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University of Applied Sciences

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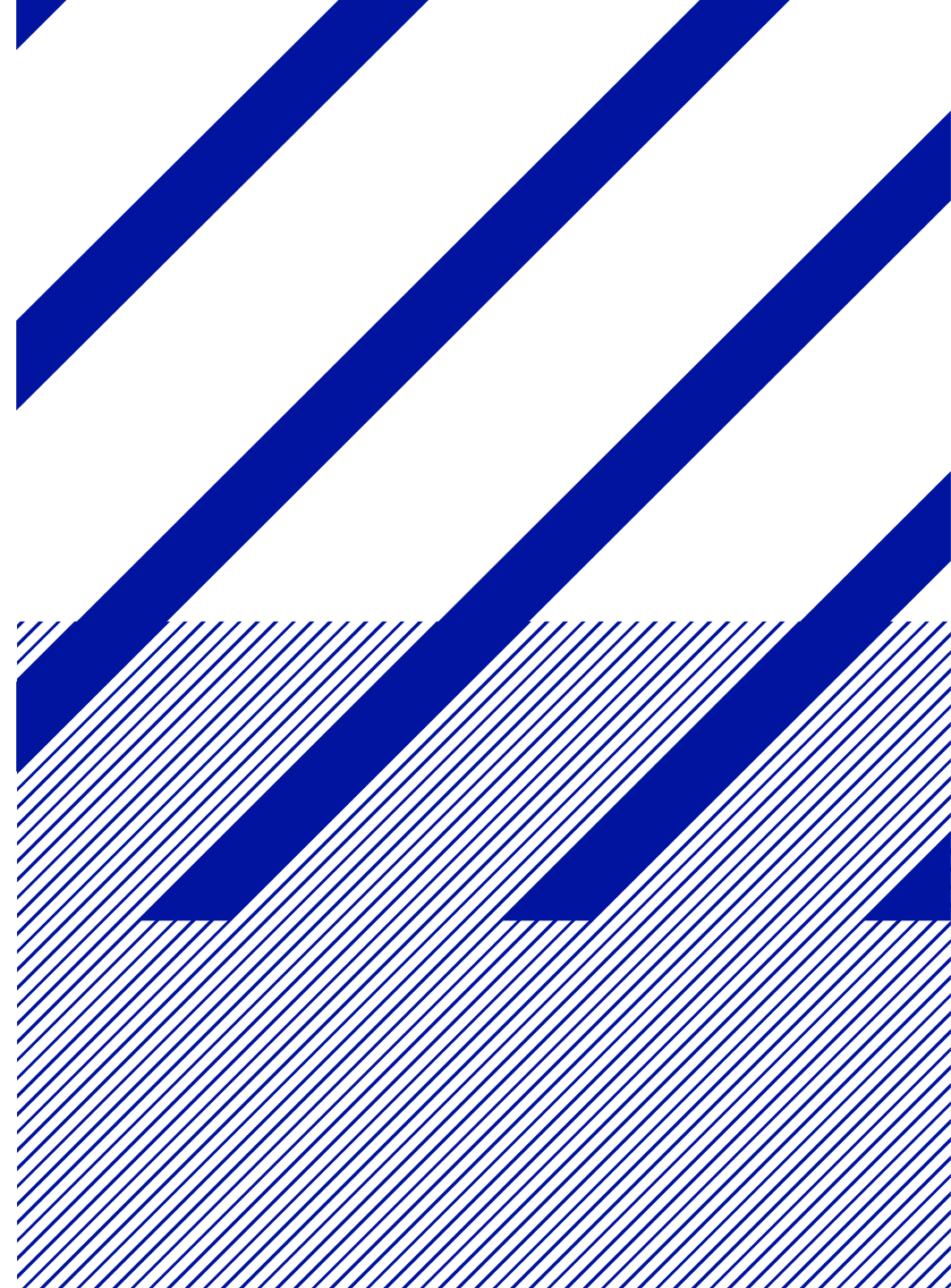
FB Energie · Gebäude · Umwelt
Energy · Building Services ·
Environmental Engineering

Potential and design of district heating networks using Geographic Information Systems (GIS)

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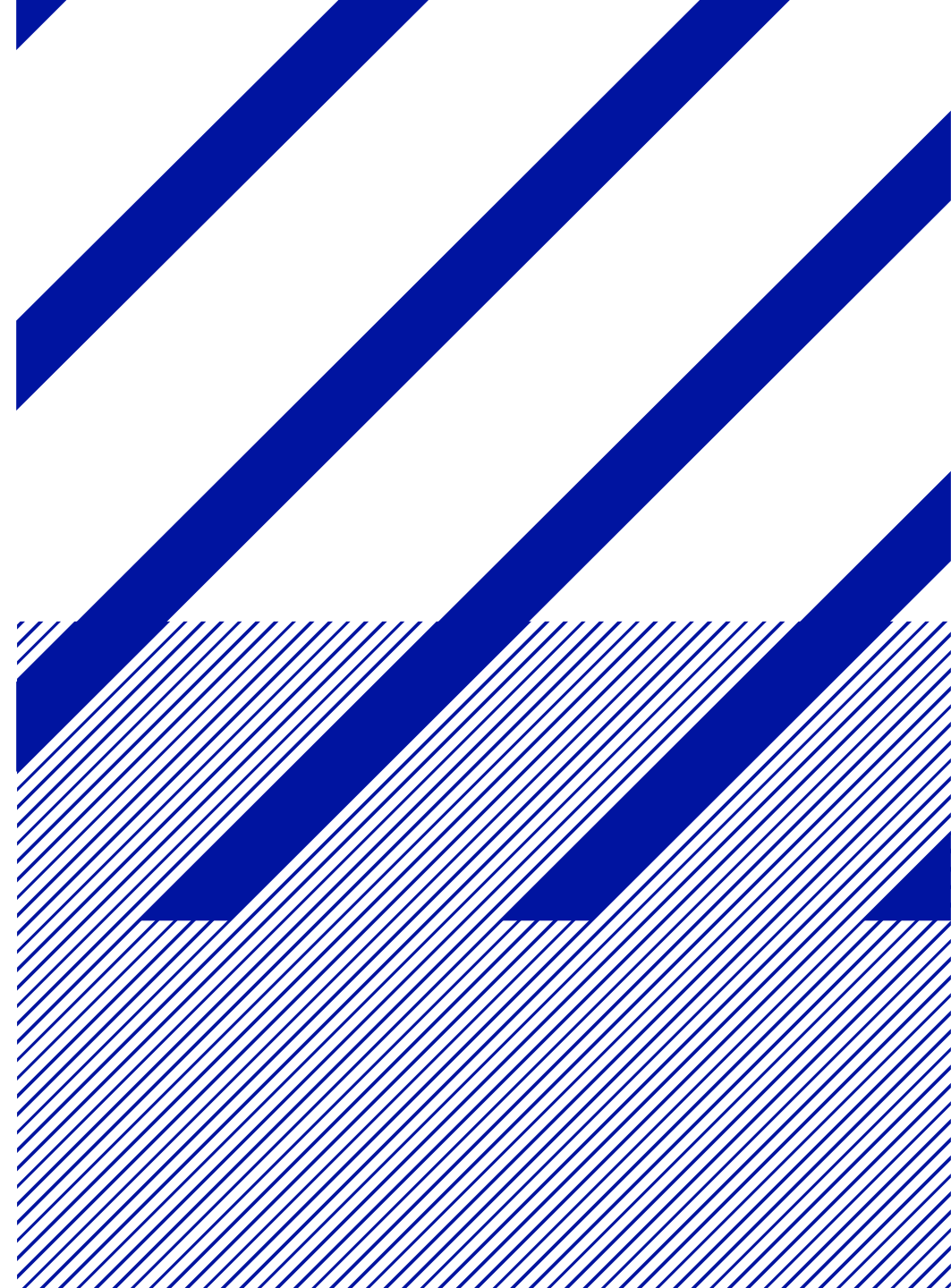
or

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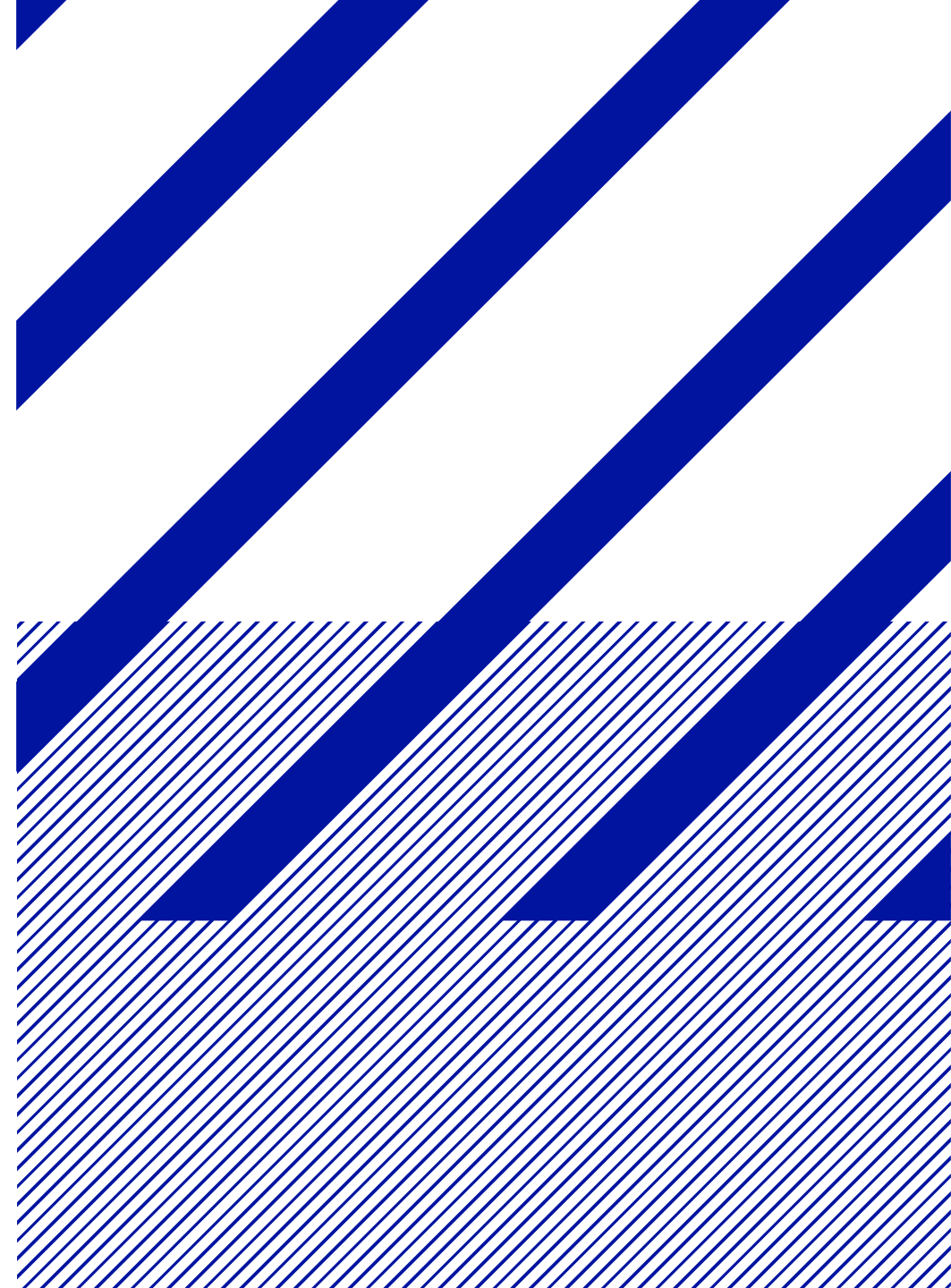
Fighting Climate Change with GIS-technology

