Smart-BEEjS

Human-Centric Energy Districts: Smart Value Generation by Building Efficiency and Energy Justice for Sustainable Living

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Socio-economic factors & Citizens' practices, enabling Positive Energy Districts

Challenging 'silo thinking' for promoting PEDs

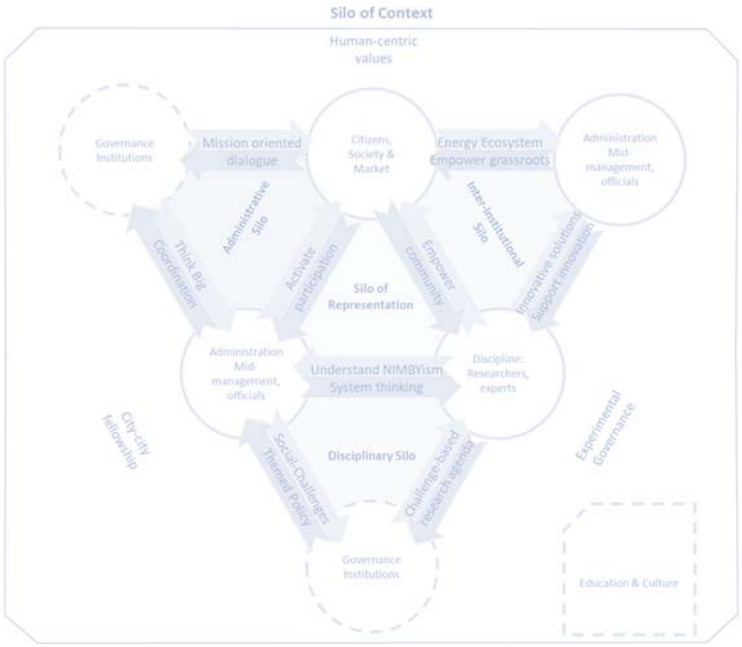

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Table of Contents

Executive Summary vi
1 Introduction 1
2 Silo thinking types and how to address them 4
2.1 Disciplinary silos: Status gap between technological and social sciences 4
2.2 Administrative silos: reluctance to collaborate among government departments 6
2.3 Inter-institutional silos: Barriers in public authorities, NGOS and business collaborations 7
2.4 Silos of representation: Barriers in public authority - citizen collaborations 9
2.5 Silos of context: Failure in adoption, replication and scaling-up of PED solutions 11
3 Conclusion and Outlook 13
List of References 15

Table of Figures

Figure 2-1. Systems thinking action-based training tool: Socio-technical configuration 5
Figure 2-2. The vicious cycle of NIMBYism in public engagement and how to break it (white boxes) 11
Figure 3-1. The nexus of recommendations to address silo-thinking..... 14

Table of Tables

Table 1-1. Socio-psychological and structural drivers and counter-drivers of different types of silos .. 3

Executive Summary

Collaboration between disciplines, sectors, institutions, and communities is essential for the successful planning and implementation of Positive energy districts (PEDs). However, silo thinking, defined in this document as the disregard of other groups' viewpoints or interests, poses a barrier to effective collaboration. Based on a review of existing literature, multiple factors were identified that could potentially cause silo thinking in the context of PEDs. First, differences in beliefs and ideologies create silos across disciplines, stakeholders, and communities. Divergent goals across sectors hinder collaboration between departments of the government. Misconceptions and prejudice present barriers in communication between citizens and the government. Furthermore, a lack of consideration for local culture and history may prevent collaboration between different cities and obstruct governments from engaging local innovations. Silos between disciplines and sectors are difficult to overcome because the long tradition of these silos means people are inexperienced in coordination across the boundaries of their own discipline or sector, making coordination more costly.

In the planning and implementation of PEDs, systems thinking is a key change in mindset that allows problem solving in the presence of interdependencies between different groups. Systems thinking can be incorporated in education, mid-management training, and work culture. Experts, researchers, and higher-level governance institutions can incorporate this type of holistic thinking to take a nexus approach or multidisciplinary approach in policy framing. As useful as it may be, in practical application, the systems approach can be obstructed by existing boundaries of organisations. Thus, the government also takes a primary role in facilitating coordination of different entities, by devising coordination bodies within the government and channels of communication with the public, as well as encouraging networks among businesses. Finally, citizens and grassroot organisations can be empowered by these government efforts and more actively engage in actions for PEDs.

1 Introduction

Positive Energy Districts (PEDs) can be defined as "energy-efficient and energy flexible urban areas or groups of connected buildings which produce net-zero greenhouse gas emissions and actively manage an annual local or regional surplus production of renewable energy. They require the integration of different systems, infrastructure and interaction between buildings, users and regional energy, mobility and ICT systems while securing the energy supply and a good life for all in line with social, economic and environmental sustainability"[1].

With the EU SET plan Action 3.2[2] aim of implementing 100 PEDs in Europe by 2025, early involvement of relevant experts, stakeholders, and citizens in PEDs from the onset is defined as both a key challenge and factor for implementation success[1]. Previous energy transition research indicates that collaboration among actors could be difficult due to silo thinking, which can perpetuate the injustices of the current unsustainable features of the energy system[3]. By defining silo thinking and identifying its potential consequences and drivers in implementing PEDs across Europe, this policy brief sets out to raise awareness and provide recommendations for policymakers and key actors to break down silo thinking.

Based on our review of empirical and theoretical literature on urban, energy and climate planning[16] [17] [23], we defined silo thinking in the context of PEDs as follows:

Silo thinking is the pursuit of one individual or group's interest or objectives without considering or recognising others' viewpoints and interests inside or outside of the organisation, discipline or community. It often leads to ineffective or suboptimal collaborations and partnerships or to failure in replicating successful programmes.

