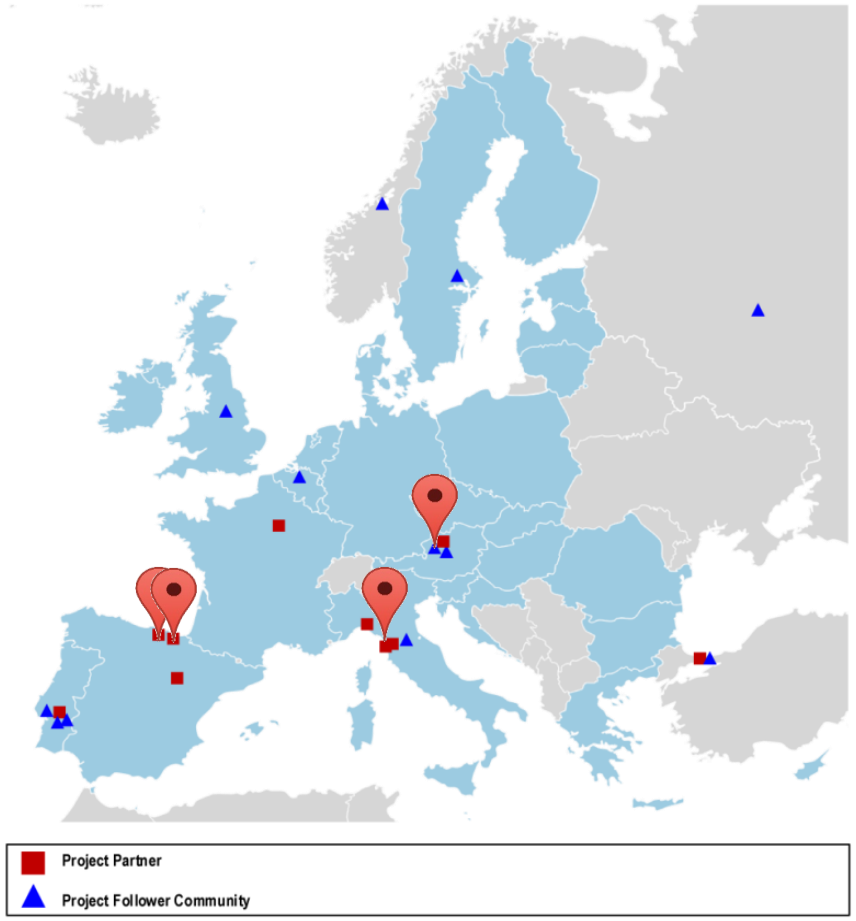
Feasibility studies

Key results of the feasibility studies of promising energy cooperation solutions for the S-PARCS Lighthouse Parks

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

S-PARCS feasibility studies: an overview



S-PARCS Lighthouse Park	Evaluated solution
Okamika-Gizaburuaga, Spain	Collaborative photovoltaic power plant
	Small hydroelectric plant
Bildosola-Artea, Spain	Public LED lightning
	Small hydroelectric plant
Ponte a Egola, Italy	District CHP
	Anaerobic co-digestion of vegetable tannery sludge
Ennshafen, Austria	Jointly organized PV installations
	Joint e-charging stations
	Shore side electricity
	Revamping old cooling water sewer
Chemiepark Linz, Austria	Cooperation with neighborhood outside the park: High temperature waste heat feed in to DHN

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Overview: Objectives and how we reached them

OBJECTIVES

1. Analyse the **most promising energy cooperation opportunities**
2. Provide **solid foundations for the next steps** with the objective of actually deploying the solution (N.B.: the studies are financed by H2020, while the installations are not)
3. **Increase awareness** on the collaboration incentives and drawbacks (company level)
4. Take into account technical, economic, environmental and social, legal and political aspects: stressing **economic and technical aspects**

