
**DECENTRALIZED COOPERATION BETWEEN SMART CITIES REGARDING
RENEWABLE ENERGIES IN THE EUROPEAN UNION:
ANALYSIS OF PROJECTS AND ACTIONS**

CAMILA ABBONDANZIERI
cabbondanzieri@hotmail.com

She is a doctoral fellow of the National Council of Scientific and Technical Researches of Argentina (CONICET, Argentina). She is a Ph.D. student of International Relations at the National University of Rosario (UNR), holds a degree in International Relations (UNR), and a master degree in International Integration and Cooperation (CERIR-UNR). She is adjunct professor at UNR and is part of the Study Group on Gender and International Relations (IRI-ULP).

Abstract

Energy issues in the European Union have been present since the beginning of the integration process in the bloc. Motivated by the challenges of the 21st century and by the intensification of problems related to energy supply, the European Commission proposed changes that resulted in the profound transformation of energy systems through the proposal of the Energy Union in 2015. In this context, decentralized cooperation projects and actions between Smart Cities have been conducted. These implied associating sub-national dimensions with regional ones for the treatment of energy problems from an efficient and sustainable resource management perspective.

Keywords

Decentralized cooperation, Smart Cities, European Union, renewable energies, Energy Union.

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DECENTRALIZED COOPERATION BETWEEN SMART CITIES REGARDING RENEWABLE ENERGIES IN THE EUROPEAN UNION: ANALYSIS OF PROJECTS AND ACTIONS¹

CAMILA ABBONDANZIERI

Introduction

The objective of this article is to identify and detail the type of projects and actions that have been carried out through decentralized cooperation between Smart Cities in the field of renewable energies in the European Union after the proposal of the Energy Union by the European Commission in February 2015. To this effect, a set of cases will be examined within the Smart Cities Information System (SCIS), such as CITYFIED, GrowSmarter, PITAGORAS and STORM. The European Innovation Partnership for Smart Cities and Communities (EIP-SCC) and the Covenant of Mayors will also be examined.

It is argued that the Smart City model is closely associated with the proposals of the Energy Union. This connection represents a “window of opportunity” that offers potential to overcome the main challenges of the energy sector and the political limitations of the Member States for the treatment of energy issues in the European Union. Based on this, it is appropriate to focus strictly on the subnational level and specifically on the concrete measures and initiatives that Smart Cities conducted to face their respective energy challenges.

The decentralized cooperation between Smart Cities regarding renewable energies in the European Union is motivated by the growing importance that energy issues have gained in recent years and by their significant interrelation with the problems associated with climate change. The energy sector includes a series of problems for the EU that make it necessary to constantly rethink the way this issue can be addressed by the European institutions. In fact, according to the analysis by Reja Sánchez and Burnier da Silveira (2016: 50), at present,

“The European bloc, the world's leading energy importer, obtains 53% of its energy from abroad with an annual cost of approximately 400,000 million euros. It is highly dependent on abroad, which weakens it and represents a high risk for growth and economic stability in the old continent”.

¹ Article translated by Carolina Peralta.



Accordingly, the European Union's commitment to renewable energies has progressively acquired an unusual significance. It is an indispensable means to lead the transition towards a transparent, sustainable and efficient energy system that is in line with the main guidelines to attain a constant and respectful growth of the environment sustained since the Maastricht Treaty in article 130 R².

With this, the energy issue interpreted through the angle of smart and sustainable planning proposed by the Smart City model is an opportunity to learn and identify challenges in the execution of public policies in the future.

In order to achieve the proposed research objective, the article is structured in two large sections: firstly, it will examine the way decentralized cooperation between Smart Cities is conducted in the European Union; secondly, the main renewable energy projects and actions carried out within the framework of decentralized cooperation between Smart Cities are identified; finally, brief conclusions will be drawn.

I. Preliminary methodological details

The method chosen for this article is the case study. This is because the object of research -decentralized cooperation between Smart Cities in the field of renewable energies in the European Union - represents a case that expresses a particular reality within the framework of the challenges and limitations of the Energy Union in the bloc.

In methodological terms, the qualitative strategy was used, using the descriptive form and the interpretive understanding of primary and secondary sources. The qualitative approach is appropriate for the objectives of the article as it offers tools to guide the research, particularly through data collection and analysis of bibliographic documents.

The sources analyzed were prepared by the official institutions and agencies of the European Union. Specialized and pertinent bibliography in International Relations was used. Feasibility is guaranteed since all the documents used are available online and publicly accessible.

The time span is closely linked to the definition of the essential concepts that guided the research. The decentralized cooperation between Smart Cities in the EU and its relationship with the Energy Union represent a case study that is circumscribed throughout the 21st century. In fact, the concept of Smart City began to be disseminated in the middle of the 21st century and its treatment by European institutions began approximately a decade ago. The European Commission proposed the Energy Union in February 2015.

Regarding the theoretical framework, framing the European Union within an International Relations category is, in itself, a problematic fact. The particular dynamics that this process has acquired has endowed it with its own characteristics that distance it from what is commonly considered as a mere integration process. What is currently internationally recognized as the European Union is the result of a long and continuous

² "Community policy in the field of the environment shall contribute to achieving the following objectives: the conservation, protection and improvement of the quality of the environment; the protection of people's health; the prudent and rational use of natural resources; the promotion of measures at international level to deal with regional or global environmental problems", Maastricht Treaty, Art. 130 R.



trajectory of advances and setbacks in delegation of powers to European authorities and the construction of a Multilevel Governance scheme, where the traditional concepts of the International Relations discipline are diluted and acquire new nuances and implications (Morata, 2002).

