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## **Master of Urban Climate and Sustainability (MURCS)**

### **Roadmaps: a platform for stakeholder connectivity towards decarbonisation of the buildings sector**

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August 2020



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## **DECLARATION**

*'This dissertation is my own original work and has not been submitted elsewhere in fulfilment of the requirements of this or any other award'.*

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August 2020

## **ABSTRACT**

Decarbonising the buildings sector is critical to achieving the Paris Agreement commitment as it is responsible for almost 40% of final energy use. However, the sector is not on track to meet the targets. Recent debates call for better coordination of agencies and stakeholders across organisational and sectoral boundaries, arguing that this would ultimately help accelerate the process. This study demonstrates that improvements to the stakeholder engagement process in policy design, reflected in the roadmaps, are an entry point for transformative changes. The discussion suggests that co-creation can be added to the framework as an instrument to enhance connectivity, weaving scattered stakeholders. In practical terms, it is a channel that makes stakeholders as part of a roadmap community. At the same time, in a long-term, it promotes a resilient network with stakeholders more aware and willing to implement roadmap targets, thus helping the sector meet climate targets. It reverberates in the conception of the roadmap itself that turns out to be a normative document as well as a platform for amplified connectivity and collaboration between stakeholders.

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## **ACRONYMS**

E4 – Emerging Economies Programme

FLOWER – Framework for Long-term, Whole-system, Equity-based Reflection

IEA – International Energy Agency

IPCC – Intergovernmental Panel on Climate Change

MOMB – Matrix of multiple benefits

SEF – Stakeholder engagement framework

UNEP – United Nations Environment Programme

## **1. INTRODUCTION**

### **1.1 TOWARDS THE DECARBONISATION OF THE BUILDINGS SECTOR**

With the Paris Agreement countries have agreed to a common goal of maintaining the global temperature increase to below 2 degrees, and preferably no more than 1.5 degrees, by the end of the century. According to the latest UNEP Emissions Gap report (2019), to be on track for the 1.5-degree goal, the world needs to reduce global emissions by over 50% by 2030 and work towards carbon neutrality by 2050.

According to the International Energy Agency (IEA), as the buildings and construction sector accounted for 36% of final energy use and 39% of energy and process-related carbon dioxide (CO<sub>2</sub>) emissions, they have a significant part in achieving this vision. However, in 2018, buildings-related CO<sub>2</sub> emissions rose for the second year in a row, to an unprecedented high of 9.7 gigatons of carbon dioxide (Gt CO<sub>2</sub>) (GlobalABC, IEA and UNEP, 2019, pg.4). Rapid increases in floor area and demand for energy-consuming services are driving this growth, outpacing efficiency improvements.

At present, mandatory policies on building and equipment performance cover less than 40% of energy use and less than half the CO<sub>2</sub> emissions from buildings. Progress on building energy codes, in particular, is lagging, especially because more than two-thirds of the buildings constructed between now and 2050 are expected to be built in countries lacking building energy codes (UNEP and IEA, 2017).

Measures in buildings can contribute over 6.5 Gt CO<sub>2</sub> reductions in annual emissions by 2040 (IEA, 2017) while stimulating a variety of co-benefits, including improved indoor and outdoor air quality, improved climate resilience. These changes can be entry points for sector achieving desired outcomes of the Sustainable Development Goals such as access to energy (SDG 7), ensure healthy lives (SDG 3) and tackle climate change (SDG 13). In addition, the sector is gaining attention and considered key for economic stimulus in response to the sanitary Covid-19 crisis due to its capacity to generate local jobs (IEA, 2020).

Noticeably, the buildings sector is a highly fragmented industry, and there is a lack of a shared vision from disparate stakeholders in the sector which slows down innovation. Succeeding these outcomes at pace and scale will require greater collaboration among policymakers at all jurisdictional levels, as well as with urban planners, architects, developers, investors, construction companies and utility companies.

## 1.2 ENERGY EFFICIENCY BUILDINGS ROADMAP

Decarbonising buildings across the entire life cycle would require a transformation of the buildings and construction sector. Reaching net-zero operational and embodied carbon emission buildings is possible but requires clear and ambitious policy signals to drive a range of measures including passive building design, material efficiency, low-carbon materials, efficient building envelope measures, and highly efficient lighting and appliances (GlobalABC, IEA and UNEP, 2020).

In this context, energy efficiency buildings roadmaps have been developed to support a common language and vision for the complete decarbonisation of buildings across their life cycle and to support the development of national or subnational strategies and policies, including, for example, Nationally Determined Contributions (NDCs)<sup>1</sup>.

As per definition, roadmaps are futures-based, strategic planning device that outlines the goals, barriers, and strategies necessary for achieving a given vision. It is a strategic plan that establishes links among tasks and action in the near, medium, and long term (IEA, 2014, pg. 4). Winebrake (2004, pg.21) explains that roadmaps provide practitioners with a normative picture of the future (i.e., what we desire), an identification of barriers (what is preventing us from getting what we desire), and strategies for achieving that future (how we overcome those barriers).

The literature on roadmaps also reiterates the importance of collaboration by involving a range of stakeholders. Winebrake (2004, pg.23) underpins that another purpose of roadmapping is to create dialogue and frame debate among industry, government, and other stakeholders. Thus, the roadmap can be a process that provides an opportunity for stakeholders to exchange ideas and knowledge in a forum that is usually public and open.

In this vein, this research brings the perspective that besides frame and shape shared goals roadmaps can act as a platform amplify the connectivity of stakeholders and create a network to help break with silos thinking and address the climate agenda.

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<sup>1</sup> Nationally determined contributions (NDCs) are at the heart of the Paris Agreement and the achievement of these long-term goals. NDCs embody efforts by each country to reduce national emissions and adapt to the impacts of climate change.

### **1.3 ABOUT THE RESEARCH**

This thesis is tied to my experience as an intern as an analyst at the International Energy Agency (IEA) in the Energy Efficiency Division (EEfD). There I work for the Emerging Economies (E4) Programme that supports the scale-up of energy efficiency activities in countries such as Brazil, China, India, Indonesia and Mexico. Overall, the programme advises these countries on the potential of energy efficiency to enable a sustainable energy system, the multiple benefits of energy and developing policy design to deliver it.

Since 2018 the IEA has been working with the Global Alliance for Buildings and Construction (GlobalABC) on the development of regional roadmaps in the E4 countries through a process of extensive stakeholder consultation. The main project I have been working on is the development of buildings roadmap for India. Within this canvas, I am assisting the organisation in its project management practises by reflecting on the process of the stakeholder engagement in the regional buildings roadmaps and how it can be improved in the national ones.

#### **1.3.1 RESEARCH AIM AND OBJECTIVES**

This study understands that co-creation is important to policy design, reflected in the roadmap, as it mobilises ingredients, i.e. collaboration, networks and innovation that can help the buildings sector get on track for the climate goals and achieve decarbonisation. The aim of this research is to explore how co-creation can contribute to roadmaps for the buildings sector decarbonisation.

Having India energy efficiency buildings roadmap as the *locus* of the discussion, the following objectives guide this study:

1. Develop theoretical and pragmatic insights on how a stakeholder engagement process works
2. Understand the role of energy efficiency multiple benefits
3. Critically build a concept of co-creation
4. Review of the stakeholder engagement approach adopted in previous regional roadmaps and explore improvements to the nationals
5. Discuss co-creation in theory and practise and how it fits into a roadmap
6. Build recommendations on how co-creation can be used considering the IEA mandate

### **1.3.2 THESIS APPROACH**

This study is an inductive piece of research using qualitative methods to shape the investigation. This was done as an embedded researcher as I reflected about specific organisational practice supported by theory while verifying possibilities for theory applicability. Central to this research was the choice of action research. Although I was not able to explore the whole methodology as the study follows the development of the India project itself, the action-research facilitated the challenge of building emergent critical questions and later adding new statements and theory, closer to interpretivism philosophical framework.

### **1.3.3 THE VOICE OF THE RESEARCHER**

Given the nature of the chosen methodology, this thesis will have chapters written in the first person, as this study is a construction based on my own experience of performing an embedded researcher. Many social scientists consider the presence of the author and her/his voice a resource and a key element in the resulting theory. Especially in Anthropology, first-person is frequently used, arguing that everyone writes from a particular vantage point or position and that this position should be acknowledged (Webb, 1992, pg. 749). They understand that the voice should not be excluded, avoided, or hidden. In alignment with the role of embedded researcher and action research methodology, I use the first person when referring to myself to recognise my role in such knowledge construction and reflection.

## **1.4 THESIS STRUCTURE**

This thesis consists of six chapters:

Chapter 1 sets the scene and provides critical information to the thesis became navigable to readers. Chapter 2 brings a literature review to support the development of insightful theoretical discussions and offer guidance to the application of theory. It discusses mostly stakeholder engagement, energy efficiency, multiple benefits and co-creation. Chapter 3 explores the reasons for the chosen

methodology and how it fits the purposes and approaches of this study. Chapter 4 presents a model developed to improve stakeholder engagement at the IEA. Chapter 5 zooms on the co-creation from the theoretical and practitioner perspectives and proposes a reflective discussion. Lastly, chapter 6 sheds light on some accomplishments achieved throughout the action research and future recommendations regarding theory and practise.

## **2. LITERATURE REVIEW**

This literature review aims to provide the foundation for a stakeholder engagement process improvement and stitch the energy efficiency multiple benefits to the conversation as well as introduce and situate the concept of co-creation. Aligning these three themes allows a better appreciation of results and discussion (sessions 4.3 and 5.1, respectively).

### **2.1 STAKEHOLDER ENGAGEMENT – THEORETICAL INSIGHTS**

Currently, policymaking is opening the top-down hierarchical model to others, more transparent and holistic that involves the public, non-state actors (private sector and not-for-profit organisations). This movement acknowledges the vital role that stakeholders from different institutional settings can contribute to addressing climate change (Akhmouch & Clavreul, 2016, pg.32).

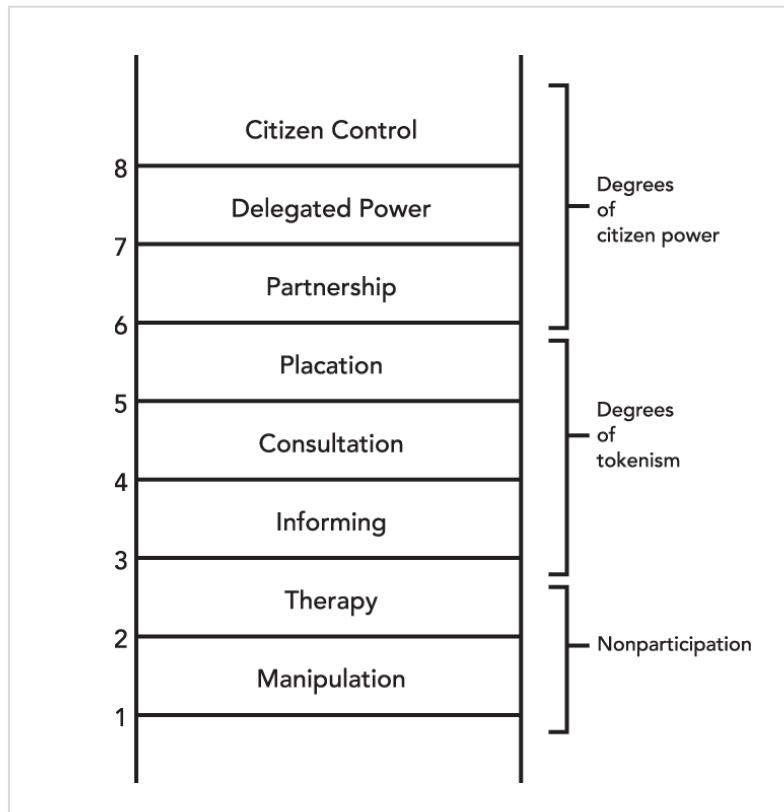
However, the engagement of stakeholders in practice it is a field imbued with complexity and conflict and awkward to navigate. Even though practitioners increasingly have been aware of the importance, they struggle with tools and approaches that accommodate it in practice (Kampelmann et al., 2016, pg.2).

According to the Akhmouch & Clavreul (2016, pg.32) engagement is an umbrella term to refer to an organisation's efforts to ensure that individuals and groups and organisations have the opportunity to take part in the decision-making processes that affect them or in which they have an interest. It encompasses a broader range of inclusive processes, from gathering information to sparking innovation.

Sherry Arnstein conceived in 1969 an original conception pointing out to the relevance of power redistribution in citizen participation. From her perspective, there are different levels of power assigned to stakeholders when achieving an outcome. To represent this idea, she arranged eight levels in a ladder pattern (figure 1) – the bottom corresponds to nonparticipation, followed by degrees of tokenism and on the top, the citizen power.

Mathur et al. (2008, pg. 601) state that engagement can be understood in three ways. First, from the management perspective aimed at capturing knowledge, increasing ownership of the project by users and trying to reduce conflict. Second, from an ethical perspective, to enhance inclusive decision making and promote equity. Individuals are engaged in their capacities as consumers, stakeholders,

taxpayers or citizens. Thirdly, from the perspective of social learning — a process where diverse stakeholders share a common forum, learn about each other's values, reflect upon their values and create a shared vision and objectives.



**Figure 1:** Eight rungs on a ladder of citizen participation. Source: Arnstein, 1969

Lane (2005, pg.285) points out that the rungs on the ladder serve to sensitise one to the fact that those who invite the actors to participate are able to set the terms of the redistribution: they can seek to educate, inform, and consult, or they can delegate power through partnership and other means. It means that different levels do not exclude each other, and they can, actually, exist as layers with different emphases depending on the institutional objectives.

In line with this idea, Connor (1988, pg. 257) points out in his interpretation of the ladder of citizen participation, that at times, several approaches should be used simultaneously in order to meet the needs of the parties involved. Consequently, sometimes, a combination of rungs can coexist in a project.



According to the AA1000 Stakeholder Engagement Standard (SES) 2015<sup>2</sup>, the engagement is now also recognised as a fundamental accountability mechanism, since it obliges an organisation to involve stakeholders in identifying, understanding and responding to sustainability issues and concerns, and to report, explain and answer to stakeholders for decisions, actions and performance.

### **2.1.1 STAKEHOLDER ENGAGEMENT – COMPILING RELEVANT STEPS FOR ITS APPLICATION**

Every stakeholder engagement should be initiated by defining a purpose. Considered as relevant stakeholders are those individuals, groups or organisations that affect or could be affected by an organisation's activities, products or services and associated performance concerning the issues to be addressed by the engagement.

The AA1000SES (2015, pg. 6) sees the engagement as a journey and envisions the process in four stages: plan; prepare, implement, and act and review. After establishing the purpose and scope, the owners<sup>3</sup> of the engagement need to ensure that a quality process will be put in place. In other words, this means that the process should:

- Enable learning from stakeholders, resulting in product and process enhancements and innovations. Contribute to the development of trust-based and transparent stakeholder relationships
- Enable understanding of the complex operating environments, including market developments, political and cultural dynamics.

According to A1000SES knowing who is responsible for what and at which level is a first step towards understanding the stakeholder landscape and identify redundancies and gaps in the institutional framework. In addition, setting criteria (interest, level of power, type) better enables the promoters to strategic considerations.

In determining levels of engagement promoters of the engagement define the nature of the relationship, they aim to develop for or with their stakeholders. Importantly is that the engagement

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<sup>2</sup> The AA1000 SES (2015) is a generally applicable, open-source framework for designing, implementing, assessing, and communicating an integrated approach to stakeholder engagement.

<sup>3</sup> Facilitators: who set up engagement processes to gather stakeholders around a given project, reform or policy (A1000SES, 2015, pg. 25)

may take place at more than one level, and it may also change over time as relationships deepen and mature. Activities and methods of engagement are informed by establishing these relationships.

		INCREASING IMPACT ON THE DECISION				
		INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICIPATION GOAL		To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision making in the hands of the public.
PROMISE TO THE PUBLIC		We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.

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**Figure 2:** Spectrum of public participation. Source: IAP2

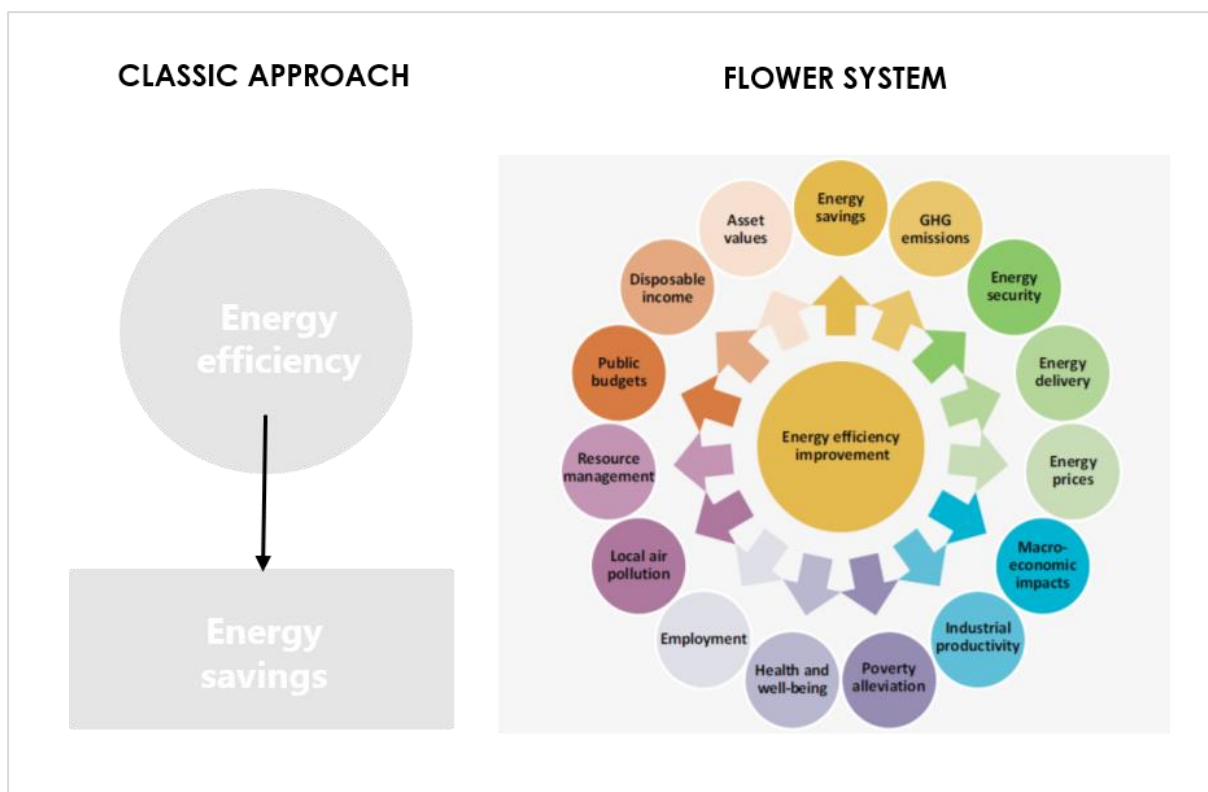
Finally, the AA1000SES (2015, pg. 24) reinforces the necessity of establishing indicators that allow an organisation to measure and evaluate the progress towards achieving quality stakeholder engagement, to identify areas for improvement and to demonstrate the value-added through engaging with stakeholders. As stakeholder engagement is a process, not an event or a one-off exercise, organisations must formalise the learning and improvement process from engagement activities and experiences to strengthen and optimise future operations.

