Deliverable D2.4

POLICY RECOMMENDATIONS BASED ON THE RESULTS OF THE LEGAL, REGULATORY & STANDARDIZATION ANALYSIS

Envisioning and Testing New Models of Sustainable Energy Cooperation and Services in Industrial Parks

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Organisation: RINA-C, with collaboration of ADRAL, BOREALIS, BSI, CUOIO DEPUR, EHOO, EI-JKU, SSSA, TECNALIA

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**Acknowledgements**

This report is part of the deliverables from the project "S-PARCS" which has received funding from the European Union’s Horizon 2020 research and innovation program under grant agreement No 785134.

S-PARCS presents a sound concept for reducing energy costs and energy consumption in industrial parks, while, at the same time, increasing renewable on-site energy production. The pre-assessment of the seven “Lighthouse Parks” from Spain, Portugal, Italy, and Austria, which participate in the study, has shown a high potential for joint energy actions, many of which are transferrable to the community of S-PARCS Followers in the UK, Sweden, Turkey, Russia, Italy, Portugal, Austria and Norway.


**Disclaimer**

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**Executive summary**

The implementation of energy cooperation and joint energy services may be hampered by multiple barriers and risks, related – for example – to the difficulties in adapting existing systems to new layouts, in developing profitable business models and in complying with the necessary legal requirements.

In this context, Task 2.3 and this deliverable D2.4 in particular deal with specific legal, regulatory and standardization issues as well as with the identification of suitable mitigation measures, to maximize replicability of S-PARCS solutions.

The industrial parks covered are Bildosola – Artea and Okamika – Gizaburuaga located in Spain, Ponte a Egola in Italy and Chemiepark Linz and Ennshafen in Austria. Moreover, the possibility of including the Portuguese context has been assessed, but it emerged that barriers that prevented a smooth realization of the S-PARCS project are mostly managerial and information provision barriers.

Thus, this report consists of a collection of policy focuses at project scale outlined based on the information provided by project partners and based on an updated desk review.

The contents of the deliverable aim at addressing potential legal regulatory and standardization issues arising from the implementation of joint energy services and energy cooperation measures in industrial parks or similar contexts.

The approach followed to carry out the work maximizes the collection of inputs from partners having hands-on experience in the development of energy cooperation and joint energy services. It is based on the following pillars:

► collaboration with project Partners at different stages of the project activities, involving the compilation of dedicated questionnaires and face-to-face meetings. Such
collaboration has the final purpose of investigating project specific issues relevant from a legal and regulatory perspective, as well as of analyzing the legislative / regulatory and standard context at national regional and local level, with a look also towards the EU regulatory framework, from a general perspective;

► analysis and elaboration of partners’ inputs and gathering of complementary information through literature desk-based review;
► presentation of main findings.

As a result, for each country involved in S-PARCS and for each solution implemented within the project, background information on legislative context is analysed and described, regulatory bottlenecks are presented and measures undertaken to tackle them and policy recommendations are provided.

The table below summarized the key findings by country and by S-PARCS solution.
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<td>Spain</td>
<td>Use of small hydroelectric installation</td>
<td>Ensure a simplified process to obtain licence of use for assets to be dedicated to the realization of renewable energy projects and to the reduction of GHG emissions, in line with existing European targets of carbon neutrality</td>
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<td></td>
<td>Installation of a PV plant</td>
<td>Facilitate companies access to the hourly energy consumption data. This data is currently accessible but only after formal requests to commercialization and distribution companies. Facilitating access to data and providing tools for its analysis can be a way to increase knowledge of energy consumptions and to motivate the implementation of measures to reduce energy use and mitigate associated emissions</td>
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<td>Italy</td>
<td>CHP plant exploiting anaerobic co-digestion of vegetable tannery sludge</td>
<td>Overcome and simplify existing legal, regulatory and standardization issues by training energy cooperation advisors able to support the companies and industrial parks in the identification and adoption of suitable energy cooperation solutions, and, at the same time, support the politicians in the adoption of the proper regulatory and legislative instruments</td>
</tr>
<tr>
<td>Austria</td>
<td>Waste heat recovery</td>
<td>Facilitate and sustain internal use of waste heat, e.g.: through economic incentives</td>
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<tr>
<td></td>
<td>To improve external usability of waste heat, enhance and generate options for waste heat use in order to reduce primary energy demand thanks to the implementation of energy cascades</td>
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<tr>
<td></td>
<td>To improve external usability of waste heat, improve legal basis for waste heat feed-in into DH networks, as waste heat producers have to negotiate with DH network operators and no right of privileged feed-in into the network</td>
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<tr>
<td></td>
<td>To improve external usability of waste heat, provide that district heating network operators, in the event of refusal of connection, must inform the third party and the competent authority of the reasons and point out measures that the third party can take to obtain access</td>
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<tr>
<td>Shore side electricity</td>
<td>Tax equality for all types of energy carriers shall be ensured at the European level</td>
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<tr>
<td>Installation of a PV plant</td>
<td>Improve possibilities for electricity sharing for large enterprises, without forcing them to register as official electricity suppliers</td>
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<tr>
<td></td>
<td>Diminish existing restrictions on direct lines, especially facilitating permissions to cross public properties or land from third parties (also applicable to other electricity generation installations)</td>
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The information collected in the deliverable is exploited for the drafting of a set of policy briefs, as a direct result of the S-PARCS experience.
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1 INTRODUCTION

The implementation of energy cooperation and joint energy services may be hampered by multiple barriers and risks, related – for example – to the difficulties in adapting existing systems to new layouts, in developing profitable business models and in complying with the necessary legal requirements.

Within D1.2 [1], dealing with barriers towards energy cooperation, a comprehensive identification of different clusters of barriers is performed. Clusters of barriers analysed include economic barriers, social/managerial barriers, framework barriers, technical/engineering barriers and information provision barriers. As a prosecution of this activity, D2.1 [2] illustrates a selection of instruments to overcome technical and non-technical barriers previously identified. Moreover, D2.2 [3] is dedicated to the analysis of specific instruments aimed at overcoming barriers that impair solutions considered by S-PARCS industrial parks as potentially implementable, narrowing down the general approach and topics introduced within S-PARCS to fit the lighthouse parks’ needs.

Thus, previous works already put a light on the urgency to address a wide range of barriers to facilitate the transition of towards decarbonization in industrial parks. Among them, it appears that non-technical barriers often play as a powerful deterrent against energy cooperation in industrial parks.

In this context, Task 2.3 and this deliverable D2.4 in particular deal with specific legal, regulatory and standardization issues as well as with the identification of suitable mitigation measures, to maximize replicability of S-PARCS solutions.

The industrial parks covered are Bildosola – Artea and Okamika – Gizaburuaga located in Spain, Ponte a Egola in Italy and Chemiepark Linz and Ennshafen in Austria. Moreover, the possibility of including the Portuguese context has been assessed, but it emerged that barriers that prevented a smooth realization of the S-PARCS project are mostly managerial and information provision barriers.

The information collected in the deliverable is exploited for the drafting of a set of policy briefs, as a direct result of the S-PARCS experience.

It is worth mentioning that the document does not have the ambition to cover all the existing legal, regulatory and standardization issues in the S-PARCS countries, but it is limited to the analysis and understanding of the issues that hamper the realization of the S-PARCS solutions, with specific reference to those analysed in the D5.3 [4] and D5.4 [5] Feasibility Studies performed in the project. Nevertheless, starting from the project’s experiences, it has been possible to gain an insight in the legal context on the highlighted topics either at national or international level. In this sense, the results do provide a generalized overview of key legal and regulatory barriers that are likely to be faced when implementing energy cooperation initiatives. Indeed,

1.1 KEY MESSAGES

Owing to the findings of Task 2.3 – collected in this D2.4 – the following key messages are extrapolated:
in order to best respond to the requirements of this Task, a methodological approach which maximizes the collection of inputs from partners having hands-on experience in the development of energy cooperation and joint energy services is followed;

at current time, the main legislative drivers of the European policy on energy issues are the Energy Union Strategy, the Clean energy Package and the European Green Deal. The policy of Member States is then largely based on these drivers;

the spreading concept of energy communities (i.e.: collective energy actions that foster citizens’ participation across the energy system) may lead to a host of benefits to the energy systems and it can facilitate access to private capital from renewables investments through citizen participation. Indeed, previously there has been little support in legislative frameworks for citizens and communities wanting to invest in energy projects;

in Spain, identified best practices include the adoption of the energy community legislation, which has enabled some options for energy cooperation. Recommendation address the licensing processes for existing assets potentially exploitable for renewable energy generation, accessibility to consumption data from energy suppliers in order to facilitate design of solutions and finally the possibility of establishing more flexible business models for energy sharing;

in Italy, identified best practices include the definition of local agreements between private entities and authorities, to facilitate bureaucratic steps and authorization processes. Recommendations address the training of energy cooperation advisors to support companies, the possibility of establishing more flexible business models for energy sharing – that can be improved with the introduction of energy communities – and the facilitation of administrative procedures for end-of-waste criteria;

in Austria, identified best practices include the support from the Austrian government on the “provider license” for shore side electricity, the possibility of managing shared generation facilities for building owners and tenants, as far as they are located in the very same building and the structured legislative process to realize charging stations to enhance electric mobility. Recommendations address the enhancement of internal waste heat utilization, as first opportunity and, in turn, the facilitation of cascade uses including competitive possibility of feeding local district heating networks. Furthermore, they cover the taxation for shore side electricity to ensure competitiveness and sustainability within the international context, the need of improving opportunities for energy sharing for large companies, also exploiting direct lines.
2 METHODOLOGICAL APPROACH

In order to best respond to the requirements of this Task, a methodological approach which maximizes the collection of inputs from partners having hands-on experience in the development of energy cooperation and joint energy services as well as direct knowledge of the local legislative framework is followed. Such approach is based on the following pillars:

► collaboration with project partners at different stages of the project activities, involving the compilation of dedicated questionnaires and face-to-face meetings;
► analysis and elaboration of partners’ inputs and gathering of complementary information through literature desk-based review;
► presentation of main findings.

In the next sections, a detailed overview of how each pillar is pursued is provided.

2.1 Collaboration with Project Partners

In order to establish a proactive collaboration with partners, a survey set to gather necessary information is prepared. Specifically, two questionnaires have been drafted. Both of them are aimed at collecting information about various legal, regulatory and standardization issues that the companies/parks face during the S-PARCS project execution, possibly representative of the national context of each park.

The first version of the questionnaire – included as Annex I – has been shared at the early stages of the project with the relevant partners, collecting a preliminary set of feedbacks on the issues of legal, regulatory and standardization barriers and corresponding solutions. It includes a mix of open and closed questions, dedicated to each solution that the park was willing to implement at time of compilation.

The second version of the questionnaire – included as Annex II – has been prepared based on the first questionnaire, in order to allow a smooth update of the information previously provided. However, the structure of the questionnaire is slightly modified in order to facilitate the collection of information in view of the final outputs expected from this Task and to highlight the importance of developing policy recommendations. The interventions for which the legal, regulatory and standardization barriers and solutions are addressed are those included in the Feasibility Studies in D5.3, developed in parallel by RINA-C and the other project partners. The questionnaire is an open-questions survey, structured in order to explore the topics from two different perspectives:

► Project-specific perspective, aimed at collecting details about the experience of the Parks/Companies in the realization of the S-PARCS projects, having in mind the final goal of proposing policy recommendations to overcome potential conflicts in the existing mitigation measures;
► General perspective, aimed at analyzing the legislative / regulatory and standard context at national regional and local level, with a look also towards the EU regulatory
framework and to analyze any potential conflict between the desired project implementation and available instruments to overcome barriers and EU/national/regional/local legislation and standards.

