19.12.2025

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Data Center Feasibility Study

Industrial Park Štúrovo

Priemyselný Park ŠTÚROVO

DDC

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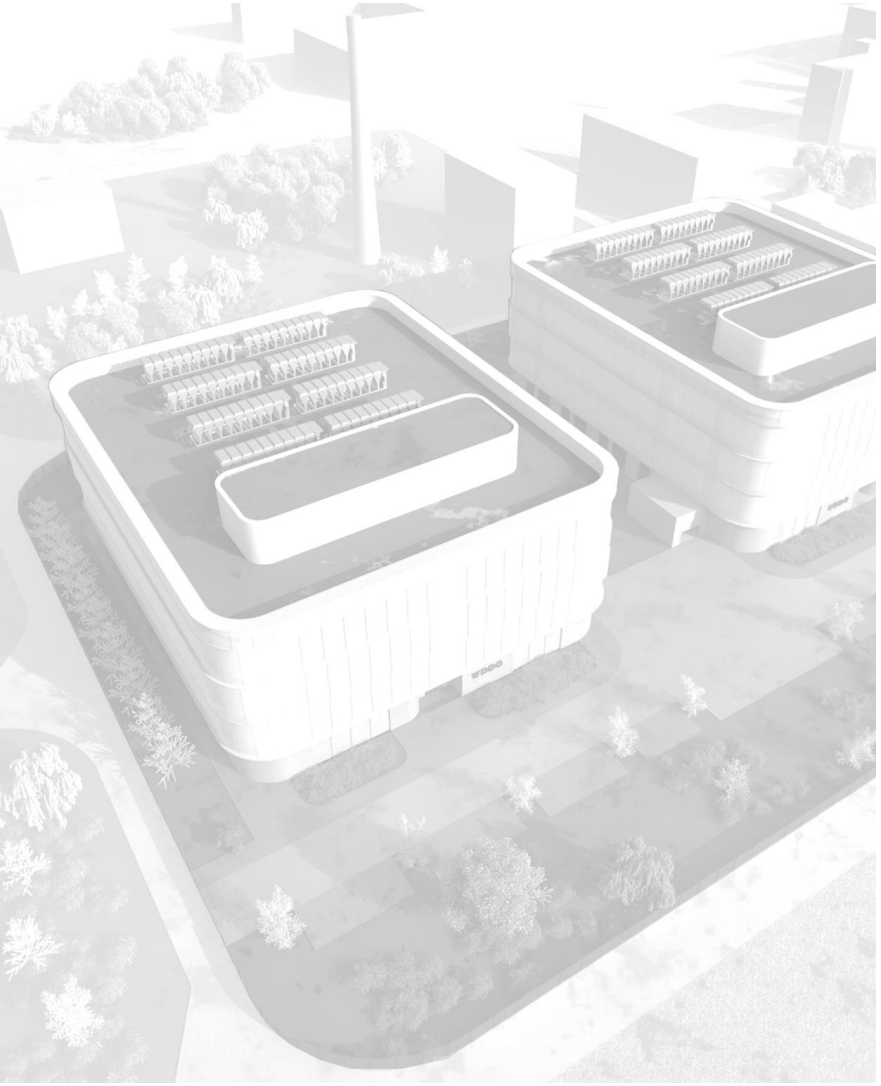

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Project goals and scope

The goal of this project is to verify the feasibility of a new Data Center project inside the Industrial Park of Štúrovo. The park already has multiple kind of energy sources and a funcional infrastructure, but the requirements of a future DC project have to be surveyed.

Key points of the feasibility study:

- Site and Location Analysis with global aspects
- Compliance with local regulations
- Evaluation of the available energy sources and infrastructure
- Preliminary Evalutation according to international standards such as EN 50600 and TIER
- Determination of the maximum achievable availability category
- Develepoment proposal with schematic volumes and floor plans

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02 Location Analysis

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Site

Railway connection

33 km branch railway network (operating with diesel trains) connecting directly to Štúrovo railway station and the international network

Power Station

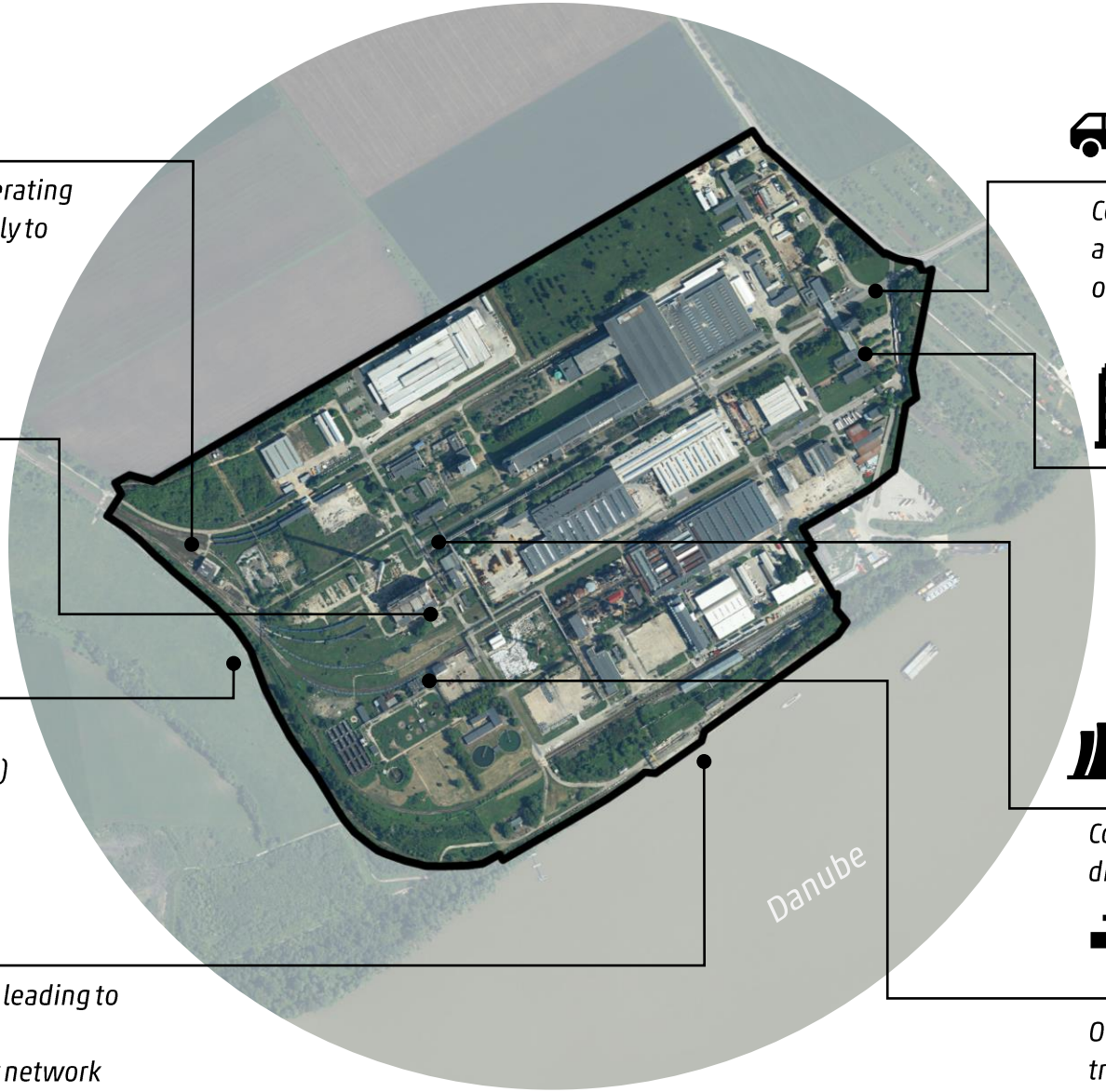
Two 110 kV connections
Two high performance transformer
Total of 40 MW capacity

Renewable energy

24 MW photovoltaic plant and battery energy storage system (BESS)
Planned: 25 MW wind energy plant

Private port on the Danube

Direct connection to the waterways leading to the North Sea and to the Black Sea
The port is connected to the railway network



Main access by road

Connection to the city and further to Esztergom or to Bratislava

Office spaces and parking

Office spaces for rental

Natural gas distribution network

Connection to the gas distribution network

Wastewater treatment

Own wastewater treatment plant

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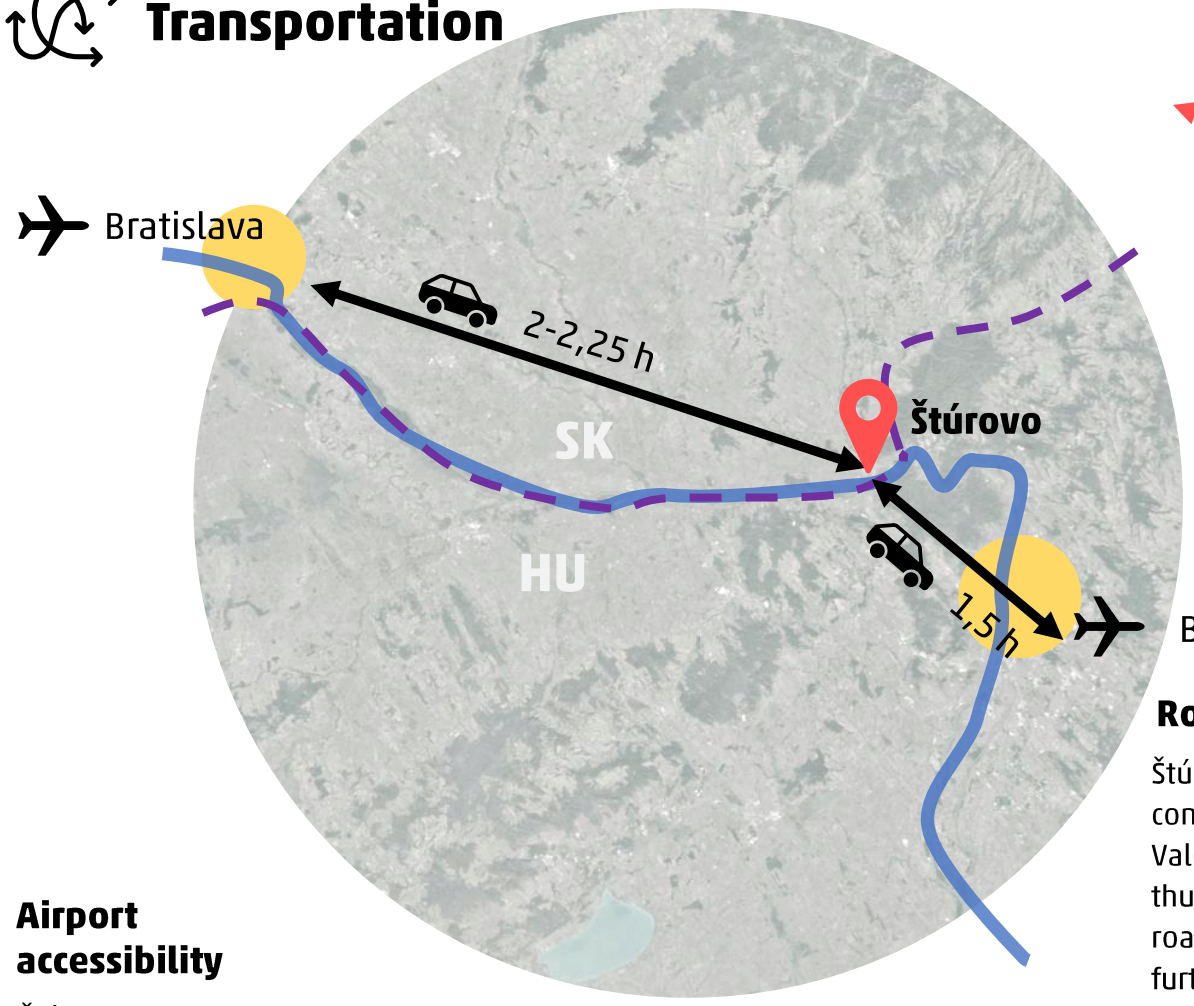
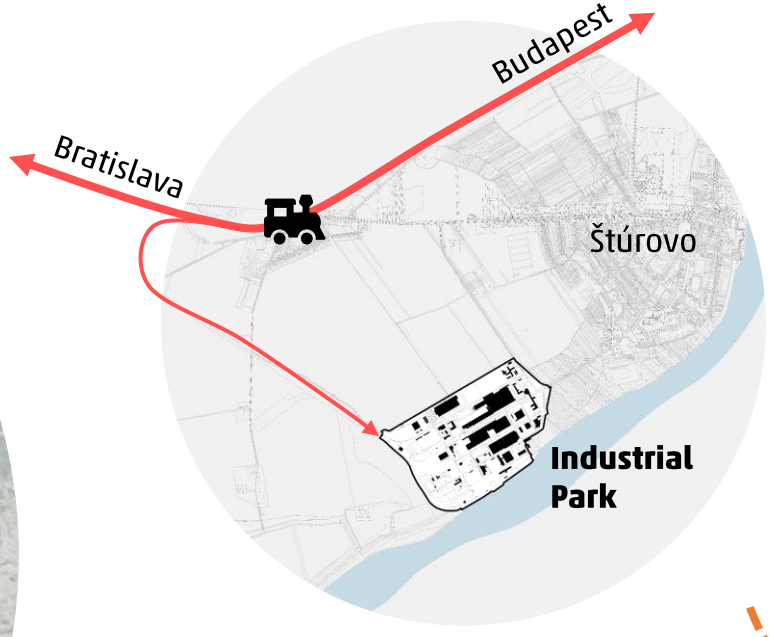
Transportation



Airport accessibility

Štúrovo and the Industrial Park are just about a 1.5-hour drive from Budapest's Liszt Ferenc International Airport and approximately 2-2.5 hours from Bratislava International Airport, offering excellent connections to flight routes across Europe and beyond.

