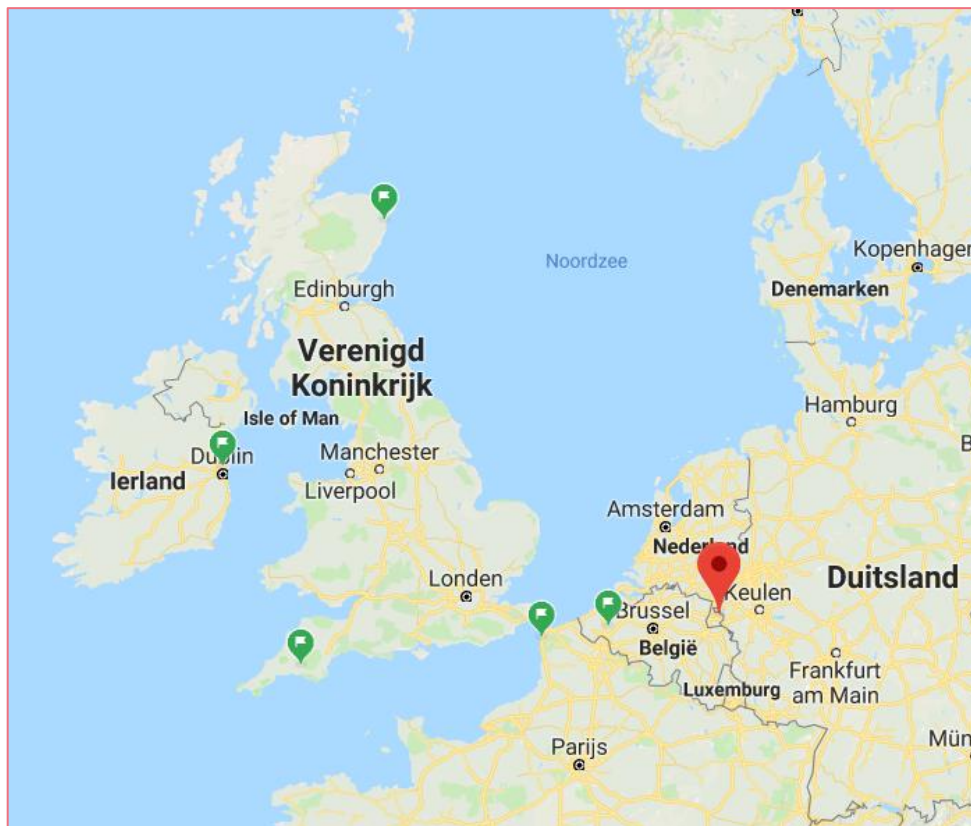


# MIJNWATER HEERLEN



MINE WATER, A BASIS FOR SUSTAINABLE ENERGY

[WWW.MIJNWATER.COM](http://WWW.MIJNWATER.COM)