Through our review, we found a range of sources and types of silo thinking, which we have classified as follows:

- **Disciplinary silos** between technical and social experts in PED policy and framework-making stages at EU and national levels;
- **Administrative silos** between different government departments in PED planning stage at national and local levels;
- **Institutional silos** in the implementation stage between local authorities, businesses and NGOs in collaboration;
- **Silos of representation** regarding public responses and their roles in the implementation stage;
- **Silos of context** that persists in the adoption, replication and scaling-up stage for PED.

Although these silo types emerge at different stages of a PED project and might involve different groups of actors, they can stem from common socio-psychological and structural factors:

- Firstly, the **competitive mindset** that drives businesses to protect their own advantages, results in their reluctance to share useful information with competitors. A spirit of entrepreneurship also urges cities to compete for funding[4], which could result in non-inclusive city networks and language barriers.
- Secondly, **misconceptions and prejudice** that different groups of actors hold against each other during the collaboration processes, such as 'citizens are selfish and ignorant', 'planners are incompetent', 'developers are greedy', could increase intergroup tensions and distrust, and form an asymmetrical power relation between experts and lay publics[5].

- Furthermore, different disciplines could have different representations of PEDs based on their socio-cultural-historical **beliefs and ideologies**. For example, economists usually represent energy users as individual and rational consumers, while critical social scientists advocate for more politically active and collective roles for citizens in PEDs[6]. Failure to recognize these different traditions in the philosophy of science underpinning different academic disciplines, and thus failure to create a common ground of knowledge and language, could end up in unconscious biases, conflicting approaches and miscommunication.
- In addition, **lack of place sensitivity** about the local, historical and cultural context when implementing technological or social interventions in different localities could end up in counter-productive results and miss the opportunity to recognise indigenous, local knowledge in niche and grass-root innovations[7] [8].
- Finally, **divergent goals** of different departments and institutions are a barrier to cooperation in forming and running PEDs. Multiple government sectors including energy, planning, and transportation, ultimately depend on availability of energy as well as a stable policy environment, and thus should have a common understanding of the sustainable energy transition. However, immediate goals often do not coincide due to differences in priorities and individual interests.

These types of silo thinking could be hard to break or to change as they create behaviours that prioritise **avoidance of change** and adherence to routine and habits of stakeholders[9] [10]. This can slow down or obstruct the efficient planning and implementation of a PED. Path dependence and subsequent resistance to change can also be explained in terms of avoidance of **risk-taking** and **costs of coordination.** Collaborating with new groups of people or using a new form of technology requires learning, which represents a higher transaction cost than working in the old and familiar partnerships[11]. Furthermore, partnership with unfamiliar entities and incorporating newly developed technology involves higher risk, making it less favourable [12]. Without **prior experience in collaborating**, administrative bodies tend to avoid collaboration with each other[13], governments avoid risk-taking in the institutions they engage with [10], and policy experts think within their own background frames. Therefore, it could be said that there are unseen incentives to adhere to familiar customs, keeping government entities in their silos.

The energy transition is a problem that would benefit from an integrative trans-disciplinary approach as well as separate government sectors such as energy, planning, and transportation. In education and research, 'systems thinking' is a concept used to approach issues that require a multidisciplinary perspective. Defined as "a set of synergistic analytic skills used to improve the capability of identifying and understanding systems, predicting their behaviours, and devising modifications to them in order to produce desired effects"[14], the systems thinking approach can equip government officials and researchers with a multidisciplinary perspective and prepare them to coordinate across the boundaries of separate academic and administrative traditions and practices[15]. The 'nexus approach', as a policymaking framework, adopts a holistic treatment of interdependent sectors[16], requiring policymakers to incorporate broader interdependencies, and focuses on the trade-offs and complementarities between systems[17]. The argument is made that the nexus approach would benefit the governance of water, energy, and food systems[18]. It is possible to envision a similar approach for the energy sector involved in PED-development as one means of promoting the decarbonisation of the energy system.

Along with systems thinking and the nexus approach, various actions such as devising coordination bodies, applying the correct incentives, and empowering stakeholders through networks and

participation (Table 1) can counter the effects of silo thinking. The following section will present counter drivers and recommendations that can challenge silo thinking in the context of PEDs.

Table 1-1. Socio-psychological and structural drivers and counter-drivers of different types of silos

Types of silo	**Drivers**	**Counter drivers**
Disciplinary silos	• Cost of coordination • Lack of prior experience in collaboration • Beliefs and ideologies	• Thematic policy coordination • Interdisciplinary resource and systems thinking training • Cultural change through challenge-based research agenda
Administrative silos	• Lack of prior experience in collaboration • Cost of coordination • Divergent goals	• Learning through pilots • Facilitation of coordination • Nexus approach in policy framing
Institutional silos	• Aversion to risk • Place insensitivity • Competitive mindset	• Innovation incentivisation • Empowerment through networks • Facilitation of trust, collaboration, and exchange of information
Silos of representation	• Misconceptions and prejudice • Beliefs and ideologies	• Understanding of representations • Trust building in public engagement • Empowerment of communities in a democratic way
Silos of Context	• Beliefs and ideologies • Place insensitivity	• Human-centric approach • Incorporation of local knowledge • Place-based approach

2 Silo thinking types and how to address them

This section will give more insights and examples of silo thinking types as well as recommendations throughout the course of PED policymaking, planning and implementation stages. As the institutional scaffolding for PED led by the local authorities varies greatly across Europe within multiple local and national governance systems[19] [20], there is no one-size-fits-all solution for breaking silos. Nevertheless, by using an institutional perspective and taking into account polycentric governance[21], it is possible to identify common themes and propose recommendations that can be adapted to the different local contexts to slowly move from silos to holistic thinking.

