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Important to think of when you prepare for this training

- This training material is primarily prepared as a face-to-face / on-location training opportunity for a group of 8-15 persons, ideally representing 4-8 different SME clusters.
- It can also be carried out as a trainer-led online training event for the same type of group. Suggestions for adapting interactive elements in such a case are included, but some further adaptations may be needed.
- The target group includes Trusted Partners (or potential new Trusted Partners) but also other stakeholders that may be involved in the development of local energy collectives, e.g., energy auditors, energy experts, local energy advisors, etc.
- The training should be interactive – with the aim that participants will actively contribute and learn both from you and each others' experience.
- Interactive elements are marked with the symbol to the right. Sometimes alternative options are given. Choose and adapt so that you do it in a way that best suits you and the group.

- You will find explanatory notes about the content of the slides in the **notes** of this presentation as well as extra material to read. Some specific notes on how to lead the training are added under *Instructions to the trainer* and *Note for the trainer*.

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Messages to convey in this training

Learn how to organise collective energy projects in business parks

Learn the benefits of collective energy projects for SMEs

Learn how you can design the role as a Trusted Partner* in the process of organising collective energy projects

Find inspiration for developing a way of working that is relevant to everyone's own situation

* This training is relevant to anyone who has/will have a coordinating/supporting role in relation to a local cluster of SMEs (a Trusted Partner) and wants to address energy efficiency and sustainability in that role.

This can be any person working with business park management, a local industry association, climate and energy advice, municipal business development, etc.

The training material combines theory on specific topics with concrete examples and interactive activities based on the participants' own experience.

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Collective energy projects

LEVEL II – Unit A

This project has received funding from the European Union's H2020 Coordination Support Action under Grant Agreement No. 894356.

Who are we?

Insert your own picture and contact info

Key elements Level I

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What do we mean with ‘collective energy projects’?

- Implementing energy efficiency measures **together**
  - Two or more SMEs join forces

- A Trusted Partner takes a facilitating role, partly unburdening the individual SMEs
  - This role can be taken by one or several of the SMEs, or a business park association, but also in some cases a municipality or energy service supplier

Examples of collective energy projects

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Area	Building	Energy Culture of companies
Buffering, Storage	Solar panels	Efficiency
PV on land	Insulation	Individual SME Barriers AND Drivers
Heat network	Heating	Behavior
Wind mills	LED lighting	
	Sensors	
	Building management	

Circularity	Transport

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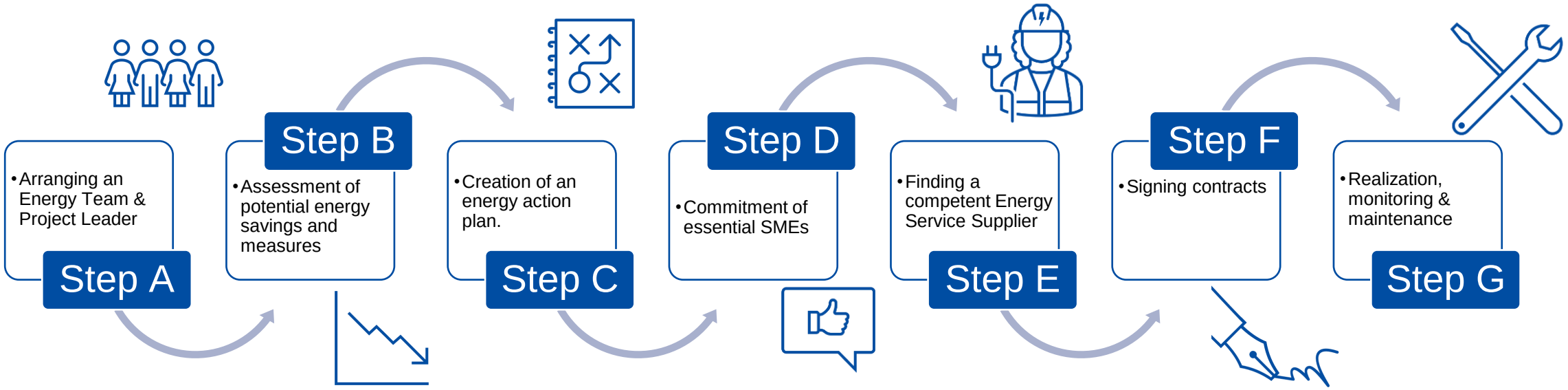
Generic overview of the process



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Step A: Arranging an Energy Team & project leader

Function of an Energy Team

- Leading this process
- Support for you (Trusted Partner)
- Needs a project leader

An energy team can consist of:

- Several ambitious SMEs (e.g. 5)
- The Trusted Partner
- A representative of a business association

Outcome of this step: a dedicated energy team and selected project leader (problem ownership)

Level 2 - How to organise collective energy projects?

Interactive session

- What actions do we need to put in place?
- When do we need to put them in place?
- What role does the TP have in each action?

Assessment of potential energy savings and measures

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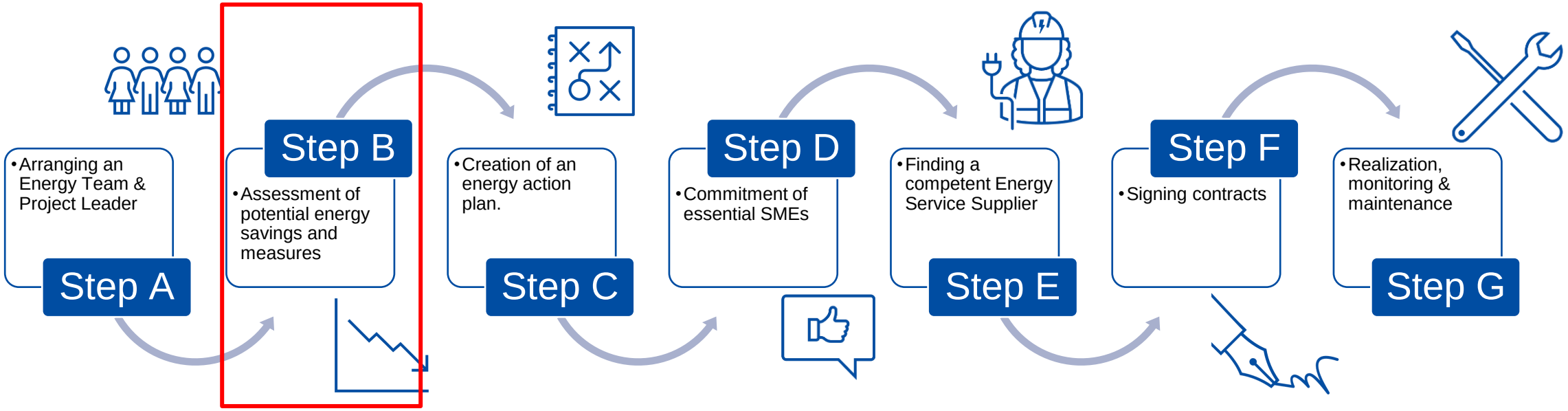
Generic overview of the process



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Step B: Assessment of potential energy savings and measures

Two approaches

- Energy audits for each SME (individual)> company-level measures
- Energy scan for the whole location of SMEs, e.g. business park, industrial area (collective)> area-level measures.