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About us



© EuroGeographics for the administrative boundaries

Hochschulen

Fachhochschule
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SAXION
Hogeschool
Enschede

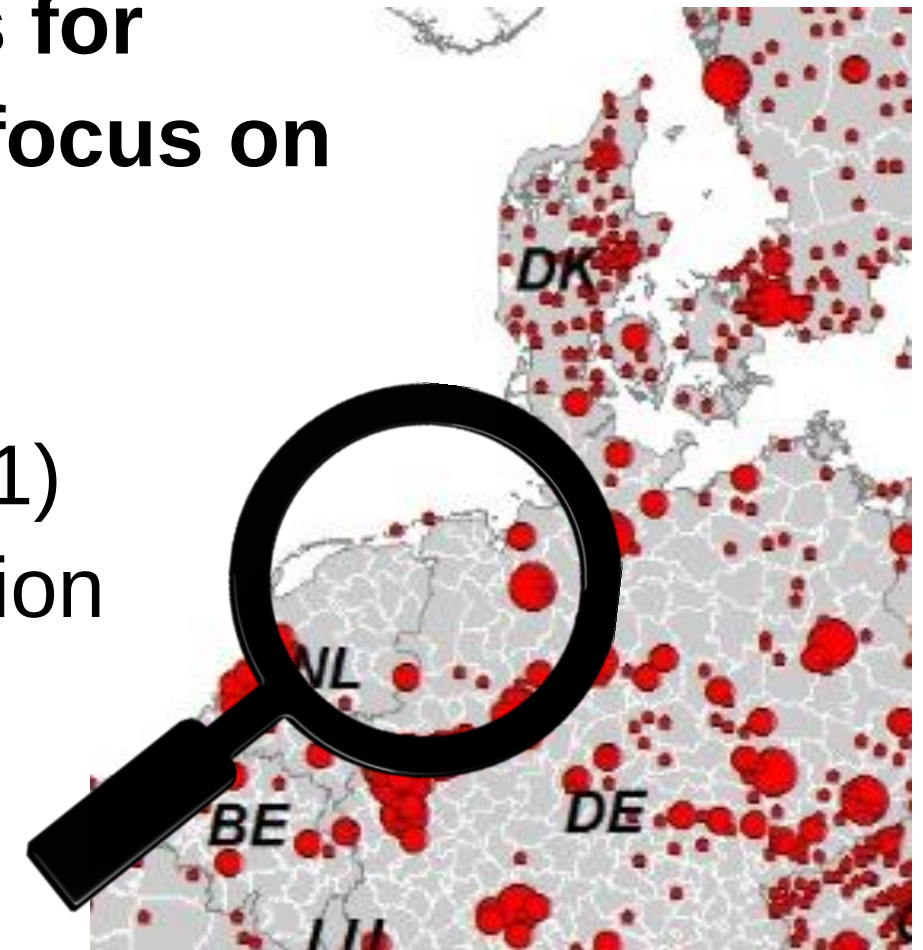
Projektpartner



A need for more energy planning

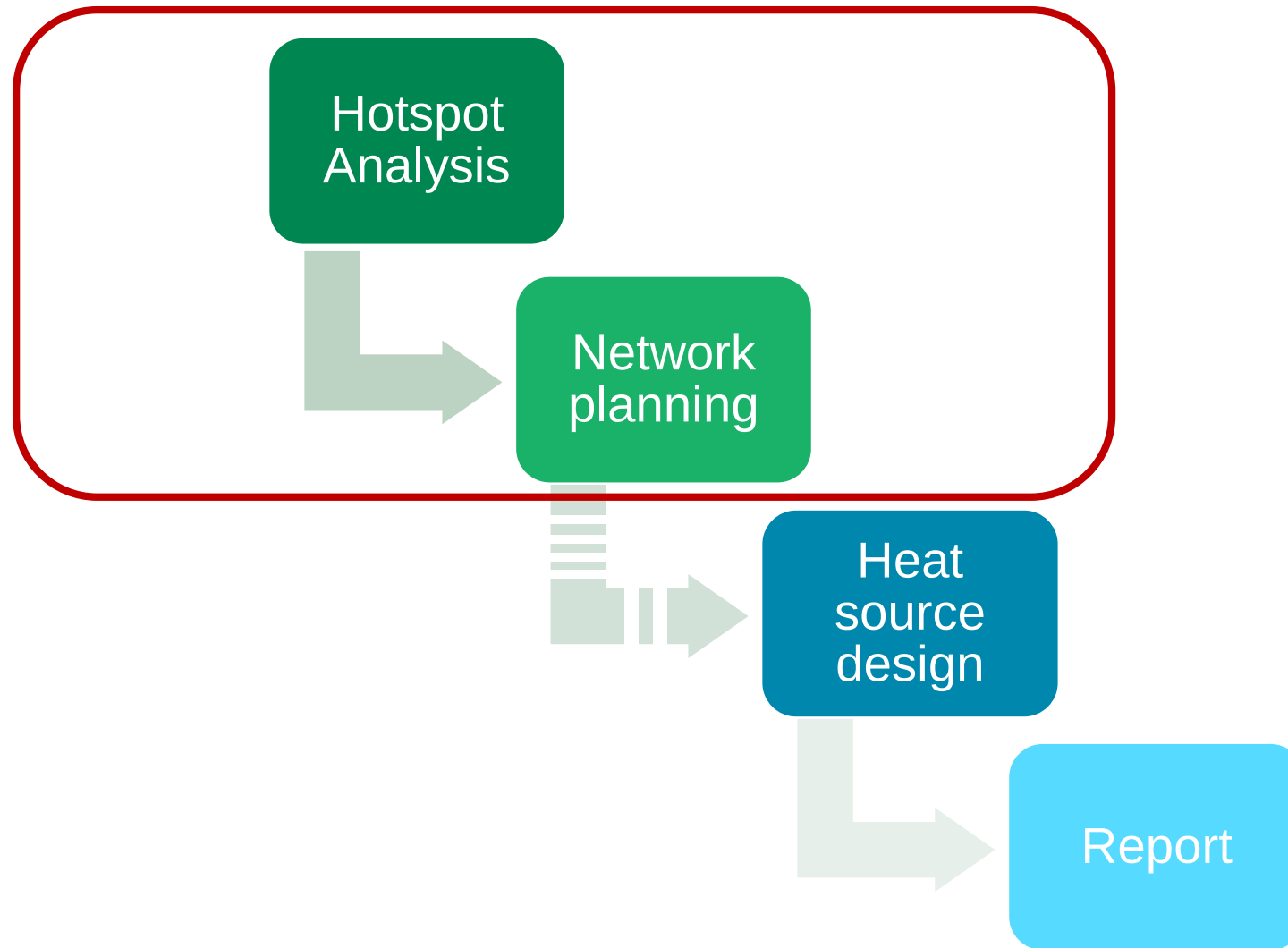
There was no freely accessible basis for integrated energy planning with the focus on heat (at least in our region)

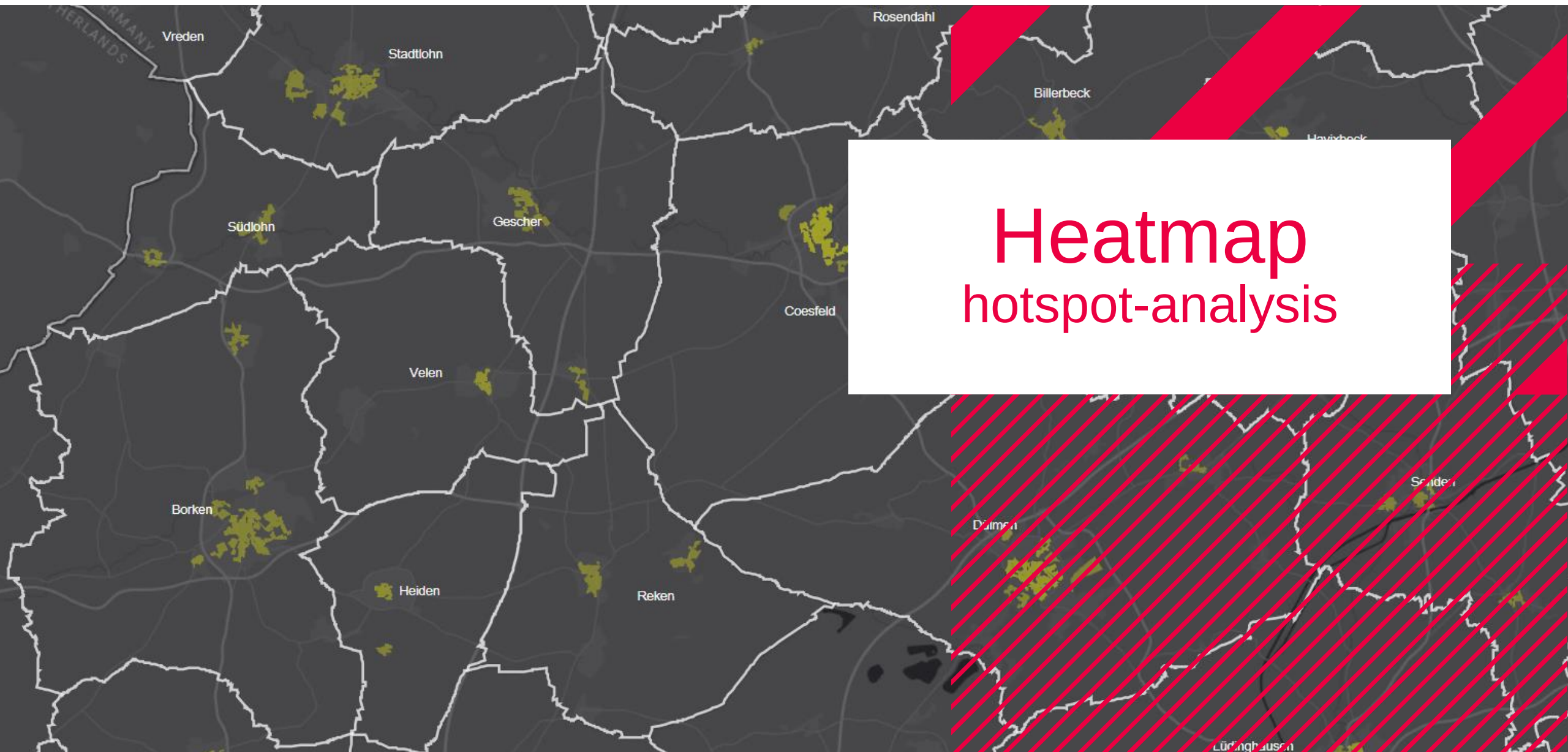
- No open geodata (until 2017/01/01)
- No open energy demand information
- No spatial context



