



Deliverable D6.9

Final report of policy relevant activities



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30/06/2021

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

This project has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement No 785134.

DELIVERABLE 6.9 – VERSION 1

WORK PACKAGE N° 6

Nature of the deliverable		
R	Document, report (excluding the periodic and final reports)	X
DEM	Demonstrator, pilot, prototype, plan designs	
DEC	Websites, patents filing, press & media actions, videos, etc.	
OTHER	Software, technical diagram, etc.	

Dissemination Level		
PU	Public, fully open, e.g. web	X
CO	Confidential, restricted under conditions set out in Model Grant Agreement	
CI	Classified, information as referred to in Commission Decision 2001/844/EC	

Quality procedure			
Date	Version	Reviewers	Comments
26 th June 21	1	Valerie Rodin	

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.

More information on the project can be found at <http://www.sparcs-h2020.eu/>

Disclaimer

The opinions expressed in this document reflect only the authors' view and reflect in no way the European Commission's opinions. The European Commission is not responsible for any use that may be made of the information it contains.

Executive summary

The aim of this report is to provide an overview of the results of S-PARCS that have an immediate policy relevance. The consortium selected 10 of the 33 deliverables produced in S-PARCS, which fit the criteria of policy relevance, clustered them in four topics and briefly describe their content and relevance to guide interested stakeholders through the large amount of materials produced in S-PARCS.

This report thereby accompanies the S-PARCS e-platform, which was designed to provide newcomers to the topic of "industrial energy cooperation" with a first stepping stone to the topic and which presents the outputs of S-PARCS in an easily accessible format. During the project's runtime a multitude of interviews, meetings, webinar, conferences and workshops were organised or attended by the S-PARCS team. In each of these interactions with external experts and stakeholders, concepts and results of the project were presented and feedback was received which significantly supported the progress of the project.

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1 INTRODUCTION

Bridging the gap between academia and the real-world by providing tangible and relevant policy advice was a core aim of the *S-PARCS: Envisioning and Testing New Models of Sustainable Energy Cooperation and Services in Industrial Parks* project. Throughout the project's runtime the S-PARCS team interacted with stakeholders from industry, policy making, research and funding agencies in bilateral discussion, at conferences, webinars and workshops. The aim of these networking and exchange activities was to reflect on the concepts and ideas developed in S-PARCS, their real-world relevance and on how to best present our results.

A key outcome of these interactions is the S-PARCS e-platform, on which the concepts, ideas and solutions, which were developed over the project's runtime are presented in an easily accessible format. The e-platform, which will continue to be curated and extended in the next couple of years, is freely and openly accessible to any interested stakeholder (<https://www.sparcs-community.eu/>).



Figure 1: Landing page of the S-PARCS e-platform

This platform provides information material about S-PARCS and summarizes key results of the project's core deliverables. Overall, the S-PARCS consortium produced 33 project reports, of which 21 are public and available to download at the project's website <https://www.sparcs-h2020.eu/>. The consortium scrutinized these public deliverables to assess their immediate policy relevance and defined 10 reports as particularly policy relevant.

As it is in the nature of complex research activities, these reports are highly specialized and detailed. Therefore, and to provide interested parties with a quick overview and guide to those reports that may be the most relevant ones for them, the present report presents them in a structured way to facilitate their accessibility in the following section.

Finally, the present report also puts a focus on the four specific policy briefs, which were written in S-PARCS. They are of immediate relevance to the topic and are therefore presented in more detail in the following.