From a theoretical perspective of Multilevel Governance, European governance is the result of the interaction between a multiplicity of actors and levels. The European Union is not a state because it lacks precisely the fundamental attributes of a state, but neither is it a simple international organization. It is a *sui generis* form of integration and political governance in the international system of the 21st century where there is not a single decision-making centre, but multiple ones.

Energy problems and the construction of an Energy Policy in the European Union can be analyzed, as Szulecki *et al.* (2016) did, based on different theoretical approaches.

First, the authors list a set of theories linked to intergovernmentalism that focus on the Member States as the main actors and holders of power in Europe. These studies emphasize the problems associated with the difficulties and obstacles in relinquishing sovereignty in a particularly complex area such as energy. Wettestad *et al.* (2012: 67) highlight, with respect to these theoretical currents, that the Member States still detain a central position in the energy discussion and that they have only carried out transfers of power to the European institutions if their national interests are not threatened.

Second, the theoretical currents linked to supranationalism and neo-institutionalism, based on the original perspective of European integration functionalism, highlight the capacity of the European institutions, especially the Commission, to set the political agenda at European level. This is to pave the way for the construction of the Energy Policy and to develop the Energy Union proposal.

Finally, the authors highlight a third theoretical approach called "governance-oriented" that includes dynamics and processes distinct from the others. On the contrary, they are capable of being analysed together to obtain a comprehensive understanding of energy problems in the European Union. In accordance with this approach, the authors emphasize how political processes in the EU transcend the multiple scales and levels between actors that make up its complex framework. Furthermore, they highlight the participation of "specific interest groups". In the latter, Wettestad *et al.* include the considerable autonomy of the European Commission to propose and promote solutions at European level, questioning a multiplicity of public and private actors, the subnational ones standing out (Wettestad *et al.*, 2012).

The "governance-oriented" approach represents a fundamental theoretical tool to analyse the role of European institutions like the European Commission, Member States and subnational actors, particularly Smart Cities, in the treatment of the energy problems of the block. Without neglecting the national level in the European Union, this approach allows an in-depth analysis of the way decentralized cooperation between subnational entities contributes in practice to approaching the energy objectives outlined by the European Commission with the Energy Union proposal.

The theoretical contributions of Wettestad *et al.* guide research on decentralized cooperation between subnational entities in energy matters. They enable analysing their



alignment with the guidelines proposed by the European institutions, in particular by the European Commission.

Undoubtedly, inquiring about the problems (in this case energy) that occur in the EU in the 21st century cannot avoid the practice of decentralization that has been taken place recurrently for approximately four decades. Not considering the actions of subnational actors, and for the purposes of this article, the role of Smart Cities in particular, implies a biased and limited analysis of the current situation in the European Union regarding renewable energies.

II. Decentralized cooperation between Smart Cities in the European Union

In the EU, international action by cities and decentralized cooperation and relationships through international networks are practices usually chosen by subnational actors to shore up their local development challenges.

Indeed, local projects focus their attention on endogenous issues. In this sense, they are key so that the particularities of each problematic situation can be identified in detail and appropriate solutions can be found in accordance with local characteristics.

Specifically, energy issues, being eminently endogenous problems, constitute a recurring theme in projects and initiatives carried out through decentralized cooperation in the European Union.

Decentralized cooperation represents a paradigm of international cooperation that differs from the traditional assistance and top-down approach. According to this new modality, cooperation actions are guided by the principles of horizontality, reciprocity and symmetry between partners.

In addition, social, cultural and political factors are incorporated as key conditioning factors for the development of the feasibility and durability of the projects. In this sense, the incorporation of actors from various sectors, on the one hand, and the principle of multilaterality, on the other, are key in decentralized cooperation.

The modalities of decentralized cooperation are varied and include a wide spectrum of practices that go beyond the mere transfer of financial resources for the execution of programmes and projects. For example, the experiences of technical assistance, technology transfer, exchange of experiences and good practices, training of human resources, and institutional development stand out.

These modalities can also be classified according to the type of initiative (Hourcade, 2011: 59):

- Long-lasting: twinning or long-term cooperation agreements
- Ephemeral: projects limited in time or specific interventions
- Common Projects: involving various actors and requiring specific interventions on particular topics
- Networks: systematized works not limited in time



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- Strategic alliances: focusing on national and regional agendas
 - Networks of political representation and lobbying: with the purpose of defending the interests of local actors and to promote municipalism in the global sphere.

Decentralized cooperation is a fundamental tool in the design of international relations strategies of subnational actors in the European Union. It allows combining the approach to local problems and endogenous development with the search for regional solutions in a synergy with a vast set of actors that face similar challenges, have similar resources and propose similar alternatives.

Within the framework of the EU, subnational actors have become true agents of international cooperation and, consequently, have given rise to a characteristic modality, which is decentralized cooperation. Over the last three decades, EU institutions have played their role as agents of endogenous development. Consequently, subnational actors began to be formally recognized as central parties in the EU's projects and actions.

