project element fits within the system approach). Once you have gone through the questions and sketched out the graph, you will repeat the process for another perspective and questionnaire. Bear in mind that this is not an exhaustive list of questions designed to conduct a quantitative assessment. Instead, they are meant to spark and guide your reflection.

Eventually with the three graphs completed, you are ready for a deep reflection and strategy designing.

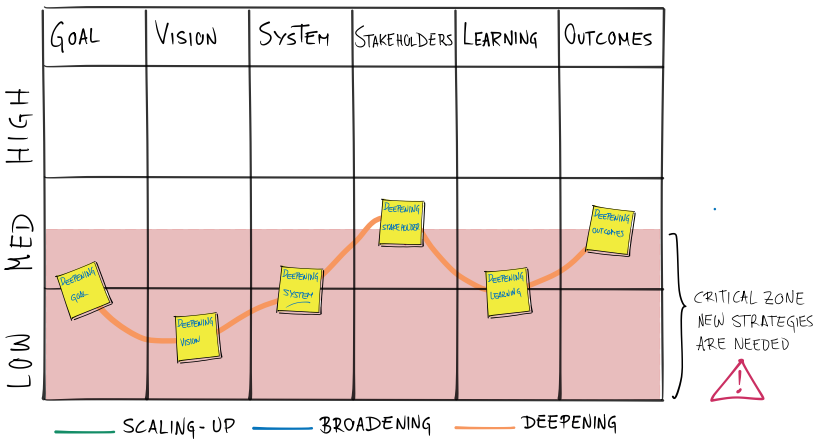
Even though the Transitions Waves method is surprisingly simple to use, it prompts deep thought on how your project is performing.

THE DYNAMICS

1.- QUESTIONING DEEPENING vs. GOALS
Are the project goals linked to societal challenges that are made explicit?

2.- SKETCHING OUT
Based on your answers assign a low/medium/high level of performance of your project goals.

3.- KEEP ON GOING
Move to the following set of questions.



Train the Trainers event. Training coaches for the Pioneers into Practice programme. Utrecht, 2015 (The Netherlands)

Boosting sustainable economy in rural areas. Innovator Catalyst series. The Climate-KIC. Budapest, 2015 (Hungary). http://goo.gl/iufdY4

STEP 2. The deepening perspective checklist

Go through the questions, project element by project element, and sketch out the level of performance of your project in relation to the deepening perspective, according to your answers from the exercise. First, go through the goal questions and try to individually respond to them in silence. After a couple of minutes start an open discussion and decide if your project goals are highly, middle or poorly aligned with the deepening perspective. Then mark that level of alignment or performance on the canvas. It is a good idea to use a post-it to write down the main reasons that led you to decide such a level and then put it on the mark. In this way, when it comes to reflecting you will have a safe anchor to guide future decisions.

check-list

GOALS

Are the project goals linked to societal challenges that are made explicit? Does the project's process design allow for reflection? Did you foresee a process to adapt the vision and the learning goals if necessary?

VISION

Do participants in the project share a long-term sustainability vision? Is such a vision relevant, compelling and specific enough? Is the project explicitly dealing with the stakeholders' expectations?

SYSTEM

Have project participants shared their perception about the dominant system in the sector? Do you know if it is necessary to protect the project so that it can move forward? Have you identified geographical, financial, regulatory exceptions or any other conditions that are actually protecting the project from competitors? Did you identify the main barriers in the system against your innovation (remember that those barriers can come from technology, infrastructures, organizations regulations, user habits, etc.)? If so, have you drawn up a contingency plan or similar?

STAKEHOLDER AND PROJECT CONSORTIUM

Did the project perform an actor analysis to produce a list of the key stakeholders? Did you map out their stances and relations? Do you count on an engagement strategy for different stakeholders? Do you plan to review such an analysis every now and then? Did you include external participants with visions and perspectives different than yours in the consortium? Do you have any governance system for both stakeholders and partners?

