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POLICY GUIDELINES

Public-Private Cooperation Models

Baltic Dialogue Platform on Smart Cities for Climate

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1 Introduction

Over the last decade, governments and particularly municipalities around the world have increasingly introduced plans and strategies for smart cities. A smart city is an urban transformation concept and a vision for the future developments of cities. It stresses the importance to integrate science and technology into information and communication systems "to increase operational efficiency and effectiveness, share information with the public, and improve the quality of services" (Cohen and Nussbaum 2019, p.9).

The idea of a smart city goes beyond the emphasis on efficiency and quality. The change towards smart cities must be seen in the context of climate mitigation and adaption, digitalization and the changing role of urban communities in a global village. The importance of cities for achieving a sustainable future can be seen in the fact that cities and communities have been integrated into the United Nation's Sustainable Development Goals (SDG 11). The European Commission has implemented this as part of a European science and innovation program, the European Innovation Partnership on Smart Cities and Communities (EIP-SCC).[1] Cities all over the globe are increasingly realizing their exceptional responsibility and role as leaders of sustainable consumption. Active cities with a strong environmental and digital agenda are redefining the highly liberal urban governmental model in Europe and are looking for ways to reinvent the sustainable city for the 21st century.

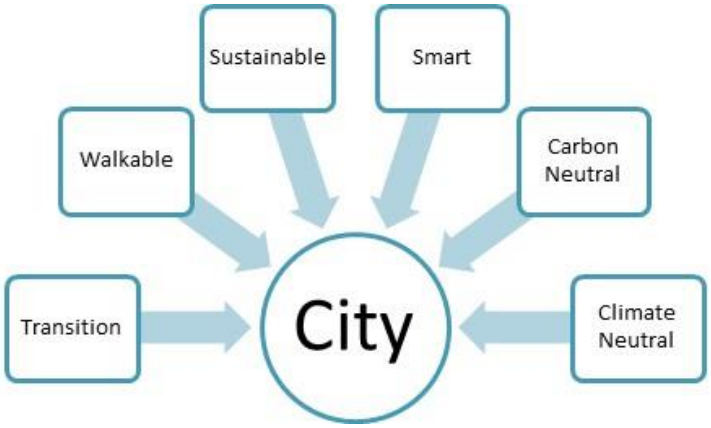

Figure 1: Common concepts for establishing sustainable cities and communities in Europe

With that in mind, each city designates its own priorities. For instance, the city of Tartu (Estonia) has focused on renovating and retrofitting Soviet-era apartments using smart technologies, implementing bike-sharing technologies, and transitioning to carbon neutral public buses. Munich (Germany) is currently testing several smart solutions in the Neuaubing-Westkreuz district, including smart lamp posts, mobility points and virtual power plants.

Regardless of the differing aims, in the techno-centric interpretation of the smart city vision, the realization of the smart cities requires the implementation and use of digital technologies in urban development and municipal governance to make "a meaningful difference to people's lives" by meeting citizens' demands, and social and environmental concerns (Bris 2020). However, the roll out of the information and communication infrastructure necessary for using

[1]https://ec.europa.eu/info/eu-regional-and-urban-development/topics/cities-and-urban-development/city-initiatives/smart-cities_en

digital technologies as well as the production and testing of hardware and software are usually not municipal tasks. Smart solutions thus require cooperation between municipalities and companies to implement smart solutions. Municipalities rely on different forms and concepts of public-private partnerships (PPP) for this end. New cooperation models with other actors (e.g. service providers, knowledge partners, citizens and contractors) provide a framework for municipalities to develop new services that explore the boundaries between the public and private sectors.

To put it simply, PPPs are two-way collaborative arrangements that connect the public sector (i.e. governing authorities) and the private sector (e.g. technology start-ups, large-scale corporations, SMEs and research centers) in order to cooperate in public infrastructure development projects. Often, PPP models are thought to be mutually beneficial regardless of the various roles public and private partners play in the organizational and financial arrangements, whether through competitive public tendering, joint ventures, stock companies or development projects (Hodge and Greve 2007, p.546). For instance, public authorities can designate innovation districts, in which companies can test and demonstrate projects that aim to improve city services. In addition, the private sector is responsible for developing technological standards and best practices, while it falls on the public authorities to review and revise existing rules and regulations that could impede the emergence of smart city developments.