## 2.2 MULTIPLE BENEFITS – MEDIATORS BETWEEN ENERGY EFFICIENCY AND STAKEHOLDERS

Energy efficiency means achieving the same level of service (measured as economic output, production quantity, or distance travelled) while consuming less energy. Measuring a negative value – the energy not consumed, or the energy costs avoided – can seem somewhat intangible and not apparent to the stakeholders (investors, consumers, and policymakers) and has led many commentators to refer to energy efficiency as the "hidden fuel" (IEA, 2014, pg.26).

Nonetheless, energy efficiency is a cross-cutting theme and can benefit many sectors (buildings, industry and transport) and government departments, from energy to environment, from finance to education and health. If robust energy efficiency policies are designed, they can connect the three pillars (3Ps) of sustainability (people, planet and profit), e.g., tackle decarbonisation as well as support local job creation and thus, economic stimulus.

Therefore, vital to energy efficiency become the "first fuel" is the creation of narratives that make it more visible and appealing to stakeholders other than only energy savings. A way of doing this is looking at the constellation of indirect and positive impacts labelled as multiple benefits (IEA, 2014, pg. 9).



**Figure 3:** Approaches to energy efficiency – as energy savings and through the FLOWER

The FLOWER (Framework for Long-term, Whole-system, Equity-based Reflection)<sup>4</sup> is a tool to visualise the multiple benefits. Besides, it helps to demonstrate the holistic relationship between the 3Ps. The energy efficiency flower is made up of 15 multiple benefits grouped into four types:

**Energy System:** energy security, energy delivery, energy prices

<sup>4</sup> FLOWER is a visual tool for community discussion and engagement about how to implement climate investments for multiple, equitable benefits, available at <https://www.climateinteractive.org/ci-topics/multisolving/flower/>

**Economic:** macroeconomic impacts, Industrial productivity, public budgets, disposable income, and asset values

**Social:** poverty alleviation, employment and health and wellbeing

**Environmental:** greenhouse gas reductions, local air pollution and resource management

Of these benefits, only reductions in energy demand and GHG emissions have been measured systematically. Nevertheless, a body of evidence is growing because quantify these benefits is essential to motivate higher uptake of energy efficiency opportunities (IEA, 2014, pg. 22).

In this way, the multiple benefits aim to capture a reality that is often overlooked, revealing that energy efficiency can provide many different benefits to various stakeholders. Nonetheless, curiously, the link between stakeholder and multiple benefits is yet to be done. This integration can be critical to reformulate the role of stakeholders in a project.

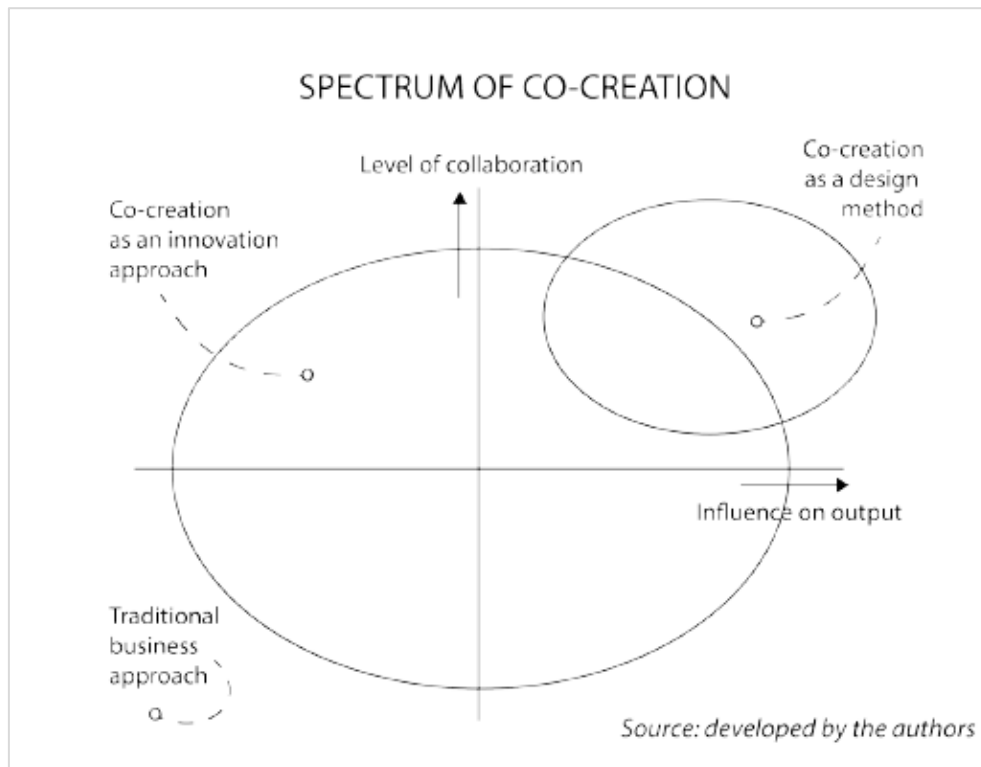
### **2.3 POSITIONING CO-CREATION**

The very literal meaning of co-creation is together (co-) make or produce something (new) to exist. The concept of co-creation can be seen as a bricolage of ideas coming from very varied fields, including marketing, public service management, urban planning, and design and innovation (Lund, 2018, pg.5)

The roots of co-creation can be traced back in Scandinavia during the '70s with a political tone seeking for community empowerment through participatory design and aligned to Arnstein's conception. In this context, it often refers to the collaboration between experts and non-experts (local people) who bring their knowledge to together developing a solution.

Over the years, other sectors appropriated themselves from the idea and moved the tone into a business-oriented with emphasis on goods and consumers and, recently, on services and customers. In the business domain, customers provide inputs. Prahalad and Ramaswamy (2000, pg. 80) describe co-creation as an avenue for better engagement between businesses and their customers. The concept of co-creation has also been linked to a business management model based on innovation in which external ideas converge to create shared value as a result of interdependence between different sectors (EU Commission, 2017, pg.5).

De Koning et al. (2016, pg. 267) points out that co-creation is still a maturing concept and to bring conceptual clarity to the term she compiled models of co-creation and generated meta-models based on the similarities. This exercise allowed the author to create three categories for co-creation. One of them is the co-creation spectrum that points out for overlapping with other movements and terms such as open innovation and participatory design. The spectrum also helps visualise the existence of different levels of influence on the output.



**Figure 4:** Spectrum of co-creation. Source: De Koning et al., 2016

Lund (2018, pg.6) explains that whereas from the 1970s onwards the discussions surrounding participation centred on rights and power, following Sherry Arnstein, participation conceptualised as co-creation instead focuses on including diverse forms of knowledge in urban processes to create innovative solutions to complex problems. Consequently, democratic legitimacy now relies to a much greater extent on output, rather than input legitimacy.

It represents a significant shift in the criteria for evaluation and the purpose of participation because it moves the discussion from representation and empowerment to the ability to solve problems. Lund (2018) warns for the fact that it can become a de-politicised process.

Associated with co-creation comes the penta-helix approach that categorises stakeholders in 5 types (businesses, public administration, local community, knowledge sector and capital) and represents them at different levels (local/micro), regional/meso, and national/macro). The penta-helix emerged from two previous approaches, triple and quadra-helix. They inaugurated the comprehension of the valuable contribution potential each stakeholder has and how hybridising elements from university, industry and government can generate new institutional and social formats for the programme and projects implementation.

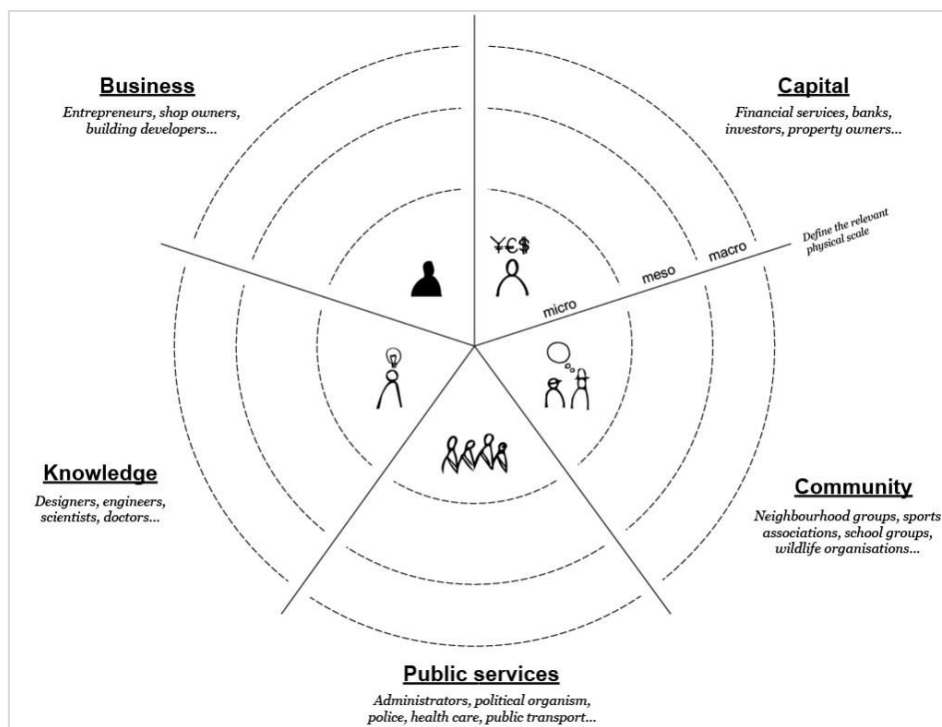


Figure 5: Penta-helix scheme. Source: OSMOS

In conclusion, co-creation is an in-progress concept with no solid boundaries. It embraces notions ranging from empowerment and the right to participate in the decisions to collaborations between the company and consumers, aiming at better goods and services. Nevertheless, more recently, the innovation perspective is gaining attention showing multi-stakeholder and variety of knowledge when getting together can produce solutions for wicked problems. This view, it extends the legitimacy of participation beyond the input to the output of a process too.

### 3. METHODOLOGY

#### 3.1 EMBEDDED RESEARCHER

By embedded researcher McGinity and Salokangas (2014, pg. 3) wanted to mean individuals or teams who are either university-based or employed undertaking specific research roles within host schools or other educational organisations, legitimated by staff status or membership to identify and implement a collaborative research agenda. The authors describe embedded research as a mutually beneficial relationship between academics and their host organisations, whether they are public, private or third sector.

The embedded role shaped this study and the way of investigating because by promoting co-creation in the development of the India roadmap, I took dual identities - the researcher bringing the academic knowledge and practitioner working with the organisation to deliver this process. This gave me a much richer understanding of the process and also the potential to influence changes in it.

#### 3.2 UNWRAPPING THE RESEARCH ONION – OUTER LAYERS

This study uses the research onion proposed by Saunders et al. (2009) to ensure adequate design and data collection techniques. The onion layers give a more detailed description of the stages of a research process and offer a progression through which a methodology can be designed.

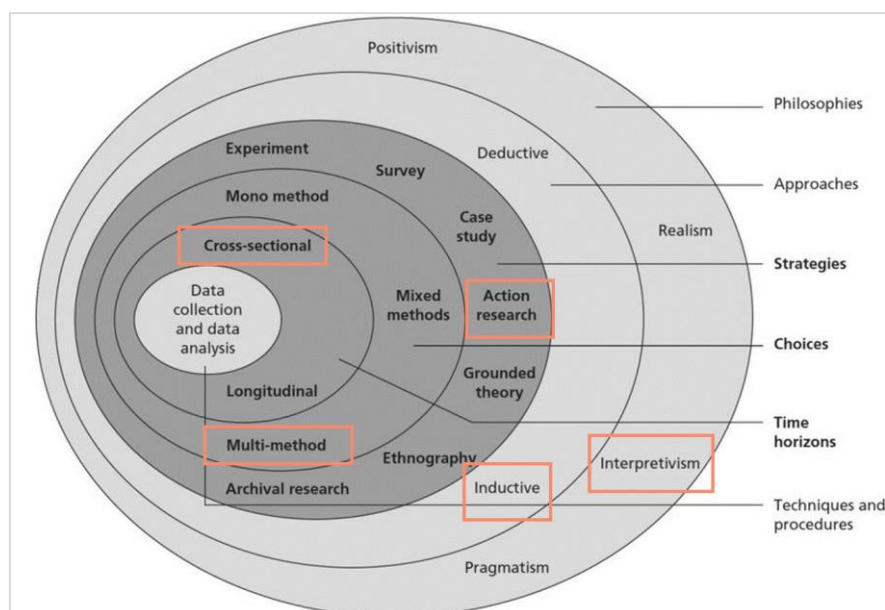


Figure 6: Research onion, Saunders et al., 2009

The research question of this study is described as:

**How can co-creation contribute to roadmaps for the buildings sector decarbonisation?**

Examining layer by layer, it follows the structure described below.

The outer layer, the research philosophy, outlines the beliefs and values that guide design, data collection and analysis of research. In essence, it is how the researcher perceives reality (ontology) and knowledge (epistemology) (Levers, 2013, pg.2).

The philosophy research of this study understands that reality is multiple, and there is not a single response that would fit that question. Hence, it comprehends the world using constructivist lenses. Constructivism is an approach to learning that holds that people actively construct or make their knowledge and the experiences of the learner determine that reality (Olesegun, 2015, pg. 66).

Epistemologically, it is positioned in the interpretivism instance as the goal is not an explanation about a fact but an understanding that has its meaning socially constructed through the interactive and participative relationship of the researcher and subject. The focus of interpretive studies is on what is specific and unique. The knowledge generated needs to put into perspective according to time, context, and culture.

At the IEA, I am tailoring a process that has been used by many organisations. The specifics and approach that made up this process are ultimately linked to my lenses and subjectivities influenced by the way I perceive the world, work and produce science within a particular context.

On the next layer, the discussion moves to the research approach that is fundamentally concerned with the use of theory, and it can be deductive, inductive and abductive. A deductive approach develops a theoretical framework and hypothesis to be tested in the field. An inductive approach is a research approach that generates knowledge from the specific to the general, as explains DeCarlo (2018).

The research question of this study supported by the initial literature review led this research to be conceptual thinking and theory building, features of the inductive reasoning. In an inductive approach to research, a researcher begins by collecting data that is relevant to her topic of interest. DeCarlo (2018) describes the process as having substantial amount collected; the researcher is able to step back to get a bird's eye view of their data identifying issues and patterns and work to develop a theory to explain them.



### 3.3 UNWRAPPING THE RESEARCH ONION – INNER LAYERS

The mid-layer of the onion is about how to find out and the appropriated research strategy for this. According to Saunders et al. (2009, pg. 600), research strategy is the general plan of how the researcher will go about answering the research question, and it can be either a quantitative or qualitative methodology.

The table below summarises the difference between quantitative and qualitative research. They diverge in the nature of the data itself, the data analysis methods and results interpreted and the researcher relation with the subject.

	<i>Quantitative</i>	<i>Qualitative</i>
(1) Role of qualitative research	preparatory	means to exploration of actors' interpretations
(2) Relationship between researcher and subject	distant	close
(3) Researcher's stance in relation to subject	outsider	insider
(4) Relationship between theory/concepts and research	confirmation	emergent
(5) Research strategy	structured	unstructured
(6) Scope of findings	nomothetic	ideographic
(7) Image of social reality	static and external to actor	processual and socially constructed by actor
(8) Nature of data	hard, reliable	rich, deep

**Figure 7:** Comparative research framework. Source: Bryman, 2016

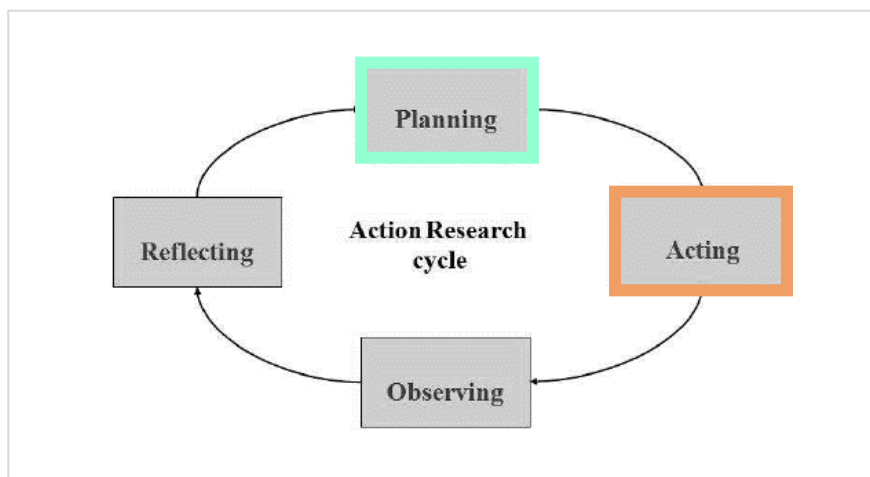
Bryman (2016, pg.49) explains that qualitative researchers tend to espouse an approach in which theory and empirical investigation are interwoven. The delineation of theoretical ideas is usually viewed as a phase that occurs during or at the end of the fieldwork, rather being a precursor for it. In fact, when conducting a qualitative research theory emerges from the data.

Being constructivist and following an inductive approach, made the research be positioned under the category of qualitative research, characterised for being subjective and mostly based on an interpretative epistemology.

As this research has a crucial connection with my role as a practitioner, action research is a methodology that allows to intervene within the organisation and reflecting on it. Vaccarino et al. (2007, pg.13) claim that the fundamental principle underpinning action research is identifying a

problematic area, imagining a possible solution, trying it out, evaluating it (did it work?), and changing practice in the light of the evaluation. In other words, a problem-solving process. However, to turn it into an action research process, researchers need to state why they want to examine that particular issue and collect information or data to show the process.

Altrichter et al. (2002) reiterate that action research involves a self-reflective spiral of activities: planning, action, observation, reflection, re-planning, and action. The steps highlighted in green and orange (figure 8) are the ones addressed in this thesis. As not being able to observe any implementation of improvements proposed for the India roadmap in time to discuss them in this study, I am partially completing the cycle, including planning and acting activities.



