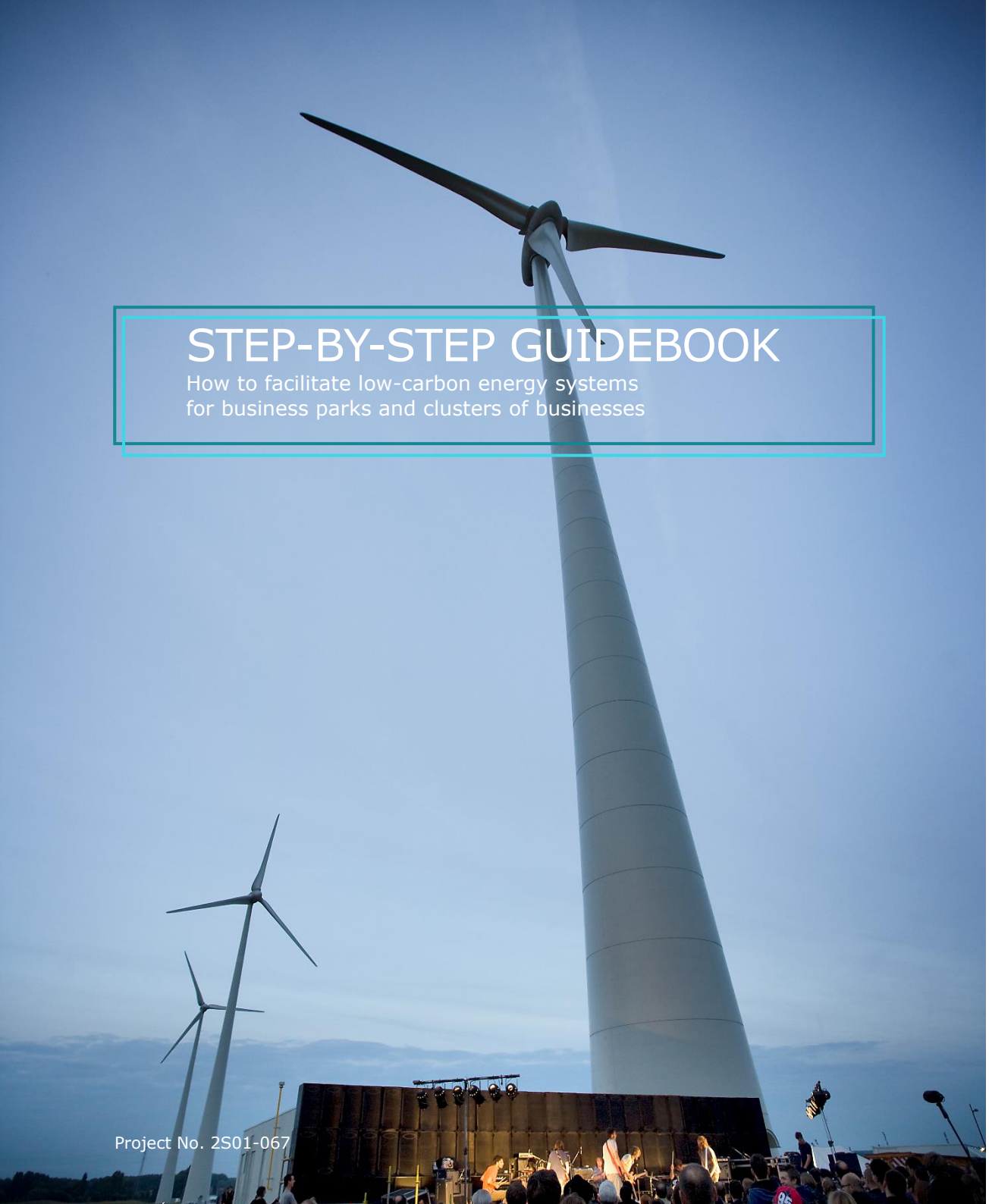


STEP-BY-STEP GUIDEBOOK

How to facilitate low-carbon energy systems
for business parks and clusters of businesses

Project No. 2S01-067

Interreg
2 Seas Mers Zeeën
BISEPS
European Regional Development Fund

Introduction

Heat and electricity are an essential to industrial processes and drive what we do in all workplaces, be they offices, shops, leisure facilities or logistics companies. Many businesses may not be overly concerned about where their energy comes from or what it costs financially and environmentally. Others will have significant concerns about energy costs, how reliable and secure their energy supply is and whether the energy is sustainably produced with low or zero carbon emissions.

Clusters of businesses, such as business parks, fall into the latter category because they are at the heart of the energy system. They have an intense demand for different types of energy (low and high-temperature heat, kinetic energy, reactive energy, etc.) and significant potential for waste heat production. As such they have the potential to become enabling hubs in the energy transition, supporting the shift towards a clean energy infrastructure.

Until recently they have relied largely on energy (electricity and gas) from fossil fuels. In the future they will be powered by solar energy from panels installed on company roofs, wind energy from shared turbines on the business park and district heat networks. The future energy system in a carbon neutral world will feature energy storage using hydrogen and batteries combined with a demand/supply response via smart grids and waste heat recovery via intelligent and adaptive district heating systems.

Potential energy production for business park			energy consumption
			
Potential wind energy 2.880.000 kWh/year	Existing solar energy 9.257.400 kWh/year	Potential solar energy 80.007.481 kWh/year	
92.144.881 kWh/Year			**51.612.995 kWh/Year**

Business parks tend to feature small to medium sized enterprises (SMEs) that lag behind larger companies in adopting low-carbon energy solutions. This means that the potential for the business park as a clean energy hub often goes unrealised. The reasons for this can include a lack of knowledge about low-carbon energy solutions, a low sense of urgency, little intention or capacity to invest time or capital, roofs unsuitable for solar power, complex energy regulations and a lack of effective policies encouraging business parks to invest in clean energy.

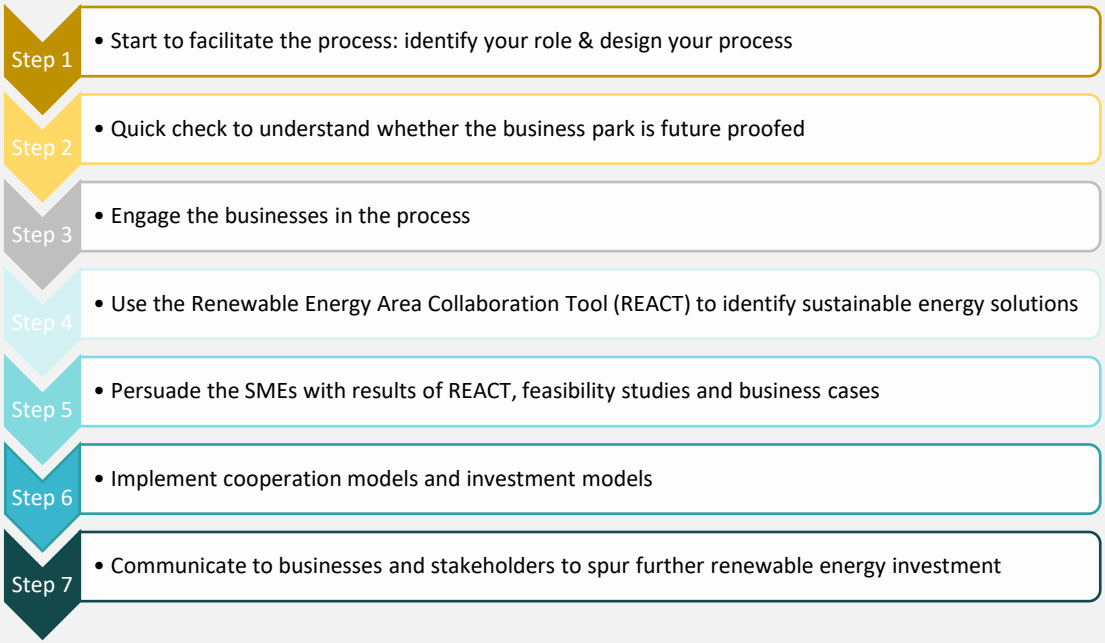
This is the context within which eight organisations in Belgium, France, Netherlands and UK set out to engage SMEs in the energy transition by setting up test sites, or 'living labs', through the BISEPS project. Within each living lab, a business park manager, a business support organisation (i.e. Business Improvement District), or cooperation of businesses was identified and engaged as the local facilitator to support SMEs in finding sustainable energy solutions. Businesses were supported to work together to achieve economies of scale and other mutual benefits. This approach helped to 'unburden' SMEs in the transition towards clean energy.

This guidebook draws on the experiences from each of the living labs and sets out best practice in starting the energy transition within business parks and helping to future proof the companies that operate there.

This guide will help to answer questions for business parks or groups of businesses considering the transition to clean energy, such as:

- What does a future proof business park look like? What are the challenges ahead and how can innovation help overcome them? What is possible today in Belgium, France, the Netherlands and the UK?
- What are successful strategies for engaging businesses in the energy transition? How can it be made easier for SMEs to benefit from the energy transition? How can businesses cooperate on energy issues?
- How can you trigger investment in sustainable energy on business parks? What are the most effective business models?

This step-by-step guidebook will illustrate how to design a process for delivering the energy transition on a business park or within a group of businesses while reducing the burden of that process on SMEs. The following chapters set out the 7 steps in the process.



This step-by-step guidebook is based on the experiences of 8 partners from Belgium, France, UK and the Netherlands, cooperating in the framework of the BISEPS-project (Interreg 2-Seas). This guide is available in English, French and Dutch on www.biseps.eu, or on www.react.biseps.eu

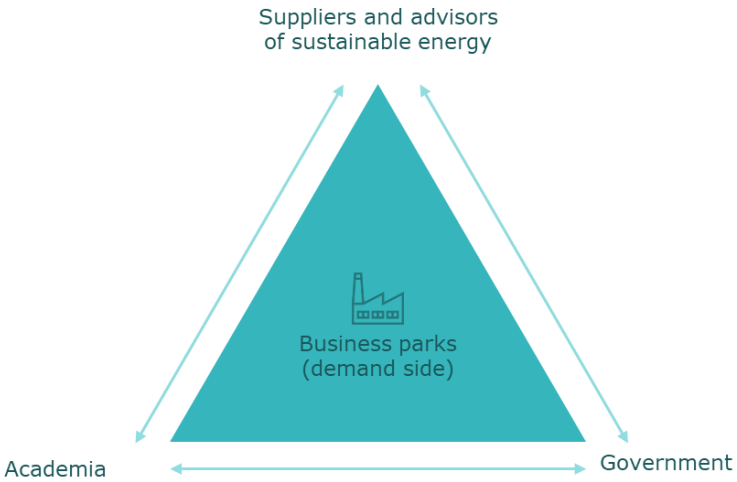
Step 1: Start to facilitate the process: identify your role & design your process.

