



Original research article

Can southern Europe lead an urban energy transition? Insights from the Energy Transition Roundtable in Valencia, Spain

Ana Escario-Chust^{a,*}, Fenna Vogelzang^{a,b}, Jordi Peris-Blanes^c, Guillermo Palau-Salvador^a, Sergio Segura-Calero^a

^a Institute of Innovation and Knowledge Management, INGENIO (CSIC-UPV), Universitat Politècnica de València, Valencia, Spain

^b Graduate School of Geosciences, Utrecht University, Utrecht, the Netherlands

^c Departament de Projectes d'Enginyeria, Universitat Politècnica de València, Valencia, Spain



ARTICLE INFO

Keywords:

Energy transition
Governance
Participation
Urban sustainability
Multi-stakeholder
Southern Europe
Valencia

ABSTRACT

Multi-stakeholder engagement spaces are important instruments for transition governance. Due to their nature they require acute consciousness of the local context and place they are based in. The research presented in this paper adds to the body of literature on how to govern the energy transition at a local level, and contributes to filling the gap on the role of multi-stakeholder engagement groups in the energy transition process within a southern European context. Empirical evidence is drawn from the city of Valencia, Spain, where innovative formulas are being developed. One such innovation, the *Mesa de Transición Energética* (MTE – Energy Round Table), emerges as a multi-stakeholder, participatory and inclusive mechanism to define the roadmap towards achieving the energy transition and urban sustainability. This new experience in the city led to the discovery and exploration of the challenges, barriers, benefits and opportunities the city had to face, as well as clarifying how such multi-stakeholder engagement spaces can facilitate the energy transition path. The research evidenced that while participants and organizers were very satisfied with the development of the stakeholder group and the resulting demonstration projects used to enhance experimentation in the city, they signaled various difficulties. Such difficulties were rooted in the context and included dealing with an uneven vision of the transition, the vulnerability of the group due to the predominant role of the local administration, and a perceived lack of action. Nevertheless, the multi-stakeholder engagement space for the energy transition in Valencia can be seen as an important driver of change for the city. It can also be seen as an experimental model to be replicated in other Spanish or southern European cities.

1. Introduction

Urban energy transitions to climate-neutrality are key to keep global warming within a safe trajectory and to achieve the ambitious goal of reducing global warming to two degrees Celsius or less, as stated by the 2016 Paris Agreement. While action has to be taken on all geographical levels, an important focus is being put on cities due to the large share of the global GHG emissions that they generate [1]. In this regard, various actions and initiatives are being developed and implemented in cities that contribute to achieving the goals of climate-neutrality and emissions reduction such as the Missions program, which was recently launched by the European Commission [2]. This program is focused on facilitating 112 European cities in achieving Climate-Neutral and Smart Cities status. Participating cities seek to implement much needed

multidimensional and systemic decarbonization strategies through a more strategic, holistic and long-term approach. The goal is to also transform these cities into experimentation and innovation hubs, inspiring other cities.

The important role that cities play in accelerating transitions is reflected by an increased interest in territorial approaches by the international academic sustainability transitions community. [3–6]. Here, transitions are considered place-based, and understood as long-term transformations driven by multidimensional changes. These changes affect technologies, markets, user practices, policies and governing institutions and cultural discourses [7], all necessary components for a shift towards more sustainable systems. Given the place-based focus, various scholars claim that different cultural and geographical environments can require different transition pathways [8,9], thus

* Corresponding author.

E-mail address: aneschu@upv.es (A. Escario-Chust).

<https://doi.org/10.1016/j.erss.2023.103047>

Received 15 June 2022; Received in revised form 1 March 2023; Accepted 13 March 2023

Available online 5 May 2023

2214-6296/© 2023 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC license (<http://creativecommons.org/licenses/by-nc/4.0/>).

highlighting the need to provide contextualization for a sustainable transition process. This emphasizes the need for greater knowledge about the complex and multi-dimensional necessities that condition sustainability transitions in each given context [10,11], in order to ensure its suitability, long-term durability and to guarantee a correct analysis for replicability. The types of actors operating in urban environments, the understanding of multi-stakeholder governance processes, the relationships between different sectors or domains, and the influence of other geographical scales [12,13] can all affect this transition. Furthermore, interactions between actors, materials, cultures, histories, and structures are crucial in constituting place-based frameworks that shape transformative potential and address sociocultural identities [14,15].

In this context, cities are looking for new transformative approaches that will help them find solutions to their problems and accelerate change, in a locally relevant and inclusive way. The use of participatory processes is one such approach, and multi-stakeholder engagement spaces are an important instrument of participatory transition governance. Here, a variety of actors come together to discover ways to implement aspects of transition agendas, establishing new ways of doing, thinking and organizing that can lead to a paradigm change to achieve sustainability [5]. Participatory multi stakeholder sustainability transition processes can be experienced differently in cities in southern European countries compared to their northern counterparts. This can be easily explained with the place-based approach due to not only geographical but also “cultural, historical, political and socio-economic factors” [8]. Nevertheless, while there exists an ever-growing body of information regarding (participatory) sustainability transition processes in northern Europe, for example through case-studies and experiences, the southern European context is less represented in this strand of research [8,9]. It is therefore important to document experiences and generate literature in order to enlarge the understanding of how such processes play out in these southern regions. Even though this might reduce comparability between places and limit the body of theory [7,16], this should lead to a more conscious and reflexive research approach on how best to utilize lessons learned in different contexts, and avoid generalized formulas based on northern European case studies [17,18]. This therefore would contribute to advancing fairer and more long-term transitions towards sustainability [19], stimulating academic interest and enriching a corpus of research by providing a southern European perspective [8,20,21].

In order to achieve this, this paper describes the design, construction and development processes that have been used for building an urban multi-stakeholder engagement space in the southern European city of València, subsequently named *Mesa de Transición Energética* (MTE or Energy Transition Roundtable). The MTE stems from the TOMORROW project, which seeks to promote the ET and the move towards decarbonized societies through the fostering of wide and meaningful stakeholder participation. The MTE aimed thereby to explore new solutions for València's ET, using innovative engagement and governance processes to co-define a 2050 ET roadmap for the city, thus serving as pilot for the transition of other European territories. Processes and outcomes were analyzed, with a view to generating a reflexive process useful for the future of the MTE. In particular, the extracted learnings aimed to be helpful in the formation and development of working groups in other socio-technical systems in València, as well as in other cities in Spain or southern Europe. This research work also aims to increase the representativeness of southern European contexts in sustainability transitions research, particularly in governance processes within the transition, aiming to start a dialogue about the specificity of this context. In essence, this research proposes to answer the following questions: How can urban energy transitions be governed in southern Europe? How can multi-stakeholder engagement spaces be integrated, facilitating the governance of the energy transition in a southern European context?

The article is organized as follows. The first section outlines the overarching theoretical framework that forms the base of this research.

In section two, the various theoretical approaches used are then set forth, which include participatory transition governance processes, and an overview of specificities that apply to Transition Management in southern European urban contexts. In section three, the case context is then outlined, followed by the description of the methodology used to create the multi-stakeholder engagement space for the ET in the city of València. In section four, the research methodology is described in detail, and the results presented in Section 5 elucidate the experience in this urban context, providing answers to the initial questions posed. Section 6, the discussion section, then highlights the observations made during this research, and the seventh and final section contains concluding remarks providing implications for future research.

2. Theoretical framework

2.1. Transitions management: experimentation, institutionalization and communities of practice

Transitions are large-scale, long-term processes that aim to transform systems by making their practices, cultures, and structures sustainable. In order to achieve such an ambitious goal, societal changes have to be made in order to develop and support a new climate-neutral system. Such changes affect institutions, technologies and actors [22]. In academic literature, the role of actors is central to sustainability transitions, focusing on the “ability of multiple actors to initiate, accelerate and facilitate transformative processes in cities by scaling, replicating and embedding in local practices and institutions, generating solutions that directly and effectively address sustainability in cities” [23]. Sustainability transitions can be governed through actively steering, directing and guiding these societal changes, though this is challenged by complexity, distributed control and ambiguity, due, among others, to the [24] “interactions between choices made by different actors within a system” [25]. Transition governance can provide inspiration for change, a sense of direction for a city, and drive the collective empowerment of actors by letting them seize opportunities, for example through communities of practice [12]. These communities of practice are classically defined as a group of people who share a passion or a concern for a shared domain, learning collectively through their regular interaction and joint practice [26].

As Wittmayer et al. describe [27], when looking at actor behavior, there are various types of governance processes operating at four different levels: strategic, tactical, operational, and reflexive (see Table 1). Interaction between these activities through a structured and facilitated process, known as Transition Management (TM) [27–32], is key to building a strategy through multiple phases where a self-organized transition can unfold [32]. TM is an interesting case for our purposes since its development has been partly built through practical experiences and applications [18], being a concept continuously adapted and extended “on the basis of explorative and design-oriented research” [33]. This adaptive and flexible nature is especially suitable for attending to new contexts and societal complexity [28], and has been introduced to the case through the TOMORROW project, detailed in Section 3.

Experimentation with different solutions and approaches is key to generate new ways of doing that can unlock fresh solutions to an urgent

Table 1
Overview of governance activities considered in Transition Management [28].

Level	Key activities
Strategic	Problem structuring, vision development, strategic discussions, long-term goal formulation, collective goal and norm setting, long-term anticipation
Tactical	Achieving goals in a specific context, steering activities, negotiation, collaboration, agenda-setting, coalition forming
Operational	Short-term, everyday decisions, specific projects and experiments
Reflexive	Learning, monitoring, assessment, evaluation

and long-standing issue such as sustainability transition [16], linking the tactical level to the operational level [27]. This approach has been widely underlined in the academic literature on sustainability transitions, which seeks to understand and stimulate possibilities for achieving change through experimentation in various forms in urban governance [13,34–36], since the traditional urban planning paradigm “is not only insufficient, but it may, in some ways, also be destructive” [37]. This positions cities as innovation hubs [37] and as major triggers to enable take-off and acceleration of transitions [38]. Nevertheless, to result in an effective and dynamic process of change, as described by Fuenfschilling and Truffer [22], sustainability transitions should swing from the deinstitutionalization of existing system configurations to the institutionalization of new and more sustainable ones. Furthermore, an important part of transition experiments is their embedding or institutionalization into local structures and regulations. Indeed, this implies that the design, approach and/or outcomes are adopted and integrated into such structures [39]. Here, institutionalization is a process in which an experiment develops from being unstable and constituting loosely coupled elements into a configuration that is clearly aligned and inter-related with well-defined practices, routines, actors, and purposes. Through institutionalization, changes can become embedded into system practices, and it is crucial to examine whether this is truly happening, as otherwise the impact of the outcomes of transition experiments can be seen as negligible [40,41].