**Figure 8:** Action-research cycle with steps addressed in the thesis. Source: Kemmis, 1985

The idea of self-reflection is central to action research. McNiff (1995, pg.6) states that when the researcher produces her research report, it shows how she has carried out a systematic investigation into her own behaviour and the reasons for that behaviour. The study shows the particular process I was gone through, not only to achieve a better understanding of topics and deliver a task but about myself as well, so I can continue refining my way of researching and working.

Besides, there is the aspiration for a social change connected to action research by improving shared social practices and understandings behind these practices (Kemmis, 2006, pg. 8). Action research does not begin with a fixed hypothesis. It starts with an idea to be developed and needs to be continually evaluated: 'How do I improve my work?' (McNiff, 1995 pg.7).

### 3.4 ACTION RESEARCH JOURNEY

Action research is a work in progress. The reflection step is critical because it feeds into the next cycle, allowing future improvements. As the study followed the pace of the India project itself, I was able to complete two steps of the cycle, planning and acting. Observing and reflecting can be a scope of future studies.

The scheme (figure 9) uses the concept of a journey mapping to communicate the process I went through to accomplish the research design. Gibbons (2018) states that journey maps are useful in informing the general narratives and themes uncovered by longitudinal research done toward a goal over time.

The mapping was designed using the advice given to new action researchers by McNiff (1995). Following the cyclical process idea, the author structures the action plan into the topic to be investigated, imagining a solution, implementing the solution, evaluating the solution and changing practice in light of the evaluation (McNiff, 1995, pg.11).

My initial idea was to research about co-creation and processes that involve collaboration and can build bridges between policy, community and science. In my view, to transform and reshape the built environment is crucial new dynamics between actors/ stakeholders to achieve deep changes toward decarbonisation and more equal societies. In this sense, the work IEA has been doing with the roadmaps gave me the chance to explore this.

Investigating the possibilities of how to align my research interest to the work at the IEA, in conversations with colleagues, repeatedly the engagement of stakeholders conducted in the regional buildings roadmaps was mentioned as not entirely satisfactory. Parallel to this, the work with national roadmaps became more urgent. Regarding India, one of the ideas was to conceive this national roadmap more a process of bringing stakeholders together than a document with targets. Therefore, improving the stakeholder engagement became my practical problem to be addressed on the national India roadmap as well as the entry point to my researchable problem, co-creation.

From this, I started to understand how the stakeholder on the regional process was done to figure out how to propose improvements to the national and raise the discussion on ways of enhancing collaboration through co-creation to contribute to policy design, particularly, to roadmaps.

The action research was the methodology to investigate the researchable problem, and figure 9 represents my research journey.

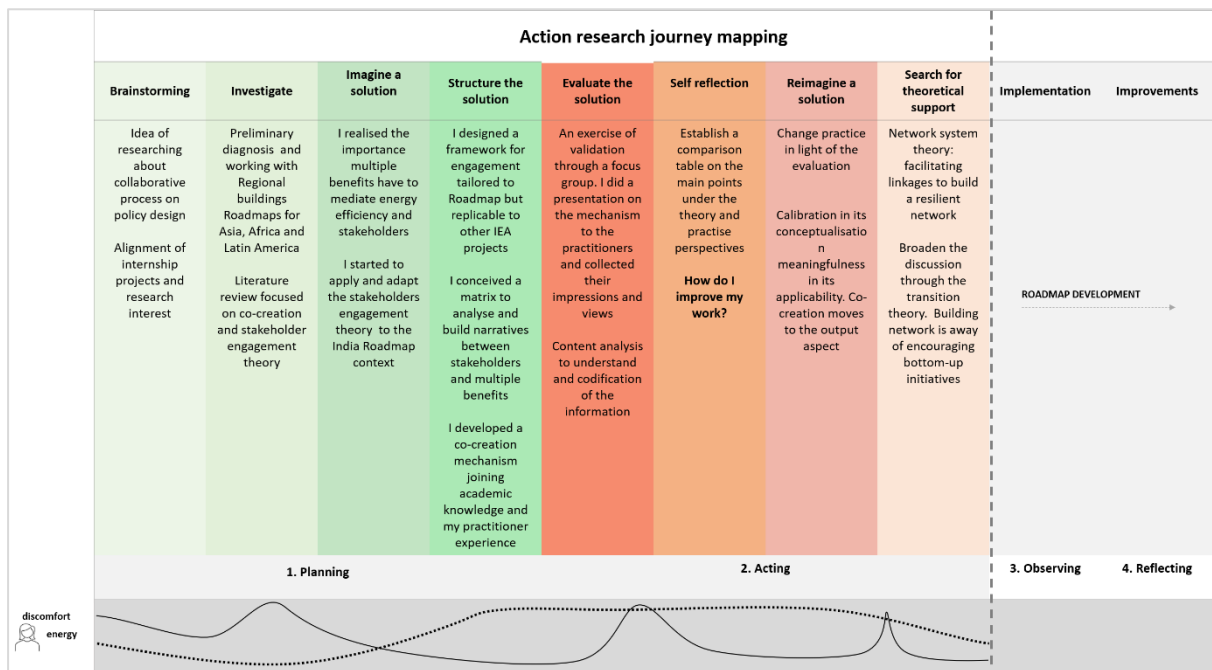


Figure 9: Action research journey mapping, 2020

I added a graphical representation to the bottom with two categories: discomfort and energy spent during the process. They are part of my self-reflection in conducting the research. Gibbons (2018) underlines that one feature of a journey mapping is exploring the experience and uncovering moments of both frustration and delight of a process.

Discomfort line peaks are related to three moments, specifically, to my thoughts about the relevance of the study at the start-end process and what I would be able to achieve by studying this. The mid-peak refers to the presentation and validation of ideas to the practitioners.

### 3.5 DATA COLLECTION AND ANALYSIS

This is a cross-sectional study. Therefore, it involves looking at data at one specific point in time as against collating concentrated data for extended periods of time for longitudinal designs (Bryman (2016, pg.70). The participants in this type of research are selected based on particular variables of

interest. The data collected is not used to determine the cause of something but to make inferences about possible relationships and support further theoretical development.

A set of multi-methods was used to gather data and information.

Desk research provided a deeper understanding of the themes discussed. It was done through scientific papers, academic books and reports provide background, discover theoretical gaps. Besides, standards and handbooks were consulted to support on theory application.

An interview was conducted with a practitioner involved in the work with the roadmaps project to get insights on lessons learned from the previous process. A survey with questions was used to get the answers. Questions and answers were transcribed (session 4.2).

Empirical qualitative data was collected to gain a better understanding and capture insights among practitioners of the organisation. A focus group was formed to discuss the co-creation instrument after a theoretical presentation. The virtual meeting took 45 minutes. The discussion was audio-recorded and *decupés* - transcribed accordingly (session 5.2)

Freitas et al. ( 1998, n.p.) raise the pros and cons of using this qualitative technique. Focus groups have some advantages in terms of allowing researchers to explore topics and generate a hypothesis, it has a high 'face validity' data, and it is comparatively easier to conduct. On the other hand, there it requires interviewers carefully trained and the research has less control over the data generated.

The empirical data was analysed by doing a simplified exercise of axial coding and interpretation. Axial coding is a qualitative research technique that involves relating data together to reveal categories within participants' voices collected. It is one way to construct linkages between data (Allen, 2017). The technique allowed me to identify main topics for reflection and improvement of the work, as requires an action research methodology.

## **4. RESULTS**

This chapter shows how the stakeholder engagement was conducted in the regional roadmaps and also identifies what the possibilities for improvement are. Hence, first, I present how the regional process was done and after, I bring the considerations from the practitioner responsible for the buildings roadmaps in the IEA. Having an understanding of the current situation, I introduce an alternative stakeholder engagement framework to be utilised in the national India roadmap.

### **4.1 REVIEWING THE STAKEHOLDER ENGAGEMENT - REGIONAL ROADMAPS**

The model of stakeholder engagement used for the regional buildings roadmap for Asia, Latin America and Africa (GlobalABC, IEA and UNEP, 2020) conducted by the IEA was based on a massive process of consultation, and it followed the sequence described below:

- Identify potential stakeholders per region (national and local authorities, companies, and international/ regional organisations)
- Divulcation of the project objectives and coordination at a national and regional level
- Identification of key actions, policies, technologies and goals for the short, medium and long term through stakeholder's consultations
- Draft of regional roadmaps, and feedback from stakeholders
- Ongoing revision and updating

The stakeholder consultation took the form of questionnaires, in-person workshops, webinars and phone conversations, and included over 120 people. It outlined the range of actions that different actors can take in the short, medium, and long term to achieve a built environment that is zero-emission, efficient and resilient.

Lane (2005, pg.285) draws attention to the fact that decision-making agencies often prefer to describe the opportunities afforded to relevant publics as a consultation which for many years has been the dominant approach used to gather advice from the public about draft proposals. From Arnstein's perspective, the consultation can often be a tokenistic exercise because it confers little real power to people.

Painter (1992) cited in Lane (2005), on the other hand, raises that asserting that genuine participation is only achieved by having power in decision-making ignores the range of benefits which may be associated with being consulted throughout other stages in policymaking. Dialogue and information exchange, which Arnstein (1969) regards as tokenistic, pre-judges the outcome of such interaction.

Therefore, based on literature review, one way of making the process more meaningful is mentioned by Connor (1988) (session 2.1) on the interpretation of the ladder of citizen participation as a combination of 'Arnsteinsian' rungs that can be used simultaneously to meet the different needs of the stakeholders instead of focusing only on one level of engagement for all types of stakeholders.

#### **4.1.1 LISTENING TO THE PRACTITIONER'S PERSPECTIVE**

In this pathway of a better understanding of how to design an improved stakeholder engagement framework for the India roadmap, I organised an interview with the practitioner responsible for the development of the regional roadmaps. The purpose was to collect insights and lessons learned from the regional roadmaps process as well as identify gaps. The interview is transcribed below.

**Researcher:** How effective was the process conducted for the stakeholder engagement in the regional roadmaps?

**Practitioner:** The process was effective in the sense that we had a relatively high number of people who contributed (higher than for other projects, as far as I am aware because we used online surveying tools that could be shared with a broad audience). We also had a good representation of different types of stakeholders (public, government, industry, academia etc.). We had a mix of people who contributed lightly (filling in one or two sections of the survey, or participating in webinars) and those who contributed in a deeper way (making detailed comments on the drafts) I believe this balance is good, however, ideally we would have had more people give more detailed comments. We also got very few objections.

**Researcher:** What do you think were the weaknesses of it?

**Practitioner:** I would have liked to follow up with certain people or groups of people to go deeper into why they made certain comments or answered the survey in a certain way. It is difficult to take at face

value the response to a survey without being sure there is no misunderstanding of the questions. Some of the questions were about the aspirations for the region, which is difficult to answer. The fact the questions were about a regional roadmap made it difficult to tie back to the experience of a particular person or country. Perhaps some of the questions throughout could have been more specifically directed to their experience rather than making inferences about the regional level (i.e. we could have tried building the regional view bottom-up).

**Researcher: What would you try to improve for the national roadmap?**

**Practitioner:** Get buy-in from actors in the space to manage certain aspects of data collection/stakeholder feedback. If it is in their interest, they are more likely to do it more effectively as they have the network and the resources. Also gives the IEA more credibility. Be very specific with our questions and make them as easy as possible to answer (i.e. related to their personal experience). Don't try to cover all topics at once. Don't lose sight of those who have engaged repeatedly; engage in one to one conversation.

In sum, from the interview, what draws my attention, in general, is the wish for more in-depth conversations and interactions with some key stakeholders. It can be related to the fact that a previous mapping and analysis to understand who the stakeholders are and, thus, how best engage with them was not done for the regional roadmaps.

## **4.2 APPLYING THE THEORY - STAKEHOLDER ENGAGEMENT FRAMEWORK (SEF) FOR THE INDIA ROADMAP**

Based on literature review, handbook consultation and interview with the practitioner, I designed a stakeholder engagement framework (SEF) for the energy efficiency residential buildings roadmap in India. Differently from the previous regional process, SEF covers different levels of engagement (IAP2) to make the process more meaningful and strategic.

The framework was conceived based on the concept of the AA1000SES (2015) and divided the process into stages - analysis, strategy, and assessment. It encompasses:

- Principles to guide the engagement approach
- Three steps for conducting engagement activities (analysis, plan, and monitor)
- A tool to understand the correlation between stakeholder and the multiple benefits



- Co-creation instrument

SEF is guided by OECD (2015, pg.35) principles of engagement: inclusiveness, clarity, information, effectiveness, integration, and adaptiveness. I highlighted two of them to reinforce the character of the proposed SEF.

Inclusiveness - principle 1: Extent to which engagement processes involve stakeholders from diverse backgrounds and consider their needs, assets and perspectives into the design and implementation of energy policies and projects.

Adaptiveness - principle 6: Customise the type and level of engagement as needed and keep the process flexible to changing circumstances.

SEF has the purpose of:

- Identify key stakeholders and ensure buy-in in the EE residential buildings India roadmap
- Define the right level and methods of engagement to different stakeholders
- Establish correlations between stakeholders and multiple benefits
- Guide future engagements from which the IEA can institutionalise the learning and actively look for improvement opportunities

The three steps for conducting engagement activities are as follows:

### **1. STAKEHOLDER ANALYSIS**

IDENTIFY – List and categorise

PRIORITISE – Power, interest, currently support energy efficiency, roadmap chapters, connection

UNDERSTAND – Matrix of multiple benefits (MOMB)

### **1-2. CO-CREATION INSTRUMENT (see 5.1)**

### **2. STAKEHOLDER ENGAGEMENT STRATEGY**

PLAN – Definition of engagement methods by levels

ACT – Implementing activities and obtaining outcomes

### **3. STAKEHOLDER ENGAGEMENT ASSESSMENT**

ASSESSMENT – Develop indicators to learn and improve

Importantly, the results presented and discussed in this thesis cover only the activities involved in steps 1 and 1-2.

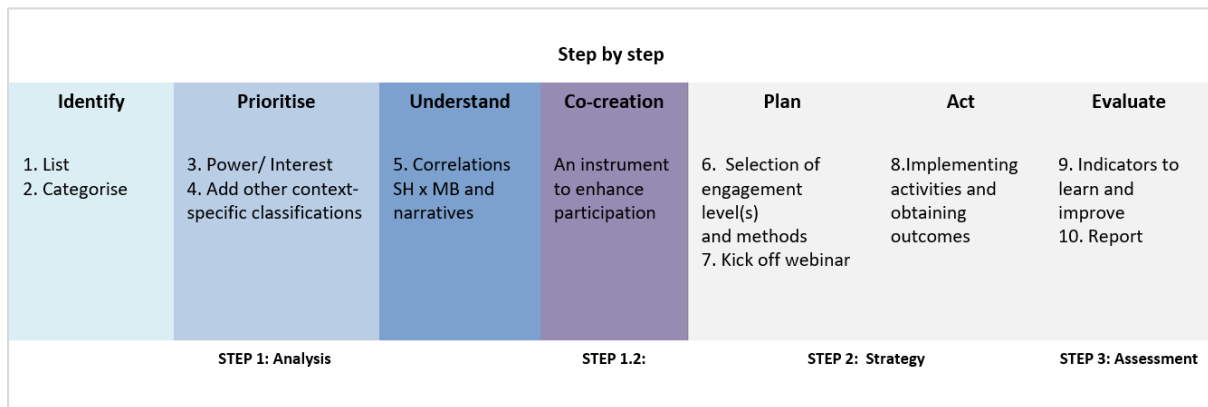


Figure 10: Framework synthesis showing the steps discussed in the thesis, 2020

## IDENTIFY

This section gathers information necessary to start picturing the existent actor's landscape in the India buildings sector. It groups stakeholders in 12 categories: Property and project developers, Architects and engineers, Industry or industry association, Financial institutions, Subnational government, National government, Utility companies, Civil society, Building owners, Building occupants, International partner – development and International partner – private.

