



POCITYF

Building & Grid Retrofit Regulatory Framework

D1.3: Building & Grid Retrofit Regulatory Framework
WP1, T1.2

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Executive Summary

General Outline

In order to bring the plans developed within POCITYF to reality, the regulatory framework is essential. Regulatory barriers may prevent projects from being implemented or affect the business case for the project so strongly, that the project developer loses interest in the project. Therefore, taking into account the regulatory framework from the beginning of each project is necessary. This Deliverable elaborates the regulatory framework applicable to the projects in the POCITYF Lighthouse Cities, Alkmaar and Évora. It also covers to some extent the legal situation of the Fellow Cities to the POCITYF project, as a start of the Replication Plans for these cities.

This deliverable aims to clarify the legal framework related to the creation of positive energy districts, and applicable to the lighthouse and fellow cities. It covers the international and EU legal context but also the national and even city-specific law applicable to the Lighthouse Cities, including the experiences from practice in this project over the past few years. This analysis has been done in close cooperation with Work Packages 6 and 7 for the respective lighthouse cities. The legal/regulatory analysis, as applied to the pillars of POCITYF, and the experiences from practice, also feed into Work Package 8, where the FCs can use the insights in their replication plans, to provide examples of what works and what holds back projects.

The main conclusions of this Deliverable are the following:

Legal and Regulatory Framework under Continuous Development

One of the most significant findings in the legal and regulatory framework is that it is under continuous development to facilitate the energy transition. On the international level, the Paris Agreement gives a strong push for countries and organisations such as the EU to work on ambitious legislation. In turn, major legislative developments are happening in the context of EU-law: the implementation of the Clean Energy Package and on top of that, the introduction of the Fit-for-55 Package that will be adopted in the coming year (2022-2023). On a national level, the Netherlands is in a major legislative revision, with the development of a Spatial Planning & Permitting Act, Energy Act as well as a new Heat Act. In Portugal, the recent DL 15/2022 streamlines the licensing procedures for (renewable) energy projects and brings many different rules on energy communities and self-consumption together in one comprehensive legal document.

The seemingly continuous development of the legal framework creates tension, in the sense that business cases may have to be changed if new rules are adopted, and as some projects are delayed because developers are waiting for new legislation to be enacted. Still, a positive element is that new insights can be adopted in legislation relatively quickly. EU legislation already steers towards local energy initiatives (Citizen Energy Communities and Renewable Energy Communities) that can play an essential role in the development of Positive Energy Districts. As soon as they are well implemented in national law, they can be used in practice. Identified barriers in the current legislation can also be addressed relatively quickly in this way. That is already an experience from the first version of this Deliverable (2020) to the second version (2022): that some of the identified barriers are already solved by now and that issues that were previously not regulated (for example in the context of energy trading among citizens) are now addressed in legislation.

Still, adapting and revising the legal framework is not a panacea: the implementation of PEDs is still dependent on many different factors, such as the development of technology, the costs of implementation (and the division of these costs between actors), the willingness of citizens to participate. These issues are addressed in the pilot projects of POCITYF as well, but reach beyond the scope of this deliverable.



Protection of Heritage Buildings and City Areas as a Barrier in Practice

A second finding relates to monumental buildings, protected city areas, etc. These buildings and areas are often well protected under the national (and local) regulatory framework, with a view to conserve their features for future generations to enjoy. This may lead to friction with the targets for the energy efficiency of buildings as set on EU and national level. This calls for local and regional authorities to develop concrete guidelines on how the interests of heritage conservation can be respected while these buildings are renovated and made more energy efficient, as envisaged in POCITYF. POCITYF aims to address and demonstrate how the balance between these two interests needs to be struck, also because the interests are weighed differently by different entities.

The standards for renovation for buildings are high, which calls for creativity and innovation at the side of the project developers. In this way energy solutions may very well fit with the historic features of the buildings.

As permitting issues are an important potential barrier, this calls for a more coordinated approach, for example in the form of guidelines on how local permitting authorities should decide on renovations in the context of the energy transition. In this regard, (local and national) authorities and experts should re-think what is and what is not acceptable in the context of the energy transition. For example, the installation of solar panels will undoubtedly have a visual impact on buildings and districts. However, these historical buildings used to have no electricity either, and the streets in historical districts used to be free of cars, both introduced only in the 20th century. A broader discussion on what types of innovation are allowed in historical buildings in the context of the energy transition would help to set the standards for the 21st century.

Replication of Projects: the Legal Framework Cannot Simply Be Transplanted

A third and last finding relates to the following cities and replication of projects. An important pillar in POCITYF is that the solutions developed in Évora and Alkmaar are replicated in other areas: both within these cities but also in the other cities (following cities), and when solutions prove to be successful, perhaps also in other areas and cities that are not part of the project.

As was expected, the national and local legislation plays a large role in how energy solutions can be implemented. This means that even when a solution can be copied and replicated in another area from a technical perspective, it might be harder to reach a positive business case with the same solution but in a different legal/regulatory environment. Even within one country, it might be difficult to replicate solutions to different cities where the local rules are slightly different. That is why in replication plans the legal/regulatory context should be taken into account from an early phase onwards. This will allow project developers and local authorities to make small amendments to the plan so it fits the local (and national) legal/regulatory environment.



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List of Abbreviations

AC	Alternating Current
ACC	Collective Self-Consumption (PT)
ACER	Agency on the Cooperation of Energy Regulators
ACM	Authority for Consumers & Market (Dutch NRA)
ADENE	Agency of Energy (PT)
AEEGS (ARERA)	Authority on Gas, Electricity and Water (IT)
ARPA	Regional Authority for Environmental Protection (Bari)
ASL	Local Health Authority (Bari)
BACS	Building Automation and Control System
BBL	Local Building Regulation (NL)
BEMS	Building Energy Management System
BENG	Almost Energy Neutral Building (NL)
BIC	Assets of Cultural Interest (ES)
BIPV	Building-integrated solar photovoltaic panels
CE	Certification for Admittance to the Internal Market
CEC	Citizen Energy Community
CEEAG	Climate, Energy and Environmental Aid Guidelines
CEER	Council of European Energy Regulators
CEI	Energy Council Standardisation Norms (IT)
CHP	Combined Heat Power Cogeneration Installations
CIEG	Costs related to sustainability and general energy policy (PT)
CIESC	Special Consumption's Tax Code (PT)
CILA	Formal notice of commencement of works (IT)
CME	Municipal Council of Évora (PT)
CTE	Technical Building Code (ES)
CTN	Technical Committee for Standardisation (ES)
CU	Consumption Unit (IT)
DB-HE	Technical Standard (ES)
DC	Direct Current
DGEG	Directorate-General of Energy and Geology (PT)
DIA	Declaration of commencement of activities (IT)
DL	Decree Law (type of Act)
DM	Ministerial Decree (type of Act; IT)
DRC	Regional Directorate for Culture (PT)
DSO	Distribution System Operator
EC	European Commission
EED	Energy Efficiency Directive
EERB	Energy Efficiency Regulation of Buildings (GR)
EIA	Environmental Impact Assessment
ENEL	National Entity for Energy (IT)
ENTSO-E	European Network of Electricity Transmission System Operators
EPBD	Energy Performance of Buildings Directive
EPC	Energy Performance Certificate
ERSE	Regulatory Authority for Energy (PT)
ES	Electricity Storage
ESCO	Energy Service Company
EU ETS	EU Emissions Trading Scheme
ETT	Energy Transition Track
EU	European Union
EV	Electric Vehicle
FC	Following City (within the structure of the POCITYF project)



FSC	Development and Cohesion Fund (IT)
GBER	General Block Exemption Regulation
GD	Distributed Generation (IT)
GDPR	General Data Protection Regulation
GHG	Greenhouse Gas
GME	Electricity Market Operator (IT)
GMLDD	Guide for measuring, reading and data in the electricity sector (PT)
GRIN	Feed-in-premium (IT)
GSE	Authority that regulates renewable energy production (IT)
GW	Gigawatt
HEDNO	Hellenic Electricity Distribution Network Operator (GR)
HV	High Voltage
ICOMOS	International Council on Monuments and Sites
IEA	International Energy Agency
IGESPAR	Institute for the Management of Architectural & Archaeological Heritage (PT)
IPCHS	Institute for the Protection of Cultural Heritage (SV)
IRC	Corporate Income Tax (PT)
IRS	Personal Income Tax Code (PT)
ISO	International Standardisation Organisation
ISP	Tax on electricity, gas and carbon-based fuels (PT)
ITC	Complementary Technical Instruction (ES)
IU	User Facility (PT)
KPI	Key Performance Indicator
KW	Kilowatt
LH	Lighthouse City (within the structure of the POCITYF project)
LISTA	Law promoting the sustainability of the Andalusian territory (ES)
LOE	Law on Building Ordinances (ES)
LOUA	Urban Planning (ES)
LPHE	Cultural Heritage (ES)
LV	Low Voltage
MGP	Daily Electricity Market (IT)
MI	Intraday Trading (IT)
MS	Member-State
MSD	Continuous trading of daily electricity products (IT)
MSP	Mobility Service Provider
Mtoe	Million Tonnes of Oil Equivalent
MV	Megavolt
MVA	Megavolt Ampere
MW	Megawatt (MWt = thermal megawatt)
NEN	Dutch Standardisation Norm (NL)
NRA	National Regulatory Authority
PAI	Hydro-geological assessment plan (IT)
PAS	Nitrogen Programme related to environmental law (NL)
PEB	Positive Energy Block
PED	Positive Energy District
PEPC	Special Protection Planning Instrument (ES)
PEPRI	Special Protection Planning Instrument (ES)
PGOU	General Spatial Planning (ES)
PMG	Minimum Guaranteed Value in the support scheme (IT)
PPTR	Regional Land and Environmental Plan (IT)
PRG	Local Legal Instrument in Bari (IT)
PUE	Évora Urbanization Plan (PT)
PUN	Single National Electricity Price (IT)



PUTT	Thematic Land and City Plan (IT)
PV	Photovoltaic (Solar Cells)
PZ	Protection Zone (PT)
RAE	Regulatory Authority for Energy (GR)
REC	Renewable Energy Community
RED	Renewable Energy Directive; RED Electrica - Spanish TSO
RES	Renewable Energy Sources
RJUE	Local Juridical Regime for Urbanization and Construction (PT)
RVS	Raad van State, Highest Administrative Judge (NL)
SCE	Subsidy Scheme for Energy Cooperations (NL)
SCIA	Simplified type of building licence with a shorter procedure (IT)
SDG	Sustainable Development Goal
SEN	National Energy Strategy (IT)
SESIAD	Secretary of State for the Information Society and the Digital Agenda (ES)
SG	Smart Grid
SME	Small- and Medium-Sized Enterprises
TERNA	Italian TSO
TSO	Transmission System Operator
TW	Terawatt
UN	United Nations
UNE	Spanish Association for Standardization (ES)
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNI	Technical Standard (IT)
UP	Production Unit (IT)
UPAC	Self-consumption Unit (PT)
UVA	Virtual Unit for Measuring Electricity (IT)
UVAC	Virtual Unit for Measuring Electricity Consumption (IT)
UVAM	Virtual Unit for Measuring Electricity Production and Consumption (IT)
UVAP	Virtual Unit for Measuring Electricity Production (IT)
VAT	Value Added Tax
WP	Work Package
ZNO	Cultural Heritage Protection Act (SL)
ZSROVE	Act on the Promotion of the Use of Renewable Energy Sources (SL)



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1. Introduction

POCITYF focuses on positive energy buildings and districts within various cities in the EU. Various innovative plans have been developed, for example with regard to peer-to-peer energy trading and smart energy storage. A common challenge within the various POCITYF cities and districts is how to involve cultural heritage buildings in the energy transition. This is one of the focus points of POCITYF. This introduction focuses on the scope, objectives and expected impact of the legal deliverable that lies before you, as well as providing the structure and relation to other activities within the project. For a general introduction into the project, please refer to the website www.pocityf.eu, where all information on the different parts of the project can be found.

1.1. Scope, objectives and expected impact

In order to bring the plans developed within POCITYF to reality, the regulatory framework is essential: projects can only proceed when fitting within the regulatory framework. Often, whereas projects are technically possible, there are regulatory issues that prevent projects from being implemented, or that affect the business case for the project so strongly, that the project developer loses interest in the project. Therefore, it is important to involve the regulatory framework from the beginning. By providing a comprehensive overview of the restrictions and potential obstacles, the project partners can anticipate on possible regulatory issues in the implementation of their plans.

This Deliverable identifies the legal/regulatory framework to the plans developed in POCITYF. The development of the plans is work in progress, but the scope of the project is clear: (1) positive energy buildings (including retrofit of monumental buildings); (2) the integration of these buildings in a smart grid with storage solutions and including not only electricity but also flexible and sustainable heating and cooling; (3) the integration of e-mobility into the grid; and finally: (4) citizen-driven co-creation and community engagement. Out of these four topics, the deliverable will focus on the first three, since there are hardly any legal documents on the fourth topic, except for the specific spatial planning procedures that are already dealt with under the first three topics.

It is clear that the projects planned within POCITYF span a wide range of topics. Therefore, this Deliverable gives a broad overview of the laws that may be applicable. For every national legal framework, the Deliverable follows the same structure of energy law (including the rules on innovative energy solutions and electric vehicles), construction law, cultural heritage law and local rules and regulations.

The objective of this deliverable is to give a comprehensive overview of the existing legal framework on international, EU and national/local level; to collect insights into how the legal framework influences the project and to identify potential restrictions and barriers in the existing legal framework in relation to the project. This serves as a basis to provide recommendations to the relevant authorities on how the legal framework should be amended in order to facilitate future PED projects, thereby indirectly contributing to replication of the solutions in other cities.

The expected impact is to create awareness of the legal and regulatory issues with regard to the realisation of a PED, which will help authorities and project developers to shape their project plans in a way that fits with the regulatory framework. This contributes to a reduction of regulatory issues that may arise at later stages in the project. From a regulatory perspective, the expected impact is that lawmakers are aware of the barriers in current legislation and that they take the recommendations along in revising the legislative framework.



1.2. Relation to other POCITYF activities

This Deliverable highlights the regulatory barriers that might affect the implementation of the POCITYF project solutions in Évora (WP6), Alkmaar (WP7) and the replication by the fellow cities (WP8). By providing a comprehensive overview of the restrictions and potential problems, the project partners can anticipate on possible regulatory issues in the implementation of their plans. This Deliverable also serves as input for the replication plans of the following cities (WP8). The findings from the different cities will again help to shape the final recommendations regarding the legal and regulatory framework at the end of the project.

1.3. Structure of the deliverable

This Deliverable elaborates the regulatory framework applicable to the projects in the POCITYF Lighthouse Cities, Alkmaar and Évora. The regulatory framework consists of three layers: international law, addressed in chapter 2 of this Deliverable, EU law, addressed in chapter 3 of this Deliverable, and national/local laws, addressed in respectively chapter 4 and 5 for Alkmaar and Évora (discussing the applicable national energy, construction and heritage law and the applicable local obligations). The first two layers, international and EU law, are also applicable to the Following Cities (FCs) in POCITYF. The third layer, with country or even region-specific law, is only applicable to the Lighthouse Cities themselves, but could also be applied to other cities in the same country (except regarding the local obligations). The third layer is also useful for the FCs, to provide an example of what works and what holds back projects. This may help project participants in the FCs to advise on how their regulatory framework could be changed in order to stimulate the creation of positive energy districts (PEDs). In chapter 6, the Directive also includes a preliminary investigation of regulatory barriers in the FCs, provided by the POCITYF partners of the FCs. Finally, in chapter 7, preliminary take-aways for the regulatory framework are provided.



2. International Law

International law forms the basis for the regulatory framework of the two other layers, EU and national/local law. For example: the Paris Agreement sets the goal to limit climate change to 1,5 - 2 degrees Celsius. The EU and the Member-States have stepped up their efforts in order to comply with the 'Paris target' and implement it in their laws with more concrete goals. These feed back into the international sphere, where all national/regional efforts are registered and monitored again. Although international law can be abstract, the obligations from international law have a concrete impact on POCITYF:

Why?

Why do cities and buildings need to be transformed into positive energy districts and neighbourhoods? Or more generally, why do societies need to change their energy consumption and production? This is because the vast majority of states agreed in the **Paris Agreement** that they would commit themselves to limit harmful climate change, which means, more concretely, that the emission of greenhouse gases needs to be limited. In this way, international environmental law creates a positive effect on the realisation of PEDs. Moreover, creating PEDs also fits very well with the sustainable development goals that are adopted by the UN, namely to strive for clean and affordable energy for all and to create liveable cities.

How?

When it comes to decreasing the energy consumption of buildings, there are many ways that could be followed, depending on the local climate and the technical and societal characteristics of the building. Within POCITYF, special attention is given to cultural heritage buildings and districts. For these buildings, it is important that the historic/heritage characteristics are taken into account in energy efficiency measures as well. The obligations from **international cultural heritage law** influence how municipalities assess retrofitting plans for cultural heritage buildings.

Who?

This project is not only about the energy-renovation of buildings and districts but also about the people who are living or working inside these buildings - the people who are affected most by the projects. They should benefit from the measures taken inside the POCITYF project. Energy costs represent a significant cost for households, especially for low-income households. If the costs of energy can be brought down by making Positive Energy Districts, this can reduce energy poverty in these districts. This is in line with the obligations states have with regard to **human rights**, especially the right to adequate housing and putting an end to poverty.

These three pillars (international environmental law; cultural heritage law and human rights law) represent the three subchapters of this chapter.

2.1. International Environmental Law

International Environmental Law encompasses several different topics related to the relation between humans and their environment, both on a local scale (e.g. pollution of the local environment, use of local resources) and on a global scale (e.g. climate change and the implications thereof). In this section, first, the Paris Agreement will be discussed, entailing commitments for the states that ratified it with regard to limiting their CO₂ emissions. Then, sustainable development and specifically the sustainable development goals (SDGs) will be discussed. Finally, attention will be paid to protection of the ozone layer, as the refrigerants used



in many innovative energy solutions have a negative impact on the ozone layer and should thus be handled carefully.

2.1.1. The International Fight Against Climate Change

Over the past decades, the sense of urgency to limit the effects of climate change has increased significantly, with the conclusion of United Nations Convention on the Framework for the Prevention of Climate Change in 1992,¹ the Kyoto Protocol in 1997,² and the conclusion of the Paris Agreement in 2015.³ In the Paris Agreement, states have committed themselves to limit climate change to well below 2 degrees Celsius. Moreover, they have committed to increasing the ability to cope with the consequences of climate change, such as heat, prolonged periods of dry weather, floods and storms. For both the mitigation of climate change to a value well below 2 degrees Celsius and the adaptation to changing climate conditions, there is an important role for the built environment.

The Paris Agreement has been signed and ratified by all EU states and by the EU itself. Thus, all POCITYF partner countries are bound by the measures in the Paris Agreement. Whereas the Paris Agreement does not include norms that are directly applicable to the POCITYF project, the obligations states have based on the Paris Agreement should serve as a basis for further action on EU and national level, which includes the adoption of norms for the integration of renewable energy in the electricity system and the improvement of the energy performance of buildings, as well as making buildings more resilient to the consequences of climate change, such as extremely warm summers (increasing the need for cooling). Thus, indirectly, the Paris Agreement is at the basis of many measures that are taken in the context of the POCITYF project.

2.1.2. Sustainable Development

Sustainable development, and sustainability in general, are currently often-used terms. The concept became widely known after publication of the Brundtland report (*Our Common Future*) in 1987.⁴ In this report, sustainable development is defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” Since, the concept has been elaborated further, for example through the introduction of the triple bottom line (the three P’s): people, planet, profit (later replaced by ‘prosperity’),⁵ which should be in balance in order to achieve sustainable development.

In 2015, the UN adopted the 2030 Agenda for Sustainable Development. One part of this was the adoption of 14 ‘Sustainable Development Goals’ (SDGs). These goals aim to bring sustainable development on many different themes, in all countries. Two SDGs are specifically relevant for the POCITYF project. SDG 7 entails the right to clean, affordable and modern energy for all, and SDG 11 aims at sustainable cities and communities, which means that they should be inclusive, safe, resilient and sustainable. The SDGs are elaborated in sub-goals, such as access to electricity and the total share of renewables in the final energy consumption (for SDG 7), and access to public transport and air quality goals (for SDG 11). The plans envisaged within POCITYF will contribute to attainment of these goals in the participating cities.

¹ UNFCCC, New York, 9 may 1992,

https://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conven_g.pdf.

² Kyoto Protocol to the UN Framework Convention on Climate Change, Kyoto, 11 Dec 1997,

<https://unfccc.int/resource/docs/convkp/kpeng.pdf>.

³ Paris Agreement, concluded in Paris on 12 December 2015, available at

https://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf.

⁴ World Commission on Environment and Development: *Our Common Future* (the Brundtland report), available at <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>.

⁵ Introduced in 1994 by J. Elkington,



2.1.3. Protection of the Ozone Layer

Another relevant but very specific subject of international climate law concerns the instruments to protect the ozone layer. This legislation is relevant as it concerns refrigerants, an indispensable part of heat pumps and climate control systems (air-conditioning) for buildings. Some refrigerants used in heat pumps and climate systems have a strong negative effect on the ozone layer, which means that they should be handled carefully. As various POCITYF demo projects have innovative heating systems, refrigerants may have to be used.

In international law, the use of substances that have a harmful effect on the ozone layer have been regulated since the 1980s. The Vienna Convention for the Protection of the Ozone Layer, concluded in 1985, and the Montreal Protocol on Substances that Deplete the Ozone Layer (the Montreal Protocol),⁶ concluded in 1987, set rules on which refrigerants may be used and under which conditions they may be used, with the aim to protect the ozone layer and to limit the use of substances that deplete it. The Montreal Protocol has been updated several times to include new types of refrigerants. The rules on refrigerants for heat pumps and climate systems are taken over into EU law,⁷ and should thus automatically also apply to the POCITYF project.

2.2. International Cultural Heritage Law

One important aspect of POCITYF is the attention paid to cultural heritage buildings and the inclusion of such buildings in positive energy districts. For cultural heritage buildings, the interests of conserving the specific characteristics of the building and the interests of the energy transition are not always in line and need to be carefully weighed against each other. In international law, the Granada Convention provides for the protection of architectural heritage on the European continent. Moreover, there are various institutions created by international law that have a specific role in the conservation of cultural or architectural heritage buildings and that may also be useful for POCITYF.

2.2.1. Granada Convention on Architectural Heritage

The Granada Convention on Architectural Heritage,⁸ adopted by the Council of Europe, is relevant for those projects within POCITYF that aim to renovate cultural or architectural heritage buildings. An important insight from the drafting procedure of this Convention is that the value of heritage buildings lies in their being used, which makes the heritage accessible to people and which protects buildings against decay.

Within POCITYF, the cultural heritage districts and buildings are in fact already being used for various functions - either as public buildings, as office buildings or as buildings with a residential function. POCITYF does not aim to change the function of the buildings, but rather the energetic performance of the buildings. Nevertheless, the Convention does provide for some rules that are also still relevant for POCITYF.

Provisions from the Granada Convention that are relevant for POCITYF are:

⁶ Vienna Convention for the Protection of the Ozone Layer, Vienna, 1985, U.N.T.S. I-26164 ; Montreal Protocol on Substances that Deplete the Ozone Layer (the Montreal Protocol), Montreal, 1987, U.N.T.S. I-26369.

⁷ European Commission, Report from the Commission on barriers posed by codes, standards and legislation to using climate-friendly technologies in the refrigeration, air conditioning, heat pumps and foam sectors, COM/2016/0749 final, available at:

<https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A52016DC0749>.

⁸<https://rm.coe.int/CoERMPublicCommonSearchServices/DisplayDCTMContent?documentId=09000016800ca436>



- That Parties to the Convention take measures to protect architectural heritage, and to include supervision and authorisation procedures (art. 3 and 4)
- That they provide financial support for maintaining and restoring of architectural heritage buildings (art. 6)
- That they undertake measures to promote the general environment in the surroundings of monuments, within groups of monuments and sites (art. 7)
- That they adopt integrated conservation policies which
 - o include the protection of the architectural heritage as an essential town and country planning objective and ensure that this requirement is taken into account at all stages both in the drawing up of development plans and in the procedures for authorising work;
 - o promote programmes for the restoration and maintenance of the architectural heritage;
 - o make the conservation, promotion and enhancement of the architectural heritage a major feature of cultural, environmental and planning policies;
 - o facilitate whenever possible in the town and country planning process the conservation and use of certain buildings whose intrinsic importance would not warrant protection within the meaning of Article 3, paragraph 1, of this Convention but which are of interest from the point of view of their setting in the urban or rural environment and the quality of life;
 - o foster, as being essential to the future of the architectural heritage, the application and development of traditional skills and materials (art. 10)
- That they undertake to foster the use of protected properties in the light of the needs of contemporary life and the adaptation of old buildings for new uses (art. 11)
- That they undertake to foster effective cooperation at all levels between conservation, cultural, environmental and planning activities (art. 13)
- That they establish appropriate machinery for the supply of information, consultation and cooperation between the authorities, cultural institutions and associations and the public (art. 14)
- That they develop public awareness of the value of conserving the architectural heritage (art. 15)
- That they coordinate their conservation policies on a European level, by means of information exchange on amongst others “the ways in which they need to protect the architectural heritage can best be reconciled with the needs of contemporary economic, social and cultural activities” (art. 17) and that they undertake to afford mutual technical assistance in the form of exchanges of experience and of experts in the conservation of architectural heritage (art. 18).

It must be noted that these provisions are very general in nature. All depends on the implementation of the measures by national and regional authorities in the countries. For all countries involved in POCITYF, the Granada Convention has entered into force, either through ratification of the treaty or through accession at a later stage or succession of another country that originally signed the treaty.⁹ This entails that these countries are bound to the Convention and, since the Convention entered into force in 1992 for most countries, that they should have implemented these rules in their national laws and/or policies by now.

⁹ www.coe.int provides a database of Conventions and legal acts by countries with regards to these conventions.



2.2.2. International Institutions and Knowledge-Sharing

Next to the protection of cultural heritage on the European continent, there are also various institutions on an international level which can be helpful in sharing knowledge on how cultural heritage buildings can be adapted to become more sustainable. In that regard, two institutions that are founded by international law are noteworthy.

First, UNESCO (the United Nations Educational, Scientific and Cultural Organisation) seeks to build peace through international cooperation in education, sciences and culture (including cultural heritage). UNESCO has a role in protecting world heritage, and it also has a programme on the development of ‘sustainable cities’,¹⁰ which may be useful for POCITYF partners for the purpose of gaining knowledge from other sustainable cities or for sharing the knowledge gained in POCITYF for the benefit of other cities with sustainable ambitions.

Secondly, ICOMOS (the International Council on Monuments and Sites), founded in 1965, is a relevant organisation. It is an associate partner of UNESCO and its aim is cultural heritage conservation of both tangible and intangible heritage, including monuments and groups of buildings.¹¹ The Council provides for knowledge-sharing through various working groups and fora. One of the themes is cultural heritage and sustainable development, and within that theme, sustainable development in urban areas is highlighted specifically.¹² Here, again, the relevance for POCITYF lies in the exchange of knowledge and best practices, with POCITYF cities profiting from the knowledge from other cities and bringing the knowledge gained in the POCITYF project to the benefit of other cities.

2.3. Human Rights Law

As mentioned before, POCITYF is not only about making an energetic change to buildings, but also to deliver the benefits of the energy transition to the people living or working inside the buildings that lie within the scope of POCITYF. Therefore, several aspects from human rights law are also highlighted in this regulatory overview. First, the concept of ‘energy poverty’ is elaborated. Then, the right to adequate housing, as laid down in different instruments, is explained.

2.3.1. Energy Poverty

Although the primary goal of POCITYF is to create positive energy districts/buildings, a secondary goal is to reduce the costs of energy for the citizens of the participating cities. As energy costs rise,¹³ also due to taxation, citizens spend an increasing amount of their income on energy costs, which leaves less remaining monthly income for other costs. This phenomenon is part of the problem of ‘energy poverty’. Improvements in the insulation of residential buildings and installation of solar panels on these buildings can reduce energy costs, although this requires an initial investment that is unavailable to many people. Moreover, for citizens living in rental houses or apartments, there is an extra difficulty: the tenant is not allowed to make structural changes to the building, and thus cannot initiate large scale insulation or installation of renewable energy technologies, whereas the owner of the building is not responsible for the energy consumption. This means that the benefits of investment in insulation and renewable energy generation technologies (to reduce monthly energy costs) do not lie with the person who bears the costs (the

¹⁰ <https://en.unesco.org/unesco-for-sustainable-cities>.

¹¹ https://www.icomos.org/images/DOCUMENTS/Statutes/2018.02.02_Statutes_EN_FR.pdf.

¹² <https://www.icomos.org/en/focus/un-sustainable-development-goals>.

¹³ Eurostat published data on energy prices for households including and excluding taxes. The latest figures are available at:

https://ec.europa.eu/eurostat/statistics-explained/index.php/Electricity_price_statistics and

https://ec.europa.eu/eurostat/statistics-explained/index.php/Natural_gas_price_statistics.



owner of the building). For POCITYF pilot projects including rental houses, this issue needs to be addressed as well. On a broader level, the issue can be solved by introducing requirements in the national legislation concerning rental houses. Additional supporting information on Energy Poverty for any city/municipality in Europe can be found in the Energy Poverty Advisory Hub.¹⁴

2.3.2. Right to Adequate Housing

The right to adequate housing is adopted in various instruments of international law.¹⁵ The right to adequate housing entails the basic concept of “four walls and a roof above your head”, but it can also be interpreted in a broader manner, namely including a certain quality and standard of living.¹⁶ Relevant to POCITYF is that it also includes the availability of resources (including electricity)¹⁷ and protection against the cold and the heat. Another aspect is the affordability of housing,¹⁸ which also includes the costs associated with housing such as the energy bill. Thus, where in the POCITYF project residential buildings are significantly improved, for example by adding insulation and by making the cost of living lower, by reducing the energy bill, this will contribute to the right to adequate housing.

2.4. Conclusion on International Law

International law as discussed above generally has a stimulating effect on the creation of PEDs. International environmental law stimulates states and local authorities to adopt laws and programmes to increase renewable energy and to decrease dependency on fossil fuels. PEDs can be one solution (alongside many others) to reach the climate objectives formulated in international law.

Cultural heritage law creates the framework within which states and local authorities work on the preservation of cultural heritage, including heritage buildings. This leads to national/local laws on the conservation of heritage building, which may restrict the use of certain technologies or even make it impossible to create positive energy building in a heritage building. However, this depends on the local situation, and one important insight from international heritage law is that a heritage building retains its value by being used. Making buildings fit for the 21st century is thereby a challenge supported by the international heritage law framework.

Finally, the interplay between international human rights and PEDs is interesting: rather than focusing only on the technological solutions, an important aspect in PEDs and in the POCITYF project is the social dimension. The standard of living is increased, and local authorities and project developers, by taking into account human rights, can focus on reaching the desired effects of the PED especially for those living in energy poverty or in houses that are in dire need of renovation.

¹⁴ The portal website is: <https://energy-poverty.ec.europa.eu/>

¹⁵ Office of the United Nations High Commissioner for Human Rights, Fact Sheet 21: Right to Adequate Housing, available at: https://www.ohchr.org/documents/publications/fs21_rev_1_housing_en.pdf, p. 11.

¹⁶ Ibid., p. 3-4.

¹⁷ Ibid., p. 8.

¹⁸ Ibid., p. 3.



3. Regulatory Framework under EU law

Considering the large impact that EU law has on many different areas in our society, it can hardly be surprising that there are several areas of EU law that are particularly relevant in the POCITYF project. In that context, four areas of EU law will be treated specifically in this chapter. These areas are energy law, data protection law, and public procurement and state aid law.

Regarding the inclusion of EU energy law in this chapter, the energy sector is an economic sector largely influenced by the EU. The energy sectors of the Netherlands and Portugal are also to a large extent influenced by EU law, through the implementation of various EU Directives and application of various EU Regulations - these Directives and Regulations will be treated below. Therefore, in section 3.1, the different roles created by EU energy law, and the way they are shifting with the energy transition, are elaborated upon. For the context of POCITYF, these are transmission, distribution, generation, consumption and the newly introduced function of ‘aggregation’.¹⁹ Then, the specific rules on smart metering and billing, on demand side management, on the energy efficiency of buildings, and on charging stations for electric vehicles are explained. It must be noted, however, that the rules set in the Directive need to be implemented on national law level. Therefore, it is important to see the EU-based rules in conjunction with the rules elaborated in sections 4.2 and 5.2 on Alkmaar’s and Évora’s regulatory framework.

Although most rules relevant for POCITYF are concentrated in EU energy law, the importance of EU data protection law for the project should not be underestimated. This is because energy management systems, as envisaged to be used within POCITYF, need household energy consumption and production data. These data are personal data, protected by EU data protection law. Therefore, it is important that data collection and use happens according to the standards set by the General Data Protection Regulation. In section 3.2, the rules on data protection law are elaborated upon.

Finally, as part of the buildings in POCITYF are publicly owned buildings, public procurement law is applicable. Moreover, state aid law is applicable where private entities receive benefits from the state, for example through subsidies, grants with favourable conditions or other benefits that they would not otherwise have received. In order to keep a level playing field in the internal market in the interaction between public bodies and private entities, the EU has introduced public procurement law and state aid law. The (national) rules on public procurement and state aid law are fully based on EU law, which is why in section 3.3, public procurement law and state aid law and their applicability to POCITYF are touched upon.

3.1. EU Energy Law

The energy sector has been regulated by EU law for over three decades already, with regular revisions.²⁰ It started with one Directive and one Regulation for the electricity sector, and similarly

¹⁹ Aggregation entails combining the consumption or production patterns (and the flexibility therein) of several smaller consumers/producers in order to create a larger market share. Officially, aggregation is defined as “a function performed by a natural or legal person who combines multiple customer loads or generated electricity for sale, purchase or auction in any electricity market.” Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU, OJ L-158/125, art. 2(18).

²⁰ See H. Vedder, A. Ronne, M. Roggenkamp, I. del Guayo, ‘EU Energy Law’ in M. Roggenkamp, C. Redgwell, A. Ronne and I. del Guayo (Eds), *Energy Law in Europe*, Oxford University Press 2016, 3rd Edition.



for the gas sector, introduced in the 1990s.²¹ Since, the legislation has been expanded with rules on energy efficiency in buildings specifically and more generally in any product, renewable energy and alternative fuels. The main principle of EU energy law, namely the introduction of competition and thus free choice of consumers and producers, requires the separation of networks from commercial activities such as generation and supply (“unbundling”) and non-discriminatory access to the networks. These basic principles are maintained, but in order to allow for new developments such as active consumers or “prosumers”, renewable energy communities and flexibility, new provisions have been introduced.

In this section, the different roles in the energy sector that are relevant for POCITYF are elaborated (3.1.1). Then, various topics that are applicable to specific POCITYF plans are elaborated: the rules applicable to self-consumption, energy poverty and consumer protection, smart metering and billing, flexibility mechanisms such as demand side management, energy efficiency in buildings and charging stations for electric vehicles (3.1.2-3.1.9).

This section is written based on the Clean Energy Package (2019) but with an extra subsection on the impact of the Fit for 55 Package (2021) for Positive Energy Districts (3.1.10) and an extra subsection on the RePOWER EU Plan that was communicated in Q2 2022.

3.1.1. Different Roles in the Energy Sector

In EU energy law, there is a strict separation of ‘regulated’ parts of the sector, and commercial parts of the sector. This is because an important principle introduced in EU energy law in 1996 is the separation of network operation from commercial activities such as the generation and supply of electricity. This separation was introduced in order to improve the internal market in energy, as previously, the entire production chain (generation, transmission, distribution, supply to consumers) was in the hands of vertically integrated companies.²² This separation, called unbundling, was developed further over the years until its current form,²³ which means that networks can only be operated by ‘transmission system operators’ (TSOs) and ‘distribution system operators’ (DSOs).

Ownership of TSOs and DSOs are restricted based on the Directive on the Internal Market for Electricity,²⁴ and on how the Member States implemented this Directive. The exact rules will not be treated here, as it lies beyond the scope of POCITYF, but it is important to make clear that there is a separation of tasks related to the operation of the electricity and gas networks and commercial activities.

The roles and tasks of TSOs and DSOs are described in the Directive. As POCITYF will mainly address local networks in cities/districts, most connections will be at DSO level rather than at TSO level. Therefore, we will focus on the tasks of DSOs rather than TSOs. For DSOs, the tasks as described in the directive are “ensuring the long-term ability of the system to meet reasonable demands for the distribution of electricity, for operating, maintaining and developing under economic

²¹ Ibid.

²² The European Commission dedicated a working paper to the barriers to the internal energy market, which included an analysis of the effects of vertically integrated companies: European Commission, ‘*The Internal Energy Market*’ COM (88) 238 Final. It identified several obstacles to achieving an internal market in electricity, p. 70 and further.

²³ For the history and development of the concept ‘unbundling’ in EU energy law, see T.M. Dralle, ‘The Unbundling and Unbundling-Related Measures in the EU Energy Sector’ *European Yearbook of International Economic Law* [2018 5], p. 21.

²⁴ The most recent rules are to be found in Directive 2019/944, art. 35 (DSOs) and art. 43-46 (TSOs). For a general overview of the current unbundling rules, see H. Vedder, A. Ronne, M. Roggenkamp, I. del Guayo, ‘EU Energy Law’ in M. Roggenkamp, C. Redgwell, A. Ronne and I. del Guayo (Eds), *Energy Law in Europe*, Oxford University Press 2016, 3rd Edition, p. 269 and further.



conditions a secure, reliable and efficient electricity distribution system in its area with due regard for the environment and energy efficiency.”²⁵ Moreover, while fulfilling this task, they need to provide information to the users of their system.²⁶ Interestingly, while DSOs are required to give priority to renewable energy when dispatching energy in their network, they should also act as neutral market facilitator when procuring energy losses.²⁷

Importantly, the balancing of the electricity grid (maintaining the frequency within the prescribed range around 50 Hz) is a task of the TSO, not of the DSO.²⁸ However, it is prescribed that the TSOs fulfil this task in coordination with neighbouring TSOs and with the DSOs connected to their network.²⁹

Another relevant provision for POCITYF, as it introduces energy storage as an important flexibility instrument, is that DSOs (and TSOs alike) are not allowed to own and operate energy storage facilities, except under very specific conditions.³⁰ In principle, the ownership and operation of storage facilities should be left to market entities, and exceptions should only be granted when the storage facility is a fully integrated network component and when a transparent tendering procedure for the storage facility did not lead to any market parties who could deliver the necessary amount of storage capacity.³¹

Finally, another important role in the energy sector is the role of National Regulatory Authority (NRA). As TSOs and DSOs are regulated entities, an entity needs to be established to regulate them, i.e., to check whether they act according to fair conditions for access, to set fair tariffs and whether they are not influenced by any market activities. NRAs are developed by EU law. Already by 1996, national regulatory authorities were established to settle disputes over contracts and negotiations in the newly liberalised energy market.³² They gradually obtained more powers with the 2003 and 2009 Directives.³³ In 2000, the regulatory authorities of 10 countries voluntarily founded the Council of European Energy Regulators (CEER), to cooperate and address cross-border issues.³⁴ In addition to CEER, an official EU Agency on the Cooperation of Energy Regulators (ACER) was established in 2009.³⁵ Although there are no cross-border issues in the POCITYF project, these agencies, CEER and ACER, are relevant for POCITYF, as they can assist in the knowledge exchange between NRAs on topics such as smart energy systems, peer to peer trading etc. In the Netherlands, the task of NRA is fulfilled by the *Autoriteit Consument en Markt* (ACM). In Portugal, this task is fulfilled by *Entidade Reguladora dos Serviços Energéticos* (ERSE).

