

# Achtergronden Geothermie

**Victor van Heekeren**

**6 april 2011**

# Stichting Platform Geothermie



## Long History – but not in Holland

Hot springs and ‘Thermae’ during several thousand years.

Top : Thermae, Termini, Sicily (It)

Left : Chaudes-Aigues, Auvergne (Fr): city heating grid constructed in 1400 AD.

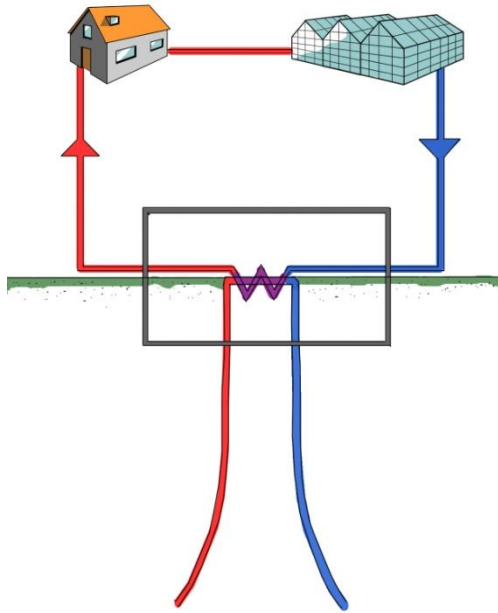


Below : first ‘industrial’ production of geothermal energy started in 1904 in Lardarello (Toscane, It).



After unsuccessful earlier attempts in the Netherlands a new start was made in 2002

# Stichting Platform Geothermie



## SPG

Established in 2002

Public Private effort (NGO)

Objective: development of **deep** geothermal

National focal point for geothermal energy

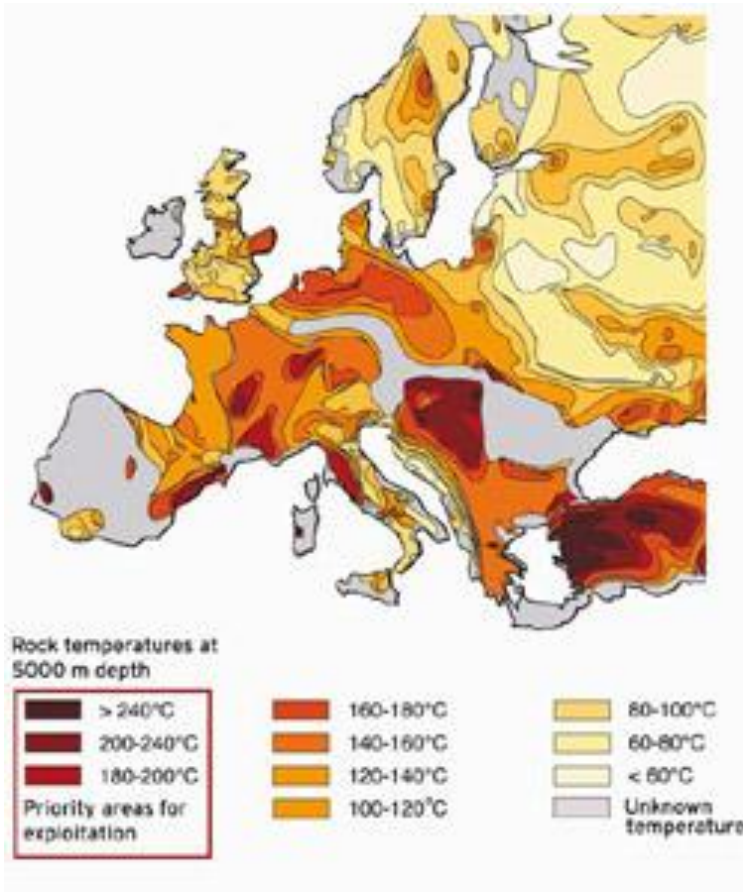
Current 'membership' > 60

International activities:

SPG is 'Association Member' of EGEC

SPG has an affiliation contract with IGA

# Stichting Platform Geothermie



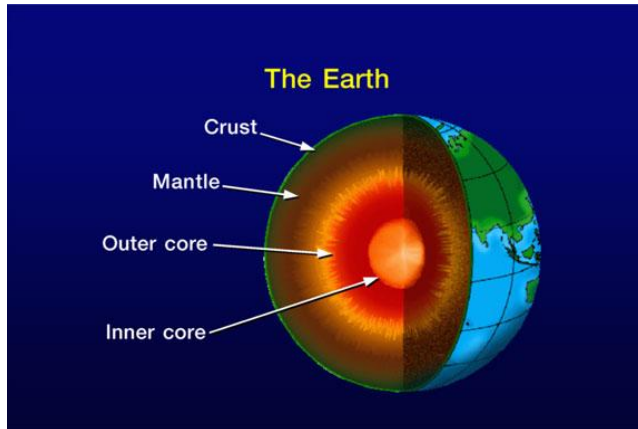
Rock temperatures at 5 km depth

## Geothermal Energy

- 1) Definition
- 2) Current state of development
- 3) Drivers & constraints
- 4) Priorities & agenda

Note: geothermal map of Europe

# Stichting Platform Geothermie

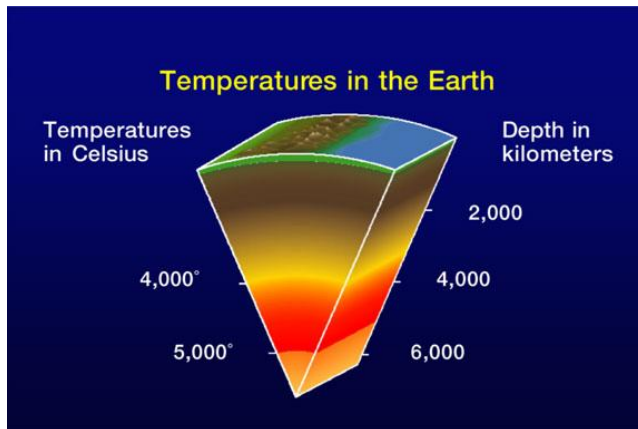


## Source(s)

99% of the Earth is – on average - warmer than 1.000 °C.

Temperatures increase  $\pm 31$  °C per km.

Heat is generated by naturally occurring nuclear processes (radioactive decay of Uranium, Thorium, Potassium etc.) in the Earth inner core and emitted to the crust.



The heat flux is an average of 0,063 W/m<sup>2</sup>. This seems modest but this is equivalent to approximately 100 PetaJoule/year in the Netherlands (equivalent of 4 mln energy efficient houses).

# Stichting Platform Geothermie



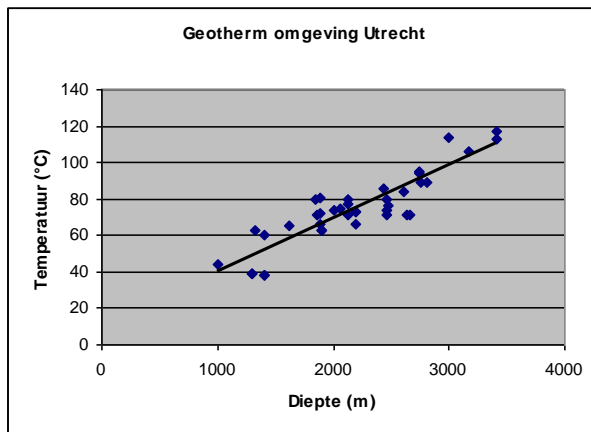
## Definition of 'The Heat under our Feet'

'Geothermal Energy is the energy in the form of heat beneath the surface of the solid earth'

(accepted by the EP in 2008).