2.1 Disciplinary silos: Status gap between technological and social sciences

Research has found that agencies supporting research on energy policy tend to have fewer social scientists on staff in comparison to environmental policy[22]. Due to this lack of recognition and engagement with the social dimension in the technocratic policy tradition[23], energy infrastructure design could perpetuate social stratification (by age, gender, class, etc)[9]. Taking transportation as an example, interviews about citizens' experiences in Bristol and Nottingham, UK reveal that low-income and ethnic minority people encounter many issues in accessing work and social services via public transport (bus) travelling from deprived area[24]. Since the Social Exclusion Unit, a thematic policy body in the Office of the Deputy Prime Minister, recognised these social aspects of transport, a series of funded programmes on social inclusion in deprived neighbourhoods have been established and monitored [25]. Similarly, coordination for conjoint projects across countries could also be facilitated by supranational funding entities such as ERA-NET to attract a critical mass of national resources on objectives and challenges of Horizon 2020 and achieve significant economies of scales[26]. Furthermore, energy policy agencies could learn from environmental agencies such as the Intergovernmental Panel on Climate Change, which makes continuous efforts in engaging with the social and ethical dimension of climate policy since its Fifth Assessment Report by liaising with a network of professionals with recognized expertise in both technical, economic and social domains[27].

Social-Challenges Themed Policy

Establish thematic policy bodies to coordinate cross-disciplinary work, connected to high-level authority. Liaise with network of recognized

Despite having coordinating committees and more social scientists involved, technical and social experts could fail to collaborate due to lack of experience, time constraints and knowledge gap[28]. By allocating more resources and training on system thinking, government and research institutes could create a dialogue across disciplines and bring a level of common understanding for experts to work on the complex energy issue. For example, system thinking training can help transport officers to recognise transportation as a social-technical system, which does not only depend on vehicle technology, road and fuel infrastructure, traffic rules, emission regulations, and economic model, but also depends on user practices and the cultural, symbolic meaning of transport[29]. Taking this systemic thinking to analyse e-scooter practice, a study in New Zealand suggests that by connecting different

Systems Thinking at Mid-management

Action-based, systems thinking professional training to empower dialogue and standardise practice

domains of social life "from innovation policy, to road user training, to changing youth stereotypes and intergenerational dynamics, to environmental attitudes, to housing policy…", the e-scootering programme will have the potential to challenge established patterns of use of urban spaces to achieve more equitable access for all[30].

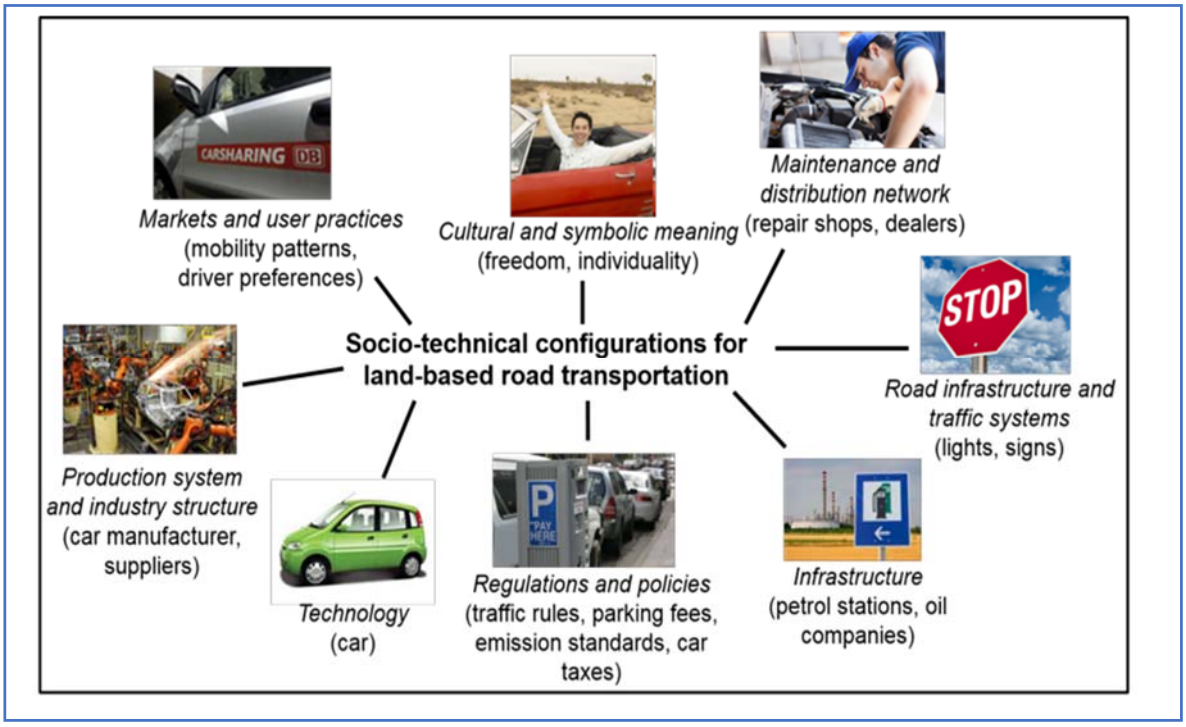

Figure 2-1. Systems thinking action-based training tool: Socio-technical configuration
Source: https://cta-toolbox.nl/tools/#aim

