Technology Assessment

Broadening the debate on shale gas

Guidelines for decision-making based on the Dutch experience

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Content

1 The need for a broad debate on shale gas

Energy is one of the most important themes of the century. The main challenge is to ensure an energy supply which is affordable, secure, clean and which can be integrated in the physical environment. When those conditions are all met one might say that the energy supply is legitimate both from an economic, environmental and societal perspective (Ganzevles & Van Est, 2011). This is a grand challenge, for example given the fact that the worldwide demand for energy and the carbon emissions are higher than ever and are expected to grow even more over the next decades (IEA, 2012a).

On both the international and national level it appears difficult to initiate a steady development towards a more sustainable energy supply. According to the International Energy Agency, the worldwide energy consumption will increase by 30% in 2030 (IEA, 2012b), which is mainly caused by emerging economies such as China, India and Brazil. This demand is mainly met by conventional fossil resources such as oil, coal and natural gas. In response to the greater need for energy and due to technological innovation, unconventional fossil resources are emerging. Shale gas is such an unconventional resource which has come to play a central role in the (inter)national energy debates over the last years. Shale gas is a natural gas, trapped in layers of shale rock which need to be cracked to enable extraction of the gas. Such extraction of shale gas is done by combining two technologies: horizontal drilling and hydraulic fracturing or, in other words, fracking. However, this technology is not free of risks and has led to a debate about the impacts of shale gas extraction on the environment.

Since the beginning of this century, shale gas production in particular has changed the energy landscape in the United States. The energy independency of this country has grown enormously and the gas prices have declined. Due to the increase in gas production, gas fired electricity plants compete with coal fired plants, which has led to a decline in carbon emissions in the US electricity sector. These developments have sparked interest in potential shale gas development in Europe. However, attitudes towards shale gas development vary considerably across countries. Whereas Poland and the United Kingdom are keen to explore the possibilities by test drillings, France has put up a ban on shale gas. In the Netherlands, with its extensive history in producing natural gas, potential shale gas development has led to a lively societal and political debate.

The Dutch debate took off around 2010 when concessions were granted for exploratory drillings to the drilling company Cuadrilla Resources. The potential drilling sites are located in the municipality of Boxtel, located in the province Noord-Brabant and in the municipality Noordoostpolder, located in the province Flevoland. Currently, 170 (of the 403) Dutch municipalities have signed a shale gas free declaration[1], stating that they would like to ban shale gas development in their region (Milieudefensie, 2014). Discussion on shale gas includes a variety of actors: government actors on three levels: national , provincial and municipal, non-governmental organisations, industry, research organisations and engaged (local) citizens. The diversity of interests involved and the fact that shale gas overlaps with other issues (including the economy and the environment) demonstrates that the debate on shale gas is multifaceted.

[1] Despite the fact that a shale gas free declaration is not a formal legal declaration it provides a good indicator of the attitude towards shale gas among municipalities

This paper focuses on the debate on shale gas in the Netherlands. In the political decision-making process relating to shale gas, the national government has highlighted the importance of clarifying the opportunities and risks related to shale gas extraction, and the question of whether this is properly regulated. This has given rise to a study commissioned by the Ministry of Economic Affairs aimed at investigating whether shale gas can be safely extracted in the Netherlands. (In the remainder of this paper this study will be referred to as the so-called 'risk and safety' study). The Rathenau Instituut found that the focus of the 'risk and safety' study was out of sync with the political and public debate about shale gas extraction in the Netherlands. For example, a media analysis showed that, besides safety risks and environmental risks, the debate also focused on how the role of shale gas extraction worldwide affects the Netherlands, as well as on local support (Waes, 2013). Also various members of parliament stressed the need for a broader debate, including the national usefulness and necessity of shale gas extraction, and the location-specific aspects relating to this issue.

Incited by these signals, the Rathenau Instituut conducted a study in 2013, with the aim to help broaden and deepen the parliamentary and public debate on shale gas in the Netherlands. As a result the institute 1) analysed the societal debate on shale gas through a media analysis, 2) studied the way in which the government has governed the political debate through desk research and by conducting stakeholder interviews, and 3) identified the local and global social issues associated with shale gas extraction in the Netherlands. The project resulted in a Dutch report[2] with recommendations and guidelines for decision-making[3] for governments and parliament which was presented to members of parliament and stakeholders in September 2013 (Vries et al. 2013a; Vries et al. 2013b). The study describes a wide range of considerations regarding shale gas, based on technical, global and local perspectives. This includes an investigation of different ideas about the potential benefits and risks associated with shale gas extraction. The international role of gas, its impact on global climate issues, their significance to shale gas extraction in the Netherlands, and the regional and local factors at play were also examined.

This English paper is based on the above study and is an edited version of the concluding chapter (De Vries, Van Est and Brom, 2013). It basically presents four recommendations with regards to the governance of shale gas development which could also be relevant to other European countries. It also provides an insight in the current developments on shale gas in the Netherlands.