Smart city initiatives emphasize cooperation with knowledge partners (e.g. universities, research centers and think-tanks) to build capacity for innovation inside the administration. No less important is cooperation with community groups, umbrella organizations, advocacy groups and energy/environmental agencies. Due to their (semi)public nature, these cooperation models will not be explored in this document. Their importance is noted to provide context for the more commercial relationships discussed in subsequent chapters.

Overall, some experts and practitioners view PPPs as a model for cooperation between public and private sector actors. Arguments for PPPs include faster project completion times, the greater use of technical expertise, and the creation not only of public value and social impact but also of private profits.

On the other hand, PPPs are not without criticism. For one, without the long-term commitment of and accountability from both parties as well as extensive monitoring and evaluation, PPPs can lead to the stalling of projects, while costing taxpayers more than originally stated in the contract. Furthermore, in a PPP setting, a private firm profits by charging the public for the commercial activities that it has developed on the smart city infrastructure. However, if the commercial activities are not well designed or provided at an affordable price, this can lead to complaints and legal challenges. In addition, private firms operating and charging for public assets may reinforce ‘notions that taxpayers’ money is being used to directly fund the profit margins of private” firms (Public-Private Infrastructure Advisory Facility 2009, p.29-32).

Within the context of the role of PPP models in smart city developments, and taking into account experiences from the Baltic region, the purpose of this policy guideline is to:

- Support municipalities to conceptualize and implement smart city projects
- Serve as an introduction to PPP models
- Highlight the advantages and disadvantages of cooperation
- Describe examples of PPP models from Baltic Smart Cities projects in Estonia, Latvia and Lithuania
- Conclusions on and PPP models in the context of climate-friendly smart city projects and recommendations for ensuring the success of PPP cooperation models

2 Public-Private Cooperation Models

In the literature, there are four major collaboration models that are discussed with regards to the collaboration models of PPP (Heuser et al. 2017; United Nations Economic and Social Commission for Asia and the Pacific 2008; World Bank Group 2018). These models are used across a variety of public services ranging from water management to public transport. These are summarized in Table 1.

The first model is Operational and Service Concessions (World Bank Group 2018). The private sector partner, the concessionaire, is granted the long-term right by the municipality to use all utility assets, this includes the responsibility for operating and investing in the assets. At the end of the concession period, the private sector must return all the assets to the public authorities. In the context of smart cities, the private firms are given the authority to operate on existing assets, such as existing public Wi-Fi networks. The concessionaire could in this case generate profits, for example, by introducing advertisements which users engage with when connecting to a network. After the concession period, the private firms must return the operating rights to the public authorities.

The Build-Operate-Transfer (BOT; World Bank Group 2018) model is an extension of the Operational and Service Concessions. In this model, the concessionaire has the additional responsibility of building up the respective infrastructure. In a BOT smart city project, private firms are given full responsibility for building the infrastructure necessary for digital services. An example could be setting up a LoRa-Wan network throughout a city. The concessionaire is then granted the right to operate and provide data and digital services to the public, while profiting from commercial services. After a certain period of time, the private firms must return the smart city assets to the public authorities.

In contrast to the BOT model, the Design-Build-Operate (DBO; World Bank Group 2018) model requires the public partner to provide the project funding. In building smart city infrastructure, the public authorities own and finance the construction of new assets, such as intelligent light posts. With the public financing, the private firms are given the right to design, build and operate digital services and infrastructure under contracts that may be renewed depending on certain conditions.

Finally, a Special Purpose Vehicle (SPV; Heuser et al. 2017; United Nations Economic and Social Commission for Asia and the Pacific 2008) is a separate legal entity that is created by the municipality or city council to operate, build and provide certain public services. In terms of smart city development, the respective public authorities set up a new organization – with its own legal entity and separate functions – to provide digital services, manage data and finance the construction of new assets. In Germany, for example, municipalities are working with semi-public IT providers on the digitization of municipal services and development of data platforms. At the same time, while the public authorities retain control of the shareholder value, SPVs also allow for the broad acceptance of the operation and management of smart city services as a commercial public offering through a tendering process extended to the private sector.