LEARNING

Does the project design include a broad and reflexive learning process? Did you identify the main gaps in knowledge and incorporated possible consequences? Are explicit learning goals defined with regard to the desired changes?

OUTCOMES

Is the connection between project results and the social challenge clear? Is a distinction made between generic and context specific results? Is there any correlation between project outcomes and how they contribute to the transformative change?

STEP 3. The broadening perspective checklist

Go through the questions project element by project element and sketch out the level of performance of your project according to your answers.

check-list

GOALS

Is the system innovation project tuned to relevant related innovative projects? And are those projects, in turns, somehow linked to each other by a (common) societal challenge that is made explicit?

Have you identified similar and related innovative projects and potential new partners? Have you spotted other application domains and functions for your project? Have you identified other initiatives and technologies that could feed your project? Do you have any strategy to replicate your project in other regions? Is there enough room planned for joint reflection with potential partners?

STAKEHOLDERS AND PROJECT CONSORTIUM

Has the project broadened the network of stakeholders? Did you look for partners out of your own network? Are the consortium participants open to others' experience? Are they willing to explore and take on board other perspectives and technologies?

LEARNING

Has it been explored if the system innovation project could be done in another context? Is there any plan to systematically check any other location or context for the project? Does the learning process include the identification of other related and relevant projects? Do you foresee exploring other domains and technologies to learn from their processes? Are you looking for synergies? Are you sharing insights and experiences with participants in other projects so as to learn about methods, problems and solutions?

OUTCOMES

Has it been envisaged to share project results with participants of similar projects? Do you have a strategy to share the learning outcomes within the project consortium and beyond? Do you take part in conferences, workshops and summits to explain and share your partial outcomes?

STEP 4. The scaling-up perspective checklist

Go through the questions project element by project element and sketch out the level of performance of your project according to your answers.

questions list

GOALS

Is the project adapted to societal trends and other new developments? Do you have any plans to take advantage of any window of opportunity provided by societal trends and other new developments? Are your goals in conflict with the mainstream trends?

VISION

Is the overarching vision brought to the attention of the big and key players in the dominant system? Is the vision promoted and explained among stakeholders in any way? Can you link the vision with any pressure or event from the macro-level? Is your vision geographically restricted?

SYSTEM

Did you gather Information about general social trends and events that could confirm or contradict your innovation (either the importance, the need or the urgency of it)? Did you identify the main barriers and bottlenecks in the dominant system? Have you identified system players that could lobby for the project? And those who can fight against the project? Do you already have a specific strategy to deal with them? Have you planned how to build bridges with the big players in the system? Or have you decided not to build them?

STAKEHOLDERS AND PROJECT CONSORTIUM

Does the network include actors from the mainstream system, even those not in favour of the project? Does the network include actors from other sectors that are not innovation and technology? Has the project identified key people with the power and willingness to influence the dominant regime? Do you have any strategies to draw key mainstream stakeholders to your project?