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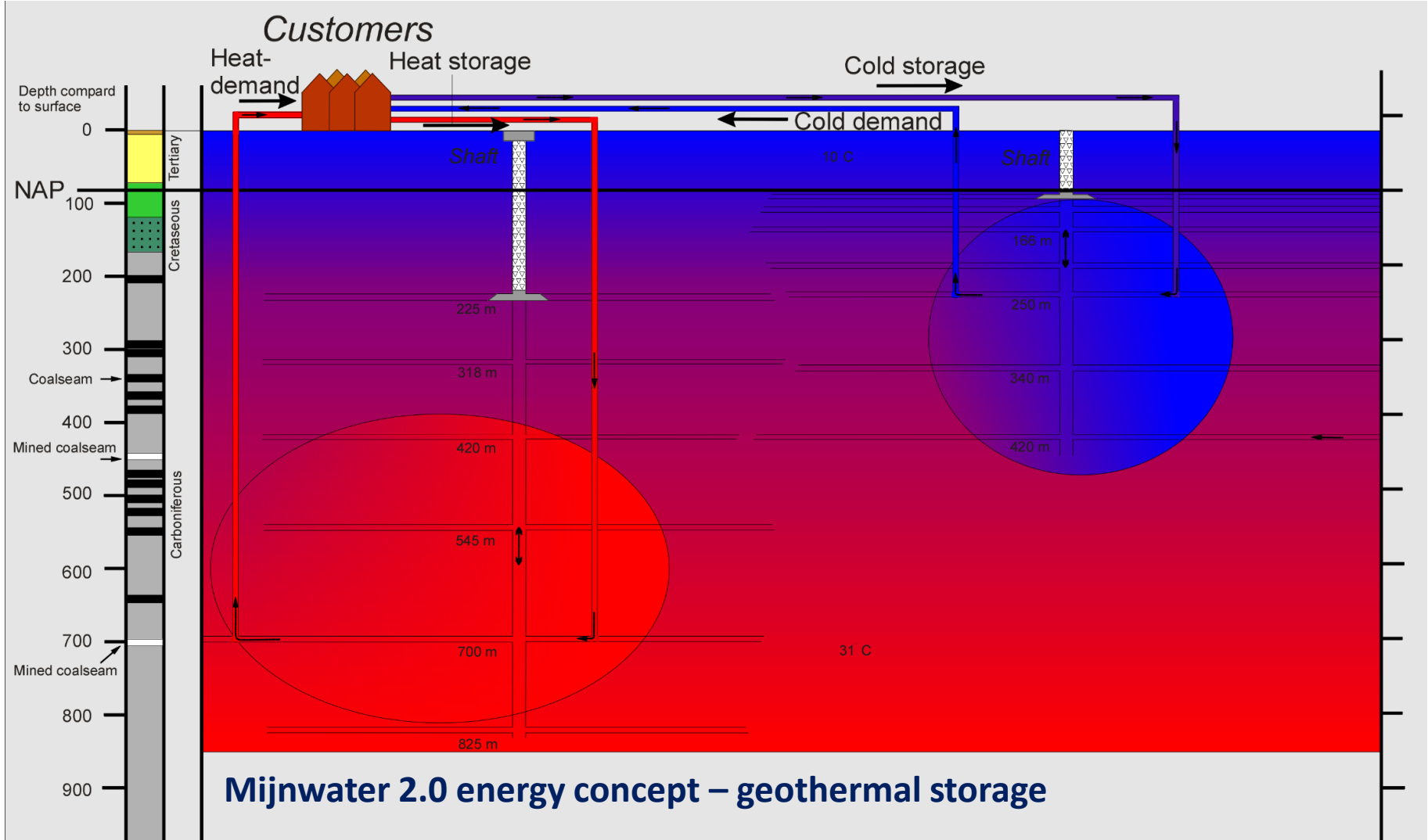
Like us on: [www.facebook.com/mijnwater](https://www.facebook.com/mijnwater)