For the treatment of problems that transcend borders and represent true transnational challenges, decentralized cooperation is an alternative with multiple benefits for subnational actors in a context marked by the political limitations imposed by the sovereignties of Member States to address energy issues.

Energy challenges represent a fundamental issue that throughout the 21st century has repeatedly driven the initiatives of a large number of decentralized cooperation actions of EU subnational actors. Indeed, energy issues have been a constant from the 1950s to the present day for European institutions. Although it has always represented a political priority, it did not receive formal legislative treatment until the entry into force of the Lisbon Treaty. Since the dawn of the integrationist process in the European Union, the relevance of the energy sector has been underlined. Although it was not formalized in primary law *per se*, it has been present in the treatment of adjacent policies such as internal market policies.

The limitations imposed by Member States reluctant to give up sovereignty quotas in an area considered strategic hampered attempts to transcend the traditional nationalist approach in dealing with the energy issue. Indeed, the connection of energy policies with the national security of the Member States is an unavoidable feature.

Both the Energy Policy in 2009 and the proposal of the Energy Union in 2015 represent significant advances. It means that the energy issue can be addressed with an approach oriented to common solutions according to the intentions of the European institutions, in particular the Commission. Even so, energy challenges, the limitations linked to the political commitment of the Member States and the reaffirmation of the protection of their national competences in energy matters, represent tensions that complicate the approach promoted by Brussels.

According to Granato y Oddone (2010: 237)

"the establishment of specific channels of international cooperation, particularly through decentralized cooperation between cities, aims to



stimulate international action by cities with the goal of building development from a bottom up perspective”.

In this sense, the emergence of subnational actors as political protagonists with capacity for autonomy and initiative in the EU is inextricably linked to international linkage practices and the first experiences of decentralized cooperation in Europe. Since the end of World War II, the participation of subnational actors in international dynamics and, more precisely, in decentralized cooperation programmes and projects, have progressively spread and consolidated as recurring practices.

Since the 1980s, a juxtaposition of factors such as globalization after the fall of the Berlin Wall and the intensification of domestic state reform processes, encouraged experiences of international relations between subnational actors from a new cooperation paradigm (Hourcade, 2011: 51).

Undoubtedly, the global trends that the Complex Interdependence theory had begun to refer to since the end of the 1970s, such as the multiplicity of international link channels and the rise of issues associated with low politics, supported a new paradigm of international cooperation that began to take hold in the eighties.

The de-hierarchization of the international agenda and the intermingling of domestic and international processes contributed to the consolidation of subnational actors on the international scene as protagonists driving local development. It also helped to strengthen international cooperation as a pertinent practice for the treatment of localized problems.

In this sense, Grandas Estepa (2011: 53) states that

“Decentralized cooperation has emerged as an alternative in which a wide range of action possibilities converge. It directly involves society in active participation, perceives the needs of the population and contributes to the strengthening of democracy and processes decentralizers that have given greater autonomy and power to local entities, considered as an important part of a development process”.

Along the same lines, Pinto da Silva (2011: 169) warns that cities have become leaders in territorial innovation processes and that decentralized cooperation is a facilitating way for cities to transform these technologies into efficient tools for the solution of local problems.

The development in the practice of novel cooperation modalities mobilized by subnational actors motivated the search for definitions and a legal framework by the European institutions. So much so that, in the 1990s, the European Commission defined decentralized cooperation as

“a new focus on cooperation relations that seeks to establish direct relationships with local representative bodies and stimulate their own capacities and project and carry out development initiatives with the direct participation of interested population groups, taking into account their interests and their views on development” (European Commission, 1992).



Through this definition, the subnational and local levels of government began to be formally endorsed as the relevant agents of this new scheme of international cooperation by the European institutions.

It is important to highlight that decentralized cooperation in the European Union can be analysed from two approaches: from an extra-bloc perspective based on its link with development cooperation and the capacities of European subnational actors in relation to partners from countries outside the EU; and from an intra-bloc perspective, between subnational actors of the EU, where practices and dynamics acquire a particular aspect and refer to endogenous development problems, such as energy issues.

Although both approaches allude to practices executed in different territories (outside or within the EU), the extra-bloc and intra-bloc perspectives certainly share the characteristics and guiding principles of decentralized cooperation as a renewed paradigm different from traditional cooperation. However, both approaches must be distinguished because the aims pursued and the resources adopted refer to two dissimilar situations.

A large part of the definitions and concepts implemented by EU institutions since the 1990s refer to decentralized extra-bloc cooperation, focusing on international practices with countries with a different development situation. On the other hand, when referring to the decentralized cooperation processes and actions that take place within the bloc, EU institutions have resorted to the decentralization approach.