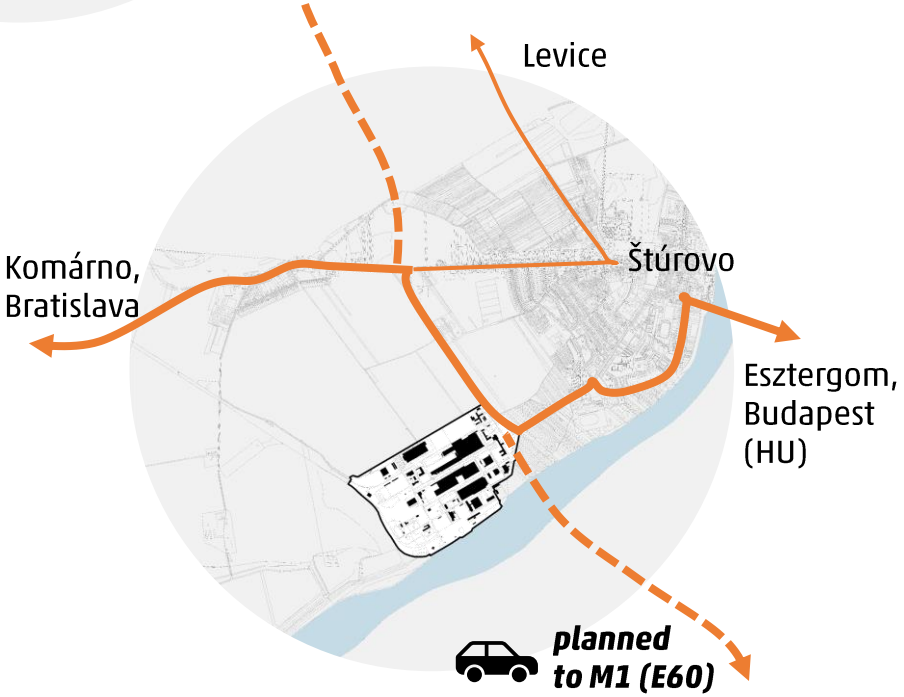


Railway

The Štúrovo railway station is located about 2 km from the industrial park and is connected directly to it by a dedicated railway tracks operating exclusively with diesel trains.
The station lies on the main international line between Budapest and Bratislava, with further connections to Western and Southeastern Europe.

Road infrastructure

Štúrovo has a good road connection through the Maria Valeria Bridge to Esztergom and thus to Budapest in Hungary. The road 63 leads to Komarno and further to capital Bratislava.
The planned new highway connection and the new bridge will be crossing the river in front of the industrial park, thus giving a faster road connection to the main cities.



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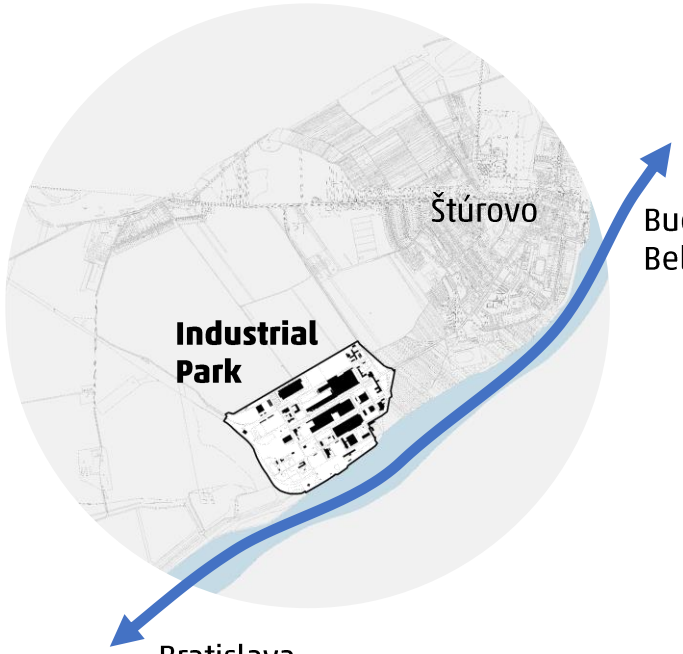
Danube

River Connections

Štúrovo, along with the Industrial Park on the northern bank of the Danube, has excellent access to international water transport routes that connects the North Sea to the Black Sea via the Elbe and Danube rivers.



Private Port and Ferry

The Industrial Park has its own private harbour with a total area of 3.65 hectares, located on the left bank of the Danube. The total usable quay length is approx. 200 m, with the possibility of further extension.
The port is equipped with a crane with a lifting capacity of up to 10 t.
A nearby cargo ferry operates between Štúrovo and Esztergom.

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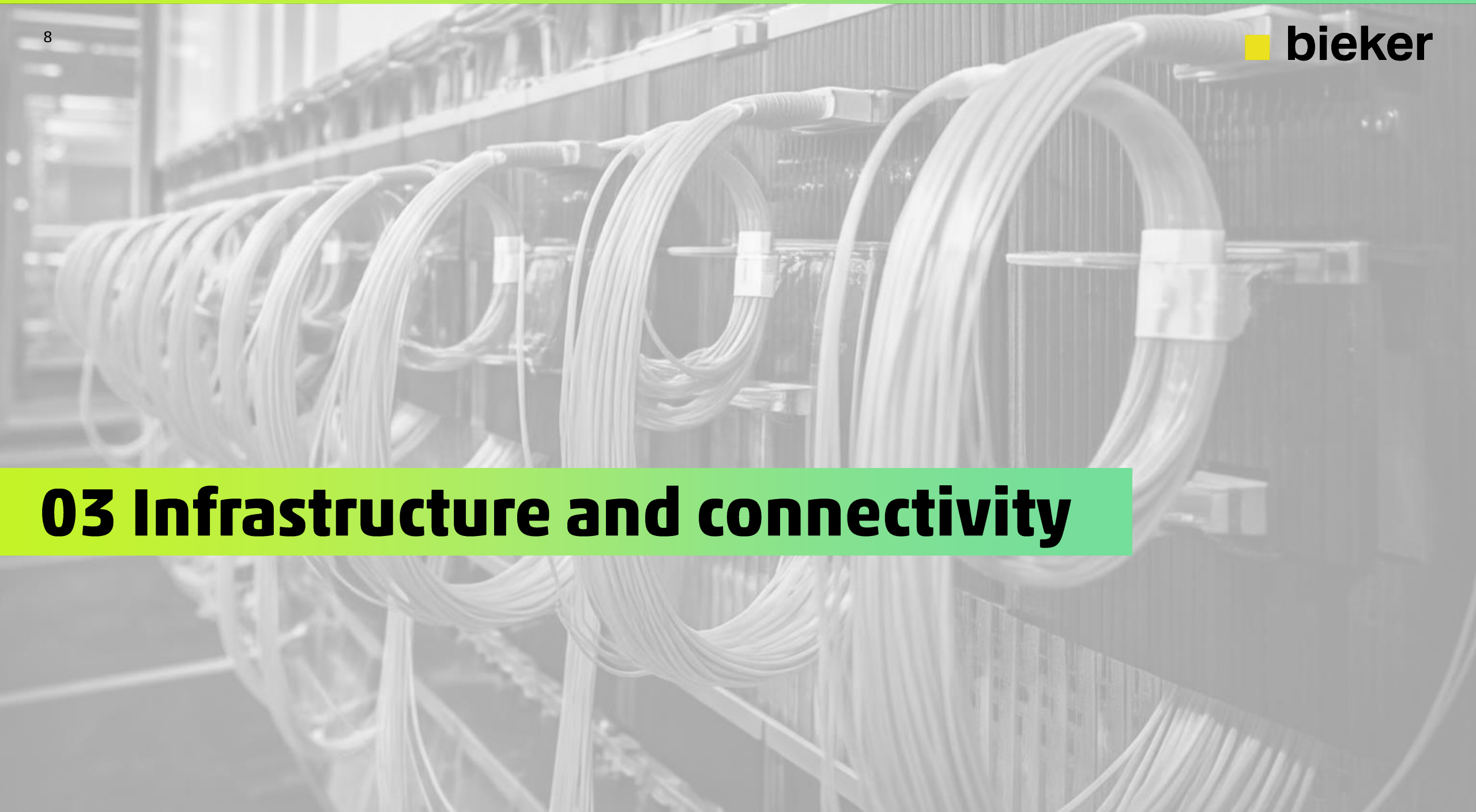

03 Infrastructure and connectivity

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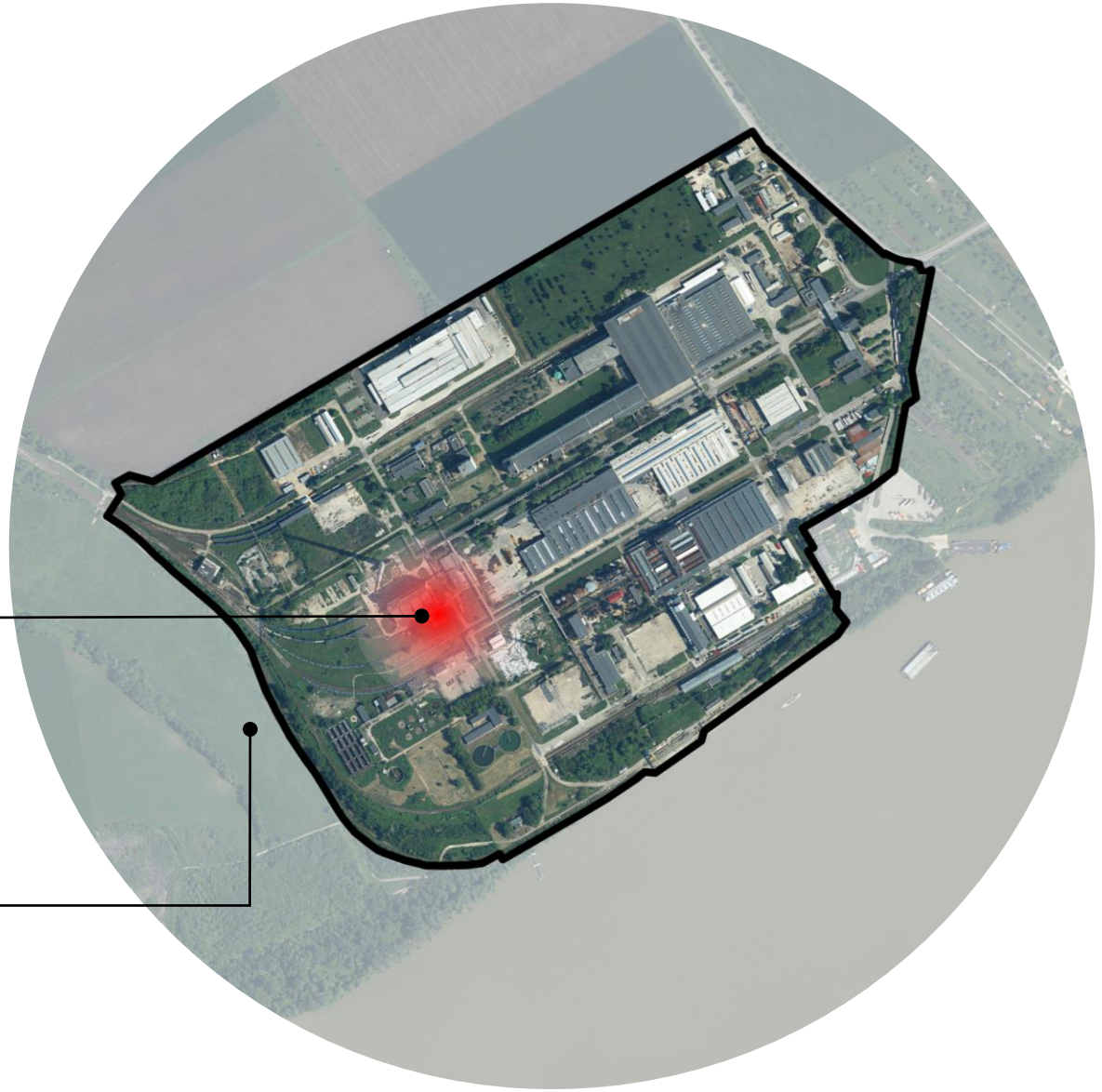
Electrical power

Slovakia stands out as a leader in clean electricity generation with more than 85% of its electricity derived from low-carbon sources (63% nuclear, 14% hydro) in the year of 2024-2025.
There is a strong amount and future-looking energy mix available and planned on site as well. The electrical power from grid can be further expanded and there is a possibility to keep it 100% carbon-free.
The on site available green energy creates a powerful basis for the energy concept of a future Data Center design.
The on-site middle voltage cabling is ideal for data centers.

Available high voltage and middle voltage grid connections:
Transformer T101: 110/22/6.3 kV
Transformer T102: 110/6.3 kV
20x20 MW in total with expansional possibilities

Solar energy plant with battery energy storage system:
24 MW electrical power from solar park
12,4 MW battery energy system (operation from 2026. July)

Wind farm with a total energy of 25 MW is planned to be realized in the near future.



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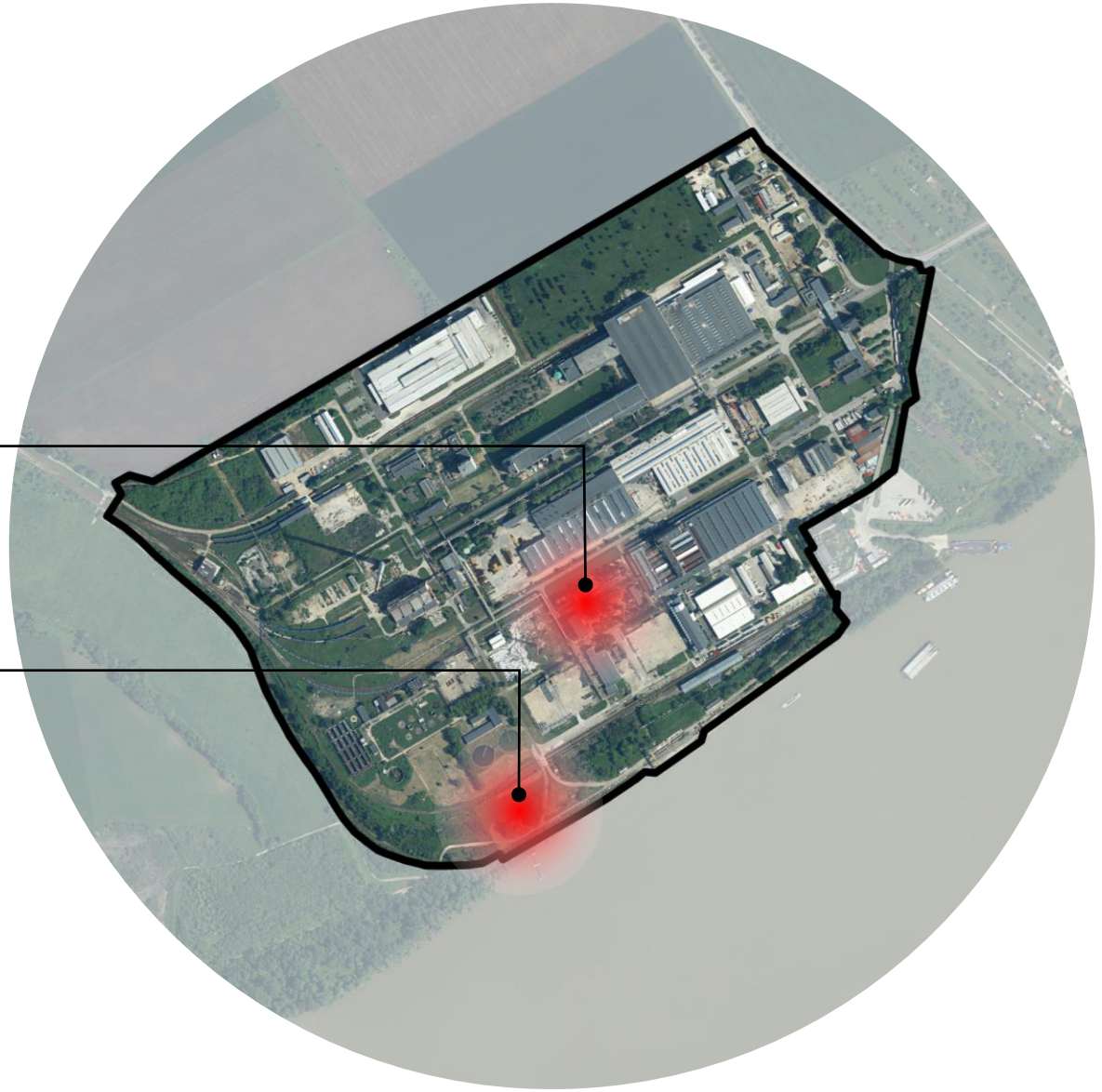
Water usage sytem

A state-of-the-art water treatment facility with a capacity of 10,000 m^3/day, integrating advanced mechanical, aerobic, and anaerobic technologies to deliver reliable, efficient, and sustainable water management solutions. The treated effluent is safely conveyed to the Danube River, meeting and exceeding the most stringent environmental standards.