As mentioned above, other roles in the energy sector that are important for POCITYF are the roles of consumers, which are put at the centre of EU energy law with the legislative revision of 2019, and the commercial roles of generation, trade and supply of electricity and gas. With the energy transition, active consumers with solar cells on the roof of their building may also sometimes produce electricity (and thus shift roles between generating electricity and consuming electricity on a hourly or even 15 min basis). Moreover, some consumers may also actively participate in the

²⁵ Directive 2019/944, art. 31(1).

²⁶ Ibid., art. 31(3).

²⁷ Ibid., art. 31(4) and (5).

²⁸ In the Directive, this is referred to as ‘procurement of ancillary services’, but later it is clarified that this includes balancing services. Directive 2019/944, art. 40(1)a, d and i and 40(4).

²⁹ Directive 2019/944, art. 40(1)a.

³⁰ Directive 2019/944, art. 36, art. 54 and recital 62.

³¹ Directive 2019/944, art. 36(2).

³² Directive 96/92/EC concerning common rules for the internal market in electricity, art. 20.

³³ Directive 2003/54/EC, art. 23, Directive 2009/72/EC concerning common rules for the internal market in electricity, art. 7(3), 10(2), 11(8).

³⁴ https://www.ceer.eu/ceer_about.

³⁵ ACER was created by means of Regulation (EC) No 713/2009 establishing an Agency for the Cooperation of Energy Regulators, OJ L 211, 14.8.2009.



energy market, for example by offering the electricity they generate or the flexibility in energy consumption patterns on the electricity market (individually or via an aggregator). The different roles are explained in more detail below, with a specific focus on the different roles in POCITYF.

3.1.2. Active Consumers at the Centre

With the Clean Energy Package, the consumer has been placed at the centre of EU energy law. Whereas the consumer used to be passive and fully dependent on the energy supplier, more and more consumers have taken an active role, combining small-scale electricity production, for example through solar panels, with electricity consumption at other moments. This active role of consumers is stimulated in EU law through various measures, that will be discussed below.

Before the Clean Energy Package, EU energy law on consumption used to be focused mainly on the protection of households and vulnerable consumers.³⁶ Thus, household consumers and SMEs (small and medium-sized enterprises) should enjoy ‘universal service’, which entails “that is the right to be supplied with electricity of a specified quality within their territory at reasonable, easily and clearly comparable, transparent and non-discriminatory prices.”³⁷

However, household consumers have become more active due to the energy transition, which also needed to be reflected in the legal framework. Already in the 2009 Directive, small-scale electricity production was made possible, but the possibilities for consumers to engage in the energy market have increased significantly since then. Therefore, in the Clean Energy Package, the attention has shifted towards ‘empowering consumers to participate in the energy market’.³⁸ First of all, energy self-consumption becomes a right for consumers.³⁹ Member-States should make sure that consumers are able to “generate renewable energy, including for their own consumption, store and sell their excess production of renewable electricity, including through renewables power purchase agreements, electricity suppliers and peer-to-peer trading arrangements,” without being subject to discriminatory or disproportionate procedures or charges. They should also be able to receive a fair remuneration for the self-generated renewable electricity that they feed into the grid: (remuneration that) “reflects the market value of that electricity and which may take into account its long-term value to the grid, the environment and society.”⁴⁰ When consumers live in apartment blocks, they should also be able to self-consume in a collective way. This is treated further in chapter 3.1.4.

Next to producing electricity, consumers should also be able to participate more or less actively in the energy market, for example by offering their flexibility of demand to the market. If consumers are to participate in the energy market through flexibility of demand, this means that they should be able to receive energy for differentiated prices, high prices when electricity is scarce and low prices when electricity is plentifully available. This is called ‘dynamic pricing’. The Electricity Market Directive requires that Member States “ensure that the national regulatory framework enables suppliers to offer dynamic electricity price contracts” and that they “ensure that final customers who have a smart meter installed can request to conclude a dynamic electricity price contract with at least one supplier and with every supplier that has more than 200 000 final customers.”⁴¹ As this requires implementation in the national legal frameworks, this topic will be treated again in sections 4.1 and 5.1 on the national regulatory frameworks for the two Lighthouse Cities. The Directive also provides for consumer protection, as suppliers are to

³⁶ Directive 2009/72/EC, art. 3.

³⁷ Ibid. art. 3(3).

³⁸ Directive 2019/944, art. 3(1).

³⁹ Directive 2018/2001, art. 21.

⁴⁰ Ibid., art. 21(2)d.

⁴¹ Directive 2019/944, art. 11.



inform their customers of the opportunities *and risks* of dynamic pricing, and they can only use dynamic pricing after customers have given their consent for this.⁴²

Rather than participating directly as end-consumers, consumers can also get together in various collectives, such as renewable energy communities (RECs) and citizen energy communities (CECs), both treated further in chapter 3.1.4. Moreover, they should also be able to engage in contracts with aggregators, who can participate in the energy market on their behalf and aggregate the demand and supply of a larger group of consumers (either households or businesses or a combination of both).⁴³ This can also be of relevance for POCITYF, where aggregators can also act on behalf of entire positive energy districts or blocks.

Finally, customers should not be impeded to act as ‘active customers’ in any way. This provision sums up several of the requirements mentioned earlier, such as that customers should be able to market their own generated electricity, that they should be able to offer their flexibility, either by themselves or collectively, or through an aggregator.⁴⁴ However, an interesting development is that active customers (when they act on the energy market) should also be financially responsible for the imbalances they cause in the electricity system.⁴⁵ This is the case for all market participants, but as consumers were not considered to be market participants before, the responsibility for imbalances was shifted to their supplier. This also had to do with the fact that, before the installation of smart meters, it was not clear which change in consumption patterns was attributable to which household. With the installation of smart meters, this can be shown on near real-time level, making it technically feasible to become responsible for this as well. Now that consumers can participate in a market both from a legal and a technical perspective, the responsibilities that come with this will also lie with these consumers. This is something consumers acting as active market participants should take into account.

3.1.3. Energy Poverty and Consumer Protection

Although current EU energy law stimulates an active role of consumers, by facilitating their investments in solar panels and electric vehicles, many consumers are facing growing concerns about whether they are able to pay the energy bill at all. The problem of energy poverty has been recognised by the EU in 2009 already,⁴⁶ and currently it is addressed as follows. Article 29 of the 2019 Electricity Directive requires Member-States to (i) define a set of criteria for the purposes of measuring energy poverty, (ii) continuously monitor the number of households in energy poverty, and (iii) report on the evolution of energy poverty and measures taken to prevent it to the Commission every two years as part of their Integrated National Energy and Climate Progress Reports, in accordance with Article 21 of 2018 Governance Regulation.⁴⁷

The Governance Regulation, in turn, requires MS to identify the numbers of customers in energy poverty and therefore are required to “[...] establish and publish a set of criteria, which may include low income, high expenditure of disposable income on energy and poor energy efficiency.”⁴⁸ It is remarkable that compared to the 2009 rules, some instruments Member-States used to have in order to contain energy prices, have been removed in the 2019 revision: it seems

⁴² Ibid., art. 11(2) and (3).

⁴³ Ibid., art. 13.

⁴⁴ Ibid., art. 15.

⁴⁵ Ibid., art. 15(2)f.

⁴⁶ For an overview of the legislative treatment of energy poverty in EU law, see M.M. Roggenkamp, L. Diestelmeier, ‘Energy market reforms in the EU: a new focus on energy poverty and energy (in)justice’ in I. Del Guayo, L. Godden, D.D. Zillman, M.F. Montoya, J.J. González (eds.) *Energy Justice and Energy Law* (OUP, 2020).

⁴⁷ Ibid., p. 14.

⁴⁸ Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action, OJ L-328/1, art. 3(3)d.



that the EU prefers to focus on market-based solutions rather than on state intervention based solutions to energy poverty.⁴⁹ However, one can wonder whether monitoring, reporting and waiting for market-based solutions will alleviate energy poverty.

POCITYF can have a positive effect on alleviating energy poverty by making local renewable energy solutions, which reduce the energy bill for external sources of energy, available to a larger group of people - also to people who could perhaps otherwise not afford the initial investment. Moreover, the energy bill is sometimes unnecessarily high due to bad insulation of residential buildings. As POCITYF also focuses on improving insulation in residential buildings, an impact on energy poverty could also be reached there.

3.1.4. Collective Generation and Supply of Electricity

In the energy transition, next to consumers acting individually by installing solar panels on their own roof, the possibility of collective generation and supply of electricity by citizens collectives has come up. The collective generation and supply of electricity, for example via so-called 'energy communities',⁵⁰ is very relevant for POCITYF and will be elaborated below.

The Citizen Energy Community (CEC) and the Renewable Energy Community (REC) are both relatively new additions to the EU energy law framework. The CEC comes from the recast Electricity Directive (Directive (EU) 2019/944), whereas the REC comes from the recast Renewable Energy Directive (Directive (EU) 2018/2001). The two types of communities are similar but not exactly the same. Both can be relevant for the POCITYF project.

CECs are defined as follows:

'citizen energy community' means a legal entity that:

- (a) is based on voluntary and open participation and is effectively controlled by members or shareholders that are natural persons, local authorities, including municipalities, or small enterprises;
- (b) has for its primary purpose to provide environmental, economic or social community benefits to its members or shareholders or to the local areas where it operates rather than to generate financial profits; and
- (c) may engage in generation, including from renewable sources, distribution, supply, consumption, aggregation, energy storage, energy efficiency services or charging services for electric vehicles or provide other energy services to its members or shareholders;

Thus, this legal form allows for an exemption of unbundling for CECs, as they may engage in generation, supply and distribution at the same time. However, CECs do have to comply with the rules on third party access.⁵¹ The Directive requires Member-States to provide 'an enabling regulatory framework' for CECs, which means for example that electricity transfers within CECs are facilitated, that DSOs cooperate with CECs and that Member States ensure that CECs have access to all electricity markets, either directly or in an aggregated form in a non-discriminatory manner.⁵²

⁴⁹ Ibid.

⁵⁰ An impressive report on the (legal) status of energy communities in the EU Member-States can be found in BRIDGE, Task Force Energy Communities, '*Energy Communities in the EU*', Report, December 2019, available at https://www.h2020-bridge.eu/wp-content/uploads/2020/01/D3.12.d_BRIDGE_Energy-Communities-in-the-EU-2.pdf.

⁵¹ Directive 2019/944, art. 6(3).

⁵² Ibid. art. 16.



The REC is defined as “a legal entity:

- (a) which, in accordance with the applicable national law, is based on open and voluntary participation, is autonomous, and is effectively controlled by shareholders or members that are located in the proximity of the renewable energy projects that are owned and developed by that legal entity;
- (b) the shareholders or members of which are natural persons, SMEs or local authorities, including municipalities;
- (c) the primary purpose of which is to provide environmental, economic or social community benefits for its shareholders or members or for the local areas where it operates, rather than financial profits;”

Thus, the differences in definition between the CEC and the REC are that for CECs, the scope of activities is broader, as it covers not only renewable energy projects but also charging of electric vehicles, energy storage and aggregation. However, CECs are limited to electricity whereas RECs may also be based on other sources of energy, such as a local renewable heat project. Another difference is that for CECs, there is no locational requirement, whereas for RECs, the idea is that shareholders or members are located in the proximity of the projects. CECs have a broader scope for participants. Also, whereas for RECs, sustainability is an important criterion, since only renewable energy projects are covered, whereas CECs can also be about non-renewable projects (although for PEDs, a connection with renewable energy is logical).

For RECs, just like for CECs, the Directive requires Member States to adopt an enabling regulatory framework that ensures that participation in a REC is open to all citizens in an open and non-discriminatory manner, and that RECs can participate in energy markets.⁵³ For RECs, the obligation for Member States goes further: they are also supposed to actively investigate legislative barriers and remove these.⁵⁴

Both RECs and CECs could be useful for POCITYF in order to allow citizens, and possibly also SMEs, to participate in neighbourhood energy projects in their district. Although the definition differs slightly, the requirements for Member States are similar. It matters how the provisions are implemented in national law and what are the exact requirements of the POCITYF demo sites whether CECs or RECs are used.

3.1.5. Smart Metering and Billing

An important preliminary requirement for active participation of consumers, prosumers and energy collectives in the energy market is to have real-time accessible information about the amount of consumption and production at a given time. This information can be made available to the consumer, to the DSO and to the energy supplier via a so-called intelligent metering system or shortly a ‘smart meter’. With the Clean Energy Package, new requirements for the metering and billing of domestic energy usage (both electricity and gas as well as heating and cooling via collective systems) are included in the ‘Energy Efficiency Directive’.⁵⁵ The following provisions are relevant for POCITYF.

The Energy Efficiency Directive requires Member-States to make sure that, as far as technically possible, financially reasonable and proportionate to their potential energy savings, all electricity and gas customers get “competitively priced individual meters that accurately reflect their actual

⁵³ Directive 2018/2001, art. 22.

⁵⁴ Ibid., art. 22(3) and (4).

⁵⁵ Directive (EU) 2018/2002 of the European Parliament and of the Council of 11 December 2018 amending Directive 2012/27/EU on energy efficiency, OJ L-328/210. As this Directive amends the previous Directive, further references to this Directive will be to the Consolidated Version, available at:

<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02012L0027-20200101>.



energy consumption and that provide information on the actual time of use.”⁵⁶ This should happen when old meters are replaced, when new consumers are connected and when buildings undergo major renovations.⁵⁷ If the new meters are so-called ‘smart meters’ or ‘intelligent metering systems’,⁵⁸ the customers should also be able to reap the benefits of having a smart meter, by having access to their data, for example by being able to share the data collected by the smart meter with a third party acting on behalf of the final customer, who is able to show the data in an easily understandable format.⁵⁹ This is very relevant for POCITYF where it concerns residential energy management systems that are also based on smart meters. A further requirement in this regard is that the Member States, when implementing smart meters, “shall ensure the security of the smart meters and data communication, and the privacy of final customers, in compliance with relevant Union data protection and privacy legislation.”⁶⁰ One can argue that this requirement is partially redundant as the data protection and privacy legislation is already very clear on this,⁶¹ but the importance of safe and secure data communication cannot be overstated.

Next to smart metering for electricity and gas, the 2019 Energy Efficiency Directive also contains rules for the metering of heating and cooling networks and domestic hot water. Here, meters are also necessary to make sure that final customers have meters that reflect their actual consumption.⁶² This should stimulate people to behave in an energy-efficient way, as their individual behaviour is reflected in their energy bills. With a fixed sum per month, there is less incentive. It becomes more difficult for buildings that contain multiple households. Therefore, the Directive provides that in multi-apartment or multi-purpose buildings, individual meters shall be installed where technically possible and cost-effective.⁶³

Next to accurate metering, another topic of the Directive is the billing for electricity, gas and heating/cooling systems: these bills should be reliable, accurate and based on actual consumption.⁶⁴ This is important to reflect the cost of the energy and to provide a financial incentive to lower the amount of energy used. Moreover, the Electricity Directive stipulates that “Member States shall ensure that bills and billing information are accurate, easy to understand, clear, concise, user-friendly and presented in a manner that facilitates comparison by final customers.”⁶⁵

3.1.6. Demand Side Management

Electricity system management entails (amongst other things) the continuous balancing of demand and supply. As the supply side of the electricity system becomes more volatile when more renewable energy is installed, stimulating extra flexibility on the demand side, in order to absorb the volatility of the supply side, can be very valuable. This flexibility can be provided via demand side management, where flexible demand responds to a shortage or oversupply of electricity at a

⁵⁶ Energy Efficiency Directive, art. 9.

⁵⁷ Ibid.

⁵⁸ Based on the 2009 Energy Package, Member States were already encouraged to introduce intelligent metering systems. Directive 2009/72/EC art. 3 and Annex I. However, no definition of ‘intelligent metering systems’ or ‘smart meters’ was given.

⁵⁹ Energy Efficiency Directive, art. 9(2)d.

⁶⁰ Ibid., art. 9(2)b.

⁶¹ See section 3.3.

⁶² Energy Efficiency Directive, art. 9a.

⁶³ Ibid., art. 9b.

⁶⁴ Energy Efficiency Directive, art. 10 and 10a.

⁶⁵ Directive 2019/944, art. 18.



certain moment.⁶⁶ As mentioned above, the participation of end-consumers and SMEs in demand side management should be facilitated.⁶⁷

Demand side management, if used well, can lead to a more efficient use of the networks and reduce the urgent need for network reinforcement. Moreover, it may lead to more energy efficiency, if electricity can be consumed close to the place where it is produced. EU energy law stimulates energy efficiency, both of appliances and of entire energy systems but until the latest legislative revision, demand side management was not yet anticipated in EU energy law. Now, there are different aspects to take into account.

First, an important principle is the principle of non-discrimination. Groups of comparable customers should be treated equally.⁶⁸ The question is whether some customers can be rewarded for their flexibility by participating in demand side management, or whether the principle of non-discrimination prevents this. It can be argued that customers who have flexibility in their demand are not comparable to customers who do not have such flexibility, and that it thus justified to also differentiate in the contracts between these two groups of customers. Here, another differentiation can be made between household consumers and other customers, such as businesses and public buildings. For household consumers, a higher level of protection, for example against extremely high electricity prices, should be maintained, in order to make sure that households always keep access to electricity. This is why, as mentioned above, dynamic pricing is only possible under certain circumstances.

Secondly, the division of roles between the network operator, the energy supplier and the customer in demand side management should be made clear. Due to the principle of unbundling, the operation of electricity networks is strictly separated from commercial activities such as the supply of electricity. However, topics such as energy storage and demand side management touch both: they can improve the possibilities for efficient network management, and, if well implemented, lower the costs of network operation, but although they can provide significant benefits to the electricity network, the activities are regarded as commercial activities, which makes it difficult for the network operator to engage or invest in them.⁶⁹ By making the DSO a facilitator rather than an active participant of demand side management, this issue can be circumvented.⁷⁰ The Clean Energy Package does mention that Member-States shall put DSOs in the position where they can procure flexibility services.⁷¹ In turn, DSOs shall specify the requirements for flexibility services, *including demand response* in a transparent and participatory process.⁷²

⁶⁶ Directive 2019/944, art. 2(20) defines demand response as “the change of electricity load by final customers from their normal or current consumption patterns in response to market signals, including in response to time-variable electricity prices or incentive payments, or in response to the acceptance of the final customer’s bid to sell demand reduction or increase at a price in an organised market (...) whether alone or through aggregation;”

⁶⁷ Directive 2019/944, art. 17 stipulates this for demand response through aggregation, whereas art. 20 on smart metering systems also refers towards this functionality in sub (a). This also shows the link between smart metering (subchapter 3.1.5) and demand side response: without accurate information on the amount of consumption or production at a given time (close to real-time), it is impossible to have consumers participate in demand response.

⁶⁸ For an explanation of the non-discrimination principle in EU energy law, see H.T. Kruimer, ‘Non-discriminatory Energy System Operation: What Does it Mean?’ Competition and Regulation in Network Industries [2011 Vol 12 No. 3].

⁶⁹ See B. Willems, J. Zhou, ‘The Clean Energy Package and Demand Response: Setting Correct Incentives’ *Energies* 2020, 13, 5672, p. 12.

⁷⁰ D. Kuiken, H. Mas, ‘Integrating demand side management into EU electricity distribution system operation: A Dutch example’ *Energy Policy* [2019 vol 129], p. 156.

⁷¹ Directive 2019/944, art. 32(1).

⁷² Directive 2019/944, art. 32(2).



Finally, demand side flexibility could be used as an alternative to network investment by the DSO, as the flexibility can be used to flatten peaks and extreme lows in a local energy system.⁷³ This is relevant for POCITYF, where the peaks and lows in the positive energy districts could be balanced better by using demand flexibility. However, a danger is that in this way, flexibility is also “trapped” at a local level of the energy system (namely at low/medium voltage level) whereas with the increasing penetration of RES, flexibility is also needed on higher levels or on different local levels than where the flexibility is organised, thus reducing the potential of the flexibility. How does this work? The flexibility can be ‘trapped’ when demand side flexibility is used as an alternative to network investment by the DSO, as the connection with a higher network may then not be sufficiently large to make use of this flexibility when the higher network needs extra flexibility. Thus, a balance needs to be struck between keeping the flexibility in the district or neighbourhood and exporting the flexibility to a higher network level, for example by taking into consideration expected network constraints in an area.

3.1.7. Improving Buildings’ Energy Performance

Since POCITYF is focused on energy efficiency in the built environment, a very important piece of legislation for POCITYF is the Energy Performance of Buildings Directive. This Directive stems from 2002 but has been revised in 2010 and amended in the context of the Clean Energy Package (2018).⁷⁴ The following section is written based on the contents of the Directive as it is currently applicable, including the amendments of the Clean Energy Package.

As a preliminary remark, there is a link between energy efficiency and energy performance of buildings. For example, the requirements of the Energy Efficiency Directive on smart metering (see section 3.1.5 above) are essential for ‘smart energy buildings’ as well, since smart meters can be used to closely monitor the energy performance of buildings.

The Energy Performance of Buildings Directive stipulates how the energy performance of buildings should be improved. This Directive required energy labelling of buildings and set the standards for how and when buildings should have an energy label. Moreover, the Directive provides specific rules for renovation and newly built buildings. It must be noted that Directives have to be transposed into national law, which means that the Member-States adopt rules in their national legal frameworks in order to comply with the Directive. In some cases, the rules adopted in Directives also have direct effect. This can be the case if the rules from the Directive are sufficiently clear, unconditional, and not dependent on national implementing measures.⁷⁵

More specifically, the Directive provides the following elements that are relevant for the POCITYF project. First, Member States should design a long-term renovation strategy of their national building stock.⁷⁶ Whereas this is national policy, POCITYF demo-sites may serve as examples of how the renovation of building stock towards positive energy districts could work. Second, minimum energy performance standards for renovation and for new buildings are required, and these standards become stricter over time.⁷⁷ These standards are elaborated in national law based

⁷³ D. Kuiken, H. Mas, ‘Integrating demand side management into EU electricity distribution system operation: A Dutch example’ *Energy Policy* [2019 vol 129], p. 156.

⁷⁴ Directive 2002/91/EC on the energy performance of buildings, OJ L-1/65, 4-1-2003; Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings, OJ L 153, 18.6.2010; Directive (EU) 2018/844 amending Directive 2010/31/EU on the energy performance of buildings and Directive 2012/27/EU on energy efficiency.

⁷⁵ ECJ Case 26/62 *N.V. Algemene TRANSPORT– en Expeditie Onderneming Van Gend & Loos v. Nederlandse administratie der belastingen*, ECLI:EU:C:1963:1; P. Craig, G. De Burca, *EU Law - Tekst and Materials*, OUP 2008, p. 275.

⁷⁶ EPBD, art. 2a.

⁷⁷ *Ibid.*, art. 4.



on the standards and methodology for calculating the energy performance of buildings provided by the Directive.⁷⁸ This makes the standards across Member States easier to compare.

The Directive already mentions that Member States may be more lenient with the energy performance standards where it concerns monuments, which is very relevant for POCITYF: after all, a major focus of the project relates to energy transition in cultural heritage buildings and districts. The leniency towards monuments in this Directive, is necessary as it is often impossible for monuments to reach the same level of energy efficiency as for newly built buildings - without compromising monumental values of the building. This is a main challenge for POCITYF.

Also relevant for POCITYF is that the Directive provides that existing buildings, when they undergo major renovation, they need to meet the standards of art. 4 of the Directive (the minimum requirements) as far as this is technically, functionally and economically feasible.⁷⁹ This wording creates an “escape” for when it would be too expensive to reach the standards with a major renovation, as in that case, it is not economically feasible. One can argue that this escape clause weakens the force of the Deliverable, as economic feasibility also depends on the expectations of the project developer and on the other requirements in the renovation of the building.

The Directive also requires the Member States to set ‘system requirements’, which entails how technical installations in buildings are placed, dimensioned and operated. This relates traditionally to heating systems, air conditioning, ventilation and hot water systems, as well as combinations thereof⁸⁰ With the amendments of the Clean Energy Package, this has been broadened spectacularly, to also include self-regulating devices, e-mobility and a newly introduced indicator, the ‘smart readiness indicator’, which is an “assessment of the capabilities of a building or building unit to adapt its operation to the needs of the occupant and the grid and to improve its energy efficiency and overall performance.”

Specifically interesting for POCITYF are the requirements regarding e-mobility, as the integration of e-mobility in Positive Energy Districts (PEDs) forms one of the pillars of POCITYF. New and renovated residential buildings with more than 10 parking spaces should allow for ducting infrastructure for each parking space. This is to anticipate on the installation of electric vehicle (EV) charging infrastructure at a later stage.⁸¹ There is an exception for projects that have received their permit before 10 March 2021 or when the costs are more than 7% of the total cost of the renovation, or when a public building has already met comparable requirements due to the implementation of an earlier directive.⁸² For non-residential buildings, either new or undergoing major renovation, the requirement is that if the buildings have more than 10 parking spaces, at least one charging point for electric vehicles should be provided, and on top of this, the ducting infrastructure should be made ready to be able to install charging facilities for one in five parking spaces.

The Directive goes on with specific rules on near zero-energy buildings, as all Member States are supposed to require that all new buildings are near zero energy buildings by 31 December 2020.⁸³ This may be relevant where new buildings are built in POCITYF projects.

Finally, the Directive gives details on the certification of the energy performance of buildings. Implementation of this Directive in 2003 and 2010 has led to the well-known ‘Energy Labels’ for

⁷⁸ Ibid., art. 3 and Annex I.

⁷⁹ Ibid. art. 7.

⁸⁰ Ibid., art. 8.

⁸¹ EPBD, art. 8(5)

⁸² EPBD, art. 8(6).

⁸³ Ibid. art. 9.



buildings, the energy performance certificates. However, the labelling has now changed as more technical requirements are introduced.

Similar to the Directives mentioned above, it matters how this Directive is implemented in the legislative frameworks of the Member States. This is addressed in chapter 4 and 5 for the Alkmaar and Évora regulatory framework and will also be relevant for the FCs in the course of the POCITYF project.

Interestingly, not all provisions related to buildings are to be found in the Energy Performance of Buildings Directive. For example, the Energy Efficiency Directive states that public bodies' buildings should have an exemplary role.⁸⁴ This may be relevant where public bodies' buildings are involved in the POCITYF project. Secondly, Member-States are supposed to promote the availability of energy audits (for buildings). The availability of well-trained personnel for this purpose is also relevant for POCITYF, as the knowledge gained from energy audits is the first step towards better insulation and better energy performance of buildings. Finally, the Member-States are required to perform an assessment of efficient heating and cooling systems, including cogeneration and efficient district heating and cooling.⁸⁵

3.1.8. Heating and Cooling

Heating and cooling plays an important role in the energy transition, as it represents half of the EU energy usage, ahead of other electricity use and transportation - while for households, heating and hot water even accounts for 79% of the energy usage.⁸⁶ As roughly 75% of heating and cooling is still based on fossil energy sources,⁸⁷ it is also essential to fulfil the international and EU's climate goals to reduce the energy usage of heating and cooling and to make the remaining energy demand for heating and cooling less reliant on fossil fuels. Although the heating and cooling sector play such an important role in the energy sector, there is no specific EU legal document dedicated to heating and cooling. Instead, as is also visible in previous paragraphs, heating and cooling are addressed in various legal instruments, such as the Energy Efficiency Directive (art. 14), and the EPBD, indirectly, for example via the energy performance of the buildings as well as the system requirements.⁸⁸ With regard to the Energy Efficiency Directive, the requirements for heating and cooling are mainly directed towards the assessment of high-efficiency cogeneration and district heating - which is a rather narrow scope considering the challenges of the energy transition of the built environment.

As will be shown in chapters 4 to 6, the national legal framework regarding heating and cooling is much more elaborated than that at EU level. This means that the comparability of the legal frameworks at national level is lower when it comes to the heat sector than when it comes to the electricity or gas sector, that have been regulated by EU law for decades already.

3.1.9. Electricity Storage, Electric Vehicles and their Charging Stations

Within POCITYF, there are also some projects that involve a link between EV charging, energy management in buildings, electricity storage and the electricity grid. In short, electric vehicles can, through their charging stations, fulfil a role in providing flexibility to the energy system by planning electricity demand. Moreover, EV batteries can temporarily store electricity. Within POCITYF, there are also projects envisaging stationary energy storage systems. Both will be treated below.

⁸⁴ Energy Efficiency Directive, art. 5.

⁸⁵ Energy Efficiency Directive, art. 14.

⁸⁶ https://energy.ec.europa.eu/topics/energy-efficiency/heating-and-cooling_en.

⁸⁷ Ibid.

⁸⁸ EPBD, art. 4, art. 8.



Electric Vehicles and their Charging Stations

The first rules on charging points for electric vehicles do not stem from the Clean Energy Package but from a separate Directive, the 2014 Alternative Fuels Directive.⁸⁹ Due to this Directive, Member States are required to ensure, through their national legal frameworks, that sufficient public charging points for electric vehicles are installed.⁹⁰

With the Clean Energy Package, ‘integration of electromobility in the electricity network’ is addressed in a separate article, with attention rather to the separation of functions in the energy sector than to the increase in charging stations without any conditions.⁹¹ It is made clear that, with regard to the connection to the grid, DSOs have to cooperate on a non-discriminatory basis with parties that intend to install charging infrastructure.⁹² DSOs cannot own or operate charging stations for electric vehicles, except for their own use⁹³ and except in very specific circumstances. These circumstances are that an open tender procedure has made clear that there are no market parties interested to construct and operate this infrastructure, that the regulatory authority has carried out an ex-ante review of the process and that the DSO operates the charging infrastructure on the basis of third party access and does not discriminate between (classes of) system users.⁹⁴ If the DSO, under the abovementioned criteria, operates charging infrastructure, this should be re-assessed every 5 years.⁹⁵ It thus becomes clear that the EU is reluctant to make DSOs own and operate charging stations, and that this should be considered the exception rather than the norm.

Stationary Storage Systems

Several POCITYF projects include stationary storage systems. It depends whether these storage systems are installed “behind the meter” and thus form part of an existing connection (that is either used for electricity production, consumption or both), or whether the storage system is a separate entity connected directly to the electricity grid, in which case it becomes an energy market participant in its own right. Similarly as for EV charging stations, EU energy law discourages TSOs and DSOs to become storage owners and operators. Only under exceptional circumstances, it is possible for a DSO or TSO to own or operate a storage facility.⁹⁶ This is only possible after consent from the NRA and after other options have been depleted: when the storage facility is a fully integrated network component and when a transparent tendering procedure for the storage facility did not lead to any market parties who could deliver the necessary amount of storage capacity.⁹⁷

3.1.10. The Impact of the Fit for 55 Package on Positive Energy Districts

As an addition in this deliverable compared to the first deliverable, the Fit for 55 package has been published. It is currently (Q1 2022) a set of legislative proposals by the European Commission. Before these proposals will reach the stage of entry into force/implementation into national law will take years, which means that the practical relevance of the package for the pilot projects and early replication projects in POCITYF will be limited. However, the package can still be relevant as an outlook for future PEDs.

⁸⁹ Directive 2014/94/EU on the deployment of alternative fuels infrastructure, OJ L 307, 28.10.2014, p. 1-20.

⁹⁰ Ibid., art. 4.

⁹¹ It must be noted that the increase in electric vehicle charging stations is now also mentioned in the Energy Performance of Buildings Directive, as will be explained in the next section.

⁹² Directive 944/2019, art. 33(1).

⁹³ Directive 944/2019, art. 33(2).

⁹⁴ Ibid., art. 33(3).

⁹⁵ Ibid., art. 33(4).

⁹⁶ Directive 2019/944, art. 36, art. 54 and recital 62.

⁹⁷ Ibid., art. 36(2).



In this section, the main changes of these legislative proposals compared to the existing law (as elaborated in the previous subsections) are highlighted. It must be noted that legislative proposals can also be amended during the “Ordinary Legislative Procedure”, so the information below is not the final information on these proposals.

Energy Efficiency Directive (EED)

The cumulative efforts of the Member States fell short of the EU-wide 32,5 % target for primary energy consumption and final energy consumption. Therefore, the EC proposes binding targets again, which are more ambitious than the previous targets, in order to reach the 55% reduction in 2030. The target is still based on indicative national efforts which are benchmarked against a set of criteria, taking into account the specific circumstances in the different countries. Next to the EU target, there is also an obligation for Member States to achieve savings in end-use energy consumption. The current obligation is set at 0,8% annually, but the proposal aims at a 1,5% yearly reduction as of 2024.

The recast EED also proposes a new framework for heating and cooling, aiming at a significant reduction of the energy use of buildings. The existing energy efficiency requirements are extended to smaller installations and should stimulate the use of waste heat and heating and cooling based on renewable energy.

As many of the PEDs in POCITYF include public buildings and other utility energy consumption (street lighting etc), the proposals related to the public sector are also relevant. The public sector is responsible for about 5% of the total energy consumption of the EU. The recast EED targets the public sector specifically to lead the way, with specific energy consumption reduction targets (1,7 % per year) and higher renovation standards (3% of public building floor area), as well as energy efficiency requirements in public procurement.

Vulnerable consumers and energy poverty have been recognised as important themes already in the Clean Energy Package. However, the recast EED aims to give more urgency to this theme by introducing an obligation for Member States to introduce measures for energy efficiency specifically for vulnerable consumers, people affected by energy poverty and people living in social housing. These people should not experience adverse consequences of this obligation. Member States are asked to make best use of the available funding, such as the funds created by the extra revenue generated by the EU ETS scheme. Especially relevant, also for POCITYF’s focus on positive energy districts, is that Member-States shall consider and promote the role of renewable energy communities and citizen energy communities to implement the measures to alleviate energy poverty.

Energy Performance of Buildings Directive (EPBD)

Although published later than the other proposals, the proposal for a recast Energy Performance of Buildings Directive can also be considered to be part of the Fit for 55 package. The goal of the recast EPBD is to achieve a zero-emission building stock by 2050. The recast EPBD will increase the renovation rate of existing buildings, especially the buildings with the lowest energy performance. It also stipulates more specific targets on air quality and makes a clear connection to clean mobility, which will be very relevant for PEDs in general and POCITYF in specific. The recast EPBD is supposed to create a long-term, stable demand for building renovation, which will also make this more cost-effective. In combination with the other legislative proposals (such as the extension of the EU ETS indirectly to building owners), this will create a large extra “renovation wave”, as the European Commission has named it.

Renewable Energy Directive (RED)

The recast RED raises the binding target for renewable energy to 40% in 2030, and introduces new targets for buildings (49% renewable energy use by 2030) and for heating and cooling (both district



systems and individual systems, with respectively 2,1% and 1,1% yearly increase in the use of renewables and waste heat).

Specific attention is paid to the transport sector, which should reduce its GHG emissions by 13% in 2030 compared to the newly introduced emissions-based benchmark for transportation. Whereas most attention is directed towards aviation and shipping, which is not so relevant for POCITYF, a specific point relevant for POCITYF is that the Directive aims at making the energy system more flexible by stimulating smart charging of electric vehicles.

Extension of EU ETS

The EU ETS (Emissions Trading Scheme) is one of the most powerful tools to limit GHG emissions in a cost-efficient way. The Fit for 55 package proposes to extend the EU ETS to shipping and aviation. Moreover, it is also proposed to create a new type of EU ETS to put a price on GHG emissions from buildings and the transport sector. Especially this new type of EU ETS can be very relevant for POCITYF, since it will influence the business case for renovations as well as for carbon-free transport. It will function as a cap-and-trade system that shortens the payback time for any change that reduces GHG emissions. The idea is not to charge building and vehicle owners directly, but rather to charge the fuel suppliers of these buildings and vehicles. Thus, the energy bill of buildings, and the money paid to fuel up your vehicle will rise.

The revenue from the extended EU ETS should at least partially contribute to a new fund, the Social Climate Fund, which is used to redistribute the financial burden, making sure that regions and households which are disproportionately affected can be supported to invest in low carbon measures. This can be relevant for POCITYF as well, as there will be a large amount of funding available for projects such as the renovation projects executed within POCITYF.

In summary...

The Fit for 55 package sharpens the targets for 2030. The support for the renovation of buildings, the increased energy efficiency and renewable energy and waste heat in the heating and cooling sector as well as the mentioning of smart charging of electric vehicles are supportive of the project targets POCITYF already has. Therefore, POCITYF may be considered and put forward as a concrete example of what will be implemented on a much wider scale in just a decade. No concrete influence of the legislative proposals on the POCITYF pilot and replication projects is expected, as the proposals will take some time to be implemented. However, if there are any insights from POCITYF that are relevant for the topics of the legislative package, they should be shared with the policy makers in due time, so we hope they can take them into account while discussing and amending the proposals.

3.1.11. RePOWER EU Plan (Addendum)

In response to the war in Ukraine and the energy crisis in Europe, the European Commission has issued the RePOWER EU Plan.⁹⁸ This plan entails measures for the diversification of energy sources, stimulation of energy savings and an extra investment in clean energy. For example, the proposal is to increase the EU's 2030 target for renewables from 40% to 45%. This entails the doubling of the installed capacity of solar PV and other stimulation measures related to renewables. Energy savings can be achieved by energy efficiency measures, as also aimed for within POCITYF. However, in the short term, this plan also proposes to lower building temperatures and shifting to public mobility to save gas and fuels. Finally, the RePOWER EU Plan comes with significant financing for the aforementioned measures, supported by various funds and loans.

⁹⁸ European Commission, Communication: 'REPowerEU Plan' COM(2022) 230 final Brussels, 18.5.2022.



