



Environmental Sustainability and Energy Transition: Guiding Principles of the New Models of Urban Governance in Pamplona (Spain)

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Abstract. Local governments in European cities are modifying their urban governance models in order to alleviate the impacts of the neoliberal model that has prevailed for decades, and to achieve more sustainable and socially cohesive cities. Cities such as Pamplona (Spain) have become a reference point, both nationally and internationally, for their policies on implementing renewable energies and combating energy poverty. Regardless of the ruling party, a city model that is committed to energy transition prevails. In this article we will analyse the energy improvement project carried out in the social housing neighbourhood of Txantrea.

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Keywords: Environmental sustainability · Energetic transition · Urban governance

1 Introduction

According to the World Bank cities are often seen as contributing to environmental degradation and represent immense ecological burdens (Livingstone 2010). Cities consume as much as 80% of energy production worldwide and account for a roughly equal share of global greenhouse gas emissions (Dodman 2018). As development proceeds, greenhouse gas emissions are driven less by industrial activities and more by the energy services required for lighting, heating, and cooling. The International Energy Agency (IEA) estimates that urban areas currently account for over 67% of energy-related global greenhouse gases, which is expected to rise to 74% by 2030. In this context more than 90% of EU citizens consider climate change to be a serious problem and 80% believe that fighting climate change can boost the economy and create jobs in Europe. There is likewise a consensus on the key ways to undertake

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energy transition, with more than 90% of Europeans favouring public measures to boost energy efficiency and renewable energy production. In fact, 72% consider that there is a need for a common energy policy among EU Member States (Pellerin Carlin et al. 2017). In this sense, the European Union remains firm in its strategy to lead the fight against climate change at a global level and to achieve technology neutrality by 2050, increasing the firmness and ambition of the various decarbonisation targets. The targets for renewable energy (renewable energy as a percentage of the total final energy consumed) and energy efficiency (trend towards a reduction of primary and final energy consumption) for 2030 have recently been set at 32% and 32.5% respectively, compared to the previously set targets of 27% in both cases (Amores et al. 2019; Pellerin Carlin et al. 2017). According to the Energy Transitions Commission, there are five key elements in energy system transitions: secure sufficient energy to support economic growth, end energy poverty and create an unpolluted living environment; reduce greenhouse gas emissions; enable change through new industry structures, standards regulations and financing models; reduce energy use across sectors through innovations; repurchase sources of energy through innovation in new business models and technologies.

More and more municipal level institutions are committed to designing plans that favour sustainability in their cities. Their lines of intervention are mainly focused on achieving environmental sustainability by reducing CO₂ emissions through improved home heating systems, promoting eco-friendly public transport, developing new models of urban solid waste management, improving public lighting, etc. But also by championing energy transition, which consists of a shift from a system dominated by finite (chiefly fossil-based) energy towards a system using a majority of renewable energy sources, also maximising the opportunities available from increased energy efficiency and better management of energy demand (Urban Innovate Actions 2015).

Throughout this article, we will analyse how during the last decade municipal governments have reoriented their urban planning towards more sustainable and energy-efficient models. We will analyse their objectives as well as the barriers they have encountered. Later, we will focus on the city of Pamplona which, together with other Spanish cities such as Barcelona and Cadiz, has decided to create a public energy operator and to implement energy improvement projects in some of its neighbourhoods. Specifically, we will analyse in detail the project implemented in Txantrea, a residential complex built in the 1960s–1970s whose inherent construction deficiencies diminished the quality of life of its residents from the outset.

2 Methodology

We have reviewed the literature on new models of urban governance and sustainability, energy transition, energy poverty and social justice, and urban innovation initiatives to improve the degree of sustainability in the city. We have likewise consulted existing legislation on energy transition in Europe and Spain and the websites of relevant international organisations: World Bank, European Association of Cities in Energy Transition, International Energy Agency, Spanish Association of Environmental Sciences, Municipal Energy Agency of Pamplona and the European Efidistrict project for

the integral energy rehabilitation of the Txantrea District in Pamplona. Furthermore, throughout 2018–2019, semi-structured interviews were carried out in Barcelona, Cadiz and Pamplona with political and technical leaders of the city council. Through them, we have been able to discover firsthand the lines that define their new models of governance and their main priorities when it comes to mitigating the negative impacts derived from the economic crisis, such as energy poverty. We also interviewed officials from the Municipal Energy Agency of Pamplona. Finally, the fieldwork carried out in the Txantrea neighbourhood has allowed us to directly observe the improvements made through the implemented energy transition projects and to know the opinion of the local residents.