Danube water is distributed on site in cleaned form. It is used for cooling and it is ideal for future data center projects as well. The supply of technological water is reliable, as the main pipes are lying in Danube river.

Used Danube water is running back to the river after high standard filtration procedure according to strict enviromental standards. This water treatment system fullfills future european requirements as well.



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Connectivity

TERRESTRIAL LINKS	
STATUS :	Operational
OPERATOR :	Energotel, a.s.
FROM :	Zeliezovce
TO :	Sturovo
DISTANCE :	45.25
VALIDATION :	Public
SOURCE :	visit validation website

TERRESTRIAL LINKS	
STATUS :	Operational
OPERATOR :	Energotel, a.s.
FROM :	Sturovo
TO :	Nove Zamky
DISTANCE :	68.66
VALIDATION :	Public
SOURCE :	visit validation website

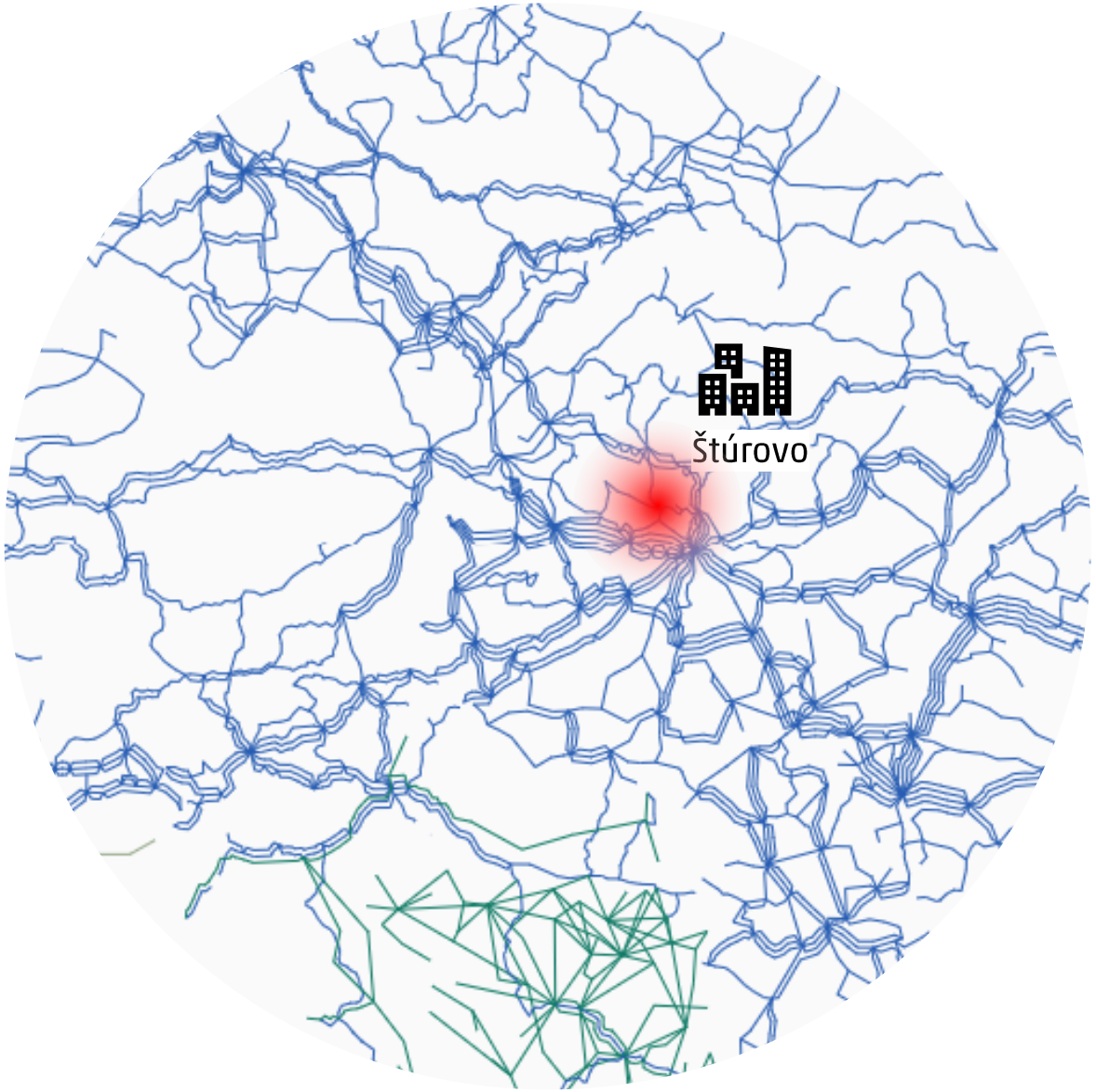
TERRESTRIAL LINKS	
STATUS :	Operational
OPERATOR :	Invitel
FROM :	Esztergom
TO :	Undefined (Slovakia)
DISTANCE :	4
VALIDATION :	Public
SOURCE :	visit validation website

The site is well connected to the city Sturovo. There are two main Internet Service Providers already present in the park:
Orange and Telekom with both up-to 200 Gbit/s capability.

Further ISPs are located in the city of Sturovo and there is a possibility to add more options of ISPs on site.

Sturovo is integrated in the international underground connectivity structure, by directly connected with Nove Zamky and Zeliezovce, while indirectly connected but close to Budapest and Bratislava.

Furthermore, Sturovo is directly connected to Esztergom, making it´s short route to Budapest (or even Vienna).



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04 Evaluation - EN 50600, TIER

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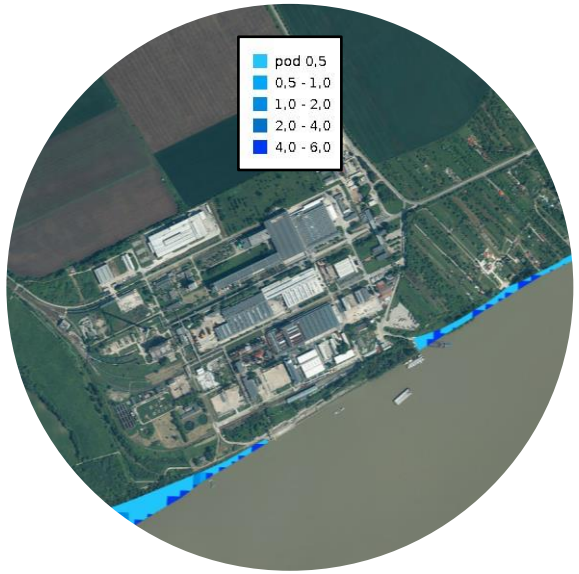
Environmental risks

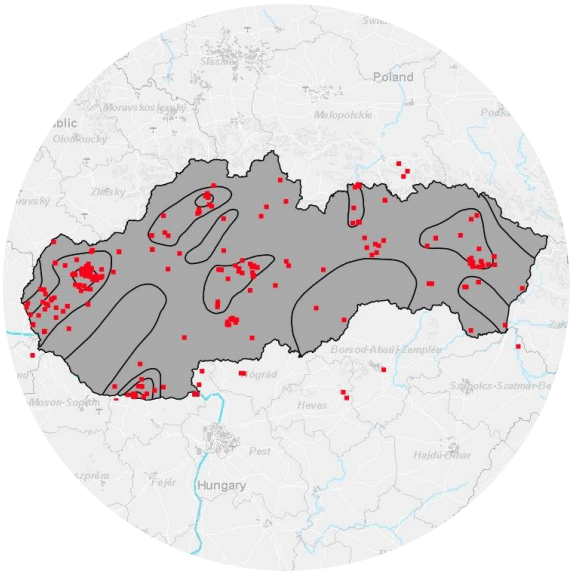


Flood map

Flooded areas in the Danube river basin, with information on flood depth derived from satellite images taken on 21 September 2024. The Industrial Park area is not under direct flood threat.

Highest water level in 1000 years:
+109,5 m ASL
Average elevation of the Industrial Park:
+122 m ASL

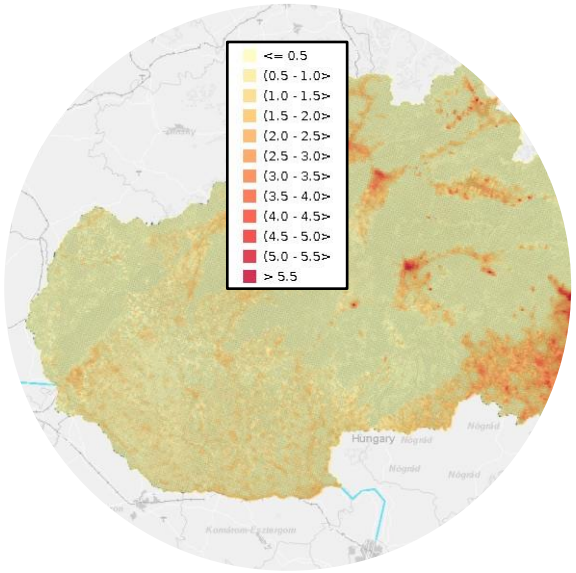
FEASIBLE, NO RISK



Seizmic map

Seismic areas in Slovakia and the epicenters of macroseismically observed earthquakes.
The vicinity of Štúrovo exhibits somewhat higher macroseismic intensity. The potential risk of earthquakes should be taken into consideration, and the data center should be designed accordingly to withstand higher seismic loads.

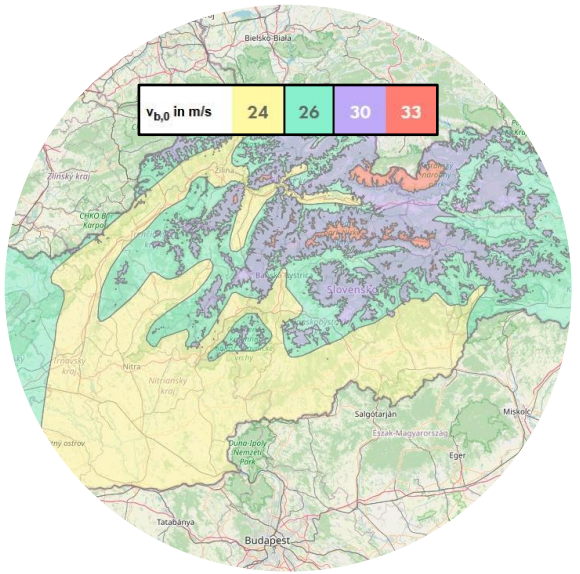
FEASIBLE, LOW RISK WITH PREVENTIVE MEASURES



Air pollution

Number of days exceeding the 24-hour limit value for PM10 concentration (50 µg/m³).
The area lies in a low to moderate air-pollution zone in terms of PM10, with SO_2, NO_2 and ozone showing similar patterns.
Overall, Slovakia's PM2.5 and PM10 levels rank among the highest in Europe.
There are no additional pollution sources in the vicinity, such as industrial plants or factories, and regular air-quality monitoring ensures proper filtration and control.

FEASIBLE, LOW RISK WITH PREVENTIVE MEASURES



Wind hazard

EN 1991-1-4 Wind Load Zones of Slovakia.

According to the Eurocode wind load zone map of Slovakia, the Štúrovo area is located in the lowest wind hazard zone in the country. There is no significant wind hazard in this area.

FEASIBLE, NO RISK

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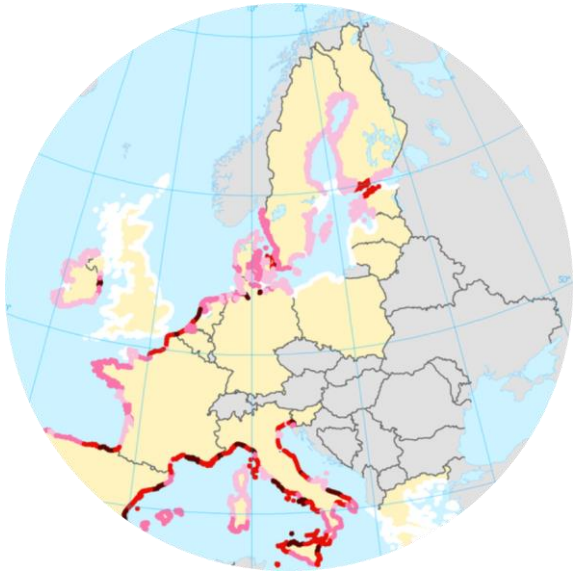
Environmental risks

Transport routes

The site is well integrated in main transport routes. The main railway is at appr. 2+km distance to the site and the onsite railways are all private paths, that are secured, protected and operating exclusively with diesel trains.
The main road is in appr. same distance, and with a secondary road connected to the site (well built road but with less traffic).
Danube funcions as tranport route as well and the site has a private and secured harbour. There is a fence between the port and the park.

FEASIBLE, LOW RISK WITH PREVENTIVE MEASURES

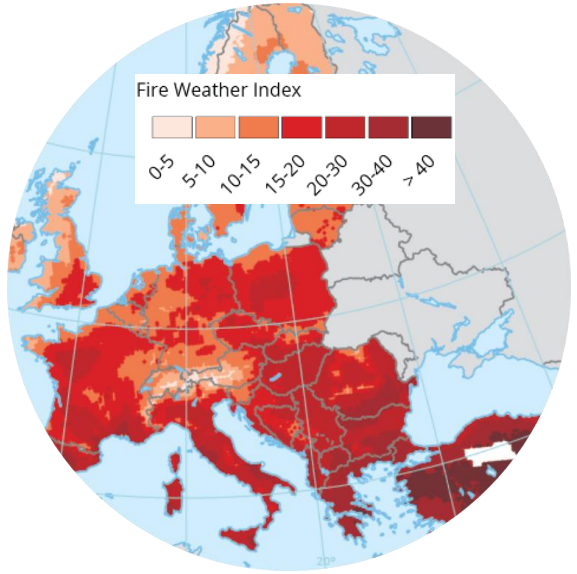


Distance Coastlines

Map of European coastlines.