Not alternatives to each other, but strengthening each other

Outcome of this step: Identification of potential energy projects and their energy savings potential (needed for business case)

Examples of collective energy projects

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Area	Building	Process
Buffering, Storage	Solar panels	Efficiency
PV on land	Insulation	Behavior
Heat network	Heating	
Wind mills	LED lighting	
	Sensors	
	Building management	

Circularity	Transport

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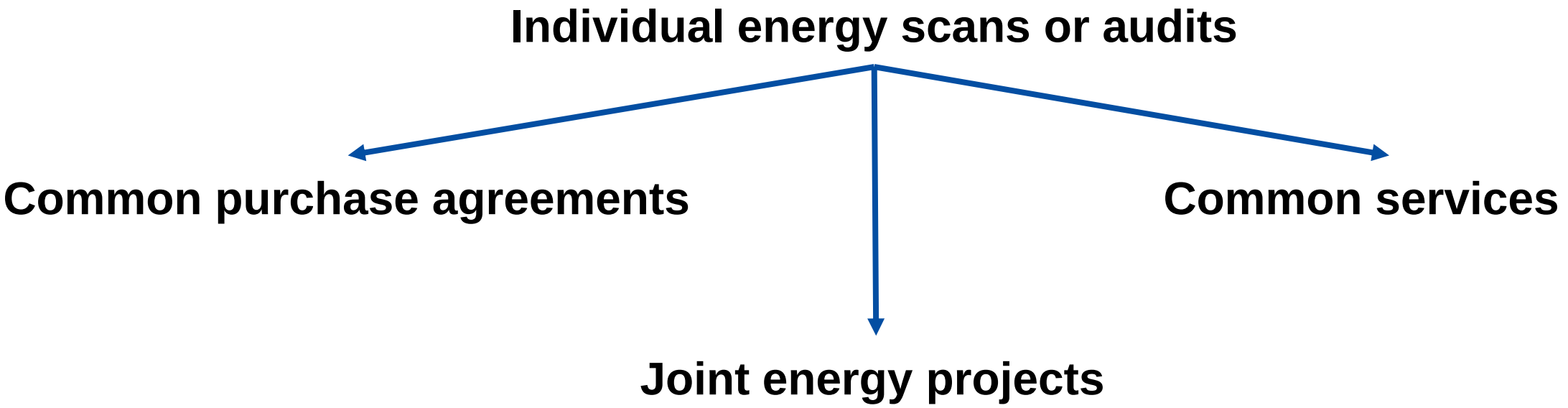
Action: Assessment of potential energy savings and measures

Final objective: Identify one main project idea to carry out collectively



Individual energy scans

Energy scans are **simplified energy audits** that can be performed **without an energy experts**

- They require relatively little information from the SME
- They can be:
  - Self-performed by the SME
  - Filled with the supervision of the trusted partner
- They **do not substitute energy audits**

The aim is to **raise awareness** about the SME's situation and identify **possible energy saving solutions**

Energy scans tools are available at https://www.energyefficientsme.eu/

Individual energy audits

Energy audits are **in-depth analyses of a company's energy situation**, performed by experts

- They provide a detailed **economic** analysis
- They require **commitment from the SME**
  - Provide meaningful and reliable data and information to the auditor
  - Contribute actively to the discussion

The aim is to **improve the understanding** of the company's energy needs and **identify solutions for improvement**

Business-park level energy audits

A business park energy audit aims at

- Focuses on **common aspects**, such as shared demands for mobility, services, etc.
- Allows identifying **synergies** among companies, related to e.g. energy or material flows

The aim is to **identify solutions at business park level** to improve efficiency and save energy and money to the companies.

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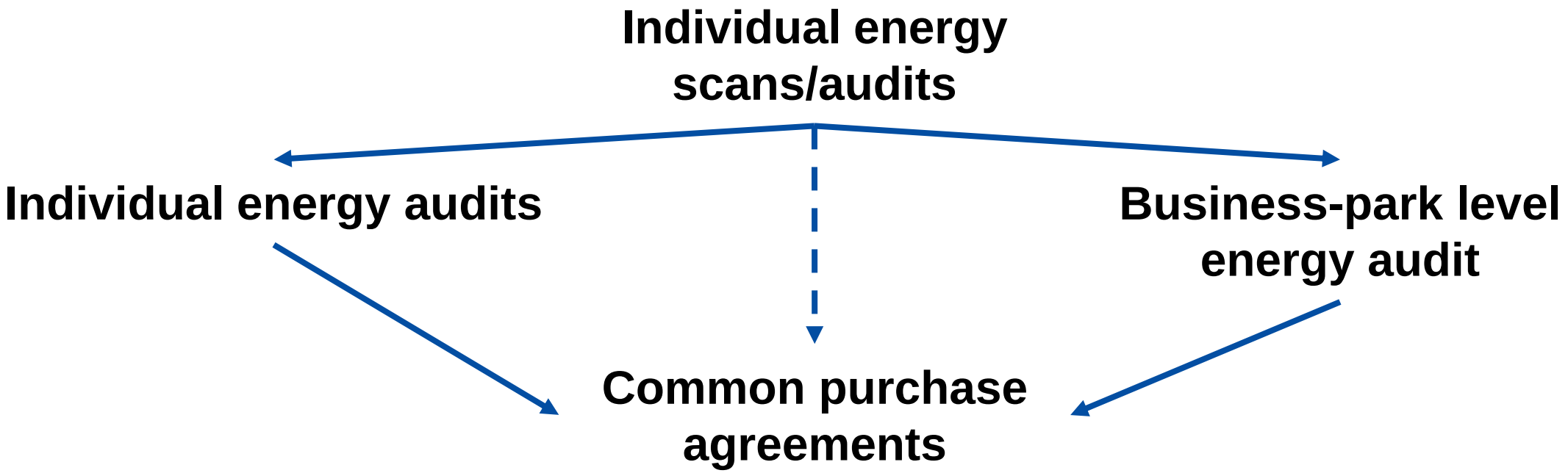
Common purchase agreements



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Common, “business-park level” services