2.2. Multi-stakeholder engagement spaces

Transition governance processes can be carried out in multi-stakeholder engagement spaces. As defined by Frantzeskaki and Rok, multi-stakeholder engagement spaces are “institutional spaces in which multiple actors convene to allow exchange of ideas, dialogue on issues and solutions and interactions concerning targeted problems and their proposed solutions” [42]. Sustainability transitions are enhanced by stakeholder engagement, as it can cause transformative social learning, promote societal change, and can lead to collective action towards the common goal of sustainability [43]. According to McCormick et al. [16], only collaborative action can enhance the effectiveness of urban sustainability projects, particularly those with ambitious goals. This is at the core of the TM approach [44], where conventional approaches to governance are inadequate, and so require experimentation and innovative solutions [16].

Frantzeskaki and Rok [42] list three reasons for creating and researching such spaces. First, they make sense of sustainability transitions through creating a shared understanding of issues and problems faced. Second, within such spaces, new knowledge for these transitions is co-created. Third, they allow the exploration of how solutions function and impact transitions. In the academic literature these governance spaces can be seen as “transition arenas” [45]. These are spaces are composed by “frontrunners” or “people with their own perception of the transition issue in question from their specific background and perspective” that participate “on a personal basis” [35]. Furthermore, within these spaces there must be found organizational representation, where actors participate on behalf of their structure or group, rather than in a personal capacity. This ensures that the process is not dependent on a single figure, and is therefore more inclusive. Actors come together in order to develop a transition agenda composed of “a number of joint objectives, action points, projects, and instruments to realize these objectives” [35], and determine who is responsible for each. Here, the group can be managed by a transition team [45] that fulfils the need of preparing, coordinating, documenting, analyzing, monitoring, facilitating and evaluating the whole process. These groups are an open, evolving process of innovation where conditions favorable to actor engagement need to be created and protected.

It must be noted that in this research work, the concept of *multi-stakeholder engagement spaces* was preferred over *transition arena*. This is due mainly due to the diverse composition of the MTE working group,

where stakeholder representation and diversity have been prioritized over expertise and knowledge.

2.3. Transition management in urban, southern European contexts

TM was proposed and introduced as a governance framework [32] in the Netherlands in the early 2000s, where it was also implemented as a practical experiment [18]. As Loorbach [32] described, it was not coincidental that TM started in the Netherlands, as this country already had a custom of creating and implementing innovative environmental policies, collaborative policymaking, and a focus on long-term planning. The interaction between science and policy stimulated a co-evolution of theory and practice, resulting in the TM approach. It was developed as a way to assist countries (primarily the Netherlands, the UK and Belgium at the time [18]) in setting up policies to make sustainability transitions within various socio-technical systems, such as the energy and mobility sectors. After acknowledging the origin of this approach in north western Europe, it is important to examine the influence of applications of TM in other contexts.

When applying TM to a case (study), it is important to pay attention to place-based factors related to local specificities, such as the existence of and interaction between local actors, the role of local government [46], how different sectors or domains relate to each other, and the influence of other geographical scales [13]. Furthermore, culture, histories and social structures are crucial when constituting frameworks that shape transformative potential [14]. This has led to the increasing significance of a cultural approach, which influences discourses, narratives and imaginaries that have the power to reconfigure the relations, redefine rules, delegitimize old regimes, establish new connections or even reproduce the *status quo* and resist change [8]. Indeed, various scholars claim that different cultural and geographical contexts require different transition pathways [8,9], thus applying a specific place-based transition approach [47]. Magnani and Osti [48] describe how, in 2016, policy support for local energy initiatives was weak in southern European countries in comparison to northern ones. Furthermore, southern European countries have experienced set-backs in the decarbonization of their energy transitions because of a scaling back of financial support mechanisms, often due to economic crises. In turn, local communities have frequently been left out of the decision-making processes of renewable energy projects, and such projects often encounter opposition, showing the disputed nature of environmental protection in the politics of countries in southern Europe [9,49]. In addition, there is often an absence of conventional energy sources and a notable dependence on imports, though such issues can also be seen as supporting factors in the development of renewable energy [49]. In north west European countries there is an extensive history of participatory renewable energy planning, particularly within the early stages of project development [50], as well as more advanced practices [50]. In comparison, in countries such as Spain, Italy, and Portugal, local participation in planning of renewable energy projects often starts only *after* the official publication of proposals by supranational bodies such as the EU.

Since the introduction of TM theory, various case studies have been undertaken where it has been put into practice. Early examples stemmed from the Netherlands and Belgium, with later case studies focusing on cities and societies in north western Europe. Frantzeskaki et al. [51] justly stated that the TM framework is now no longer a ‘Dutch’ approach given its application in many other countries, both inside and outside of Europe. However, in the same paper [51], it is also acknowledged that a large share of the practical applications still focuses on affluent western European societies. Indeed, when looking at TM research literature, the largest share of the cases stems from western Europe (Fig. 1). From the reviewed cases, it was found that only a tenth of cases relate to southern Europe, and so the underrepresentation of this particular regional context in TM literature and approach is clear. Since TM is the outcome of a combination of theory and practice, the implementation of the approach in any specific context can lead to different lessons. These

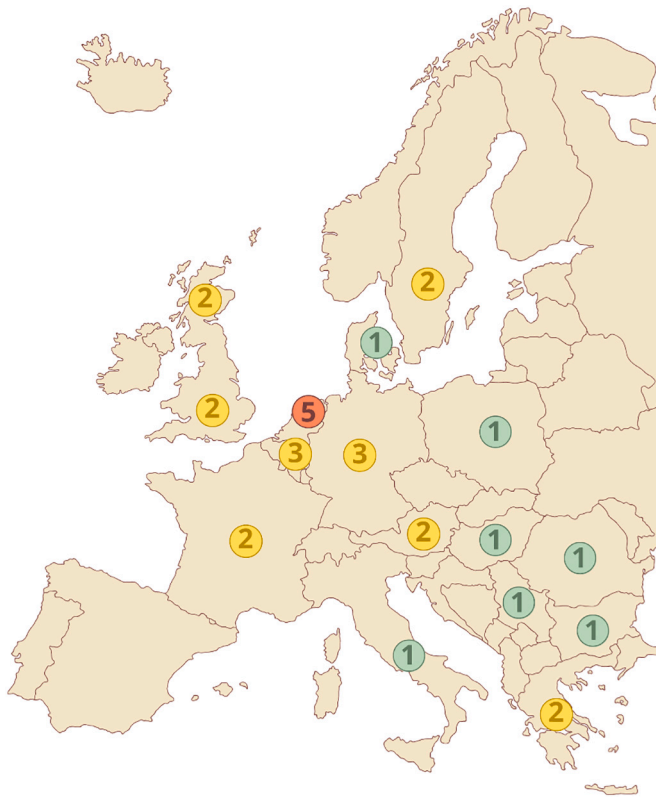


Fig. 1. Overview of cases in the TM literature in Europe. Source: Author's own elaboration. In green, 1 case found; yellow, 2 to 3 cases found; red, 4 or more cases found.

lessons can again be used to advance the generic model of TM by including the newfound insights [32].

3. Case context

3.1. València towards sustainability

Only in recent years has the focus on the energy system gained importance in València. The city is located on the east coast of Spain with a population of approximately 800.000 inhabitants and double this amount in its metropolitan area. In 2015 it experienced a governmental shift which re-defined its priorities, one of them now being the transition to sustainability. A national political change in 2018 has since boosted this new agenda due to the government being far more climate aware. As a board member of Energy Cities (the European Association of local authorities in the energy transition) since 2019, the city then adopted a Climate and Energy Action Plan to reduce its GHG emissions. [52]. The sustainability focus of the city has led Valencia to be a pilot city for the TOMORROW project, and it has recently joined the European Commission's Missions program [2], to become one of the 112 *Climate Neutral & Smart cities by 2030*.

With the political shift and an increasing civic interest in the climate crisis, València is now experiencing a plethora of disruptive initiatives in the energy system. These initiatives generally started within the social sector, but have encouraged a new approach to an ET with a balanced leadership among public institutions, civil society/activism and the private sector [53]. The transition is still weak in València's energy system, but local government interest, a new national legal framework promoting, among others, self-consumption, the stimuli from Europe, all combined with the climate crisis, have encouraged municipalities to start implementing measures to promote and be part of the ET [53]. In doing so, they face many dynamics that include overcoming the

oligopoly of the energy sector in Spain, high energy prices (the second highest prices in Europe), its consideration as a commodity instead of a basic need, the dependency on fossil fuels, the lack of market understanding by consumers, and the poor reputation of the sector [18]. Given this difficult context, different initiatives have emerged in order to change the rules of this (until now) static sector. They aim to seek a new culture of energy production, distribution and consumption in, for example, the shape of energy cooperatives. Nevertheless, the social movements' lack of consolidation, the lack of formal and informal governance spaces, weak public sector leadership and the isolation from other socio-technical systems all hinder València's sustainable ET [54].

Among the numerous initiatives that are now currently in operation, the implementation of the European project TOWARDS Multi-stakeholder transition ROADMAPS (TOMORROW, H2020, Grant Agreement ID: 847136) in the city of València stands out. The TOMORROW project aims to help participating cities to improve their capacities for transitioning to sustainability, and to involve civil society and potential key actors to actively participate in the decarbonization process. It was launched in September 2019, and through it València proposed a process to establish an ET roadmap with the aim of translating it into its ET strategy. From September 2020 to February 2022 this process has been co-designed by the *Mesa de Transición Energética* (Energy Transition Roundtable), or MTE, a multi-stakeholder group that has been actively working on producing the roadmap. This roadmap for transition has since become the Fair and Inclusive Energy Strategy for the city, approved in September 2022.

