

Natural High at Kupferbrunnberg

Status Quo – Vision – Process

Statusquo

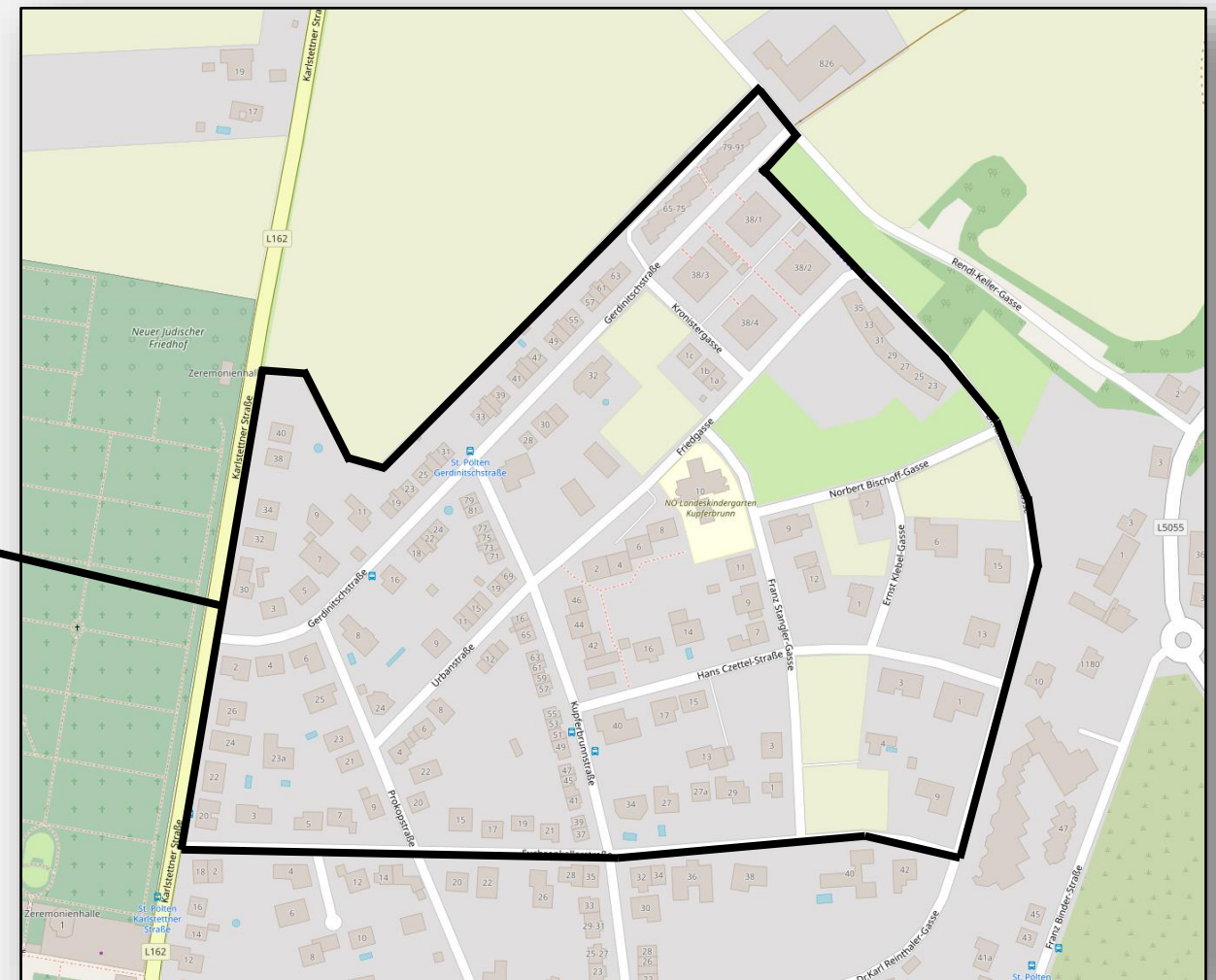
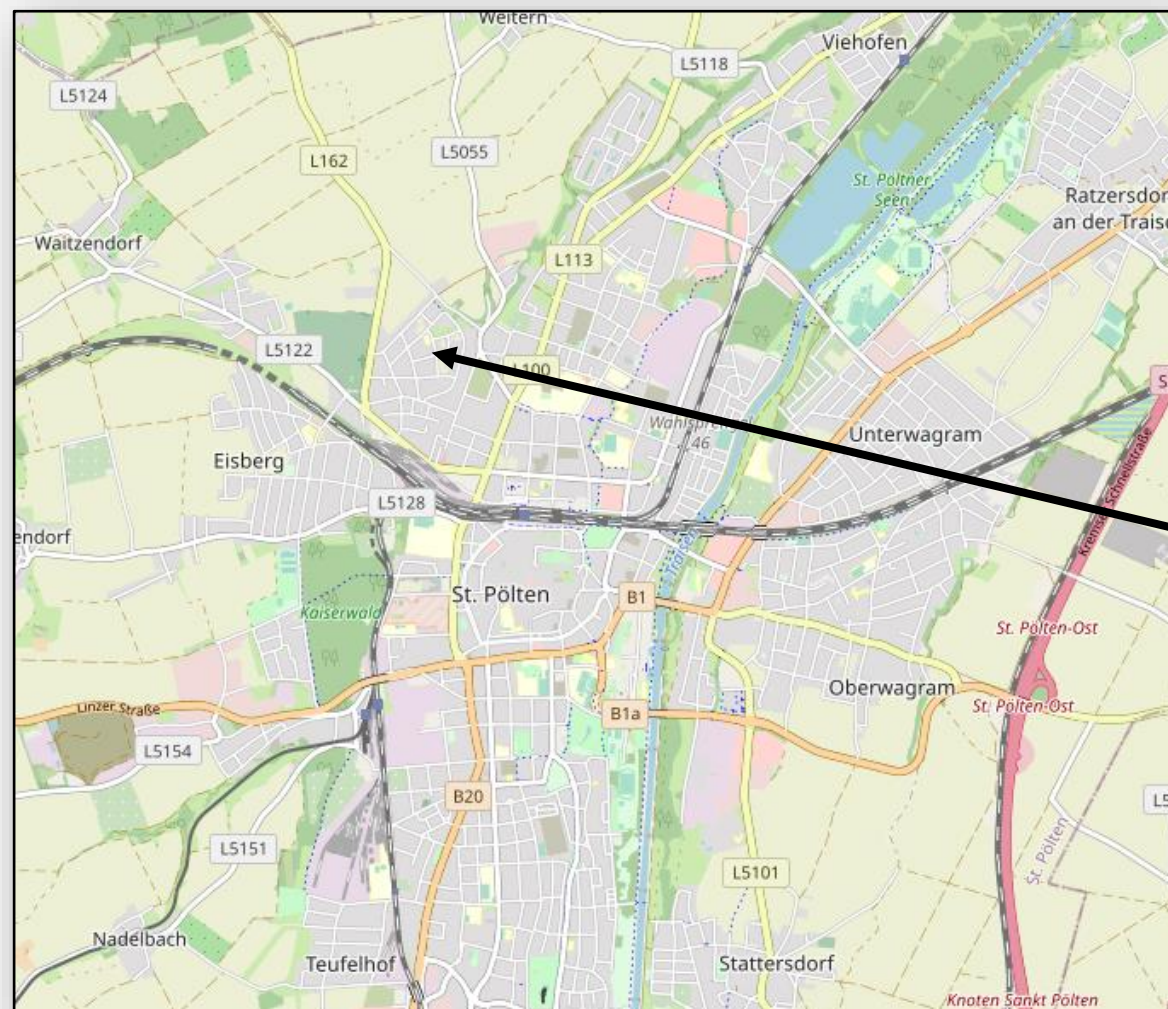
Natural High
at
Kupferbrunnberg

Use the strengths, seize the opportunities,
work on the weaknesses, and minimize the risks

- Located in the northwestern part of St.Pölten
- Located on the river terrace 20 meters above the city center alluvial plain
- Close to the center of St.Pölten
- Exclusively residential use
- Close to the outside environment of the city

Basic information

Inhabitants	456 approx.
Area dimension	16,7 ha



Strengths

- 25% of the houses use solar energy panels
- Settlement consists of many green areas and public spaces



Strengths

Friendly neighborhood

Close to the centre

Solar energy

Healthy environment

Weaknesses

- Car centric oriented settlement without sidewalks and bike lanes
- There is not a single bike sharing station
- Not a great state of a road infrastructure



Weaknesses

Bike sharing

Cycling lanes/sidewalks

Old buildings

Bad state of infrastructure

Opportunities



- The whole area has a big solar energy potential
- A farm right outside the settlement border that can be used as a source of the biomass
- There is a district heating available only for some of the houses



