



3RD INTERNATIONAL CONFERENCE ON
**SMART ENERGY SYSTEMS AND
4TH GENERATION DISTRICT HEATING**

COPENHAGEN, 12–13 SEPTEMBER 2017



AALBORG UNIVERSITY
DENMARK

Heat demand mapping implications on energy planning

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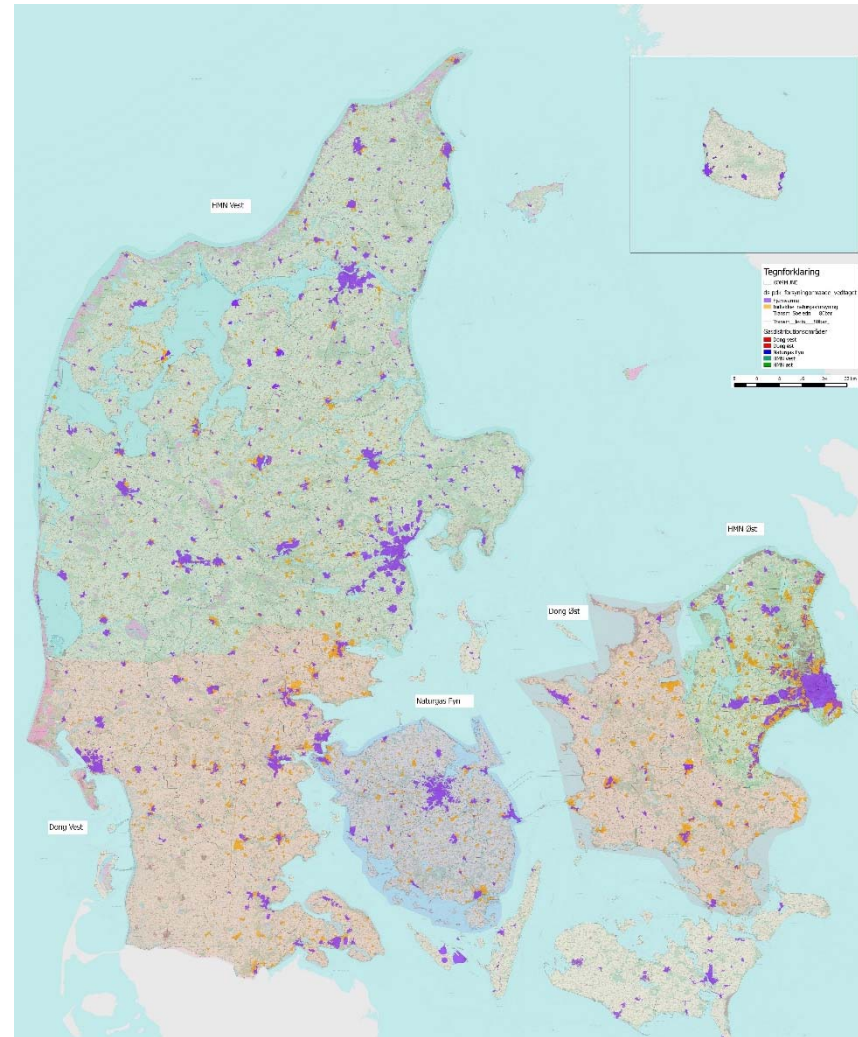
The case of Denmark



- **Started as a response to the oil crisis in the 1970s**
- **Building and dwelling register established in 1976**
 - **Uniform registration of all buildings in Denmark**
- **First heat supply act implemented in 1979**
 - **Municipalities obligated to do heat planning and zoning for district heating and natural gas**
 - **Based on socio-economic best option**
- **Heat planning as part of national energy planning**

Denmark today

- **64% of Danish household supplied by district heating**
- **Focus is on expansion of district heating coverage**