To deliver the energy transition on a business park, the park owners, the companies located there and their energy suppliers and advisors need to work collaboratively and understand the value of emerging ideas on CO_2-reduction and the importance of applying them to their businesses. However, for many, energy isn't part of their core business and, as a result there is little time and resource allocated to working co-operatively on energy projects with neighbours.

The role of the facilitator in the energy transition, be they a business park owner, business support organisation or other group, is to reduce the burden of implementing clean energy solutions on the business park. There are three clear steps in designing an "easy" energy transition:

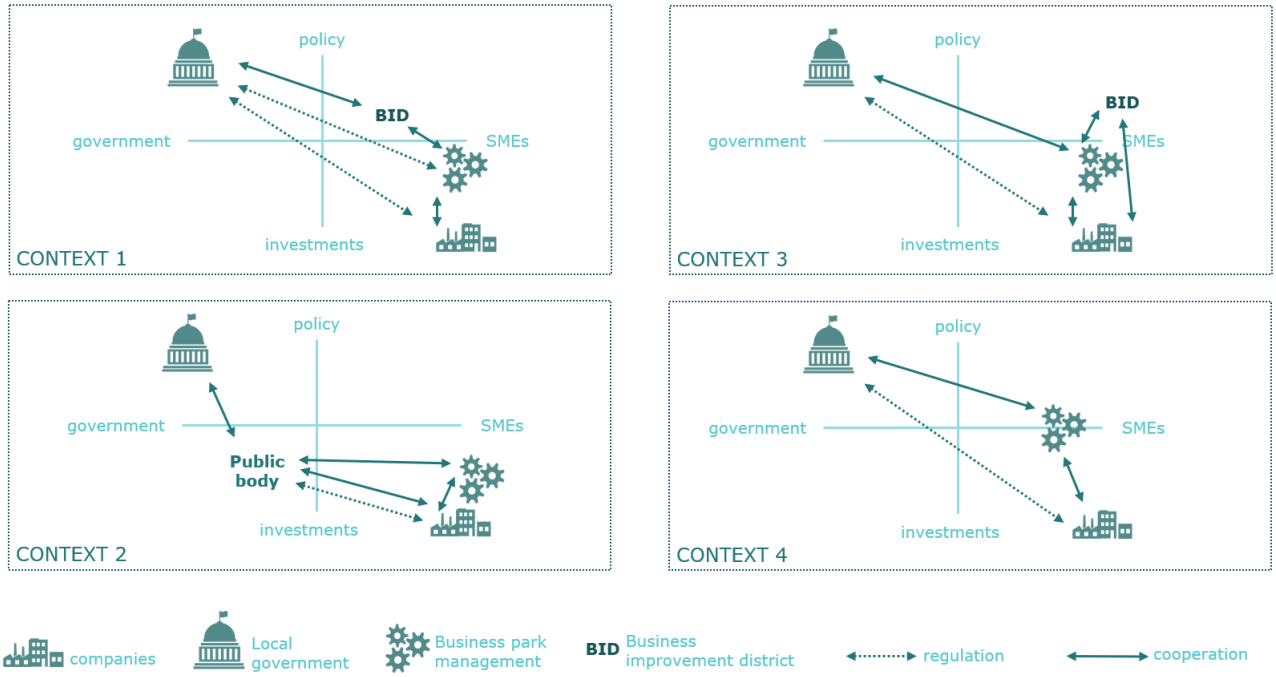
1. Analysis and mapping of the relationship and compatibility between different companies across the business park
2. The search and creation of alliances between businesses with corresponding goals and interests
3. The development of sustainable business cases for energy projects that deliver maximum results through collaboration.

The differences in government and management organisation / culture in the four countries involved in the BISEPS project influenced the approach to these three steps. The project highlighted differences in the extent to which companies in France, Belgium, Netherlands and UK work together to achieve common goals, and this can affect the speed of the energy transition. This can also lead to a different insight into the energy flows at each location.



BISEPS also showed that the goals relating to clean energy in each country are often determined by the government rather than by the business community. The challenge is for the business community to take charge of its destiny and set collective goals in working towards and implementing the energy transition. The government can help by reducing obstacles and unburdening businesses and citizens to work together to get the job done collectively and in a way that enables everyone to benefit.

The differences between the four participating countries are summarised in the diagram below.



The government policy, management culture and associated organisational structures within the country you are operating in will define which tactics are most successful in unburdening businesses and supporting them towards the energy transition. In the UK and the Netherlands engaging with business parks overseen by a representative body, such as a Business Improvement District (BID), proved helpful in delivering this work. This is because the companies already know each other, business to business relationships already exist through the BID and they are used to work collaboratively on a range of issues.

As a facilitator in the energy transition, you should consider the following approach. You should keep in mind the following dos and don'ts.

Do

1. **Organise a kick-off meeting** to create a collective approach. After the kick-off, it is important to regularly plan update meetings to keep the group involved in shaping the work and informed. You need to find the balance between keeping the companies updated and not wasting their time. The best way to engage the companies is when a small, influential, representative group is used to shape and drive the work on behalf of, but in close collaboration with, the others.
2. **Provide advice** on legal, administrative, planning, technical matters so that companies can concentrate their time and effort on developing the project. The aim is to find the balance between unburdening the companies by providing them with timely, authoritative advice and doing all the work for them. The long-term goal is for the companies to be engaged as a self-sufficient business park. Show the financial return or, when payback times are too long for companies (e.g. when building a heat network), propose working with a third party willing to take longer payback times.
3. **Connect businesses engaged in a similar sector** so they can discuss their business processes and explore common ground and their sustainable energy ambitions. This approach can be far more powerful than authorities and/or experts telling them what to do. Create alliances of companies with corresponding goals and interests.
4. **Make intention agreements between partners** to sustain interest, commitment and involvement, particularly during longer term projects such as heat networks. By signing an intention agreement, the willingness to cooperate is made clear. When problems occur, the agreement can be used to find solutions.
5. **Enhance social acceptance** by involving local residents and giving them the opportunity to invest in or benefit from the sustainable energy project. One solution is to create a cooperative structure whereby local residents are one of the partners. The partners involved in the cooperative structure should also sign the intention agreement if one exists.
6. **Create the possibility for businesses to work together** by initiating and managing a business-led energy community, a business park management association or BID.

Don't

1. **Don't be too complicated in the beginning**: the risk is to discourage and to lose some companies at the very beginning of the project. Nevertheless, companies have to be aware that this kind of project needs time and investment. It is important to be very clear and to find the balance.
2. **Don't offer a full support** because companies need to engage with the whole process. By offering full support, companies would be less engaged and less likely to commit time and resource to successfully developing sustainable energy solutions. They would simply be energy consumers responsible for paying the bills.
3. **Don't start the infrastructure works without a legal contract.** in case an energy exchange is set-up between 2 companies without a legal contract or a third party in between, you cannot influence the parties anymore as you are not aware of the different agreements and / or problems that occurred in the past. In this way, it is very difficult to give neutral advice and to find solutions for upcoming problems.

Barriers

- Business engagement
- Time priorities – core business first
- Landlord/tenant relationships
- Knowledge of energy systems, distant decision making on energy
- Capital investment
- Grid connectivity, network capacity

Key success factors of unburdening trajectories

- Leadership
- Engagement
- Having assets in place opens opportunities
- A Local Energy Community is crucial

Opportunities

- New income streams
- Improve energy security and costs
- Reduce CO_2 emissions
- Lower overheads
- Energy efficient workspace
- Active and healthy workforce
- Ease of meeting CSR requirements
- Retain value of business park
- More attractive for new companies
- Changes in regulation

Risks

- Insufficient business support, board buy-in
- Local Authority / regional development agency (dis)interest
- Long term financial commitments, debt funding, revenue uncertainty
- Planning permission and restrictions
- Changes in regulation

Step 2: Quick check: is the business park future proof?