Business-park energy audit

Individual energy scans/audits

Identification of common need for services

Common service agreements

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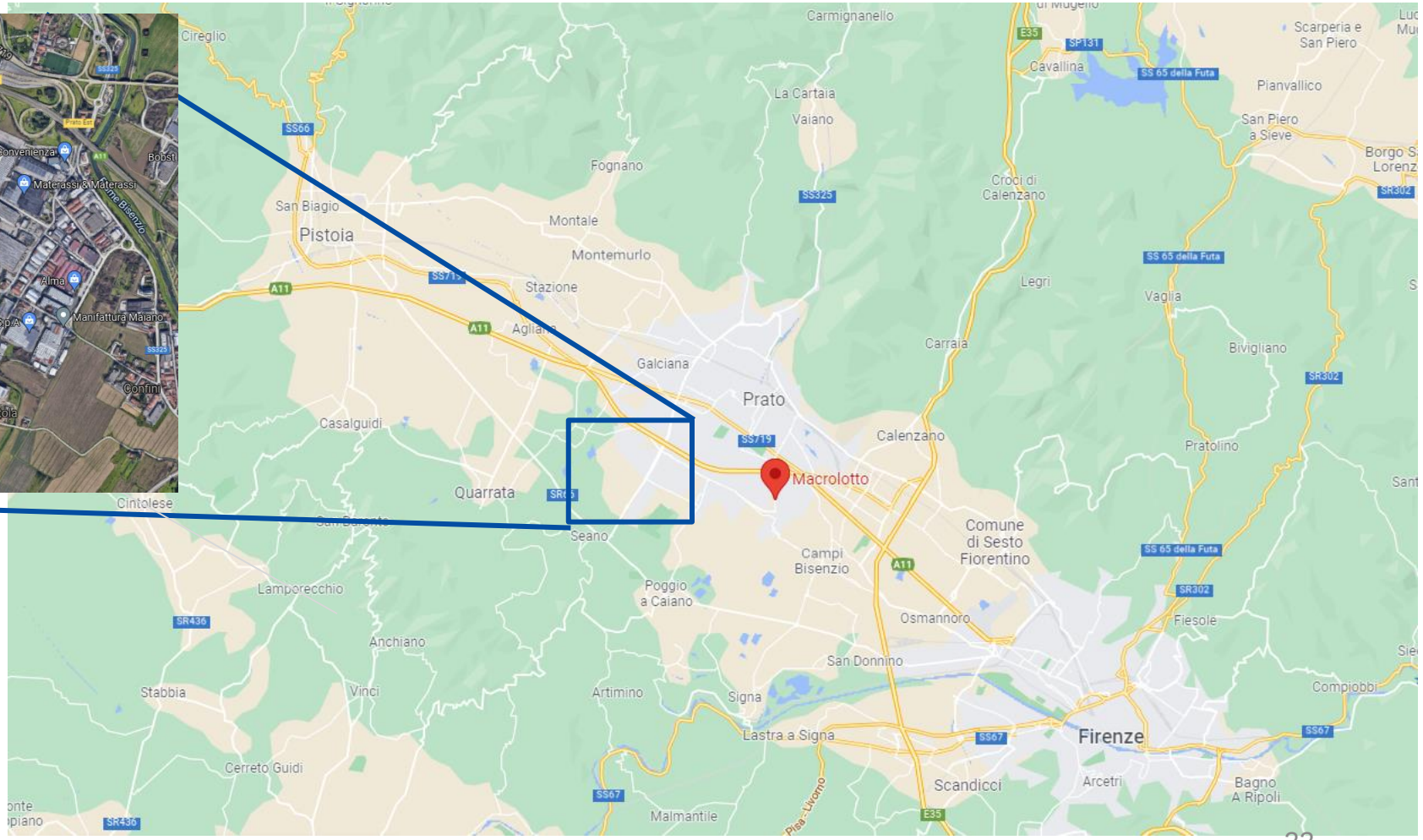
Shared electric mobility - Macrolotto (Prato, IT)



- Industrial area of more than 350 SMEs, mostly textile
- Fleet of **EVs for car-pooling** shared in the industrial park

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Synergic projects

Business-park energy audit

Individual energy scans/audits

Identification of potential synergies

Synergic projects

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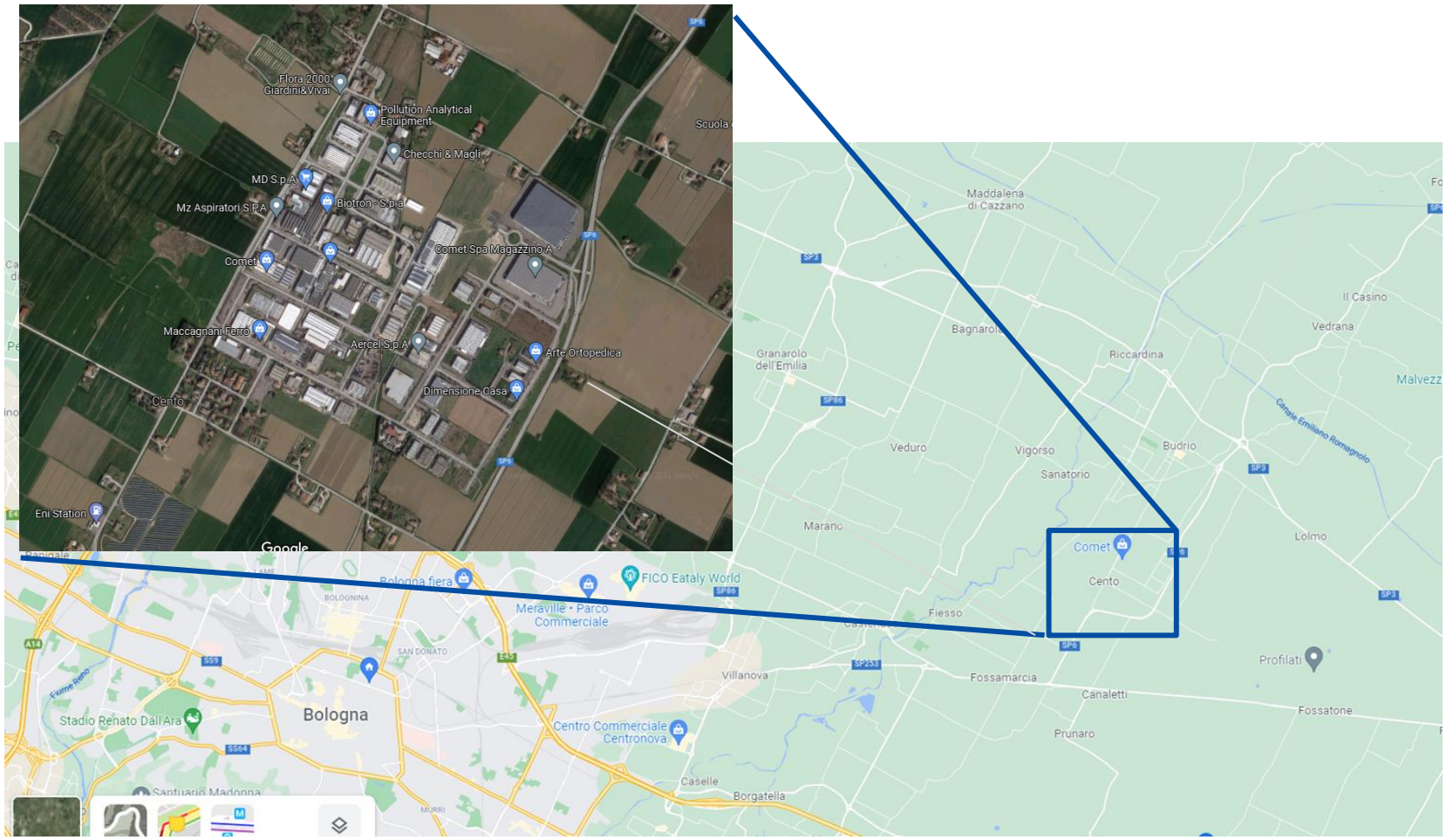
Local district heating - Cento di Budrio (IT)



- Industrial area of more than 100 SMEs
- Waste heat from local food production plant is transferred to a **local district heating network** and shared with the other SMEs

How to choose?