To conclude, the participants are asked to suggest policy recommendations to solve the main bottlenecks they have experienced or of which they are aware of.

In addition, face-to-face virtual meetings have been arranged when delivering the questionnaires, in order to emphasize the objectives of the questionnaire itself and – as needed – when a first round of information is collected and to discuss potential outcomes.

2.2 Literature Analysis

With the aim of providing a clear and complete overview of existing legislative issues and opportunities in the European context, a literature analysis is performed.

The analysis is focused on outlining the overall European legislative framework with respect to the significant topics for S-PARCS and on deepening the inputs provided by project partners, whenever deemed as necessary.

2.3 Presentation of Main Findings

Once all the inputs are collected and analyzed, a suitable and homogeneous structure for the presentation of the final findings is elaborated, consistently with the structure of the proposed questionnaires.

In this sense, findings are presented by country and by solution. For each country, a general overview of the legislative framework is presented, and then legal issues are explored solution by solution. Specifically, for each solution, a brief description, the analysis of applicable policies and of existing policy challenges and the description of encountered solutions and desired policy recommendation are dealt with. Policy recommendations may be given at solution level or at country level, on a case by case basis.

The structure in which these contents are presented aims at reflecting the typical structure of a policy brief.
3 EU POLICY FRAMEWORK

This chapter provides a description of the most relevant aspects of the EU policy framework with respect to energy efficiency and energy cooperation.

3.1 Context

The general principles on energy policy published by the European Parliament state: “Challenges facing the EU in the field of energy include issues such as increasing import dependency, limited diversification, high and volatile energy prices, growing global energy demand, security risks affecting producing and transit countries, the growing threats of climate change, slow progress in energy efficiency, challenges posed by the increasing share of renewables, and the need for increased transparency, further integration and interconnection in energy markets. A variety of measures aiming to achieve an integrated energy market, security of energy supply and a sustainable energy sector are at the core of the EU’s energy policy”[1]. Such principles are thus the drivers for a comprehensive and long-term development of the energy sector in the EU and effectively summarize the ambitions of the EU, as well as the targets of the policy measures undertaken in the EU and in its Member States.

Currently, the Energy Union strategy[2] is the main policy instrument to deliver transformation of the energy sector, which aims at bringing secure, sustainable, competitive and affordable energy to all EU consumers - households and businesses. The strategy specifically aims at establishing a European framework to ensure clean energy access and security across five dimensions: security, solidarity and trust; integrated internal energy market; energy efficiency; climate action, decarbonizing the economy; research, innovation and competitiveness.

In this framework, energy efficiency measures are increasingly recognized as a means not only to achieve a sustainable energy supply, cut greenhouse gas emissions, improve security of supply and reduce import bills, but also to promote the EU’s competitiveness. Energy efficiency is therefore a strategic priority for the Energy Union, and the EU promotes the principle of ‘energy efficiency first’[3].

The policy agenda aims at achieving the following by 2030:

- a reduction of at least 40% in greenhouse gas emissions compared to 1990 levels;
- an increase to 32% of the share of renewable energies in energy consumption;
- an improvement of 32.5% in energy efficiency;
- the interconnection of at least 15% of the EU’s electricity systems.

As a latest development, the European Green Deal[4] sets out the ambitious EU climate policy that aims for Europe to become the first climate neutral continent by 2050.

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The European Green Deal recognizes that further decarbonizing the energy system is critical to reach climate objectives in 2030 and 2050. The production and use of energy across economic sectors account for more than 75% of the EU’s greenhouse gas emissions and energy efficiency must be prioritized. To this purpose, the EU will ensure that energy and climate plans presented by the Member States are aligned with the ambition of the EU as a whole.

As a first step of the Roadmap established by the European Green Deal, in 2020 the European Commission has proposed the first European Climate Law, which enshrines the 2050 climate neutrality objective in legislation. The Climate Law will also ensure that all EU policies contribute to the climate neutrality objective and that all sectors play their part.

The proposal also provides for the conditions to set out a trajectory leading the European Union to climate neutrality by 2050, for regular assessment of progress towards climate neutrality and the level of ambition of the trajectory identified, and mechanisms in case of insufficient progress or inconsistencies with the EU 2050 climate neutrality objective. In this context, Article 3 identifies energy efficiency as a key principle to set such trajectory to carbon neutrality.

### 3.2 Clean Energy Package

In 2019 the EU completed a comprehensive update of its energy policy framework to facilitate decarbonization of the energy sector, in accordance with the EU's Paris Agreement commitments for reducing greenhouse gas emissions.

This update – called the clean energy for all Europeans package - marked a significant step towards the implementation of the Energy Union strategy.

Based on Commission proposals published in November 2016, the Clean Energy for All Europeans Package consists of eight legislative acts, addressing themes such as energy performance in buildings, renewable energy, energy efficiency, governance of the EU Energy Europe, electricity market design. Following the political agreement by the Council and the European Parliament (between May 2018 and May 2019) and the entry into force of the different EU rules, EU countries have 1-2 years to transpose the new directives into national law.

In 2018, key pieces of legislation in the Clean Energy package entered into force.

- the revised Energy Performance of Building Directive (EU) 2018/844;

The remaining legislative acts in the Clean Energy Package, relating to electricity market design (Electricity Directive, Electricity Regulation, Risk Preparedness and ACER), were adopted in May 2019. This part of the package seeks to establish a modern design for the
EU electricity market, adapted to the new realities of the market. The aim is to create a more flexible, and market-oriented economy, which is better placed to integrate a greater share of renewables.

3.2.1 Relevant Key Provisions

**Revised Energy Performance of Building Directive**
- accelerate the rate of building renovation towards more energy efficient systems;
- strengthen the energy performance of new buildings.

**Revised Renewable Energy Directive**
- overall EU target for Renewable Energy Sources consumption by 2030 raised to 32%;
- Member States must require fuel suppliers to supply a minimum of 14% of the energy consumed in road and rail transport by 2030 as renewable energy;
- sustainability criteria for forestry feedstocks as well as GHG criteria for solid and gaseous biomass fuels.

**Revised Energy Efficiency Directive**
- overall EU target for energy efficiency in 2030 of 32.5%, with a possible upward revision in 2023;
- EU countries will have to achieve new energy savings of 0.8% each year of final energy consumption for the 2021-2030 period.

**Governance Regulation**
- requirement for Member States to draw up integrated National Energy and Climate Plans for 2021 to 2030, which will outline how to achieve the targets.

**Electricity Market Design**
- flexibility to accommodate an increasing share of renewable energy in the electricity grid;
- definition of “citizen energy communities”;
- market-based investments in the sector, while decarbonizing the EU energy system;
- new emissions limit for power plants eligible to receive subsidies.

3.2.2 Energy Communities

Along with the specific key provisions of each single Directive or Regulation included in the Clean Energy Package, it is worth – considering the specific context and aims of S-PARCS – to deepen the spreading concept of **energy communities**, that can be defined collective energy actions that foster citizens’ participation across the energy system.
According to the findings of the Joint Research Centre\(^7\), energy communities can bring a host of benefits to the energy systems. They can support system operations by providing flexibility services locally and alleviating the need for traditional network upgrades. Customers may also benefit from lower energy prices and access to private capital from renewables investments through citizen participation.

Indeed, previously there has been little support in legislative frameworks for citizens and communities wanting to invest in energy projects.

The Internal Electricity Market Directive defines a "citizen energy community" as follows:

"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".

Art. 16 lays down the specific provisions of the Directive on the subject of citizen energy communities.

The revised Renewable Energy Directive defines a "renewable energy community" as follows:

"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".

Art. 22 lays down the specific provisions of the Directive on the subject of renewable energy communities.

The concept of energy communities is not new in the energy sector, nevertheless there is now the opportunity for this communities to become a standard model on the energy markets and to spread on a larger scale and it is expected that an increased feasibility in business models will support reaching the relevant EU targets.

As explained in the Articles above, participants and entities that may join citizens and energy communities are multiple. Participants eligible to join citizen energy communities include natural persons, local authorities and micro, small, medium and large enterprises, given that participants engaged in large-scale commercial activity and for which the energy sector constitute a primary area of economic activity do not exercise any decision-making power. Renewable energy communities have a more restricted membership and only allow natural

persons, local authorities and micro, small and medium-sized enterprises whose participation does not constitute their primary economic activity. A separate provision requires Member States to ensure that participation in renewable energy communities is accessible to consumers in low-income or vulnerable households.\(^8\)

An overview on how the Energy Communities are developing also from a regulatory point of view in the S-PARCS will be provided along the following chapter. Here below, in order to provide a wider focus on the S-PARCS countries, also an insight of Portugal legislation on the theme of energy communities is presented, as a good practice for other Member States.

In Portugal, the legislative decree of October 22, 2019 established the legal regime applicable to the self-consumption of renewable energy, individual, collective or by renewable energy communities.

Renewable Energy Communities (RECs) contribute to the production and development of renewable energy consumption, in a logic of complementarity with the rest of the national electrical system, in order to ensure the fulfilment of Portugal's energy and climate targets and objectives.

- The final consumer, namely the domestic consumer, has the right to participate in a REC, maintaining its rights and obligations as final consumer.
- The RECs have the faculty of:
  - Produce, consume, store and sell renewable energy, namely through renewable electricity purchase contracts;
  - To share, within them, the renewable energy produced by the production units from which are owners, in compliance with the other requirements, without prejudice to of REC members to maintain their rights and obligations as consumers;
  - Access all appropriate energy markets, both directly and through aggregation, in a non-discriminatory way.

Until 2019, only individual self-consumption was allowed.

This legislative decree allows the self-consumers to group themselves and the same unit of energy production may have several self-consumers (collective self-consumption).

It also allows self-consumers and other participants in renewable energy projects to constitute legal entities (the Energy Communities) for the production, consumption, storage sharing and sale of renewable energy.

This legislative decree seeks to make Portugal achieve the goals set under the National Energy-Climate Plan for 2021-2030, namely to achieve a 47% share of energy from renewable sources in gross final consumption in 2030, as well as to reduce the price of electricity consumption for those who join self-consumption. It guarantees greater energy and environmental efficiency, and ensures that opportunities for energy transition (e.g. national

electricity system costs) are shared fairly and impartially, both by companies and by citizens interested in participating, without public subsidies.

Finally, right in the S-PARCS project, the feasibility for the installation of a PV plant in Spain is a tangible proof of the new opportunities opened up and supported by introduction and standardization of the energy communities in the EU policy framework, applicable also to small and medium enterprises.

3.2.3 Closed Distribution Systems

According to Art. 28 of Directive 2009/72/EC a “closed distribution system” means a system classified as a closed distribution system by national regulatory authorities or by other competent authorities, where so provided by the Member State, which distributes electricity within a geographically confined industrial, commercial or shared services site and does not supply household customers, without prejudice to incidental use by a small number of households located within the area served by the system and with employment or similar associations with the owner of the system.

Furthermore, among the additional criteria that may be fulfilled by closed distribution systems is the following “for specific technical or safety reasons, the operations or the production process of the users of the system are integrated”. This criterion captures situations where several companies jointly use a distribution system which optimises an integrated energy supply, or requires specific technical, safety or operational standards. This is particularly common in industrial sites where, for example, heat from electricity generation is used in the production process of other users of the system. Another reason could be where it is necessary for the users of the site to operate to different reliability standards than those applying on the public grid, for example in relation to frequency\(^9\).

