



A new Smart Cities Marketplace Initiative on Regulatory Frameworks within the Integrated Planning, Policy and Regulation Action Cluster

Authors:

Marit Myrstad (Trondheim Municipality), Klaus Livik (Powel), Annemie Wyckmans (NTNU)

Abstract

Cities need an adequate set of framework conditions in the field of regulations to fulfill their climate and energy ambitions. We therefore propose a new initiative to support the transition towards a regulatory framework based on the ambitions for positive energy blocks and districts (PEBs/PEDs) and climate neutral cities laid out in the European Green Deal. The Initiative is based on the experiences of +CityxChange and other SCC01 Lighthouse projects.

Europe's supply, transport and consumption is in the middle of a paradigm shift. Cities are transitioning towards an integrated, renewable and decentralized energy market structure. Rapid advancements in technology within energy, e-mobility and digitalization present financially attractive alternatives for an energy transition. However, existing regulatory and legal frameworks are acting as obstacles, rather than enablers, in the transition towards positive energy districts and climate neutral cities.

This Initiative proposes a path to a modern and fair regulatory and legal framework for positive energy districts and cities, supported by a renewable European energy market. As a starting point, the Initiative invites European experts to cooperate on 11 multi-sector actions and required changes in current regulatory frameworks. These proposed actions will provide powerful incentives to create and operate positive energy districts and cities within or including a local energy system, which would hence become a scalable reality.

This Initiative will seek cooperation and knowledge transfer with experts in local and European projects, networks and platforms. The Initiative aims to propose changes in regulation focused on best practices in cities, industry, research and societal stakeholders



that engage in transdisciplinary demonstration and innovation activities. This will be executed in order to deliver results that support energy transition.

First-Year Activities & Outcomes

This Smart Cities Marketplace Initiative (SCM) is planned to be launched 2020 on 21 October 14h-16h, pending availability of key SCM and EC stakeholders. The launch will be held online. To the launch, SCM and SCC01 stakeholders will be invited, as well as other networks of interest such as the BRIDGE initiative, the Mission Board on Climate-Neutral and Smart Cities, Living-in.eu, and CIVITAS. The Initiative will organise **scoping talks** with the four latter initiatives in the autumn in order to identify opportunities for cooperation.

The Initiative will perform a small scoping exercise towards the SCC01 BoC and AC leaders, summarising the efforts on the 3 September joint meeting, to identify key priorities for this initiative. We will also ask the AC leaders and SCC01s specifically for dialogue on potential connections.

During the launch, the Initiative will be briefly presented, followed by a **workshop** with the participant to map their priorities, needs and capacities for contributions. The participants will be invited to submit these on beforehand, to enable us to present and discuss a first draft canvas of interest during the workshop. Participants will be asked to register on beforehand, and divided into small discussion groups to discuss and fine-tune the draft canvas.

Based on the canvas of priorities, needs and capacities, a **working document** will be drafted, summarising **the state of the art** in terms of regulatory frameworks for smart cities. This will be done in cooperation with the SCIS Policy Paper.

This initial charting will give rise to a **series of online working meetings**. These will be held with down-to-earth, peer-to-peer knowledge exchange and cooperation between experts in this field on concrete cross-cutting activities. Depending on the specific scope, the working meetings will be held either in cooperation with **core networks** within their established meeting arenas, or organised by ourselves to attract participants across stakeholder networks. The working meetings will enable us to create an overview and substantiate whether and how regulatory frameworks are a problem for the development of climate-neutral and smart cities, to enable them to be better addressed.

Based on the working meetings, a first **policy paper** will be created, in cooperation with interested experts from Smart Cities Marketplace and other networks/platforms. The policy paper will be **presented in selected European arenas**, to generate concrete discussion and influence agenda-setting of national and European regulatory and other relevant policy frameworks. The policy paper will:

- Take stock of the most persistent problems now regarding regulatory frameworks.



- Chart and categorise the main problems with regulatory frameworks when planning and implementing smart and climate-neutral solutions.

In parallel to these meetings, this Initiative will clarify what is the realistic capacity and competency of the participants, in order to be able to plan for achievable outcomes. Together with the participants, we will create a **timeline and growth plan** for extending the original scope towards other aspects of smart and climate-neutral cities in the future. The growth plan will be discussed with SCM and presented at the end of Y1.