Opportunities

Energy community

District heating

Car sharing

Biomass power plant/Agricultural PV

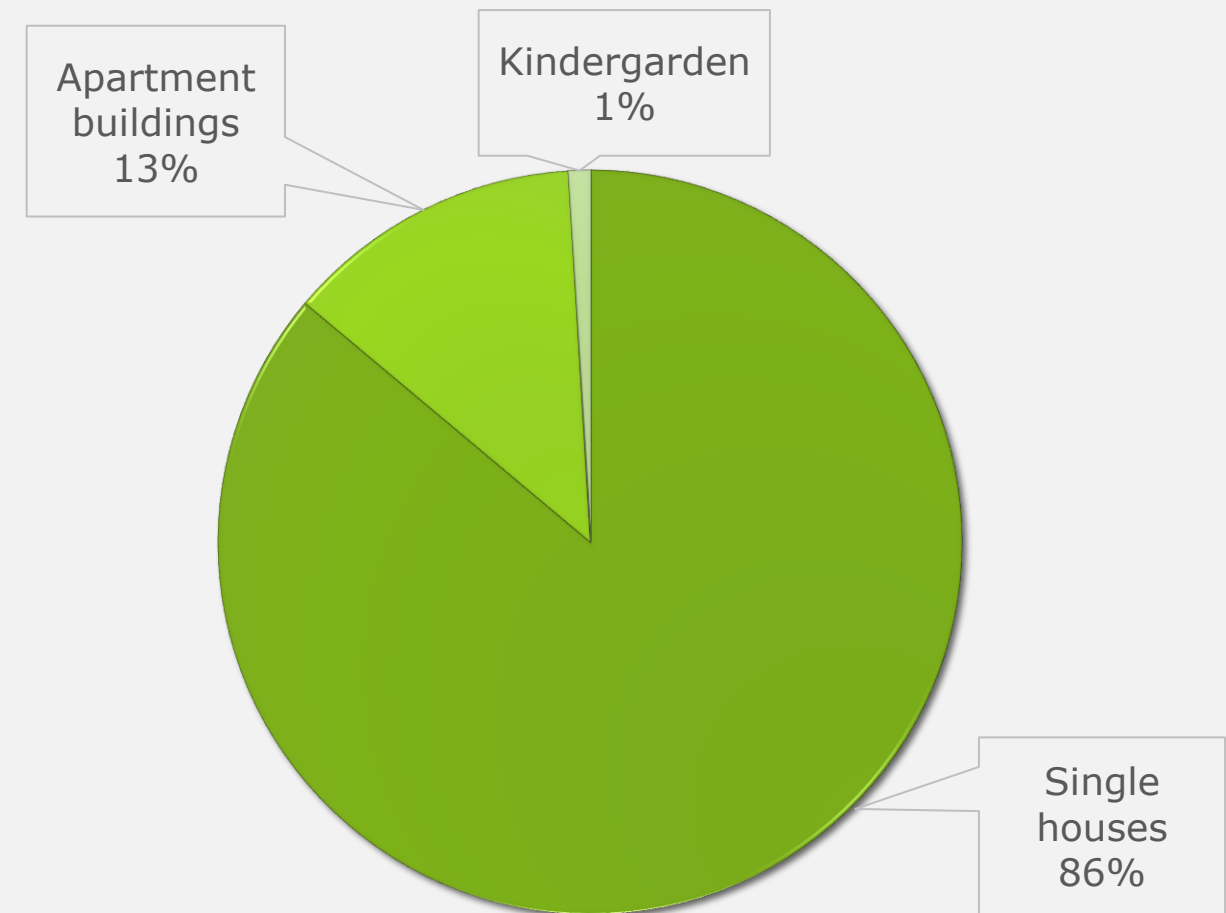
Threats



- Most buildings in the settlement are single resident houses
- Basic commercial services are not provided in the settlement, so the inhabitants are forced to travel to other parts of the town
- The streets are not as safe as they should be



Buildings use in %



■ Single houses ■ Apartment buildings ■ Kindergarden

Threats
Zoning level
Only residential buildings
Dangerous streets
Historical buildings

Mobility

- The settlement is served by two bus lines – 4 and 6
- Bus stops are easily accessible and located in the center of settlement and the frequency is every 30 minutes
- Most of the cars are parked at the side of roads
- Some streets do not have sidewalks and none of the streets have bike lanes

- Walkable zone in 5 mins
- Bicycable zone in 5 mins
- Cycling lanes
- Bike stations
- Bus stops
- T Train station
- 🔌 Electric vehicle charging station
- 🛒 Grocery store
- ✚ Hospital
- 🏫 School- kindergarden, elementary, high
- 🎓 University



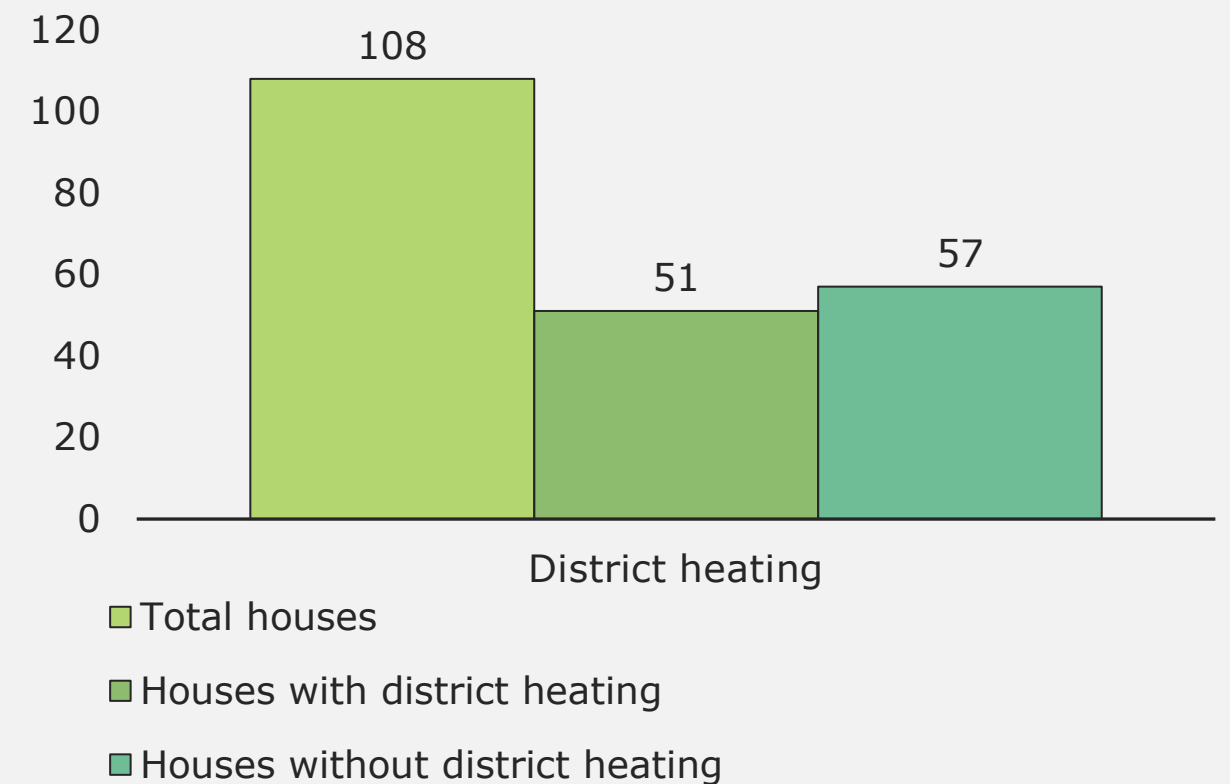
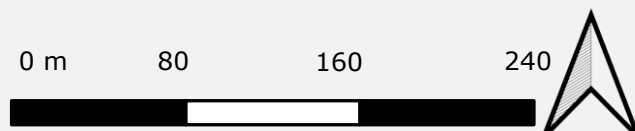
0 100 200 m
1:10 000

Heating

- About one half of the settlement has availability of long distance heating
- Only newer houses can be connected to the public network
- Terraced houses has reduced heating costs



- Houses with access to district heating
- Houses without access to district heating

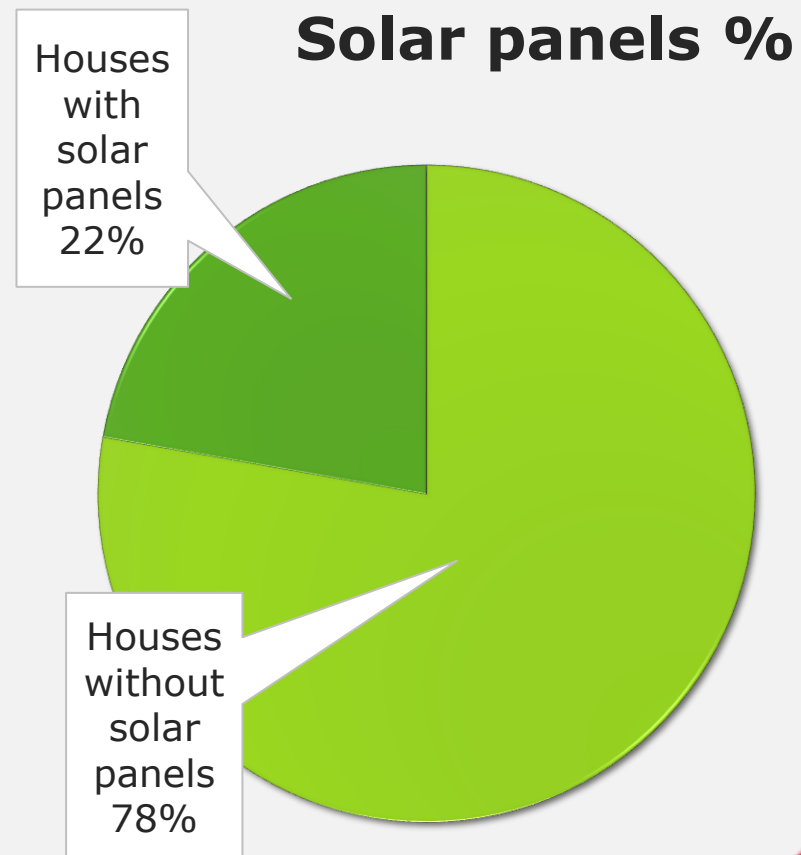


- Pioneering low-energy terraced house complex with a total of nine residential units with climate-friendly heating using air heat pumps