Slovakia is located in the heart of Europe, on the edge of the Carpathian-basin and it is a landlocked country.
The closest coastlines in Italy are at appr. 500 km away from the site.

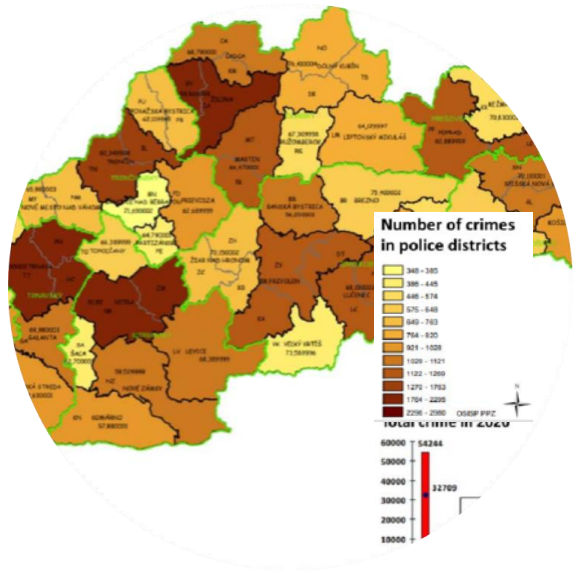
FEASIBLE, NO RISK



Danger of Wildfire

The number of wildfires are moderate in recent years in Slovakia and the country is considered with a moderate wildfire risk in Europe. However, there are no surrounding forests close to the industrial park and on one side neighboring by the Danube. The site inside the park is well protected and the site is well equipped with several water tanks for a possible fire risk.

FEASIBLE, LOW RISK WITH PREVENTIVE MEASURES



Criminal danger

Map of crimes in Slovakia 2020.

According to the official data, Sturovo is considered with a moderate crime risk inside the country. The country itself considered with low criminal risk as a whole. Furthermore, the potential sites are lying in a closed and protected industrial park.

FEASIBLE, LOW RISK WITH PREVENTIVE MEASURES

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Environmental risks

Foundry

There is a modern metal foundry facility operating since 2016 in the industrial park. There is no sensible vibration due to it`s activity.

NO RISK

Electromagnetism

Due to the private railway connections there is no dangerous risk of electromagnetic influence on DC building, because this privalety (by the Park) owned railway line is operating exclusively with diesel trains. If there would be a possibility of electromagnetic influence, the project is still feasable, because there are different options for protection.

NO RISK

Chemical and other hazards

There are no facilities or chemical plants engaged in activities that pose an explosion or fire hazard inside or in close distance to the industrial park. Furthermore, there are no natural sources or factories causing air pollution in the park or in close distance.

NO RISK

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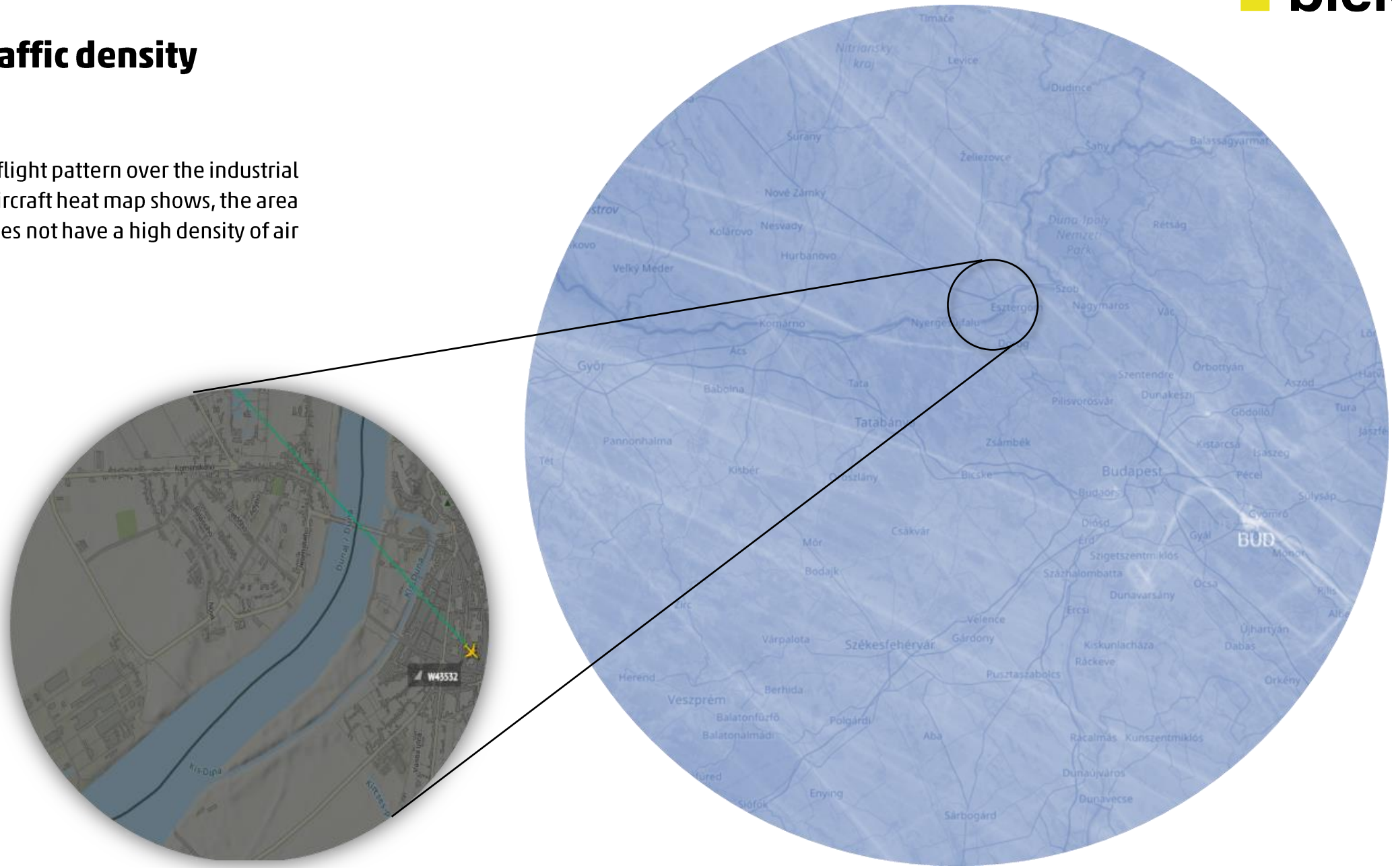
Air traffic density

There is no main flight pattern over the industrial park and as the aircraft heat map shows, the area of city Sturovo does not have a high density of air traffic.

NO RISK



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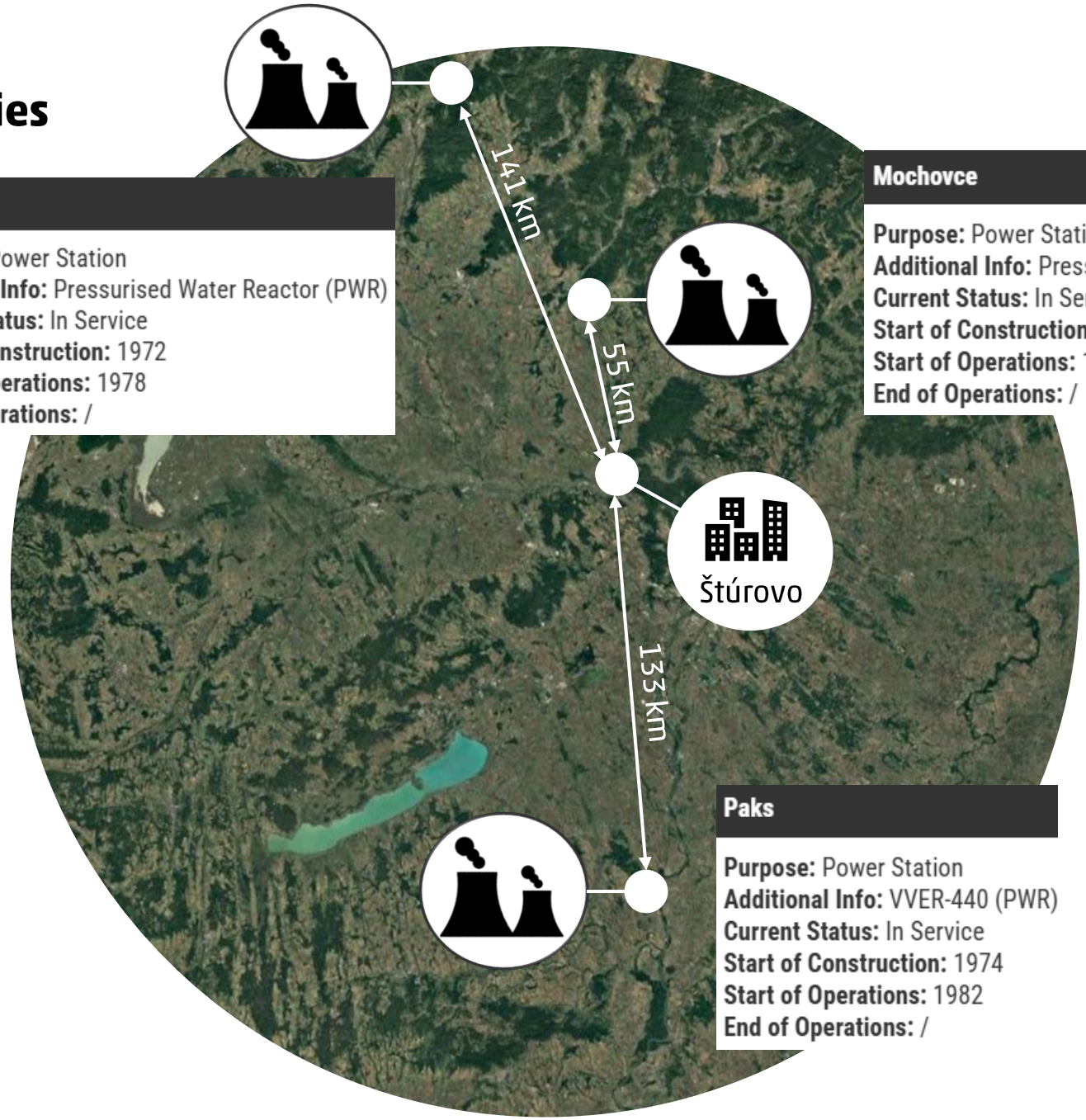
Distance to nuclear facilities



Bohunice

Purpose: Power Station
Additional Info: Pressurised Water Reactor (PWR)
Current Status: In Service
Start of Construction: 1972
Start of Operations: 1978
End of Operations: /

Mochovce

Purpose: Power Station
Additional Info: Pressurised Water Reactor (PWR)
Current Status: In Service
Start of Construction: 1981
Start of Operations: 1998
End of Operations: /

Paks

Purpose: Power Station
Additional Info: VVER-440 (PWR)
Current Status: In Service
Start of Construction: 1974
Start of Operations: 1982
End of Operations: /

Closest active nuclear facilities are:

- Bohunice at appr. 141 km distance
- Mochovce at appr. 55 km distance
- Paks at appr. 131 km distance

NO RISK

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05 European standards and future goals

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Green Deal

The Industrial park provides several opportunities for realizing a green and sustainable project. Europa is aiming for clima neutral industry by 2050 and over 100 data centre operators and trade associations are committed to the European Green Deal.
Furthermore, they agreed to make data centres climate neutral by 2030. The site provides a forward-looking and perfect enviroment for sustainable Data Center projects. Following investments and natural resources are either already avaliable or will be prepared in following years:

- Available green and carbon free power on site
- 24 MW solar power plant with BESS system
- Future wind power plant
- Smart water usage system served by Danube
- Possibility of waste heat utilization on site

We purchase 100% carbon-free energy

We prioritise water conservation

We reuse and repair servers

We prove energy efficiency with measurable targets.

We look for ways to recycle the heat

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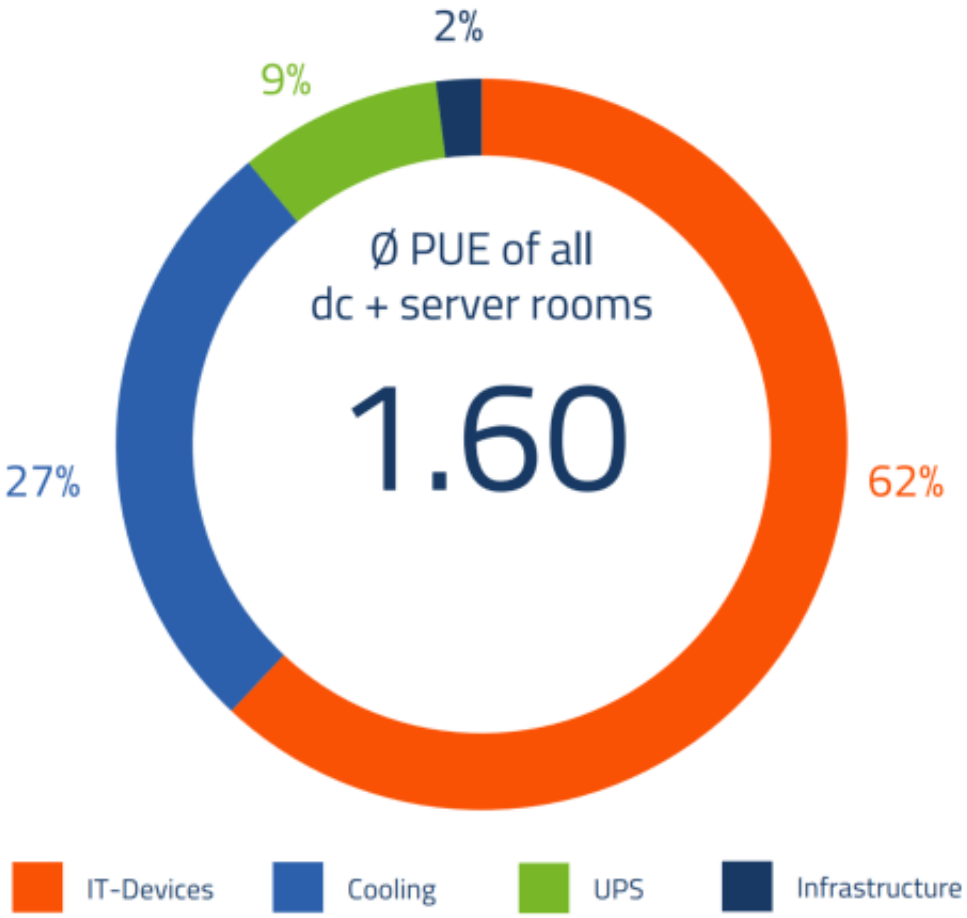
Energy Efficiency Directive