Our Ambitions

To support the transition towards regulatory and legal frameworks that enable the societal planning, implementation and management of smart and climate-neutral districts and cities - for and with the citizens, local businesses and other stakeholders.

To broaden the opportunities and incentives for city administrations to fulfil their climate and energy ambitions, and to become positive energy cities in the future.

To engage with partners from other projects and networks to share knowledge and experiences in a concerted manner, and to create the right preconditions for new joint projects.

The overall ambitions are in line with several activities addressed within the SCM COVID-19 Charter and recovery plans, the EU Green Deal and the Mission Board on Climate-neutral and smart cities.

Background

At present we are in the middle of an energy paradigm shift from a fossil fuel based, unidirectional and centralized supply model towards a renewable energy based, multidirectional and decentralized prosumer model. The change is so fundamental that no intermediate state in between the old and the new paradigm is comfortable: nor from the infrastructural point of view is this the case, neither from the societal or the regulatory point of view. This transformation therefore comes with winners, who want to advance even faster, and, on the other hand, those that are comfortable with the status quo and stand on

the brakes to move away from business as usual. In this dynamic context, regulatory frameworks and how these are being managed play a pivotal role.



Today regulations are experienced to be obstacles, rather than enablers, in implementation of new technologies and solutions that will contribute to the European Green Deal, because of lack of incentives for implementation of new technology, business models and sustainable investments like local power production, refurbishments, demand side actions and energy efficiency investments, smart chargers etc. Many pilot projects are ongoing, but typically the regulations do not make it logical and profitable to scale up to enable the energy transition.

This is an observation that states how important it is to start initiatives that help to create new preconditions which bring regulatory frameworks in line with energy transitions and innovations as addressed by the EU.

This energy transition requires fast growing investments and the full integration of local, sustainable energy resources. Actors and bodies outside the traditional energy sector are and will be important for this progress. The energy industry is well regulated, with a split between natural monopolies, such as distribution networks or low voltage grids, and open markets for trade of a range of electricity products and services. This model fits well to serve the existing structure of the energy and power market, but is not appropriate for managing the future energy system.

At the same time energy consumers such as citizens and local businesses who want to contribute to sustainability are looking for opportunities to become more active prosumers. Focus on sustainability, technology shifts and digitalisation challenge current regulations for both urban development and energy. This is not only relevant for the traditional energy actors within electricity generation, transport and supply. Several additional parties have been observed to take an interest, like housing associations, new businesses and even start-ups. Investments in local renewable energy production, increased energy-efficiency, local batteries and flexibility, e-mobility, home automation, and smart meters are consequences of the ongoing transition. In parallel it is obvious that innovative business models and sustainable city development will evolve in similar directions. In order to safeguard optimal socio-economic outcomes, regulatory frameworks must in turn adapt to the new reality.

In short, this development will further enhance and support the transition of cities towards becoming climate-neutral, smart and sustainable, and allow for these processes to be more widely scaled up and replicated. This will in turn further fuel the energy transition and increasingly challenge the existing regulatory frameworks. These frameworks were developed to serve the traditional energy industry, building sector and management of municipalities, and are hence often experienced as an obstacle for the energy transition and sustainable urban development. Improved environment, smarter solutions, digitalisation and better information will also give a positive impact on public health and economic recovery.



In the transition towards the creation and operation of local sustainable energy systems and markets, which is a key tenet for smart and climate-neutral cities, bottlenecks reside at the levels of regulations of the electricity grid, trade/supply of electricity, building regulations, health and safety, security etc. Tensions arise between the technical requirements of keeping the electricity grid in balance at every moment, the actual situation of increasing decentralised and multi-actor production and the guaranteed principles of a free market. Rules regarding the easy switching of energy suppliers hamper the development of long term engagements in local energy systems and thus also the investments in the latter.

Furthermore, the current regulation neglects the connections and exchanges between the different energy carriers typical of a (local) multi-energy system. Such ‘sector coupling’ is becoming particularly important between electrical and thermal infrastructures. Putting scalable flexibility to work remains difficult or impossible. Unbundling of grid, generation, supply and consumption gives important incentives and a better understanding and clarification of roles that may lead to improvements in local multi-energy systems including production, conversion, storage, transport and consumption.

