

# PLANNING METHODOLOGIES IN THE DES INITIATIVE



## DISTRICT ENERGY IN CITIES

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



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# CONCEPTUALLY: HEATING AND COOLING ARE LOCAL

## Heating is inherently local...

- Thermal energy travels badly, and geography plays a large role.
- Buildings, the built environment, and industry are different from typical energy sectors
- Cooling is hidden under electricity
- The way in which heating takes place is much more diverse than other energy sectors, largely due to different framework conditions

...so traditionally 'planning' for heating and cooling has been neglected in the energy transition

Any planning for heating and cooling must explicitly address the spatial dimension and take local resources into account.

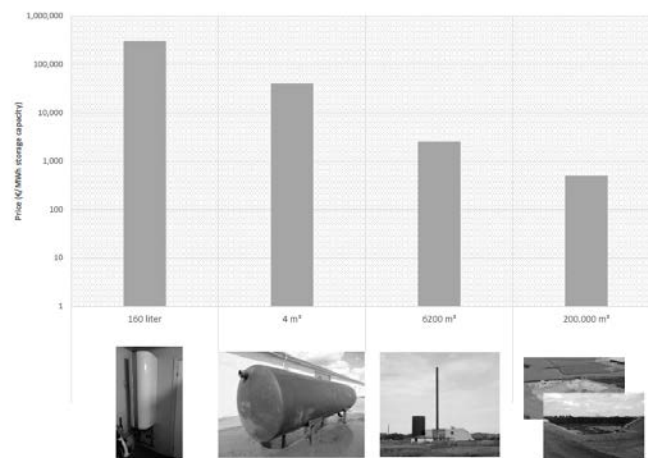
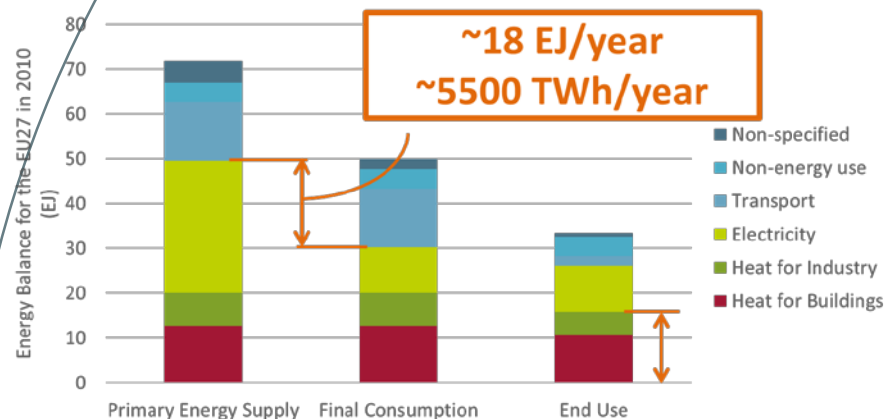




# BUT: COMMONALITIES EXIST

There are general trends and drivers:

- Both heat and cold demands are significant, and more widespread than previously assumed
- Heating and cooling sources are abundant: almost every place has waste heat, access to water, bioenergy, or geo-/solar thermal energy
- Cities inherently thrive on density, which aggregates energy demands.
- Energy production and storage technologies are typically cheaper at a larger scale.



...so there are some general methodologies that we can use to develop a strategy for heating and cooling.