By this definition, it is clear that closed distribution systems may be of interest in the context of industrial parks, as they are mainly dedicated to industrial customer, and this is why they have been inserted as a focus. Nevertheless, their relevance has not emerged within the S-PARCS specific solutions and Lighthouse Parks.

Depending on the specific country, the possibility of establishing closed distribution systems as well as different rules, exemptions and taxation regimes varies\(^10\) and as a result their feasibility and profitability cannot be straightforwardly assessed.

It is noted that according to the Directive (EU) 2019/944 on common rules for the internal market in electricity, citizen energy communities are also allowed to become distribution system operators either under the general regime (i.e.: the national grid) or as “closed distribution system operators”. The ownership and management of electricity networks may be of interest to community members that want to consume local energy from their own generation assets. Various exemption possibilities for the EU Member States with regard to closed distribution networks have been added in the Directive (EU) 2019/944 and thus, it is

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\(^10\) [https://www.ceer.eu/documents/104400/1f1bf5c46-a772-0190-064f-cc586c444319](https://www.ceer.eu/documents/104400/1f1bf5c46-a772-0190-064f-cc586c444319)
mentioned that specific legislation with regard to this type of energy distribution systems may vary across the Member States.
4 SPAIN

This chapter illustrates the main findings relevant for the Spanish industrial parks of Bildosola – Artea and Okamika – Gizaburuaga.

The Bildosola – Artea park is implementing the following solutions within S-PARCS:

► use of a small hydroelectric installation;
► installation of a LED lighting system.

On the other side, the Okamika – Gizaburuaga park is implementing the following solutions within S-PARCS:

► installation of a PV plant for shared self-consumption;
► use of a small hydroelectric installation.

The installation of a LED lighting system is not included in the next sections as it is typically a simple solution from a regulatory and legal perspective. For this case, the enabling aspects can be related to funding availability and/or profitability of the investment.

4.1 General Context

This paragraph introduces the pillars of Spanish legislation with respect to the theme of energy efficiency, relevant to the scopes of this work.

RD 56/2016 Eficiencia energética, en lo referente a auditorías energéticas, acreditación de proveedores de servicios y auditores energéticos y promoción de la eficiencia del suministro de energía (Energy efficiency, with regard to energy audits, accreditation of energy service providers and auditors and promotion of energy supply efficiency)\(^\text{11}\)

This transposes the 2012/27/EU Directive, a framework of measures for the promotion of energy efficiency within the Union in order to ensure the achievement of the Union’s 2020 20% headline target on energy efficiency and to pave the way for further energy efficiency improvements beyond that date.

Large companies are now obliged to periodically (every four years) perform energy audits for at least 85% of the consumption, or instead, set up Energy Management Systems (e.g. in accordance with ISO 5000). In the Basque Country, and according to data unveiled by the Basque Government, 609 companies have already performed energy audits of more than 3,500 installations. This means that more than 90% of the large companies have already fulfilled their obligations. According to inspections performed by the regional government, the average quality of the audits is high and sometimes excellent. In contrary to other Spanish regions, the Basque Government is considering the possibility to expand the obligation to perform energy audits to companies that although not being large, show a high energy consumption.

Ley 4/2019 (regional law) de Sostenibilidad Energética de la Comunidad Autónoma Vasca (Energy Sustainability of the Basque Country)\(^\text{12}\)

This law is in line with the previously mentioned RD 56/2016, obliging large companies and large consumers (>500 tonne oil equivalent) to perform energy audits with the aim of adopting energy efficiency measures and incorporation of RES installations, as well as to set up energy management systems that comply with the obligations set out by this law (internally or through an ESCO). It is also focused on setting an “exemplary role” of the public administration of the Basque Country, disposing specific energy efficiency measures for public administrations and buildings.

**National Energy and Climate Action Plan for 2021-2030**

Furthermore, following the expiring of current National Energy Efficiency Action Plan (2020) and Renewable Energy Plan (2020), the Spanish Government has recently submitted its Integrated National Energy and Climate Action Plan for 2021-2030, aimed at leading the Country to:

- 23% reduction of GHG emissions compared to 1990 level;
- 42% share of renewables in energy end-use;
- 39.5% improvement in energy efficiency;
- 74% share of renewable energy in electricity generation

as well as to long-term decarbonization in 2050 combined with the achievement of a 100% renewable electricity system.

The plan confirms the high commitment and established tradition of Spain in the exploitation of renewable energies and particularly wind energy and it defines how the emissions should be reduced and which transformations are expected across multiple sectors.

Finally, renewable and citizens energy communities are identified as a key measure to enable and boost diversity of stakeholders and existence of participatory projects as well as to enhance distributed energy generation.

### 4.2 Use of Small Hydroelectric Installation

#### 4.2.1 Background

This project foresees the installation of a small hydropower plant, using existing river dams for electricity production in the two Spanish industrial parks.

Such project is hampered by the difficulties faced when trying to obtain the license to use exploit the existing facilities, which currently are subject to an expired license of the previous owners, which used to run a mill. In this situation, any company in the park or any other entity could request the renovation of the license.

In this context, the park manager entity promoted the initiation of some exploratory tasks to scout the availability of potential grants, investors, incentives, etc. for the exploitation of the dams. In this first stage, a confidentiality agreement was signed among the involved parties.

In a wider context, similar regulatory issues may arise whenever a company or a park is willing to make use of existing facilities in the proximities of the park, as well as potentially of spaces that from some reasons are not private property or do not have a specific owner.

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4.2.2 Policy Challenge

The obtaining of the license is a binding requirement for the realization of the project. The administrative procedure requested up to the national level is quite long and complex and includes a round for claims, whereby it may be possible to have to deal with different views and opinions within the public authorities, as well as civil society, considering that the dams are of environmental and cultural interest.

The difficult administrative process foreseen by the Basque government’s environment department that must be carried out and the possible delays by appeals that may be filed by different agents of the civil society or environmental platforms act as deterrents for the realization of the energy cooperation project.

4.2.3 Solutions and Policy Recommendations

In order to unlock the licensing process, BSI has established dialogues with different public administrations and authorities. Specifically, conversations have been held with both the Basque Water Agency (URA) and the Hydroelectric Confederation of the Cantabrian Sea of the General State Administration, (connected to the Ministry for Ecological Transition and Demographic Challenge). In order not to delay the subject, it is convenient that a legal entity makes the application (e.g. company). In this process, also investors for the realization of the project are being sought.

Moreover, in order to strengthen the initiative and the request of the license, also the Basque Energy Agency (EVE) has been contacted by BSI. EVE is indeed interested in fostering the development of energy communities. If it will offer subsidies and/or incentives for this solution, a deeper involvement of companies could be achieved.

As a result of the analysis of the regulatory, legal and standardization issues encountered in S-PARCS, the following policy recommendations are outlined:

► assurance of a simplified process to obtain license of use for assets to be dedicated to the realization of renewable energy projects and to the reduction of GHG emissions, in line with existing European targets of carbon neutrality.

4.3 Installation of a Photovoltaic Plant

4.3.1 Background

This project foresees the installation of a photovoltaic (PV) plant in the Okamika – Gizaburuaga industrial park. The PV plant shall serve to provide electricity to multiple companies in the park and is for self-consumption purposes.

At the initial stage of the project, solutions of shared self-consumption were not authorized by the national legislative framework, and only the owner of a renewable energy plant was allowed to use the electricity produced. Thanks to the most recent legislative developments, shared self-consumption from PV production is now allowed in Spain for plants smaller than 100 kW, under regulatory provisions of RD 244/2019, as specified in Section 4.3.3.
In addition, the companies in the park are rather small with quite limited consumptions, and the issue of energy consumption and consequently energy management and energy efficiency are not a priority. This situation may be different in case of parks hosting large companies, which have the possibilities of implementing internal energy management procedures to minimize consumptions and related energy costs. As a result, in case of small to medium enterprise, it is common that there is low awareness about specific energy consumption data and energy demand.

In this context, not all companies have smart metering systems or any form of monitoring. Companies using the 3.0A and 3.1A electricity rates (the most common one among SMEs) may not even have hourly data made available by the electricity provided and thus access to hourly energy consumption data for more than one company becomes extremely challenging.

This lack of data prevents the possibility of assessing the feasibility of projects involving electricity supply (specifically in this case) or other types of energy.

Thus, along the project, numerous efforts were made to obtain this data, through calls, emails, interviews, awareness workshops, etc. Eventually, the information was retrieved thanks to an official request sent to the energy supplier by the park manager, asking for access to the data collected by the electricity meter reading of the companies, upon authorization of the single companies.

The feasibility studies performed thanks to the collected data highlight that the most profitable scheme is attributed to the photovoltaic installations with 100% self-consumption, although for this to be possible the installations would be very small. Indeed, due to the low price of the electricity market and the low consumption during the central hours of the day as well as in the summer months (when the energy received from the sun is higher and therefore could be used more to compensate the consumption), larger photovoltaic installations are less profitable. On the other hand, the benefits achieved through collective self-consumption are not as high as expected and it is observed that the involvement of additional companies having complementary consumption profiles. Moreover, for those scenarios in which the area available for PV installations is small, the possibility of using roofs from nearby buildings may be beneficial (the RD 244/2019 makes it possible to set the distance between the generation and consumption to less than 500 meters).

4.3.2 Policy Challenge

The policy challenge associated to such initiative is twofold:

- the legal and regulatory landscape at national level has not incentivized/obliged companies (particularly smaller ones) to monitor their energy consumption on a sufficiently detailed basis;
- electricity self-consumption was initially allowed only to the owner of the renewable energy plant and shared self-consumption was not possible unless the owner registered as an energy producer (this aspect has been largely promoted within the S-PARCS project since its beginning and it has been solved along the project).
The second point constitutes a binding legal obstacle for the realization of the project. Also, it may prevent the economic sustainability of an investment for the installation of renewable energy sources.

4.3.3 Solutions and Policy Recommendations

Along the duration of the project, solutions to address existing challenges arose.

Firstly, thanks to the effort of the park manager and its contacts, data that are normally not available to entities that were not direct consumers could be retrieved.

A possible favorable condition to prevent the issue of data availability and accessibility is to set up a centralized approach for energy management and contracting of electricity supply, for example promoted by the park manager.

Secondly, recent updates in the Spanish legislative framework have facilitated and incentivized the investments in renewable energy installations and have changed the habits of smaller companies in terms of energy data management, especially when they are willing to make use of the electricity surplus. These updates include:

- RD15/2018 Medidas Urgentes para la transición energética y protección a los consumidores (Urgent measures for the energy transition and consumer protection)
  This Royal Decree removed the “sun tax” and administrative barriers that discouraged investments in PV in the last years. Besides, it supports a consumer-led energy transition and is fully in line with the EU’s new rule which states that EU citizens have the right to generate, consume, store and sell electricity without placing punitive taxes and fees on them.

- RD 244/2019 regulating the administrative, technical and economic conditions of self-consumption of electricity
  This Royal Decree illustrates the conditions that make self-consumption viable, allowing shared self-consumption (not possible before). The Royal Decree incorporates a simplified mechanism to compensate electricity produced in excess. Before this RD came into force, the self-consumer had to legally register as energy producer. Now, the energy marketer compensates the user for electricity produced in excess through the monthly bill. This applies to installations up to 100 kW that produce electricity from RES. The economic compensation can be as much as 100% of energy consumed (monthly basis). The RD makes possible that the owner of the solar plant and the consumer are not the same entity, and in line with the case of shared self-consumption, consumers are now allowed to make use of surplus of neighbours, if the latter are not consuming their share.