<http://www.heatroadmap.eu/maps.php#>

Approaching the problem

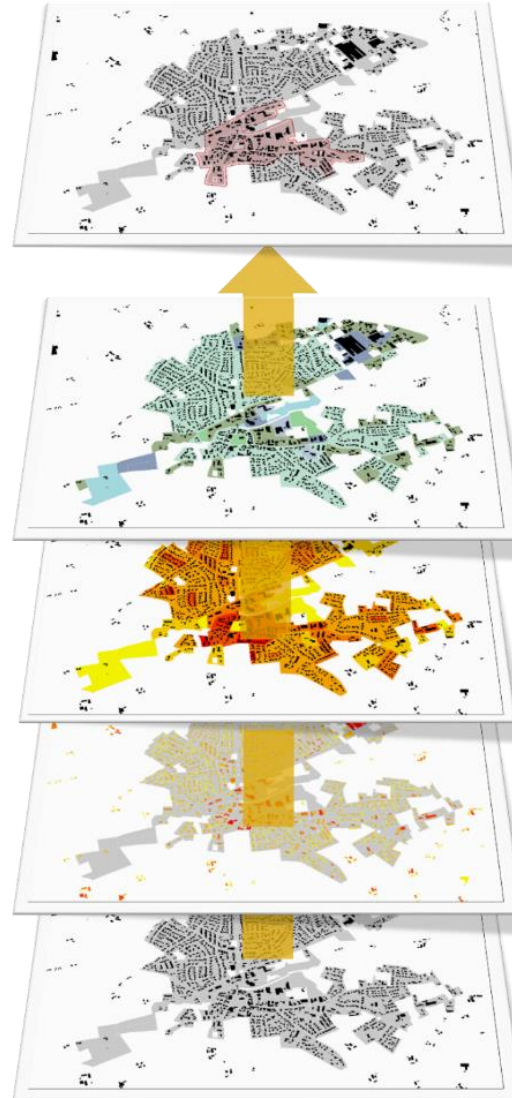




Heatmap

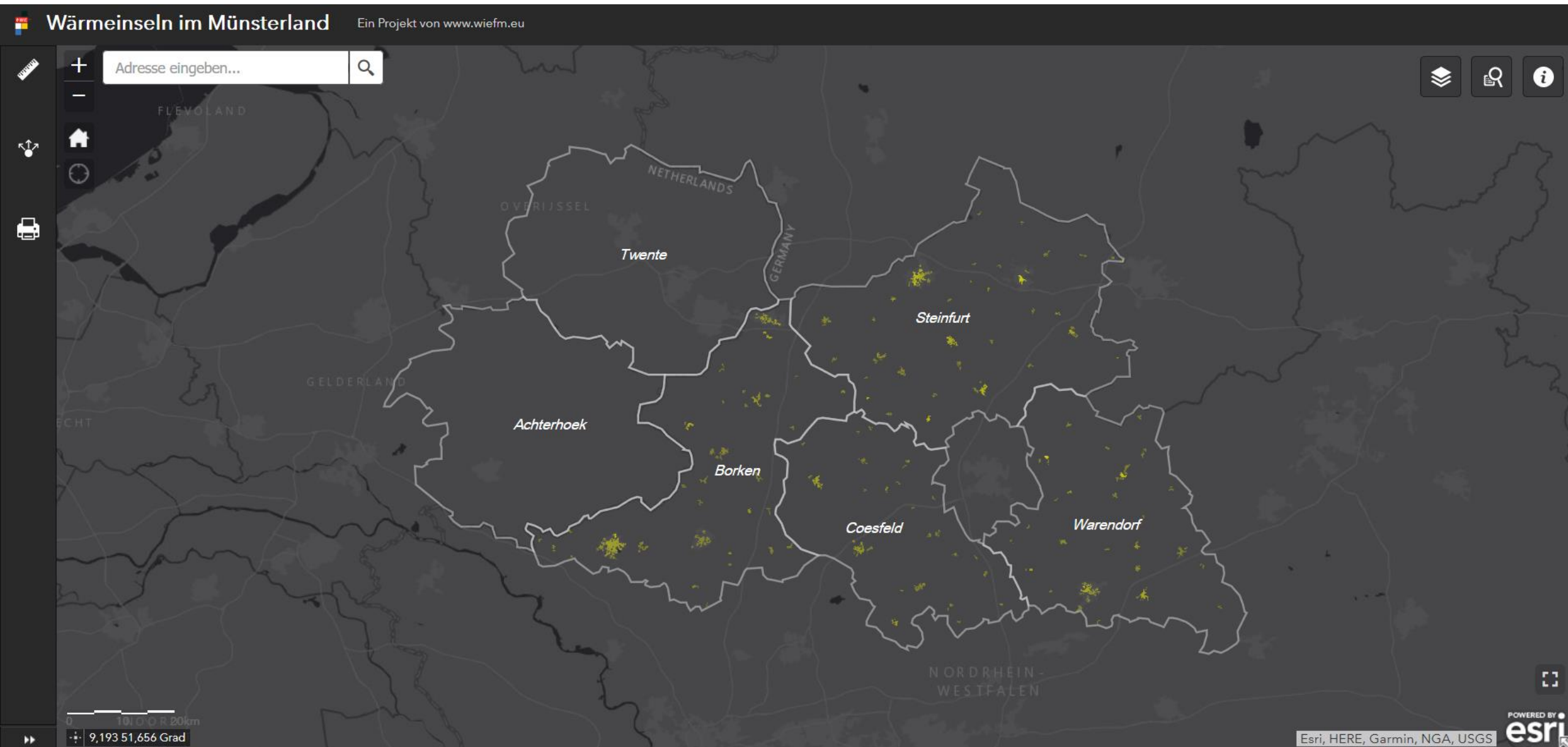
hotspot-analysis

HotSpot - Analysis

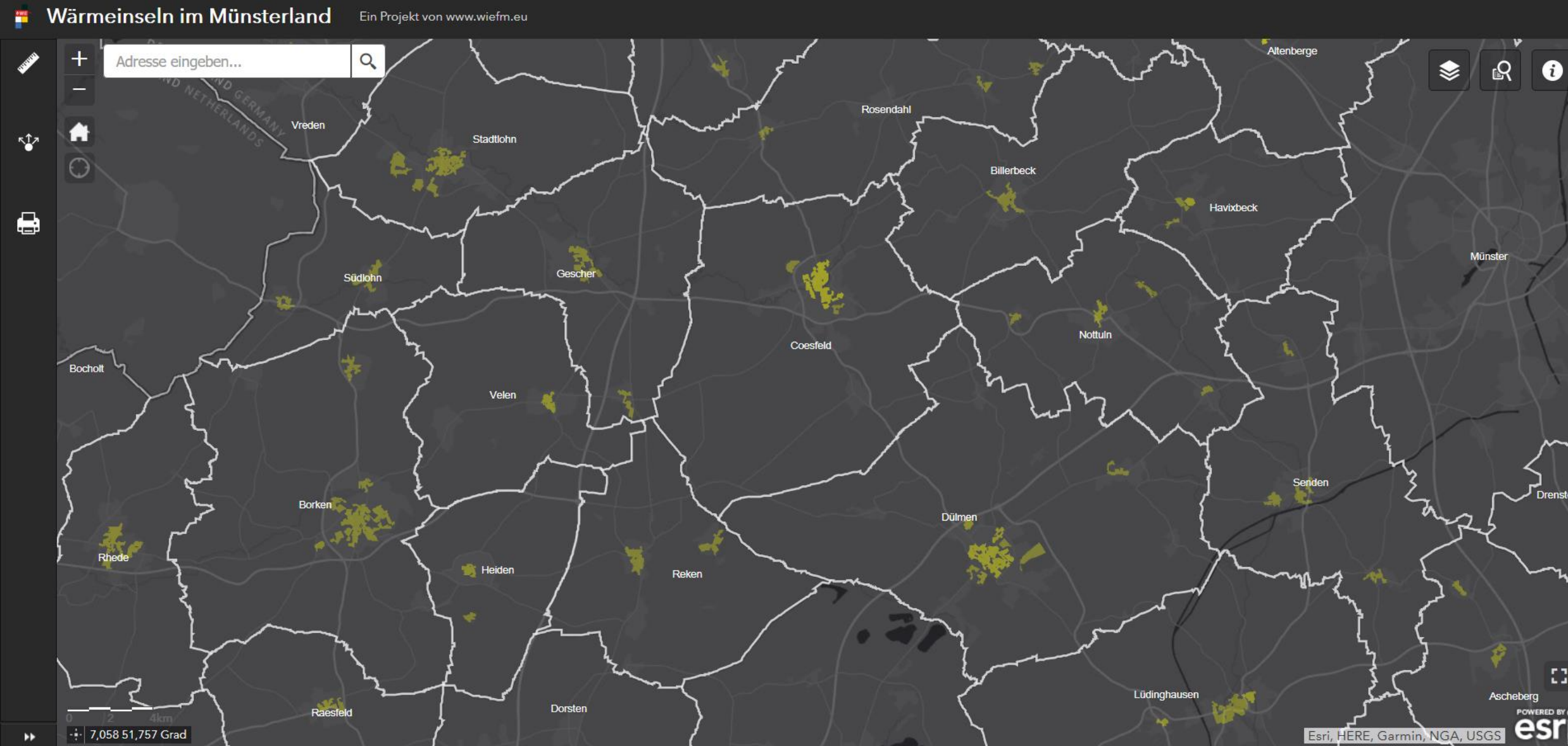


- 5 Hotspot:
- Results
- 4 City block:
- Landuse
- 3 City block:
- Aggregated heat demand
- 2 Buildings:
- Specific heat demand
- 1 Buildings:
- Type, area, age