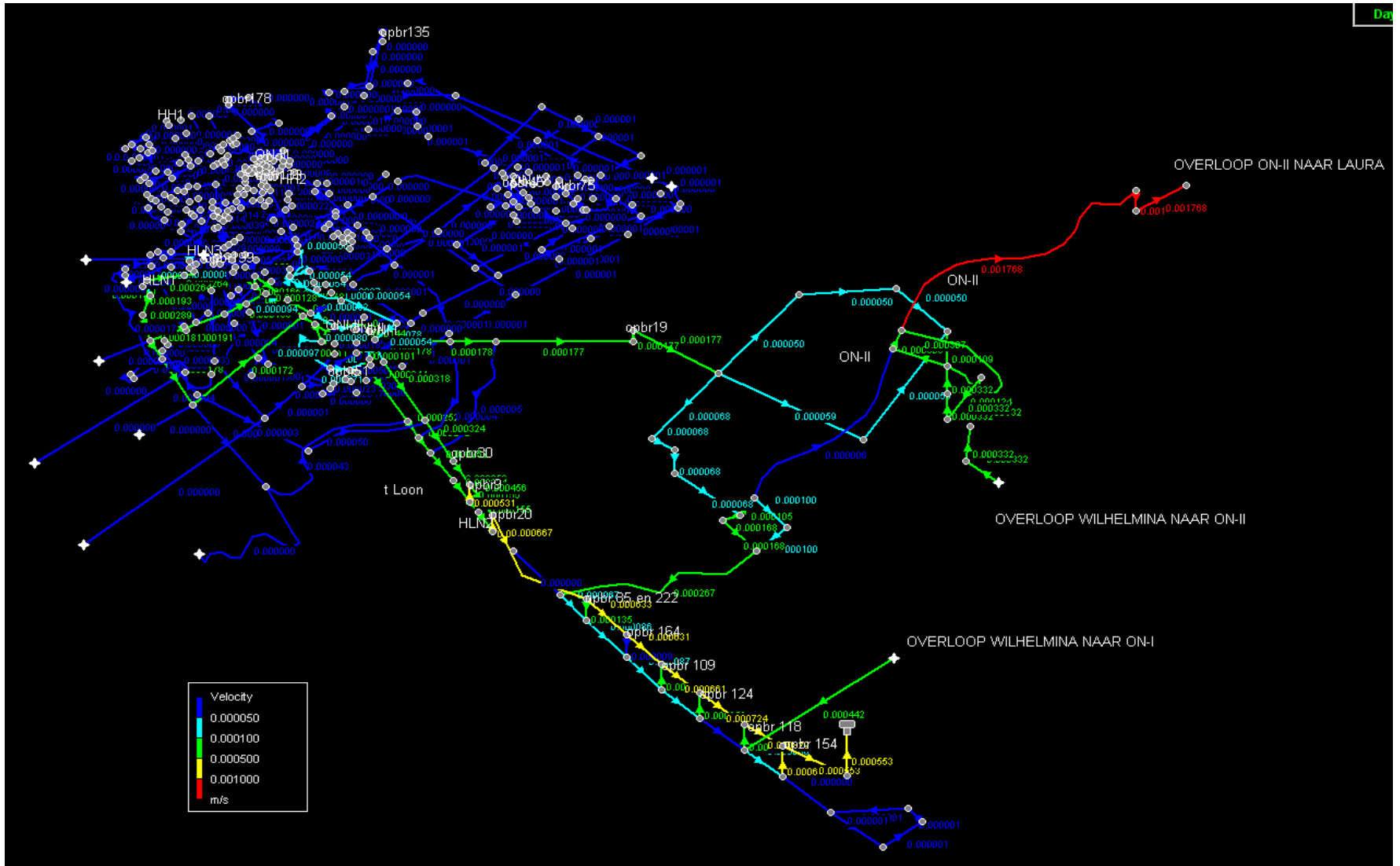
The SPONW project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 440993.