2 S-PARCS INFORMATION MATERIAL: A GUIDE

As described in the introduction, the aim of this section is to provide an overview of those 10 deliverables that the consortium considers to be the ones with immediate policy relevance. The reports are clustered in four topics:

- **Solutions – Barriers – Instruments: Planning and designing concepts for industrial energy cooperation**
 - The first set of deliverables presents insights into those aspects of energy cooperation solutions that need to be considered at the planning and conceptualizing stage of cooperative activities. They provide structured information about potential barriers, state-of-the-art solutions and implementation instruments. They are not limited in their scope, neither on a geographical nor topical level and aim to facilitate the first steps towards planning the implementation of energy cooperation solutions.
- **Legal, regulatory and contractual aspects of industrial energy cooperation**
 - Secondly, two reports deal with legal, regulatory and contractual aspects of energy cooperation. While the *guide on contractual issues for joint energy services and energy cooperation* provides insights into this topic from a general perspective, the policy recommendations are tailored to the specific situation in Spain, Italy and Austria.
- **Real-world applications**
 - The way that actual energy cooperation implementations can look like is presented in this third group of reports. All of them deal with the assessment of potential cooperative measures in the specific context of S-PARCS Lighthouse industrial parks. They present feasibility studies and future energy cooperation plans which were designed and conducted specifically for these parks. The final deliverable in this group presents a Portuguese case study of an unsuccessful attempt to establish energy cooperation between companies in a park, which serves at illustrating the many challenges and obstacles that can be encountered and need to be mitigated as early as possible in the planning stage.
- **Training Toolkit (available in French, German, Italian, English, Spanish and Portuguese)**
 - The final report is the training toolkit, which summarizes and explains the outcomes of the project in an easy-to-read way and is provided in multiple languages.

Report	Policy Relevance
Solutions – Barriers – Instruments: Planning and designing concepts for energy cooperation	
D1.1 S-PARCS solutions inventory	<p>This report presents an inventory of possible energy cooperation/services solutions, which could be qualified for mutualised procurement and utilisation. To make the assessment of this list of solutions easily accessible, the report is combined with an excel file intended to guide the reader through the proposed solutions by providing different filtering options. Stakeholders can use this inventory for eliciting first ideas for potential energy cooperation activities in their specific setting. <i>Link to the report: https://bit.ly/3rbt5KZ</i></p>
D1.2 Barriers towards Energy Cooperation	<p>Knowing upfront the potential barriers that may stand in the way of a successful implementation of energy cooperation, is of high importance in the planning process. This report provides insights into different forms of barriers, both technical and non-technical barriers. The results presented in this report can help to identify and overcome the detected barriers at an early stage. As soon as the specific barriers are identified, the next report D2.1 shows ways to overcome them. <i>Link to the report: https://bit.ly/3ejtC8o</i></p>
D2.1 Instruments addressing technical and non-technical barriers - generic results	<p>Here, a selection of instruments to overcome the barriers identified in D1.2 is presented. The report aims at supporting stakeholders in identifying the most effective instruments relevant for their specific barriers. <i>Link to the report: https://bit.ly/36z2sq2</i></p>
Legal, regulatory and contractual aspects of energy cooperation	
D2.3 Guidance on contractual issues for joint energy services and energy cooperation	<p>The Guidance provides an overview of the main contractual aspects that deserve to be regulated within the contracts concerning the sharing of services and infrastructures. Also, the Guidance intends to offer insights that take into account the legislation in force in the country where the park is located and the specific expectations of the parties involved. <i>Link to the report: https://bit.ly/3hliDb0</i></p>
D2.4 Policy recommendations based on the results of the legal, regulatory & standardization analysis	<p>In terms of policy relevance, this report is a key output of S-PARCS and presents a summary of legislative context, regulatory bottlenecks and recommendations regarding energy cooperation in Italy, Spain and Austria. 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. Here, the aim is in 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. 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. <i>Link to the report: https://bit.ly/3z3pvVU</i></p>
Real-word solutions	
D5.2 Report on the potential for joint energy	<p>This deliverable describes nineteen energy cooperation opportunities in five Lighthouse Parks in Italy, Austria and Spain. It</p>