The European Commission distinguishes four phases in the trajectory that European institutions have experienced in dealing with decentralization that have influenced considerations associated with decentralized cooperation:

- “Development projects at local level” (1980 - mid-1990s): support of micro-projects promoted by the community, mainly in the area of rural development and provision of local infrastructure. This is a stage characterized by the lack of systemic understanding of the participation of the European Union.
- “Evolution towards actor-based approaches and reflection on systems” (mid-1990s-2010): represented by growing institutional interest in supporting decentralized cooperation practices through a first generation of projects aimed at subnational actors as participants keys. The themes were expanded to include social cohesion, local economic development, environmental sustainability and internally displaced people.
- “Recognition and incorporation of the perspective of subnational actors in cooperation” (2005 onwards): based on the growing international recognition of subnational actors as development actors, it promoted the review of previous agreements; creation of thematic financial instruments; formulation of specific communication; launch of thematic programmes, etc.
- “Reconnection of decentralization and development through territorial approaches” (from 2013): evidence of a clear qualitative leap in the way of linking decentralization, development and subnational actors that drives the development of a coherent strategy. (European Commission, 2016: 10)



Although the extra-bloc and intra-bloc perspectives of decentralized cooperation in the EU share a large set of essential characteristics with respect to the definitions and concepts used, it should be noted that they represent two diverse approaches that require being nuanced and contextualized.

The intra-bloc perspective of decentralized cooperation is associated with the concept of "subnational integration", that is, the exercise of decentralized intra-regional cooperation, conceived to reinforce integration ties (Ventura and García Fonseca, 2012: 51). These authors warn that decentralized cooperation would help to strengthen regional integration. At the same time, integration could contribute to legitimizing the decentralized cooperation process as there is no conflict between both processes, and that complementarity would be a strategy for deepening integration.

To meet the research objective of this article, the intra-bloc perspective is fundamental to analyse renewable energies projects and actions within the framework of decentralized cooperation between Smart Cities in the EU. This is because it refers to practices within the EU and directly to local development problems.

II.1. The role of Smart Cities in decentralized cooperation in energy matters in the European Union

In recent years, cities began to be directly challenged to deal with energy problems. Coll (2014: 2) argues that cities, conceived as the fundamental socio-economic, cultural and political organizational systems of the 21st century, are in the best position to address local challenges through the provision of public services and the implementation of educational, economic, security, energy, and mobility policies. According to this author, in the policy design and implementation phase, they are actors with advantages as they identify directly the details of local problems.

Throughout the 21st century, European cities have had to face the challenges caused by the effects of globalization and decentralization. This is in addition to the dynamics of the integration process of which they are part, such as the increase in urban population and pollution, the vicissitudes of climate change, the scarcity of natural resources (Russo *et al.*, 2014) and energy challenges.

According to these authors (Russo *et al.*, 2014: 1), the new challenges combine issues related to competitiveness and sustainable urban development simultaneously. In their analysis, the authors also list a series of indicators to account for the scope of urban problems in the European Union: for example, they warn that the level of urbanization is above 75%, with expectations of growth at a 80% by 2020. They also highlight that energy consumption exceeds 70%, with a considerable percentage of greenhouse gas emissions.

In particular, the Smart City paradigm began to gain attention in the European Union for the unique way in which energy issues are understood and addressed from an efficient and sustainable perspective that differentiates it from the traditional management of



urban resources. Specifically, it invests explicitly on the implementation of renewable energies as part of the solutions in its projects and actions.

Regarding the definition of Smart City, it should be noted that there is vast literature regarding this new paradigm of the city in the 21st century. According to Villarejo-Galende (2015: 17),

“Since the appearance of the concept and due to the popularity it has aroused in the media, high expectations have been created in the business, political, and even academic world, undoubtedly encouraged by the impulse received from the European Commission”.

According to the European Parliament (2014: 17), a city can be defined as smart,

“when investments in human and social capital and in transportation and ICT infrastructures contribute to sustainable economic development and improve the quality of life, with a rational management of natural resources, through a participatory government”.

The Smart City model acts as a facilitator and promoter within the framework of decentralized cooperation in energy matters in the European Union for two main reasons: on the one hand, due to the characteristics of the Smart City model; on the other hand, due to the very nature of energy challenges. The combination of both reasons provides a favourable context and great potential for the development of projects and actions carried out through decentralized cooperation.

Indeed, in this scheme, the projects and actions resulting from decentralized cooperation in the EU have a unique treatment when they are executed by actors whose perspective on the efficiency and sustainability in the management of resources transcends local limits and favours joint practices with similar transnational partners to achieve solutions in synergy.

Thus, the Smart City model implies a redefinition on how local challenges are perceived and their solutions are provided. It must be added that energy challenges represent a problem that cannot be limited to a specific place. Therefore, solutions cannot be defined in isolation without considering a comprehensive set of actors in the bloc.

In fact, energy challenges are not limited to national borders. They represent a transnational challenge that requires coordinated, consistent and joint treatment by a wide spectrum of levels and actors in the European Union. The approach to energy challenges conducted by European institutions is outlined regionally and tries to involve the entire bloc in order to make the transition to a new energy system in accordance with the proposal of the Energy Union.

With regard to these issues, decentralized cooperation represents a viable alternative for Smart Cities in the European Union. They fulfil their own local energy objectives in tune with other actors in the bloc that have similar characteristics. These are based on the exchange of successful practices that promote a sustainable and efficient management model that can be replicated on a regional scale.



In accordance with the decentralized cooperation modalities previously listed, with regard to EU Smart Cities, the exchange of good practices and the use of networks of this type of cities stand out.

Regarding the first modality, the publication and dissemination of good practices with concrete experiences of each Smart City in energy matters represent a resource frequently implemented from a top down perspective by European institutions (mainly the European Commission³). From a bottom-up perspective, it is done by networks of subnational actors⁴. This modality will be exemplified with concrete cases in the next section.