Label (stakeholder)	Type (category)	Currently support EE	Potential to influence	Interest	RM connection	Acts at national or sub-national level?	Main activity relating to buildings	Description
All India Housing Development Association	Civil society	NO	2	inform	NB	National   Sub-national		
Alliance for and Energy Efficient Economy-AEEE	Civil society	YES	2	consult	NB   MA	National   Sub-national	Local think tank working on research activities in the space of buildings sector	Industry led, membership based not-for-profit organization that drives energy efficiency (EE) markets and policies in India. It engages in capacity building, market development, policy advisory and industry advocacy initiatives
Building Material and Technology Promotion Council-BMTPC	Civil society	NO	3	consult	MA	National	Help in scaling up new and proven construction material and technology	In order to bridge the gap between research and development and large scale application of new building material technologies, the erstwhile Ministry of Urban Development, Government of India, had established the BMTPC in 1990
Bureau of Energy Efficiency - BEE	National government	YES	5	collaborate	NB	National	Nodal agency in India to promote EE	BEE is a statutory body under MoP whose mandate is to promote energy efficiency across different sectors in the country. Mandate of BEE is to promote energy efficiency across the identified DCs under the EC act. Residential sector is not yet part of the EC act so BEE enabling policies in the sector on voluntary basis

Figure 11: Stakeholder mapping table, 2020

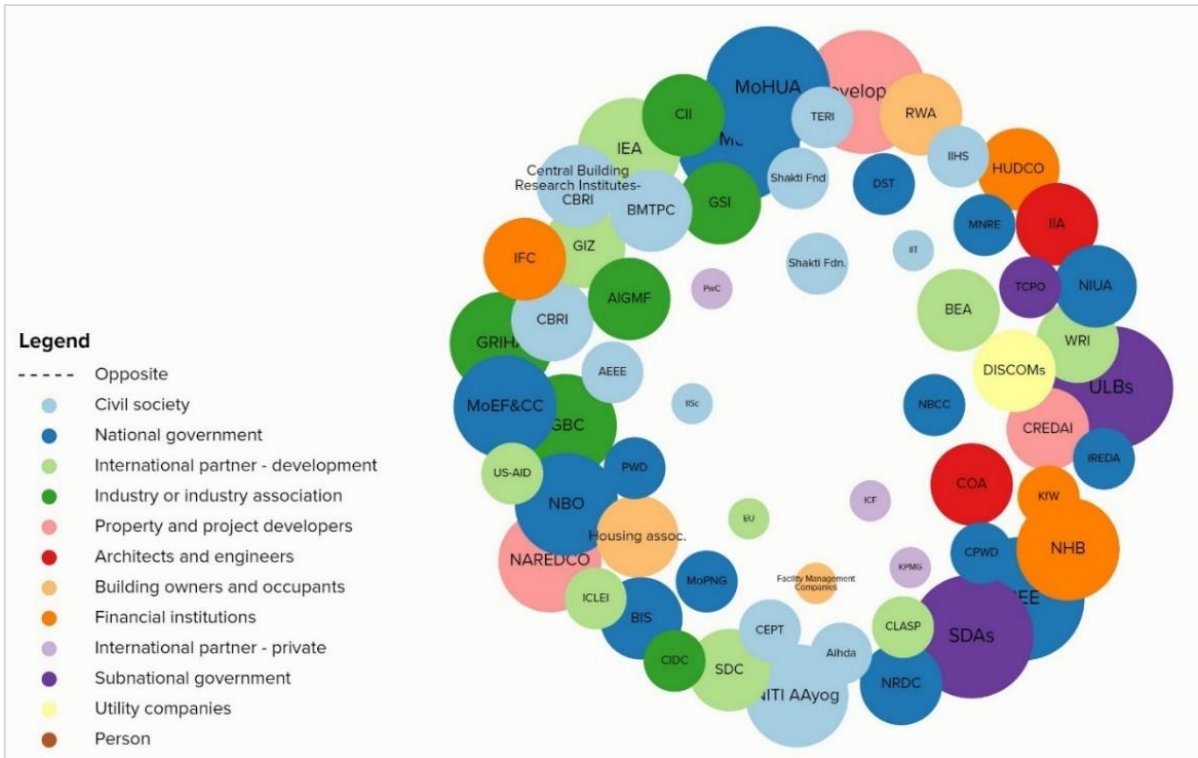
Based on the literature, I also created some categories that would help prioritise the constellation of stakeholders:

- Currently support energy efficiency activities – it allows to identify what are the stakeholders that need to be brought on board to the project
- Potential to influence EE residential buildings
- The interest, in other words, the desired level of engagement with the stakeholder
- The connection that each stakeholder has with the chapters, namely: new buildings, materials, and urban planning
- The level of action – national or sub-national or both
- Description of their mandates and roles

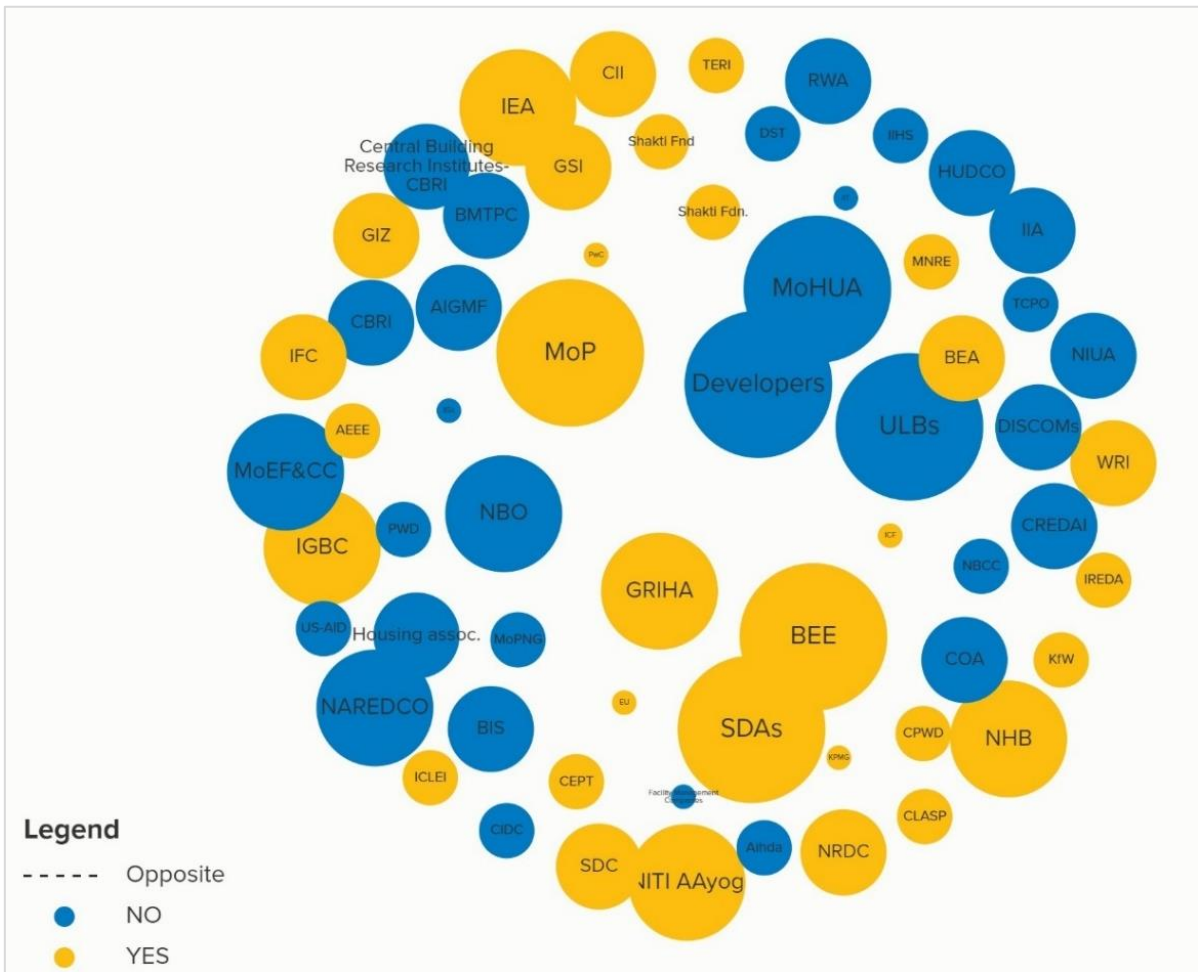
### **PRIORITISE**

After consolidating information in the table, I chose to use a programme for data visualisation called Kumu. Basically, it is a platform for mapping stakeholders and systems to understand relationships better. Through its online platform, Kumu creates interactive, web-based network maps which allow creating different ways of viewing relationships within the network. This capability helped me clarify key aspects and visually identify trends that were not easily readable from the data compiled in the table.

This first map shows stakeholders divided into 11 broad categories. Different nodes size represents the power of influence that each stakeholder has in the buildings sector. This map also reveals how energy efficiency crosses different disciplines, raising the importance of multiple benefits as there are different motivations and interests from various stakeholders.



**Figure 12:** The constellation of stakeholders x influence in the building sector, 2020



**Figure 13:** Stakeholders currently involved in energy efficiency initiatives, 2020

The second map demonstrates through yellow nodes, stakeholders who are already part of any policy program in any capacity (regulatory, implementer, policy advocacy) which links to mainstreaming energy efficiency in the buildings sector in India.

A third example illustrates that the roadmap is broadly divided into three themes - new buildings, urban planning and material efficiency. It presents the bifurcation of stakeholders as per their interest to influence a particular stream in the roadmap. The bifurcation is done depending on the mandate of the organisation, their ongoing projects and policy initiatives.

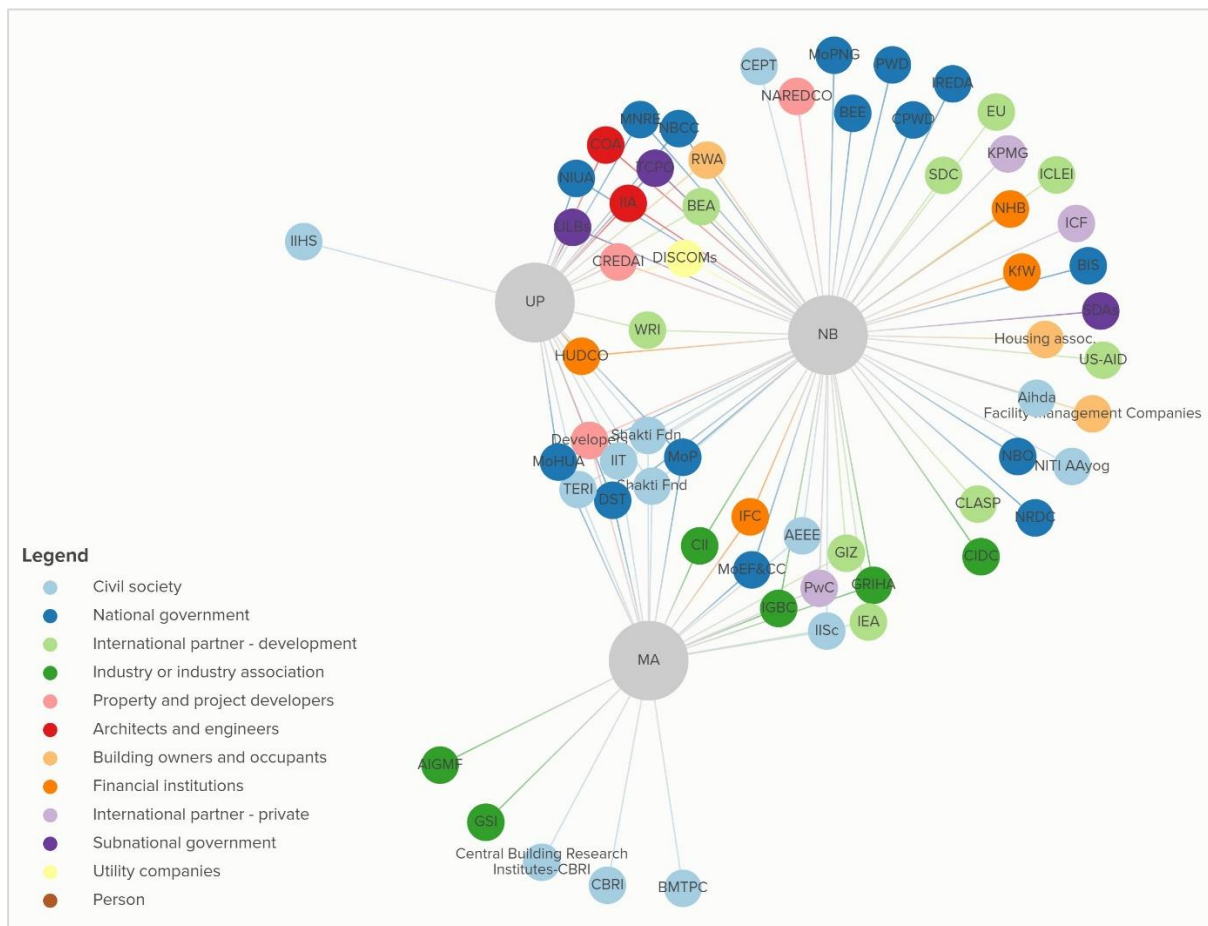


Figure 14: Stakeholders x roadmap theme, 2020

Lastly, an example that illustrates the bifurcation of stakeholder depending upon their presence at the national or sub-national level and the level of governance they are active or can have influence. Also, a filter adds the information to demonstrate who among them are already part of any policy program in any capacity (regulatory, implementer, policy advocacy) in energy efficiency.

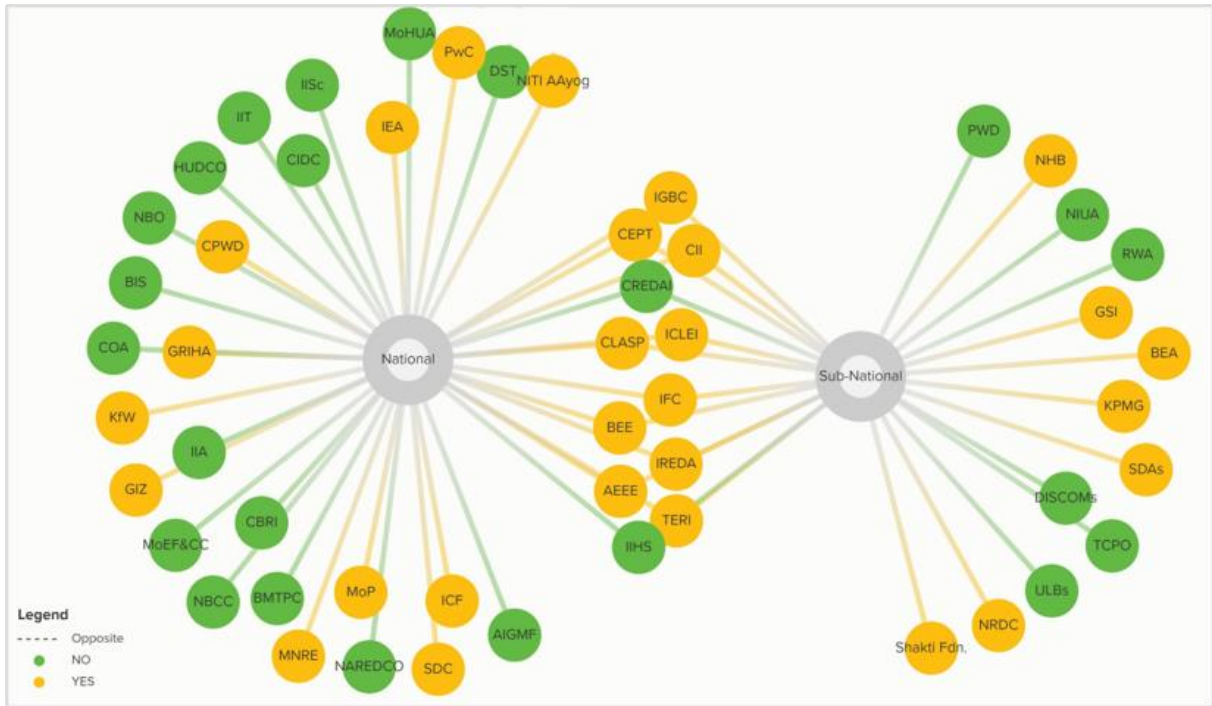


Figure 15: Stakeholders x level of action, 2020

To design a strategic approach for the engagement that is not only based on extensive consultation. I used the spectrum of public participation developed by the International Association for Public Participation (IAP2). It proposes five types of engagement inform, consult, involve, collaborate.

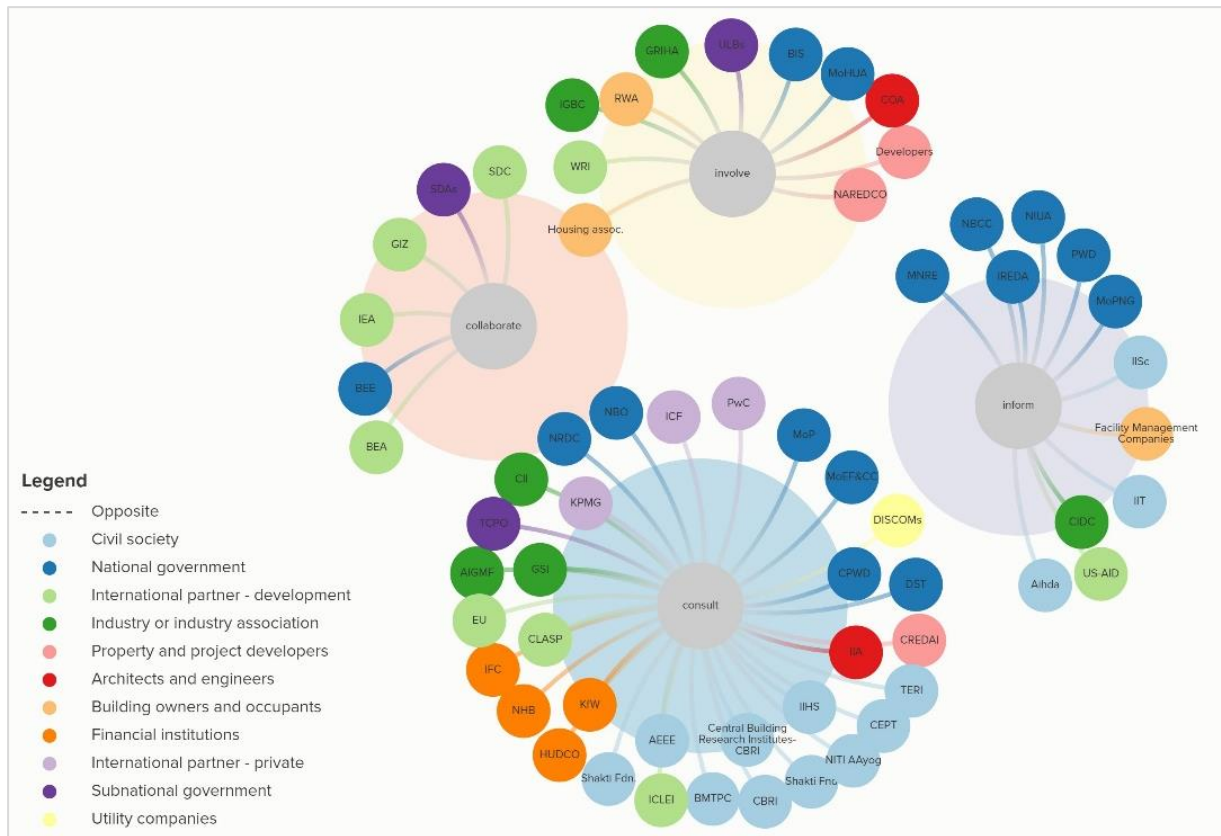


Figure 16: Stakeholders x level of engagement, 2020



**UNDERSTAND**

For this session, I developed a matrix of multiple benefits (MOMB). It was designed to improve the dialogue with stakeholders through:

1. Building narratives

- Establishing correlations among multiple benefits and stakeholders to help build context-specific narratives on gains from implementing energy efficiency measures
- Presenting key data to stakeholders (emissions reduction, air quality improvement, energy savings, resource efficiency, job creation, poverty alleviation, health benefits, safety, and security) illustrating the potential benefits but in a tailored manner

2. Refining the target-audience for reports, webinars, workshops

A visual matrix is a resource that can help identify trends, strengths, and opportunities and also transmit understands among different practitioners. The MOMB presents multiple benefits in the rows and stakeholders in columns. In this display filled squares to denote the relationship between them. Each sector will have a different pattern of filled squares, but through that will be possible to understand how each sector, stakeholders and multiple benefits form a landscape.