Step B can lead to many project ideas.

How do you evaluate them? How do you choose among them?

How to choose?

Economic indicators	Payback time
	Net present value
	Internal rate of return
Environmental indicators	Primary energy savings
	Avoided CO_2 emissions
	Other avoided pollutant emissions

Payback time (PBT)

The simplest of the indicators: after how much time have we recovered the initial investment?

$$PBT = \frac{Investment\ cost\ [EUR]}{Savings\ [^{EUR}/_{year}]}$$

Clearly, lower PBTs are better!

Net present value (NPV)

More advanced indicator. Answers to the question “what will be the overall value of the investment at the end of its lifetime?”

$$NPV = \sum_t \frac{Cash\ flow(t)}{(1+i)^t}$$

Where *i* is the interest rate of an investment of similar risk to the one under consideration

A **Positive** NPV mean that, by the end of its lifetime, the project is more valuable than a generic investment of similar risk

Internal rate of return (IRR)

Similar to the NPV. Answers to the question “if this was an investment, what would be its interest rate?”

In practice, it is the value of *i* in the calculation of the NPV that makes it equal to 0

$$0 = NPV = \sum_{t} \frac{Cash\ flow(t)}{(1 + IRR)^t}$$

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Environmental indicators

1) How do we compare energy in different forms?

$$EI = \sum_i E_i f_i$$

- E_i → the amount energy saved of type i (e.g. electricity, natural gas, etc)
- f_i → the conversion factor to primary energy or avoided CO_2 emissions
- EI = primary energy or avoided CO_2 emissions

Other avoided pollutant emissions

2) Energy and CO_2 emissions are not the only emissions avoided when saving energy

The avoided emissions of SO_X, NO_X, PM, but also sources of water pollution, can and should be accounted

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Introduction to the GEAR@SME - Business Case Tool

Multiple (non-energy) benefits

Indicate

Select benefits that can be expected as a result of implementing the energy efficiency measure

Note that the columns below show examples only, and other indicators may be more relevant for a specific energy efficiency measure or company.

	Alt A	Alt B	Description/specification	Quantify *Examples of indicators, whose expected improvement may be possible to estimate to quantify the benefit*	Monetize *Examples of economic parameters, which may be known or estimated, that can be used to calculate an economic value for the benefit*
	0	0			
Production					
Increased production	☐	☐		units produced	profit per unit produced
Higher productivity	☐	☐		units produced per unit of input	revenue per unit sold
Improved equipment performance	☐	☐		share of output that fulfills default specifications	
More reliable production	☐	☐		number of production disruptions, or downtime	cost of production disruption, lost production revenues
Better and/or more consistent product quality	☐	☐		number of complaints/returns, share of on-spec. product	
Reduced scrap/rework costs	☐	☐		amount of scrap	cost of rework/disposal
Improved capacity utilisation	☐	☐		utilisation rate/throughput	
Lower product losses / Increased yield	☐	☐		losses or yield	revenue per unit sold
Shorter processing cycles	☐	☐		number of cycles per day or week	profit per processing cycle
Operation and maintenance					
Lower maintenance needs	☐	☐		maintenance requirement (personnel man-hours/materi	cost of maintenance
Easier system operation	☐	☐		man-hours required for a procedure	
Reduced wear and tear on equipment/machinery	☐	☐		maintenance requirement (personnel man-hours/materi	cost of maintenance
Extended life of equipment	☐	☐		economic lifetime	annulaized equipment cost
Reduced cleaning requirements	☐	☐		time needed for cleaning / time interval between cleanir	cost of cleaning
Reduced downtime	☐	☐		downtime	lost production revenue per hour downtime
Greater control of equipment and temperatures	☐	☐		share of on-spec. product, measured variations	
Reduced need for engineering controls	☐	☐			
Reductions in labour requirements	☐	☐		number of man-hours needed	salary cost
Reduced consumption of utilities/ancilliaries	☐	☐		use of e.g. water, cooling chemicals, facilities needed	cost of utility production
Reduced back-up requirements	☐	☐		pieces of back-up equipment needed	
Work environment					
Better worker safety	☐	☐		days of sick leave, number of accidents	rehabilitation costs, sick leave costs
Reduced noice	☐	☐		noice volume, time of exposure	
Better lighting	☐	☐			
Greater comfort	☐	☐		indoor temperature, humidity etc	
Better air quality	☐	☐		concentration of carbon dioxide, particles, etc	

Creating an energy action plan

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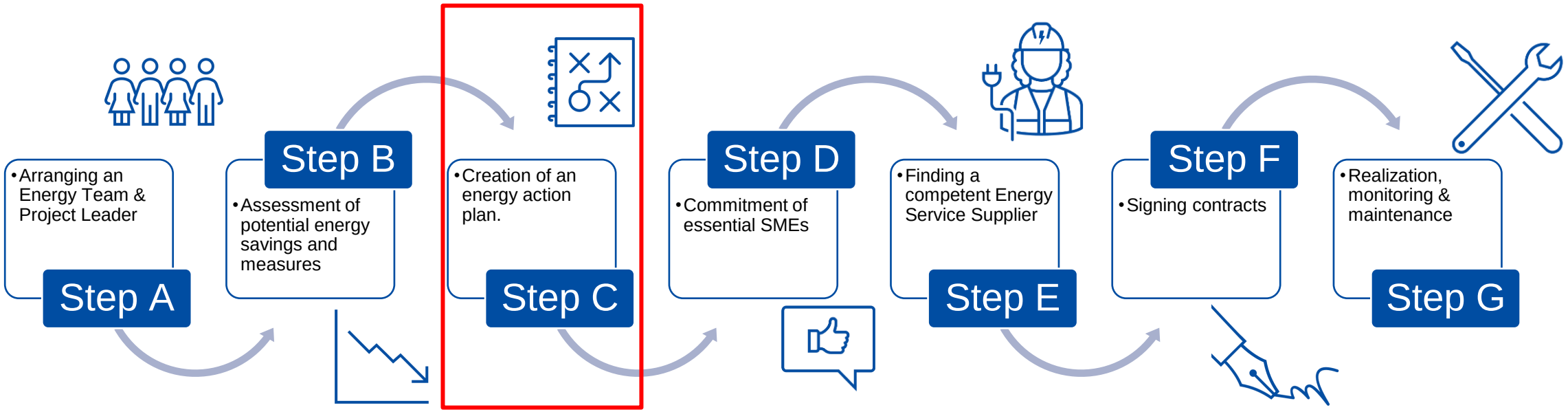
Generic overview of the process