The MTE was coordinated by a motor group (*Grupo Motor*) which acted as a driving force for the process. The group, which had no prior experience of working together, was composed of València City Council, the Polytechnic University of València and the València Climate and Energy Foundation. València City Council drives the ET vision in line with the sustainable urban transition already underway within the city. This vision had representation at different scales and fields of action, giving space to the proliferation of innovative initiatives that combined social demands focused on the climate emergency. The Polytechnic University of València provided access to a research team from INGENIO (CSIC-UPV). This is a joint research institute with a focus on innovation and knowledge management, and is well-connected to research networks of national and international relevance in the field of sustainability transitions. The research team was in charge of designing the participatory methodology, selecting the stakeholders and facilitating the sessions. This facilitation consisted on building systematic, structured and active sessions, based on a creative approach to guide exercises and to discuss challenges and solutions. The València Climate and Energy Foundation delivered technical secretariat support for the MTE, proposed key working themes and was in charge of organizing and coordinating meetings with the Urban Strategy Steering Committee and other working groups in València. From the outset, the MTE became a space for collaboration and co-creation of new solutions to energy problems, bringing together different actors in the city in a balanced, participatory and inclusive manner.

3.2. Setting up the MTE (Energy Transition Roundtable)

The methodology used for the composition of this multi-stakeholder engagement group in València was based on the TM methodology for actors in transition processes [55,56] – introduced through the TOMORROW project - and the EIT Climate-KIC visual toolbox for system innovation [57]. Two analytical methods for system and actor analysis were used to shed light on local city dynamics, for example by explicitly identifying connections and relations in different levels between actors, classifying the importance or influence of actors in the system (see Appendix A), and facilitating co-creation processes that include participants from various backgrounds [55]. The MTE construction processes followed eight steps (see Fig. 2), summarized below.

Implementing place-based [47] transition governance processes

requires insight from frontrunners, intervention points, and innovations that best suit a specific place [24]. In order to do this, a triangulation of sources and methods has been used for data collection. First, a review was carried out of the main strategic plans, policy documents and articles related to the energy system in València since 2015 (post government change). Through this secondary data analysis, one hundred stakeholders in València's energy system were identified, belonging to both formal and informal institutions. Through a visual exercise and an analytical tool [57], stakeholders were rated on three attributes: relevance, interest, and expertise. These attributes were mapped using a matrix to understand the differences and to find (conflictive) relationships between them (see Appendix A). This stakeholder analysis, together with the first round of interviews, explained below, provided a key overview and an integrated perspective of València's energy system, identifying its main interactions, inertias, current problems and challenges for the future.

Using this extensive list plus the analytical map, a total of twenty-one preliminary stakeholders were selected and classified according to their field (see Fig. 3): government & public sector, civil society, businesses sector, academia, and intermediaries [55]. In addition, the media was also included as a stakeholder due to its relevance in narrative construction and cultural discourse related to sustainability transitions [58].

After this process twenty-one final stakeholders (changes were made, as some were included, others excluded, but they remained twenty-one once again) were selected according to their interest, their strategic relevance, their influence on the energy system, their ability to contribute resources and knowledge, and their profile as a frontrunner due to their experience in València's energy system (see Appendix B). These members participate as representatives of a specific institution or organization, and their role consists of contributing ideas, points of view, expertise, information, proposals, knowledge and interests from their represented organization or institution. Due to this, as the process evolved, three more permanent stakeholders were invited, giving a total

of 24 stakeholders in the MTE. Non-permanent actors like Energy Cities and the Polytechnic University of Madrid were invited as independent entities when their expertise was seen (by the stakeholders) as beneficial and/or necessary for clearing doubts, providing training or showcasing experiences from other places.

From April 2019 to February 2022 twelve collective 2 h workshops and meetings were held, eleven virtual and one in person (see Appendix C). The meetings had a convergent approach with a 3-part structure. First, an informative themed talk by an expert opened the meeting. Second, the main group was then divided into 3 subgroups where discussions and work related to the topic was carried out. And finally, each meeting ended with a plenary session with the exchange of all subgroup results. After ten such collective workshops, willingness to take action and collectively generate an impact on the city and the ET led the groups to start working on "demonstration projects". Out of 41 projects established by the MTE stakeholders during the first workshops and brainstorming sessions (see Appendix D), six demonstration projects were chosen according to their viability and impact. To facilitate the project work, six sub groups were created, one each for the six demonstration projects. The MTE stakeholders joined one or more project subgroups according to their interest and expertise. In total 18 demonstration project meetings were held, three per project. During these meetings each stakeholder subgroup defined the scope, background, justification, objectives, governance, roadmap, budget and financing for their respective demonstration project.

The meetings resulted in an energy transition roadmap for València, focused around the six demonstration projects and seven central themes of action: energy culture, energy law, building renovation, renewable and local energy, carbon neutral districts, innovation and entrepreneurship, and decarbonized mobility. Each demonstration project is accompanied by a project sheet which includes a summary, barriers and opportunities, actions, actors involved, targets, budget and monitoring.

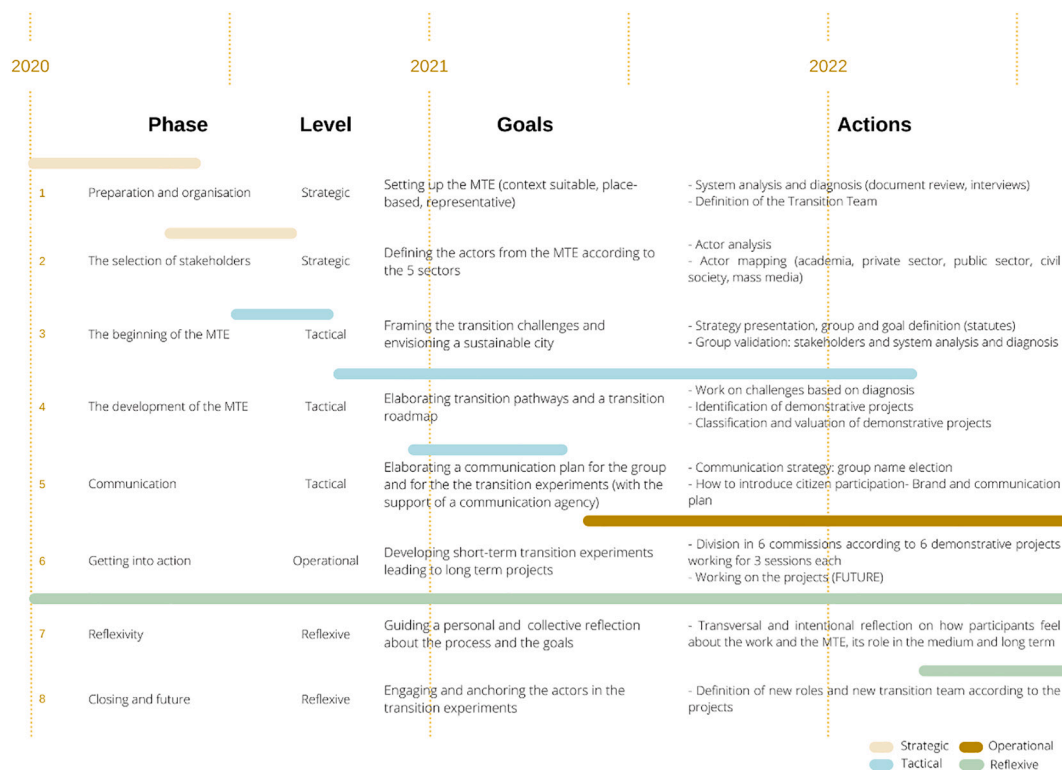


Fig. 2. Steps followed during preparation, development and closing of the MTE. Source: Author's own elaboration.

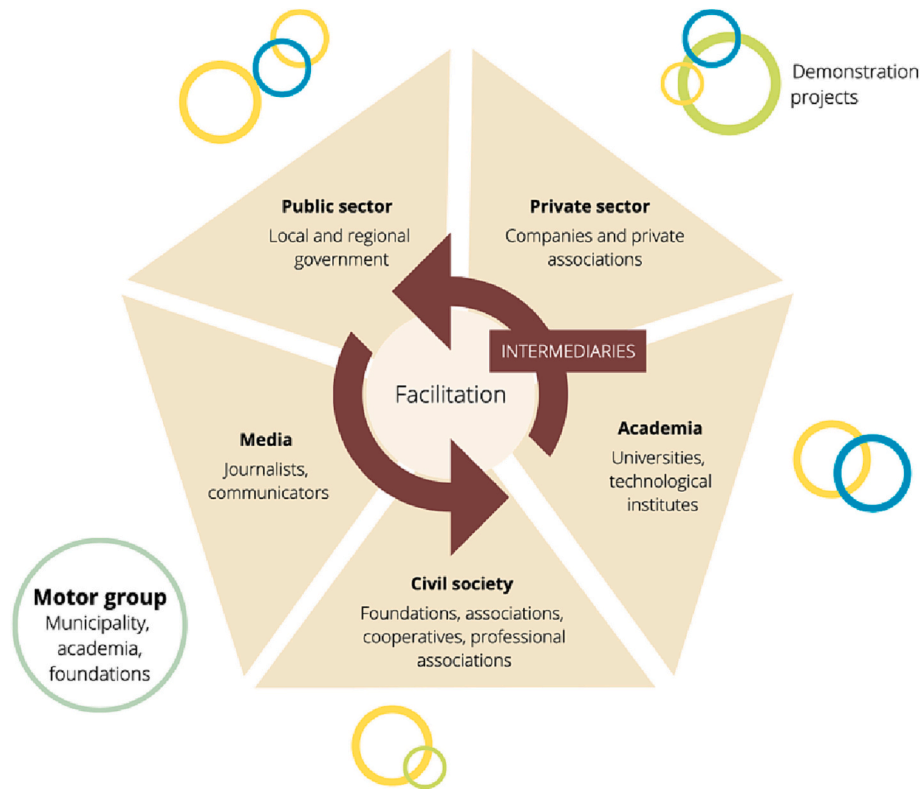


Fig. 3. Model used in the city of València.
Source: Author's own elaboration.

4. Research methodology

After setting up the MTE stakeholder group and defining a global perspective of the energy system in València, the research processes focused on analyzing the primary activities and their outcomes. Another goal was to induce group reflection on the MTE and its impact on each stakeholder and the city as a whole. The research was therefore grounded in a critical realist approach whereby social context shapes and influences theory implementation and how actors then interact with it [59]. In this regard, the research design employed a deductive-inductive approach, in which the theoretical framework was used to analyze the reality of the MTE, while at the same time being open to emergent issues arising from the analysis of collected data. In addition, since the nature of the present study was exploratory rather than explanatory, and focused on a single experience (given its uniqueness in the context), care was needed when interpreting the findings in order to avoid biases and generalizations.