	services in industrial parks	depicts the main barriers that the industrial parks are facing, which in addition to legal and economic factors, in many cases are linked to soft factors (limited trust, perception and behavioural issues), and outlines the next steps planned to solve them. Finally, it provides some useful transferability considerations for other industrial parks looking for benchmarks to increase energy efficiency in a cooperative manner. <i>Link to the report: https://bit.ly/3xUHttX</i>
D5.4	Public report on the results from the feasibility studies for the most promising joint energy projects in the Lighthouse Parks	This report summarizes the key results of the feasibility studies of promising energy cooperation solutions for the S-PARCS Lighthouse Parks. Furthermore, it shows that the involved companies but also their closer environment can benefit from energy cooperation in multiple ways. The individual feasibility studies take into account technical, economic, environmental and also social, legal and political aspects, i.e. the overall assessment was strongly oriented towards a classic PESTEL analysis. The focus was on technical and economic aspects as these are commonly very decisive for companies, nevertheless environmental aspects are highly valued and of increasing interest, which is why life cycle assessments were carried out. Additionally, S-PARCS' key performance indicators, which allow the comparison and measuring of different energy cooperation opportunities, were calculated. <i>Link to the report: https://bit.ly/2UMfwWv</i>
D5.5	1 energy cooperation plan per park	This report showcases the Energy cooperation plans performed in the S-PARCS Lighthouse Parks for the most promising opportunities identified. Each Lighthouse Park contributed to the realisation of the plan. Energy cooperation is an opportunity in view of the dynamic changes in the energy sector in the coming decades, for this reason, each park has identified its own roadmap taking into account its potential and its trajectory on this topic. <i>Link to the report: https://bit.ly/36DYcWk</i>
D5.6	Barriers to Energy Cooperation – a Case Study	This report will highlight the barriers encountered, will provide assessments of how these barriers can be overcome in the specific framework of Portugal and will summarize the report in a policy brief to be used for dissemination in Portugal. <i>Link to the report:</i>
Training Toolkit (available in French, German, Turkish, English, Spanish and Portuguese)		
D6.4	Training toolkit	This training toolkit summarizes and explains the outcomes of the project in an easy to read way and is provided in multiple languages. <i>Link to the report: https://bit.ly/3ia1NAJ</i>

3 POLICY BRIEFS ON INDUSTRIAL ENERGY COOPERATION

In a joint effort between S-PARCS Lighthouse Industrial Parks and the research partners, policy briefs on four distinct topics were produced in which specific legal, regulatory and standardization issues are discussed and suitable mitigation measures are identified to maximize replicability of S-PARCS solutions.

The approach followed to develop these policy briefs focused on the collection of inputs from partners having hands-on experience in the development of energy cooperation and joint energy services. It was based on the following pillars:

- ▶ the collaboration with project Partners at different stages of the project activities, involving the compilation of dedicated questionnaires and face-to-face meetings. Such collaboration had the ultimate purpose of investigating project specific issues relevant from a legal and regulatory perspective, as well as of analysing 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; and
- ▶ finally the presentation of main findings.

The whole process was coordinated by S-PARCS partner RINA-C and actively involved all other members of the consortium. As a result of the work done to identify potential legal, regulatory and standardization issues, a dedicated report (D2.4, see link in the table above), which details the research process, provides background information on relevant European legislation and present the findings separately for each country.

Based on this extensive report, four policy briefs were produced, each of which highlights a specific topic:

- ▶ Policy Brief #1: Industrial Energy Cooperation for Waste Heat Recovery in Austria
- ▶ Policy Brief #2: Industrial Energy Cooperation for Electricity Solutions in Austria
- ▶ Policy Brief #3: Industrial Energy Cooperation Solutions in Italy: a case study
- ▶ Policy Brief #4: Industrial Energy Cooperation Solutions for Renewable Energy Integration in Spain

These four policy briefs are presented in the following section.

Industrial Energy Cooperation for Waste Heat Recovery in Austria

Austria has energy efficiency, renewable energy and sustainability goals that are supported by various institutions, regulatory framework, roadmaps and subsidy schemes. Nevertheless, legal and regulatory barriers to industrial energy cooperation exist and they cannot be tackled without law/regulatory amendments, possibly influencing a large number of projects despite specific characteristics. S-PARCS aims at providing concrete solutions to overcome these barriers. We provide policy recommendations on the theme of waste heat recovery, based on real experiences from our Austrian Lighthouse industrial parks.