Step C: Creation of an Energy Action Plan

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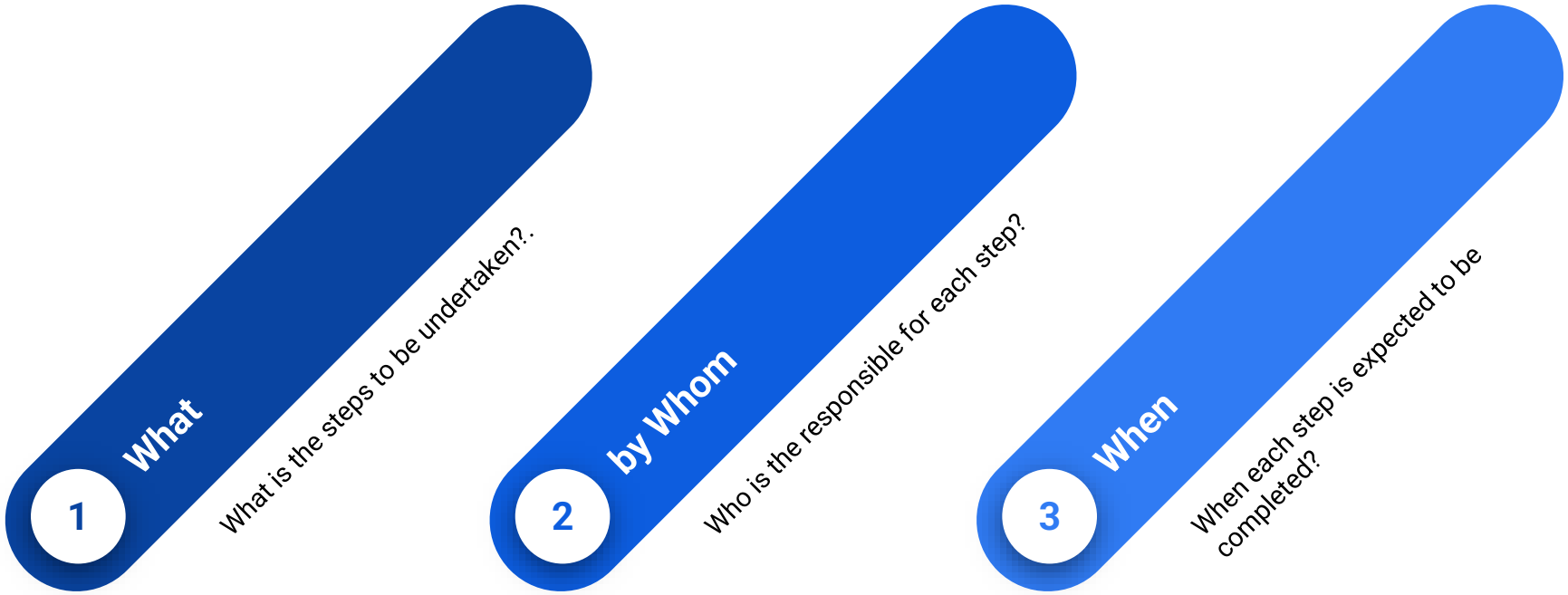

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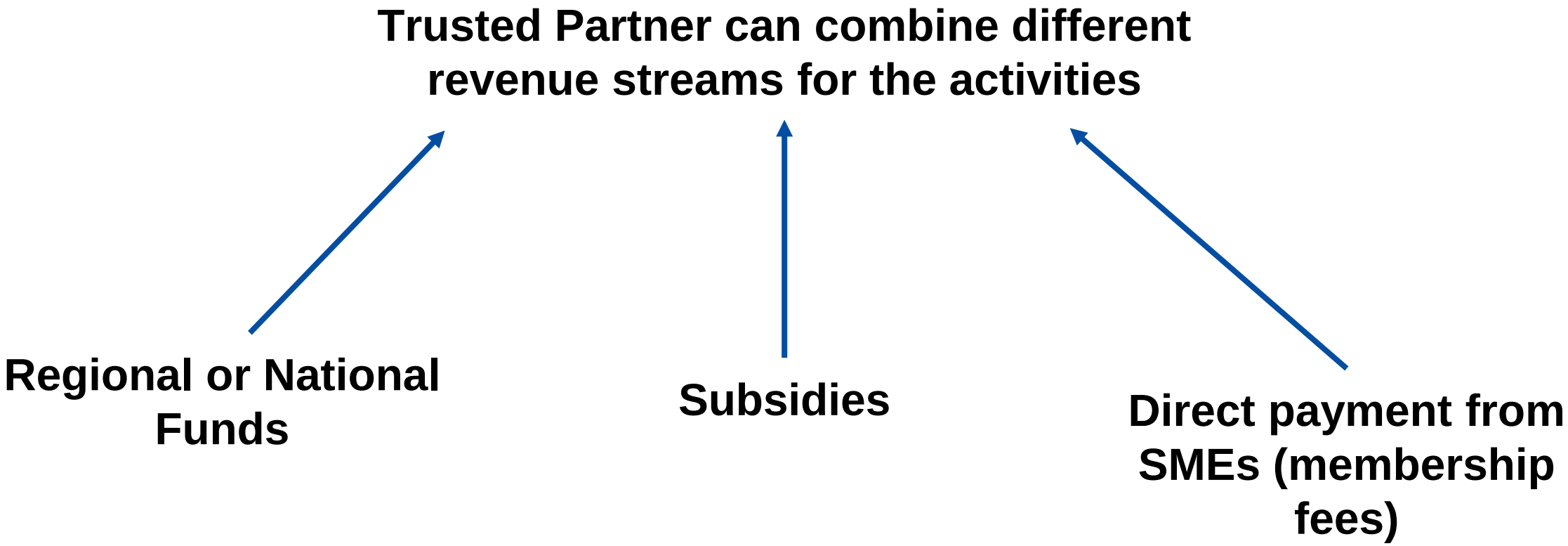
In-depth steps

1. (Pre-financing for the development of Energy Action Plan)
2. Create the Energy Action Plan
3. Discuss and Finalize the Energy Action Plan