Table 1: Public-Private Partnerships (United Nations Economic and Social Commission for Asia and the Pacific 2008; Heuser et al. 2017; World Bank Group 2018)

Models of Collaboration	*Definition*	*Advantages*	*Disadvantages*
Operational and Service Concessions	The concessionaire (i.e. the private sector partner) has the long-term right to use all utility assets, this includes the responsibility for operating and investing in the assets. At the end of the concession period, the private firms must return all the assets to the public governing authorities.	The private firms operate the existing assets from the beginning of the contract, which means there will be an instant cash flow for investments and servicing debt. The concessionaire has the right to determine performance and technological standards within the regulatory and contract requirements.	Tariffs imposed through a contract may prevent the private firms from maintaining a profitable rate of return.
Build-Operate-Transfer (BOT)	The private sector partner builds, owns and runs the project for the time of the contract. After the end of the concession the facility is transferred to the public agency.	For the period of the concession the private sector finances, possesses and builds the smart solution and runs it. Afterwards it is transferred to the public institution.	The burden of risk is mainly placed on the private firms. The risk for the public authorities are limited.
Design-Build-Operate (DBO)	The concessionaire designs and builds the facility. The public institution provides the funding for the project and retains ownership.	Similar to BOT, the concessionaire is given the right to design, build and operate smart solutions that are owned by the public institution.	The private firms do not take any financing risks and it falls on the public authorities to do so.
Special Purpose Vehicle (SPV)	The public authorities create their own legal entity (or subsidiary), which is responsible for operating, building and providing services. The operation and management of services can be extended to companies and other cities.	The creation of a separate legal entity leads to greater commercial efficiency as well as transparency.	As the entity is still under the ownership of the public authorities, autonomy and transparency can be an issue although it has been suggested that reporting on a fully commercial basis could resolve this.

In the context of smart city development, some caveats or limitations need to be considered when using PPP collaborative models. These are:

- Long-term contracts
- Technological standards and replicability
- Conflicts of interest
- Data sovereignty
- Ensuring the inclusion of third-party stakeholders
- Interoperability

To ensure parties involved in PPPs are committed to long-term value delivery as outlined in detailed roadmaps, ***long-term contracts*** are often used. While these provide for a certain planning horizon for both the public and the private sector partners, long-term contracts can lead to a dependence on one provider, which might result in a lack of investment in updating infrastructure and limited profits.

The implementation of smart city solutions often involves the deployment of recent or new technologies. For mass deployment and the interchangeability of providers, **new technological standards** need to be developed, without which cities run, for example, the risk of establishing systems that are incompatible with the solutions implemented by other providers. One example of how this caveat has been addressed is the EU-level coordination group Sector Forum on Smart and Sustainable Cities and Communities (SF-SSCC). The forum consists of the European Committee for Standardization (CEN), the European Committee for Electrotechnical Standardization (CENELEC) and the European Telecommunications Standards Institute (ETSI), which was formed in 2017 to serve as an advisory and coordinating body for European standardization activities related to smart and sustainable cities and communities (ETSI 2019).[2]

As PPPs involve awarding contracts, stakeholders need to ensure transparency and avoid compromising personal interests that could be perceived as **conflicts of interest**. While there is no specific regulation guiding conflicts of interest and the smart city per se, the European Union Agency for the Operational Management of Large-Scale IT Systems (eu-LISA) has published a guideline on such matters (eu-LISA 2018).[3]

As smart cities mainly involve the collection of huge amounts of data, the ownership of public data has been called into questioned within the wider discussion on **data sovereignty**. To address this issue, smart city planners have introduced clauses regarding new data directives focused on ethics, privacy and security into contracts. An example of this issue is present in the smart city planning in Barcelona (Spain), where the city council has published an agenda that requires large technology corporations to return machine-readable data to the public authorities, while also making sure they encrypt the data to preserve citizens' privacy (Bria 2019, p.87).

As mentioned above, PPPs include both the private sector (e.g. large corporations, technology start-ups and research centers) and public authorities. However, as smart city solutions center on solving societal issues using technology, there have been calls for **the inclusion of civil society organizations and the general public as a third sector** (see Chapter 3 for examples).