At the outset, secondary data was mainly collected from project documents and websites, minutes, workshop canvases, reports and publications, as well as strategic plans and policy documents. This secondary data helped to analyze and shape a preliminary understanding of the energy system in the city. This understanding was also improved by the stakeholder mapping which was then used to identify and select the system actors.

Primary data was then collected through three sources: semi-structured interviews, participant observation, and informal conversations with system actors. The semi-structured interviews were conducted online, with 21 interviews at the outset of the MTE in March 2019, and with 24 interviews in April–June 2021. The interviews covered every actor of the MTE including the motor group, and their duration ranged from 45 min to 1 h 35 min. They captured the opinions and experience of the involved actors concerning both the city's energy and MTE processes (activities, context, organization, evolution and

outcomes). Such an approach enabled a more in-depth view of the functioning of the group. Guided by the TM framework the interviews were coded, through both inductive and deductive codes, and interpreted using NVivo software. Since all the authors of this paper were involved in all the phases and processes (including methodology definition, actor analysis, system analysis, facilitation and design of the sessions and the elaboration of the materials), participant observation of the authors and their informal conversation with the stakeholders provided additional first-hand information leading to a better understanding of the results. Researchers' comments and conclusions were subsequently shared and discussed between them. Finally, secondary data such as written summaries from the meetings and interviews were used to complement the research findings.

5. Results

In accordance with this qualitative research approach, the MTE was implemented as a way of coordinating and leading a shared definition of the energy transition roadmap (strategic level). Its aim was to create a citizen alliance (tactical level), and to collaborate with other urban strategies for climate change mitigation and adaptation. Such an ambitious goal requires fundamental changes, cooperation, and a long-term vision, and this understanding led the stakeholders and the motor group through a process of collective reflection on the energy system (reflexive level). Once the goal of creating the transition roadmap was met, the practical work started through the definition of the demonstration projects (operational level), following the *learning by doing* motto. This section presents chronologically the results of the empirical analysis of MTE governance processes, following the Wittmayer et al. [27] TM proposal of four different levels for TM governance processes.

5.1. Preparation and organization: new ways of doing, organizing and building (strategic level)

From the first round of interviews with the relevant actors in the energy system, carried out before the creation of València's MTE, interview assessments showed negative past connotations in relation to the ET or the acceleration towards sustainability in the city. The little momentum experienced so far and the fragility of the situation to date were mentioned. In the stakeholders' opinions, this situation has contributed to the lack of consolidation of formal and inclusive spaces for transition governance. Consequently, it denotes a weak network of actors, although there were some notable exceptions in the field of consumer cooperatives, albeit in limited number. Indeed, communities of practices in the energy system were perceived to be less abundant and having less autonomy than in other socio-technical systems within the city, e.g., the agri-food system, with their strong roots to the surrounding agricultural area, the *Horta de València* [52,60]. Furthermore, despite the fact that the municipal government tries to achieve an intermediary and driving role, the stakeholders disagree that clear leadership exists in the city regarding the ET. They agreed that leadership has existed at the *individual* level but that it has not managed to transcend into the public sphere or the political agenda, due to the "historical rigidity of public administrations towards change" (I20). According to the stakeholders, the ET has not been prioritized as one of the great needs of the city, and public demand related to ET and the climate emergency has only just started to emerge.

Compared to other urban energy systems in Spain or Europe, another key difference is the lack of a holistic analysis of the entire system itself. For example, adequate baselines have not been previously defined, and the path dependencies related to the ET roadmap have not been evaluated, nor the inertia of the system and associated institutions. This is coupled with an absence of a true shared vision by all the energy actors involved in València for a future based on sustainability. Insufficient community solutions, the lack of extensive participation plus shortcomings in cooperatively producing future plans or scenarios in the city were criticisms levied against the transition process, since the majority of actions are individual or business-focused.

Finally, it was noticed that the legal framework in Spain has been adverse, and multiple administrative barriers have been holding back new initiatives. Indeed, one interviewee said: "I think that a brake is that not all the institutions, nor all the actors in the city of València and in the City Council walk at the same pace" (I19). The involvement of the public administration in the ET was therefore seen as positive since it was perceived as an opportunity to update and overcome the bureaucratic burden, coordinating better both vertically and horizontally. It was also an opportunity to communicate and diffuse the initiative in order to foster its proximity to the public (a role that the València Energy Office aims to take up in the near future).

Regarding stakeholder relations, regular interactions between actors facilitated the building of more solid connections, the establishment of networks and a systemic view of the energy system, thus "changing the relationships between the entities that are at the Roundtable" (I2). According to the interviews, this engagement process has also facilitated more institutional trust and the group feeling of being a community working with shared values and common direction. The stakeholders now realize that the creation of the MTE in València has become an achievement in itself.

5.2. Development and delivery: experimentation and communities of practices (tactical and operational levels)

After the second round of interviews, all the participants felt satisfied and even pleasantly surprised both by the course of the meetings and by the institutional commitment. All the stakeholders considered the role of the motor group critical, and highlighted the difficulty to work independently as "citizens or organizations, on their own without anyone

pushing them to advance, as they do in the Netherlands" (I9), and that "spontaneously, it would have been impossible to organize ourselves" (I11). According to the majority of the stakeholders, the (supposed) independent process is perceived to have a lack of neutrality, being more dependent on individual stakeholder interests instead of being a process focused on the city and its citizens' needs. At the same time, participants see the public administration as the embodiment of political and economic commitment to sustainability and a scaling-up of process needs -horizontally and vertically [61]. Also, it is seen as a provider of the necessary knowledge and familiarity of inherent urban scale dynamics, and with this familiarity and knowledge comes a potential influence over such dynamics. The role of the public administration is also seen as key in the demonstration projects developed by the group. Five out of six demonstration projects needed strong institutional support and involvement regarding development and correct management. Also, the fact that two out of three of the motor group institutions are public administrations (the València Climate and Energy Foundation is strongly related to the municipality) was detected by some interviewees as a vulnerability of the MTE. Such vulnerability is due mainly to the exposure of the group to political changes and specific political interests, compromising the long-term existence of the MTE and thereby reducing its autonomy. Nevertheless, each demonstration project showed a variety of actors all of whom were implicated and involved. All of the projects were designed as short-term, practical and with a collective approach, though mindful of the long-term scenario to induce long-term changes.

Overall, the clarity and transparency of the methodology and the knowledge management were positively valued. Nevertheless, the general goals of the MTE may have been less clear for some interviewees, since a misalignment of expectations around the MTE has been found. Despite the existence of the MTE statutes and the transparency of the motor group with continuous references to co-defining the city roadmap (the principal aim of the group), several stakeholders were impatient about the execution of the demonstration projects. This created a sector of the MTE that was demanding a more active and practical involvement, pushing to see the roadmap actions implemented across the city. The stakeholders also highlighted that this (perceived) lack of action consequently decreased and limited the impact of the MTE on the city in its transition to a sustainable future. The group was thought to be too immersed in discussions despite "the moment of environmental and social urgency in which find ourselves" (I23).

Regarding a more operational level, a stronger presence of technological projects to the detriment of social projects was also pointed out. In addition, though a minority view, three of the interviewees also expressed their concerns regarding the possible preconception of the demonstration projects discussed by the motor group, resulting in a lack of genuine innovation for the city. One of them stated: "I personally understand that we are participating in a project that [already] exists" (I14). This feeling of being conducted to work on existing projects which were then badged as new and innovative MTE demonstration projects stressed the distrust of these participants, and highlighted their concerns for an independent and transparent process. This led to the creation of a co-optation shadow.

On the whole though, the facilitating team from INGENIO was seen as a key and positive element mainly due to the impartiality and objectivity that it could bring to all the decision-making process. The facilitating team was also appreciated for its expertise and dynamism that turned the group into "not just a space for participation anymore" but a space with "some differential traits that relate mainly to how the dynamization was planned" (I7). Such facilitation made the process more participatory, dynamic and structured by using design thinking techniques that guaranteed an active and creative approach to guide exercises and discuss challenges and solutions during the workshops/sessions. Finally, MTE connection and coordination with other *Mesas* (Round Tables) related to different socio-technical systems, such as mobility or agri-food, appeared as one of the main future challenges and

one of the strong demands identified by the group.

5.3. Multi-stakeholder spaces: diversity of backgrounds and principles of actors (reflexive level)

As it became clear from the interviews, controversy arose among MTE members concerning the values and principles that should guide the ET. This controversy is centered around two opposing visions of the transition. On one hand, participants perceived the transition as a technological evolution with “the promotion of renewable energy, increasing citizen participation in some way, energy efficiency...” (I23). On the other hand, a smaller part of the group aimed for a radical transformation of social and ecological systems, connecting the transition to a fairer and more democratic energy model instead of seeing energy solely as a consumer good. Other issues were also included, such as “... degrowth, losing privileges, which is something taboo, [avoiding] prioritizing as if energy transition is for a middle or upper-middle class, taking power away from some actors, destabilizing the current regime...” (I23).

However, from the participant interviews it could be determined that all members but two did not perceive these differences themselves, and they assumed a uniformity in the group. Added to this, stakeholders did not work on sharing and building common transition perspectives and MTE expectations. Despite this, the diversity of actors and backgrounds was valued as enormously positive, with the representation of the five-strand helix (Fig. 3) as a key innovation, particularly with the inclusion of the media as a key stakeholder. Nevertheless, some interviewees pointed out a lack of social actors. The interviews also showed that certain actors, such as civil society, were underrepresented, or were even missing, such as financial entities, other political sensitivities, startups and stakeholders from the innovation ecosystem of València. In contrast, there was a stronger presence of actors belonging to the public sector, some of which are hybrid with a technical profile, which is seen as very common in the energy field.

Finally, the COVID-19 pandemic and the resulting strong lockdown in Spain had an important role in the development of the process, since an online format was adopted. Through the use of collaborative tools, platforms and facilitating techniques, this inconvenience became an opportunity. According to the participants, less time was spent on travel or logistics, facilitating and increasing commitment and attendance due to increased geographic flexibility. Such effectiveness also created space for other activities like plenary sessions and reflexive sharing. Nevertheless, there has been a lack of informal contact in the sessions, an issue that has also been frequently pointed out during the interviews.

