The rise of ATES in the Netherlands
The Netherlands

- 16,000 square mile
- 16.8 million habitants
- Land reclamation
- Gateway to Europe
- Innovation and adaptation
- 3rd Foreign investor in U.S.
- 2nd Exporting country in agriculture
Sea Level Rise a threat to the U.S.
City Energy Problem

• 41% of electricity in the US is used for heating/cooling buildings

• 51% of all freshwater usage in the US is used for producing electricity

• Peak-power consumption accounts for 50% of the electricity bill for buildings
A commercial energy efficiency solution

Technology

Benefits

• 40% reduction of heating energy consumption
• 65% reduction of cooling energy consumption
• 90% of peak power reduction
• Pay-back is 4-8 years
• Proven technology 2500+ systems deployed
Generalised building energy demand based on climatic data 1976-2000

Legend
- A Mainly cooling demand
- B Prevailing cooling demand
- C Heating & cooling demand
- D Prevailing heating demand
- E Mainly heating demand
90’s obstacles to implement ATES

- Developers
- End-users
- Government
What has been done?

European Union Policy Instruments:

  *Introduction energy certification schemes*

  *State specific target on renewable energy*

  *Remove barriers in supply and use of energy*

Dutch Policy Instruments

• Promotion

• Protection
Dutch Government Structure

**National level**
- Ministry of Internal Affairs and Kingdom Relations
  - Building regulations

**Provincial level**
- Ministry of Infrastructure and the Environment
  - Soil, Water, spatial planning
  - Supervision of regional water authorities (RWAs)
  - Groundwater regulation
  - Co-ordination with other regional policy areas

- Provinces (12)
- Municipalities (393)
  - Local spatial planning
  - Local permits

**Municipal level**
- Regional Water Authorities (24)
  - Operation/management of regional water systems
  - Water quality & water quantity

- Ministry of Economic Affairs
  - Climate change, sustainable energy
Dutch Policy Instruments

Promotion

• Energy Performance Coefficient (EPC)
  Requirements for energy efficiency

• European Energy Performance of Buildings Directive (EPBD)
  Energy Performance Certificate when selling/renting

• Dutch Energy Performance Norm for Buildings (NEN 7120)
Dutch Policy Instruments

Protection to prevent negative effects
• On ecology
• On interest in the surroundings of an ATES system
• Due to interference with other geo-energy systems
Dutch Acts

• National Water Act
• Soil Protection Act
• Environmental Management Act
• Environmental Licensing Act
• Provincial Environment Regulations

• Geo Energy Systems Amendment
Geo Energy Systems Amendment

• Planning improvement
• Quality and Reliability
• Unifying permitting process
• Shorten procedures
Online ATES Tool

- Online access
- Realized ATES systems
- ATES opportunities
  - Policy
  - Permitting
  - Expected investments
  - Pay-back times
Gemeente Den Haag (werkversie)

(Potentiële) warmtebronnen en leidingen

Geothermielebron
Lage temperatuurbron
Warmtecentrale op gas
Geothermielebron
Lage temperatuurbron
Biomassacentrale

Leidingen
- Ringleiding
- Effluentleiding Hoogheemraadschap
- Stadsverwarming (120-70°C)
- Stadsverwarming (90-70°C)
- Geothermieleiding (70-40°C)
- Rivierwaterleiding Dunea
- In aanleg
- Mogelijke tracées Metropool
- PCM duwboot

Studiegebieden
Temperatuur netwerk
- 100-70
- 70-40
- 60-30

Kernwijken
1. Scheveningen Haven
2. Wittebrug
3. Omgeving ICC
4. Bentpondhout
5. Mariahoeve
6. Centrum, ERDH
7. Vrederust
8. Laakhaven
9. Segbroekkant
10. Loosduinen

Gemeente Den Haag
Derde Studiedag: Ontwikkeling Stadsbouw & Planologie
Datum: 10-11-2014
What are the results?

Figure 2-6 Number of energy storage projects in the Netherlands and prospects until 2020; prognoses based on yearly grow during the last five years [8]
Contact us

• If you are a developer

*Share your plans/drawings and receive a business analyses comparing traditional and ATES set up*

• If you are a policy maker

*Join the G2G Program including site visit in NL*

• If you a researcher

*Join the Knowledge Exchange Program with Deltares, TNO, TU Delft*
Further reading

• [www.dutch-ates.com](http://www.dutch-ates.com)
  • Dutch Policy on ATES systems
  • Combining climatic and geo-hydrological preconditions as a method to determine world potential for aquifer thermal energy storage

ATES Integrated Approach

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<thead>
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<th>Single Building</th>
<th>Between Buildings</th>
<th>Area development</th>
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<tr>
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