The current disciplinary divide in universities and academic journals could also create knowledge resistance among energy researchers and practitioners[31]. Therefore, in the long run, interdisciplinary and system thinking approach should also be incorporated in education and research in the energy field. For instance, an effort to deconstruct traditional engineering silos using "culturally sustaining pedagogies" has been proposed by a group of energy scholars in the University of San Diego to value and cultivate the cultural and social pluralism that creates a democratic educational experience for engineer students[32]. Furthermore, some leading universities in the US and EU have started to organise research groups around societal challenges by problem-focused programs rather than academic disciplines such as the Energy and Resources Group at the University of California—Berkeley, the Business Based Technology Development program at Aarhus University, the Natural and Social Science Interface at ETH Zurich, and the Science Policy Research Unit at the University of Sussex[33].

Challenge-based research agenda

Systematic work to change the cultural norms through education

2.2 Administrative silos: reluctance to collaborate among government departments

Pilot, scale-up, and transfer of skills

Learn from previous experience, pilots, and peers

The barriers created by reluctance to collaborate among government entities is implied by the fact that local governments are more likely to implement projects in sectors owned or operated by the local government (e.g. waste, or water management) and not in sectors which are governed on a national level (e.g. energy, transportation)[13]. Such a reluctance to collaborate with certain departments can be due to a lack of capacity to coordinate.

One measure to overcome such a lack in capacity is to draw on past experience or start with a pilot program. In the case of Turin, Italy, for example, the city council's previous experience in collaboration in such pilot projects as part of European project consortiums made it easier for them to adopt the smart cities project, which require collaboration of the various departments. The Interdepartmental Programme directorate (IPE) of the Dutch government is an example of a pilot collaborative effort developing into a larger-scale collaboration[34]. Before the IPE was established, a handful of officials in the Ministry of Economic Affairs, the so-called Energy transition Project (ETP), came together to facilitate the energy transition. The ETP engaged a diverse network of actors in forming their vision and producing reports. Eventually, the work was continued by the IPE, which consisted of six ministries in the beginning and later expanded to all ministries.

Mission-oriented governance

Bring together expertise from different departments through horizontal and vertical coordination

Coordination between departments requires information exchange, feedback when information is shared, setting a consensus regarding priorities, and settling potential problems. To incentivise the use of additional time and expertise in these collaborative activities, a common mission supported by higher-levels of government as well as various forms of coordination bodies can be helpful. Vertical coordination between a city government, the regional government, and the national government is proposed to facilitate coordination between sectors. Studies have found that cities embedded in multi-level governance systems where regional, national, and international levels are all supportive of climate action are more likely to govern climate action than those that are not[35]. Furthermore, horizontal coordination can be facilitated by establishing coordination bodies, where labour is specifically allocated to collaboration between departments. In the example of smart cities, cross-sector departments, "special staff units" and informal interdepartmental working groups have been established[36]. Establishing formal interdepartmental working groups can overcome misalignment of incentives between departments due to different department goals - the Interdepartmental Program Directorate (IPE) established by the Dutch government, is a prime example of this at the national level[37]. In 2006, IPE formulated an Action Plan Energy Transition, with some thirty officials from six ministries working part-time as part of the task force. By having officials from existing departments join the taskforce, the IPE aimed to motivating changes within the dominant energy policy regime. Through taskforce meetings, existing policy groups were forced to formulate their ideas and plans in a more detailed and cohesive manner.

Having the public sector take a key role in framing the discussion can help in formulating common goals, such as learning from global actions that seek a common policy framework among different

Think big

Each sector of government realises its interdependence to other sectors and sets a common goal

sectors. Schout (2001) points to the fact that sectoral ministries have different objectives, which are drafted and negotiated in order to be accepted as official policies, and incorporating another agenda into the process can be highly labour intensive[11]. Moreover, in negotiations, where it is difficult to push for too many demands, certain agendas, such as environmental objectives, may not have priority[11]. In its efforts to become a smart city, the city of Turin experienced difficulties in coordinating with the public utility services, because they lacked the incentives to make necessary changes[38]. Integrating policy from different sectors that form a nexus in addressing complex system-wide problems has been found to be crucial [39]. Integrating the goals of different sectors at the stage of policy framing can be a basis of coordinated policy design and implementation.

2.3 Inter-institutional silos: Barriers in public authorities, NGOS and business collaborations

Innovative R&D Thinking Facilitation

Incentivise government to collaborate with innovative niche technology and projects innovative work ethos and practices

Innovation at corporate level is found to be supported by employment contracts that involve long term incentives for managers of research and development, stock options with long investing periods and 'golden parachutes' for executiv[40]. Risk-taking can thus be encouraged[41] by incentive structures and work culture. However, these contracts are not typically offered to lower-level employees or in the public sector. In a lab experiment, tolerating or rewarding early failure and rewarding long-term success was found to motivate people to explore innovative business tactics and subsequently led to higher probability of strategy optimisation[41]. innovation Building a better work culture and trust can also serve as enablers of incentivising innovation. A culture that promotes experimentation, rewards innovation, and gives employees the time and resources to cultivate new ideas is required to convince employees that innovation is truly appreciated[42]. It is also important that the organisation builds and maintains the reputation of valuing innovation in order to secure the trust of the employees.