Types of Activities and Partners foreseen in the Initiative

In this initiative, we aim to build a long-term, quadruple helix ecosystem of local and European actors that will collaborate to influence the development and implementation of regulatory and legal frameworks to support the transition towards positive energy cities. This is an important first step to chart and categorise the main problems with regulatory frameworks in developing and implementing smart and climate-neutral solutions.

It is important to perform this mapping and structuring exercise in a quadruple helix ecosystem, as discipline-specific approaches do not have the adequate capability and approach to manage complex challenges. Developing high-impact, cross-disciplinary, cross-sectoral and cross-cultural cooperation is necessary to obtain an overall understanding of regulation impacts and results, and to develop and demonstrate the innovation potential that lies within more dynamic regulatory frameworks. This SCM initiative will enable us to build such a cooperation ecosystem.

The initiative aims to build knowledge-creating teams bringing together cities, industry, researchers and societal stakeholders that engage in transdisciplinary demonstration, innovation and supportive research in the initiative topics. Face-to-face and online workshops will bring together representatives of projects conducted locally or at European scale. We also welcome activities involving students.

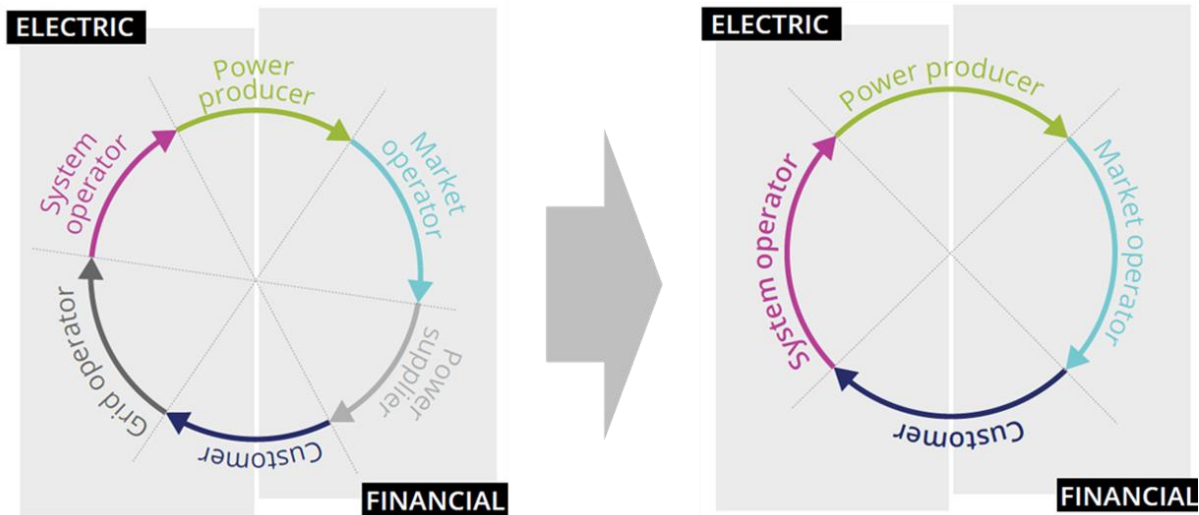


Through peer-to-peer exchange the participants will develop a joint understanding of the cross-disciplinary and cross-sectoral approaches necessary to develop better-fit regulatory frameworks, and to test these in sandboxes where appropriate. The network created in these workshops will be significantly expanded during SCM events, as well as in cooperation with existing and future SCC01-type lighthouse projects, and the relevant HEU Partnerships and Missions.

Our Approach: Regulation of local energy systems

This initiative will map, discuss, develop and propose innovative regulatory actions to enable the transition, using an approach that acknowledges the multi-level, multi-sectoral, multi-functional, and multi-type nature of energy system planning and operation. It gives better understanding of the relationality and interdependencies in governing energy and urban planning. In the local energy system, this is featured through interactions between the defined roles such as system operator (including the local grid), producer, consumer and the local flexibility market operator. This has amongst others been analysed, and will be further developed, in the H2020 SCC01 project +CityxChange.

The figure from +CityxChange shows (left) the main principle in how the European power market is organised in six different roles with each country having national legislation and regulation (Electric and Financial). The transition towards local energy systems with flexibility markets and positive energy districts (right) could be operated with only four roles - given the reality of expedient regulations. In addition to these four roles, additional stakeholders in the built environment, local authorities and housing associations need to be taken into account - to name but a few.