The debate on shale gas extraction in the Netherlands has grown increasingly polarized, which should serve as an incentive to facilitate a broader debate. The current decision-making process appears to be mired in a narrow debate regarding the opportunities and risks associated with shale gas extraction, and this has prevented a fruitful public debate and learning process relating to the issues above. The benefits of such a more broader debate would be twofold. First, it would enable the public to become informed about significant issues related to shale gas. Moreover a broader debate is necessary in order to make a policy decision about an exploration drilling that has the support of a large proportion of the public. Facilitating a broader debate is necessary in order to organize open policy development, which involves dealing constructively with possible resistance and different points of view, and which may be included in the decision-making process. If a central government fails to do so, the debate will probably further polarize and thus prevent efficient decision-making.

[2] Vries, A de., R. van Est & A. van Waes (red.), Samen Winnen. Verbreding van schaliegasdiscussie en handvatten voor besluitvorming. Den Haag: Rathenau Instituut 2013
(download: http://www.rathenau.nl/uploads/tx_tferathenau/Rapport_Samen_winnen_-_Verbreding_van_discussie_over_schaliegas_-_Rathenau.pdf)

[3] Vries, A. de, A. van Waes, R. van Est & J. Visser (red.)(2013b). Het Bericht – Schaliegas: veelzijdig debat vereist. Den Haag: Rathenau Instituut 2013
(download: http://www.rathenau.nl/uploads/tx_tferathenau/Het_Bericht_-_Schaliegas_veelzijdig_debat_vereist.pdf)

First of all, it is important to acknowledge that there must be opportunities for an open policy process for shale gas extraction. The responsible authority can manage an open policy process by positioning the above-mentioned ‘risk and safety’ study, and the broad public agenda that developed during its realization, as a starting point for a broader debate on shale gas rather than as a final end in the political decision-making process relating to shale gas extraction (recommendation 1). In this debate it is essential to clarify the role natural gas (including shale gas) can play in the politically desired transition to a sustainable energy supply (recommendation 2). Furthermore, the relationship between the central and local governments must be improved when it comes to shale gas extraction, as well as more broadly, extending to making decisions related to underground activities (recommendation 3). This relationship is currently poor, which can create administrative frustration among local authorities and will be counterproductive in the long term. Finally, we note three issues that will become relevant factors in case the decision is made to conduct exploratory drillings in the Netherlands: draft a set of risk procedures in conjunction with the relevant parties (recommendation 4a); actively monitor trends and developments relating to shale gas in other countries (recommendation 4b); and, rather than thinking in terms of exploratory drilling technologies, think in terms of large-scale social-technical tests, which clearly identify the opportunities and risks associated with shale gas extraction and the social significance, use and necessity of shale gas in the Netherlands, also at the regional level (recommendation 4c). The following paragraphs will elaborate on each of these four recommendations more specific ally. This paper ends with a brief update of the current developments regarding shale gas in the Netherlands.

2 Recommendation 1

Broaden the debate on shale gas by involving public opinions and criticism in policy development

It would be advisable for a responsible authority (the Ministry of Economic Affairs in the Dutch case), to take different opinions (of the feedback group, the Environmental Impact Report Committee and the public) seriously and to specifically present the 'risk and safety' study as a point of departure for the political debate. This may serve as a good basis for further discussion about a variety of issues, including the usefulness and necessity of shale gas extraction. This leads to the following recommendation:

Take the broad public agenda that arises during a study on risks and safety of shale gas as a solid point of departure for the political debate on the usefulness and necessity of shale gas extraction

The importance of considering various points of view and factors in the political and administrative decision-making process is explained by describing the public debate on shale gas and the administrative situation.

Shale gas has received widespread coverage in traditional media in the Netherlands, as well as being a trending topic in social media networks. From 2010 to December 2012, a total of 413 newspaper articles on shale gas were published; between January and mid-July 2013, a total of 415 articles appeared. The daily newspaper *Trouw*, for example (in its issue of 22 June 2013) ran a piece in which 55 academics voiced their concerns regarding shale gas, expressing the view that this form of energy does not accord with a transition to a sustainable energy supply (*Trouw*, 2013).

Given the dwindling supplies of conventional gas in Slochteren (where the Groningen gas field is located[4]), this focus on shale gas is justified. Besides national economic interests, there is also the issue, at the national level, as to what extent natural gas (including shale gas) can contribute to reducing global climate problems and can play a role in the transition to a sustainable energy supply. The media have also focused on local ideas regarding location-specific opportunities and risks relating to shale gas extraction. At the same time, those involved in the political debate (both members of parliament and interest groups) are advocating a broad dialogue on the need and necessity of shale gas and have acknowledged the importance of public support at the local level. The challenge is to use this great social and political commitment constructively in the political decision-making process. This requires a process of open policy development,[5] in which the central government demonstrates curiosity and respect, is open to opposition, and pays attention to those possessing a wide range of knowledge, ideas and interests. Being open to opposition and different opinions is effective both in terms of knowing where the central government can and cannot alter policy plans, and in terms of responding effectively to the opposition and, in so doing, reduce people's resistance (Verhoeven, 2009). However, if the central

[4] The Groningen gas field, discovered in 1959, is located in Slochteren in the northern part of the Netherlands and is one of the largest natural gas fields in Europe.

