PI-SEC

GUIDELINES

PI-SEC REPORT 2.4:
Regulatory and planning implications for municipalities

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Introduction

When engineering meets pragmatism, challenges arise in terms of how to solve problems. The process of studying how instruments and tools can be improved and developed to integrate energy aspects into urban planning, has from a methodological perspective centered around a basic challenge. The challenge that we have found to be at the core, is that while municipal urban planning is a pragmatic practice working on district or city scale, energy planning is a more direct problem-solving process, based on engineering principles and working at a different scale. Engineers and municipal planners also work at different ends of the timeline. Typically, municipal planners lay out large structures of land use, functions and possibilities in municipal master plans and zoning plans, before handing these over to other stakeholders responsible for technical detailing, property agreements and a multitude of smaller, individual projects. In between the start of a municipal area plan and the realized neighborhood, a range of procedures, political actors, market and legal regulations make the process from plan to reality rather unpredictable.

PI-SEC WP2 is concerned with the needs in municipal planning for realizing smart energy communities, and the results are hence focused on municipal planners as a target group. This means that our recommendations go beyond the 'building project' as this is not the core of a municipal planners' work. Our results emphasize the implications in relation to the pragmatic role of urban planning; a situation where a range of needs and trade-offs must be met in this practice.

The PI-SEC planning wheel (Report 2.2) outlined a new overarching process for understanding how to integrate energy into urban planning. The PI-SEC Planning wheel presents no less than 23 challenges and best practices (A-Z) based on our study of Bergen, Oslo and the municipalities from the research center Zero Emission Neighborhoods that we compared our findings with. Many of the best practices are related to the navigation of multiple stakeholder projects, stakeholder commitment, citizen involvement and differing goals.

The results are based on interviews and workshops with the mentioned municipalities we describe the implications of our findings on municipal planning and regulation.

This PI-SEC report includes 9 implications, that we discuss individually.

As the discussions illustrate, the work to improve our cities and communities will never be finished. The interplay between different stakeholders, objectives, people and time, will keep making integrated planning interesting and full of opportunities. The nine implications therefore suggest new possible research directions for improving municipal planning beyond PI-SEC.

Contents

1. METHODS AND RESEARCH QUESTIONS FOR TASK 2.4

Task 2.4 will develop guidelines to be embedded in existing Norwegian planning instruments to create a better toolkit for the PI-SEC case projects, and other Norwegian built communities and neigbourhoods with similar targets.

1.1 Research question

Task 2.4 answers the questions:

How can the test experiences be embedded in existing Norwegian planning instruments to create a better toolkit for the PI-SEC case projects?

Can the results be scaled up and transferred to other projects than those included in PI-SEC?

The project proposal for PI-SEC promised that:

"Task 2.4 develops guidelines for the test experiences to be embedded in existing Norwegian planning instruments to create a better toolkit for the PI-SEC case projects, and other Norwegian projects with similar targets. For the latter, sensitivity analysis will be performed to evaluate whether the results can be scaled up and transferred to other projects than those included in PI-SEC, and whether the results are relying on research support and demonstration project status (with corresponding resources and attention). The guidelines will help urban decision-makers identify opportunities for integrating smart energy targets, KPIs and planning instruments in existing planning regulations and city level strategic planning, create measurable targets for the case projects and identify the right organizational process for coordination and implementation across departments and sectors. They will give experience- and science-based advice on how public-private partnerships can be used to consolidate cooperation on energy targets between cities, industry, citizens and research, and help mainstream environment-friendly investments, e.g. performance-based contracts, fast-track for municipal processes."

1.2 The PI-SEC Planning Wheel

Figure 1: The PI-SEC Planning Wheel.

The PI-SEC Planning Wheel represents a process that aims to achieve and keep multi-stakeholder design and commitment in the planning of new smart energy communities. The different steps (A-Z) includes suggestions for which challenges to take into consideration along a planning timeline and includes some best practice examples. The suggested iterative process suggests large focus on stakeholder commitment at the beginning, strong anchoring and later the creation of incentives for stakeholders to commit to higher than 'business-as-usual' goals. The PI-SEC Planning Wheel is the result of a participatory process with urban planners, climate departments, utility companies, private developers and researchers. The full description of the PI-SEC Planning Wheel is to be found in PI-SEC Reports 2.2. and 2.3.

1.3 Sensitivity analysis

A sensitivity analysis checks to which extent the research findings of one study are representative for other cases. The sensitivity analysis is based on a comparison with cases in the research center Zero Emission Neighborhoods (ZEN), gap analysis, workshops and international literature review. The findings are triangulated by comparing with state-of-the-art research and four scientific publications. Finally, the gap involving citizen participation was explored through a workshop at ISOCARP2018 and a test of the PI-SEC Planning Wheel in Bodø in May 2019.