Network facilitation

Enable or collaborate with networks of niche activities and SMEs – improve awareness level of non-mainstream solutions and activate 'network effects'

In the perspective of community energy projects, governments often assume risk-averse attitudes, favouring collaboration with larger, well-established companies or developers representing mainstream technologies, over local organisations, specialised and niche SMEs, or advanced technology[10]. This may lead to governments thinking within a silo of mainstream solutions. Additionally, local governments and initiatives that use niche technology may subsequently have a difficult time reaching out to higher level government or other sources of funding, because of the risk-natured activities, and scarcity of information. As lack of risk-taking is an issue contributing to this type of silo thinking, it is recommended that

government officials should be encouraged to take risks in the form of exposure to research and development (R&D) and collaboration with local niche initiatives in order for these projects to survive and flourish[43].

Grassroot innovators and small-scale businesses often operate on their own, putting them in a weaker position compared to established companies. Lack of networks with the government, as well as limited financing options and legal knowledge to develop their business, are obstacles to starting and effectively maintaining small businesses and grassroot innovation projects[10]. In addition, small businesses are disproportionally affected when it comes to effectively dealing with local or national bureaucracy due to limited capacity in time and capital[44]. This further limits them in investing their efforts in innovative activities.

Consolidated and verified information about grassroot innovation and niche technology can alleviate aversion towards niche innovation, and may serve as a guideline for future community projects for the organizations themselves. Such information can also empower grassroot organizations to learn from other cases. In the case of community energy projects, intermediaries might initiate relevant networks, gather and disseminate knowledge about different cases, provide guidance and facilitate future projects[45]. Such information can be used by government officials to reduce uncertainty about new and localized projects. Furthermore, intermediary organisations can broker the relevance of community energy projects for wider policy discourses, such as energy security and sustainable development [46] . An example of an intermediary is Community Energy Scotland [47], which is a charity that provides practical and ongoing support for the financial and technical aspects of community energy project development. The organisation also represents community organizations at the policy level and serves as a platform for communities to form networks.

Energy 'ecosystems' facilitation

Enable cooperation, trust and exchange of activities among different agents of the system (at local/city or national levels)

An initiative that involves several organisations can fail or produce suboptimal results when actors perceive that sensitive information may be exposed to competitors or monitoring entities. Reluctance can occur due to the negative perceptions of other groups and fear that information might be mishandled[48]. As a result, public and private organisations might be reluctant to share confidential and sensitive information leading to an "impasse" for collaboration and creating communication silos between these actors.

The role of facilitating cooperation, trust, and exchange of information can be played by an existing actor, such as an energy cooperative or private firm that often partners to establish PEDs: that is, if a firm or organisation is willing to play the role of a "keystone" in the business ecosystem. Lansiti and Levien (2004) suggest that a keystone firm often provides advantageous services to niche firms in order to collaborate with them, such as an information platform [49]. Such connections not only benefit the niche firms, but also keystone firms because connecting with a diverse set of niche firms diversifies and widens the keystone's market, making them more resilient to market changes. A similar synergy can be created by a private or public organisation that collaborates with different PED projects. They can act as a hub for information exchange and thus attract a diverse set of partners. A potential example of such a keystone is IssyGrid, a smart grid project in Issy-les-Moulineaux, France that was developed by the municipality and nine private companies[50]. Within this project, SoMobility, a consortium of partners from the real estate, software and technology, construction, public transportation, and public financial sectors, uses data to ease traffic and create mobility solutions in the IssyGrid district. This

data, along with data from other partners in the project, is added to an open data portal (data.issy.com) that is hosted by the municipality, Issy-les-Moulineaux. The continued publication of data could play a role in getting other communities interested, plan similar projects, and ultimately create new opportunities for the groups involved in the data platform.

Alternatively, a third-party actor without direct financial interest in market competition can be created to break communication silos between different organisations. It can manage the flow of information and confidentiality issues, as well as the funds to facilitate PED enablement. Unlike when an existing group takes up this role, the establishment of such an actor requires public funds. However, the use of such funds are justified as they will be used to create public goods, namely to facilitate transitioning to sustainable energy.

An example of a third-party facilitator is the department created as part of the Renewables and Energy Efficiency in Community Housing programme (REECH)[51]. REECH was a pilot programme for retrofitting a large number of houses in some of the most deprived areas of Liverpool and Merseyside. It also promoted behavioural change by identifying the financial and health benefits of the REECH programme (through a study conducted at Liverpool John Moores University) and provided some households with energy production infrastructure such as solar PV panels and heat pumps. It involved various city councils in the areas, multiple housing providers, private citizens, and local SMEs. The housing providers were unwilling to share internal information because of their sensitivity and potential disadvantages in competition. The city councils committed the funds of the project to create a strategic dedicated department that allowed housing providers and SMEs to safely disclose information.

2.4 Silos of representation: Barriers in public authority - citizen collaborations

Local siting of technologies and hazardous facilities in the past have shown that project proponents tend to hold a very negative view of "NIMBY-Not In My Back Yard" responses of the public, a prejudice that typically portrays local protesters against unwanted local place changes as ignorant, irrational and selfish[52] [53]. Such a misconception or silo of representation can be anticipated, for example, when a PED is going to transform significantly the aesthetics of heritage districts such as in POCITYF[54] project in Évora (Portugal) and Alkmaar (the Netherlands) [50] or when wind turbines are planned in the vicinity of a community, such as the operative PED in the Åland Islands (Finland)[55]. Meanwhile, in some cases such as Samsø island, Denmark [56], local communities are actually pioneers in pushing forward renewable energy community, as these more decentralized forms of generating renewable energy often generate less local impact and are more democratic.

