

### TRACK 100% OF ENERGY LOSSES IN THERMAL GRIDS



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## **Context of this Presentation**

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Der Energieeffizienzverband für Wärme, Kälte und KWK e.V.

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## **DistrictLab-H Simulation Studio**

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The software solution for engineering support throughout all phases of thermal network development.







#### **Feasibility Study**

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SGDHC

## network oment. Real-time operation



# A software solution based on 30 person.year of R&D effort entirely conducted in CEA





## USE-CASE #1 FEASIBILITY STUDY (SMALL TOWN SCALE)

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## Feasibility study (small town scale)

### Inputs

- Network layout
- Positioning and characterization of the consumers
- Pre-sizing of heat generators



**Energy Mix** 



### • Production cost: $45 \in / MWh$

- Renewable share: 87 %
- CO2 content: 66 gCO2 / kWh





## USE-CASE #2 CONTROL-COMMAND OF A MULTI-SUPPLY UNIT SYSTEM

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## Automatic control of a multi-producer network





Virtual commissioning of a fully automatic controller on a DistrictLab-H simulator:

- Stability
- Pre-setting of the parameters





### Merit-order, Pumping characteristics and Influence Zones







## USE-CASE #3 IMPROVING THE OPERATION OF AN ANERGY LOOP

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## Anergy loop with heat only consumers



Heat pump)



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Temporal evolution of the heat extracted from the ground by the geothermal probes

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USE-CASE #4 OPTIMIZING THE SUPPLY TEMPERATURE OF A LARGE-SCALE 2<sup>ND</sup> NETWORK

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### Critical temperature and transportation time







## **CONCLUDING REMARKS**

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## "Take-away" messages

The design and operation of district heating networks are increasingly complex subjects requiring the usage of an Up-To-Date simulation tool.

The DistrictLab company markets the "Simulation Studio" software to this end and provides services based on this tool.

The DistrictLab company has an office in Hamburg, Germany, operated by Dr Axel BECKER





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## ALLOWING HUMANS TO ACCESS SUSTAINABLE THERMAL COMFORT

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