The planning wheel was presented to Bergen and Oslo municipalities and discussed in relation to their ongoing city developments and the case studies. Also, the researchers were invited to Bodø, where the planning wheel was tested in relation to the development of the municipal district plan [kommunedelplan (KDP)]. During the meetings with Bergen municipality, stakeholders from the utility companies, the smart city office and the climate department, feedback were provided into how the PI-SEC results are in accordance with their own ongoing projects. In Bodø, a workshop was held in which a design thinking approach was taken to develop a common mindset and explore first steps, and to link the results of ZEN and PI-SEC to the future scenario.
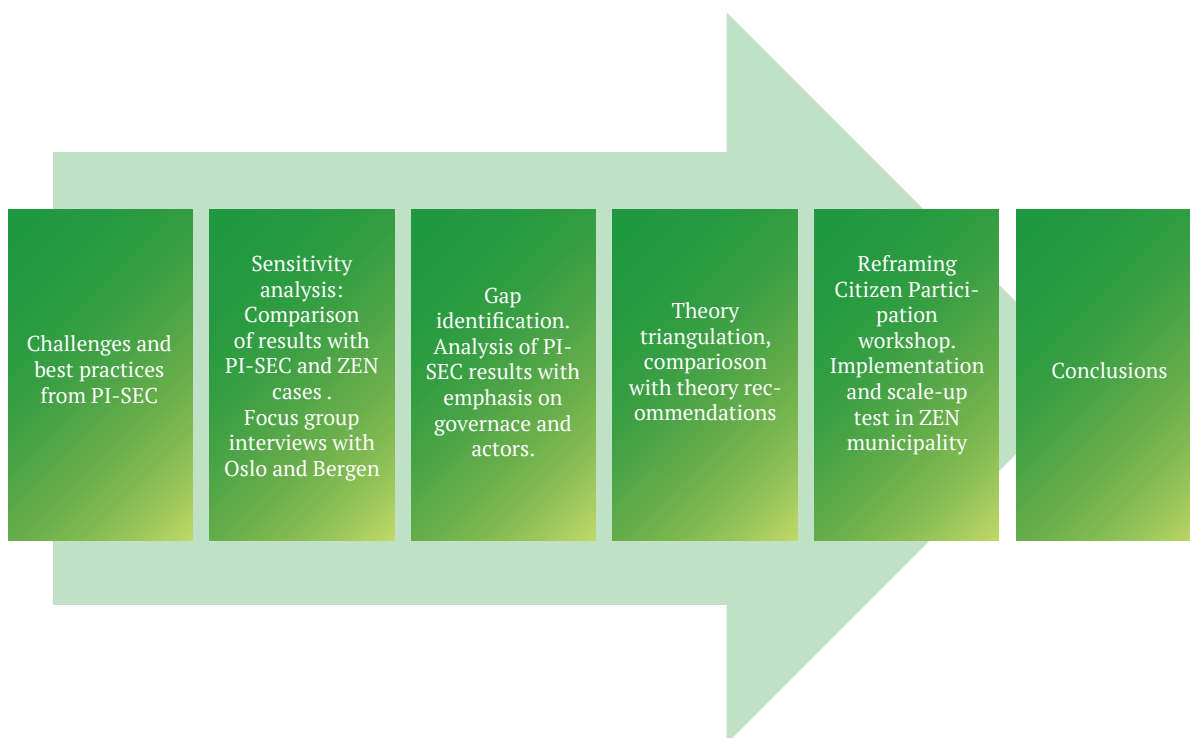

Figure 2: Research design for task 2.4

The workshops and meetings were recorded, discussions and interviews analyzed, and the Van der Manen highlighting technique was used to identify the information that stood out and could give insights into the implications of the PI-SEC toolkit.

	City population (1.1.2017)	Project owner	Area size in m²	Planned/Existing function	Construction	Phase
Elverum - Ydalir	14 877	Public (Municipality)	430 000	Residential area with a school and kindergarten	New construction: 1 000 dwellings (ca. 100 000 m²), a school (under construction) and a kindergarten	Planning and implementation
Oslo - Furuset	666 759	Public (Municipality)	870 000	Multifunctional local center with 1 400 dwellings and 3 800 inhabitants, 213 100 m² (existing)	Retro-fitting/upgrading and new construction: 1 700 – 2 300 dwellings and 2 000 – 3 400 work places (up to 160000 m²)	Implementation and Operation
Bergen - ZVB	278 556	Private (Developer)	378 000	Residential area with a kindergarten and additional services (planned)	New construction, 720 dwellings (92 000 m²), a kindergarten and additional service functions	Planning
Trondheim – NTNU Campus	190 464	Public (University/ Municipality)	339 031	University Campus (existing)	Retro-fitting and new construction (ca. 136 000 m²)	Planning and operation
Trondheim -Sluppen	190 464	Public (Municipality)	275 000	Multifunctional local centre with a mobility hub (planned)	Retro-fitting and new construction	Planning and operation
Steinkjer – Former NRK site	12 744	Public (Municipality)	11 113	Kindergarten and dwellings (planned)	Re-use and new construction of 10-12 dwellings	Planning
Evenstad - Campus	2 530 (Municipality)	Public (University)	61 000	University campus (existing)	Building stock in use: 10 000 m², no further construction planned	Operation
Bodø – New City – New Airport	51 002	Public (Municipality)	3 400 000	Multifunctional city center extension with residential and business areas (planned)	Re-use and new construction: 2 800 dwellings in the first construction stage	Planning
Bærum – Fornebu	124 008	Public (Municipality)	3 400 000	Multifunctional local center, ca. 265 000 m² existing building stock	New construction: 3 700 dwellings, 2 600 are built and in operation	Planning and operation

Figure 3: Cases used for sensitivity analysis

1.4 Testing the PI-SEC Planning wheel in ZEN

In May 2019, we tested the PI-SEC Planning wheel in the ZEN pilot of Bodø. In Bodø, the civil and military airport will be moved ca. 900m south, giving thereby room to new city development on a 2.4 mio2 site at a central location close to the city center. The so-called 'New City – New Airport' project is currently in the planning phase by two main planning documents under development – the area plan [områdeplan] for the new airport and the municipal sub-plan [kommunedelplan] for the new city development area. ZEN and PI-SEC was contacted by members of the planning unit within the technical department with the request to give input to further planning, especially on how a "good" planning for high ambitious neighborhoods developments should look like.

1.4.1 Methodology

The whole-day workshop in Bodø had two objections: Firstly, to present and test the PI-SEC planning wheel and to get feedback on it. Secondly, to enable attendees to develop own ideas and measures to fulfill a good planning within a multi-stakeholder framework with help of design thinking methodology. Eight persons attended the workshop: 4 from the planning unit within the technical department, 1 person from the department of business and development and 3 persons from the department of physical development and real estate.

The workshop was split in five parts and started with an introduction of the participants, using the empathy mapping method through 4 questions each participant should present him/herself. Part two focused on the development of a worst-case scenario for the development of the municipal masterplan for Bodø's 'New city – New Airport' project. Participants where split in two groups for the worst- and following best-case development. Three facilitating researchers representing ZEN and the PI-SEC Planning Wheel gave the

participants further information about the tool and theory after the lunch break. After this input, the participants worked on a best-case scenario for the planning phase for the 'New City – New Airport¨' development, using their knowledge on good practice through the Planning Wheel as basis. Finally, the workshop finished with a discussion of lessons learned.

In addition to the workshop, complimentary qualitative interviews with 5 stakeholders in the field of citizen participation, innovation, energy planning and project management with regard to the 'New City – New Airport' were conducted to evaluate the process of development in Bodø and the findings of the workshop from a broader view.