[5] In referring to "transparent and inclusive policy development", we refer to the notion of "agonistic pluralism", as defined by Chantal Mouffe (2000). Whereas antagonism refers to a battle between enemies, agonism denotes a conflict between opponents who respect one another. Mouffe defines the goal of democratic politics as transforming antagonism into agonism. The democratic decision-making process need not necessarily result in a wide consensus - as the deliberative model assumes - but there must be opportunity to mobilise different points of view.

government remains negligent in this area the discussion will only become further polarised, thereby complicating fast and efficient decision making.

However, the chosen approach at that time seemed seems more likely to obstruct than facilitate such a process (see section 3), which could easily end up polarising public opinion. This applies to the central government's management of the political debate (in terms of both the actual substance of the debate and in terms of the process involved), where it should be noted that the two aspects of substance and process are strongly correlated.

"Location problems" refers to problems involving the search for a location for objects that generally form part of infrastructure projects, including wind farms and drilling rigs. These four strategies are often used by policymakers when dealing with these types of location problems[6]: strategy 1) *acting independently, while ignoring potential resistance* (Dear 1991, 294); strategy 2) *enforcing national policy and therefore circumventing local policy*; strategy 3) *risk communication to inform concerned citizens* and strategy 4) *implementing economic compensation plans* (Benford *et al.* 1993: 32, Kraft & Clary 1991: 301). In the Netherlands, the central government mainly used the first two strategies in recent years (Wolsink 1994; Verhoeven 2009). As for strategy 2, from 1 July 2008 the Government Coordination Regulation [in Dutch: *Rijkscoördinatieregeling*] was used regularly for projects in the national interest, ranging from a wind farm in the province of Flevoland to the underground gas storage in Bergermeer in the province of North Holland. The above strategies have proved to be, in the main, not very successful and are actually more likely to result in more, and more vehement, opposition, which is in fact what we are currently witnessing in the shale gas debate. The central government's ignorance of the public debate only appears to have mobilised resistance.

The initial approach of the Ministry of Economic Affairs was to treat shale gas extraction in the same manner, from an administrative perspective, as the extraction of traditional natural gas, which was not believed to create any significant resistance (Metze, 2013). However, this method - strategy 1 - caused serious public opposition. As a result - and under pressure from the House of Representatives - the Ministry announced in June 2011 that it was imposing a moratorium on exploratory drilling.

In managing the actual political debate, the 'risk and safety' study at the behest of the Ministry of Economic Affairs occupies a central position at this stage of the decision-making process. The purpose of this exercise was to examine whether the explorative activities relating to shale gas extraction can be conducted safely and whether permits can legitimately be granted. The Ministry appears to assume that a political decision can be made based on the technical 'risk and safety' study conducted (strategies 1 and 3).

A feedback group[7], set up in order to increase the legitimacy of the study, has become an interesting public debate forum that provides a platform for different ideas about shale gas, while also criticising the 'risk and safety' study. In other words, the debate conducted in the feedback group demonstrates the value of the report while at the same time indicating its boundaries. By requesting confidentiality and secrecy, the Ministry of Economic Affairs has attempted to maintain control over the report, and several representatives of environmental organisations and local governments have left the feedback group in response.

However, the completion of the 'risk and safety' study certainly does not signal the end of the shale gas debate, as there remain too many scientific uncertainties regarding opportunities and risks, the report

[6] Based on research conducted by Dr Imrat Verhoeven, Assistant Professor of Public Policy at the University of Amsterdam.
[7] The feedback consisted of representatives of provinces, municipalities, industry, water companies, grassroots organizations, ngo's and an independent expert.

does not focus on location-specific opportunities and risks, and it fails to address questions regarding usefulness and necessity. The Environmental Impact Report Committee (which was asked to give advice on the approach and the draft report) concluded that an extension of the debate is desirable due to public concerns and in order to create public support (Environmental Impact Report Committee, 2013).
In October 2013 the results of the 'risk and safety' study were published. The results indicated that the risks associated with shale gas drillings would be 'manageable' and the current regulation should be adequate enough. Based on the results of the research, the minister concluded that shale gas could be safely developed in the Netherlands. This increased public protest and intensified local opposition.
As described above, it is advisable for a responsible authority to take different opinions and views seriously as this will serve as a good basis for further discussion about shale gas. Initial steps in this direction have been taken in the Netherlands. For example, the minister of Economic Affairs stated in a letter his desire to conduct an open and transparent debate (Kamp, 28 June 2013).