# Geothermal source & storage



# 3-D modelling of reservoir



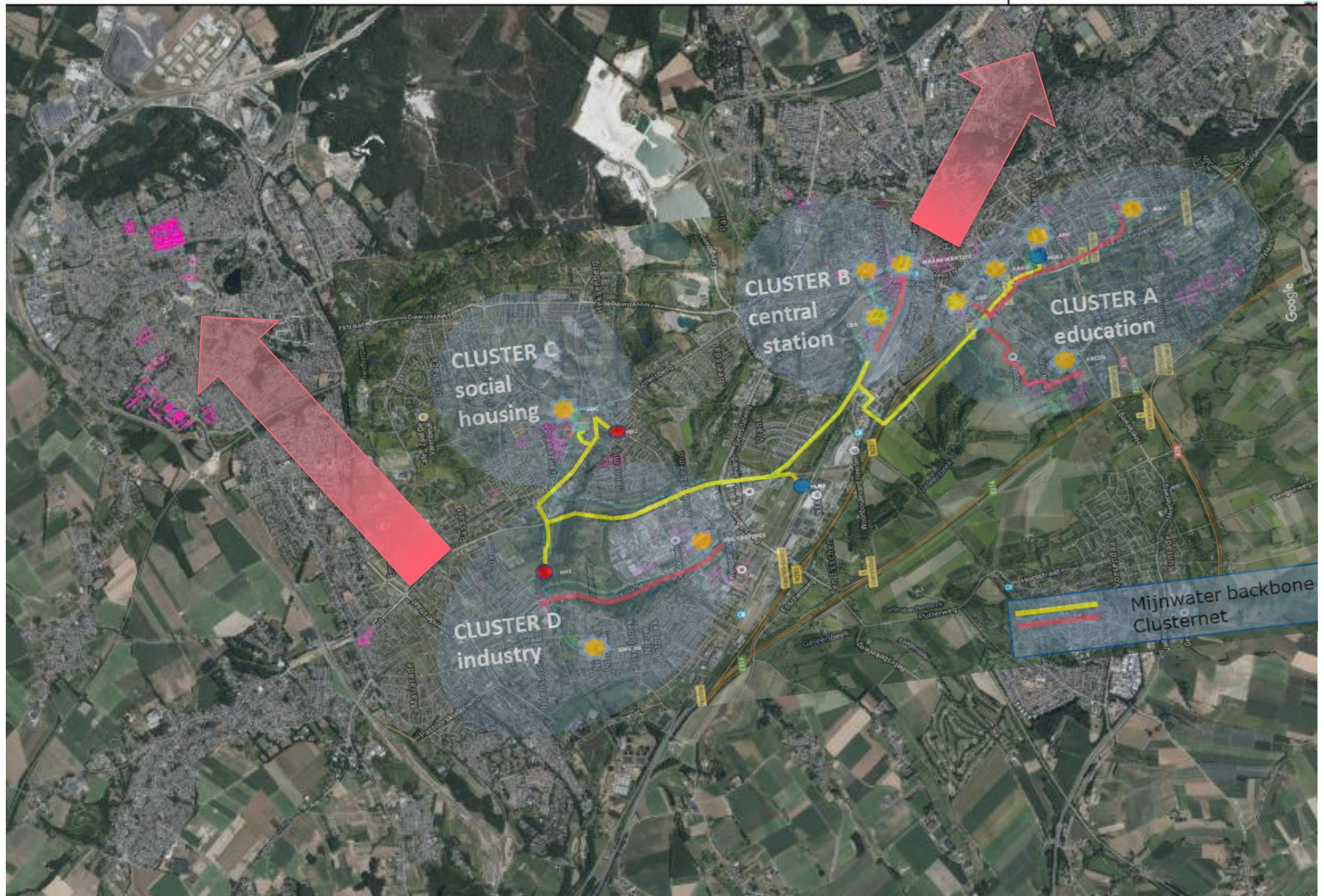


# Upscaling 2020-2025



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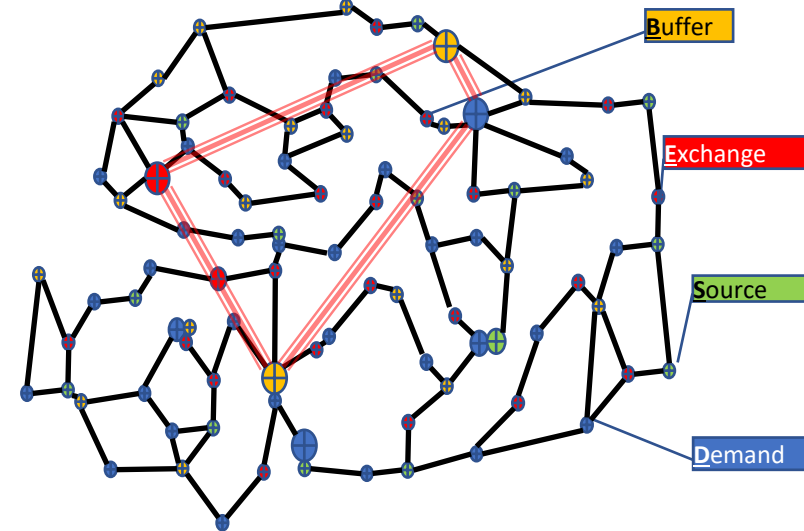