3.2. Data Protection Law

As mentioned above, it is essential for a project like POCITYF to closely monitor data protection, as (household) energy management systems require the collection and processing of personal data, which are protected by EU data protection law. The key equipment in this regard is the ‘smart meter’, which collects the household data and sends them to external entities such as the DSO, the energy supplier and possibly to an external energy management system or an aggregator. There are some rules on the safety of smart meters enshrined in the Energy Efficiency Directive (as discussed above) but this does not diminish the role of the General Data Protection Regulation, which is applicable on top of other rules applicable to smart meters.

The General Data Protection Regulation (GDPR) safeguards personal data of EU citizens.⁹⁹ This may also be relevant when data on energy usage of consumers are shared, for example to give real time information on the current electricity demand of a building, or to predict patterns of consumption in the future and to anticipate on these patterns. It must be noted that POCITYF already pays specific attention to data protection issues in Work Package 11. In this Deliverable, the rules on data protection are set out, as these rules are also part of the regulatory framework applicable to POCITYF. However, the specific application of the rules to the POCITYF projects will not be part of this task but rather part of Work Package 11.

It must be noted that the GDPR does not protect all data, it envisages specifically the protection of *personal* data.¹⁰⁰ However, since POCITYF is involved in energy management at household level, personal data are involved. The GDPR gives specific rules on the processing of data, which comprises any operation performed on the data, including collection, storage, consultation, use and combination of the data.¹⁰¹ The GDPR lists six important principles with regard to the processing of personal data:

Personal data shall be:¹⁰²

- (a) processed lawfully, fairly and in a transparent manner in relation to the data subject (**‘lawfulness, fairness and transparency’**);
- (b) collected for specified, explicit and legitimate purposes and not further processed in a manner that is incompatible with those purposes; further processing for archiving purposes in the public interest, scientific or historical research purposes or statistical purposes shall, in accordance with Article 89(1), not be considered to be incompatible with the initial purposes (**‘purpose limitation’**);
- (c) adequate, relevant and limited to what is necessary in relation to the purposes for which they are processed (**‘data minimisation’**);
- (d) accurate and, where necessary, kept up to date; every reasonable step must be taken to ensure that personal data that are inaccurate, having regard to the purposes for which they are processed, are erased or rectified without delay (**‘accuracy’**);
- (e) kept in a form which permits identification of data subjects for no longer than is necessary for the purposes for which the personal data are processed; personal data may be stored for longer periods insofar as the personal data will be processed solely for archiving

⁹⁹ Regulation (EU) 2016/679 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation, hereinafter: GDPR), OJ L 119/1.

¹⁰⁰ GDPR, art. 2 and 4(1).

¹⁰¹ GDPR, art. 4(2).

¹⁰² GDPR, art. 5(1)



purposes in the public interest, scientific or historical research purposes or statistical purposes in accordance with Article 89(1) subject to implementation of the appropriate technical and organisational measures required by this Regulation in order to safeguard the rights and freedoms of the data subject ('storage limitation');

(f) processed in a manner that ensures appropriate security of the personal data, including protection against unauthorised or unlawful processing and against accidental loss, destruction or damage, using appropriate technical or organisational measures ('integrity and confidentiality').

The "controller" is responsible for compliance with these principles. The controller is the (natural or legal) person that determines how and when the data will be used.¹⁰³ In the context of smart grids and smart buildings, this could be for example the grid operator or the company that aggregates the usage patterns of several buildings.

Thus, it is important that personal data are only shared or processed when this goes according to the principles mentioned above, thus only when this is necessary (data minimisation), when the time the data are stored is limited, and when the purpose is known beforehand and agreed upon by the participants of the project. Next to attention to data protection, specific attention should also be paid to cybersecurity, since the more data are exchanged between buildings, vehicles and the electricity grid, the more exposed the electricity supply is to hacks or other cyber-attacks. A specialised European Commission Working Group has published a report about this matter, with a list of minimum safety standards and safety measures.¹⁰⁴

In order to ensure compliance with the GDPR, the energy management systems used in POCITYF should be 'secure by design' and incorporate both data protection and cybersecurity in the system design. This is very important to monitor in order to ensure compliance with the GDPR. Within the POCITYF consortium, there is a specific work package with deliverables dedicated to data protection.¹⁰⁵ Therefore, the exact implications of the GDPR for POCITYF will not be elaborated further in this deliverable.

One specific issue that is relevant for POCITYF is that personal data can only be processed if there is a legal ground for this.¹⁰⁶ Several grounds are available. The first option is that the "data subject" (the person whose data are concerned) gives consent for this, for one or more specific purposes. However, consent can also be withdrawn again.¹⁰⁷ When an energy management system is based on this, it is problematic if too many participants in such a system withdraw their consent, especially if this means that the number of participants in the energy management system goes below a certain 'critical mass' that is needed to make the system work.

There are also other grounds for data processing. A relevant option for POCITYF is that data processing is allowed if this is necessary for the execution of a contract to which the data subject is party.¹⁰⁸ This can be a solution to the issue identified above regarding the withdrawal of consent. A contract between the data subject and the energy management system owner could be used, in order to make sure that there is a legal ground for data processing. Such a contract should then

¹⁰³ GDPR, art. 4(7).

¹⁰⁴ Smart Grid Task Force Expert Group 2, Final Report 2019, https://ec.europa.eu/energy/sites/ener/files/sgtf_eg2_report_final_report_2019.pdf.

¹⁰⁵ D11.11 Ethical Monitoring and GDPR Conformation Plan and D11.4 Data Management Plan.

¹⁰⁶ GDPR, art. 6(1).

¹⁰⁷ Ibid., art. 7(3).

¹⁰⁸ GDPR, art. 6(1)b.



include this ground, the conditions for data sharing and processing (including the limitations thereof) as well as the time period for which the data sharing and processing is necessary.

Further legal grounds include the situation that processing is necessary for the compliance with a legal obligation to which the controller is subject, vital interests of the data subject or another natural person, necessity for the performance of a task carried out in the public interest or in the exercise of official authority vested in the controller and when this is necessary for legitimate interests pursued by the controller or by a third party, except if these interests are overridden by other interests such as the fundamental rights of the data subject.¹⁰⁹ The collection of data by DSOs in order to maintain the electricity grid in balance is an example of a task carried out in the public interests. Moreover, the DSO also has the legal obligation to collect certain data. An interesting question to be answered within the POCITYF project (WP11) is which data are absolutely necessary for the DSO to execute the tasks required by public interests, and which data are needed in order to form a PED, and which data are not essential but “nice to have”.

3.3. Public Procurement and State Aid Law

The EU internal market has an extensive system to maintain a level playing field between different market participants and to govern the relation between the public sector and the private sector. Two pillars of this system are public procurement law and state aid law. They may both be relevant for POCITYF, depending on the situation.

3.3.1. Public Procurement Law

Public procurement law aims to ensure that public organisations procure the goods and services they need in open, competitive procedures that give a fair chance to all possible market participants that are interested in delivering the service or good concerned. When, in the POCITYF project, public buildings are renovated, these activities will need to be organised via a public procurement procedure, depending on the nature and size of the order.¹¹⁰ The rules for this originate from EU law but they are implemented in national law. Therefore, if public buildings are part of POCITYF, the project developers should refer to the nationally specified public procurement rules.

3.3.2. State Aid Law

The other pillar is state aid law - designed to make sure that states and local authorities do not give financial or other benefits to one company or group of companies at the expense of others. Within POCITYF, this could be relevant where projects are not feasible without support from the (local or national) government and where authorities may want to support the projects in order for them to be realised anyway.

In principle, state aid is not permitted under EU law, unless it falls under an exemption. This could be because the amount of aid falls below a threshold,¹¹¹ in practice when less than € 200.000 per three fiscal years is granted, or because the aid measure is exempted, either as part of a category of aid or as an individually allowed aid measure.¹¹²

¹⁰⁹ GDPR, art. 6(1)c-f.

¹¹⁰ The threshold values for this depend on whether the order is on ‘goods’ or ‘services’ and on whether it concerns the national or regional government. The exact values are available in Commission Delegated Regulation (EU) 2019/1828 amending Directive 2014/24/EU in respect of the thresholds for public supply, service and works contracts, and design contests, art. 1.

¹¹¹ The threshold is set in Commission Regulation (EU) No 1407/2013 of 18 December 2013 on the application of Articles 107 and 108 of the Treaty on the Functioning of the European Union (TFEU) to de minimis aid.

¹¹² This is then based on art. 107(2) or (3) TFEU.



In addition, in the context of the State Aid Modernisation programme, aid for culture and heritage conservation is included as a new category of aid in the new General Block Exemption Regulation (GBER). The GBER significantly extends the possibilities for Member States to grant “good aid” to companies without prior Commission scrutiny, be it in the form of investment or operating aid. Commission Regulation (EU) No 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty.

Finally, the Climate, Energy and Environmental Aid Guidelines (CEEAG) give guidance on the circumstances under which state aid can be given to energy projects.¹¹³ The Guidelines have just been published (Dec 2021) and will be applied in practice from now on. They provide specific rules on how states and lower governments should apply the state aid criteria to - amongst others - renewable energy projects and are used to determine whether an aid scheme is indeed compatible with the internal market. Although the guidelines are mainly relevant for government authorities that are responsible for developing aid schemes, the guidelines could have indirect relevance for the projects developed within POCITYF, if a form of (financial) government support or guarantees is used.

3.4. Heritage Law and Policy

The inclusion of heritage buildings in Positive Energy Districts is one of the pillars of POCITYF. Therefore, it is also part of the legal/regulatory analysis at all levels (international/EU/national). Whereas there are significant legal documents on international level, that are implemented by detailed local regulation, EU law does not have specific legal instruments for the topic of heritage law. However, heritage buildings are mentioned at some points in legal documents. A notable, and relevant, exception is that both in the Energy Efficiency Directive and in the Energy Performance of Buildings Directive, buildings that are part of special protected areas because of their architectural or historical merit, are excluded from some obligations.

For example, in the Energy Performance of Buildings Directive, Member States may decide not to apply minimum energy performance requirements to these kinds of buildings.¹¹⁴ In the Energy Efficiency Directive, whereas public buildings are supposed to fulfil an exemplary role, historical buildings are excluded from this obligation.¹¹⁵ The same goes for public authorities concluding contracts to buy or rent buildings: whereas in principle, these buildings should comply with the same exemplary standards, historical buildings are excluded from this obligation.¹¹⁶

It must be noted that although there is almost no EU legislation on the topic of heritage in the built environment, there is some policy on this topic. For example, the year 2018 was devoted to the EU’s cultural heritage, and the EU is active in raising awareness about cultural heritage, funding parts of the maintenance, sharing of knowledge and contributing to research on cultural heritage.¹¹⁷ In this way, the EU contributes to the conservation of heritage buildings.

¹¹³ Communication from the Commission, ‘Approval of the content of a draft for a Communication from the Commission on the Guidelines on State aid for climate, environmental protection and energy 2022’, Brussels, 21.12.2021 C(2021) 9817 final ANNEX’.

¹¹⁴ EPBD, art. 4(2)a.

¹¹⁵ EED, art. 5(2)a.

¹¹⁶ Ibid., Annex III.

¹¹⁷ [https://www.europarl.europa.eu/RegData/etudes/BRIE/2018/621876/EPRS_BRI\(2018\)621876_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2018/621876/EPRS_BRI(2018)621876_EN.pdf).



3.5. Conclusion on EU law

There are a few main conclusions on the impact of the EU legal framework on the realisation of PEDs in general and the POCITYF project in specific:

- EU law sets specific targets and obliges Member-States to develop plans to reach these targets, for example with regard to the reduction of Greenhouse Gases and the increase of renewable energy and the renovation of the built environment. These targets and the plans developed by Member-States provide a positive stimulus on the creation of PEDs, as they also lead to local targets that could be fulfilled by creating PEDs. However, it depends on the implementation and the focus of Member-States to what extent PEDs are stimulated by the EU-wide targets.
- Whereas pre-2019, EU energy law was not geared towards the creation of PEDs, this has changed with the introduction of the Clean Energy package, which allows a much more active role for consumers and introduces several concepts into legislation that are relevant tools to use for the realisation of PEDs, such as energy aggregators and citizen energy communities. Moreover, the push from EU law and policy towards the installation of smart meters is also important: without smart metering, it is difficult to create a PED. The same goes for EV charging infrastructure: this is an important requirement for the successful introduction of electric mobility in a city.
- However, here again, much is left to the implementation of the legislation by Member-States. As Member-States implement EU legislation in a different way, the replicability of the solutions developed within POCITYF is influenced by the way Member-States implemented EU law.
- With regard to the Fit for 55 package, although this package contains many promising proposals, the package is not yet adopted as law - and implementation after adoption may take even more time. Therefore, although the proposals are very interesting, they will probably come too late for most projects executed within POCITYF.
- EU Data Protection Law (the “GDPR”) requires careful consideration of which personal data are necessary to process: an algorithm to match demand and supply in a PED should not collect and process more personal data than necessary, and where personal data are collected and processed, this can only be done after permission from the person in question.
- As many PEDs inside POCITYF contain publicly owned buildings and/or projects that are supported by (local) governments, public procurement and state aid rules need to be observed. As these rules are in existence for decades already, their existence should not come to a surprise to local governments. However, the time needed for correct public procurement procedures should not be underestimated in the execution of projects in the context of POCITYF.



4. Dutch Regulatory Framework

National acts and regulations fill in the norms set at international and EU level with more specific requirements. This is also the case for Dutch energy law, construction law and heritage law, which will be elaborated below. Next to these rules, which are applicable throughout the Netherlands, the specific local obligations for the municipality of Alkmaar are also discussed. Finally, section 4.5 gives an interim conclusion with an analysis of how the legal framework would be applied to the POCITYF projects taking place in Lighthouse City Alkmaar, and whether any impediments are to be expected from this.

4.1. Dutch Energy Law

4.1.1. Introduction

Dutch energy law encompasses several themes, under the main categorisation of electricity law, gas law and heat supply law. They were historically addressed in separate legislative Acts, but there is a quite mature proposal for combining them into one ‘Energy Act’ (Energiewet), which will probably be adopted in law in the coming years.¹¹⁸ However, as this proposal has not been adopted as law at the moment of writing this Deliverable (Q1 2022), and as the proposal can still be amended in the legislative process, the current situation will be described in this chapter.

In this section, the main Acts will be treated first, after which the lower legislation will be treated where relevant. There are several Regulations (*Algemene Maatregelen van Bestuur (AMvBs)*, *Regelingen* and *Besluiten*) which further specify the rules enshrined in the main Acts. The discussion of the lower legislation is structured according to several topics, going from general to specific. First, the Network Codes will be treated. Then, energy tax law and support schemes. Following this, Electric Vehicles and their charging stations will be treated. Finally, the Experiments Regulation, which allows for specific innovative projects in the energy sector, will be treated. In this way, the different parts of Dutch energy law that could be relevant to the projects planned in Alkmaar are all covered.

4.1.2. Main Acts: Electricity Act

The Electricity Act is the main framework of rules related to the electricity grid and electricity market in the Netherlands. It starts with an elaborate list of definitions to terms referred to in the Electricity Act. These definitions are not only relevant for the Electricity Act itself but also for various other forms of lower legislation, such as Regulations, Decisions and Network Codes.¹¹⁹ Provisions from the Electricity Act that are relevant for POCITYF are the rights and duties of transmission and distribution system operators (TSOs and DSOs),¹²⁰ where the rules from EU energy law concerning unbundling are implemented into national law,¹²¹ and where the tasks of network operators are laid down.¹²² The Electricity Act provides that network operators cannot engage in

¹¹⁸ The last status (Nov 2021) was a completed draft proposal including the supporting documents but excluding the last reports on feasibility. The proposal and supporting documents are available at: <https://www.rijksoverheid.nl/documenten/publicaties/2021/11/26/wetsvoorstel-energiewet-uht>

¹¹⁹ Elektriciteitswet, art. 1. Lower legislation that depends on the definitions in the Electricity Act can be found at:

<https://wetten.overheid.nl/BWBR0009755/2020-02-01/0/Hoofdstuk1/Paragraaf1/Artikel1/informatie>.

¹²⁰ Elektriciteitswet, art. 10 and further.

¹²¹ Interestingly, the Netherlands, contrary to all other EU Member-States, decided that DSOs also needed to be fully ownership unbundled. It thus goes further than what is required by EU law. CEER Legal Affairs Committee, ‘Implementation of TSO and DSO Unbundling Provisions’ 2019, p. 10.

¹²² *Ibid.*, art. 16.



other activities than the activities necessary for the tasks established in law.¹²³ This can be an important limitation to innovative energy projects in the Netherlands. However, a valuable exception is that government regulations can be used to expand the range of tasks that network operators are allowed to fulfil beyond the activities listed in the Electricity Act.¹²⁴

Concerning the *production* of electricity, several provisions in the Electricity Act are relevant. First, a remark on definitions. Electricity production is not defined, but ‘producer’ is defined as follows: *producent: een organisatorische eenheid die zich bezighoudt met het opwekken van elektriciteit*; One could wonder whether this also encompasses prosumers, which cannot really be considered to be an organisational unit. The Electricity Directive ((EU) 2019/944) has a broader scope: there, producer is defined as a natural or legal person who generates electricity. The legal status of prosumers between ‘producers’ and ‘consumers’ is discussed in literature, but in Dutch law, for the time being, prosumers are being treated as consumers.¹²⁵

First, in order to coordinate the production capacity in the Netherlands, the creation or enlargement of an installation to produce sustainable electricity larger than 50 MW, with the exception of wind energy, for which the threshold is 100 MW, requires a permit (*Omgevingsvergunning*) or another administrative procedure (*Inpassingsplan*).¹²⁶ Moreover, a plan to construct or change such an installation needs to be notified to the Minister of Economic Affairs.¹²⁷ Small (household) electricity production installations, if intended to feed electricity into the electricity grid,¹²⁸ do not need to be notified to the Minister, but they do need to be notified to the relevant TSO, DSO and energy supplier via a website, www.energieleveren.nl.¹²⁹ Without notification before installation, it is not possible to supply excess electricity to the grid (*terugleveren*) or to net one’s own consumption with production at another moment (*saldereen*).¹³⁰ These two types of support for small scale electricity generation will be treated under section 4.1.5, Energy Tax Law and Support Schemes. With this registration, the DSOs know what to expect from each connection: which source of renewable energy, the connected capacity of the installation and whether or not a storage device is located behind the meter. This allows the TSO and DSOs to better predict the network flows at any given moment.

Another obligation, also stemming from EU law, is that in order to make the electricity sector in the Netherlands more sustainable, the Electricity Act provides that electricity producers and suppliers have the duty to ensure that the electricity they produce or supply is produced in a sustainable and efficient manner.¹³¹ For very large producers (more than 10 GWh per year), the efforts to produce electricity in a sustainable and efficient manner need to be reported to the Minister of Economic Affairs.¹³² However, these reports are not public, and therefore, it is difficult to assess what this means in practice.

¹²³ *Ibid.*, art. 17.

¹²⁴ The list of activities is laid down in art. 16 of the Electricity Act. Art. 17a states that this range can be expanded by government regulation (*Algemene Maatregel van Bestuur*).

¹²⁵ L. Diestelmeier, D. Kuiken, ‘Legal Framework for Prosumers in the Netherlands’ in M. M. Roggenkamp, & C. Banet (Eds.), *European Energy Law Report Vol. XII* (Intersentia, 2018), p. 152-153.

¹²⁶ Elektriciteitswet, art. 9b. For other installations (not sustainable electricity), the threshold is 500 MW). The ‘*omgevingsvergunning*’ will be elaborated further in section 4.2.1.

¹²⁷ Elektriciteitswet, art. 9b(3).

¹²⁸ Off-grid systems do not need to be registered.

¹²⁹ This is based on obligations from EU law (Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation, art. 40(5)).

¹³⁰ The netting mechanism (*saldereen*) is reduced over the coming decade, and will be replaced with a system based on selling excess electricity via the electricity supplier.

¹³¹ Elektriciteitswet, art. 68.

¹³² *Ibid.*, art. 68(2).



Concerning the production of renewable electricity, the Electricity Act also provides rules on Guarantees of Origin, which can be used to prove that a certain kWh is produced in a sustainable manner.¹³³ This represents a market value in an electronic market system, executed by Certiq, a subsidiary of TenneT, the Dutch TSO.¹³⁴ These Guarantees of Origin (GoOs) are essential in the system of Dutch subsidies for renewable energy, as support is coupled to the generated amount of kWh, which has to be proven by the GoOs. However, this system does not apply to small household producers, which are supported with the *salderingsregeling* and *terugleververgoeding*.¹³⁵

As a final note, the Electricity Act requires the adoption of Network Codes. These are elaborated in the sections on lower legislation below. Moreover, it is possible to get an exemption of certain provisions of the Electricity Act, based on another type of lower legislation, the Experimenteer AMvB. This is also treated below.

4.1.3. Main Acts: Heat Supply Act

One of the projects planned for Alkmaar in the context of POCITYF is the introduction of a heat network in a district. Therefore, it is important to elaborate the provisions applicable to heat supply, enshrined in the Heat Supply Act. It must be noted from the start, that the Heat Supply Act is currently in a revision process, which means that the framework as elaborated below will be amended within the coming years.

In the Netherlands, most households have an individual source of heating, often a natural gas-fired central heating system.¹³⁶ This type of individual heat supply is not governed by the Heat Supply Act. However, 5,2% is connected to a collective heat network.¹³⁷ This percentage is growing as the Netherlands is aiming to phase out natural gas for heating, and replacing this with another source of individual heating (individual heat pumps), and with collective heat solutions. The Heat Supply Act is applicable to the latter.

These collective heat solutions could be larger heat pumps (which supply heat to an entire block of houses) or large collective heat networks, which can have many different sources of heat but are often fed with heat from industry or waste incineration plants. Due to the costs for creating the network, heat networks are mainly useful in densely populated areas where many connections lie relatively close to each other, such as cities. Heat networks function as natural monopolies: they require high upfront investment costs, but low transmission costs per unit of heat. Moreover, it is very inconvenient to have several heat networks next to each other in one street. Due to this, it is (at the moment) impossible to switch between different heat suppliers once connected to a heat network.¹³⁸ Therefore, there is a need to protect consumers connected to heat networks and to regulate how such networks can be operated and what tariffs can be asked for a heat connection

¹³³ Ibid., art. 73-77a.

¹³⁴ <http://www.certiq.nl/wij-zijn/>.

¹³⁵ See section 4.1.5 for more details.

¹³⁶ By 2050, all households in the Netherlands are supposed to have switched to a sustainable source of energy for heating their house, for hot water and for cooking. Dutch Government, Klimaatakkoord, 28 June 2019, the Hague, p. 15. Text available at:

<https://www.klimaatakkoord.nl/documenten/publicaties/2019/06/28/klimaatakkoord>.

¹³⁷ Based on data for 2017. This number is rising: in 2012, 4,6% of the households were connected to a heat network. In the coming years, the percentage is expected to rise even further. Stichting Natuur en Milieu, Verkenning Warmtenetten 2018, p. 2.

¹³⁸ A parallel can be drawn between heat networks and other networks such as the electricity, gas and water networks. For an explanation of natural monopolies in the energy sector, see J. Perloff, *Microeconomics* (Pearson, 2009 5th ed.) p. 369/370; W. Kip Viscusi, *Economics of Regulation and Antitrust* (MIT Press, 2005, 4th Ed.) p. 402.



and supply. This is why the Heat Supply Act (and the Heat Regulation, which contains the specifics on the tariffs) was adopted.

The scope of the Heat Supply Act is the ‘supply of heat to users’, with the exception of landlords who supply heat to their tenants and owners’ associations (*Verenigingen van Eigenaren*),¹³⁹ which act on behalf of the owners of apartment buildings or other buildings with shared roofs/corridors/staircases/other shared premises. The Act covers both district heating networks as well as heat/cold storage (*Warmte/Koude Opslag*) and apartment block heating (*blokverwarming*). At least once a year, and at the end of a contract, heat suppliers should provide a complete and sufficiently specified bill of the delivered heat, which is an implementation of EU energy law.¹⁴⁰ Maximum tariffs are set for the connection to a heat network as well as for the supply of the heat.¹⁴¹ Moreover, as stressed in EU energy law already, no unjustified discrimination between different users of the heat is allowed.¹⁴²

The Heat Supply Act creates an obligation to obtain a permit before the heat can be supplied, except in the following cases: if the supplier supplies heat to less than 10 users, delivers less than 10.000 gigajoules of heat annually, or if the supplier is the landlord or owner of the building in which the heat is delivered.¹⁴³ This permit is granted by the Minister of Economic Affairs if the heat supplier can prove to be able, from a financial, technical and management perspective, to fulfil the required tasks as a heat supplier, with further requirements and procedure filled in by the Heat Regulation.¹⁴⁴ The permit can be withdrawn again if the heat supplier does not comply with the rules and regulations applicable to the supply of heat.¹⁴⁵

Just as with electricity and gas, the Heat Supply Act protects consumers against the failure of their heat supplier: in case a heat supplier cannot fulfil its obligation to supply heat to consumers anymore, this needs to be communicated to the Minister of Economic Affairs without delay.¹⁴⁶ The Minister can appoint heat suppliers of last resort, which are able to supply heat in case of problems with the regular heat supplier of a heat network.¹⁴⁷

Finally, the Heat Supply Act provides that the Dutch Authority for Consumers and Markets (ACM) is the authority in charge of the enforcement of the rules enshrined in the Heat Supply Act and in charge of setting the maximum tariffs for heat networks.¹⁴⁸

Experience from practice

The current Heat Supply Act was not written with a large-scale heat transition in mind. This causes several difficulties. For example, it is important that heat networks have sufficient offtake during a sufficiently long time period, in order to cover the fixed costs. Under the current legislation, it is not possible to prescribe which source of heat should be used in a certain area. It is not yet clear whether this will be the case under the new legislation. This makes it difficult to develop a heat network. In practice, this led to a change of plans in Alkmaar as well: it was foreseen that residential area Bloemwijk would be connected to the HVC heat network. However, the new buildings would only have a

¹³⁹ Heat Supply Act, art. 1.

¹⁴⁰ Heat Supply Act, art. 2. This is based on Energy Efficiency Directive, art. 9.

¹⁴¹ Heat Supply Act, art. 2(3) and 5.

¹⁴² *Ibid.*, art. 2(4).

¹⁴³ *Ibid.* art. 9.

¹⁴⁴ *Ibid.*, art. 10 and the Heat Decision, *Besluit van 10 september 2013, houdende regels ter uitvoering van de Warmtewet (Warmtebesluit)*, art. 9 and 10, available at <https://wetten.overheid.nl/BWBR0033940/2020-01-01>.

¹⁴⁵ Heat Supply Act, art. 11.

¹⁴⁶ *Ibid.*, art. 12b.

¹⁴⁷ *Ibid.*, art. 12c.

¹⁴⁸ *Ibid.*, art. 15-18.



limited heat demand. This made it impossible to reach a positive business case, as sufficient offtake of the heat could not be guaranteed in this area.

As mentioned above, the Heat Supply Act will undergo major legislative revision in the coming years. The focus of the current Heat Supply Act is mainly on consumer protection, but this is expected to shift towards expanding heat networks (changing the way the market is organised and changing the tariff rules) and increasing the sustainability of heat networks (mainly making the sources of heat more sustainable).¹⁴⁹ The new Heat Supply Act should give sufficient space for a diversity of sources of heat and thus for differentiation of the rules on a local level, and local and national authorities should have sufficient possibilities for steering heat networks in order to safeguard societal interests.¹⁵⁰ However, the revision of the Heat Supply Act is currently in a deadlock between national government and municipalities, so the revision process will still take some time.

Another legislative development is the draft proposal on municipal instruments in the heat transition (*Wet Gemeentelijke Instrumenten Warmetransitie*). As soon as this proposal is adopted into law, municipalities will have a powerful instrument to steer on the heat transition in certain areas. They can indicate which areas will be decoupled from the gas network by which year. This can give a serious impulse to sustainable forms of heating but the specific application depends on the final form of the instruments: for example whether municipalities can only indicate which areas will be decoupled from the gas network, or also what alternative shall be used in these areas (such as a heat network), and whether this alternative is exclusive or whether individual building owners can choose to use a different alternative.

Concerning tariff regulation, the current tariffs are set on a comparison with natural gas (expenses on heat should not be higher than if the user would have used gas-based heating). As the Dutch government is actively raising the price of heating one's house with natural gas,¹⁵¹ and promoting heat networks as a sustainable alternative, the prices of natural gas and heat networks will be decoupled in order to give people a financial incentive to switch.¹⁵²

4.1.4. Lower Legislation: Network Codes

In order to make the electricity network operate smoothly, specific technical rules are adopted. These rules are enshrined in so-called 'network codes', in which tariffs (*Tarievencode*), a uniform way of measuring (*Meetcode*) as well as many other issues are treated.¹⁵³ Moreover, all terms and notions are laid down in another code, the *Begrippencode*.¹⁵⁴ The legal basis for adopting network codes is the Dutch Electricity Act,¹⁵⁵ but the underlying obligation to adopt network codes already stems from EU law,¹⁵⁶ where both national and European network codes are required to be adopted.¹⁵⁷ As these documents are very technical and elaborate, with many specific situations

¹⁴⁹ Kamerbrief (Letter to the Dutch parliament), dated 14-2-2019, on the Heat Supply Act 2.0, available at <https://www.rijksoverheid.nl/documenten/kamerstukken/2019/02/14/kamerbrief-over-warmtewet-2.0>.

¹⁵⁰ Ibid.

¹⁵¹ <https://www.rijksoverheid.nl/onderwerpen/belastingplan/belastingwijzigingen-voor-ons-allemaal/energiebelasting>.

¹⁵² There is no official statement on this yet, but Minister Jetten has confirmed this orally at the request of 44 municipalities: <https://www.bnnvara.nl/kassa/artikelen/minister-jetten-onderzoekt-of-koppeling-gasprijs-en-warmtenet-kan-worden-losgelaten>.

¹⁵³ All codes are available at <https://www.netbeheernederland.nl/publicaties-en-codes/codes>.

¹⁵⁴ <https://wetten.overheid.nl/BWBR0037938/2020-01-01>.

¹⁵⁵ Elektriciteitswet, art. 31.

¹⁵⁶ Regulation (EC) No 714/2009 on conditions for access to the network for cross-border exchanges in electricity, art. 6. In its successor, Regulation (EU) 2019/943, chapter VII is entirely dedicated to network codes.

¹⁵⁷ The European Network Codes are available at https://www.entsoe.eu/network_codes/.



and exceptions, it is not possible to give a general overview of which rules from the Dutch network codes are applicable to the demo projects. However, it is important to take into account the effects of the network codes in the business plans for the various demo-sites.

For example, due to the tariff structure as laid down in the *Tariefcode Elektriciteit*, energy storage solutions have to pay for their connection as if they were the end users of the electricity, whereas they are not.¹⁵⁸ This makes it more difficult to reach a positive business case for energy storage, or, in practice, energy storage needs to take place *behind the meter* of a large consumer, rather than having a separate connection (and having to pay separately for the network connection costs). This makes it more difficult to create a neighbourhood battery concept. However, based on the findings, the tariff structure for energy storage will be amended in the coming years.

Another example is that one of the POCITYF projects includes the use of Direct Current (DC) technology. Nothing in the Electricity Act forbids the use of DC technology. However, the current standard in the Network Codes is Alternating Current (AC): all network codes are written with AC technology in mind. Therefore, in order to be able to construct a network based on DC technology, the project developer and DSO will have to ask the NRA (ACM) for an exemption (*Ontheffing*) from the relevant network codes: *Netcode*, *Meetcode* and *Begrippencode*.¹⁵⁹ This exemption is then based on art. 37a of the Electricity Act, in combination with the Policy Rule on the Procedure for Exemptions based on art. 37a of the Electricity Act (*Beleidsregel procedure voor ontheffingen ex artikel 37a Elektriciteitswet*).¹⁶⁰

4.1.5. Lower Legislation: Energy Tax Law and Support Schemes

Next to serving as income for the state, the tax system may have the secondary purpose to stimulate certain (desired) activities and to hold back undesirable activities. The energy-related taxes, rebates and other forms of support are quite complex and may change. In this section, the taxes and rebates that are relevant for POCITYF will be treated.

Taxes on Energy Consumption

The Dutch government aims to stimulate an efficient use of energy (electricity and natural gas). Therefore, it charges a tax on the consumption of electricity and gas, the Energy Tax (*energiebelasting*).¹⁶¹ In order to support the transition from natural gas to other forms of heating, the tariffs for natural gas are increased each year, whereas the tariffs for electricity are lowered.¹⁶² In the context of POCITYF, this effect should also help to ameliorate the business case for several projects in which a transition from gas to electricity is envisaged.

Next to the general energy tax, all electricity and natural gas consumers, both industrial and household consumers, pay a surcharge per kWh of electricity and cubic metre of gas, the *Opslag Duurzame Energie*.¹⁶³ This surcharge is used again to finance support schemes for renewable energy, such as the one below.

Support for Collective Electricity Production

¹⁵⁸ ACM, Marktscan Elektriciteitsopslag, report published in September 2020, available at <https://www.acm.nl/sites/default/files/documents/marktscan-elektriciteitsopslag.pdf>, chapter 5.3.

¹⁵⁹ Ontheffingsaanvraag Gelijkstroomnet Liander: <https://www.acm.nl/sites/default/files/documents/2018-10/ontheffingsaanvraag-gelijkstroomnet-liander.pdf>.

¹⁶⁰ Beleidsregel procedure voor ontheffingen ex artikel 37a Elektriciteitswet, available at <https://wetten.overheid.nl/BWBR0033117/2013-04-01>.

¹⁶¹ <https://www.rijksoverheid.nl/onderwerpen/milieubelastingen/energiebelasting>.

¹⁶² Ibid.

¹⁶³ The legal basis is the Act on the Surcharge for Sustainable Energy (*Wet opslag duurzame energie- en klimaattransitie*), <https://wetten.overheid.nl/BWBR0032660/2020-01-01>.



Energy Cooperations and Associations of Owners (*Verenigingen van Eigenaren, VvE*) are able to collectively generate renewable electricity. When they do so, they can request financial support via the *Subsidieregeling Collectieve Elektriciteitsproductie (SCE)*, previously known as the postal code rule (*postcoderoosregeling*). The scheme is intended to be used by individuals and SMEs (on a household connection) who do not have the opportunity to place solar panels on their own roof, or for those who share their roof, especially useful for apartment blocks. Indirectly, this is also to level the differences in energy bills created by the fact that some people can use net metering whereas others cannot. However, whereas the scope of the previous scheme was limited to solar energy, the current scheme is also open to wind- and water-based renewable energy projects.

As with the previous scheme, the SCE requires participants of the collective energy generation project to live in the same or one of the neighbouring postal codes of the project, creating an element of local connection. The subsidy budget is determined on a yearly basis and projects benefit from it in the form of a Contract for Difference that supports the price levels at times when the electricity price is below a certain predetermined level. In order to avoid overproduction of electricity, there is also a minimum price level below which the production is also not supported.

Solar systems for Small Connections

Several POCITYF pilots in Alkmaar include the use of solar panels. For households and small connections (maximum 3x80A), it is possible to “net” the produced electricity with the consumed electricity over a year. This netting rule (*salderingsregeling*) allows households and small connections, such as SMEs, a good tariff for their electricity: rather than receiving the market value for the generated electricity (a few cents per kWh), they can net these kWhs with kWh that they have used at another moment in the year,¹⁶⁴ which saves more than 20 cents per kWh. This is extra beneficial as the consumer also does not have to pay taxes and levies over these kWhs. It must be noted that net metering is only possible for the amount that is consumed, i.e. if a household consumes 2000 kWh and its solar panels produce 2500 kWh, it can net 2000 kWh. The remaining 500 kWh can still be delivered to the electricity network, but for a much lower remuneration (*terugleververgoeding*).¹⁶⁵ The amount of this remuneration differs per electricity supplier. It must be noted that, whereas net metering is mostly used for solar panels, it can also be used for other types of electricity. A differentiation is made for renewable energy (such as solar, wind): there is no maximum amount of net metering except that it cannot exceed one’s own usage.¹⁶⁶ For net metering of energy from non-renewable sources, the maximum is set at 5000 kWh.¹⁶⁷

¹⁶⁴ Elektriciteitswet 1998, art. 31c.

¹⁶⁵ This needs to be a “reasonable reimbursement” (*redelijke vergoeding*). Elektriciteitswet 1998, art. 31c(3).

¹⁶⁶ *Ibid.*, art. 31c(1).

¹⁶⁷ *Ibid.*, art. 31c(2).



Net metering was introduced in 2004, but the Minister for Economic Affairs has announced that the net metering rule will be slowly reduced from 2023 onwards,¹⁶⁸ although this proposal has not made it into formal legislation. The reason for this is that the costs for solar panels are currently much lower than before, which means that the compensation (fiscal stimulation) via the net metering rule was considered too generous.¹⁶⁹ A second reason is that with this reduction of net metering, the Ministry wants to stimulate realtime usage of the produced energy as well as storage. This will also relieve the capacity shortage in certain parts of the distribution grid.

Thus, in the plans announced by the Minister, from 2023 onwards, the net metering rule will be reduced with 9% per year. This entails that in the first year, only 91% of the generated electricity can be netted with consumption. The year after, this will only be 82%.¹⁷⁰ The reduction of the netting rule stimulates self-consumption of the generated electricity and storage ‘behind the meter’, as this will be less expensive than delivering the electricity back to the electricity network and using it at another time.

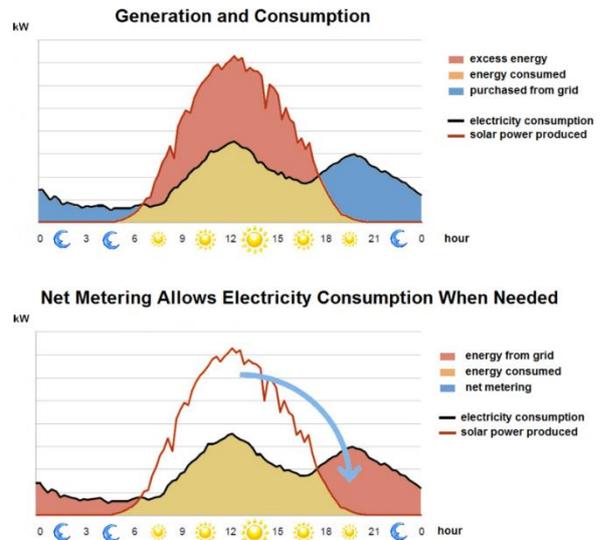


Figure 1: Net Metering, Source: Delphi 234, CC-BY-SA3.0.