Expansion of district heating



Several studies with focus on expansion potential



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www.4dh.eu

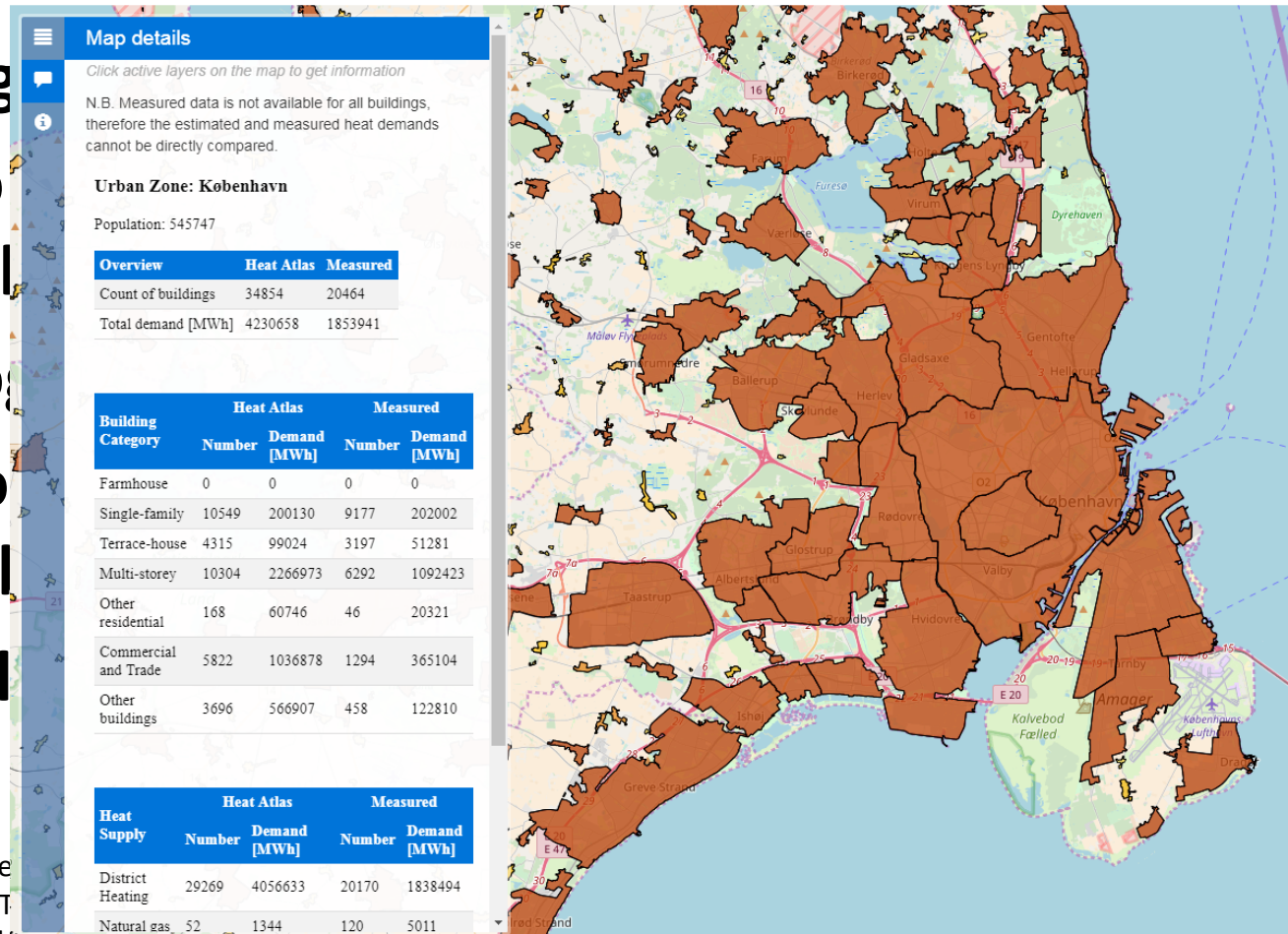
www.reinvestproject.eu

www.heatroadmap.eu

Danish heat atlas