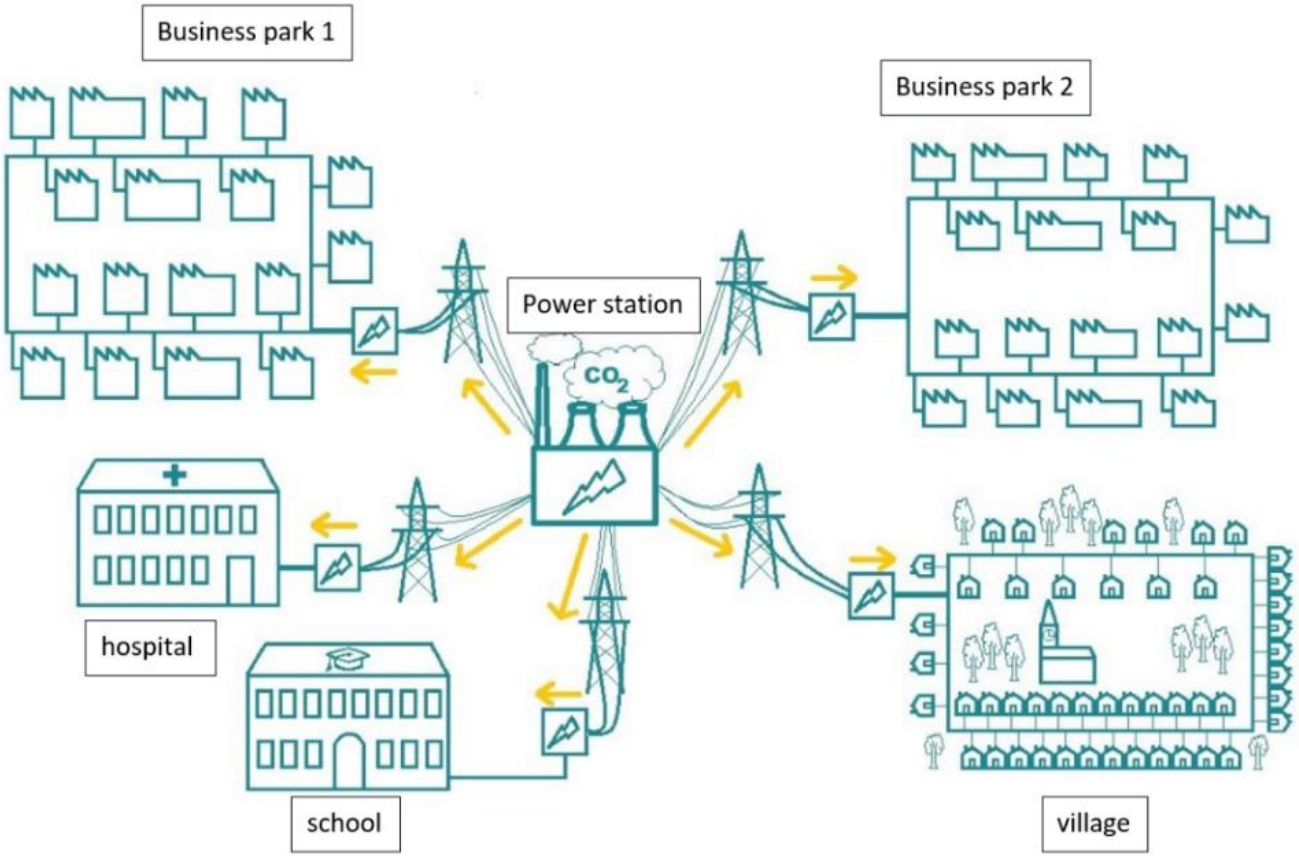
The available space for new business parks is increasingly scarce and the number of planned greenfield developments is finite. Our energy system is in transition, congestion threatens our mobility, and our climate is under pressure. New business parks must be future proof and make best economic use of the available space, means and resources. In this section we will focus on the energy aspects of future proof business parks.

Business parks can play a significant role within the energy system of tomorrow as we shift from centralised energy production based on fossil fuels or nuclear power towards a system characterised by decentralised production of local renewable energy supported by energy storage.

Business parks are particularly suitable for renewable energy production as they usually have high energy consumption, available factory buildings with large roof spaces and often suitable locations for onshore wind energy production. This offers many opportunities for developing smart energy solutions focussed on matching energy production with energy demand, through use of, for example, energy storage, demand flexibility (demand side response) and integration of electric vehicles with the local energy system. A cluster of businesses with different demand profiles working together can create a more robust energy system which maximises renewable energy production.

From a centralised to a decentralised energy system

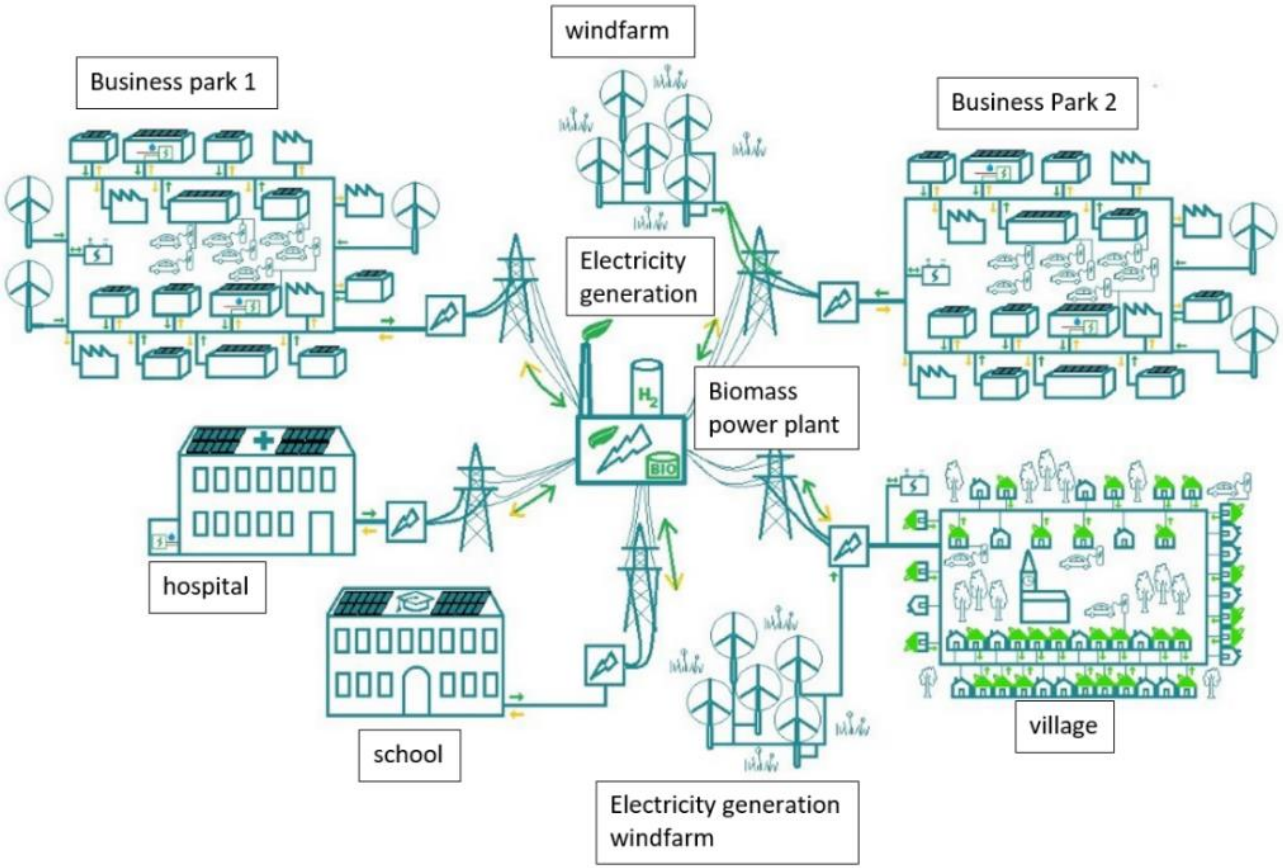
The two diagrams (below) explain the distribution of electricity in the past and in the future.



In the past the electricity is produced at one central place and distributed to all end consumers.

We are moving towards a decentralised electricity system. In the future electricity will come from multiple sources be they windfarms, solar, centralised biomass plants and combined heat and power (CHPs). These will be supported by electric vehicle charging stations and storage facilities as these are added to the energy system.

The energy flows from everywhere to everywhere. Energy consumers are increasingly becoming energy producers ("prosumers"). And they are increasingly able to work together, for example at district and business park level, for the production of shared energy or the exchange of energy.



A future proof business park is energy neutral (or energy positive, producing more energy than it uses) and aspires to:

- Minimize energy consumption (particularly of fossil fuels)
- Maximize production of renewable energy
- Maximize energy exchange/trading locally and with the wider network
- Maximize cooperation between businesses

The added value of developing a future-proof business park should be made clear to national and local governments, business park developers, landlords, the businesses and nearby residents.

Although there is high potential to improve energy efficiency and generate renewable energy on existing business parks, often little of this potential is realised as:

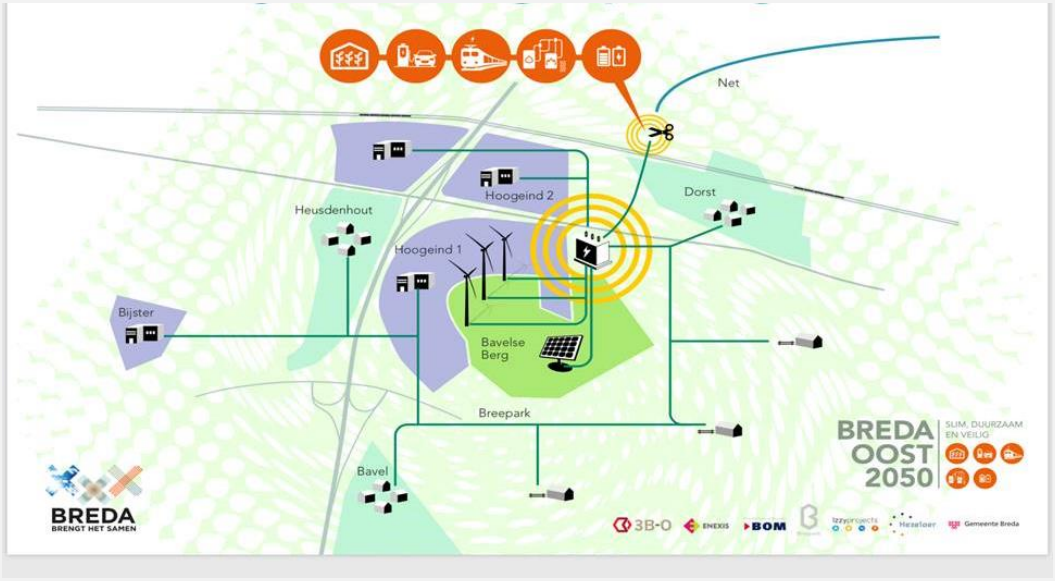
- The financial returns are lower when compared to alternative investments in core business activities
- Renewable energy is often a long-term investment and considered too long for some businesses to invest themselves
- Businesses do not have the time or knowledge to dedicate to energy efficiency measures or producing renewable energy
- A mismatch between the potential energy production and the demand can limit the benefits for an individual business.

Bringing businesses together as a cluster and considering energy demand and generation for the group or business park can help to overcome these barriers, unlock the potential of sustainable energy and increase investment. Unburdening businesses and making the process easier for businesses, particularly SMEs, is also essential.

Trading or exchanging energy on a peer-to-peer basis between businesses or on a business park level is currently possible in only very limited cases in the four partner countries due to legislative or regulatory constraints. The translation of the European Clean Energy Package (CEP) into national legislation in each of the EU member partner countries and similar changes in the UK can help unlock the potential for additional investments in local renewable energy production. It is expected that the new legislation will define the conditions for energy trading and exchange within a local energy community such as a business park.

Future proofing a business park requires upgrades to the infrastructure to allow local generation and distribution of both electricity and heat. It is important to make full use of planned infrastructure improvements or road works, for example to install piping for district heating or to optimize the electricity grid.

