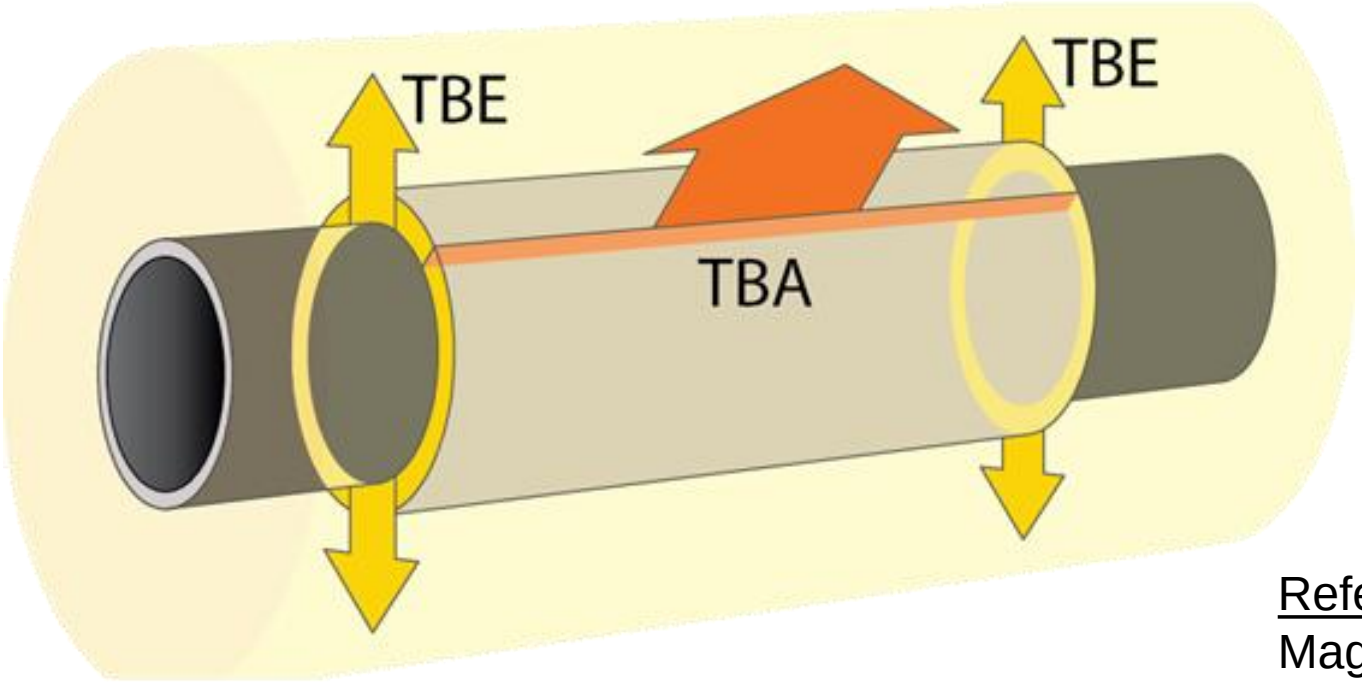
LIVSLÄNGD HOS HYBRIDISOLERADE FJÄRRVÄRMERÖR



Beviljad budget: 567000 kr

projekttid: augusti 2020-Mars 2021

Reference group:
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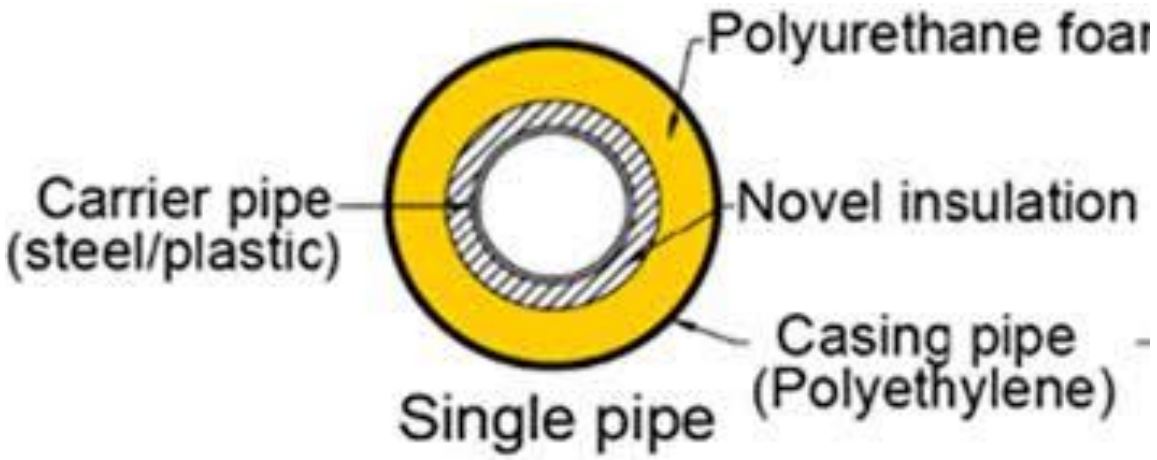
Background: 2011-2020