Written by: Francesco Peccianti¹, Silvia Vela¹

Based on S-PARCS deliverables: D2.1, D2.4, D5.4

Related to publications by: Marie Holzleitner², Simon Moser², Stefan Puschnigg², Valerie Rodin²

Further contributions: Chemical Park Linz, Ennshafen business park and industrial port

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Background

Several companies, especially from the energy intensive sectors, generate significant amounts of waste heat that may not be entirely consumed internally. Such waste heat flows may remain constant along the year or may oscillate with seasons.



Ennshafen industrial park

Chemiepark Linz industrial park



Applications where heat flows are demanded are numerous and variegated, either in industrial or civil sites. For example, they can be exploited for space heating purposes, in cascade for other industrial processes or for cooling through adsorption or absorption chillers.

Depending on the site location, feeding waste heat into local district heating networks can be a viable and valuable solution for energy recovery.

The policy challenge

Policy challenges arise when waste heat cannot be recovered internally.

As a matter of fact, 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 nor towards district heating network operators; legal status of participating companies remains unclear. Moreover, there are no norms that regulate how heat as an energy carrier is defined and pressure and temperature levels, heat amounts are usually calculated via temperature differences and additionally, there is no legal claim for building heat pipelines over private ground. Finally, the assessment of waste heat as being a zero-emission source of energy, to be treated as equal to green energy, is also uncertain.

This results in a fragmented situation, in which customer prices, feed-in obligations, metering schemes are not addressed homogeneously and consistently. Compared to the Electricity Market Directive or the Gas Directive for the energy sources of electricity or gas, a private law contract is the basis for heat supply, as a reflection of the absence of relevant regulations.

Despite the presence of these limitations, conventional district heating remains the classic business model to utilize waste heat externally. However, for an industry generating waste heat, the construction of its own district heating network is not lucrative because it is common that the local district heating supplier owns significant customer access.

In this situation, the district heating network operator is a (eventually price-regulated) monopoly to the local end-user and acts 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 than directly sell its heat. As to antitrust provisions the network operator is obliged to open its network to other market participants if that is factually possible, it also has a legitimate interest in ensuring the economic supply of heat to its customers or to choose the third party. In General, the contracting parties are free to make provisions on the waste heat supply, but they have no guarantees of a successful agreement.

Each case is highly individual and overall contract designs (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.) vary. Under certain circumstances, a feed-in claim can be derived for antitrust reasons (e.g.: no or minor burden for the network operator). One argument against feed-in might be the so-called “technical or economical impossibility/unreasonableness” (but its legal definition is not given). In any case, the use of waste heat must prove to be economically more favourable for the network operator than using its own generation units.

Thus, negotiations are characterized by high complexity due to multiple parameters analysed and are often associated with low assurances of success, resulting in a major legal barrier to energy cooperation.

Solutions and Policy Recommendations

In this framework, the issue of feed in into local district heating networks can only be resolved by direct negotiations. The best alternative is usually to talk and discuss terms with the network operator and try to reach a private law agreement for selling the waste heat.

As a facilitation to waste heat supply into district heating networks to maximize use of clean energy, the recast of the Renewable Energy Directive obliges district heating networks operators to increase the share of heat from renewable sources and waste heat in their network.

Owing to the lessons learned in S-PARCS when analysing the implementation of solutions for waste heat recovery, and thanks to lessons learnt for the development of this solution, a set of policy recommendations is proposed.

Policy Recommendations

- 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 district heating network, as waste heat producers have to negotiate with network operators and have no right to privileged feed-in into the network. Guarantees are a policy instrument often demanded in order to cancel out long-term risks.
- Ensure that district heating network operators, in the event of refusal of connection, must inform the third party of the reasons and point out measures that the third party can take to obtain access.

Acknowledgement



This policy brief results from the project S-PARCS “Envisioning and Testing New Models of Sustainable Energy Cooperation and Services in Industrial Parks”, which received funding from the European Union’s Horizon 2020 research and innovation program under grant agreement No 785134.