Breda Oost 2050 (Netherlands)



Studies show that a cooperative approach can benefit the demand (energy consumer, businesses, SMEs) side.

Here are five recommendations based on the 3B-O Breda living lab case study from the BISEPS project.

1. Connect supply side (energy sector) with the demand side and support both sides to cooperate.
2. Use existing networks that are already cooperating within the business cluster. Support and strengthen essential partners with information from energy companies, grid owner and finance providers.
3. Identify potential revenue models that support a cooperative approach and discuss these with existing organisations or facilitators (i.e. the local BID).
4. Support the cooperating businesses to make action plans and business cases for investment.
5. Support businesses to roll out and operate successful projects.

Complexity of implementing renewable energy solutions for SMEs, business parks and clusters of SMEs

The table below shows the different barriers to implementing technological solutions.

Sustainable energy technology solution		Technical-energetic complexity	Economic complexity (business case)	Legal & legislative issues	Organisa-tional complexity	Spatial challenges
Largescale wind energy	Tall wind turbines, e.g. 150m, 2-3 MW			Country specific		Noise, shadow, footprint
Small scale wind energy	Small wind turbines, e.g. 10-80m, 0,01-0,5 MW			Country specific		Noise, shadow
Photovoltaic solar panels (PV), roof mounted and car parks	Private production installation, for own electricity consumption. Surplus may be sold over network.	Roof stability is essential.	Sized on demand and best financial return.	Restrictions on sale PPA contracts in some countries.	Can be difficult if have landlord, tenant and investor all involved.	Visual intrusion in heritage areas.
Photovoltaic solar panels (PV), ground mounted	On land adjacent to business park with private wire (direct line) to businesses or power purchase agreements (PPAs) over local network			Restrictions on sale PPA contracts in some countries.		Suitable land not often available, may have higher value for other uses.
Battery storage	Building integrated and larger stand alone for increased use of PV/wind generation, maximising savings from time of use tariffs and provision of flexibility services to the local network		Rapidly developing market sector, especially for flexibility. Price drop expected.	Regulation lagging behind market & technology developments. Country specific.		
Solar thermal	Private production installation, for own heat consumption	Low temp, summer				On roofs, carparks
Heat pumps	Using environmental sources for heat like geothermal (deep, shallow), air, water…	Low temp, for space heating				
Individual CHP	Combined Heat and Power (CHP) produces electricity and heat, for one SME	Matching heat & electricity demand				
Shared CHP	Combined Heat and Power (CHP) produces electricity and heat, shared amongst 2 or more SMEs	Matching heat & electricity demand.	Depending on distances & energy volumes.	Install CHP where electricity is demanded.	Longer term engagement of SMEs is required.	
District heating	A heat grid/network provides heat to a cluster of SMEs. Heat is centrally produced or might be local waste heat.	Temperature, load profiles & energy volumes.	Depending on distances & energy volumes.		Longer term engagement of SMEs is required.	Depends on trajectory & site.

Sustainable energy technology solution		Technical-energetic complexity	Economic complexity (business case)	Legal & legislative issues	Organisa-tional complexity	Spatial challenges
Direct line (private wire)	Electricity exchange between 2 businesses, e.g. from PV on one roof to 2 SMEs	Matching energy profiles.		Country specific		
Electricity sharing	Share energy from shared renewable energy installation, e.g. wind, solar. amongst more than 2 businesses	Matching profiles required.		Country specific		
Smart electric grid	Continuous matching of demand / supply / storage with a cluster of SMEs	Developing technology.	Not well known.	Lack of legal frameworks.	Engagement and equipment.	

LEGEND

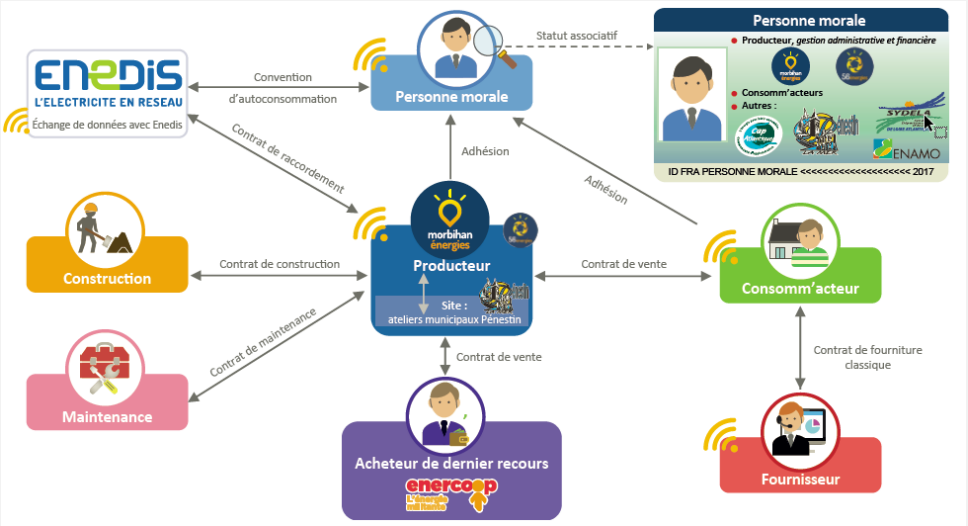
MINOR BARRIERS	MODERATE BARRIERS	MAJOR BARRIERS

An innovative energy system for a business park

Collective PV autoconsumption

Location: City of Penestin, West of France, Business park "du Closo"

One prosumer (Municipal workshop of the city of Penestin, 40 kWp, Producer AND Consumer), 12 business consumers (2 restaurants, 3 shops, 3 offices, 4 building companies)



Who does what?

- Personne morale: Producers and consumers must be legally bound in the same legal entity
- Producteur: Morbihan Energies sell the shared electricity between businesses
- Acheteur de dernier recours: Enercoop buy the excess of electricity (if any)
- Consomm'acteur: active consumer, the 12 businesses.

Step 3: Engage the businesses

Effective engagement is a 'golden thread' running through the seven stages of developing a local, integrated renewable energy system. Identifying priority stakeholders and their different needs and developing a plan to inform and involve them throughout the project is an important first step.

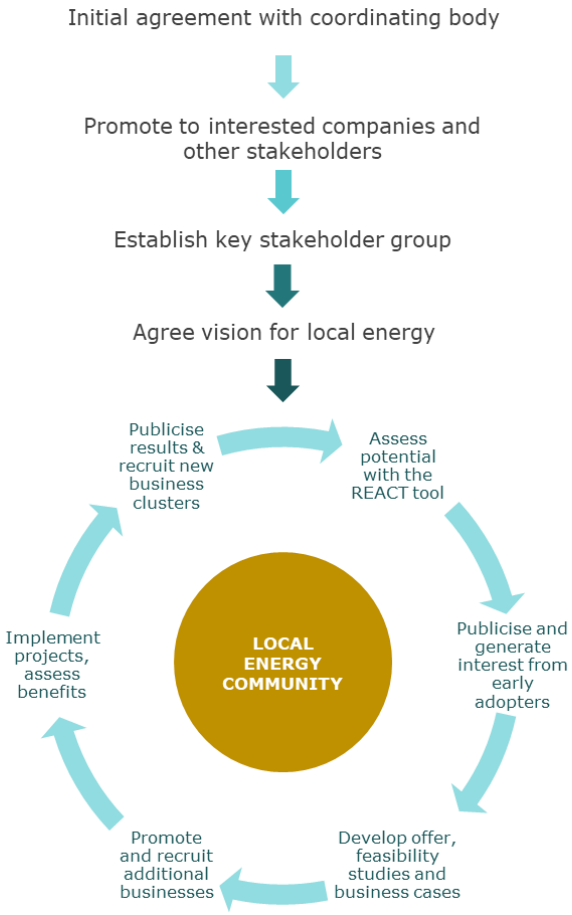
The BISEPS project trialled various engagement approaches in different countries. Over the course of the project it became clear that a similar process and set of engagement principals applied.

Identify and engage early adopters and other key stakeholders

Identifying businesses who will be early adopters of renewable energy technology requires significant effort at the start of the programme. This is covered in step 1. Engagement must continue through the project cycle as you move from developing initial proposals through to feasibility work, business case, identifying funding and delivery. This will enable you to build a momentum within the business park and recruit additional businesses to take part as renewable energy starts to deliver benefits. Businesses joining later can benefit from the experience of early adopters and drive increasing use of sustainable local renewable energy.

Getting the support of established organisations and networks is essential to the start of the engagement process and to identifying early adopters. Business parks often have a coordinating body that provides services to businesses there. This may be a private or public sector business park manager, business park association or a Business Improvement District (BID). Working with such an organisation can give access to key stakeholders and improve credibility and buy in with businesses. Local authorities may also have a convening role, bringing businesses together and involving them in the economic development of the wider area.

Bringing early adopters and key stakeholders together at an early stage to discuss and shape a shared vision is an essential step. Key stakeholders to consider include businesses, business park managers, regional development agencies, landlords, property managing agents, local authority planners and utility network operators. The support of local politicians can add credibility to the project in its early stages. A multi-channel approach is helpful to engaging interested parties, making best use of what is already available. For example, using existing platforms such as business park associations, business improvement districts (BIDs) and trade associations. The local authority may lead at this stage hosting events and sending communications targeting a specific area or creating an online space as happened in Breda during BISEPS.


Initial agreement with coordinating body
Promote to interested companies and other stakeholders
Establish key stakeholder group
Agree vision for local energy
Assess potential with the REACT tool
Publicise and generate interest from early adopters
Develop offer, feasibility studies and business cases
Promote and recruit additional businesses
Implement projects, assess benefits
Publicise results & recruit new business clusters
LOCAL ENERGY COMMUNITY

During the initial kick-off meeting, challenge the core group of committed businesses and other stakeholders to define their long-term goals around energy. Issues to consider should include:

- Whether companies aim to become carbon zero and by when.
- What barriers are preventing them from moving ahead with renewable energy projects.
- How could the project deliver added value to them.

BISEPS partners found it useful to provide businesses with insights about developments in the energy sector to inform these discussions. It was also important to explain how energy can be an opportunity to develop new income streams rather than simply a cost and how working together can help overcome the barriers and increase benefits for all participating businesses. For some technologies, such as district heating, cooperation between neighbours on a business park is essential. For other, such as solar and storage, cooperation can add value and enable the business park to get more out of the investment.

