

PTES Development In Denmark

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Pit Thermal Energy Storages (PTES) in DK

Project	Size [m ³]	Heat capacity [MWh]	Year of finalizing
DTU	500		1983
Ottrupgaard	1.500	43,5	1995
Marstal Sunstore 2	10.000	638	2003
Marstal Sunstore 4	75.000	6.960	2012
Dronninglund	60.000	5.500	2014
Gram:	122.000	11.300	2015
Vojens:	205.000	18.800	2015
Toftlund:	85.000	6.500	2017
(Langkazi, Tibet)	15.000	1.000	2018
Høje Tåstrup	70.000	3.300	2022

Dronninglund 2013-14 – 60,000 m³

Supported by
EUDP (Danish
national
support scheme)

37 573 m² solar
collectors

60 000 m³ pit
heat storage

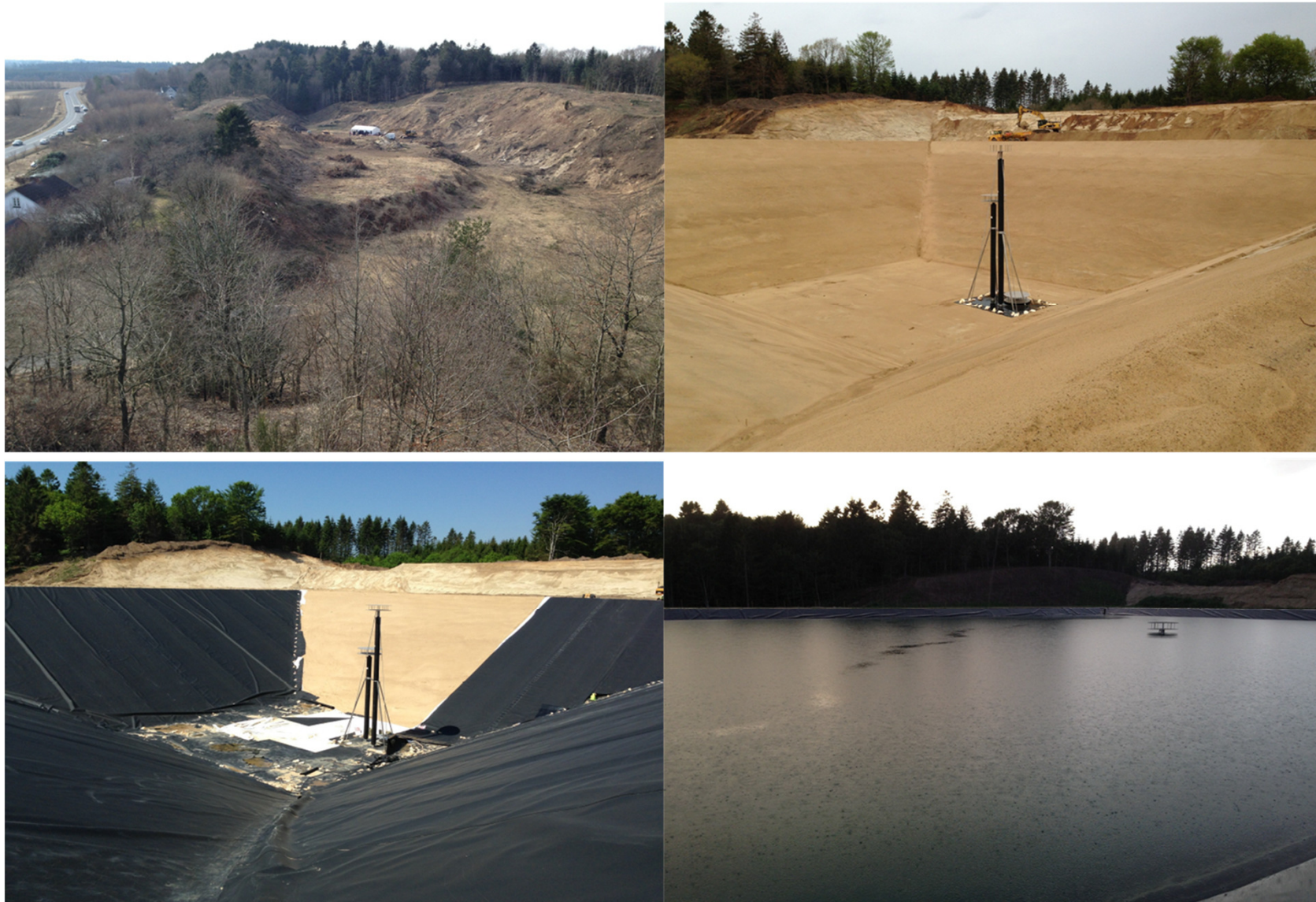
2.1 MW_{cooling}
absorption heat
pump *

Bio oil boilers

Gas engines



Dronninglund



Høje Taastrup 2019-22 - 70,000 m³

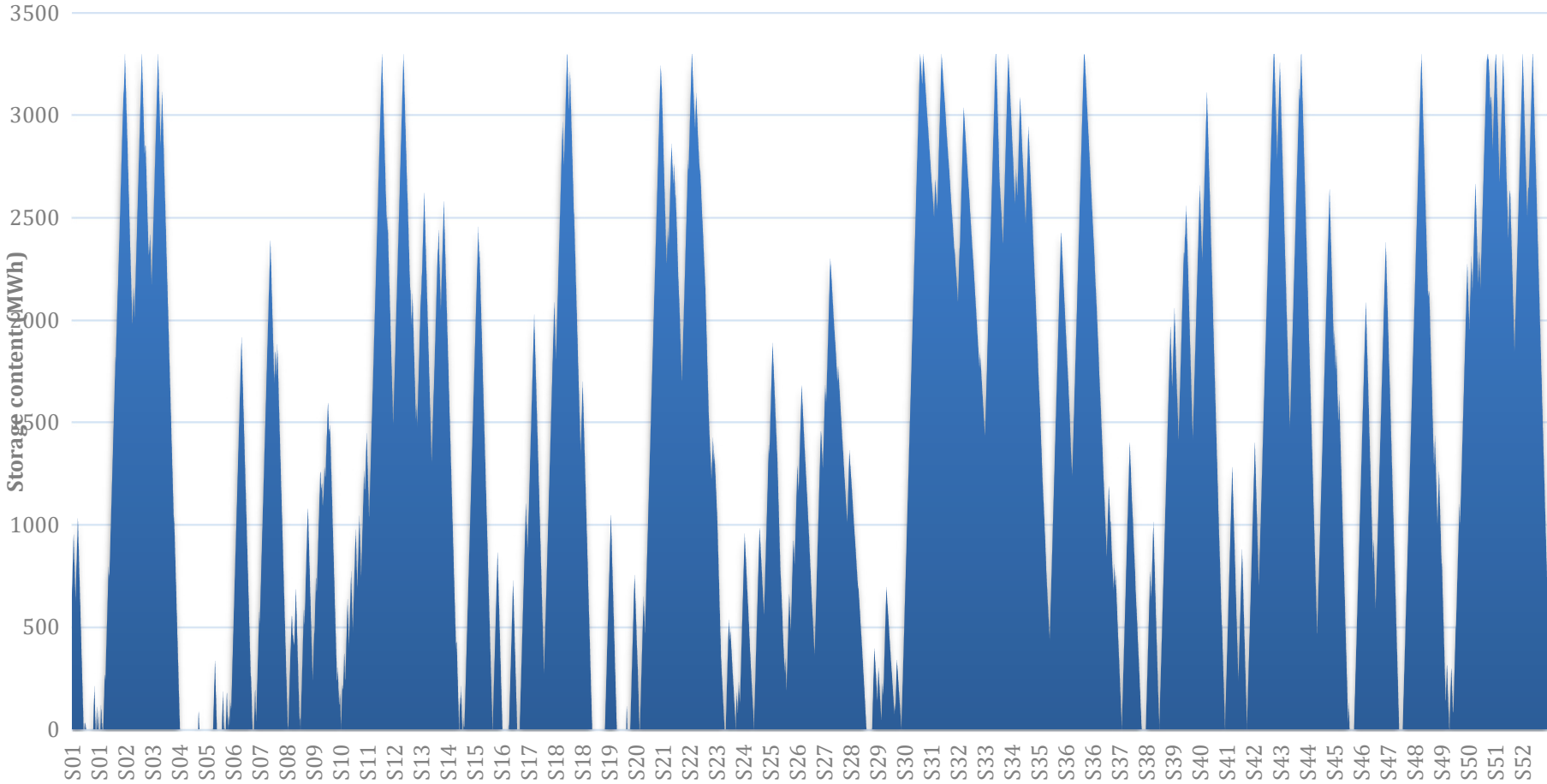
Supportet by
EUDP (Danish
national
program)