Cylindrical Vacuum panel



Declared thermal conductivity 0.005 W/mK

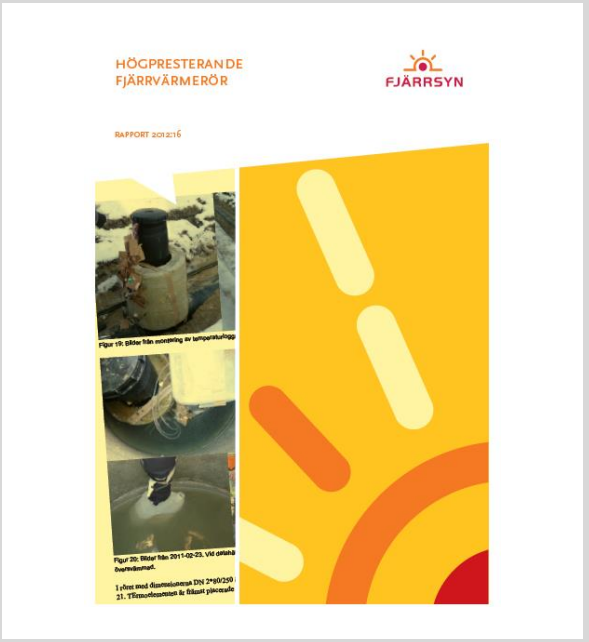
About **5-6 times** better than PUR

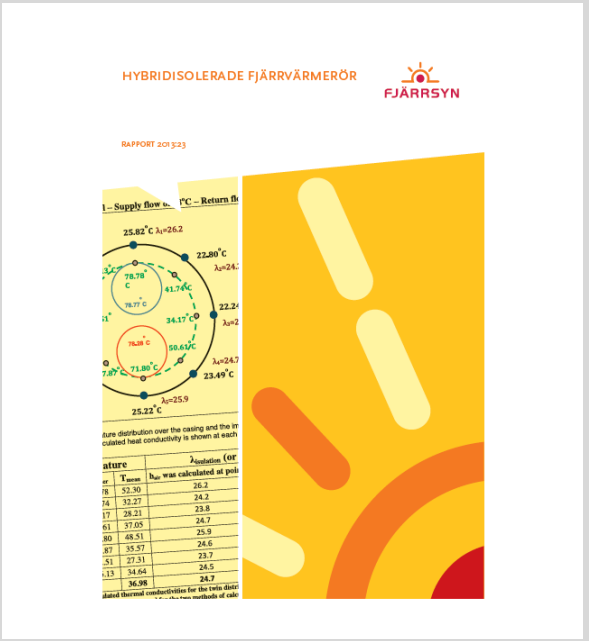
POWERPIPE

RI.
SE

Conclusions:

- **40-45%** better thermal performance for a single pipe
- **35-40%** better thermal performance for a twin pipe
- The performance of the hybrid insulated pipes will **always** be better than ordinary insulated pipe.





- A hybrid insulated pipe by vacuum panels fulfil the technical demands. However, the cost of the vacuum panel is about 10 times more than polyurethan insulation per cubic meter.

Considering **3 (!)** times better thermal performance of the VIP, still VIP has a price which is about 3,3 times more than polyurethan.