Agree a vision and develop a plan

Use the answers and information from the kick-off meeting create a single vision for the business park or group of businesses. Each business will have their own ideas for the vision – and every business park will have different priorities to suit the local needs. In Breda, installing solar PV was the top priority, their vision was to enable businesses to share energy across the municipality. Other partners' priorities included district heating and sharing high temperature steam.

Once the vision is agreed the next challenge is to explore how the aims of the group might be achieved and what stages are necessary to reach the goal. This vision and the first project ideas are the basis for the next round of engagement with a wider group of businesses and other stakeholders. Use the free REACT tool developed by the BSEPS project to scope out the first potential projects. How to use REACT is covered in Step 4.

Engagement with companies must take place on multiple levels to ensure that all company decision makers (energy, sustainability, facilities, finance etc.) understand and buy into the vision. This may not be a significant issue for SMEs with fewer staff, but larger companies often make energy purchasing and investment decisions elsewhere, be that at head office or in another country. This can cause a delay in decision making or even stop decisions being taken. Groups of early adopters need more engagement and one-to-one support as they develop their first projects.

Broadening understanding of the project, celebrating success and building awareness about the importance of locally generated renewable heat and power is a key part of the ongoing engagement and communications strategy. Using existing channels and networks in and around the business park can be an effective way of reaching wider stakeholder groups.

Communications tools within a business park

- Press coverage and social media channels to reach a broad audience once you have engaged with your core group and agreed a vision.
- Newsletters and mailouts for companies with more specific information and detail of planned actions, including recruitment of businesses wanting to install renewable energy technologies.
- Representation at industry events attended by the companies on the business park.
- Contact/meetings with individual businesses and their landlords (if appropriate) to recruit early adopters and support them through project development.
- Seminars or similar events to present opportunities and progress reports to interested businesses.

Green Deal Business Parks Breda

Within the BISEPS framework, the Platform BV Breda was founded by and for entrepreneurs on the business parks. It cooperates with the municipality of Breda and educational institutes to unburden companies to realize rooftop solar PV and activate the reduction of energy consumption. The Platform BV Breda has set up an organization Stichting Breda-Energie, which roll-out solar PV panels on all industrial areas in Breda. Even when the construction of the roof is not strong enough there are solutions.

Other partners are Energy company Hezelaer Energy, Grid Owner Enexis BV (Enpuls) and the BOM a execution company form the province of North-Brabant.

It is an initiative for and by companies on the business parks. Arranging the energy transition together by filling all business roofs with solar panels and transferring the energy that is left with the Stichting Bredase Energie to other companies in Breda.

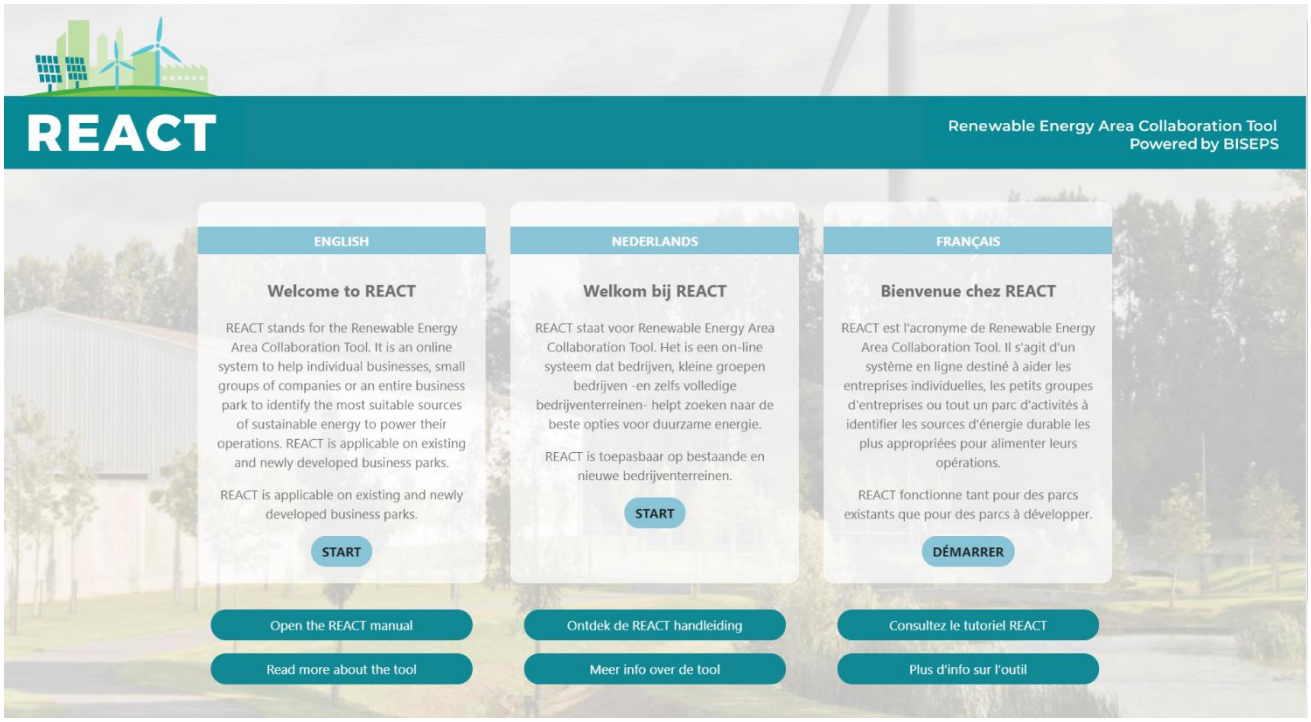
Step 4: Use the Renewable Energy Area Collaboration Tool (REACT) to identify sustainable energy solutions.

Good quality data is essential when making energy investment decisions. However, data collection at company and business cluster level can sometimes be a struggle.

The Renewable Energy Area Collaboration Tool (REACT) is an open-source user-friendly tool, that has been developed to determine the optimal low carbon technology solutions for groups of business and business parks, exploiting potential energy synergies. The tool aims to partly replace expensive and time-consuming energy audits at business cluster level, making energy investment decisions more straightforward and therefore more likely.

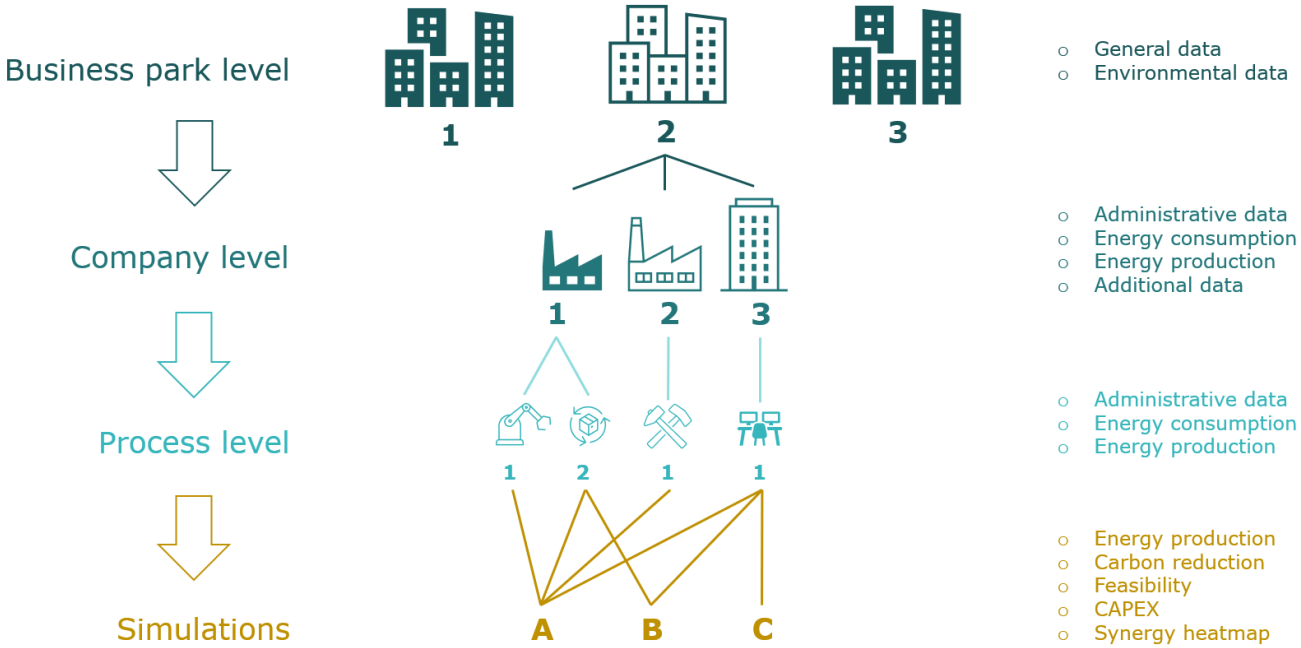
The main target group for the tool is business park managers aiming to deliver money savings and reduce CO2 emissions across a group of businesses.

To keep the tool easily accessible and user-friendly, the required data inputs are kept to a minimum. The main inputs are general business and energy data from the companies, collectively and individually.


REACT
Renewable Energy Area Collaboration Tool
Powered by BISEPS
ENGLISH
Welcome to REACT
REACT stands for the Renewable Energy Area Collaboration Tool. It is an online system to help individual businesses, small groups of companies or an entire business park to identify the most suitable sources of sustainable energy to power their operations. REACT is applicable on existing and newly developed business parks.
REACT is applicable on existing and newly developed business parks.
START
NEDERLANDS
Welkom bij REACT
REACT staat voor Renewable Energy Area Collaboration Tool. Het is een on-line systeem dat bedrijven, kleine groepen bedrijven -en zelfs volledige bedrijventerreinen- helpt zoeken naar de beste opties voor duurzame energie.
REACT is toepasbaar op bestaande en nieuwe bedrijventerreinen.
START
FRANÇAIS
Bienvenue chez REACT
REACT est l'acronyme de Renewable Energy Area Collaboration Tool. Il s'agit d'un système en ligne destiné à aider les entreprises individuelles, les petits groupes d'entreprises ou tout un parc d'activités à identifier les sources d'énergie durable les plus appropriées pour alimenter leurs opérations.
REACT fonctionne tant pour des parcs existants que pour des parcs à développer.
DÉMARRER
Open the REACT manual
Read more about the tool
Ontdek de REACT handleiding
Meer info over de tool
Consultez le tutoriel REACT
Plus d'info sur l'outil

Companies need to input three types of information:

- *General information*: type of business, size, location on the business park, operating hours;
- *Energy use information*: type of primary energy used (electricity, natural gas, steam, etc.), total energy use (optional), energy use profile (optional);
- *Energy production information*: availability of energy, such as solar power or waste heat, potential for production of own energy, e.g. roof space suitable for solar panels.