Efficient and scalable energy systems require that roles and interactions are defined in detail. This is a prerequisite for setting up manageable and trustworthy regulations. In the next phase, conditions then arise for business models to bring sustainable added value. In several pilot projects, derogations can be permitted in the context of 'legal sandboxes' – specific experimentation zones where rules are temporarily released in order to test new set-ups.

The following 11 derogations will be discussed:

1. Define and specify needs for new/changed mandates and responsibilities that will be necessary for the climate-neutral and smart cities of the near-future, towards a climate-neutral Europe by 2050.
2. Energy system operators are allowed to buy system services to avoid grid disturbances and reduced quality of supply locally to a locally set price.
3. The grid tariff and price structure must be set dependent on local grid costs.
4. Producers are allowed to sell locally without a supply license.
5. Metering requirements are in line with local market preferences when it comes to system operation and billing of supply, including the grid fee.
6. If possible digitally, the consumer shall be free to sell flexibility and buy supply locally.



7. How can tax regulations be used to strengthen incentives to implement local, sustainable energy systems and roles. This would imply, for example, that what is desirable in the system is not or only slightly taxed, and what is not desirable is heavily taxed (de facto coming down to a 'green tax shift'). Another example is whether we can avoid double taxation of storage (feed in, feed out).
8. Possible to operate a local energy system independently of the responsibility of the local distribution system operator (DSO) – or in cooperation with the DSO.
9. Funding instruments to support local energy system start-ups.
10. Invoicing and metering procedures that allow consumers to be part of both the local and global power market.
11. Licenses that invite and give commercial actors incentives to new entrants to operate local energy market roles.

If regulatory frameworks would admit the above listed multi-sector actions and required changes, this would provide a powerful incentive to create and operate positive energy districts within or including a local energy system, which would hence become a scalable reality. It is critical that the polycentricity regulation with a multi sector approach enables the energy transition contribution from local energy systems – to start as positive energy blocks (PEBs) or larger positive energy districts (PEDs).

Regulatory elements to address and investigate in this SCM Initiative

This initiative will seek cooperation with knowledgeable experts in Europe (e.g., the BRIDGE initiative) to address how regulation must be set up to be able to be the backbone of local sustainable energy initiatives, in a holistic perspective. It will deal with initiating projects, investments and operational resources as a system - and not sectorwise for transport, production, consumption, tariffs, market operation and system operation.

We will investigate in which cases regulations in ongoing Horizon2020 projects are experienced to be “show-stoppers” for innovation and upscaling from pilots to implementation, and how projects address these obstacles, and how regulations could be innovated to strengthen the incentives for these innovations. We will also investigate how regulations create obstacles and opportunities for the European Green Deal targets. These discussions, based on on-the-ground experiences from ongoing national and European projects, will inform better alignment of regulations towards creating a climate-neutral Europe.



As a starting point, we have identified the following regulatory elements as points of focus - these will be updated based on the mapping exercises that will be performed as the first steps of the initiative:

- Transparency.
- Incentives and measures for the city to become a positive energy city in the future.
- Incentives and measures for a green shift in local energy systems--- and how they may be strengthened through innovative regulations.
- How to regulate businesses that involve both transport (monopoly), supply and investments in energy resources.
- Development of new/changed roles, mandates and responsibilities, including DSO and local system actors - and opportunities for new actors to generate new business models (link to SCM Action Cluster on Business Models).
- Digitalisation - and new possibilities for small producers/consumers to act as individual actors in the local market.
- Taxation, fiscal incentives and tariffs/pricing.
- Permits of supply and production.

The devil is in the details

Many actors agree that current regulatory frameworks are not fit for purpose anymore and therefore need updating or profound revision. However, national regulations differ from member state to member state. This implies that desirable updates or revisions will depend much on the regulation at hand, complicating a general EU wide approach when it comes to the specificities of rules.

The work of the initiative will therefore take into account two levels of action:

Level 1: General principles of the energy markets, most often built on a translation of EU directives in the concerned countries, that thus start from the same principles (e.g. the unbundling principle);

Level 2: Specific rules of national energy markets and systems (including the specificities of TSO's and DSO's functioning) that must receive a tailor-made, local address.