Moreover, measures and investments such as energy management systems, distributed electricity generation installations, etc. are eligible for the 2019 grants of the Energy Agency of the Basque Government (EVE).

As a result of the analysis of the regulatory, legal and standardization issues encountered in S-PARCS and thanks to lessons learnt in the favorable Spanish context, the following policy recommendations – in the context of renewable energy installations, with specific reference to solar power plants - are outlined:
facilitate companies access to the hourly energy consumption data. This data is currently accessible but only after formal requests to commercialization and distribution companies. Facilitating access to data and providing tools for its analysis can be a way to increase knowledge of energy consumptions and to motivate the implementation of measures to reduce energy use and mitigate associated emissions.

**develop flexible business models to install and exploit renewable energy installations.** Business models could combine public, private or community participation on investments and exploitation. The new regulation for self-consumption in Spain (the new RD 244/2019), was a crucial step for the development of energy communities; for example, allowing shared self-consumption between different consumers and producers, up to a distance of 500 meters.

The policy recommendations are to be intended up to the EU level, and at national level for those countries in which similar provisions are not in place or turn as not effective.
5 ITALY

This chapter illustrates the main findings relevant for the Italian industrial park of Cuioidepur, which is implementing a Combined Heat and Power (CHP) plant exploiting anaerobic co-digestion of vegetable tannery within S-PARCS.

Moreover, a quick overview on the theme of sustainable mobility is presented, as the applicability of this solution has been widely discussed in the context of S-PARCS. In this context, there is not specific reference to any legal or regulatory issues – as they did not arise in S-PARCS – but only a general presentation of the specific status of sustainable mobility in Ponte a Egola and main regulatory framework.

5.1 General Context

Italian legislation is aligned with the main EU requirements with respect to energy efficiency and related topics. It is worth mentioning that as for current status, the Efficiency in Buildings Directive, as updated under the Clean Energy Package has been transposed in D. Lgs. 48/2020, while the revised Energy Efficiency Directive has been transposed in D. Lgs. 73/2020. The other revisions are still undergoing still have to be implemented in the Italian legislative framework.

As the other Member States, Italy has recently submitted its National Energy and Climate Action Plan14.

The plan lays a central emphasis on citizens and businesses (in particular SMEs), in such a way that they become key players and beneficiaries of the energy transition and in order to do so it promotes self-consumption and renewable energy communities as new players. Practical agenda in this sense foresees the streamlining of authorisations for self-consumers and renewable energy communities as a regulatory step and the planning of the development of energy communities.

Also, it encourages energy efficiency across all sectors and it promotes the further development of renewables, by exceeding, if possible, the 30% target set.

Specific regulatory instruments facilitating energy cooperation and energy efficiency in industrial parks or any other industrial symbiosis in Italy can be found in the following references or in other dedicated publications.

UNA STRATEGIA ENERGETICA PER L’ITALIA – 2° Rapporto, Le vie per la decarbonizzazione e lo sviluppo economico e industriale dell’Italia, FEDERMANAGER & AIEE (An Energy Strategy for Italy – 2° Report, Pathways towards decarbonization and economic and industrial developement of Italy)15

This publication consists in an analysis of the strength and weaknesses of the national energy system, also in light of the EU context and requirements.

PIANO NAZIONALE INTEGRATO PER L’ENERGIA E IL CLIMA 2030, 2019 (National Energy and Climate Plan 2030)\textsuperscript{16}

This plan, published by the Italian Ministry for Economic Development, aims at promoting energy policies that facilitate transition towards environmental, social and economic sustainability in Italy.

It identifies five areas of intervention to guide policies related to energy and climate issues in Italy. The five areas are: decarbonization, energy efficiency and security of supply, internal energy market, research and innovation, competitiveness.

Despite the efforts, the energy cooperation topic, until now, is not clearly defined in the regulatory framework and energy cooperation in industry represents a strategy that needs to be further implemented in order to reach the EU environmental objectives. Even though no significant regulatory conflicts emerged during the S-PARCS project, this situation leads to an increased uncertainty in the field of energy cooperation due to the changeable legal rules. In this developing framework, the S-PARCS approach could be the key to promote dedicated regulations and incentives.

Existing criticalities appear at national level, which needs to be improved in order to support energy cooperation within industrial parks through regulatory acts or tax reliefs.

In addition to the solution-specific policy recommendation given in the next sections, according to the experience grown in Ponte a Egola and during the S-PARCS project, it is recommended to overcome and simplify existing legal, regulatory and standardization issues by training energy cooperation advisors able to support the companies and industrial parks in the identification and adoption of suitable energy cooperation solutions, and, at the same time, support the politicians in the adoption of the proper regulatory and legislative instruments.

5.2 Combined Heat and Power plant exploiting anaerobic co-digestion of vegetable tannery sludge

5.2.1 Background

This solution foresees the development of a Combined Heat and Power (CHP) plant in Cuiodepur. The plant is designed to use biogas (and further biomethane) yielded by the anaerobic co-digestion of vegetable tannery sludge to produce heat and electricity for companies within the industrial park and for the wastewater treatment plant managed by Cuoiodapur.

The CHP plant is planned to be connected to already existing infrastructures – in terms of industrial area heating pipelines – to transport heat from Cuoiodapur to tanneries. Such infrastructures are already connected to a CHP facility placed in the middle of the industrial park, in the sub-area called Romaiano.

The facility is not running nowadays, but the owner has been involved in the project as key stakeholder, together with the technology providers. The tanneries involved in the project are

\textsuperscript{16} \url{https://www.mise.gov.it/index.php/it/energia/energia-e-clima-2030}
the ones in the Romaiano area, since they are the most energy-intensive companies in the industrial area and they can benefit from the presence of already-built industrial area heating pipelines. The electricity produced will be used by Cuioidepur and, if exceeding, put into the national grid. This energy opportunity requires high investment costs.

The figures below present the scheme of the actual configuration (Figure 5-1) and the scheme of the foreseen configuration for this solution (Figure 5-2) that shows the flows exchanged and the energy potential in the foreseen configuration, also including the potential installation of additional small CHP plants to help feeding the energy need of the tanneries, supplied by natural gas.

Figure 5-1: Actual configuration

Figure 5-2: Foreseen configuration
Depending on the actual configuration that will be implemented, it may be possible that an amount of energy surplus energy (electricity and/or heat), which cannot be exploit for self-consumption, will be generated.

Once the system is implemented, the stakeholders involved may have the interest to sell the energy surplus in order to maximize the profits for the investment and to establish a convenient trade.

5.2.2 Policy Challenge

It is clear that this solution has a significant degree of complexity, especially considering the number of actors involved and the high investment costs expected. The policy challenges met for the development of the solution affect different aspects of the solution.

First of all, the selling of self-produced energy is subject to regulatory and economic constraints.

As far as the potential surplus of thermal energy, it appears that there are not existing barriers to sell it to the district heating network already existing in Ponte a Egola – privately owned. The manager of the network is then entitled to sell the thermal energy in its grid to the tanneries or to other end-users connected to the grid.

In the case of Ponte a Egola, the existing bottlenecks to trade thermal energy are related to the selection of proper tariffs, which guarantee profit for the district heating network manager on one side which guarantee a decrease in water treatment costs borne by the tanneries due to a reduction of energy costs for the waste water treatment plant thanks to the increased efficiency of the CHP plant.

Conversely, the selling of electricity surplus directly to the tanneries from the CHP plant where a surplus is potentially generated it is not allowed in the current regulatory framework, which foresees the self-consumption only on behalf of the owner of the plant. This situation would also be complicated by the fact that the CHP plants owned by Cuioidepur are – in turn – indirectly owned by the tanneries that have shares of Cuioidepur itself and that would be the end-users of the electricity surplus.

With reference to the idea of using activated sludges from Cuioidepur and solid wastes and solid wastes (fleshing, etc.) from tanneries for biogas production, the main barrier is related to the concept of “End of Waste”, regulated both at national and European level. Indeed, wastes and sludges to be sent to treatment facilities (that remove waste and moreover produces energy) in theory need to follow the rules of waste management and tracing of wastes that could hinder the adoption and operation of this energy solution.

Finally, the research of economic incentives to carry out the investment, the uncertainty and gaps of the current legislative framework in the field of energy cooperation and the related bureaucratic obstacles act as barriers for the realization of the project.

5.2.3 Solutions and Policy Recommendations

In October 2019, the consortium of the tanneries of Ponte a Egola signed an agreement with the Tuscany Regional Authority to boost circular economy and to support and enhance its energy cooperation strategy.
This direct agreement with local/regional entities is an important tool and it is useful to tackle bureaucracy and fasten the adoption of energy cooperation actions, facilitating connections between industrial area and regional government and/or local authorities. Moreover, it could speed up the process and could be a tool to tackle two main barriers: the uncertainty and fragmentation of legislation and the inherent slowness linked to bureaucratic obstacles. The agreement may turn of support also when the energy cooperation action will face with NIMBY protests.

The trade for thermal energy is regulated under D. Lgs. 102/2014 - which transposes the European Energy Efficiency Directive 2012/27/EC - constituting the main the main regulatory framework for district heating networks in Italy. Also, the possibility of implementing this scheme is confirmed by the above-mentioned agreement with the Regional Authority.

With specific reference to the possibility of selling the electricity produced by the CHP plant to the tanneries, an official request to the national authority in charge\(^\text{17}\) was made at the initial stages of the project, also the possibility of involving an ESCO was taken into consideration.

Eventually, the issue is now solved and it is foreseen that the electricity surplus, which cannot be distributed among private actors according to current legislation in Italy for energy generation and self-consumption, is sold to the national grid according to the tariff schemes foreseen at national level for similar plants (in terms of type and size).

As for the barriers hampering the use of wastes and sludges for biogas production, mainly arising from end-of-waste legislation, the work to find a solution is still in progress in Ponte a Egola area.

However, it is acknowledged that the sludges, generated by Cuoiodepur’s waste water treatment plant, and exploited within the anaerobic digestor, should not face any major obstacle related to waste legislation considering that they remain in the same installation and under the same owner. This situation allows to avoid the waste status and procedures related to waste management.

Conversely, for the case of solid wastes from the tannery, which have to be transported to the anaerobic digestor plant and which have to face a change of owner, agreements will have to be developed.

According to the latest legislative developments on the matter on end-of-waste in Italy (L. 128, 2\(^\text{nd}\) November 2019), end-of-waste authorizations can be released at national level, under the authority of the Ministry of the Environment or at local level, by the local authorities. When authorizations are released at regional level, they apply on a case-by-case basis and are thus specific for the entity posing the request for the authorization.

Recently, guidelines to promote and facilitate a correct implementation of the end-of-waste legislation in Italy have been published\(^\text{18}\).

\(^{17}\) [https://www.gse.it/](https://www.gse.it/)
Also, in this case, the direct agreement between Cuoidepur and Tuscany Region is likely to facilitate and accelerate the concession of end-of-waste for the flesh wastes generated by the tanneries.

Potential end-of-waste applications for flesh wastes generated by tanneries have also been studied by Confidustria, as potential contributors to enhancement of circular economy in Italy\textsuperscript{19}. Also, ARPAT (national agency for environmental protection) has published an analysis on waste generation in tanneries.