Some inputs are optional and when data is currently not known, the required information will be derived from statistical datasets to estimate the energy consumption and profile of the company. For example, the specific energy use of different industrial applications can be estimated through life cycle analysis statistics. Likewise, the energy use per m² of office space can be estimated based on historical datasets. Additionally, the yield of a roof-mounted solar PV installation will be calculated for the given geographic location. REACT will, however, produce more accurate results if detailed, site-specific data, such as the total energy consumption or the yield of an existing solar power installation, is available. This will reduce estimation variance.

To produce the most accurate results, information about the legal, economic and spatial constraints at the business park level also need to be input. For example, REACT includes questions about whether wind turbines are permitted locally, about the applicable cost of capital and the geothermal heat potential of the site. These parameters can be found in various national databases.

Based on the inputs, REACT delivers tailored advice on the most suitable energy solutions for a specific group of businesses. The optimal configuration will be the result of a combination of technical, economic, financial, legal, spatial and organisational parameters.

The tool produces a series of simulations that show the costs and benefits of each potentially suitable technology. The simulations are listed and sortable by total primary energy use, CO2 emissions, investment and operational costs and payback time. The technical and economic data produced by REACT can be used by business park operators as a starting point for further investigation and detailed feasibility work.

REACT can be used for both existing and planned / new build business parks. In the case of planned or new build parks, various preconfigured energy use load profiles are available to make the simulations as accurate as possible.

Using REACT to identify the potential for sustainable energy and energy sharing

Through the simulations it produces, REACT provides an insight into:

- Overall feasibility
- CO2-savings
- CAPEX
- Technical feasibility
- Extra information

The synergy map shows the current electricity and heat demand as well as the potential from solar PV and waste heat. Through REACT, you can use one of the four 'Toggle' buttons shown to filter your results and to view each aspect more clearly. The colours indicate the energy intensity of each business.

You can use the synergy map as the starting point to create new simulations within REACT. For example, if you have identified a cluster of companies with a high electricity demand you could explore linking them to companies with high potential for generating electricity through solar PV.

PV

Overall score	Co2 savings	Capex (capital investment)	Technical feasibility
100	32 kton	€86,860	High

Extra information

Estimated available capacity: 86 kWp
Estimated yearly energy: 81.7 MWh
Estimated self consumption ratio: 76.8%

Wind

Overall score	Co2 savings	Capex (capital investment)	Technical feasibility
81	1.59 kton	€2.4M	Medium

Extra information

Estimated available capacity: 2.3MW (1 turbine)
Estimated yearly energy: 4.03 GWh
Estimated self consumption ratio: 66.8%

CHP

Overall score	Co2 savings	Capex (capital investment)	Technical feasibility
18	1.4 kton	€0.6M	Medium

Extra information

Estimated optimal capacity: 400kW/400kW
Estimated yearly electricy: 2.8 GWh
Estimated self consumption ratio: 80%
Estimated yearly heat: 2.8 GWh
Estimated self consumption ratio: 40%

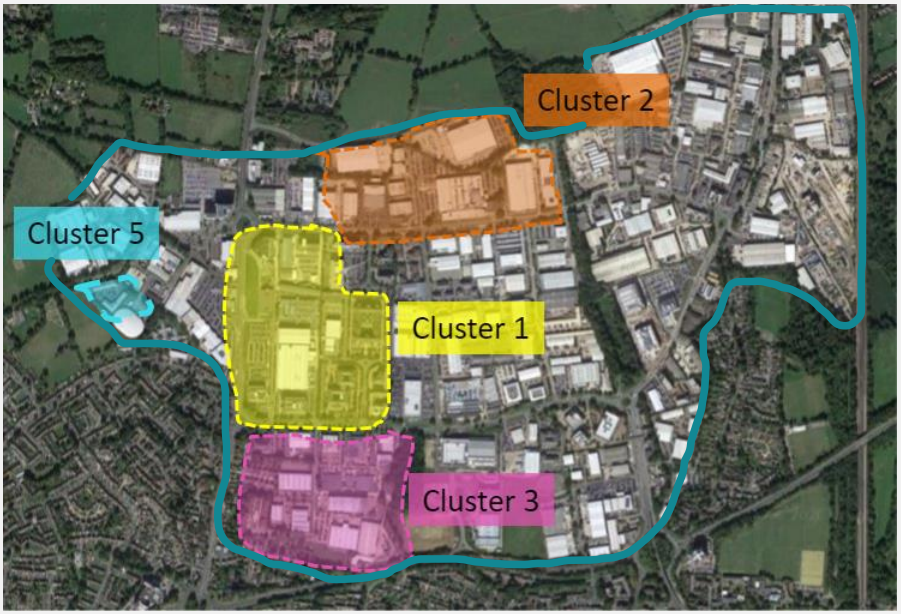
Toggle electricity demand | Toggle heat demandl | Toggle solar potential | Toggle waste heat potential

Manor Royal (UK): a clustering of businesses

The Manor Royal Business District near Gatwick Airport in West Sussex is one of the largest business parks in southeast England covering more than 240 hectares. It supports over 600 businesses and employs approximately 30,000 people.

A high-level feasibility study identified several groups of businesses, or 'clusters', with potential to generate, store and share sustainable energy. Working in partnership with the local Business Improvement District, the project team focused on building relationships with interested groups of businesses and fostering a common energy ambition within each cluster.

This approach made the engagement process easier as there tended to be common ground between the businesses in each cluster (i.e. geographic location, business sector, compatible processes / energy needs etc.). Working in smaller business clusters rather than addressing the needs of the whole business park can also ensure that the clean energy simulations produced by the REACT tool are more focused, accurate and applicable to the real world.



Step 5: Persuade the SMEs with results of REACT and business cases.

By using the results from REACT or developing more detailed businesses cases, businesses can be persuaded to consider investing in clean energy technology. This approach will enable you to clearly set out the benefits for the businesses, both individually and collectively, including:

- Reduced energy costs (detailed in the business case);
- Improved efficiency;
- Reduced carbon footprint;
- Reputational as a pioneering business with a commitment to clean energy;
- Associated benefits from co-operating with neighbouring businesses;
- …

When talking to companies, they also need to be made aware of the possible barriers and how they can be helped to overcome these. Potential barriers include:

- Technical feasibility and the need to conduct feasibility studies (i.e. to establish roof stability for solar PV);
- Legal concerns and the need for specialist legal advice;
- Safety concerns and addressing misconceptions around the technology (i.e. solar PV and fire risk);
- Investment cost concerns and the need to show the possible investment models and develop a financial feasibility study.

To overcome cost concerns, different suppliers could be invited to submit a proposal for installing the technology as part of a competitive process. Alternative investment models, including third party investors, setting up an energy service company (ESCO) or a group purchasing arrangement could also be considered and is discussed in Step 6.

Having established a strong case for investing in clean energy technology through REACT results, feasibility studies and business cases, it is important to follow this up face-to-face with stakeholders on the business park. As the facilitator supporting businesses towards the clean energy transition, it is recommended that you organise a group session to discuss results with all businesses on the business park. This can be followed by more detailed bilateral meetings on a regular basis with individual companies to explain the results in greater depth and answer questions. The contact person within each company should be provided with all data and presentations. This will allow them to disseminate all the information internally.

In addition to engaging with representatives from the companies, you should keep all stakeholders informed and involved during the process. It is advised that you invite other interested partners, including distribution grid operators and local authorities, to the group session and involve them closely as you develop and deliver your business cases.

Subsidies and support: Energy markets alone usually cannot deliver the desired level of renewables in the EU, meaning that national support schemes may be needed to overcome this market failure and spur increased investment in renewable energy. If these public interventions are not carefully designed however, they can distort the functioning of the energy market and lead to higher costs for European households and businesses. Different support schemes that exist for production of renewable energy in Europe, are briefly described below:

Feed-in tariffs: Feed-in tariffs (FiTs) set a fixed guaranteed price at which power producers can sell renewable power into the electric power network, they normally oblige grid operators to guarantee grid access to renewable energy and oblige them to buy at government-fixed prices from generators that feed renewable energy onto the grid. They are set at a level required to guarantee the security of long-term investment in renewable energy, encouraging long-term contracts that are usually of 10-20+ years' duration. Feed-in tariffs vary according to the type of technology and are often reduced over time as technologies mature and costs decrease.

Feed-in Premium (or premium feed-in tariffs): These are fixed premiums which are provided on top of the market price received for energy sold to the electric power network. They normally make up the shortfall between the market electricity price and the (often higher) cost of producing electricity from renewable sources.

Quota Obligations: Quota obligations such as Renewable Portfolio Standards or Renewable Obligations oblige electricity suppliers to produce a certain percentage of their electricity from renewable sources. Meeting the quota obligation is usually measured in terms of tradable green certificates, each of which is one megawatt hour (MWh) of renewable electricity generated. Utilities can then either produce their share themselves or buy the corresponding number of certificates on the market.

Investment grants: on a national level, investment grants for renewable energy are available in several countries and are often devised to stimulate the take-up of less mature technologies.

Tax incentives: tax incentives are often complementary to other types of renewable energy incentive programmes. They are powerful and highly flexible policy tools that can be targeted to encourage specific renewable energy technologies and to impact selected renewable energy market participants especially when used in combination with other policy instruments.

Fiscal incentives: fiscal incentives, including soft or low-interest loans are loans with a rate below the market rate of interest. Soft loans may also provide other concessions to borrowers, including longer repayment periods or interest holidays.

What can you learn from BISEPS business cases?

