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North-West Europe
HeatNet NWE
European Regional Development Fund



Parallel session B Heat Mapping for DHC development

Heat Mapping for DHC development

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Heat Mapping in a few words ...

- Quantify the heating / cooling load
- Residential, tertiary or industrial use
- Different scales for different uses
- Additional data can be added

More information on the HeatNet platform :
<https://guidetodistrictheating.eu/>

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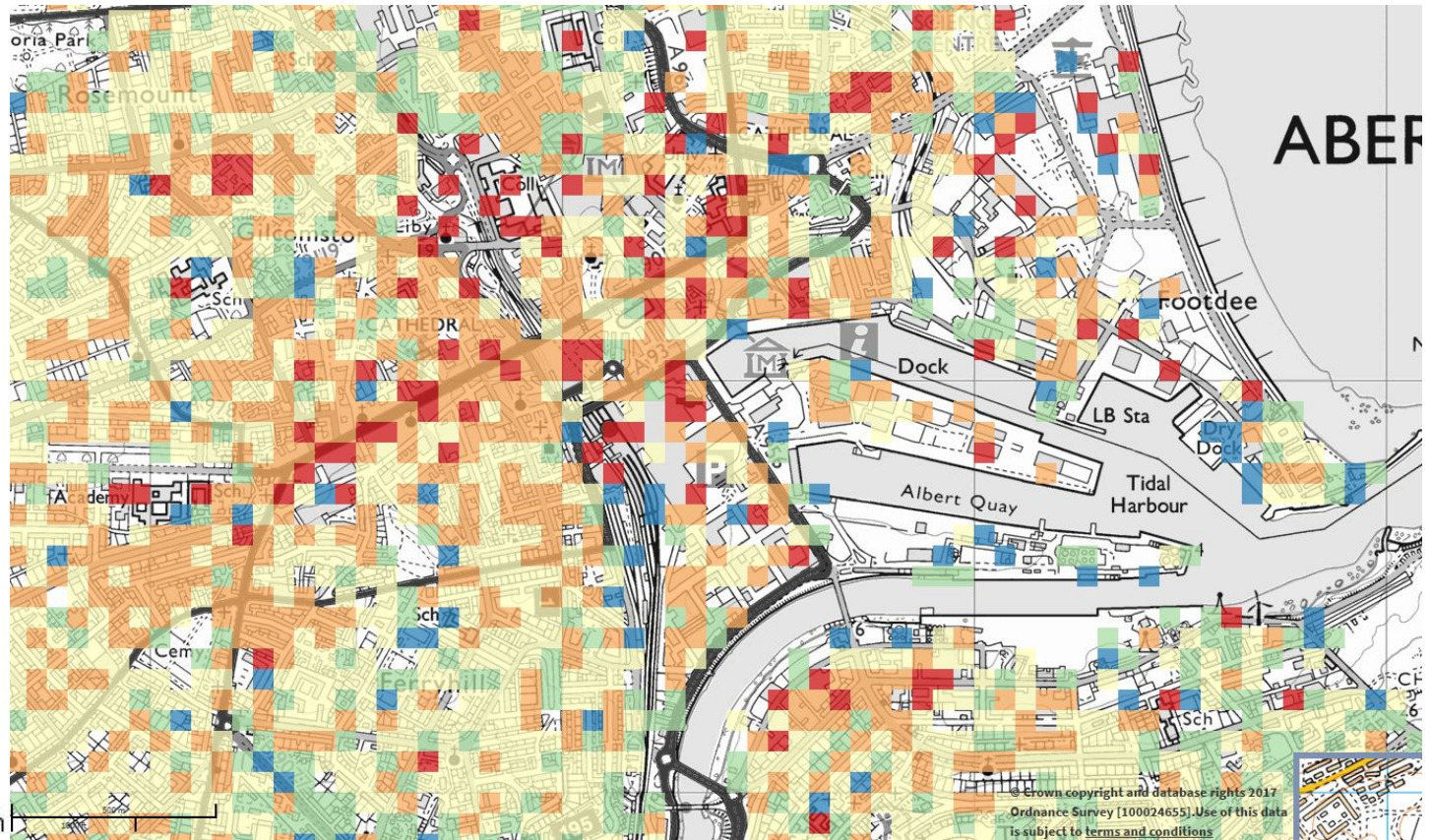
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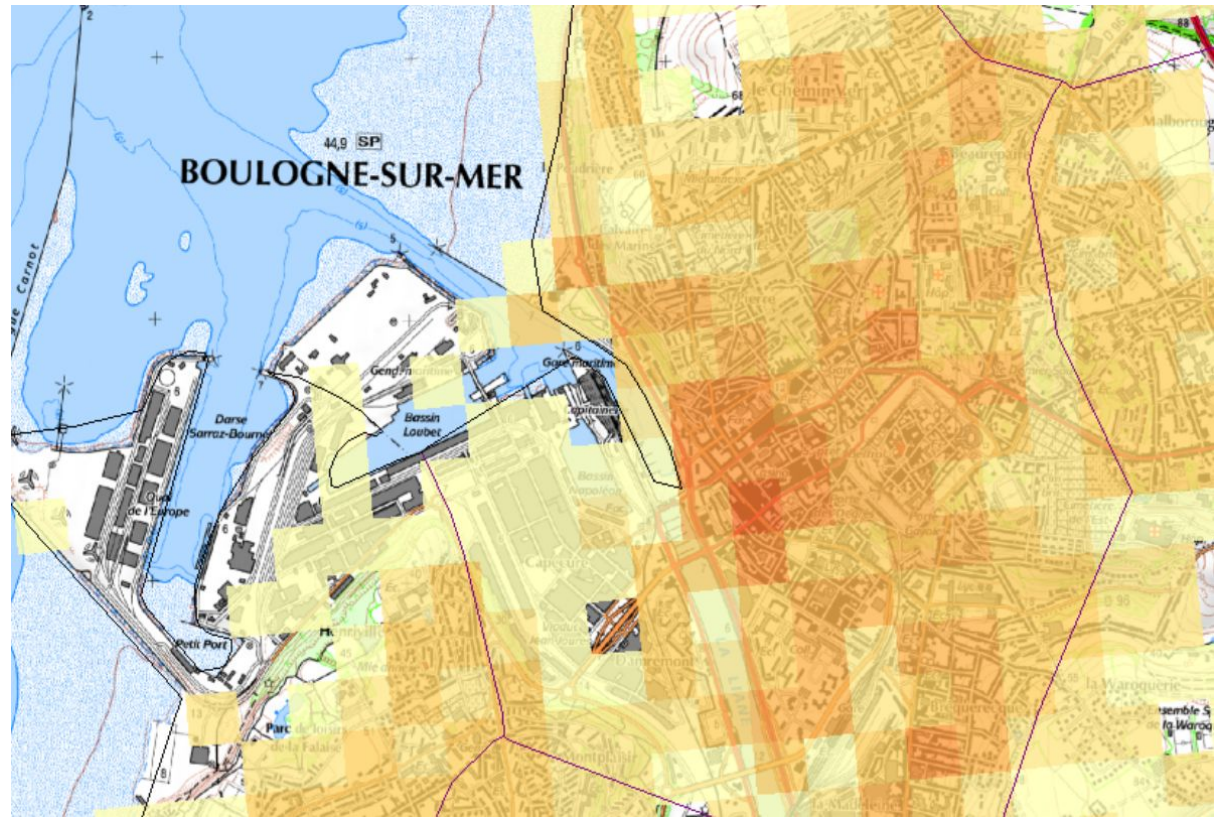
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A few examples of heatmaps