3 Urban Sustainability and the Paradigm Shift in Governance Models

Sustainability as a guiding principle in urban planning requires a reorientation of the trends that have governed aspects of social, economic and political life in cities (Bridges 2016). It entails technical, organisational and institutional changes (Frantzeskaki et al. 2017) and a new model of governance –a model characterised by nine principles: transparency, consensus, equity, responsiveness, effectiveness and efficiency, accountability, rule of law, participation and strategic vision (European Commission 2001). In the new governance, the implementation of public policies is the final product of decisions and actions of the different stakeholders, where the role is a model that is committed to the integration between public institutions, business and the private sector, non-governmental organisations and citizens. Relations between them develop horizontally, breaking the traditional hierarchical implantation (Gudelis and Guogis 2011). In this process the public sector is responsible for coordinating initiatives and favouring the ideal macro-technological environment to attract investment and population; the private sector contributes capital and business appearance; and the citizens play an active role in the design and improvement of their city or neighbourhoods (Bin Abdul et al. 2009) (Table 1).

All these principles will be key when designing a sustainable city model. The extent to which sustainability ideals are institutionalized depends on a sound analysis that helps to form new understandings of the ways in which human-environment systems are coupled – and how this coupling should inform governance action in support of sustainable urban development (Bridges 2017). In this sense, most European cities have included sustainability as a meta-objective in their urban and economic redevelopment strategies. Urban elites are in search of a ‘sustainability fix’ to ensure the strengthening of the competitiveness of the city by improving the quality of life and respect for the increasingly restrictive European and national environmental requirements, without threatening the good business climate created during the 1990s. Consequently, the environment is increasingly considered as an extra-economic factor of urban growth and as a tool to enhance urban competitiveness (Béal 2012).

Opposite to the neoliberal model in which cities were managed as entrepreneurship (Harvey 1989) instead of responding to the needs of citizens, a new type of city model is envisaged. Gone is the urban polices that promoted the privatisation of basic

Table 1. Nine principles of urban governance.

Principle	Application
Transparency	Economic, statistical information on projects and objectives achieved for citizens
Consensus	Coalition of interest between urban government, business sector and citizens
Equity	Initiatives that favour intra-urban social and territorial cohesion. Reduction of vulnerability
Responsiveness	Promote decentralisation processes Definition of roles and responsibilities of different stakeholders and levels of government operations in urban projects
Effectiveness & Efficiency	Projects in line with the needs and wishes of the population A more integrative approach, one that goes beyond the boundaries of the different departments
Accountability	Reducing inputs for the same outputs Reducing prices for the same outputs Getting greater outputs or improved quality for the same inputs Getting proportionally more outputs or improved quality in return for increase in resource (UK Local Government Department 2006)
Rule of law	Promote initiatives that favour the achievement of the objectives established in the law and framework documents
Participation	Permeable governance structures Bottom-up and top-down strategies to favour active citizen participation
Strategic vision	Enduring projects that continue over time despite potential changes in municipal government