Although each city represents a singular unit with specific problems, the Smart City model tends to ensure that, in general terms, energy objectives and priorities are similar in the European Union, regardless of the particularities of each case and as long as they promote the efficient and sustainable management of energy resources. In other words, the Smart City model does not exist in practice as such; it is rather an ideal type that cities tend to follow through the efficient and sustainable management of their resources. Thus, the dissemination of good practices as a form of decentralized cooperation helps subnational actors to achieve their energy objectives guided by the Smart City model.

The second modality of decentralized cooperation, city networks, represents another of the resources frequently chosen by Smart Cities in the EU. According to Granato and Oddone (2010), the articulation in associative networks occurs when two or more local governments agree to carry out policies that are translated into concrete actions. Each performs one or more specific tasks in relation to horizontal cooperation with the other participating local governments in order to strengthen the development of one or more public policies. Just to mention one case, we can highlight the Covenant of Mayors, launched in 2008 with the aim of voluntarily bringing together subnational governments to contribute to the fulfilment of the energy and climate objectives of the European Union. City networks will be analysed in greater depth in the next section.

Decentralized cooperation, either through the exchange of good practices or through city networks, allows Smart Cities to work directly on local energy problems without incurring the political cost associated with addressing energy issues in national terms. In this sense, the local gives more legitimacy to decentralized cooperation projects and actions in energy matters and promotes an approximation of approaches with partners, avoiding the political limitations of the Member States.

The positive externality of this decentralized cooperation scheme in energy matters between Smart Cities results in a kind of interconnection of energy models by fostering certain types of practices. By promoting sustainable and efficient management of resources, it ultimately contributes to the transition of the bloc's energy systems, as encouraged by the Energy Union proposal.

³ Within this group of reports, "The Making of a Smart City: Best practices across Europe" (2017), published by the Smart Cities Information System (SCIS) stands out. It is a platform for the exchange of information, experiences and know-how and for collaboration between Smart Cities. The initiative is supported by the European Commission.

⁴ Within this set of reports, the online database of the Covenant of Mayors is included, in which the experiences and good practices of a large group of localities in the bloc are shared. Retrieved from <https://www.covenantofmayors.eu/plans-and-actions/good-practices.html>



II.2. Renewable energy projects and actions within the framework of decentralized cooperation in the European Union

Over the last decade, there has been a proliferation of projects and actions dedicated to energy issues in the European Union. In a context of political limitations imposed by the sovereignty of the Member States in energy matters and the energy challenges of the Energy Union, “windows of opportunity” have been opened for the treatment of energy problems by subnational actors, especially Smart Cities.

In order to obtain a comprehensive understanding of decentralized cooperation between Smart Cities in energy matters, this section will examine a series of concrete proposals and initiatives that were carried out in the European Union in recent years.

Within the vast spectrum of energy issues, for methodological purposes we opted to focus the analysis on the case study of renewable energies. The reason for this lies in the fact that there is a large set of ongoing energy projects. In order to delve into a particular case study and to analyse the information qualitatively and in greater detail, the projects and actions dedicated to renewable energies will be exclusively addressed. It is an indicative and significant object in the efficient management scheme and sustainable use of resources as promoted by the Smart City paradigm. Furthermore, it is a fundamental factor wielded by the European institutions to promote the profound transformation of an energy system in accordance with the Energy Union.

III. Smart Cities Information System

The Smart Cities Information System (SCIS) is a platform supported by the European Commission dedicated to the exchange of information, experiences and technical knowledge, whose objective is to collaborate to promote Smart Cities in the EU. SCIS projects and actions are concentrated in three areas: energy, mobility and transport, and ICTs.

The objectives of this initiative are to establish good practices that can be replicated by other subnational actors of the bloc; identify barriers and highlight lessons learned in order to find efficient solutions through the implementation of technology; and, provide recommendations and make suggestions to policy makers.

In 2019, regarding the energy area, fifty-five projects were identified⁵. Within this set, we have selected CITYfIED, GrowSmarter, PITAGORAS, and STORM as they refer to renewable energies. In the selected case studies, the fact that the European Commission has participated with funding of between 50% and 100% stands out.

The objective of the CITYfIED⁶ project is to develop integrated, replicable and systemic strategies to adapt EU cities and urban ecosystems so that they meet the requirements

⁵ The projects are available online at SCIS. Retrieved from <https://smartcities-infosystem.eu/sites-projects/projects>

⁶ The project ran between April 2014 and March 2019. The European Commission financed more than 50%. The pilot cities were Laguna del Duero, Lund and Soma. European cities that have started to adopt the measures were identified in Germany, Italy, Spain and Sweden. Information about the impact of the project is available online. Retrieved from <http://www.cityfied.eu/the-cityfied-project/impacts.kl>



of the Smart City paradigm. The project focuses on reducing energy demand. It promotes renewable energy sources by investing in innovation technologies and methodologies in the construction of houses, power lines and urban heating networks. Basically, the project's strategy involves working in three places that act as pilot cases, generating models that can be replicated by others actors. According to the project's evaluation, the impacts transcended the proposed objectives, achieving positive externalities for the communities where such actions were conducted. Indeed, according to the project's final report, CItYFiED successfully implemented three comprehensive strategies for deep building modification, covering 190,462 m² in the three project cities, involving 2,067 homes. More than 5,700 citizens have benefited. CItYFiED used € 37.8 M to generate a profound impact in the selected cities by reducing energy consumption and greenhouse gases, providing better use of renewable energy sources and it had high social acceptance. Therefore, without limiting itself merely to energy objectives *per se*, the project had social, economic and environmental impact.