The best practice to measure the energy efficiency of a data center is the PUE index. It tells us how much energy is needed to keep the IT equipment on running. The average PUE value is 1.60, while the European Commission is targeting 1.20 for the new buildings in the near future. This is part of the Green Deal strategy.
PUE value will be calculated and ensured in later design stages, however the fact is already visible, that the opportunities offered by the site make reaching **1.2 PUE** possibble for a future project.

$$PUE = \frac{\text{Total power consumption of the data center}}{\text{Power consumption of all IT devices}}$$



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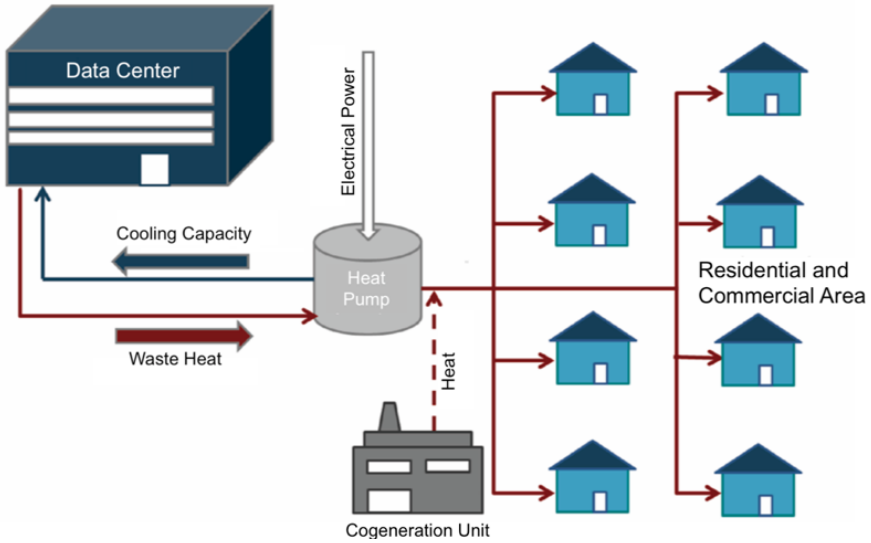
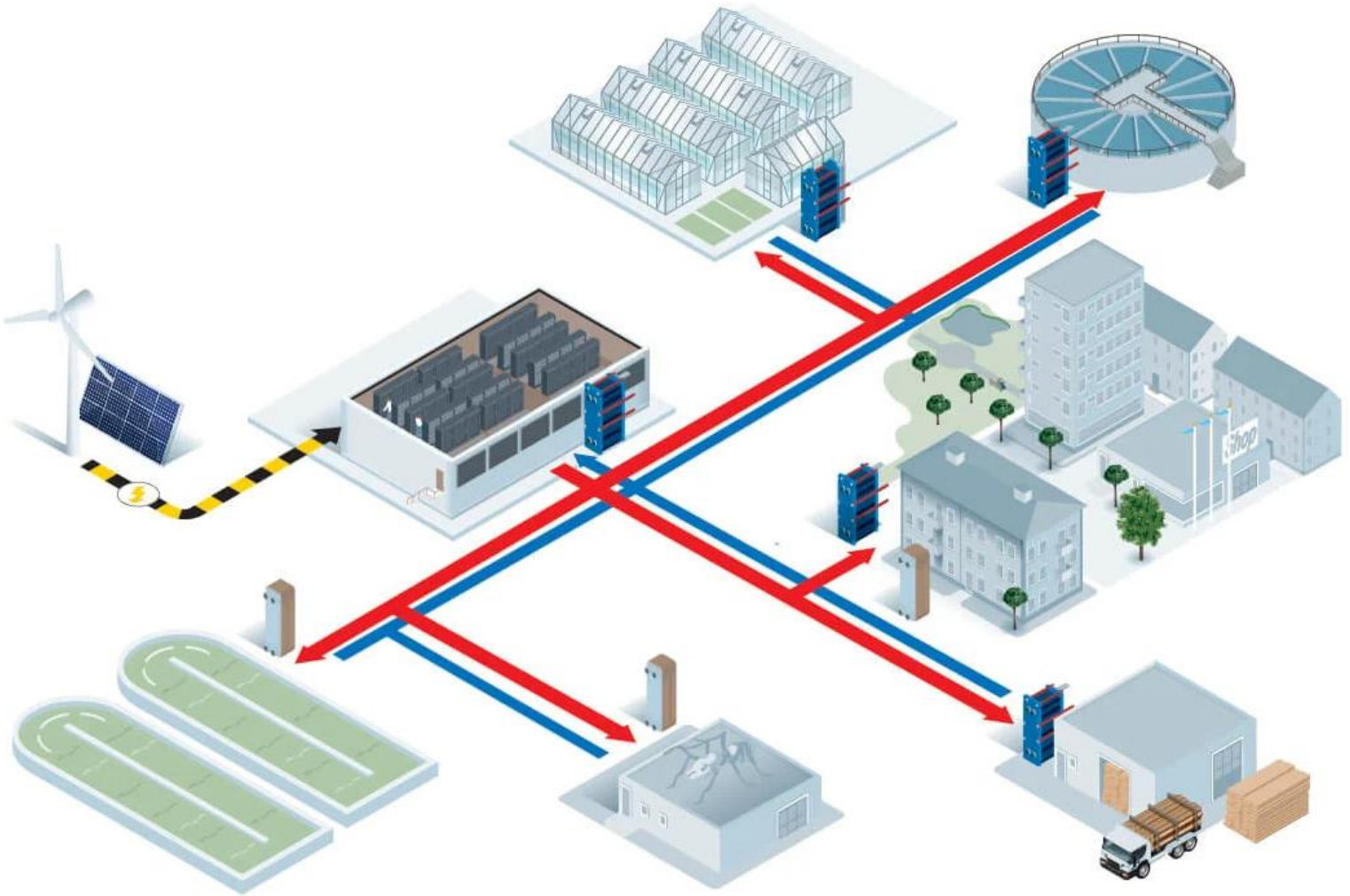
Waste Heat Utilization

The most important secondary product of a Data Center is waste heat and it is a huge opportunity for the surrounding areas. The city of Sturovo is near to the site as well, but waste heat utilization can be built out on site very effectively.
There are several workplaces, factories inside the industrial park, where waste heat could be used in all seasons.





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06 Site Analysis

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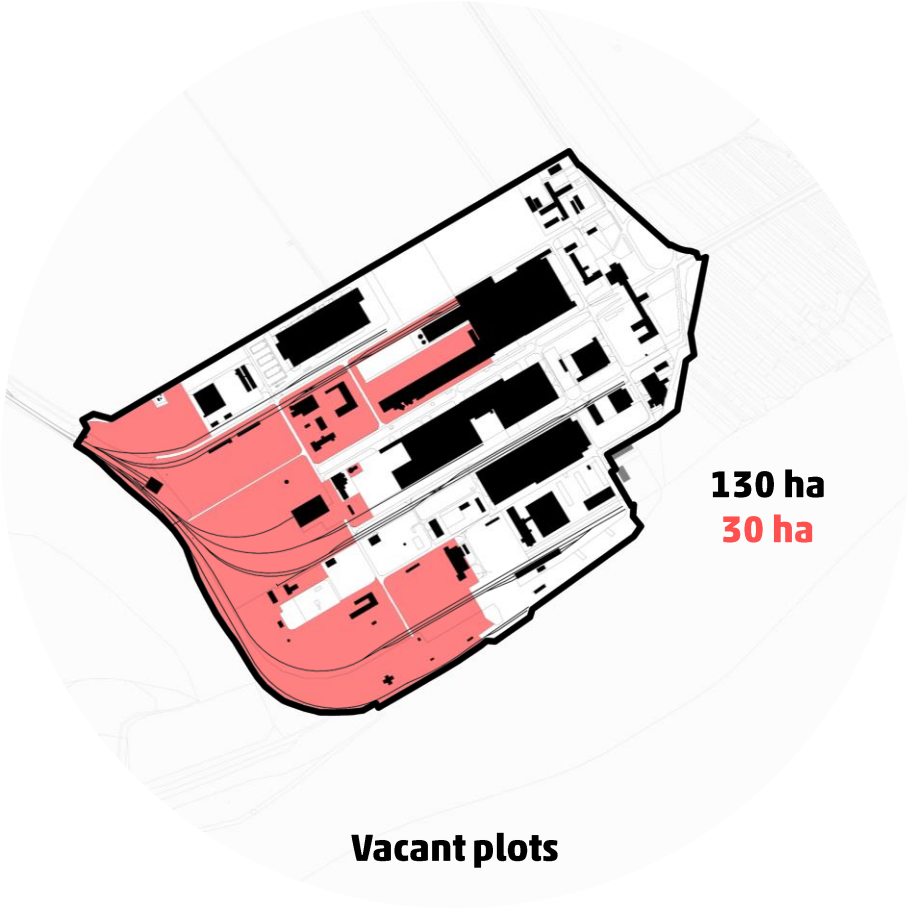
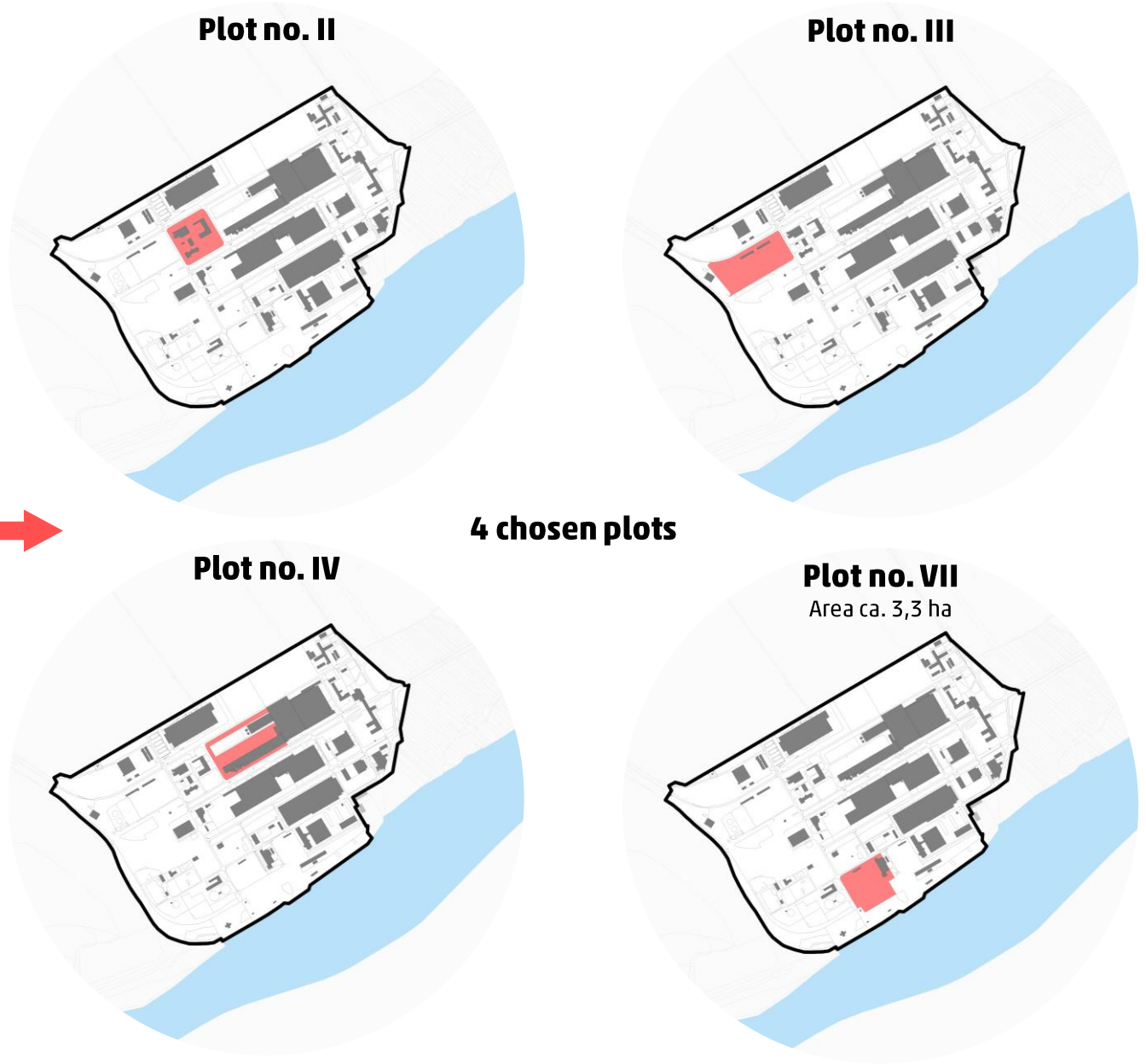
Site assessment



Out of the 130 ha area, a total of approx. 30 ha of land is available for further development. Several aspects should be taken into consideration for the development, such as plot size and shape, as well as the proximity of railway tracks and existing building structures on the site. After a preliminary assessment, four plots have been selected for further analysis.