Further reading

The complete list of policy recommendations based on the results of the legal, regulatory and standardization analysis was developed in Work Package 2 of the S-PARCS project. Detailed information is included in Deliverable 2.1, Deliverable 2.4 and Deliverable D5.4 and is available to download at:

<https://www.sparcs-h2020.eu/results/deliverable/>

The majority of our project reports are freely available online at <https://www.sparcs-h2020.eu/>.

Holzleitner, Moser, Puschnigg (2020) Evaluation of the impact of the new Renewable Energy Directive 2018/2001 on third-party access to district heating networks to enforce the feed-in of industrial waste heat. Utilities Policy, Volume 66, October 2020, 101088.

Moser, Puschnigg, Rodin (2020) Designing the Heat Merit Order to determine the value of industrial waste heat for district heating systems. Energy, Volume 200, 1 June 2020, 117579.

S-PARCS policy briefs

We summarize key findings of the S-PARCS projects in a series of policy briefs, all of which can be found here: <https://www.sparcs-h2020.eu/#results>

Contact information

We are looking forward to hearing from you and are happy to discuss with you.

Contact us at contact@sparcs-h2020.eu or get in touch with our project coordinator Andrea Kollmann kollmann@energieinstitut-linz.at

Industrial Energy Cooperation for Electricity Solutions in Austria

Austria has energy efficiency, renewable energy and sustainability goals that are supported by various institutions, regulatory framework, roadmaps and subsidy schemes. Nevertheless, legal and regulatory barriers to industrial energy cooperation exist and they cannot be tackled without law/regulatory amendments, possibly influencing a large number of projects despite specific individualities. S-PARCS aims at providing concrete solutions to overcome these barriers. We provide policy recommendations on the subject of electricity, based on real experiences from our Austrian Lighthouse industrial parks.

Written by: Francesco Peccianti¹, Silvia Vela¹,

Based on S-PARCS deliverables: D2.1, D2.4, D5.4

Contributions: Matthias Linhart², Werner Auer³, Valerie Rodin², Simon Moser², Marie Holzleitner²

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Background

Boosting the use of clean electricity is a well-known strategy to meet future decarbonization and renewable energy targets. In S-PARCS, our Austrian Lighthouse industrial parks have pursued this strategy through various paths: shore-side electrification, installation of photovoltaic (PV) power plants and direct lines and electric mobility.

Ennshafen industrial park



The supply of shore-side electricity is a European measure to reduce the local environmental impact of anchoring ships at ports and necessary infrastructure is to be installed as a priority in ports of the TEN-T Core Network and in other ports by 2025, unless there is no demand and the costs are disproportionate to the benefits, including environmental benefits.

The installation of cooperative PV plants is evaluated according to different schemes (cfr. D2.1, see below for further reading):

- installation on multiple roofs, with joint purchase of engineering and hardware equipment to lower the burden on each company;
- installation on multiple roofs, jointly financed by companies and local communities;
- installation on a large facility, the spaces on which are rented by many companies.

Also, considering the possibility of installing an electricity generation plant and sharing the energy produced, the concept of direct lines (i.e.: electricity lines that do not exploit the infrastructure of the existing national grid) is discussed.

Finally, the installation of shared charging stations in the premises of the park to promote electric mobility is analysed.

The policy challenges

Policy challenges to these solutions do not pose major limitations, however legal issues do appear during their implementation.

Shore-side electricity supply requires effort at the European level to ensure a homogeneous taxation across countries and in comparison with other fuels. This is expected to minimize the risk of shifting anchoring to ports with less strict requirements and costs as well as to pay back as much as possible of the high upfront investments.

In the context of the project, the installation of PV power plants is legally feasible according to current national legislation, and relevant taxation is also regulated.

Considering the large size of companies involved, the latest concept of an energy community for electricity sharing (as for Clean Energy Package) does not apply. Indeed, participation of large corporate players in communities may lead to an imbalance in value sharing and may impact the decision-making power within the energy community itself. Direct lines thus appear as a solution, but they are heavily restricted as they are not allowed to cross public properties or land from third parties and also because there are strict requirements on certain hardware components.

