Ministerie van Economische Zaken

Kas als Energiebron

LTO Glaskracht Nederland

MEMO

By : Frank Schoof
To :
Date : April 28, 2016
Subject : New (third) call Kennisagenda Aardwarmte

Contract-management

Many geothermal projects in The Netherlands are being developed by the parties that will also use the heat produced (groups of horticulturalists, municipalities/district heating companies). Much of the necessary specialised knowledge and experience is not available from within these groups but has to be found elsewhere. This leads to the need of clear agreements, especially on an operational level: who does what and when, who is responsible and who is liable? The holder of the exploration or exploitation permit ('the operator') has to be in control to reduce failures and costs and increase safety.

Kennisagenda wishes to support the industry (future operators) by proposing a structured framework of contracts and/or checklists, based on the Dutch regulation and situation concerning the construction- and exploitation- process.
The proposition could contain the following steps:

- Enumeration of the required disciplines (design, doublet-construction, construction of surface-equipment, maintenance of the doublet, maintenance of the surface equipment)
- Establishment of the relations and interfaces between the parties involved, including transfer of responsibilities and liabilities. Including HSE. For both exploration and exploitation.
- Investigation of possible standardisation. (contracts/ modules, checklists). In English where appropriate, in Dutch where useful.
- Standardisation of relevant non-operational agreements, such as "unitisation agreements" and "Notitie bijvangst koolwaterstoffen". To be considered and suggested as an option.

To enhance implementation, we envisage a report in Dutch, with English parts where needed. (like the contracts/ checklists.) We are aware of the international standards and examples, like IADC. These are useful, but not tailored for the Dutch geothermal situation. A sound legal background is probably necessary for this topic.

Basic asset-management

Whereas the topic 'contract-management' focusses on the responsibilities et cetera of the parties involved in a geothermal project, this issue focusses more on technical matters and operational situations.

Setting up a businesscase for a geothermal project requires sufficient insight in both the drilling ánd the exploitation phase. Although the exact surface-installation depends on the results of the drilling much can be planned and estimated in advance. This includes (collecting and setting up) the necessary knowledge and organisational structure.
What types of equipment is suited for the site?
Who will operate and maintain them?

Who will supervise and set the (safety) standards (based on DAGO HSE standards), what type of skills are necessary?
What (safety) standards apply in the operational phase?
A part of these questions is site-specific and can only be answered áfter drilling, a big part however is generic. The generic plan should give the basis for the organisation, the operating-standards and (thus) the safety and costs.
Operators joined in DAGO have set up pragmatic knowledge exchange (on issues like NORM, maintenance of seals, decommissioning, optimisation HEX's). Kennisagenda-projects should enable DAGO to come to standardisation. The study should therefore not (only) clarify the theoretical framework, but also give O&M management tools that help experiences to be easily shared and generalised. A kick-off with at least representatives of DAGO and SSM should specify the exact demands, scope and priorities for this study. Following well accepted standards (ISO55001 or others) may prove useful to develop the plan. In this way organisational aspects ('Management of change', interruptions) are addressed.
Experience from the other countries and the oil & gas industry (sized to the geothermal scale and – situation) is seen as valuable, to avoid theoretical exercises. Language is to be discussed: English where necessary for the interaction with (foreign) companies, Dutch for the general parts?

It is important to note that NOGEPA's Asset Integrity Standard will be finalised this summer, conform to the Mijnbouwbesluit (artikel 3, lid 1, artikel 67, lid 1, artikel 68) and the Mijnbouwregeling § 8.2.3. Please take into consideration to adapt this standard to the geothermal situation and extend it with O&M management tools and checklists to fulfil the geothermal operators demand.

Barrier-management

After drilling the properties of the reservoir can be assessed. Risks and possible damages (blow-out, leaks) can be estimated. Based on regulations and the site-specific safety- and other requirements the required well-completion (well-head et cetera) can be established. The study should address the risk-evaluation and risk-mitigation of surface-equipment, in particular the effects on the wellhead, áfter the drilling phase. As a next step guidelines for well-head and (other) surface-equipment can be established. (no part of the study.) A kick-off with at least representatives of DAGO and SSM should specify the exact demands, scope and priorities for this study. Previously a study on wellhead-design has been conducted for Kas als Energiebron.
This study builds on the well integrity study (and the HAZID which is part thereof) that is currently being conducted.