The NIMBY misconception can lead to a vicious circle[53] (Figure 2-2). Project proponents often prefer modalities of public engagement that avoid collective expressions of concerns - such as quantitative surveys -, or that only allow for a tokenistic level of participation - such as one-way dialogue project meetings and exhibitions [57]. By doing so, some citizens can feel manipulated and increasingly distrustful of PED proponents, thus creating exactly the opposition which PEDs proponents will then label as NIMBYism.

Understand NIMBYism

Research can inform policymaker about citizen's expectation towards PED and local socio-cultural context to prepare a suitable engagement plan.

This vicious circle could be broken firstly by understanding citizens' concerns before, during and after an intervention. Place attachment and social justice are alternative socio-psychological explanations for public responses to technologies and policy interventions. In the case of North Wales offshore wind farm construction, for example, group discussions in coastal towns nearby found that local residents' opposition arose from the threat to local identity because the symbolic meaning of the industry attached to the wind farm involves the disruption of the scenic, natural beauty of the restorative landscape[58]. As trust in key actors plays a key role in mediating the negative attitude towards renewable energy projects, authors suggest that project developers should understand the public's interpretation of change to prepare appropriate communication and participation plans.

In addition, research on public attitudes over wind power in Europe reveals that feeling excluded from unfair decision-making process explains the "backyard motives" better than citizens' selfishness[59]. Therefore, involving the public in an in-depth, longitudinal and empowered way often leads to a higher satisfaction with the process and higher trust in the proponents. To attract more active participation in city affairs, governors should make themselves more easily available and encourage citizenship responsibility rather than only consumer duty from the citizen [60] . The Active Neighbourhood office in Frankfurt, Germany, for example, provides Neighbourhood-managers available at fixed hours to address the concerns, problems, questions, and recommendations of local stakeholders[61]. In the meantime, officers can use innovative community engagement techniques such as consultancy on the street, or in an event, rather than traditional meetings in working hours to make the decision-making process more accessible for all interests. The sustainable transportation team of Torres Vedras, Portugal, for instance, proactively reaches out to NGOs that work with disabled people to get feedback for their new built road plan to ensure its inclusive design[62].

Activate participation

Promote active citizenship through communications. Attract inclusive consultation through innovative ways.

For more information: https://www.citizenshandbook.org/toc.html

Empower community

Coordinator from living lab or researcher can mediate the power relation between different stakeholders in the collective discussion, to ensure citizens are allowed to give voice to their views.

In the long run, changing public participation from consultancy to co-creation practice will mediate the power asymmetry in the decision-making process, encourage two-way dialogue and crowdsource creativity for PED design[63]. A Swiss smart-city that has launched a "living" lab experiment for the co-creation of a mobility behaviour change app found that the protected space of the lab strengthens the reciprocal trust between citizens and policy-makers to the point that it empowered citizens to discuss about potentially conflicting topics such as future mobility scenarios[64]. Qualitative research on smart-meters in France has concluded that by giving participants the chance to discuss the energy problem and solutions collectively in

focus groups, citizens were able to suggest alternative arrangements that reduced household energy demand in peak hours by encouraging social activities[65].

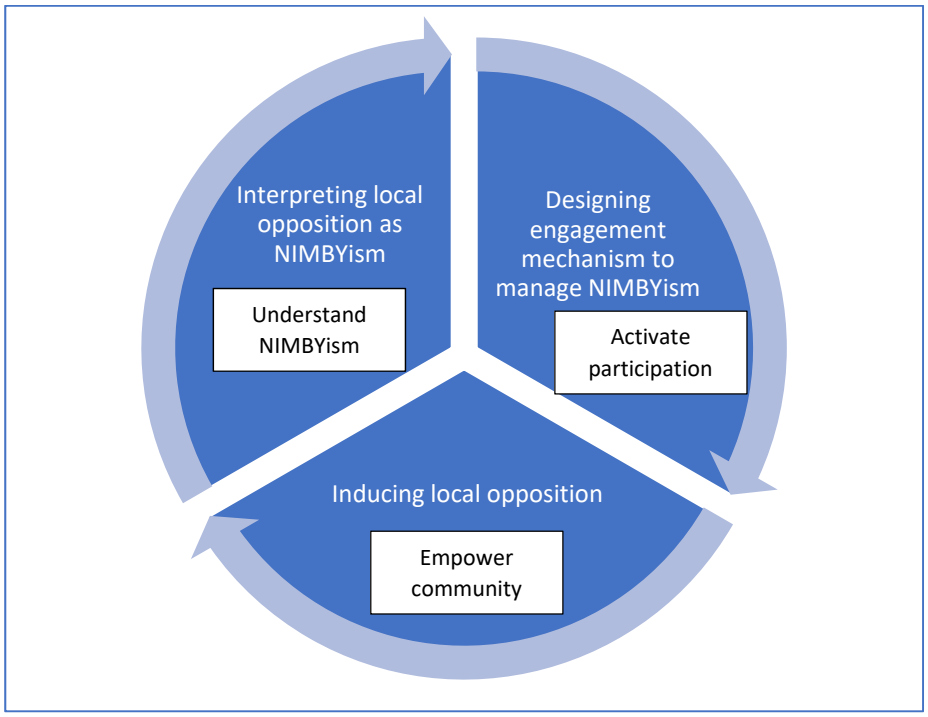

Figure 2-2. The vicious cycle of NIMBYism in public engagement and how to break it (white boxes)

Source: Adapted from Devine-Wright, 2010 [53]

2.5 Silos of context: Failure in adoption, replication and scaling-up of PED solutions

Failure in adoption, replication and scaling-up of PED could happen if the process of knowledge translation from research to practice and knowledge transfer between cities does not thoroughly consider the different local contexts as well as historical, cultural and political landscapes.

