



**BEST PRACTICES FOR  
INDUSTRIAL AREAS  
– a report**



Best practices for industrial areas

Published by: City of Kokkola  
(Hannu-Pekka Pukema)  
[www.kokkola.fi](http://www.kokkola.fi)

Layout and graphic design: City of Kokkola  
(Juha Klemola)

Images and graphics: City of Kokkola  
Printing: Painotalo Välikangas, Kokkola

Date of publication: 11 November 2024

© 2024 City of Kokkola

# Sisällys

1	Lead project for battery chemistry .....	5
2	Development of industrial service concepts .....	6
3	Regional cooperation helps with attracting investments .....	7
3.1	Creating the conditions needed for industrial investment .....	7
3.2	The role of cities in facilitating functional ecosystems .....	9
4	BEST PRACTICES FOR INDUSTRIAL AREAS .....	10
4.1	Infrastructure .....	10
4.2	Logistical accessibility and transport routes .....	14
4.3	Electricity and energy .....	18
4.4	Services and safety .....	23
.	Case: Kokkola Industrial Park KIP .....	28
5	REFERENCES: .....	30



Co-funded by  
the European Union



# 1 Lead project for battery chemistry

The lead project for battery chemistry is a project funded by the Council of Tampere Region with ERDF funding and based on the National Battery Strategy 2025 and its national visions and objectives in the battery value chain. Finland aims to be an internationally renowned expert in the battery chemistry value chain, as well as a country in which companies are interested in making investments.

The lead project for battery chemistry involves the urban areas of Kokkola, Vaasa, Pori, Turku, Lappeenranta, Jyväskylä and Kuopio, whose ecosystem agreements are mainly related to battery chemistry expertise or business operations closely related to it.

The operators involved in the project play a key role in combining battery chemistry expertise and facilitating the growth of domestic expertise. Cooperation between the cities involved, skills development, information exchange and the promotion of resource efficiency have been coordinated in the project's three action units:

1. Strengthening top international expertise in battery chemistry and increasing effectiveness and visibility (University of Oulu)
2. Creating a network of universities of applied sciences and upper secondary vocational schools in the battery value chain (Centria University of Applied Sciences Oy and the Central Ostrobothnian Educational Consortium)
3. Industrial service concepts in the battery chemistry value chain (City of Kokkola).

The concrete measures of the project will strengthen the cities' top expertise in battery chemistry nationally and internationally. The aim is to strengthen the Finnish battery ecosystem and the construction of the associated value chain by focusing in particular on operations related to battery chemicals and by developing national cooperation between operators in the battery chemistry sector.

Common challenges related to battery chemistry will be resolved by making efficient and broad use of expert resources, strengthening regional expertise and combining interfaces with other ecosystem agreements.



Figure 1 Partners in the lead project for battery chemistry

## 2 Development of industrial service concepts

The City of Kokkola has taken on responsibility for the development of industrial service concepts in the lead project for battery chemistry. Its key objective is to identify best practices and innovative models for developing service concepts for industrial areas that also make it possible to promote their international competitiveness.

A modelling of an efficient industrial ecosystem entity was drafted to serve as a foundation for the development of industrial service concepts. This served as the basis for the discussions in the first round table organised for the project during Kokkola Material Week in 2023. The modelling was updated and further developed in industrial area development workshops, which were held in 2024 around four different themes.

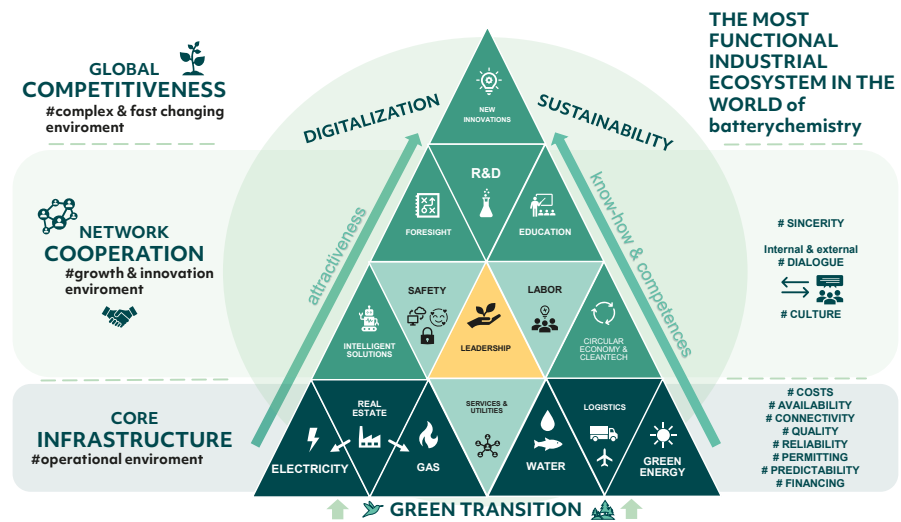


Figure 2 Pyramid modelling of the world's most efficient ecosystem

The underlying idea behind the workshops has been to grow skills, establish good practices, and create potential new common quality criteria and a peer support network for operators in industrial areas. Workshops were held in four different localities with representatives attending from various organisations spanning the whole country, from Tornio to Hamina and Pori to Joensuu. On the basis of the workshops, the Best practices in industrial areas guide was compiled (p. 10).

In the first workshop (February 2024, Helsinki), various industrial areas presented their operations to the participants and themes were identified for the next workshops. The second workshop on infrastructure and transport routes (April 2024, Tampere) provided examples of regional cooperation and looked further into land use solutions and accessibility. The theme of the third workshop (June 2024, Kokkola) was services and safety. The fourth and final workshop (September 2024, Lappeenranta) focused on the theme of electricity and energy.



