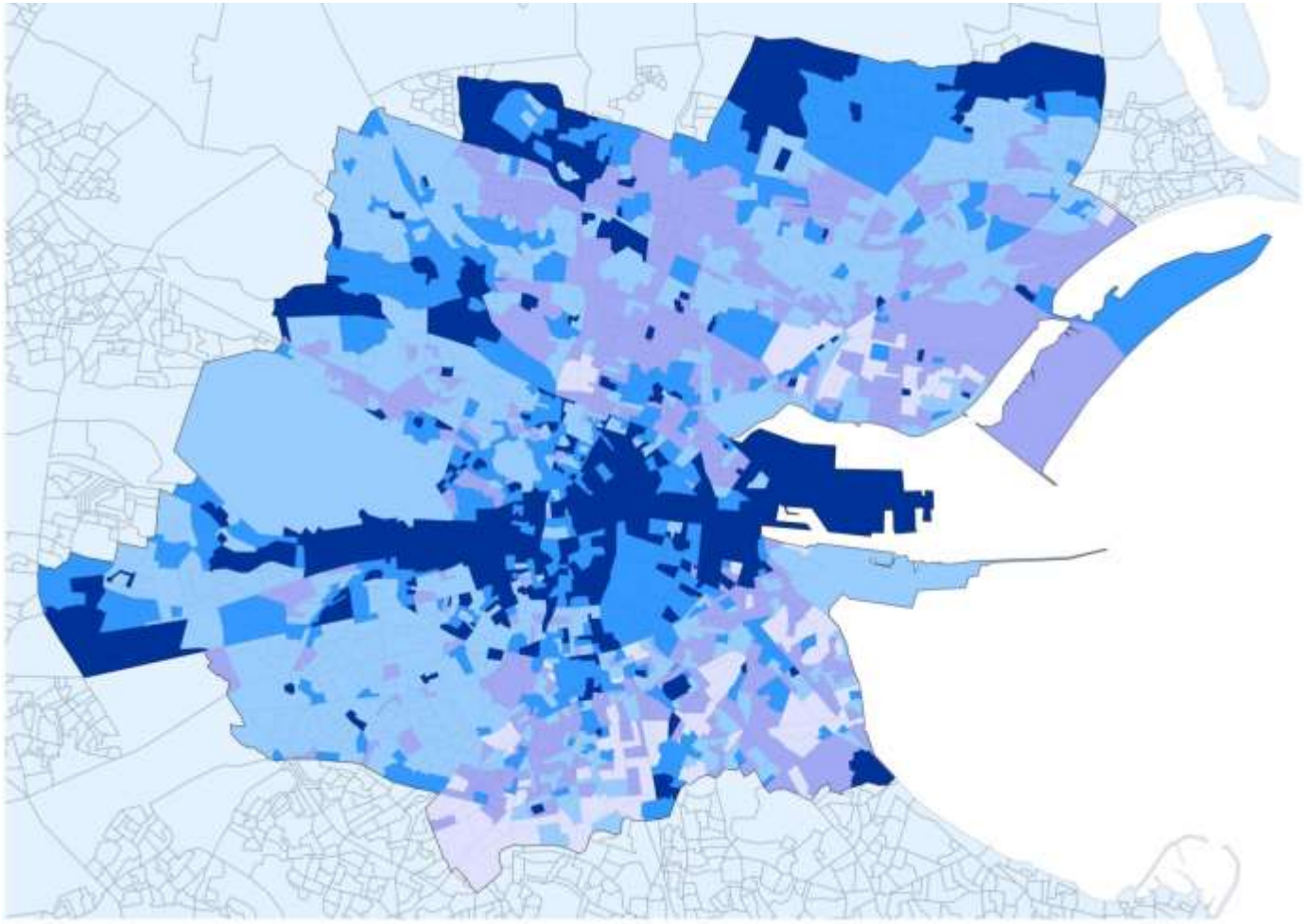
GIS Techniques Applied to Energy Mapping for Local Authority Energy Spatial Planning



Donna Gartland – Strategic Sustainable Energy Planner

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Purpose

- Analyse local level energy demand and production within spatial context
- Bridge the gap between spatial and energy planning
- Enable planners to better answer energy related queries
- Enable planners to create evidence-based energy policy

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Matching local demand with local sustainable resources