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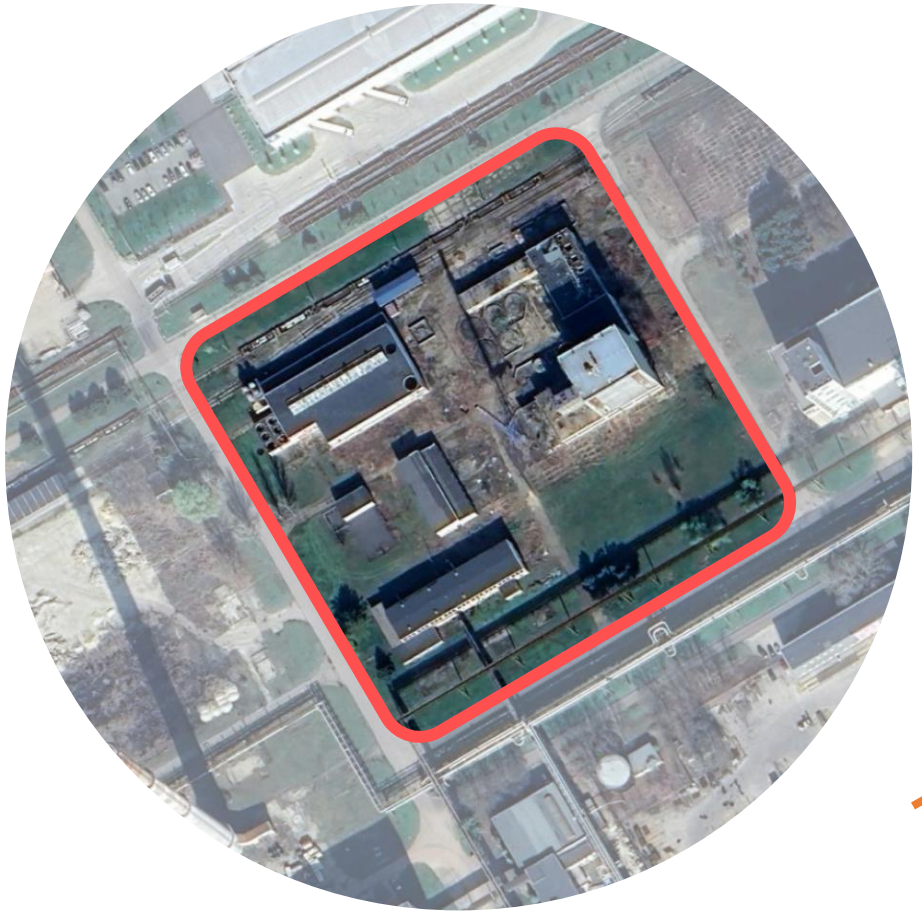
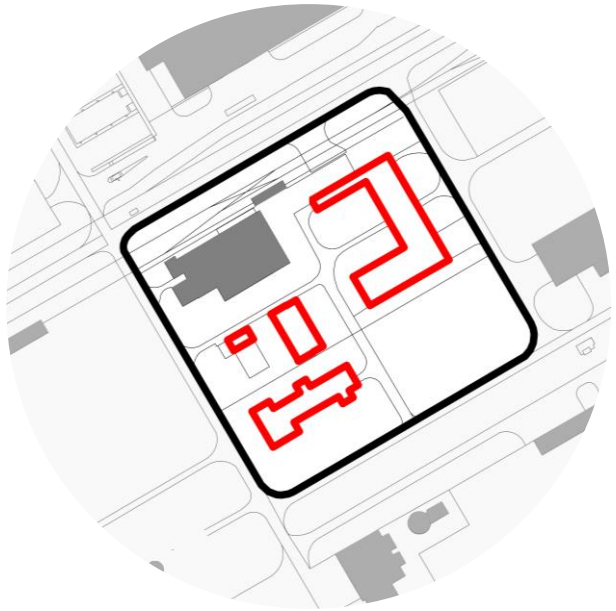
Plot evaluation

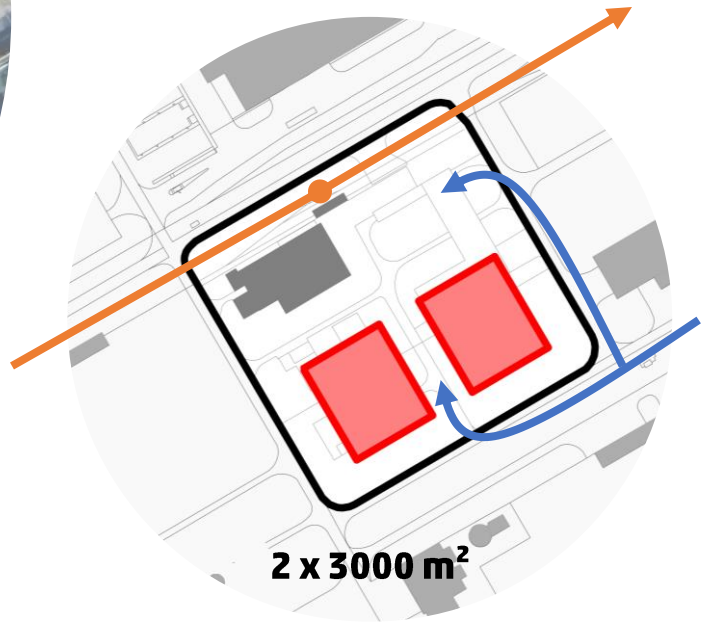


Plot no. II.
3,1 ha



Demolition

The plot has a regular, well-defined shape, but several existing buildings are located on it. However, there is an already prepared and validated demolition permit for these buildings in order to release space on the plot. This adds some additional investment costs, but the park has the ability and necessary equipment for the demolition by itself.
The railway tracks running along the northern side of the plot can be retained and, if needed, used for deliveries.



Developement

During the preliminary check, two building blocks of **3,000 m²** each, with dimensions of 50 × 60 m, were used as a basis. After demolishing a significant portion of the existing buildings, the two blocks can be easily placed on the plot, either along the southern side or the eastern side, although other demolition and placement configurations are also possible.
The railway line running along the northern side of the plot does not interfere with the development, but it could be demolished if needed. Road access is possible either from the southern side of the plot or via the service road running along the eastern side.

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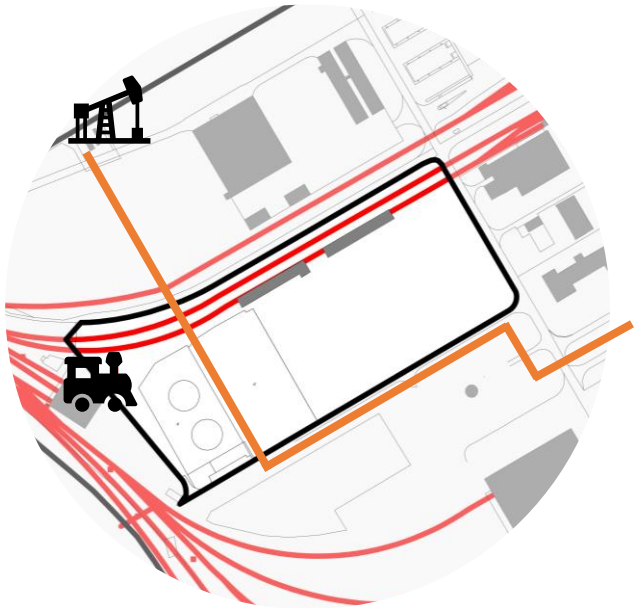
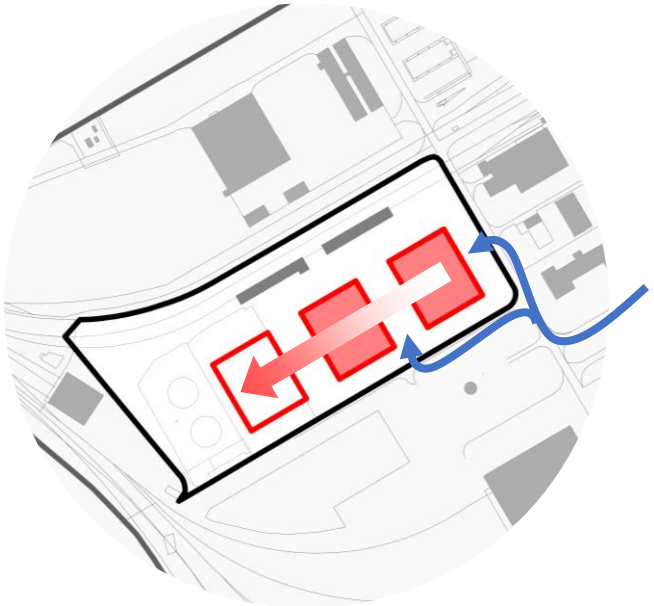
Plot evaluation

Plot no. III.
4,23 ha





Existing infrastructure

The plot is spacious and has a relatively regular and clearly defined shape. There are few existing buildings on the site, which is advantageous for development. However, the existing infrastructure located near the plot and running across, but it could be relocated or demolished if necessary.
A railway branch line entering the industrial park reaches the vicinity of the plot and splits nearby, but it could be relocated or demolished if necessary. The intensity of railway traffic is controlled by the Park. The railway is operating with diesel trains, that means, there is no electromagnetic influence on the future DC buildings.
A main gas pipeline running from the gas station crosses the western third of the plot.

Developement

Similar to the previous plot, the starting point is the assessment of how a 3,000 m² block with dimensions of 50 × 60 m can be placed on the site. The elongated shape of the plot allows for a phased, multi-stage development; up to three blocks can be positioned along the southern side of the plot. The railway branch line running along the northern side can also be retained and utilized in this case. The plot is well integrated into the internal road network.

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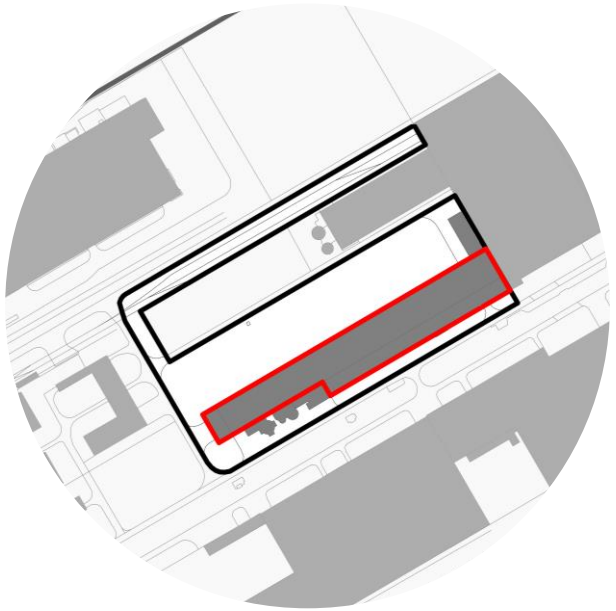
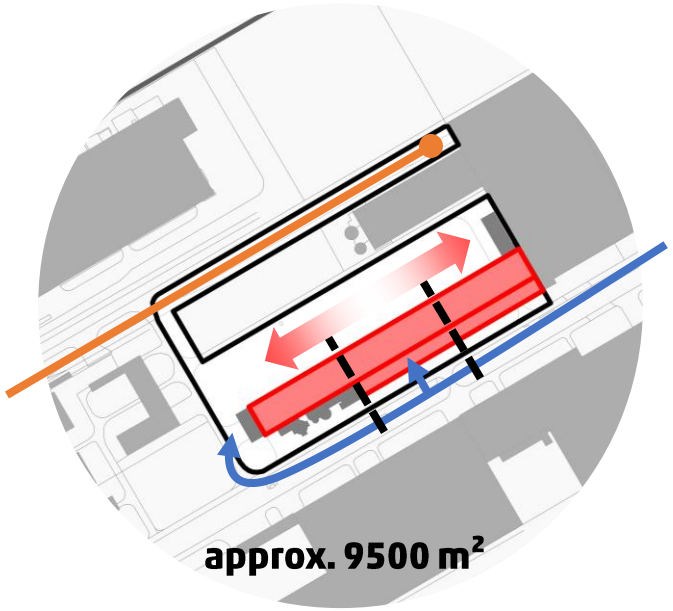
Plot evaluation

Plot no. IV.
3,8 ha





approx. 9500 m²

Existing Building

The plot has an ideal size; however, the indentation creates a significant constraint.
On the southern side of the area, there is an existing building complex consisting of an industrial facility of approximately **10,000 m²**, whose demolition would be resource-intensive. At the same time, there is an opportunity for the adaptive reuse of the existing building, which would also positively influence the environmental footprint of the potential development.

Adaptive reuse

The existing building, with appropriate modifications, could be suitable for accommodating a data center. Its longitudinal layout allows for phased development, potentially starting with a smaller-scale project and capacity.
The site has an excellent location within the industrial park, directly along the main transport axis. The railway branch located on the northern extension of the plot does not significantly affect the development carried out within the existing structure.

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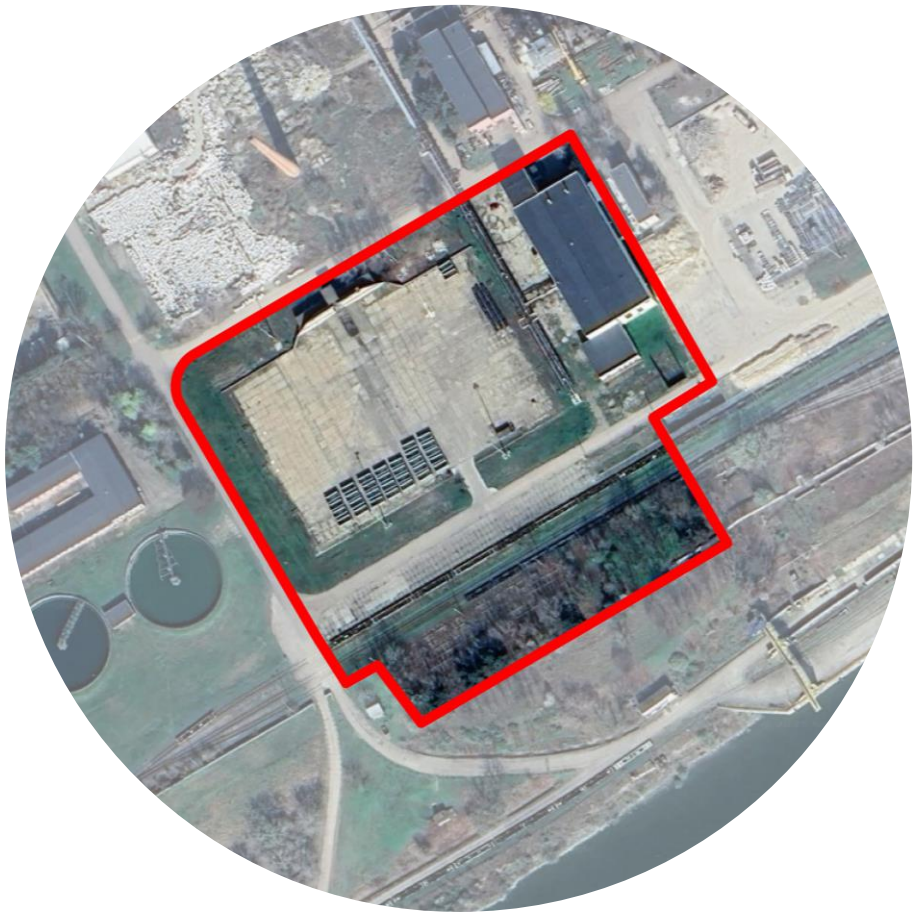
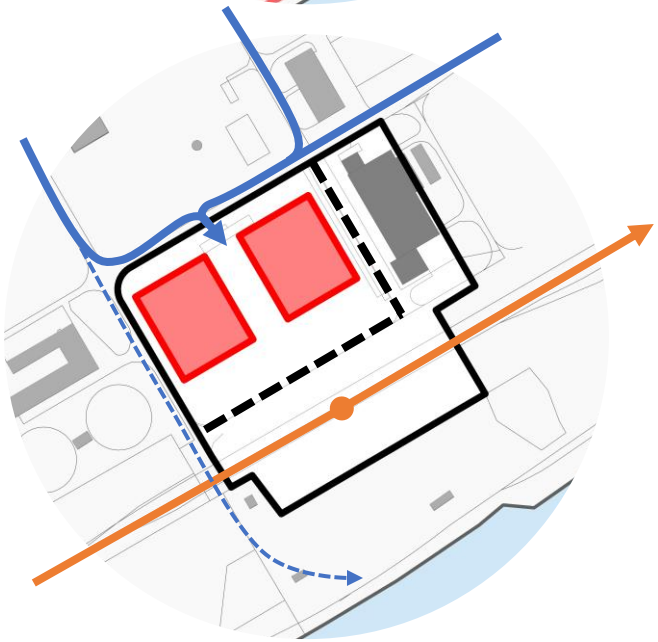
Plot evaluation



Plot no. VII.
3,3 ha

Empty plot

The plot located closer to the Danube has the advantage of a large, continuous, undeveloped area. On the eastern side of the plot there is an existing building, which can be demolished or adaptively reused depending on the future development approach.
The railway branch line running along the southern, Danube-facing side , but it`s traffic is controlled by the Park. This railway line can be relocated or demolished if required.