Figure 3 Annual clock of the workshop series on the development of industrial areas

## 3 Regional cooperation helps with attracting investments

Creating favourable conditions for business, developing economic activities, attracting investments and gradually building investment projects require time and long-term work. This is a public activity that is not limited to one single administrative sector.

It can take 5–10 years from an investment decision to the start of construction of productive investment facilities. The key thing during this time period is to resolve various challenges and issues through cooperation.

Investment solutions are formed on market terms and regardless of municipal boundaries. In a sense, therefore, the areas are competing with each other for investments. However, cooperation between municipalities and the coordination of measures offer more potential than competition between municipalities.

### 3.1 Creating the conditions needed for industrial investment

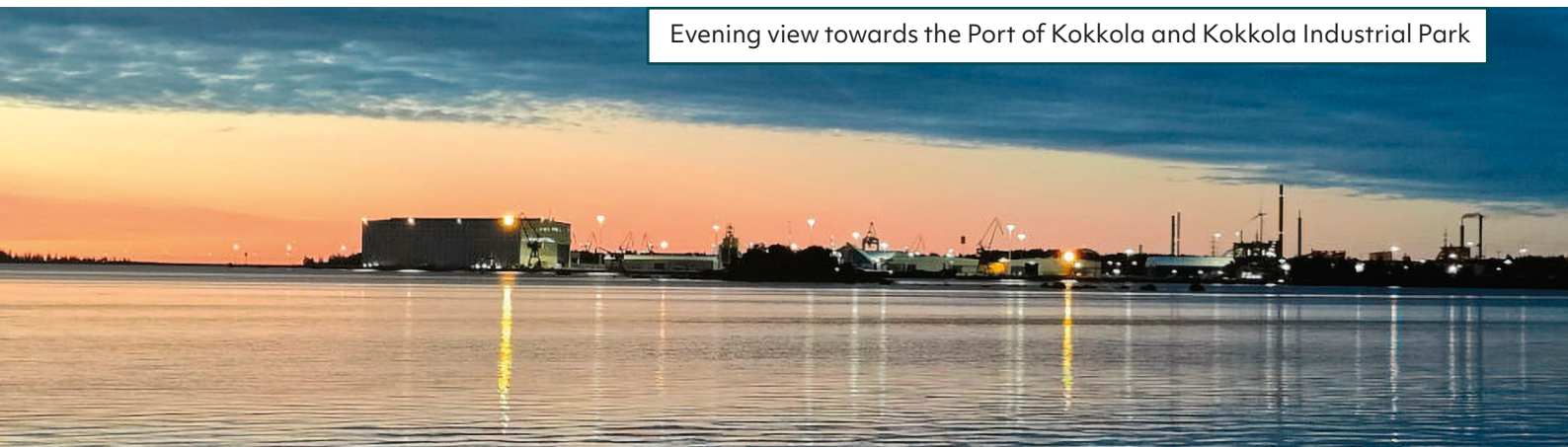
**In order to create and communicate about industrial investment proposals, the following are required:**

- a proactive approach from municipalities
- cross-municipal cooperation that is beneficial to all parties, between various areas, cities and municipalities
- regional decision-making
- coordination of cooperation
- up-to-date information and situation picture on business development.

Different areas of Finland have different strengths, needs, special characteristics and sources of competitive advantage, which give them a basis for both strengthening anticipatory work and identifying key elements of and recommendations from their own development work. In other words, no one is expected to have it all, and instead areas must find their own strengths as part of the national division of labour between the various areas. We need to consider what areas investments are being made in and what industries there are proving particularly attractive.

Exchanging views, achieving systemic understanding and preparing for alternatives require interaction as well as a common direction, goals and practices. Various matters are compiled into models and system descriptions, which improve overall understanding of how things work in Finland and the area, what investments mean and what we have to offer.

Evening view towards the Port of Kokkola and Kokkola Industrial Park



**Building a common knowledge base can, at best, create a common regional vision that:**

- » provides a framework for dialogue between the various stakeholders
- » strengthens the link between business development and land use
- » supports an area's 'invest in' work and expresses the joint will of the area
- » facilitates the clarification of the roles of the various operators and the pooling of business interests
- » facilitates better coordination, management and communication within the entity.

A unified vision clarifies the shared will of the area and supports the attraction of the right international investors and industrial operators.

The development of industrial activities and investment conditions is complex. Areas must also be able to identify their own weak points and be able to find solutions to them in cooperation with other actors, such as the state.

A clear, stable and mutually thought-out vision of the future will provide a good framework for industrial investments. In addition to the regional economic strategy, a shared will among Finnish industrial areas and a vision for the future are also needed. These goals will become achievable when every operator – including political decision-makers – is capable of committing to long-term action at all levels of operations.





## 3.2 The role of cities in facilitating functional ecosystems

In light of the above, we need trust, cooperation and new ways of thinking, both in the public sector (state, areas, cities, municipalities, universities, research centres) and in the private sector (production, financing). Ecosystem activities are based on interaction and co-development between businesses and entrepreneurs, research operators, public administration and operators in the third sector.

Understanding the perspective of ecosystems and their continuous development is key. Each organisation is part of a larger ecosystem – a network of its own stakeholders. The better an organisation understands the essence of its own ecosystem, the better it is able to make use of both its own resources and capabilities and those available in its network. This creates the preconditions for transforming the operating environment of the ecosystem and helps to expand silo-based thinking and move away from established operating models.

Within one ecosystem, there are simultaneously cross, parallel and competing cooperation networks. It is therefore important to understand the characteristics of value chains and networks, clusters and ecosystems as complementary cooperation models.

### Key measures

- » mapping regional strengths, priorities and areas for development
- » cross-municipal regional cooperation for attracting businesses
- » creating a common strategy and system descriptions for the area
- » modelling the impacts of regional investments to support decision-making and safeguard the development of the infrastructure network
- » considering the national will of industrial areas and vision for the future.