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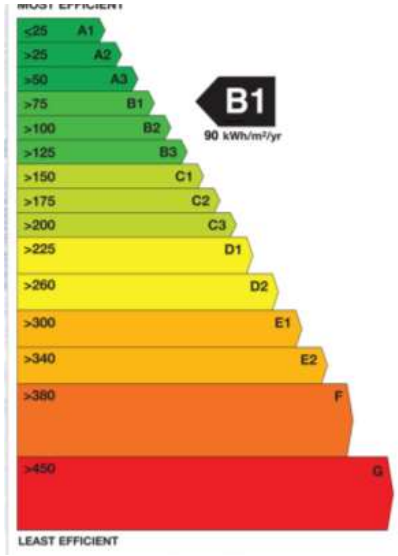
Target Areas for Energy Efficiency



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Methodology: Residential Sector

Building Energy Rating

Census 2011

Small Areas

50-200 dwellings per Small Area

4 Dwelling Types

7 Construction Periods

Housing Data Sub-sets

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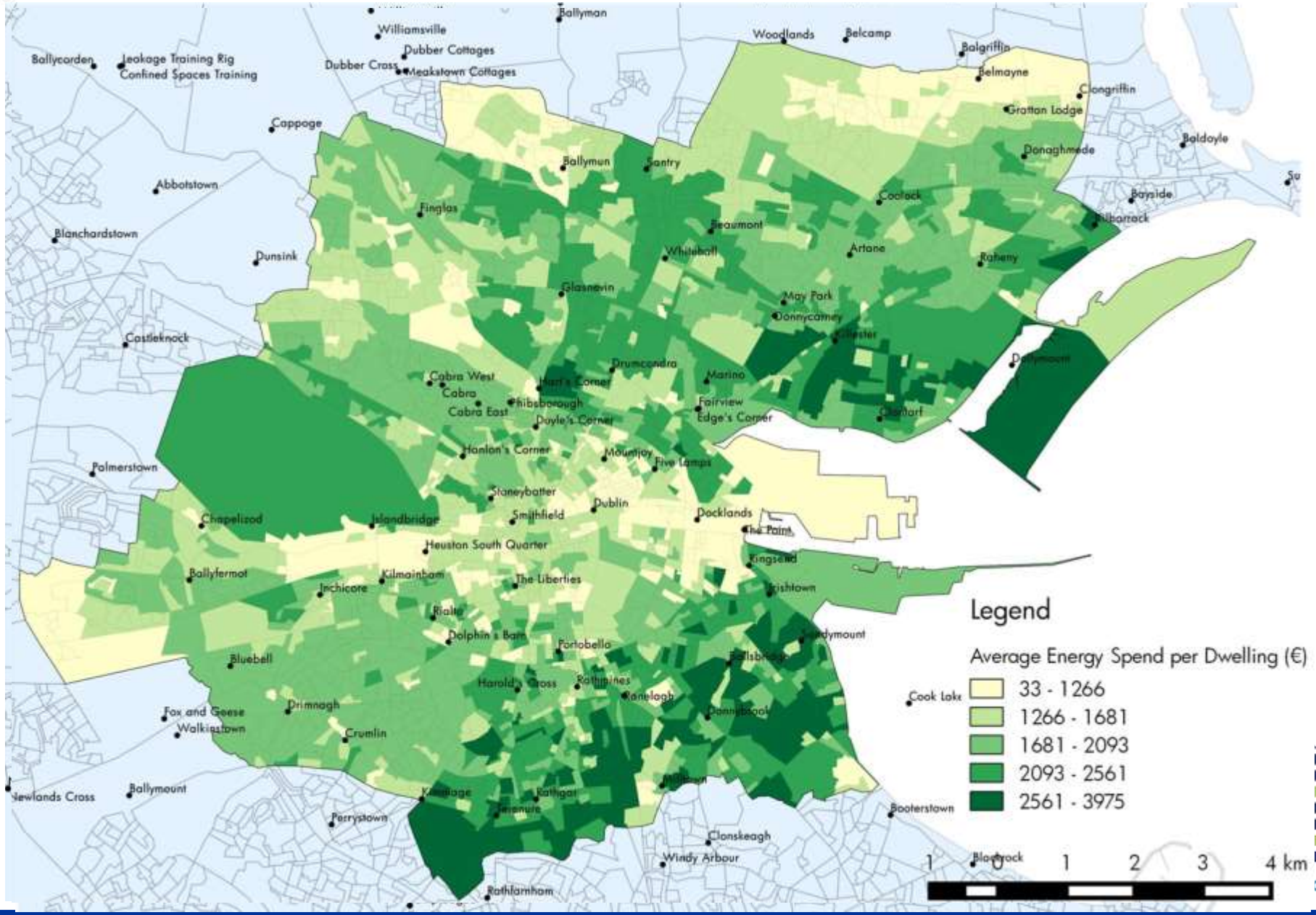
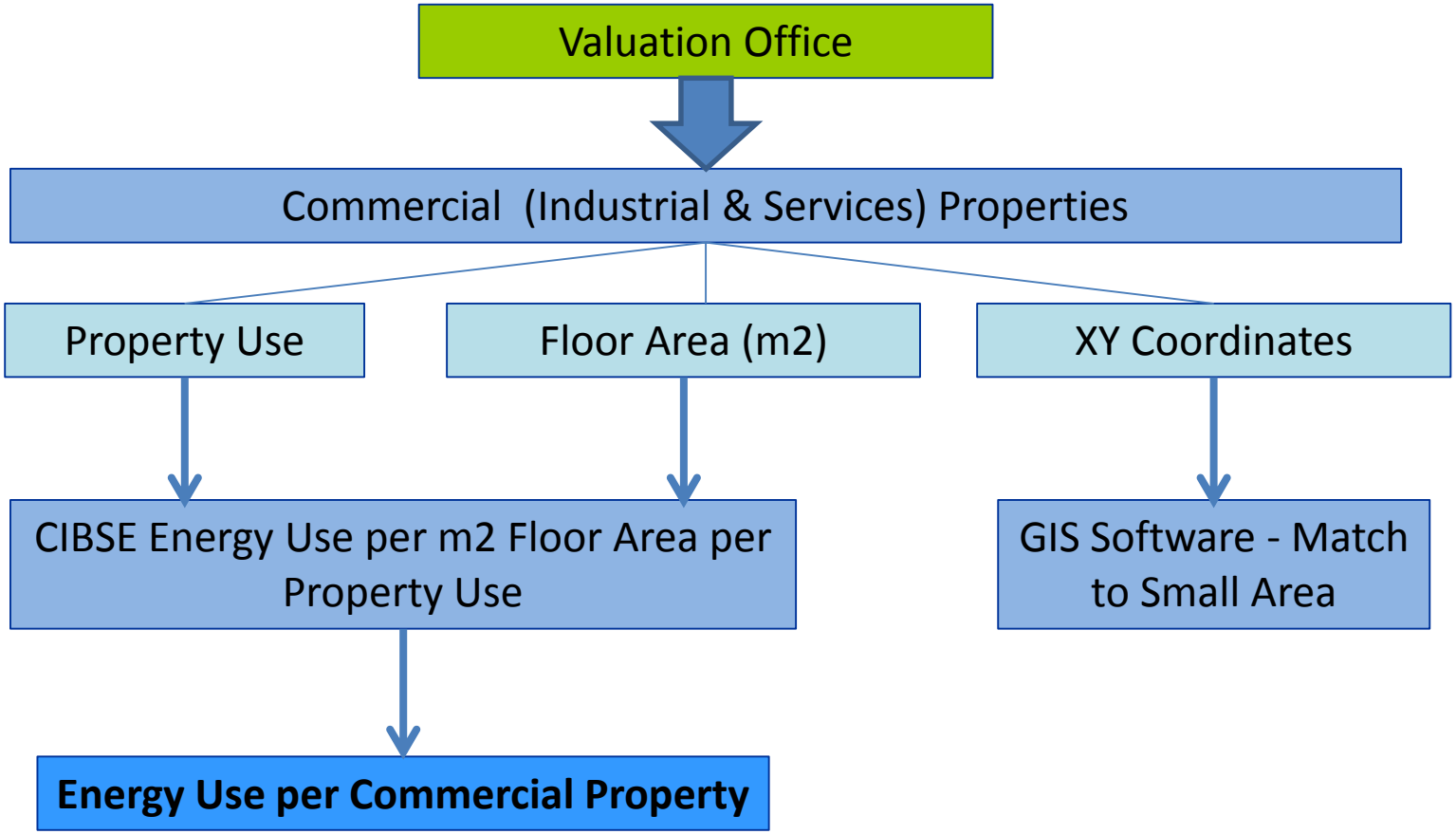
Methodology: Residential Sector