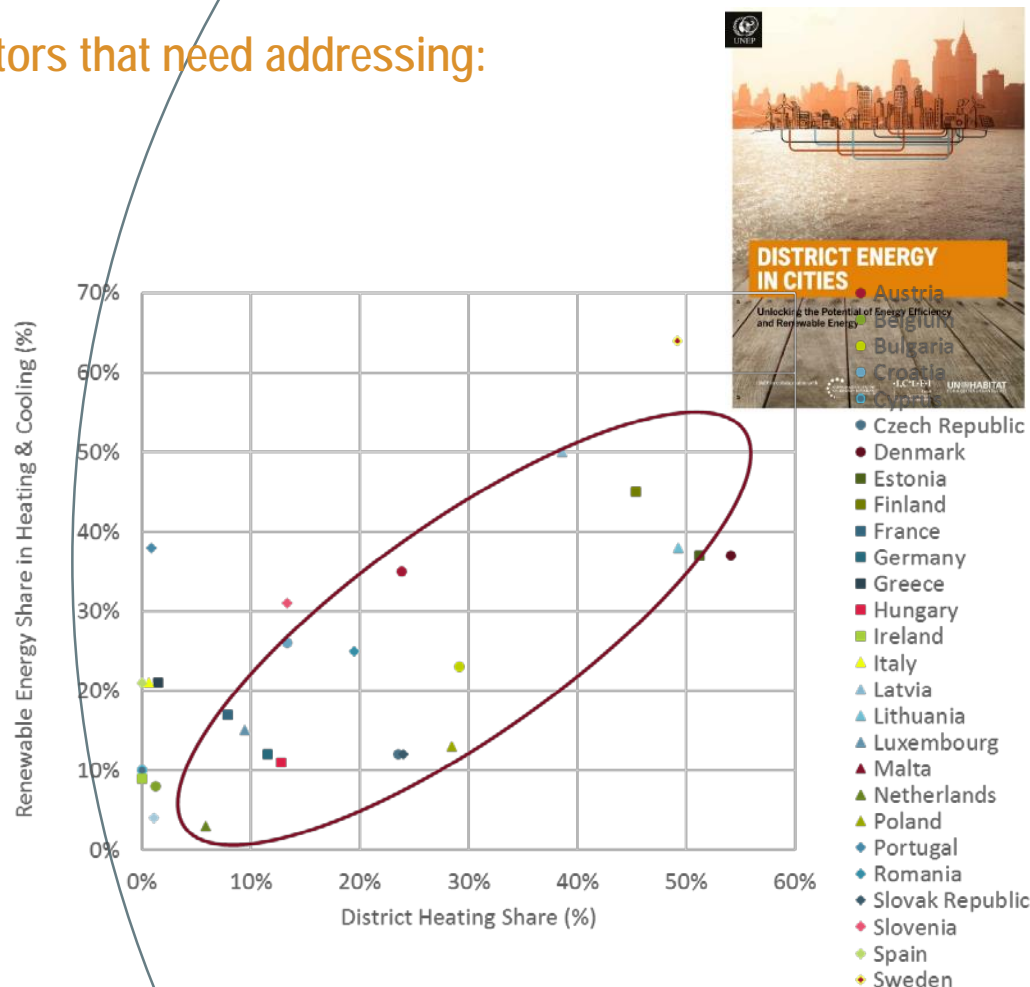




# SO, WHAT DO WE NEED FOR: COMMON PLANNING APPROACHES?

While locally diverse, we know the factors that need addressing:

- **Spatial planning:** This includes planning towards matching local resources and local demands efficiently
- **The built environment:** the state of the building stock, and the need for both building performance and sustainable energy
- **The wider energy system:** particularly the interaction with the power system
- **Enabling framework conditions** need to be developed that can locally incentivise clean, efficient solutions



...so there are things which we should be able to estimate

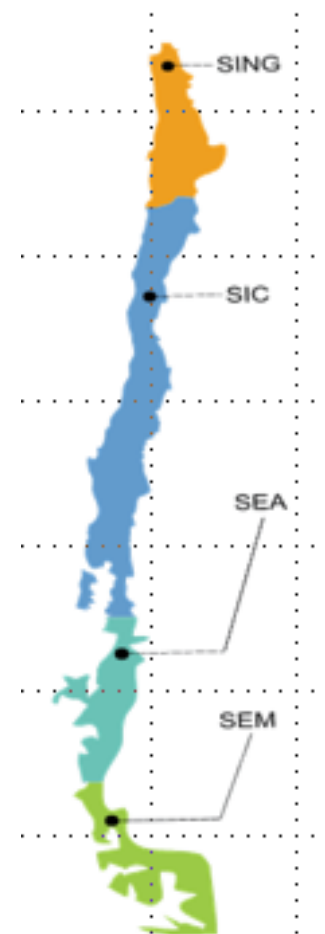


# EXAMPLE: HEAT ROADMAP CHILE

## Overarching questions:



- What is the cost and potential for district energy, based on the spatial disaggregation of energy demands and resources?
  - Cost of building infrastructure: function of the density and energy demands
  - Based on **top-down** GIS analysis
- What is the (socio-economic) cost and potential of an energy system, which includes district energy?
  - How much of this is actually feasible? What does this mean for the other energy sectors?
  - Based on EnergyPLAN analysis
- How can this be developed? What type of projects will this lead to, in terms of future urban DE developments??



