

## Two Approaches of Seasonal Heat Storing:

### Pit Heat Storage and Borehole Thermal Energy Storage

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## Agenda

- Borehole thermal energy storage in Braedstrup
  - Design and implementation
  - Preliminary measuring results
- Pit heat storage in Marstal
  - Design and implementation
  - Preliminary measuring results
- Key figures and conclusions

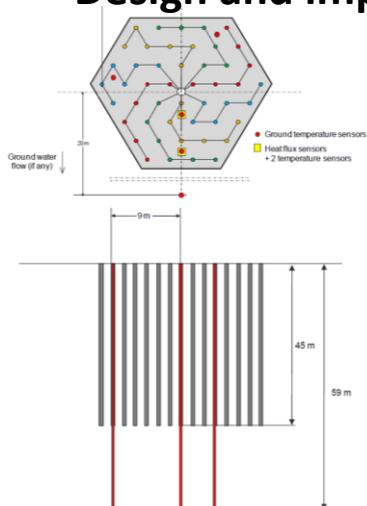
## Borehole thermal energy storage in Braedstrup



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## Design and implementation, Braedstrup



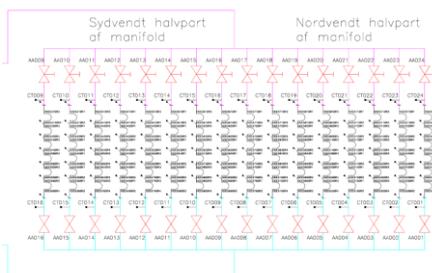
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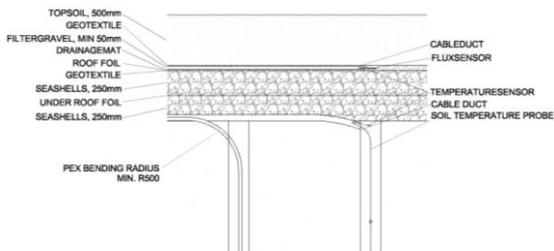
## Design and implementation, Braedstrup



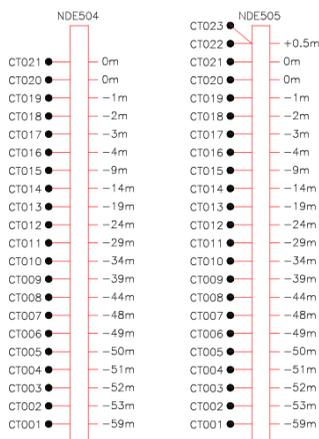
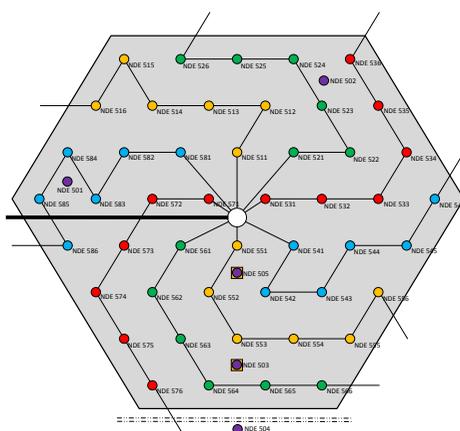
## Design and implementation, Braedstrup



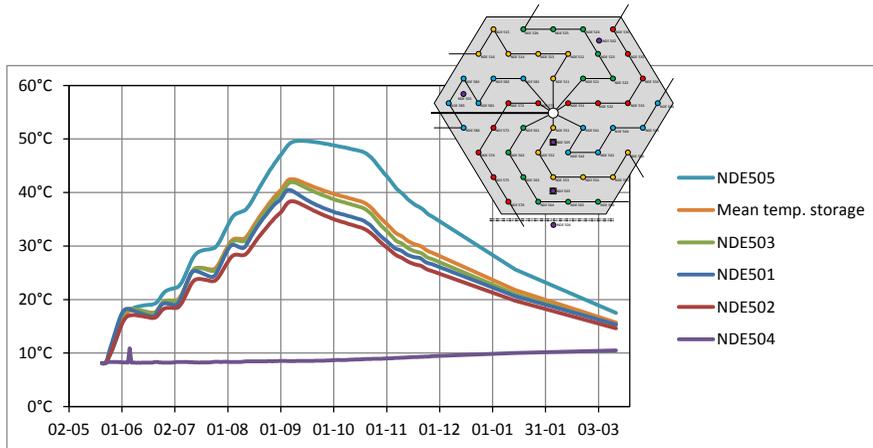
## Design and implementation, Braedstrup