The GrowSmarter⁷ project promotes efficient urban solutions based on the development of three cities that have been selected as models. Through the cases of Stockholm, Cologne and Barcelona, the intention is to disseminate a set of twelve efficient urban solutions grouped in three dimensions, among which the incorporation of renewable energy sources for the urban supply network stands out. This project was conducted so that the rest of the cities of the block could have successful models and reference good practices that can be replicated in their own localities. Specifically regarding the energy dimension, the project fosters actions for the remodelling of districts with low energy consumption following the renovation of buildings and electrical management.

Regarding the evaluation of the project, the three cities mentioned attest the effective implementation and validation of the actions in their own territories and promote the dissemination of their practices by making the lessons learned visible. For example, at the 25th United Nations Conference on Climate Change that took place in Madrid in 2019, the GrowSmarter project had a panel to share urban efficiency practices in renewable energy. This meeting resulted in consensus between political representatives from different cities in Spain⁸. In the specific case of Cologne, it has been working with the neighbouring town of Leverkusen on mobility issues since 2019 based on the lessons learned through GrowSmarter⁹.

As for the PITAGORAS¹⁰ project, it focuses on the efficient integration of urban districts with industrial parks based on the development of efficient and sustainable power lines in the cities of Graz and Brescia. The main objective of the project is to disseminate a

⁷ The project ran between January 2015 and December 2019. More than 50% of the funding came from the European Commission. In addition, the project is part of the Horizon 2020 Programme. Since the beginning of the project, an area of 123,000 m² was renovated to improve energy efficiency. The visibility of efforts to save energy consumption generated repercussions for citizens. The results and impact of the project to date are available online. Retrieved from <https://cordis.europa.eu/project/rcn/194441/reporting/es>

⁸ For additional information, check the official communication portal of the project at <https://grow-smarter.eu/inform/blog-updates/blog-archive/?c=search&uid=3eKwPPp6>

⁹ <https://grow-smarter.eu/inform/blog-updates/blog-archive/?c=search&uid=ONaylG0t>

¹⁰ The project ran between November 2013 and October 2017. More than 50% of the funding came from the European Commission. According to the results, electric arc furnaces were replicated in 400 cases in the European Union. The results are available online. Retrieved from <https://pitagorasproject.eu/sites/pitagoras.drupal.pulsartecnalia.com/files/documents/SCISconference2017Tecnalia%20Pitagoras%20project.pdf>



large-scale, efficient, profitable and highly replicable power generation system that allows sustainable urban planning based on low electricity consumption.

The implementation of the technology for these cases was related to the improvement of renewable energy sources, such as solar energy and the seasonal thermal energy storage system. Regarding its potential as a project, PITAGORAS was presented at multiple conferences between 2014 and 2017 in various cities of the European Union, such as Bilbao, Brescia, Belfast, Barcelona, Ostrava, Lyon, Brussels, Milan, and Budapest. The objective was to share knowledge and to disseminate business opportunities among local entrepreneurs, highlighting the importance of building links with the local business sector. Thus, decentralized cooperation tends to intertwine with various relevant actors in the social fabric. In this sense, the political action of the cities directly challenges the productive sector based on the guidelines of projects focused on sustainable and efficient solutions.

Finally, the objective of the STORM¹¹ project is to promote energy efficiency in urban districts through the use of renewable energy sources for producing and storing energy based on learning consumption algorithms. The implementation of this technology allows maximizing consumption performance. The cities selected were Heerlen and Rottne. The benefits of the project can be transferred to a wide range of stakeholders in the European Union and their replication, dissemination and learning contribute to a broad development of this type of energy systems at regional level.

In short, according to the typology previously listed, the cases examined can be considered as Common Projects since they imply specific interventions on specific topics with defined purposes.

The objectives outlined by the four projects are directly related to the intention of generating replications of models and dissemination of successful practices. These imply the propagation of trends and promote a kind of approximation in the approaches and solutions to be implemented by EU subnational actors regarding energy challenges. Decentralized cooperation in these case studies is also linked to the formulation and execution of Common Projects and to the dissemination of good practices through the SCIS platform.

On a different level, the funding of the projects by the European Commission encourages the transition to an energy system that is in tune with the main objectives of the Energy Union proposal. In this scheme, the Smart City paradigm addresses energy challenges, disseminates practices and promotes energy solutions within the framework of the political limitations of the Member States.

¹¹ The project was conducted between March 2014 and August 2018. All funding came from the European Commission. According to the results, a reduction of up to 57% of energy inefficiency was achieved in the cases studied. Project results and impact are available online. Retrieved from <https://storm-dhc.eu/en/storm-controller/final-test-results>



IV. The European Innovation Partnership on Smart Cities and Communities

The European Innovation Partnership on Smart Cities and Communities (EIP-SCC) brings together different cities, industries and citizens with the purpose of improving the quality of urban life by identifying and conducting sustainable and efficient solutions in an integrated manner in the areas of energy, transport and ICTs. Its objective is to catalyse progress in these closely related areas and offer interdisciplinary alternatives to improve services by reducing energy consumption¹².