Scottish heatmap around Aberdeen (50 m² scale)
From <http://heatmap.scotland.gov.uk/>

A few examples of heatmaps



French heatmap around Boulogne-sur-Mer (200 m² scale)
From <https://www.geoportail.gouv.fr/>

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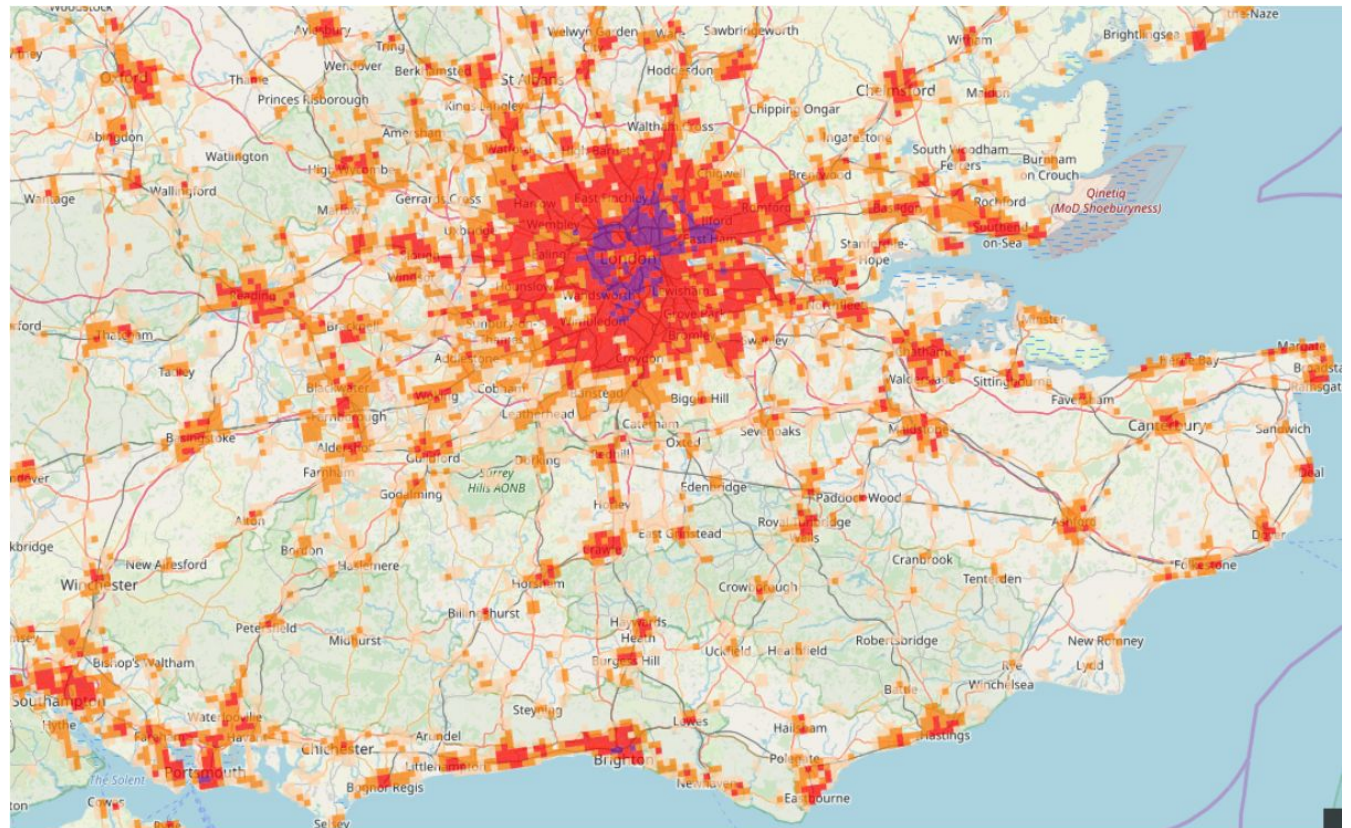
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A few examples of heatmaps



Heat demand density in South East England (1 km² scale)
From Stratego

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A few examples of maps



📍 Non-neutral DC's 📍 Carrier neutral DC's
📍 Building with multiple DC's

Data centers around London
From

<https://datacentermap.com>



Existing gas network around Huddersfield (UK)



Hospitals and care facilities around Paris
From

<https://www.geoportail.gouv.fr/>

Feedback from the HeatNet pilot : Plymouth City Council

As part of a study performed by
Burohappold Engineering (2016)