70.000 m² pit
heat storage
90°C constant
30 MW in- and
outlet

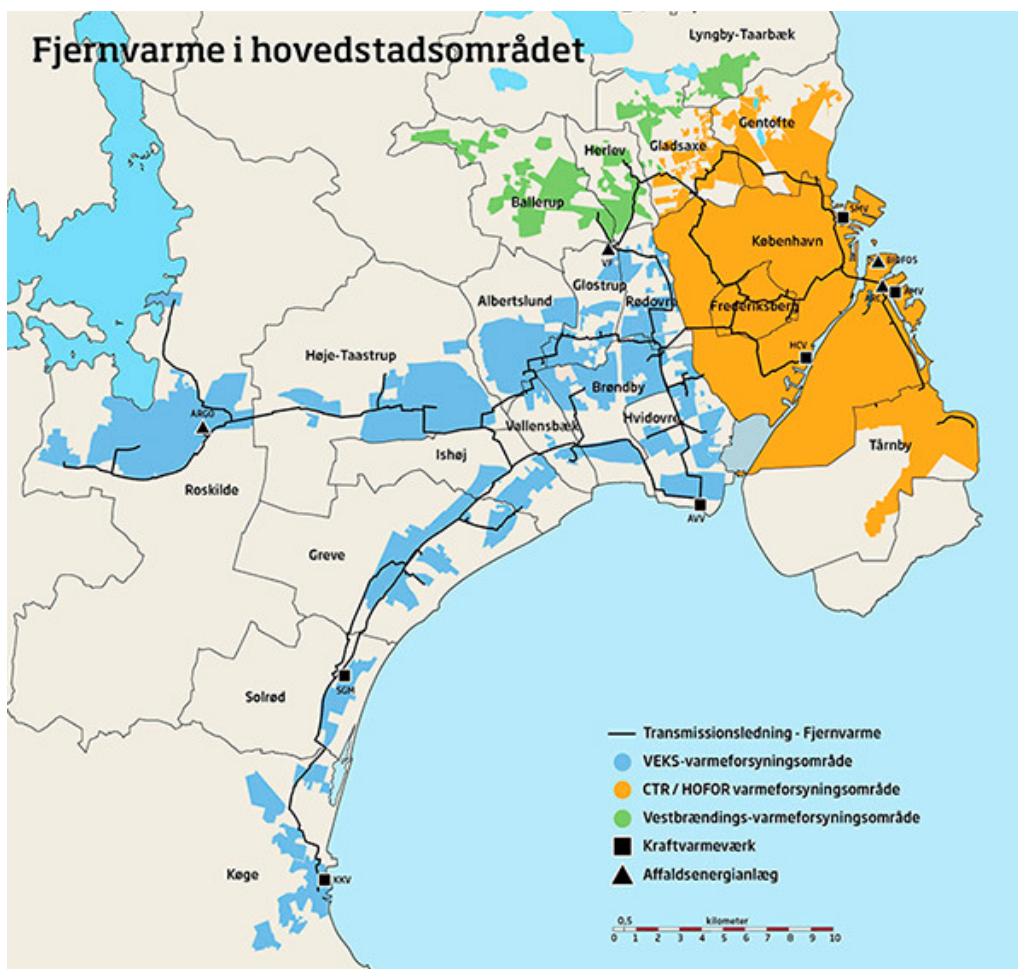
New PP-liner
New generation
of insulation
material in lid



Høje Taastrup



Integrate 2 supported by EUDP



- In Integrate 2 next generation of Pit Thermal Energy Storages is developed
- VEKS (DH municipality owned transmission utility) and Hjørring-Hirtshals (utilization of excess heat from Hirtshals Harbour) are cases.

Integrate 2 - Test of materials

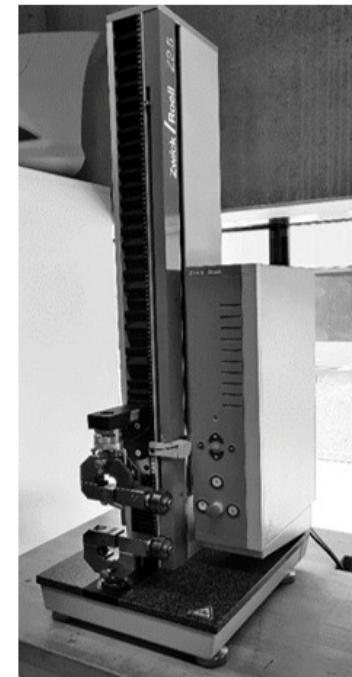
Tests

- Test of membranes at high temperatures in laboratory
- Test of membranes under real conditions
- Test of foams for insulation in the lid
- Test of material for weight pipes
- Test of fiber glass for in- and outlet
- Design solutions

Test of foams in heating chambers



Heating chamber - exposure in dry and damp heat



**Thank you for attention
Questions?**

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For further information