Source: European Commission (2001), Schönberger (2013), Piñeira et al. (2019)

services, and the urban growth model characterized by a deregulation, a weak political accountability and the absence of an effective administration (Lois et al. 2016a, b; Sassen 2001a, b). Now local governments are committed to a regenerative city, off-setting the high consumption patterns of conventional cities, and regenerating parts of the biosphere that have already led to limits being exceeded; and a liveable city, ensuring opportunities for people to flourish, to provide citizens with security, health, culture and commerce (Thomson and Newman 2018). But this model is grounded within a restorative ecological world view (Girardet 2010) that requires urban design, urban renewal and circular economy approaches that recognise cities as complex systems and promote sustainable urban transformations (SUT), which encompasses both sustainable urban structures and environments and (radical) economic, social, cultural, organizational, governmental and physical change processes (McCormick et al. 2013). SUTs relates to different urban sustainability issues, ranging from poverty, over-population, unhealthy housing conditions, inadequate infrastructure, hygienic problems, poor water quality and uncontrolled pollution, etc. (Ernst et al. 2016). Problems that require long-term, focused governance approaches and flexible, adaptive, and thoughtful policy designs that emphasize deliberation, probing, experimentation, and learning (Hamann and April 2013; Van den Bergh et al. 2011).

In this context numerous European cities that are championing a new sustainable city model based on economic efficiency, citizen welfare and environmental protection, in which energy transition towards the use of renewable energy and integrated power generation in the city are seen as the key factors of change. Four characteristic advantages of such distributed energy systems include the ability to: offer low to zero carbon emissions; offset capital-intensive investments for network upgrades; provide local energy independence and network security; and motivate social capital and cohesion (Kammen and Sunter 2016a, b). It is a model in which the control of energy is not a privilege of large energy companies, but a citizen's right, where local administrations or even households can own their energy and therefore produce it, consume it and market it freely and at a fair price.

Cities such as Naples, Grenoble, Turin, Bristol, Plymouth, Nottingham, Barcelona, Pamplona and Cadiz have been working for several years to ensure affordable housing, green energy and public water supply, and to win other battles against neoliberal policies (Burgen 2019). In 2020 there are already more than 9,347 cities in the European Union, with an aggregate population of 238,353,400 people, who have signed the Pact for Climate and Energy and have proposed an action plan to cut CO₂ emissions by at least 40% by 2030 and increase resilience to climate change. However, these initiatives are not implemented at the rate they should be. There are numerous limitations that stop them. At EU-level, four elements have been identified (CIRIEC 2018):

- The legal instrument concerning common rules for the internal market in electricity, implemented by the national government through laws which are very restrictive. In the Spanish case, and even though Spain is a world leader in photovoltaic energy, the government established the “Sunshine tax” in 2015, although it did not go into effect until 2018. This tax was a lien that forced consumers of self-regulated renewable energies to pay a supplement to contribute to the energy industry. The reasoning behind the tax was that even if people were generating their own energy, they were still hooked up to the power grid, and should therefore contribute to its sustainability and maintenance.
- EU legislation on public procurement: Directive 24/2014 of 26 February 2014 on public procurement restricts the possibility for municipal energy companies to supply electricity to the population to a maximum of 20% of its activities, while previous legislation (Directive 24/2004/EC) allowed selling up to 50%.
- EU legislation on State aid: EU State aid legislation does not allow community energy companies to differentiate tariffs between customer categories due to continuously rising energy costs, giving the market access to only larger, “free market” companies.
- EU austerity policy: this prompted national governments to amend legislation to bring it in line with debt and deficit requirements.

In addition to these obstacles, there are others of a more local nature. Through legal directives and guidance documents, the EU seems to be able to influence urban planning - which is the responsibility of the municipality -, establishing common objectives to tackle energy problems. It seems to forget the complexity in including energy issues in urban planning: multiple actors, different scales, long-term

implications and uncertainty in the processes, methods and basic definitions (Cajot et al. 2017). On the other hand, the fact of having limited installation space is a challenge for achieving a balance between the energy demand of cities and the density of energy available from renewable sources. The need to innovate technologically to be more efficient, together with the fact that the most people in the city live in apartment blocks, complicates the installation of solar panels on the roof of a building. Most blocks house a mix of owner-occupiers and tenants, and in some countries/cities there is still no legal framework for people living in apartments to share energy generated from communal solar panels.