The 'risk and safety' study commissioned by the Ministry of Economic Affairs and its design in terms of the process involved could possibly have contributed to more transparent policy development if it had been organised based on an "agonistic" perspective. During the moratorium on shale gas exploration - which was in effect during the 'risk and safety' study - a broad public debate about shale gas arose among the Dutch public. The debate conducted within the feedback group regarding the lack of specific relevant questions about shale gas reflects this broader debate, making it clear that shale gas extraction calls for a broad public agenda. The challenge is to create opportunities within policy development and to be open to specific issues and questions regarding these issues: local concerns, location-specific risks, (long-term) economic and environmental goals, and the question of whether the current laws and regulations can be applied and are adequate. Below we present several suggestions for how this might be accomplished.

3 Recommendation 2

Clarify the role of gas in the transition towards a sustainable energy supply

The Dutch government's current policy is aimed at an affordable, reliable and clean energy supply, and the objective is for the country to be carbon-neutral by 2050 (see box 1 for more on this target). In order to achieve this target, fossil fuel consumption will need to be sharply reduced over time. Given this target, a fundamental question is whether shale gas extraction in the Netherlands can, in fact, contribute to the transition from an energy supply largely based on fossil energy to a sustainable energy supply. This brings us to the following recommendation:

Explore and clarify the public interest of shale gas extraction in terms of achieving the Dutch government's goal of creating a reliable, affordable and clean energy supply.

In order to explain the public interest of shale gas extraction for the Netherlands, the following must be clarified: if, and how, can shale gas extraction be integrated into the national energy policy and the objective of creating a reliable, affordable and clean energy supply? Furthermore, how can shale gas contribute to a carbon-neutral energy supply in the long term? Over time, fossil fuel will come to play a marginal role in the energy supply as a whole. There are two ways in which shale gas, in the medium term, can be combined with a transition to a sustainable energy supply. First of all, by replacing coal with gas, and secondly, by using gas revenues to encourage energy-efficiency and promote the use of renewable energy. These considerations are elaborated upon below.

Gas transition: from exporter to distributor

The International Energy Agency (IEA) anticipates a sharp increase in fossil energy consumption (i.e. oil, coal and gas) in the coming decades. In the Netherlands, as elsewhere, the amount of energy that can be generated using fossil fuels continues to grow unabated in an absolute sense (Ganzevles & Van Est 2011, 402). There is a global emergence of the extraction, marketing and consumption of both conventional and unconventional gas, including shale gas. Revenues from Dutch gas fields are expected to shrink, resulting in a sharp decline in income from gas exports in the coming years. Since shale gas can potentially generate additional revenues, the Dutch government may be inclined to use the Dutch gas supplies to their full potential (Ministry of Economic Affairs, Agriculture and Innovation 2012, p31). However, the extent of shale gas supplies in the Netherlands is currently not known, nor is it clear how much they will generate in revenues for the state. Exploratory drillings could possibly provide answers to these questions.

Besides the possible extraction of shale gas, the Netherlands can benefit from the global emergence of gas by positioning itself as a gas-distributing country. Since 2005, the government has been committed to turning the Netherlands into North-western Europe's gas hub (Netherlands Court of Audit, 2012). The underlying notion is that the Netherlands stands a good chance of achieving this objective for various reasons, including the high quality of the gas transport network in place - which is connected to other countries - and the many options available for underground storage (Van der Hoeven, 2009). A substantial amount of money has been invested in recent years, both in the national network (e.g. the construction of pipelines from the northern to the southern part of the Netherlands) and in the supply of gas to and from other countries (Netherlands Court of Audit, 2012). The government believes these options can contribute to creating an affordable and reliable energy supply in the short and medium term.

Full use of the Dutch gas supplies - which may also include shale gas extraction - and the goal of creating a Dutch gas hub do not, in and of themselves, indicate anything about whether or not these efforts will contribute to the goal of creating a carbon-neutral economy.

Transition to sustainability

When discussing shale gas, we must ask whether its extraction is in the public interest, which is why it is important to also focus on the question of whether shale gas extraction is in line with the Dutch government's climate goals (see box 1 for further explanation). A number of options are available for creating a cleaner energy supply. First, a focus on energy efficiency will reduce carbon emissions, and secondly, the replacement of fossil energy with renewable energy will result in a cleaner energy supply. Thirdly, replacing electric power generated by fossil-fuel power stations with power generated by gas-powered plants results in lower carbon emissions. Nevertheless, the third option will never result in a carbon-neutral energy supply. From a clean-energy perspective, the replacement of fossil-fuel power stations with gas-powered plants over time is therefore merely a temporary option, and the same applies to shale gas.

The target of achieving a carbon-neutral energy supply by 2050 requires a major effort in terms of energy-efficiency and in terms of actually replacing fossil fuels with renewable energy sources, and we have a long way to go yet. Currently, only 5 per cent of energy in the Netherlands is generated by renewable energy sources; the government's target is to increase this percentage to 16 per cent by 2020. From a clean-energy perspective, however, we are witnessing a countertrend. For one, several plans have been developed in recent years for the construction of three new fossil-fuel power stations[8], in addition to the six plants already in operation. Coal tends to be the most economical, reliable and available source of energy, as well as being the most polluting. This makes fossil-fuel power stations[9] suitable for a policy aimed at low energy costs, but not in terms of a clean energy supply.