C.1: Pre-financing for the development of Energy Action Plan



C.1: Pre-financing for the development of Energy Action Plan

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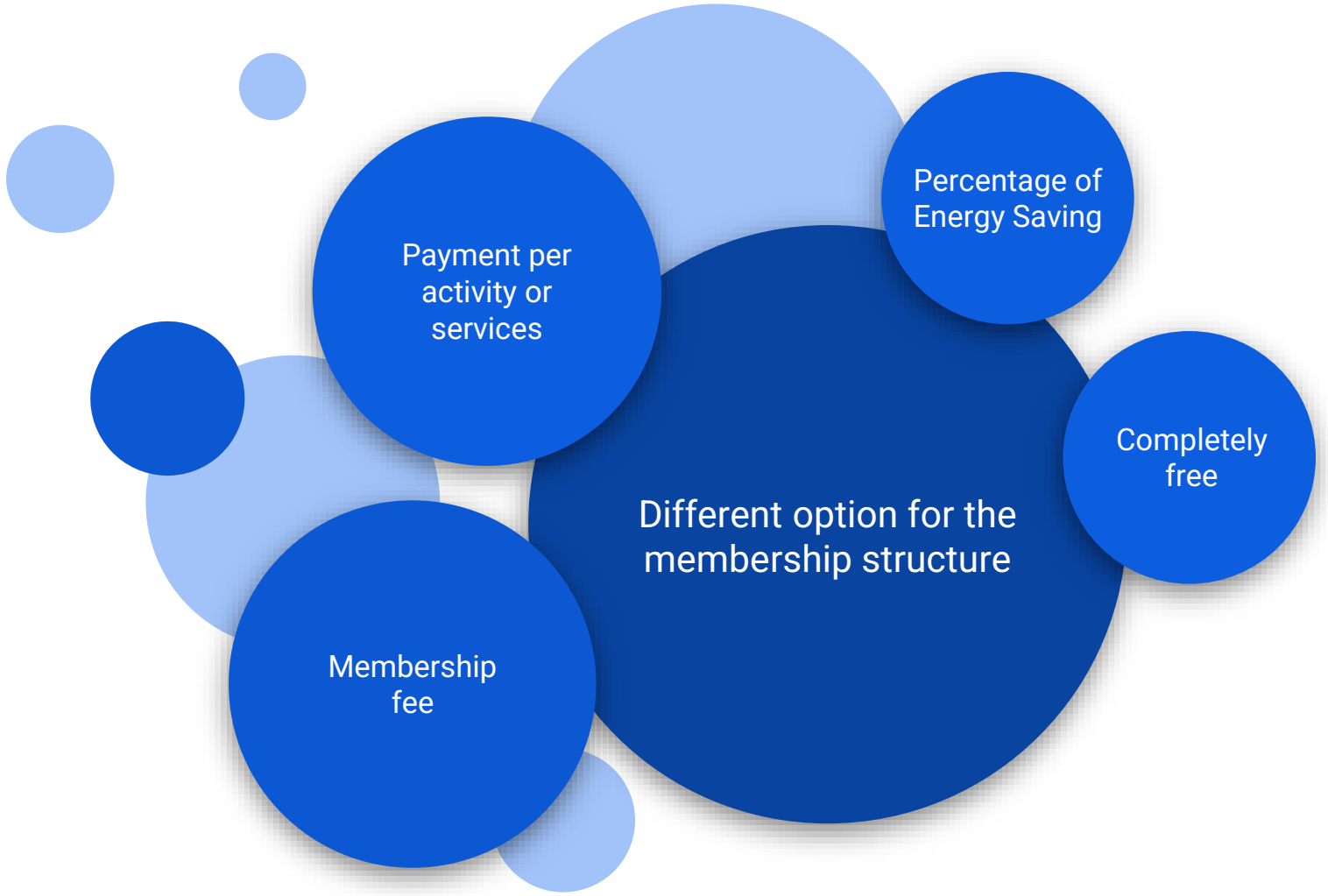

C.2: Create the Energy Action Plan

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Energy Efficiency measure selected

Analyze process in detailed

Define the Timeline

Agreement among Energy Team

C.2: Create the Energy Action Plan

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Action plan for energy efficiency (compact)

Updated date:

#	Description of measure	Persons(s) responsible	Status	Target date	Method for follow-up
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

What should be done

By Whom

When

Action plan approved by: _____

Signature _____

Date _____

C.2: Create the Energy Action Plan

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Action plan for energy efficiency (detailed)

Updated date:

#	Energy target addressed	Area/ Equipment	Description of measure	Type of measure	Person(s) responsible	Status	Target date	Expected energy saving (kWh/yr)	Reduced CO2 emissions (kg/yr)	Net cost savings (euro/yr)	Investment cost (euros)	Non-energy benefits / Other consequences	Method for follow-up	Result of follow-up	Comment
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															

Information about energy savings, emission reductions, costs and multiple benefits

Action plan approved by: _____

Signatur _____

Datum _____

Exercise – Create your Energy Action Plan

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Action plan for energy efficiency (compact)

Updated date:

#	Description of measure	Persons(s) responsible	Status	Target date	Method for follow-up
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

Action plan appr

Date

Measure: Installation of PV Panels and the the Electric Energy among the Energy Team. You, as a trusted partner, have to create the business plan. What are the steps to be taken, who is responsible and what is a feasible timeline for the project?

C.3: Discuss and finalize the energy action plan

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Action plan for energy efficiency (compact)

Updated date:

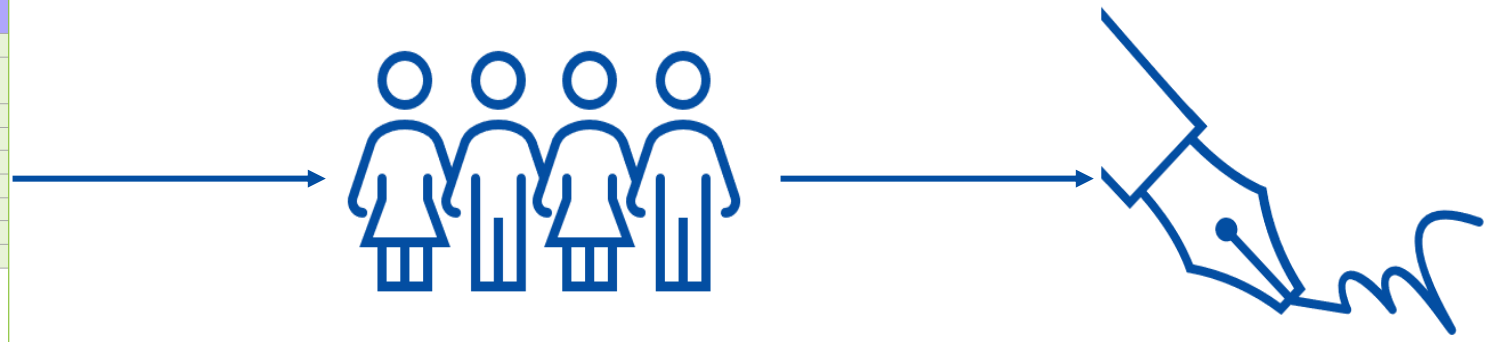
#	Description of measure	Persons(s) responsible	Status	Target date	Method for follow-up
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