Some of these obstacles can be circumvented. The dissemination of good practices can lead to a change in policies and programs at the national level or in networks that seek to promote sustainable urban development (Bulkeley 2006). That is why to accelerate the energy transition and based on the practices of its members, the European Association of Cities in Energy Transition has presented proposals organised in five strategic areas: empowering local actors, knowing the resources and flows of territories, rethinking financial solutions, inventing a new local government, and urbanising as a way to reduce energy use. Examples of good practice can be found in Germany, where the *Energiewende* policy for the transition to low-carbon energy has encouraged re-municipalisation in more than 280 municipalities since 2000. In the UK, Bristol has established a District Heating scheme; Oxford is developing a large-scale low-carbon energy transport infrastructure; Birmingham has improved energy and carbon efficiency in 60,000 homes and schools; Nottingham has set up an energy company (Robin Hood Energy), and Plymouth, an energy community organisation. In France and Italy, the *Positif* and MLEI Padova FIT projects are aimed at the energy renovation of existing buildings. In Spain, with 15% of the population living in energy poverty and with an increase of 83% in energy prices since 2013 (Steinfort 2019), the social emergency –non-payment of bills and cuts in supply– has led to the emergence of social movements such as the Alliance against Energy Poverty in Catalonia and Navarre. In the latter, the “Guarantee of Basic Supplies” platform has called for a law to prevent cuts in electricity, water or gas in homes that social services have deemed are in a situation of proven need (Martínez Lorea and Martínez Sordoni 2017). On the other hand, among pioneering cities in the implementation of energy transition, Barcelona, Pamplona and Palma de Mallorca stand out for having created new municipal electricity companies. Cadiz is also at the top of the list for having involved residents in writing fairer energy policies, and the city has its own power company founded in 1929 (in which the city council has a 55% stake). From 2017 the city has supplied all municipal requirements and around 80% of households with energy from renewable sources.

Thus, all these interventions are an example of a change in urban governance in which the forms of innovation and experimentation are being organized to govern particular situations, creating an “experimentation policy” where the government of urban sustainability is increasing its importance (Bulkeley et al. 2017).

4 Pamplona: A Municipal Government Committed to Energy Transition

According to the Deloitte Report, 70% of Spain's population live in cities, which consume 40% of the final energy (in the building and road transport sectors) and are responsible for 70% of total GHG emissions. Of these city-related emissions, 20% are generated by the main sectors (building, road transport and waste); 10% are indirect emissions (derived from the generation of electricity and refining necessary for consumption in cities); and 40% are produced outside the city, but are necessary to obtain and transport the products consumed there (Amores et al. 2019).

In this context, Pamplona has embarked on a re-municipalisation of energy systems. Sustainability is a top priority for the city's government, regardless of the political party in power. The city council has set up a municipal energy operator which will initially supply the city's lighting, as well as public buildings and equipment, and later supply private buildings. The aim is to get the city to supply itself with green energy. There have also been a series of new urban development policies which go hand in hand with the rehabilitation of the consolidated urban fabric, the promotion of energy sources, and the fight against energy poverty. According to the exploratory study for the fight against energy vulnerability carried out by the city council, 50% of the city's housing stock needs improvement interventions. In 2015 the city council granted 233 economic aid packages to families in social emergency situations that could not afford to pay for energy supply; these families were concentrated in four neighbourhoods: Rochapea (21.46%), Mendillori (12.88%), Etxabakoitz (12.02%) and Txantrea (11.16%). Specifically, the latter was one of the districts chosen for rehabilitation and energy improvement. These initiatives have been supported by the Regional Government of Navarre, which since 2015 has subsidised up to 40% of investments over 30,000 euros in order to improve the energy efficiency of heating networks for communities of homeowners and proprietors of commercial premises whose supply proceeds from a central energy source. As part of this aid, Provincial Decree 61/2013 has also been amended, regulating protectable actions in the area of housing, increasing the percentage of aid from 40% to 50% of the maximum amount that can be subsidised (from 6,000 euros to 7,500 euros), and reducing the minimum investment from 6,000 to 4,000 euros. These grants for thermal enclosures are available to those homeowners' associations that agree to carry out the work in a coordinated manner.