Therefore 3 'sources' (by definition)

- Stored heat
  - Heat Flow (NI :  $0,063 \text{ W/m}^2 = 100 \text{ PJ/yr} =$  equivalent of 4 mln new EE houses)
  - **Heat in Place (NI : 38.000 PJ)**
- (one new energy efficient – EE - house consumes less than 25 GJoule per year)



# Stichting Platform Geothermie



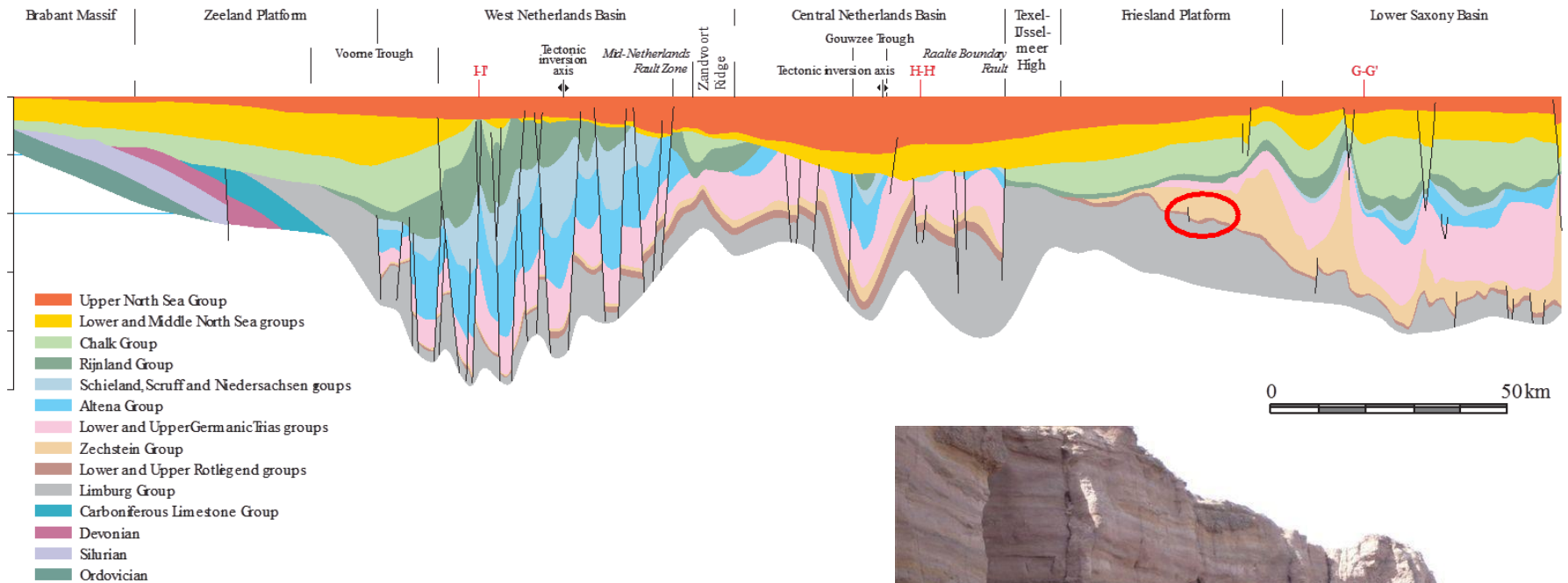
Eon	Era	Periode	miljoen jaar geleden
F a n e r o z o ï c u m	Cenozoïcum	Neogeen	23
		Paleogeen	
	Mesozoïcum	Krijt	65
		Jura	146
		Trias	200
		Perm	251
		Carboon	300
	Paleozoïcum	Devoon	359
		Siluur	416
		Ordovicium	444
		Cambrium	488
	Precambrium		542