LEARNING

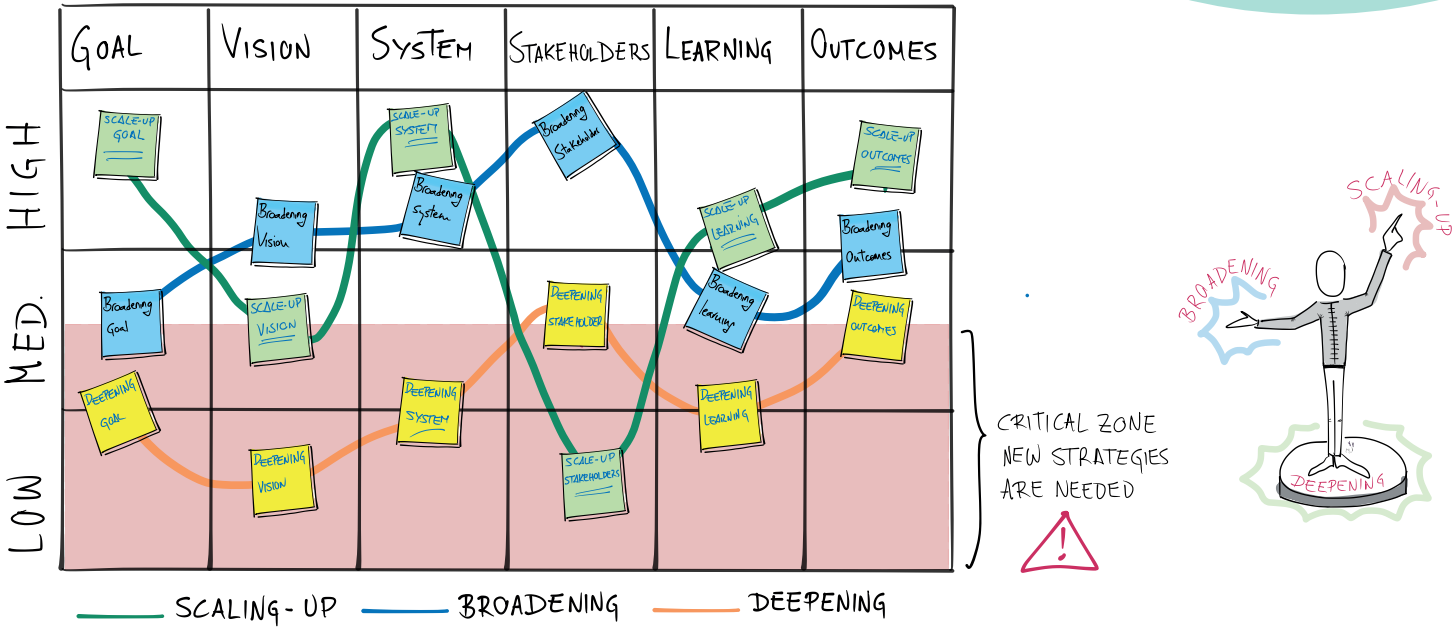
Does the learning also focus on how experiences could be anchored into the dominant system? Do you have an on-going plan to learn from the barriers in ways of thinking in the meso-level? And what about the ways of doing or organising? Are infrastructures and regulations in the learning goals? Have you analysed if your project can fit within society current values or user habits?

OUTCOMES

Do you count on a plan to communicate your results? If so, does it include resources and budget? Are you going to share the outcomes from the learning process, as well? Do you plan to communicate to a mass audience in the meso-level?

questions list

Green skills for boosting transition in water management Innovator Catalyst series. The Climate-KIC. Valencia, 2014 (Spain). https://goo.gl/llq0oS



STEP 5. Debrief

After completing the Transition waves canvas, spend time to reflect on the outcome as well as the process.

Generally speaking, would you say that your project fits within a system approach? Have you found any patterns in the weaknesses and/or the strengths? Is there any repeated weakness in the system area or a steady strength in the broadening wave? Or in any others? Do you think you have a better and a deeper understanding of your project? Did you manage to spot the main risks for your project to keep the system approach? Where do you think you have more opportunities to improve your project?

After applying the tool, has your perception about the importance of the learning process changed? Do you think a formal learning and reflecting plan is needed? If you want, you can brainstorm ideas about how to design such a process: who to involve, what activities to do...

Tips

- The Transition Waves method provides a guide, not quantitative assessments, so don't spend too long working out the most accurate level for each item.

- You're mostly looking for elements in the critical zone.