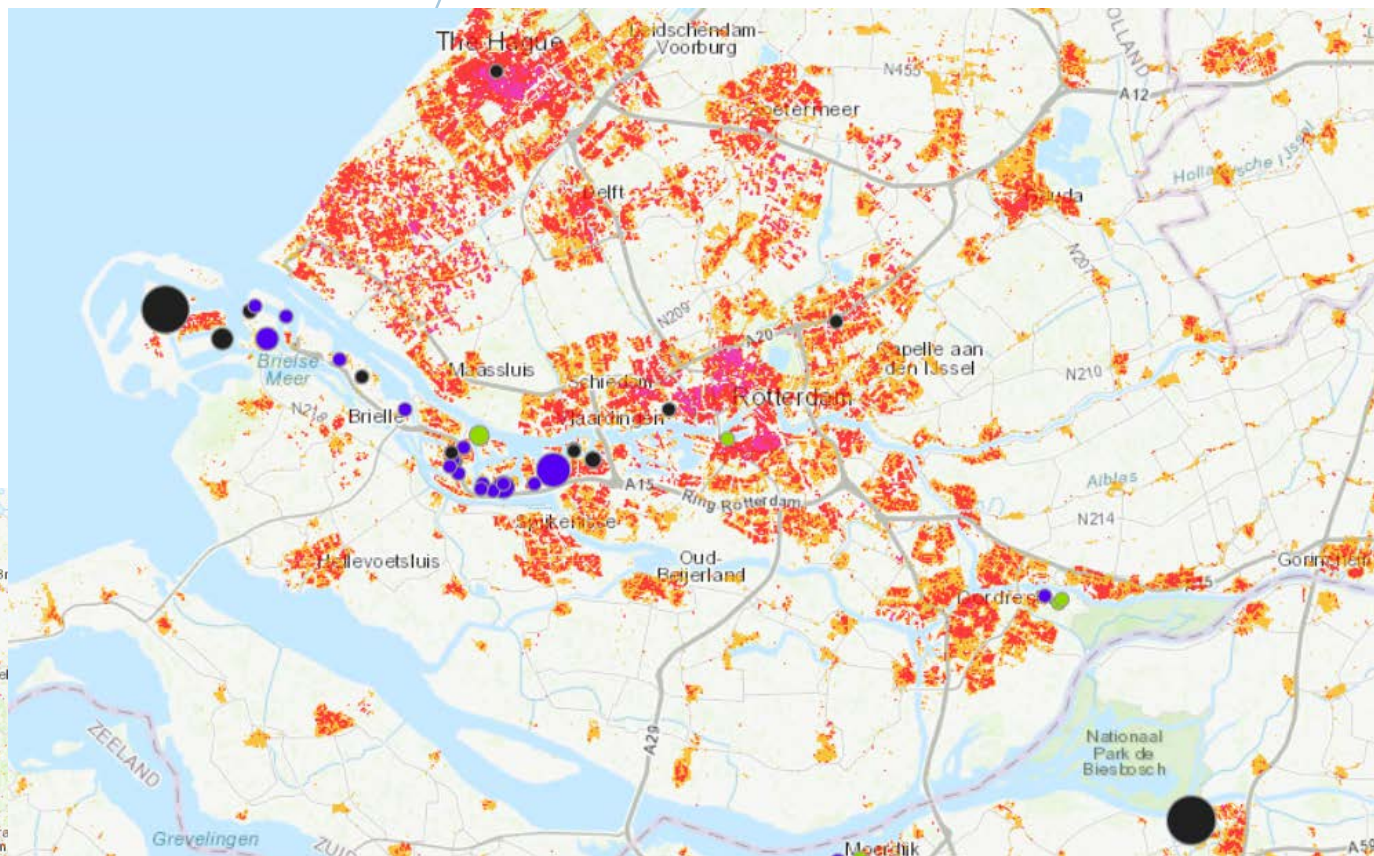


# EXAMPLE: HEAT ROADMAP CHILE



## Spatial mapping:

- Heating and cooling demand
- Resources for DE
- Identify potential
- Identify rough costs of DE



