ENERGY MAPPING AND DATA COLLECTION TO IDENTIFY LONG-TERM OPPORTUNITIES FOR DISTRICT ENERGY SYSTEMS

17 JUNE, 2021

DISTRICT ENERGY IN CITIES

A GLOBAL INITIATIVE TO UNLOCK THE POTENTIAL OF ENERGY EFFICIENCY AND RENEWABLE ENERGY

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WHAT DO WE DO?

Our goal: **Help cities tackle the energy transition through district energy**

Our model: A private-public partnership with over 60 partners

Our Approach: Take best practices from around the world, adapt and replicate

Where are we: Supporting over 30 cities in 14 countries

What we do:

MARKET TRANSFORMATION

1. Increase **knowledge** of multiple benefits of district energy
2. Provide **technical assistance** to identify potential pilot projects, undertake pre-feasibility studies, design business models, support the tender process and develop long-term local district energy strategies.
3. **Scale-up** locally, through the establishment of local multi-stakeholder coordination units, and nationally , supporting the development of a national framework to support project development.
4. **Unlock investments**: Support the identification of financial mechanisms to address financial barriers and support the first projects in new markets.

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eTraining on District Energy Development

Module 1
Fundamentals of district energy

Module 2
Stakeholder coordination for district energy development

Module 3
Energy mapping and data collection to identify long-term opportunities for district energy systems

Module 4
Strategy development: Incorporating district energy into a local energy and low-carbon heat/cool strategies

Module 5
Policy development: Integrating district energy systems into urban planning

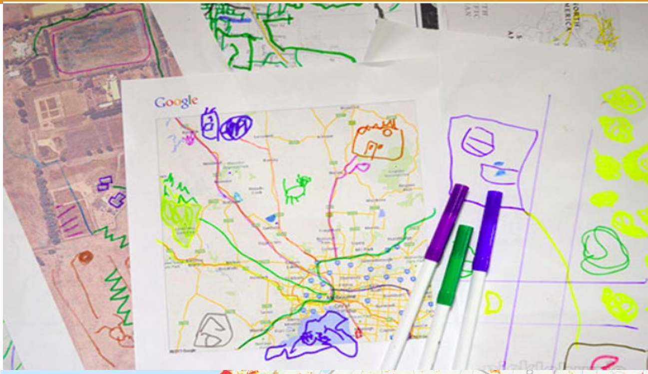
Module 6
Business models, financing options and procurement of sound sustainable district energy systems

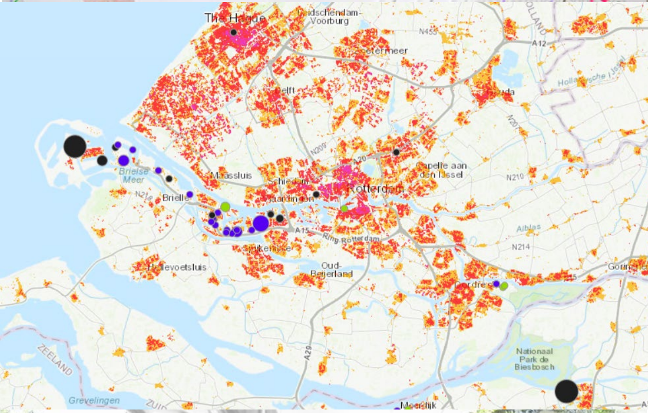
WHAT IS ENERGY MAPPING?

Source: Unspalsh

In District Energy ...

Energy mapping refers to the **visual representation** of energy and material flow distribution along the system, **related to its geographical location**