Electricity

- About 22 percents of houses have installed solar panels on their roofs already
- Both new and old houses have solar panels
- Houses with solar panels are randomly located in the settlement



Vision: climate-friendly, mobility-friendly, life-friendly



How to achieve our goals –
4 steps for a transition to a positive energy district



Use the solar potential
and create a renewable
energy community



Promote sustainable
mobility through safe
multi-purpose lanes and
the creation of sharing
offers



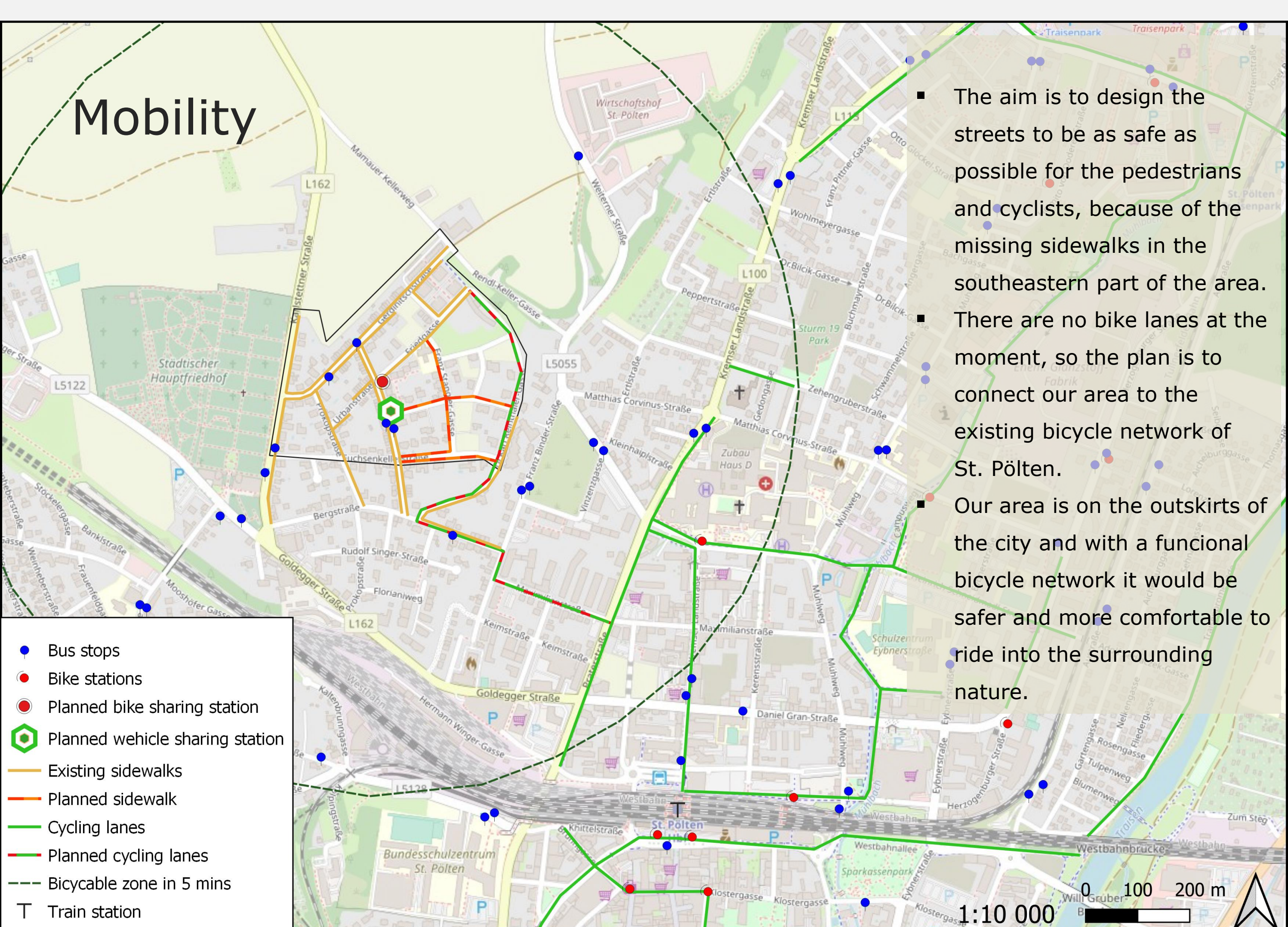
Use the possibility of the
district heating and
implement a heat pump
system for the areas
where it is not available



promoting society and
neighborhoods and daily
and social infrastructure



Mobility



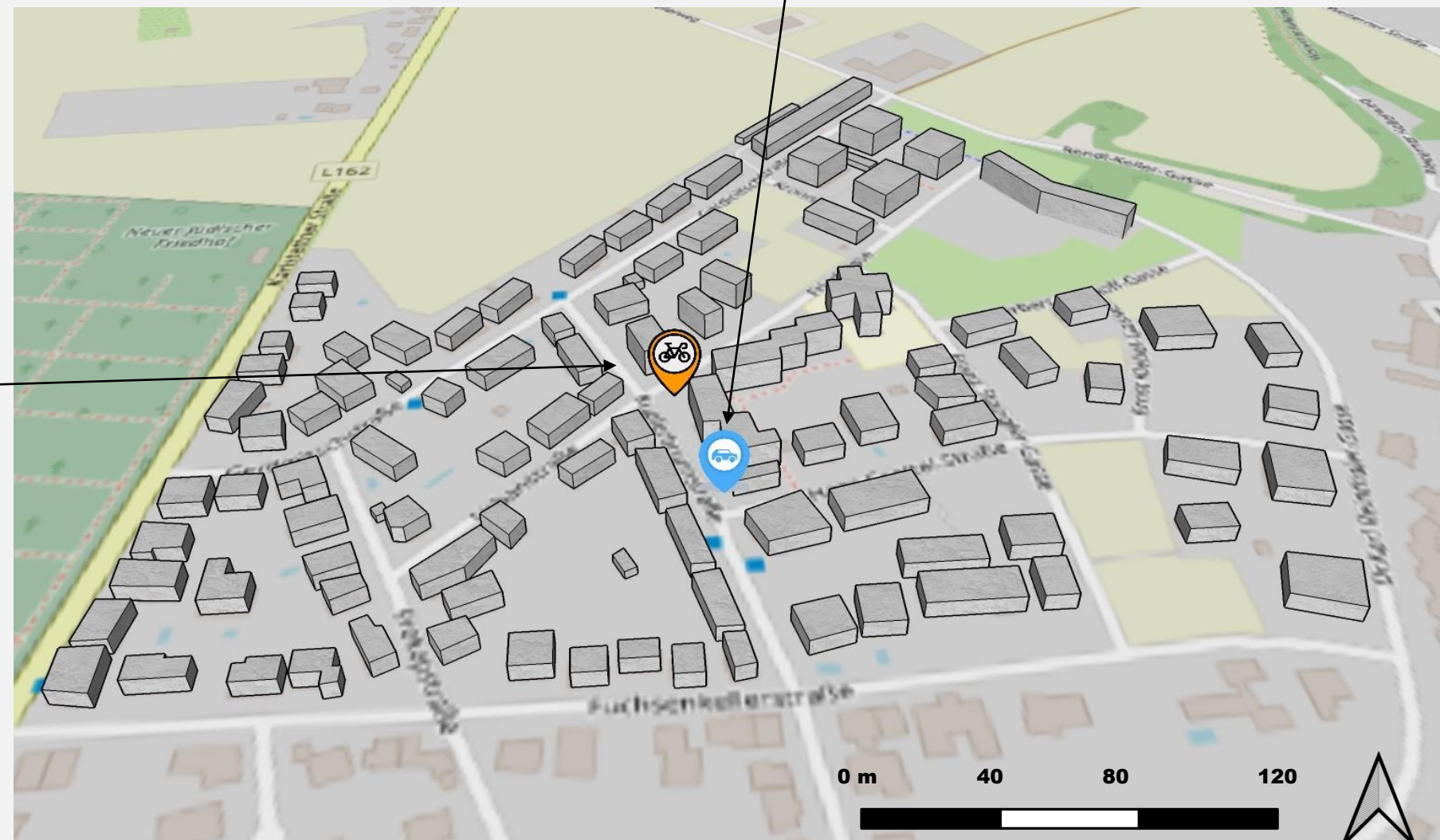
- The aim is to design the streets to be as safe as possible for the pedestrians and cyclists, because of the missing sidewalks in the southeastern part of the area.
- There are no bike lanes at the moment, so the plan is to connect our area to the existing bicycle network of St. Pölten.
- Our area is on the outskirts of the city and with a functional bicycle network it would be safer and more comfortable to ride into the surrounding nature.