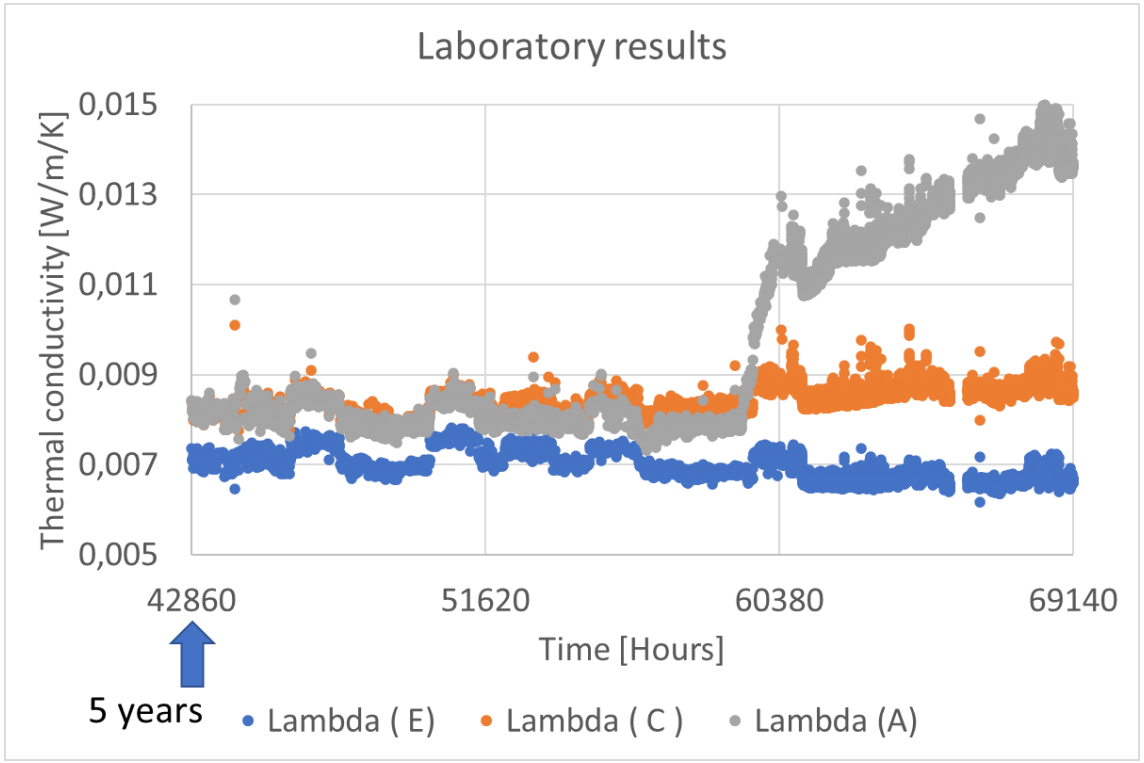
The aim of ongoing project is the calculation of payoff time for hybrid insulated pipes.

Payoff time is a function several parameters among them; the lifetime of the vacuum panels and the cost off energy.

Lifetime / Laboratory

Condition:

- Supply pipe temperature 115 °C, 8 years

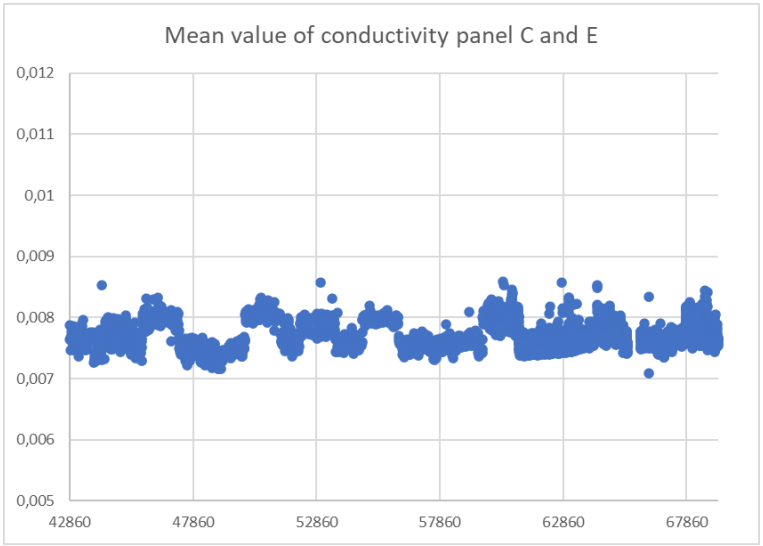


Conclusions 1 : (based on panel A)

- The limetime of panels is at least 7 years at 115 °C, with expected performance (3 times better than PUR) **A**nd the rest of the time (up to 50 years)1.8 times better than PUR.