Box 1: Climate and energy targets in the Netherlands

Clearly explain the role of gas

An important question is whether shale gas can, in fact, contribute to a cleaner energy supply, and replacing fossil fuels with gas - including shale gas - could play a key role in this process. Note that this does not necessarily apply only to gas and shale gas in the Netherlands. As stated, gas and shale gas represent temporary options. Gas in general - and, in this case, shale gas in particular - can then be defined as a transition fuel. There may be two reasons for this: replacing coal with gas directly reduces carbon emissions, and the flexibility of gas-powered plants is required for increasing the number of renewable energy sources within the total energy supply. See box 2 for a possible solution regarding the role of gas.

[8] Construction is currently underway of three fossil-fuel power stations in the Netherlands: two in the Maasvlakte port and industrial area near Rotterdam and one in Eemshaven in the province of Groningen.

[9] The Energy Agreement authored by the Social and Economic Council, states that five fossil-fuel power stations built in the 1980s will close down: three in 2016, followed by the remaining two in 2017

The Netherlands Environmental Agency (Planbureau Leefomgeving) presented a solution, proposing that revenues from natural gas be used to fund sustainable innovations (Hoogervorst *et al*, 2013). This would allow the consumption of fossil fuels, including shale gas, to contribute indirectly to a transition to sustainability. Revenues from gas (including shale gas) would cover the cost of the two sustainable options listed above: energy-efficiency and renewable energy. This type of "transition change" will only be effective in the long term if, in addition to the use of gas revenues, consumption of coal and gas is phased out altogether.

Box 2: 'transition change'

4 Recommendation 3

Improve cooperation between national and local governments

The Dutch shale gas case shows that cooperation between national and local governments in terms of shale gas leaves a lot to be desired. Specifically, regional and municipal councils perceive a lack of formal control in the decision-making process relating to shale gas, making them feel as if that they are not able to focus enough on the concerns and interests of their constituents in the decision-making process relating to shale gas. This situation often leads to frustration at the local and regional administrative levels, which has made some local authorities resistant to change. For example, a total of 170 municipal governments to date have signed a '*shale gas free declaration*', indicating their view against shale gas development . This perceived lack of formal say among local governments has created friction between the national government and local governments, thereby thwarting the decision-making process relating to shale gas. This is not without risk: for example, decisions may be too undefined due to a lack of dialogue between the parties concerned, or they may end up getting revoked by the next government in office. Therefore the national government should improve collaboration with lower level governments, not only on shale gas development, but also on other activities in the underground. This leads to the following recommendation:

Improve collaboration with local and regional governments in aligning underground and aboveground activities

This paragraph starts out by discussing the current situation, after which we explain how more balanced cooperation can be achieved in order to help increase trust between the parties.

Current relationship between national and local governments
In relation to shale gas extraction, the central government has approached local governments in recent years based on the four top-down strategies listed in section 2. This states that the central government initially anticipated that shale gas extraction would not result in a great deal of local resistance (strategy 1). In addition, the central government has the option to use the so called Government Coordination Scheme in order to bypass local governments' policies (strategy 2), as well as complying with prevailing regulations for mineral extraction, as provided for in the Mining Act. However, the latter does not really provide solutions to issues such as social unrest, support from the local community, the impact on regional planning or interference with other subterranean activities. By maintaining existing procedures, the central government does not provide local governments and actors with sufficient opportunities for official control. This attitude is in line with strategies 1 and 2 and is certainly not likely to invite a cooperative attitude from local governments.

Strategy 3 concerns risk communication in order to inform concerned citizens (or local governments), while strategy 4 involves the use of economic compensation plans. To date, information provided by the central government to residents and local governments regarding the risks associated with shale gas extraction has not really managed to ease people's concerns. In the case of the Dutch municipalities, the communities expressed major concerns regarding uncertainty of the location specificity (and therefore the level) of the technical risks identified.

The Dutch shale gas case also shows the lack of trust among local players that arises if they perceive that they have no control and feel they are not receiving adequate information. If the parties agree on commitments together and honour these commitments when making decisions regarding shale gas

extraction, this could represent a step forward. In the municipalities investigated, this relates mainly to commitments regarding information provision and conducting a debate of the use and necessity of shale gas extraction in a timely manner.

There are currently no compensation schemes in place for local residents in connection with shale gas extraction. The confusion regarding investments versus revenues and compensation constitute a local point of concern. For the Dutch provinces (North Brabant and Flevoland), the specific advantages for the region must be clear in the decision-making process relating to shale gas extraction. This might involve for example less expensive energy in the region - which could contribute to a favourable business climate - or a percentage of the revenues from natural gas for the province, or a compensation plan. These types of revenues and any compensation plans should preferably be clear in advance and to all parties involved: who benefits in what way, and on what basis?