Such supporting material and the existence of previous studies on the subject may also support the obtaining of the end-of-waste authorization.

As a result of the analysis of the regulatory, legal and standardization issues encountered in S-PARCS and thanks to lessons learnt for the development of this solution, the following policy recommendations are outlined:

\begin{itemize}
  \item facilitate and promote formal agreements that support transition to circular economy and energy cooperation between multiple actors (e.g.: public authorities, industrial organizations, etc.), as they act as enabler and facilitator of concrete interventions;
  \item develop and allow flexible business models to exploit energy produced by high efficiency systems;
  \item adopt smooth and clear administrative processes to obtain end of waste authorizations.
\end{itemize}

5.3 Sustainable Mobility

During the S-PARCS project, the opportunity to promote solutions of sustainable mobility has been investigated in the context of Ponte a Egola.

The park is located in a sub-urban area, in the proximity of small urban settlements where most of the workers of its companies live. Along with the mobility of people actually working for the companies of the Park, the industrial area also mobilizes a certain amount of road transport (trucks) to transport freights, wastes and supplies.

While it is recognized that there are not suitable conditions to envision a sustainable mobility for freights, wastes and supplies as for the current situation and management of the park as well as considering the transport network of the area, there has been initial discussion to encourage sustainable mobility for the working staff.

Nowadays, more than 20 Enel-x charging stations for electric cars are installed in the municipalities area near by the park. in addition, there already some bike paths in the area nearby the park, both in place or under construction.

In order to promote the use of sustainable mobility for the staff of Ponte a Egola, further charging stations could be installed in the park to promote the electric cars and the bike paths could be connected to the industrial area of the park also and the train stations to

\textsuperscript{19}
support the mobility of the workers who live in the close by urban area or the ones who could reach the work by train.

Nevertheless, the companies themselves do not have deep interest in pushing this solution to the attention of the relevant authorities, as – considering their small size – the companies do not own any vehicles fleet and thus they do not see any tangible and direct benefit for the implementation and increase of sustainable mobility.

Here below, a brief overview of regulatory instruments relevant for the issue of sustainable mobility is presented.

The National Energy and Climate Action Plan aims at promoting the use of alternative fuels and, in particular electricity for the for private mobility and the mobility of goods as a strategy to meet the national targets.

Among the specific actions to pursue this objective, a series of regulatory and planning instruments are foreseen, such as Plans for a Sustainable Urban Mobility (Piani Urbani per la Mobilità Sostenibile) and a National Infrastructural Plan for the Recharge of Electric Vehicles (Piano Nazionale Infrastrutturale per la Ricarica dei veicoli alimentati a energia Elettrica).

The main applicable legislation consists of:

► D. Lgs. 16 December 2016, n. 257, as transposition of Directive 2014/94/EU on the deployment of alternative fuels infrastructure;
► Decree 3 August 2017 of the Ministry of Infrastructures and Transportation, with specific provisions for charging stations;
► Decree 4 August 2017 of the Ministry of Infrastructures and Transportation on the definition of Urban Strategies for sustainable mobility.

In order to provide citizen and investors with more practical information for the installation of charging points for electrical vehicles, there are many guideline documents available at national and local scale. It emerges that there are several requirements to be met for the installation of charging points, for example:

► communication of the location of the station to the national authority (Catasto Nazionale) in order to properly register the land used for the station and related parking(s);
► registration of the charging station in the National Record of Infrastructures (Sistema Informativo Nazionale Federato delle Infrastrutture);
► mandatory registration of beginning of works under certain conditions (SCIA - Segnalazione Certificata di Inizio Attività);
► compliance with national authority of firefighters guidelines to to minimize risk of fire and explosion during the installation procedure;
► compliance with regulations and standards applicable to electrical systems;
► fiscal regime applicable to new parking lots.

Finally, it is worth noticing that as an effect of the COVID pandemic, mobility laws are rapidly evolving and the financial support to electrical and sustainable mobility is expected to grow.
for example for the case of private end-users. A good response to these type of incentives by
the population may also act as a driver for the improvement of electrical mobility solutions\textsuperscript{20}.

6 AUSTRIA

This chapter illustrates the main findings relevant for the Austrian industrial parks of Chemiepark Linz and Ennshafen.

First of all, both the parks are analyzing their possibilities to implement (cooperative) solutions that allow waste heat recovery. Moreover, for the case of Ennshafen, the following solutions are being implemented or analyzed within S-PARCS:

► shore side electricity;
► installation of PV plants (feasibility study level);
► E-Mobility charging stations (pre-feasibility study level).

6.1 General Context

As for other European countries, Austria has energy efficiency, renewable energy and sustainability goals that are supported by various institutions, regulatory framework, roadmaps and subsidy schemes. The latter are often also suitable for joint energy projects, e.g. for PV\textsuperscript{21}. There are also diverse public and private consulting services for SMEs and large enterprises that aim to increase energy efficiency etc. (e.g. Energiesparverband \textsuperscript{22}, Business Upper Austria \textsuperscript{23}, e-control \textsuperscript{24}, Cleantech-Cluster \textsuperscript{25}). In this framework, Energy Communities in different forms are expected to play an important role and they are also specifically mentioned in the government program for 2020-2024\textsuperscript{26}.

Currently the new “Erneuerbaren-Ausbau-Gesetz” (EAG) (eng: Renewable Development Act) is under development and shall come into force in 2021. The EAG will introduce the Renewable Energy Communities (Erneuerbare-Energie-Gemeinschaften) on the national level. Other laws are also currently being amended, supplemented and adapted in accordance with the Directives of the EU. Citizen energy communities (Bürgerenergiegemeinschaften) will be included in the EIWO 2010 (eng: Federal Act Providing New Rules for the Organisation of the Electricity Sector – Electricity Act 2010) for instance. In the sense of Article 2/15 RED II enterprises could also operate as ‘jointly acting renewables self-consumers’. At the national level, similar constructs already exist in this respect (§ 16a EIWO 2010), however they may be adjusted.

At smaller geographical scale, it is worth mentioning that most federal states included “energy” as a topic in their spatial planning regulations.

In general terms, as a good practice, the institutions mentioned above, and others of course as well, aim at networking, knowledge exchange, legal/regulatory/technical advice and dissemination of successful projects. Therefore, they can support companies and other

\textsuperscript{21} http://pv-gemeinschaft.at/umsetzung/
\textsuperscript{22} https://www.energiesparverband.at/en
\textsuperscript{23} https://www.biz-up.at/
\textsuperscript{24} https://www.e-control.at/en/industrie
\textsuperscript{25} https://www.cleantech-cluster.at/cleantech-cluster/unsere-leistungen-ihre-vorteile-als-partner/
\textsuperscript{26} Die neue Volkspartei und Die Grünen - Die Grüne Alternative, Regierungsprogramm Österreich 2020-2024, 2020
partners in overcoming potential barriers to improve energy performance. Nevertheless, some legal/regulatory barriers cannot be tackled without law/regulatory amendments and, for example, joint energy projects for households but also for industrial players might face an easier implementation if the EAG will be in force in 2021. However, as energy cooperation is highly individual in many cases, the new law might not influence all projects but only a few.

Remaining barriers may be either caused by missing regulatory frameworks, which causes a law-free bubble for companies, that would be technically, economically and socially capable of cooperation (i.e. in situations where there are no technical problems but economic ones like metering and billing energy) or due to obsolete frameworks, which hinder (or even forbid) energy cooperation where it would be possible and efficient. Especially the latter point was identified as crucial in the Austrian project Open Heat Grid which dealt with market, policy, regulatory and technical barriers for the different participating technologies of hybrid networks27.

6.2 Waste Heat Recovery

6.2.1 Background

At Chemiepark Linz large amounts of waste heat are produced that cannot be utilized internally completely. Mainly there are offgas streams that are available during the full year. In addition, there is surplus steam generated by exothermal chemical processes especially in the summer months and there is a cooling water system connecting various waste heat sources with the Danube river. For this solution, the idea is to feed this heat at least partially directly via heat exchangers and/or indirectly via heat pumps into the existing DHN of the city.

As an alternative, the internal use of waste heat for cold generation is evaluated; currently an electricity driven refrigeration cycle, including separation of products via condensation. The idea is to replace this system by waste heat driven sorption chillers, as this could lead to reduced electricity consumption and lower heat emissions.

Moreover, also in Ennshafen park a solution implying selling of heat is foreseen where the heat of waste water could be utilized via a heat pump to supply the building heating system of its neighboring company.

6.2.2 Policy Challenge

In case of internal use of waste heat within the same company that produces the heat, no legal issues are expected.


Moreover, also for the case of direct sell of heat to an end-user, no legal issues are expected.

Note: The following paragraphs represent a general outline of the Austrian waste heat feed-in situation in Austria. More information and legal analyses can be found in Holzleitner et al. 28, Holzleitner 29, within the project OpenHeatGrid 28, and S-PARCS Deliverable 1.2 / Section 4.3.3 [1].

The policy challenge arises when giving the heat externally, as in Austria there is no dedicated law for external waste heat utilization and a contractual framework is not established, neither towards a single private customer or towards the DH network operator. Thus, customer prices, feed-in obligations etc. (no feed-in or transit claim to the DH network for third parties) are not addressed homogeneously.

Metering, energy prices and load profiles have to be addressed. Additionally, there are no norms that regulate how heat as an energy carrier is defined. There are no regulations about pressure and temperature levels, heat amounts are usually calculated via temperature differences. In case of direct heat exchange between companies there are no regulations, e.g. as mentioned before there is no legal claim for building heat pipelines over private ground. The legal status of the participating companies is unclear as well as the declaration of waste heat as green or conventional energy, depending on the initial energy source, which has impact on the emission trading market.

Thus, compared to the Electricity Market Directive or the Gas Directive for the energy sources of electricity or gas, a private contract is the basis for heat supply. This reflects due to the absence of relevant regulations.

Despite the presence of these limitations, conventional district heating remains the classic business model of the “cross-border” exchange of heat.

As a matter of fact, for an industry with waste heat potentials, the construction of its own DH network is not lucrative because it is common that the local DH supplier owns significant customer access. As such, the DH network operator is like a price-regulated monopoly to the local DH end-user.

Thus, the DH network operator is to be regarded as a dominant company with regard to the integration of heat sources, since the potential heat generator that wants to feed-in usually has no other possibility to directly sell his heat.

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Moreover, the network operator is only obliged to open its network to other market participants, if that is factually possible. The contracting parties are free to make provisions regarding backup capacities, load and generation profiles, entry points, temperatures, etc., but they have no guarantees of a successful agreement with the network operator that has a legitimate interest in ensuring the supply of heat to his customers or to choose his own third party.

Under certain circumstances, a feed-in claim can be derived for antitrust reasons (if there is a particular environmental advantage and no or minor burden for the line operator). One argument against feed-in might be the “technical impossibility”, however, as this usually depends only on the technical and financial effort and is highly individual from case to case, there is no legal definition of “technical impossibility” given.

Depending on the overall contract design (i.e. defining the partner who bears the costs of the components of the waste heat feed-in as well as the definition of feed-in profiles, backup capacities, etc.) between the industry and the DH network operator, the use of waste heat must prove to be economically more favourable for the DH network operator than using its own generation units.