DRAFT

Action plan approved by: _____

Signature _____

Date _____



Commitment of essential SMEs

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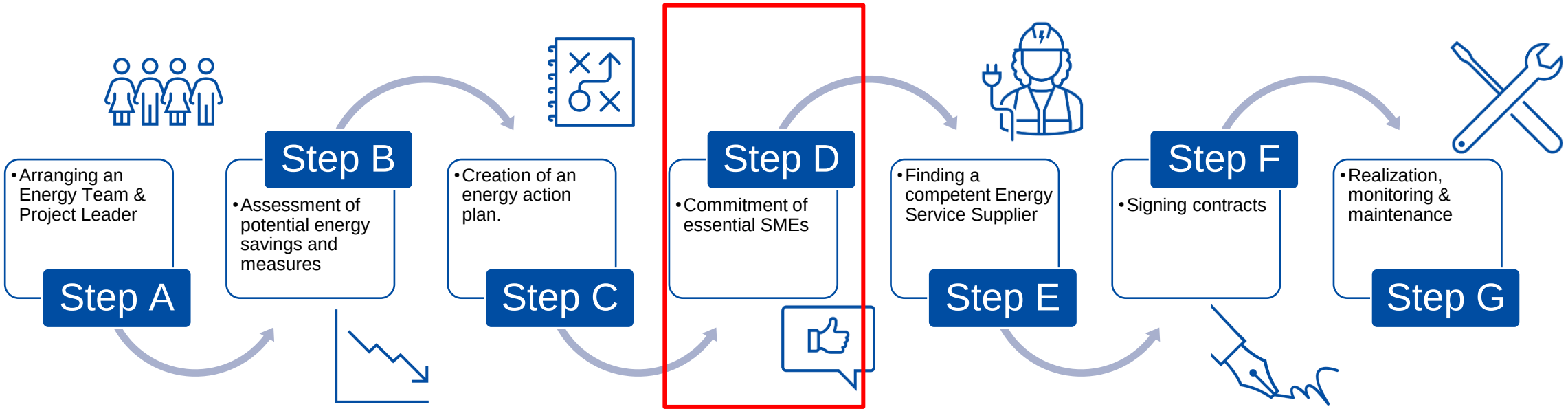
Generic overview of the process



Step D: Commitment of Essential SMEs

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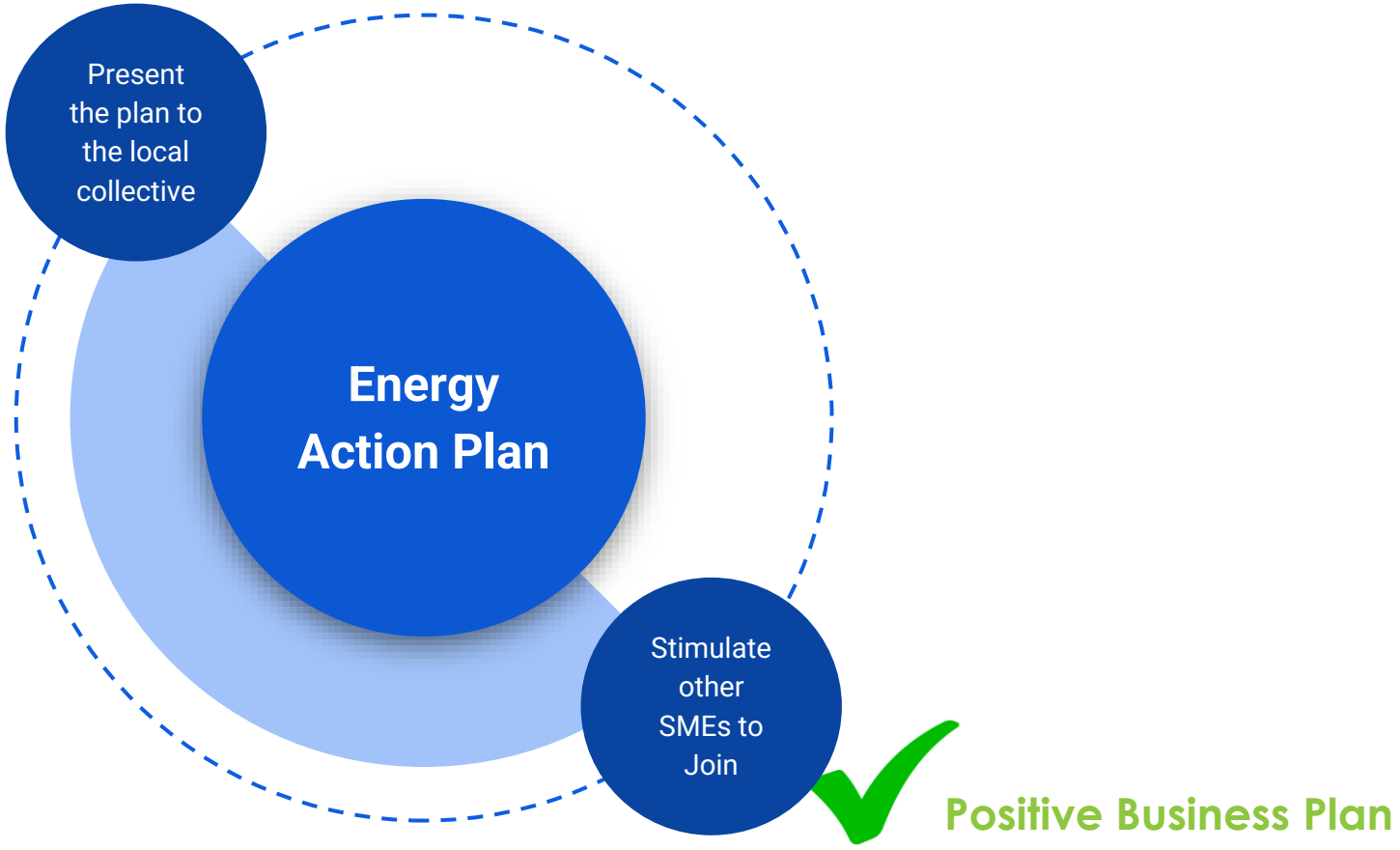

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In-depth steps

1. Explain the idea to other SMEs
2. Conduct additional energy scans and audit at SMEs
3. Engage enough SMEs

D.1: Explain the idea to other SMEs

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Support the Energy Team to organize the event for other SMEs

Communicate the plan using the right drivers

D.2: Conduct additional Energy Scans and Audits at SMEs

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Join the collective Energy Project