# 4 BEST PRACTICES FOR INDUSTRIAL AREAS

## 4.1 Infrastructure

When investors are considering and assessing investment targets, the first consideration is the attractiveness of the operating environment: the available locations and good logistical links.

In addition to pre-zoned plots, the functionality of the logistics for goods in the area is highly important to operators, in particular the functionality of ports and rail transport. In addition to these, as well as the availability of labour, important factors include sources of raw materials; the availability of electricity, energy and water; and synergies with other operators.

Whether we are striving for new investments and businesses in an area or a more dynamic city, it is worth combining strategic business development and land use work and making use of the business data produced by them. Land use solutions and logistical accessibility create the conditions for attracting investments, new businesses and residents, and strengthen an area that is growing sustainably, developing and attractive.

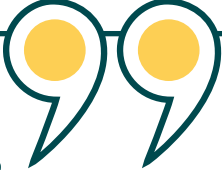
### 4.1.1 Land use solutions

It is important to cooperate on designing and building efficient infrastructure from the very beginning. The key thing is that the infrastructure is suitable for the purpose and that its realisation is realistic. Therefore, familiarity with the operators in the industrial area and their needs is important before planning and construction begin. Information flow plays a key role.

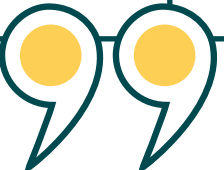
Coming together with the operators in the industrial area and creating an effective dialogue model will build mutual trust. They will also help to synchronise processes and solidify commitment to the promises, investments and timetables within which projects are prioritised.



*A well-thought-out and clear vision: whom will industrial areas be targeted at and what kind of industry will be located in different areas? -KOKKOLA*



*The most important lesson is the anticipatory and bold building of infrastructure and the belief in the kind of industry we are aiming for and that we want to see start being built. Huge amounts of infrastructure have already been built on the plots and land use has been anticipated. The project teams and the joint structures of 'invest in' operations have provided a solid foundation for all the work. -KOTKA-HAMINA*



*Closer cooperation between the city and its strategic companies (energy, water, port, development company) has significantly improved the design of industrial areas. -PORI*

## 4.1.2 Anticipatory preparation of plots for intensive industries

The ecosystems of both the manufacturing industry and the circular economy require space. There is often a need for large plots with dedicated contingency and interference areas, and possibly even closed test environments. The planning and preparation of industrial large areas and plots, as well as the infrastructure they require, involves many time-consuming phases and requirements, such as legally mandated consultation and clarification requirements for land use, with the aim of securing many other objectives. A further task of land use planning is to find ways to overcome urban sustainability and climate challenges.

Even in a short time span, attracting new industrial operators will become easier if the plots for intensive industries have been prepared in advance. Realising investments usually takes a long time. Once the impact studies, plans and other necessary measures relating to infrastructure and logistics links have been completed, they no longer delay or limit the opportunities for companies to move into the area. This approach also means that unnecessary construction can be avoided.

Proactive and flexible land use planning is a real competitive advantage. In anticipation, it is essential to take into account the different paces of time-consuming land use planning processes and needs companies have that require rapid realisation. The difficulty of reconciling different time horizons poses a real challenge. It is essential to ensure that the parties responsible for the development of land use and business operations meet and that information is circulated between those involved as smoothly as possible. Both sides must have sufficient knowledge of land use planning processes that are important for businesses, as well as an understanding of the development of business operations and the needs of companies.

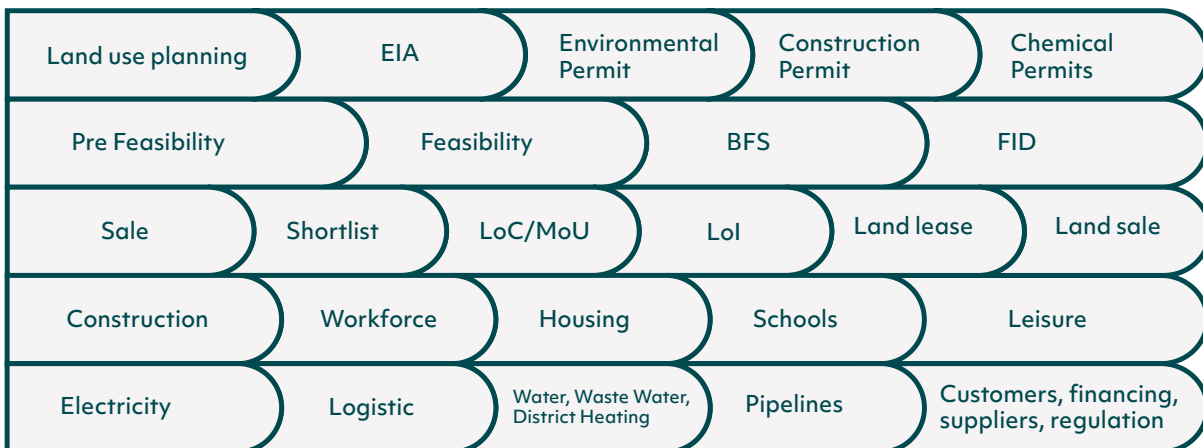


Figure 4 Processes to be synchronised in investment projects.  
Image source: City of Kokkola, Business Finland

*The most important lesson is anticipation, long-term planning and setting sights far enough ahead. With regard to infrastructure, we have to get ahead on various matters and planning needs to be done really proactively, including in terms of where traffic is directed. Realisation of investments is very much long-term work and the infrastructure must be ready. A bold approach is needed with decisions and sufficient vision is necessary.*

*For example, from the point of view of Kokkola Industrial Park, the construction of the road Satamatie in 2008 was key, as this completely changed the infrastructure in the area. And when the Port Tower plans were being drawn up, it was not yet known what kind of central hub it would form for the entire area. -KOKKOLA*

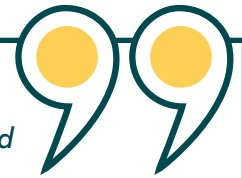
### 4.1.3 A clear land acquisition plan

The number of projects centred around companies moving into the area has increased significantly in recent years. From the municipalities' point of view, it is important that the land areas are used effectively: carrying out the projects is more significant than reservations alone. For this reason, municipalities must pay particular attention to whom land areas are reserved for and under what conditions. Municipalities must also vet operators from the perspective of ownership base, ethics of operations, financial solvency, organisation and competence, for example.