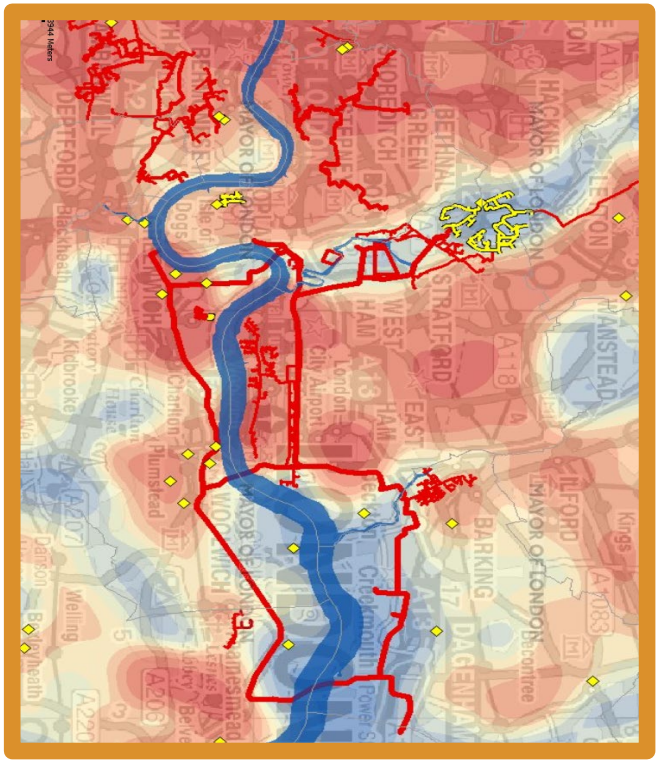




Source: District Energy in Cities Initiative

Why do energy mapping in DES?

- To **identify individual projects, properly expand and connect them in the future**, and link this expansion with other infrastructure development.
- It allows networks that **maximise waste heat recovery** and **targets high energy density areas** leading to more cost-effective solutions.
- Allows zones to be selected where the city can apply its **land-use authority**, and tailor specific incentives.
- Very important for developing **stakeholder engagement.**
- **Raises public awareness** as a visual tool



Source: District Energy in Cities. Unlocking the Potential of Energy Efficiency and Renewable Energy

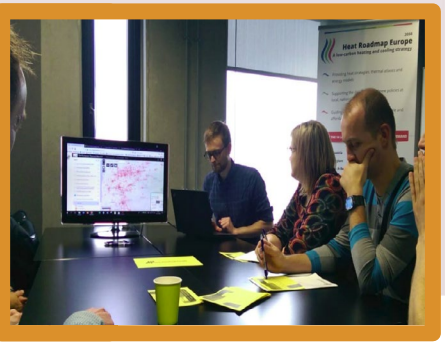
From an energy system perspective

- **Link locations, distances, heating and cooling demand** needs **spatially**.
- Supports the **development of long-term strategies at local and national level**.
- Identify **potential (new) pilot projects** and/or **interconnection of existing networks** or retrofitting needs.


Source: Heat Roadmap Europe (left), Deltares Unsplash (right)

From a process perspective

- Visual tools are an **easy way to present otherwise complex and abstract data to different audiences**.
- Keep **non-technical stakeholders on board**.
- **Enable** stakeholder **understanding** and **discussions**.

Source: Heat Roadmap Europe

Why do energy mapping in DES?

Different project types might develop and maintain energy mapping for different reasons

New

- Demonstrate DE in the city and justify expenditure
- Identify initial starter networks and demonstration projects
- Boost confidence in the project and secure private sector investment

Consolidation

- Seek to maximise the connection of waste heat both low and high temperatures
- Identify potential distributed renewable production
- Optimise interconnection and potential for integration of a district cooling and a district heating network