Cooperation between different levels of government

The central government's current approach has created local opposition and resistance; this is because there is currently insufficient opportunity for influence at the local level and for broader considerations of other activities, both underground and aboveground. In order to ease the current friction between central and local governments in the debate on shale gas extraction and the future underground activities, cooperation between the various levels of government must be improved, particularly where it concerns the coordination of underground and aboveground activities. This is important, since the energy transition - besides above-ground integration - also calls for below-ground integration, for example for heat and cold storage or geothermal energy. We also face many challenges in terms of fossil fuels and nuclear (storage) and renewable energy, and in order to address these challenges, constructive cooperation between the central government and provincial and municipal authorities is vital.

Coordination and integration of aboveground activities are provided for in the Town and Country Planning Act and other legislation; these rules relate to the drafting of zoning and integration plans. The General Environmental Protection Act applies specifically to (explorative) shale gas drilling; it provides that an environmental permit is required for the construction of a drilling tower and drill rig, in order to construct roads and pipes, cut trees, and perform other activities. The Act also officially provides for options to file objections or file an appeal, while municipal and provincial authorities have the right of recommendation.

When it comes to aboveground activities, municipal and provincial authorities are less likely to have control. Under the Mining Act, the provincial authority only has limited powers, despite possessing the right of recommendation and the right to issue the extraction permit (Mineur, 2013). This act provides for minerals located at a depth of more than 100 metres and for geothermal heat located at a depth of more than 500 metres. The required permits must be issued by the Minister of Economic Affairs, and the provincial authority has no powers when it comes to the deep underground areas. The growing number of underground activities has resulted in increased use of the subsoil; these activities can interfere with each other in the absence of proper coordination.

There is also the fact that underground activities also affect aboveground work. The activities falling under the scope of the Mining Act are sometimes even inimical to provincial town-planning interests, including the preservation of protected nature reserves. A report regarding the province of North Brabant shows that its current policy is not sufficient to guarantee sustainable use of the subsoil, be able to protect provincial interests and be able to assess activities performed by third parties. There is currently a lack of coordination between provincial and central government policies when it comes to deep-underground activities - including shale gas and carbon storage - in relation to provincial interests such as drinking water and quality of life (Province of North Brabant, 2013). This means the coordination between below-ground activities and aboveground activities or interests is currently inadequate. This

coordination is complex because there is a great deal of confusion and uncertainty regarding the potential of the subsoil and the profitability of the related activities.

The need for a more integrated approach for underground activities and more opportunity for local governments to provide input is widely acknowledged in the Dutch political community. Like other new underground activities, shale gas extraction calls for a regional planning approach and, therefore, effective cooperation between municipal, provincial and central governments.

The above-ground and underground activities are currently governed by different authorities. By more effectively coordinating these separate activities, you create opportunity to expand the role of lower-level governments. This makes it possible to include local concerns on the agenda in the official decision-making process.

Initial steps have already been taken in this direction. Currently, a new policy framework on the underground activities is in the making. Provincial (regional) governments have invested a great deal of energy recently in developing provincial plans for underground activities. The new policy framework (in Dutch: *Structuurvisie Ondergrond*) examines these activities on an integrated basis, i.e. by not focusing only on mineral extraction such as natural gas production but also considering geothermal energy, heat and cold storage, gas storage, CO_2 storage, and so on. This framework can play a key role in the cooperation between national and local governments. As part of the decision-making process relating to shale gas extraction, the decentralised governments therefore feel it is sensible to use the it an as a basis for the decision-making process.

The framework may also include an amendment of the Mining Act (Province of North Brabant, 2013). Dutch provinces are currently reviewing whether the Mining Act can be amended in order to facilitate greater control by local governments (interview with the North Brabant provincial government and interview with the Flevoland provincial government, 2013). Besides the provincial governments, the Association of Dutch Municipalities is also advocating greater influence in the shale-gas debate.

5 Recommendation 4

Approach exploratory drillings from both a technical and social point of view

We argued above that any exploratory drilling will only be possible once there is political clarity about a) the role of shale gas in the transition to a sustainable energy supply and b) an integrated plan outlining the strategy to be adopted for underground activities and the role of regional and local governments and the corresponding players.

The underlying study also shows that a greater understanding is required of location-specific risks and reliable ways to manage these risks before any exploratory drilling can be performed. This requires effective consultation between drilling companies, local governments and relevant stakeholders. In addition, it is important to monitor experiments involving explanatory drilling abroad. If one opts to conduct exploratory drilling, it is important to ensure that there is room to learn about technical and social opportunities and risks. We therefore prefer to use the term "*large-scale social-technical tests*" rather than "exploratory drilling".