Lastly, in order to combine the systems of different providers and to change from one provider to another (e.g. when a concession ends), **interoperability** is required. **Interoperability** is the extent to which smart city developers sufficiently address challenges to the integration of technologies, systems and data flow. For instance, the Digital Europe program for the period 2021 – 2027 was adopted in July 2019 by the EU to address the best interoperable use of smart city technologies across the EU in order to deploy "decentralised solutions and infrastructures required for large-scale digital applications" (European Parliament 2019).[4]

[2] For full activities and announcements, see: https://www.etsi.org/technologies/smart-cities#:~:text=The%20CEN%2DCENELEC%2DETSI%20SF,and%20sustainable%20cities%20and%20communities

[3] For full text, see: https://www.eulisa.europa.eu/Organisation/GoverningBodies/Documents/Rules%20on%20Conflict%20of%20Interest.pdf#search=conflict%20of%20interest

[4] For full text on the regulation, see: https://www.europarl.europa.eu/doceo/document/TA-8-2019-0403_EN.html

Excursus: Digital Public Services – An alternative to commercial interests?

In this guideline public-private cooperation is described as an option for developing smart cities. Within this box, we want to provide some space for thought in order to look further and discuss the future of digital public services.

One important reason for public-private cooperation is the lack of expertise and capacities in public institutions and agencies. Public services are rarely seen at the forefront of digitization. The COVID-19 crisis this year has forced administrations in many countries to introduce tools and skills that were often not available before. Even the improved digital capacity of public institutions in post-COVID-19 situations will not replace the need to think about a fundamental change in the theory and practice of governance. This change must alter the way information enters the public domain, how data is used for decision-making, and how information shapes the relationship between public institutions and citizens.

Digital skills are an important prerequisite for smart cities and digital public services. However, today, there is large variation in digital skill levels among individuals. This must be considered when developing digital public services. Public services cannot be built on exclusive digital platforms as long as a proportion of the population lacks the knowledge to access these services. Training programs need to be developed and rolled out to address this situation, and alternative easy-to-access interfaces are needed for those who are less digitally skilled.

Although many EU countries have adopted the necessary building blocks for digital democracy, like a digital identification card (ID card) and supporting national identification service, these tools are rarely used for exercising citizen voting rights. With one exception (Estonia), digital voting is not used on national, regional or local levels, which reduces access to (and the convenience of) policymaking. These restrictions are usually justified by digital security arguments, even though no security incidents have ever affected Estonia's e-elections (15 years and counting). The slow progress of digital democracy in the EU hinders the development of digital public services, creating additional technological barriers for citizen participation.

As public institutions lag behind in digitization, global commercial service providers are increasingly filling the gap. Commercial social networking platforms, streaming services and video publication platforms, and search engines are providing services today that could be public. For many users, these services look and feel like public services because of the role these services fill in the social/public lives of citizens and because of the free/ungated access to the services. These private services are not only a threat to privacy, but also to the survival of local services (not only digital). Even more importantly, these private services impose market barriers for any public digital services that may be introduced in the future.

The security of personal data held by public digital services must be evaluated in the context of constant personal data extraction by global digital service providers. This data is often used for commercial purposes and is not be available to public administrations for improving public services. People's readiness to share large amounts of personal information with global digital service providers combined with a reluctance to share any personal data with governmental institutions must be seen as a paradox of the modern digital lifestyle. Although governmental institutions can have a profound impact on the lives of citizens and use personal data to improve public services, governmental institutions are less trusted than some foreign corporations that have strong commercial agendas.

Smart city development could therefore be a chance to change the direction and kick-start progress in digital public services. A starting point would be a broad public discussion about which services in a smart city should be public and how cities could provide these services as a public good.

3 Examples of Public-Private Cooperation Models in the Baltic Smart Cities

3.1 Example from Estonia

The cooperation model for retrofitting apartment buildings in the SmartEnCity project in Tartu (Estonia) combines the efforts of building associations (NGOs), the city, a non-governmental energy agency, the national grant holder (SA Kredex) and commercial banks to create a financial basis for the renovation work. The design of the buildings and the refurbishment work was carried out by private contractors under the supervision of the building associations, the city, an energy agency and SA Kredex. Street art installations were added by national and international artists selected by local committee. This cooperation model was developed to fit the local situation, which involved privately owned buildings, private construction services, private energy services, public funding and bank loans. The funding model was developed to improve the affordability of innovative solutions and reduce the financial risk for vulnerable groups.