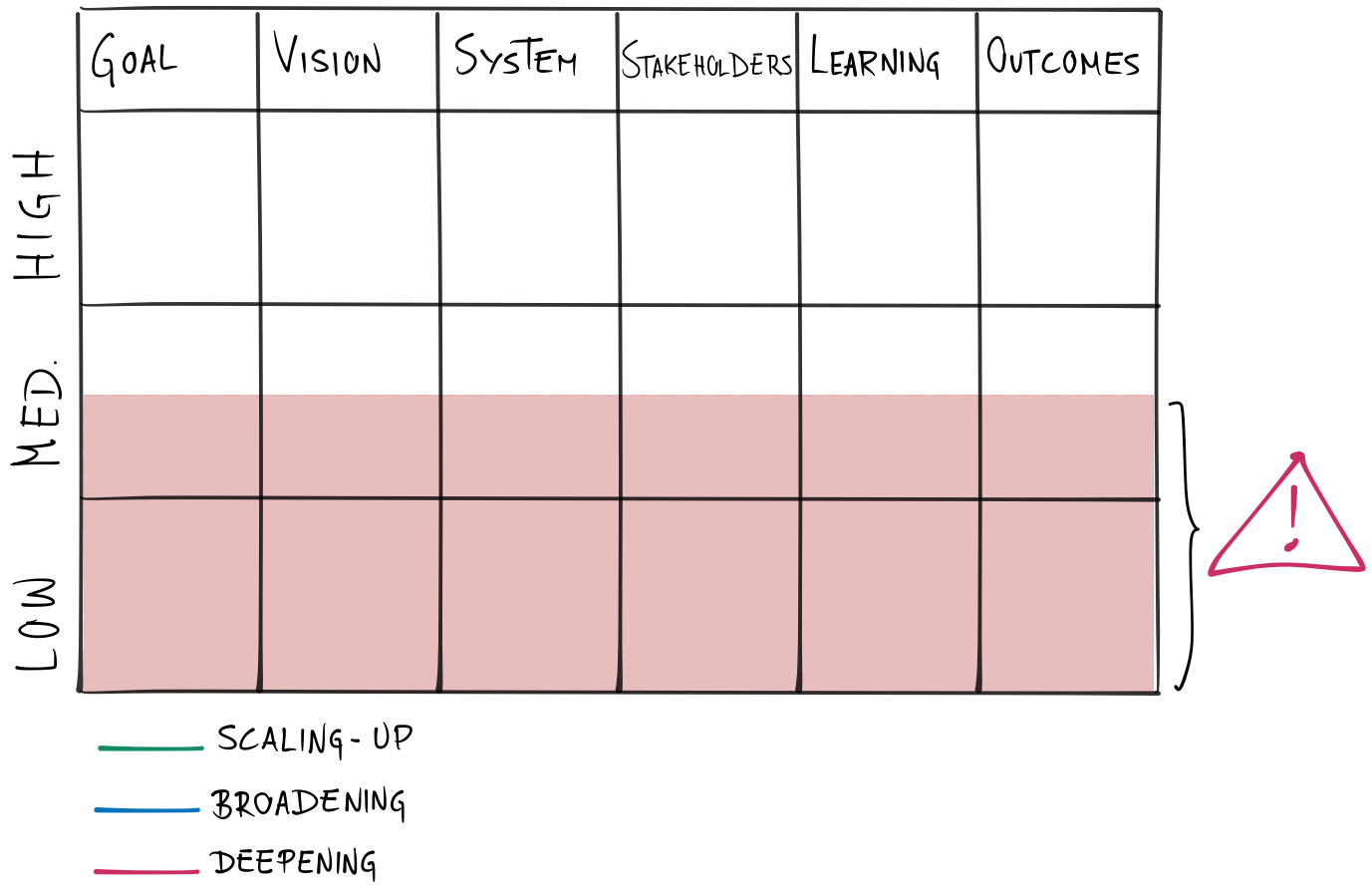
- In the early stages of a project, it is common to find low performance relating to scaling up or broadening. This is natural. Teams haven't had the time yet to place their project in a broader context.

- The tool can be very time and effort demanding. Therefore you might want to apply it only for one of the three context perspectives: deepening, broadening or scaling-up. If that is the case, try to apply to areas that you feel it are weaker.

Find out more

http://www.climate-kic.org/transitions-hub

The Canvas



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Tool 16
Six systemic strengths

Niche Management
Conceiving a tailored action plan to reinforce systemic project management.