Developement

Consistent with previous evaluations, the placement of two 3,000 m² blocks (50 × 60 m each) was assessed. These blocks can be accommodated within the available open area, enabling development with minimal demolition of existing structures.
The on-site railway line does not impose significant constraints on the development potential. The plot is accessible from multiple points and maintains direct connectivity with the industrial park's port infrastructure.

Based on this analysis, this plot is recommended as the primary focus for further development.

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07 Compliance with local regulations

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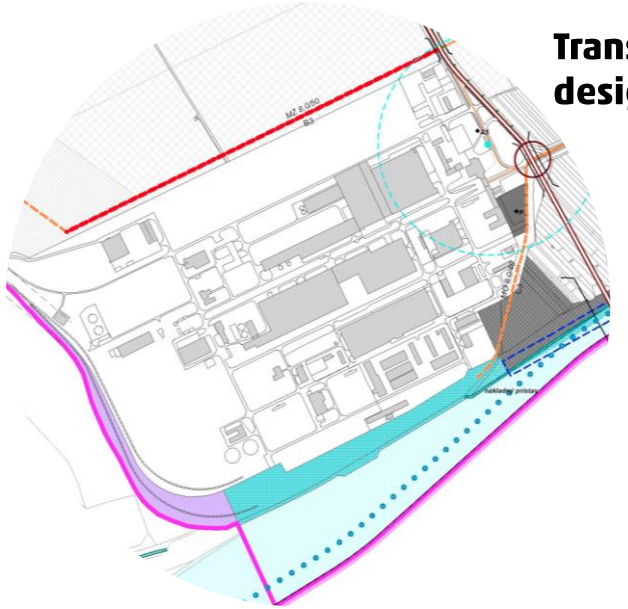
Zoning Plan

Zoning plan of the city Štúrovo

The urban development and zoning plans of the city of Štúrovo are from 2008, and its amendments and supplementations from 2013 and 2024.
For the industrial park area, the following regulatory parameters have been defined:

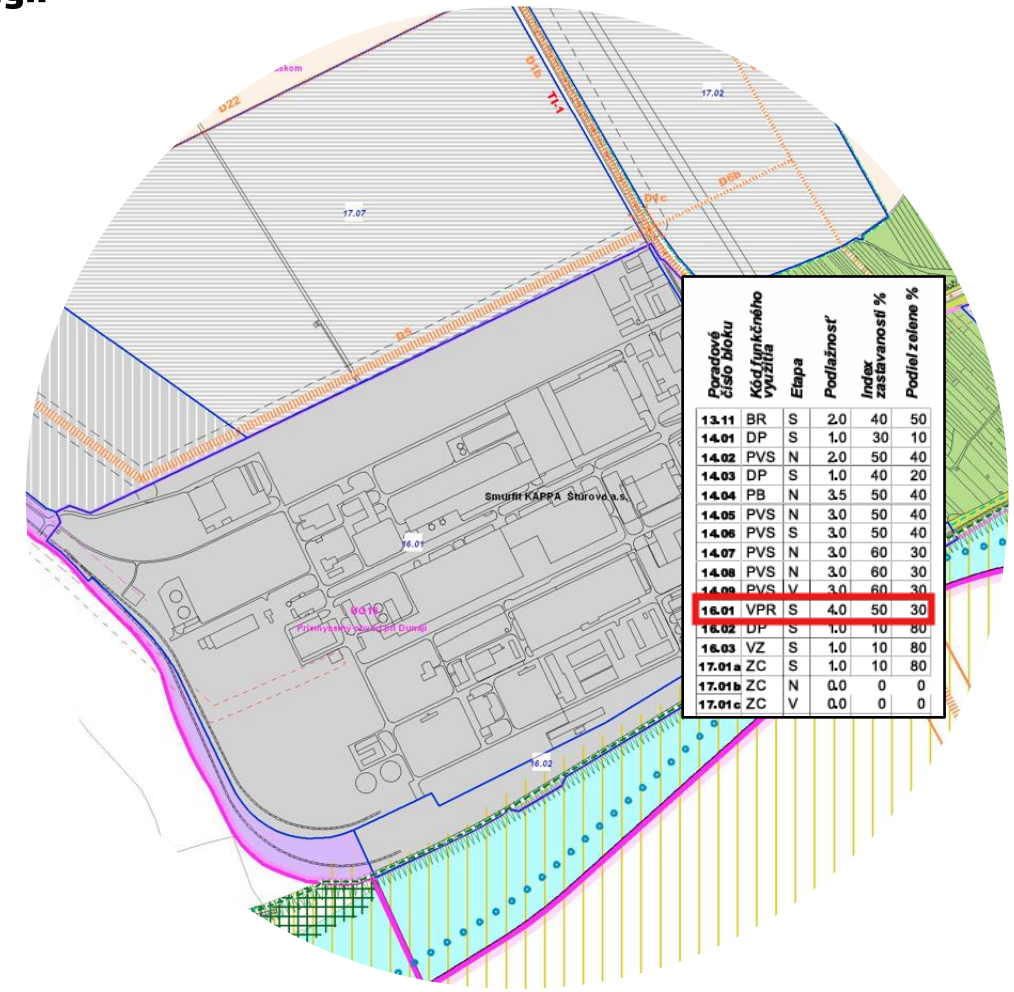
Zoning block:	16.01
Land use designation:	VPR Industrial zone
Number of floors:	**4.0**
Building covarage ratio:	**50 %**
Green space ratio:	**30 %**

Under the current regulatory framework, a data center may be established in the industrial park.



Technical utilities design

Transportation infrastructure design



Poradové číslo bloku	Kód funkčního využití	Etapa	Podlažnost	Index zastavanosti %	Podíl zeleně %
13.11	BR	S	2.0	40	50
14.01	DP	S	1.0	30	10
14.02	PVS	N	2.0	50	40
14.03	DP	S	1.0	40	20
14.04	PB	N	3.5	50	40
14.05	PVS	N	3.0	50	40
14.06	PVS	S	3.0	50	40
14.07	PVS	N	3.0	60	30
14.08	PVS	N	3.0	60	30
14.09	PVS	V	3.0	60	30
16.01	VPR	S	4.0	50	30
16.02	DP	S	1.0	10	80
16.03	VZ	S	1.0	10	80
17.01a	ZC	S	1.0	10	80
17.01b	ZC	N	0.0	0	0
17.01c	ZC	V	0.0	0	0

Regulation of functional land use and spatial arrangement

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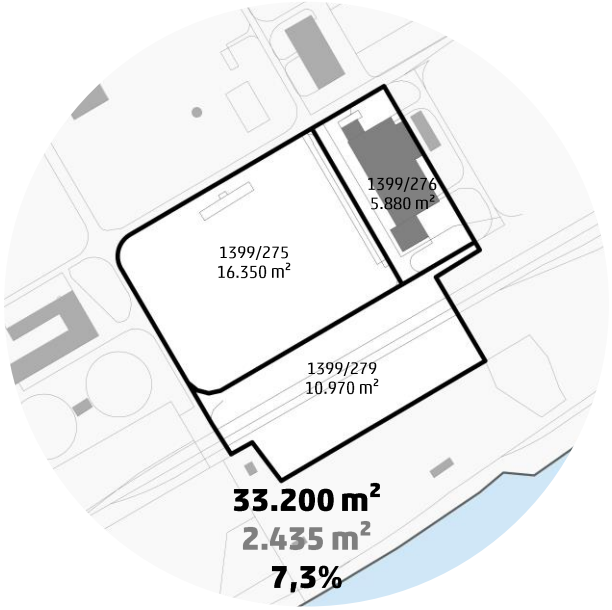
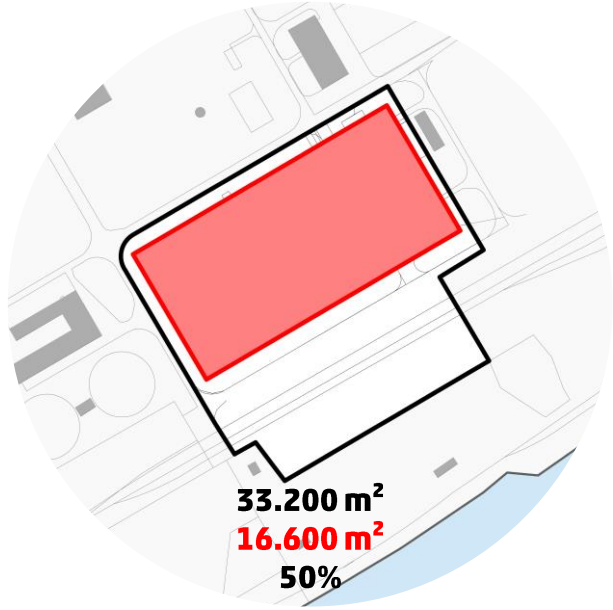
Buildability

Aerial view of the plot



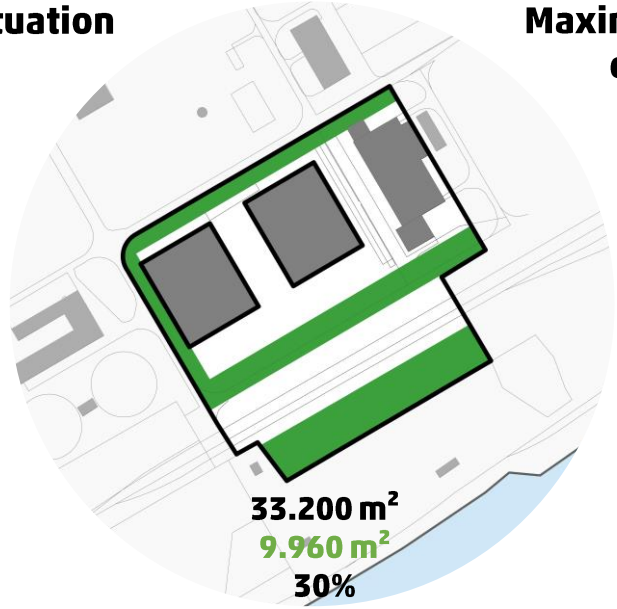
33.200 m²
2.435 m²
7,3%

Existing situation



33.200 m²
16.600 m²
50%

Maximum building coverage



33.200 m²
9.960 m²
30%

Minimum green space

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08 Development proposal

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Visualisation

Aerial view

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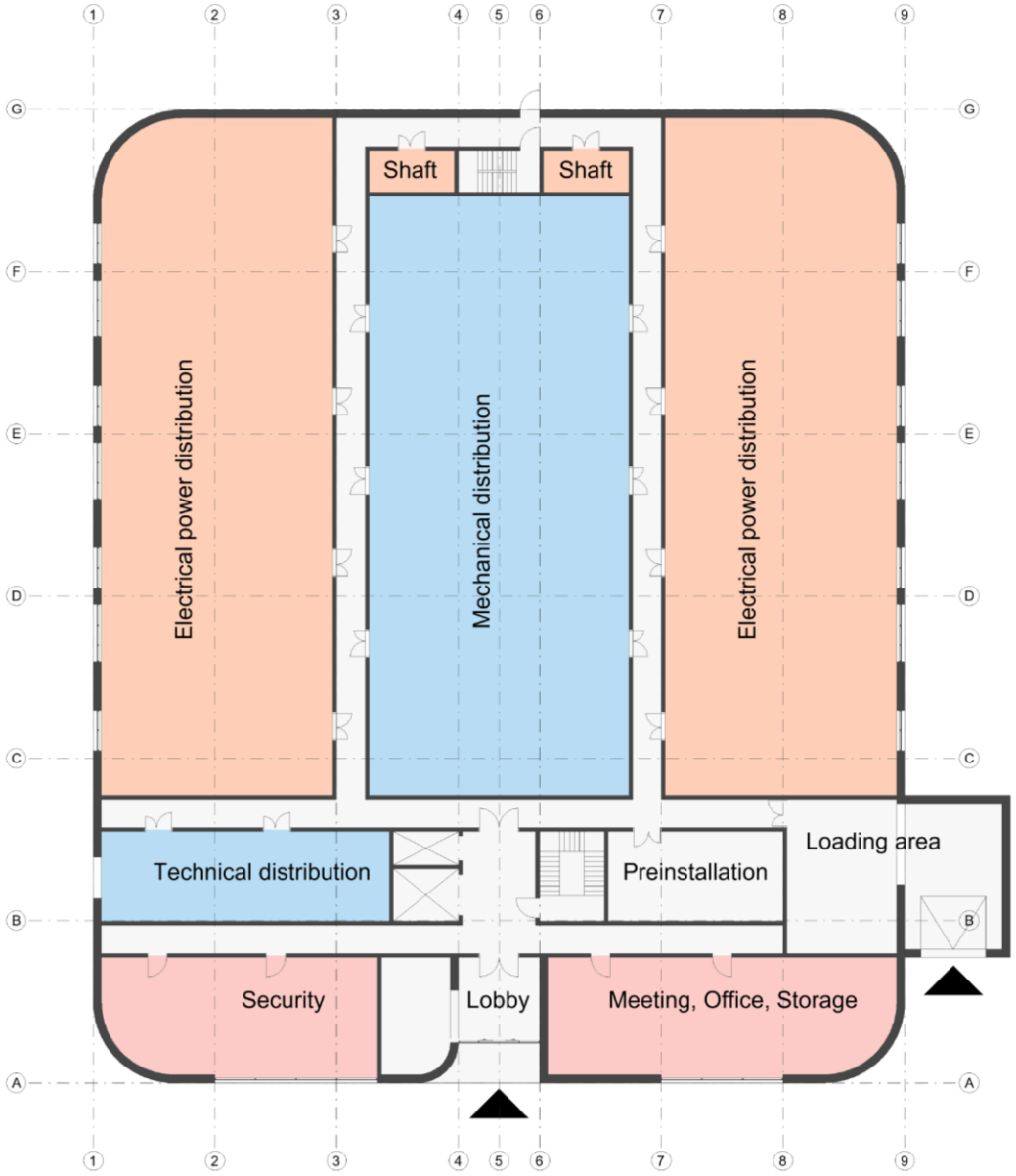
Ground floor