Stakeholder- analysis

Communication and public awareness are important for the development of new geothermal projects. Due to the increasing number of projects and the increasing interest of government and private parties in this form of sustainable energy the need for tailor-made and independent/reliable information grows.
The Kennisagenda wants to contribute by commissioning a stakeholder analysis for geothermal as such. Not for specific projects. The purpose is to establish which (national) groups are relevant for the development, what (type of) questions do they have, what answers do they expect and from whom, what should be the role of the different entities in the geothermal sector, of SSM and of government. It is envisaged that at least a big part of the questions reflect the need for basic

information. What is geothermal? What are the risks, how big are they? What is done to prevent risk X or Y?

As a next step a basic communication-approach can be drawn. What type of communication is required, by whom and when? (factsheets, leaflets, meetings with special-interest groups) et cetera. All this with the non-projectspecific nature of the analysis in mind.

As a final step most of the 'content' can probably be provided fairly quickly (description of risks et cetera). The Supervisory Group will assist with some of the answers, some answers will probably require more research and outside of the scope of work.
The proposal probably contains go/ no go moments after each step. The proposed budget should take this into account. The content will have to be in Dutch. The other documents mentioned above can be in English. Interviews with stakeholders in Dutch.

Improving the use of existing geothermal well data

Operators use logging-data amongst others for the determination of their production plan. Additional research on available data and material (cuttings) leads to more information and possibly better predictions on wear, tear and future production-costs. If operators know about the available techniques, their costs, benefits and limitations an operator (or group of operators in the same area) can make better decisions on this issue.

We suppose this to be a relatively short investigation. The presentation of the results in an easy-to-use form is important as this increases the practical usability. At least a Dutch summary, English were useful.

Completion design

The completion of the well in the aquifer can be done in several ways, each with its own advantages, costs and risks. Completion-concepts should be investigated for the roughly four different types of aquifers in the Netherlands. The influence of depth (common 2-3 kilometres, but greater depths are to be considered) should be addressed. The study is to include the implications for the costs, design, construction and operation. Special attention needs to be given to the 'knowledge-transfer' aspect, p.e. via an open-source internet-tool and/or a manual-type of report. Apart from the 'standard' workshop/ public meeting at the end of the study.

Aligning methods for calculating well-performance

Several methods for calculating well-performance exist. Project-initiatives are often puzzled by different predictions from different geological advisors, without a clear insight in the origin of these differences. Availability of data and (other) uncertainties of course influence the reliability of the predicted outcome. In earlier meetings with experts it was discussed if geological advisors could establish more transparency in when to use which model and how to interpret the outcome given their assumptions and shortcomings. The purpose is to make operators more aware of the assumptions and (thus) uncertainties, i.e. by using an uncertainty-matrix. We can imagine that several advisory companies in this field join forces to make a proposition for a study that after completion has a reasonable chance of being implemented.

Open innovation

Knowledge Agenda also wishes to pay attention to longer term developments and technical and process- innovation in the geothermal sector. This can be for instance the re-use of technologies from other sectors, innovation in drilling technology, operation & maintenance, storage (specific for geothermal heat), hybrid concepts et cetera. All Kennisagenda-indications and -proposals need to explain how the proposition or study makes the geothermal sector more competitive and/ or more widely applicable. This especially is the case for this category.

In this phase we think of limited desk-research and calculations only, perhaps some small tests. Field-experiments and demos are not foreseen. Parties can apply for support in these phases at RVO (p.e. DEI-subsidy). The study should be vendor-independent. Not the advantages et cetera of specific equipment or software is to be investigated, but the vendor-independent principles that lie behind it. Either a combination of vendors or a vendor-independent company seems best suited to do the study. Indication of contract-value: 25k. Language: Dutch or English.