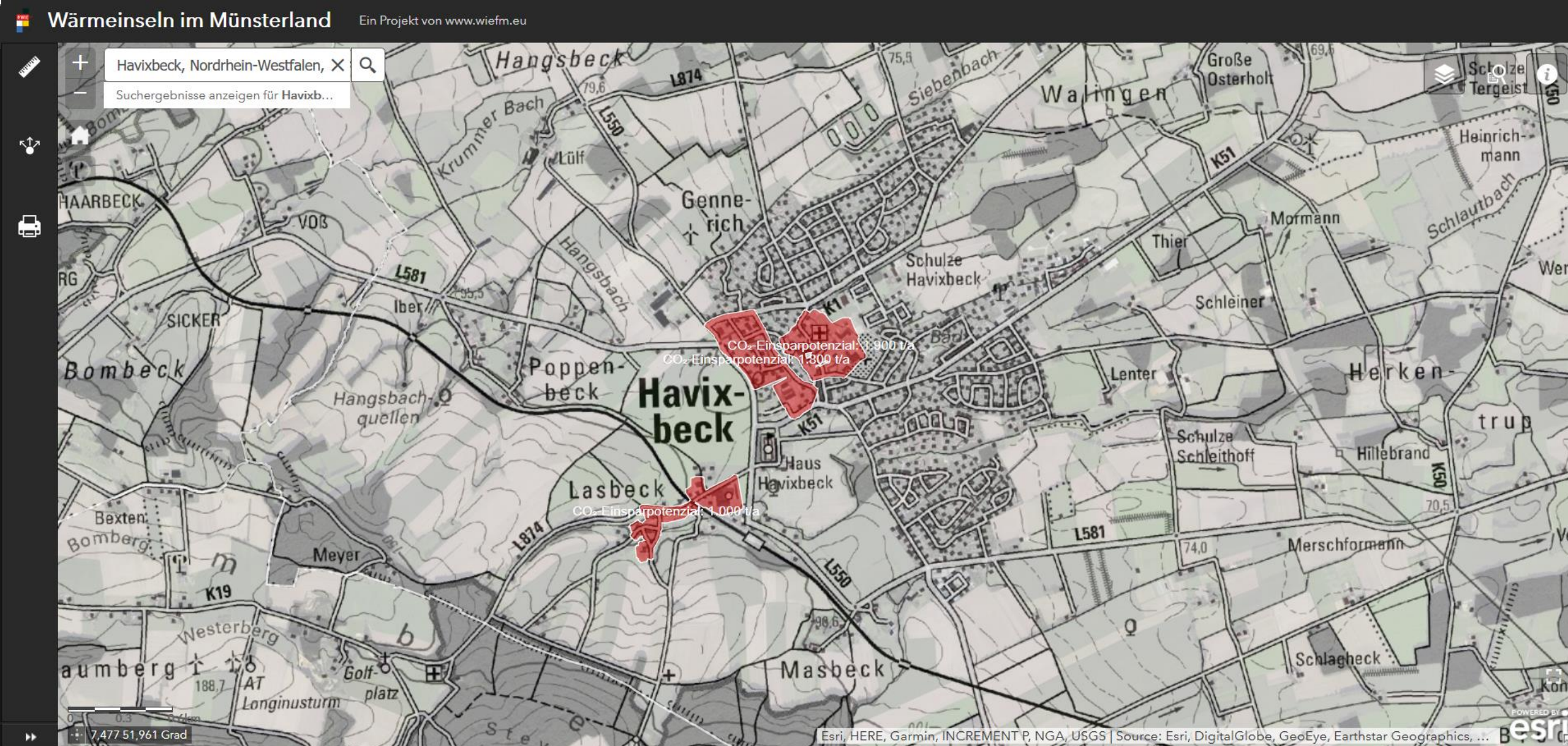
Wärmehotspots im Münsterland



Wärmehotspots im Münsterland

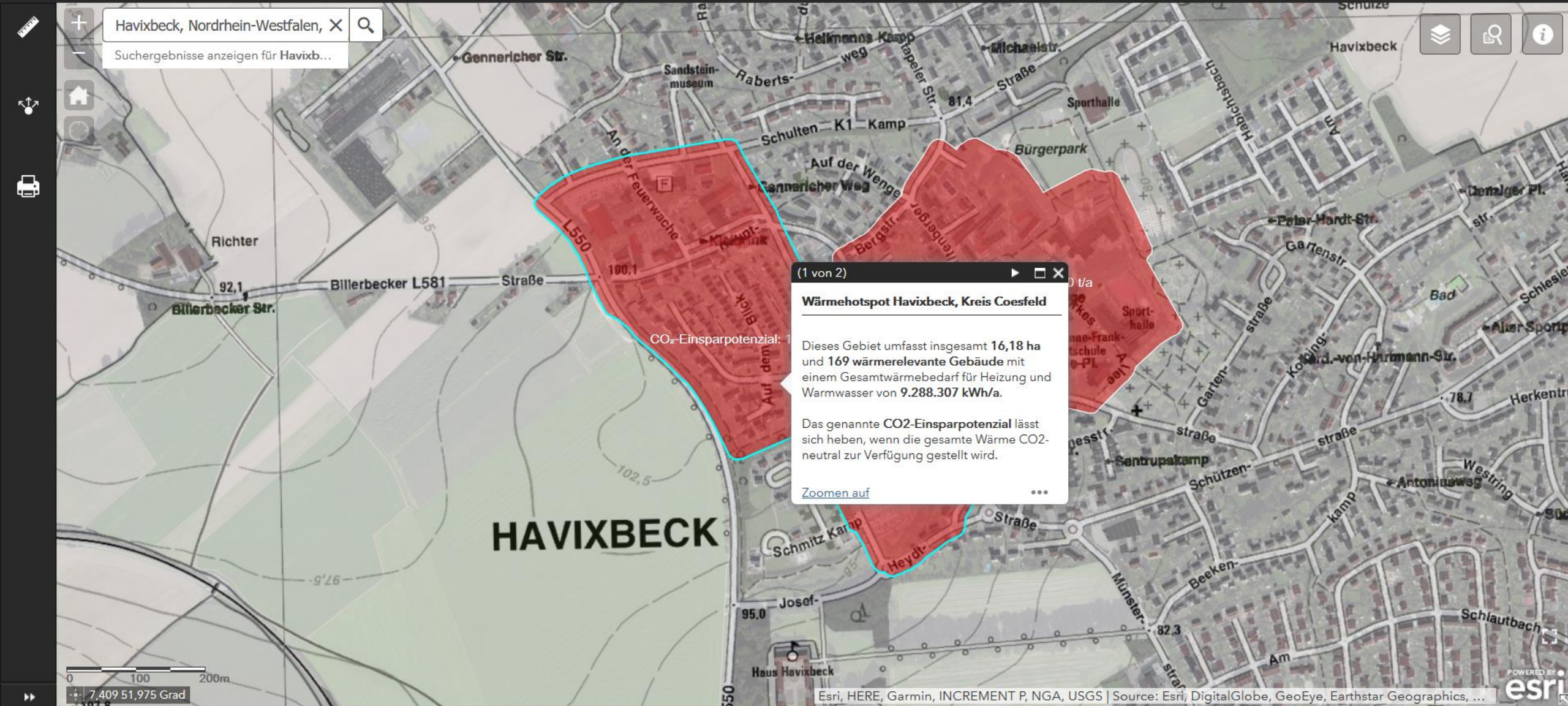


Wärmehotspots im Münsterland



Wärmehotspots im Münsterland

 **Wärmeinseln im Münsterland** Ein Projekt von www.wiefm.eu



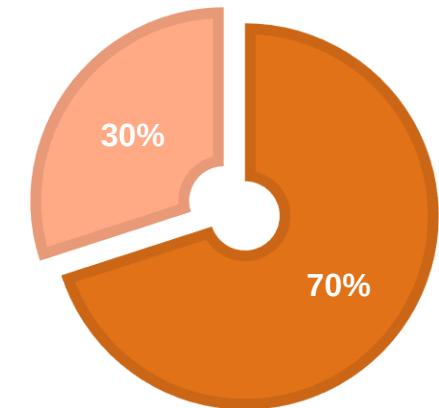
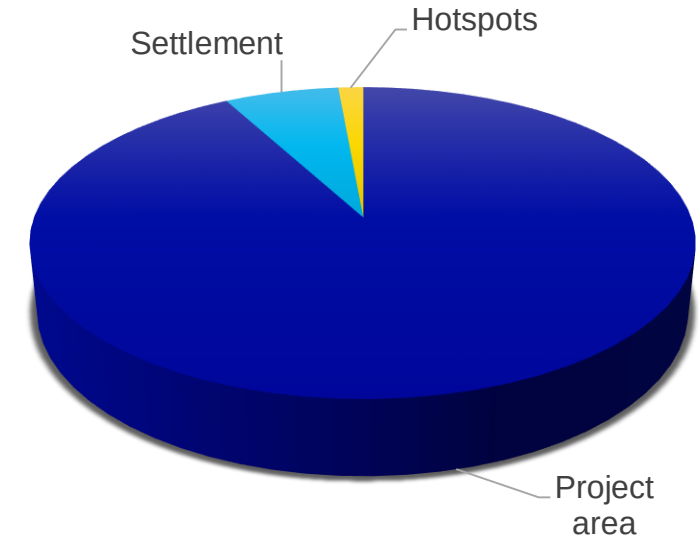
Wärmehotspots im Münsterland