Active dialogue with the operator also involves risk management, as well as entering into agreements. Any plot reservations and leases can be tied to the progress of the project and clear release clauses can be inserted to be triggered if progress on the project stalls.

In long-term processes, it is important to identify the role of project organisations as operators in the early stages of the project. Land acquisition processes can last several years. The preparation of plots may require several land purchases involving land exchanges, so continuous dialogue with landowners is important.

*Cooperation between municipalities in land acquisition and land use planning has worked efficiently, creating a solid foundation for the development of industrial activities in the area. -VAASA/MUSTASAARI*



#### Key measures

- » productisation and pre-preparation of suitable plots for industrial investment needs
- » anticipatory land use planning and ensuring the smooth running of municipal land use planning and permit processes.

Work in a workshop for the lead project for battery chemistry



## 4.1.4 Moving permit processes towards the one-stop shop principle

From the point of view of attracting investments, safeguarding competitiveness, the investment decision process and the construction of an efficient industrial infrastructure, it is essential that critical permit matters and processes are managed well. Construction of investment projects entails a long timespan, and making an investment decision depends to a large extent on there being permits already in place.

The preparation of permit matters also requires a proactive approach. Preparations must be made for potential appeals and delays caused by them in the processing of the permit. For example, the permit process for new electricity transmission networks needs to involve consideration of their impact on existing infrastructure such as roads, railways and telecommunications networks.

From the perspective of investment projects, especially in the mining and battery industries, it is important to clarify and ensure proactive and smooth permit processes, the duration of which is predictable in terms of permit and appeal processes and final results.

However, in the case of new sectors, such as for battery plant projects, predictability of the decisions of permit-issuing authorities and courts is often a challenge, as these sectors may not have a previous benchmark in terms of the best technology for reducing emissions, for example.

We need to start moving towards the one-stop shop principle. In order to facilitate digital and centralised services and applications, interfaces between municipal and central government services must be developed, which requires a great deal of integration between different operators. On the other hand, this makes it possible for different parties to make use of information produced by other parties within the permit process.

### **Tips for 'invest in' operators**

#### **1. Putting down roots in an area**

- » Managing social relations and working with the residents of the area is important for obtaining public acceptance.
- » Active dialogue and regular hosting of well-organised public events can raise awareness of and reduce opposition to the project.

#### **2. Preparation and anticipation**

- » Finland requires an environmental impact assessment (EIA) process as part of setting up operations in a location.
- » It is a good idea to look into permit matters carefully. This will also allow for a fast track procedure to be implemented in the future.

#### **3. Open interaction**

- » Strong interaction between different areas on the content of the project and its impacts is important so that different operators can prepare proactively in terms of logistics and infrastructure.

## 4.2 Logistical accessibility and transport routes

Good logistical accessibility is a key competitive factor in an industrial area. Supply chains must be built taking into account the needs of businesses and ensuring that all parts work well together.

The condition of transport routes and infrastructure play an important role in increasing capacity and making investments attractive. Anticipatory planning, influencing and preparedness can prevent sub-optimisation and, for example, roads being developed in fits and starts.

Investments in industry will significantly increase road and rail transport during both construction and production. They set the requirements for efficient transport infrastructure that also facilitates other functions of society: accessibility, security of supply and safety.

An aerial photograph showing a long, straight road cutting through a dense green forest. The road has white lane markings and a few cars are visible in the distance. The sky is overcast.

*Without road and rail connections, many of the projects currently pending will not be implemented. -KRISTIINANKAUPUNKI*

*Ensuring the accessibility of the area through all four modes of transport – ports, rail connections, road connections and airports – supports comprehensive logistics operations and attracts a wide range of industrial activities. -VAASA/MUSTASAARI*

*The proximity of the port and the comprehensive electrical and water infrastructure have proven to be the main attraction factors. - PORI*

## 4.2.1 Understanding, enhancing and improving material flows in logistics chains

From the point of view of the functioning of the industrial area and the efficiency of its production operations, it is important to pay attention to the planning of material flows and to the improvement and enhancement of the logistics chain in order to ensure profitable production activities.

The logistics chain ensures that production flows well from the point of purchase of raw materials and components to delivery, receipt and storage. It guarantees that the materials are on the production line at the right time and ensures that the customer receives the products in line with the agreed timetable.

Developing Finnish transport and logistics chains and ensuring they remain as efficient as possible will help to keep transport costs for foreign trade and companies' logistics costs under control. Logistics solutions will create smooth, flexible and safe flows of goods and people in both industrial and surrounding areas.

Here too, instead of simply transporting goods, it is a matter of close strategic cooperation between different operators, in which those involved commit together to longer-term development and ensuring competitiveness.

When planning material flows with the logistics operator, their perspective can also be taken into account in the area's infrastructure. Goods flows as a whole can be divided into sections, which makes it possible to consider different approaches to logistics at departmental or function level, for example. This helps to ensure compatibility between infrastructure and operations and to individually tailor concepts for each sub-area to customer needs.

The most important thing is to model solution-centric alternative logistics solutions and to determine overall costs. Careful review of industrial area traffic and simulation of various logistics options from the arrival of raw materials to the transportation of finished products can be carried out effectively using digital simulation models.