Next to the net metering rule, another tax rebate is that a household which buys solar panels can be regarded to be an enterprise (for the purpose of generating electricity), which means that VAT over the acquisition of the system can be reimbursed. This saves 21% over the original investment. This is possible for house-owners but also for tenants: the requirement is that the bill for the solar panels is on the same name as the electricity bill.¹⁷¹ If *enterprises* consider the acquisition of solar panels, the normal VAT rules for enterprises apply.

Taxation of Energy Storage

Before 2022, energy storage was taxed twice, which was unfavourable for the business case. This was because the system of energy taxation focused on the end user, whereas energy storage created the situation that electricity was considered “consumed” by the storage facility, then produced again by the same storage facility, after which it was consumed again, this time indeed by the end consumer. This double taxation made it difficult to develop a business case for energy storage. This issue was flagged over the past years and amended with the *Belastingplan 2022*.¹⁷²

¹⁶⁸ Kamerbrief Minister Wiebes, 30-3-2020, available at <https://www.rijksoverheid.nl/ministeries/ministerie-van-economische-zaken-en-klimaat/documenten/kamerstukken/2020/03/30/kamerbrief-over-afbouw-salderingsregeling>.

¹⁶⁹ Ibid., p. 1-3. The investment could be recuperated in 5-7 years according to calculations by TNO. This will become approximately 9 years with the proposed changes.

¹⁷⁰ Ibid., p. 2-3.

¹⁷¹ https://www.milieucentraal.nl/energie-besparen/zonnepanelen/zonnepanelen-kopen/btw-op-zonnepanelen-terugvragen/?gclid=EAlaIqobChMikJG--3G6QIVDNd3Ch0wsg4BEAAYASAAEgLMzVd_BwE#vragen.

¹⁷² Dutch Ministry of Finance, *Belastingplan 2022*, available at <https://www.rijksoverheid.nl/onderwerpen/belastingplan/belastingplanstukken>, p. 12/13. The *Belastingplan* has the status of Act and is currently formalized into Dutch legislation.



4.1.6. Lower Legislation: EV Charging Stations

Several of the POCITYF pilots in Alkmaar include charging stations for electric vehicles. The legal framework can be split into the public law framework (i.e. the conditions prescribed for connections) and the private law framework (i.e. the contracts between different entities). The public law framework for these charging stations depends on the setup that is used. For example: will the charging stations be located on public ground or as part of private property? Will the charging stations have their own connection, or will they be part of a larger connection? Will vehicle to grid functionality be used, and if so, how will this be integrated in the Connection Conditions between the connected party and the DSO (Liander), in order to reward the flexibility that is offered by the EV owners?

There have been several cases about whether a DSO or a company linked to a DSO can be involved in offering EV charging facilities, and if so, under what conditions. For example, after a formal investigation, the Dutch NRA (ACM) agreed with Allego (a former daughter company of Alliander, the same mother company as for DSO Liander) that Allego was allowed to own charging stations but that it was not allowed to buy and sell electricity, and offer this to the EV owners.¹⁷³ Since then, an independent party (unaffiliated to a DSO) buys and sells electricity that is offered to EV owners via a Mobility Service Provider (MSP).¹⁷⁴ The MSP thus charges a tariff for the electricity (which is paid to the independent party), and also charges a tariff for making use of Allego's charging stations.¹⁷⁵

The public law framework on local level is also important: municipalities can fulfil various roles with regard to EV charging stations. First of all, they can set the right framework through the local rules as enshrined in the *Algemene Plaatselijke Verordening*, through decisions concerning the traffic and parking spaces (for example, reserving parking spaces for EVs). Especially when a larger EV charging station (a "hub") is planned, the municipality can also set terms and conditions for the development from a spatial planning law perspective. The municipality can also connect different partners active in the municipality to reach innovative concepts such as bidirectional charging or combining EV charging with lampposts.

Finally, municipalities can facilitate and stimulate EV development in their area by adopting policy that stimulates the construction of sufficient charging infrastructure and by investing in charging stations and EV themselves. With regard to the latter, municipalities can stimulate EV significantly by determining in the tender conditions for the next public transport contract that all local public transport needs to be zero emission, and by making use of EV technology for their own mobility - cars as well as other vehicles such as garbage trucks or cleaning vehicles.

Concerning the private law aspects of EV Charging stations, the contractual relations between the different actors matter. Several actors can be involved. Charging points can be owned by the owner of the building or by an independent 'Charging Point Operator' (a company operating a pool of charging points) - in the latter case, a contract for leasing a certain area in a building (parking space) is needed between the charging point operator and the owner of the building. The charging and billing at charging points are often managed by a mobility service provider (MSP). In that case, another contract is needed between the charging point operator or building owner and the mobility service provider. The EV owners then engage in a contract with the mobility service provider rather than with the building owner.

¹⁷³ <https://www.acm.nl/nl/publicaties/publicatie/15462/ACM-sluit-onderzoek-af-Allego-past-werkwijze-aan>.

¹⁷⁴ The MSP is the entity with which the EV-owner has a contract, which allows the EV-owner to 'fill up' the electric vehicle at different charging stations.

¹⁷⁵ <https://www.acm.nl/nl/publicaties/publicatie/15462/ACM-sluit-onderzoek-af-Allego-past-werkwijze-aan>.



Finally, when the charging points also facilitate ‘vehicle-to-grid’ services, where the electric vehicles help to support the balance of the electricity grid, the main beneficiary is the DSO. However, it is difficult for DSOs to directly compensate EV owners for their flexibility. There is no legal basis for this. A possible construction is that the DSO contracts MSPs for flexibility services, and the MSP then transfers the benefits to the EV owners that helped to substantiate that flexibility at a certain time. However, one issue is that this only works when sufficient EVs are connected to charging stations and when these EVs have given permission for bidirectional charging. This is relevant as bidirectional charging may also increase the wear and tear of the EV, especially of the batteries. Therefore, in the abovementioned construction, the EV owner needs to receive sufficient (financial) stimulus to offer the vehicle for this service, in order to compensate for the extra wear and possible risks or inconvenience (such as not being able to use the car for a certain period).

4.1.7. Lower Legislation: Innovative Energy Projects: Experiments Regulation

In the sections above, the rules applicable in Dutch energy law are elaborated. However, sometimes the currently applicable rules hold back innovation in the energy sector. Therefore, the Dutch government adopted an ‘Experiments Regulation’ which stimulates innovation in the energy sector by allowing specific exceptions of Dutch energy law, for example with regard to decentralised renewable energy generation, basically creating a “regulatory sandbox”.¹⁷⁶ The first Experimenteer AMvB¹⁷⁷ was valid between 2015 and 2018, and was aimed specifically at exceptions to the Electricity Act. Although a new version of this Act was prepared, it was later decided to not adopt a new version, as the Regulation did not lead to a significant amount of innovative projects, and the highest advisory organ for legislation (*Raad van State*) expressed its doubts regarding the choice of legal instrument as well as the compatibility with EU law.¹⁷⁸ Therefore, this is no longer possible for new energy projects.

4.1.8. Lower Legislation: Standardisation and Industry Norms

Both for individual buildings and for smart energy systems in the Netherlands, there are several Dutch technical standardisation norms (NEN-norms) that are applicable. For example, NEN norm 1010 is applicable to low-voltage electrical installations and aims to ensure the safety of this type of installations. Moreover, there are also norms applicable to the persons who design and install such installations. Based on NEN 3140 (low voltage) and NEN 3840 (high voltage), it needs to be clear for each installation, which person is the responsible person (*installatieverantwoordelijke*). This person needs to ensure that the installation was performed safely and that, after the construction work has finished, the installation can be used safely. NEN norms are also applicable to E-mobility, including electric buses and charging stations.

Whereas the NEN norms exist for good reasons, there might be specific issues, especially with the retrofit of heritage buildings. A concrete example from practice is that with a retrofit, the fuse box (*meterkast*) will often have to be adjusted too. The fuse box needs to adhere to the NEN norms applicable at time of installation or retrofit. So, in the case of a retrofit of an old (heritage) building, the fuse box will have to be adjusted to newer norms. As long as this fits within the original location of the fuse box, this is not problematic. However, when this does not fit any more

¹⁷⁶ E.C. van der Waal, A.M. Das, T. van der Schoor, ‘Participatory Experimentation with Energy Law: Digging in a ‘Regulatory Sandbox’ for Local Energy Initiatives in the Netherlands’ *Energies* [13,2 2020] gives several examples of how experiments under this regulation work and how they are perceived by participants.

¹⁷⁷ Besluit van 28 februari 2015, houdende het bij wege van experiment afwijken van de Elektriciteitswet 1998 voor decentrale opwekking van duurzame elektriciteit (Besluit experimenten decentrale duurzame elektriciteitsopwekking); Staatsblad 2015, 99.

¹⁷⁸ State Secretary Yesilgoz, Letter to the Parliament (*Kamerbrief*) DGKE-E / 21139861 ‘Evaluatie experimenten decentrale duurzame elektriciteitsopwekking’. See also: <https://www.rvo.nl/subsidies-regelingen/experimenten-elektriciteitswet>.



because the fuse box needs to be expanded, or because the location old fuse box does not adhere to the current norms (max 3 meter away from a door to street level; direct access from the hall/entry room), the fuse box will have to be relocated. Especially for monumental buildings this can be problematic, when the fuse box then needs to be located in a monumental entrance hall. This issue needs to be taken into account in case of the retrofit of a heritage building. For this reason, it is also important to contact the DSO regarding the retrofit of a heritage building with a problematic fuse box well in advance, as DSOs are in principle not allowed to connect buildings with fuse boxes that do not adhere to the norms. However, in such specific cases, specific solutions (“maatwerk”) may be developed between the project developer and the DSO.

4.2. Dutch Housing and Construction Law

This section on Dutch construction law is based on a combination of spatial planning law, which determines what kind of buildings can be constructed in a certain area and according to which conditions, and technical construction law. As a preliminary remark, it is important to note that this field of law is under major revision at the moment. Therefore, first, the old regime, that is currently applicable, will be treated. Then, the new regime, which is planned to be introduced from 2021 onwards but which has been postponed several times already, will be discussed.

For POCITYF, it would have been useful if the Environmental Planning Act and related legislation had been adopted already. Especially the rules on the built environment (Besluit Bouwwerken Leefomgeving) would add instruments for municipalities to enforce local energy measures in buildings including buildings that are part of the PED.

4.2.1. Spatial Planning Law

Current Regime: Spatial Planning Act

The current spatial planning regime is based on the *Wet Ruimtelijke Ordening* (the Spatial Planning Act).¹⁷⁹ This Act specifies the obligation for authorities (both the central government and local governments, such as municipalities and provinces), to adopt *Structuurvisies* (Area Visions) for the areas they govern.¹⁸⁰ These Area Visions contain the main principles of the spatial planning policy in that area. Then, the Spatial Planning Act requires local authorities to adopt Local Spatial Plans (*Bestemmingsplannen*) for every area they govern. These Spatial plans contain the purpose of each area and the buildings thereon (“*bestemming*”), i.e. residential purposes, nature, industrial estate and may specify rules with regard to the use of the area.¹⁸¹ Thus, it also specifies which activities may take place in the area they concern. Spatial Plans are adopted for a period of 10 years and have to be revised afterwards.¹⁸²

Whereas construction activity within urban areas is regulated by municipalities (who draft the spatial plans and are the permitting authority for construction activities), part of the planning area for POCITYF is located in Olympia Park, which is partially rural area (*landelijk gebied*). In rural areas, the province plays a large role. Spatial Planning in this area is based on the *Provinciale Ruimtelijke Verordening*.¹⁸³ However, this is translated in a *Bestemmingsplan* adopted by the Municipality.

¹⁷⁹ Wet Ruimtelijke Ordening, 20 October 2006, BWBR0020449, available at <https://wetten.overheid.nl/BWBR0020449/2018-07-01>.

¹⁸⁰ Wet Ruimtelijke Ordening, chapter 2.

¹⁸¹ Ibid., art. 3.1.

¹⁸² Ibid., art. 3.1.

¹⁸³ https://www.noord-holland.nl/Onderwerpen/Ruimtelijke_inrichting/Omgevingsvisie_en_PRV/Beleidsdocumenten/Provinciale_Ruimtelijke_Verordening_juni_2019.pdf.



New Regime: Environmental Planning Act

As mentioned above, a large reorganisation of Dutch spatial planning law is anticipated. This legislative revision has been prepared for years already and will be adopted and implemented in the coming years. The Environmental Planning Act (*Omgevingswet*), which is expected to enter into force in July 2022¹⁸⁴ replaces many previous Acts, amongst which the Spatial Planning Act. In the new Act, spatial planning will be based on physical environment visions (*'Omgevingsvisies'*) rather than the Area Visions mentioned above. Local Spatial Plans will be replaced with *Omgevingsplannen* (physical environment plans).

Physical environment plans have to be based on the framework created by the Physical Environment Vision developed for that area. These rules used to be spread over many different Acts, and the Environmental Planning Act brings all these Acts together and ensures that all locally applicable spatial planning rules are easy to find. An important characteristic is that public participation procedures are no longer centrally organised but depend on the locally applicable rules and on how deviations are allowed under the Physical environment plan (*Omgevingsplan*). Whether this is the case for the POCITYF pilot projects thus depends on the plan adopted in Alkmaar. Another change is that, contrary to the *bestemmingsplan* which is revised every 10 years, the *Omgevingsplan* is continually applicable but can be changed when needed.

For certain activities, a permit (*Omgevingsvergunning*) is needed. This relates to the construction of new buildings, renovation of existing buildings and adding a new part to an existing building, as well as for deviating from the Physical Environment Plan.¹⁸⁵ This means that for projects in the context of POCITYF, a permit is necessary in case the building is structurally changed. Smaller changes, such as the installation of solar panels on the roof of existing buildings, is generally possible without a permit, unless the solar panels are located on a monumental building or in a protected city area.¹⁸⁶

In order to obtain the right permit, the project developer should indicate the plans in the online tool *Omgevingsloket Online* (www.omgevingsloket.nl). With this tool, one can first check whether it is necessary to apply for a permit (*vergunning-check*), and if this turns out to be necessary, the application is automatically sent to the right authority, who will then decide whether or not (or under which conditions) a permit can be granted. This tool is a one-stop-shop, which also takes into account whether the project entails changes to a monumental building.

The Environmental Planning Act replaces many different Acts and Regulations, it aims to centralise the rules on spatial planning and construction. The Environmental Planning Act also creates an umbrella under which more detailed rules are laid down in four main Regulations: *Omgevingsbesluit* (Regulation on the Environment), *Besluit Kwaliteit Leefomgeving* (Regulation on the Quality of the Environment), *Besluit Activiteiten Leefomgeving* (Regulation on Activities in the Environment) and *Besluit Bouwwerken Leefomgeving* (Regulation on Buildings in the Environment). These four Regulations together specify the rules applicable to activities, for example industrial activity, and buildings. They specify which activities may take place where, under what conditions and what kind of procedures are available for obtaining a permit for the envisaged activity of building. The rules applicable to buildings are very relevant for POCITYF. Therefore, these rules are explained below as construction law.

¹⁸⁴ The implementation date has been postponed multiple times due to implementation issues, IT issues and political uncertainties.

¹⁸⁵ Dutch Ministry of Interior Affairs, Infoblad Verbouwingen gives a good overview. It is available here: <https://www.rijksoverheid.nl/binaries/rijksoverheid/documenten/brochures/2010/07/20/verbouwingen/infoblad-verbouwingen-16-7.pdf>.

¹⁸⁶ See section 4.3 below.



4.2.2. Construction Law

In this section, first the general rules on Construction and Housing will be described. Then, two specific issues for POCITYF will be analysed more specifically: the specifics on the energetic performance of buildings (both new and renovated buildings); and the rules on the physical appearance of buildings (*welstand*) are elaborated. Finally, some considerations are added on social housing corporations and on the impact of nitrogen rules on construction activities.

General Rules on Construction and Housing

An important starting point is that certain activities require a permit (*Omgevingsvergunning*) before they can commence. The different permits necessary for activities used to be spread over many different Acts and permit granting authorities. With the introduction of the WABO (*Wet Algemene Bepalingen Omgevingsrecht*),¹⁸⁷ this process has been centralised, and a one-stop-shop permit granting process has been set up. The necessity to obtain a permit can be laid down in a national, regional or local Act, and depends on the activity and several specifics: for example, the placement of solar PV panels on the roof of an existing building is in principle possible without a *Omgevingsvergunning*, when certain rules (about the height of the panels and the distance to the rooftop) are adhered to. However, the local rules can stipulate that a permit is required in any case.

Under the current regime, the *Woningwet* (Housing Act) specifies that, unless deviation is explicitly allowed in the permit (*Omgevingsvergunning*), it is not allowed to construct a building which does not adhere to the rules applicable to that type of building.¹⁸⁸ Next, this Act specifies that the rules applicable to different types of buildings need to be laid down in a Regulation.¹⁸⁹ This has been implemented by the adoption of the Construction Regulation (*Bouwbesluit*).¹⁹⁰ This Regulation gives a detailed description of all construction rules in the Netherlands for new buildings and renovations of existing buildings - ordered in safety norms, health norms, usability (*bruikbaarheid*) and sustainability. Projects in Alkmaar which change the construction of buildings (including insulation measures, windows, etc.) will have to comply with the Construction Regulation. Importantly, the Construction Regulation also implements the requirements of the EU Energy Performance of Buildings Directive in the Netherlands.

With the introduction of the Environmental Planning Act (see above), the parts of the *Woningwet* applicable to buildings, as well as the *Bouwbesluit* will be replaced. The rules from the *Woningwet* will be adopted in the *Omgevingswet*. The *Bouwbesluit* will be replaced by the *Besluit Bouwwerken Leefomgeving* (Regulation on Buildings in the Environment),¹⁹¹ one of the four major Regulations that is adopted under the umbrella of the Environmental Planning Act. This Regulation copies many of the rules that were applicable in the Construction Regulation already before, although some rules are also updated.¹⁹² Whereas most rules remain the same, the structure of the Regulation is very different. The old Regulation was based on different pillars, namely safety norms, health norms, usability (*bruikbaarheid*) and sustainability, the new Regulation is based on

¹⁸⁷ Wet van 6 november 2008, houdende regels inzake een vergunningstelsel met betrekking tot activiteiten die van invloed zijn op de fysieke leefomgeving en inzake handhaving van regelingen op het gebied van de fysieke leefomgeving (Wet algemene bepalingen omgevingsrecht), <https://wetten.overheid.nl/BWBR0024779/2021-07-01>.

¹⁸⁸ Woningwet: Wet van 29 augustus 1991 tot herziening van de Woningwet, BWBR0005181, art. 1b.

¹⁸⁹ Ibid., art. 2.

¹⁹⁰ Bouwbesluit 2012, available at <https://wetten.overheid.nl/BWBR0030461/2020-03-10>.

¹⁹¹ A consolidated version (including the latest changes, dated 13 May 2020) is available at https://aandeslagmetdeomgevingswet.nl/publish/pages/179195/bbl_geconsolideerd_matrix_13_mei_2020.pdf.

¹⁹² See for example Besluit van 13 december 2019, houdende wijziging van het Bouwbesluit 2012 en van enkele andere besluiten inzake bijna energie-neutrale nieuwbouw, available at <https://zoek.officielebekendmakingen.nl/stb-2019-501.html>.



construction in general, construction of new buildings, renovation of existing buildings, use of buildings and demolishing of buildings. Another main difference between the old regime and the new regime is that some rules used to be determined by the national legislation (the Construction Regulation) will now be brought back to the municipal competence.

An interesting rule from the new regime is that whereas the *Besluit Bouwwerken Leefomgeving (BBL)* provides energy and sustainability norms for buildings, municipalities can adopt *stricter* norms than the national norms, via specific rules (“*Maatwerk*”). This is possible via two ways, first of all via the specific conditions of a permit (norms for one building or one construction permission) and secondly for an entire area, via the *Omgevingsplan*. This allows municipalities to aim for higher ambitions with regard to energy and sustainability. It must be noted that only stricter norms are allowed, municipalities are not allowed to adopt *lower* norms than the norms enshrined in the BBL.¹⁹³

As the BBL is currently not yet into force, these new instruments cannot be used for the buildings that are retrofitted in Alkmaar at the moment. However, they can be used in replication areas, especially when specific higher norms are adopted in the Physical Environment Plan (*Omgevingsplan*).

Energetic Performance of New and Existing Buildings

There are two standards in Dutch construction law, one for new buildings and one for existing buildings, to be used when they are renovated. In Alkmaar, both new buildings (such as Investa’s building) and existing buildings (such as the high-rise building Van der Veldelaan) are part of POCITYF.

For new buildings, since 1 January 2021, new buildings must comply with the BENG Norm (Almost Energy Neutral Building, or *Bijna Energieneutraal Gebouw*).¹⁹⁴ This is also an implementation measure for the Energy Performance of Buildings Directive. This is relevant for demo sites where new buildings are erected, such as Investa’s building and the newly built houses in *Bloemwijk*.

The BENG Norm consists of three parts, namely (1) the maximum energy need of a building, to be calculated in kWh per m² of usage surface per year; (2) the maximum primary fossil fuel energy usage, also in kWh per m² of usage surface per year; and finally, (3) the minimum amount of renewable energy, in percentage of the energy usage.¹⁹⁵ These three criteria reflect the ‘trias energetica’ of minimising energy usage, increasing energy efficiency of the energy that needs to be used and increasing renewable energy. The exact norms per building type differ and are very specific - they will be part of the Construction Regulation from 2021 onwards.

Experiences from practice

InVesta will construct a new building within the context of POCITYF. For this building, the normative framework of BENG will be used to measure the KPI data. However, the innovative POCITYF elements (battery storage; circular construction materials; acoustic heatpump; DC grid; rooftop and façade PV and smart charging system for e-vehicles) go beyond the BENG norm and thereby contribute to the building being energy-positive rather than energy-neutral.

¹⁹³ Bbl, art. 4.150. See also: Mr. J.J. Karens, prof. dr. ir. A.G. Bregman en prof. mr. dr. K.J. de Graaf, ‘Duurzaam wonen: de rol van het bestemmingsplan en het toekomstige omgevingsplan’ in KNB, *Preadvies Duurzaam Wonen*, p. 104.

¹⁹⁴ <https://www.rvo.nl/onderwerpen/duurzaam-ondernemen/gebouwen/wetten-en-regels/nieuwbouw/energieprestatie-beng/indicatoren>.

¹⁹⁵ Ibid.



For the renovation of existing buildings, the norms are less strict.¹⁹⁶ The rules are applicable to the partial renewal, extension or change of a building, but for complete demolition and reconstruction, the requirements for new buildings need to be adhered to.

For renovation, the rules are less strict than for new buildings, but still, they are made stricter over time, also in terms of the energetic performance of buildings, for example related to thermal isolation. The exact norms are very specific and can be found in the Construction Regulation itself.

An important new rule relates to large renovations (*ingrijpende renovatie*), which is defined as more than 25% of the surface of the building. If more than 25% of the surface of the building is changed, there are extra requirements with regard to renewable energy.¹⁹⁷ This is an implementation of EU law, specifically the Renewable Energy Directive.

Physical Appearance of Buildings (*Welstand*)

A specific part of the Dutch system of permits for building plans and renovations is that it is usually necessary to test whether the physical appearance of the building (including the proposed plans) fits within the rules and policy on the physical appearance of buildings in an area. In order to test this, a committee (*de Welstandscommissie*) is called upon to review the plans and to advise the local permit granting authority on whether the plans should or should not be allowed (and consequentially, whether a permit should be granted). In certain instances, it is not obligatory to have a specific committee for this task. However, this depends on the local implementation of the rules. The local rules on the physical appearance of buildings are laid down in local policy rules (specifically: *de Welstandsnota*), which include both a description of the different areas and the different types of developments which are (not) allowed in that area.¹⁹⁸

Experiences from practice

In the context of the realisation of PEDs, this procedure can be problematic, for example when installations to generate renewable energy are constructed on the roof of a high rise building, this influences the physical appearance of the building in a way which the architect originally did not foresee. Especially if the building is part of a series of (similar) buildings, this can be a reason to refuse a permit. This was the case with the high-rise building at the Van de Veldelaan with a solar PV installation on the roof. The committee indicated this to be problematic.

POCITYF also aims to include cultural heritage buildings in PEDs. However, the committee generally applies a stricter test with regard to cultural heritage buildings. This means that it is more difficult, and, in some areas, even impossible to install installations such as heat pump units or solar panels on such buildings.¹⁹⁹

4.2.3. Other Relevant Issues

Social Housing Rules for Corporations

As the PED districts in Alkmaar include several social housing buildings (and social housing corporations among the LH partners), it is relevant to take the rules and obligations of the Housing

¹⁹⁶ Construction Regulation, art. 5.6.

¹⁹⁷ The exact rules can be found here:

<https://www.rijksoverheid.nl/documenten/richtlijnen/2021/12/02/leidraad-eis-hernieuwbare-energie-bij-ingrijpende-renovatie>.

¹⁹⁸ For Alkmaar: Welstandsnota 2016:

https://alkmaar.welstandinbeeld.nl/Data/Gemeenten/Alkmaar/Modules/TekstPagina/Front/bestanden/specifiek/M_6713ba9d-c272-495d-b6eb-f3346e6153e9/welstand_alkmaar_26september2016.pdf.

¹⁹⁹ Several cases (not in Alkmaar) are elaborated in: <https://pointer.kro-ncrv.nl/historische-binnenstedente-mooi-voor-zonnepanelen-beschermd-stadsgezicht> (in Dutch).



Act (Woningwet) into consideration.²⁰⁰ The Housing Act restricts housing corporations in their investment decisions, but with a new amendment (in force from January 2022 onwards), sustainability of their building stock becomes one of the core tasks of housing corporations.²⁰¹ This gives housing corporations more room to invest in retrofitting of their buildings. Moreover, the new amendment also allows corporations to participate in energy communities and to install solar panels on the roofs of shared (social housing/private ownership) apartment buildings.²⁰²

Nitrogen Compensation Obligations

A large issue in the Netherlands at the moment is the issue of nitrogen deposition within protected nature areas. These areas currently contain too much nitrogen - whereas the Dutch government has a duty to protect these areas and to reduce the amount of nitrogen on the basis of EU law. This is why the Dutch Administrative Jurisdiction Division of the Council of State (*Raad van State*) ruled that the policy and the general binding regulations with regard to nitrogen (*programmatische aanpak stikstof, PAS*), based on compensation of the effects afterwards, could not serve as a basis for permits anymore and had to be redesigned.²⁰³ The redesign process is currently ongoing and many measures are considered as part of a policy package to reduce nitrogen deposition. However, in the meantime, it is not possible to obtain a permit for any activity that emits nitrogen - including construction activity. Whereas the nitrogen emissions from construction activity are relatively low, it is still difficult to obtain the permit.

Experiences from practice

Project developers must show how they prevent nitrogen emissions in the construction process, for example by using electric equipment rather than diesel equipment, or by reducing nitrogen emissions elsewhere in the neighbourhood. Although there are quite a few construction activities in the context of POCITYF (construction of new buildings InVesta and Bloemwijk) as well as renovation activities (Van de Veldelaan, de Meent), this issue has not led to delays.

4.3. Dutch Cultural Heritage Law

This section describes local heritage law, as this is part of the legislative framework. However, until now, heritage law does not play a large role in the current POCITYF activities in Alkmaar. Therefore, no specific lessons learned are highlighted here already. Nevertheless, when the POCITYF solutions are replicated in the city centre of Alkmaar, or in other Dutch municipalities, the legal framework below will be relevant. The main lesson from Dutch heritage law is that there are various categories, and the level of protection varies between these categories. Generally, however, heritage buildings will face more difficulties than non-heritage buildings especially when installations (solar panels, heat pumps) are placed on the roof or facade of these buildings; and where the interior is also protected, insulation measures may also prove to be difficult to implement. However, although the implementation may be more difficult than for other buildings, this does not mean that it is not possible to renovate heritage buildings. It pays off to contact the relevant authorities well in advance in order to develop plans that are in line with the heritage rules. An interesting finding is that whereas the protection of certain categories of heritage is based on heritage law, protection can also stem directly from spatial planning law.

General Structure and Categories

Monuments

²⁰⁰ Woningwet: Wet van 29 augustus 1991 tot herziening van de Woningwet, BWBR0005181, art.

²⁰¹ Woningwet, art. 45 sub 2c(1) and 2l.

²⁰² Woningwet, art. 45 sub 2c(1).

²⁰³ Raad van State, 29 May 2019, ECLI:NL:RVS:2019:1603 and ECLI:NL:RVS:2019:1604.



There are different classes of monumental buildings in the Netherlands. Buildings which are considered of national importance or significance can be given the predicate ‘national monument’ (*rijksmonument*). Buildings with regional importance or local importance can be given the predicate ‘provincial monument’ (*provinciaal monument*) or ‘municipal monument’ (*gemeentelijk monument*). In principle, a building cannot be more than one type of monument at the same time, so it is either a national monument or a provincial monument or a municipal monument. In Alkmaar, there are 341 national monuments and 184 municipal monuments.²⁰⁴

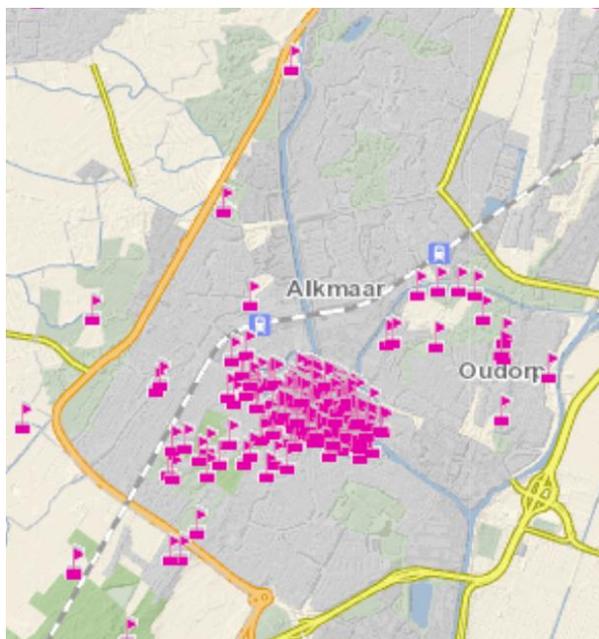


Figure 2: Location of Monuments in Alkmaar, source: viewer tool at maps.noordholland.nl.

The legislation on monuments used to be all in the same Act, the Monuments Act (*Monumentenwet 1988*), but this has been split with the introduction of the *Omgevingswet*. Now, the rules on how buildings (and other forms of heritage, such as archaeological sites and movable property) receive their predicate of ‘monument’ and the rules on selling or leasing monumental buildings are laid down in the Heritage Act (*Erfgoedwet*), whereas the rules on changes in the physical environment, including changes to monumental buildings, are laid down in the *Omgevingswet* and in the local regulations that stem from this Act.²⁰⁵

Beeldbepalend pand

Next to the legislation applicable to monuments, it is also possible to mark certain buildings as *beeldbepalend pand* under the Dutch spatial planning law. There is no direct translation in English, but with this predicate, the municipality indicates that the building has a significant appearance. The protection of this predicate is less strong than that of monuments, which means that only the outside appearance (façade and roof, or sometimes only the façade) needs to stay in its original form, but that changes inside a building are permitted. Alkmaar has 918 buildings that are qualified as *beeldbepalend pand*.²⁰⁶

Protected village or city areas

Some areas in the Netherlands are given the predicate ‘protected village or city area’ (*beschermde dorps- of stadsgezicht*). The main difference between this predicate and the abovementioned

²⁰⁴ Information provided by the municipality of Alkmaar.

²⁰⁵ See section 4.2.1.

²⁰⁶ Information provided by the municipality of Alkmaar.



categories is that this predicate is valid for an entire area or district. Buildings located within such areas are not protected as strictly as monuments (although there may be monuments located within a protected area, for which the stricter protection regime is applicable). However, some elements of construction law are restricted for buildings in these areas. As the city centre of Alkmaar is one of the replication areas of the POCITYF project, the exact construction rules in this area are relevant to consider in the development of the projects.

In general, local rules need to take into account the cultural and historical values of sites and districts. For protected city areas, specific rules are written in local regulations (*Bestemmingsplan*), which means that the rules are different for each area. The municipality of Alkmaar has three areas with this predicate. The historic city centre, Westerhoutkwartier and Droogmakerij De Schermer.²⁰⁷ How these areas are regulated is stipulated in the local Heritage Regulation, which is treated below.

With regard to the norms applicable to monuments, a relevant rule from the new *Besluit Bouwwerken Leefomgeving* (Dutch construction law) is that the rule that buildings need to have an energy label when they are sold, is not applicable to monuments, irrespective of whether they are local monuments or state monuments.²⁰⁸ This Regulation also provides several other exceptions for monumental buildings compared to the general construction rules applicable in the Netherlands: for example, several construction and renovation activities are allowed (without a special permit) for all buildings but not for monumental buildings.²⁰⁹ This means that for the same construction intervention, a permit will be needed when the intervention relates to a monumental building. This requirement introduces an extra check for construction plans which is not necessary for normal buildings, but which helps to preserve monumental buildings.

Local Rules relating to Heritage

The local rules for heritage buildings are laid down in the Heritage Regulation. The Heritage Regulation stipulates how municipal monuments and protected village or city areas should be treated. In the local Heritage Regulation of Alkmaar (*Erfgoedverordening Alkmaar*), it is forbidden to damage or destroy a monument and to perform actions as mentioned in art. 2.2 of the Act on General Provisions of Physical Environment Law (*Wet Algemene Bepalingen Omgevingsrecht*),²¹⁰ which are in practice ‘to demolish, to disturb or to change in any aspect’.²¹¹

Especially the latter, to change in any aspect, is relevant for any proposed replication projects within POCITYF. In the local Heritage Regulation of Alkmaar, it is also stated that an *omgevingsvergunning* will only be granted when there is no overriding interest of heritage conservation (“*indien het belang van de monumentenzorg zich daartegen niet verzet*”).²¹² Whether this condition is satisfied in a particular case, is assessed by the Monuments Committee (*Monumentencommissie*), which is created by the local Heritage Regulation of Alkmaar.²¹³ This committee advises the local authorities on whether or not an *omgevingsvergunning* should be granted in a particular case.

This means, for example, that solar panels on monumental buildings are only possible in certain cases, and only under certain conditions. How this is implemented, differs per municipality. In

²⁰⁷ See <https://www.gemeentelink.nl/gemeente/alkmaar/stadsgezichten/> for maps and more detailed information on these protected areas.

²⁰⁸ Bbl, art. 6.28.

²⁰⁹ Bbl, art. 2.15g.

²¹⁰ Erfgoedverordening Alkmaar, art. 10: https://decentrale.regelgeving.overheid.nl/cvdr/xhtmloutput/historie/Alkmaar/417940/417940_1.html.

²¹¹ Wet Algemene Bepalingen Omgevingsrecht, art. 2.2(1)b.

²¹² Erfgoedverordening Alkmaar, art. 11.

²¹³ Ibid., art. 3.



Alkmaar, the website provides that it will often not be possible to install solar panels on a monument, since this would affect the monumental look of the building.²¹⁴ However, it could be possible to install solar panels on a side building next to the main building, assuming that the side building has less monumental value than the main building. Moreover, where it concerns The *Rijksdienst voor Cultureel Erfgoed* (State Service for Cultural Heritage) has published a guideline with considerations on how and under what conditions solar panels can be installed on monumental buildings.²¹⁵

4.4. Local Obligations in Alkmaar

Next to obligations from Dutch law, there are also local laws and policy documents in the Municipality of Alkmaar that POCITYF will have to take into consideration. First and foremost, the local implementation of spatial planning law is relevant, as the required permits for construction work will have to fit within the local framework. The local Heritage Regulation has already been mentioned, but next to this Regulation, the local Area Regulations (*Bestemmingsplan*, *Omgevingsplan*) are relevant.

Experience from Practice

For Alkmaar, there are several restrictions with regard to Olympia Park (PEB1). Part of this zone is protected landscape, as it entails specific landscape types: “*droogmakerijenlandschap*”, and partially “*jonge duinlandschap/strandwallen- en strandvlaktelandschap*”.²¹⁶ Moreover, it is a protected birds area (*weidevogelgebied*). In the protected zones, only limited construction activity is allowed: only a limited amount of high buildings, and not too many buildings in total.

An important piece of local legislation is the Local Ordinance on the Physical Environment (*Verordening Fysieke Leefomgeving Alkmaar*).²¹⁷ Whereas the *Omgevingsplan* contains policy considerations for different area, this legislation lays down specific rules on many topics, such as the use of public space (with or without a permit), the organisation of events, rules on parking in the public space, and how to deal with local pollution. Especially relevant for POCITYF is chapter 8, on local (municipal) heritage, including heritage buildings, as one of the replication areas in Alkmaar is the historic city centre. However, whether and how this influences replication activities in POCITYF still needs to be elaborated.

Next to local (hard) legislation, the impact of policy documents adopted by the Municipality of Alkmaar should not be underestimated. The city government (*College van B&W*) is formed by a coalition of five parties. In their coalition agreement, the city government states that it focuses on concrete measures and that it follows the national guidelines on the energy transition.²¹⁸ Alkmaar as a lighthouse city fits well in this approach, as the POCITYF project will provide a lot of experience on which concrete measures need to be adopted in order to facilitate an energy transition in various districts of Alkmaar.

²¹⁴ <https://www.erfgoedalkmaar.nl/nieuwsbrief-53/verduurzaam-je-monument/>.

²¹⁵ Rijksdienst voor Cultureel Erfgoed, ‘Zonne-Energie en Uw Monument - Wegwijzer voor Eigenaren en Huurders’, available at <https://www.cultureelerfgoed.nl/publicaties/publicaties/2014/01/01/zonne-energie-en-uw-monument-wegwijzer-voor-eigenaren-en-huurders>.

²¹⁶ <https://maps.noord-holland.nl/WebViewer/index.html?viewer=ilc>.

²¹⁷ Verordening van de gemeenteraad van de gemeente Alkmaar houdende regels omtrent de fysieke leefomgeving (Verordening fysieke leefomgeving), 16-7-2021, available at <https://lokaleregelgeving.overheid.nl/CVDR660526/1>.

²¹⁸ Coalitieakkoord “Alkmaar aan Zet” 2018-2022, p 10.



4.5. Application of the Legal Framework to Alkmaar Pilot Projects

In this section, the regulatory framework concerning energy law, construction law and heritage law applicable in the Netherlands is applied to the demo projects in Alkmaar, in order to assess whether any legal/regulatory obstacles can be identified. As a preliminary remark, it must be noted that, since the execution of the projects is currently work in progress, it may be that extra issues come up during the coming years, when the projects are developed and installed. Moreover, as many laws that are relevant for POCITYF are planned to undergo revision in the coming few years, it may also be that issues that are unproblematic under the current rules will become problematic in the future, or vice versa, that issues that are currently problematic will be resolved already by the legislative revisions.