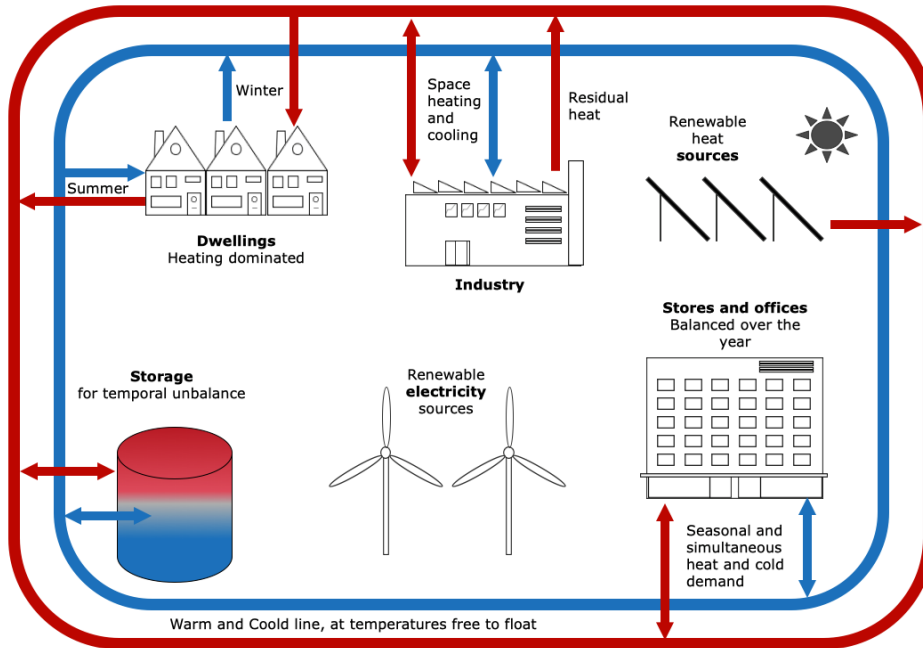


# Definition 5GDHC



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## 5th generation district heating and cooling

Five principles:

1. Closing the energy loop
2. Use low-graded (green) sources for low-graded demand such as heating of buildings