Evolutie.EU



# Stichting Platform Geothermie

## ZW-NO Doorsnede van Nederland

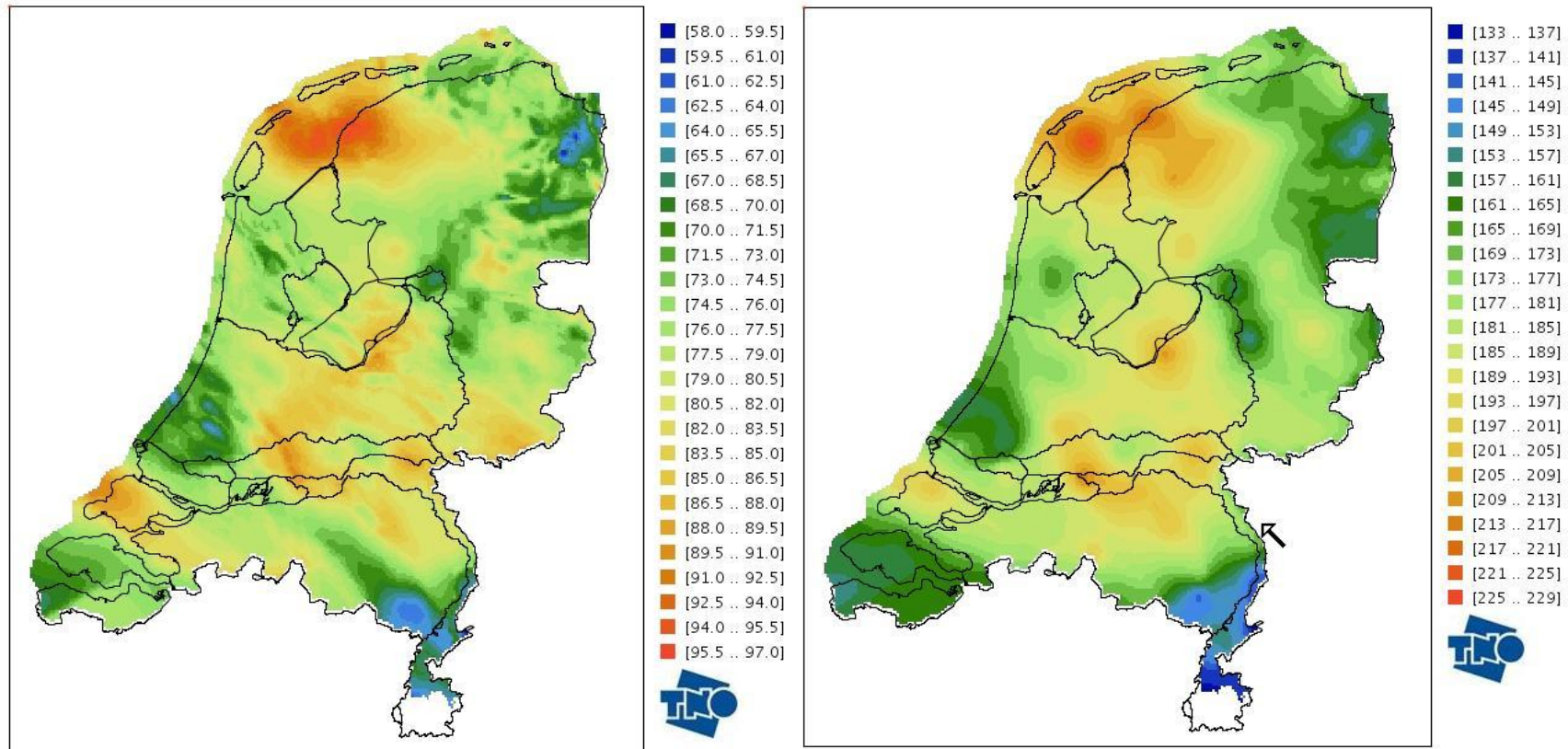


 = Koekoekspolder



# Stichting Platform Geothermie

Temperatures in the Dutch sub-soil at depths of 2000m (left) en 5000m (right); source: ThermoGIS (TNO).