Aim : providing information on
potential DH schemes



Work package 3 - all loads

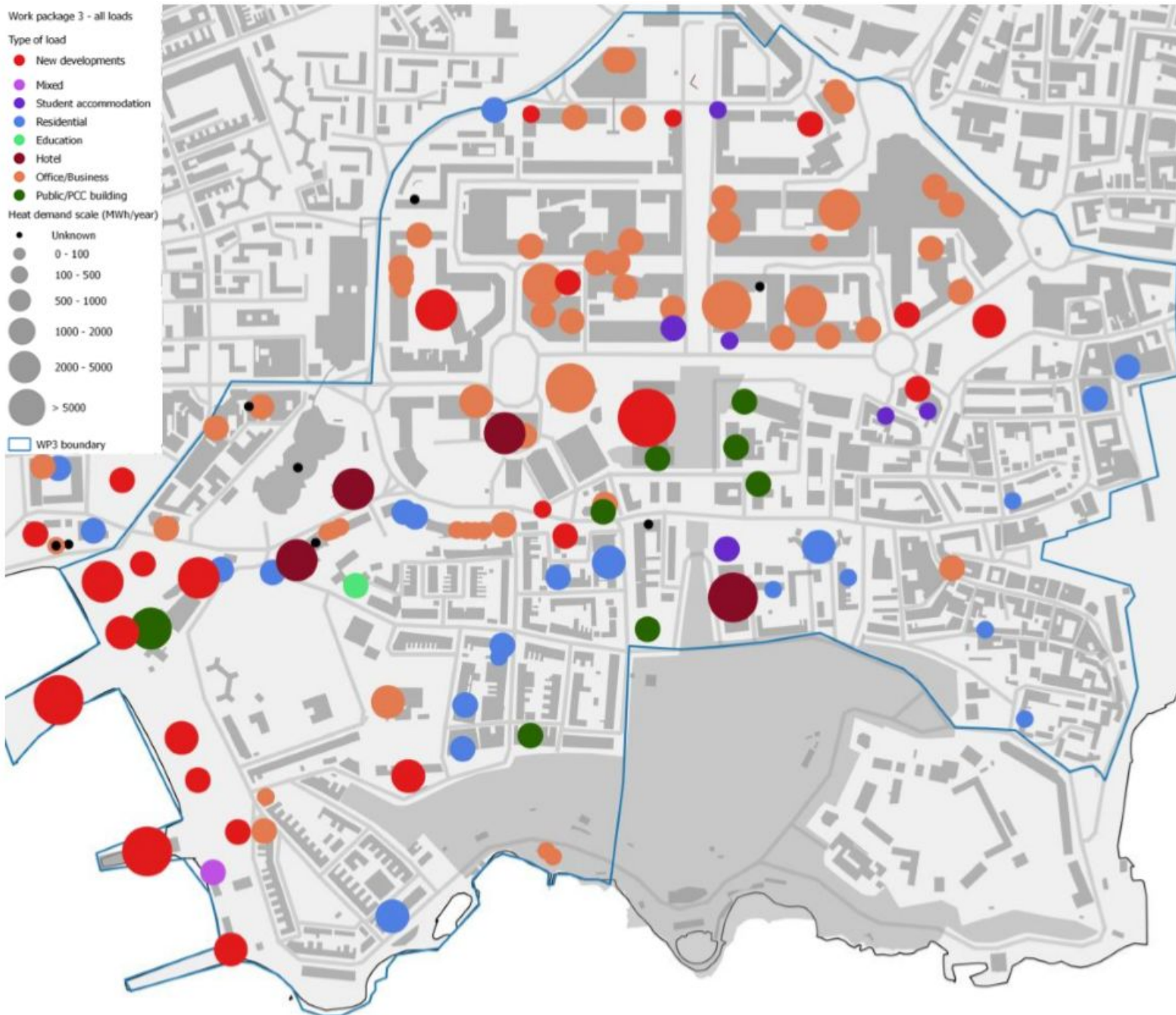
Type of load

- New developments
- Mixed
- Student accommodation
- Residential
- Education
- Hotel