Methodology: Commercial Sector



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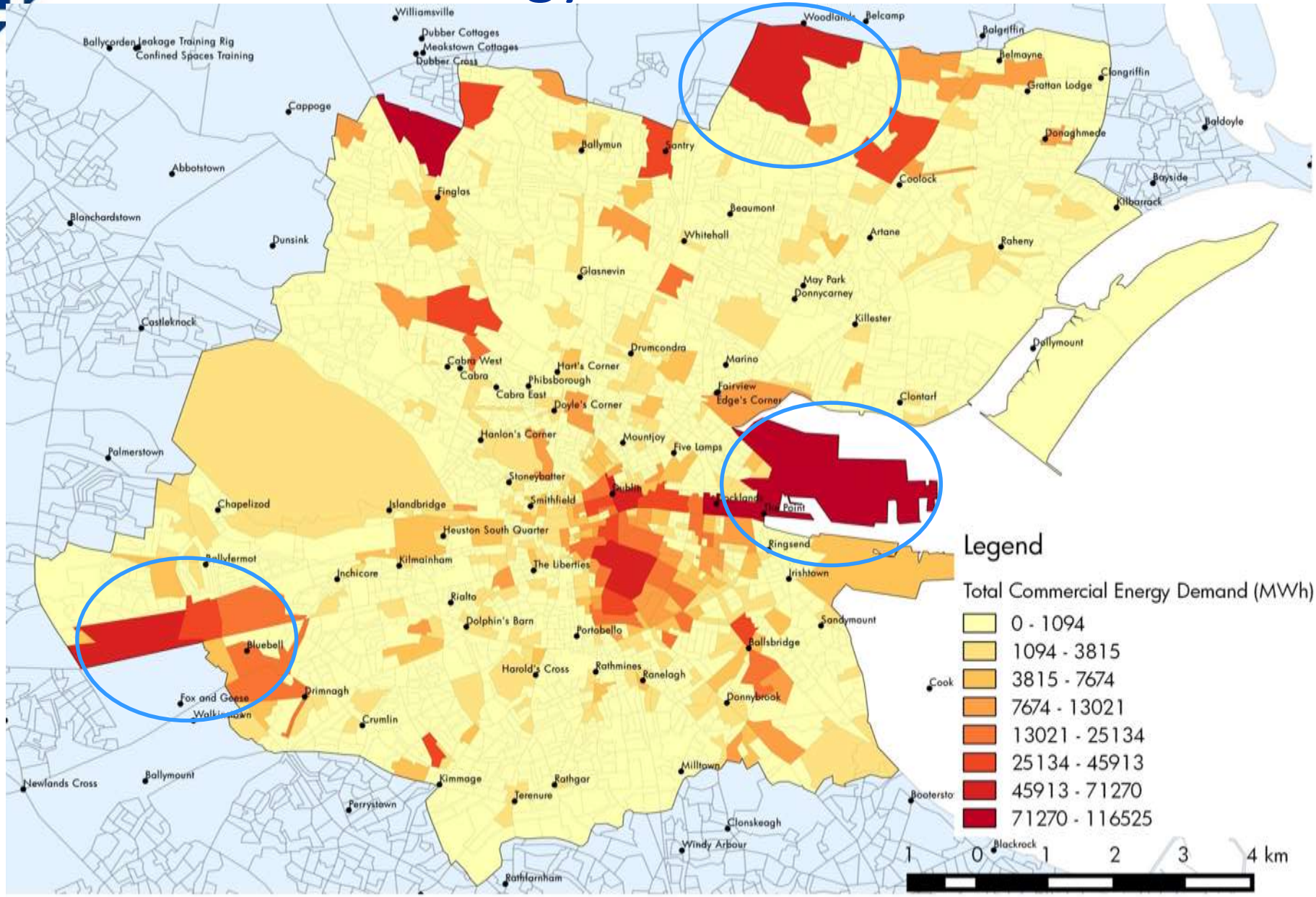
Methodology: Commercial Sector



Results: District Heating Potential

- DH plays large role in de-carbonisation and sustainability of cities like Stockholm and Copenhagen
- Flexibility allows higher % RE and low-carbon resources into heat supply

Feasibility of DH depends on the Heat Demand Density (kWh/km2)