Human-centric evaluation

Human-centric values based on culture, history and political context. Apply ethical approaches.

The tradition of generalising technical, policy or even social knowledge for mass adoption fails to recognise where, when and how the knowledge is produced and thus leads to inconsistent results when it is applied to other place at other times[22]. Therefore, besides the usual considerations by technical experts such as local climate, geography and natural resources, human and social dimensions should also be on the checklist for PED adoption. Cities can address this silo by conducting human-centric research and evaluation which usually uses ethical-based[66] and participatory action-based approaches [67] "to access local understandings of energy and sustainability, and to gain insights into local interactions between multiple forms of knowledge and power". This way they could avoid prescriptive, generic, interventions.

City-city fellowship

Create platform for a knowledge exchange between cities, not only one-way knowledge transfer.

Similarly, for replication purposes, research on smart cities by the EC-H2020-SCC Replicate project has observed that it is the ecosystems of stakeholders and their related power interdependencies available in the local context that ultimately define the adoption of one or another energy technology, more than their mere rational and mechanistic cost-value analysis [8]. For that reason, the Replicate project's City-to-City Learning Programme has been set to challenge the conventional one-way knowledge transfer practice from lighthouse to follower cities, which usually portrayed the latter as passive receiver of technologies and interventions. By celebrating local knowledge and reformulating follower cities as fellow cities, the programme was able to create a platform for equal knowledge exchange between cities.

Experimental governance

Urban living lab as a test base for relevant technological and social intervention.

Place-specific interventions are also thought to be another way to engage people into the energy transition towards PEDs, especially in the scale-up stage from positive energy district to positive energy city. Urban planning practitioners have, therefore, promoted the concept of urban experimentation, or urban living laboratories. "The idea is to engage energy users in more sustainable living, and that policymakers, researchers and practitioners may draw upon experiences from these laboratories and up-scale the lessons learned. Heiskanen and Matchoss, [109] for example, discuss technocratic and inspirational learning in such experiments and how to use learning across sites to upscale."[23]

3 Conclusion and Outlook

In issues such as climate action and energy transition, that require integrated efforts from diverse disciplines, sectors, and stakeholders, systems thinking can be a way of thinking that can help to counter and overcome challenges posed by silo thinking. The framing of policy that facilitates PEDs can benefit from incorporating systems thinking into the policy framing process. Including the systems thinking approach in higher education can create cultural norms of utilising the knowledge and skills of all connected disciplines when addressing a problem. This way of thinking is linked to taking an integrative approach in framing policies by pulling together relevant sectors and departments within policy making structure. In facilitating policy for PEDs, this nexus approach can involve different sectors of government in building a common objective, setting the stage for collaboration between departments in policy making and implementation.

On an operational level, the administrative boundaries of educational and government departments can be a barrier to collaborating and implementing an integrative approach to support PEDs. Systems thinking training could create dialogue across disciplines to promote closer coordination between experts and government officials. Furthermore, local government employees can be encouraged to collaborate across departments through dedicated coordination bodies and support from higher level government bodies.

In planning and implementing a PED project, the perspective of various stakeholders should be taken into account, in order to incorporate the demands of the public and to realise the potential of the market. It could be argued that a sustainable PED can only be designed with proper representation of citizens' views. Understanding misconceptions, such as NIMBYism, and empowering citizen participation through long term engagement can create solutions that will be better received by those same citizens. To take a step further, co-creation of PED projects with citizens could include the crowd sourcing of collective innovative ideas that are relevant to the local context. Furthermore, involvement in the design and implementation of a PED is likely to lead to citizens' further involvement in PEDs.

Synergies can be created in facilitating PEDs when government entities, businesses and grassroot organisations collaborate effectively with each other. Government can utilise the potential of grassroot innovation and niche solutions by incentivising innovation. Furthermore, government can assist businesses involved in PED projects by facilitating networks, and promoting collaboration between the businesses.

Holistically, all these silos are interconnected through nodes of actors in academia, administration and society, and each actor contributes to more than one silo type. Therefore, to have a successful collaboration within and between these actors, one should consider and address all possible silos that could happen around them. For example, based on the nexus of recommendations in the Figure 3-1, we can imagine a policy expert receiving multidisciplinary training, who goes on to further coordinate between sectors and promote coordination with the public. As a result, breaking one silo can also contribute to breaking others.

As mentioned in the introduction, the same socio-psychological or structural factor could be the driver for more than one silo. Hence, in the short run, governance institutions could devise different measures to facilitate the collaboration within and between actors, attuning to specific silo type. Meanwhile, in the long run, education from within and socio-cultural change between actors could lead to a more sustainable destruction of the existing silos.