The demo projects in Alkmaar are categorised in four pillars. The projects envisaged under these pillars are mentioned below, with an assessment of whether there are any specific points of attention or unresolved issues in the regulatory framework.

(Stand-alone) Positive Energy Buildings

Buildings will be equipped with state-of-the-art insulation, solar PV installations, heat pumps and home batteries. There are no legal impediments to these projects per se, as long as the projects comply with the Construction Regulation (*Bouwbesluit*). If, for some reason, a deviation from the Construction Regulation is needed, this is possible under the condition that the offered solution is equivalent (*gelijkwaardig*) to the technical standards required by the *Bouwbesluit*, to be defended by the applicants in the permitting procedure and to be decided by the authorities that hand out the *Omgevingsvergunning*.²¹⁹ This is the case for the Investa Building as well as for Bloemwijk, that both go beyond the BENG norm and thus the Construction Regulation.

Another point of attention relates to the proposed home/building energy management systems: they need to comply with data protection and privacy law. This is a topic of continuous attention within ETT 1. Furthermore, if monumental buildings are involved, legal issues may arise as these changes may endanger monumental features of the building. No monuments are involved in the demo sites in Alkmaar, but this may become an issue for the replication area of the historical city centre.

Some other hurdles in the Alkmaar project based on the regulatory framework are that the permitting process proved to be more burdensome than expected. In the case of Bloemwijk, this was because the history association of Alkmaar filed an objection against the demolition and reconstruction of Bloemwijk due to historical reasons. In the case of the high-rise building at the Van de Veldelaan, the *Welstandscmissie* raised esthetical issues with changing one building in a line of similar buildings. Finally, the smart lamp post - charging pole innovative solution required certification, which was not originally foreseen.

Flexible and sustainable district heating/cooling with innovative heat storage solutions

This pillar entails several projects, such as the installation of a city energy management system, the low temperature heat network, the installation of stationary battery systems for energy storage, a virtual power plant which combines the supply and demand patterns of the different solutions, and the usage of DC grid technology. Legal issues related to these solutions are the following: again, for the energy management system and the virtual power plant, it is important that these comply with data protection rules, especially where personal data are involved.

²¹⁹ *Bouwbesluit*, art. 1.3 (Gelijkwaardigheidsbeginsel). In Dutch: Aan een in hoofdstuk 2 tot en met 7 gesteld voorschrift hoeft niet te worden voldaan indien het bouwwerk of het gebruik daarvan anders dan door toepassing van het desbetreffende voorschrift ten minste dezelfde mate van veiligheid, bescherming van de gezondheid, bruikbaarheid, energiezuinigheid en bescherming van het milieu biedt als is beoogd met de in die hoofdstukken gestelde voorschriften.



Regarding stationary battery systems, there are rules related to which entity can own a battery system. For example, whereas network operators (both DSOs and TSOs) could benefit from battery storage systems for solving congestion issues, they are not allowed to operate such installations, except in very specific circumstances. In Alkmaar, the smart storage systems are all owned by the building owners (Alkmaar Sport; Van Alkmaer; Woonwaard and InVesta). As mentioned in 4.1.4 and 4.1.5, the tariff and taxation system for stationary batteries used to be very unfavourable, but this is being adjusted.

With regard to district heating/cooling networks and heat storage solutions, the delay of the revision of the Heat Supply Act negatively impacts the project (see above, chapter 4.1.3). Next to Bloemwijk, this is also the case specifically with the Olympiapark area, where the idea is also to realise a heat network.

E-mobility integration into smart grid

Under this heading, the following projects are envisaged: smart solar charging stations, using the batteries from EVs in the virtual power plant, smart control of the (bidirectional) charging of electric buses and the usage of public lamp posts based on DC network technology.

With regard to smart solar charging stations, using batteries from EVs in a virtual power plant, and smart control of electric buses, no legal impediments are visible in the current legal framework. It is important that the contracts between different entities (such as the virtual power plant operator, the mobility service provider(s), the charging station owner(s), the EV owners and the bus company) are adjusted to the specific functionality that is asked. Dutch private law gives these entities the freedom to engage in such contracts.

With regard to Direct Current (DC) network technology, the current standard in the Netherlands is Alternating Current (AC). As mentioned above (section 4.1.4), an exemption from several network codes will be required in order to use a DC network.

With regard to smart mobility, several Dutch standardisation norms (NEN-norms) are applicable, with regard to charging stations, electrical buses, and the communication between buses and charging stations. These norms have to be respected, and parties involved in the e-mobility projects need to make clear agreements on who is responsible for following which part of the norms.

Regarding e-mobility, the main issues identified are not so much the regulatory framework itself but the consequences of the tax framework for fossil fuels vs EV on the business case, and the communication between the bus and the charging station (from a technical perspective), which should be laid down in standardization codes. In practice, this latter point is being tackled by the VDV261 and ISO15118 standards which are used by more and more providers of buses and charging infrastructure. However, there is no obligation to adhere to these standards, meaning that this issue is mitigated but not completely solved.

Citizen-driven co-creation

This pillar aims at community engagement and at replication of the demo solutions. In practice, this comes down to stakeholder and ecosystem management, group meetings and the organisation of an innovation festival. No legal/regulatory impediments are expected from this type of activity.



5. Portuguese Regulatory Framework

National acts and regulations fill in the norms set at international and EU level with more specific requirements. This is also the case for Portuguese energy law, construction law and heritage law, which will be elaborated below. Next to these rules, which are applicable throughout Portugal, the specific local obligations for the municipality of Évora are also discussed. Finally, section 5.5 gives an interim conclusion with an analysis of how the legal framework would be applied to the POCITYF projects taking place in Lighthouse City Évora, and whether any impediments are to be expected from this.

5.1. Portuguese Energy Law

5.1.1. Introduction

Generally, as energy law tends to be developed in response to technological developments, there is a legislative lag per definition. It is thus also foreseeable that the POCITYF solutions to be implemented in Évora will - given their pioneering nature - be at odds to a certain extent with the existing legal regime. There are two different kinds of obstacles (besides blatant prohibitions) to energy innovators - either that the law recently enacted is unable to sufficiently address the targeted problem; or that there is no regulation specifically concerning itself with a particular solution (potentially even involuntarily restricting an innovation). Luckily, the legal framework for Portuguese energy law is developing at fast pace, which means that findings from POCITYF may find their way into updated legislation, for example related to the innovative elements of energy sharing within districts and bidirectional charging for electric vehicles.

Traditionally, generation, networks and supply were separated and could not be organised by consumers. However, within energy communities, the tasks of generation and supply can in principle be taken on by citizens themselves - and they can also combine other energy services with this. In this section, first the basic principles for the organisation of the electricity system will be explained. Then, the legal framework for renewable energy communities and self-consumption will be assessed. Afterwards, the specific framework for electric vehicles and energy tax law will be addressed, in order to give a full overview of the legal framework applicable to POCITYF energy solutions.

5.1.2. The basic principles for the organisation of the electricity system

With a very recent new Decree Law (DL), 15/2022 of 14 January 2022,²²⁰ the organisation of the national electricity system is described. This an overhaul of existing legislation as earlier DLs on this topic are revoked by this DL. Moreover, this DL specifically aims to implement EU legislation (Directive 2019/944 and Directive 2018/2001) into Portuguese law. This DL describes the regulatory framework for the generation, transmission, distribution, storage and commercialization of electricity and for the electricity markets organization. For the purposes of this Deliverable, the focus will lie with the activities that take place within POCITYF.

First, the entities relevant in this context are the Energy Services Regulatory Authority (*Entidade Reguladora dos Serviços Energéticos* - ERSE) which (for the purpose of contextualising this within EU law) serves as Portugal's National Regulatory Authority; and the Directorate-General of Energy and Geology (DGEG) serves as the licencing entity.²²¹

²²⁰ DL 15/2022, Diário da República n.º 10/2022, Série I de 2022-01-14, páginas 3 - 185, <https://dre.pt/dre/detalhe/decreto-lei/15-2022-177634016>.

²²¹ DL 15/2022, Art. 12(2).



Rather than the previous “ordinary and special” system, the generation, self-consumption and storage of electricity are now covered by a single framework of prior control - the method of control depends on the size and nature of the activity. In short, the production of electricity from non-renewable energy sources, the production of renewable electricity with a capacity greater than 1 MW and energy storage facilities of more than 1 MW are subject to a production and exploration license.²²² For smaller renewable electricity installations, a prior registration regime is in place for installations in place for injection into the electricity grid of less than 1 MW; and for installations used for self-consumption between 30 kW and 1 MW; storage facilities of equal or less than 1 MW and for R&D/demonstration installations of more than 30 kW.²²³ An even lighter regime is the “prior communication” option (a known concept from earlier legislation), which is in place for self-consumption and R&D installations between 700 W and 30 kW, as well as for re-equipment of an existing wind or solar plant which was licensed under the prior control procedure.²²⁴ Finally, for very small or R&D installations (up to 700 W) where injection of the surplus electricity in the electricity grid is not foreseen, no prior communication is necessary.²²⁵ DGEG has a key role in this system as the authority issuing production and operating licenses for large installations as well as proof of registration/communication for other installations.²²⁶

For installations for which a production and operation licence are needed, a specific timetable applies: it starts with the application for a grid capacity title.²²⁷ An exception is that for UPACs (self-consumption units),²²⁸ only when the injection of surplus electricity in the electricity network is expected to be more than 1 MVA, a grid capacity title is needed. Once a grid capacity title has been issued by DGEG, the project developer has 1 year to apply for the production license if an EIA is necessary, or 6 months if no EIA is needed. If the project developer fails to apply for the license in this period, the title expires again.²²⁹ DGEG, as licencing authority, has 1 year to respond to the application. The application for a grid capacity reservation is coupled to a caution that needs to be paid when the installation is not realised (or delayed).²³⁰

Experience from Practice

In Évora, the solar energy projects can be divided in two: the BIPV (building-integrated solar photovoltaic) panels that are planned to be installed on several municipal buildings, and a community solar farm with conventional PV panels. For the community solar farm, the planned capacity was more than 1 MVA. However, it turns out that even though the project would technically be eligible to apply for a license, this is typically not granted in practice, because only projects awarded via the ‘solar auctions’ system are awarded with a license. The project developers are currently looking into how to proceed with the community solar farm, for example by creating a R&D project rather than a regular project.

The plans for BIPV installations and their related infrastructure in buildings have also sparked some issues regarding licensing. Next to the construction and local requirements (treated in section 5.2-5.4), another issue is that some innovative components are not yet certified (CE-compliance) and can thus not be licensed. This is an interesting chicken-and-

²²² DL 15/2022, Art. 11(2). There are some other categories too, such as “autonomous production or storage when subject to EIA obligation” and other categories not listed under the other paragraphs of the article, related to the prior registration or prior notification regime.

²²³ DL 15/2022, art. 11(3).

²²⁴ DL 15/2022, art. 11(4).

²²⁵ DL 15/2022, art. 11(5).

²²⁶ DL 15/2022, art. 11(6), art. 12.

²²⁷ DL 15/2022, art. 18.

²²⁸ The UPAC will be addressed in next subchapter, 5.1.3.

²²⁹ DL 15/2022, art. 18(6) and art. 14.

²³⁰ DL 15/2022, art. 13. The height of the caution depends on the type of installation and the capacity.



egg situation: in an innovative environment such as POCITYF, new technologies will be tested in practice, which is a step towards market-readiness taking place in before or in parallel to steps in the CE certification process. However, when it is not yet clear how components act in real situations, it is difficult to say whether the developers should invest in the CE certification process.

5.1.3. Legal regime applicable to self-consumption and RECs

Renewable Energy Communities (RECs) and Self-Consumption are important aspects of the Évora Lighthouse Projects in POCITYF. Both the BIPV panels on buildings and the community solar farm are planned to be constructed as ‘collective self-consumption’ projects, which makes the legislation on this topic relevant for all electricity generation in Évora’s POCITYF projects. Therefore, their legal framework will be set out in detail below. The framework is set by DL 15/2022, which has replaced much of the earlier legislation on self-consumption and RECs. Regulamento n. 373/2021, however, has not been revoked and is thus still applicable, as long as it does not contradict the framework law of DL 15/2022.

Renewable energy communities and production units for self-consumption

For the purposes of this section, it is important to take into account the definitions first. A main element is “*autoconsumo*” (self-consumption), defined as “consumption ensured by electricity produced by one or more UPACs and carried out by one or more self-consumers of renewable energy.”²³¹ This definition refers to UPACs, another key element in this context. UPACs are production units for self-consumption, which have renewable energy as their primary source, and which *may* include a storage facility as well. UPACs are intended mainly for the satisfaction of one’s own energy needs and are installed either inside an IU (user facility)²³² or in the *vicinity* of one.²³³ Thus, this incorporates not only self-consumption in the same location but also the proximity element as developed in the Renewable Energy Directive for RECs. Interestingly, UPACs may be owned and/or managed by third parties. This provides extra room for investment in UPACs, as long as the electricity is mainly intended for self-consumption.

Experience from Practice

In Évora, several municipal buildings will be equipped with BIPV panels. They will share the generated energy with other municipal buildings in the environment. The community solar farm is also planned to become a collective self-consumption project in which citizens of Évora can participate. The “proximity”/vicinity rules are relevant in this context, as only those located in the proximity of the generation can participate in the collective self-consumption. However, it seems that the new rules on “proximity” are specifically drafted for low-voltage connections (households), whereas some of the municipal buildings have a medium-voltage connection. It is not completely clear how the rules should be interpreted in this case. If interpreted in a literal way, this will exclude several buildings, but if interpreted in a contextual or purposive way, it should be possible to include these buildings.

Another important concept here is the “self-consumer”, defined as a final consumer who produces renewable energy for their own consumption, and who can store and sell this electricity - but if this is done as a non-domestic consumer, the storage or sale of electricity should not be the main commercial or professional activity.²³⁴ This means that municipalities and companies can also participate in this activity, which is very relevant for POCITYF. Importantly, self-consumption can

²³¹ DL 15/2022, art. 2e

²³² The user facility, which is the place where the electricity is consumed again. DL 15/2022, art. 2(rr).

²³³ The proximity is described in DL 15/2022 art. 83 and ranges from max 2 km to max 20 km depending on whether the installation is connected to the same transformer station or not.

²³⁴ DL 15/2022, art. 2(f).



take place individually or collectively. The DL provides specific rules for collective self-consumption, also as implementation of EU Directive 2018/2001.

Collective Self-Consumption (ACC in Portuguese) groups must have an internal regulation about the requirements for access for new members and departure of existing members, the decision-making process (which majority is required for deliberation), the way of sharing electricity and the payment of the tariffs, as well as the destination of the surpluses and the commercial relationship policy, and the application of the revenue coming from this. These rules will have to be communicated to the DGEG within three months after the UPAC comes into operation.²³⁵

Experience from Practice

It is not yet entirely clear how to register collective self-consumption, especially in the case of collective self-consumption between municipal buildings. Would the municipality be able to create a company specifically for this goal, or should another entity be chosen? This is an element to be addressed in Évora in the coming time.

Self-consumption taxes and tariffs

The UPAC (and consequently the CER) do not incur in tariffs for their internal transfers of electricity. However, when using the national electricity grid, they are required to pay tariffs for grid use (feeding electricity into the grid or consuming electricity from the grid).²³⁶ The tariff will, however, see a partial or total tax deduction for the costs related to sustainability and general economic interest energy policy (*custos de política energética, de sustentabilidade e de interesse económico geral* - CIEG). The amount deducted varies based on an order made once per year by the member of the energy minister, who considers the benefits that the self-consumption regime provides, and the existence of disproportional costs affecting the long-term sustainability of the national electricity system. In the absence of this decision, the ERSE will define the part to be deducted.

In sum, self-consumers have the right to install one or more UPACs, establish direct lines and/or internal networks when there is no access to the public network, consume the electricity produced in UPACs in their IU, operate storage facilities and trade surplus energy from production for self-consumption, through electricity markets, bilateral contracts or peer trading regimes, directly or through third parties. In the meantime, self-consumers will maintain their rights and obligations as normal electricity consumers, and they always have the possibility of ceasing to be a self-consumer. The obligations of self-consumers relate to having the right prior notification procedure for their installation and bearing the tariffs for the connection to the electricity grid as well as tariffs for usage of the grid (for the moments when it is used), as well as locating the UPAC as close as possible to the location of consumption - and minimizing the surplus - and in this way contributing to reducing grid constraints.²³⁷

Furthermore, collective self-consumer groups must also appoint a duly qualified technician and a managing body for the collective self-consumption entity, to be entrusted with the practice of operational management of the activity. The owners may also define the powers of the managing body, granting them the competence to manage the internal grid, to manage the connection with the public service electricity grid, to interact with the operator (e.g. sharing the production ratios), to manage commercial relations of the UPACs (e.g. the conducts to adopt with the surplus and representative powers).

²³⁵ DL 15/2022, art. 86.

²³⁶ DL 162/2019, Article 18; The tariffs' value is established in ERSE, Directive 5° 2020, Diário da República, series 2, part E, n° 57, 20 March 2020, p.157-158 <https://dre.pt/web/guest/home/-/dre/130469271/details/maximized?serie=II&parte_filter=33&day=2020-03-20&date=2020-03-01&dreId=130469191> .

²³⁷ DL 15/2022, art. 88.



This is not troublesome for the implementation of the project's solutions and might even be a helpful imposition. Requiring a managing body to be established ensures that the operation keeps running without any unnecessary delays (which may otherwise be caused by a lack of rapidity in decision making, limiting the efficiency of the project), and provides the flexibility required to allow for efficient energy flows between buildings. Moreover, as owners remain in control over the Production Unit and the selection of the managing body, the opportunity to replace an inefficient manager encourages productive management.

Metering of UPACs and CERs

It is mandatory to meter the total electricity production, electricity injected and extracted from energy storage facilities connected to the national electricity grid and in a collective UPAC/REC when the installed power is more than 4 kW (such as the entities likely to be created by the POCITYF project).²³⁸ This metering is done remotely by the system operator and must be capable of measuring both energy inflows and outflows. Further, the meter should be installed at the connection point between the UPAC/REC and the national electricity grid (and every associated IU except in cases of a smart grid).²³⁹ The general requirements and rules pertaining to the metering energy consumption using smart meters (as well as an overview of the advantages they provide) can be found in section (3.1.4).

The requirement of utilising smart meters may pose as a challenge when implementing the project's solution across cities other than Évora, as not all locations have a high penetration of smart meters, and the costs tied with acquiring, installing and exploring smart meters must be borne by the self-consumers (unless the expected installation date was set for the near future).²⁴⁰

Regulation

On May 5th, 2021, the Portuguese Energy Services Regulatory Authority published the Regulation 373/2021²⁴¹, to approve the self-consumption regulation and to revoke the Regulation 266/2020. This Regulation contains more specific information compared to the DL 15/2022 on the rules for self-consumption and renewable energy communities. The Regulation 373/2021 brings the description of the main shareholders involved on the self-consumption procedures (users, energy market agents, the DSO and the TSO) and how their commercial relationships must occur. It also defines how to properly measure and manage the relevant data, how to share energy regarding collective self-consumption and renewable energy communities' modalities, and data availability. Lastly, the grid use tariffs are also regulated. The regulation also enables pilot projects for these new rules assessment.

A final note on RECs and self-consumption is that the main obstacle as experienced in POCITYF right now is that even though the legal framework is now in place, the idea of community ownership is not yet fully accepted in society, leading to distrust about whether others are not taking advantage. In practice, this means that it is very hard to set up a REC unless they are funded by an investor. However, the current legal structure of RECs makes it difficult for investors to participate: the REC must be owned by its members, and the investor cannot take part of the REC as such, he cannot be entitled to the product of the REC, the produced energy. Thus, there is still work to be done in order to make RECs an accepted part of the energy sector.

²³⁸ DL 15/2022, art. 95.

²³⁹ The meter must fulfil the ministerial order n.º 231/2013 of 22 July.

²⁴⁰ DL 15/2022, art. 95(6).

²⁴¹ Regulation 373/2021, Diário da República, Series 2, N.º 87/2021, 5 May 2021. <

<https://dre.pt/der/detalhe/regulamento/373-2021-162753427> >.



5.1.4. Portuguese E-vehicle regime

The legal sources regulating e-vehicles²⁴² (electric mobility - *mobilidade elétrica*) in Portugal were adopted some years ago - which may explain why the regime established is unidimensional. The legal framework concerning charging points addresses the installation and operation of charging points in a detailed manner, but makes no mention of the possibility that vehicles might feed electricity back into the electricity grid.

On the subject of charging points, DL 90/2014 mentioned smart meters when stating that the responsible member of the government shall establish, by ministerial order, the requirements applicable to the functioning of charging points.²⁴³ ERSE Regulation 879/2015 (adopted in 2015) also noted that charging points should use smart meters²⁴⁴ - by the end of the following year, a ministerial order establishing exactly the same requirement was published.²⁴⁵ However, the newer ERSE Regulation 854/2019 does not mention the term “smart meter” for charging points, but specifies that the meters should conform to the ERSE Guia de Medicao, Leitura e Disponibilizacao de Dados (GMLDD) 2015 and provide communication and data storage capabilities.²⁴⁶

The character of DL 90/2014 is not directly supportive of V2G (vehicle to grid) solutions, such as those proposed by the POCITYF project. This is because DL 90/2014 establishes a charging point as being infrastructure that is exclusively dedicated to charging the vehicle’s batteries.²⁴⁷ Despite this, however, there may be some room for manoeuvre as the same article defining charging points mentions that the vehicles charged may be associated to services related to the electric mobility. This mention might allow to argue that the DL 90/2014 is compatible with the V2G solution, even without this being explicitly said in the legislation.²⁴⁸

The scope of DL 90/2014 is narrow, concerning itself with electric mobility and its impact in the national electricity grid (and giving scant attention to the other innovations that widespread e-vehicle ownership may provide). In essence, it is not truly something that might raise obstacles to the implementation of the POCITYF solutions, as much as it is proof that something in the legal landscape is lacking - namely a framework on the use of vehicles as power storage units capable of injecting power into the grid at different geographical points and at different moments in time.

Expecting the creation of specific frameworks is in line with the DL 90/2014 as it mentions that the electric mobility managing entity should cooperate in investigation, update the technology and develop new functionalities of the electric mobility grid and cooperate in the integration of

²⁴² DL 39/2010, Diário da República, series 1, .º80/2010, 26 April 2010, p.1371 <<https://dre.pt/pesquisa/-/search/614137/details/maximized>>; amended three times, by: Law 64-B/2011, Diário da República, series 1, n.º.250/2011, 30 December 2011, p.5538-(48), article 139.º <<https://dre.pt/pesquisa/-/search/243769/details/maximized>>; DL 170/2012, Diário da República, series 1, n.º148/2012, 1 August 2012, p.4007 <<https://dre.pt/pesquisa/-/search/179069/details/maximized>>; (and) DL 90/2014, Diário da República, series 1, N.º111/2014, 11 June 2014, p.3096 <<https://dre.pt/pesquisa/-/search/25676885/details/maximized>>

²⁴³ DL 90/2014, Article 6 (8).

²⁴⁴ ERSE, Regulation 879/2015, Diário da República, series 2, n.º249/2015, 22 December 2015, p.37122 <<https://dre.pt/web/guest/pesquisa/-/search/72953312/details/normal?q=Regulamento+n.%C2%BA%20879%2F2015>>.

²⁴⁵ Portaria 221/2016, Diário da República, series 1, n.º 153, 10 August 2016, p.2714, Articles 1 and 5(2) <<https://dre.pt/web/guest/pesquisa/-/search/75126729/details/normal?q=Portaria+n.%C2%BA%20221%2F2016>>.

²⁴⁶ Erse, Regulation 854/2019, Diário da República, series 2, n.º211/2019, 4 November 2019, p.99 <<https://dre.pt/dre/detalhe/regulamento/854-2019-125874308>>

²⁴⁷ DL 90/2014, Article 6 (1).

²⁴⁸ DL 90/2014, Article 6 (1).



the electric mobility grid with the national electricity system.²⁴⁹ This means that efforts from the managing entity to incorporate V2G services can be expected, and may lead to a direct acknowledgement of this practice in the Portuguese legal framework.

Lastly, it must be mentioned, that while this DL does not establish the possibility of using vehicles as storage units, DL 162/2019 (on Self-Consumption) does so, as its definition of storage energy includes storage in vehicles when the user's installation has a bi-directional charging point.²⁵⁰ As such, it may be argued that this more recent legislation opened the door a bit further to implementing the vehicle to grid approach discussed in the POCITYF, however it is not clear whether this shall be considered a different energy source for effects of the UPAC or CER.

5.1.5. Energy Tax Law

This section will consider the relevant tax measures that might facilitate the implementation of POCITYF solutions, looking at the incentives for renewable energies included in the national personal and business income tax rules, the special consumption's tax and the state budget.

Personal Income Tax

The Personal Income Tax (IRS)²⁵¹ establishes beneficial regimes for individuals with organised accounting (mainly those who are self-employed or entrepreneurs) who use electric vehicles in their work-related travel.²⁵² Individuals with organised accounting are autonomously taxed in relation to the purchase of a light passenger vehicle, at a rate of 10% for vehicles costing under €20000, and a rate of 20% for more expensive vehicles. Hybrid vehicles are taxed at 5% and 10% respectively. Electric vehicles are exempted from these taxes entirely. This stimulates electric mobility, which is relevant for the POCITYF project.

Corporate income tax - IRC

The benefit for electric cars also exists under the Corporate Income Tax (IRC) framework.²⁵³ Under the framework, electric cars are exempted from the taxes, while other vehicles are taxed at a rate of between 10% and 35% - 10% for vehicles which costing less than €27500, 27.5% for vehicles costing between €27500 and €34999, and 35% for vehicles costing over €35000. This tax is paid by taxable persons that do not benefit from exemptions and do not perform activities of an agricultural or commercial nature.

Unfortunately, it seems that the incentives for renewable energy in both regimes starts and stops at electric vehicles. Also, despite the substantial tax exemptions offered, the incentives for electric cars are limited to business vehicles.

The general tax law, besides the incentives on the acquisition of electric cars by businesses, does not show any manifest advantage or support of the POCITYF project. That means that special taxes must be considered as well as the tax included in legal documents which are not entirely tax oriented, such as the National State Budget.

Special Consumption's Tax

²⁴⁹ DL 90/2014, Article 21 (2) n), o), t).

²⁵⁰ DL 162/2019, Article 2 l).

²⁵¹ "Código do Imposto sobre o Rendimento das Pessoas Singulares (Código do IRS)", Law 82-E/2014, Diário da República n.º 252/2014, 2nd suplemente, Series I, 31 December 2014 <<https://dre.pt/web/guest/legislacao-consolidada/-/lc/70048167/view>>.

²⁵² Código do IRS, Article 73.

²⁵³ "Código do Imposto sobre o Rendimento das Pessoas Coletivas (Código do IRC)", Lei n.º 2/2014, Diário da República, series I, n.º 11/2014, 16 January 2014 <<https://dre.pt/web/guest/legislacao-consolidada/-/lc/64205634/view>>, Article 88.



The Special Consumption's Tax Code (CIESC)²⁵⁴ encompasses a diverse set of consumption taxes that impact a wide range of goods. Within that range, it establishes a tax (known as the ISP) for petroleum and energy products. The ISP covers electricity, gas and carbon-based fuels.²⁵⁵ The fuels used by public transport vehicles, and the electricity used by trams, undergrounds, trains and trolleys, are exempted from this tax. As can be seen, a missed opportunity is that this regime does not show support for renewable energy production or the use of private electric vehicles, which could both have been exempted.

The CIESC establishes the minimum and maximum ISP unitary charges (tariffs) over the different fuels and energy products. In the tariff structure, it may be argued that the tax values are more advantageous for electricity than for carbon-based fuels.²⁵⁶ This difference in values may be interpreted as a support for the use of electricity over hydrocarbons - but even then, there is no distinction between electricity generated from RES and electricity generated from fossil energy sources. Furthermore, there is no specific exemption for RES under the CIESC except for biofuels.²⁵⁷

On top of the already mentioned levies, there are additional CO₂ emission costs that should be considered with the ISP.²⁵⁸ Electricity produced from renewable sources pays no such CO₂ tax, which means that, to a point, this can be identified as a support for renewables and therefore relevant for the POCITYF project.

The support for renewable energy in tax law seem to come from indirect benefits more than it does from big exemptions based on the environmental advantages they have when compared to fossil fuels.

5.2. Portuguese Housing and Construction Law

Under the Portuguese construction law framework, Decrees that might affect the implementation of the POCITYF solutions have been issued. Construction law in general is divided between public works (and therefore under the scope of the Public Contracts Code)²⁵⁹ and those procured by private entities (and therefore under the scope of the Civil Code).²⁶⁰ However, the mostly procedural impositions of the Public Contracts Code and the Civil Code are not the ones expected to impose direct restrictions on the deployment of the POCITYF solutions. Specific regulations as the Regime of Urbanization and Construction (RJEU) and the General Regulation of Urban Construction (RGEU) are more explicit establishing restrictions and shall be considered for that reason.

²⁵⁴ “Código dos Impostos Especiais Sobre o Consumo”, Decree-Law n.º 73/2010, Diário da República, series I, n.º 118/2010, 21 June 2010 <<https://dre.pt/web/guest/legislacao-consolidada/-/lc/34478675/view?q=73%2F2010>>.

²⁵⁵ CIESC, article 88 (1) d), 88 (5).

²⁵⁶ CIESC, articles 91, 92; see that the tax value for electricity is comprehended between 1 and 1,10 euros per MWh while (for comparison) for unleaded petrol is between 359 and 650

²⁵⁷ Biofuels exemption CIESC article 90

²⁵⁸ CIESC, article 93.

²⁵⁹ “Codigo dos Contratos Públicos”, enacted by DL 18/2008, Diário da República, series I, n.º 20/2008, 29 January 2008, p.753 <<https://dre.pt/home/-/dre/248178/details/maximized>>; as of its version after the Portuguese Parliament Parliamentary Resolution 16/2020, Diário da República, series I, n.º 56/2020, 19 March 2020.

²⁶⁰ “Codigo Civil”, enacted by DL 47344, Diário do Governo, series I, n.º 274/1966, 25 November 1966, p.1883 <<https://dre.pt/web/guest/pesquisa/-/search/477358/details/normal?l=1>>; as of its version after Law 85/2019, Diário da República, Series I, n.º 168/2019, 3 September 2019 <https://dre.pt/web/guest/pesquisa/-/search/124392057/details/normal?p_p_auth=5LNJRj3r>.



5.2.1. Legal Regime of Urbanization and Construction (RJEU)

Per the RJEU,²⁶¹ municipalities must enact urbanisation or construction regulations, and regulate the fees and guarantees required to pursue those activities,²⁶² with the RJEU imposing restrictions on a general level (to be implemented by municipalities). Municipalities are, nonetheless, expected to establish which projects are of reduced urbanistic importance,²⁶³ and such projects are exempted from requirements of licenses, authorizations or prior communication. In essence, the RJEU establishes general procedural requirements and provides municipalities with the competence to detail and implement the requirements.

Results and possible obstacles caused by what this document translates to in the municipality will be discussed below in the local requirements section. Therefore, analysing this document may be at times abstract, or of relevance only to the implementation procedure.

Under the RJEU, modification works in immovable property classified (or undergoing classification) under the Portuguese cultural Heritage Law, or in protection zones established under the same law and in immovable property subjected to limitations due to their public use; as well as in areas not included in allotment operations - are dependent on a license.²⁶⁴ Further, less imposing works depend on prior notification.²⁶⁵ The license and approval of prior information is the competence of the Municipality (Câmara Municipal).²⁶⁶

As the above passage indicates, not only historic and protected buildings, but also those with a public use (such as schools and public services buildings) require a license to be granted before a construction project can begin. This goes far beyond the comparatively simple requirement of prior notification to be given, as it must be established that the plan is made accordingly to the: Municipal and Intermunicipal land use plans; special protection plans; preventive measures; priority urban development areas; priority construction areas; administrative servitudes; public use restrictions; or any other law/regulation applicable.²⁶⁷ However, there are some projects that are exempted from these previous checks. Those of relevance within the context of this project are projects of little urbanistic importance and projects dealing only with the interior of a building (or fractions of a building, thus not implying changes to the building's structure); its façade; mat and tiles or construction of roofs.²⁶⁸ Further, the aforementioned works, when executed outside of the urban areas, are exempted from licensing requirements if the building is used for residential purposes and is not comprised of more than two independent houses.

The installation of renewable energy production installations (including micro-production) associated with the property's main building is considered a project of limited urbanistic

²⁶¹ DL 555/99, "Regime Jurídico da Urbanização e Edificação", Diário da República, series I-A, n.º 291, 16 December 1999, p.8912 <<https://dre.pt/pesquisa/-/search/655682/details/normal?q=Decreto-Lei+n.%C2%BA%20555%2F99+de+16+de+dezembro>>; in it republished version of DL 136/2014, Diário da República, series I, n.º 173, 9 September 2014, p.4809 <https://dre.pt/web/guest/pesquisa/-/search/56501680/details/normal?p_p_auth=XoJL1674>; amendments up to Law 118/2019, Diário da República, series I, n.º 178, 17 September 2019, p.3 <https://dre.pt/web/guest/pesquisa/-/search/124750731/details/normal?p_p_auth=XoJL1674>.

²⁶² RJEU, Article 3.

²⁶³ RJEU, Article 2(l) - Work of Little Urbanistic Relevance: Edification and demolition works that due to their size, nature or location have a reduced urbanistic impact.

²⁶⁴ RJEU, Article 4.

²⁶⁵ Ibid.

²⁶⁶ RJEU, Article 5.

²⁶⁷ RJEU, Articles 20(1) and 24.

²⁶⁸ RJEU, Article 6.



importance under the RJEU. This class of project includes:²⁶⁹ the installation of solar PV panels and solar thermal collectors for the heating of water (with an area no larger than the building's roof or 1m taller than the building); the installation of wind turbines (with a maximum height of 4m above the building's highest point, and with a maximum radius of 1.5m); and the reconstruction of outer walls, the roof using materials that provide energy efficiency gains, providing they have the same aesthetic finish.

These stipulations seem to simplify some of the procedures for the installation of the POCITYF solutions, as they ought to be considered of limited urbanistic relevance. However, this 'projects of little relevance' exemption does not apply to buildings which are classified under heritage law (either individually or as part of a group, or are undergoing classification), nor does it sidestep any additional requirements imposed by the municipality.²⁷⁰

Experience from Practice

Within POCITYF, the proposed solution for the municipal buildings is innovative BIPV panels. However, it turns out that this type of construction activity is not easily licensed, due to the visual impact of the solutions. In short, the licensing authority does not accept changes in the materials used in the building, as well as the colour of the glass. At the moment, the Évora project developers are investigating how they can develop the project in such a way that it will be able to be licensed. Even when agreement has been reached on this topic for this specific project, the issue will come up again in replication situations in Portugal.

The urban construction projects promoted by the municipalities in an area included by the municipal plan are also exempted from previous control.²⁷¹ This is unsurprising, as competent entity for issuing licenses is the municipality. It will assess urbanisation works and lands' remodelling works in line with the municipal land use plan, considering protective measures, proprietary urban development areas, public utility restrictions and other legal rules applicable before coming to a decision.²⁷² Reasons for refusal of a license may thus include: a lack of conformity with the municipal land use plan; negatively affecting the surroundings of a classified sight and/or monument (or the building itself); negatively impacting cultural, historic, archaeological or landscaped heritage (natural or built); and affecting the towns' aesthetics.²⁷³ The same holds true in cases where the project may result in existing services and infrastructure, or where granting a license would require the municipality to incur objectionable installation and maintenance costs (as may be the case when the works impact the water and electricity grids).

Under the RJEU, where construction projects do not follow the locally applicable legal regime, they may be stopped or suspended by the competent administrative bodies. Further, the mayor may order the new building (or modifications) to be demolished, or require alterations to the project to ensure that it complies with the law.²⁷⁴ If the impositions established are not followed, the mayor may establish an administrative possession and coercively execute the impositions at the expense of the owner. After the measures have been fulfilled, the administrative possession lapses.²⁷⁵

The RJEU appears to also give municipalities various grounds to restrict the deployment of the project's solutions. While the RJEU mainly sets out the procedural requirements for a construction

²⁶⁹ RJEU, Article 6-A(1) g), h).

²⁷⁰ RJEU, Article 6-A(2)(3).

²⁷¹ RJEU, Article 7.

²⁷² RJEU, Article 21.

²⁷³ RJEU, Article 24.

²⁷⁴ RJEU, Article 102, 102-A, 102-B, 103, 105, 106.

²⁷⁵ RJEU, Article 107-108.



project (e.g. obtaining licenses and seeking approval for plans), it also establishes more specific provisions make clear that certain projects (such as the installation of solar panels) should, as a general rule, have a lower bar applied. However, the specific requirements are to be set by the Municipalities.

Charges are to be paid for the issuing of licenses, declarations, and authorisations.²⁷⁶ Charges are liquidated when a license is approved by the mayor in accordance with the regulation approved by the municipal assembly.²⁷⁷

5.2.2. General Regulation of Urban Construction (RGEU)

Although specific requirements are decided at the municipality level, the RGEU²⁷⁸ is relevant as a national source of law. It is applicable to any construction project, including modifications to existing buildings that are subjected by law to an urbanisation plan (while urban perimeter and rural areas subjected to protection).²⁷⁹ Furthermore, it is applicable to industrial or public use buildings, with the municipality retaining the power to increase the scope of the regulation.²⁸⁰

For Municipalities to issue a construction license for the mentioned buildings, they must comply with this regulation and other regulations that the Municipality are responsibility to enforce.²⁸¹

The RGEU broadly establishes that all buildings must be constructed in a specified manner and using specified materials, as a means of fulfilling hygiene and security conditions.²⁸² Further, under the RGEU, buildings must be constructed (or altered) in a manner that satisfies the fundamental requirements of energy saving and thermal insulation.²⁸³ The RGEU also lays out specific requirements for constructions, related to walls, staircases, etc. These requirements are extensive, but they do not jeopardise the implementation of solutions envisaged by the project, as multiple exceptions exist. Nonetheless, the regulations must be considered when changes are substantial.

The RGEU also covers aesthetic requirements for construction projects. Projects, including building and renovation works both in urban and rural areas must be planned, executed and maintained in a manner that contributes to the aesthetic value of the group of the surrounding buildings, not jeopardising the appearance, proportions and look of the surroundings.²⁸⁴ It must be noted that the RGEU merely establishes the guidelines for specific requirements, but not their exact content.

Municipalities are responsible for inspecting the constructions, and have the power to issue fines where there is a breach of the regulation.²⁸⁵ Regarding monuments and public interest buildings, municipalities cannot authorise any project without prior authorisation from the National

²⁷⁶ RJEU, Article 117.