ACTIVITIES

1. **Interviews and discussion** to identify the best possible options among the ones proposed by S-PARCS (and further)
2. Engagement with **park managers as well as companies** within the parks
3. **Data gathering and analysis** though questionnaires and templates
4. High level analysis and proposals of specific **scopes for the feasibility studies**
5. **Discussion** with park managers
6. **Iterations** on each feasibility study
7. Finalisation of **results, findings** and definition of the **next steps**
8. Preparation of **energy cooperation plans**

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The S-PARCS approach to energy cooperation

State of the Art of Energy Cooperation in Industrial Parks: Solutions, Opportunities & Barriers

We identified 41 energy cooperation SOLUTIONS & clustered them in 5 categories:

- Managerial Actions
- Contractual Instruments
- New physical installations
- Information and Communication Technologies
- Logistics and Mobility

→ Focus on the **cooperation part**: this is the innovation

Each solutions was matched with barriers to their implementation. **BARRIERS clustered in 5 categories**:

- Economic
- Social-managerial
- Framework (Legal/Regulatory aspects)
- Technical/Engineering
- Information provision (incl. data)

→ **Social / organizational** and information provision barriers are often the most crucial barriers for industrial energy cooperation (result from expert interviews in the park)

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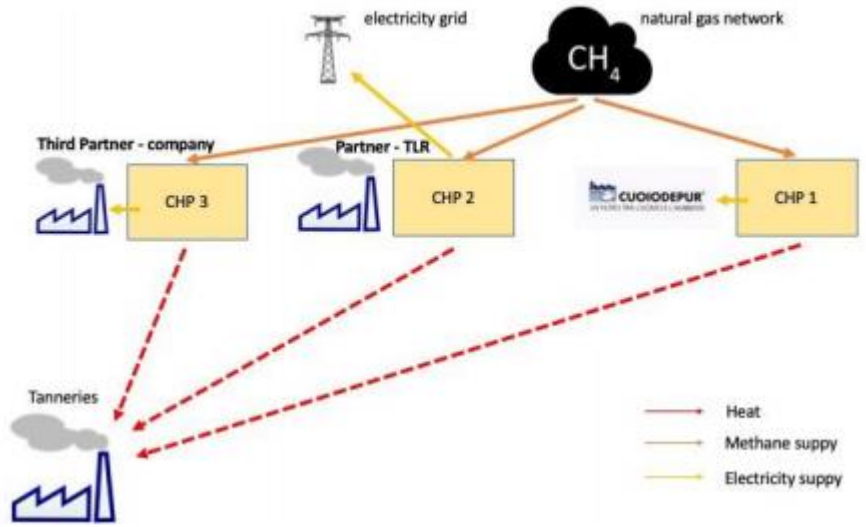
The parks: Ponte a Egola

Info on the park

Ponte a Egola → One of the most important industrial clusters of the leather producing sector in Italy and internationally.

Technical solution

The implementation of a combined heat and power (CHP) network based on three gas-based CHP plants was analysed. The concept would allow to supply the Ponte a Egola tanneries, Cuoiodepur as well as external partners with heat and electricity. Furthermore, in the future, locally produced biomethane based on tannery sludge could further increase the local economic and environmental benefits.