## Preliminary measuring results, Braedstrup



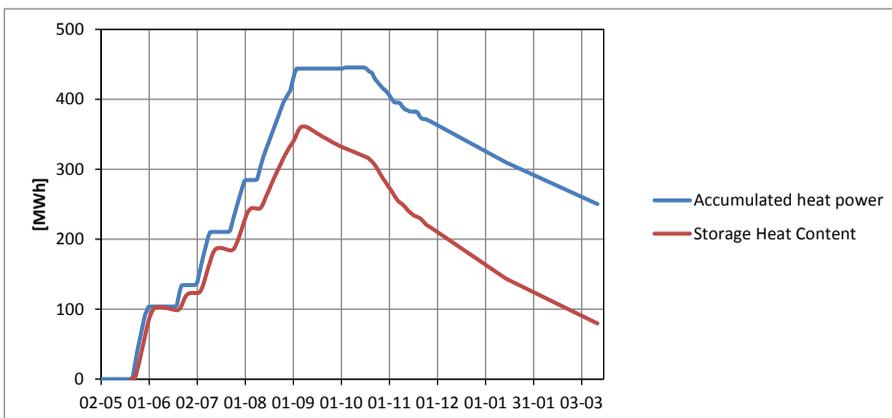
## Preliminary measuring results, Braedstrup



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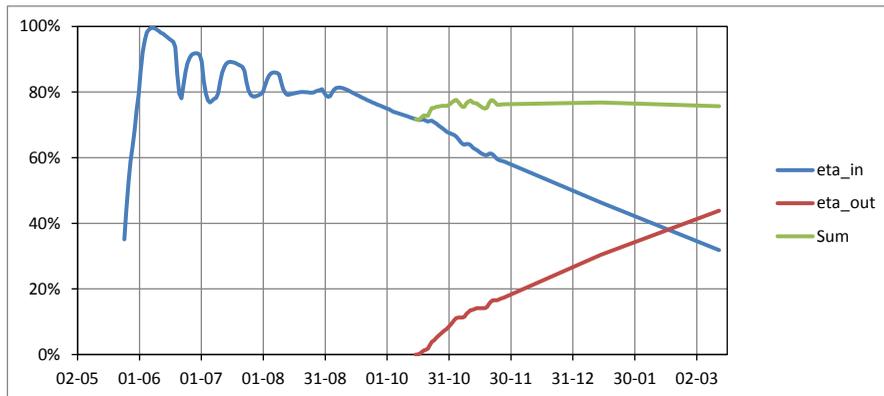
## Preliminary measuring results, Braedstrup



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## Preliminary measuring results, Braedstrup



## Pit heat storage in Marstal



## Design and implementation, Marstal



## Design and implementation, Marstal



## Design and implementation, Marstal



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## Design and implementation, Marstal



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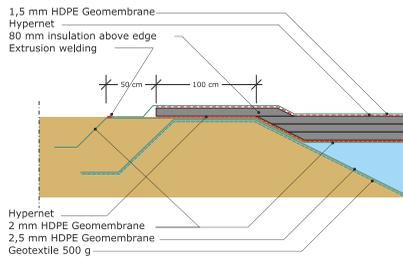
## Design and implementation, Marstal



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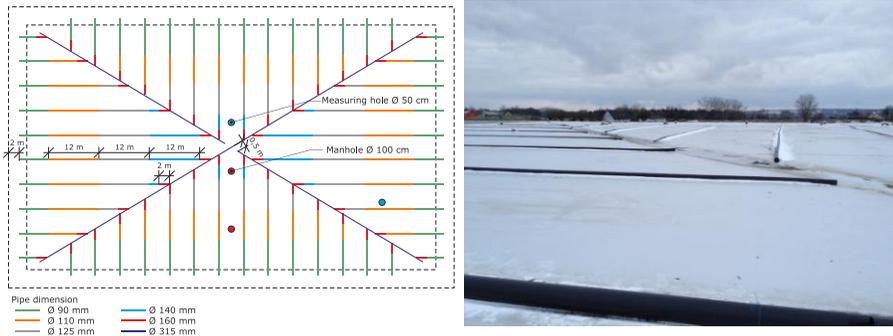
## Design and implementation, Marstal