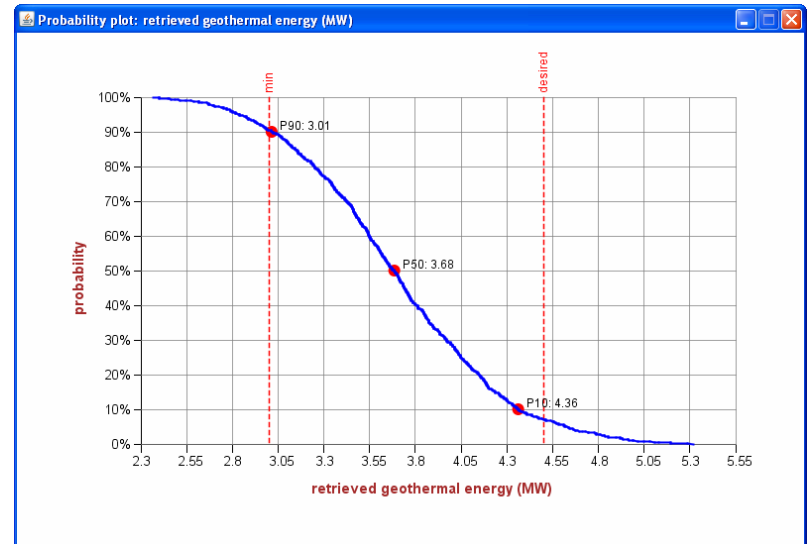
# Stichting Platform Geothermie



## Thermal capacity of wells

Function of (a.o.):

- Permeability
- Thickness of Sandstone layer
- Temperature



# Stichting Platform Geothermie



## Where are we now?

### Horticulture :

- 4 completed wells with a combined capacity of roughly 24 MW<sub>th</sub>
- 1 new well will start drilling soon

### Housing projects :

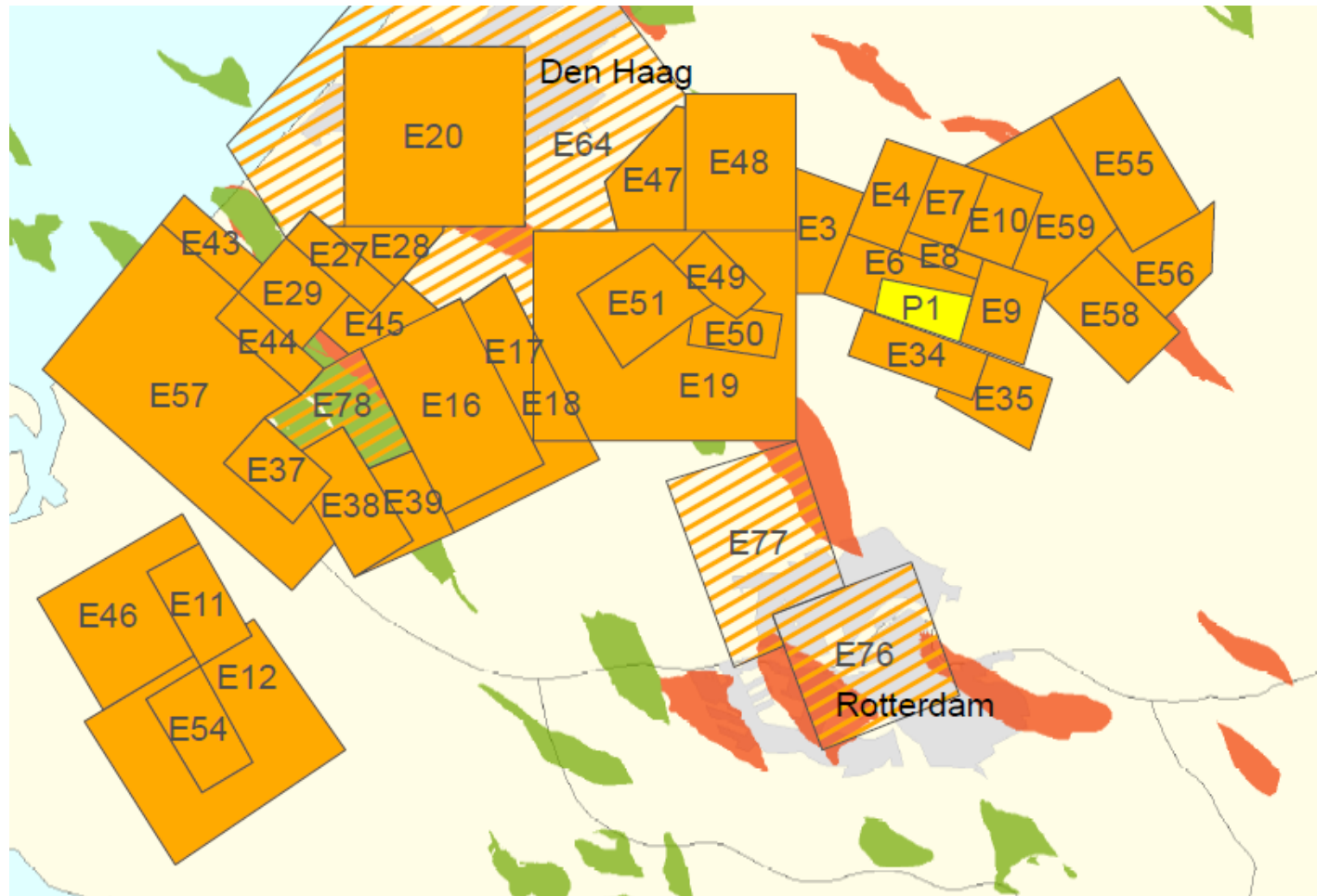
First (deep) geo-heating grid under construction; drilling of wells was completed and tested in 2010 (The Hague project, 4.000 houses). Capacity will be 6 MW<sub>th</sub>.