4.1 EFIDISTRICT: An Urban and Energy Rehabilitation Project in the Txantrea Neighborhood

La Txantrea is a mid-20th century working class neighbourhood, a prototype of social housing. It has 8,883 homes, 71% of which (6,335) were developed between the 1950s and 1980s. Most of the dwellings were affected by deficiencies in thermal insulation, since it was not until 1979 that the basic building regulations on thermal conditions in buildings were approved by Royal Decree. By all measures it was considered an optimal neighbourhood for implementing the European Efidistrict Project, which falls

within the Intelligent Energy Europe program (Horizon 2020). The institutions in charge of managing it are the Regional Government of Navarre and Nasuvinsa, a public housing and urban planning company of the regional government which obtained financing for 75% of the total cost. Its objective is to achieve the integral regeneration of the neighbourhood by developing measures that favour and improve energy savings in buildings, implementing heating systems that operate with renewable energies, and improving residents' living conditions. Its lines of action are focused on three areas:

- Achieve a reduction in energy consumption and therefore in energy demand. The actions carried out are aimed at solving the thermal insulation problems of buildings. A commitment has been made to improve this situation, since the poor quality or poor condition of the buildings was causing energy loss from windows, doors, floors and façades. The renovation work has focused on the thermal insulation of the façades –by External Thermal Insulation System or Ventilated Facade–, insulation in the holes of the blinds, replacement of window frames and windowpanes, and insulation for roofs and ceilings on lower floors. This provides greater internal comfort in the home and a reduction in energy consumption. Some estimates have been presented on the energy consumption and savings afforded by thermal insulation, even halving the energy consumption of a house. It is expected that with the installation of individual control systems and the renovation of the heating network, energy savings could reach 70%.
- Renovate the thermal infrastructure of the neighbourhood. Currently, it has different heating cooperatives consisting of the centralisation of energy production through a boiler that serves a group of buildings and homes. The thermal network dates from the 60s and 70s, and due to its age presented problems in conservation, maintenance, regulation and control, since it did not adapt to current regulations. The actions included renovating the installations and incorporating regulators and individual energy consumption meters (Table 2 and Fig. 1).

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Table 2. Dwellings affected by improvement actions

Heating District	No. dwellings (improved)	Year of construction	Typology
Orvina I	272	1964–1968	GF + 4
Orvina II	1,200	1971	GF + 6 to GF + 9
Orvina III	704	1973	GF + 6 to GF + 8
Txantrea	1,602 (947)	1951–1963	GF to GF + 3
San José	596 (460)	1954–1956	GF + 1 to GF + 4
San Esteban	432 (368)	169–1972	GF + 4
Santiago	627	1969–1972	GF + 3 to GF + 4
Casas Herrera	182	1972	GF + 4

Source: Financial Model Design Efidistrict. GF (Ground Floor) + (no. floors)

- Create a new heating network powered by renewable energy. This will have a thermal power plant fed by biomass and a new distribution network that will connect the plant to the points of consumption (boiler rooms and heating

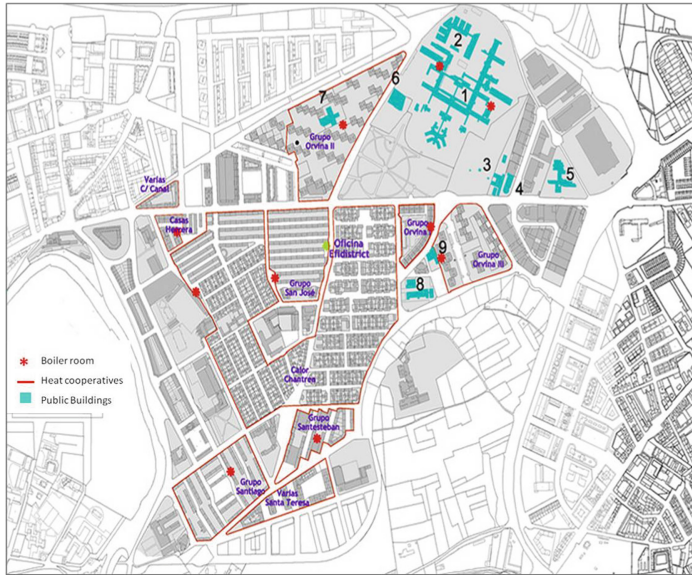


Fig. 1. Heating cooperatives in Txantrea neighbourhood.