6. Discussion

This section further examines the relevance of multi-stakeholder groups as drivers of change. It also qualitatively evaluates the contextual influence produced on this kind of TM process towards ET. It does so by contributing to a deeper understanding of three key issues in the city of València: *the central role of a more reflexive approach; the role of experimentation, institutionalization and a lack of participatory culture; and the pioneering of a mission-oriented framework.*

6.1. The four governance levels and the centrality of reflexivity in the city of València

In València, the TM framework has been useful to define the ET roadmap in relation to the implementation of six demonstration projects. In particular, the supportive conceptualization of the four governance levels has contributed to the strategy, implementation and evaluation of the MTE. The reflexive level stands out as key, as its implementation throughout the whole process has contributed to a long-lasting MTE, where continuous learning and process revision and redirection have gone hand in hand with working on a city-wide Just and

Inclusive Energy Strategy. Nevertheless, given the reflexive approach, some issues need to be addressed, such as an over presence of demonstration projects based on technology and energy efficiency, the need to work on the values and principles for the ET, and the need for an increased presence of social and opposed actors.

At the MTE operational level, it has been acknowledged that there is a strong presence of demonstration projects based on technology and energy efficiency, and a weak presence of projects with a focus on social rights including policies that consider energy as a basic good (see Appendix C). This issue was found directly linked to three phenomena. First, the underrepresentation of social actors. Overcoming this would have required further intentional reflection, since the issue of energy can generate a strong inertia leading to the overrepresentation of technological actors to the detriment of social ones. Second, the assumption of a uniformity of values and principles between MTE members concerning the ET. Despite not generating any conflict given its tacit character, not setting a clear common definition for the group of what “energy transition” means could have led to masking other transition views [19], such as the social perspective of ET, less likely to be considered in a technological field. However, it is important to point out that some of the demonstration projects do have a social aspect, such as the Energy Offices, which provide technical support for vulnerable people and assist users in accessing state aid. The roadmap has also been written with an energy justice approach, driven more by the interests and approach of the motor group. Third, the existence of a strong stakeholder alignment with the public administration, with only a few dissonant voices. This has been an unintentional product of the lack of interest from certain groups of MTE actors, resulting in a very homogeneous group. Certain groups, holding contrary positions to the institutionalized forms of organization and articulating different transition visions, may have refused to join the process due to the strong institutional character of the initiative, coupled with previous participatory disappointments. Consequently, there has not been a strong presence of radical power at the niche level in the MTE. Without such radical power the Roundtable is more likely to have conducted a transformation at the regimen level [62]. This could be powerful but runs the risk of legitimizing dominant discourses [62,63] and making invisible contrary visions which can generate resistance, creating “winners and losers” of the sustainability transition [15,64].

Despite this, the reflexive governance process conducted by the motor group has brought the desired outcome (roadmap) closer to systemic change and to envisaging a fundamental transition away from the existing energy system [63]. The transversal reflexive activities during the sessions facilitated a continuous redirection of the MTE process according to stakeholder needs and expectations, and stimulated a collective reflection, both key for the organicity of the process and for stakeholder appropriation. Here, interviews conducted at the beginning and the end were also a useful tool to assess the process [19], and to guide reflection on the overarching governance of the ET process and its impact on the city and its citizens. Collective back-casting and envisioning were also central in exploring València's energy system, as was working on new stakeholder capacities, developing new organizing networks, and developing relationships between them [16,38,63], without business-as-usual expectations [62].

As noted by the stakeholders, a more reflexive approach leads to slower transitions, but at the same time “acceleration affects our ability to govern inclusively, and acceleration tends to produce different social realities that are anchored in temporal and spatial processes of differentiation” [65]. This dilemma of speed vs. inclusion “ultimately entails asking which kinds of societies we want to be part of co-producing” [65], broadening the epistemic basis on how to responsibly formulate transitions and accelerate transition strategies. Together this highlights the fact that a low carbon energy future is “far more a social, organizational, economic, cultural and political challenge” than a technical one, and that “achieving these goals demands a structural transformation of urban systems” [15], centering the process of change upon the

interactions of the city actors [15,61–63].

6.2. Southern Europe: the role of experimentation, institutionalization and a lack of participatory culture

The fact that the empirical distribution of transition governance processes is concentrated in the Global North and in particular in northern European regions [21] is singled out by the MTE participants. The stakeholders are also aware of the many political and cultural differences found in northern European countries. This determines a first southern bias related to the lack of confidence in an independent and autonomous future for València's MTE. The ideal and most desirable scenario of a multistakeholder space leading to a community of practice working on their own without institutions or administrations directing the process [42] is less likely to happen in this southern context than in northern ones. All the MTE stakeholders considered the role of the motor group vital, and agreed it was difficult to work autonomously due to the lack of experience, but also because of cultural, contextual, historical, political and socio-economic reasons [8] (“we are not the Netherlands”, remarked an interviewee). This lack of tradition is an old struggle in southern European countries and can drive stakeholders to leave the whole process in the hands of the public administration, increasing the risk of co-optation [56]. In such cases, a special warning should be given in order to avoid the misuse of public participation towards instrumentalization and tokenism. This is crucial since it could jeopardize trust [35], as signaled by certain MTE interviewees, a thorny element within these processes [66]. However, despite the strong institutionalized character of the MTE, the reflexive and purposeful participation has contributed to creating a transformative space for stakeholders which inspires and enables new collaborative and experimentation-led visions regarding sustainability. Some of the MTE participants also recognize that the demonstration projects have transformative potential themselves, both in the city of València and country-wide. Nevertheless, they need to be implemented and scaled up to eventually replace the dominant practices [60], unlocking new solutions to accelerate the transition on an even more operational level [27,38].

Although the academic literature surrounding transitions emphasizes the importance of experimentation as a key element, there are certain issues to keep in mind. First, there is a risk with such initiatives as they may be applicable only on a local scale, with limited application in other contexts or areas [60]. To avoid this, the benefits and outcomes of the MTE need to be well-shared and communicated [13,66,67], with a strong knowledge orientation. They also should be interpreted using a place-based approach [7], with further attention to generalization to other contexts and Round Tables. Second, we consider that these preliminary demonstration projects have enough transformative potential to generate policy changes in the southern European context. However, there is a risk that the demonstration projects remain as short-term actions, and act in isolation without the comprehensive vision of the whole urban system. Furthermore, working in silos could result in a highly saturated pilot-project environment but with little impact and blocked upscaling. Accordingly, the demonstration projects should be implemented with long-term ambitions, motivating and embedding their institutionalization [41], especially given the urgency of the climate issues in southern European countries. It is time to focus on flexible approaches and to be open to learning, even from failures, thereby putting experimentation at the center, which is a very uncommon practice in southern parts of Europe.

6.3. Present and future: pioneering a mission-oriented framework

The MTE in València, considered innovative and disruptive by the participants, led to a two-year commitment and a common understanding between the various actors at different levels. In this way, the working group became a learning platform to address a problem that transcended social and technological boundaries. However, it is

important to not underestimate the influence that economic issues have on its continuity and the correct scaling up of the demonstration projects. Ensuring financing has been, and continues to be, the never-ending challenge for the motor group and the participants, since the participants' willingness to continue with the projects is challenged by the ending of the TOMORROW project. In sum, this suggests working harder on public-private partnerships and coalitions. The good news is that universities can also play a vital role [68], due to their innovative and experimental nature. Indeed, the city of València has two high profile public universities that could make a difference. Also, the current European program ‘Missions’, with its 112 European cities aiming to become climate neutral before 2030 [2], created a new context whereby ET is gaining interest, and innovative governance arrangements are finding legitimacy in southern European cities. In particular, this connects with the new national legal framework that offers the chance for Spanish municipalities to start implementing measures to promote and be part of the ET [53]. On one hand, this can be seen as an opportunity to boost new multi-stakeholder governance spaces to address key urban transformations. On the other hand, it faces the risk that possible failures and pitfalls in negotiating the transition pathways are to come. Therefore, it seems essential to consider this initiative in the city of València as a pioneer experiment, and one which is able to feed the replication and consolidation of other projects. Furthermore, the MTE and its learnings have served as a pilot for the development of similar multi-stakeholder engagement groups in other socio-technical systems of the city, such as the agri-food system [69,70], and the general urban agenda [53].

7. Conclusion

The importance of Valencia's Just and Inclusive Energy Strategy, initiated by the MTE and grounded in place-based, participatory and long-lasting approaches, has led the city to implement a multi-stakeholder group to define the roadmap towards the urban ET. In doing so, it has become a national pioneer in these types of experiences. During the eight-step process of the MTE, a systemic analysis of the energy system and its actors, then validated and complemented in the MTE, was followed by twelve collective workshops and eighteen themed workshops giving rise to six demonstration projects. The MTE process contributed to collectively frame the ET challenges and envision a sustainable city through the co-creation of transition pathways. In addition, a communication plan was elaborated for the MTE activities and demonstration projects. During the process, the implementation of a reflexive approach was essential to protect the process, to project long-lasting measures and to stimulate stakeholder awareness of the structural changes necessary to reconfigure the system. This reconfiguration gives the same importance to the environmental, social and economic relations in València's energy system by defining a holistic strategy to achieve these changes at city level.

The lack of similar experiences in Spain and other southern European countries was one of the reasons why the design and governance of this multi-stakeholder engagement space became a major challenge for the municipality, the stakeholders and the researchers involved. Here, the TM methodology, despite being a methodology mainly developed through north-western European experiences, has proven to be an adequate basis that allows the formulation of an urban ET strategy in southern Europe. Yet these transition governance experiences require special attention in southern European countries, since they lack a consolidated participatory tradition and institutional trust has been socially reviled. All of this could lead to a lack of confidence from actors concerning the process, the outcomes, and also on the future of these multi-stakeholder experiences. The role of the public institutions as enablers and facilitators of these processes is more intense in southern Europe than in the northern regions of Europe. This too needs greater attention, especially with regard to maintaining a high degree of independence, which helps to challenge dominant structures. Yet public institutions are also very important in order to keep the actors in

equilibrium, assisting the building of relations and making sure that the transition they are pursuing has a social and just approach. These factors are crucial in contexts where social needs among the energy sector have been neglected, privileging private interests over civic duties. Other aspects include overcoming political cycles that interfere with the need for a long-term and scalability approach, the politicization of the group, and limited funding, all of which hinder an action-oriented focus. Overall, it seems necessary to maintain the focus on the interactions of the city actors as well as those in the ET, in order to promote a systemic change in the relations between the private sector, public administration, politicians, policy makers, practitioners, researchers and citizens.