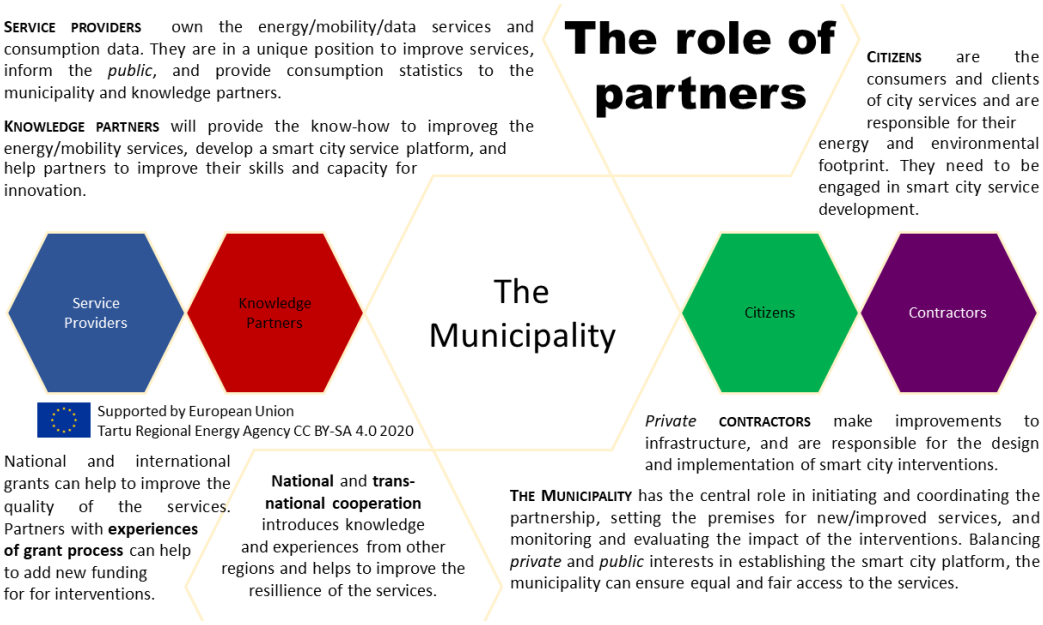

Figure 2: The roles of partners in smart city development in Tartu, Estonia.

The cooperation and funding model was developed by the Tartu SmartEnCity consortium (signatories of the grant agreement) and coordinated by the municipality. Implementation was supervised by a multidisciplinary expert group, which included technical, management and science representatives, among others (see Figure 2). As decisions on retrofitting the privately owned buildings were made by the building associations, the engagement of these associations and the support of residents was a critical part of the project. The building

associations were continuously informed regarding the roadmap for renovations: preparing energy audits, technical design, setting up a tender, applying for grants and supervising the construction work. A training program was developed to strengthen the practical skills of residents in order to improve energy efficiency and reduce residents' carbon footprints. Residents who had received training were recognized as smart city ambassadors and encouraged to share their knowledge with their peers.