1:10 000

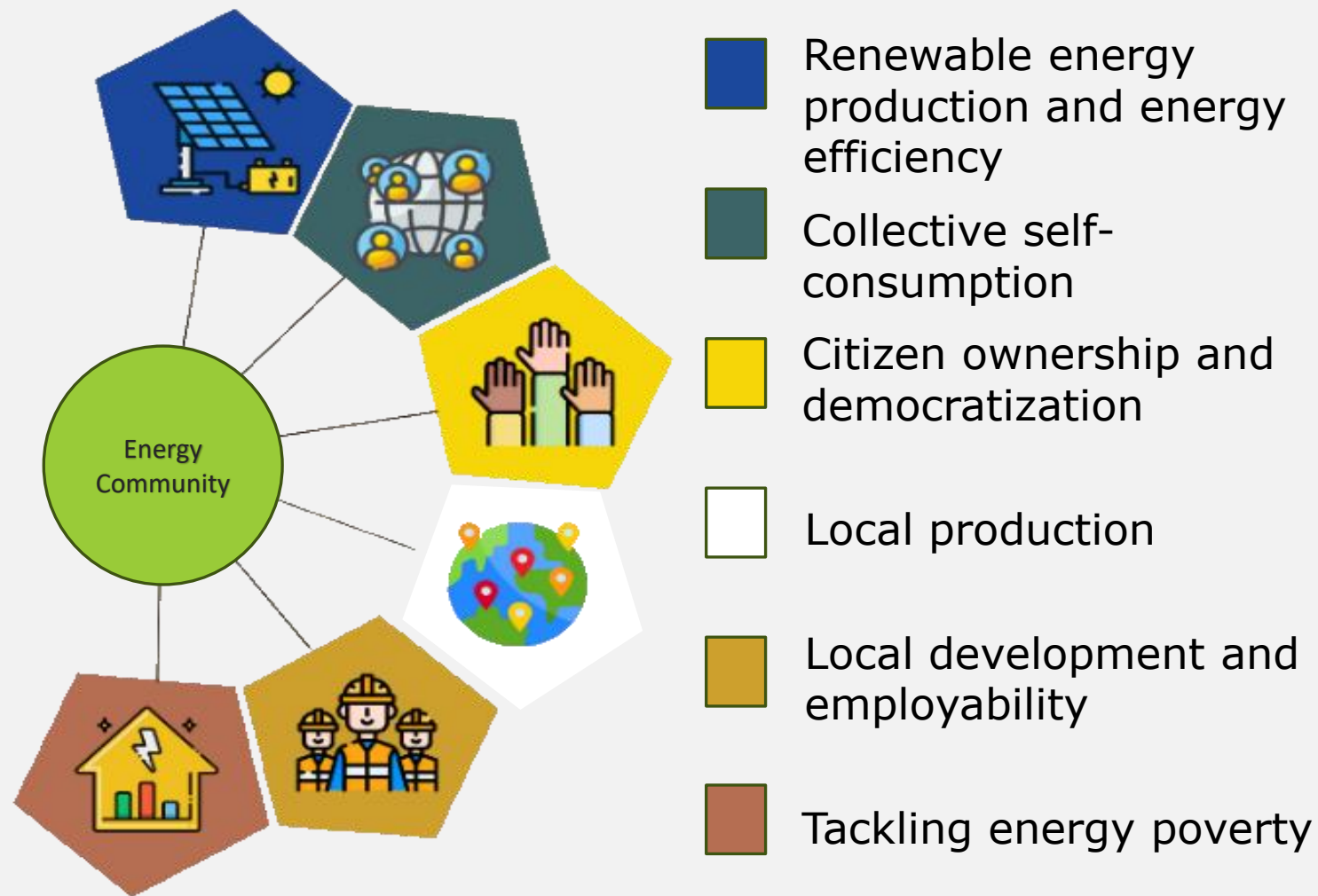
0 100 200 m

Shared Mobility

- The plan is to increase mobility through a shared bike station and a station based shared car
- Create a mobility concept with the local people and MO.Point
- Both will be located near the center of the settlement and in the highest population density zone



Electricity



Potential Solarpanels, on the solar catastral map of St. Pölten you can see the high solar potential in the area of the Kupferbrunnberg



Electricity storage:

The energy transition requires efficient storage systems -

2 market-ready storage technologies:

- Lithium-ion Batteries
- Lead-acid Batteries

And 3 future approaches:

- Electricity converted into hydrogen. This is compressed and saved. When electricity is required, the hydrogen is converted back into electrical energy by a fuel cell.
- Thermochemical storage systems – which are with energy densities three to four times higher than water storage systems and can store heat with almost no loss.
- A third way to store electricity from a renewable energy system is to use batteries from old electric cars.



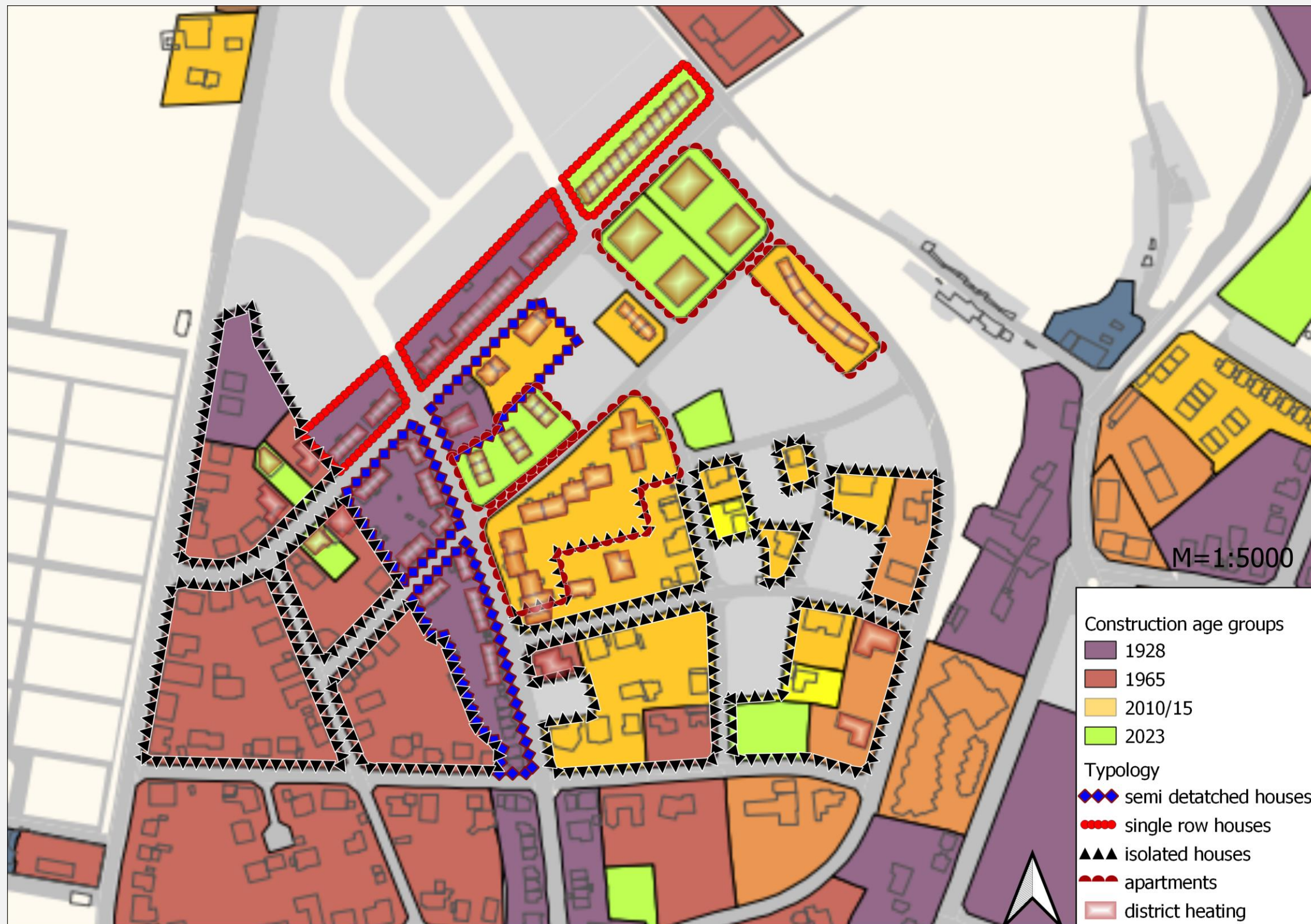
Agri-PV – Solar Power and Agricultural Products

- Opportunity for Agri-PV at the nearby fields
- The loss of space caused by the PV system is absolutely minimized (less than 2%).
- Additional revenue for agriculture
- Crisis-proof in the event of climate-related crop losses
- Regional, parallel production of electricity and food
- Higher social acceptance due to minimal loss of space