The Danish Heat Atlas 2016 - with metered data

- Building
- Used to
- district l
- Used to
- Based o
- million l
- Availabl



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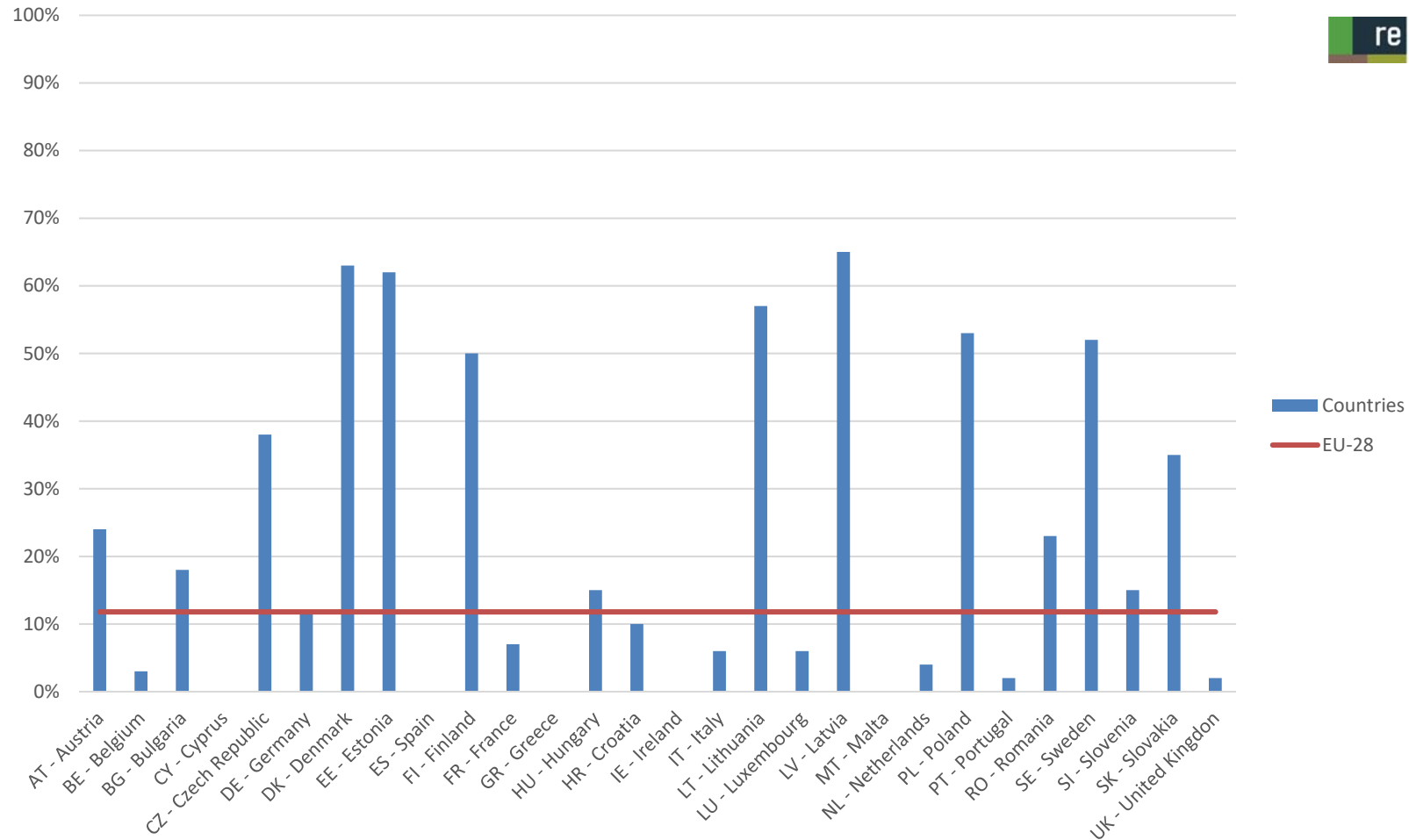
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European district heating