### **This helps those involved to:**

- » take into consideration the impact of traffic flows
- » locate any bottlenecks in logistics
- » identify needs for terminals and loading and meeting points
- » ensure timely transportation of both raw materials and finished products
- » do their part to facilitate growth.

In order to facilitate more efficient material flows, it is also worth considering solutions for intermediate storage and the development of internal logistics. In doing so, particular attention should be paid to the development of processes and the digital systems supporting them, well-functioning space solutions and optimised internal transport solutions.



Evening view of Meripuisto in Kokkola





## 4.2.2 Accessibility of the industrial area from the perspective of the workforce

The accessibility of the area will also be important for the mobility and availability of a skilled workforce in the near future. A sustainable urban environment with its services helps make the area appealing to both businesses considering relocation and the experts they need, along with their families.

Municipalities must consider the location of various operations and forms of land use and their mutual relationships in the employment zone, urban area, city or population centre; the facilitation of housing, mobility and services; and the creation of the conditions for diverse economic activities.

The key thing is that the city can be reached by various modes of transport without unnecessary effort or sitting in traffic jams. The means to make this a reality include positioning housing, workplaces and services in such a way that mobility is possible by foot, bicycle and public transport.

### **The most significant means to make accessibility and the transport system more efficient**

- » reconciliation of transport and land use
- » optimisation of the performance of the entire logistics chain
- » sustainable infrastructure investments
- » coordination of sustainable mobility services
- » utilisation of new digital technologies and automation.

## 4.3 Electricity and energy

One of the strengths of Finland's investment environment is the comprehensive nature of what it has to offer, which can be used to appeal to investors from around the world. There is a particular emphasis on low carbon approaches in the production of both raw materials and energy. The advantages and resources of our industrial operating environment include responsible production, energy know-how, good availability of low-carbon energy, and a competitive price for it.

In industrial areas it is important to strive for circular economy solutions and synergies and the construction and utilisation of industrial symbioses comprising various companies. This means integrated and compatible industrial processes that help each other to function, at the core of which is resource efficiency.

Industrial symbiosis allows different operators to reduce the amount of waste they generate and improve energy efficiency. For example, waste heat produced by one enterprise or other sidestreams identified in the area can be efficiently used to meet the energy needs of another business or as a resource in local energy production.

It is also worth taking into account the wider utilisation of the potential of industrial integration and internal infrastructure, such as joint steam production, logistics, etc.

The aim is to facilitate an emissions-free energy system in a cost-effective manner, improve energy self-sufficiency while ensuring the sufficiency of electricity and energy, and make efficient use of low-cost electricity generation that fluctuates according to the weather.

### 4.3.1 Electricity prices

It is important that operators in the area have free access to the electricity market, that they can buy emission-free renewable electricity from the market at competitive prices and that the pricing of electricity transmission is also competitive.

In industrial areas, a shared electricity contract can be concluded and distribution agreed between different companies. Power purchase agreements (PPAs) are long-term electricity purchase agreements in which typically a large electricity user or a number of smaller electricity users agree to purchase a certain amount of electricity from the electricity producer at the price set out in the agreement, for example for 10–20 years.

### 4.3.2 Generation, availability and certainty of electricity

Reliable, stable and secure electricity grids form one of the key national competitiveness factors driving investment. Keeping them in good condition is a key prerequisite for the cost-effective electrification of our energy system, facilitating clean transition investment projects, and achieving Finland's climate targets.

Problems with access to electricity must be identified in time, and investments need to be timed correctly and in the right places. Making use of the wind and solar power potential of the whole country and levelling out production between areas are essential. In this way, the proportion wind and solar power account for of the overall supply can be increased by generating electricity in the areas where conditions are most favourable at the time.

Electricity and energy networks constitute essential and critical infrastructure for industrial relocation projects. The capacity of energy transmission networks must be increased, because industrial investments undergoing a clean transition require a great deal of renewable energy. All energy networks (heat, steam, cold and gas) have a role to play in the bigger picture.

Investments in transmission networks are long-term investments, the benefits of which will materialise within 10–20 years. A competitive industrial area must have sufficient transmission capacity. Active dialogue between the municipality, industrial areas and grid operator Fingrid will help those involved anticipate the needs associated with development and construction of the grid in the future.

For electro-intensive operators, the key factors are the connectivity of production and operators based in the area to the electricity grid (110 kV), sufficient connection capacity, and an area's transmission and transformer capacity. In industrial areas with high electricity consumption, dual supplies from different sources are needed to be able to manage disruptions.

Industrial areas may be home to several local network companies that need to be able to cooperate easily with each other. Regular interaction between grid companies and industrial operators on development plans and growth opportunities as well as investment plans related to electricity availability with area-specific implementation timetables are important.

### 4.3.3 Energy storage

The importance of the need to store electricity and energy will only increase. Storage ensures access to affordable electricity and stabilises peaks in green, renewable and weather-dependent electricity generation. The development of an industrial area must take into account future forms of energy storage.

Battery technology and also larger battery systems can be used to manage peaks in electricity generation that varies depending on the weather, as well as to store energy and balance supply and demand for electricity. Batteries make it possible to store electricity when too much electricity is produced and allow for electricity to be released into the grid when generation is insufficient.

The creation of seasonal heat reserves and underground energy generation are solutions to improve security of supply in preparation for crises in the future.

Utilisation of small-scale nuclear power: Small modular reactors (SMRs) produce emission-free energy (electricity and heat) and are an alternative to fossil fuels in district heating and industrial applications. These modular nuclear reactors with an output power of under 300 MW can operate close to consumption points and provide both flexibility and security of supply to the overall entity and ensure industrial areas have sufficient electricity.

