# Prototype: Energy system optimization with RIVUS
## as a basis for sustainable planning for communities

**HEAT-App**
**District Heat**

**iDEE**

**Ill. 1:** Parameterization of two comparative system setups for a local/regional heat supply scenario.

**Parameter Setting**



| | District heat energy cost [€/kWh] | Alternative energy cost [€/kWh] | Base heat pipe cost [€/m] | Limit district heat capacity [MW] | Energy loss fix [kW/m] | Energy loss variable [%/m] | Energy demand scaling [%] | Existing heat pipes share [%] |
|---|---|---|---|---|---|---|---|---|
| Reference | 0.035 | 0.07 | 50 | No Limit | 0.006 | 0.008 | 100 | 10 |
| Comparison | 0.045 | 0.07 | 50 | No Limit | 0.006 | 0.008 | 100 | 10 |



**Ill. 2:** Starting from the status quo (orange) an optimal system extension (red) for a respective parameterization is shown.

**Ill. 3:** Cumulative investment and operating costs as well as primary energy input per energy source for a respective system parameterization.
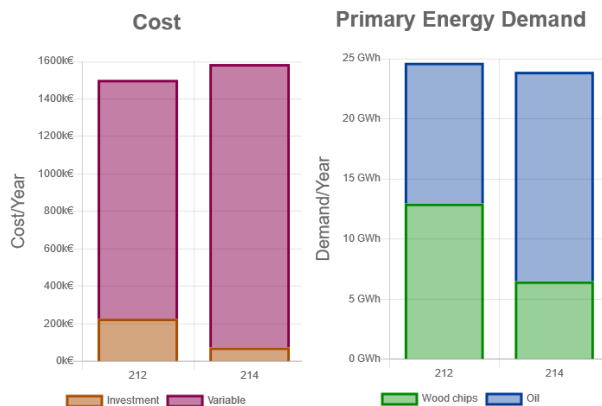


## Background

The sustainable transformation of regional heat supply systems is one of the essential pillars of a $CO_2$ neutral energy supply. However, the realization of strategies in local actions is sometimes linked to complex decision-making processes, especially when it comes to an investment in a grid-bound supply.

## Method

With the combination of spatial analysis and mathematical optimization, scenarios of an optimal heat supply are determined. The heat supply on object level with the geographical location and a possible route for a net-bound supply is used as basis for this.

## Goal

- Quick and uncomplicated determination of supply scenarios as the basis for a decision for a sustainable supply
- Closing the gap between strategic guidelines and local planning processes
- Transparency in showing sensitivities of individual optimal system setups with regard to variations in parameter settings

## Innovation

- Combination of GIS analyses with mathematical optimization
- Interactive web interface for broad and easy use in different stakeholder circles.

## Benefits

- Complete acquisition of the supply system on object and route level
- Identification of possible optimal treatment setups under given conditions

## Demonstration

- Prototype developed in the project IDEE in INTERREG AT-IT
- Provision for the communities of the Salzburg Lake District
- Provision for the municipalities of Maniago and Feltre in Italy
- Integration and application in ERA process for the project Berchtesgadener Strasse in Salzburg
- Available online at https://ispacevm42.researchstudio.at/heatapp/districtheat

## Publication

- Hofsäß, F. (2018): Grid based energy system setup optimisation with RIVUS in dedicated regions. International Sustainable Energy Conference 2018, 67-76. 10.32638/proceedings.isec2018.201813

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