- Office/Business
- Public/PCC building

Heat demand scale (MWh/year)

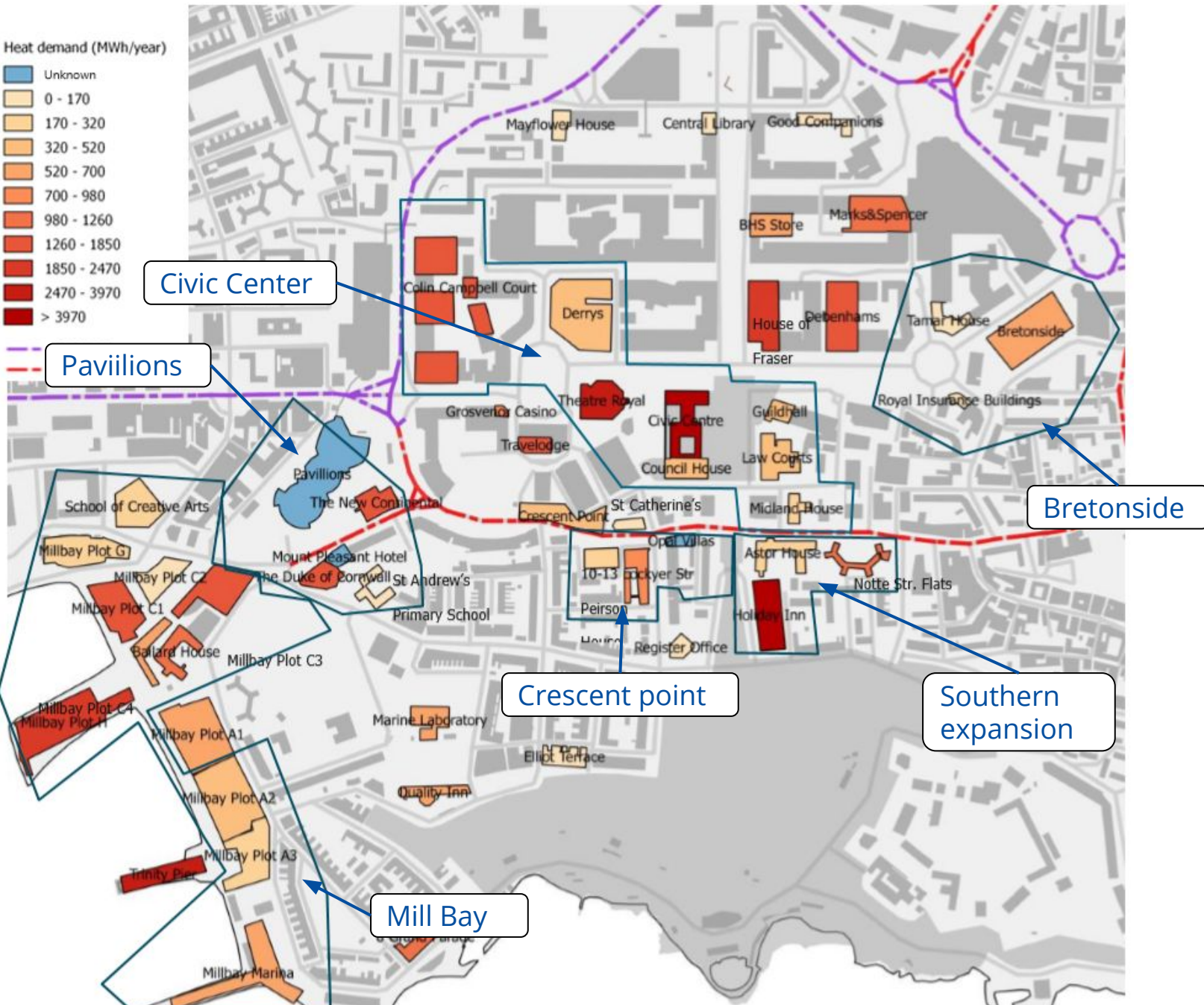
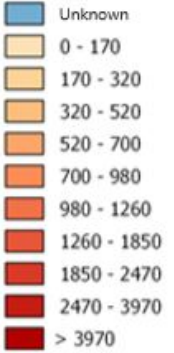
- Unknown
- 0 - 100
- 100 - 500
- 500 - 1000
- 1000 - 2000
- 2000 - 5000
- > 5000