Thus, there is the need to negotiate about different, interrelated parameters. Negotiating the determination of one parameter automatically influences the others. This general barrier to energy cooperation can lead to high complexity, potentially resulting in frustration and perplexity of negotiators, as has been outlined in [1] and is well known in the context of industrial symbiosis (cf. Gibbs31, Domenech et al.32)

6.2.3 Solutions and Policy Recommendations

In this framework, the issue of feed in into DHN can only be resolved by negotiations between the DHN operator and the Chemiepark Linz companies. The best alternative is usually to talk and discuss terms with the network operator and try to reach a private agreement for selling the waste heat to it.

The DH network operator could also be obliged to take heat from third party heat generators for ecological reasons. However, this is not justifiable from a legal perspective, because the network operator would be limited in his freedom of access and freedom of occupation without sufficient substantive justification.

For this purpose, the Commission's proposal for the recast of the Renewable Energy Directive would have provided specific regulations. In the Commission's original proposal DH networks operators would have been obliged to feed-in third-party heat from renewable sources and waste heat into their network. However, in contrast to the Commission's original proposal, the European Parliament has now changed the conditions. Feed-in now only has to happen if it is technically and economically feasible for the district heating network.

Thus, the analysis of the provisions for district heating and cooling in the current recast of the Renewable Energy Directive raises doubts that third party access to the network is really a suitable instrument to stimulate the feeding of waste heat into district heating systems or that it actually strengthens competition in the field of district heating production. Due to the special features of the networks, especially due to the local limitations of the district heating network (in contrast to the interconnected networks of electricity and gas), it is questionable whether an obligation of the district heating network operator to accept and pay for a feed-in is technically possible in many cases at all. Therefore, it can be assumed that there is not a significant change in the district heating networks legislation due to the multitude of reasons for refusing to connect to the district heating network.

As a result of the analysis of the regulatory, legal and standardization issues encountered in S-PARCS and thanks to lessons learnt for the development of this solution, the following policy recommendations are outlined:

► facilitate and sustain internal use of waste heat, e.g.: through economic incentives;
► improve and generate options for waste heat use in order to reduce primary energy demand thanks to the implementation of energy cascades;
► improve legal basis for waste heat feed-in into DH network, as waste heat producers have to negotiate with DH network operators and no right to privileged feed-in into the network;
► provide that district heating network operators, in the event of refusal of connection, must inform the third party and the competent authority of the reasons and point out measures that the third party can take to obtain access.

6.3 Shore Side Electricity

6.3.1 Background

Ennshafen is a TEN-T Core Node port on the Rhine-Danube TEN-T Corridor and facing the European regulations for fulfilling future quality standards regarding infrastructure.

Based on European regulations (TEN-T and directive on the deployment of alternative fuels infrastructure) the need for shore-side electricity for inland waterway vessels and seagoing ships in maritime and inland ports has to be assessed in the national policy frameworks of Member States. Such shore-side electricity supply shall be installed as a priority in ports of the TEN-T Core Network and in other ports by 31.12.2025, unless there is no demand and the costs are disproportionate to the benefits, including environmental benefits.

The supply of shore side electricity is thus seen as an important measure to reduce the local environmental impact of anchoring ships at ports.

The Austrian national framework (based on the Austrian government program) contains the demand for implementation of shore-side electricity in all relevant Austrian ports and berths. Therefore, feasibilities have been assessed and technical engineering work is ongoing to prepare solutions in time.
6.3.2  Policy Challenge

Despite recognizing that relevant barriers do not exist for the implementation of this solution from a legal and regulatory perspective, the following legal issues are relevant in this context:

► some kind of “provider license” for ports for greater amounts of electricity (as part of the infrastructure service) must be fixed in detail and
► the taxation of electricity is under investigation on European level, as today taxation of diesel fuel for usage in vessels has got international benefits; thus, this may have an influence on the acceptance of alternative fuels by the market partners.

The first issue is relevant at national level, while the second one applies at EU level.

Along with these specific issues, it should be taken into account that upfront costs to provide shore side electricity for the ports are very high and depending on the location and season of the year, the load factor of such shore side electricity supplies is quite low, consequently the implementation of such systems is a heavy economic burden for the port operators.

Furthermore, market-distortion can appear if the legislation concerning shore side electricity and the mandatory utilization by ships differ for neighboring countries and regions, as ship operators evade higher costs by anchoring at ports with less strict regulations and therefore less cost, or by exploiting different types of fuels (e.g.: tax-exempt) where this is still possible.

6.3.3  Solutions and Policy Recommendations

As far as the practical legal issues mentioned in the previous paragraph are concerned, the following straightforward solutions have been identified:

► as for the issue of “provider license”, the Austrian ministry is aware of this topic and has stated, that it will be clarified in writing (“enactment”);
► as for the issue of electricity taxation, the topic is part of the actual revision process of the directive on the deployment of alternative fuels infrastructure, which is just in preparation on EU level.

Furthermore, the following policy recommendations are outlined to prevent potential market distortions arising from the possibility that ship operators have to evade higher expenses by choosing different ports:

► tax equality for all types of energy carriers shall be ensured at the European level.

6.4  Installation of Photovoltaic Plants

6.4.1  Background

The installations of photovoltaic plants is evaluated according to two different schemes, which lead to different legal implications.

A first solution is to install a shared PV plant on the roofs of multiple companies is being evaluated within S-PARCS. In this scenario, it would be possible to jointly purchase engineering and hardware equipment for large PV installations. Through the purchase pool CAPEX are lower and it is more probable that economic criteria of the companies are met,
leading to increased numbers of PV installations. An alternative and/or additional idea may be the jointly organised installation of PV power plants on the roofs of a number of exemplary companies at the Ennshafen industrial compound that is financed by employees of companies’ resident at the Ennshafen. In addition, financiers of the PV power plant could be residents of the local communities Enns and Ennsdorf, the community area on which the industrial and business park Ennshafen is located or other partners.

6.4.2 Additionally, the feasibility of installing a PV plant on the rooftop of the Logistikzentrum building at Ennshafen, where several companies have their offices. The produced renewable energy could be shared among the tenants. Policy Challenge

With regards to legal requirements concerning the physical installation of PV power plants on the roofs of multiple companies, legal procedures set out by the corresponding state laws must be adhered. However, they do not pose any significant barriers with the exception of minor time delays. The relevant laws are summarized for each state in Table 6-1:

Table 6-1: State laws installation PV power plants

<table>
<thead>
<tr>
<th>Corresponding Law</th>
<th>Upper Austria</th>
<th>Lower Austria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature Protection Act (“Naturschutzgesetz”)</td>
<td>- Permit for free-standing PPP (Photovoltaic Power Plant) &gt; 500 m² on grassland required</td>
<td>- Permit for free-standing PPP on land outside city / town centers required</td>
</tr>
<tr>
<td></td>
<td>- Notification for free-standing PPP of 2 to 500 m² required</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Particular terms PPP in the close vicinity of lakes and rivers</td>
<td></td>
</tr>
<tr>
<td>Building Code (“Bauordnung”)</td>
<td>- Notification for free-standing PPP with &gt; 2 m of height or building-integrated PPP with &gt; 1.5 of height above the building surface</td>
<td>- Notification for free-standing PPP &gt; 50 kW required</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Notification for PPP in protected areas and protected old town areas required</td>
</tr>
<tr>
<td>Land Use Regulation Act (“Raumordnungsgesetz”)</td>
<td>- PPP &gt; 5 kW cannot be erected on designated building land with the exception of commercial building land, industrial building land and special areas of the building land for Seveso-III companies</td>
<td>- Free-standing PPP &gt; 50 kW must only be erected on land designated for grassland photovoltaic power plants (“Grünland-Photovoltaikanlagen”)</td>
</tr>
<tr>
<td></td>
<td>- Erecting free-standing PPP on grasslands is only allowed in the case of a corresponding land use designation with the exception of PPP installed for agricultural self-consumption</td>
<td></td>
</tr>
<tr>
<td>Commercial Law (“Gewerbeordnung 1994”)</td>
<td>- Grid-connected PPP that generate self-consumption may require a commercial permit in exceptional cases</td>
<td>- Grid-connected PPP that generate self-consumption may require a commercial permit in exceptional cases</td>
</tr>
</tbody>
</table>


**Corresponding Law** | **Upper Austria** | **Lower Austria**
--- | --- | ---
Electricity Law ("Elektrizitätswirtschafts- und organisatonsgesetz") | - PPP over 200 kW require a permit | - PPP over 200 kW require a permit
Water Privilege Act ("Wasserreichtsgesetz") | - n. a. | - Permit required if the PPP is erected in a flood drainage zone

Other legal requirements might need to be fulfilled if aviation or monument conservation are affected.

Legal provisions for company constructs for participants of a common PV power plant as well as tax laws are based on national law.

In this framework, a number of side issues and topics arise.

First of all, the discrepancy of the useful lifetime and the assumed lifetime for depreciation purposes. Despite the 25- to 30-year-warranty provided by a majority of PV panel producers the useful lifetime of PV modules for accounting purposes is 20 years even though generated income from PPP are still subject to tax after 20 years.

The income derived from the feed-in of a PV power plant in Austria is considered a source of commercial income and thus subject to the corresponding tax. The investment costs incurred by the installation of a PPP are fully tax deductible.\(^{35}\)

Currently the self-consumed electricity by PPPs is completely exempt from the electricity tax and is not payable by the operator of a PPP for electricity fed into the grid which is why the electricity tax has no effect on the feasibility of a PPP.\(^{36}\)

As far as funding schemes are concerned, it is noticed that it is necessary to avoid fulfilling all of the following prerequisites, resulting in the necessity of a banking license:

- receipt of funding;
- entitlement for repayment;
- commercial implication;
- administrative engagement with leeway in decision-making.

It is worth noticing that in this specific case, the concept of energy communities as intended within the Clean Energy Package may likely not support the realization of the project due to the considerable size of the companies involved. Indeed, renewable energy communities can be effectively controlled by micro, small, and medium-sized enterprises that are ‘located in the proximity’ of the renewable energy project; while citizen energy communities exclude medium-sized and large enterprises from being able to exercise effective control, meaning by control – in accordance to the Electricity Market Directive – “the possibility of exercising decisive influence on an undertaking, in particular by: (a) ownership or the right to use all or part of the assets of an undertaking; (b) rights or contracts which confer decisive influence on

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\(^{35}\) Bundesministerium für Finanzen, ‘Steuerliche Beurteilung von Photovoltaikanlagen – Photovoltaikerlass’, Vienna, Austria, 2014

\(^{36}\) Austrian legal code, ‘Bundesrecht konsolidiert: Gesamte Rechtsvorschrift für Elektrizitätsgabegesetz Fassung vom 17.04.2020’, Vienna, 2020
the composition, voting or decisions of the organs of an undertaking”. This provision is possibly related to the concern that actual participation of large corporate players in energy communities may create imbalance in value sharing and actual impact on the decision-making power within the energy community itself.

Moreover, for the installation of a PV plant on the rooftop of the Logistikzentrum building at Ennshafen, there is no legal issue to this cooperation project owning to the existence of an Austrian act promoting shared generation facilities for building owners and tenants, as far as they are located in the very same building.

Finally, as an additional issue that may arise when an entity is keen on installing an electricity generation plant and sharing the energy produced there is the regulatory framework to be applied to direct lines, i.e.: in simple terms, electricity lines that do not exploit the infrastructure of the existing national grid. Indeed, this option is heavily restricted as the lines are not principally allowed to cross public properties or land from third parties, furthermore, it must be ensured that a clear separation between this dual supply system and the public electricity grid is given (no galvanic connection). Consequently, hardware and switching systems have to be installed and negotiated with the local grid operator that fulfil those requirements while ensuring continuous electricity supply of the energy consumer.