1.4.2 Findings

Through the workshop and the supplementary interviews, we identified a bundle of challenges and measures to address these challenges. Most of the identified challenges and how to cope with them are covered by the PI-SEC wheel's specific practices and tools. Other challenges are context dependent and as such unique for the Bodø case as e.g. special challenges related to the military as stakeholder. Political commitment and sufficient knowledge on how to develop a ZEN area among different kinds of stakeholder as consultants, building industry, municipal administration etc. were specifically stressed among participants in the workshop. Climate change and especially rising sea level and stronger winds were named as issues with a strong impact on further development of the 'New City – New Airport' project.

We identified a change of mind and willingness to cooperate among stakeholders in Bodø. Local building industry and energy stakeholders are opening to new cooperation and are expressing a need for knowledge development, new business models and a more active role in the creation of local cooperation.

Snapshots from the Bodø workshop, 14.05.2019

2. RESULTING GUIDELINES

The following guidelines are the combined results of the theoretical sensitivity analysis comparing PI-SEC toolkit and challenges with ZEN insights, and the final testing and feedback on the PI-SEC Planning Wheel in Bergen, Oslo and Bodø in spring 2019.

In the sensitivity analysis, we found that in order to scale and replicate the findings and recommendations from PI-SEC, there is a need for smarter governance models and open innovation processes in public-private partnerships. Also, the revival of citizen participation methods is needed, as the actors currently find it difficult to engage with citizens in a manner that relates well with the smart energy community goals of smart energy, energy integration and emission reductions. Finally, the municipalities of PI-SEC and ZEN express the need to look at how different types of municipalities can work in different ways to anchor projects that have higher ambitions than 'business as usual'. Based on a combination of empirical data and theoretical review, we propose the following guidelines to assist municipalities in finding the 'highway for good solutions' that they are trying to achieve.

The following chapters we will go through each implication.

Looking at PI-SEC planning and implementation idea from the municipal planning side, achieving a good process that allow for co-design with all relevant stakeholders is an overwhelming challenge. The process most commonly includes municipality planners and climate section, private developers, real estate, utility companies, and architects. Essential facilitators to gain for energy and climate gas reduction like the building industry or energy utilities are often reluctant to opt for more as asked from regulation and law framework. When aiming for climate gas reduction on a neighborhood level, the commitment and participation of multiple stakeholders – including citizens- within the process is crucial, and citizen involvement often fails because it is overlooked and not a traditional part of the planning process for all sectors. For the construction industry, ZEN and PI-SEC planning requires that the projects go far beyond the ambitions of current building act requirements. Moreover, this requires the collection and provision of data regarding emission in building materials and construction processes.

Recommendation 1:
Develop contextual planning approaches because project characteristics and context - are different

As experience-sharing between municipalities and cities become increasingly relevant nationally and internationally, it is important for the municipal planners to consider the characteristics of their case. In PI-SEC, and in the wider Zero Emission Neighborhoods (ZEN) research centre, we have seen that different municipalities also have different starting points that influences how a project should be planned and implemented. This starting point and pre-conditions need to be taken into account before choosing process and measures.

The point of departure, according to our study participants, depends upon:

Table 1: Characteristics and description of different starting points for the planning and implementation of smart energy communities

CHARACTERISTICS	DESCRIPTION
Overarching: • **ability to avoid silos/work across sectors and disciplines**	Moving from ideas to visions and into implementation in climate and energy related projects, conflicts with the silo structure of municipalities. The organization of work therefore has large impact on the success of project planning.
Size and structure of the municipality organization	A small and tight-knit municipality organization with good connection to different sectors in their organization and beyond, will have a different point of departure and can plan less rigid. For example, it is recommended in PI-SEC and Annex 63 that a coordinator or coordinating unit is selected that works across the different sectors to achieve holistic energy and emission reduction goals. This is because innovation and engagement for more integrated planning demands that more stakeholders are involved. Someone has to know where knowledge is located and how to organize people of different disciplines. While a small municipality can have only one person that can coordinate a team with frequent meetings, a larger municipality may need a complete unit for coordination, depending on size and organization.
Decision making authority	Where the coordinating unit, team or person is placed and which decision-making authority this person has, will have significant implications for the planning of integrated projects such as smart energy communities. In a high-level unit such as within the city council leader, within a city council or in a department. For municipalities with only one unit for decision-making related to the building project, or for planners that are dependent on following a complex decision-making structure on multiple levels, parliamentary system or city council, will predetermine the sequence. The one who has the authority to change the budget, will be central here. It is important to also consider the informal decision-making structures before deciding upon the approach.

CHARACTERISTICS	DESCRIPTION
Organization of planning system	The action plan (handlingsdel) determining strategies for each sector in a certain period, can be strictly in line and integrated in the financial plan (økonomidelen) of the municipality. However, in many smaller municipalities this is not the case as there are no decisive national policy on how this should be done. This leaves more chance to a personal and institutional relationships (governance) and anchoring in smaller municipalities. How well linked these two are, may influence the ability of a project to realize visions. The realization of sector plans depend on this link between visions, strategies and funding.
Strength of network	Size and quality of the coordinators network, geographic distance and distance between people and institutions. These are aspects that affect trust, as these are connected to the need to create a platform for learning and exchanging experiences during innovative project planning. Culture for how people in the network communicate, will also differ. Do you meet in person or use online meetings? Are you used to working across geographical distances? The strength of the network can depend upon: • whether the right competency for the job exist within your network • if the project is led well, to create progress through clear mile stones, follow-up, defined responsibilities etc. • how the human resources within the network are managed • repeatedly and strong involvement of the same network without progress can be demotivating for the persons involved – this has less to do with the size of the network
Private or is the project municpal-led?	We see that the process from idea to implementation is influenced by who the project owner is. This also influences the vision holder, as it determines how much consensus one must have politically as well as which measures are available.
Driving champion or common vision?	In some projects there is one actor with a good idea and this one drives this idea forward towards the finishing line. In other projects, there will be a competition or a demand from outside the organization, that trigger action. The latter triggers discussion and a group of people will start working to find out what the vision and goal can be. These are two very different starting points that require different approaches. The latter will require extensive work to co-ordinate responsibility and to build up competency within the group. If there is one driving champion, the challenge is to create engagement among other actors and find out which interests exist beyond a larger task. This work of grounding the vision will then be of greater importance.