WP3 boundary

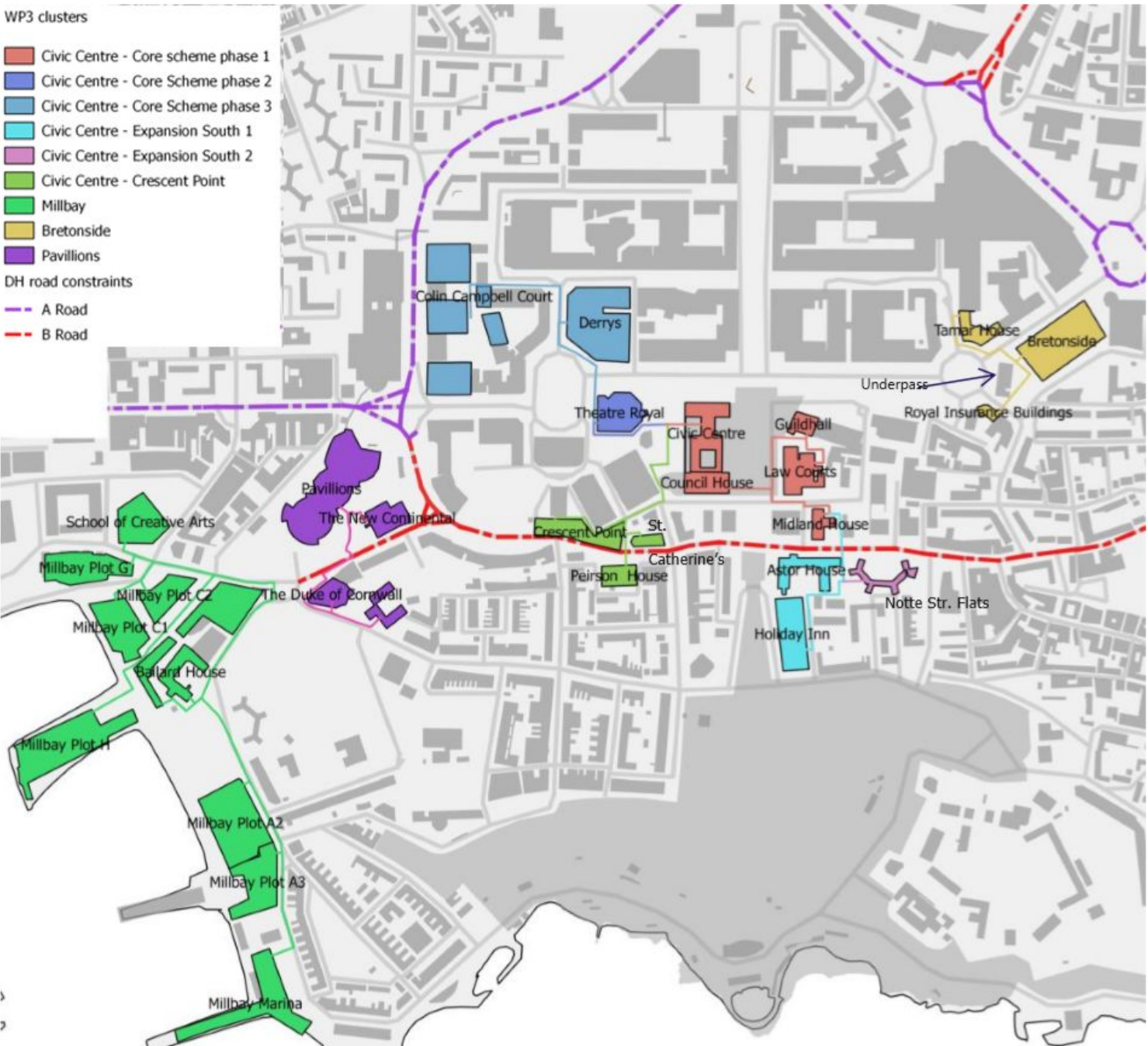


District heating opportunities with all loads - from Burohappold Engineering (2016)