A number of business cases were developed for the living labs in the four Interreg 2-Seas countries (Belgium, France, UK, Netherlands) during the BISEPS project. The BISEPS-partners created summaries of the lessons learned which are available at www.biseps.eu.

Each summary describes the following aspects of the pilot business cases:

- The nature of the business group or 'cluster': this summarises the reason for focusing on the business cluster, its geographical location, a description of type of industrial / economic activities performed there, the opportunities and threats to creating sustainable energy synergies in the business cluster.
- The technical case: this summarises what is technically feasible, which are the best technical solutions and concepts for sustainable energy for the business cluster, what variations were explored, what the spatial consequences are, the conclusions on energy and carbon reduction and the production, consumption, volumes and load profiles.
- The financial case: this summarises whether the business case is financially feasible, what the investment costs are, the internal rate of return (IRR) or payback time, the subsidies and other incentives available, who will invest (funding arrangements, third party, etc.), and who will benefit.
- Policies, legal context, organisational options: this summarises the relevant energy strategies in the city, region or country that affect the business case, what legal solutions or frameworks are used, how you will facilitate cooperation between businesses (SMEs), the role(s) of SMEs, public authorities, grid owners, business park managers, BIDs, etc. and how the solution will be managed.

The pilot business cases cover a wide range of sustainable energy solutions such as solar energy, wind energy, waste heat, geothermal energy, biomass & biofuel, Combined Heat and Power (CHP), electricity sharing & smart grids, heat exchange, energy storage, and energy cooperation models for business clusters.

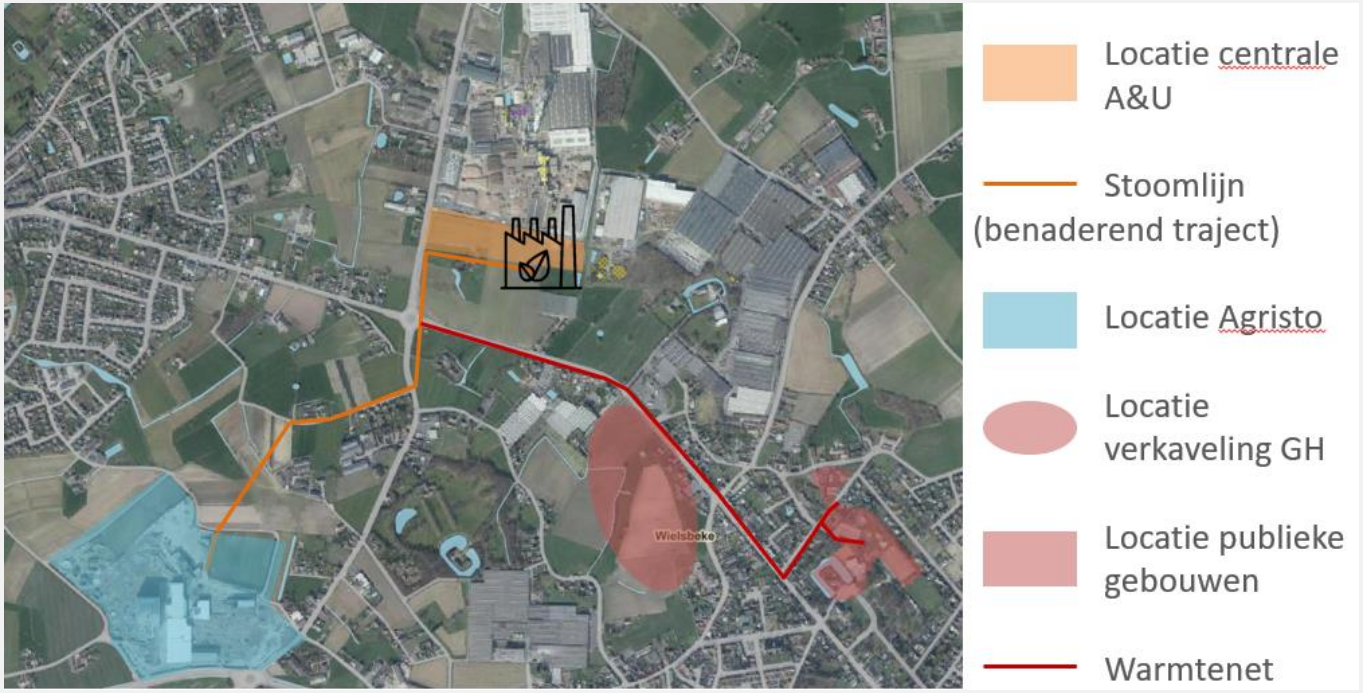
The business cases cover the involvement of 742 companies, identify €59,143,395 of investments in total, and a carbon reduction of 63,561 tons per. year

Supporting district heat – some lessons learned (Belgium)

Creating heat networks is a long-term process and, above all, it's important to involve all the different stakeholders during the various phases of the project. It is important to support business parks and unburden them as much as possible during the early assessment and planning stage.

In the first instance, assessment of the heat supply and demand within the area of interest is important to identify a potentially viable project. The next stage involves carrying out feasibility work to assess the potential project, taking into consideration technical, juridical and economic parameters. Carrying out early feasibility studies can also help to bring the stakeholders and future partners together and raise the profile of the project and the importance and value of the energy transition. The signing of a cooperation agreement between the different parties at this point can be helpful and assist with delivering the next steps.

Following the feasibility stage, a business case needs to be developed and refined and investment plans developed. The project has a greater chance of success as soon as a long-term investor (e.g., cooperative organisation, public network operator, waste incineration company) can be found. Once an investor has been identified, they will generally assume leadership of the project.



Step 6: Implement cooperation models and investment models.

A number of financial, social and organisational models are available to overcome barriers to investing in renewable energy projects. Here is a selection of models considered most suitable for the BISEPS business cases, taking into consideration the investment climate in the relevant region.

Collective purchase: energy and solar PV

The typical collective purchase approaches to energy projects involve joint purchase of energy and collective solar PV purchase. In both examples, the companies involved can be facilitated by the local or provincial government, the business park association (i.e. the BID) or business park management. In specific cases, consumer organisations and parties with a political or sustainability point of view do the same. This approach strengthens the negotiating position of companies over potential suppliers and can lead to reduced costs through economies of scale. Additionally, collective purchases can also be attractive to suppliers as a fast and cost effective way to generate business. As the WRI states: "By organizing interested consumers (and their potential installation sites) into groups, collaborative purchasing can reduce transaction costs, educate potential buyers and aggregate demand". In that way solar panels can be installed and energy can be bought at lower-than-average costs.

How to fill a business park with PV?

SMEs in West-Flanders (Belgium) collaborated on a joint project to install solar PV at business park level, taking advantage of the synergies created by businesses working together. BISEPS-partners Leiedal, POM WVl and WVI assisted 53 companies on 6 business parks to invest in solar PV by providing workshops, professional assistance and close follow-up. Business park associations also promoted and supported the process.

The businesses were supported to consider different options for investing in solar PV on business parks. These included collective installation, individual installation or energy sharing. The most feasible scenario involved optimised self-consumption of the solar electricity by individual companies. Energy sharing of solar PV (e.g. collective installation) proved to be economically unfeasible at the current time mainly due to organisational complexity, legal constraints and tariff constraints. Feasibility studies were provided for all companies, demonstrating payback periods ranging between 5 and 10 years.

The joint approach to the project allowed participants to mitigate problems collectively and supported businesses that don't have the time or resource to focus on renewable energy. The process delivered extensive guidance, tailormade feasibility studies and roof stability studies (via group buying at a lower price), shared knowledge of the market and the offer of potential installers. The group approach demonstrated the importance of peer pressure and adoption dynamics (early adopters and followers) in the process. Unfortunately, some problems were unavoidable, such as poor roof stability and tenant/leaseholder issues.

Table below: examples of feasibility studies for PV

	energy use (kWh)	peak power (kWp)	solar PV production (kWh)	CO2-reduction (ton)	investment amount (€)	payback time before investment allowance (year)	self consumption rate (annual, %)
Company 1	329493	176	138739	64	187924	8,1	42%
Company 2	1583396	608	483722	223	633824	7,8	31%
Company 3	286000	310	294500	59	293650	10,8	103%
Company 4	6300	6	5700	1	7440	5	90%
Company 5	14629000	5009	4758161	2189	3775000	7,8	33%
Company 6	92077	75	71250	33	85750	8,8	77%
Company 7	195278	82	76000	35	90800	5,3	39%
Company 8	78310000	1838	1694849	780	1504000	8,1	2%

Business Improvement District (BID)