As in the city of València, the urban ET towards sustainability is gaining interest across southern Europe. This increased interest will help new innovative and transformative governance arrangements to spread throughout southern European cities. Indeed, these governance instruments have shown their transformative potential to make policy changes in other parts of Europe. Here, the MTE experience can be a breeding ground for new multi-stakeholder and participatory approaches towards ET in southern cities, and an important reference to find support, methods and legitimation. The scaling-up and replication of these multi-stakeholder groups will help overcome the limitations of a single qualitative research case. Through additional evidence more

detailed insights will be gained. The results of such research can then be systematically integrated into the TM approach and promote a bigger scale discussion of the potential impact of these experiences on the ET towards sustainability in southern Europe.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

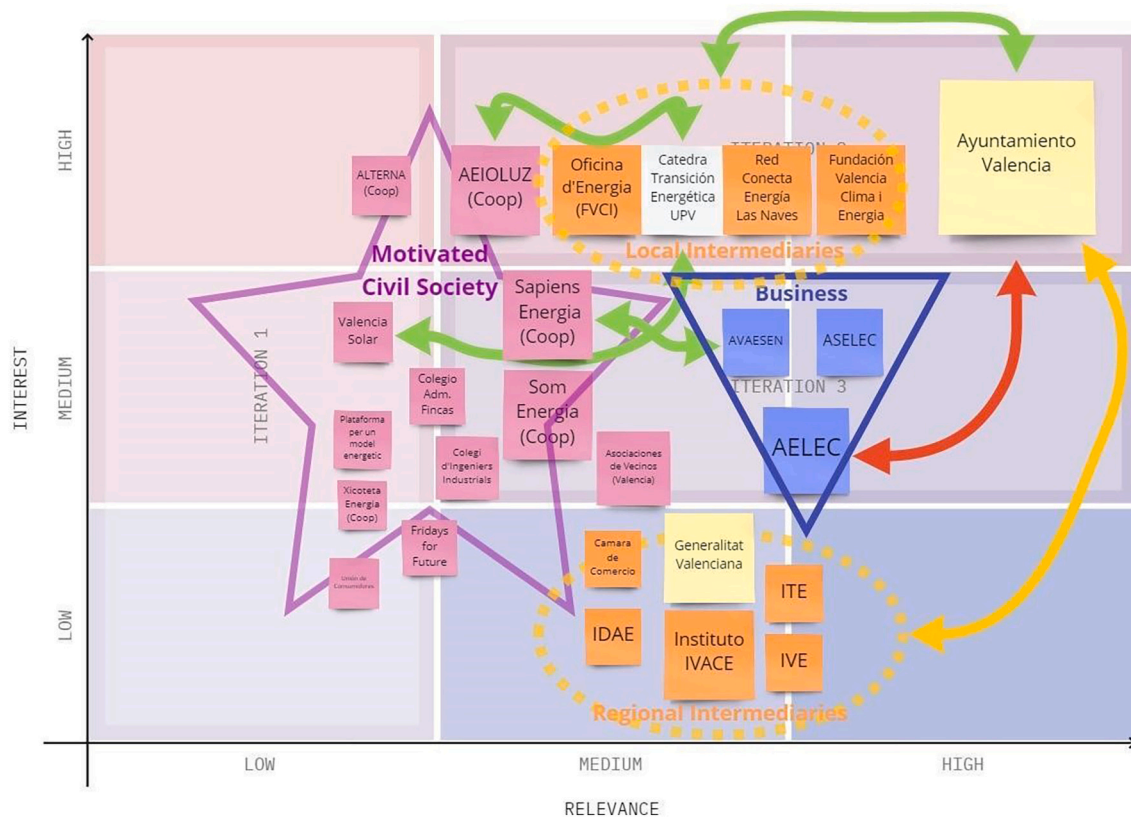
Data availability

Data will be made available on request.

Acknowledgements

This work has received funding from the Research and Development Aid Program (PAID-01-20) from the Universitat Politècnica de València; the Generalitat Valenciana and the European Social Fund through the postdoctoral grant CIAPOS/2021/178; and for open access from CRUE-Universitat Politècnica de València.

Appendix A. Relevance/interest/expertise map for energy system stakeholders in València. Source: Escario-Chust et al. [71]

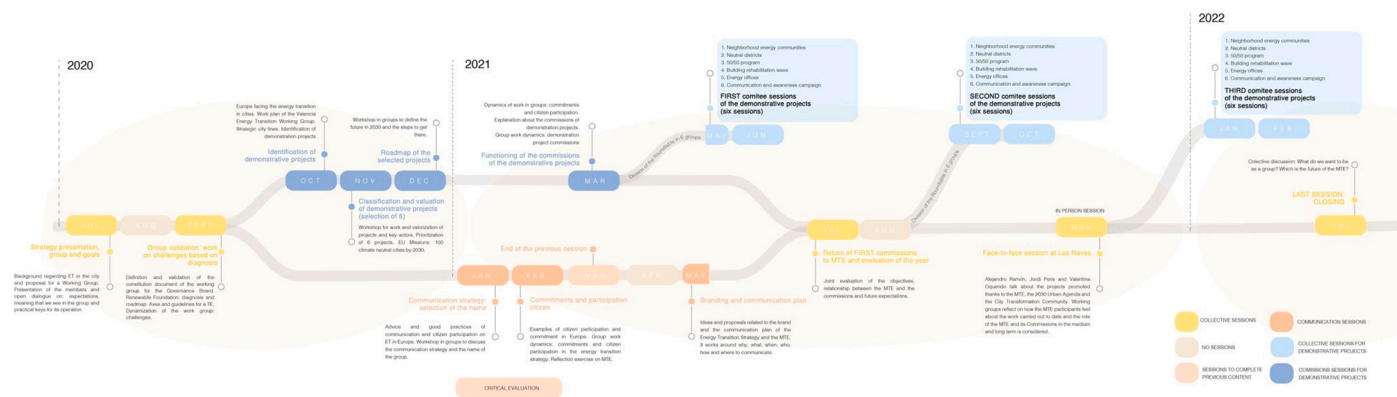


Appendix B. Stakeholders belonging to the MTE. Source: Author's own elaboration

	Institution	Category
1	València City Hall	Government (Local)
2	València Climate and Energy Foundation	Government (Local)
3	General Climate Change Directorate	Government (Regional)
4	General Energy Directorate	Government (Regional)
5	General Ecological Transition Directorate	Government (Regional)
6	Las Naves (Red Connecta Energía)	Intermediary
7	IVE (Valencian Institute of Building)	Intermediary
8	IVACE Energy (Valencian Institute of Business Competitiveness)	Intermediary
9	Chair in Energy Transition Polytechnic University of València	Academia
10	ITE (Energy Technology Institute)	Academia
11	AVAESEN (Valencian Region Energy Association)	Private sector
12	ASELEC (Association of Electrical Installers, Telecommunications and Renewable Energies of València)	Private sector
13	i-DE (Iberdrola Group)	Private sector
14	Acioluz	Civil Society (Cooperative)
15	Som Energía València	Civil Society (Cooperative)
16	Ecologistes en Acció País Valencià	Civil Society
17	AAVV (Federation of Valencian Neighbourhood Associations)	Civil Society
18	College of Industrial Engineers	Civil Society
19	Environmentalist journalist	Media
20	Environmental Journalists Association	Media
21	Communicator and expert	Media

Grey is for separating the different categories. Government, intermediary, academia, private sector, civil society and media.

Appendix C. Outline of the sessions. Source: Author's own elaboration



Appendix D. Explanation of the six demonstration projects chosen by the MTE. Source: own elaboration

Name of the demonstration project	Description	Lines of action
Energy culture campaign	Setting up a large communication and awareness campaign to motivate action and highlight good practices and make a new energy culture emerge in València	Energy culture, energy law
Neighbourhood energy community	Creating energy communities with a new way of generating, using and managing energy at the local level through the cooperation of different agents	Renewable and local energy, carbon neutral districts, innovation and entrepreneurship
Deployment of energy offices	Setting up One-Stop Shops or offices to respond to concrete questions of citizens and other local actors, to facilitate their participation in the energy transition	Energy culture, energy law, building renovation, renewable and local energy
50/50 program	Setting up a program in which schools will try to save energy, and the saved energy costs can be spent for 50 % by the students and for 50 % by the school board	Energy culture
Carbon neutral districts	Transforming 3 districts in València to become carbon neutral by 2030, by implementing different transformative initiatives	Carbon neutral districts, renewable and local energy
Building renovations wave	Converting buildings in the municipality of València in highly efficient buildings with zero emissions, with a single electricity supply	Building renovation