Heating/Cooling

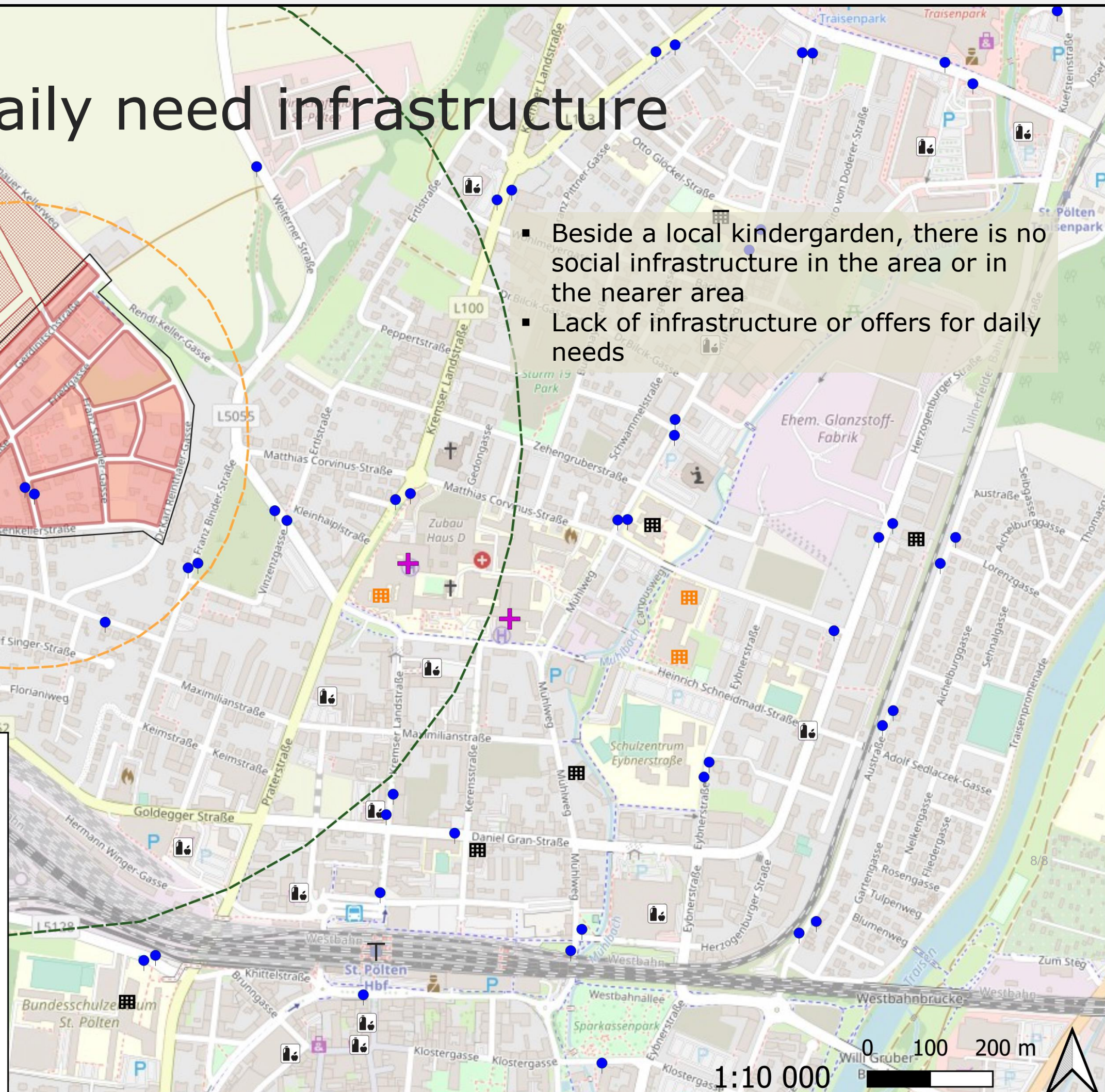
- Implement the district heating in all the building where it is available, more renewable energy for the district heating
- Thermal Renovation where it is possible – Program “Thermal Renovation Coaching”
- Heating/Cooling Pump for the other areas



Social and daily need infrastructure

- Beside a local kindergarden, there is no social infrastructure in the area or in the nearer area
- Lack of infrastructure or offers for daily needs

- Walkable zone in 5 mins
- Bicycable zone in 5 mins
- Bus stops
- Housing
- Planned housing
- ✚ Hospital
- School- kindergarden, elementary, high
- University
- Grocery store
- T Train station





Process and Details



Social aspects – Vision and Vision Next Level

- ➔ Building land reserves as future development areas as a major challenge
- ➔ Vision Next Level attempts to integrate the newly emerging area into the existing district

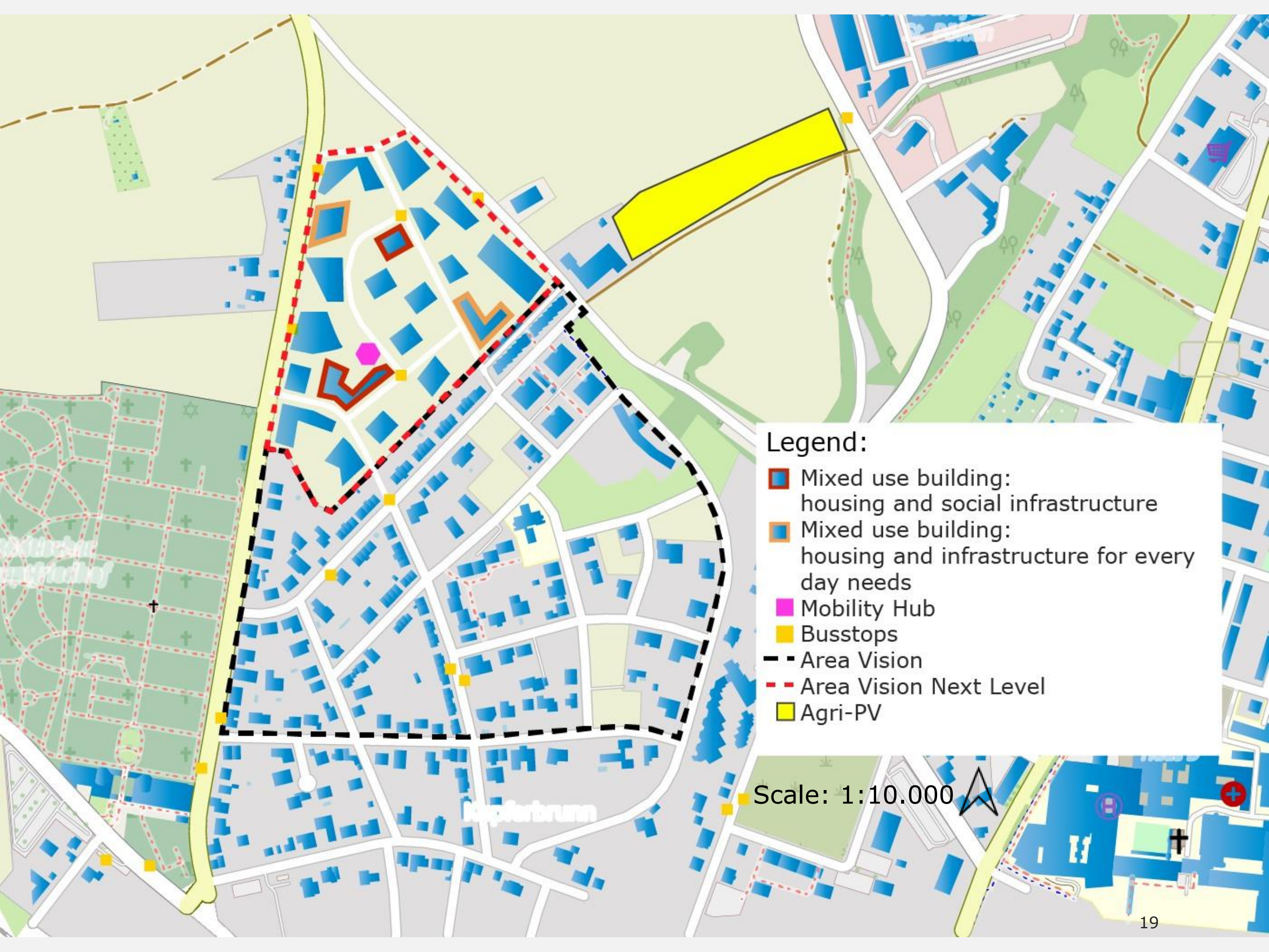
	Status quo	Vision	Vision Next Level
Inhabitants	456	522	1100
Residential units	206	236	520
Area size in ha	16,7 ha	16,7 ha	24 ha

Vision:








- Vacant lots are developed
- Sharing offers are developed (bike, e-car, cargo)
- Safe cycling and walking
- Renewable local energy community
- Soft instruments: thermal coaching, workshops for students, information days
- Raising awareness for upcoming projects in the north

Vision Next Level:

- Planned as traffic-calmed area so that all ways can be covered without car
- Focus on social infrastructure and daily need infrastructure
- The development area works without a car and on the 15-minute principle
- If cars, then e-cars
- Renewable energy is produced by a local energy community and Agri-PV
- The new buildings will be low-energy houses, using heat/cooling pumps
- During construction, attention is paid to reusable materials and sustainable materials
- Expanded sharing offers at the mobility hub, which is offered in the center of the area



Legend:

-  Mixed use building: housing and social infrastructure
-  Mixed use building: housing and infrastructure for every day needs
-  Mobility Hub
-  Busstops
-  Area Vision
-  Area Vision Next Level
-  Agri-PV

Scale: 1:10.000

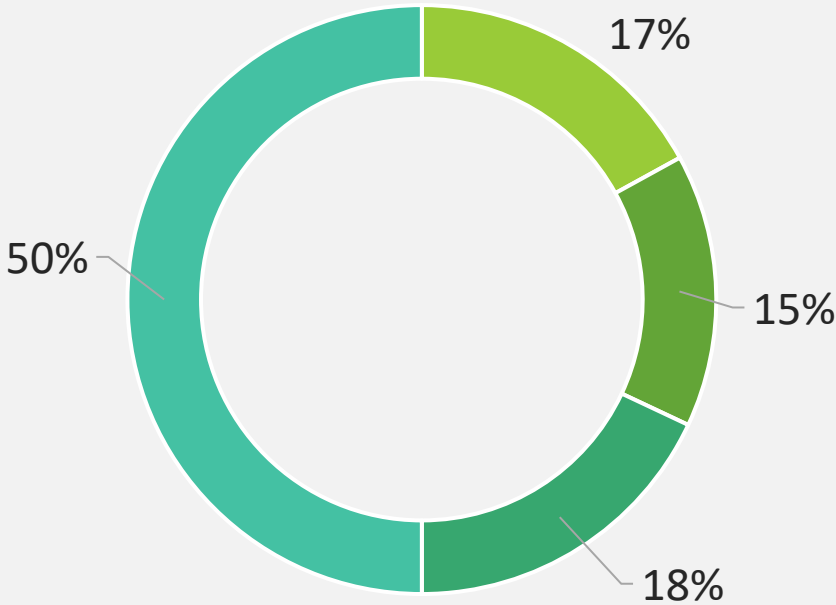


Mobility

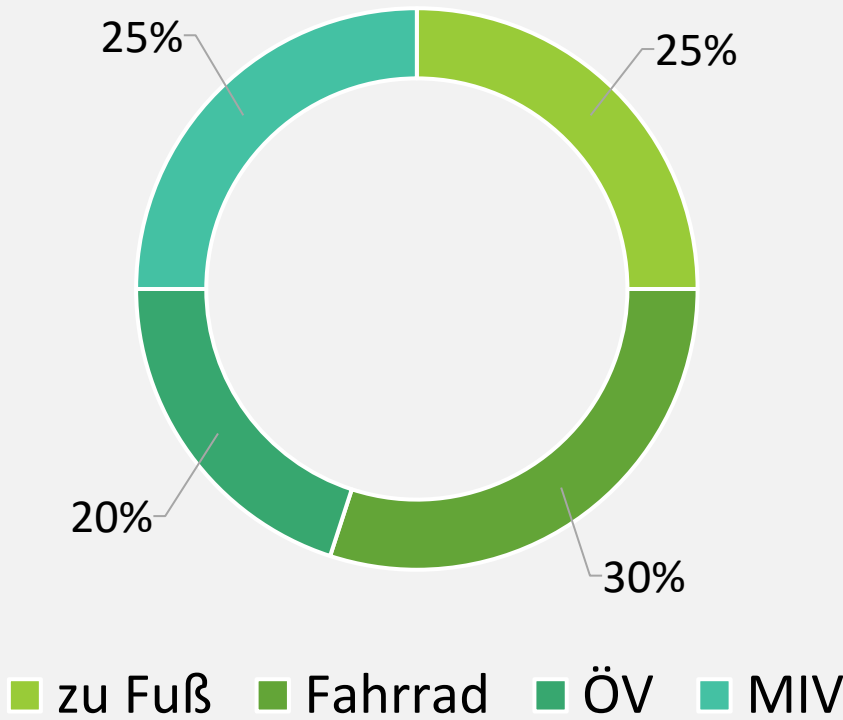
Mobility key figures	
Average energy consumption/km by car kWh/PKM	0,58
Cars per 1000 inhabitants in St. Pölten	582/1000
average number of cars per household in lower Austria	1,3
daily trip frequency	3
cars saved per sharing car	up to 10

Mobility energy demand	Status quo	Vision	Vision Next Level
Average daily distance St. Pölten	35	30	25
percentage of journeys made by car	50	30	25
Mobility energy demand (GWh/area/a)	1,69	0,99	1,43
Renewable share in %	10%	50%	100%

Modal Splits in %
Kupferbrunnberg Status Quo



Vision Next Level



Electricity

	Status Quo	Vision	Vision Next Level
Electric energy demand (kWh/P/a)	1500	2500	3000
Electric energy demand (GWh/area/a)	0,68	1,31	3,30
Renewable share in %	85%	100%	100%

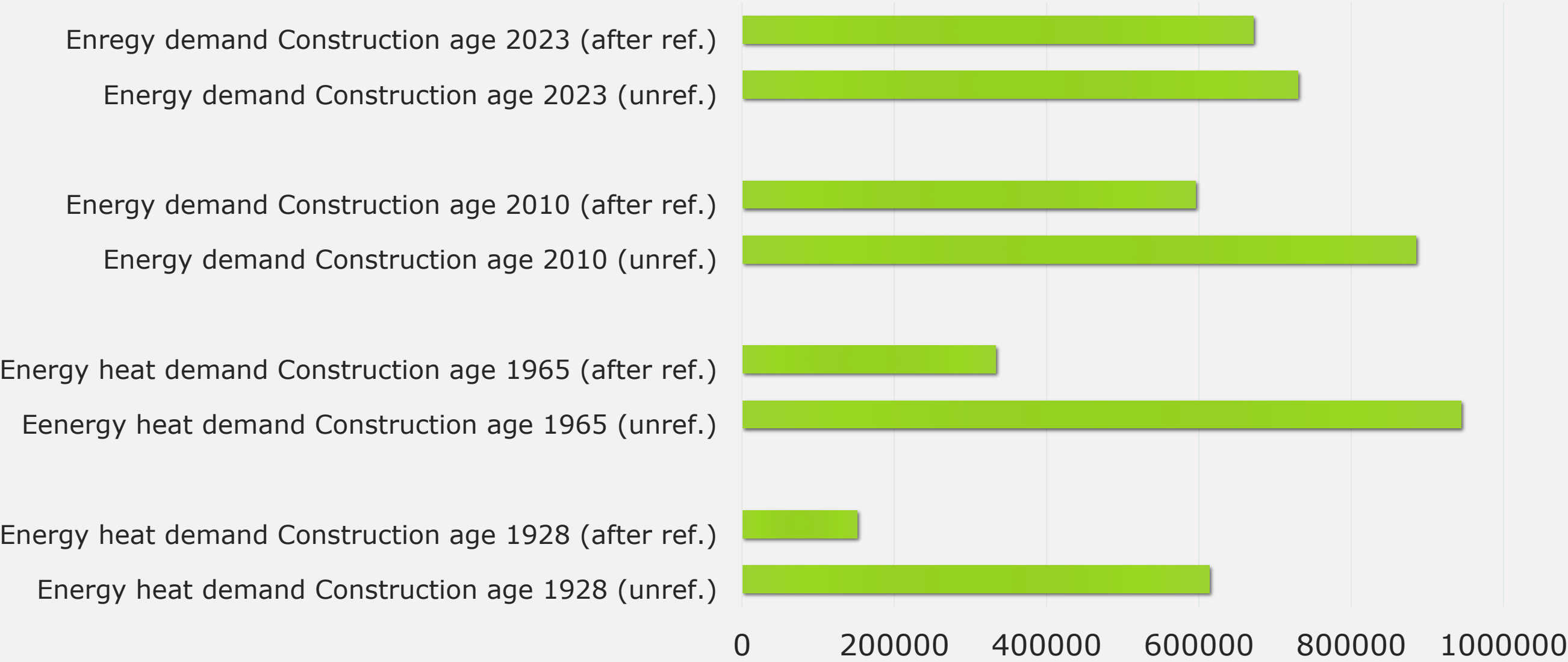
- High potential for using solar energy to generate electricity, surpassing the estimated consumption levels.
- The abundant sunlight, coupled with modern solar technologies, positions the community as an ideal candidate for sustainable energy production. With ample rooftop space and suitable terrain for solar panel installations, the potential capacity for solar power **far exceeds current energy demands**.
- By capitalizing on this renewable resource, the settlement has the opportunity to not only meet its electricity needs but also contribute surplus energy to the grid, fostering a greener and more energy-independent community.