CHARACTERISTICS	DESCRIPTION
Area characteristics	Important things to consider related to the choice of property/properties: • Is the area a 'brown field' or a 'green field' or a neighborhood with upgrading potential? • How is the market value and income of existing dwellings • Public property or private property; or a mix? • Which actors have licenses (konsesjon) and clear investment interests in the area? • The area characteristics will often consider population, public space, green space, connections, public services such as schools and hospitals, new apartments etc, while energy is only one of these elements
Available tools and resources, particularly	• Experience and documentation – municipalities that have several large and ambitious project proposals developed, seem to have improved their work processes and succeeded. This has to do with trust, network and ability to direct resources across silos • Financial starting point • Available property: owning property puts the municipality in a position to 'lead the way' with public construction in a climate friendly direction • License holders in the area (konsesjonsholdere) and other specific clauses that influence the degree of freedom to design the area. • Existing knowledge/experience and access to knowledge (network/research projects, etc.)
Time and timing	Some projects have a long-time horizon while others work in close relation with municipal planning process and political cycles to determine their time plan. Participants in PI-SEC and ZEN explain that a project timeline can be too short but also too long. Stakeholders need time to mature and agree on common targets and visions, yet too long-time horizons make the link between identified needs and available investments and realistic goals difficult to manage. A long-time horizon means many moving targets and changes in political priorities. This can particularly affect citizens, as their needs and expectations may have changed, or they have been disappointed due to lack of progress. This can further influence the political view of the project. Different stakeholders may also have misaligned and have different timelines in mind, for example related to the market potential and profitability of dwellings, need for schools and daycares, nursing home needs etc. These needs do not necessarily agree with planning processes or environmental ambitions. Time horizon and timing is therefore a constant challenge of energy and climate ambitious projects administered by public sector.

Recommendation 2:
Add cross-sectoral coordination and strategic anchoring

At the current planning system, it is mostly the private developers that benefit and depend upon early meetings with the municipality, while this means that renewable energy assessments are done too late and cannot influence localization. Localization is perhaps the most essential tool that urban planning has to impact energy, both in regards of mobility aspects and in terms of energy use in buildings.

It has been clear not only from our findings but also other researchers in ZEN [3]that a success factor for integrating energy into urban planning has been to find reasons for why energy utilities should be involved earlier in the municipal planning process. Meaning; what would be the incentive for utility companies to be involved earlier? The PI-SEC Planning wheel suggests some tools and approaches for doing so. However, the implications of the recommendations are that researchers or energy experts need to help strengthen the project team.

To have project managers that do not belong strongly to one sector only, but manages to hold strategic leadership throughout is also a wise choice in this regard [4] However, focusing on commitment from a new actor also means that it needs to be an over-arching thought about how this effects other aspects of the plan and that this doesn't lead to an increased focus on energy systems and technical aspects instead of qualitative aspects of the plan. Finding the right team that can work across each sector and also include people as the 4th Helix, should be of high priority. A Quadruple Helix means that industry, public sector, academia and citizens should be equally considered along the timeline of a smart energy community project.

For utility companies to see the benefit of early involvement and broad stakeholder idea generation, they need more predictability in terms of risk, cost and benefit. In the studied pilot projects, we have seen that projects anchored in a way that spans across all departments, and preferably within the strategic division of the municipality, bring the predictability that the main actors need.

Recommendation 3:
Redesign responsibility division between private and public stakeholders

New urban design projects represent opportunities where things like human behavior, energy technologies, businesses and spatial qualities overlap and depend upon cross-sectoral facilitation. From a municipal side, the need for flexible governing of responsibilities between privat, public, knowledge and citizen partners is a key implication of our findings and recommendations.

The perceived imbalance of responsibility between stakeholders in the planning and implementation phase prevent the visions set in the early planning phase from being realized. It is not always clear who holds the responsibility for what, and the new and collaborative processes make this even more unclear. As more complex planning processes will involve a more fine-tuned collaboration between private and public stakeholders, the responsibilities must be planned in detail. The product should be seen as an integrated project deliverable, including some qualitative aspects that can only be judged by the dwellers and people impacted by the final design.

All stakeholders need to commit and contribute more than 'business as usual'.
While the ambition level is increased by the high environmental commitments following the Paris agreement, stakeholder collaboration and the relationship between private and public actors are old topics in urban planning. The liberalization of utilities revitalized the need to better governing private and public stakeholders, and the emission reduction agenda and 'smart cities' have increased the need for better practices and policies even further. This was also named as the main challenge from the municipal point of view when mapping the challenges of ZEN development in 2017/2018. During the redesign of the PI- SEC Planning Wheel, Stakeholder collaboration and commitment turned out to be the most significant component during the planning and implementation phases.

The "low bid syndrome" can be recognized as a major determinant behind the customary adversarial behavior [of stakeholders]. An important aspect is that governance and planning are identified as the key leverage points for transformative change (McCormick et al., 2013), yet neither are simple key points to address and may change quickly in the right direction.

Interviews however, show that larger scale projects which require cross-disciplinary approaches and innovative partnerships, transforms the city municipality's routines and handling of innovation processes.
It is therefore important that the challenge of realizing visions is not interpreted as a need for very detailed and inflexible contracts? While integrated project deliverables are recommended for negotiation, we also see that too detailed and inflexible contracts lead to top-down management and a too narrow view on what is to be delivered. This can lead to an inability to readjust and innovate openly and thus reinforce innovative project's inability to take into account changing targets and citizen's perspectives and engagement after the contract writing.

Recommendation 4:
Align regulatory boundaries and develop platforms for stakeholders to redesign goals across system borders in the planning stage

During planning and implementation of master plans that include an integration of mobility, behavior, energy in buildings and attractiveness, design is challenged by the misalignment of decisions on different system levels. By system level, we have identified

- Regulatory boundaries: collaboration between regional (fylke), municipality (kommune), national and local political goals
- No clear platform for county council, municipalities and national decision makers to discuss and realign objectives
- Multiple agendas: different goals and interests of each stakeholder making them prioritize differently. This also includes different perceptions of what key concepts entails such as sustainability, 'good' city, and smart energy community. Each stakeholder understanding concepts and goals and system borders differently depending on their role, understanding and agenda. However, individuals also perceive processes and goals differently depending on their relations with other stakeholders and former roles: this impacts governance and cannot be underestimated.