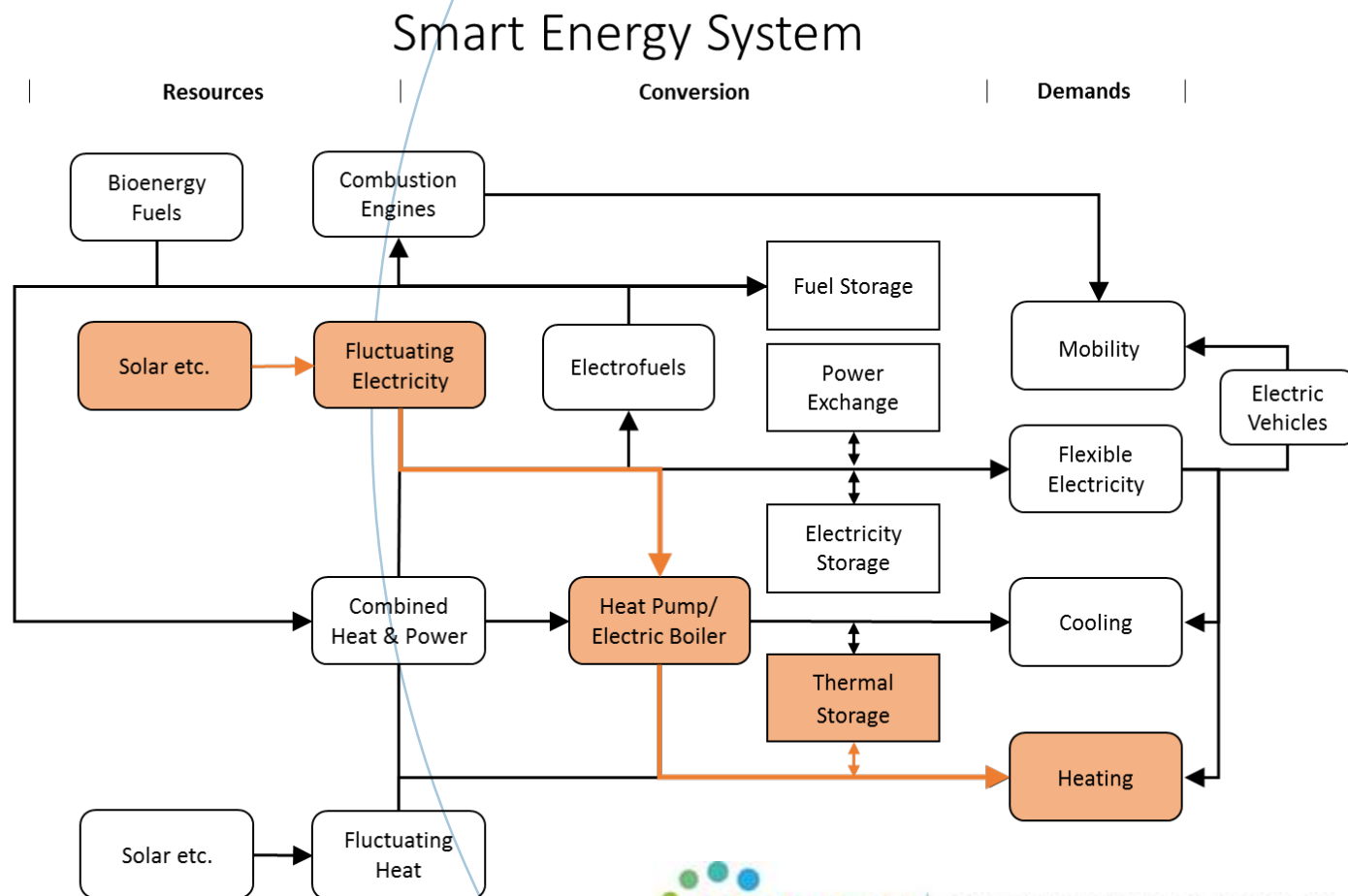


# EXAMPLE: HEAT ROADMAP CHILE



## Energy system analysis:

- Reference model
- Integration of RES
- Integration and impact of DE
- Costs of new energy system