Heat demand (MWh/year)



District heating opportunities with significant loads and clusters - from Burohappold Engineering (2016)



District heating opportunities with clusters - from Burohappold Engineering (2016)

In conclusion :

Heat maps are powerful tools

Prove useful at different scales

Special care on the data used

(European - national - local)

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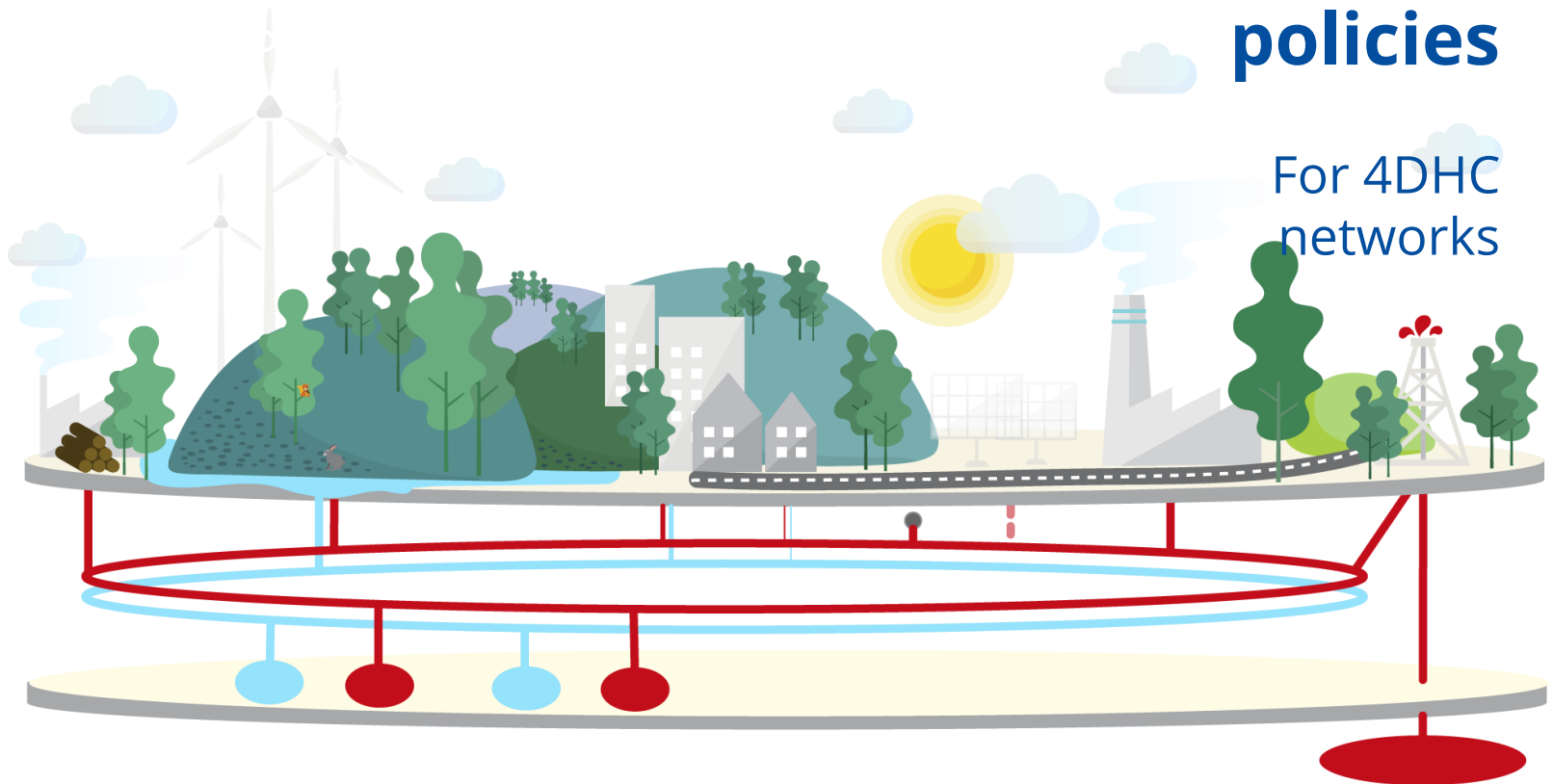
Parallel Session B: Spatial policies

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Parallel Session B:
Heat mapping and spatial policy for
DHC development