In the Bergen case as an example, the regional governor stopped the project entirely due to a conflict with urban sprawl regulations that came in place after the project had been politically approved by the previous government. In Furuset, the National Road Administration did not agree with the municipality's plan of adding space and attractiveness through a highway lid. The Regional Governor [Fylkesmann] has overturning authority regarding health and environment while the National Road Administration focuses on cost and safety. Large road infrastructure plans are made by the National Road Administration, working on different time schedule but with more authority than local municipalities. Furthermore, national decision makers can make stricter decisions on things like urban sprawl or traffic limiting policies. While private developers mainly involve collaboration with local municipality, maximizing the emission reduction potential of neighborhoods, depend upon the ability to cross traditional system borders[5].

Actors' inconsistent interests or conflicts and subsequent influence on each other's actions and policy outcome, makes the process of bargaining, coalition formation, and conflict mediation imperative. In these processes, many actors may be forced or convinced to change their attitude and set other goals, which may differ from their original and real interest. Based on their new goals, new networks will be formed, and actors may play new roles. Such loops can be repeated again and again until a particular condition is satisfied. Thus, the fragmentation of responsibilities across multiple institutions causes a variety of conflicting political interests and strategies. To solve these conflicts, actors affect and are affected by (re)negotiation procedures and discourses, and their asymmetrical power relations, which reflects the complexity of governance networks, can challenge the sustainable energy planning. Despite the initial common goal of actors to become sustainable, their different perspectives, strategies, knowledge and capacities can undermine the process,

rather than facilitating it. Furthermore, the multiplicity of actors and hidden informal exercise of power to protect special interest can exacerbate the political and managerial complexity, ambiguity and uncertainty. This can lead to prolongation, recurring controversies, stagnation, and unwilling adaptations, and challenge transparency, accountability and legitimacy of the planning process. The outcome of our research shows that strengthening the institutional governance is critical for taking cooperative action and for the implementation of effective policies. It is important for planners to realize when a governance model is working against the identification of which'governance' changes are needed to successfully integrate sustainability into energy planning.

Recommendation 5:
Balance socio-economic and qualitative goals with high environmental goals

The interviewees that had a role in coordinating the implementation of ambitious neighbourhood pilots within the municipalities, describe a constant struggle to balance the expectations and costs of meeting high environmental standards of buildings and infrastructure, while at the same time ensuring good spatial qualities that may impact citizen's sustainable behavior the most.

Central in the PI-SEC Planning Wheel is the "the Core of the Community" description, aiming at having all stakeholders contributing to the ideas of what makes a neighborhood attractive and 'good' for its citizens. A Core of the Community Fund was suggested, where the private and public stakeholders in visionary building projects contribute to ensuring that this core is constructed early in the implementation process. In return, the municipalities would need to reward the private stakeholders by for example limiting other developers and utility companies from constructing in the same area.

When conducting the interviews in the different pilot projects, stakeholders involved could, broadly speaking, be divided into two groups. One group, enthusiastic to reach for high environmental goals and seeing this as chance for innovation and better performance of their own organization and the other group being more reluctant and skeptical. Among stakeholders from this group, a ZEN development is often perceived as implementing an additional burden, by making the development more expensive and time consuming as well as not being congruent to social development goals[6]. Urban planners often see it as their responsibility to opt for a 'better' city for citizens, and to create a city people want to live in. Beginning with new and smart energy technology, is obviously not the priority in this work. In this context interviewed partners often mentioned that first - and before ZEN - they want to develop "a good place for people to live".

The Steinkjer case for example showed how resistant the future users of the ZEN development are against the concept of ZEN. ZEN was perceived as an additional burden to an already delayed and difficult project development. Future users' resistance against the re-use of existing buildings – a main concept within ZEN – stopped the further development of the neighborhood as ZEN pilot project.

Trade-offs between comfort and environmental goals also must be understandable concepts from the citizen's side. As an example, you reduce the amount of parking spaces, the local services need to be improved and everything must be within a reasonable distance. This is sometimes far beyond what the municipalities can promise. Therefore, the implementation of measures to provide alternatives in this case for car-use must be provided. In the Ydalir case, buying a house will come with a bike. On the other hand, the "enthusiastic" group also pointed out this problem but emphasized the importance to develop the neighborhood in balance with environmental and social development goals. The idea "You have to give something while you take something" (give and take-concept) was mentioned from several interview partners, meaning to develop an understanding for where to cut down perceived comfort, but then improving services and usability at another part. So, if you get an electric bike when you buy a house, and in this way branding the cycle pathway in Ydalir, is as god example of that. While cutting down parking spaces within the Ydalir neighborhood, the cycle network and connectivity to surrounding areas will be improved. It also shows how private and public stakeholders can find co-benefits.

In the Furuset case, the beginning of the project included a human-centered approach where there was a

clear goal to improve the feeling of safety and the feeling of inclusion from the side of lower-income families in Oslo. However, as the project has become focused on zero emission, the energy system design and technical aspects seem to have taken priority amongst many stakeholders. This again illustrates our earlier recommendation to ensure that the project team and new exploratory approaches that can bring the two objectives together.

The balancing socio-economic and environmental goals also seem to imply different views on what the role of citizen involvement should be. While urban planners in the municipalities seem to have a view on participation as a democratic exercise, climate and emission stakeholders, but also private developers, seem to add a view on participation where the aim is to change people's behavior. In this regard, they belong to two sides of Arnstein's ladder: one side that wants to give power to the citizens in developing their own visions, and the other side that wants to manipulate or inform the citizens in a way that leads them to behave a certain way. It is important for municipal planners to be aware of these differences and to understand the role of socioeconomic targets and inclusion in creating sustainable neighborhoods.

Recommendation 6: Aim at smarter governance

Despite technological advancement and large-scale funding mechanisms, the transformation towards zero emission neighborhoods and better integrated planning practices needs to happen at a strategic level in the municipalities but also regionally and nationally. 'Smarter' governance implies that the decision makers and the organization from top to bottom have the capacities, resources and significant support to implement the changes a holistic planning require. Now, the ideas seem to be greater than the political and practical abilities. We also see that municipalities do not find the sufficient capacities in the national governments, and therefore rely on linking to international networks, something with which academic partners can assist[7]. Yet while academia is helpful in achieving the multi-level 'smart' governance, the relationship to the citizens depend upon in-depth, long-term community engagement work and more urban ecological approaches. This is a mismatch that needs to be resolved.