substations) of the heat clusters. The biomass plant, driven by Nasuvinsa, will be developed in two distinct phases. It is estimated that it will provide service to more than 4,500 homes in the neighbourhood, as well as to public and service buildings, and that it will result in a savings of between 5% and 10% on the bill. It is expected to operate with 90% renewable energy of local origin: forest biomass in the case of Navarre, as 70% of the forest mass of the region is publicly owned. The total cost is estimated at more than 12.5 million euros, of which Nasuvinsa is covering 6.5 million euros from the Operational Program of the European Regional Development Fund 2014–20 for Navarre. The other 6 million is being covered by the ENGIE company as the concessionaire of the plant for 25 years.

The environmental, economic and social benefits derived from the project have encouraged support from different levels of government and citizens. In relation to the latter, it is worth noting that throughout the process of neighbourhood improvement and energy transition, neighbourhood participation has been a key element. A project office was created in the neighbourhood from the beginning so that residents could request information and assistance. In addition, numerous informative meetings were held with representatives of the heating cooperatives, as well as with neighbourhood residents. Once work began, the informative meetings or agreements were made at homeowners' meetings or at the work commissions. The latter were created with the representation of different residents by block for the purpose of discussing issues related to the execution of the work and the drafting of the project. Finally, we should mention the creation of a follow-up commission where all the actors involved in the project –institutional (regional government, city council), technical (property administrators, technicians of the

cooperatives) and citizens– were brought together in an effort to ensure that the entire process was transparent and clearly understood (Fig. 2).

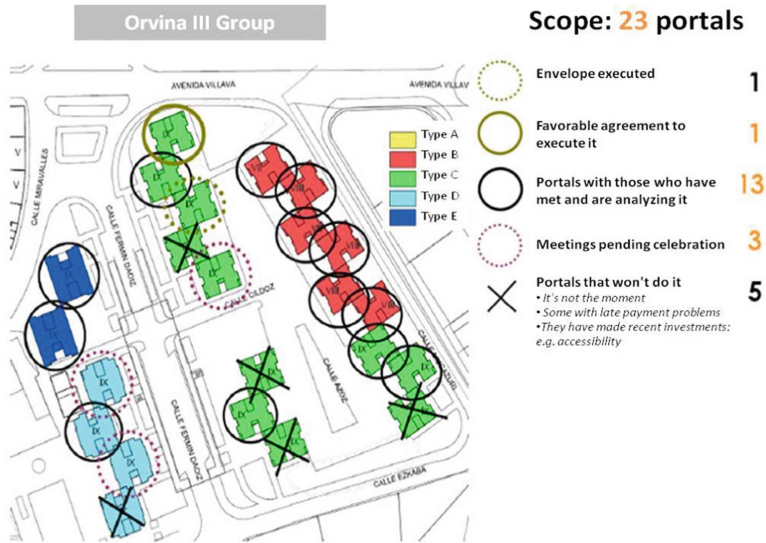


Fig. 2. Example of a heating cooperative showing meetings and agreements.

5 Conclusions

Local governments are aware that it is necessary to develop a new model of governance that advocates sustainability and the welfare of citizens. But this can only be achieved by leaving behind past practices and focusing on innovative policies that can tackle the challenges of energy and water efficiency, reduce waste generation, and improve existing recycling systems.

City governments are increasingly demonstrating what can be done in cities. The progress made in energy policy, efficiency and renewable energy systems over the last two decades has been significant and has meant a real change. However, they are still insufficient. The practices that today are considered innovative in some European cities must become the norm, both in everyday politics and in economic regulation and legal mandates. Only in this way will energy transition become a reality. Pamplona is on the right track. Its commitment to renewable energies as a government agreement that continues over time, together with the implementation of energy improvement projects in various neighbourhoods in collaboration with the residents, has changed the image of the city council. Currently, citizens perceive it as an institution with which they can work. Thus, there are two areas in which Pamplona has become a state reference: energy equality and energy transition.

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