A wide group of actors, including European institutions like the European Investment Bank, as well as public and private actors, participate in the funding of EIP-SCC projects. Two types of initiatives are currently being carried out: the Lighthouse Projects, which are partially financed by the Horizon 2020 programme; and projects and actions financed by private and public entities (such as the European Structural Investment Fund) with the purpose of disseminating solutions linked to the Smart City paradigm that can be replicated by the rest of the EU subnational actors.

The EIP-SCC aims to generate connections between the private sector and the cities with sources of financing to carry out certain projects. Its objective is to try to overcome the difficulties associated with access to financing. In addition, it acts as a link to develop strategic connections between interested actors so that projects can be executed.

The EIP-SCC created a set of Action Clusters where partners can meet to work on specific issues related to the problems of Smart Cities and exchange experiences. They share the added value of local and national practices and identify the main focuses of attention and steps to follow. The Clusters are organized around different thematic areas and one of them refers to Sustainable Districts, which specifically emphasizes the reduction of energy consumption and environmental impact. The budget to achieve the energy transition and to modernize the infrastructure is significant. Therefore, in order to alleviate this situation, the cities with the greatest difficulties in accessing financing that allow them to achieve energy objectives are identified. Based on this, the EIP-SCC partners use strategies to contribute to the cases with major disadvantages¹³.

Within the framework of EIP-SCC, projects and actions related to renewable energies are conducted, including the Deep Retrofitting Project and the Positive Energy Blocks Project (PEB Project). The first project promotes energy saving in a strategic way by improving the existing stock. It is intended to be launched in 2020 throughout all the countries of the bloc, with the expectation of having at least one case per Member State. The project consists of choosing strategic buildings and, supported by the use of ICTs, helping to reduce their energy consumption through the generation of their own renewable energy. The objective of the second project is to promote the interconnection of three buildings per city that can produce more energy than they consume per year, generating positive energy consumption. This project for the implementation of renewable energy sources will be launched in 2020 and has the support of the European Commission.

¹² Information about objectives and projects is available online from EIP-SCC. Retrieved from <https://eu-smartcities.eu/page/what-eip-scc-marketplace>

¹³ The information regarding the EIP-SCC Action Clusters is available online. Retrieved from <https://eu-smartcities.eu/clusters>



A series of similarities can be found with the projects and actions of the SCIS. On the one hand, within the framework of the EIP-SCC, there is the strategy of generating successful cases and disseminating good practices so that they can be replicated by different subnational actors. On the other hand, it is important to underline the participation of the European Commission as a financier in a context characterized by the difficulty in accessing funds to pay for the projects.

Finally, according to the typology of decentralized cooperation, a series of conclusions can be drawn. In the first place, with regard to the projects themselves, it is possible to affirm that they are once again Common Projects that imply concrete interventions on specific topics. Secondly, the nature of the EIP-SCC as a suitable space for links between multiple actors to solve project financing problems, leads us to consider this case as a kind of strategic alliance by becoming a nucleus that enables relationships between actors. In other words, this space transcends the project planning and diagramming aspect and actually promotes, in a strategic way, the link between actors so that projects can be carried out.

IV.1. The Covenant of Mayors

The Covenant of Mayors for Climate and Energy¹⁴ is a network made up of local and regional authorities on a voluntary basis whose purpose is to locally implement the climate and energy goals of the European Union. The Covenant of Mayors is made up of a consortium of five European city networks: FEDARENE, Energy Cities, Climate Alliance, Eurocities, CMR and ICLEI Europe. It is a bottom-up initiative started in 2008 with the support of the European Commission that currently has more than 9,000 participants.

The Covenant of Mayors adopted the Smart Cities perspective within its scope of action and began to participate in the meetings organized by networks associated with this city paradigm¹⁵. The Covenant's approach allows working towards the development of a standardized model of solutions that can be replicated by other partners. In 2015, after the announcement of the Energy Union proposal, the Covenant of Mayors incorporated a series of objectives to align with the energy initiatives put forward by the European Commission. The approach to the decarbonization of energy sources was deepened and the promotion of resilient cities and energy systems where citizens can have safe, sustainable and affordable access to energy was intensified. In addition, the Covenant committed to comply with the Action Plans for Sustainable Energy and Climate 2030

¹⁴ The European Federation of Agencies and Regions for Energy and the Environment (FEDARENE), created in 1990 defines the strategy of the Covenant of Mayors; Energy Cities is a lobbying network of 1,000 local governments located in 30 countries; Climate Alliance brings together 1,700 members from 26 countries of the European Union, regional governments and NGOs dedicated to the fight for climate change; Eurocities, founded in 1986 by six large European cities (Barcelona, Birmingham, Frankfurt, Lyon, Milan and Rotterdam) is the largest network of large cities in the European Union; The Council of European Municipalities and Regions (CEMR) is the oldest association of local and regional governments that since 1951 has promoted the construction of a democratic, peaceful and united Europe founded on respect for local government, the principle of subsidiarity and citizen participation; ICLEI Europe is an association of local and regional governments committed to sustainable urban development that provides members in Europe, North Africa, the Middle East and West Asia with a voice on the European and international scene. It is a platform to connect with partners and tools to promote environmental, economic and social change.