Facts & Figures

HotSpot Analysis

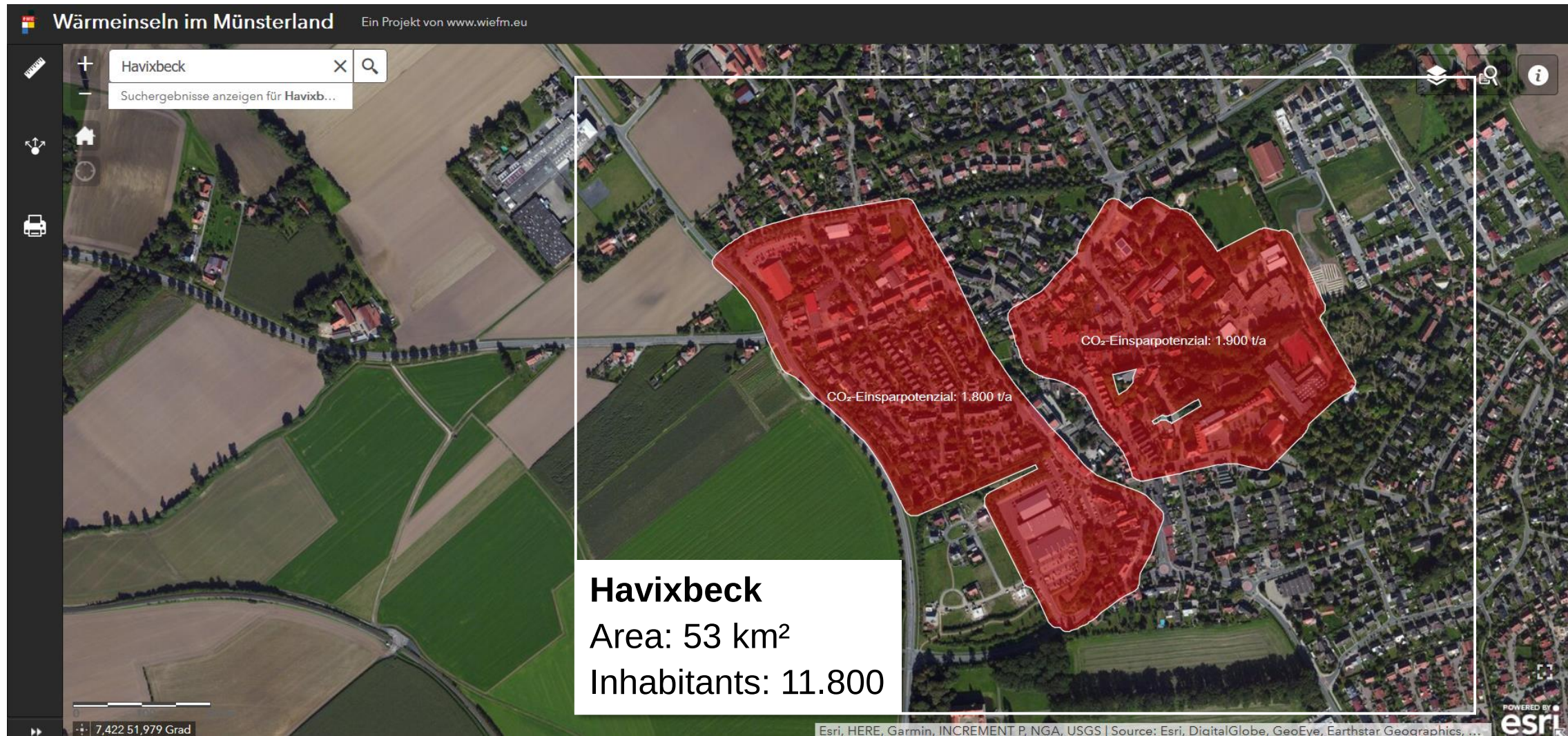
- 10 % of the project area is settlement area
- 1 % of the project area is covered by hotspots
- 30 % of the total heat demand (heating and warm water) within the hotspots



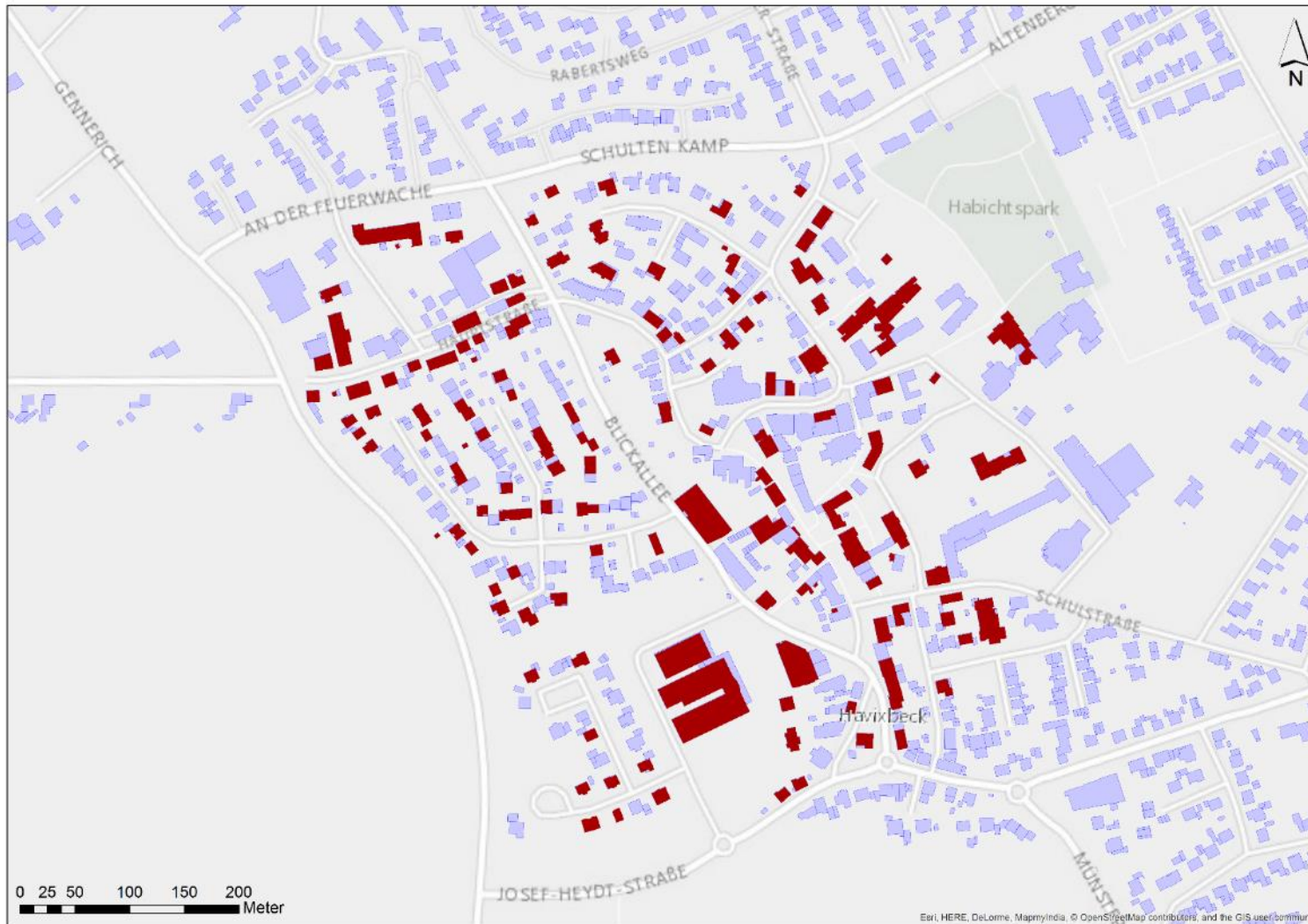
The background of the slide features a grayscale aerial map of a residential area with building footprints and road networks. Overlaid on the right side are several red geometric elements: a solid red triangle at the top, a solid red parallelogram below it, and a large area at the bottom right filled with red diagonal hatching. A white rectangular box is positioned in the center-right, containing the title text.