Facing risks together - clear-headed

There are a number of requirements that must be satisfied before any exploratory drilling can be performed. For one, the existing laws and regulations are a key factor in whether safe explorative shale gas drilling is successful. If these laws are properly designed, this reduces the likelihood of soil contamination and other potentially hazardous effects. This includes setting standards, as well as making commitments regarding responsibilities if hazardous effects manifest themselves, and factoring in other underground soil activities.

In order to address these issues, it is possible to organise a process in which both sides negotiate the terms, responsibilities and liabilities associated with exploratory drilling. This includes, for example, drafting the safety conditions, drafting integrated contingency plans, formalising claim funds and developing widely supported success factors. It is important to involve all local parties concerned in this process.

Recommendation 4a

In granting permits for exploratory drilling, it is important to draft risk procedures for all relevant parties.

It is recommended that a set of risk procedures be drafted when granting permits for exploratory drilling, listing all the conditions under which such drilling can be conducted safely. This includes, for example, the vicinity of fault lines, the effectiveness of drill rigs in preventing leaks; the amount and degree of hazard of the chemicals involved; the distance between water-collection areas and the drilling operation; and the distance between the drilling operation and inhabited and protected nature reserves. In addition, it is also important to specify the responsibilities and liabilities in this process. In order to ensure majority support for the exploratory drilling, with the confidence that it will be conducted safely, these procedures must be drafted in conjunction with local governments, key stakeholders in the area (including water companies) and other relevant parties. Keywords in this process are transparency, influence and trust.

Monitor international trends

Large-scale shale gas extraction is a recent phenomenon in the United States, and in Europe countries including Poland and Great Britain are performing exploratory drillings. Since these developments are recent, there is still a great deal to be learned at the technical, social and regulatory levels, which is why it is important to closely monitor trends and developments and learn from these countries' experiences.

Recommendation 4b

Actively monitor international trends and developments relating to shale gas, and learn lessons.

Large-scale social-technical tests instead of only exploratory drilling

Exploratory drilling can provide a more realistic idea of the extractable potential of shale gas and of the technical risks associated with its extraction, based on the local composition of the underground used.

It is clear that shale gas extraction continues to raise many questions. Another key aspect is that exploratory drilling must also provide scientific data regarding location-specific technical risks relating to soil and water contamination and earthquakes. In addition, it is important to investigate the social aspects of shale gas extraction, including noise, unrest in the community and damage to the national environment. Keep in mind that exploratory drilling takes "only" several months and that the results reveal short-term risks. Exploratory drilling may be designed to obtain information on extractable supplies of shale gas in a specific country. However, it is better to think in terms of large-scale experiments resulting in knowledge about technical opportunities and risks relating to shale gas extraction, and which can also foster a learning process relating to the social significance of shale gas and its usefulness and necessity.

Recommendation 4c

Besides exploratory drilling conducted for the purpose of keeping track of shale gas supplies and monitoring the technical risks involved, it is important to develop an understanding of the social significance of shale gas and its usefulness and necessity.

6 Current developments in the Netherlands

The abovementioned recommendations were presented to members of parliament and stakeholders in September 2013 (Vries et al. 2013a; Vries et al. 2013b) and acquired significant media coverage. In September 2013, the ministry of Economic Affairs presented the 'new' procedures, in line with the recommendations. Any exploratory drilling was postponed to 2015.

Prior to making a decision about an exploratory drilling, the Ministry of Economic Affairs has initiated a separate Structural Plan for shale gas (in Dutch: *Structuurvisie Schaliegas*). This plan will be integrated in the framework on the underground (as described in section 4). The Structural Plan for shale gas is expected to be completed in 2015.

This plan will provide a broader assessment framework for deciding on permits for (exploratory) shale gas drillings. This helps the national government to manage the choice for possible locations on which shale gas drillings may occur in the future. The plan involves a study in which the most suitable shale gas locations in the Netherlands will be identified. This will be based on local environmental impact assessments. This implies that more location specific research will be carried out.

Also other important topics, highlighted in this paper, are put under scrutiny in the Structural Plan for shale gas. The usefulness and necessity of shale gas (as described by recommendation 1) and its role in the energy supply (as described by recommendation 2) will be examined. This implies inter alia the clarification of societal pros and cons of shale gas production in the Netherlands.

In response to the announcement of the Structural Plan for shale gas in September 2013, some members of parliament, ngo's and local governments gave criticism. They perceived the Structural Plan for shale gas as a step in the direction of actual shale gas development. They want to first address the usefulness and necessity of shale gas before examining possible locations for shale gas drillings. The Structural Plan for shale gas, examines both issues in parallel.

In May 2014, the ministry of Economic Affairs informed about the design of the Structural Plan for shale gas through a draft memorandum. As part of the procedure societal actors could react on the scope and level of detail of the Structural Plan for shale gas. Various actors took the opportunity to express their views on shale gas. Opponents such as environmental groups joined forces and submitted their objections. According to water companies the design of the Structural Plan for shale gas is inadequate to ensure a safe water supply. Also municipalities mobilize and help citizens to file objections against shale gas development. The draft memorandum has again led to questions about the usefulness and necessity of shale gas, which is according to municipalities and environmental groups, not yet adequately addressed. These recurring issues demonstrate the complexity and versatility of the on-going debate on shale gas.