²⁷⁷ RJEU, Article 118.

²⁷⁸ DL 38382, “Regulamento Geral das Edificações Urbanas”, Diário do Governo, 1st supplement, series I, N.º 166, 7 August 1951 <https://dre.pt/web/guest/pesquisa/-/search/289214/details/normal?p_p_auth=UofgT0ea> ; in its wording subsequent to DL 220/2008, Diário da República, series I, n.º 220/1951, 12 November 2008, p.7903 <https://dre.pt/web/guest/pesquisa/-/search/439866/details/normal?p_p_auth=XoJL1674>.

²⁷⁹ RGEU, Article 1.

²⁸⁰ Ibid.

²⁸¹ RGEU, Article 3.

²⁸² RGEU, Article 15-16.

²⁸³ RGEU, Article 17.

²⁸⁴ RGEU, Article 121, 122.

²⁸⁵ RGEU, Article 160-164.



Education Minister. Further, in protected zones (established for public buildings), the approval of the Minister of Public Works is required.²⁸⁶ With this stipulation, the RGEU ensures that the competent entities are involved in the decisions that affect culturally relevant properties.

Under the RGEU, the municipality has the ability to classify a building as being ‘of interest’, thereafter affording the building special protections. The RGEU also establishes that any modifications that might harm the value of buildings or natural elements classified as having municipal value will not be accepted.²⁸⁷ Under the same provision, the municipality may require restorative works to bring the property back to its original state (when the cultural value justifies so).

Another issue relates to installations on the rooftop of a building.²⁸⁸ Per this requirement, any addition to the roof of a building which forms part of a group may not exceed the highest existing point, unless the addition is decorative. However, to consider a RES installation (such as a solar panel) a decorative element is not advisable, both under the RJEU and under municipality requirements which will be seen in the next sections.

It appears that the special conditions for wind generators and solar/PV panels which are present in the RJEU are not replicated in the RGEU. This may create an overlap between both regulations regarding the installation of solar panels or a wind turbine on a building which is part of a group, as while the RJEU provides that it is of reduced urbanistic relevance if it stays within 1 meter of the building’s current peak (for solar panels) or 4 meters (for wind turbines), the RGEU states that no element of the building should stand taller than the group’s current peak.

In short, municipalities play a pivotal role in all the decisions over construction law, but they are not autonomous when their decision affects national cultural heritage. As will be shown in chapter 5.3, then multiple layers of authorities are responsible for licensing, which has its effect on the possibilities for heritage buildings to adopt innovative solutions.

5.2.3. Portuguese Regulation on the Energy Performance of Buildings

Directive 2010/31/EU was transposed in Portugal through DL 118/2013, which was amended several times.²⁸⁹ It covers the energy certifications system,²⁹⁰ the regulation for the energy performance of residential buildings,²⁹¹ and the regulation of the energy performance of services and commercial buildings.²⁹²

The Certification System

The certification system is of relevance to the POCITYF project as it incentivises the development of highly energy efficient projects, especially those with the capacity to generate on a small scale. Additionally, DL 118/2013 highlights the need to support buildings with near-zero energy needs that fulfil their needs with renewable energies, namely renewables produced locally or in the

²⁸⁶ RGEU, Article 123.

²⁸⁷ RGEU, Article 124.

²⁸⁸ RGEU, Article 59.

²⁸⁹ Diário da República, series I, N.º 159/2013, 20 August 2013, p.4988 <<https://dre.pt/pesquisa/-/search/499237/details/maximized>> lastly republished by Law 52/2018, Diário da República, series I, n.º 159/2018, 20 August 2018, p.4229 <<https://dre.pt/home/-/dre/116108098/details/maximized>>; amended afterwards by DL 95/2019, Diário da República, series I, n.º136, 18 July 2019, p.35 <https://dre.pt/web/guest/analisejuridica/-/aj/123185845/init/normal?p_p_auth=VUFce49G&AnaliseJuridica_WAR_drefrontofficeportlet_mode=dt>

²⁹⁰ DL 118/2013, articles 3-21.

²⁹¹ DL 118/2013, articles 21-31.

²⁹² DL 118/2013, articles 32-50.



vicinities.²⁹³ This is, in essence, a summary of the positive energy district's objective of the POCITYF project. DL 118/2013 establishes that the construction of such buildings should be incentivised through the adoption of supportive measures, such as granting funding to potentiate the energy performance of buildings and the transition for buildings with near-zero energy needs.²⁹⁴ Although this is not a grant of financial support in itself, the measures shows that incentives are expected to be implemented through law.

The aim of DL 118/2013 is to increase the performance of buildings in general, and it does so by imposing requirements that must be met and certified when:²⁹⁵

- a new building is constructed
- An existing building undergoes considerable modifications
- buildings are sold
- buildings which are used for commerce or services:
 - o and have a usable floor are of 1000 m² or more
 - o Includes shopping malls, supermarkets and covered swimming pools with usable floor are of 500 m² or more
 - o Includes publicly owned buildings, buildings occupied by a public entity and frequently visited by the public, with usable floor area of more than 250 m²

DL 118/2013 also lists the buildings that are exempted from having their performance evaluated. This exemption does not cover historic and/or heritage buildings generally, but places of worship, ruins and military bases specifically.²⁹⁶

Beyond providing for certificates to be issued, DL 118/2013 allows for pre-certificates of performance to be issued. These are available for buildings prior to construction commencing, or for considerable works, and takes into account the technical, economic and environmental viability of highly efficient alternative systems, such as:²⁹⁷

- decentralised renewable energy installations
- cogeneration
- heat pumps
- collectives or urban networks of heating and cooling (especially when based totally or partially in energy from renewables)

Both certificates and pre-certificates include recommendations on how to improve the energy efficiency of a building.²⁹⁸ These are generally valid for 8 years, though for large commercial and service buildings the certificates are valid for 10 years.²⁹⁹ Performance certificates are inspected by the Directorate General of Energy and Geology, and the certificates system is managed by the ADENE (the national energy agency).³⁰⁰

Energy performance of residential buildings

²⁹³ DL 118/2013, article 16.

²⁹⁴ DL 118/2013, article 17.

²⁹⁵ DL 118/2013, article 3.

²⁹⁶ DL 118/2013, article 4; Directive 2010/31/EU of the European Parliament and the Council, of 19 May 2010

on the energy performance of buildings, provides for the exception of cultural heritage buildings and places of worship and ruins on article 4.

²⁹⁷ DL 118/2013, article 5.

²⁹⁸ DL 118/2013, article 6.

²⁹⁹ DL 118/2013, article 15.

³⁰⁰ DL 118/2013, article 10, 11.



DL 118/2013 establishes the minimum standards applicable both to new developments and to those being modified. The minimum standards aim to promote the improvement of the thermal behaviour (ability to conserve heat) and energy efficiency.³⁰¹

The construction of new buildings, interventions in the building structure (walls, ceiling, windows or doors), and energy evaluation of new and buildings undergoing major renovations are covered under the certificates' regime.³⁰² The regulation carves out exceptions for non-residential buildings and buildings classified (or undergoing classification) under Portuguese heritage law.³⁰³

Experience from Practice

This exception entails that the requirements for energy efficiency of buildings are not applicable to historic buildings classified under Portuguese heritage law, which is relevant to the POCITYF project as one of the main pilot areas (Évora city centre) contains many historic buildings (see chapter 5.3).

Buildings are evaluated by their thermal behaviour, their energy needs and their overall energy efficiency.³⁰⁴ The specific requirements of DL 118/2013 apply to:

- New buildings - thermal performance and energy efficiency of the technical systems, even requiring the use of solar installations for water heating, but opening the possibility for other renewable energy installations to be used as an alternative;³⁰⁵
- Renovated buildings - thermal behaviour and technical efficiency requirements, including the use of solar power installations (which may be substituted by other renewable energy production installations) when adequate;³⁰⁶
- Existing residential buildings - that are renovated for the introduction of a new technical system or improvement of the existing one must comply with the requirements set forward if that is technically sound, functional and economically viable.³⁰⁷

Compliance with this regime must be assessed under the *ex-ante* control system established through construction law. Therefore, compliance with this regulation must be analysed when issuing any authorisation or license for modification or construction works.³⁰⁸

Given the intent and objectives of the POCITYF project, it seems likely that any building renovated during the course of the project will comply with the requirements of DL 118/2013. The DL can also be used as a standard to compare results between different buildings.

Energy performance of services and commercial buildings.

DL 118/2013 also addresses commercial buildings, while also establishing exemptions for historic and heritage buildings.³⁰⁹ The regulation also covers aspects relating to the thermal behaviour of

³⁰¹ DL 118/2013, article 22

³⁰² DL 118/2013, article 23.

³⁰³ DL 118/2013, article 23.

³⁰⁴ DL 118/2013, article 24, 25.

³⁰⁵ DL 118/2013, article 26-27.

³⁰⁶ DL 118/2013, article 28-29.

³⁰⁷ DL 118/2013, article 29-30.

³⁰⁸ DL 118/2013, article 30.

³⁰⁹ DL 118/2013, article 32, 33.



and energy efficiency concerning:³¹⁰ new builds,³¹¹ renovated and remodelled buildings,³¹² and (to a more limited degree) existing buildings.³¹³

While existing buildings are, in principle, not bound to thermal behaviour or efficiency requirements, (except when they are subject to modification), their energy performance must be evaluated periodically, with the intention of identifying methods of reducing their energy footprint.³¹⁴

As with residential buildings, this is enforced through the *ex-ante* control mechanism of licenses and authorisations for urbanisation or modification works, as established by Portuguese construction law, which monitors compliance with this regulation and any adjacent ministerial orders.³¹⁵

Its identical character makes it so that the analysis of these regulations on commercial buildings arrives at the same conclusions that were reached for the residential buildings: The POCITYF project will be able to comply with the requirements, and moreover may use them as a reference to quantify its achievements above the legally required baseline.

5.3. Portuguese Heritage Law

Cities like Évora which enjoy a rich past will naturally have a considerable number of old and historical buildings. This may pose challenges in the implementation of renewable energy and energy efficiency solutions. This is why the Évora historical city centre was chosen as one of the pilot sites to investigate how heritage buildings and positive energy districts can be combined. This section will analyse how Portuguese law protects cultural heritage buildings, and investigates whether it acts as an obstacle to the implementation of energy solutions (such as the installation of PV panels).

Experience from Practice

Because the Historic Centre of Évora was inscribed on the UNESCO World Heritage List (since 1986 already), it is subject to the protection and enhancement of cultural heritage, in accordance with Law No. 107/2001 of 8 September.³¹⁶ The Historic Centre is protected as a whole, which means that all buildings in the Historic Centre are considered monuments and are subject to the same protection. Likewise, POCITYF also includes many historic buildings (and even historic parking spaces):

- Municipal Market 1 de Maio (located in the Historic Center - Protected building);
- Arena d'Évora (located in the protection zone of the historic center wall. Protected building);
- Garcia Resende Theater (located in the Historic Center. Protected building);
- S. Mamede School (located in the Historic Center. Protected building);
- City Hall (located in the Historic Center. Protected building);
- Rossio de S. Brás School (located in the protection zone of the historic center wall. Protected building);
- Vista Alegre School (located outside the Historic Center. Building not protected);
- Environment Space (located in the Historic Center. Protected building);

³¹⁰ DL 118/2013, article 34, 35.

³¹¹ DL 118/2013, article 38, 39.

³¹² DL 118/2013, article 42, 43

³¹³ DL 118/2013, article 46, 47.

³¹⁴ Ibid

³¹⁵ DL 118/2013, article 50.

³¹⁶ Lei No. 107/2001, art. 43 and 15.



Parking lot at Av. Eng. Arantes e Oliveira (located in the protection zone of the historic center wall. Protected area);
 Parking lot for heavy vehicles on Av. Túlio Espanca (located outside the protection zone of the historic center wall. Unprotected space).

Classification

DL 309/2009 provides the further legal framework for the protection of cultural heritage.³¹⁷ DL 309/2009 established cultural heritage classification procedures for immovable property, and set out the legal regime applicable regarding the protection of such locations. DL 309/2009 includes individual and group classifications (*conjunto ou sítio*), and even allows for other forms of real estate (roads, gardens and squares) to be given the cultural heritage designation.³¹⁸ However, due to Lei No. 107/2001 art. 15(7), designation as Unesco World Heritage leads to monumental status in Portugal instantly - which is confirmed by DL 309/2009:

*The classification procedure can result in building or places being categorised as having different cultural interest/relevance being rated as property of notional, public or municipal interest.*³¹⁹

*When the immovable property in question has been classified as World Heritage, this will amount to it being classified of national interest with its own special protection zone, and that classification being published in the National Journal (Diário da República).*³²⁰

Finally, next to individual buildings, also a group of buildings or lands can be declared a group (*conjunto ou sítio*) accordingly to how those categories established in international law.

Licensing

For protected buildings and sites, renovation or rehabilitation requests must be evaluated by the CME (the municipal council of Évora), based on the Évora local requirements, see chapter 5.4, as well as the DRC (Regional Directorate for Culture). The application can be submitted solely to the CME and the CME requests evaluation to the DRC or the applicant can simultaneously submit the application for licensing to the CME and the DRC. The two bodies decide independently from each other, which means that a positive decision from the CME will not affect the decision of the DRC.

Protection Zones

The classification of a building may affect the implementation of solutions due to the restrictions that put into place to protect its value. Additionally, the protection zones (PZs) and corresponding legal regime set out in DL 309/2009 has the potential to impact how and whether POCITYF solutions can be implemented.

There are three zones specified by DL 309/2009, and these are divided into three groups: General PZs; Provisional Special PZs; and Special PZs.

General Protection Zones

*While a building or place is undergoing a classification procedure, it establishes a zone that spans 50m from its external borders.*³²¹ This PZ (protection zone) is the least

³¹⁷ Decree law 309/2009 'Património Cultural Imóvel procedimento de classificação e regime jurídico das zonas de proteção', Diário da República, 1.st series, N.º 206, 23 October 2009; in its more recente version after Decree Law, 265/2012, Diário da República, 1.st series, N.º 251/2012, 28 December 2012.

³¹⁸ DL 309/2009, Article 2.

³¹⁹ DL 309/2009, Article 3.

³²⁰ DL 309/2009, Article 72.

³²¹ DL 309/2009, Article 36, 37.



restrictive of the three, with DL 309/2009 establishing only that such zones are administrative servitudes, and therefore that licenses cannot be granted by the municipality, or other entities, for construction or works that change the topography, alignment, the distribution of volumes, cover or outer coating of the buildings, without previous positive decisions from the competent cultural heritage administration.³²² The effects of this general PZ are merely temporary, and it lasts only until a special protection area that better suits to the building or place is granted.³²³

Provisional Special Protection Zones

This PZ serves as an alternative to the General PZ, and may apply to buildings or places during a classification process when the general zones is seen as insufficient to protect the building. The classification lasts until Special PZ status is granted.³²⁴ They are set by the IGESPAR I.P. and have the amplitude required for the protection value of the site. This classification may also be applied to zones where it is not possible to build (zonas non idificandi).

This temporary but strict protection may be repealed when the reasons behind its enactment are no longer verifiable.

Special Protection Zones

Unlike the other zones, the special protection designation is not temporary, and is attributed to property of interest classified under the Portuguese Heritage Law.³²⁵ The procedure giving rise to this designation may be requested by any interested party, or may be initiated autonomously by the IGESPAR, which defined the zone together with the regional culture and territory directorate (DRC) and the municipality (CME).³²⁶

The Special PZ is of sufficient size and imposes sufficient restrictions to allow it to capably protect and esteem the property, with the nature of these restrictions established on a case by case basis. These might include, inter alia, restrictions or prohibitions on construction within certain zones; the designation of an area as archeologically sensitive, with interventions restricted to safeguarding procedures; prohibiting alterations to buildings or groups which are to be preserved; establishing conditions regarding the regularity of conservation work; and imposing rules regarding advertisements in the area.

The Special PZ is aimed at ensuring the surrounding landscape of a property in the different perspectives from which it is contemplated, as such the special zone may include green areas as gardens or historic parks that are relevant to defend the context of the historical building. In these areas, no licenses can be provided for operations without a favourable decision from the IGESPAR I.P, except when it only concerns the alteration of the interior.³²⁷

Special PZs are clearly the most likely to create barriers to the employment of POCITYF solutions, due predominantly to their permanence and specificity regarding the type of protection afforded a property. Any solution, therefore, will have to be tailored to the building in question, and remain mindful of the restrictions in place.

³²² DL 309/2009, Article 14°; DL 107/2001, Diário da República, series I-A, N.° 209/2001, 8 September 2001, Article 43.

³²³ DL 309/2009, Article 40.

³²⁴ DL 309/2009, Article 36, 38, 39, 40.

³²⁵ DL 309/2009, Article 36.

³²⁶ DL 309/2009, Article 41.

³²⁷ DL 309/2009, Article 51.



DL 309/2009 also provides for the specific restrictions that come from a group of properties being classified as ‘culturally interesting’. This is different from the PZs and has different implications for the POCITYF project. In these instances, a wider area is jointly classified as culturally relevant - though this does not mean that individual properties or areas within the group have not also been given protected status.³²⁸

Restrictions applicable the area of a place or group

In the delimited area of a place or group (conjunto), the IGESPAR, I.P. in together with the regional culture and territory directorate and the municipality where the building is located, shall establish gradual restrictions on: volume; morphology; height; outer shell colours of buildings; zones where it is not possible to build; zones of archaeological sensibility; buildings or groups of buildings which must be integrally preserved; buildings or groups of buildings which may be the object of modificative works; those which are to be preserved and those bound to the works regime of DL 140/2009.³²⁹

The restrictions do not differ from those established by under protection zones and are equally flexible. One of the mentioned classifications, which differs slightly from the others, is the classification of a building as of municipal interest:

First the classification of a building, or group (conjunto ou sítio), as of municipal interest is a competence that rests with the municipality.³³⁰ This does not mean that the IGESPAR and the Directorate are not involved, since the IGESPAR will issue an opinion on the classification, and both of them will publicise the municipality’s decision.³³¹

Secondly, while buildings of municipal interest might have PZs, this is only the case when the competent municipality organ decides to act, due to the territorial management tools not being sufficient to guarantee the preservation of the environment in question. This is done in the interest of maintaining the valuation of the property.³³²

Another possible legal obstacle is formed by the safeguarding plans (*Plano Pormenor de Salvaguarda*), initially mentioned in Decree Law 380-99. These may include rural and urban land.³³³ This plan works as a territorial management tool to establish restrictions aimed at maintaining the natural and historic value of a property.³³⁴

The mentioned set of restrictions in PZs, buildings or groups of buildings, buildings or groups of buildings of municipal interest, and land covered by a safeguarding plan, mostly propose limitations to alterations of the external parts of buildings. This suggests that they may only restrict solutions that impact the outside aesthetic.

Projects of National, Public or Municipal Interest

Next to the building-specific rules elaborated above, DL 140/2009, which established the legal regime for projects, interventions and constructions in goods (immovables and others) of national, public or municipal interest is also important to take into account.³³⁵

³²⁸ DL 309/2009, Article 55, 56.

³²⁹ DL 309/2009, Article 54.

³³⁰ DL 309/2009, Article 57, 59.

³³¹ DL 309/2009, Article 61.

³³² DL 309/2009, Article 58.

³³³ DL 380-99, Diário da República, Series I-A, n.º 222/1999, 22 September 1999: revoked by DL 80-2015, Diário da República, series I, N.º 93/2015, 14 May 2015.

³³⁴ DL 309/2009, Article 63-66.

³³⁵ DL 140/2009, Diário da República, Series I, n.º 113/2009, 15 July 2009, article 1.



The most important contribution made by DL 140/2009 is the establishment of the principles that must be followed when intervening in goods of public interest: prevention, planning, gradualness, inspection and information.³³⁶ The *prevention* aspect implies a requirement that alterations, interventions and acts to be systematically considered, monitored and evaluated as so ensure that they do not affect the cultural goods' integrity or authenticity. *Planning*, in this context, refers to the rigorous projections required from qualified technicians to ensure that the methods and resources employed at the execution phase are the correct ones. *Gradualness* can be seen as a synonym for 'proportional' - the restrictions faced must be proportional to the cultural value. *Inspection* refers to series of inspections that will be carried out on any areas or buildings which are approved as compliant. *Information* also carries its ordinary meaning, and refers to the publishing of intervention data in a systematic manner for historical, documental and statistical purposes.

These principles are not directly applicable, but they are close, as they are restated by requirements for alterations and interventions. They may serve as guidelines regarding what to expect and what conduct to adopt when acting with cultural goods and properties. Some examples of the principles put into practice are:

*That approvals and authorisation of works or interventions in cultural goods require the submission of a preliminary report by a qualified technician with at least 5 years of relevant experience.*³³⁷

*The competent cultural heritage administration office may demand complementary information. It will also proceed with a preliminary inspection of the good and monitor the alterations or interventions relating to the said goods.*³³⁸

*Those responsible for managing the alteration or intervention shall produce two additional reports. An interim/progress report within the term established by the competent cultural heritage administration office, and a final report upon the conclusion of the works (due within 30 days of the project's conclusion).*³³⁹

*The need for a preliminary report on immovable goods stating the criteria substantiating the reconstruction, modification, augmentation and conservation works: The adequacy of the said interventions regarding the characteristics of the building, its degree of classification as national, public or municipal interest and the foundation of its cultural value (historical, architectural, artistic, scientific or technical interest); Compatibility of the materials and propositions with the existing ones; Risk-Benefit analysis of the proposed works/interventions; Consequences of the works/interventions in the archaeological patrimony; the proposed use for the building; bibliography; photographic or video survey of the whole and details of the interior and exterior of the building.*³⁴⁰

In theory, it may seem that many solutions implemented in a historic building will be acceptable provided it complies with the stated requirements. In practice, the administrative processes may stifle the implementation of solutions by driving up costs and timeframes with the amount of

³³⁶ DL 140/2009, Article 2.

³³⁷ DL 140/2009, Article 4-5.

³³⁸ DL 140/2009, Article 6-8.

³³⁹ DL 140/2009, Article 9-10.

³⁴⁰ DL 140/2009, Article 15.



reasonings, authorizations, justifications, and positive opinions required (not to mention inspections). As for the restrictions in solutions caused by Portuguese heritage law, it seems that the law mostly establishes a general notion that the integrity of the building must be respected. Anticipating the limitations of the solution without an objective and specific standard may, however, be complicated.

It could be argued that unless the specific solution being employed would potentially destroy the culturally relevant part of a building or place, it should be allowed. For example, while it is not unreasonable to argue that installing a PV panel in a building may only be problematic when the roof to which the panel is connected is an essential for the cultural interest of the building. However, there might be problems if the authorities considered that a sizable structure, even when situated on the roof, will break the harmony of the culturally relevant building or place, reducing its cultural value.

It could be expected that Portuguese heritage law would create some obstacles when installing sizable, visible installations on buildings or in places classified as being of cultural interest. However, while some instances are clear-cut (few would suggest covering a roman temple with solar panels), not all will be, and discovering what is permissible and what is not may use up time and other more finite resources.

5.4. Évora Local Requirements

When it comes to applying construction law and cultural heritage law, municipalities enjoy a prominent role in establishing the specific requirements to be followed in adjusting traditional buildings. When looking at a specific location, it is possible to find that some municipalities establish requirements that go above and beyond the national legislation, due to the characteristics of buildings and their historic and immaterial value. In the specific context of Évora - a city and municipality in southern Portugal - it is necessary to assess what form these specific local requirements take, and whether they might clash with the POCITYF project's solutions.

Évora's Municipal Regulation for Construction, Urbanisation and Urbanistic Taxes must first be considered.³⁴¹ Article 3 of the Regulation sets out which constructions are of limited urbanistic importance (accounted for in the Juridical Regime for Urbanization and Construction - RJUE). This type of constructions benefits from the application of a shorter notice requirement and further benefits established in the RJUE. This does not encompass areas containing buildings which are classified as having cultural value, according to the municipal territorial and special planning.³⁴²

Of relevance for the POCITYF project, Article 3 restates the RJUE's support for the implementation of solutions based on PV technology and other technical equipment, establishing that such installations are of limited importance.³⁴³ Nevertheless, the Municipal Regulation imposes additional requirements on the use of panels, demanding that the equipment is not visible from public space. In short, any installation of technical equipment that is not visible from public space and installed in a building that is not classified as having cultural relevance will be a construction of limited urbanistic importance, and is thus able to enjoy a fairly permissive regime.

Within this regulation, the requirements set out in Articles 17, 19 and 24 must be considered:

³⁴¹ Évora's Municipality, Public Notice n° 384, "Regulamento Municipal de Edificação, Urbanização e de Taxas Urbanísticas", Diário da República, 2nd series, N.º 79, 23 Abril 2010 <<https://www.cm-Évora.pt/pt/site-municipio/atividademunicipio/Regulamentos/Paginas/list.aspx>>.

³⁴² Regulamento Municipal de Edificação, Urbanização e de Taxas Urbanísticas, Article 3(4).

³⁴³ Regulamento Municipal de Edificação, Urbanização e de Taxas Urbanísticas, Article 3(1) K).



Article 17

Establishes the general rules of architectonic and urbanistic constraints, establishing that the new constructions and alterations to existing constructions must improve the overall architectural style and surroundings. This must be done by following the provisions of Articles 17 to 27, which may exceptionally be set aside if the municipality is presented with a reasoned justification (due to its functional characteristics or the characteristics of its surroundings), and it agrees to the project.

Article 17 provides for the mandatory application of the forthcoming provisions. It also establishes an exemption for the application of the provisions in exceptional circumstances for building landscape changes. Due to the possibility of exemptions, even if the requirements of this following articles are problematic, there is still an opportunity to bypass them.

Article 19

Provides that inclined roofs should employ traditional construction techniques and covering materials, such as the clay tile in its natural colour, of the Lusa type, Canudo or Romana, except in the case of industrial buildings and equipment. Further, the Article also provides that constructions of limited urbanistic importance (set out in Article 3) may use a different material, providing it adopts the colour of a clay tile.

Article 19 may impose some restrictions that might affect the type of PV shingles used in non-industrial buildings with inclined roofs. Even if the installation of PV units in the building is taken as being of limited urbanistic importance, the colour seems to matter. The use of external equipment, such as PV panels, has its own rules. These are set out in Article 24.

Article 24

Establishes the requirements and limitations applicable to solar panels and heating and air conditioning equipment. In essence they should be placed in a manner that ensures they are not seen from public spaces (the street), and when that is not possible, they must be concealed so that their impact on a building's image and its surroundings is limited. When placed in a façade (and visible from public place), they must be concealed by the use of grids or other elements which prevent it from projecting from the façade. Further, when the installation of panels is made onto a surface visible from a public space, the panels must (if technically possible) be at the same level as the remaining coverage.

This requires solar panels to be hidden (or at least obscured) from public as much as possible. This naturally may restrict the POCITYF solutions focused on PV, since the municipal requirements value more the looks of a building than its efficiency, due to the high economic value brought by the overall historic relevance of the city landscape. Even so, it is important to remember that these requirements may be set aside by justifying the interest of the solutions to the municipality - which as a municipality involved in the project - may be more agreeable to lifting some of these restrictions.



Another document of utmost importance is the Évora Urbanization Plan (PUE),³⁴⁴ which establishes rules for construction and renovation works in Évora.³⁴⁵ Within the plan, the city's historical centre is classified as having great cultural value, and is subjected to specific urbanistic rules which cover the green areas within the historical centre.³⁴⁶ The view of the city landscape, especially the historic centre, must be protected.³⁴⁷ Further, within the historical centre of the city, green areas and buildings which enjoy the following additional protection requirements, which must be observed:³⁴⁸

- Interventions on the green areas must be carefully landscaped and treasure the biophysical value of these areas, adjusting to the biodiversity and human use of the areas.³⁴⁹
- Regarding the buildings, the interventions must safeguard and value the property, aiming to endow all with good housing conditions.³⁵⁰ Modifications works should keep the alignment and volume of classified buildings, and even non-classified buildings must have their pre-existing volumes, structural elements of value and decoration elements of value, being respected.³⁵¹
- The restrictions on the historic centre (within the city walls) specifically cover limitations to roofs, wall coverings, window frames and solar panels.
 - o Regarding roofs, the PUE requires red ceramic tiles in the *Canudo* style, or the Roman with edges in *Canudo*.³⁵²
 - o Regarding wall's coverings and window frames, the PUE establishes requirements of colour and material - e.g. window frames may not be made from anodized aluminium.³⁵³
 - o Regarding the use of solar energy panels, they are only to be admitted if fixed to terraces, or roofs exposed to the south quadrant, with their top painted in tile colour or grey, and in any case not visible from public areas.³⁵⁴

Experience from Practice

As mentioned, these specific requirements from the PUE greatly restrict the possibilities of installing a large number of PV panels, not only due to the required aesthetic characteristics but also due to the placement requirements. However, the combination between the local requirements and the heritage law requirements makes it even more difficult: plans that are approved by the local authorities can still be rejected by the DRC, which makes it difficult to develop a plan that will be accepted by both layers of authorities.

Other locations in the city also deserve special protection, such as urbanisation zone 1 (an area with constructions of urbanistic and architectural value), Malagueira (a singular area of urbanistic

³⁴⁴ Plano de Urbanização de Évora (PUE), Évora's Municipal Assembly 22 January and 29 October 1999, ratified by Council of Minister's Resolutions n.º13/2000, Diário da República, series 1-B, n.º 74, 28 March 2000 - Modified by Évora's Municipality, notice 12113/2011, Diário da República, 2nd series, N.º 107, 2 June 2011; (and) Évora's Municipality, Rectification Declaration n.º1970/2011, Diário da República, 2nd series, N.º 246, 26 December 2011 <<http://www.cm-Évora.pt/pt/site-viver/Habitar/ordenamento-do-territorio/>>

³⁴⁵ PUE, Articles 1 and 3.

³⁴⁶ PUE, Article 8.

³⁴⁷ PUE, Article 9.

³⁴⁸ PUE, Article 8 (2).

³⁴⁹ PUE, Article 36.

³⁵⁰ PUE, Article 66.

³⁵¹ PUE, Article 68.

³⁵² PUE, Article 73.

³⁵³ PUE, Articles 74, 75.

³⁵⁴ PUE, Articles 76



and architectural value urbanised following architect Siza Vieira's plan), and the Monumental Green Area (a rural area between the historical centre and Alto de S. Bento, which encompasses 12 elements of patrimonial value).³⁵⁵ The most stringent of protections, however, is reserved for buildings classified as having cultural value - national monuments, immovable property with a public interest, immovable property of value to the municipality. For these buildings, only works of conservation and repair are accepted (and exceptionally, restorative work may be approved).³⁵⁶

In the annex to the Urbanization plan the buildings, façades, areas or archaeological relevance, green areas and specific elements of value that are not classified are identified in accordance with their value as heritage (E₁, E₂, E₃, F₁, F₂, V₁, A, P).³⁵⁷

- In the Buildings E₁ and E₂, conservation, restoration, and rehabilitation works are possible with integral preservation of façade³⁵⁸
- In E₃ the works mentioned might also include the façade
- Facades F₁ must be integrally preserved
- F₂ buildings may be altered, providing the alterations do not result in a significant transformation of the previous lines or the profile of the building group³⁵⁹
- Green Areas (V₁) must see their characteristics relevant to the time period when they were constructed preserved³⁶⁰
- Areas of archaeological relevance (A) and areas in the historical centre require all interventions in the subsoil to be monitored for historic/archaeological purposes³⁶¹
- Specific elements of value, marked with P, should be conserved and esteemed - the demolition or deformation of elements such as chimneys, frizzes, bands, trims, metal bars on balconies, lookouts, flat roofs (or any other element recognised by the municipality) is forbidden³⁶²

This shows that even property (and its constituent elements, such as roof tiles and chimneys) which are not classified under Portuguese cultural heritage legislation can be protected by local obligations. The aforementioned distinctions and restrictions to construction work require a special level of care to be taken when devising and implementing solutions for buildings spaces identified under a city's urbanisation plan, however there are potential spots which may overcome such limitations. Naturally, not all restrictions are capable of paralysing the deployment of solutions under the POCITYF project, and the municipality's participation in the project, specifically in deciding which buildings are used - could well be an indication that applications for licences to retrofit those buildings will be granted.

Évora's local requirements seem to focus on maintaining the harmony of the city, protecting its sights and surroundings. This preoccupation becomes increasingly clear the closer one gets to its historic city centre, particularly, near monuments and historic buildings. The concerns with disguising PV panels seem to be the one with the most potential to be troublesome, as conditions relating to their installation, operation and maintenance might result in sub-optimal energy generation. The additional concerns with tiles and window frames may also affect the use of solar-based technology, such as PV shingles and glass. Even if the municipality does not oppose to their use, the imposition of additional requirements relating to the installation's characteristics

³⁵⁵ PUE, Articles 10-12.

³⁵⁶ PUE, Articles 6 and 13.

³⁵⁷ PUE, Article 6.

³⁵⁸ PUE, Article 14.

³⁵⁹ PUE, Article 15.

³⁶⁰ PUE, Article 16.

³⁶¹ PUE, Article 17.

³⁶² PUE, Article 18.



complicate matters. The local requirements seem as to be extension of the cultural heritage law requirements, defining specifically the exact level of care to be taken with those buildings.



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5.5. Application of the Legal Framework to Évora Pilot Projects

This section serves to apply the legal framework above to the pilot projects developed in Évora and to identify the lessons learned. Like the project itself, the section is structured according to four pillars. For each topic, a short description of the project is given.

Positive Energy (stand-alone) Buildings

In Évora, energy saving solutions will be implemented, increasing local penetration of renewable energy through solutions that respect the city's historical and architectural façade. This means that creative PV solutions (PV glass, PV canopy, PV shingles) will be developed. The challenge is implementing these solutions in accordance with the local building codes and architectural designs, making it suitable for historical areas. The buildings will also become "smart" through the installation of bidirectional smart inverters and Power electronics Energy Routers, combined with an Advanced Building Management System, that will monitor local generation and demand.

As mentioned in the 'Experience from Practice' in this chapter already, there are quite a few issues with the retrofit of buildings in order to turn them into Positive Energy Buildings, especially where it concerns innovative solutions such as BIPV panels, or heritage buildings, or both at the same time. An important conclusion in this context is that the policy for the retrofit of heritage buildings needs to be streamlined better: this saves costs and time both on the project developers' side and on the side of the licensing authority that needs to decide on the specifics of the project each time. Guidelines to determine which changes are and are not allowed would be useful. Here, it is important that a (political) choice is made on how far heritage buildings can be retrofitted. Right now, the rules are very restrictive, which makes it almost impossible to retrofit buildings. However, keeping the buildings exactly the same will lead to very high energy bills in the future. In this context, the consideration from chapter 2.2 of this Deliverable is relevant: the value of heritage buildings lies in them being used. If the costs of using the building (in this case, the energy bill) are too high in the future, this may be a risk to the buildings.

The recently revised rules on energy sharing do have a positive effect, especially when buildings can be coupled and profit from the rules on collective self-consumption. This will allow buildings with sufficient space for solar panels to compensate for other buildings close by. However, the rules on "proximity" now seem to be drafted mainly for households, not for buildings with a medium voltage connection. How the rules should be interpreted specifically for larger connections remains to be seen.

The use of innovative components in some of the proposed systems is another issue. When these components are not CE-certified, it is difficult to use them in practice or to receive a license for the system as a whole. However, it is inherent to innovation that components need to be tested in real-life situations. One could say that the CE certification process works as a barrier for the use of innovative components in complex energy systems.

Positive Energy Districts

The positive energy buildings will be coupled and combined into Positive Energy Districts through a Smart Distribution Management System. The infrastructure will be sustained by advanced ICT solutions that foster flexibility and efficient energy flows between buildings and the distribution network. Another innovative element in POCITYF is the introduction of a P2P energy trading platform, as a cornerstone transactive layer allowing the operation of local market between buildings, also rewarding citizens' sustainable actions. The use of grid-connected energy storage solutions will also contribute to the energy performance of the selected sites.

The generation of energy will change drastically towards decentralized generation mostly in residential areas and block/district, since the energy produced by RES will be injected into the



micro-grids. POCITYF will demonstrate innovative storage through a platform and algorithm to provide grid flexibility solutions, which allow the effective management of the core issues of interdependent energy sub-networks and sub-systems of sustainable district/city smart grid environments. Another innovative element is that 2nd life batteries will be used, as mentioned above.

A concrete example of how the energy management and trading will lead to electricity savings: In the commercial park, the freezers' thermal inertia is used to achieve monthly energy savings. During POCITYF, the timely management responsible for the performance of this method will be optimized, by being automated and added, as a module, to Schneider BMS that will be therein installed. On the other hand, in Évora city centre, municipal buildings will target market-oriented flexibility services to improve their self-sufficiency, which can be used as an ancillary services market product or for the DSO.

The Positive Energy Districts pillar is mainly about how generation, consumption and storage can be coupled to each other in a smart way. There are no legal/regulatory hurdles from the work on algorithm development at the moment. Regarding the P2P energy trading, the project developers are waiting for a new regulation, which has been announced already but not published, on how to apply the sharing coefficients between different energy users in a trading platform. Moreover, it is not yet clear how these coefficients need to be communicated to the right authorities.

Energy storage, also an important part of this pillar, is also not foreseen to cause specific issues. This is because of the choice to integrate storage in the energy routers “behind the meter”. This saves a layer of complexity from a legal/regulatory perspective. The use of second life batteries for this purpose has not caused any legal/regulatory issues either - these batteries are already certified and commercially available and can thus be used in the project too.

Waste No More

Another element in the Évora demo site is contributing to the circular economy by demonstrating and replicating success stories for waste streams (heat and material) utilization, originating from different sources, as an alternative highly efficient pathway for satisfying energy needs and reducing waste. This includes the introduction of Pay-As-You-Throw systems for waste production and recycling systems. Another element is the use of 2nd life EV batteries as residential batteries.

No legal/regulatory issues have been identified for the projects developed under this pillar.

E-mobility integration into smart grid

POCITYF aims to demonstrate and perform replication studies for the idea of V2G and smart solar power-driven charging stations to support the demand-supply energy management (with a scheme of smart charging management) at district level, while increasing their large-scale energy storage capacity and promotion of more environmentally friendly mobility solutions. This pillar concerns the development of an energy management platform for the control of EV charging, bidirectional and smart EV charging, smart lamp posts with EV charging and 5G functionality, e-mobility services for citizens and an EV sharing scheme introduced by Alkmaar, to be demonstrated within the city centre. Given the current problems that Évora faces in terms of traffic and parking in the historical area of the city, this solution is expected to reduce the congestion of private and municipal-owned cars for short distance urban provision of services, via EV sharing mechanisms with Évora municipality-owned EVs.