Network Planning

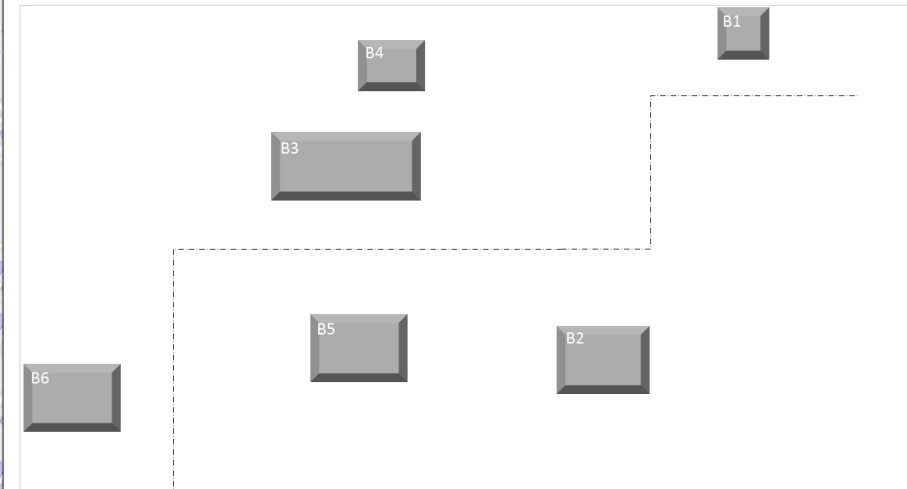
Example



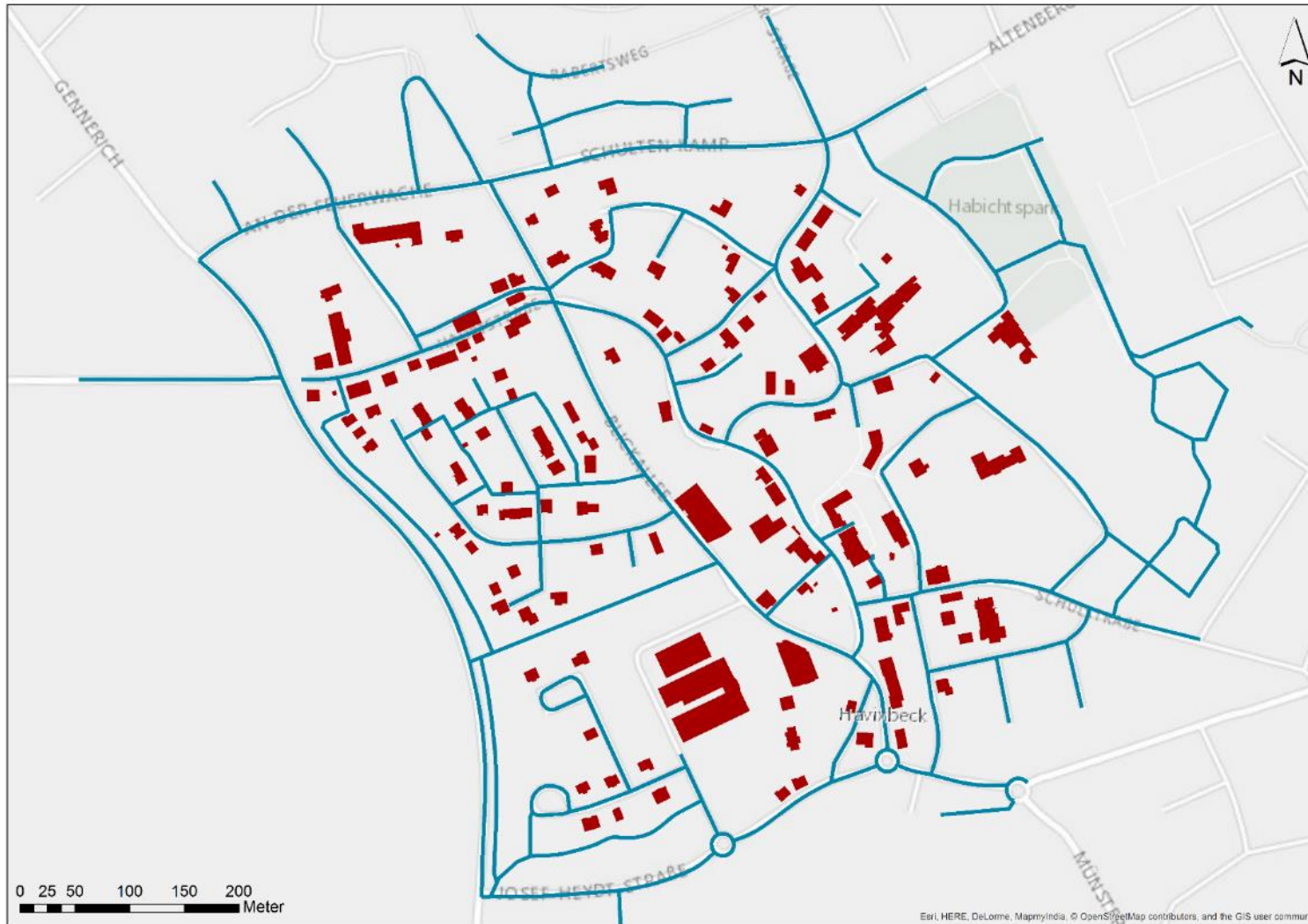
Example - Selecting Buildings



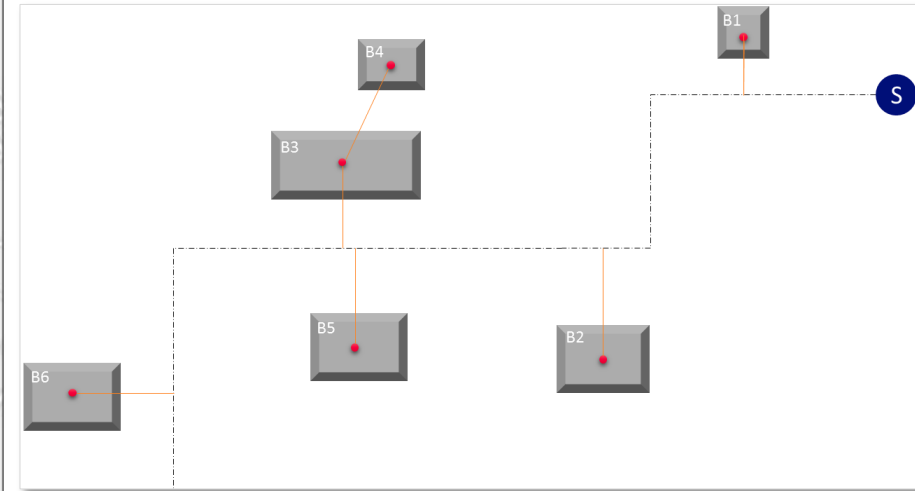
Schematic representation



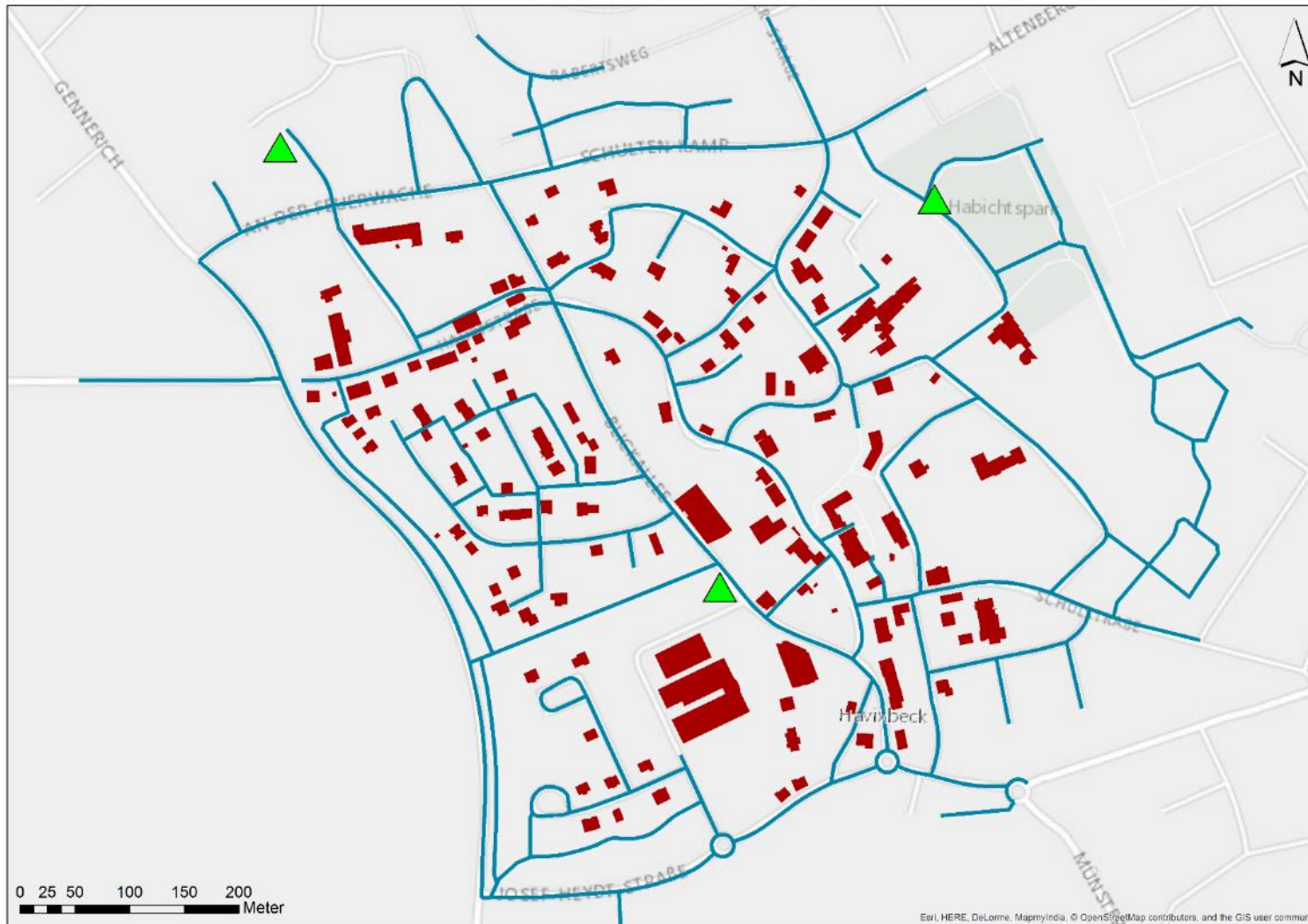
Example – Preparing (Road) Network



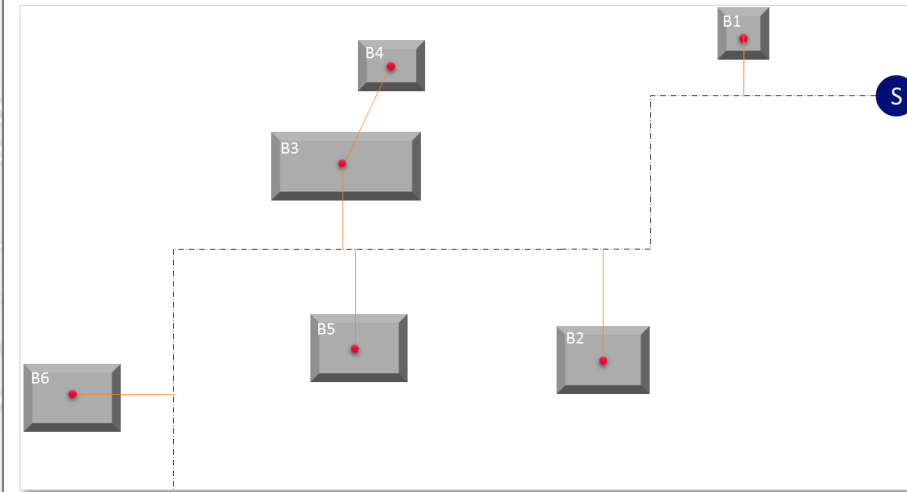
Schematic representation



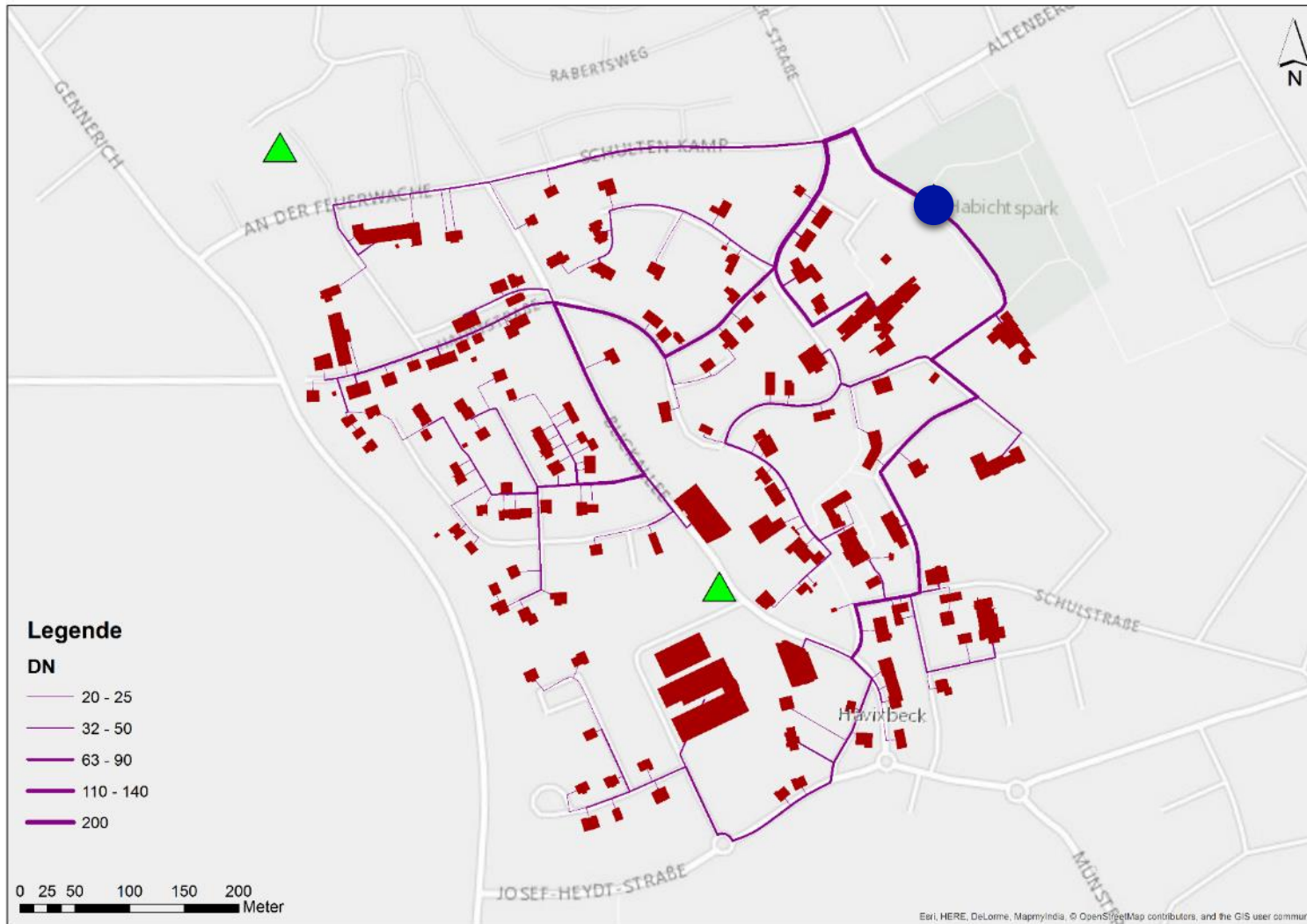
Example – Locating of Heat Source



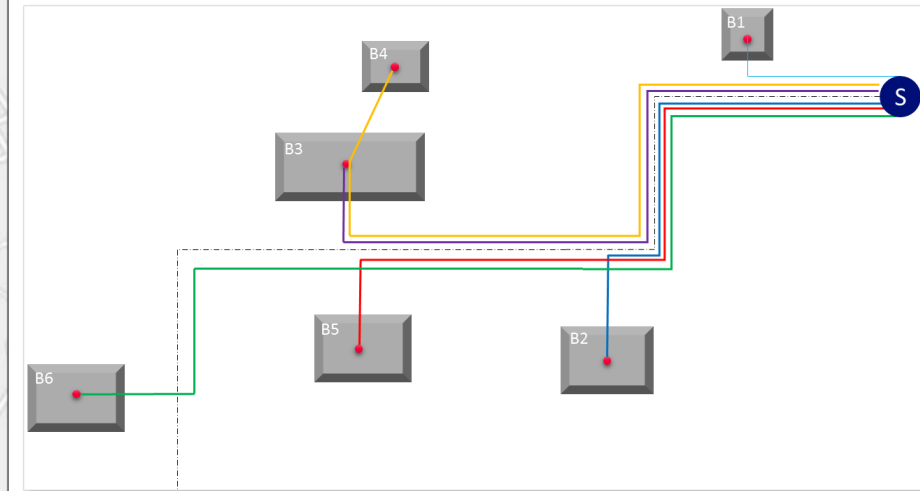
Schematic representation



Example

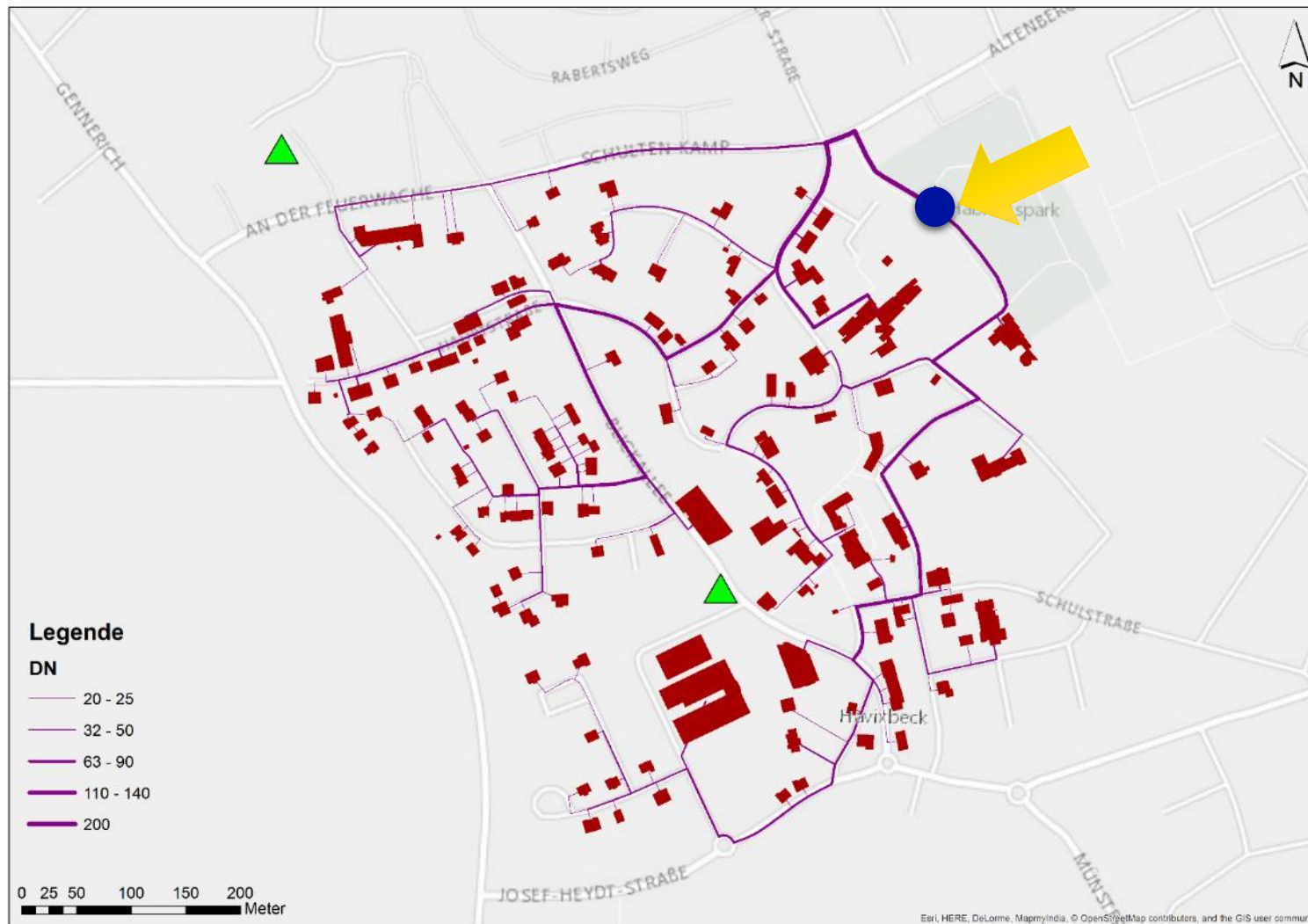


Schematic representation

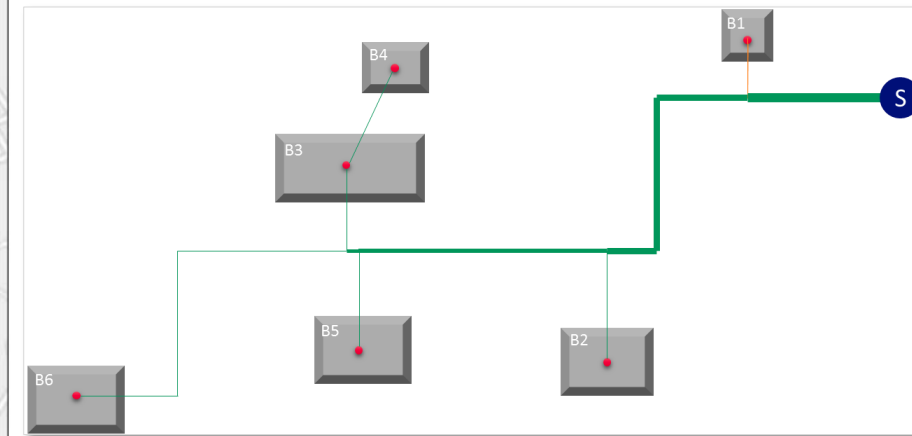