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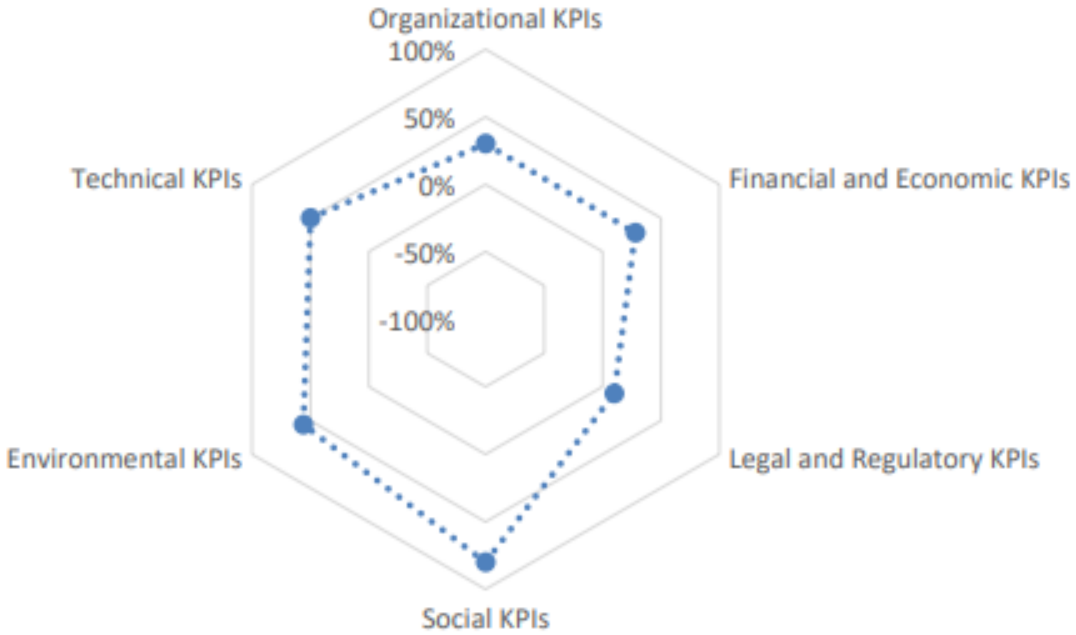
The parks: Ponte a Egola

Results

The economic analysis shows that the investment is feasible as the CAPEX and OPEX (maintenance costs) will be covered by cost savings achieved through the self-consumption of energy plus the revenues resulting from the heat sold to tanneries and power.



Next steps

The next steps will consist in carrying on the engagement of all relevant stakeholders, particularly financing bodies for support in covering the investment costs.

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The parks: Ennshafen

Info on the park

Ennshafen → It is the newest and most modern public port in Austria. Ennshafen port as a neutral infrastructure operator offers direct access to the modern trimodal port and container terminal.

Technical solution

95 % of the employees in the park are car commuters, a future increase of e-vehicles is expected for which an attractive charging infrastructure at the workplace could be conducive. Therefore, the benefit of shared e-charging stations compared to a scenario in which the companies installed their own e-charging stations was evaluated.

Technical solution

The jointly organized installation of solar-photovoltaic panels on company roofs has been studied to increase the renewable share of the park. Hence, suitable roofs and power capacities were evaluated and business models developed, in order to reduce financial barriers and generate additional benefits for the companies as well as other local stakeholders.

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The parks: Ennshafen

Results

The feasibility analysis of potential local installations of shared charging points show that shared charging points on company premises result in significant cumulative economic advantages over individual charging points and that they are competitive with charging rates offered by energy service companies or household electricity prices.

The local companies taken into consideration are all suited for the installation of PV plants with respect to high rates of self-consumption as well as competitive life-cycle-costs of electricity of the generated electricity. Financing through a joint power plant scheme provides a possibility to significantly reduce the amount of upfront equity capital necessary.

Next steps

Start with small numbers of charging stations while at the same time providing room for installing additional ones in order to avoid extensive financial burdens

Concrete price offers should be obtained, taking into consideration the local conditions for the installation of PV power plants in order to set up a detailed financing scheme.

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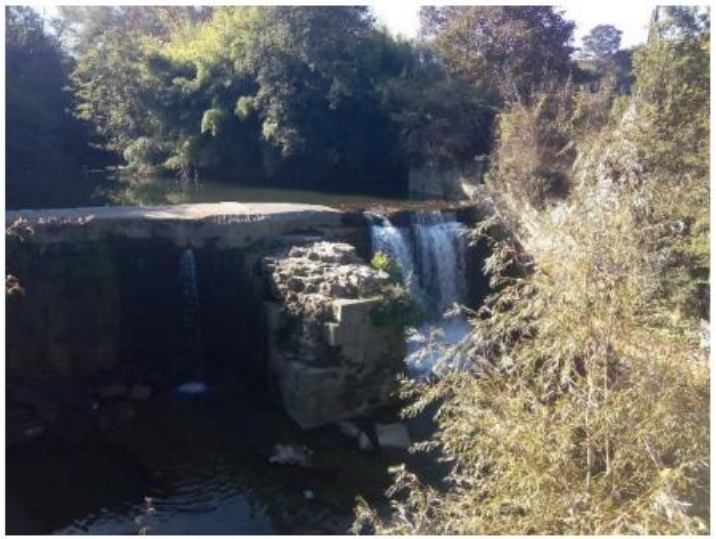
The parks: Okamika-Gizaburuaga and Bildosola-Artea