Solar Potential/a	kWp	GWh/a
Status Quo	546,7	0,55
Vision	2436,2	2,44
Vision Next Level	3436,2	3,44

Heating

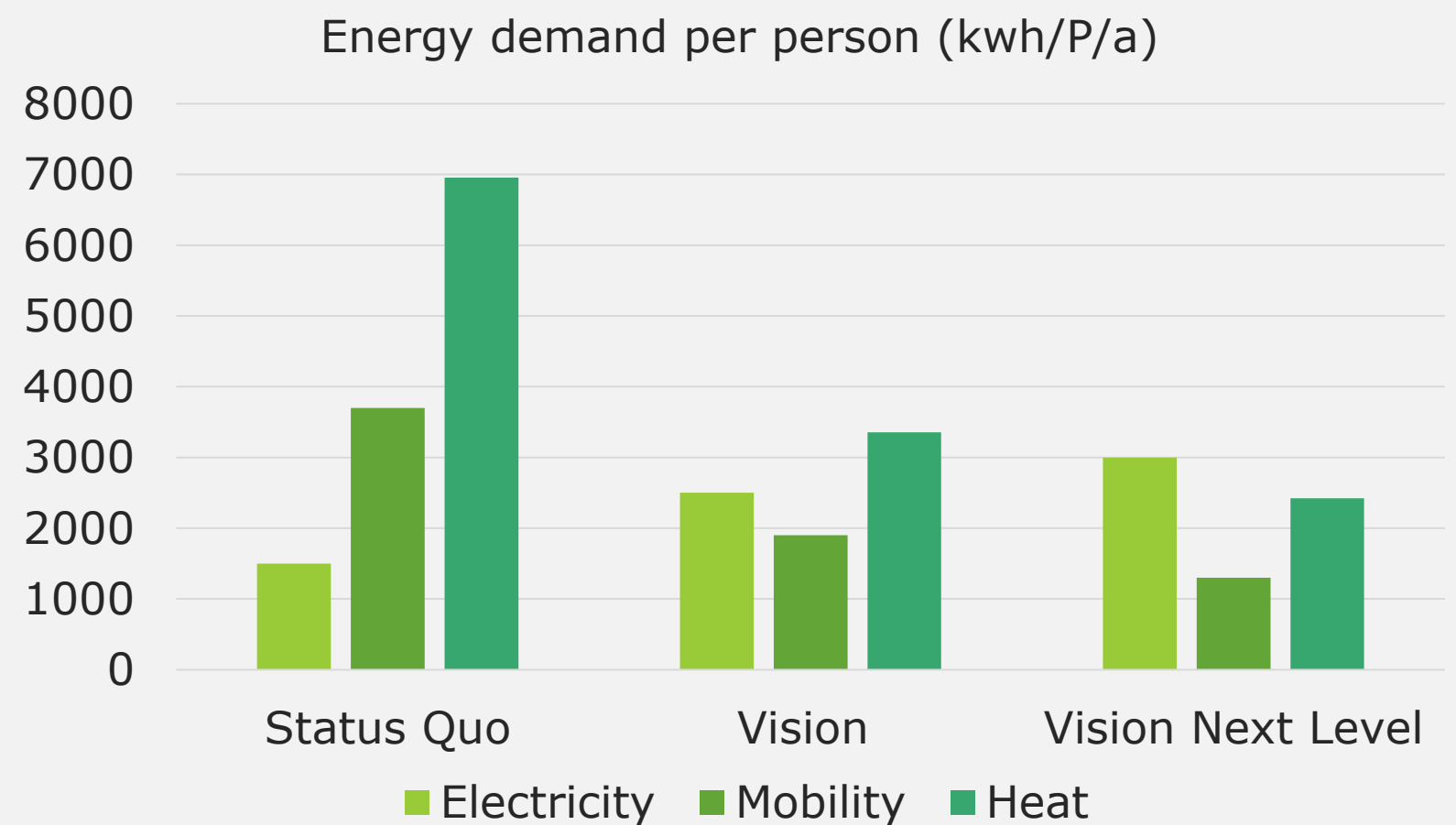
	Status Quo	Vision	Vision Next Level
Heat energy demand (Gwh/area/a)	3,17	1,75	2,66
Renewable Share in %	20%	60%	80%

Energy heat demand by sub areas in kWh/m²/a (according to tabula webtool)

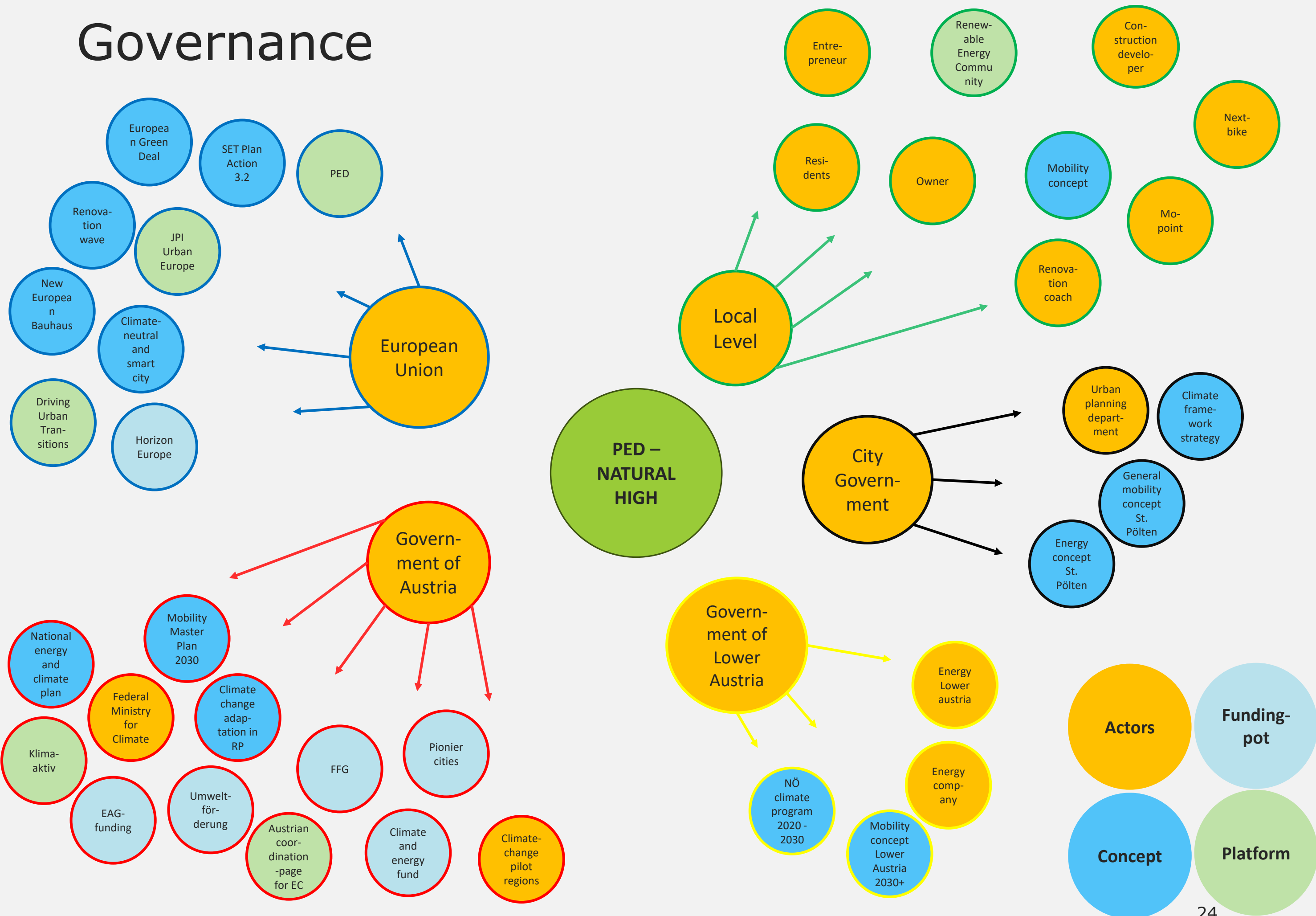


Energy total and comparison

	Gwh/area/a	weighted ren. Share in %
Total energy demand (Status Quo)	5,5	25%
Total energy demand (Vision)	4,0	70%
Total energy demand (Vision Next Level)	7,4	93%



Governance



Timeline

02.06.2024	06.2024	03.06.2024 - 07.06.2024	08.07.2024	08.07.2024	08.07.2024 - 31.08.2024
<p>Kick-off event Kupferbrunnstreet-festival</p> <p>Reason: Solar potential in Kupferbrunnberg, committed citizens; photovoltaic promotion -> renewable energy community, city of St. Pölten sees area as future development area (building land development zones); achievement of targets according to climate framework plan, pioneer city)</p>	<p>Information weeks</p> <p>Information on plans, opportunities, local renewable energy community (how it works, advantages and disadvantages, financing)</p>	<p>Citizens' forum</p> <p>What changes the residents would like to see? What measures can be implemented quickly?</p>	<p>Information stop opens</p> <p>Information campaign with information stop and direct mailing supervised and implemented by an external planning office together with the city and the local citizens' initiative</p>	<p>Opening of nextbike station</p> <p>Kupferbrunnberg will be integrated into the nextbike network of St. Pölten at the start of the vacations</p>	<p>Climate and energy workshops</p> <p>Workshops are offered over the summer, mainly for pupils</p>