The utilisation of gas (e-LNG and hydrogen) must be taken into account, but in addition to gas power stations, more even regulating power is needed. Hydrogen is the raw material of the future for industry and its entire value chain and can offer many new opportunities in the development of industrial sites. The availability and price of hydrogen are competitive factors that should be invested in in places where electricity is available and affordable. Hydrogen's downstream products, along with the associated processes, offer both new industrial investments and innovations. Hydrogen should, therefore, be seen as a raw material for further processing and its local downstream value chains should be promoted.



#### 4.3.4 Decentralised energy resources, offgrid use and energy communities

Decentralised energy resources are energy generation plants with smaller scale capacity or energy storage facilities connected in a decentralised manner to a distribution network near consumption. They facilitate local utilisation of the energy produced. The use of decentralised electricity generation and decentralised energy resources has become more common due to the effects of higher energy prices, increased energy demand and climate change.

Decentralised energy resources enable the offgrid use of an electricity distribution network that benefits both distribution network companies and end users. Offgrid use can improve the security of electricity supply. It facilitates the continued supply of electricity to end-users in the event of electricity shortages, failures or scheduled maintenance breaks in the electricity distribution system. This protects critical functions and reduce the costs of power cuts and high electricity prices. Offgrid use facilitates the use of energy resources owned by end users alongside the resources of energy companies.

Energy communities can help to increase energy self-sufficiency together and invest in larger power generation equipment and/or storage facilities at lower unit costs. In addition to the pursuit of economic benefits, an energy community also increases opportunities to influence the way in which its own electricity is generated and thus the environmental impact.

Energy saving, energy efficiency and its improvement are essential elements that need to be optimised in the area and associated investments monitored as technology is developing continuously.

#### 4.3.5 Useful heat

Useful heat and cooling capacity are important in terms of cost-efficiency and competitiveness. Their better and more efficient use become more important in future investments and can even be seen as a sales asset. Useful heat and cooling capacity:

- » improve the energy efficiency of industry
- » reduce dependence on virgin energy sources
- » support sustainable development.

Useful heat has huge potential, the utilisation of which in the district heating system, for example, is in line with the principles of the circular economy. Useful heat can be used to save energy and improve energy efficiency, through means such as closed loops, heat pumps and heat storage.

Recovery and reuse of useful heat are essential, especially in energy-intensive industry where exploitation of the strengths of the entire industrial ecosystem is profitable.

New innovations should also be considered in directing the extra heat generated in the operations of industrial areas, for example to be used by city residents. Waste heat produced by the paper industry can be used, for example, to heat farms operating in the food industry or agricultural greenhouses.

Recovery of useful heat should be considered part of the energy efficiency of buildings. The starting point for designing new buildings is that there is no point in building or heating empty spaces. The energy efficiency of old buildings can also be improved cost-effectively.

Many industrial areas or data centres, for example, also require electricity-intensive cooling. The return of cooling water to waterways may become a problem for the natural ecosystem if the temperature of the water fed into the waterways is too high.

#### 4.3.6 Future trends in flexible energy production and consumption

**Readiness for flexible energy consumption** is a significant and critical element of the green transition, process design and ecosystem construction. However, flexible energy consumption is a challenge in the context of high demand for products and high electricity prices.

**Production flexibility solutions** should be kept to a minimum. If demand and product prices are high, production must be able to run without restricting the use of electricity. Flexibility in the use of electricity is possible in industrial processes where there is real leeway.

Harmonising productive sub-processes and flexible solutions is challenging. Flexibility solutions should be tailored so that the production process can also act as a buffer against fluctuations in electricity generation.

Tuotannollisten osaprosessien ja joustoratkaisujen yhteensovittaminen on haastavaa. Joustoratkaisut tulisi mitoittaa siten, että tuotantoprosessi voi toimia samalla bufferina sähköntuotannon heilahteluja vastaan.

- » for example, overcapacity in hydrogen production makes it possible to store a large amount of electricity locally or via pipelines
- » planning production processes in such a way so as to facilitate efficient and rapid means to scale up or down production
- » electricity capacity to be procured from the balancing market for balancing power between generation and consumption and maintaining the operational security of the electricity system.

**A diversified energy mix is needed in energy production methods**, in which green energy and utilisation of local strengths are essential. In addition to the green energy production plants in the area, there is also demand for bioenergy in all its forms (solid, liquid, gas).

- » encouraging use of domestic fuels in energy production (e.g. wood chip)
- » supporting local, smaller-scale forms of production
- » focusing on minimising energy consumption, energy storage and use of waste heat, for example in data centres whose computing power can be adjusted according to spot prices.



## 4.4 Services and safety

### 4.4.1 Services

Services create and strengthen the core functions of the industrial area's businesses. They support both individual operators and the entire industrial area.

The operators in the area should consider together the services they have a shared need for, what they expect from them and how they can produce them. Services may be provided, for example, by a joint enterprise of the operators or the area's own service production, by jointly procuring some of the services from various service providers. By making use of both individual services and the strengths of the ecosystem of an industrial area, the competitiveness and efficiency of operations in the area will be increased and the safety, smooth running and maintenance of the infrastructure of the enterprises and operators in the area will be supported.

The key ideals of the broad range of services to be built in the industrial area are customer orientation, flexibility, cost-effectiveness, sustainability, and digital solutions.

The services of the industrial area can be divided into various sub-sections, such as:

#### 1. Infrastructure services

- » **Electricity, water and gas services:** The supply of high-output and continuous energy, water and gas required by industrial areas, as well as the necessary and regular maintenance and monitoring of these systems.
- » **Telecommunication services:** High-quality and reliable telecommunications, including internet connections, are critical for communications between operators and for the continuity of business processes.
- » **Transport, logistics and transport services** may include the management of intra-industrial area transport and logistics, delivery of goods, and transport and logistics services. Internal transport arrangements as a service means organising transport routes within the industrial area, industrial rail tracks, loading and loading areas for trucks and optimising logistics. Parking services, i.e. parking arrangements for employees, customers and visitors, as well as parking supervision, must also be taken into account.
- » **Waste management and recycling services** play an important role in minimising the environmental impacts of an industrial area as well as in organising efficient waste treatment and recycling.