### 6.4.3 Solutions and Policy Recommendations

The legal constructs to enable a certain number of legal or personal entities the operation of a common PV power plant – as the ones designed on the companies rooftops - are plentiful. Which company construct is most reasonable depends on the contractual details and objective (and vice-versa) and should be evaluated beforehand, preferably with the aid of legal counsel.

Examples of legal constructs, as also presented in D5.3 [4], include:

- **Non-trading partnership:** In order to establish a non-trading partnership a number of people sign a partnership contract, defining obligations and rights of each individual. The advantage of this partnership is that it does not have to be registered in the commercial register up to a certain annual turnover. Each individual is, however, personally unlimitedly liable and all partners have to be involved in all legal matters concerning the partnership which is why this type of partnership is hardly applied for common PV power plant projects.

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General Partnership ("Offene Gesellschaft"): the general partnership is one of a number of people that form a legal entity that has to be registered in the commercial register. The thus founded legal entity can be the owner of a PV power plant. All partners are, however, personally und unlimitedly liable41;

Private limited partnership ("Kommanditgesellschaft"): the private limited partnership is one of a number of people that form a legal entity that has to be registered in the commercial register. The private limited partnership is a personal company where the liability of limited partners is limited to the guaranteed amount but the liability of the general partners is unlimited. Due to the unlimited liability of the general partners this legal construct is hardly applied for common PV power plant projects41;

Limited liability company: the limited liability company (LLC) is a legal entity where none of the associates is liable with their private property. The LLC is registered in the commercial register and requires a starting equity capital of 35,000 €. The LLC requires one or several directors. All associates have a claim to the company’s profits relative to their share of the starting equity capital41;

Limited partnership with a limited liability company as general partner ("GmbH & Co KG"): in the case of the GmbH & Co KG the “personally” liable associate (i.e. general partner) is the LLC, resulting in the LLC being liable to its share of the starting equity capital. This company construct combines the advantages of the private limited partnerships and the LLC but requires more effort with respect to establishing the contractual basis which is why this construct is only reasonable in the case of PV power plants larger than 100 kWp 41;

(Registered) Association ("Verein"): an association is a legal construct that – under Austrian law – is not allowed to be profit-oriented. A potential financial profit must not be transferred to members of the association or third parties and must only be used for the explicit purpose of the association. For these reasons an association that is established for the purpose of operating a joint PV power plant must be set up with detailed scrutiny and conceptualization of fiscal aspects 41;

Cooperative: a cooperative is a legal entity that is founded through a cooperative contract and through a registration in the commercial register. The purpose of a cooperative is to support the earnings and the economy of their members. Cooperatives can be founded with limited or unlimited liability. In the case of an unlimited liability a cooperative’s member is liable with the full amount of their personal property. In the case of a limited liability the members are liable to an amount equaling twice the company share. In both cases (limited and unlimited) the cooperative’s member is only held liable in the case of liquidation or bankruptcy of the cooperative42.

Furthermore, one concept that has proven to avoid fulfilling the above-mentioned prerequisites for fund-raising schemes and therefore the necessity of a banking license is the sale-and-lease-back model. In this model a person purchases a certain share of a PV power

42 S. Woess-Gallasch et al., Innovatives Finanzierungs- und Geschäftsmodell für PV Gemeinschaftsanlagen auf Mehrparteienhäusern zur Vor-Ort Nutzung, BMVIT, 2017
plant and leases it back to the company that pays a certain annual “rent” to the seller in return. In any case it is recommended to consult legal counsel when planning the installation and operation of a shared PV power plant and it is complicated to devise a legally sound construct for a common PV power plant which makes it especially difficult for laymen to devise such a concept.

In case of crowd-funded PV installations, the integration of an external institution experienced in such projects could be considered, in order to avoid legal complications.

Finally, for the case of the installation of the PV plant on the on the rooftop of the Logistikzentrum building at Ennshafen – as already mentioned – legal feasibility is guaranteed by the Austrian act promoting shared generation facilities for building owners and tenants, as far as they are located in the very same building.

As a result of the analysis of the regulatory, legal and standardization issues encountered in S-PARCS and thanks to lessons learnt for the development of this solution, the following policy recommendations are outlined:

- improve possibilities for electricity sharing for large enterprises, without forcing them to register as official electricity suppliers;
- diminish existing restrictions on direct lines, especially facilitating permissions to cross public properties or land from third parties.

6.5 Sustainable Mobility: E-Mobility charging stations

6.5.1 Background

This solution analyses the potential economic effects resulting from a shared use of charging points with 11 and 22 kW charging power on the premises of the Ennshafen, assuming that only few company specific charging points have been installed yet (Status April 2020). The exemplary locations of these shared charging points were defined by an analysis of the premises of the Ennshafen applying a maximum acceptable walking distance of 300 m (equaling a walking time of 3 – 4 minutes ) from the electric charging point to the parking lot of a company.

6.5.2 Policy Challenge

As a first step, the binding legislation on the matter of electric charging stations shall be identified within the wide framework of electricity legislation.

In detail, pursuant to § 2 par. 1 no. 20 GewO 1994, the operation of electricity undertakings as defined in § 7 no. 11 ElWOG 2010 is excluded from the scope of application of the GewO 1994. This provision leads to the application of the provisions of electricity law. In this specific case, however, the question of the applicability of this provision arises. In that respect, the Administrative Court determined that the sale of electricity via e-charging stations and the construction of an e-charging station required for this purpose are not covered by the

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44 VwGH Ro 2018/04/0010
exemption under § 2 par. 1 no. 20 GewO 1994. This means that the provisions of the GewO 1994 apply to the operation or construction of an e-charging station.\textsuperscript{45} However, since the operation of an e-charging station is to be qualified as a free trade, only the general requirements for conducting a trade must be met and a registration must be submitted to the trade licensing authority.\textsuperscript{46} According to § 5 para. 2 GewO 1994, no certificate of professional competence is required.

Moreover, the potential need of public authorizations to install charging stations is to be evaluated. In Austria, the erection of charging points by a company generally does not require a public authorization (‘Betriebsanlagengenehmigung’), provided that they are not erected at sites with a high risk of potential hazards.\textsuperscript{47}

Finally, with respect to requirements according to building laws different necessities exist in Austria. Given the fact that building laws are passed on state level, Austria features nine different building laws that stipulate different requirements for erecting electric charging points that are detailed in Table 6-2.

\textbf{Table 6-2: Requirements for erection of charging points according to Austrian state building laws}

<table>
<thead>
<tr>
<th>State</th>
<th>Open spaces</th>
<th>In buildings / garages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burgenland</td>
<td>ncpr if without baseplate cpr if with baseplate</td>
<td>ncpr</td>
</tr>
<tr>
<td>Carinthia</td>
<td>ncpr</td>
<td></td>
</tr>
<tr>
<td>Lower Austria</td>
<td>cpr for fast charging points</td>
<td></td>
</tr>
<tr>
<td>Upper Austria</td>
<td>ncpr</td>
<td></td>
</tr>
<tr>
<td>Salzburg</td>
<td>ncpr</td>
<td>Ncpr – however, in cases of high capacity charging points the building authority should be contacted</td>
</tr>
<tr>
<td>Styria</td>
<td>ncpr</td>
<td></td>
</tr>
<tr>
<td>Tyrol</td>
<td>cpr</td>
<td>ncpr</td>
</tr>
<tr>
<td>Vorarlberg</td>
<td>Ncpr, provided the spacing and minimum distances are complied with</td>
<td></td>
</tr>
<tr>
<td>Vienna</td>
<td>ncpr if &lt; 3 m in height cpr / crn depending on the type of charging point</td>
<td></td>
</tr>
</tbody>
</table>

Legend:

- No construction permit required… ncpr
- Construction permit required… cpr
- Construction notification required… crn

The connection to the grid has to be done by a licensed electrical technician in accordance with the technical requirements set forth by the TAEV\textsuperscript{48}. In the case of charging stations that surpass the physical capacity of the existing grid infrastructure or the threshold of 1,000 V

\textsuperscript{46} Stangl/Reiterer, Der Verwaltungsgerichtshof stellt klar: E-Tankstellen unterliegen der Gewerbeordnung, Kleinwasserkraft Österreich Magazin 2019, 38 (40).
\textsuperscript{47} Bundesministerium für Verkehr, Innovation und Technologie, Leitfaden für Betriebe – Genehmigungsverfahren Ladeinfrastruktur für Elektrofahrzeuge, Vienna, 2017, p.3
\textsuperscript{48} TAEV Technischen Anschlussbedingungen für den Anschluss an öffentliche Versorgungsnetze mit Betriebsspannungen bis 1000 Volt
other laws such as the “high-current-line-law” (“Starkstromwegegesetz”) might apply which is why in addition to contacting the local authorities it is recommended to contact the local grid operator before implementing charging points at a site.\textsuperscript{49}

In addition to the aforementioned legal requirements it is recommended to evaluate a potential change in the grid level (Netzebene) of a company when adding several (fast-) charging points to the existing load as a change in the grid level might result in additional costs if for example a transformer has to be purchased and operated which is the case when moving from grid level 6 to grid level 5.\textsuperscript{50}

6.5.3 Solutions and Policy Recommendations

As mentioned in the previous section, there are a number of steps to comply when evaluating the installation of charging stations, such as:

- identification of current legislative framework, in terms of e.g.: electricity, market, buildings, space occupancy;
- identification of technical requirements for physical installation;
- identification of technical and economic requirements for operation.

Having developed the previous steps, there are not regulatory or legal barriers expected.

\textsuperscript{49} Bundesministerium für Verkehr, Innovation und Technologie: Leitfaden für Betriebe – Genehmigungsverfahren Ladeinfrastruktur für Elektrofahrzeuge; Vienna (2017)
\textsuperscript{50} E-Control Austria: Leitfaden Netzanschluss; Vienna (2016)
7 CONCLUSIONS

The implementation of energy cooperation and joint energy services may be hampered by multiple barriers and risks, related – for example – to the difficulties in adapting existing systems to new layouts, in developing profitable business models and in complying with the necessary legal requirements.

In this context, Task 2.3 and this deliverable D2.4 in particular deal with specific legal, regulatory and standardization issues as well as with the identification of suitable mitigation measures, to maximize replicability of S-PARCS solutions. The analysis focused on different relevant scales, from the EU one, to the regional ones, based on the specific proposed interventions and barriers. In addition, elements related to the specific incentives and/or binding regulations have been incorporated and presented whenever relevant.

Thus, this report consists of a collection of policy focuses at project scale outlined based on the information provided by project partners and based on an updated desk review.