Percentage of citizens served by district heating



Active vs. Passive heat planning



- **Many countries without focus on heat planning**
- **Similar for the European Union 10 years ago**
- **Without active planning:**
 - **Risk of economically more expensive heating**
 - **Bad utilization of resources (excess heat from industry, co-production with electricity)**
 - **Lack of focus on energy efficiency in building sector**

Mapping in Europe



**+ national mapping following Article 14 of the 2012
Energy Efficiency Directive or other initiatives**

Local vs. regional

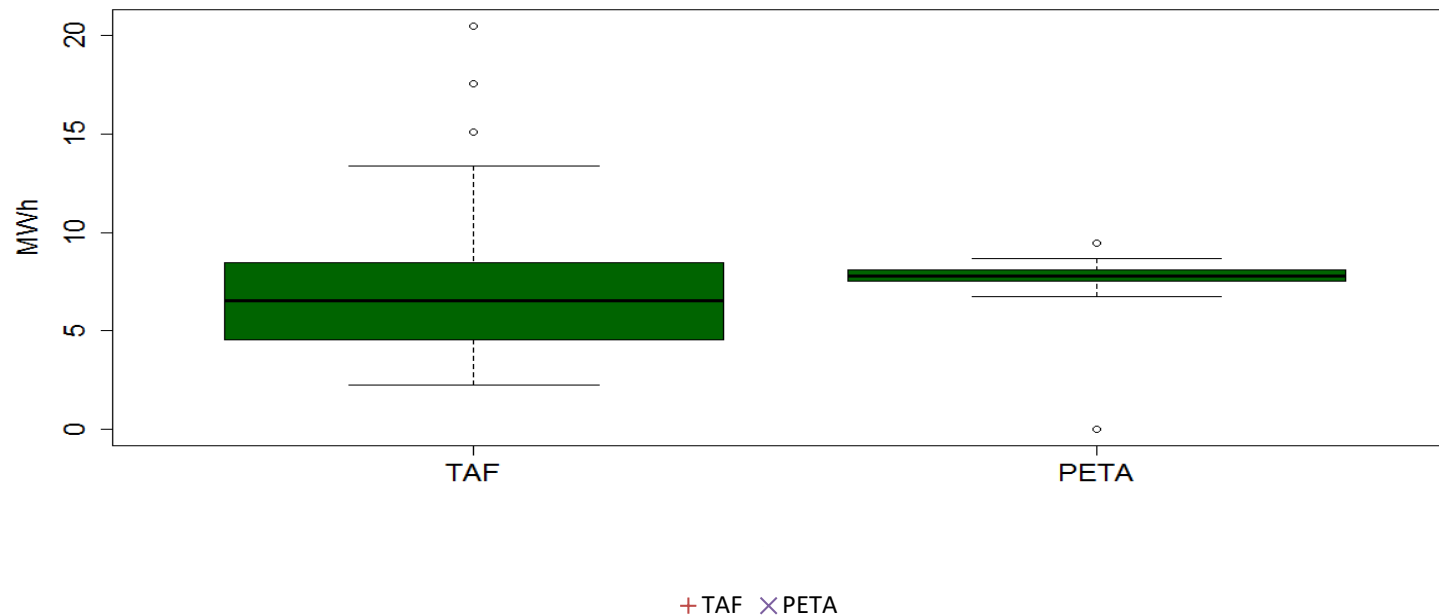


- **Heat demand maps combined with resource maps gives the option to plan for an integrated heating sector**
- **Level of details has to be weighted against cost (man-hours, data intensity, etc.)**
- **Regional/nation maps highlight areas of high potential**
- **Local maps ensures solid data foundation for feasibility studies**

An example from Belgium



- **Thermal Atlas Flanders and Pan-European Thermal Atlas in Province of Limburg**



Thank you for the attention!