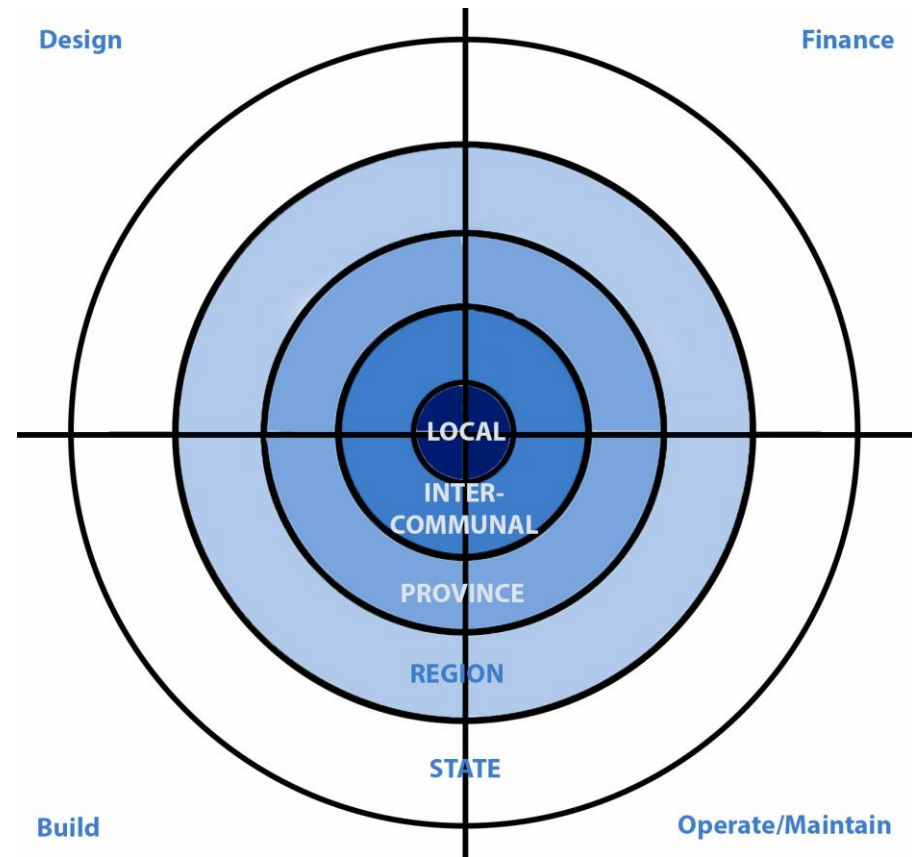
Spatial policies

For 4DHC
networks



Legislation by phase and governmental level.

Legislation in the NWE countries can be found on different governmental levels: state, region, province, inter-communal and local.



Similar general spatial policies and issues.

In most of the selected countries, the DHC relevant legislation is in the process of change, ought to change in order to fit and accommodate DHC - or is outright insufficiently compatible for DHC networks.

Similar general spatial policies and issues.

Heating- and cooling networks are infrastructural projects. They are:

- intimately linked to municipal or inter-municipal urban developments;
- spatially aligned with road networks that connects neighborhoods;
- density depended for it's economic viability - as well as the use of buildings and their depreciation over long periods, comparable to those of most urban infrastructures.

Similar general spatial policies and issues.

DHC is not (yet) seen as local public utility resulting in the lack of benefits other public utility services have.

If the elementary infrastructure (boiler rooms, pipes, substations etc.) is provided with a special status, it is simplifying the complex processes in regard to planning rules.

Unfamiliarity with DHC stokes fear of possible damages, which can complicate crossing or building adjacent to canals, railways, highways, etc.

Crossing country borders with DHC is also not possible yet.

Specifics for Ireland

- District heating (DH) currently holds less than 1% of the heating market in Ireland, yet, holds great potential for the Irish market because of the high density planning.
- Specific legislation for District Heating in Ireland is lacking. Promising are the several District Heating schemes, which have been undertaken by local authorities recently. Moreover, a small number of local authorities incorporated District Heating Policy.
- Grants for energy efficiency measures for individual households do not include equipment for DH connection, neither provide grants for DH substations.
- The lack of specific legislation allowing developers to obtain licenses for resource exploration, development and drilling under third party lands still remains a barrier.
- Currently the legislation does not reflect the green credentials of DH.

Specifics for France

- Within NWE, France has incorporated DHC in its most advanced form in its legislation. A specific legislation is in place to stimulate DHC. Moreover, recently an action plan to promote DHC is launched.
- In order to be eligible for subsidies to either build a DHC or transform an existing infrastructure into a "green" solution, a masterplan is required to describe the DHC to develop in 10-year time.
- Local authorities perform an essential role in planning and development regulations.
- The local urban plan (Plan Local de l'Urbanisme, PLU) is intended to reinforce the integration of energy issues in urban planning.
- New and renovated buildings located within a classified area are obliged to be connected to the heating network. But there is no obligation for existing non-renovated buildings.
- There is a requirement to study the feasibility of integrating a district heating and to perform a costs-benefits analysis regarding the use of industrial waste heat and district heating.
- Local government is able to set a density-threshold
- Barrier is the large number of different institutions constituting the French administration.