#### 2. Security services

- » **Security and guard services:** Area surveillance and security systems, including access control, camera systems and security personnel.
- » **Services for crisis situations:** Rescue plans, safety exercises, emergency situation management and crisis communications. Fire safety services and necessary safety equipment.
- » **Cyber security services:** Protecting an industrial area against cyber threats as information security issues become increasingly prominent. System security, data encryption services and cyber attack response.

### 3. Environmental Services

- » **Environmental management services** ensure that local legislation is complied with, potential problems can be identified at an early stage and the operation of an industrial area does not endanger the environment. Ensuring environmental protection and continuously monitoring environmental impacts. Waste water treatment and air quality monitoring. Monitoring of groundwater, soil and air quality.

### 4. Servicing and maintenance services

- » **Maintenance and technical servicing:** Regular maintenance of buildings, machinery and infrastructure and inspection of pipelines, electrical equipment and sewer systems to ensure they are in good operating condition and safety.
- » **Construction services:** Repair, construction and expansion services to support the growth of the industrial area and the expansion needs of the operators.

### 5. Support and additional services

- » **HR Services:** Necessary recruitment and personnel management services for industrial area operators. This could also include temporary employment agency services.
- » **Training and safety consultancy:** Training on safety matters, especially for critical operators. For example, hot work training, first aid training and training for handling dangerous substances.
- » **Restaurant and catering services:** Catering services for employees in the area, such as lunch canteens and catering services for various kinds of event.
- » **Healthcare services:** Employee healthcare, occupational healthcare and first aid services.

### 6. Administrative services

- » **Inter-authority cooperation** with local authorities in order to ensure timely management of permits, inspections and requirements.
- » **Statutory guidance:** Legal services and guidance services for companies, regarding compliance with legislation, in particular in the field of the environment and safety.





## ESSENTIAL

- » zoned industrial plots
- » basic infrastructure that is in good condition and expandable:
  - transport routes,
  - transmission systems,
  - pipelines
- » reliable basic commodities and raw materials:
  - electricity and energy,
  - water and waste water,
  - gas,
  - data connections
- » logistics services
- » provision of a subcontracting network in the area for both construction and operating phases
- » specified service providers.



## TO BE TAKEN INTO CONSIDERATION

- » maintenance and cleaning services
- » occupational health services
- » restaurant services
- » centralised security services:
  - guard services,
  - access control,
  - movement restrictions,
  - cyber security
- » training.

## FACTORS THAT BRING ADDED VALUE

- » taking into account the overall industrial area concept and the overall impact
  - » permit services and support with permit procedures
  - » access to sustainable energy solutions
  - » business and service networks that support operations
  - » shared marketing and communications
  - » attracting talent, drawing power and retention.

Service provision workshop for industrial areas

## 4.4.2 Safety

In the day-to-day operations of industrial areas, it is essential to ensure the continuous maintenance and development of safety.

The foundations of a strong common safety culture in an industrial area are the commitment of management, shared risk management and safety practices, their monitoring and continuous training.

### 1. Commitment of management

Safety cultures are built on the basis of the commitment of senior management to developing preparedness and safety. Safety must be an integral part of the organisation's strategy and management must set an example in their day-to-day actions so that all personnel understand the importance of safety in the industrial area as a whole.

### 2. Clear responsibilities and roles

The safety requirements of industrial areas can be complex. It is important to define responsibilities and roles precisely so that everyone has a clear understanding of their role in maintaining safety. Additionally, the continuous development of safety expertise must also be ensured.

### 3. Continuous communication and cooperation

Safety management requires efficient, clear and transparent communication that ensures that employees are aware of risks and operating practices. Communications channels supporting the efficient sharing of safety information must be created for internal and external communications. Regular exercises and active daily communication help promote the effectiveness of communications in crisis situations.

### 4. Risk management and anticipation

Risk management is the basis for the management of safety in an industrial area. Proactive action can be used to identify, assess and manage potential hazards and to avoid instances of damage or accidents.

The objective of external safety is to prevent external threats to the industrial area and to ensure a safe operating environment for all those working in and visiting it. The external safety of industrial areas entails physical protection of the site, monitoring of external operators, systematic background checks on new actors and preparedness for wider societal threats, such as strikes, hybrid influencing and sabotage.

Industrial sites should implement joint security measures and detailed plans. The use of technology and monitoring systems makes it possible to better detect, prevent and protect against intentional interference.

The latest technologies also allow for continuous monitoring of environmental impacts. This ensures they can also be reported to legislators and customers. By using artificial intelligence, for example, large amounts of data can be analysed, real-time data analyses can be carried out and potential environmental risks can be predicted.

In order to ensure business continuity, the risk management plans of industrial areas must also include anticipatory preparedness for extreme phenomena caused by climate change, such as floods and storms.

## 5. Safety practices and compliance with them

Clear and concrete safety practices ensure a strong safety culture. The area's organisation must have clear and precise emergency response protocols and evacuation practices. These shall be updated and compliance with them monitored on a regular basis.

Industrial areas must take into account the environmental ecosystem, which means considering residential areas and groundwater areas, for example. The aim of environmental safety management is to prevent and manage the impacts an industrial area has on the environment, such as waterways, air and soil. Infrastructure maintenance, such as the control, monitoring and maintenance of pipeline networks and sewer systems, is essential.

Taking environmental safety into account ensures that the area's operations are sustainable and comply with legislation. It must be ensured that environmental impacts are assessed and that all operations comply with existing environmental standards.

## 6. Education and orientation

Continuous and regular training of workers and orientations for new workers on safety practices are essential measures for establishing and consolidating the safety culture. In orientations for international workforce, any language and cultural differences should also be taken into account. Visitors will also need guidance on safety practices in the area.