The disconnection between the 'sustainable smart city' ideal and practice is not merely a question of developing good policies but much more a managerial/governance question of organizing strong collaboration between government (at all levels) and other stakeholders. The new and neoliberal models of local governance propose the public "goodness" of privatization, lean government and deregulation through the implementation of "competitive regimes of resource allocation" (ref) as solutions to urban problems. Therefore, the importance of corporate innovation and technological enhancement delivered by private service providers has been reinforced, which exposes and re-claims the international competition. As a result, the European Commission earmarks its funding programs for creating smart cities, attracting many municipalities and universities to engage. While this has resulted in a better collaboration between these actors, there is a risk that it shifts the smart city agenda towards the 'urban entrepreneurialism' and 'market governments' rather than participatory and progressive urban politics. Thus, this demands planners to be aware of the risk that such a business-driven development of smart city can result in a prioritization of business goals over social and economic ones, rising problems, such as social polarization and inequality. assuming that while the neoliberalism is a contentious and powerful political project and paradigm, engineering a sustainable smart city is a challenging task. The solution is in developing a new governance model, in which all involved actors, including citizens, fully understand and get involved in the development process of the smart city In this regard, our contribution here is to bring the attention to the politics behind the technical context , which can help academics, planners and politicians to see some of what can be learned from the realities of politics and limitations of governance theory. More importantly, they can find a mutual way to deal with it more efficiently.

Accordingly, we did our research in PI-SEC based on this assumption that; including both community actors, public sector, private sector and academic partners into innovation processes is justified and productive. However, our findings [4, 5, 7-11]) have shown that the outcomes of such endeavors do not necessarily turn out as expected. In one of our papers we explored how governance mechanisms have influenced the planning process of Zero Village Bergen (ZVB) which is one of two main cases in PI-SEC, in which heterogeneous actors

have struggled to find the practically integrated solutions. In Zero Village Bergen, which is a typical example of dominating power constellations in today's neo-liberal housing market, private actors, such as the developer BYBO, has played a leading role. At the academic sector, the Zero Emission Building Centre at NTNU has played an intermediary role, trying to bridge the private sector and public sector interests. Even though the universities as a part of the public sector are supposed to represent the public interest, their scientifically-based way of framing the ZVB concept, ended up being in sharp conflict with the priorities of other public sector actors. We concluded that that actors/decision-makers mainly pursue a logic of appropriateness and follow rules rather than a logic of consequence or rational choices. As a result, reaching the desired outcome is not dependent on a single factor or specific course of action; indeed, several factors/courses of actions should coexist and coincide. Evaluation, then, can no longer focus on the question of whether the policy outcome agrees with a single policy intention, such as zero energy neighborhood, but on whether it responds to the objectives of all the parties involved in the moment of policy-making. Our suggestion is that instead of considering decisions a result from the intention and interests of independent actors, we should pay our attention to the interaction patterns and the ways in which individual actors and organizations fit together (or not). In such context, interest and power play significant roles in problem/agenda setting and choices of alternatives. In contrast to idealized description of planning processes with well-defined stages and clear role divisions, this case study highlights temporary and fragile consensus building as the result of political games, requiring a successful bargaining strategy and collaboration with the government (not only the politicians) on both local, regional and national levels. Hence, the efficiency of the governance network has been challenged by different factors such as

- the informal/interpersonal networks and their direct interference;
- a secret collusive relationship with politicians, which the outside world could rarely glimpse; the presence of unresolved tensions/conflicts;
- frustration over the lack of clear and visible goals;
- uncertainty about access to the critical resources;
- lack of transparency of interests and strategies;
- distortion and change of the set agenda or the policy process.

In the current political-administrative environment, in which the introduction of experimental zones or pilot projects in city planning is increasingly popular, it may be some lessons to be learned from the current case study regarding how these emerging initiatives relate to the established planning practices and perspectives. While the municipality did not feature as an active partner within the ZEN center in this narrative, municipalities are increasingly taking part in cross-sectoral partnerships and platforms e.g. under the smart-city umbrella. Thus, there is a substantial potential for conflict of roles here, between public authorities as guardians of the public interest, and the formal and informal bindings that occur when municipalities form alliances with commercial actors, who will seek to pursue their self-interest [28, 29].While it is difficult to draw any firm conclusions on the basis of such a "messy" reality, we would like to stress the importance of striking the balance between securing democracy and legitimacy of planning through "due process" as well as the need for new forms of governance with respect to dealing with pressing energy and climate concerns. Due process is a requirement that legal matters can be resolved according to established rules and principles, and that individuals can be treated fairly.

Recommendation 7:
Include open innovation as a part of municipal planning

'The most important output from larger EU projects, was that the municipality learned how to administrate innovation projects'

> *Municipal planner*

The stakeholders involved in smart energy community planning, either belong to a tradition of what is called explorative innovation and exploitative innovation processes. Exploitative innovation means that new projects are designed through existing knowledge and construction processes within the said organization, and that the stakeholders take an instrumental and predefined approach to create something new. Explorative innovation

means taking a much more intuitive approach, exploring new future scenarios in a more serendipity manner, embracing lateral thinking and allowing for exploration and co-creation throughout the organization to meet higher ambitions in new ways. In open innovation, both types of innovation are needed, and this requires leadership on all levels to ensure the capacity building needed to implement the new ideas.