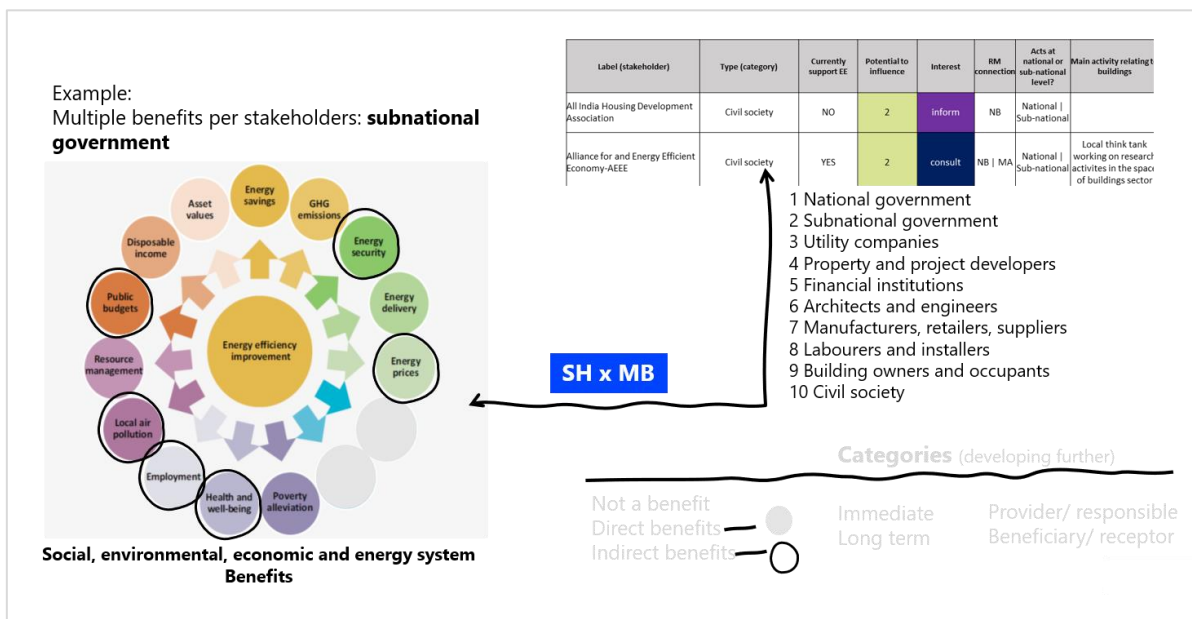


Figure 17: The matrix thought process

Type	Multiple Benefits/ Stakeholders	1 - Property and project developers	2 - Architects and engineers	3 - Industry or industry association	4 - Financial institutions	5 - Subnational government	6 - National government	7 - Utility companies	8 - Civil society	9 - Building owners	10 - Building occupants
Energy system	Increased Energy Security										
	Reduced Energy System Costs										
	Increased Integration of Renewables										
Economic	Increased Energy Productivity										
	Creation of Jobs										
	Increased Affordability of Services										
	Freeing up of Public Budgets										
	Increased Competitiveness of Industry										
	Higher Asset Values of Real Estate										
Social	Increased Energy Access										
	Better Health and Wellbeing										
	Increased Safety and Security										
	Increased Resilience to Extreme Weather										
Environmental	Reduction of GHG Emissions										
	Improved Air Quality										
	Increased Material Efficiency										

Figure 18: Matrix of multiple benefits x stakeholders – MOMB, 2020

Examples of possible readings extracted from the matrix to be developed and refined:

- Energy-efficient buildings enable freeing up of public budgets by financial resources businesses and governments that improve public budgets
- Energy-efficient buildings enable increased energy security by lowering fuel import dependency and reduce costs for primary fuel storage, reducing the occurrence of blackouts
- Energy-efficient buildings enable increased integration of renewables by facilitating the integration of clean energy technology by reducing volatility and enabling flexibility

This association results in progress on the process of first, making the multiple benefits more evident, revealing to the stakeholders what energy efficiency can provide and second, understanding how better engage with them in a project (session 2.2).

A two-way FLOWER represents this linkage moving from the classical approach that energy efficiency means energy saving, passing by the unidirectional FLOWER to the two-way which stakeholders are



part of the constellation and the multiple benefits act as mediators between them and energy efficiency.

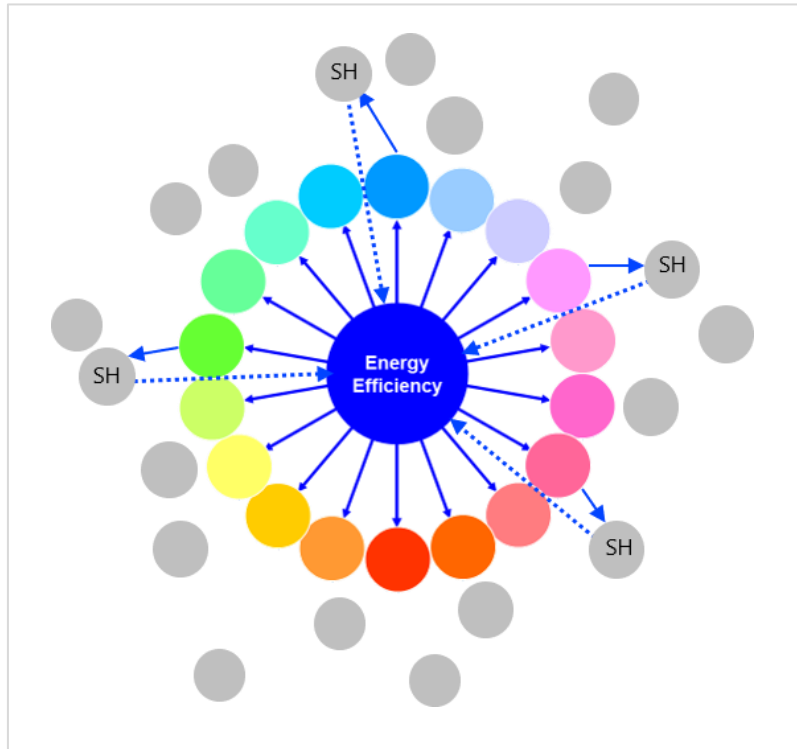


Figure 19: Two-way FLOWER, 2020

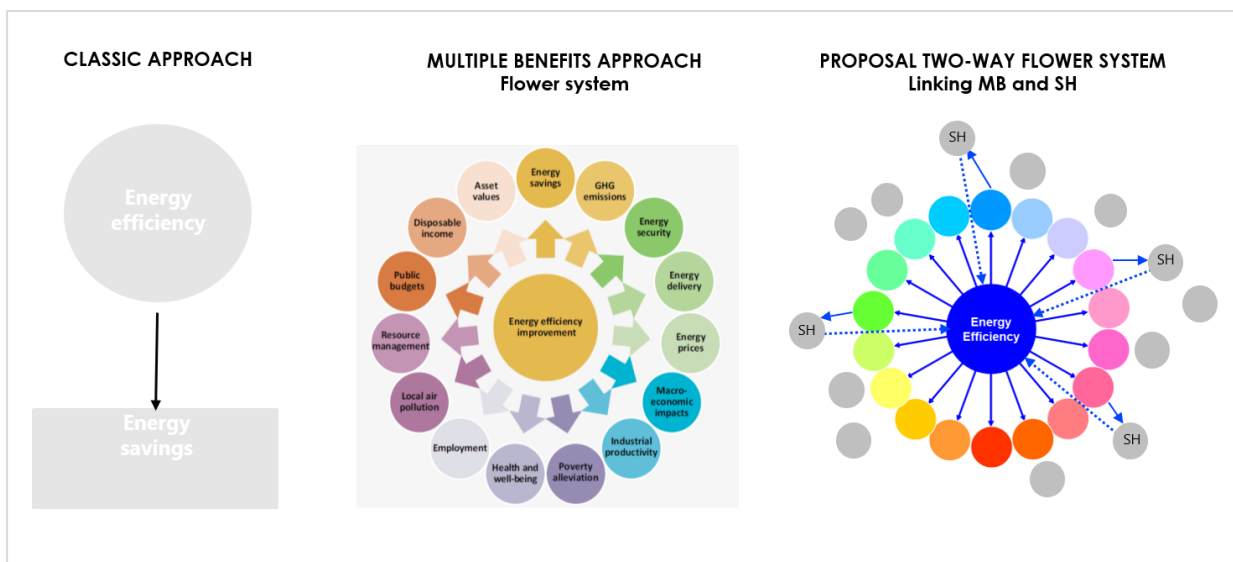


Figure 20: A progress process approach to energy efficiency, 2020

## 5. DISCUSSIONS

This chapter seeks to explore how stakeholder engagement could be enhanced through more collaboration by utilising the co-creation instrument. In this sense, the chapter presents a conceptualisation of co-creation through a theoretical angle as well as includes practical considerations gathered in the validation process made with practitioners involved with the buildings sector. Lastly, it explores a turning point for the understanding of the co-creation role to enhance connectivity.

### 5.1 CO-CREATION INSTRUMENT

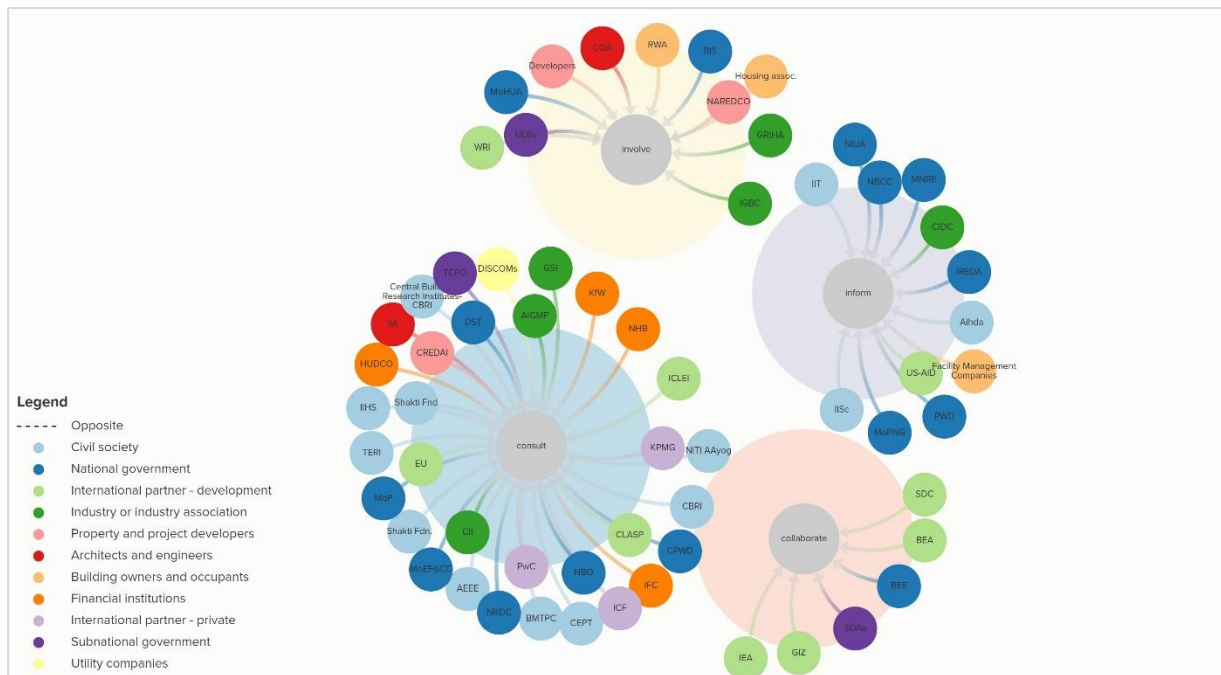
This subsection will have a presentation format, similar to the one I gave to the IEA colleagues. It was the theoretical portion of the focus group exercise I did to collect empirical data from experienced practitioners involved directly or indirectly with India roadmap.

I started the presentation with an explanation about the research aims and my role as an embedded researcher. I showed the stakeholder engagement framework - SEF (session 4.1) and mentioned that I would be focusing on step 1.2 – co-creation instrument.

Step by step						
Identify	Prioritise	Understand	Co-creation	Plan	Act	Evaluate
1. List 2. Categorise	3. Power/ Interest 4. Add other context-specific classifications	5. Correlations SH x MB and narratives	An instrument to enhance participation	6. Selection of engagement level(s) and methods 7. Kick off webinar	8. Implementing activities and obtaining outcomes	9. Indicators to learn and improve 10. Report
STEP 1: Analysis			STEP 1.2	STEP 2: Strategy		STEP 3: Assessment

Figure 21: SEF within SEF, 2020

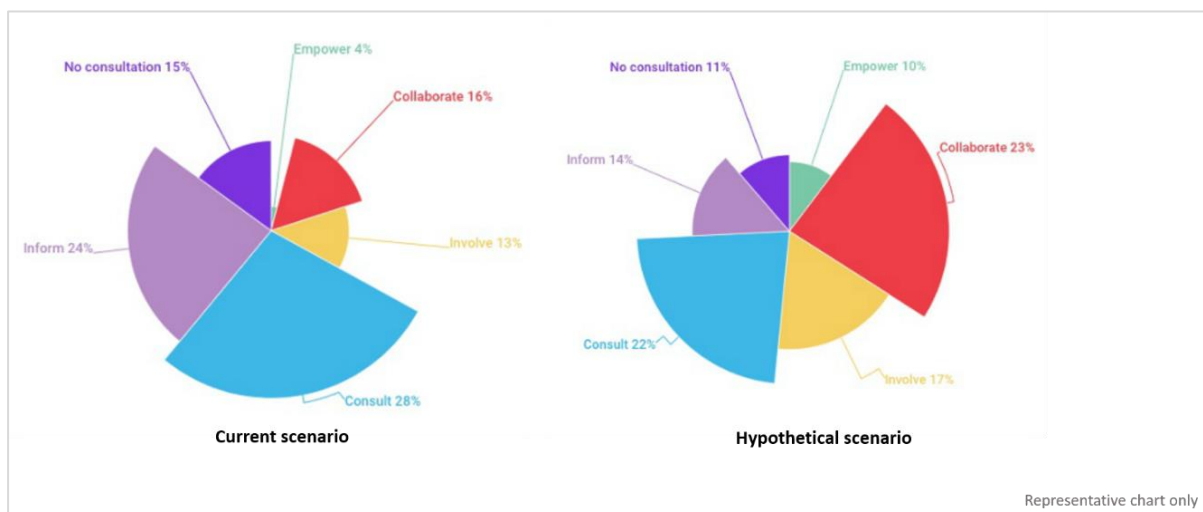
Subsequently, I showed the current stakeholder analysis for the India roadmap in terms of different levels of classification and the importance it has to improve the engagement process.



**Figure 21:** Stakeholders x level of engagement, 2020

The idea was to point out that although levels are becoming more diversified, still consultation is far more representative than other levels. Another point was that collaboration has its focus mostly on other international organisations and central bodies of government (national and subnational level).

Moving to the next slide, I proposed them to look at these graphics and imagine if the current situation moved towards the hypothetical one. What would the roadmap process look like, with more collaboration?



**Figure 22:** Different levels of engagement. Source: Open Government Partnership – OGP, 2020

To answer this question, I took the power-interest matrix to explain the idea of enhancing collaboration through co-creation, defined in this study as an instrument to promote the inclusion of stakeholders and foster innovation.

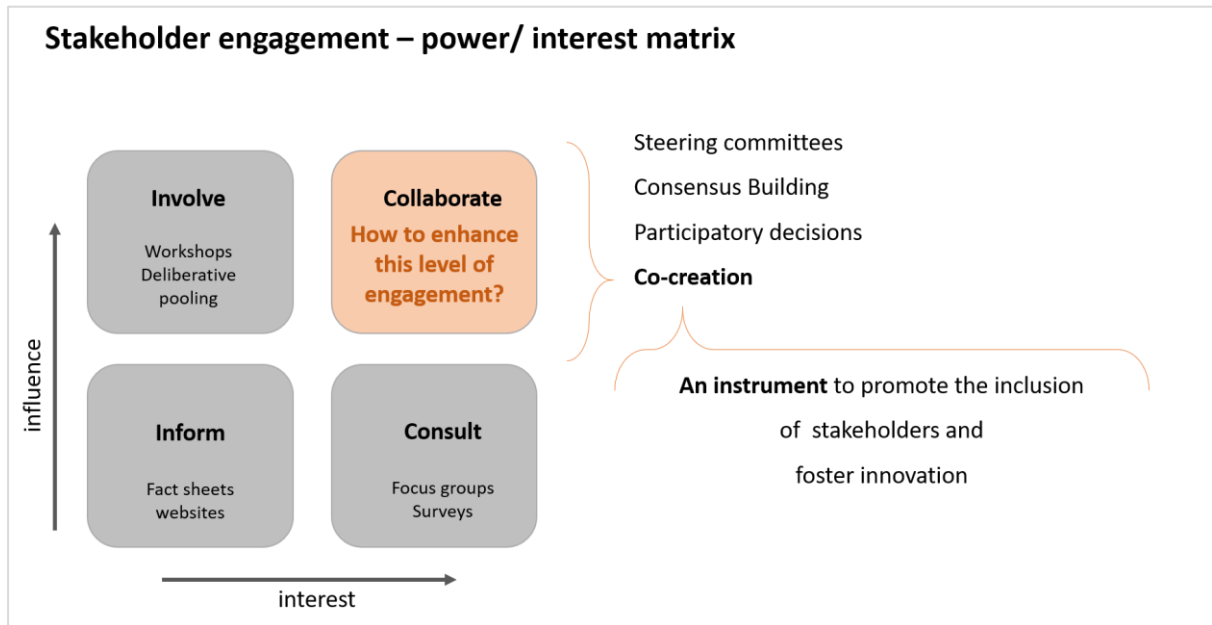


Figure 23: Power/ interest matrix highlighting collaborate level

In order to make them better realise the definition of co-creation, I presented a timeline to explain the evolution of the concept over time.