Practical exercises play a key role. Regular testing of and training on contingency plans created for exceptional situations is important.

## 7. Continuous monitoring and improvement

The development of the safety culture requires continuous monitoring and evaluation. Accident and risk monitoring systems allow areas to analyse and develop safety.



# Case: Kokkola Industrial Park KIP

Production operations at Kokkola Industrial Park (KIP) began nearly 80 years ago. Over the decades, the 700-hectare area built around the then Kemira and Outokumpu factories has grown into an internationally significant inorganic chemicals industry ecosystem that is the biggest of its kind in Northern Europe. KIP is also an excellent example of industrial integration and infrastructure to support the heavy chemical industry. Many of the production businesses in the area are descendants of either Kemira or Outokumpu. There are 16 production companies in the area, most of them international, and their core functions are supported by approximately 60 service companies. In total, there are nearly 80 companies in the KIP area, with a total of 2,400 employees.

KIP boasts an excellent location; Kokkola-Pietarsaari Airport is about 15 minutes by road and located along the main railway line, the rail network extends into the core of the large industrial park. The location, deep fairway (14 m) and services offered by the Port of Kokkola, which is based in the area, (including the Rail Wagon Tippler Terminal and All Weather Terminal) provide significant support for the export industry.

The area offers pre-zoned plots of land, premises, pipe bridges, fibre connections, sewerage, and a good internal road and rail network. The relocation of manufacturing companies to the area is facilitated by a comprehensive, high-quality and ready-made infrastructure serving the area's core activities as well as diverse flows of raw materials complemented by an abundance and almost self-sufficient supply of commodities (e.g. energy, water, district heating, compressed air).

The KIP area is of enormous importance to the vitality of and employment in Kokkola and the surrounding province. This success is based on robust, decades-long co-operation and a pioneering approach in the utilisation of the concept of an industrial circular economy. Various synergies have been created between the companies in the area at a variety of levels, such as the utilisation of the side streams of the process industry, centralised service production and the joint development of operating cultures, in particular around EHSQ functions (environment, health, safety, quality).



Aerial photograph of Kokkola Industrial Park

## Shared values facilitating a functioning service ecosystem

**Kokkola Industrial Park's Association (KIP ry)**, founded in 2006, has been key in the building and development of systematic cooperation between companies in the industrial park and its visibility.

KIP ry has created a common strategy guiding the development of the industrial park. The association defines the annual themes of activities, which are then discussed in five active working groups: ICT, HR, marketing, safety and the environment & energy. The activities of KIP ry create a new standard for large industrial areas with a focus on safety, the environment and social responsibility, as well as trust and cooperation between different operators.

A large network of service businesses has grown around the production companies of Kokkola Industrial Park. Service companies provide products and services that support the core functions of production facilities, such as maintenance, planning, port, real estate, facility, ICT, electrical engineering, security, contracting and project services.

Local service provision is pivotal for the competitiveness of export companies. Local service providers operate with flexibility and are familiar with the specificities of production facilities. Flexibility is particularly important in the process industry, where service providers are often required to react quickly to changing situations.

**KIP Service Oy**, which operates within the park, is a comprehensive operator in terms of the park's infrastructure, creating the conditions for businesses to easily relocate to the park and facilitating the efficient utilisation of valuable industrial land.

KIP Service is responsible, among other things, for the safety of and teleoperations in the park. It creates an operating environment that enhances the success, competitiveness and operational reliability of operators based at the park, as well as a network of partnerships delivering commodities, services and solutions. All in all, the one-stop-shop model offered by KIP Service has contributed to creating a success story for the entire park.

The All Weather Terminal at Kokkola Harbour



## 5 REFERENCES:

In addition to the materials produced in the workshops, understanding has been increased through the following sources to build on the content of the workshops on industrial area development and to compile this report.

- Akkuarvoketjun edistäminen ('Promoting the battery value chain'), Audit Report 4/2024, National Audit Office of Finland
- Enabling cost-efficient electrification in Finland, SITRA STUDIES 194, 2001
- Kansallinen akkustrategia 2025 ('National Battery Strategy 2025'), Ministry of Economic Affairs and Employment, 2021
- Karppi, I., Sankala, I., Tammiharju, J., Helve, H., Kolehmainen, J. 2024. Yhteen sovittamista: Yhteistyön ja ymmärryksen syventäminen elinkeinot huomioivassa maankäytössä ('Reconciliation: deepening cooperation and understanding in land use that takes business into consideration'), Tampere University
- Keränen, Krista, Ekosysteemitoininnan ABC ja mitä arvoa ekosysteemimäinen lähestymistapa tuottaa ('The ABC of ecosystem activities and the value an ecosystem approach offers'),
- Kokkolan ekosysteemisopimus ('Kokkola's ecosystem agreement') – Finding Value workshop 6 March 2024, presentation material
- Kivistö, Markku, 2024, Finland the most competitive hydrogen economy country in Europe, Business Finland, Kivistö Markku, presentation material, 11 September 2024
- Leppänen, Kukka, 2023, SÄHKÖNJAKELUVERKKOON LIITTYVÄT SAAREKEKÄYTÖT, KÄYTTÖTAPAUKSET JA NIIDEN KANNATTAVUUDEN PERUSTEET ('ISLAND OPERATION IN THE ELECTRICITY DISTRIBUTION NETWORK, USE CASES AND FUNDAMENTALS OF THEIR PROFITABILITY'), master's thesis, Tampere University
- PUHTAAN ENERGIAN JA POWER-TO-X-INVESTOINNIT KAAKKOIS-SUOMEEN ('CLEAN ENERGY AND POWER-TO-X INVESTMENTS IN SOUTHEAST FINLAND'), FAST EXPERT TEAMS, LUT University, 2024

<https://www.kip.fi/>

<https://kipservice.fi/>