Conclusion 2: (based on panel B and C)

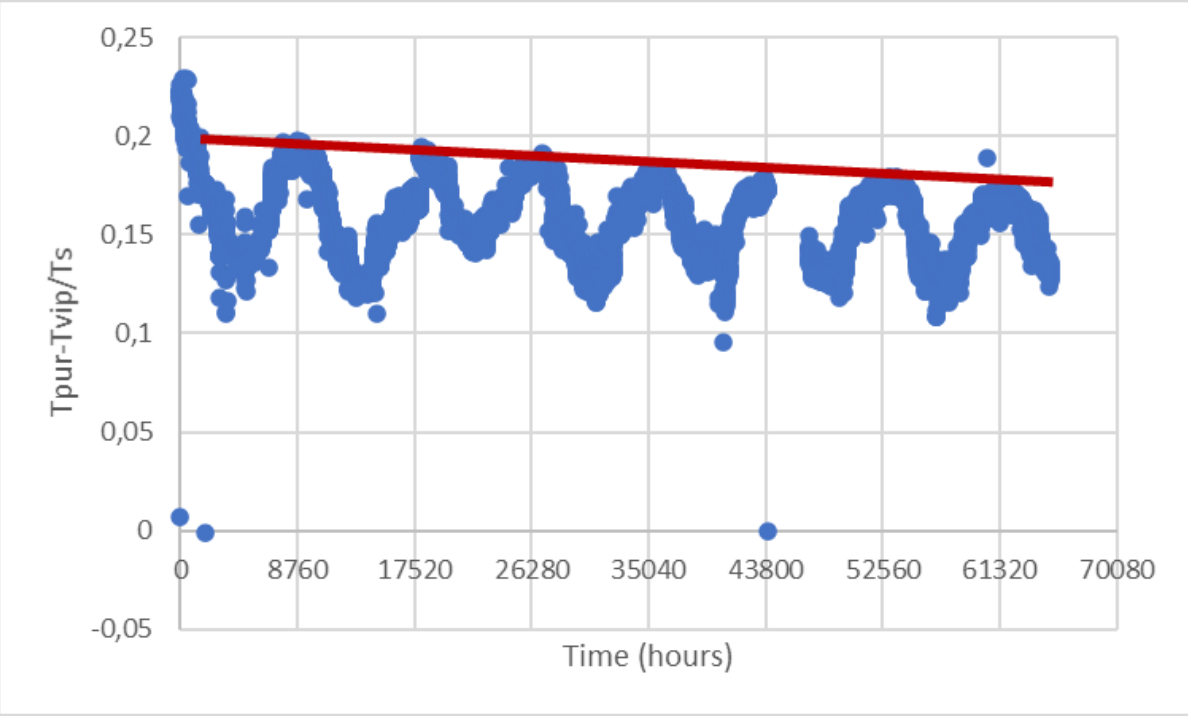
- No measurable degradation



Lifetime / Fieldstation-Varberg

Condition:

- Supply pipe temperature 90 °C,
- Return pipe 60 ° C
- Duration 8 years



Conclusions 1 : (based on field station)

- The panels degrade by 1,8% per year.

The expected lifetime with assumption that panels will be 1.8 times better than PUR is 64 years.

The panels reach a thermal performance as PUR after mor than 150 year

Payoff time:

	Energy saving [kWh/pipe]/Year (12 meter pipe)	cost saving kr*	Panel pris per pipe	payoff time
DN80/160	763	650/380	978	1.5/2.5
DN80/180	558	474/280	978	2.0/3.5
DN80/200	438	372/220	978	2.6/4.5
DN80/225	345	294/173	978	3.3/5.5
DN100/200	713	606/356	1257	2/3.5
DN100/225	513	436/256	1257	2.9/4.9
DN100/250	398	389/199	1257	3.7/6.3
DN100/280	314	267/157	1257	4.7/8.0

* Energy price 0.85/0.5 per kWh

Other parameters which should be added:

- Higher production cost
- Lower PUR cost which is replaced by VIP

- Advantages which is difficult to add in payoff model:
    - prolonged lifetime of PUR
    - lower heat demand helps to increase electricity generation in heat and power plants.
    - lower Co2 emissions


Thanks for your attention.
Question/comments
Solar district heating in Denmark