Energy Scan

Energy Audit

Updated Business Plan

D.3: Engage enough SMEs

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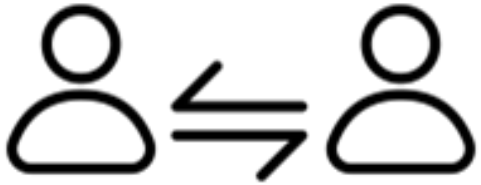
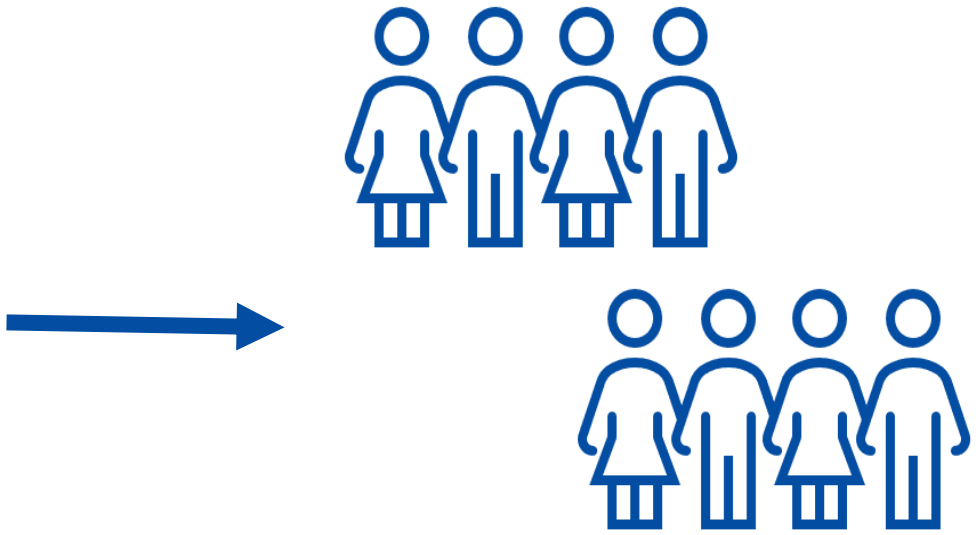


Inclusion of other companies in the energy project



Agreement on the Energy Action Plan

Case Study - Energy Community in the Municipality of Melpignano (IT)

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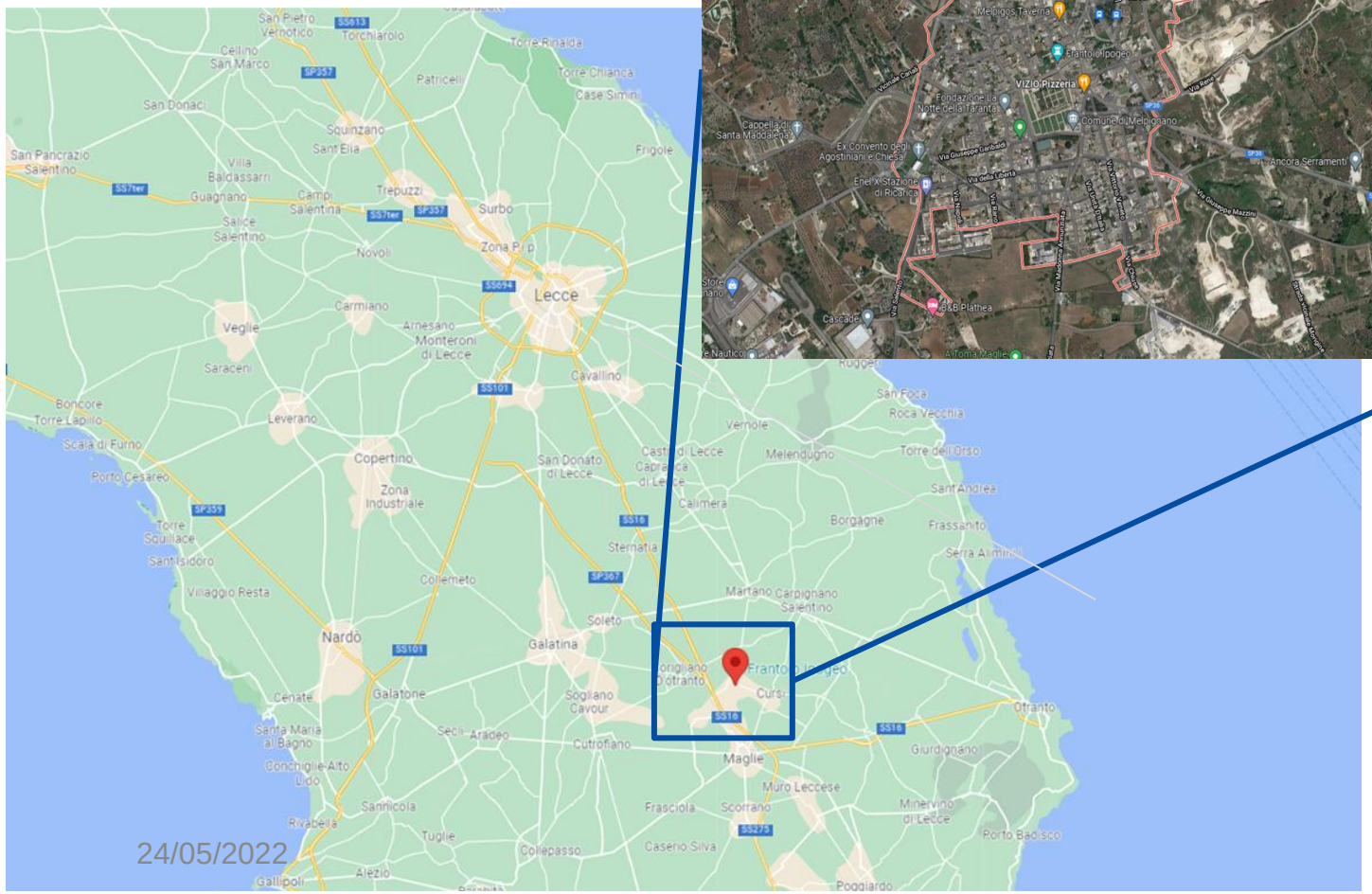

- **"Community Cooperative"**
- Made up of **members-citizens-users**
- initial goal of creating a widespread **network of photovoltaic systems** on the roofs of homes, businesses and public buildings.

Case Study - Energy Community Comunità di Melpignano (IT)

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Step A

Energy Team:

- Citizens
- Local Administration (Leader)

Step B

Solar panels

Solar Panels on:

- Houses
- SMEs
- Public Buildings

Case Study - Energy Community Comunità di Melpignano (IT)

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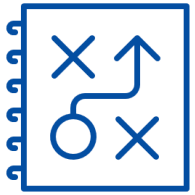
Step C



- Create the energy action plan
- Communicate the plan with initiatives of capacity buildings

Step D

Commitment of further citizens and the SMEs:

- Citizens/SMEs who have usable space

179.67 kW of PV system installed

Training summary

- Assessment of potential energy savings and measures
  - Use of energy scans and energy audits
  - Three suggested pathways: common purchase agreements, common services, joint energy projects
  - Evaluation based on economic and environmental indicators

- Creation of an energy action plan
  - (Pre-financing for the development of Energy Action Plan)
  - Create the Energy Action Plan
  - Communicate the Energy Action Plan to Energy Team

- Commitment of essential SMEs
  - Explain the idea to other SMEs
  - Conduct additional energy scans and audit at SMEs
  - Engage enough SMEs

Questions & Feedback

Thanks for your attention!