Specifics for Flanders

A proposed legislation, in favour of heat networks, is waiting to introduce a heat and cold regulator, an obligation to make heat maps, -plans, and mandatory feasibility studies within 500m of the Flemish heat map.

Legislation is sometimes lacking or even contradictory:

- Considering geothermal energy, it is unclear who owns the heat
- Recovery of waste heat is not high on the agenda in Flanders
- The use of surface water for heating or cooling is taxed
- Heat networks cannot be integrated in zoning plans
- A heat network is not considered a standard underground construction.
- Grid operators have special privileges concerning contaminated soil, but DHC is not seen as grid operator.
- Only public utilities with public interest are allowed in the public domain. 1-on-1 connections are there for impossible. Although there might be a bright spot: innovative technologies are allowed in these residential expansion areas.
- In Flanders waste incineration is decreasing and incinerators will be shut down. However, the waste incinerators with the best DHC network might hold out.

Specifics for Scotland and England

In England, legislation concerning DHC networks is limited, if present at all. In contrast, Scotland has a Heat Policy Statement, with a target and action plan to promote DHC.

- ‘heat’ is not a legally defined entity.
- The only current legislation specific to DHC is the Heat Network Regulations 2014, which describes the billing and metering for DHCs. However, this does not legislate the quality of heat, market competition or DHC monopolies.
- Regulatory control of abstraction and discharges, required for open- loop Ground Source Heat Pump systems, is solely aimed at protecting groundwater, not regulating heat or guaranteeing the abstracted water is suitable for its intended use.
- Currently, Scottish District Heating regulation is in its consultation phase. Already, local authorities are required to contribute and maintain the National Heat Map for Scotland.
- "Duty to Cooperate" on strategic issues like Development Plans between planning agencies.
- Regulations of (semi-)governmental agencies are sometimes overprotective or they are afraid of collateral damage.

Specifics for The Netherlands

- The basic principle of spatial law in The Netherlands is "decentralized what is possible, centralized what should be".
- The heat transition plays a role in the spatial policy of municipalities.
- The RES is an instrument to make joint choices for the generation of sustainable electricity, the heat transition in the built environment with required storage + infrastructure.
- DHC is possible to incorporate in zoning plans.
- The Activities decree has some rules that will help 4DHC:
 - Industry has to comply with the mandatory measures list, which says that every measure on energy efficiency you can earn back in 5 years you have to carry out.
 - Heat generated is recovered to the extent that it is technically and economically feasible. Supervision by the EA's is not adequate right now.
- The underground is not as regulated as it should be, a structural vision is needed. There is no general depth criterion in the civil code for the use of the underground by third parties.
- Ground- and drinking water rules differ between provinces, because the fear for collateral damage differs.

Afterthoughts.

The energy transition not only has an impact on the habitat; there is a mutual influence between the design of the energy supply and the habitat. A successful energy transition is therefore dependent on the way in which the habitat (not only the physical environment, but also the actors who live, work and recreate in it) influences the choice for different transition paths. Ideally, integrated and creative solutions are sought at different scales. To this end, it is important that spatial assessment at the local level is not disproportionately hampered and the transition paths are not considered separately.

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Funded by the Horizon 2020 programme
of the European Union

Hotmaps: the tool to start national and local heat strategies

Greening our cities with district energy

Europe, 15.09.2020



Hotmaps – What for?

*Hotmaps develops, demonstrates and disseminates **a toolbox to support public authorities, energy agencies and planners in strategic heating and cooling planning** at local, regional and national levels, and in line with EU policies.*



Hotmaps – The 3 pillars

- **User-driven**: developed in close collaboration with 7 European pilot areas
- **Open source**: the developed tool and all related modules will run without requiring any other commercial tool or software. Use of and access to Source Code is subject to Open Source License
- **EU-28 compatible and adaptable**: the tool will be applicable for cities in all 28 EU Member States by default and users can upload their own data

The experts behind the project

Scientific partners



TECHNISCHE
UNIVERSITÄT
WIEN
Vienna | Austria



Pilot areas for developing and testing the tool



Bistruta Municipality





Regional overview





Live demonstration

www.hotmaps.eu



Questions where Hotmaps can help

- **What is the demand** for heating and cooling in my region and **where is it located?**
- **Which options are available for reducing GHG** emissions from heating and cooling in my region?
- **Which** renewable energy and excess heat **sources could be economically feasible** to use in my region?
- Which **shares of district heating** make sense in my area?
- Which **areas are potentially interesting for district heating?**
- Which **levels of heat savings** could be economically feasible for my region?



Explore Hotmaps

- Software:
www.hotmaps.eu
- Project:
www.hotmaps-project.eu
- Open Source Data:
<https://gitlab.com/HotMaps>
- Open Source Modules:
<https://github.com/HotMaps>
- Wiki:
<https://wiki.hotmaps.eu>