- Shorter pipelines to connect more users – less investment in pipes
- More cost-effective than individual solutions – economies of scale
- Lower heat losses in pipes and less pumping requirements – lower running costs

- Dublin City Heat Map reveals **over 75%** of small areas have a high enough heat density to be suitable for DH
- South Dublin Heat Map revealed **10 key areas** suitable for DH development

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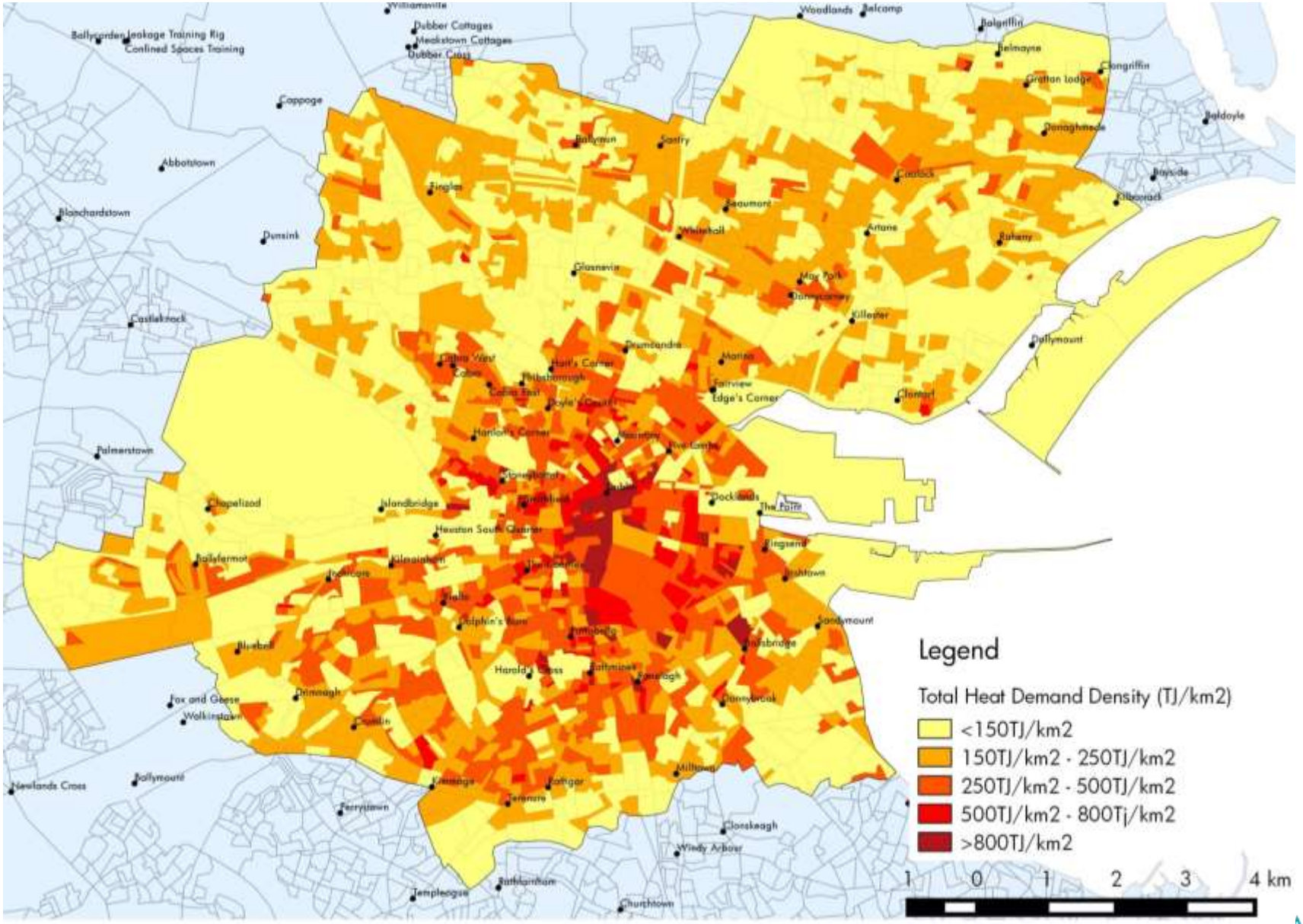
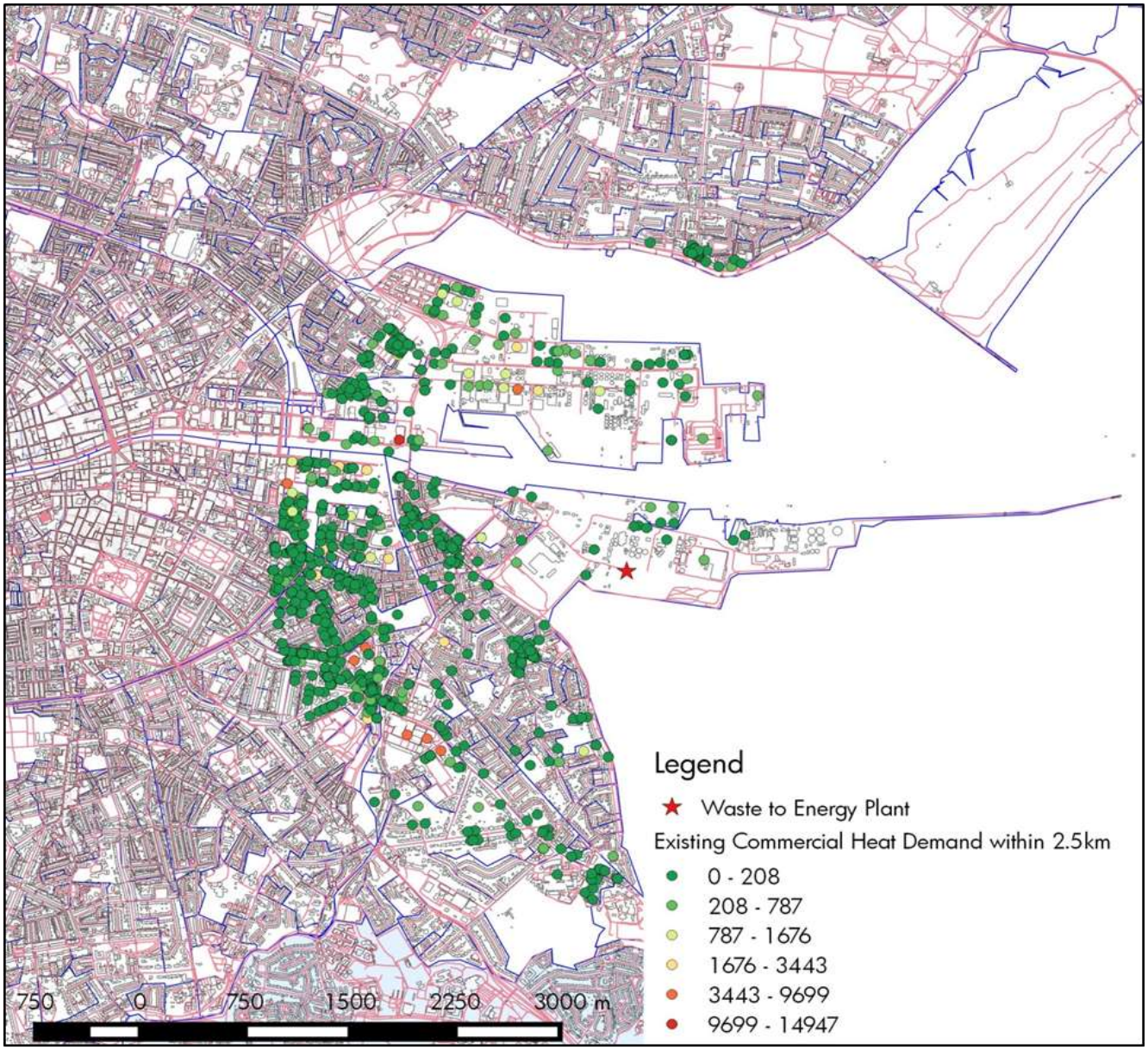
Results: District Heating Potential