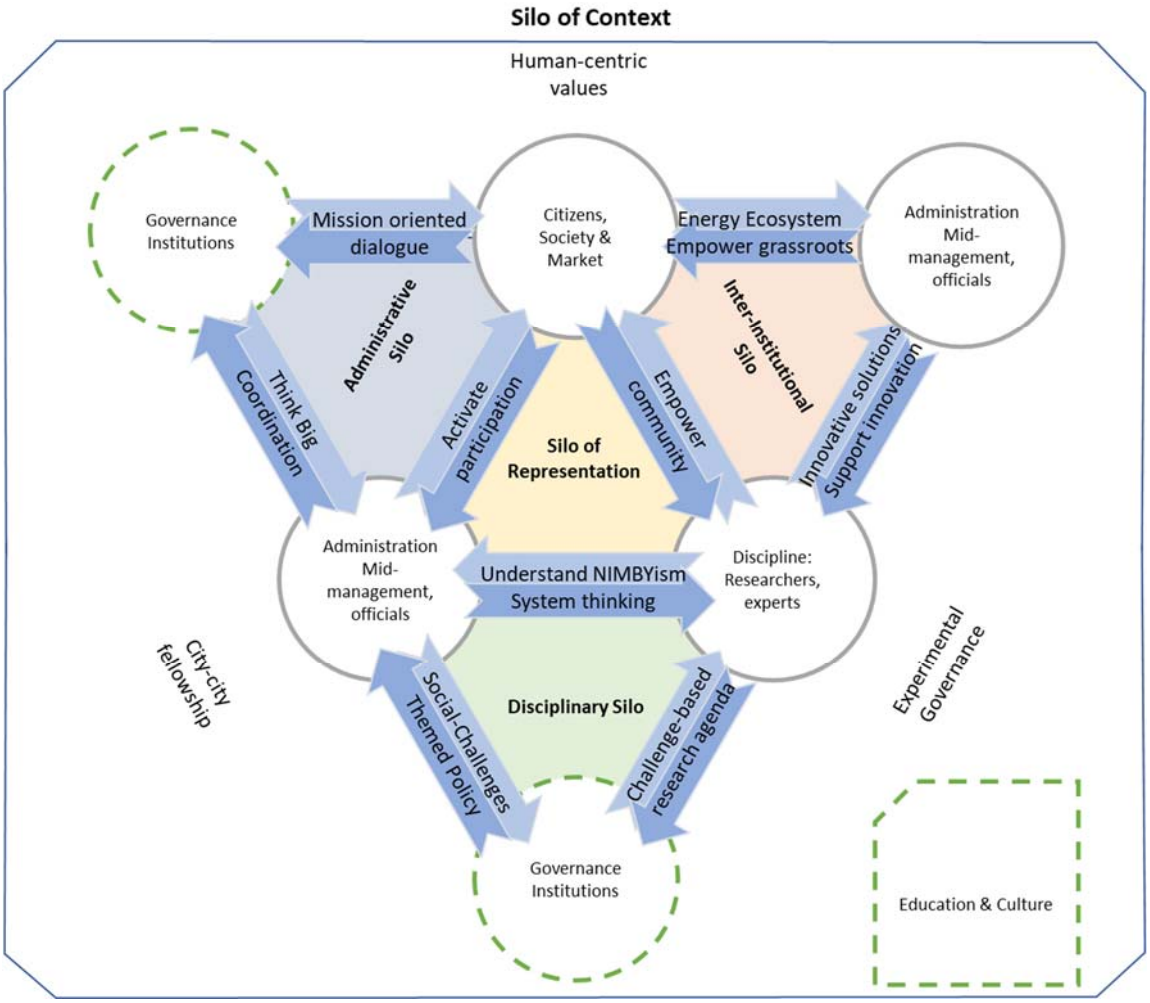

Figure 3-1. The nexus of recommendations to address silo-thinking

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About the Smart-BEEjS Project

Energy transition is supported in the EU by legislative developments, such as the Strategic Energy Technology Plan that aims to transfer power to consumers by decentralising the energy eco-system at the local district-level. However, this transition occurrs at a time of increasing wealth inequality, energy poverty, and gender difference. Thus, the long-term vision of the Smart-BEEjS project is **to design transformational pathways** that tackle **Energy Poverty and Justice**, providing evidence and using the decentralised nature of **'Positive Energy Districts'** and **'Networks of Districts'** as the central platform of transformation, whilst recognising the economic, social and environmental challenges faced. Tackling the issue of energy injustice and poverty is an essential pillar for contributing to the **decarbonisation of our economies** without leaving large parts of the population behind.

Behind any decision or intervention – whatever the field of expertise, technological, business or policy – are **people**. Therefore, **the overarching training aim of Smart-BEEjS** is to provide, through a multilevel, multidiscipline and interdisciplinary training platform, a programme to produce the technology, policy making or business oriented **transformative and influential champions of tomorrow**; educated in the personal, behavioural and societal concepts needed to deliver the success of any technological proposition or intervention under the human-centric perspective of energy justice.

The Smart-BEEjS project recognises that the new level of decentralisation in the energy system requires the **systemic synergy of different stakeholders**, who are **inseparable** and interrelate continuously to provide feasible and sustainable solutions in the area of **energy generation and energy efficiency**. They balance attention towards technological and policy-oriented drivers from a series of perspectives:

- **Citizens and Society**, as final users and beneficiaries of PEDs;
- **Decision Makers and Policy Frameworks**, in a multilevel governance setting, which need to balance different interests and context-specific facets;
- **Providers of Integrated Technologies, Infrastructure and Processes of Transition**, as innovative technologies and approaches available now or in the near future;
- **Value generation providers and Business Model Innovation (BMI)** for PEDs and networks of districts, namely businesses, institutional and community-initiated schemes that exploit business models (BMs) to provide and extract value from the system.

In order to introduce cooperation and shared thinking, Smart-BEEjS presents a balanced consortium of beneficiaries and partners from different knowledge disciplines and different agents of the energy eco-system, **to train at PhD level** an initial generation of **transformative and influential champions** in policy design, techno-economic planning and Business Model Innovation in the energy sector, **mindful of the individual and social dimensions,** as well as the **nexus of interrelation between stakeholders** in energy generation, technology transition, efficiency and management.

The overarching aim of the project is to boost knowledge sharing across stakeholders, exploiting a human-centric and systemic approach to design Positive Energy Districts (PEDs) for sustainable living for all.

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