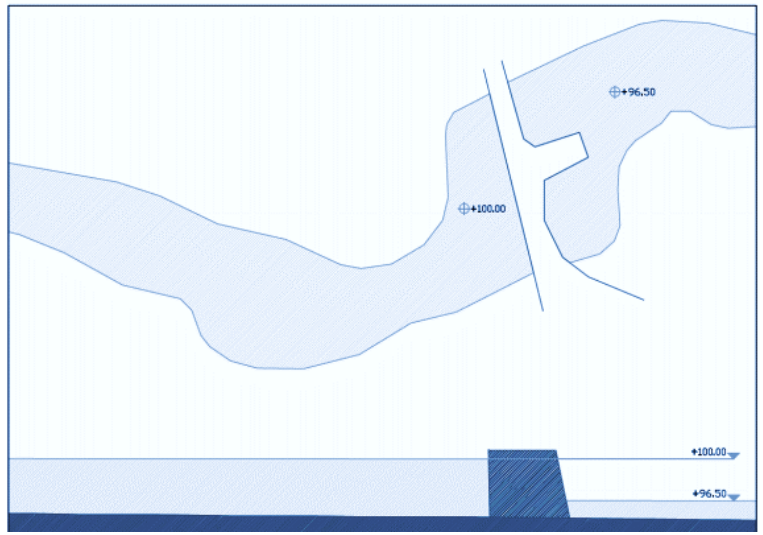
Info on the park

Okamika-Gizaburuaga and Bildosola-Artea → Result of the industrialdeak initiative. "Industrialdeak" companies, promote the business activity in the municipalities where they operate. The companies of the Industrialdeak Programme are the result of the interinstitutional collaboration between Sprilur S.A. (Basque Government), the Provincial Councils and the Municipalities. They are mixed company parks.

Technical solution

The joint investment into micro hydropower plants was evaluated. Focus was laid on self-consumption of the produced electricity by the local companies, still, (surplus energy) grid feed-in would be possible





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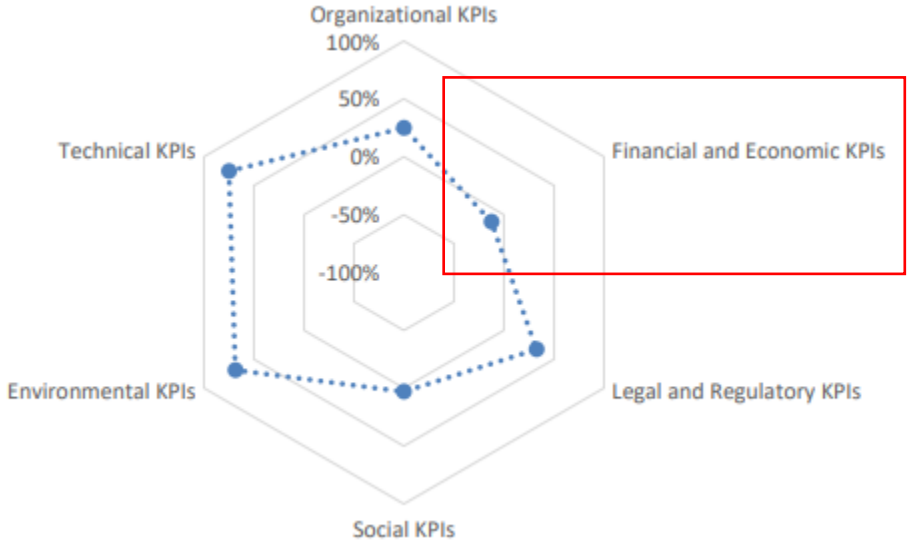
The parks: Okamika-Gizaburuaga and Bildosola-Artea