Results: District Heating Potential



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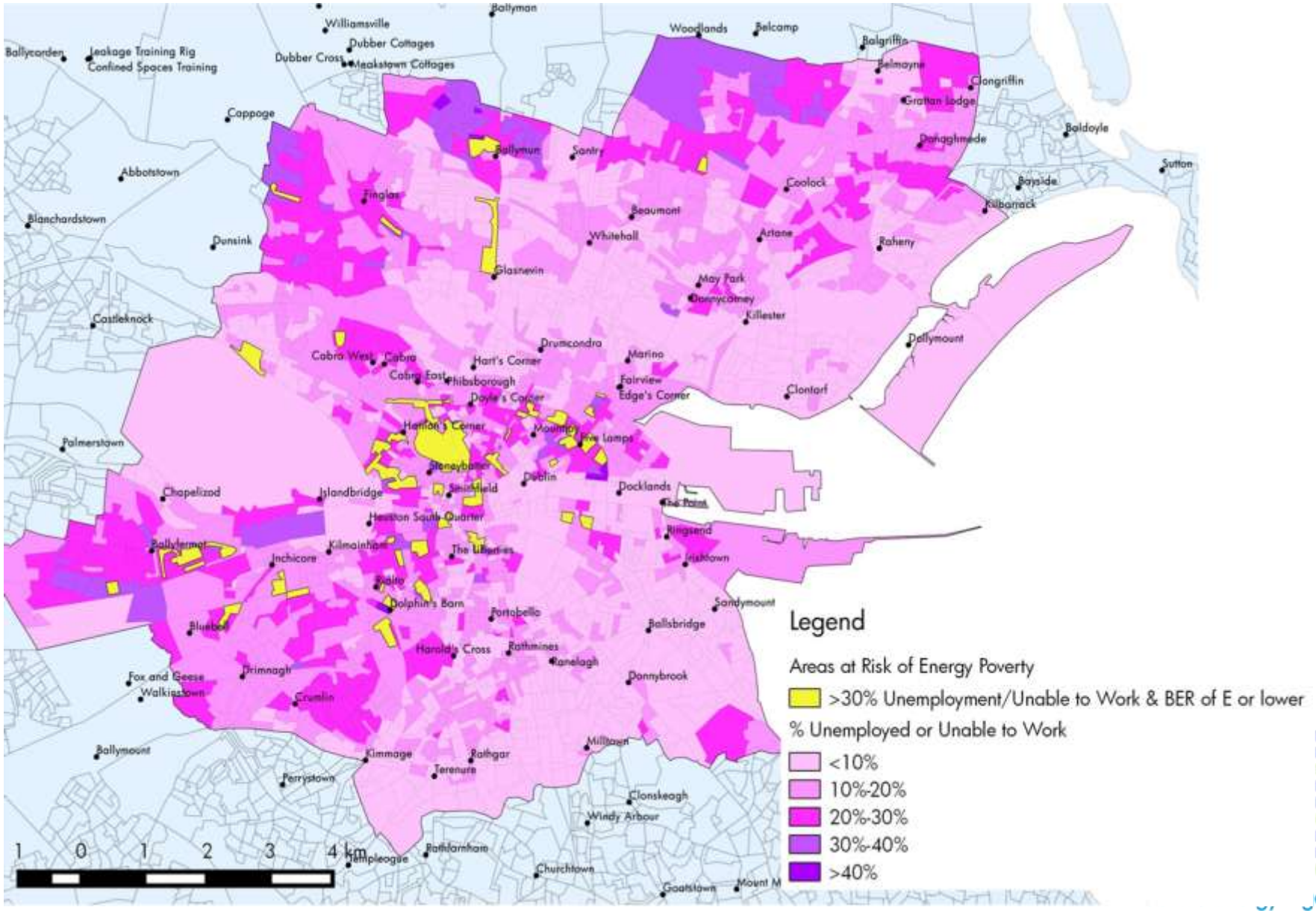
Results: Energy Poverty Areas



Policy Implications

Heating – A local level issue

- DH best way to **integrate high levels of RE and EE** into heating sector of urban areas
- EU policy already states that if DH is cost-effective, **measures must be put in place to ensure development**
- Energy White Paper states a **DH framework** to be put in place
- Low-cost DH will **lower running costs** for businesses and dwellings **– help to combat energy poverty**
- Areas outside of DH zones – analysis of most suitable **individual solutions**, i.e. heat pumps, biomass/wood systems, solar thermal

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Policy Implications

Residential Sector

- New building regulations helping to lower energy in new builds, **but no affect on the old, inefficient housing already built**
- Often high number of rentals in areas with poor BER – **no incentives for landlords to improve**
- Energy costs are increasing, cost of rent increasing, no change in energy efficiency = **more at risk of energy poverty**

Renewable Resources

- Identify local sustainable resources and **quantify impact** on local energy demand
- Example: If all dwellings in Dublin City had 1kW of PV **= output of 13% residential sector electricity demand**

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Thank you

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