Electricity : - (various initiatives)



# Stichting Platform Geothermie

**However : realisation levels modest compared to licence applications**



# Stichting Platform Geothermie



High potential but:

- Financial crisis, low fossil fuel (gas) prices and weak markets for horticultural products
- Dutch guarantee scheme not (yet) successful
- Insufficient policies & instruments for major markets



# Stichting Platform Geothermie



## Overall perception of policy progress and policy perspectives:

‘Warm feelings’ and high expectations

### However:

a) ‘Warm feelings’ and high expectations are often (erroneously) based on the assumption that things will sort themselves out without actual government action.

b) Developments in policy and legal framework are sometimes a bit slower than hoped for.

# Stichting Platform Geothermie



## Policy developments

**Pro:** growing perception that  $\pm 40\%$  of our national energy demand is low temperature heating, which is possibly best addressed by geothermal energy.

**Contra:** general trends in government spending for energy & environment.

# Stichting Platform Geothermie



## Priorities & SPG Agenda:

### Legal

- Mining Act review
- Heat Law
- Moratorium

### Financial instruments

- UKR/EOS/MEI ?
- Guarantee scheme
- SDE+
- Financing fund

### Various [vision(s) & roadmaps]

- Targets (versus NREAP's)
- Technical issues
  - Very deep and unconventional plays
  - Potential for existing buildings

# Stichting Platform Geothermie



Distributiepomp

interface/afleverset



## Conclusions:

- Progress not half bad for 'a new kid on the block' which geothermal in fact is - in the Netherlands - and this explains some of the weaknesses in the Dutch Legal Framework.
- Potential & perspectives for further development and implementation are promising.
- A sound Legal Framework – including government attitude and policies - is crucial for this development.
- Speed of change of this regulatory framework could be improved.

# Stichting Platform Geothermie



Energy from the Earth : the Sky is the limit

Stichting Platform Geothermie

Victor van Heekeren

Jan van Nassastraat 81

2596 BR Den Haag

Tel ; (+31) (0) 70 3244043

[www.geothermie.nl](http://www.geothermie.nl)

[Info@geothermie.nl](mailto:Info@geothermie.nl)

Twitter : @geothermie\_nl

LinkedIn : Platform Geothermie (NL)