01.09.2024	01.09.2024	01.10.2024	01. 2025	06.2025	10.2025	01.2026
<p>Order for mobility concept</p> <p>Sustainable mobility concept is being developed by St. Pölten together with mo-point, including rapid implementation of station-based sharing services in Kupferbrunnberg</p>	<p>Concept development for LEC</p> <p>Type of LEC, organizational form, billing structure, determination of electricity price -> subsequent establishment of the company form</p>	<p>Kick-Off Renovation coaching</p> <p>Launch of renovation campaign with know-how support (types, urgency, funding methods)</p>	<p>Start of realization mobility concept</p> <p>Start of construction of cycle paths and protective paths (network connection with existing path network); sharing offers are created and continuously evaluated</p>	<p>Kick Off Vision Next Level</p> <p>In order to guarantee a functioning integration of the new development area, the start of vision next level is an information event for the residents of Kuperbrunnberg, the future neighbors</p>	<p>Resolution of the zoning plan and development plan</p> <p>The plans set out key points for sustainable energy, future infrastructure and social housing</p>	<p>Development areas are advertized</p> <p>Exclusion areas will be integrated into the Kupferbrunnberg district during planning, with a focus and central component on the social, daily infrastructure that is currently lacking (shopping facilities, educational opportunities, restaurants)</p>

01. 2026	04. 2026	06.2027	2027-2042	05.2029	2042
<p>Agri-PV</p> <p>Pilot area with Agri PV together with EVN and the farmers on the agricultural land in the north of Kupferbrunnberg</p>	<p>Expand District Heating</p> <p>Expansion and district heating is decided in order to develop the new residential areas, and the district heating will also be greener</p>	<p>Start of development of the first new building areas</p> <p>apartment buildings matching the typology in the north of the existing area, attention on reusable materials, environmentally friendly</p>	<p>Smart, sustainable mobility-concept</p> <p>Smart, sustainable mobility concept, with safe infrastructure for cycling and walking, was thought about and implemented from day one</p>	<p>Neighborhood get-to-know-you days</p> <p>New development areas must be integrated into existing ones; there is a special offer to get to know each other - the get-together days</p>	<p>Project completion</p> <p>Successful project completion occurs when the entire development area has been completed and a common neighborhood has been created</p>

Sources:

Status Quo

Slides 1 - 8

- Photos: Own Photos
- Maps:
 - base map: openstreetmap
<https://www.openstreetmap.org/#map=16/48.2175/15.6222>
 - own editing
- approximate population: Calculation according to the population density in 2022 by building block
- Graphics: Excel, own editing
- SWOT: own observations and calculations
- Carsharing icon: https://www.freepik.com/premium-vector/ride-car-sharing-icon-outline-ride-car-sharing-vector-icon-web-design-isolated-white-background_73793633.htm
- SWOT icons: <https://www.istockphoto.com/de/grafiken/swot-icon>

Vision

Slides 9 - 12

- Pictograms: MicrosoftPowerpoint pictograms
- 3D Maps: own edit; base: openstreetmap, <https://www.openstreetmap.org/#map=16/48.2175/15.6222> (24.11.2023)
- Mobility map: own edit, base: openstreetmap, <https://www.openstreetmap.org/#map=16/48.2175/15.6222> (24.11.2023)
- vision mobility goals are consistent with the overarching goals of concepts like the mobility concept of lower Austria 2030+, Active mobility guiding concept St.pölten, or the mobility master plan 2030
- Bikesharing pictogram: background: own picture; sharing bikes: <https://www.augsburg.de/aktuelles-aus-der-stadt/detail/bikesharing-naechste-umsetzungsschritte-stehen-an-2> (24.11.2023)
- E-carsharing pictogram: background: own picture; shared car: <https://www.electrive.net/2018/04/19/ovo-praesentiert-v2g-lader-fuer-den-heimgebrauch/> (24.11.2023)

Slides 13 - 14

- Map: own edit; base: solarkataster St.Pölten: <https://st-poelten.map2web.eu/lists?location=1738603,6142904,17&pinned=&toc-id=50109> (24.11.2023) and google maps, <https://www.google.at/maps/@48.2185939,15.6181004,379m/data=!3m1!1e3!5m1!1e4?entry=ttu> (24.11.2023)
- Pictogram: <https://eurocrowd.org/blog/2021/10/03/boosting-energy-communities-through-crowdfunding/> (24.11.2023)
- Electricity storage: <https://pvaustria.at/pv-speicher/>; <https://greenenergylab.at/innovative-loesungen-wie-man-erneuerbare-energie-effizient-speichert/> (24.11.2023); Picture: <https://www.fuelcellstore.com/blog-section/battery-energy-storage-for-the-pv-system>
- Agri-PV: data oriented towards: <https://www.energiepark.at/agri-pv-sonnenfeld-bruck-leitha/> (24.11.2023); own picture

Slides 15 - 17

- Heating/Cooling maps: own edit, base: own research, google maps: <https://www.google.at/maps/@48.2161786,15.6207699,15.92z?entry=ttu> (24.11.2023), Baualterplan_akt_Baubestand 2023 St.pölten, district heating St.Pölten: <https://st-poelten.map2web.eu/lists/pois?pinned=&toc-id=516> (24.11.2023)
- Social and daily need infrastructure: own edit, base: openstreetmap: <https://www.openstreetmap.org/#map=16/48.2175/15.6222> (24.11.2023); planned housing, St.pölten bebauungsplan: <https://st-poelten.map2web.eu/lists/pois?pinned=50503&toc-id=1467> (24.11.2023)

Process and Details

Slides 20 – 23: Calculations

- average household size St.Pölten: <https://simil.io/politisch/sankt-poelten-stadt/st-poelten/haushaltsgroesse> (24.11.2023)
- car density st.pölten: <https://noe.orf.at/stories/3207064/> (24.11.2023) by vcö
- Average number of cars per household in Lower Austria: https://www.noel.gv.at/noe/NOELRU7_Mobilitaetserhebung_2018_Barrier_efrei.pdf (24.11.2023)
- car sharing car replaces up to 10 private cars: (cacluations by vcö) <https://www.umweltberatung.at/carsharing-mitfahrboersen> (24.11.2023)
- population calculations: population density st.pölten: Bevölkerungsdichte 2022 baublock.pdf
- Energy expenditure per km traveled by car (0,58): umweltbundesamt: https://www.umweltbundesamt.at/fileadmin/site/themen/mobilitaet/date_n/ekz_pkm_tkm_verkehrsmittel.pdf (24.11.2023)
- Austria on the way average daily route length: Österreich unterwegs 2013/2014
- Tabula Webtool: <https://webtool.building-typology.eu/#bm> (24.11.2023)
- Renewable share of mobility energy: <https://www.iea.org/reports/global-ev-outlook-2023#overview> (24.11.2023)
- renewable share of electric energy: <https://www.energie-noe.at/strom-in-niederoesterreich-wir-nuetzen-die-kraft-der-natur> (24.11.2023)
- Data modal split St. Pölten: general mobility concept St. Pölten: https://www.st-poelten.at/images/Folder/GVK_St_Poelten_Endstand_20140226.pdf (24.11.2023)
- electric energy demand (kwh/p/a) status quo: https://www.e-control.at/newsletter-5/2022/-/asset_publisher/mg4CSkniK7cM/content/k-serie-rechnungen (24.11.2023)
- The average electricity yield of a photovoltaic system in Austria in 2022 was 950 to 1,200 kilowatt hours per kilowatt peak of installed power: <https://www.energyagency.at/> (24.11.2023)
- average living space: <https://www.statistik.at/statistiken/bevoelkerung-und-soziales/wohnen/ohnsituation> (24.11.2023)
- energy shares St. Pölten: <https://www.global2000.at/sites/global/files/GLOBAL2000Landeshauptst%C3%A4dtestudie.pdf> (24.11.2023)

Slide 24: Governance

- Governance, Actor/Concepts mapping: JPI Urban Europe: <https://jpi-urbaneurope.eu/ped/> (24.11.2023)
- Horizon europe: https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe_en (24.11.2023)
- Further eu programs: https://setis.ec.europa.eu/implementing-actions/positive-energy-districts_en (24.11.2023)
- Climate adoptions: <https://www.klimawandelanpassung.at/> (24.11.2023)
- National energy and climateplan (NEKP): https://www.bmk.gv.at/themen/klima_umwelt/klimaschutz/nat_klimapolitik/energie_klimaplan.html (24.11.2023)
- climate adoptions in the austrian government program: https://www.dievolkspartei.at/Download/Regierungsprogramm_2020.pdf (24.11.2023)
- Driving urban transitions: <https://dutupartnership.eu/> (24.11.2023)
- climate and energyfund: <https://www.klimafonds.gv.at/> (24.11.2023)
- FFG and Pioniercities: <https://www.ffg.at/presse/mission-klimaneutrale-stadt-erste-pionierstaedte-stehen-fest> (24.11.2023)
- energy concept St. Pölten: <https://www.st-poelten.at/images/Folder/Energieleitbild.pdf> (24.11.2023)
- General mobilityconcept St.Pölten: https://www.st-poelten.at/images/Folder/GVK_St_Poelten_Endstand_20140226.pdf (24.11.2023)
- Climate change adaptation regions: <https://klar-anpassungsregionen.at/klar-programm> (24.11.2023)
- Renewable energy communities: <https://energiegemeinschaften.gv.at/> (24.11.2023)
- Klimaaktiv: https://www.bmk.gv.at/themen/klima_umwelt/klimaschutz/nat_klimapolitik/klimaaktiv/angebote.html (24.11.2023)
- Climate and energyprogram: <https://www.noel.gv.at/noel/Klima/KlimaEnergieprogramm2030.html7> (24.11.2023)
- Energy lower austria: <https://www.energie-noel.at/> (24.11.2023)