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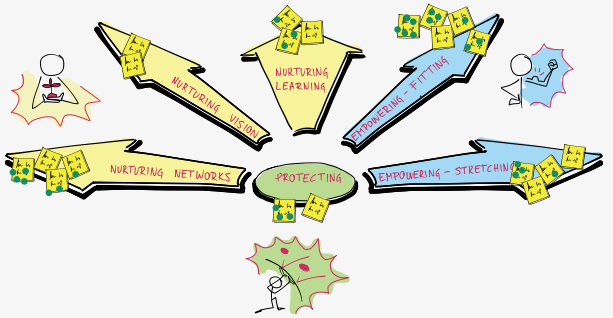
Six systemic **strengths**



HOW MANY	From 1 person to groups of 10 people.
HOW LONG	60-90 min.
DIFFICULTY	Medium.
WHAT YOU GET	A comprehensive identification of actions to improve the way your project performs within the system.
WHAT YOU NEED	You should start with a clear vision of your challenge and the Transition waves graph. Transition waves gives you a strategic vision of the weaknesses and strengths of your project in the three context perspectives. Alternatively you might start with a description of your project, the system (multi-level) and the barriers for innovation you are dealing with.
WHAT IS NEXT	If you got here, you probably went through many of the tools of this booklet. Now it is time to 'do'. You may opt for developing a long-term strategy comprising the main actions conceived or get into the operative pan right after the tool.

What it is

Conceiving a tailored action plan to reinforce systemic project management.

When to use

Generally speaking you should apply this tool after developing the initial document for your project and before getting into operative plans.

When you are working on the project management plan you should also develop your system management plan, this helps steer the project process and to navigate through the different levels of the system.

Why it is useful

Two common reasons why innovation projects don't create societal change are that the projects get stuck in 'business as usual' or it is not able to mature enough because of external conditions or lack of connections.

Six systemic strengths helps you identify actions to avoid this and allows you to develop system management strategies to keep the project on the track to the dominant system.

The Transition waves provides you with a collection of weaknesses and strengths; Six systemic strengths allows you to build a strategy or action plan on the Transition waves outcomes.

Steps

STEP 1. Understanding the canvas

The canvas is made up of three different areas, accounting for each of the three context perspectives described in Niche Management. The central part is a circle which represents the protection against current competitors and conditions that your project has or should have.

Starting from the circle, there are three expanding arrows on the left hand side. These arrows represent the actions you have already taken or could take to improve the way your project relates to other innovative initiatives in the micro-level.

On the left hand side, two more arrows point outwards. These tools will hold the actions related to the way you plan to scale-up and break into the dominant system.

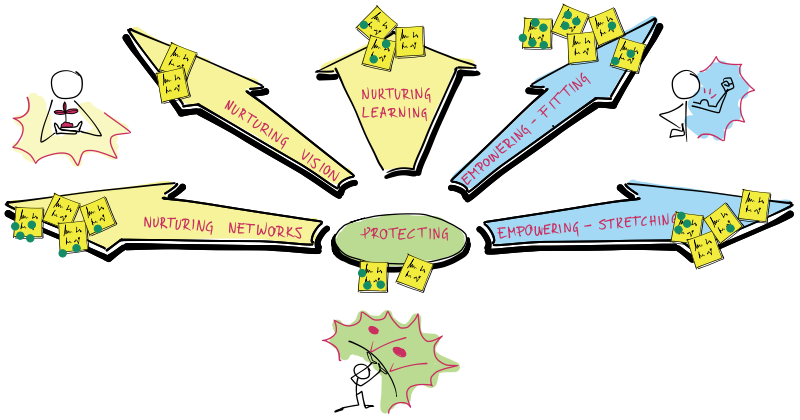
STEP 2. Protecting/ shielding actions

Spend five to ten minutes to work individually, think up as many actions as possible about how to protect your project against the current competitors or just the current market rules that keeps it from growing. Actions can range from tax protection, regulations, etc. For instance, since flying drones and many drugs have restrictive regulations, research activities involving those devices might have some exemptions (a university may be granted a license to fly a drone in an urban area. The general public are NOT allowed to do this) to develop new products or services in the future. You must think of both actions to be taken and actions that you have already taken, and are necessary to keep.

