

MINUTES of Meeting

Title	Minutes of the first workshop on design and system integration
Place	GZB, Bochum, DE
Date	2018.11.23
Prepared By	VITO-Allaerts
Purpose of Meeting	Project Deliverable 3.1

Agenda:

1. France (BRGM and Storengy)
2. Belgium (VITO and NODA GmbH)
3. Switzerland (Unige)
4. The Netherlands (TNO)
5. Germany (GZB and Delta-h)

Participants:

Name	Company
Charles Maragna	BRGM
Charlotte Rey	Storengy
Fleury De Oliveira Filho	Uni Geneva
Florian Hahn	GZB
Frank Wilschut	TNO
Jan Erik Nielsen	PlanEnergi
Kay Alwert	NODA
Koen Allaerts	VITO
Luca Guglielmetti	Uni Geneva
Maartje Struijk	TNO
Mart Kivikas	NODA
Martijn Clarijs	TNO
Patrick Egermann	Storengy
Reza Sohrabi	Uni Neuchatel
Thomas Vangkilde-Pedersen	GEUS
Torsten Seidel	Delta-h
Virginie Hamm	BRGM

Workshop highlights and summary:

1. France, BRGM and Storengy

Presenters: Charlotte Rey (Storengy) and Charles Maragna (BRGM)

The French demo in Paris demonstrates a BTES system with solar thermal collectors for delivering heat to office buildings. They will develop a simulation model for the BTES with lateral heat recovery boreholes. The maximum temperature of the storage is 40°C according to French authorities. Several scenario's will be evaluated in order to determine the optimal system design and integration in the existing buildings.

Questions and suggestions from other project partners:

- The design supply temperature of 70°C is very high for ground-coupled heat pumps, this should be investigated further.
- A monitoring campaign is advised by the project partners in order to get a clear overview of the heat demand of the buildings, the necessary temperature for heating and domestic hot water consumption.
- Analyze other scenario's with regards to domestic hot water production, e.g.:
 - o Hot tapwater production with electric boilers and low temperature district heating system.
 - o Domestic hot water production with preheating by the low temperature district heating and additional electric heating.
 - o ...
- Experience from other partners for BTES simulations:
 - o Trnsys
 - o Modelica
 - o EnergyPlus

2. Belgium, VITO and NODA

Presenters: Kay Alwert (NODA GmbH) and Koen Allaerts (VITO)

The Belgian demo in Mol demonstrates demand side management on building level at a geothermal district heating system. A smart controller will be implemented in 8 buildings in order to use the thermal mass of the building as thermal storage for peak shaving. In addition the return temperature to the geothermal power plant will be reduced. The principle of the controller was explained by NODA.

Questions and suggestions from other project partners:

- The suggested approach of influencing the outdoor temperature sensor of the building offers some drawbacks. For instance domestic hot water production can offer limitations especially in buildings with low temperature heating systems (like underfloor heating) -> Ultimately an integrated approach (in the building's BMS) is the best solutions and offers most flexibility and options for peak shaving and lowering the return temperatures.

3. Switzerland, UniGE

Presenters: Luca Guglielmetti (Unige)

At the Geneva pilot site a high temperature ATES system is investigated.

At the Bern pilot project an underground heat storage for seasonal storage of waste heat from the local power plant and geothermal heat is investigated. The heat from the storage will be reinjected in the district heating system. Two options are evaluated: direct injection at high temperature in the supply and injection in the return of the district heating system at lower temperature.

4. The Netherlands, TNO

Presenters: Martijn Clarijs (TNO) and Frank Wilschut (TNO)

In the North of the Netherlands at ECW a high temperature ATES system will be demonstrated. A district heating system distributes geothermal heat to a local greenhouse cluster and the idea is to increase the share of geothermal heat in winter by storing excess heat in the ATES system in

summer. The demonstration site will be used as case-study for the Chess and Heatmatcher model (simulation models to optimize thermal grids) taking into account specific information like measurement data, heat demand profiles, infrastructure typology and thermal grid layout.

5. Germany, GZB and Delta-h

Presenters: Florian Hahn & colleague (GZB) and Torsten Seidel (Delta-h)

At the GZB site in Bochum, Germany, an abandoned coalmine will be used to store low-temperature heat that is generated by solar thermal collectors. The shallow mine is flooded with water since it was abandoned in the 50s. GZB together with Delta-h made detailed dynamic thermal simulations in order to find the most suited injection and extraction points for maximizing the storage capacity. In a second phase they will investigate the potential to connect the storage to their office buildings which are heated and cooled with a BTES system. There is a large replication potential in the area since it was an important mining region. The presentation also included a site visit to the drilling site and to the boiler room with the geothermal heat pump system of the GZB building.