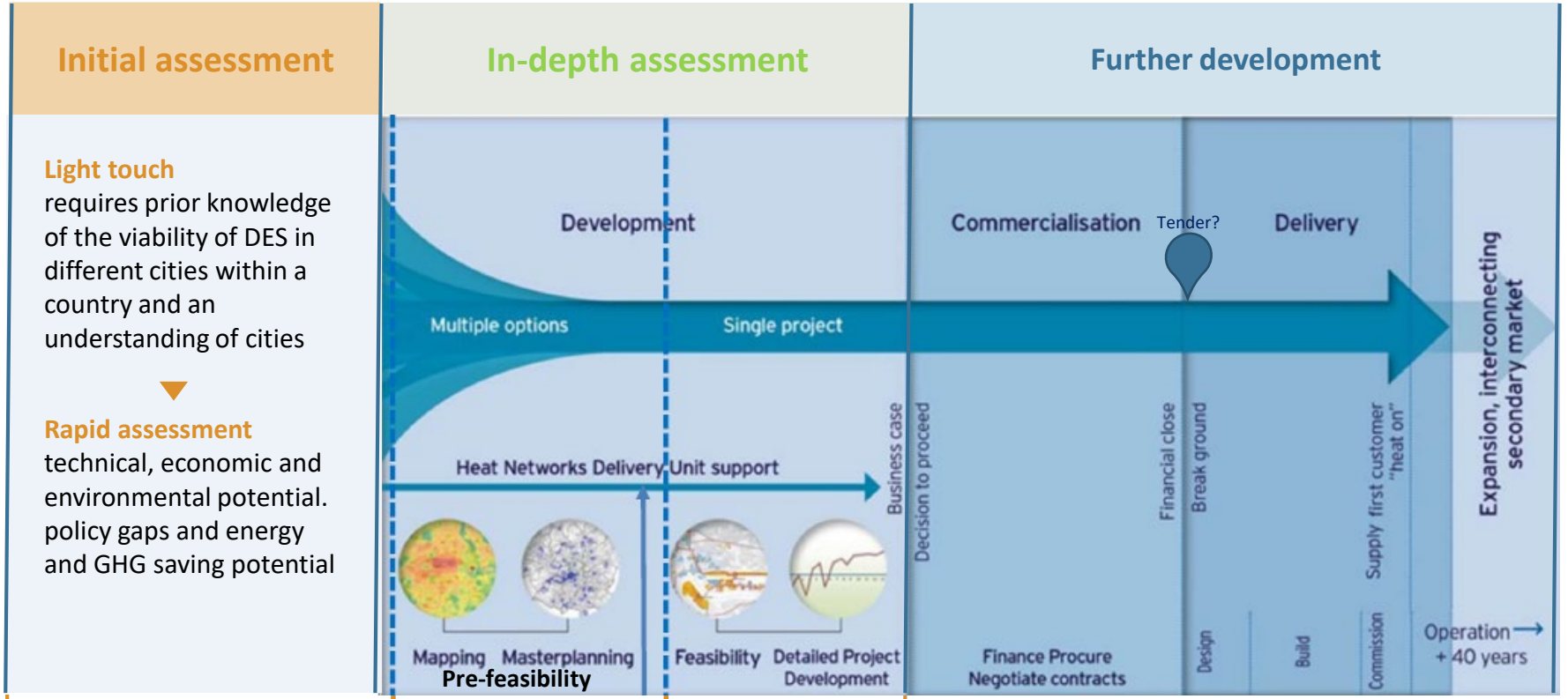
Refurbishment

- Identify potential interconnection or transmission lines
- Understand losses in the network and identify stages or redevelopment
- Identify potential waste heat sources that could be connected
- Attract private sector investment by showcasing potential projects and the strength of data collection

Expansion

- Identify optimum interconnection and pooling of networks
- Identify renewable sources of innovative waste heat
- Attract private sector investment networks
- Identify optimal expansion of network

Types of Energy Mappings along District Energy Development Phases



Source: Adapted from Carbon Trust

Use mapping strategically to achieve the right answers

1. Initial mapping
> Where should efforts focus on?
- Broad scope: national, regional and city scale
- High uncertainty, low data needs
- Relatively quick

Average time required: 1-2 months approx.

2. Mapping for detail
> Should a feasibility study be encouraged?
- Local scale (district)
- Higher level of certainty, but some assumptions
- Relatively time consuming

Average time required: 1-3 months approx.

3. Mapping for feasibility
> Can we financially /technically assure the feasibility of the project?
- Local scale (district)
- Highly specific scope
- High level of certainty
- Time consuming

Average time required: 3-4 months approx.

→ Increasing data and cost requirement →

→ Increasing certainty →

THANK YOU FOR YOUR ATTENTION

For more information on please visit the website or contact:

District Energy in Cities: http://districtenergyinitiative.org

Copenhagen Centre on Energy Efficiency: https://c2e2.unepdtu.org/