7 References

Algemene Rekenkamer (2012). *Gasrotonde: nut, noodzaak en risico's. Nederland als Europees knoopunt van gastransport*. Den Haag, 14 juni 2012.

Benford, R.D., H.A. Moore & J.A. Williams Jr. (1993) *'In Whose Backyard?: Concern about Siting a Nuclear Waste Facility'*, Sociological Inquiry, 63, 1: 30-48.

Commissie Mer (2013). Persbericht: *Tussenadvies effectstudie schaliegas*. 1 juli 2013

Dear, M. (1992*) 'Understanding and Overcoming the NIMBY Syndrome'*, Journal of American Planning Association, 58, 3: 288-300

Ganzevles, J. & R. van Est (2011). *Energie in 2030, maatschappelijke keuzes van nu*. Den Haag: Rathenau Instituut. Boxtel: Æneas

Hoeven, M. van der (2009). Brief aan de Voorzitter van de Tweede Kamer. Betreft: Kamerbrief Gasrotonde. Den Haag: Ministerie van Economische Zaken, 23 oktober 2009

IEA (2012a). *Golden Rules for a Golden Age of Gas*. World Energy Outlook. Special Report on Unconventional Gas. Parijs: International Energy Agency

IEA (2012b). World Energy Outlook 2012. Parijs: International Energy Agency.

Trouw (2013a). 'Hoogleraren: 'Schaliegas is voor Nederland niet interessant'. In: *Trouw,* 22 juni 2013.

Kamp, H.G.J. (2013). Brief aan de Voorzitter van de Tweede Kamer. Betreft: Klankbordgroep in relatie tot het schaliegasonderzoek. Den Haag: Ministerie van Economische Zaken, 28 juni 2013.

Kraft, M.E. & B.B. Clary (1991*) 'Citizen Participation and the NIMBY Syndrome: Public Response to Radioactive Waste Disposal'*, The Western Political Quarterly, vol. 44, No. 2: 299-328.

Metze, T. (2013*) What the frack? Development of a controversy about hydraulic fracking for shale gas in the Netherlands.* Paper for IPA Conference 2013, 3-5 July, Vienna.

Milieudefensie 2014. Schaliegasvrije provincies en gemeenten in Nederland. Factsheet update 4 juni 2014.

Mineur, J. (2013). *Boring naar schaliegas op land*. De juridische mogelijkheden van gemeenten, provincies en waterschappen. 3 juni 2013.

Ministerie van Economische Zaken, Landbouw en Innovatie (2012). Delfstoffen en Aardwarmte in Nederland. Jaarverslag 2011. Den Haag: Ministerie van Economische Zaken.

Provincie Noord-Brabant (2013). Leef en vestigingsklimaat en Notitie Beleid Ondergrond; d.d.18-06-2013; bijlage 1 behorende bij het Statenvoorstel nr. 49/13 grondwater

Verhoeven, I. (2009). *'Boze burgers. Politieke mobilisatie tegen de gemeentelijke herindeling van Den Haag en omgeving'*. Sociologie, 5(2), 203-220.

Vries, A. de, R. van Est, A. van Waes (red.)(2013a). *Samen winnen: Verbreding van schaliegasdiscussie en handvatten voor besluitvorming.* Den Haag: Rathenau Instituut.

Vries, A. de, R. van Est & Frans Brom (2013). From*: Samen Winnen. Verbreding discussie schaliegaswinning.* red. Annick de Vries, Rinie van Est en Arnoud van Waes, 2013.

Vries, A. de, A. van Waes, R. van Est & J. Visser (red.)(2013b). *Het Bericht – Schaliegas: veelzijdig debat vereist***.** Den Haag: Rathenau Instituut.

Waes, A. van (2013). *Shale gas frames, arguments and coalitions in the Netherlands and Denmark. And the relation with renewable energy development*. Masterthesis, Eindhoven University of Technology, Department of Industrial Engineering & Innovation Sciences.

Wolsink, M. (1994) *'Entanglement of Interests and Motives. Assumptions Behind the NIMBY-Theory on Facility Siting',* Urban Studies, 31, 6: 851-866.

Who was Rathenau?
The Rathenau Instituut is named after Professor G.W. Rathenau (1911-1989), who was successively professor of experimental physics at the University of Amsterdam, director of the Philips Physics Laboratory in Eindhoven, and a member of the Scientific Advisory Council on Government Policy. He achieved national fame as chairman of the commission formed in 1978 to investigate the societal implications of micro-electronics. One of the commission's recommendations was that there should be ongoing and systematic monitoring of the societal significance of all technological advances. Rathenau's activities led to the foundation of the Netherlands Organization for Technology Assessment (NOTA) in 1986. On 2 June 1994, this organization was renamed 'the Rathenau Instituut'.