Supply Temperature: 80° C
Return Temperature: 60° C

Example – Network Design

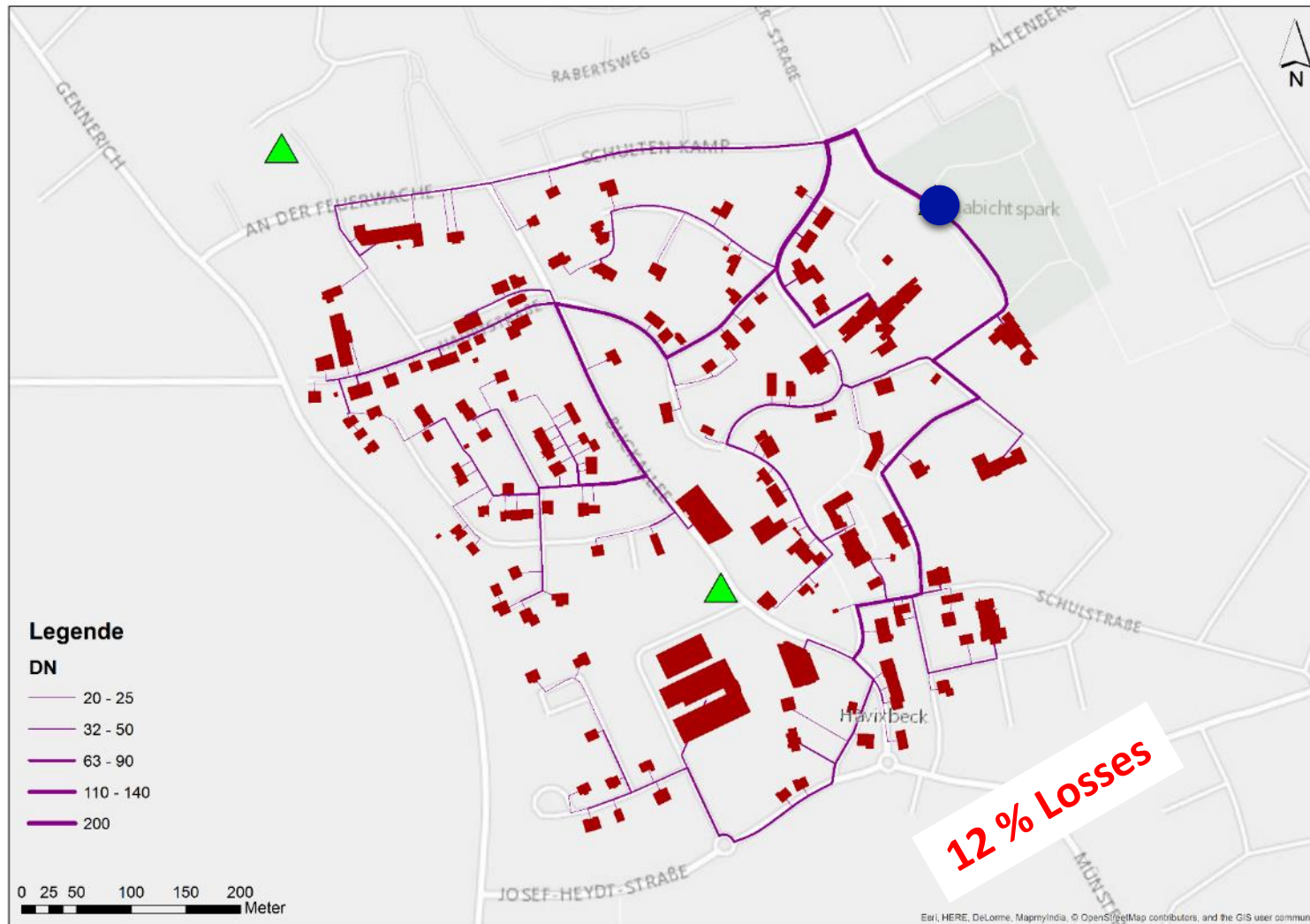


Schematic representation



Supply Temperature: 80° C
Return Temperature: 60° C

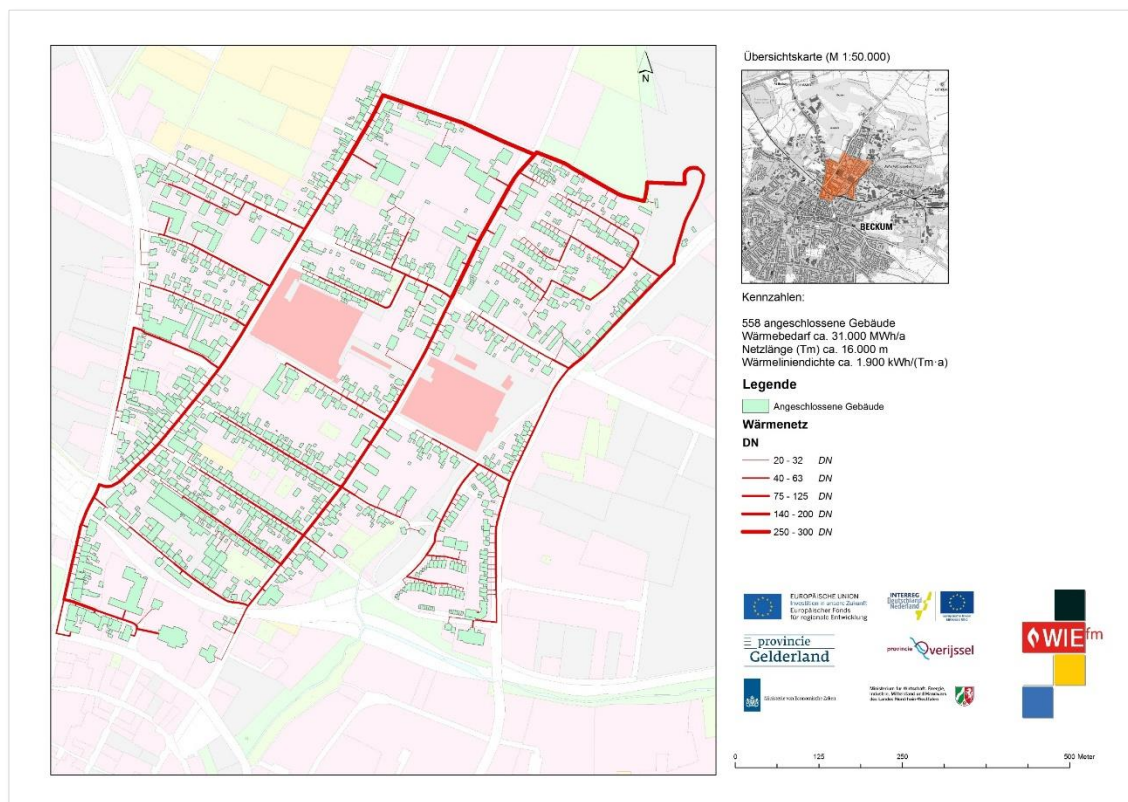
Example – Network Figures



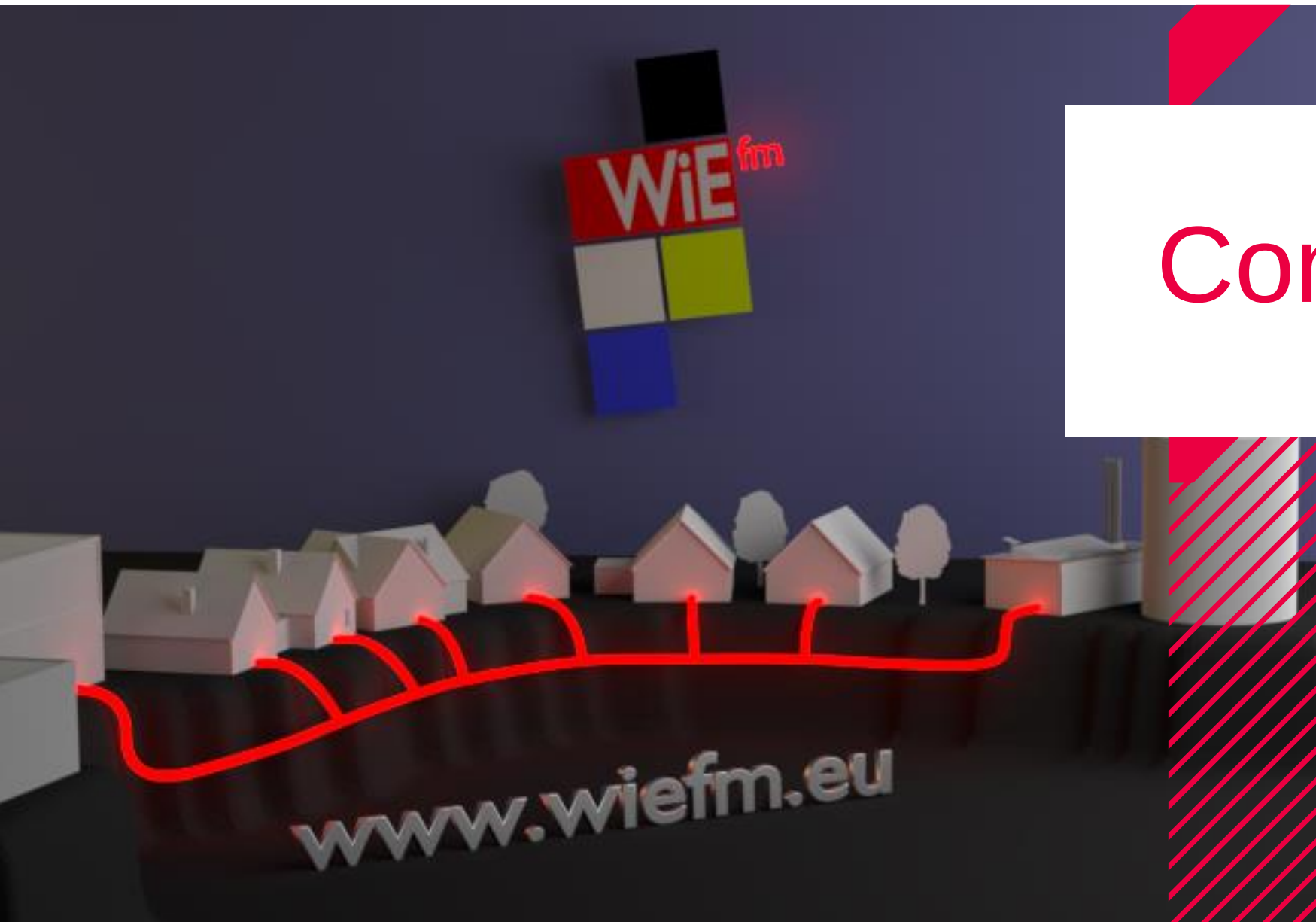
Load-profile	Heat demand [kWh/a]	Count [n]
EFH & MFH	3,457,752	107
GH	209,201	3
GKO	1,862,659	12
GMK	1,518,330	37
Sum	7,047,942	-
Losses	830,651	-
Total	7,878,593	159

5.2 km Primary lines
2.6 km Secondary lines
7.8 km Pipe system total
1,015 kWh/m·a
2.25 Mio € Investment
229 € / m

Example - Project Report