Finally, the main steps to comply with when evaluating the installation of charging stations are reported below:

- 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.

Solutions and Policy Recommendations

There are already solutions in place to face the legal barriers presented.

The proper taxation of shore-side electricity is a topic of the revision process of the directive on the deployment of alternative fuels infrastructure, in preparation at EU level.

Then, legal constructs to enable a certain number of legal or personal entities the operation of a common PV power plant are plentiful (e.g.: non-trading partnership, general partnership, private limited partnership, limited liability company, limited partnership with a limited liability company as general partner, (registered) association, cooperative). Which company construct is most reasonable depends on the contractual details and objective (and vice-versa) and should be evaluated beforehand. It is also highlighted that – differently from other countries – Austria allows shared generation facilities for building owners and tenants, as far as they are located in the very same building.

Owing to the lessons learned in S-PARCS when analysing the implementation of electricity solutions, and thanks to lessons learnt for the development of this solution, a set of policy recommendations is proposed.

Policy Recommendations

- Ensure tax equality for all types of energy carriers potentially substituted by shore-side electricity at the European level.
- 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 property or land from third parties.

Further reading

The complete list of policy recommendations based on the results of the legal, regulatory and standardization analysis was developed in Work Package 2 of the S-PARCS project. Detailed information is included in Deliverable 2.1, Deliverable 2.4 and Deliverable 5.4 and is available for download at:

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Industrial Energy Cooperation Solutions in Italy: a case study

Italian legislation is aligned with the main EU requirements with respect to energy efficiency topics. Transposition of the latest Directives under the Clean Energy Package is ongoing. Italy has also recently submitted its National Energy and Climate Action Plan until 2030, which identifies citizens and businesses as key players and beneficiaries of the energy transition. Despite the efforts, the energy cooperation topic is not clearly defined in the regulatory framework and energy cooperation in industry represents a strategy that needs to be further implemented. S-PARCS aims at providing concrete solutions to overcome these barriers. We provide policy recommendations on the theme of energy cooperation, based on real experiences from our Italian Lighthouse industrial park.

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Based on S-PARCS deliverables: D2.1, D2.4, D5.4

Contributions: Eleonora Annunziata², Fabio Iannone², Francesco Spennati³

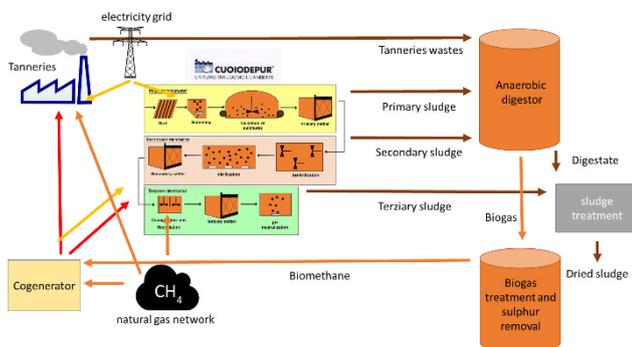
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Background

The energy cooperation solution analysed as real case-study in Italy is evaluated for Ponte a Egola, an industrial area mainly composed of several tanneries and a shared wastewater treatment plant, managed by CuoioDepur.

The solution foresees the development of a Combined Heat and Power (CHP) plant designed to use biogas (and further biomethane) yielded by the anaerobic co-digestion of vegetable tannery sludge to produce heat and electricity for the tanneries, for the wastewater treatment plant and for the grid if in surplus. The CHP plant is planned to be connected to already existing infrastructures – in terms of industrial area heating pipelines – to transport heat from CuoioDepur to tanneries. This infrastructure is already connected to another pre-existent CHP facility that is not running nowadays. Also including the potential installation of additional small CHP plants to balance the whole network and limit natural gas is under study.

Energy cooperation solution schematic



Depending on the actual configuration that will be implemented, it may be possible that an amount of energy surplus energy (electricity and/or heat), will be generated. 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.