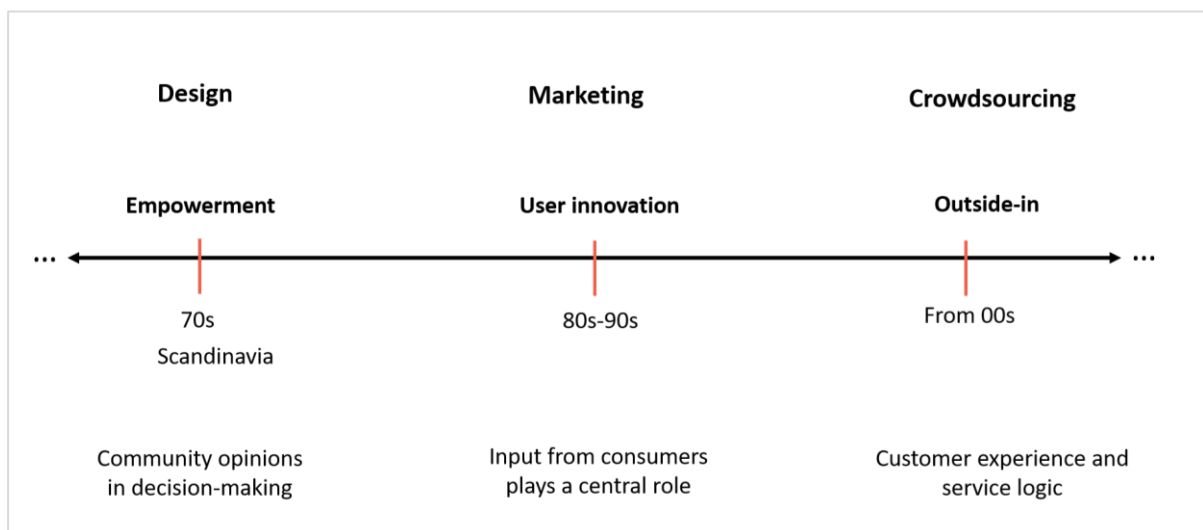
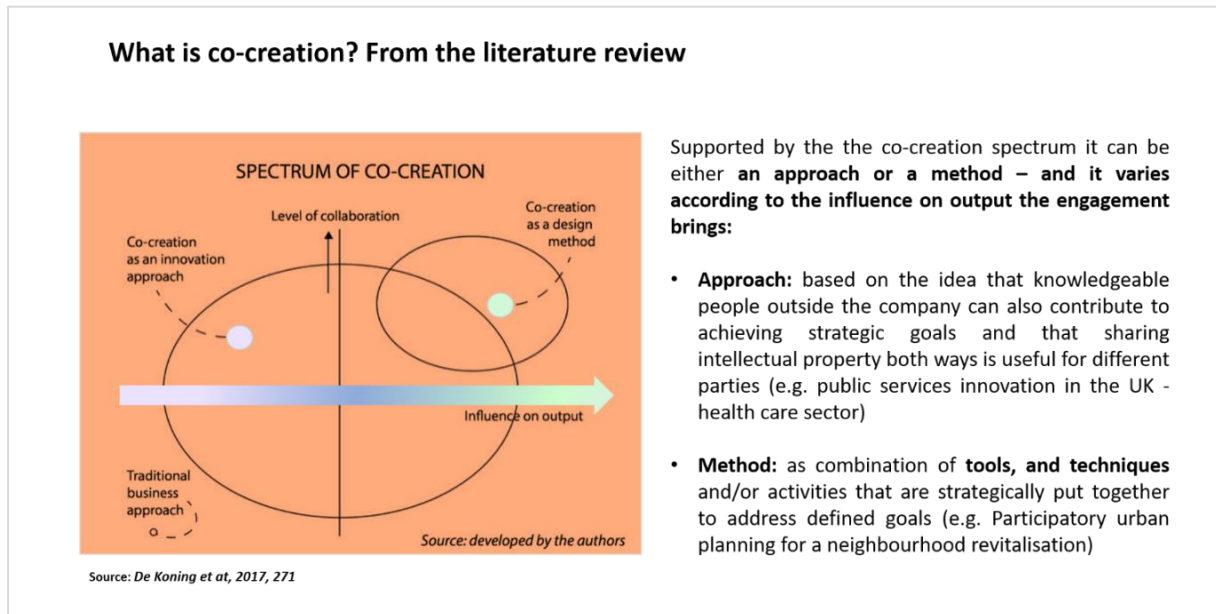


Figure 24: Timeline of co-creation, 2020

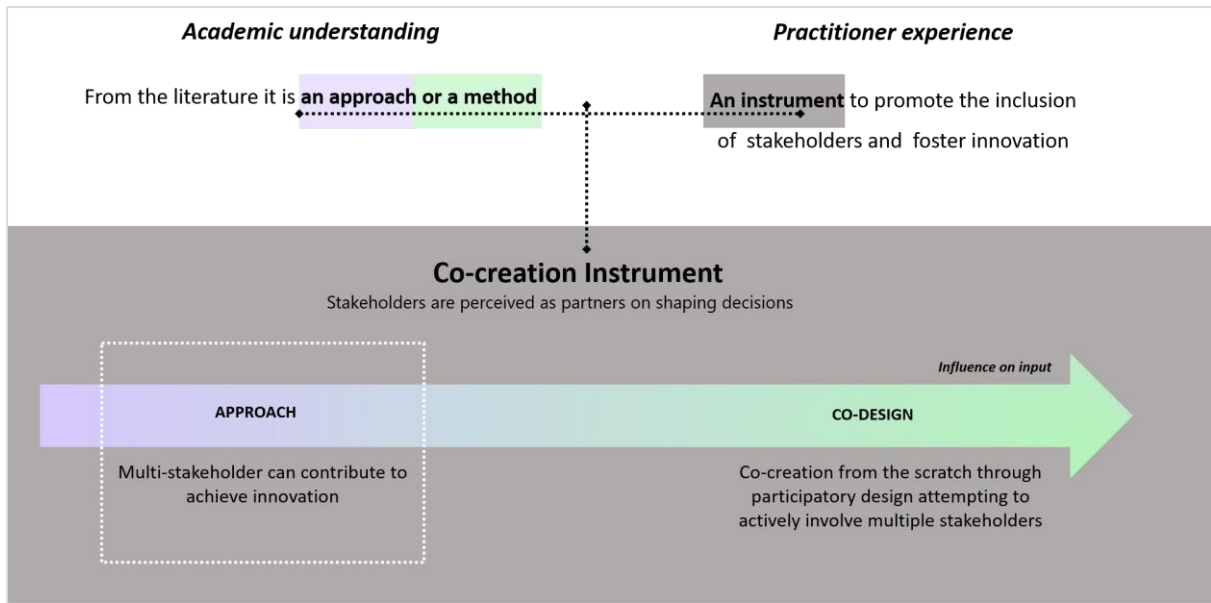
Importantly was to mention that co-creation is a maturing concept far away from having a robust and precise definition. Because of that, I borrow the spectrum elaborated by De Koning et al. (session 2.3) to try set boundaries while keeping some flexibility in its application.



**Figure 25:** Approaches of co-creation based on De Koning et al. (2016)

The spectrum points out that co-creation can be understood either in terms of an approach – having the innovation component as the core of it, e.g., to improve public services in the UK through doctor-patient partnerships (Lund, 2018, pg. 5). Or in terms of a design method using tools and techniques, e.g., in the case of neighbourhood revitalisation and participatory urban planning for it. Therefore, it can embrace the improvement of something existent or start from scratch.

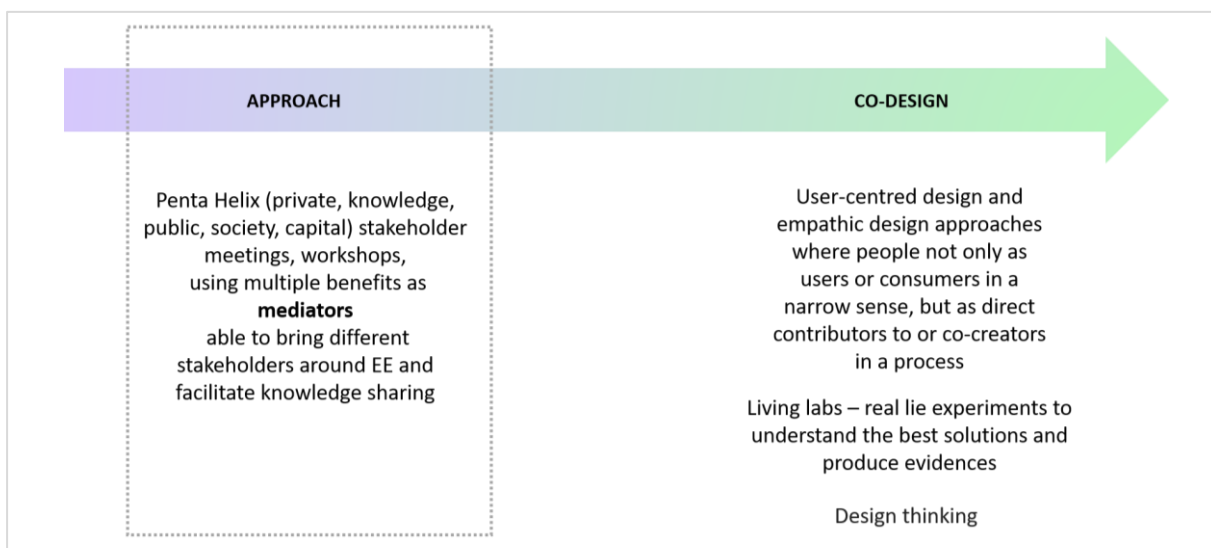
Joining the dots from academic learnings and practitioner experience, I revisited De Koning's spectrum to propose the co-creation instrument. It seeks to promote the inclusion of stakeholders through different degrees ranging according to the influence stakeholders can have on the input. It accommodates two types/degrees of co-creation, namely: approach and co-design.



**Figure 26:** The birth of co-creation instrument, 2020

Approach represents the most moderated way of conceiving co-creation. It refers to the potential partnerships have on producing new ideas (IAP2 spectrum). It is based on the notion that multi-stakeholders means a variety of knowledge, and this can lead to innovative solutions. On the other hand, co-design is the most extreme approach, requiring participation from scratch and also involving multiple stakeholders. It is related to the 'right to participate' and Arnstein conception.

Approach is based not only on salient stakeholders (government, e.i.) but searches for embracing a diversity of stakeholders in the collaborative level. Penta-helix sessions can be the forum of co-creation and use multiple benefits as mediators to shape common interests and facilitate knowledge sharing.



**Figure 27:** Examples of how co-creation instrument can operate, 2020

The arrangement of these inclusive sessions can be structured, making use of MOMB (session 4.2) as a tool. The idea is to add a third component for its use – called enhancing collaboration.

### 3. Enhancing collaboration (session 4.1)

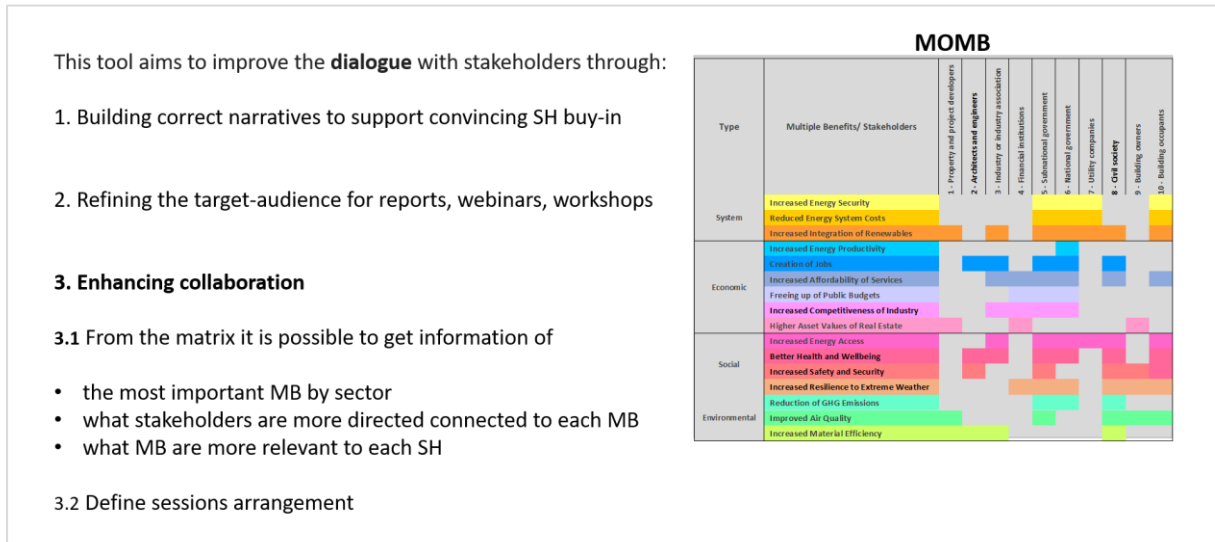


Figure 28: Using the matrix to enhance collaboration, 2020

The first visual illustrates the multiple benefits by sector in terms of importance. In this case, it is showing that integrating renewables and increasing energy access are the most relevant, followed by job creation, increasing resilience to extreme weather and improving air quality. The snapshots obtained from the MOMB, can provide with information to guide sessions' arrangements, e.g., stakeholders interested in improved air quality or stakeholders involved with the most relevant multiple benefits for the buildings sector.

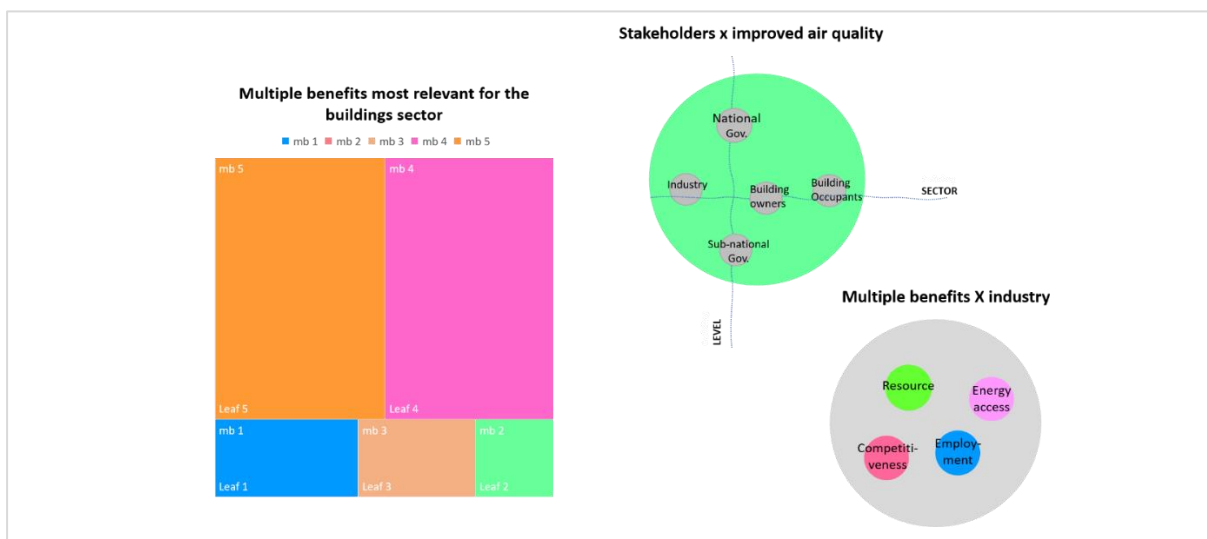


Figure 29: Visuals with information possible to extract from MOMB

I concluded the presentation by raising some advantages of using co-creation.

- Foster the development of synergies and **create bridges and network in the fragmented building sector**
- Expand **the longevity** of the project
- involving multiple stakeholders **we can obtain a better end outcome**
- Promote **transfer and shared experiences, capacities and resources** (knowledge, information)
- Foster social transformation and learning in **democratic values**, since it helps to strengthen the **feeling of belonging, involvement and commitment** to the stakeholders

**Figure 30:** Why use co-creation?

## **5.2 VALIDATION OF THE CO-CREATION INSTRUMENT WITH PRACTITIONERS**

**Interviewee's identification is kept anonymous, i.e., E1**

**Date:** 10.07

**Type of session:** online through Teams platform

**Start and end time:** 12:30 – 13:15 p.m.

**Duration:** 45 minutes

**Number of participants/ practitioners:** six (four females and two males)

The primary purpose of this focus group was to capture opinions from the practitioners about the proposed co-creation instrument (chapter 5.1) and from their feedback, understand the practicalities and get some insights to refine its applicability.

The session had two moments. Firstly, I introduced the theoretical portion of the co-creation instrument, through a PowerPoint, to contextualise the discussion and offer some understandings reached so far (chapter 5.1). After that, I opened the floor for the debate to get their feedback and impressions.

The discussion was guided by a few questions, such as:

- **How could this idea be incorporated into practice?**



- **Could co-creation add value to the E4 programme?**
- **In the context of the India roadmap: raise possible challenges, barriers and benefits**

Their feedback is transcribed below:

**E1:** Just to add that Thais and I had a conversation yesterday and this is an applied approach and the exercise is how we could benefit from this approach, having in mind and recognising our role as IEA, how this approach could bring benefits for the roadmap for example, at the municipal level and perhaps vertical and horizontal cooperation.

**E2:** Also about the matrix, I would like to add that it is a guide when talking to the stakeholder and helps tailor engagement and conversation with people because you were able to identify their most interest.

**E1:** How to take the multiple benefits in terms of the next level – in the analytical and data side – who is measuring what? **Who is quantifying what? How get this data comparative and present it? And there is also a communication challenge how to direct our outreach and kind of enable the right network to do their things or IEA to play the facilitator bringing people that usually don't talk to each other. I see an interesting piece of communication.**

**E3:** A big challenge for IEA policy making, in general, is not doing a good job at conveying. This approach can be useful for analysing who is the audience that should be considered in a more holistic and cross-sector way. Reflects the recently launched Global Recommendations<sup>5</sup> in a more concrete way of looking at that.

**E2:** The work with the table shows when trying to connect the multiple benefits with the stakeholder is a bit cloudier, and it is necessary to dig to try to answer exactly what is the benefit. Structuring the sentences in the table in a more consistent way to help to bring notions energy efficiency in buildings contribute to 'this' and 'this' is interesting to these people because of this. And actually, when you try to phrase you realise that it is not necessarily clear. She believes it is a valuable exercise.

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<sup>5</sup> Convened by the Executive Director of the IEA in response to the global slowdown of energy efficiency progress, the Global Commission for Urgent Action on Energy Efficiency was established in June 2019 at the IEA's Fourth Annual Global Conference on Energy Efficiency in Dublin, Ireland. The Commission has 23 members and is composed of national leaders, current and former ministers, top business executives and global thought leaders. With analytical support from the IEA, Global Commission members have examined how progress on energy efficiency can be rapidly accelerated through new and stronger policy action by governments across the globe. It has developed this series of actionable recommendations to support governments in achieving more ambitious action on energy efficiency.

**E4:** I think it is possible from this, to select the 5 or 6 multiple benefits that are important to a particular report or webinar and guide what stakeholders would have a stake on that essentially.

**E1:** In the Brazil case where the landscape is confused, and institutions do not have clear what they want, having this mapping would be useful for them and us (IEA).

**E3:** Find the balance between the complexity and the nuance of reaching every relevant stakeholder. Making sure that you are not overwhelming the project with too much engagement, how much value you can actually get from these meetings? For instance, the time that is going to take to include all these people and talk to them. The more people involved, the more complexity you create. In the real project, there is no time or budget to do this. How to refine this to the top 3 priorities to consider to any project? And if you have more budget and time what you can add to that? Prioritise, otherwise, it can be overwhelming to the practitioner

**E5:** I think that the exercise is interesting, but as a practitioner, I would be scared of interacting with all stakeholders. So, trying to focus on the top 2 or 3 stakeholders would be better. In the case of the India roadmap, it is necessary to think through many lenses, in terms of ministry and developers consider but also in terms of the practicalities associated with buildings practitioners, that are the people who will be able to use the system if a new building code is made and also in terms of practicalities of the ones that will do the enforcement and inspect. Identify the crucial stakeholders to get something from the stakeholders to get something approved politically and also design something that would be pick up easily from the other hand.