References

- [1] P.R. Shukla, J. Skeg, E.C. Buendia, V. Masson-Delmotte, H.-O. Pörtner, D. C. Roberts, P. Zhai, R. Slade, S. Connors, S. van Diemen, M. Ferrat, E. Haughey, S. Luz, M. Pathak, J. Petzold, J.P. Pereira, P. Vyas, E. Huntley, K. Kissick, M. Belkacemi, J. Malley, Climate change and land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems. <https://philpape rs.org/rec/SHUCCA-2>, 2019. (Accessed 12 November 2022).
- [2] European Commission, Directorate-general for research and innovation, EU missions: 100 climate-neutral and smart cities. <https://op.europa.eu/en/publicatio n-detail/-/publication/822ec360-c9bf-11ec-b6f4-01aa75ed71a1/language-en/for mat-PDF/source-256649647>, 2022. (Accessed 12 November 2022).
- [3] J. Köhler, F.W. Geels, F. Kern, J. Markard, E. Onsongo, A. Wiczorek, F. Alkemade, F. Avelino, A. Bergek, F. Boons, L. Fünfschilling, D. Hess, G. Holtz, S. Hyysalo, K. Jenkins, P. Kivimaa, M. Martiskainen, A. McMeekin, M.S. Mühlemeier, B. Nykvist, B. Pel, R. Raven, H. Rohrer, B. Sandén, J. Schot, B. Sovacool, B. Turnheim, D. Welch, P. Wells, An agenda for sustainability transitions research: state of the art and future directions, *Environ. Innov. Soc. Trans.* 31 (2019) 1–32, <https://doi.org/10.1016/J.EIST.2019.01.004>.
- [4] European Environment Agency, P. Kivimaa, F. Geels, B. Turnheim, M. Asquith, F. Kern, Sustainability transitions: policy and practice, Publications Office, European Environment Agency, 2019. <https://op.europa.eu/en/publication-deta il/-/publication/da060542-d8f7-11e9-9c4e-01aa75ed71a1/language-en>. (Accessed 12 November 2022).
- [5] N. Frantzeskaki, V.C. Broto, L. Coenen, D. Loorbach, Urban sustainability transitions, in: *Urban Sustainability Transitions*, 2017, pp. 1–380, <https://doi.org/10.4324/9781315228389>.
- [6] F. Ehnert, F. Kern, S. Borgström, L. Gorissen, S. Maschmeyer, M. Egermann, Urban sustainability transitions in a context of multi-level governance: a comparison of four European states, *Environ. Innov. Soc. Trans.* 26 (2018) 101–116, <https://doi.org/10.1016/J.EIST.2017.05.002>.
- [7] L. Coenen, P. Benneworth, B. Truffer, Toward a spatial perspective on sustainability transitions, *Res. Policy* 41 (2012) 968–979, <https://doi.org/10.1016/J.RESPOL.2012.02.014>.
- [8] S. Krupnik, A. Wagner, O. Koretskaya, T.J. Rudek, R. Wade, M. Mišák, S. Akerboom, C. Foulds, K. Smith Stegen, S. Batel Adem, F. Rabitz, C. Certomà, J. Chodkowska-Miszczuk, M. Denac, D. Dokupilová, M.D. Leiren, M.F. Ignatieva, D. Gabaldón-Estevan, A. Horta, P. Karnøe, J. Lilliestam, D. Loorbach, S. Mühlemeier, S. Nemoz, M. Nilsson, J. Osicka, L. Papamikrouli, L. Pellizzioni, S. Sareen, M. Sarrica, G. Seyfang, B. Sovacool, A. Telešienė, V. Zapletalová, T. von Wirth, et al., Beyond technology: a research agenda for social sciences and humanities research on renewable energy in Europe, *Energy Res. Soc. Sci.* 89 (2022), 102536, <https://doi.org/10.1016/J.ERSS.2022.102536>.
- [9] M. Frolova Ignatieva, B. Frantál, V. Ferrario, C. Centeri, D. Herrero-Luque, V. Gronas, S. Martinát, M. Puttilli, L. da Silva-Almeida, F. D'Angelo, Diverse energy transition patterns in Central and Southern Europe: a comparative study of institutional landscapes in the Czech Republic, Hungary, Italy and Spain. <https://di gbug.ugr.es/handle/10481/70888>, 2019. (Accessed 12 November 2022).
- [10] S. Ruggiero, H. Busch, T. Hansen, A. Isakov, Context and agency in urban community energy initiatives: an analysis of six case studies from the Baltic Sea region, *Energy Policy* 148 (2021), 111956, <https://doi.org/10.1016/J.ENPOL.2020.111956>.
- [11] T. Hansen, L. Coenen, The geography of sustainability transitions: review, synthesis and reflections on an emergent research field, *Environ. Innov. Soc. Trans.* 17 (2015) 92–109, <https://doi.org/10.1016/J.EIST.2014.11.001>.
- [12] J.M. Wittmayer, D. Loorbach, in: *Governing Transitions in Cities: Fostering Alternative Ideas, Practices, and Social Relations Through Transition Management*, 2016, pp. 13–32, https://doi.org/10.1007/978-4-431-55426-4_2.
- [13] V. Castán Broto, G. Trencher, E. Iwaszuk, L. Westman, Transformative capacity and local action for urban sustainability, *Ambio* 48 (2019) 449–462, <https://doi.org/10.1007/S13280-018-1086-Z/TABLES/4>.
- [14] J. Miörner, C. Binz, Towards a multi-scalar perspective on transition trajectories, *Environ. Innov. Soc. Trans.* 40 (2021) 172–188, <https://doi.org/10.1016/J.EIST.2021.06.004>.
- [15] G. Walker, P. Devine-Wright, S. Hunter, H. High, B. Evans, Trust and community: exploring the meanings, contexts and dynamics of community renewable energy, *Energy Policy* 38 (2010) 2655–2663, <https://doi.org/10.1016/J.ENPOL.2009.05.055>.
- [16] K. McCormick, S. Anderberg, L. Coenen, L. Neij, Advancing sustainable urban transformation, *J. Clean. Prod.* 50 (2013) 1–11, <https://doi.org/10.1016/J.JCLEPRO.2013.01.003>.
- [17] D. Loorbach, N. Frantzeskaki, F. Avelino, Sustainability transitions research: transforming science and practice for societal change, *Annu. Rev. Environ. Resour.* 42 (2017) 599–626, <https://doi.org/10.1146/annurev-environ-102014-021340>.
- [18] D. Loorbach, J. Rotmans, The practice of transition management: examples and lessons from four distinct cases, *Futures* 42 (2010) 237–246, <https://doi.org/10.1016/J.FUTURES.2009.11.009>.
- [19] S. Sillak, K. Borch, K. Sperling, Assessing co-creation in strategic planning for urban energy transitions, *Energy Res. Soc. Sci.* 74 (2021), 101952, <https://doi.org/10.1016/J.ERSS.2021.101952>.
- [20] E.J.L. Chappin, A. Ligtoet, Transition and transformation: a bibliometric analysis of two scientific networks researching socio-technical change, *Renew. Sust. Energ. Rev.* 30 (2014) 715–723, <https://doi.org/10.1016/J.RSER.2013.11.013>.
- [21] G. McCrory, N. Schöpke, J. Holmén, J. Holmberg, Sustainability-oriented labs in real-world contexts: an exploratory review, *J. Clean. Prod.* 277 (2020), 123202, <https://doi.org/10.1016/J.JCLEPRO.2020.123202>.
- [22] L. Fuenschilding, B. Truffer, The structuration of socio-technical regimes—conceptual foundations from institutional theory, *Res. Policy* 43 (2014) 772–791, <https://doi.org/10.1016/J.RESPOL.2013.10.010>.
- [23] T. Elmquist, E. Andersson, N. Frantzeskaki, T. McPhearson, P. Olsson, O. Gaffney, K. Takeuchi, C. Folke, Sustainability and resilience for transformation in the urban century, *Nat. Sustain.* 2 (2019) 267–273, <https://doi.org/10.1038/s41893-019-0250-1>.
- [24] J. Halbe, C. Pahl-Wostl, A methodological framework to initiate and design transition governance processes, *Sustainability* 11 (2019) 844, <https://doi.org/10.3390/SU11030844>, 11 (2019) 844.
- [25] L.B. Fischer, J. Newig, Importance of actors and agency in sustainability transitions: a systematic exploration of the literature, *Sustainability* 8 (2016) 476, <https://doi.org/10.3390/SU8050476>.
- [26] W.M. Snyder, E. Wenger, Our world as a learning system: a communities-of-practice approach, in: *Social Learning Systems and Communities of Practice*, 2010, pp. 107–124, https://doi.org/10.1007/978-1-84996-133-2_7.
- [27] J.M. Wittmayer, F. van Steenberg, N. Frantzeskaki, M. Bach, J.M. Wittmayer, F. van Steenberg, Á.N. Frantzeskaki, Á.M. Bach, in: *Transition Management: Guiding Principles and Applications*, 2018, pp. 81–101, https://doi.org/10.1007/978-3-319-69273-9_4.
- [28] D. Loorbach, Transition management. New mode of governance for sustainable development, International Books, Utrecht, 2007. <https://www.jstor.org/stable/jc orpciti.58.48>. (Accessed 12 November 2022).
- [29] C. Roorda, J. Wittmayer, Transition management in five European cities—an evaluation title: transition management in five European cities—an evaluation. <http://creativecommons.org/licenses/by/4.0/orsendalettertoCreativeCommons>, 2014. (Accessed 12 November 2022).
- [30] J.P. Voß, A. Smith, J. Grin, Designing long-term policy: rethinking transition management, *Policy. Sci.* 42 (2009) 275–302, <https://doi.org/10.1007/S11077-009-9103-5/TABLES/1>.
- [31] J. Rotmans, R. Kemp, M. van Asselt, More evolution than revolution: transition management in public policy, *Foresight* 3 (2001) 15–31, <https://doi.org/10.1108/14636680110803003/FULL/XML>.
- [32] D. Loorbach, Transition management for sustainable development: a prescriptive, complexity-based governance framework, *Governance* 23 (2010) 161–183, <https://doi.org/10.1111/J.1468-0491.2009.01471.X>.