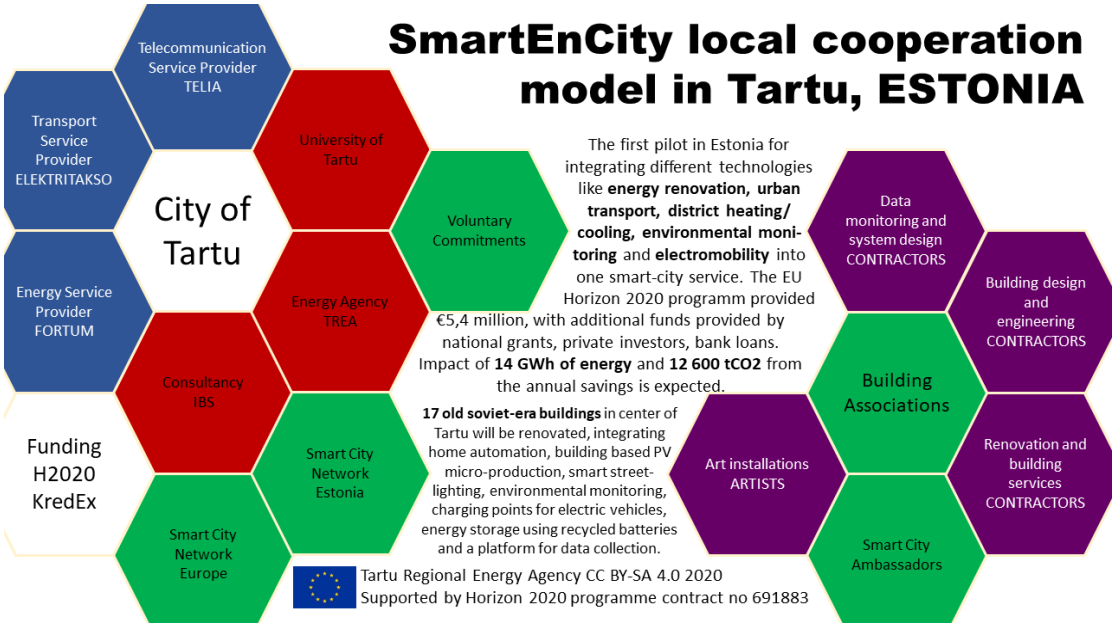

Figure 3: SmartEnCity local cooperation model in Tartu, Estonia (White = public institutions, red = knowledge partners, purple = private contractors, green = community groups).

Similar principles for active citizen engagement were also used for other parts of the SmartEnCity project and will continue to be employed during the replication stage. At the time of writing, the city of Tartu is setting up an innovative cooperation model to promote the city's ambitious long-term energy and climate goals, which will invite local organizations and citizens to join and support the campaign. According to the plan, all public services will be carbon neutral by 2030, while organizations, associations and citizens can sign a voluntary contract declaring their support and commitment to the plan.

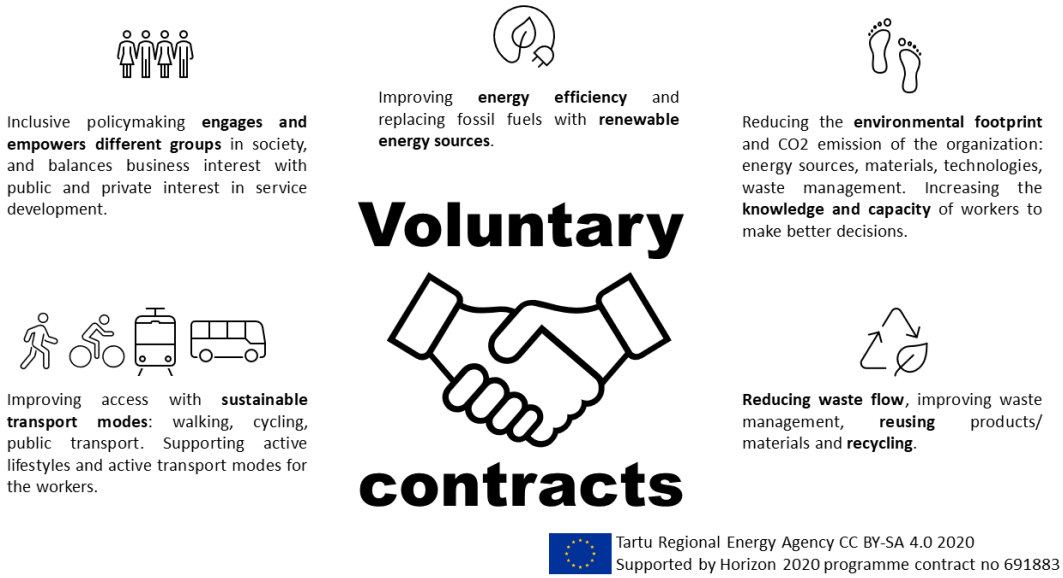

Figure 4: Voluntary contracts for climate neutrality in Tartu, Estonia.

One of the challenges of coordinating the wide variety of renovation activities and actors involved concerned differences in data availability, formats and standards. Most of the data about energy (and other resource) carriers, production and consumption used in sustainable planning was not made publicly accessible, while the different data protocols used were often incompatible with each other. A further challenge was the rapid increase in construction prices in the local market.

3.2 Example from Latvia

Although the development of PPP policy in Latvia began in the 1990s, the first “Concession Law” was adopted as early as January 20, 2000 with state institutions subsequently appointed to elaborate PPP policy. Up to now, PPP uptake in Latvia has not been a success.

Following extensive consultations among stakeholders on issues related to PPP implementation, five PPP pilot projects were prepared. The aim was to establish good practice and identify potential obstacles. Each of the five pilot projects represent a different sector and different PPP model. On the basis of these five pilot projects, elaboration of PPP standards and the development of guidelines began. However, the pilot projects revealed a number of shortcomings in existing legislation. In response to these shortcomings, and in order to adapt Latvia’s legislation to the new directives of the European Parliament and European Council,[5] a new PPP regulatory framework was developed. The resulting “Law on Public-Private Partnership” was adopted and entered into force in 2009.