Conclusion



Conclusion

Subheadline



- ✓ We showed that energy planning is possible with open GIS data and how
- ✓ Our tools enable quick and easy implementation of DH
- ✓ Our results are published and presented in form of web maps (wiefm.eu)





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Please contact us:

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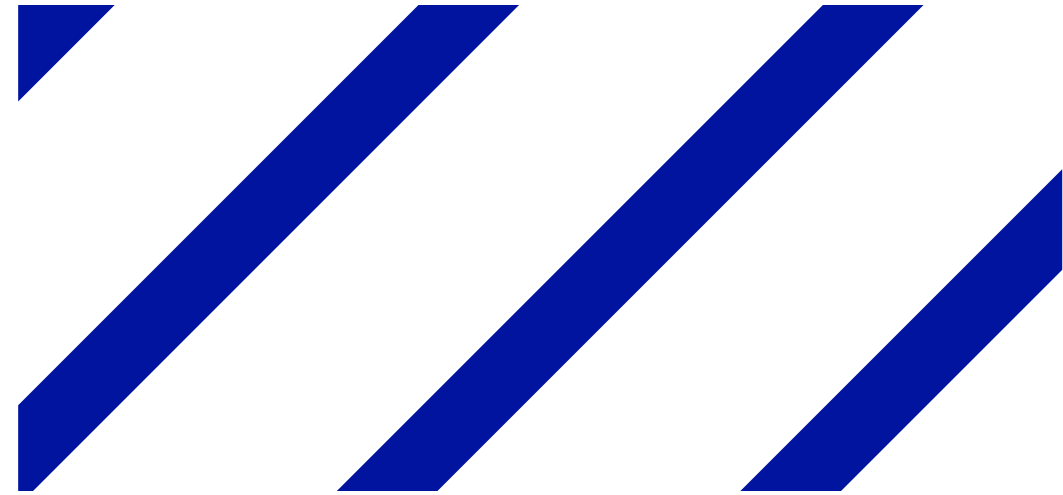
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Ministerie van Economische Zaken

Ministerium für Wirtschaft, Energie,
Industrie, Mittelstand und Handwerk
des Landes Nordrhein-Westfalen