As with the energy storage systems, the EV chargers in this pillar are connected “behind the meter” so on the existing connections. This saves a layer of legal/regulatory complexity, as for EV chargers connected to the public grid, additional certification is needed.



Citizen driven co-creation

Although this pillar is essential to POCITYF, there are no significant legal/regulatory issues with regard to the activities planned under this pillar. Therefore, no legal analysis will be provided here.



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6. Regulatory Challenges in the Following Cities

This section will shortly elaborate on the regulatory challenges, found in the different Fellow Cities (FC), that might affect the deployment of solutions by the POCITYF project. The analysis is categorized similarly to the previous analysis of the Dutch and Portuguese Legal regimes: issues arising from construction requirements, energy law, local obligations and especially cultural heritage regulations.

The input for this section is provided by the project partners from the different FCs: RINA-C (from Bari); ZAG (from Celje); DIPGRA and ITeC (from Granada); European Green Cities (from Hvidovre); Mol (from Ioannina); EMI (from Ujpest). This section has been refined in January 2022 but it must be noted that the main efforts of the FCs (in the form of their respective replication plans) have only just started. Therefore, refined regulatory considerations from the FCs, based on their replication activities, may be found in the Replication Plans rather than in this Deliverable.

For each FC, the following structure has been used:

General introduction, followed by four subchapters, namely;

1. Energy Law
2. Construction Requirements
3. Heritage Law
4. Local Obligations

Within the energy law section, the structure is based on the main pillars of POCITYF: positive energy buildings and positive energy districts (including amongst others the rules on (collective) self-consumption, followed by the rules on peer-to-peer trading and storage, and finally E-Mobility integration. The fourth pillar, citizen co-creation, is left out of this analysis as this does not involve other legal aspects than the data protection element that is already treated in Chapter 3.2. Where possible, the translation from legal framework to concrete legal barriers has been made by the cities.

6.1 Bari

The legal framework applicable in Bari shows support for renewable energies as Italy seeks to achieve the 2030 renewable energy targets. The analysis on the compatibility between the POCITYF project and the different legal obligations will be developed below by discussing the applicable energy law (focusing especially on positive energy buildings), construction law and heritage law both at a national and local level. The analysis at a local level focuses on the specific details of Bari regarding the implementation of solutions in potential areas of interest and the possible constraints.

6.3.1. Energy Law

Positive Energy Buildings and Positive Energy Districts

In general, the Italian electricity sector is evolving rapidly with the introduction of a new model that includes the integration and management of renewable energy, energy efficiency, grid digitisation and storage systems. In 2017, the Italian government approved the National Energy Strategy (SEN) setting out future policy goals for the electricity sector, including the percentage of renewable energy grid integration. The process towards smart grids is a prerequisite for the achievement of the SEN targets in 2030. PEDs fit perfectly into this movement.



An important element in PEDs is (collective) self-consumption. The law decree DL 162/19 Art.162bis regulates the introduction in the Italian national grid of self-consumption units and energy communities. The plant that can create these communities must be based on renewable sources, be installed later than 01/03/2020 and have a maximum installed power of 200kW. This type of energy sharing inside an apartment block or a small neighbourhood allows reducing the load on the national grid and the subsequent energy losses. For each kWh of “shared energy” the GSE is paying to the community both a unitary and a special tariff.

The Italian government has several schemes in place to incentivise renewable energy and energy efficiency. With regard to the latter, white certificates are available: these tradable instruments give proof-of-end-use energy savings. The scheme aims at supporting the production of thermal energy from renewables and high-performance cogeneration units as well as small-scale interventions of energy efficiency for private persons and the public administration.

Regarding small and medium sized renewable energy, the two main incentive strategies are Feed-in tariffs (“Ritiro Dedicato”) and On-site Exchange (“Scambio sul posto”). Ritiro Dedicato is a remuneration type active in Italy since 2018 that allows the producer to sell energy directly to the GSE at a specified price, instead of participating in the free energy market. The price can be either a minimum guaranteed revenue (PMG) or it can depend on the hourly zonal price (PO). For PV systems in 2021, the PMG has been equal to 39.9 €/MWh.

Scambio sul Posto is a special type of self-consumption in situ that allows the producer to compensate the electrical energy produced and injected in the national grid at a certain time with the amount that is taken from the grid and consumed in a different time interval. A necessary condition is that the plant and the consumption site share one only point of interconnection with the national grid. This system applies to renewable energy plants having a capacity up to 200kW commissioned after 31 December 2007 and to high efficiency combined heat and power plants with a capacity up to 200kW.

A simplified sale and purchase arrangement is another tool offered by the GSE under which producers are paid a minimum guaranteed price for every kWh. Producers with small-sized plants and a nominal electrical capacity up to 1MW may benefit from this scheme for the first 2 million kWh per year fed into the grid, with the possibility of receiving more if the hourly zonal prices prove to be more advantageous.

The Ministerial Decree DM 04/07/2019 introduced other types of incentives for renewable power generators, subdivided for the type of energy source (wind, sun, biomass ...) and size of the plant. These incentive mechanisms are called Auctions and Registers (“Aste” and “Registri”) and work in a very similar way. Two or three times a year a register/auction procedure is opened and a maximum amount of power that can be incentivized is set for each energy source. The power plant owners can participate in the tender process and obtain a Global special tariff (TO) (if $P < 250\text{kW}$) or an incentive to the hourly zonal price. The main difference between the two methods is the size since only the power plants with an installed power higher than 1MW can participate in the registers. All the incentive strategies mentioned above are not cumulative: the implementation of one incentive forecloses the others.

For what concerns the production of thermal power using solar collectors, the present standard is UNI EN 12977 of 2018. It’s divided into 5 sections, and it specifies the minimum requirements about durability, reliability and safety of solar plants. Even the solar thermal plants take benefices from the GSE.



The energy produced by renewable energy plants has interconnection and dispatch priority. Moreover, the operator of the national transmission grid (i.e. Terna) and the operators of the local distribution grids, have the obligation to connect every plant that makes a connection request to the grids that they operate. A request to be connected to the power grid can be filed before the construction of the plant is completed, or even started because no time limit is set as to how long before the start of operations the request can be filed. The request to be connected to the power grid must be filed with either the operator of the local distribution grid if the capacity requested is below 10GW, or Terna, if the capacity requested is equal to or more than 10GW.

Important technical requirements for both active and passive users of the grid are laid down in Technical standard CEI 0-16 (HV and MV networks); and Technical standard CEI 0-21 for LV networks of electricity distribution undertakings.

Regarding Building Energy Management Systems (BEMSs), the standard that regulates this topic is the EN 15232. This standard introduced a classification of the control services of the technical plant of buildings; it is the standard for their implementation and the evaluation of their impact on the energy performance of the building. Regarding automation, control and plant management, EN 15232 defines the list of the minimum functions that must be installed for different energy efficiency classes and the methods to determine the impact of these functions in the calculation of energy performance indices. This standard also provides to the reader dedicated tabs to understand which functions are necessary for designing a building automation and control system (BACS) and calculating its efficiency. 4 categories are described starting from A (higher performance) to D (not efficient BACS). The Ministerial Decree 26/05/2015 prescribed that for non-residential buildings in case of new constructions or substantial retrofitting, the minimum level of automation that is required is level B of the previous standard, making in this way advanced automation and control system compulsory for buildings in the tertiary sector, whether public or private.

Finally, in order to comply with EU law, Italy has scheduled the upgrade of thousands of 1G smart meters to 2G smart meters. The installation of smart meters in buildings is indispensable for the implementation of Positive Energy Districts.

Support to municipalities for investments in energy efficiency and sustainable territorial development

Decree-Law no. 34 of 30 April 2019 (Growth Decree-Law) established economic support in favour of municipalities, up to a maximum of € 500 million for the year 2019 from the Development and Cohesion Fund (FSC) for interventions related to investments in the field of energy efficiency and sustainable territorial development in the public space (including public lighting) and public buildings.

The government of Puglia region (where Bari is located) during recent years put in action several laws to incentivize decarbonisation and self-consumption of energy and distributed generation models. The most recent one is the introduction of a regional energy revenue (“Reddito energetico regionale”) that is financing the buy and installation of PV, thermal solar and micro-wind systems up to 6'000€ (if a storage system is installed this amount can reach 8'500€).

Peer-to-Peer Trade and Storage

The increased amount of RES in the electricity system requires flexibility and smart management. The regulatory authority approaches this challenge through pilot projects, such as smart grid (resolution ARG/ elt 39 10); electric mobility (Resolution ARG/ elt 242 10); storage systems (Resolution ARG/ elt 199 11) and participation of distributed generation in the dispatching services market (Resolution 300/2017/ eel). The pilot projects all have given the same indication: including new players in this market is very complex, and in cases where there has been effective active



participation in the market, it has still been scarce. Nevertheless, this is an important market to participate in for positive energy buildings in PEDs.

The Legislative Decree no. 28 of March 3, 2011 "legislated" this initiative of the authority, providing that DSOs that modernise their assets are entitled to a higher return on invested capital. Interestingly, this concerns not only the (remote) control of production systems but also charging infrastructure for electric vehicles.

Trading and participation in the balancing market is also possible: next to the traditional electricity market, Italy has a nodal system for the balancing of the grid. To extend the participation to the balancing market (MSD), TERNA created a virtual unit (UVA) that can participate in this market by modifying energy consumption (UVAC), production (UVAP) or both (UVAM). Every node inside the unit has to be equipped with a smart meter that can measure the amount of energy that is exchanged with the grid, and the point of interconnection with the national grid has to send to TERNA the aggregated value with a maximum time interval of 4 seconds. The remuneration method can be fixed on the energy exchange (€/kWh) or on the reserve power available (€/MW). All consumption sites and renewable production sites can participate in this as well. Nevertheless, although this allows for active participation in the market, but it does not allow for peer-to-peer trading (yet).

The storage of electricity is also regulated in Italy. Referring to Del. AEEGSI 574/2014 e 642/2014 a Storage system is defined as a set of devices, equipment and management and control logic, functional to absorb and release electricity, designed to operate continuously in parallel with the grid with the obligation to connect third parties or capable of causing an alteration of the exchange profiles with the electricity grid (input and/or withdrawal). The storage system may or may not be integrated with a production plant (if any). This does not include systems used in emergency conditions which, therefore, only come into operation when the power supply from the electricity grid is interrupted for reasons beyond the control of the person who has the availability.

- Bidirectional Storage system: can absorb electricity both from the production plant and from the grid with the obligation to connect third parties.
- One-way Storage system can only absorb electricity from the production plant
- Production side Storage system: installed, either in the DC electrical circuit (possibly also integrated with the inverter) or in the AC electrical circuit, in the part of the plant between the production plant and the electricity meter produced
- Post-production Storage system: installed in the part of the plant between the electricity produced and the electricity meter taken and injected

A storage system is considered to be a production plant (or generation group of a plant) powered by non-renewable sources. As a transitional measure, the procedural and economic conditions for high-efficiency cogeneration plants shall apply. From the point of view of the connection to the grid with the del. 642/2014/R/eel it has been established that the technical requirements of V1 to the 3rd edition of CEI 0-16 and V1 to the 2nd edition of CEI 0-21 must be obligatorily met by all storage systems. Storage systems are required to participate in system services such as voltage control.

The general criterion followed for the drafting of this part of the standard is based on the requirements already valid for the generator/converter connections already in place, which the Electrical Storage (ES) uses to connect to the grid. In the case of coexistence of the storage with other power generators regarding grid services, the ES is considered as a single generator with nominal power equal to the sum of the nominal power of the generator and the storage installed.



Regarding the integration of the storage systems in the national electrical system, the national authority for electrical energy, gas and water system (ARERA) set in 2014 the most relevant rules:

- Art.1: the provisions for the connection are the same that are applied for high-efficiency cogeneration systems
- Art.2: regarding dispatching services, these systems are treated either as individual production plants or as generation groups constituting a single production plant, with related obligations
- Art.3: if the energy withdrawn from the grid is used only for the supply of storage systems and for the supply of auxiliary services of any production plants, these withdrawals are valued based on the hourly zonal price (without application of distribution, transmission and other system charges)
- Art.4: if, on the other hand, the energy withdrawn is used also to supply consumption sites, the abovementioned charges are normally applied to the hourly zonal price
- Art.6: there is full compatibility with almost all types of incentives for photovoltaic systems, the only exception being the on-site exchange, as with this type of contract the share of self-consumed energy is incentivised, and the existence of a storage system could alter this quantity without any possibility of control.

To be eligible for incentive instruments such as green certificates, energy account (no longer active), thermodynamic solar energy, only the power of the part of the production plant is considered, excluding storage systems, even in cases where these systems are an integral part of the same production unit.

E-Mobility Integration E-Mobility is stimulated in Italy: for private owners, a tax incentive scheme exists. For public transport, the 2017 Stability Law launched a substantial financing plan for the renewal of the road rolling stock used for Local Public Transport for the period 2019-2033. These include electric and natural gas buses for the integration and replacement of the existing bus fleet. During discussions with regional and local authorities, it was also decided to proceed with the establishment of an interinstitutional political table for discussion and consultation on transport, composed of the Ministries of Infrastructure, Economic Development and Environment, as well as Regions and local authorities.

It is proposed to accelerate the provisions of paragraph 10 of Article 18 of the Legislative Decree. 257/2016 (transposition of the Alternative Fuels Directive)³⁶³ providing that public administrations, bodies and institutions dependent or controlled by them, Regions, local authorities and utilities for activities carried out in provinces with high PM10 particulate matter pollution, at the time of replacement of their car fleet, buses and public utility vehicles, including those for municipal waste collection, are required to purchase at least 30% by 2022, 50% by 2025 and 85% by 2030 of electric and hybrid vehicles with external charging, methane and hydrogen, and electric or methane in the case of buses.

Starting from 2017, Puglia region government included in the regional stability law provisions to incentivise sustainable mobility consisting in the granting of non-repayable incentives for the purchase and installation of domestic charging points for electric vehicles powered by renewable sources. This measure was then confirmed in subsequent years.

The recipients of this incentive are private citizens and condominiums. The maximum non-repayable contribution attributable to each intervention is 80% of the cost to be financed, up to a maximum of €1500 with a total regional budget of 50.000€.

³⁶³ Directive 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the deployment of alternative fuels infrastructure



During the contacts with the city of Bari a strong interest from both the city and the region in hydrogen as an energy vector emerged. As hydrogen is not part of the project in the other cities, the legal/regulatory provisions related to hydrogen will be elaborated further in the annex to this deliverable.

6.3.2. Construction Requirements

Construction activities generally require a specific permit issued by the competent local administration. Depending on the type of intervention, four types of licences exist in Italy:

- Building permit: an administrative licence issued by the competent local administration committee to allow the construction in compliance with the relevant town planning provision. A project with all the technical specifications required must be prepared by a technician (e.g. engineer or architect) registered with the competent professional board and submitted for approval;
- Certified notice of commencement of works (SCIA - Segnalazione Certificata di Inizio Attività): a simplified type of building licence with a shorter procedure. The competent authorities checks the notice within 30 days from the submission.
- Formal notice of commencement of works (CILA - Comunicazione di Inizio Lavori Asseverata): used for minor construction works without making a substantial alteration to the property surface area and to the structures. The formal notice must be submitted by a technical registered with the competent professional board and submitted for approval.
- Notice of commencement of works (CIL - Comunicazione di Inizio Lavori): used for minor construction works (e.g. finishing renovation). The notice can be submitted directly by the owner.

Energy Performance of Buildings:

Interventions involving the external envelope of the building and/or the heating, ventilation and air conditioning system requires the fulfilment of specific energy performance requirements. The minimum requirements for energy efficiency and energy needs in buildings, in compliance with Directive 2010/31/EU, are defined by the Ministerial Decree 26/05/2015. The Decree sets and regulates:

- The building minimum energy performances, drawn up during the design phase of the building. In the design phase both non-renewable and renewable primary energy must be taken into account;
- The energy performance certification, drawn up upon completion of the building and/or the retrofitting interventions. Only non-renewable primary energy must be taken into account.

Additionally, in Italy, the competence to legislate on energy efficiency is delegated to the Regions and therefore in many cases there are rules and obligations different from the national ones, which still serve as a basic reference. In the case of Bari and the Puglia Region, additional requirements are in force in addition to what is required at national level. This obviously affects the replicability of positive energy solutions for buildings.

A specific report including all the checks required by the national law must be provided to the competent authority together with all the design documents. The energy performance limits of buildings and the related checks depend on the intended use of the building (limits for public buildings are usually more restrictive) and the type of building intervention to which it is subjected.



In particular, regarding the production from renewable energy sources, the national law (D.lgs 28/2011) sets the following specifications for new constructions or major renovations (equivalent to the 1st level renovation of D.M. 26/06/2015):

- 50% of the energy requirement for the production of domestic hot water must be produced from renewable energy sources;
- 50% of the energy requirement for heating + cooling + domestic hot water must be produced from renewable energy sources;
- Installation of electricity production plant from renewable sources with a minimum power higher than the ratio between the roof surface of the building and the coefficient 0.5

For electricity generation facilities, the general principles governing authorisation procedures for the construction and operation of generation facilities are set out under national law, notwithstanding each region may implement regional laws regulating the authorising procedure within the national framework. Since 2004, as a general principle, a single authorisation issued by the competent region (or the province if it is so empowered by the region) is required to construct and operate any renewable energy plant having a capacity higher than a certain threshold (i.e. 60kW for wind, 20kW for solar photovoltaic, 100kW for hydroelectric, 200kW for biomass, and 250kW for gas from waste and depuration treatments and biogas). For generation facilities fuelled by non-renewable energy sources having a capacity higher than 300MW, the single authorisation is issued by the Ministry for Economic Development. Large generation facilities are only allowed after an Environmental Impact Assessment procedure has been fulfilled.

6.3.3. Heritage Law

Italy has in place a very strict legislation to protect its national cultural heritage. The relevant Italian law on the protection of cultural heritage is the Legislative Decree n. 42/2004 “Code of Cultural Heritage and Landscape” and subsequent amendments that was designed to reinforce the importance of Italy’s cultural heritage and collect all the pre-existing codes.

The Code regulates the procedure for the issuance of a “Declaration of Remarkable Public Interest” procured to protect real estate and other areas with cultural value throughout the country. In particular, the Code protects landscape assets, defined as territory that is expressive of the Italian identity and whose character derives from both natural and man-made factors, and historical buildings.

To prohibit owners, possessors, or holders of real estate and areas that have a landscape interest from destroying or harming them, it sets forth stringent rules for the approval of building refurbishment projects and landscape planning projects and activities and establishes the procedure for the approval of “Landscape Plans” affecting certain territories with cultural value in the country, a procedure that includes public participation and consultation mechanisms. In particular, it is required to submit a proposal of intervention to the respective authorities and ask for an authorisation. Certain minor interventions, however, do not require government authorization. It also grants legal recognition to the profession allowed to of intervenors in cultural property and regulates penalties for the violation of the protective provisions.

Limitations in the refurbishment of cultural heritage districts and buildings

This is the second potential barrier that is to be completely resolved and might affect the POCITYF approach in Italy.

In Italy, listed historic buildings and districts fall under the control of the Ministry of Cultural Heritage and must be treated in compliance with the Cultural Heritage Code. This code imposes considerable limitations on the type of alteration and refurbishment of this class of buildings. Each



intervention requires the approval of the government department responsible for monuments and artistic treasures (Soprintendenza per I Beni Architettonici).

The interventions usually allowed are limited to those that will not significantly alter the building appearance, that will be reversible and fall within the principle of minimum intervention (minimal intervention or conservative repair). The main objective is the preservation of the historic buildings and districts ensuring that the original dignity of the building is maintained. Therefore, interventions on cultural heritage districts and buildings require in-depth studies.

The success of the intervention on the historical asset depends on the coordination between different professionals (engineers, architects, conservators and art historian for the most complex cases) confident with the thematic areas of restoration and energy efficiency (with reference to POCITYF innovative solutions for Positive Energy building and districts).

In addition, for listed buildings with specific architectural constraints the installation of elements affecting the original fabric of the buildings requires direct approval of the responsible of the Heritage Building Office. Such kind of approval depends on the approach and personal evaluation of the responsible entity and can slow down the refurbishment process, reduce the installed elements or, at some point stop it completely.

According to the Law DL 115/2008, Art 11 comma3, the energy efficiency works that include the installation of solar thermal collector or PV system adhered to or integrated into the roofs of buildings with the same inclination and orientation of the pitch and whose components do not change the shape of the buildings, are considered ordinary maintenance works and are not subject to the rules of the declaration of commencement of activities (DIA). On the other hand, if these installations are made in an area subjected to environmental or historical limitation, they need approval from the municipality and the superintendence of cultural heritage that can impose limitations or not allow the project. Even if every region has its specific procedures, the main limitation is regarding the fact that the system installed has no visual impact and is perfectly integrated into the building. In 2017 a Presidential Decree (DPR 31/17) removed the constraint of asking permission to the superintendence for installation in an environmental-interest area, but not for installation in the historical city centre or traditional building.

An important improvement is represented by the so-called “Simplification Law” of 31/05/2021 that extended the definition of “buildings” eligible for PV installation and modified the role of the cultural heritage ministry in the installation of PV and thermal solar collectors in the historic city centres. In particular, the Ministry (through the superintendence) must participate in the project giving its opinion that is mandatory, but it is no more binding. If in one month the ministry has not given any suggestion, the municipality can proceed with the concession or deny the permission.

In the construction law of Bari Municipality is stated that these types of installation can be authorized with particular prescription as long as the view and the environmental perspective, the light and the historical features of the monument are not modified or disturbed.

On the other hand, in order to further incentivize sustainability, Puglia region prohibited the installation of PV plants on the ground in agricultural land, to remove the inconvenient trade-off between food and energy sectors. Preference is given to the location of these installations in planned production areas, on the roofs and facades of buildings, on canopies and structures covering car parks, parking areas or pedestrian zones. In conclusion, there is an ongoing process to progressively incentivize the installation of PV and solar collector in an urban environment that suggest a progressive simplification of the installation also in historical city centres.



6.3.4. Local Obligations

Local obligations in Italy refer mainly to the urban development and local building regulations. In this section an overview of the local regulatory framework and relationship with POCITYF project is illustrated for the following city Bari. In addition, specific consideration at local level are provided for the construction and operation of generation facilities which are generally regulated at national level, but can be regulated by regional law for the permitting and authorising procedures.

Urban Development and Local Building Regulations

Regulatory framework

The Italian law regarding urban and rural development is largely delegated to the regions (having the role of coordinator) and to the municipalities (having an operational role).

The Regional and Territorial Plans “Piani di coordinamento” describe guidelines of the overall aims and strategic choices regarding road infrastructures, areas of environmental interest to be safeguarded and the hypotheses of urban development.

On the other hand, the municipal general regulatory plan “Piano Regolatore Generale” (local planning), in the Italian legal system, is the urban planning tool that regulates building activity within a municipal territory, which every Italian municipality must adopt, in accordance with the law. It contains indications on the possible use or preservation of the portions of the territory to which it refers.

At last, at the operative local level, the building regulation “regolamento edilizio” is drawn up, which describes normative within the context of the intervention. The building regulation is a non-urbanistic instrument that therefore regulates the construction methods of the building at the municipal level, guaranteeing compliance with the technical-aesthetic, hygienic-sanitary, safety and general regulations of the buildings.

The compound of the Urbanistic tools at regional and municipal level with the building regulation, sets the legal framework that should be referred to with regard to potential interventions related to the POCITYF project.

The single authorisation, when issued, substitutes all the authorisations, licenses and permits that would otherwise be required to build and operate the generation facility under applicable laws (except for the environmental assessments). The single authorisation is issued upon the completion of a single administrative procedure, during which all the positions of the interested public authorities are jointly evaluated.

Renewable energy plants with an installed capacity lower than the above-mentioned thresholds are exempt from the single authorisation requirement and benefit from a simplified ‘deemed consent’ procedure (known as the PAS procedure). Regions can increase the thresholds for the simplified authorisation procedure up to 1MW. Certain categories of construction works that have a minor impact on the surrounding environment, can be carried out in a deregulated regime by filing with the competent municipality a notice of the planned start of the works.

Authorisations to construct and operate transmission networks or distribution networks

At a national level, the authorisation for the construction of electric lines is issued by either the Ministry for Infrastructures for electric lines with a voltage above 150 kV or by the competent province for electric lines with a voltage up to 150kV.



An application for the authorisation must also be filed with the Ministry for Economic Development and with any other authority responsible for areas crossed by the interconnection facilities (eg, military sites, rivers, forests, mines, telecommunications lines, railways and public ways) for their approval. Only after the approval of all other interested authorities has been obtained can the authorisation be issued.

In urgent cases, the start of construction works can be authorised under a temporary authorisation, conditional upon the applicant providing a guarantee as security for the fulfilment of any obligations that may be set forth by the final authorisation, or the demolition of the works constructed under the temporary authorisation where the definitive authorisation is denied. Temporary authorisation can be issued only with the prior approval of the Ministry for Economic Development.

Access to the distribution grid

The electricity transmission grid operator (ie, Terna) and electricity distributors must grant equal access to every operator requesting it (provided that it complies with technical requirements), without prejudice to the continuity of service and in compliance with technical and economic conditions for access. Grid operators must also provide sufficient information to ensure the efficient and safe functioning of the grid.

6.2. Celje

The deployment of the POCITYF project solutions on smart buildings with energy storage is mostly possible under Slovenian energy and construction law. Restrictions may, however, appear when considering cultural heritage, as the Institute of the Republic of Slovenia for the Protection of Cultural Heritage might impose restrictions regarding the renovation of the cultural heritage. These heritage limitations, the construction requirements, local obligations and energy law will be discussed more thoroughly below. As the development of the replication plan in WP8 progresses, and the list of the innovative solutions to be implemented in Celje approaches the final selection, more attention will be given to specific legal issues, associated with the specific solutions. Here, the positive and negative experiences from the Lighthouse Cities will be taken into account. At the moment, the replication plan is still in an early phase of development, which makes it difficult to analyse the legal framework in all its details. However, main developments are listed below.

6.2.1. Energy Law

Positive Energy Buildings and Positive Energy Districts

For positive energy buildings, self-consumption is an important element. The national energy regulations in this regard are developing continuously, along with the development of energy policies and strategies on the EU level. In 2022, the *Decree on self-supply of electricity from renewable energy sources* was updated in accordance with the new ZSROVE, which was adopted in July 2021 and is in force since August 2021.

The old version of the decree (from 2019) posed some important limitations, e.g. not allowing the owner of a self-supply device to market or sell the electricity produced on that device (instead, the surplus of the produced energy over the consumed energy in the accounting period was handed over to the supplier), disallowing district-level electricity storage, etc. The new decree still has to be studied more thoroughly, but some general observations can already be made. It maintains and upgrades the concept of individual and common self-supply, introduces some additional benefits for users, simplifies some procedures, broadens the group of consumers that can enter the self-supply system, etc. The changes follow the Directive (EU) 2018/2001 on the promotion of



the use of energy from renewable sources. This Decree has an important value in the context of POCITYF and allows the deployment of PV on buildings.

Peer-to-Peer Trading and Storage

Peer-to-peer trading is not specifically mentioned in the legal framework. With regard to local energy storage, an energy storage device may also be connected to the installation or the network to which the self-consumption device is connected. Further, district-level electricity storage is allowed.

E-Mobility Integration

No specific barriers have been flagged yet concerning the integration of e-mobility in the system.

6.2.2. Construction requirements

The Slovenia building code, *Construction Act* regulates the conditions for the construction and renovation of buildings and other issues related to the construction of buildings. The purpose of this Act is to protect the public interest, including the protection of cultural heritage and the promotion of sustainable construction.

In general, the buildings must meet the essential requirements: mechanical resistance and stability, including earthquake safety (as Slovenia is in an earthquake-prone area), fire safety, hygiene, health and environmental protection, safety in use, noise protection, energy-saving and heat conservation, universal construction and use of buildings, and sustainable use of natural resources.

There is an interplay between construction law and cultural heritage law as well as energy law. Regarding construction law for protected buildings or cultural heritage buildings, the designed or implemented solutions may or may not meet the prescribed essential and other requirements of the Construction Act, if this is based on the opinion or conditions of the competent cultural heritage assessor. However, the derogation must not directly endanger the safety of the property, the life and health of the people, the neighbouring property or the environment. As for the *Energy Act (2019)*, which implements the transposition and enforcement of EU law in the legal order of the Republic of Slovenia, and the *Rules on the efficient use of energy in buildings*: the rules also apply to the renovation of a building or its individual parts, where this is technically feasible.

In 2022, new *Rules on efficient use of energy in buildings* (PURES 2022) [18] were adopted together with the relevant Technical Guideline (TSG-004) [19]. Both documents, which are already in force (from June 4th), set even higher requirements regarding energy use in buildings, both for the design of new buildings and renovations of existing ones. The requirements are related to zero energy standards as agreed by the European Union, which is particularly difficult to achieve in dense building structures of urban areas and in accordance with other legislative restrictions. However, PURES 2022 allows exceptions for existing buildings if they are protected according to the regulations on the protection of cultural heritage (only for parts of the building and/or premises defined by the service responsible for the protection of cultural heritage).

Therefore, when planning solutions, especially for PED 1, it will be necessary to establish very good communication with ZVKDS and obtain relevant information for individual buildings. ZVKDS representatives will have to be informed in detail about the technologies. It will be necessary to coordinate with them regarding the planned interventions on the building and, in specific cases, to find solutions outside the historical building volume in question (extensions, canopies, courtyards, etc.).

The Construction Act (also Building Act) has been updated. The new act has entered into force with the beginning of 2022, but is not yet applied. It will be applied in June 2022. Also, the *Spatial*



Management Act from 2017 has been updated. The new act has entered into force with the beginning of 2022 and will be applicable from June 2022 onwards.

6.2.3. Heritage Law

The *Cultural Heritage Protection Act* states that integrated heritage preservation is implemented in the planning and actions of the state, provinces and municipalities by incorporating the heritage into sustainable development, respecting its special nature and social importance. Integrated heritage preservation is a set of measures to ensure the continued existence and enrichment of the assets: Its maintenance, restoration, renovation, use and revival. The Institute of the Republic of Slovenia for the Protection of Cultural Heritage (IPCHS) issues cultural protection conditions and consents for undertakings to immovable heritage. Usually, there are quite severe restrictions regarding the renovation of the cultural heritage buildings; particularly the appearance of, amongst others, front (street) façades, windows, roofs. Solutions must always be agreed on a case-by-case basis. Installation of technologies that do not visually disturb is possible in minimal intervention. Some technologies may be installed on specific micro-locations, which are not visually exposed (such as backyard, roof, and attic).

To some extent, this poses an impediment to the POCITYF plans. Careful consideration will need to be given to the technologies, and the possibilities of installation in ways that, are both, permitted and allowed for their integration and joint operation for several buildings.

6.2.4. Local Obligations

The public utility company Energetika Celje Ltd., owned by the local community, is a public service provider of the heat energy distribution and operator of the natural gas distribution network in the area of the municipality of Celje. How this and other obstacles of municipal nature may rise and impact the POCITYF project solutions will be assessed by the FC partners in the course of the project.

6.3. Granada

The Spanish legal framework becomes increasingly specialised and directly applicable the closer it gets to the local level. However, most of the local competences do not come directly from national legislation but from disposition of the autonomous communities, in this case Andalucía. Thus, the legal system with regard to for example cultural heritage buildings is based on two sources: national and community-based (Andalusian) legislation. This combination results in a building-protective system which might be able to impose requirements, of compliance with their building preservation objective, to be observed when entering in technical modification.

6.3.1. Energy Law

Positive Energy Buildings and Positive Energy Districts

After decades of traditional organisation of the energy sector in Spain, the new energy model, based on Royal Decree 244/2019, of April 5, is based on decentralised generation. It regulates the administrative, technical and economic conditions of self-consumption of electrical energy. At its basis is the fact that each Spanish citizen is free to produce its own energy, to obtain compensation for its surpluses, able to share it, and may install energy storage systems to store any surpluses. This is an elaboration of EU law. The provisions regarding (collective) self-consumption are very relevant to positive energy buildings and districts.

The legal framework provides that for photovoltaic installations, the installed power will be the maximum power of the inverter. Importantly for rented/leased buildings, the consumer and the owner of the facility are allowed to be different. The net-metering system allows for a



simplification of processing once the measuring system is installed. Finally, the framework also provides automatic registration in the Self-Consumption Register for certain cases.

There are different modalities of Self-consumption:

1. Self-consumption without surpluses: in this case, the installation does not inject surpluses to the network. For this purpose, it will be necessary to install an anti-discharge system (also called injection 0).
2. Self-consumption with surpluses: In this case, the injection of the surplus into the electrical network is allowed. This is further divided into two sub-categories:
 - 2.1. Modality with surpluses accepted for compensation: When you have the right to a mechanism for compensation for surpluses.
 - 2.2. Modality with surpluses not subject to compensation: When you do not have the right to a compensation mechanism for surpluses, or voluntarily choose not to avail yourself of compensation.

All photovoltaic self-consumption installations with a power of less than 100 kW will be entitled to receive compensation for surpluses (that is, the Net Balance).

Collective Self-consumption is allowed and regulated. In this case, a single photovoltaic installation can serve several consumers, under the following conditions:

- Nearby indoor network facilities. When consumers and the photovoltaic installation are directly connected to the same indoor network, this would be the case of neighbouring communities.
- Nearby facilities through the network. Which would be those that meet any of the following requirements:
 - They derive from the same transformation centre.
 - They are less than 500m apart.
 - Their cadastral references coincide in the first 14 digits.

For the allocation of energy, it will be necessary to install a generation meter in the photovoltaic installation or installations to be shared. The allocation of energy will be according to the allocation agreements freely agreed upon by the different consumers who have subscribed to collective self-consumption.

Peer-to-Peer Trading and Storage

Peer-to-Peer trading is not mentioned specifically but the scheme above including the sale of surpluses of electricity allows consumers to trade their electricity - although it is not peer-to-peer. Moreover, collective self-consumption can be seen as a replacement of peer-to-peer trading: rather than individuals trading with each other, the collective provides energy for the individuals partaking in it.

About energy storage, Article 5 of Royal Decree 244/2019, point 7 says that storage elements may be installed in the self-consumption facilities, regulated in this royal decree, when they have the protections established in the safety and industrial quality regulations that are of application. Moreover, the storage elements will be installed in such a way that they share measurement equipment that records the net generation, measurement equipment at the border point or measurement equipment of the associated consumer.



According to the Fifth Transitional Provision on Storage elements, there are some storage facilities to which the provisions of the Complementary Technical Instruction ITC-BT-52 on special-purpose facilities and infrastructure for recharging electric vehicles,³⁶⁴ and the Complementary Technical Instruction ITC-BT-40 (on low-voltage generating facilities)³⁶⁵, do not apply. Until the approval of the industrial safety and quality standard defining the technical and protection conditions for storage elements installed in facilities for self-consumption, which are not covered by these additional technical instructions, these storage elements shall be installed in such a way that they share measurement and protection equipment with the generation installation.

E-Mobility Integration

E-Vehicle charging stations are mentioned specifically in Article 48 of the law 24/2013. It describes energy recharge service as having as a primary function the delivery of energy through vehicle charging services and storage batteries in conditions that allow charging efficiently and minimum cost for the user and the electrical system. The energy recharging services will be provided by the corresponding companies that must submit to the Ministry of Industry, Commerce and Tourism (or, where appropriate, to the Autonomous Community in whose territory they will exclusively carry out their activity), communication of the beginning of activity accompanied by a responsible statement on compliance with the requirements determined by regulation.

6.3.2. Construction requirements

The Technical Building Code (in Spanish CTE)³⁶⁶ is the regulatory framework that establishes the requirements buildings must meet concerning basic safety and habitability, established by the Law on Building Ordinances (LOE).³⁶⁷

The CTE aims to respond to the demand of society regarding the improvement of the quality of the building while seeking to improve user protection and promote sustainable development, applying both to new buildings and interventions on existing ones. It can, as established by the LOE, be completed with the requirements of other regulations issued by the competent Administrations, in other words, the regional and local rules apply in a case-by-case basis.

The **DB-HE** is the primary document whose purpose is to establish the rules and procedures that allow compliance with the requirements of energy saving. With the new DB-HE, the quality of the thermal enclosure of buildings will be improved, and the use of the most efficient and sustainable technologies for their conditioning will be promoted. These objectives will allow adequate comfort conditions to be achieved with minimal energy expenditure.

In December 2012, within the Spanish Association for Standardization (UNE), the Technical Committee for Standardization CTN 178 “Smart Cities” was launched, chaired by SESIAD (Secretary of State for the Information Society and the Digital Agenda) and secretariat by UNE.

The CTN 178 SMART CITIES is the standardization of requirements, guidelines, techniques, indicators and tools that contribute to the development of communities towards smart communities, covering the concept of community any finite unit of a local entity.

Specifying the technical requirements, two key standards in CTN 178 must be addressed:

³⁶⁴ *Approved by Royal Decree 1053/2014, of December 12, on the infrastructure for recharging electric vehicles*

³⁶⁵ *of the Royal Decree 842/2002, of August 2, which approves the electrotechnical regulation for low voltage*

³⁶⁶ <https://www.codigotecnico.org/index.php/menu-ahorro-energia.html>

³⁶⁷ Law 38/1999 of November 5, on Building Ordinances, Article 15.



- UNE 178104 Standard establishes the minimum requirements to guarantee the interoperability of the city platform (which will ensure the proper functioning of the Smart City services that it supports) in addition to their efficiency, performance, security and scalability, focus on the requirements of the information exchange mechanisms and transversal operation of the city.
- UNE 178301 establishes the way to evaluate the publication of Open Data or Open Data of a City. It is determined in the form of metrics and an indicator, which allows to measure the level of maturity of the opening of data prepared or guarded by the public sector to facilitate its reuse, in the field of Smart Cities. Additionally, a list of data sets that are considered a priority in open data initiatives is established, accompanied by a series of recommended vocabularies to be used in their publication.

By using the UNE standards, developed by consensus among all interested parties and following the procedures of the Spanish Association for Standardization - which include a period of public consultation on projects - errors are avoided, priorities closer to problems are formulated, and the uncertainty of administrations and industry is reduced.

6.3.3. Heritage Law

To establish the main difficulties when working on the historic urban centre, it's necessary to clear the Spanish legislative characteristics. Urbanism legislation is complex, due mainly to territorial decentralization, (State, Region, and municipality), the complexity in approval law procedures and the current distribution of competences. Besides, to be affected by the heritage protection act, increase the complexity.