As a result, for each country involved in S-PARCS and for each solution implemented within the project, background information on legislative context is analysed and described, regulatory bottlenecks are presented and measures undertaken to tackle them and policy recommendations are provided, as summarized in the Table below.
## Summary of Policy Recommendations

<table>
<thead>
<tr>
<th>Member State</th>
<th>Energy cooperation and energy efficiency solutions</th>
<th>Policy Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spain</td>
<td>Use of small hydroelectric installation</td>
<td>Ensure a simplified process to obtain licence of use for assets to be dedicated to the realization of renewable energy projects and to the reduction of GHG emissions, in line with existing European targets of carbon neutrality</td>
</tr>
<tr>
<td></td>
<td>Installation of a PV plant</td>
<td>Facilitate companies access to the hourly energy consumption data. This data is currently accessible but only after formal requests to commercialization and distribution companies. Facilitating access to data and providing tools for its analysis can be a way to increase knowledge of energy consumptions and to motivate the implementation of measures to reduce energy use and mitigate associated emissions</td>
</tr>
<tr>
<td></td>
<td>CHP plant exploiting anaerobic co-digestion of vegetable tannery sludge</td>
<td>Develop flexible business models to install and exploit renewable energy installations. Business models could combine public, private or community participation on investments and exploitation. The new regulation for self-consumption in Spain (the new RD 244/2019), was a crucial step for the development of energy communities; for example allowing shared self-consumption between different consumers and producers, up to a distance of 500 meters</td>
</tr>
<tr>
<td>Italy</td>
<td>Waste heat recovery</td>
<td>Overcome and simplify existing legal, regulatory and standardization issues by training energy cooperation advisors able to support the companies and industrial parks in the identification and adoption of suitable energy cooperation solutions, and, at the same time, support the politicians in the adoption of the proper regulatory and legislative instruments</td>
</tr>
<tr>
<td></td>
<td>Shore side electricity</td>
<td>Facilitate and promote formal agreements that support transition to circular economy and energy cooperation between multiple actors (e.g.: public authorities, industrial organizations, etc.), as they act as enabler and facilitator of concrete interventions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Develop and allow flexible business models to exploit energy produced by high efficiency systems</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adopt smooth and clear administrative processes to obtain end of waste authorizations</td>
</tr>
<tr>
<td>Austria</td>
<td></td>
<td>Facilitate and sustain internal use of waste heat, e.g.: through economic incentives</td>
</tr>
<tr>
<td></td>
<td>Waste heat recovery</td>
<td>Improve and generate options for waste heat use in order to reduce primary energy demand thanks to the implementation of energy cascades</td>
</tr>
<tr>
<td></td>
<td>Shore side electricity</td>
<td>Improve legal basis for waste heat feed-in into DH network, as waste heat producers have to negotiate with DH network operators and no right to privileged feed-in into the network</td>
</tr>
<tr>
<td></td>
<td>Installation of a PV plant</td>
<td>Provide that district heating network operators, in the event of refusal of connection, must inform the third party and the competent authority of the reasons and point out measures that the third party can take to obtain access</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tax equality for all types of energy carriers shall be ensured at the European level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Improve possibilities for electricity sharing for large enterprises, without forcing them to register as official electricity suppliers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Diminish existing restrictions on direct lines, especially facilitating permissions to cross public properties or land from third parties (also applicable to other electricity generation installations)</td>
</tr>
</tbody>
</table>
8 REFERENCES


ANNEX I: QUESTIONNAIRE – FIRST VERSION

Fiche on legal, regulatory and standardization issues for energy cooperation within industrial parks

Introduction

The objective of the fiche is to collect information about various legal, regulatory and standardization issues that the companies/parks face during the S-PARCS project execution.

In general, every information on this subject that has an impact on the execution or the decision making processes about energy cooperation should be reported as the collection of the different perspectives is crucial.

Through these fiches, potential solutions will be proposed whenever possible and, worst case scenario, these issues will be highlighted to other interested entities in a mutual benefit learning loop. This is meant to be continuous process as additional information and/or updates are critical on these subjects and their communication is the key to gain a consistent perspective.

In the end, a deliverable listing legal, regulatory and standardization issues and the associated mitigation measures will be promoted to be translated into policies.

Moreover, the circulation of this information among S-PARCS lighthouse parks and follower ones will help solve and/or anticipate the above mentioned issues.

The below presented fiche should be compiled as far as possible according to the status of the issue (solved / unsolved / unsolvable).

Finally, please present also opportunities that changes in regulation etc. has provided.

Fiche

<table>
<thead>
<tr>
<th>Location</th>
<th>City (region if relevant) / State</th>
<th>Date</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Entity</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Project</th>
</tr>
</thead>
</table>

Please mention the topic/project/solution related to the legal/regulatory/standardization issue. If it is a solution from D1.1 please mention it and/or describe it in its general attributes to clarify the framework.

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
</table>

Please describe the issue you are facing / you faced in terms of legal, regulatory and/or standardization barrier. If relevant, please attach links to legislation articles and/or other relevant documents. Examples could be: i) the existence (non-existence) of a regulatory framework obstructing some
aspects of the project; ii) unclear or conflicting regulation at local level; iii) absence of standards or references for on a precise subject; iv) etc.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Idea</th>
<th>Engineering / development</th>
<th>Implementation</th>
<th>Operation</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Area</th>
<th>Regulatory</th>
<th>Legal</th>
<th>Standard</th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>Level</th>
<th>Local</th>
<th>Regional</th>
<th>National</th>
<th>EU</th>
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</table>

<table>
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<th>Emerging time</th>
<th>Pre-existing</th>
<th>Change</th>
<th>Unknown</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Severity</th>
<th>Binding</th>
<th>Required project adjustment(s)</th>
<th>Not Binding</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Status</th>
<th>Solved (section 9)</th>
<th>Work in progress (section 9)</th>
<th>Unsolved (section 10)</th>
</tr>
</thead>
</table>

Please mention if you solved the problem or not

Solution

If the issue was solved / bypassed / in progress, please provide a description of the solving process, identifying as well main actors and their roles

Restrictions nature

If the issue was not solvable and the consequence was the termination of the project study / operation, please provide input about the reasons: they could be linked to the extra costs, the impossibility to satisfy safety standards, the law restrictions, etc.
ANNEX II: QUESTIONNAIRE – SECOND VERSION

The questionnaire reported below is tailored to the solutions being implemented in the Spanish Park of Bildosola-Arte. Once the solutions are adjusted, it is representative also of the questionnaires shared with the other Parks.

Fiche on legal, regulatory and standardization issues for energy cooperation within industrial parks

Bildosola – Artea Park (Spain)

Introduction

The objective of the fiche is to collect information about various legal, regulatory and standardization issues that the companies/parks face during the S-PARCS project execution, possibly representative of the national context of each park.

In general, every information on this subject that has an impact on the execution or the decision-making processes about energy cooperation should be reported, as the collection of the different perspectives is crucial to support the development of energy cooperation projects.

Through these fiches, potential solutions will be proposed whenever possible and, worst case scenario, these issues will be highlighted to other interested entities in a mutual benefit learning loop. This is meant to be continuous process as additional information and/or updates are critical on these subjects and their communication is the key to gain a consistent perspective.

In the end, a deliverable listing legal, regulatory and standardization issues and the associated mitigation measures will be promoted to be translated into policy recommendations.

Moreover, the circulation of this information among S-PARCS lighthouse parks and follower ones will help solve and/or anticipate the above-mentioned issues.

Practical Information

The fiche consists in an open-questions questionnaire. The questionnaire covers the themes discussed in the introduction from two different perspectives:

- **Project-specific perspective**, aimed at collecting details about the experience of the Parks/Companies in the realization of the S-PARCS projects, having in mind the final goal of proposing policy recommendations to overcome potential conflicts in the existing mitigation measures. Only the project that are actually being implemented are analyzed;

- **General perspective**, aimed at analyzing the legislative / regulatory and standard context at national regional and local level, with a look also towards the EU regulatory framework and to analyze any potential conflict between the desired project implementation and available instruments to overcome barriers and EU/national/regional/local legislation and standards.

The fiche should be compiled as far as possible according to the experience and knowledge of the parks’ representative, both within and outside the boundaries of the S-PARCS project. Details about the present status of the projects, of the existing or overcome regulatory issues for their implementation, and about opportunities generated by changes in regulation etc. shall be explained to maximize the effectiveness of the interview.
Questionnaires are specifically developed for each industrial park. While the general part is the same for all the participants, the project specific questions depend on the solutions actually under implementation in each park / company.

Please feel free to use more rows than those we have inserted.

Thank you in advance for your time and cooperation!
General legal, regulatory and standardization issues for energy cooperation within industrial parks

- Please, list and describe the existing main regulatory instruments facilitating energy cooperation and energy efficiency in industrial parks or any other industrial symbiosis in your Country (at regional / national / EU level). For example, think about government incentives and regulations (tax incentives, energy efficiency targets and please include also any business-as-usual practices or best practices that are in place in your Country/region and that could be replicated in other contexts.

- Please describe which barriers can be overcome through these regulatory measures. If possible, please include also relevant examples or mention transformations that were activated by the regulatory instruments.

- Please describe the main legal/regulatory/standardization barriers that you face for energy cooperation and energy efficiency.

- Have your energy cooperation and energy efficiency initiatives ever been hampered by any regulatory and standardization conflict (e.g.: inconsistencies, legislative gaps, contradictory provisions, etc.)?

- Do you see any potential conflict between the S-PARCS approach for solutions and instruments to overcome barriers and EU/national/regional/local regulatory framework? If yes, what would you suggest to improve the effectiveness of S-PARCS approach to improve the legislative context?

- Please describe any energy efficiency or energy cooperation initiatives that could not be carried out in your park / company because of legislative barriers (in your experience in S-PARCS or in other experiences) and explain the main reasons (e.g.: extra costs, impossibility to satisfy safety standards, property rights). If possible, please include information about specific relevant legislation.
Project-specific regulatory and standardization issues for energy cooperation within industrial parks

1. Hydroelectric

- Please provide a brief description of this project in your park or provide reference to other project activities where this information is available.

- Please describe the issue you are facing / you faced in terms of legal, regulatory and/or standardization barrier. If relevant, please attach links to legislation articles and/or other relevant documents.
  - examples could be: i) the existence (non-existence) of a regulatory framework obstructing some aspects of the project; ii) unclear or conflicting regulation at local level; iii) absence of standards or references for on a precise subject; iv) etc.

- With reference to the previous question, also please specify the level to which the issue applies (EU / national / regional) and why. If conflicting law/standards apply, please highlight it and provide a brief explanation below.

- Are you solving the issue? If yes, please explain the steps you followed to overcome this problem, and if it required to adjust the project or introduce any mitigation measure. If the issue was solved / bypassed / in progress, please provide a description of the solving process, identifying as well main actors and their roles.
2. LED lighting

- Please provide a brief description of this project in your park or provide reference to other project activities where this information is available.

- Please describe the issue you are facing / you faced in terms of legal, regulatory and/or standardization barrier.

  If relevant, please attach links to legislation articles and/or other relevant documents.

  - examples could be: i) the existence (non-existence) of a regulatory framework obstructing some aspects of the project; ii) unclear or conflicting regulation at local level; iii) absence of standards or references for on a precise subject; iv) etc.

- With reference to the previous question, also please specify the level to which the issue applies (EU / national / regional) and why. If conflicting law/standards apply, please highlight it and provide a brief explanation below.

- Are you solving the issue? If yes, please explain the steps you followed to overcome this problem, and if it required to adjust the project or introduce any mitigation measure. If the issue was solved / bypassed / in progress, please provide a description of the solving process, identifying as well main actors and their roles.
Policy Recommendations

- Based on the previous questions, on your experience and on your knowledge of existing legislative frameworks, please provide policy recommendations that you consider as important for pursuing the objective of S-PARCS and energy cooperation within industrial parks. Please also specify at what level(s) each policy recommendation should ideally be implemented (e.g.: local / regional / national / EU).

- Please, provide any additional information that you consider useful for the identification of policy recommendation and mitigation measures, aimed minimizing potential conflicts between existing regulatory and legislative instruments.

Thank you!