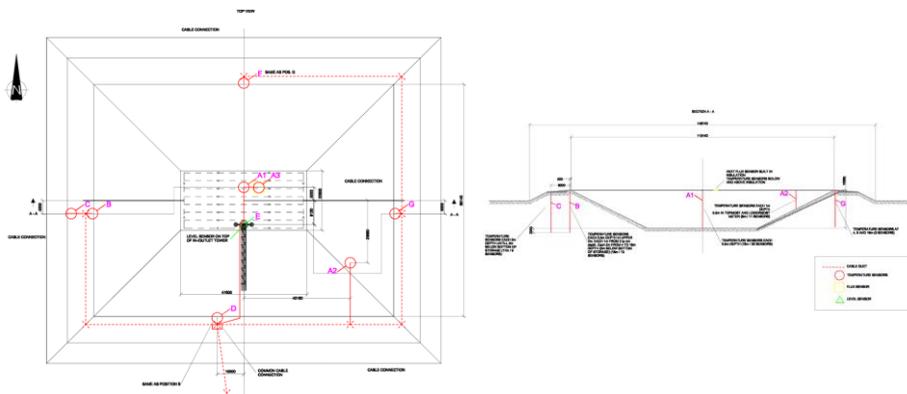
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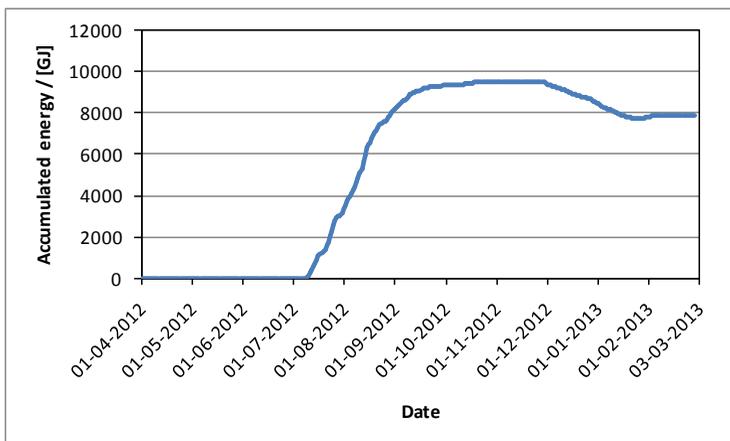
## Design and implementation, Marstal



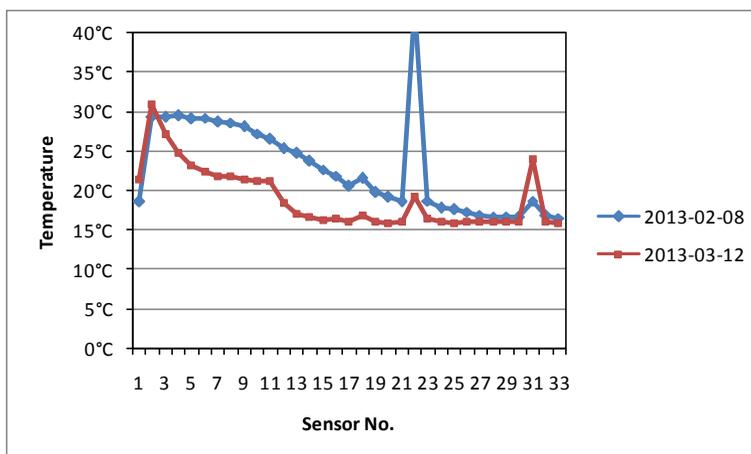
## Preliminary measuring results, Marstal



## Preliminary measuring results, Marstal



## Preliminary measuring results, Marstal



## Key Figures and conclusions

	Borehole Storage, Braedstrup	Pit Heat Storage, Marstal
<b>Size:</b>	19 000 m <sup>3</sup> soil / 5 000 – 10 000 m <sup>3</sup> water eq.	75 000 m <sup>3</sup> water
<b>Prize:</b>	240 000 € (13 €/m <sup>3</sup> soil) (24 - 48 €/m <sup>3</sup> w <sub>eq</sub> )	2.4 M€ (32 €/m <sup>3</sup> )
<b>Heat supplied to the storage during first part season:</b>	445 MWh	2 640 MWh
<b>Heat recovered from storage during first part season:</b>	195 MWh (44%)	472 MWh (18%)
<b>Biggest implementation challenges experienced:</b>	Precise soil conditions unpredictable	Very weather dependent
<b>Sponsors:</b>	Energinet.dk and EUDP	EC 7 <sup>th</sup> framework

## Thank you for your attention

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