¹⁵ The information about the Covenant of Mayors' participation in Smart Cities conferences is available online. Retrieved from <https://www.pactodelosalcaldes.eu/informaciones-y-eventos/eventos/eventos-precedentes/2243-smart-cities-and-communities-conference.html>



(which imply a 40% reduction in greenhouse gases) and to implement local actions to mitigate climate change¹⁶.

In order to translate the political commitment into practical and measurable projects, the participants of the Covenant agreed to conduct Action Plans for Sustainable Energy and Climate (SECAPs). These plans specify the actions they plan to take in pursuit of the block's objectives and in tune with the Energy Union.

Briefly, the participants commit to share periodic reports to assess the status of their action plans on an annual basis. Through the Covenant of Mayors platform, the results and impact of each of the actions conducted by the signatory cities can be monitored.¹⁷ Based on the monitoring reports of each signatory, a database with good practices is generated and participants can access it to obtain details about the projects that can be replicated. Detailed information about each of the action plans includes an overview of the project, an inventory of emissions, the action plans themselves (including budget information), progress, key actions, and additional support.

Over the last ten years, the Covenant has capitalized on the experience of an initiative generated bottom-up, based on multilevel cooperation and a framework of action oriented to localized planning. In addition, the participants of the Covenant have benefited from the exchange of successful experiences of the block's partners.

In quantitative terms, the Covenant of Mayors is made up of 9,847 participants, covering a total population of 315,484,544 inhabitants. In addition, it involves 221 coordinators, 31 NGOs, 67 thematic agencies, 96 city networks and 2 strategic partners. Of all the proposed action plans, 180,392 actions have been successfully implemented¹⁸.

In short, the decentralized cooperation that is done within the framework of the Covenant is based on the network nature of this initiative. In this sense, the dissemination of good practices and commitment to the exchange of techniques is one of the more frequent resources. In addition, the financing issue is present and its resolution is supported by the European Commission.

Conclusions

In the European Union, the practices undertaken under the decentralized cooperation paradigm are multiple and varied. Each case must be analysed taking into consideration the context of realization in which it is immersed and, fundamentally, the characteristics of the partners involved. In this sense, one of the basic clarifications consists precisely in specifying the intra-bloc modality of decentralized cooperation in the European Union.

As discussed throughout the article, Smart Cities have essentially resorted to four modalities of decentralized cooperation for the treatment of renewable energies in the

¹⁶ The information about the goals and commitments of the Covenant of Mayors is available online. Retrieved from <https://www.pactodelosalcaldes.eu/sobre-nosotros/el-pacto/objetivos-y-alcance.html>

¹⁷ The information about the particular actions of the participants is available. Retrieved from <https://www.pactodelosalcaldes.eu/planes-y-acciones/resultados.html>

¹⁸ The information about the Covenant of Mayors is available online. Retrieved from <https://www.eumayors.eu/about/covenant-initiative/covenant-in-figures.html>



European Union: city networks, common projects, the exchange of good practices and technical knowledge and, to a lesser extent, strategic alliances.

Although the four typologies have been defined as differentiated practices at the beginning of the article, the analysis of the projects and actions of the SCIS, EIP-SCC and the Covenant of Mayors has shown that the typologies are not exclusive. On the contrary, they are capable of being combined and interrelated to promote the capacities of the actors involved. For example, the participation of Smart Cities in city networks has promoted the exchange of good practices between partners and has frequently encouraged the dissemination of successful models to be replicated by the other actors.

Likewise, the lessons learned in projects such as CITYFiED, GrowSmarter and PITAGORAS were made visible in different forums in various locations. The projects involved a vast group of actors in the social fabric in order to enhance local economic and social capacities from a sustainable and efficient perspective in energy and environmental terms. As a consequence, decentralized cooperation, in its different forms, represents a fundamental tool not only to achieve visibility of practices and knowledge within the framework of the application of local projects, but also to involve several local actors with economic and social relevance.

Ultimately, it is a public management proposal that allows associating local action with local capacities and international experience.

The participation of the European Commission as provider of funds is a salient feature of the different types of projects and actions of the Smart Cities decentralized cooperation regarding renewable energies. The significant presence of the institution contributes to the execution of programmes and actions that, ultimately, are aligned with the proposal to generate a transition to a sustainable energy system according to the Energy Union. In some cases like STORM of the SCIS, the Commission has financed the entire project.

Finally, it is worth noting that, within the framework of decentralized cooperation projects and actions in the field of renewable energies, the Smart City model has acted as a facilitator and promoter of joint solutions for local challenges based on efficient and sustainable management. This is fundamentally due to the very nature of the energy challenges and the postulates related to the Smart City paradigm itself.

In short, the notion that decentralized cooperation is conceived to reinforce integration ties is consistent with the situation of renewable energies in the European Union. In addition, we were able to identify the connection between the problems located at subnational level promoted by the Smart City model, with the proposals designed at regional level from the Energy Union. In this scheme, the treatment of the issue of renewable energies in the projects and actions is representative of how the replication of models and the exchange of good practices are promoted. Similar trends are disseminated with regard to energy management in a sustainable and efficient way in the European Union.

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