The policy challenges

This solution has a significant degree of complexity, 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. The selling of thermal energy to the district heating network already existing in Ponte a Egola – privately owned is legally feasible (cfr. D. lgs. 102/2014). The manager of the network is then entitled to sell the thermal energy to the tanneries or to other end-users connected to the grid. The existing bottleneck to trade thermal energy is the selection of proper tariffs, which guarantee profit for the district heating network manager on one side, and on the other side 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 is not allowed in the current regulatory framework, which foresees the self-consumption only on behalf of the owner of the energy plant. This situation is also being complicated by the fact that the CHP plants owned by CuoioDepur are – in turn – indirectly owned by the tanneries, which have shares of CuoioDepur and who would be the end-users of the electricity surplus.

As for using activated sludges from CuoioDepur 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 cooperation solution.

Finally, 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.

Solutions and Policy Recommendations

Multiple instruments to tackle the existing bottlenecks have been identified in the project.

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 its energy cooperation strategy. This direct agreement with local/regional entities is an important tool to tackle bureaucratic obstacles and fasten the adoption of energy cooperation actions, facilitating connections between the industrial area and regional government and/or local authorities. Finally, it reduces risks related to the uncertainty and fragmentation of legislation and Not-In-My-Backyard protests.

With 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 was made at the initial stages of the project and the possibility of involving an ESCO was taken into consideration, as this is a general instrument identified to overcome non-technical barriers in the project (cfr. D2.1, see below for further reading). 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 for energy generation and self-consumption in Italy, 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. However, it is acknowledged that the sludges, generated by the wastewater treatment plant, and exploited within the anaerobic digester, 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 tanneries, which have to be transported to the anaerobic digester 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 (cfr. L. 128, 2 November 2019), end-of-waste authorizations can be given at national level, under the authority of the Ministry of the Environment or at local level, by the local authorities. When

authorizations are given at regional level, they apply on a case-by-case basis and are thus specific for the entity posing the request for the authorization. Once more, the direct agreement with the Tuscany Region is likely to facilitate and accelerate the concession of end-of-waste for the flesh wastes generated by the tanneries. Also, the existence of previous studies on the specific subject may support the obtaining of the end-of-waste authorization.

Finally, the solution is associated with high investment costs that may prevent its realization. Despite this not being a legal obstacle, an increased availability of financing or incentives for energy efficiency solutions is identified along S-PARCS (cfr. D2.1) as a driver to energy cooperation.

Owing to the lessons learned in S-PARCS when analysing the implementation of a real energy cooperation solution in Italy, the following set of policy recommendations is proposed.

Policy Recommendations

- Introduce standardized professional training courses to generate specific competencies on industrial symbiosis and energy cooperation – particularly for industrial parks.
- 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.
- Develop and allow flexible business models to exploit energy produced by high efficiency systems.
- Adopt smooth and clear administrative processes to obtain end of waste authorizations.

Further reading

The analysis of instruments to tackle non-technical barriers and the complete list of policy recommendations based on the results of the legal, regulatory and standardization analysis was developed in Work Package 2 of the S-PARCS project. Detailed information is included in Deliverable 2.1, Deliverable 2.4 and Deliverable 5.4 and is available to download at: <https://www.sparcs-h2020.eu/results/deliverable/>

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Acknowledgement



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Industrial Energy Cooperation Solutions for Renewable Energy Integration in Spain

Spanish legislation, consistent with the European legislative framework, aims at the enhancement of energy efficiency and increased use of renewable energy sources. The National Energy Action Plan until 2030 identifies renewable and citizen energy communities as a key measure to boost the diversity of stakeholders and implementation of participatory projects as well as to enhance distributed energy generation. Thanks to the experience built in S-PARCS – aimed at providing concrete solutions to overcome barriers to energy cooperation – we provide policy recommendations for industrial energy cooperation in Spain, based on real experiences from our Spanish Lighthouse industrial parks.