- 20 MW power divided to two buildings
- 10 MW IT power each building
- Dimensions appr. 50x60 m
- 4 storey building with cooling equipment placed on the roof
    - First floor: entry, lobby, loading area and technical components
    - Second floor: White Space with offices and storage
    - Third floo: White Space with offices and storage
    - Fourth floor: White Space with offices and storage
    - Roof: Cooling plant
- Generators on the ground inside plot



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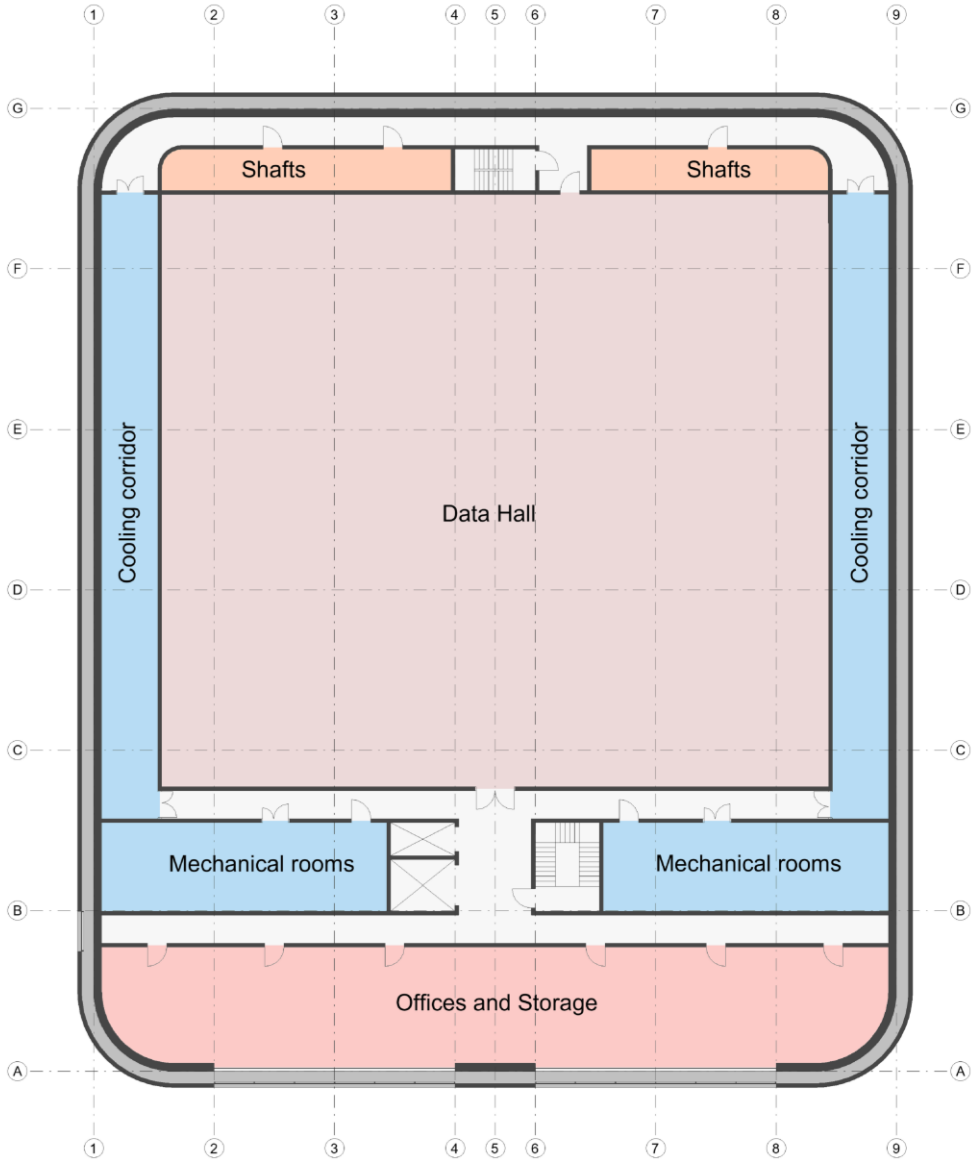
White space

- One Data Hall room on each storey, can be divided if needed
- Flexible design optimal for
    - Colocational
    - Enterprise
    - Hyperscale needs.
- Appr. 1.500 m2 serverrooms distributed on three floors
- Appr. 3,30 MW IT load each Data Hall
- 2,2 – 2,75 kW/m2 IT load, but flexible
- Appr. 630 piece of placeable 80*120 cm size rack units each Data Hall (appr. 5 kW/Rack)
- Appr. 690 piece of placeable 60*120 cm size rack units each Data Hall (appr. 4,5 kW/Rack)
- Nice view from offices on the Danube



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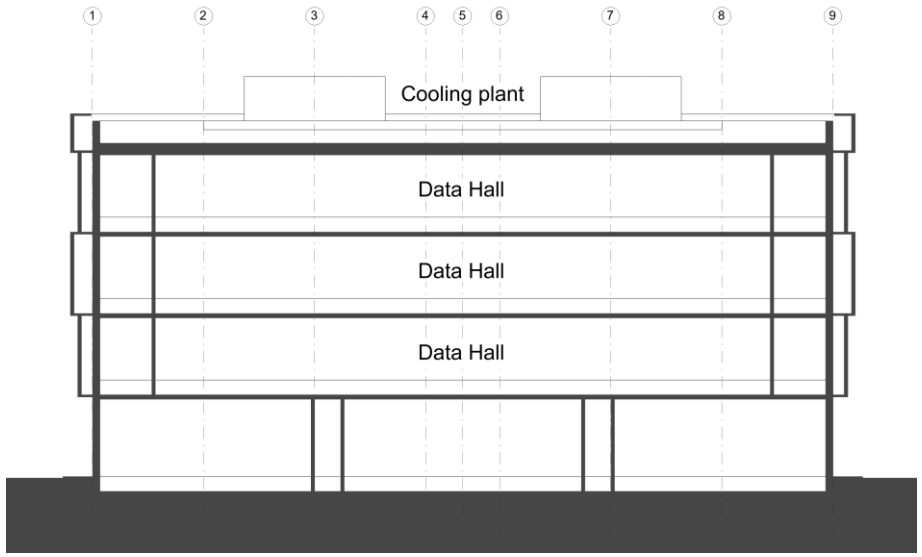
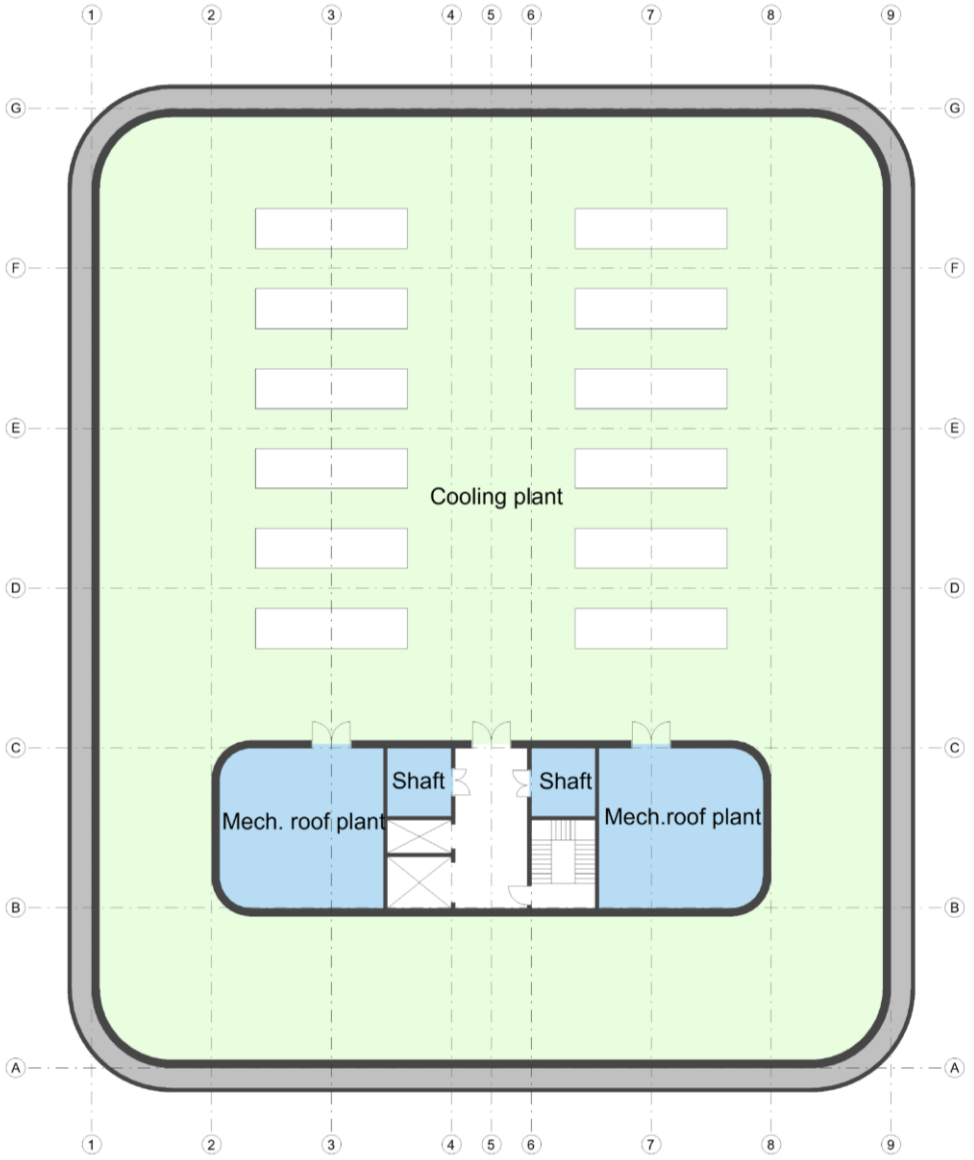
Roof and section

- Cooling plant placed on the roof, generators on the ground
- 5 - 6 m storey height inclusive raised floor
- 4 storey but scalable design





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Visualisation

View from the main entrance

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Visualisation

View from the Danube

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Conclusion of the feasibility study

Taking all aspects of the feasibility study into account, the final conclusion is that several plots within the Industrial Park are suitable for the development of a new Data Center project.

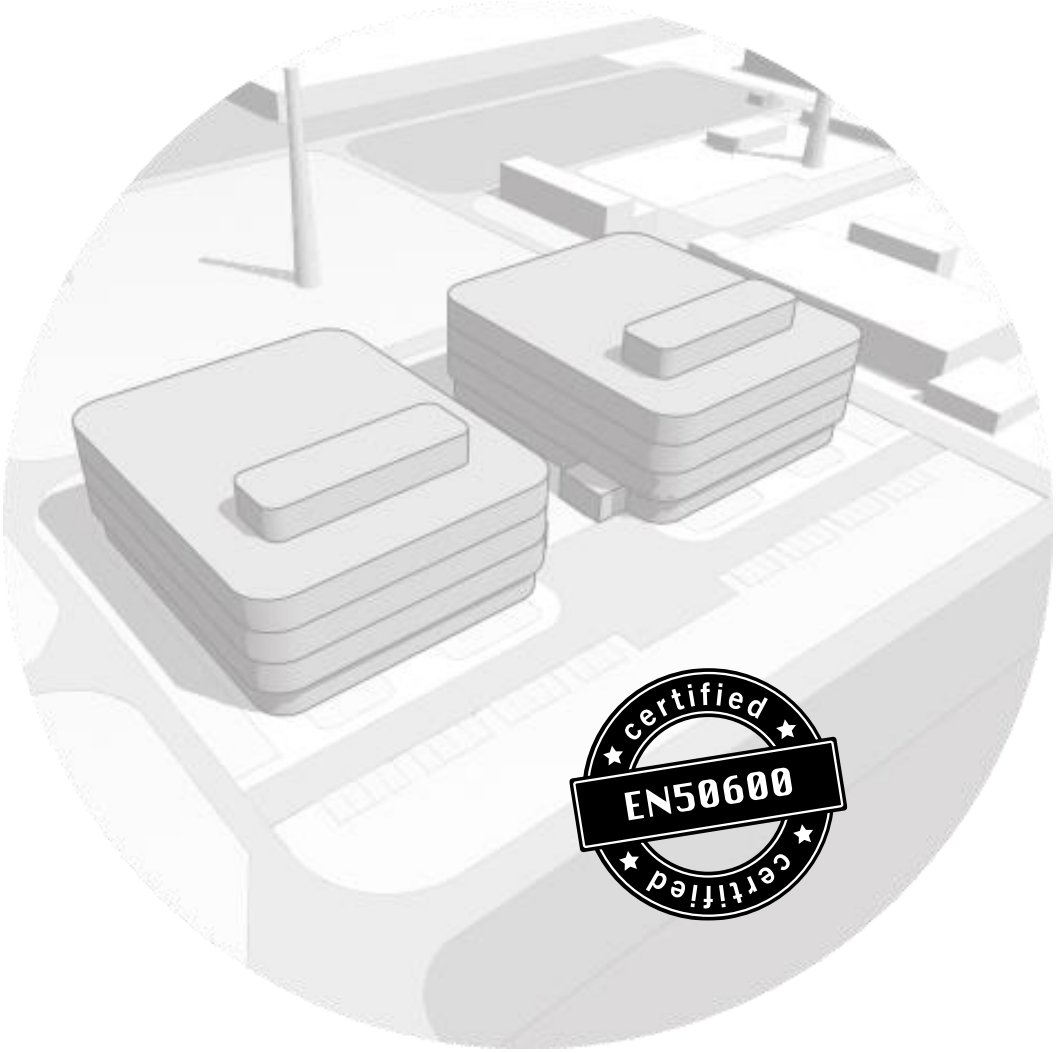
The available grid capacity and on-site, self-produced energy sources enable the Park to support Data Centers with a total power consumption of at least 20 MW. At this scale, it is recommended to divide the data center into two or three buildings, developed in multiple phases.

The project has the potential to achieve the highest certification levels under the TIER and EN 50600 standards, provided that an appropriate design concept is applied.
However, it is recommended that the selected certification target aligns with the intended facility type, such as colocation, enterprise, or hyperscale. While all of these are achievable, each defines specific requirements for the building design and infrastructure.

GREEN DEAL

TIER III DESIGN
LuxConnect Datacenter DC1.3
SER 01-1, 02-1, 01-2, & 02-2
Expires 17 May 2020
UPTIME INSTITUTE CERTIFIED

TIER IV DESIGN
LuxConnect Datacenter DC1.3
SER 03-1 to 09-1 & SER 03-2 to 09-2
19 May 2014
UPTIME INSTITUTE CERTIFIED



19.12.2025

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Bringing ideas together

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