Building infrastructure for LT-waste heat in 5g-DHC grids
Content

➢ Our story – short review of Mijnwater history

➢ Mijnwater 3.0 - 5th generation DHC

➢ Upscaling as cornerstone of energy transition

➢ Mijnwater@Work

➢ Questions?

Herman Eijdems
Innovation manager
Mijnwater B.V. Heerlen
h.eijdems@mijnwater.com

Twitter: @heatnet_nwe https://twitter.com/heatnet_nwe
LinkedIn: @heatnet nwe https://www.linkedin.com/company-beta/11088687
Facebook: @heatnetNWE https://www.facebook.com/heatnetNWE/

Mijnwater B.V. is Pilot partner in HeatNet-NWE supported by Interreg North-West Europe
Shallow geothermal heat
Flooded Shafts and Galleries approx. 1/40 of coal production (voids 1/12)
MIJNWATER HISTORY

Underground reservoir 8 million m³ water

1 liter = 14 Wh ($\Delta T=12$)
5.7 m³ water = 1 Tesla
Thermal storage of minewater in Heerlen = 1.4 million Tesla's
MIJNWATER HISTORY

Mijnwater 1.0 energy concept – geothermal source

Customers

Depth compared to surface

NAP

Coalseam

Mined coalseam

Carboniferous

0

100

200

300

400

500

600

700

800

900

Winter

Summer

Infiltration

Shaft

Shaft

10 °C

165 m

250 m

340 m

420 m

625 m

700 m

31 °C

Interreg
North-West Europe
HeatNet NWE

European Regional Development Fund
Mijnwater 2.0 energy concept – geothermal storage
MIJNWATER HISTORY

CLUSTER D
industry

CLUSTER C
social housing

CLUSTER B
central station

CLUSTER A
education

Serving 4 clusters with 200,000 m² buildings in public area
MIJNWATER 3.0 5th generation DHC

Phasing out fossils by green sources, intelligent and time control
Total Energy Consumption of an average dwelling is covered by 10 m² solar irradiation
MIJNWATER 3.0  5th generation DHC

Right place!

Right moment!

Right temperature!

Ambitiegrafiek Energietransitie Parkstad Limburg

Sheet nr. 12 | Oct 3, 2018 | © Mijnwater B.V.
MIJN WATER 3.0 5th generation DHC

5g DHC grid in Heerlen

industry

industry surplus

dwellings

local green generation

commercial

Including data centres, shops, etc.

(shallow) Geothermal

Seasonal heat storage

< 25-28 °C

MT Heat storage

MT Cold storage

> 16-18 °C

electricity

Dwellings

Electricity surplus

Including data centres, shops, etc.

Interreg North-West Europe HeatNet NWE

European Regional Development Fund
MIJNWATER 3.0 5th generation DHC

Mijnwater Artist Impression
3 aggregation levels
MIJNWATER 3.0 5th generation DHC

Actual Energy-Demand

Step 1. savings

Remaining energy-demand

+ LT waste heat

cooling

Step 2. Heat regained from cooling + waste heat

Additional supply from heat pumps

Circular regain of cooling/heating

Step 3. Heat generation with a CoP > 5

Electricity heating

Electricity cooling
MIJNWATER 3.0 5th generation DHC

- Optimise efficacy on each level
- Energy consumption
- Investment in buildings for energy saving
- Investment in regional provisions for energy saving

Investment
MIJNWATER 3.0 5th generation DHC

Investmentspace = €19/GJ

National Gas Consumption for dwellings:
310 PJ/year

Investmentspace:
€ 5,9 Billion per year

Within 30 years:
€ 100 Billion

€ 14.500,- per dwelling +
€ 4.000,- of avoided costs for CV boiler etc.
(7 million dwellings)

(National) Business Case
Parkstad Limburg:
• 250,000 Inhabitants
• 8 Municipalities
• 211 km²

Carbonneutral 2040

Energy consumption 2014/a:
• Total 29,6 PJ; 550 M€
• Buildings: 66%; 360 M€
• Dwellings: 37%; 200 M€
• 4% RES

98% of expenditure outside the region
Expansion Heerlen, cluster B

- **MIJNWATER UPSCALING**
- **Wonen Limburg** - Divers 389 won - 2023
- **Aurora 221 appt** - 2020
- **Grasbroek 80 appt** - 2019
- **Praktijkschool** - 2019
- **Belastingkantoor** - 2020
- **Carbon 6** - 2020
- **Picture of clustercentrale**
- **CBS incl datacenter BD** - 2021
- **SSC**
- **App. LTM weg** - 2023
- **Molenwei Weller** - 172 appt - 2020
- **Wonen Limburg** - Weller Zeswegengebied 500 won - 2021/2023
- **Wonen Limburg** - Wonen Limburg Divers 389 won - 2023
- **Belastingkantoor** - 2020
- **Maankwartier**
- **Maanstaeete** - 2019
- **App. LTM weg** - 2023
- **Molenwei Weller** - 172 appt - 2020
- **Wonen Limburg** - Weller Zeswegengebied 500 won - 2021/2023
- **Belastingkantoor** - 2020
- **Maankwartier**
- **Maanstaeete** - 2019
Expansion Heerlen, cluster C

- De Wieer 60 apt b – 2019/2020
- De Kom 153EG – 2019/2020
- Magistraat 32 won - 2019
- Schuttersweide 100 won - 2022
- Rennemig Weller 96RaR -2020
- Wonen Limburg Divers 153 won - 2023
- Vrieheide 994EG - 2020
- Heerlerheide Centrum

Expansion Heerlen, cluster C

- MIJNWATER UPSCALING
- © Mijnwater B.V.

Interreg North-West Europe
HeatNet NWE
European Regional Development Fund
Expansion to the city of Brunssum

- 194 flatwoningen Europalaan 487-835
- 32 appartementen Radar Europalaan
- 92 flatwoningen Henri Dunantstraat 351-517
- 140 flatwoningen Henri Dunantstraat 519-773
- 60 portiek etage appartementen Ridderbuurt
- 182 woningen Wonen Limburg diverse locaties
- 20 patiobungalows Tarcisius
- 138 eengezinswoningen Egge
- 52 appartementen Savelbergstraat
- 36 woningen Wonen Limburg diverse locaties

MIJNWATER UPSCALING

Interreg North-West Europe
HeatNet NWE
Expansion to the city of Kerkrade
Mijnwater Wells
Pressure and bufferinstallations
Clusterbasement
**Sector-energy provision**
- 150-200 dwellings
- 2*twinpipe-system
- T-traject 30/15 en 45/30
Connecting high rise buildings
Connecting high rise buildings
Storage Vessels 70 m³
New Skid Cluster D
Trespassing local barriers
Trespassing local barriers
Building Connections
DISTRICT HEATING AND COOLING
A SUCCESS FOR THEIR FUTURE