3. Decentralized demand-driven energy supply
4. Integral approach of energy chains
5. Utilise local sources as much as possible

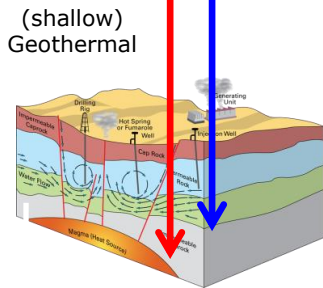
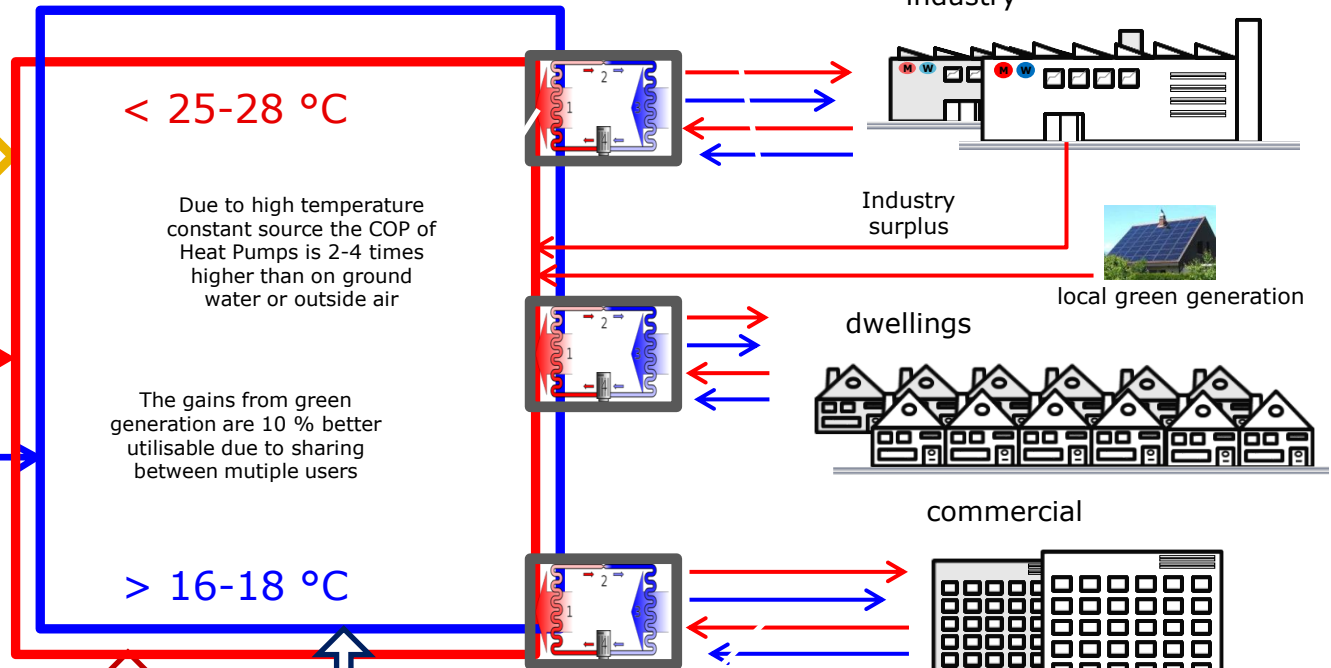