Write down one idea per post it, making an effort to be succinct, specific and descriptive. Then start an open discussion explaining each card and putting them on the canvas. During this step it is essential to avoid judgements on the ideas or to criticise them, it is time to unleash creativity not to analyse proposals. As participants are explaining their ideas, new ones can arise because they trigger new links with other ideas. Let those ideas in and include them on the canvas. As you stick cards on the canvas, some overlaps of clusters can appear. If so, draw those clusters and remove repeated cards if necessary.

STEP 3. Nurturing actions

Repeat the same process, but this time thinking about actions to nurture and improve the vision, the learning process and your relations with stakeholders. As there are three areas, you may want to spend more than ten minutes for individual ideation, before starting brainstorming. Sometimes the same or similar idea can be linked to different categories. For instance, you can organise workshops with potential stakeholders for both broadening your network and learning from others' experiences. If so, use two cards with the same idea repeated. It is also normal to collect more ideas about one category than another, in terms of project stage and characteristics.



STEP 4. Empowering actions

Now it is time for actions that lead your project to step into the dominant system. Think of two different approaches to scale up to that dominant market. On the one hand, think of those actions to compete against the current solutions, infrastructures, regulations... How can you take advantage of your innovation and the windows of opportunity? What is your system competitive advantage?

Then think of potential ways of adapting your solution to the current conditions. Can you build it on some existing solutions? Can you take advantage of any current processes and build your solution in it?

Proceed in the same way as in the previous steps.

STEP 5. Prioritisation

Now take a step backwards and have a look at the big picture with all the action. It is time for analysis, relationships and prioritization. With this big picture in mind, start analysing actions proposed in each category, looking for connections among ideas or clusters of ideas, in different categories. Identify those relations in terms of actions subordinated to others, or those you should do at the same time, etc. Eventually rank the ideas in each category to come up with the most important two or three actions per category (strategy). As the discussion is playing out, new ideas can emerge, maybe as a merger of previous ideas or maybe as something new. It is important to write them down and place them on the canvas. For prioritising proposals in each category, sticky dots can be used as a simple method (three dots each participants...).

STEP 6. Debrief

Once you have completed the canvas and the prioritisation, spend some time to reflect on the outcome and the process. Remember that the goal of the tools is not the outcome as such, but mainly the deep discussion that can be triggered as a consequence. And, also remember that the following questions are not a checklist to fulfil but rather a spark of inspiration for a fruitful discussion.