Basic competences structure:

- Land uses and its regulation (legislative competences) is a nationwide basis competence (State Ground Law)
- According to the Spanish Constitution (Art. 148), among exclusives competences belonging to the Autonomous Community,³⁶⁸ are Land Planning, Urbanism and housing. Andalucía is the competent authority which approves the General Urban Development Plans (PGOU) of local municipalities (legislative and executive competences) located within its area.
- Local Government does not have legislative competences, but it has a strong role in planning and management, particularly thorough General Plans (PGOU) and other law figures as "Special Protection Plans".
- In respect of heritage, despite the fact exist a national law, the protection role is given to the Autonomous community, which develops its Heritage Protection Act.

The basic scheme of Urbanism legislation and Heritage protection:

- Spanish Estate:
 - o Constitution: Competences sharing, art. 148 and 149
 - o Estate ground Law.
 - o Sustainable Economy Law
 - o Law 16/1985 on Spanish Historical Heritage (LPHE)
 - o Heritage Catalogue
- Autonomous Community- Andalusia

³⁶⁸ Spanish Constitution, Chapter 3.



- Law 7/2002, Urban planning (LOUA)
- Law 14/2007, on Andalusian Historical Heritage
- From 23rd December 2021 it has been modified by the new “Law 7/2021, of 1st December, promoting the sustainability of the Andalusian territory (LISTA)”
- Heritage Catalogue
- Local - Granada Town
 - General Planning: PGOU- 2001 (adapted according to LOUA- 2009)
 - Special Protection Planning:
 - PEPRI Alhambra y Aljares- 1989 (Especial Plan for Internal protections and renovation) under revision. There is too a Master Plan for the Alhambra, non-binding.
 - PEPRI Albayzín- 1990 (under revision, which advance was released in 2019)
 - PEPC Centro- 2002

Considerations of the Steering Committee for Cultural Heritage and Landscape of the Council of Europe

About historic buildings, the tension between conservation and existing regulations to achieve certain public good objectives, such as improving energy efficiency, which might erode heritage value, is highlighted. However, the conclusion is that these heritage buildings tend to suffer less from these tensions due to special exemptions, in some cases on a discretionary base. To overcome this situation, it is proposed to replace these exemptions with a parallel control system that allows a reasonable fulfilment of objectives, where the related system should be based on the scientific analysis (greater analysis and understanding of performance and energy in traditional buildings) of buildings. This allowed to integrate them into contemporary uses and needs and thus contribute to their maintenance.³⁶⁹

6.3.4. Local obligations

Considerations of the Junta de Andalucía legislation

With the development of the Andalusian Government’s competences, it is established in the Statute of Autonomy:

- Art. 37.18.º “Public policies will be oriented to guarantee and ensure [...] the conservation and enhancement of the Andalusian cultural, historical and artistic heritage;
- Art. 68.3.1.º” the Autonomous Community has exclusive jurisdiction over heritage protection, without prejudice to the provisions of article 149.1.28.º of the Constitution.”

Such competences lead to the Andalusian Heritage Law (Law 14/2007, of November 26):

- Art. 6 the Constitution of the General Catalog of Andalusian Historical Heritage “as an instrument for the safeguarding of the assets, their consultation and disclosure”.
- Art. 7. Its structure, which includes Assets of Cultural Interest, Assets of General Cataloguing and those included in the General Inventory of Movable Assets of the Spanish Historical Heritage.

Delegation of competences regarding Historic Complexes.

- This protection content can be instantly incorporated into the General Urban Planning or through the mandatory preparation of Special Protection Plans or development planning with the same content.

³⁶⁹<https://rm.coe.int/CoERMPublicCommonSearchServices/DisplayDCTMContent?documentId=09000016806a56d9>



- After the definitive approval of the protection planning, with the binding report of the Ministry of Culture, the municipalities can request the delegation of competences for the authorization of projects regulated by the said plan, under article 40 of Law 14 / 2007, of November 26, the Historical Heritage of Andalusia.
(This issue is of relevance to POCITYF subsequent proceedings)

General Considerations on Protection Planning:

In summary, the relevance of the protection activities is established in the plans. According to the level assigned to each building, different interventions can be carried out, with the appropriate approval of the competent authority. At the same time, special emphasis is fixed on the landscape issue and/or consistency aspect of the entire area, which implies taking special attention with visual perception, and would require most environmental impact studies.

In fact, the recent experience in the city of Granada and other municipalities in the province of Granada with POCITYF project is that one of the main impacts taken into account in historical, cultural, natural, and touristic areas, is the visual impact. Thus, PV facilities are important barriers for the regulatory approval.

Despite the protectionist nature of protection planning, these rules also aim at transforming the historical complexes. They provide room for specific measures, as long as this intends an improvement in their connections with the territorial or urban environment or avoid degrading uses establishing an action framework. Historically, there have been activities by the Andalusian Government in the historical centres, called Integrated Rehabilitation Areas, which, although having a very protectionist character, meant a strong physical and socio-economic intervention. If there is currently any intervention of this type, it can be a good channel to establish synergy with the POCITYF project.

Circumstances of the historical city centres of the province of Granada:

There are only four historical centres with protection planning approved by the Andalusian Government, which implies that they have delegated the competences to their municipalities, three of them are in the capital (the three plans mentioned). This delegation of competences, at least formally, avoids the delay of the works authorization processes

Any other issue that may impact the POCITYF project solutions will be assessed by the FC partners in the course of the project.

Typology of Protected Assets:

The following classification could be made:

- BIC: Assets of Cultural Interest- Under the tutelage of the state administration
 - o It is the most relevant administrative Heritage figure and with the highest protection level.
 - o It is considered by the regional laws identically than national law does
 - o There is an obligation to define the environments of the BIC
- Inventoried assets:
 - o They are those that are easily below the BIC
 - o They can be included by the autonomous communities.
 - o Without having the relevance or social value of a BIC, consider it valuable enough (historically or socially) for its special protection.



- Properties listed in the protection catalogues of the Special Plans:
 - o Buildings that the municipalities designate with a protection degree.
 - o They include from those mentioned above (BICs ...) to those with environmental or landscape protection, in which any type of intervention is easier.

As a summary, it can be assured that there is a link between urban planning legislation and Historical Heritage regulations, where planning is tacitly recognized as the valid instrument to respond to historical centres, it is in the Special Protection Plans where are collected much of the law for rehabilitation

Reflections and problems

The first challenge for intervention in the historical complex of Granada is that it is “truffled” with properties registered with different protection figures, which together with the special protection of a landscape nature makes specific actions extremely complex. As an example, almost the entire area of the Albaicín is affected by BIC environments.

Currently, there are several urban plans under review. This may delay the management of licenses, although officially this service is not paralyzed.

There is a new classification of the whole of the Alhambra that, within the BIC category, adopts a new modality, going from “Historical Complex” (made up of real estate) to “Monument”, which means altering the limits of the complex, a new delimitation that should be consistent with those established in the PEPRI review.

When acting in historical complexes which have approved protection planning, such as the case of Granada city, getting building licenses would initially be easier, provided that it is not considered a BIC. BICs require the mandatory authorization of qualified authority, in this case, Regional Cultural Ministry. Both the approval committees and the heritage catalogues are usually very restrictive, hindering many interventions that could have positive effects. It is essential to improve coordination between administrations and for our part a very intense communication work.

In practice, Granada County Council has had some meetings with the regional administration and different municipalities. At the moment it seems that there is a great fear of both regional and local technicians to approve PV facilities because of their visual impact, and a possible solution would be to develop some pilot projects with innovative integrated solutions that could give the technicians sufficient insight to be able to specify concrete characteristics that would be accepted in terms of visual impact.

If the building does not have a protected status, all kinds of solutions are possible. But as long as the objective of preserving the building dominates, the degree of compliance with the Technical Code will not be entirely possible. This doesn't mean that it cannot be fulfilled in part. All technical knowledge must be oriented towards maximum compliance, determining the level of legal responsibility for deficiencies.

6.4. Hvidovre

6.4.1. Energy Law

Positive Energy Buildings and Positive Energy Districts

Danish energy consumers historically always used to have a strong position in the energy sector via direct common ownership of utilities and district heating systems, as well as indirectly via



publicly-owned companies in the gas and electricity sectors.³⁷⁰ This is reflected in various parts of Danish energy law, but more importantly, it also contributes to a culture of ‘active’ consumers that are more willing to engage in citizen energy projects than in countries where consumers have historically only had passive roles. Thus, a fertile ground for positive energy districts. Another factor that helps Denmark in this regard is the early acceptance of renewable energy (with Denmark being a frontrunner for more than 30 years already), as well as the collectively organised heat supply,³⁷¹ which makes it easier to make the heat supply more sustainable than in a system with individual heat supply.

The main Act shaping the electricity supply in Denmark is the *Elforsyningsloven*.³⁷² This Act regulates the production of electricity, connections to the electricity transmission and distribution system as well as the rules on the collective supply of electricity. However, it turns out that the main legal issues do not spring from the framework Acts but rather from more specific rules.

In the development of the pilot projects in Hvidovre so far, some specific legal/regulatory issues have become clear already. This mainly relates to the rules on energy taxation that have a rather negative outcome for the business case of the projects in POCITYF. For example, in the **Act of Electricity Taxes**, it is stated that electricity consumption from plants over 6 kW can no longer be offset in the collective electricity supply without having to pay taxes.³⁷³ This is a problem for social housing companies. How this and other obstacles in energy law may rise and impact the POCITYF project solutions will be assessed by the FC partners in the course of the project.

Peer-to-peer Trading and Storage

Peer-to-peer trading is currently not provided for in the Danish energy law framework. Regarding storage, Denmark has a strong orientation on collective facilities rather than individual facilities. It can be expected that this will also influence the legal framework with regard to electricity storage.

E-Mobility Integration

A specific issue identified in Hvidovre is that a standardization of how to tax and measure the production of renewable energy in the same system as a charging point is necessary. At the moment, the Danish legislation is making it impossible to get a substantial tax refund for the EV-charger owned by a local energy community if we mix power produced by local PVs in the same circuit.

6.4.2. Construction Requirements

Hvidovre Municipality’s motivations in planning and implementing smart city measures in Hvidovre FC is largely motivated the climate partnership DK2020. To meet its goal of being CO2 neutral by 2050 as part of this partnership, Hvidovre Municipality has set a milestone of reducing CO2 by 80% in 2030 relative to 1990.

The Municipality has prepared a Climate Action Plan, which it is currently in the process of political approval and public hearing. After the final approval (foreseen in December 2022) the initiatives in the Climate Action Plan will be financed via the municipal budget in the coming years.

When the budget is set, the projects will be planned, including the final approval and financing of the projects, by means of preparing the following steps/items:

- meeting with the relevant department in the municipality,

³⁷⁰ A. Ronne, ‘Energy Law in Denmark’ in Roggenkamp, Redgwell, Ronne, del Guayo (Eds) *Energy Law in Europe*, OUP 2016 (third ed), p. 454.

³⁷¹ *Ibid.*, p. 457.

³⁷² *Elforsyningsloven*, LBK nr 119 af 06/02/2020.

³⁷³ *Elafgiftsloven*, LBK nr 1321 af 26/08/2020, art. 2 Stk 3.



- initial description of the project,
- presenting the project to the administration of the municipality,
- preparing the project by the relevant department for a decision in the municipal council (including gaining the approval of documents by the law and economics departments),
- proposing and answering any additional questions, and
- approval by the council.

The planning and implementation of all smart city initiatives

All smart city measures conducted in Hvidovre Municipality must consider and submit to any relevant locally enforced regulations. For one, the Building Regulations^x - defined by the national Danish Ministry of Transport,^{xi} Building and Housing^{xii} - apply to all smart city initiatives that involve the:

- construction of new buildings,
- additions to existing buildings,
- demolition of buildings, and/or
- maintenance or other alterations of existing buildings which have an impact on the energy consumption of the building.

A building permit must be obtained from the local council unless otherwise stated, and the relevant structural engineers and fire consultants must be used. Moreover, all smart city initiatives must take the local plans into account. Local plans regulate the appearance of new and existing construction projects. Local plans for Hvidovre FC, including the replication area, can be found here in Danish: <https://visplaner.plandata.dk/>.

In addition, the national law concerning energy can be considered of particular importance to planning of smart city measures in Hvidovre FC. In Denmark, energy is regulated by the Act of Electricity Supply^{xiv} and the Act of Electricity Taxes.^{xv} Important for POCITYF, and a potential barrier for the implementation of smart city measures involving social housing companies, is the fact that electricity consumption from plants over 6 kW can no longer be offset in the collective electricity supply without having to pay taxes.

The Local Plans also regulate the appearance of new and existing construction projects.

Buildings to be preserved (cultural heritage buildings) are covered by the Building Regulations 2018, including energy efficiency - exempt from the provisions of the Building Regulation only under exceptional circumstances. This is not expected to be the case in the FC of Hvidovre, but the Danish Building Protection Act will be addressed below.

6.4.3. Heritage Law

Danish Building Protection Act

Cultural heritage sites can be covered by a *conservation urban plan statute*, a local conservation plan or *designated following Section 19 (appointed by the Minister) of the Building Protection Act*. In these cases the planning has sought to preserve the external appearance of the buildings in question - as part of a building whole. The State administers protected buildings, while the municipalities are responsible for the cultural heritage.³⁷⁴

Hvidovre has around 900 listed buildings, and although there are no “conservation urban plan statute” or “conservation plan” for any of the buildings, the FC plans to involve a local institute, Forstadmuseet (Suburban Museum) in the development plans to secure that the history and values of a typical South of Copenhagen suburban municipality, preserving its values. This plan will

³⁷⁴ <https://www.retsinformation.dk/Forms/R0710.aspx?id=199864>



include buildings especially from the fifties and the seventies, but also some older areas of historical importance - a former military camp with fascinating architectural cultural heritage and a village with old peasant houses.

6.4.4. Local obligations

Heating supply has been centralized for many years, which has resulted in high prices. The FC expect to run an experiment in Hvidovre with decentralized low-temperature district heating in an “Energy Island” in Avedøre (part of Hvidovre). How this and other obstacles of municipal nature may rise and impact the POCITYF project solutions will be assessed by the FC partners in the course of the project.

Alongside 32 other municipalities in the Capital Region, Hvidovre Municipality has joined the climate partnership DK2020. This partnership sets the goal for each municipality of being CO2 neutral in 2050. Each municipality is obliged to set up ambitious milestones, which Hvidovre Municipality is currently in the process of doing.

6.5. Ioannina

In Ioannina the limitations to the deployment of solutions under POCITYF stem mainly from the heritage law limitations that require time-consuming bureaucratic procedures. Another possible barrier for POCITYF is that at the moment the possibility of energy exchange between different buildings is provided only if the natural or legal persons who own the property, jointly participate in an energy community for the production of electricity from RES (Renewable Energy Sources).

6.5.1. Energy Law

Positive Energy Buildings and Positive Energy Districts

Greece has a high degree of energy poverty. Therefore, the Ministry of Environment and Energy has launched the Plan for the Fight against Energy Poverty which provides high subsidies for the benefit of the poorest households for the installation of energy autonomous RES (photovoltaic systems on the roof), for energy upgrading of households and cheap electricity bills under the «Save» program. Special care has been given to the lignite areas, where the subsidy rate will reach 90%.

Buildings and districts can be equipped with solar PV systems and other small/medium sized RES installations. It is currently regulated by the Ministerial Decision 15084/382³⁷⁵ and Decision 74999/3024³⁷⁶ and concerns the installation of photovoltaic stations to cover needs of electricity consumers, by applying energy offset (net-metering). The PV system needs to be on the building or adjacent to it. However, it must be noted that virtual net-metering (participation in a remote PV field) is also possible.

With Law 4414/2016 self-production with energy offset was extended to other technologies and specifically to small wind turbines, biomass/biogas/biofluid stations, small hydroelectric stations, and electricity-heat cogeneration stations (CHP).

Importantly, these rules are only applicable to small systems: the power of each grid-connected photovoltaic system can be up to 20kWp or up to 50% of the agreed power consumption (for virtual net-metering up to 50% of the sum of all consumptions participating), if this value is higher than

³⁷⁵ Government Gazette 759B/5.3.2019

³⁷⁶ Government Gazette 3971B/30.8.2021



the limit of 20kW, but in any case, not over 1MW. The duration of the contract between the self-producer and the electricity provider is 25 years from the day of activation of the connection. A connection contract with the Network Administrator must have preceded.

In case of a shared ownership building, there can be multiple systems. Each photovoltaic system is assigned exclusively to one consumption meter.

- The energy offset is performed on an annual basis. The excess energy (surplus) is injected in the HEDNO (Hellenic Distributor Network Operator) grid and is "credited" and transferred to the next billing period.

Especially for self-producers (public or private entities) that pursue public interest purposes, for registered farmers, as well as for energy communities (E.Com.) is allowed, based on Law 4414/2016 and Law 4513/2018, the installation of photovoltaic stations to cover 100% of their own needs with the application of virtual energy offset (virtual net-metering).

Peer-to-Peer Energy Trading and Storage

The possibility of energy exchange between different buildings is provided only if the natural or legal persons who own the property, jointly participate in an energy community for the production of electricity from RES (Renewable Energy Sources). Law 4513/2018 "Energy Communities and other provisions" introduces the institutional framework for the establishment and operation of Energy Communities (E.Com.) in Greece with the aim of promoting social and solidarity economy and innovation in the energy sector, addressing energy poverty, promoting energy sustainability and innovation, the production, storage, self-consumption, distribution and supply of energy as well as the improvement of energy efficiency at end-use at local and regional level.

This framework provides financial incentives and support measures for the Energy Communities. The support measures mainly concern the development of RES power plants. The utilization of domestic RES potential is a central national energy goal as it contributes to the diversification of the national energy mix, increases security of energy supply and tackles climate change while strengthening the development of the national economy. A favourable framework is adopted for the development of RES electricity generation stations by local communities, making them an active part in the promotion of RES in Greece in the context of achieving the goal of RES participation in the energy balance.

The law describes in detail the activities of energy communities, which may be profit or non-profit. Some typical examples include:

- Operation of a photovoltaic system in a building or park for virtual self-production of community members (e.g. households in apartment buildings, small businesses, etc.)
- Operation of a photovoltaic park by a local government or energy provider for solar social policy
- Operation of a wind farm by the members of the community and/or by local authorities for virtual self-production or sale of electricity in the network
- Operation of a biomass or biogas plant for energy production from the rural community and supply chain management
- Greenhouse operation with co-generation unit
- RES installation operation with energy storage system
- Operation of desalination unit with RES



Electricity Storage

The installation of storage units in the electrical system of the country is considered a necessity in order to achieve further penetration of RES. The current institutional framework for the development of electricity storage facilities is keeping trapped 170 projects (including emblematic investments) that have already been licensed for the installation of hybrid stations on non-interconnected islands and more than 50 projects awaiting evaluation because of the institutional gaps identified across the spectrum of storage activity in Greece.

To solve this problem, the Ministry of Environment and Energy has set up a project team to formulate and complete the regulatory framework for the installation of electricity storage projects. The team is tasked with examining the institutional gaps and proposing legislative and regulatory interventions that make possible:

- The participation of storage units in the electricity markets as independent participants.
- The support of investments through the participation in the respective power mechanisms and the exemption of the storage stations from unfavourable and abusive charges or other restrictions of development and activity in accordance with the policies of other EU countries.
- The compatibility of the framework with EU Directives and Regulations.
- The inclusion of storage stations in portfolios together with RES units for their joint activity in the electricity markets.
- The installation and efficient utilization of scattered storage units in users' facilities (producers - consumers - self-producers).
- The integration of storage devices (BtM - Behind the Meter) in RES production stations.
- The development of storage on Non-Interconnected Islands.

With Law 4513/2018 (Energy Communities) and the Ministerial Decision 15084/382³⁷⁷ it is now possible to install storage units in combination with self-generating systems. These storage systems are not allowed to exchange energy with the distribution network. That means the stored energy comes exclusively from the installed RES system and is used only for self-consumption. Current market prices of battery storage systems make them anyway an advantageous choice only for buildings disconnected from the grid for the moment.

E-mobility Integration

As far as electric mobility is concerned, Greece remains one of the least prepared European countries. Two critical factors are the lack of appropriate infrastructure and the limited availability of EV models in the Greek market compared to the bigger markets in the EU. However, the National Plan for Energy and Climate sets e-mobility high on the priority list, with a target that EV will represent at least 30% of all newly registered vehicles by 2030.

In an effort to address the fast-developing needs, the Greek Government introduced Law 4710/2020 «Promotion of Electromobility» which provides incentives to alleviate the cost of using an electric vehicle (EV) and promotes the development of charging points.

Specifically:

³⁷⁷ Government Gazette 759B/5.3.2019



- Incentives for the development of E-mobility: Creation of free parking spaces for EV; Incentives for licensing of EV production units and goods or EV items; Imposition of environmental tax and ban on importation of old, polluted used vehicles.
- Tax incentives for the development of Electromobility: Exemptions from income for expenses or concession of a vehicle of zero or low pollutants; Tax depreciation on the means of transportation of zero or low pollutants; Exemption of the purchase of a car of zero pollutants from the cost of acquisition of assets.
- Organisation of the electricity market and the EV charging infrastructure: Organization of the EV recharging market; Registry of Infrastructure and Electromobility Market Bodies; Pricing of recharging services; Development of publicly accessible EV recharging infrastructures.
- Spatial arrangements for the development of charging infrastructure: location of parking points and EV recharging by local authorities; Location of taxi parking spaces with EV recharging points; Location of EV parking spaces for the disabled.
- Urban planning regulations and other requirements for the installation of EV chargers.
- Installation of EV recharging infrastructure in buildings (new and existing) and in areas housed by General Government bodies; Exemption from the approval of small-scale works; Fire protection measures; Electrical Installation Specifications for EV recharge points of connection to the Electricity Distribution Network.

According to the same law, Municipalities must prepare an "Electric Vehicle Charging Plan" within their administrative boundaries, for allocating of publicly accessible normal or high-power recharging points and parking spaces. The elaboration of the plan may be financed from the resources of the Green Fund.

The Action «I move electrically» (Government Gazette 3323/07.08.2020) defines the terms, conditions and procedures for strengthening the market of purely electric or hybrid electric vehicles with external charging (CO₂ emissions up to 50g / km), including motorbikes, tricycles, scooters and bicycles, with the possibility of withdrawing (or replacing) an old vehicle, as well as the purchase and installation of "smart" home EV charging point.

6.5.2. Construction Requirements

Laws 4067/2012 (New Building Regulation) and 4759/2020 (Modernization of Spatial and Urban Planning Legislation) constitute the main regulatory framework for buildings and urban planning.

Law 4495/2017 is setting the legal framework for arbitrary buildings. As arbitrary construction is defined any construction or installation, which is carried out or has been carried out without the required building permit or in excess of it or in violation of the applicable urban planning provisions or on the basis of a permit that has been revoked or cancelled. Arbitrary change of use is defined as any change of use for which the required building permit has not been issued. The concept of arbitrary construction/change of use also includes the urban planning violations of this law. The school complex "Polykladiko" included in the Ioannina replication area falls in the category of existing building without building permit.

The law defining the framework for all stages of conducting public tenders for projects, supplies and services currently in force is Law 4412/2016 (further specified by Law 4782/2021). The Law is in harmonisation with the EU-Directives 2014/24/EU and 2014/25/EU.



There are also specific construction rules on the energy performance of buildings. The energy efficiency of buildings is calculated based on a methodology defined in the Energy Efficiency Regulation of Buildings - EERB³⁷⁸ which includes, in addition to the thermal insulation characteristics of the structural elements of the external surface of the building (shell), other factors that play an important role as well, such as heating/air-conditioning and hot water production facilities, the use of renewable energy sources, passive heating and cooling elements, shading, indoor air quality, adequate natural light and the design of the building. The energy efficiency calculation methodology covers the annual energy efficiency of the building and has been prepared in accordance with the relevant European standards.

The EERB determines the minimum requirements for the energy efficiency of buildings and structural elements. These requirements have been set in order to achieve the optimal cost-balance between the relevant investments and the energy costs saved throughout the life cycle of the building.

Information on the standard energy efficiency of the building, as well as cost-effective advice on improving its efficiency, are given in the Energy Performance Certificate (EPC) based on EU legislation. The EPC is useful to the owner, the prospective buyer and the tenant of a building or building unit. The owner assigns to an energy inspector the elaboration of energy inspection and the issuance of the EPC.

All in all, the regulatory framework for constructions does not show likely of being a barrier for POCITYF, whereas the EERB stimulates energy efficiency in buildings and thus the solutions developed in POCITYF.

6.5.3. Heritage Law

Due to its long and rich history, Greece is a country with a rich cultural and architectural heritage. The cultural monuments that are found in almost every city, as well as the multitude of buildings of special architectural interest that accompanied each page of its history, are characteristic images of the country and are recognized internationally as achievements of special historical and artistic value. Our cultural stock extends from classical antiquity to modern times and constitute a cornerstone of our national identity.

The protection of architecture and cultural heritage has been the subject of protection through a variety of legal provisions. First, a continuous effort is made for the protection of cultural heritage through the signing of International Conventions. In the Greek legal order, the protection of cultural heritage is solemnly secured, through the provisions of the Constitution and especially of Article no. 24 but also through the following laws:

- The General Building Regulations: Law 4067/2016 (New Building Regulation) Article 6 about the protection of the architectural and natural heritage.
- Article no. 18 par. 1 of the Constitution
- The Granada Convention for the Protection of the Architectural Heritage of Europe ratified by Law 2039/1992, prevailing over any other contrary provision of law under Article no. 28 of the Constitution
- Law 5351/1932 amended and supplemented by Law 3028/2002 (Government Gazette A153) "On the protection of antiquities and cultural heritage in general"

³⁷⁸ Decision no. 178581/2017, Government Gazette 2367/B` 12.7.2017



According to the latter law, properties that are erected earlier than the last 100 years and later than 1830, are protected as newer monuments (before 1830 they are characterised as ancient). Newer monuments can also be characterised buildings and properties younger than the last 100 years if their protection is required due to architecture, urban planning, of ethnological, folkloric, technical, industrial or generally historical, artistic or scientific significance. Similarly, historical places are protected, i.e. areas or settlements that were the site of exceptional historical or mythical events, as well as areas with indications of the existence of monuments or complex works of man and nature, later than 1830.

The Ministry of Culture and Sports compiles and publishes since 1993 the Permanent List of Archaeological Sites and Monuments that protect building monuments, archaeological sites and historical sites of Greece. It is noted that the list includes only the monuments for which there was a need for declaration, in order to either be classified as protected (newer monuments) or to delimit protection zones (prehistoric, classical, Byzantine and post-Byzantine) or to resolve any disputes regarding their protection provisions of the law (mainly in the case of post-Byzantine monuments). Two of our proposed PED buildings, the old Town Hall and the «Pyrsinella» mansion with its yard and surrounding area, are listed as newer monuments.

Regarding potential barriers for POCITYF, the Cultural heritage Heritage Act Law(N3028 3028/2002), article 10, prohibits changes of on the protected buildings, (such as façade changes), which can alter directly or indirectly its appearance or even certain uses of the building, enforcing the use of certain materials in some situations.

The law also requires approval for every technical work or change of use to a protected building, from the Ministry of Culture and Sports after the opinion of the Central Archaeological Council or the Central Council for Newer Monuments (in the POCITYF case). These restrictions may forbid some kind of energy solutions to some buildings or may force alterations to the chosen solution to be made, which is time-consuming and sometimes challenging.

6.5.4. Local Obligations

All technical projects in the city are assigned under the responsibility of the Technical Services of the Municipality and are approved by the Town Council. For major projects prior public consultation with citizens and local businesses is usually a prerequisite. For projects executed around the Lake District the approval of the Public Property Service (“Ktimatiki”) might also be obligatory.

Currently, no legal barriers for POCITYF are identified at local level. Whether, and how, local obligations may affect POCITYF FC projects will be assessed by the FC partners in the course of the project.

6.6. Ujpest

Restrictions to the adoption of the POCITYF solutions in Ujpest can be found in energy law, construction requirements and heritage law. These will be elaborated below, by showing what kind of requirements are set in place and how they might be problematic. In some cases, it may even be required to change the legal framework in order to realise the projects planned in the context of POCITYF.

6.6.1. Energy Law

Positive Energy Buildings and Positive Energy Districts

With regard to Positive Energy Buildings, there are considerable restrictions that might affect the implementation of the POCITYF project solutions in Hungary.



Ujpest knows many shared ownership buildings. However, it is not possible for a commonly owned solar PV installation on the roof or façade of a shared ownership building to be used directly by the tenants (lowering their electricity consumption). According to the existing regulation, “Household Size Small Power Centre” means a power center under 50 kWp connected to one electricity meter, and the settlement of production and purchase is based on the “net metering system”. It is the same with PV power centers as well. In a multi-flat building, each flat has an electricity meter. So, the condominium community can install PV only under 50 kWp on the roof of the building, and this is only for the electricity consumption for common purpose such as lighting in common places, elevators, etc.. The consumption of the flats under the limit of 50 kWp can’t be combined or summed up. It is a significant barrier in the installation of PVs regarding the possible numbers implemented on the roof of multi-flat buildings. A relevant change of regulation is assumed in the plan. According to the planned technical solution we planned as many PVs installed on the buildings as technically possible.

Further, the installation of a PV system below 50 kW requires a replacement of the original meter by a bi-directional electric meter. This requirement will naturally prolong the installation procedure. Such PV installations follow a yearly balance accounting system. This allows consumers to use the electricity network as a free of charge storage unit, which is beneficial for these consumers. However, it is less advantageous for the DSO, which bears the costs of this system. Moreover, a side-effect of this accounting rule is that it disincentives consumers from investing in a battery or storage system.

Peer-2-Peer Trading and Storage

The second pillar of POCITYF relates to P2P trading (between buildings or citizens) and storage of electricity. However, Peer to Peer trading of electricity via the public distribution systems in Hungary is not allowed so far, even though this is required by EU law in the future. A regulation of renewable energy community is lacking. This limits the possibilities for Positive Energy Districts.

There are some other rules that are relevant in this regard. For example, in the case of a hybrid system (such as PV and storage) they require special requirements and certification by the electric service providers. There is no differentiation between PV converters and battery/storage converters from the point of view of connection rules. This type of indiscriminate requirements (even to situations which are materially different) also exist regarding the connection process and technical requirements: they are the same for 300W PV panels, micro PV systems and 40 kW PV systems. However, if the PV installation produces more than 50 kWp, it should be treated as small power plant and should be attested by the service provider in the design and the installation phase.

All hybrid installations (PV and storage) and smart grids should be certified by the electricity service provider.

E-mobility Integration

The installation of V2G charging stations follows the same requirements as the PV system installation in regard to plans and permitting processes. Whereas it is good that there are concrete rules, the issues mentioned above on the requirements for different installations are valid here as well.

6.6.2. Construction Requirements

The following problems related with construction requirements might be found in Ujpest in the context of POCITYF.



First, it is good practice to use the step by step renovation guidelines with implementation of extra thermal insulation on the solid walls without windows, there are separate windows changing at the apartment. However, this process is not included into the national renovation grant & loan system.

Secondly, under Hungarian Law, private residential houses and offices are free to decide on their heating/cooling systems. In practice, this means that they are mostly using gas -based systems, which have lower investment costs than utilisation of renewable energy sources such as biomass or geothermal energy. This may reduce the willingness to participate in a transition to renewable sources. Considering the investment prices, it also matters to say that there are strong regulations for using ground source heat pumps in the urban areas creating a complicated technical system and increase the investment prices. In this context, it is also relevant that the local District Heating company has a long-lasting contract with a commercial power plant. This limits the use of renewable sources for the district heating system.

As an alternative heat source for the district heating system, geothermal energy could be considered. However, this would involve expensive deep drillings and would have strong regulatory frameworks applicable to it. These two factors make the use of geothermal sources economically less appealing.

Another possible problem is the fact that installations of PV panels at rooftop of apartment houses sometimes require the approval of majority of the owners, which may limit the capacity to conduct such alterations in apartment buildings with multiple owners.

In order for installing a collective energy system with potential to captivate the Hungarian citizens there must be an emphasis put into transparency of information regarding the real costs that such investments may entail.

6.6.3. Heritage Law

Regarding the barriers and opportunities to deploy solutions in cultural heritage buildings, renovation works might be restricted in the project area. In this regard, special attention must be given to renovation works in the Town Hall and building alongside the Main Square of Újpest. The use of thermal insulation on façade; changes to windows using certain materials; and the installation of PV panels on the roof and façade (if it can be seen from public spaces) is restricted and needs to be permitted by the Committee of City Appearance.

Such requirements require PV installation to be treated using a common guideline and best practice. Further, extra thermal insulation on the façades that may be seen from public spaces should be authentic with the building circumstances and formal feature of the details. These two requirements show to be the most fundamental obstacles to the deployment of the POCITYF project solutions in Újpest related to cultural heritage buildings.

According to the legislation on the outside insulation and the protected facades of the historic buildings are mostly prohibited, while inside insulation is too expensive, and risk of condensation could easily occur. It could be a barrier in complex EE renovation of buildings, but in our plan there are no protected buildings.

6.6.4. Local Obligations

Some regulatory issues spring from the division of competences between different authorities. Two examples, related to public lighting and to school buildings, are highlighted below.

As the public lighting system is the domain of the Municipality of the Capital (Budapest), there is only a limited role of the Local Government of Újpest to foster a smart public lighting system,



even in the form of an ESCO (energy service company) financing by technology provider. Further, as the energy consumption of the public lighting is not measured, all smart solutions, lowering the energy consumption of the public lighting system, require the installation of a connection box for accounting meters in order to make sure that the energy savings are well registered.

Secondly, specific issues exist with regard to school buildings: the Primary and secondary schools belong to the Klebesberg Centre of Education, a national institute, so the Local Government of Újpest has limited influence introducing energy efficient solution for these buildings.

Further problems that may rise from the implementations of solutions at a local level will be reported by the FC in the course of the POCITYF project.



7. Conclusion and Take-Aways

General Conclusion

In order to bring the plans developed within POCITYF to reality, the regulatory framework is essential. Regulatory barriers may prevent projects from being implemented or affect the business case for the project so strongly, that the project developer loses interest in the project. Therefore, taking into account the regulatory framework from the beginning of each project is necessary. This Deliverable elaborates the regulatory framework applicable to the projects in the POCITYF Lighthouse Cities, Alkmaar and Évora. It also covers to some extent the legal situation of the Fellow Cities to the POCITYF project, as a start of the Replication Plans for these cities.

This deliverable aims to clarify the legal framework related to the creation of positive energy districts, and applicable to the lighthouse and fellow cities. It covers the international and EU legal context but also the national and even city-specific law applicable to the Lighthouse Cities, including the experiences from practice in this project over the past few years. This analysis has been done in close cooperation with Work Packages 6 and 7 for the respective lighthouse cities. The legal/regulatory analysis, as applied to the pillars of POCITYF, and the experiences from practice, also feed into Work Package 8, where the FCs can use the insights in their replication plans, to provide examples of what works and what holds back projects.

The main conclusions and take-aways of this Deliverable are the following:

Legal and Regulatory Framework under Continuous Development

One of the most significant findings in the legal and regulatory framework is that it is under continuous development to facilitate the energy transition. On the international level, the Paris Agreement gives a strong push for countries and organisations such as the EU to work on ambitious legislation. In turn, major legislative developments are happening in the context of EU-law: the implementation of the Clean Energy Package and on top of that, the introduction of the Fit-for-55 Package that will be adopted in the coming year (2022-2023). On a national level, the Netherlands is in a major legislative revision, with the development of a Spatial Planning & Permitting Act, Energy Act as well as a new Heat Act. In Portugal, the recent DL 15/2022 streamlines the licensing procedures for (renewable) energy projects and brings many different rules on energy communities and self-consumption together in one comprehensive legal document.

The seemingly continuous development of the legal framework creates tension, in the sense that business cases may have to be changed if new rules are adopted, and as some projects are delayed because developers are waiting for new legislation to be enacted. Still, a positive element is that new insights can be adopted in legislation relatively quickly. EU legislation already steers towards local energy initiatives (Citizen Energy Communities and Renewable Energy Communities) that can play an essential role in the development of Positive Energy Districts. As soon as they are well implemented in national law, they can be used in practice. Identified barriers in the current legislation can also be addressed relatively quickly in this way. That is already an experience from the first version of this Deliverable (2020) to the second version (2022): that some of the identified barriers are already solved by now and that issues that were previously not regulated (for example in the context of energy trading among citizens) are now addressed in legislation.

Still, adapting and revising the legal framework is not a panacea: the implementation of PEDs is still dependent on many different factors, such as the development of technology, the costs of implementation (and the division of these costs between actors), the willingness of citizens to participate. These issues are addressed in the pilot projects of POCITYF as well, but reach beyond the scope of this deliverable.



Protection of Heritage Buildings and City Areas as a Barrier in Practice

A second finding relates to monumental buildings, protected city areas, etc. These buildings and areas are often well protected under the national (and local) regulatory framework, with a view to conserve their features for future generations to enjoy. This may lead to friction with the targets for the energy efficiency of buildings as set on EU and national level. This calls for local and regional authorities to develop concrete guidelines on how the interests of heritage conservation can be respected while these buildings are renovated and made more energy efficient, as envisaged in POCITYF. POCITYF aims to address and demonstrate how the balance between these two interests needs to be struck, also because the interests are weighed differently by different entities.

The standards for renovation for buildings are high, which calls for creativity and innovation at the side of the project developers. In this way energy solutions may very well fit with the historic features of the buildings.

As permitting issues are an important potential barrier, this calls for a more coordinated approach, for example in the form of guidelines on how local permitting authorities should decide on renovations in the context of the energy transition. In this regard, (local and national) authorities and experts should re-think what is and what is not acceptable in the context of the energy transition. For example, the installation of solar panels will undoubtedly have a visual impact on buildings and districts. However, these historical buildings used to have no electricity either, and the streets in historical districts used to be free of cars, both introduced only in the 20th century. A broader discussion on what types of innovation are allowed in historical buildings in the context of the energy transition would help to set the standards for the 21st century.

Replication of Projects: the Legal Framework Cannot Simply Be Transplanted

A third and last finding relates to the following cities and replication of projects. An important pillar in POCITYF is that the solutions developed in Évora and Alkmaar are replicated in other areas: both within these cities but also in the other cities (following cities), and when solutions prove to be successful, perhaps also in other areas and cities that are not part of the project.

As was expected, the national and local legislation plays a large role in how energy solutions can be implemented. This means that even when a solution can be copied and replicated in another area from a technical perspective, it might be harder to reach a positive business case with the same solution but in a different legal/regulatory environment. Even within one country, it might be difficult to replicate solutions to different cities where the local rules are slightly different. That is why in replication plans the legal/regulatory context should be taken into account from an early phase onwards. This will allow project developers and local authorities to make small amendments to the plan so it fits the local (and national) legal/regulatory environment.



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