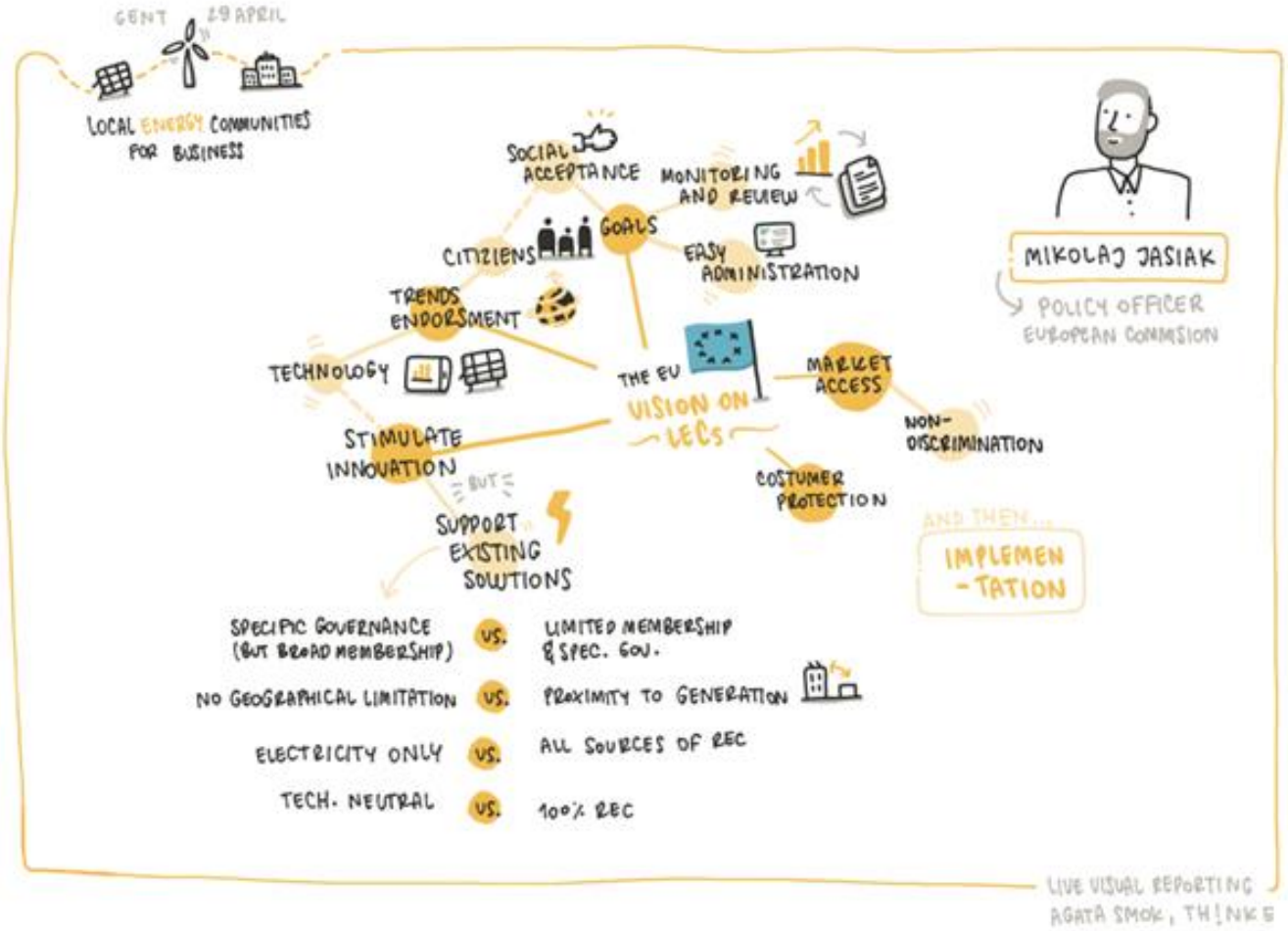
Business Improvement Districts (BID) are about working in partnership based on the principle that more can be achieved through collaboration than working alone. The Interreg IVA 2Seas-project Safe-Ice defined a BID as follows: "a business led and business funded scheme to improve a defined commercial area, such as a town centre or industrial estate through additional services or new initiatives. BIDs can deliver any projects or services that are agreed by the businesses in the BID area and that are over and above anything that the local council, police and other public sector organisations may provide. A BID can be proposed by any business ratepayer, property owner, local authority or other key stakeholders with an interest in the BID area."

Local Energy Communities

Local Energy Communities (LECs) facilitate cooperation between energy consumers e.g. through joint renewable energy production. A high-level conference on LECs for businesses was co-organised by the BISEPS-project on 29th April 2019 in Ghent (BE). The conference focused on how the European directive on LECs can be implemented by countries to maximize renewable energy production on business parks.

LECs have the potential to promote mid-size renewable energy production and facilitate the exchange of the energy generated. Business parks have significant potential for renewable energy production. Production is limited by auto-consumption as electricity exchange is not well facilitated in the legislation of the countries of the 2-Seas Region involved in BISEPS (France, UK, Netherlands, Belgium). For a LEC to be successful on a business park, larger companies should be able to play a role within it. Implementing the European package in national legislation should facilitate electricity exchange on business parks and with their surrounding areas. There should be an easy way to bring owners of available roof space together with organisations willing to invest in solar panels. This should be possible for individuals and SMEs. An example of this kind of collaboration could involve a logistics warehouse with only limited energy consumption but a large available roof area. A neighbouring company may have a large electricity demand but a roof area that is too small to produce the electricity it needs from solar panels. Although there are clear potential benefits for parties involved in LEC, the economic margins of LECs are expected to be limited.

The Interreg 2-SEAS-project LECSEA focusses on LECs – find out about Local Energy Communities on www.lecsea.eu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29 APRIL
LOCAL ENERGY COMMUNITIES FOR BUSINESS
SOCIAL ACCEPTANCE
MONITORING AND REVIEW
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THE EU VISION ON LECs
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AND THEN...
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POLICY OFFICER
EUROPEAN COMMISION
SPECIFIC GOVERNANCE (BUT BROAD MEMBERSHIP) VS. LIMITED MEMBERSHIP & SPEC. GOV.
NO GEOGRAPHICAL LIMITATION VS. PROXIMITY TO GENERATION
ELECTRICITY ONLY VS. ALL SOURCES OF REC
TECH. NEUTRAL VS. 100% REC
LIVE VISUAL REPORTING
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Cooperative

"A cooperative is an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly-owned and democratically-controlled enterprise." (www.ica.coop)

Individuals and companies can be members of a cooperative. A cooperative is owned and controlled by its members, who are classed as associates, and the benefits are divided among the members. Energy cooperatives are cooperatives that are formed for the purpose of producing, selling, consuming or distributing energy. For example, the cooperative issues shares that generate funds that can be invested in energy projects. Members become co-owners of the installations for energy production.

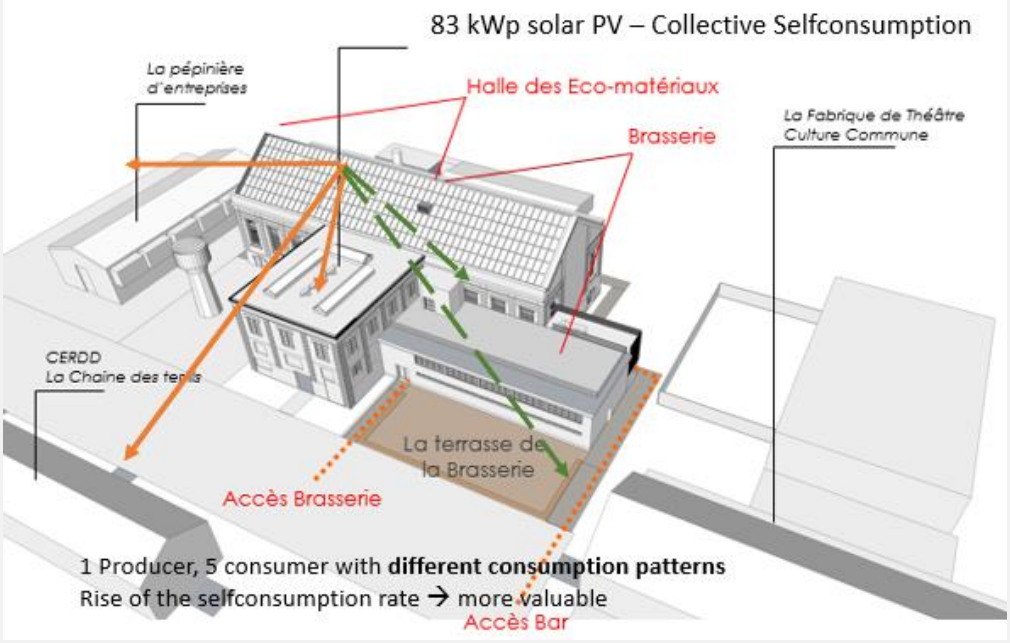
Base 11-18, Lose-en-Gohelle (France)

The Base 11 19 business cluster is located in a former mining area in northern France. The public authority, Communauté d'Agglomération de Lens-Liévin (CALL), decided to redevelop the area as a sustainable development incorporating a small business cluster.

A decree from 24th November 2019 permits collective self-consumption of energy generated on site (maximum power 3MW) within a 2km radius. Consumer and producer must be legally bond in same legal society.

Five companies share electricity within the business cluster. The CERDD (approx. 10 employees) the CD2E (approx. 30 employees), and a start-up nursery work on week days from 8am to 6pm. CPIE and Culture Commune (10 employees each, have the same kind of work regime, plus weekend working. A school-restaurant will be involved in the project as well.

Synergies will be created between the businesses involved by combining the consumption/load profile of the five companies and then sharing the solar electricity between the companies.



(c) Sunelis

Energy Service Company (ESCO)

An ESCO, or Energy Service Company, is a business that develops, installs, and arranges financing for projects designed to improve the energy efficiency and maintenance costs for facilities over a long time period, typically 5 to 20 years. ESCO projects can entail a combination of different cost-effective measures to achieve energy savings, or can simply include one technology or application.

These services are bundled into the project's cost and are repaid fully or partially through the financial savings generated over the life of the contract (and possibly beyond). This is called performance-based contracting with sub-forms such as ESC (energy supply contracting). Most performance-based energy efficiency projects include the maintenance of all or some portion of the new high-energy equipment and building elements over the life of the contract (M-EPC).

Public-Private Partnership (PPP)

There is no one widely accepted definition of public-private partnerships (PPP). The PPP Knowledge Lab defines a PPP as "a long-term contract between a private party and a government entity, for providing a public asset or service, in which the private party bears significant risk and management responsibility, and remuneration is linked to performance". PPPs typically do not include service contracts or turnkey construction contracts, which are categorized as public procurement projects, or the privatization of utilities where there is a limited ongoing role for the public sector. PPPs can as such be a tool to leverage private capital and expertise and to support the deployment of renewable energy projects.

Step 7: Communicate to businesses and stakeholders.

The story doesn't end with the implementation of cooperation models and investment in low carbon energy technologies. In order to support the wider roll-out of energy communities at business park level and accelerate the energy transition, it is crucial to share best practices and lessons learnt.

Pioneers can share their experiences on collaboration and local energy communities through a wide range of communication activities and thus explain and convince companies and business park managers with similar needs to take action.

In a first step, businesses can 'spread the word' via all kinds of channels, such as the media, social media and specialist publications. A more engaging way to share experience is to actively participate in events, conferences and workshops etc., where business can take the floor to present their knowledge and experience.

You may wish to organise a networking event and invite your network and stakeholders to your business park or cluster to demonstrate what has been done. Show them the benefits of your investments and remember to mention the barriers you overcame. People will be eager to learn from your experience and will consider you as a pioneer, which is likely to benefit your own business in the long run.

Colofon

STEP-BY-STEP GUIDEBOOK. How to facilitate low-carbon energy systems for business parks and clusters of businesses

Output 3 of the BISEPS-project.

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