Results

Solutions related to self-consumption have proven not to be viable according to the three criteria recommended by IDAE for a plant to be viable: Energy index, Power rating and Simple return period.
It could become viable if the possibility of public support for microhydraulic generation, prioritizing its social and environmental advantages, is considered.



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The parks: Chemiepark Linz

Info on the park

Chemiepark→ it maintains a steam and cooling water network that is jointly used by several independent companies located in the park. Although the existing system is constantly optimized, further optimization opportunities exist

Technical solution

The waste heat utilization potential from Chemiepark Linz for a feed-in to the local district heating network (DHN) was analysed. The implementation could lead to economic as well as environmental benefits, furthermore it would benefit the local community.

- **Option #1: direct reuse of industrial waste heat for DHN in winter and (with the addition of absorption chillers) for summer cold production.**
- Option #2: use of the high temperature stream to replace vapour-compression cycle chillers with absorption.
- Option #3: low temperature cooling water streams using a heat pump to increase the temperature of the cooling water to the desired DHN supply temperature.

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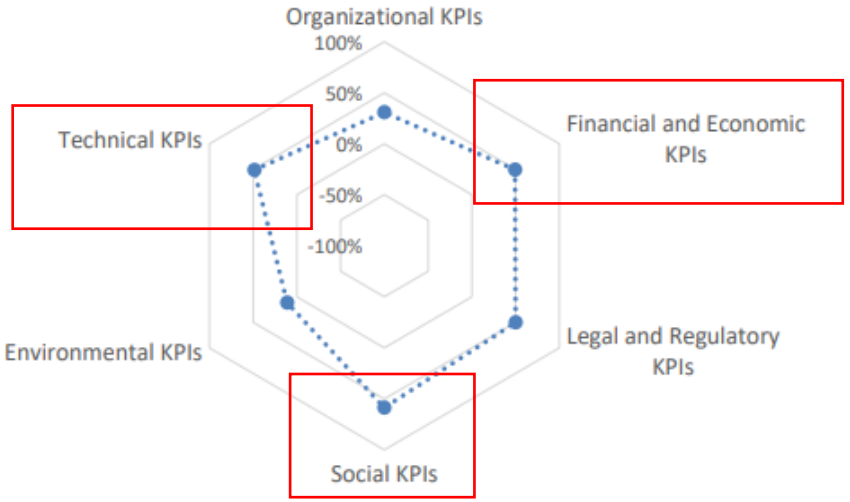
The parks: Chemiepark Linz

Results

Chemiepark Linz is integrated into the City of Linz, close to a power plant by the DHN operator and in accordance with local, national and European climate goals, further intensification of collaboration is very likely, with the current study being of exemplary character.



Next steps

As climate and environmental matters are of increasing interest in the City of Linz, the Chemiepark and apparently also for the DHN operator due to mild winters, hot summers and changed consumer habits, the basic idea of the conducted pre-feasibility study will be further discussed in order to elaborate satisfying collaborations

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Conclusions

For all Lighthouse Parks several feasibility studies of great diversity were elaborated – in terms of cooperative solutions but also with a focus on the barriers and instruments addressed and the impacts evaluated.

- ✓ Full details are presented in **D5.4** of the project available on our website, including figures and comments on the specific feasibility studies
- ✓ Methodology is the key to achieve the proposed objective as well as collaboration with the relevant stakeholders

➢ In all parks solutions were found!!

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Thank you!

http://sparcs-h2020.eu

Francesco Peccianti – RINA Consulting
francesco.peccianti@rina.org