Over the following years, the development of PPPs in Latvia has faced many obstacles and struggled to prove its potential. To date, no PPPs have been agreed at the national

[5] 2004/17/EC coordinating the procurement procedures of entities operating in the water, energy, transport and postal services, and 2004/18/EC coordinating the procurement procedures of entities operating in the construction, supply and services sectors.

government level. The whole process has been challenged by the contradictory results of the initial large-scale PPP projects. The best-known example being the project of the Riga South Bridge, colloquially known as “The Golden Bridge” due to elevated project costs. The subsequent general reluctance combined with ineffective taxation and legal regulation have inhibited the large-scale adoption of PPPs. Thus, the only successfully implemented PPP examples have been several small-scale municipal projects that involve, for example, schools, pre-schools, elderly day-care centers and sports infrastructure.

One-Stop-Shop for Renovations in Riga

One example from Riga is the smart collaboration model “One-Stop-Shop”, although it is not a genuine PPP as explained below. The aim of the project was to meet the city’s long-term building renovation goals as well as to motivate residents to renovate their homes. In Riga, almost 85 % of residents live in multi-apartment buildings, of whom 94 % own their apartments. Around 6,000 multi-apartment buildings (75 %) were built in the post-war period with poor insulation. Households are the largest energy consumer in the city and account for 36% of energy used.

The One-Stop-Shop was set up to provide all the necessary information on renovation programs. The municipality delegated the task of developing an integrated multi-apartment building renovation funding program to Riga Energy Agency. In order to coordinate the process, the city council set up a special commission, which included representatives of large housing companies, the city’s finance department, the Construction Board and other stakeholders. The One-Stop-Shop employed four specialists, including a grant program manager and an assistant (who coordinated the municipal grant scheme), an energy efficiency consultant, and a construction work expert. It was fully financed by the municipality and did not generate any revenues.

The biggest challenge was to secure financing and win the necessary political support for the One-Stop-Shop. The city’s engagement in the European Covenant of Mayors initiative was a good starting point to convince politicians. In parallel, a pilot municipal funding program was established, which allocated grants to private multi-apartment buildings to cover up to 50 % of the costs for energy-efficient renovation works and 80 % of the costs for energy audits. After an energy audit of a multi-apartment building, the One-Stop-Shop would recommend the implementation of certain energy-efficiency measures. It would also provide information on renovation project financing, available subsidies and other financing sources.

Various communication channels were used to reach homeowners – from meetings, seminars, physical and online consultations to outreach via various web channels, including the fund’s website,[6] media and social networks. Local events at the neighborhood level, organized in cooperation with local community leaders, proved to be the most efficient way to reach out. The information provided on the website or in local media was not sufficient, homeowners preferred face-to-face meetings.

Between 2018 and 2020, 154 multi-apartment buildings were renovated. The idea to shift control and management of building renovation from the municipality to homeowners through setting up cooperatives was successful. Homeowner cooperatives contracted renovation works directly from suppliers. In order to encourage the setting up of cooperatives, the municipality provided homeowners with a 90 % tax discount for two years. In addition, homeowners could access a collective bank loan to finance the remaining costs.

The main challenge was to convince apartment owners of the need to complete the deep renovation of their multi-apartment building in a single step due to the lack of co-financing. The

[6] www.renove.lv

most convincing arguments for homeowners were potential energy and financial savings as well as an increase in building value. In the best-case scenario (deep renovation), homeowners could achieve up to 50 % in energy savings, thereby decreasing their overall utility bills by 40 %.

3.3 Example from Lithuania

Ignitis Group's innovation department and the Mobility Innovation Center are two interesting cases from Lithuania that work on facilitating public-private collaboration to create and test innovations in the energy and transport sectors. This type of collaboration model is not a conventional PPP as described in Table 1.

Ignitis Group is an international state-owned energy company. The group's innovation department is responsible for innovation development, and establishing partnerships with start-ups, partner companies, universities and other utility companies. The Mobility Innovation Center was established by three Lithuanian public companies: Lithuanian Railways, Lithuanian Post and Road Maintenance. The center encourages innovation in Lithuania's transport-communications sector, and acts as a facilitator between state-owned transport and private companies.