- [33] F. Avelino, J. Grin, B. Pel, S. Jhagroe, in: *The Politics of Sustainability Transitions* 18, 2016, pp. 557–567, <https://doi.org/10.1080/1523908X.2016.1216782>.
- [34] H. Bulkeley, V.C. Broto, M. Hodson, S. Marvin, H. Schroeder, K. Janda, J. Zhao, A. Armstrong, S.Y. Chu, S. Ghosh, Peers Fehr, *Governing urban low carbon transitions*, in: *World Bank Urban Symposium on Climate Change*, Routledge, 2010, pp. 45–57, <https://doi.org/10.4324/9780203839249-10>.
- [35] N. Frantzeskaki, A. Dumitru, I. Angelovski, F. Avelino, M. Bach, B. Best, C. Binder, J. Barnes, G. Carrus, M. Egermann, A. Haxeltine, M.L. Moore, R.G. Mira, D. Loorbach, D. Uzzell, I. Omman, P. Olsson, G. Silvestri, R. Stedman, J. Wittmayer, R. Durrant, F. Rauschmayer, *Elucidating the changing roles of civil society in urban sustainability transitions*, *Curr. Opin. Environ. Sustain.* 22 (2016) 41–50, <https://doi.org/10.1016/J.COSUST.2017.04.008>.
- [36] C. Luederitz, N. Schöpke, A. Wiek, D.J. Lang, M. Bergmann, J.J. Bos, S. Burch, A. Davies, J. Evans, A. König, M.A. Farrelly, N. Forrest, N. Frantzeskaki, R. B. Gibson, B. Kay, D. Loorbach, K. McCormick, O. Parodi, F. Rauschmayer, U. Schneidewind, M. Stauffacher, F. Stelzer, G. Trencher, J. Venjakob, P. J. Vergragt, H. von Wehrden, F.R. Westley, *Learning through evaluation – a tentative evaluative scheme for sustainability transition experiments*, *J. Clean. Prod.* 169 (2017) 61–76, <https://doi.org/10.1016/J.JCLEPRO.2016.09.005>.
- [37] H. Ernstson, S.E.V. der Leeuw, C.L. Redman, D.J. Meffert, G. Davis, C. Alfsen, T. Elmqvist, *Urban transitions: on urban resilience and human-dominated ecosystems*, *Ambio* 39 (2010) 531–545, <https://doi.org/10.1007/S13280-010-0081-9/FIGURES/6>.
- [38] F. Nevens, N. Frantzeskaki, L. Gorissen, D. Loorbach, *Urban transition labs: co-creating transformative action for sustainable cities*, *J. Clean. Prod.* 50 (2013) 111–122, <https://doi.org/10.1016/J.JCLEPRO.2012.12.001>.
- [39] T. von Wirth, L. Fuenschilling, N. Frantzeskaki, L. Coenen, in: *Impacts of Urban Living Labs on Sustainability Transitions: Mechanisms and Strategies for Systemic Change Through Experimentation* 27, 2018, pp. 229–257, <https://doi.org/10.1080/09654313.2018.1504895>, doi:10.1080/09654313.2018.1504895.
- [40] D. Loorbach, J. Meadowcroft, *Governing societal transitions to sustainability*, *Int. J. Sustain. Dev.* 15 (2012) 19–36, <https://www.researchgate.net/publication/254869409>. (Accessed 12 November 2022).
- [41] J. Holmén, S. Williams, J. Holmberg, *Comparing sustainability transition labs across process, effects and impacts: insights from Canada and Sweden*, *Energy Res. Soc. Sci.* 89 (2022), 102522, <https://doi.org/10.1016/J.ERSS.2022.102522>.
- [42] N. Frantzeskaki, A. Rok, *Co-producing urban sustainability transitions knowledge with community, policy and science*, *Environ. Innov. Soc. Trans.* 29 (2018) 47–51, <https://doi.org/10.1016/J.EIST.2018.08.001>.
- [43] L. Gonzalez-Porras, A. Heikkinen, J. Kujala, R. Tapaninaho, *Stakeholder engagement in sustainability transitions*, in: *Research Handbook of Sustainability Agency*, Edward Elgar Publishing Ltd., 2021, pp. 214–229, <https://doi.org/10.4337/9781789906035.00021>.
- [44] J. Wittmayer, F. van Steenberg, J.N. Quist, D. Loorbach, C. Hoogland, *The community arena: application of transition governance in local communities*, in: G. Balint, B. Antala, C. Carty, J.-M.A. Mabieme, I.B. Amar, A. Kaplanova (Eds.), *2nd International Conference on Sustainable Transitions Diversity, s.n., Lund, Sweden, 2011*, pp. 343–354, doi:10.2/JQUERY.MIN.JS.
- [45] K. Hölscher, J.M. Wittmayer, F. Avelino, M. Giezen, *Opening up the transition arena: an analysis of (dis)empowerment of civil society actors in transition management in cities*, *Technol. Forecast. Soc. Chang.* 145 (2019) 176–185, <https://doi.org/10.1016/J.TECHFORE.2017.05.004>.
- [46] T. Nochta, C. Skelcher, *Network governance in low-carbon energy transitions in European cities: a comparative analysis*, *Energy Policy* 138 (2020), 111298, <https://doi.org/10.1016/J.ENPOL.2020.111298>.
- [47] L. Coenen, T. Hansen, A. Glasmeier, R. Hassink, *Regional foundations of energy transitions*, *Camb. J. Reg. Econ. Soc.* 14 (2021) 219–233, <https://doi.org/10.1093/CJRES/RSAB010>.
- [48] N. Magnani, G. Osti, *Does civil society matter? Challenges and strategies of grassroots initiatives in Italy's energy transition*, *Energy Res. Soc. Sci.* 13 (2016) 148–157, <https://doi.org/10.1016/J.ERSS.2015.12.012>.
- [49] M. Prolova, M.J. Prados, A. Nadai, *Emerging renewable energy landscapes in southern European countries*, in: *Renewable Energies and European Landscapes: Lessons from Southern European Cases*, 2015, pp. 3–24, https://doi.org/10.1007/978-94-017-9843-3_1/TABLES/1.
- [50] D. Stober, M. Suškevičs, S. Eiter, S. Müller, S. Martinát, M. Buchecker, *What is the quality of participatory renewable energy planning in Europe? A comparative analysis of innovative practices in 25 projects*, *Energy Res. Soc. Sci.* 71 (2021), 101804, <https://doi.org/10.1016/J.ERSS.2020.101804>.
- [51] N. Frantzeskaki, J.M. Wittmayer, F. Avelino, M. Bach, K. Olscher, in: *Transition Management in and for Cities: Introducing a New Governance Approach to Address Urban Challenges*, 2018, pp. 1–40, https://doi.org/10.1007/978-3-319-69273-9_1.
- [52] *Ajuntament de València, Plan de Acció para el Clima y la Energía Sostenible de la ciudad de València, València, 2019*.
- [53] J. Peris-Blanes, S. Segura-Calero, N. Sarabia, D. Ribó-Pérez, *The role of place in shaping urban transformative capacity. The case of Valencia (Spain)*, *Environ. Innov. Soc. Trans.* 42 (2022) 124–137, <https://doi.org/10.1016/J.EIST.2021.12.006>.
- [54] V. Pellicer-Sifres, S. Belda-Miquel, I. Cuesta-Fernandez, A. Boni, *Learning, transformative action, and grassroots innovation: insights from the Spanish energy cooperative Som Energia*, *Energy Res. Soc. Sci.* 42 (2018) 100–111, <https://doi.org/10.1016/J.ERSS.2018.03.001>.
- [55] C. Roorda, J. Wittmayer, P. Henneken, F. Steenberg, F.N. van, D. Loorbach, *Transition management in the urban context: guidance manual, DRIFT*, Erasmus University Rotterdam, Rotterdam, 2014. www.drift.eur.nl. (Accessed 12 November 2022).
- [56] G. Silvestri, J. Wittmayer, T. de Geus, *Workbook for urban transition makers, DRIFT*, <https://www.citiesoftomorrow.eu/resources/toolbox/guidelines/workbook-k-urban-transition-makers>, 2020. (Accessed 12 November 2022).
- [57] J. de Vicente, C. Matti, *Visual toolbox for system innovation*, in: *A Resource Book for Practitioners to Map, Analyse and Facilitate Sustainability Transitions, Transitions Hub Series, Climate-KIC, Brussels, Belgium, 2016*.
- [58] F.W. Geels, *Micro-foundations of the multi-level perspective on socio-technical transitions: developing a multi-dimensional model of agency through crossovers between social constructivism, evolutionary economics and neo-institutional theory*, *Technol. Forecast. Soc. Chang.* 152 (2020), 119894, <https://doi.org/10.1016/J.TECHFORE.2019.119894>.
- [59] R. Pawson, N. Tilley, *Realistic Evaluation*, Sage, 1997.
- [60] R. Raven, S. van den Bosch, R.I.J. de T.M. 51. 1, 57-74. *Weterings, transitions and strategic niche management: towards a competence kit for practitioners*, *Int. J. Technol. Manag.* 51 (2010) 57–74, <https://doi.org/10.1504/IJTM.2010.033128>.
- [61] D. Petrovics, M. Giezen, D. Huitema, *Towards a deeper understanding of up-scaling in socio-technical transitions: the case of energy communities*, *Energy Res. Soc. Sci.* 94 (2022), 102860, <https://doi.org/10.1016/J.ERSS.2022.102860>.
- [62] E. Shove, G. Walker, *CAUTION! Transitions ahead: politics, practice, and sustainable transition management*, *Environ. Plan. A* 39 (2007) 763–770, https://doi.org/10.1068/A39310/ASSET/A39310.FP.PNG_V03.
- [63] M. Hodson, S. Marvin, in: *Mediating Low-Carbon Urban Transitions? Forms of Organization, Knowledge and Action* 20, 2012, pp. 421–439, <https://doi.org/10.1080/09654313.2012.651804>, doi:10.1080/09654313.2012.651804.
- [64] A. Sanz-Hernández, *How to change the sources of meaning of resistance identities in historically coal-reliant mining communities*, *Energy Policy* 139 (2020), 111353, <https://doi.org/10.1016/J.ENPOL.2020.111353>.
- [65] T.M. Skjølsvold, L. Coenen, *Are rapid and inclusive energy and climate transitions oxymorons? Towards principles of responsible acceleration*, *Energy Res. Soc. Sci.* 79 (2021), <https://doi.org/10.1016/J.ERSS.2021.102164>.
- [66] F. Celata, R. Coletti, *Enabling and disabling policy environments for community-led sustainability transitions*, *Reg. Environ. Chang.* 19 (2019) 983–993, <https://doi.org/10.1007/S10113-019-01471-1/TABLES/3>.
- [67] A. van Buuren, D. Loorbach, *Policy innovation in isolation? Conditions for policy renewal by transition arenas and pilot projects*, *Public Manag. Rev.* 11 (2009) 375–392, <https://doi.org/10.1080/14719030902798289>.
- [68] G.P. Trencher, M. Yarime, A. Kharrazi, *Co-creating sustainability: cross-sector university collaborations for driving sustainable urban transformations*, *J. Clean. Prod.* 50 (2013) 40–55, <https://doi.org/10.1016/J.JCLEPRO.2012.11.047>.
- [69] N. Sarabia, J. Peris, S. Segura, *Transition to agri-food sustainability, assessing accelerators and triggers for transformation: case study in Valencia, Spain*, *J. Clean. Prod.* 325 (2021), 129228, <https://doi.org/10.1016/J.JCLEPRO.2021.129228>.
- [70] A. Escario-Chust, T. Zerbian, S. Segura-Calero, G. Palau-Salvador, *The multiple and contested worlds of urban food governance: the case of the city of Valencia*, in: *Feeding the Melting Pot: Agroecological Urbanism for Inclusive and Sustainable Food Practices*, AESOP- Sustainable Food Planning Conference, Almeré, the Netherlands, 2022.
- [71] A. Escario-Chust, F. Vogelzang, G. Palau-Salvador, S. Segura-Calero, *Valencia towards sustainability. The case of the Energy Transition Board*, in: *Book of Abstracts. 7th NEST Conference*, Lyon, France, 2022, p. 47.