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Based on S-PARCS deliverables: D2.1, D2.4, D5.4

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Background

The energy cooperation solutions analysed as real case-studies in Spain foresee the joint exploitation of renewable energy sources for electricity production.



Okamika-Gizaburuaga industrial park (left)

Bildosola-Artea industrial park (below)



The first solution is the installation of a **small hydropower plant** on unused existing river dams located in the proximity of the potential end-users.

Moreover, the project promotes the installation of a **photovoltaic (PV) plant** to provide electricity to multiple companies in the park via shared self-consumption, which turned out to be the most profitable alternative among other energy consumptions schemes assessed.

The policy challenges

Challenges related to the implementation of these solutions are manifold.

Firstly, the **exploitation of existing assets for renewable energy production** is hampered by the difficulties in receiving or renewing the license to make use of existing facilities, which in this specific case are currently subject to an expired license of previous owners. This situation is highly common whenever there are existing facilities or spaces that are not private property or do not have a specific owner.

Secondly, the assessment of the feasibility and design of the PV plant have proven quite challenging due to the **limited data on consumption profiles available for small/medium companies**, as a result of lack of awareness on energy efficiency aspects. Also, it emerges that increasing the size of the plant may not be profitable due to currently low electricity prices and low consumption during the central hours of the day as well as in summer (when solar radiation and plant productivity are at their peak) or to difficulties in finding end-users with complementary consumption profiles.

It is also worth highlighting that **shared self-consumption** of self-produced energy was not authorized (i.e.: only the owner of a renewable energy plant was allowed to use the electricity produced). However, thanks to the most recent legislative developments, shared self-consumption from PV production is now allowed in Spain for plants smaller than 100 kW and for end-users located within a distance of 500 m from the generation plant.

Solutions and Policy Recommendations

The challenges encountered reflect common obstacles to the implementation of energy cooperation solutions.

In order to unlock the licensing process, the park manager has made a great effort to **engage stakeholders** (i.e.: companies of the park, public administration, local environmental authorities, energy agency and investors). The engagement has also been

beneficial for the identification of incentives and subsidies.

As for initial findings of the project (cfr. D2.1, see below for further reading), a favourable condition to improve 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. As a confirmation, in this specific case, data were 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 companies.

Finally, recent updates in the Spanish legislative framework (i.e. RD 15/2018, RD 244/2019) **incentivize the investments and facilitate exploitation of renewable energy installations**, by directly affecting the possibilities of SMEs in terms of energy data management, especially when willing to use the electricity surplus. Similarly, measures and investments, such as in energy management systems, distributed electricity generation installations, etc. are eligible for grants from the Energy Agency of the Basque Government.

Owing to the lessons learned in S-PARCS when analysing the implementation of real energy cooperation solutions in Spain, the following set of policy recommendations is proposed.

Policy Recommendations

- Assure simplified processes to obtain licenses of use for assets to be dedicated to the realization of renewable energy projects and to the reduction of greenhouse gas emissions, in line with existing European targets of carbon neutrality.
- Promote and facilitate the evaluation of projects, in terms of costs and benefits (economic, environmental,

social, ...) as a whole, thus facilitating the comparison of the proposal solutions taking into account the different agencies involved (water, electricity, infrastructure, ...) avoiding partial evaluations and allowing a more efficient decision-making.

- Facilitate companies (especially SMEs) in accessing energy consumption data, also by harmonising the energy bill format including detailed information on their energy mix, prices and demand. Thus promoting the figure of the "Active Client" in line with the European Parliament's directive 2019/944 which puts the figure of the consumer at the center of the new energy scheme. With more information, of higher quality, with a more active role in the market and a greater control of its costs, which generates its energy to store it and even exchange it with other consumers nearby or not.
- Allow and promote shared self-consumption from renewable or efficient energy generation and promote renewable energy communities whose primary purpose is to provide environmental, economic, or social benefits to their member partners or the local areas in which they operate.
- Develop flexible business models to install and exploit renewable energy installations. The business models could combine public, private or community participation on investments and exploitation.

Further reading

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