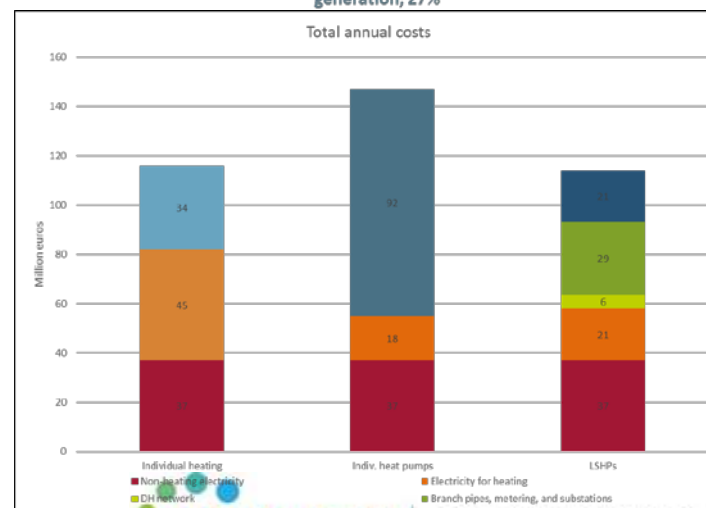
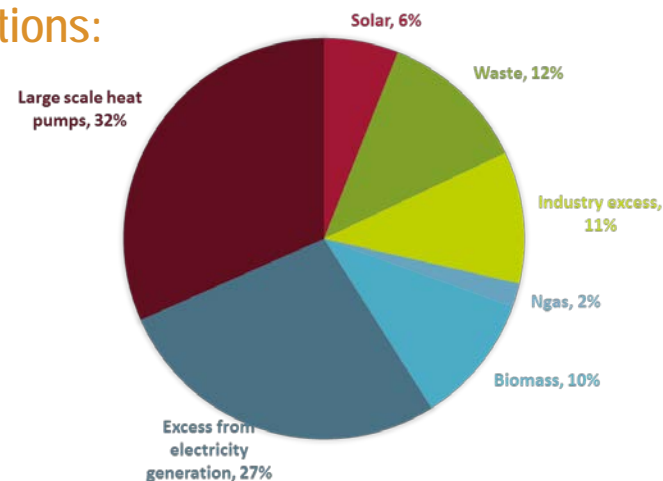
# EXAMPLE: HEAT ROADMAP CHILE



## Project typologies and enabling framework conditions:

- Project typologies:
  - What kind of technology combinations will be likely?
  - Where will the largest investment need to be made?
  - How does this combine with the current policy framework (RAs and DAs)
- Capacity building
  - Communicating results and methodology
  - Disseminating models and codes so they can be refined
  - Move from top-down to bottom-up mapping and modelling

### 4. FINAL CONSUMPTION IN DH HRE2050

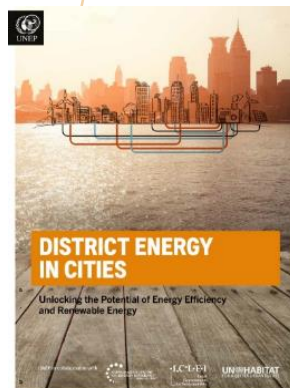






### We need more widespread planning for district energy:

- District energy is local, but there are enough similarities that common approaches are possible.
- An integrated approach is needed that includes considering spatial planning, the built environment, the wider energy system, and enabling frameworks.
- Top-down modelling can give a rough, although imprecise methodology that can then allow for local planning and refinement



### Methodology and Key Steps

1. **Assess** existing energy and climate policy objectives, strategies and targets and identify catalysts.
2. **Strengthen** or develop the institutional multi-stakeholder coordination framework
3. **Integrate** district energy into national and/or local energy strategy and planning
4. **Map** local energy demand and evaluate local energy resources
5. Determine relevant **policy design** considerations
6. Carry out **project pre-feasibility** and viability
7. Develop **business plan**
8. Analyse **procurement options**
9. Facilitate **finance**





DISTRICT ENERGY  
IN CITIES  
INITIATIVE

# THANK YOU!



For more information on the Global District Energy in Cities Initiative, please visit the website or contact:



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