**E1:** Another point to think is why this would be important for an international organisation like the IEA? By using contact closed list and it is difficult to reach beyond that circle, too often we end up having energy efficiency people talking to energy efficiency people. Perhaps framing the importance that advancing on the EE agenda and achieving the sustainable goals and climate goals we need to move beyond that – framing these challenges and how practically this kind of approach can help with that – taking into account the limited capacity. I suggest thinking about why.

**E5:** Perhaps other stakeholders that we can create partnerships and make it broader than a pure energy efficiency project focus, especially in emerging countries where the primary goal of buildings are not going to be the energy efficiency and climate goals, but the new housing or better housing. So, the multiple benefits can work to deliver the right message to the right people in a right language.

**E2:** We will have the chance to test some of these ideas and approaches for the India roadmap. Put in practise and test and see. And from now we need to understand how to use this and shape the

sessions of the roadmap and people we are trying to convene. I hope this can be a good tool for this preparation, and we will be able to see how effective it is.

E6: Just to add that one of the main barriers is the difficulty of having the same language to bring a common perspective. One thing I thought is that the stakeholders to involve will very much differ whether you are talking about, national policymaking, local policymaking. At the national level, you need to convene representative organisations. But if you are talking about local level actions or neighbourhood level as in the example you gave, you might be able to convene citizens themselves through meetings.

### 5.2.1 ANALYSING THE DATA COLLECTED

After the validation process, I developed categories to organise and illuminate the data collected. Later it was possible to abstract a more general formulation of these categories to find principles that would stimulate further discussion and theoretical reflection (Bryman, 2016, pg.84)

Challenges	Barriers	Benefits	Opportunities
Work with a large number of stakeholders - Prioritise stakeholders	For instance, the time that is going to take to include all these people and talk to them. The more people involved, the more complexity you create. In the real project, there is no time or budget to do this	From this to select the 5 or 6 multiple benefits that are important to a particular report or webinar and guide what stakeholders would have a stake on that essentially	Enable the right network to do their things or IEA to play the facilitator bringing people that usually don't talk to each other
Find the balance between the complexity and the nuance of reaching every relevant stakeholder	By using contact close list and it is difficult to reach beyond that circle, too often we end up having energy efficiency people talking to energy efficiency people.	A bit cloudier, and it is necessary to dig to try to answer exactly what is the benefit. Structuring the sentences in the table in a more consistent way to help to bring notions energy efficiency in buildings contribute to this 'this' and 'this' is interesting to these people	Perhaps framing the importance that advance on the EE agenda and achieve the Sustainable goals and climate goals we need to move beyond that

	Administrators speaking the same language and addressing the issues from a common perspective and with comparable tools and resource	A way of looking at the Global Recommendations in a more concrete way	We can create partnerships and make it broader than a pure energy efficiency project focus, especially in emerging countries
		Useful to cases where the landscape is confused, and institutions do not have clear what they want, having this mapping would be useful for them and us (IEA)	An interesting piece of communication
- A large number of stakeholders - prioritise	- Time-consuming - EE closed community - Common language	- Calibrate target-audience - A concrete way to think about EE Global recommendations - Great tool for internal exercise	- Enable a network - Chance to expand the closed circle - Mainstream EE in projects with other main focus

**Table 1:** Codifying the perspectives raised by practitioners, 2020

### 5.3 CALIBRATING THE CO-CREATION INSTRUMENT

After the analysis of the data collected from the focus group session with practitioners, I started a process of critically reflecting on the model and the co-creation instrument I have conceived and presented. Alluding McNiff (1995), in his inaugural paper 'Action research for professional development: Concise advice for new action researchers', I started to question myself - How do I improve my work?

The table below summarises some points on the co-creation discussion looking through the theory and practise lenses to help build an answer to the question.

A	B	C	
THEME	THEORETICAL INGREDIENTS	PRACTITIONER FEEDBACK (chapter 5.2)	
1. Multi-stakeholders approach (see 5.1)	Key to foster innovation	Time-consuming	Find a balance and prioritise with whom collaborate
2. MOMB (see 4.2)	Key tool to two-way FLOWER - linkages among stakeholder and energy efficiency	Great internal exercise to the organisation understands what precisely the benefits represent to the stakeholder	An important piece to deliver the right message to the stakeholders in the right language
3. Penta-helix sessions (see 5.1)	Forum of co-creation. It is key to integrate penta-helix using multiple benefits as mediators	EE Community is closed	Enable the right network to do their things or IEA to play the facilitator bringing people that usually don't talk to each other

**Table 2:** Summarising themes for the instrument calibration, 2020

Although the variety of stakeholders, theoretically, is a way of promoting innovation, it is rejected by the practitioner experience considered a time-consuming activity. On the other hand, the matrix is seen as a great tool to be used both for internal and external comprehension and communication of gains and impacts the multiple benefits can bring to stakeholders. Lastly, the proposed expanded sessions, through the lenses of practitioners, can be a way of IEA to play the role of facilitator and enable a network between stakeholders that usually are not connected. Nevertheless, the energy efficiency sector is characterised by being a very closed community operating in a bubble.

McNiff's question can be rephrased as how comments from the column [C] can improve the applicability of themes in column [A], having into consideration that there is the will of putting co-creation somehow into practise?

Taking a valuable comment made by the interviewee E1 (chapter 5.2) on the importance of moving beyond the closed community to advance on the EE agenda and achieve the sustainable goals and climate goals and how, practically, this kind of approach (co-creation) can help that, I jump to the reflection.

Since the beginning, it was a challenge to understand how co-creation would improve policy design and fit the purposes of such an international organisation like the IEA. As time passes working there,

it became progressively clear the enormous potential that the organisation has on facilitating conversations and interactions among stakeholders. Moreover, this is one of the most powerful value the E4 programme has.

Hence, to take advantage of such critical position the previous theoretical model needs to be calibrated at the themes (1) penta-helix approach, and (3) sessions, in a way that the mandate of the IEA - a global clean energy hub<sup>6</sup> - accommodates these ingredients of the approach type in a better way.

Moreover, it implies conceptual changes. Lund (2018, pg.6) explains that whereas from the 1970s onwards the discussions surrounding participation centred on rights and power, following Sherry Arnstein, participation conceptualised as co-creation instead focuses on including diverse forms of knowledge in urban processes to create innovative solutions to complex problems. Consequently, democratic legitimacy now relies to a much greater extent on output, rather than input legitimacy (see 2.3).

Lund's thinking is the hook to come up with another scale for the co-creation instrument. It means that the focus is not on more or less influence on the input, where only direct collaboration in a moderated or extreme versions is legitimate. A qualitative scale for the level of collaboration desired in a project looking at the impact on the input and output can be more significant, accommodating Arnstein's (input) and Lund's (output) perspectives.

In other words, it embraces a spectrum of collaboration from ways of participating and making part of the decision to the ability to solve problems and find innovative solutions collectively.

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<sup>6</sup> The mandate is based on three pillars: expanding the IEA's mandate on energy security beyond oil to natural gas and electricity; opening the agency's doors to emerging countries; and turning the IEA into a global clean energy hub, including for energy efficiency. <https://www.iea.org/about/structure>

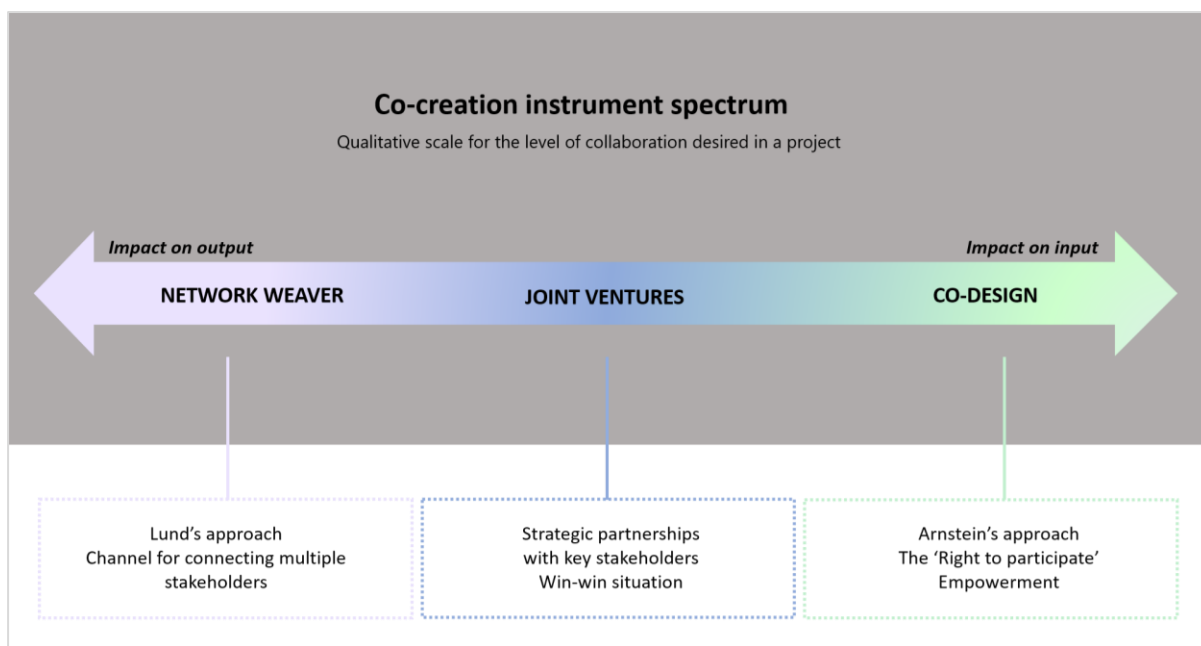


Figure 31: Spectrum of calibrated co-creation instrument, 2020

The calibrated instrument ranges from the network weaver, passes through the joint ventures to the co-design. The network weaver enables connections and synergies to happen, and ultimately it can help flourish bottom-up initiatives. In the network weaver, the IEA does not collaborate directly to several stakeholders but facilitate and create a channel to an emerging and intentional network (penta-helix) be formed. In this way, it becomes a more strategic and less time-consuming process.

Joint ventures seek to make partnerships based on the idea that, especially in developing countries, projects may have other priorities that pure energy efficiency, even though they represent an opportunity to mainstream measures and address the climate agenda.

Aligned to this calibration, theme (2) matrix keeps being an essential tool. Nevertheless, instead of enhancing collaboration, it can be used by the E4 programme in its role of facilitator of possible linkages to improve stakeholder connectivity (figure 28).

In a short-term, the 'network weaver' can be a channel that makes stakeholders as part of a roadmap community, promoting cohesiveness to the sector. At the same time, in a long-term, it turns out to be a resilient network with stakeholders more aware and willing to implement roadmap targets, thus helping the sector get on track and meet climate targets. Besides this, the network weaver can facilitate knowledge sharing and generate data around the multiple benefits, building more pieces of evidence.

## Network weaver

E.g. The buildings and construction sector is a highly local and fragmented industry, with no large businesses having significant control of the value chain

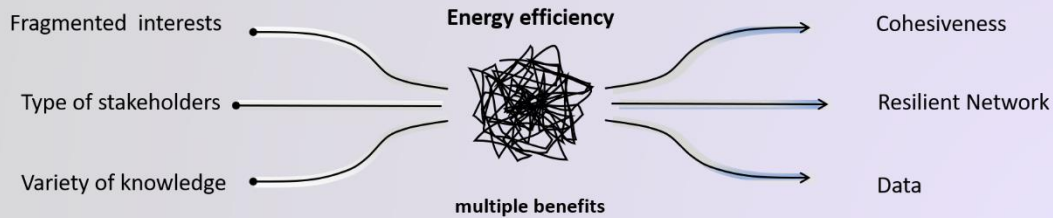


Figure 32: Visual synthesis of network weaver for the buildings sector. Based on OSMOS scheme.

As per such reinterpretation, also reviewing the role of a roadmap itself helps set co-creation accordingly. Besides to offer guidance, targets and time for the adoption of policies, a roadmap can stimulate the growth of a network. In other words, it can be at the same time normative while a platform to implement the network weaver type of co-creation.

The platform can come in various forms and scopes, ranging from volunteer-based alliances to formalised structures. Regardless of the format, it should encompass good practices dissemination, policy proposals discussions, dialogue, awareness-raising, and even trainings around the multiple benefits.

## Energy efficiency buildings roadmap approach

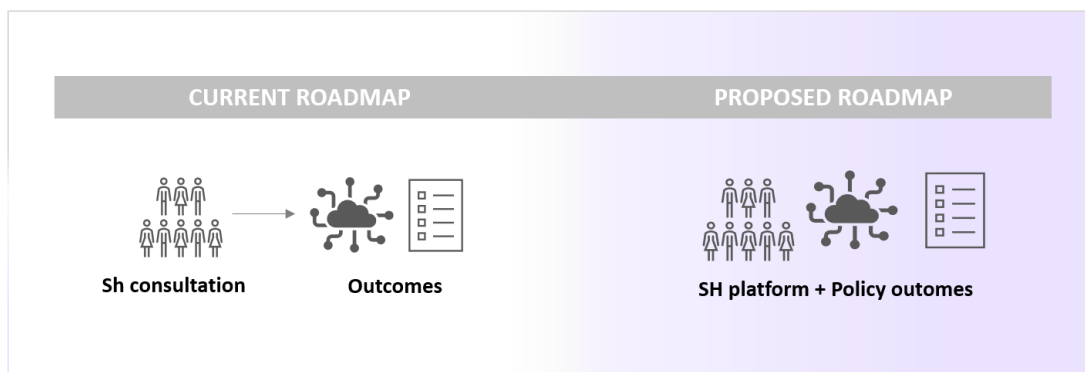
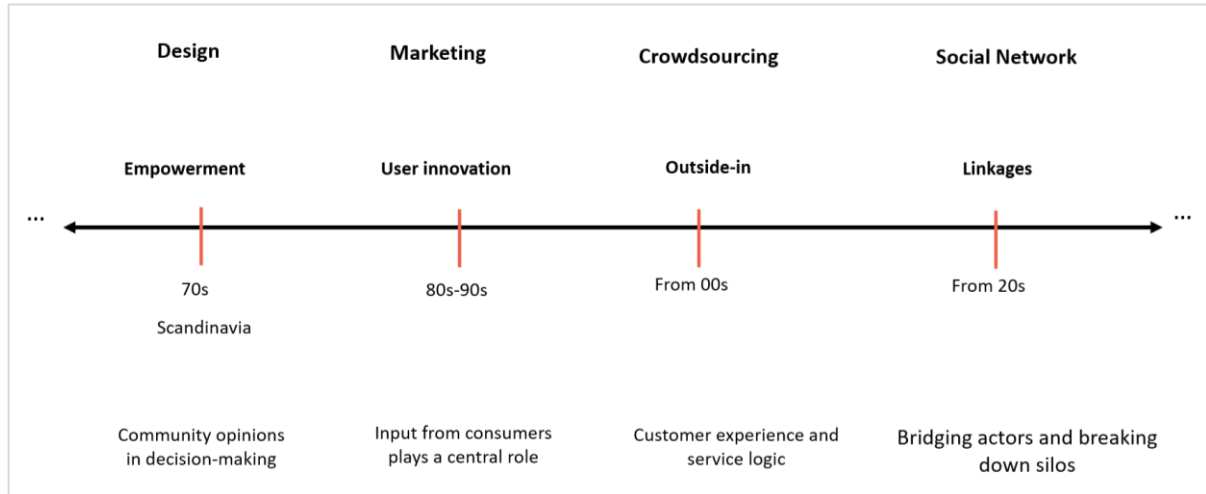


Figure 33: Adding value to the roadmap, 2020



In a broader sense, this calibration involves adding another layer to its historical meaning (session 2.3). From the notion of empowerment to a more pragmatic perspective, it gains a network dimension where the value is on the possible linkages and relationships that break down silos thinking.



**Figure 34:** Timeline plus new layer, social network

Given this conceptual calibration in the co-creation instrument and its applicability, it makes sense to return to the literature and substantiate some ideas presented.

### 5.3.1 BACK TO THEORY - INSIGHTS FROM SOCIAL NETWORK THEORY AND TRANSITIONS THEORY

Actors organised in networks are considered essential for changes. Research on networks highlights their vital role in the adoption and implementation of reforms and the development of innovative practices (Therrien & Normandin, 2020, pg.2). Networks of actors working together are seen to be especially useful in dealing with complex multi-level problems, such as those related to the environment and adaptation to the climate crisis.

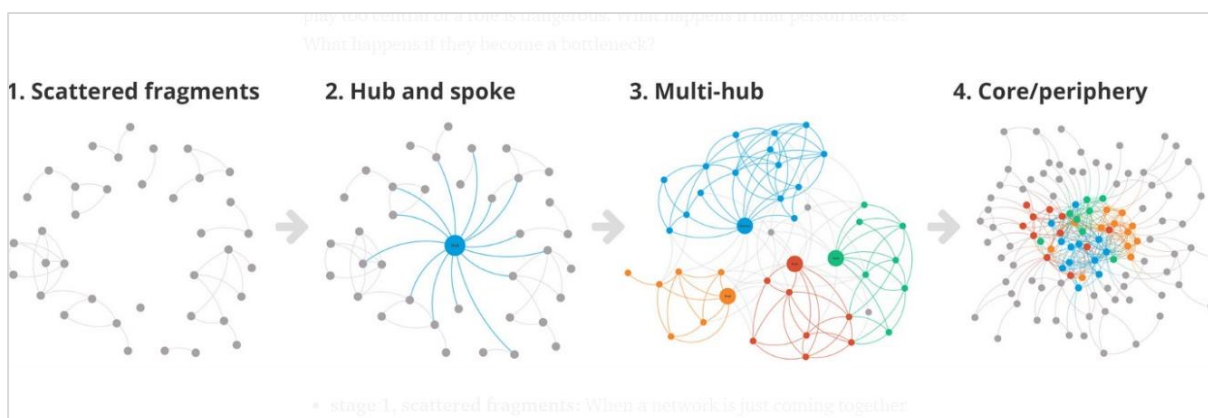
The social network theory views social relationships in terms of nodes and ties. Nodes are the individual actors within the networks, and ties are the relationships between the actors. The emphasis lies on the relationships and the ties between actors within the network, and the structure and the quality of the relations are the main determinants of its usefulness to its participating individuals (Caniel and Romijn, 2008, pg. 614).

Therrien & Normandin (2020, pg.4) point out that the heterogeneity of actors in a network reflects the sharing of information and resources, access to specialised resources and inter-organisational learning. Connecting actors fulfil a crucial strategic function, helping to build consensus and enabling the transfer of information and ideas. A particular type of linking actors is called bridging organisations (Kampelmann et al., 2016, pg.2) whose objectives are overcoming barriers to cooperation and they occupy a special role in the network structure as they serve as 'glue' between actors (Chassagnon, 2008).