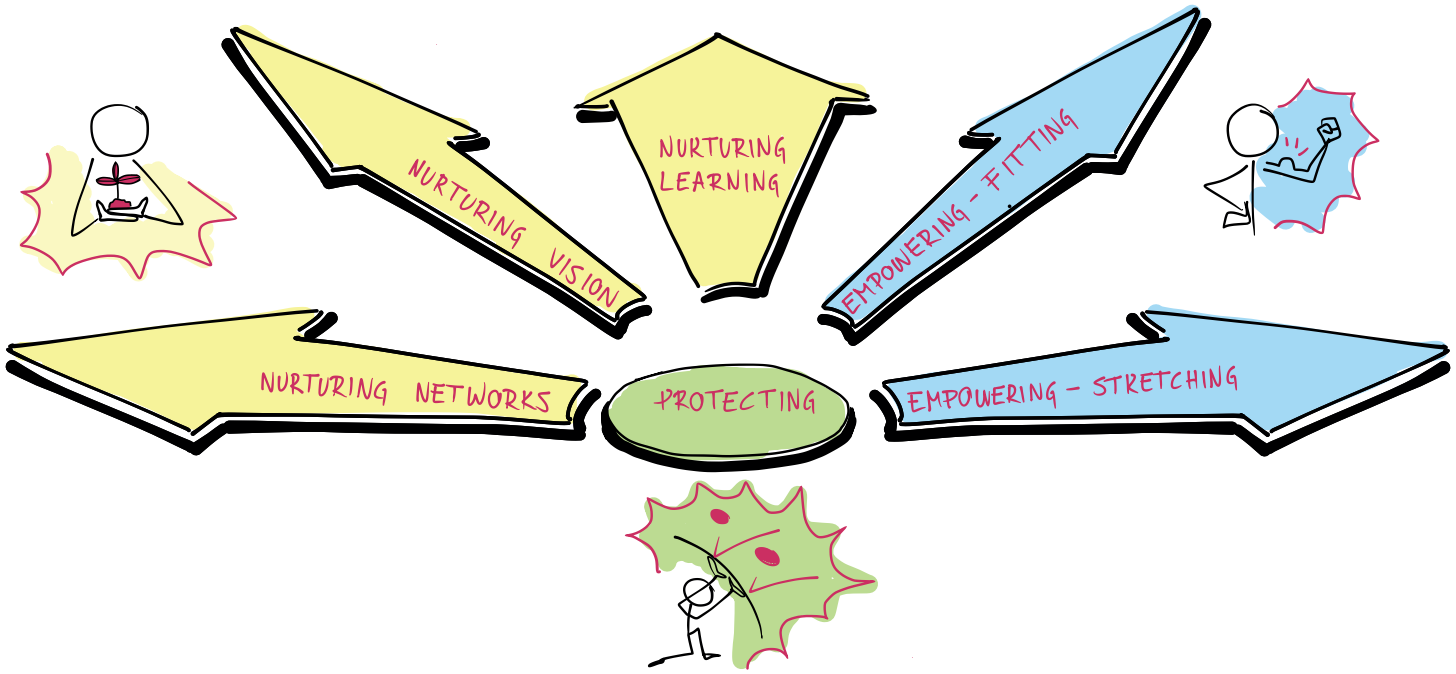
Did you find it easy to think up actions related to each strategy? Did you see the straight relation between the Transition Waves tool and the Six Systemic Strenghts tool? Was there any additional information you would have liked to have had? Is there one dominant strategy (category) in terms of number of ideas or importance? Is there any strategy with no actions or very few? Why? Did you find it easy to reach a consensus on the prioritisation of actions? Is there one action considered as having paramount importance and standing out from the rest? In which area should you make more efforts to keep your project from stalling? What is the weakest project position, the relations with other innovation projects or the capacity to break into the market? Do you think it is possible to draw up an action plan from the outcome?

> When you are working on the project management plan you should also develop your system management plan, this helps steer the project process and to navigate through the different levels of the system.

Find out more

http://www.climate-kic.org/transitions-hub

The Canvas



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Visual **toolbox** for system innovation

A resource book for practitioners to map, analyse and facilitate sustainability transitions.

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Transitions Hub
Alice Bauer. Transitions Hub Manager
Cristian Matti. Learning and Knowledge Manager
Jon Bloomfield. Advisory Board
Aled Thomas. Advisory Board
Christoph Auch. Advisory Board
Fred Steward. Advisory Board
Hannes Utikal. Advisory Board

Climate-KIC Education
Ebrahim Mohamed. Director of Education
Christoph Auch. Professional Education Lead
Anne Bartens. Education Manager

Coordination
Cristian Matti and Alice Bauer

Author
Javier de Vicente. System innovation consultant and facilitator https://es.linkedin.com/in/jdevicente/en

Technical review
Bence Fülöp, Boelie Elzen, Dave Green, Jose Andringa, Kati Berniger, Lydia Sterrenberg, Markus Allbauer, Richard Bubb, Roberto Colucci, Sergio Belda, Suzanne van den Bosch and Tijmen Altena.

Graphic Design
Paula Rincón de Arellano

Copy Editor
Lee Monk


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Professional Education
eit Climate-KIC
Transitions Hub
9 782960 187410