# 5G DHC Grid in Heerlen



The only needed external energy is electricity (gasless solution) which can be derived from green generation

Due to low temperature grid gains from datacentres, greenhouses, solar collectors, etc. are utilisable leaving from 28 °C



## Seasonal heat storage

Shallow geothermal buffering stores energy unendless up to 30 °C with minimal losses



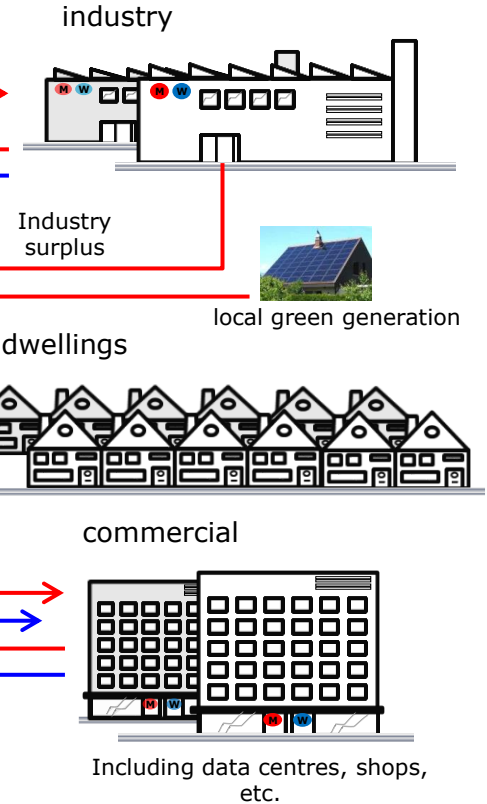
MT Heat storage



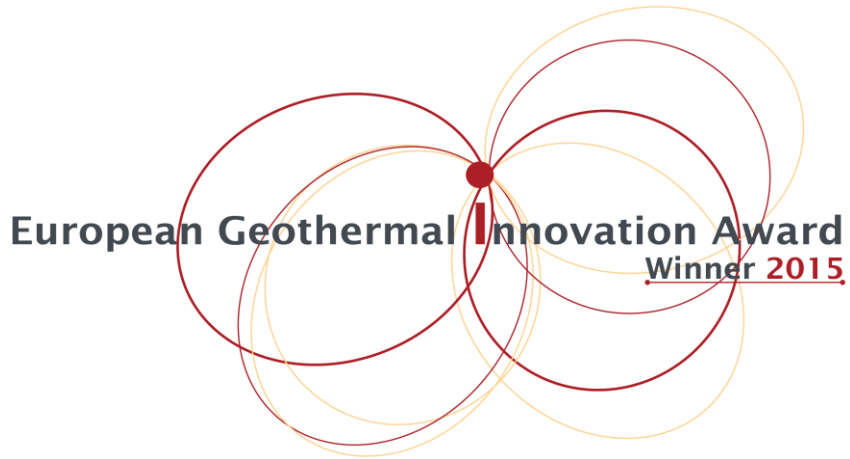
MT Cold storage

Modern buildings need 35 % cooling energy (in thermal flow) against 65 % heating energy. The grid enables exchange of these flows in time.

Mid term buffering in the area stores energy for months up to 130 °C with < 10% losses



# Prizes



# Developments



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1. Utilization of mine geothermal
2. Building a smart demand driven grid



## Smart control framework:

<https://www.storm-dhc.eu/en>



## Interreg HEATNET-NWE 6 pilots

<https://www.nweurope.eu/projects/project-search/heatnet-transition-strategies-for-delivering-low-carbon-district-heat/>



## LIFE Life4HeatRecovery

<http://www.life4heatrecovery.eu/en/>



## D2Grids: Rolling out 5GDHC

<https://www.nweurope.eu/projects/project-search/d2grids-increasing-the-share-of-renewable-energy-by-accelerating-the-roll-out-of-demand-driven-smart-grids-delivering-low-temperature-heating-and-cooling-to-nwe-cities/>



## ReWardHeat: Renewable and Waste Heat Recovery for Competitive District Heating and Cooling Networks

<https://cordis.europa.eu/project/rcn/224317/factsheet/en>



## CAGE: Development and demonstration of several cost-saving and output-improving installation technologies

<http://www.geothermica.eu/projects/cage/>



# Powered with Mijnwater energy



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# Decentral energy plants



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# Prefabricated energy stations



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**MIJNWATER**  
INITIATIEF VAN *gemeente* HEERLEN

365/24 LEVEREN VAN *warmte* OF *Koude*.

WARMTE- en *KOUDE*VRAAG HEBBEN EEN *kleine* *piek*

OPNIEUW *Schachten* GEBOORD

SYSTEEM OMGEZET VAN AANBOD- NAAR *VRAAG-gestuurd*

verbruik METEN KOST GELD  
20°C  
zonder METEN IS GOEDKOPER LEVEREN

250.000 INWONERS

ENERGIE-neutraal IN 2040

CLUSTERNETTEN

ZELFLERENDE SYSTEMEN

CLUSTERNETTEN

MIJNSCHACHTEN VOL MET *water*

EEN KLANT DIE VRAAGT IS DOEK METEEN EEN *producent*

HIJ KRYGT GEGARANDEERD EEN LAGERE PRIJS

	CONVENTIONAL	MIJNWATER	MIJNWATER FUTURE
FOSSIL	24250	9503	0
HEATLOSS	37250	5750	0
H-STORAGE		16833	16033
CO <sub>2</sub>		-60%	-100%
HEATLOSS		-85%	-100%

DOOR BACKBONE ≥ 5-VOUDIGE *opbrengst*

ONDERGRONDSE *thermoskan* OM PIEKEN OP TE VANGEN

WAT DOET 'N *klimaat* systeem MET *GEZONDHEID*

temperatuur KAN OBESITAS BEÏNVOEDEN

BETREKKEN *LOKALE onderwijs- en onderzoeks-INSTELLINGEN*

PALET

CREËREN VAN: *werk-GELEGENHEID* en *energie-ONAFHANKEL'KHEID*

Slim MANAGEN VAN *warmte* EN *koude* KAN IN PRINCE OVERAL

DE MIJNEN ZIJN EIGENLIJK NIET MEER NODIG

PRESENTATIE 24 NOV 2015 HEERLEN

PARKSTAD LIMBURG ENERGIE-TRANSITIE

NEW BUSINESS

KaapZ.NL