In integrated community planning, public and private stakeholders need to work together and achieve an open innovation process. However, while participatory approaches are good in coming up with consensually agreed solutions, sometimes decisions are missing the will from stakeholders to implement (Svenfelt et al., 2011). One of the most common pitfalls of larger open innovation projects with multiple stakeholders is that the projects quickly become top-heavy, and that the building project spends more and more resources on top-down leadership instead of bottom-up and horizontal strengthening and capacity building. As the power-struggle between actors slows down the innovation process, new political goals and cost requirements are added, and the implementation is done by the actors who already have tools and resources in place to construct the minimum requirement. This often means leaving out social aspects and spatial qualities, and the new and groundbreaking ideas emerging from citizen involvement.
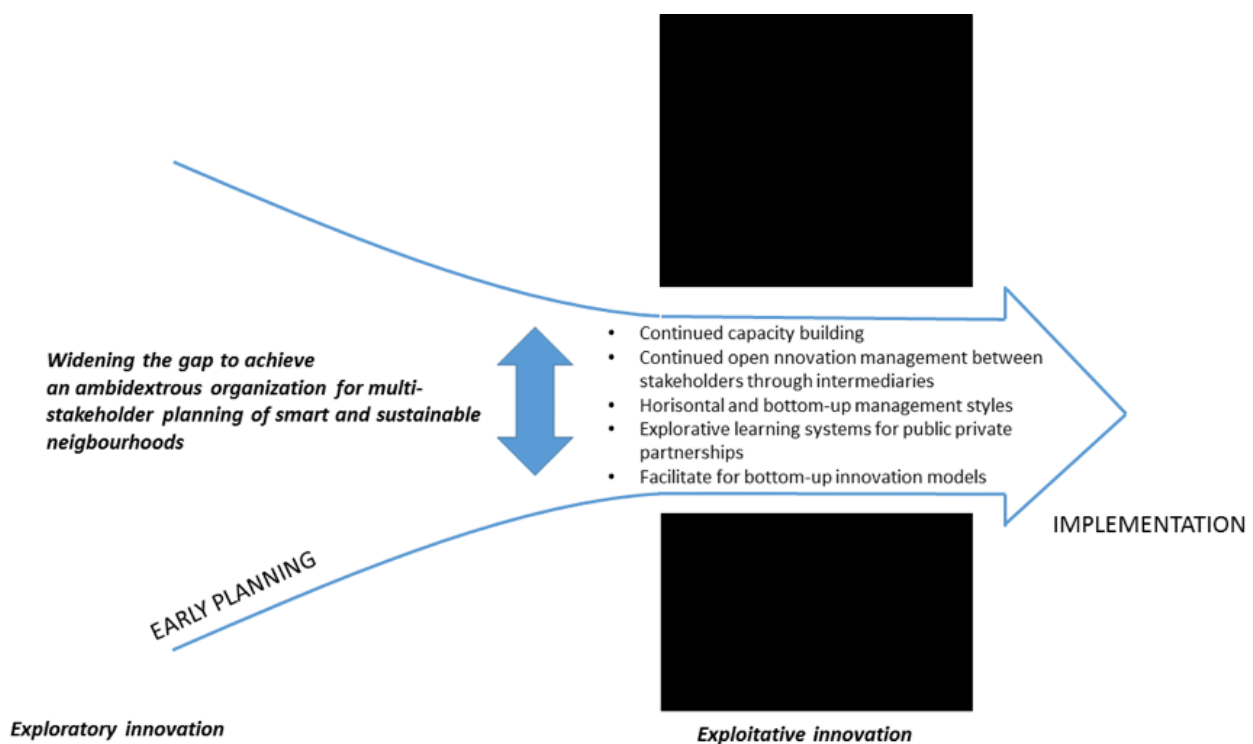

Figure 4: Open innovation, achieving a balance between exploratory and exploitative innovation models

Recommendation 8:
Create awareness and organizational policy on how to use innovation intermediaries

For the process and measures suggested in the PI-SEC Planning Wheel to succeed, knowledge transfer must play a fundamental and important part. This can be done by innovation intermediaries. "An innovation intermediary plays a key role in bringing together partners with different knowledge bases and facilitate consensus (De Silva et al., 2018; Hargadon and Sutton, 1997). Howells (2006, 721) defines innovation intermediaries broadly as "organizations that provide a supportive role for collaboration between two or more parties during various stages of the innovation process" but at the same time acknowledges that intermediaries are also individual actors".

Futurebuilt clearly played this role in the Furuset case, as the creation of a separate body for motivating, training and coordinating greener architecture projects in Oslo. This independent actor was added to help break down the 'silo separation' while other city municipalities explain that their size and organizational structure may need something similar yet more contextually fitted.

An argument from several municipalities is that there is a need for a better coordination unit, facilitating innovation in the direction of environment, climate and energy, that can work across the municipal organization. In Furuset, the Futurebuilt programme was one such example, created to develop environmentally ambitious architecture in the Oslo region, and has been the coordinating body ensuring stakeholder collaboration particularly within the municipal organization. Despite a thorough citizen-involvement phase and strongly documented citizen needs, the timeline from citizen involvement to implementation has been lengthy. Also, the lack of investment interest in the area has been a significant barrier. The area is seen by public media as 'challenged' with a high immigrant population and low housing prices ([12, 13]). As the public sector is spending more than usual on low-emission buildings on municipal land - what the urban planners refer to as "the Core of the Community" (CofC) - it is difficult to finance. The CofC is in this case the spatial qualities combined with the citizen behavior aspects related to energy use and spatial planning in the Furuset neighborhood. The CofC is to include a public square, the upgrading of a shopping mall and community house, a park, a green axis, all centered around a public transport hub with metro access; also containing charging stations for electric vehicles. This core is seen as key to make sure the inhabitants use the neighborhood in a sustainable way and that they participate in the community; something that again affects the need for safety and security that was identified in the citizen participation at the beginning of the project.

However, as the implementing stakeholders are different from the ones who built the visions together with citizens at the beginning, new understandings conflict. This is well-known in urban planning literature. The life cycle of a development is long and within this development people in the project leave while new people join (Lindkvist et al. 2018). The very nature of a project as a "temporal and transient and distributed organization imposes certain limitations and opportunities in terms of organizational learning" (Styhre et al., 2004, p. 964).

The coordinator, being municipality, a department, a coordinating unit or a company, will need to think about how to implement knowledge transfer management as a continuous and fundamental part of integrated planning. Currently, energy ambitious projects fail to make use of existing insights from previous and ongoing projects and have few concrete ongoing activities to ensure knowledge transfer. Knowledge transfer is a social construct and is more than data. While the 'smart' component of innovative municipal planning allows for the gathering of data on numerous issues, it only becomes knowledge ones translated through a format by people in a meaningful setting.

Recommendation 9:
Reconsider how to give people the fourth side of the helix

As earlier described, there is a gap between the scenarios and methods developed and applied with citizens and multiple stakeholders at the very beginning of a project, and the realized plans. This is of course not new, and this mismatch will always be a part of any design and development process. However, what is new is that 'smart' technology, and that co-creation policies are becoming active parts of the strategic documents in Norwegian municipalities. This should open new possibilities in terms of co-creation with citizens, and the possibility to divide responsibilities and accountabilities more effectively.