The partnerships in these cases are driven by open innovation methodology. Ignitis Group and Mobility Innovation Center *invite innovators from private companies and start-ups to test their products on public infrastructure*. Products should improve the effectiveness of the system and increase environmental sustainability. Energy and transport companies provide free access to the transport and energy infrastructure, and to the data they manage. Companies and start-ups are selected internally and externally. Internal selection is done through online applications, while external selection is done through hackathons and public innovation fairs, among other methods.

Start-ups and other private companies become partners to public corporations. Parties sign cooperation agreements. This partnership (which is not a conventional PPP) enables partners to test new technological solutions in real-life conditions. *This type of partnership is based on non-commercial purposes* – private companies and start-ups are not financially rewarded. The relationship is driven by common interests and knowledge exchange.

The cooperation model is beneficial to both parties without demanding too great of a commitment. Companies and start-ups are able to test their innovations without committing to transfer their rights or sell their technology to the public sector. Meanwhile, the public sector partner is not obliged to buy the new technologies if they do not see value in the technologies. The success of this model depends on the companies' ability to develop new ideas, and openness to reviewing infrastructure and data systems. This requires of the public sector partner a strong committed team, open-minded leadership, good communication with the private sector and the ability to identify real problems.

4 Conclusions and Recommendations for Public-Private Collaboration in Climate-Friendly Smart City Projects

Today, collaboration between the public and private sectors in smart city projects is very common. These collaborations can be beneficial for both sides. However, caveats within collaboration models need to be considered by public institutions in order to ensure long-lasting results in the interests of cities.

The examples from the three Baltic countries presented above were successful in their setup and implementation:

- The case of SmartEnCity in Tartu (Estonia) demonstrates the importance and benefits of broad participation and cooperation in smart city projects. In contrast to PPP models, which are used to promote cooperation between public institutions and private companies, in this case citizens and research institutions were also integrated in order to secure public acceptance and the scientific assessment of outcomes.
- The pilot smart collaboration model, the One-Stop-Shop, in Riga (Latvia) shows how public-private collaboration can accelerate the achievement of climate neutrality goals. It also ascertained the acute need for a complete, integrated municipal service to guide and support private households, motivate them to overtake control and management of their multi-apartment buildings, and promote and stimulate the implementation of energy-efficiency measures.
- The Lithuanian example shows that particularly in the development stage of new solutions PPPs might not be the optimal solution, whereas if public companies and start-ups cooperate on a non-commercial basis the results can be beneficial for both sides.

The description of PPP experiences in Latvia, however, also indicate that cities should carefully consider the option of PPPs. In Latvia, the adoption of PPP models as presented above is low. Another lesson from the examples presented is that collaboration with actors like companies, research institutions and civil society can also be successfully set up and implemented using alternative arrangements to PPPs. Cities should examine whether such models might fit their envisaged purposes.

Recommendations

It is important that the following points are considered when choosing to cooperate with private companies:

- At the start, a common vision and strategy should be developed with the participation of citizens. This also applies for the development of individual projects for which the perspective of affected citizens and civil society needs to be integrated, for example, within co-creation workshops. This ensures that goals and project outcomes are widely accepted and shared among stakeholders (see also Uraia 2015).
- The city should carefully examine whether a smart solution best fits the goals to be achieved or if other (analogue) options exist that might suit better (e.g. changes in infrastructure).
- The city should consider whether a PPP model best suits the envisaged project or whether conventional project development is more beneficial.

- Public institutions should carefully consider the advantages and disadvantages of PPP models described in Chapter 2 in order to identify the model that best suits the project, the city context and long-term goals.
- The city should ensure that they have sufficient negotiation capabilities in order to ensure a win-win situation between the public and private partners (Uraia 2015).
- Public institutions should ensure that the technologies developed can be (financially) run over the long-term and that skills are transferred to the city in order to sustain the project independent of the private partner when the contract ends (Uraia 2015).
- For the experimentation and development of new solutions, the Lithuanian example could be a model to be further tested in other cities.
- In order to assess the outcomes of smart city projects independently, cooperation with research institutions should be considered.

Recommended reading for more in-depth recommendations: Uraia (2015) “Public-Private Partnerships for SMART City Management. Recommendations for local governments to prepare and implement SMART PPPs.”

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