



SDHplus
Solar District Heating in Europe

*WP2 – SDH enabling buildings with high energy performance
Task 2.2 – Development of adapted and/or new models*

**D2.4 – Report on adapted
and/or new possible models
Format for reporting (language: English)**



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INTRODUCTION

Country

Denmark

Responsible partners for the deliverable (organizations and persons)

PlanEnergi, Daniel Trier and Per Alex Sørensen

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TOPICS TO BE INCLUDED

1. *Which models are you planning to replicate? Please choose from D2.3 document "Model Bornholm" used by Bornholms Forsyning.*
2. *Which are the main changes needed in order to replicate the chosen models in your country?
The model is not geared to the challenges with high energy performance buildings and to selling solar heat.*
3. *Which stakeholders (utilities, local authorities, etc.) do you plan to involve?
Bornholms Forsyning. New district heating networks are planned in the towns of Svaneke, Årdsdale and Listed on the eastern coast of Bornholm.*
4. *Please describe how the model will work and the role of the different stakeholders
The model is based on the simple principle that new customers should not pay large up-front investment costs. Instead the costs for the district heating plant and the main pipe network are covered by the heat bill and therefore spread out over a long payback period. The loans for the district heating company are depreciated over 25 years with a low interest rate because they are "municipality guaranteed" which means that the municipality vouch for the utility.*

The heat price is calculated as one a part for variable costs such as the fuel demand for the district heating plant, and one part for fixed costs such as the repayments for both the district heating plant units (boiler, storage etc.) and main pipe network.

Examples of economy: For a house with a consumption of 2000 litres of oil the yearly cost for heating is as follows:

- *District heating with hotline and service visit every 3rd year: 1931 €/year. Of which 1155 € are variable costs for 14 MWh heat.*
- *Oil heating 3347 €/year (of which 3067 € is oil).*
- *Electrical heating: 2912 €/year.*

New customers pay an investment cost (which can have a special price for signing up before the pipes has been installed). In earlier examples from Bornholm the cost has been 2200 € for the connection pipe, a heat meter with leak alert, district heating unit with hot water tank and shunt regulation for heating, all incl. installation plus removal of oil boiler and old hot water tank, and removal or emptying of oil tank. For electrically heated houses the connection fee is zero. This is done to make it more interesting for these houses to be connected because they there most likely need a new (waterborn) internal heating system thus requiring other investment costs to be able to use district heating. No investment costs are paid before the first district heating is supplied.

An information leaflet and agreement paper is sent to all households in the proposed district heating area informing about the following points:

- *60 % of the houses have to be connected if the project is to be realised.*
- *There will be held an information meeting*
- *Example of the feasibility incl. investment costs and savings.*

- *Promotion of district heating.*
- *A map of the area involved.*

Similar information is published in local newspapers incl. a reminder about the public information meeting.

Arguments used for convincing people to sign up have until now been:

- *Compact heating unit easy to regulate.*
- *Nearly no maintenance.*
- *No smoke and noise from oil boiler.*
- *CO₂ neutral heat with local biomass.*
- *Low energy cost.*
- *Service and leakage alert is included in the heat price.*
- *The plant is prepared for solar thermal.*

To these arguments will be added

- *High performance buildings meeting the 2015 building code requirements in DK will have a reduction of 50 % in connection costs (1,150 € instead of 2,300 €) and in fixed costs connected to the building /1,75 €/m²/year instead of 3,50 €/m²/year).
*The argument for this is that high performance buildings only cause 50 % of the burden to production plant and distribution pipes compared to standard houses.**
- *Solar thermal will make it possible to save biomass, reduce emissions (especially dust) in the summer period where a lot of tourists are on the island) and stabilise the future heat price for the customers.*

Since there is no need for changes in the legislation for this model to be implemented there is no need to involve local authorities.

A variety of the model is used in different Danish district heating companies. Some utilities operate with a mix where some of the investment cost in the district heating plant is paid by the customers and the rest is covered by the heat bill (i.e. paid back over time). Bornholms Forsyning operates with the most distinct separation between their investment cost and what is required as start-up costs for new customers.

- 5. What is the final aim of the model implementation?
To have as large network connection percentage as possible as large solar fraction as possible and to improve the reputation of district heating in general which as an overall goal aims to reduce the GHG emissions in the heating sector.*
- 6. Please include the foreseen timetable for the model implementation (hearing with stakeholders, preparation of draft documents, etc.)
Connection campaign will take place in 2014. Implementation is expected in 2015.*
- 7. Describe the replication potential of your model
The model can be replicated if it is possible for the district heating utility to finance the investment in connection pipes and house installations during implementation.*

8. *Explain how is your model related to WP2, that is how the supply of solar district heat for new or existing and renovated buildings / settlements with high energy performance or even at nearly zero-energy standard can be a business opportunity
The model is related to WP2 by adding special conditions for high performance buildings and arguments for use of solar thermal.*

9. *Explain how you and the SDHplus project take part in the model implementation, e.g. you are the consultant, you provided the stakeholders with information, you are the DH association, etc.
PlanEnergi has discussed the model with Bornholms Forsyning and provides Bornholms Forsyning with informations.*