During a workshop at ISOCRARP 2019 in Bodø, PI-SEC and ZEN researchers explored what academics, urban planners and policy makers thought would be the key issues for reframing citizen participation. A returning issue is that citizens must feel motivated and that it should be meaningful for the citizens to be a part of the municipalities' decision making. Using storytelling and design thinking methodology within the workshop, the participates were enabled to set up a new frame for citizen participation. That resulted in the co-creation of the basketball-concept among a diverse set of stakeholders with different background during the workshop.

Five key factors from organization, facilitation, methods, communication to participants characterize the basketball basket concept. Taking these 5 factors in consideration and create adequate measures among them

will enable municipal (and private) actors to create better participation procedures with citizen.

The concept involves that the municipality receives ideas and feedback continuously from citizens. This will be a measurement of the citizen engagement, where city administration can get an overview of which themes are important for dwellers and people in general, and how the opinion is on certain issues. The Basketball concept (Fig. 5) visualizes a central pool of input from citizens. A facilitator will play the role of achieving good participatory processes, by taking ownership to the processes as well as the results. In addition, it will be the facilitator's task to create inviting situations and motivations to collaborate and will design methods for citizen participation directed at different user needs. The facilitator is a person or an organization that will be the meeting point between municipality and citizens.
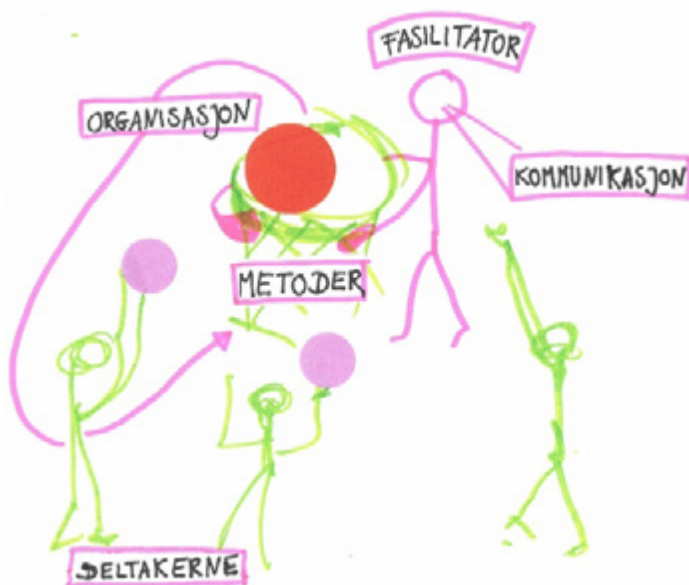

Figure 5: Open innovation, achieving a balance between exploratory and exploitative innovation models

Our findings show that an increased technology-focus of smart city concepts along the project timeline can disturb the citizen participation mechanisms, hampering the achievement of the real 'participation' level of Arnstein's framework. In smart city projects, where municipal decision-makers try to integrate technocratic strategies to democracy of the cities, the level of citizen participation cannot go beyond the tokenism. In other words, citizens are engaged as 'consumers or testers' to identify problems and contribute to technical solutions (such as producing an app, or feeding back on a development plan, or to perform certain roles/ responsibilities), and being sources of data that can be turned into products. Thus, they are asked to act in certain ways, instead of entirely doing of (acting on?) their own volition. In addition, they are not delegated to challenge or replace the fundamental political rationalities shaping an issue or a plan. In this regard, 'informing' and 'consultation' are the highest possible levels of citizen participation, unless we rethink the 'smart citizens' and 'smart citizenship' concepts. Challenges to democratization of information and expertise do not happen quickly but evolve in the interplay of technological innovation and new governance of stakeholders. We do not claim that it is necessary or possible that all citizen participation activities should reach the highest level of 'citizen power', because information sharing, knowledge access and equality are also parts of democratization. But we argue that the stakeholders' approach towards the role of citizens can affect and transform the citizens' view and willingness to participate, especially when they realize that their contribution is necessary to transform a survival city to a liveable and attractive city. Even though it is still early to make clear conclusions, our studies lead to a few recommendations relating to the structure and form of citizen participation. The municipality and urban decision-makers should find a way to align the informal structure of the citizen participation of the pilots with formal regulatory structure. This will foster the 'citizen power' on a longer term and thereby strengthen a strong democracy.

The city municipality should clarify its vision and strategy towards citizen participation, within and beyond the pilot project, indicating that citizen participation intention and success is very much dependent on 'the eye of the beholder'. Within the output-oriented approach, citizen participation can become a process of formal compliance with the expectations of the external environment (e.g. EU), being pushed for participation. This can unintentionally cause `decoupling' between the external image and actual citizen participation. The city planners and decision-makers need to clarify and communicate their approaches to the problem, intervention methods and resources, and possible decisional procedures; identifying why (goals), how and with what means they will reach their visions; and in which areas citizens are 'consumers/ end-users' or 'residents' and which levels of participation fit the specific goals and approaches (output-oriented) or (input-oriented). External evaluation or research on the quality of citizen participation in practice may be helpful to assess democratic values such as community building, representation and influence.

3. CONCLUSIONS

While the PI SEC Planning Wheel, atoolkit for the planning and implementation of Smart Energy Communities, can provide insights into how challenges along the processual timeline can be met, transition depend upon smarter govnerance and smarter municipalities. As the guidelines resulting from the sensitivity analysis show, better realization of bold visions depend upon

- the ability to develop an open innovation culture between citizens, private and public sector
- developing a predictable path to ensure the involvemnet of utility companies at an early stage
- the consistent and profficent application of knowledge transfer strategies to ensure a learning organization that can create neighbourhoods which encourage sustainable behaviour
- rethinking citizen participation and it's role in neigbourhood planning
- increased capacity building on 'smart' opportunities on national, regional and local level

These planning implications further depend upon the development of new roles to reduce sectorized planning, better alignment between international, national, regional and municipal objectives and stakeholder timelines, a clearification of responsibilities for qualitative aspects and focus on socio-economic aspects to ensure the equal cities needed to reach sustainability goals.

CON-CLUSIONS

ACKNOWLEDGEMENTS

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