Kazadi et al. (2017, pg.527) cited in Reypens et al. (2019) says that innovation network theory can shed light on how organisations may integrate multiple stakeholders during the innovation process. In many activities, the locus of innovation is not the individual organisation but rather its network. Innovation networks combine dispersed resources, knowledge, and capabilities.

There are several approaches ranging from the traditional ones, asking managers to focus on the relevant stakeholders (Mitchell et al., 1997) to broader, asking managers to take into account the structure of the stakeholder network (Sciarelli & Tani, 2013, pg.180). How networks and their structure should be used in stakeholder management is still under debate.

Building a network takes time and evolves through many stages. June Holley, in her network weaver handbook (2012) introduces the concept of network development in four stages (figure 35) which supports the comprehension of the idea about the resilient network (figure 32).



**Figure 35:** Network weaver stages. Source: Mohr, 2016

Mohr (2016) explains how a network is formed. In stage 1, there are scattered fragments and a network is just forming. It is the initial phase when people are being listed as potential stakeholders for the project. There are lots of silos and not much interconnection. Subsequently, stage 2, hub,

represents a centralised hub in the early stages of a network, connecting across the various fragments. Stage 3, multi-hub, the network continues to develop, and more trust-based relationships are formed. Lastly, stage 4, core/periphery represents multiple hubs overlapping. No stakeholder is playing the central role. In addition to that, there is a diverse periphery. This is what the author refers to as a smart network (in this thesis called resilient network). The periphery serves as a source of new ideas for the network.

Hermans et al. (2012, pg. 613) warn that without active leaders who take responsibility for building a network, spontaneous connections between groups emerge very slowly, or not at all. Powerful actors are able to shape the composition of the network, either through providing the financial resources or through creating a space for the network to grow.

Broadening the discussion, it is relevant to mention the transitions theory that sees social networks a relevant process. Many scholars have been arguing that to counteract path dependence, inertia, and lock-in genuinely transformative change must be the result of alterations at every level of the system simultaneously. That is, one must alter technologies, political and legal regulations, economies of scale and price signals, and social attitudes and values together (Sovacool 2016, pg.3).

Geels (2014, pg.4) explains that, according to the transitions theory, changes occur through interactions between three levels: the niche (the locus of radical innovations), the regime (the locus of established practices and associated rules that enable and constrain incumbent actors concerning existing systems), and the landscape (exogenous developments or shocks – such as climate change).

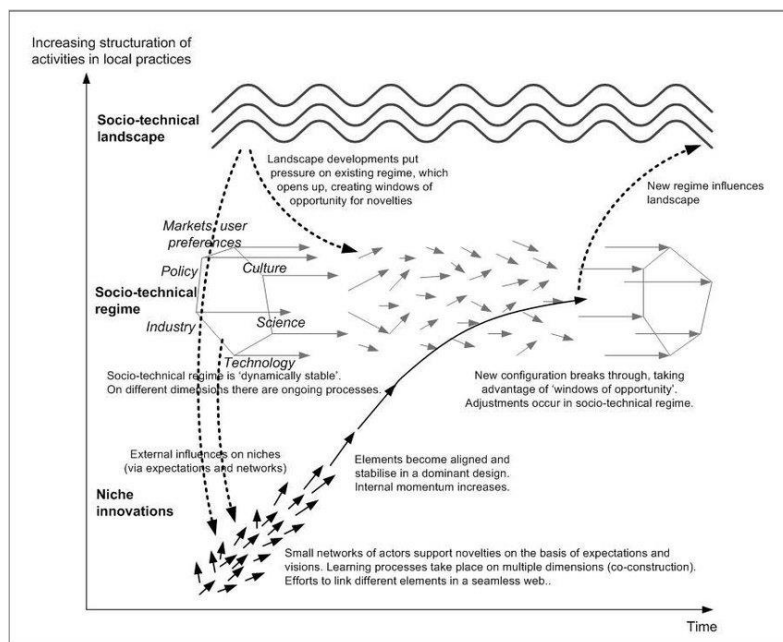


Figure 36: Visual synthesis of the transitions theory. Source: Geels, 2014

Concerning niches development, three internal processes are identified crucial: (1) the articulation and subsequent convergence of visions, (2) learning and experimentation and (3) the building of social networks. The convergence of actors' perceptions refers to the degree to which their strategies, expectations, beliefs, and practices go in the same direction (Hermans et al. 2012, pg.614).

In a nutshell, the core logic is that niche-innovations build up internal momentum (through learning processes, price/performance improvements, and support from influential groups) that lead to changes at the landscape level, creating pressures on the regime. The destabilisation of the regime creates windows of opportunity for the diffusion of niche-innovations.

## 6. CONCLUSION AND RECOMMENDATIONS

This study aimed to respond to the following research question:

### **How can co-creation contribute to roadmaps for the buildings sector decarbonisation?**

By playing the role of an embedded researcher, the following sessions cover the theoretical and practitioner points of view.

### 6.1 CONCLUSION

The transition towards decarbonised buildings sector is a long pathway requiring much more than a traditional revision of building codes. In fact, it equates to change of culture in the sector that cannot be achieved individually. Put the buildings sector on track to climate target is a challenge that demands collaboration and connection between different actors, governments, private sector researchers, architects, at all levels.

Recent debates in the field of energy transition call for better coordination of agencies and stakeholders across organisational and sectorial boundaries, arguing that this would ultimately improve to accelerate the process (Huck et al., 2020, pg.3).

Overall, the study is aligned with this debate and claims that improvements to a stakeholder engagement process in policy design, reflected in the roadmaps, are an entry point for transformative changes. As an embedded researcher, these improvements to the energy efficiency buildings roadmap in India consist of:

- The use of a stakeholder engagement framework that is vital to understand the stakeholders and make the process more strategic and meaningful. It ensures that stakeholders are appropriately involved in the project by assigning levels and methods of engagement according to their characteristics. This process is related to the work between the organisation and specific stakeholders (nodes) within the networks.
- The co-creation instrument, having the spectrum as a reference (figure 31) can be added to the SEF (aiming at impacts on the output) to enhance relationships between the buildings' sector stakeholders and improve their connectivity (ties). By facilitating a shared channel, the

instrument weaves scattered stakeholders (figure 35) and structures a network, making stakeholders as part of a roadmap community and nurturing a future resilient network. Also, while strengthening linkages between stakeholders, it encourages bottom-up initiatives to happen.

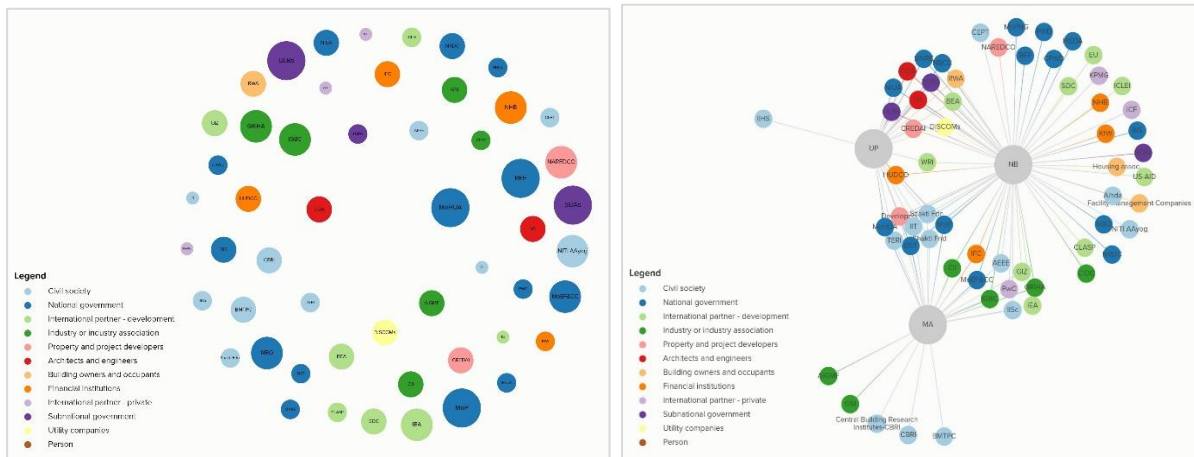


Figure 37 and 38: Stakeholders seen through nodes and ties, 2020

The stakeholder engagement framework (SEF) including the instrument, therefore, comprises a broader range of processes, from gathering information to sparking connection and innovation. It is illustrated below:

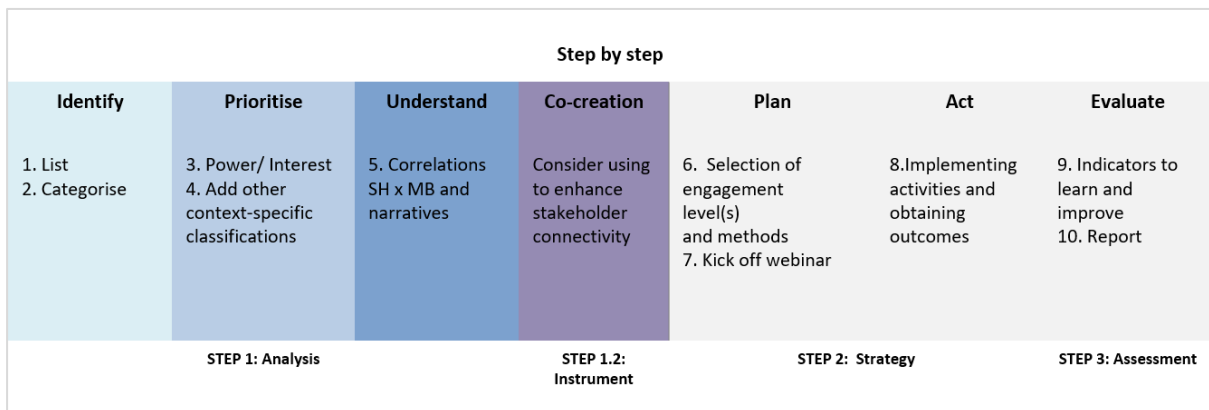


Figure 389: Final SEF showing including co-creation instrument, 2020

Moreover, the co-creation instrument offers the possibility for organisations like the IEA value to their programmes, in this case to the E4 programme, reinforcing the role of a bridging organisation

(Kampelmann et al., 2016, pg.2) and having this strategic function of facilitating the connection between stakeholders and enabling the transfer of information and ideas.

#### Some theoretical contributions of this thesis:

- Attempting to bring some clarity to the co-creation concept that still has no solid definition. This was done by connecting authors and existing theories such as the ladder of participation from Arnstein (1969), models of co-creation by De Koning et al. (2016) and co-creation in urban governance from inclusion to Innovation by Lund (2018). This exercise was important to confer credibility to the study while contributing to accumulating knowledge and helping build robustness to the field.
- Envisioning that as an in-progress concept it requires to set some boundaries but also to accept increments, and both will make it more meaningful over time. Indeed, this is the idea behind the concept of the instrument. Through the scale on the type of collaboration desired, either an input or output, co-creation accumulates pre-existent definitions (design and business) and integrates a new layer (social network) that assigns the *zeitgeist*<sup>7</sup> (sustainability) to it.
- Establishing some insights related to the theoretical dialogue between stakeholder management, network system and transitions theory. This linkage extends the focus beyond a focal organisation. Thus, the stakeholder management gains a more critical role in the context of decarbonisation pathways, by expanding its scope of influence (scattered stakeholders) to the management of network structures that ultimately is one of the components to the development of niche-innovations.

#### Practical contributions of this thesis:

- Although the idea of the multiple benefits was conceived to make the energy efficiency more appealing, the link with the stakeholders has not made yet. Establishing this relationship is

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<sup>7</sup> *Zeitgeist* is a word used in German philosophy, meaning the **spirit** of the age. It refers to an invisible agent or force dominating the characteristics of a given epoch in world history.

crucial to deepen the narrative of energy efficiency as a cross-cutting theme that can bring actual benefits to a variety of stakeholders and the energy efficiency agenda.

- The MOMB can be seen as the early stage of a broader process for both internal and external understandings on the relationship of stakeholders and multiple benefits aiming at building evidence to quantify and monetise them.
- Creating an engagement framework that aims at understanding the stakeholders before planning and ensures the best methods for their engagement in a particular project. It avoids stakeholder's fatigue and gives more credibility on how the IEA interacts with stakeholders.
- Raising self-reflection among colleagues. Implementing a culture of innovation can take many years. The focus group and validation process to get feedback (session 5.2) can be seen as part of a process to awake awareness and interest of colleagues, being a seed for changes in the future.
- Promoting standard procedures to deal with stakeholders. Taking into consideration that the E4 programme is quite recent – running since 2018 – and has a strong component of interacting with stakeholders, this study started to establish a coherent procedure that can be replicated to other projects instead of making the project manager start from the scratch every time.
- Introducing a new platform for data visualisation (KUMU) tested on the development of the India roadmap, and that can be used for several purposes, especially communicating ideas in a better way to the different audiences.
- Adding value to the roadmap itself that turns out to be a normative document as well as a platform for relationship building by providing opportunities to a network grow and develop linkages among a diversity of stakeholders.



## 6.2 RECOMMENDATIONS

Further recommendations comprise:

### For future studies:

- As mentioned before (appendix 1), this study does not cover the entire action-research cycle but planning and acting. Therefore, one future study could focus on observing the implementation of co-creation in the India roadmap and its impacts and results. From that would be possible to reactivate the action research by reflecting on the process and how to improve it. Also, what the consequences of adding the platform feature to the roadmap are.
- Investigate the connections between stakeholder management theory and social network analysis too. The network approach to stakeholder management theory has only been barely touched, and how networks and their structure should be used in stakeholder management is still under debate. The focus is usually on the stakeholders' relations centred on the organisation and not on decentralised networks with several actors.
- Research about co-creation and how the network grows, in which extent it encourages partnerships to be formed and what are the quality for them. Besides this, it could be interesting to investigate networks growth and the relation with bottom-up initiatives.

### For the organisation:

- Refine MOMB to become a useful tool for several projects that aim to understand the relationship between stakeholders and energy efficiency using multiple benefits. It also involves making it a more practical tool in excel programming.
- Think about MOMB further development. In addition to helping with narratives and target-audience, MOMB can be a tool to capture a deeper layer of data and build evidence on quantification and monetisation of energy efficiency.

- Institutionalise the stakeholder engagement framework (SEF) by using it as a methodology for other projects as a way of, first, not starting every time the process from scratch, thus saving time and second by using the same methods is possible to benchmark it, looking at lessons learned and improvements.
- More profound stakeholder involvement in projects requires having a mix of levels and types of engagement, instead of focusing only on consultation. This is the key solution to increasing holistic project value creation. Introduce social network analysis while mapping the stakeholders. It can be structured using the guidelines proposed by KUMU. It will help then the project manager understands the best approach to the resilient network.
- Think about the roadmap as having two delivering outcomes. An actionable document that articulates strategic thinking, defining goals and targets, and also a platform for collaboration that makes stakeholders as part of the roadmap community which in long-term can become a resilient network, more willing to implement those actionable points.

### **6.3 LIMITATIONS**

The research was linked to real project development, and as a consequence, followed its pace and achievements reached by July 2020. Therefore, this study had a time constraint concerned the research as I could only cover the action-research spiral partially (appendix 1) as well as the stakeholder engagement framework (SEF) which steps 2 (strategy) and 3 (assessment) could not be developed in time to the thesis submission. In addition, as co-creation has no solid background definition, it can confer some inconsistency to the discussion.

### **6.4 FINAL REFLECTION**

Vaccarino et al. (2007, pg.13) claim that the basic principle underpinning action research is identifying a problematic area, imagining a possible solution, trying it out, evaluating it (did it work?), and changing practice in the light of the evaluation. In other words, a problem-solving process. However,

to turn it into an action research process, researchers need to state why they want to examine that particular issue and collect information or data to show the process.

When I decided to research about the co-creation as a thesis topic, it was because I believe that the transformation of the built environment requires new dynamics between state, markets, and civil society to achieve deep changes toward decarbonisation and more than this, to more equal societies. In this vein, through co-creation, I wondered I could start understanding how to build bridges between stakeholders and collaboration.

Therefore, initially, my focus was on how to enhance collaboration. It was the most obvious pathway to research. However, it happened that because of my object – buildings roadmap and the organisation I am working at as an embedded researcher – I discovered that the possibilities for collaboration don't need to rely only on a direct manner, using Lund's definition - through the legitimacy of the input. When also considering the legitimacy of the output, the options of designing partnerships, the core of the sustainability pathway, expand.

Participating also in tailoring the conception and meaning of the roadmap project was very thought-provoking in terms of trying to find a way of the roadmap to be not only a document to be delivered to the India government but an opportunity of creating something impactful aiming at real changes.

The embedded research journey had a turning point when I came to know networks theory and my understanding of stakeholder engagement expanded from the management of a scattered picture to the magnitude of connections and networks. Combining this knowledge to the purposes of a proposed roadmap brought more sense to the story I was trying to weave for my research and work.

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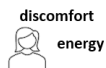
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## APPENDIX 1: ACTION RESEARCH JOURNEY MAPPING

Action research journey mapping									
Brainstorming	Investigate	Imagine a solution	Structure the solution	Evaluate the solution	Self reflection	Reimagine a solution	Search for theoretical support	Implementation	Improvements
<p>Idea of researching about collaborative process on policy design</p> <p>Alignment of internship projects and research interest</p>	<p>Preliminary diagnosis and working with Regional buildings Roadmaps for Asia, Africa and Latin America</p> <p>Literature review focused on co-creation and stakeholder engagement theory</p>	<p>I realised the importance multiple benefits have to mediate energy efficiency and stakeholders</p> <p>I started to apply and adapt the stakeholders engagement theory to the India Roadmap context</p>	<p>I designed a framework for engagement tailored to Roadmap but replicable to other IEA projects</p> <p>I conceived a matrix to analyse and build narratives between stakeholders and multiple benefits</p> <p>I developed a co-creation mechanism joining academic knowledge and my practitioner experience</p>	<p>An exercise of validation through a focus group. I did a presentation on the mechanism to the practitioners and collected their impressions and views</p> <p>Content analysis to understand and codification of the information</p>	<p>Establish a comparison table on the main points under the theory and practise perspectives</p> <p><b>How do I improve my work?</b></p>	<p>Change practice in light of the evaluation</p> <p>Calibration in its conceptualisation meaningfulness in its applicability. Co-creation moves to the output aspect</p>	<p>Network system theory: facilitating linkages to build a resilient network</p> <p>Broaden the discussion through the transition theory. Building network is away of encouraging bottom-up initiatives</p>	<p>ROADMAP DEVELOPMENT →</p>	
1. Planning				2. Acting			3. Observing	4. Reflecting	



APPENDIX 2: VISUAL SYNTHESIS OF THE TRANSITIONS THEORY

