Responsible innovation of shale gas

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Introduction

The extraction of unconventional gas has engendered public controversies in many countries around the world. The controversy on shale gas is just one in a range of examples of energy projects that face difficulties in the implementation phase. The interaction between citizens, businesses, local authorities and environmental organizations may be, or become, problematic, and turn energy projects into difficult and risky enterprises. The government and the energy industry therefore consider the antagonists in such cases as showstoppers. Thus, policies and communication are organized accordingly and the value-laden basis of controversies is ignored. Hence national authorities and energy companies complain that either the public is ill-informed (Wynne, 2001), resistant to scientific information, or only concerned with its own short-term interests (Bell, Gray, & Haggett, 2005; Wolsink, 2006). This is referred to as the "technocratic pitfall" (Roeser, 2011).

In this paper we aim to clarify these controversies by focusing on the fundamental public values that underlie shale gas developments. This value-laden basis of social conflict is often ignored. We argue that the contestation finds it roots in the diversity of (conflicting) stakeholders' values (Correljé, Cuppen, Dignum, Pesch, & Taebi, forthcoming). This means that responsible innovation not only requires more or better dissemination of information, or a more elaborate risk assessment, but it requires the acknowledgment of different (moral) viewpoints of stakeholders, which should be taken as a point of departure to identify and to construct shared solutions. A societally responsible development of energy projects requires the accommodation of the variety of stakeholders' values.

We will first identify and operationalize these public values at stake. The Netherlands will be used as a case study. It is an important European country in natural gas discussions and it is the second largest producer of natural gas in Europe. It is anticipated that there could be substantial amounts of unconventional gas present, while proposals for explorations have been submitted. Since then there has been a fierce public debate between the proponent and opponents of conventional gas, from which we obtain our rich empirical insights.

Method & analysis

The data used for the analysis in this paper are taken from the Dutch public debate on shale gas. Two separate studies have been performed. The first study aims to identify the range of values that are (implicitly and explicitly) present in the Dutch shale gas debate. The second study aims to add a dynamic perspective, by looking into the changes in discourses over time.

The first study consisted of three steps. In the first step, a database of arguments that are used by Dutch stakeholders was created. For the analysis a snowballing strategy was used. Analysis started with key documents from the National Government, NGOs, Industry, and the Dutch Energy Council. References cited in these reports were scrutinized in a next step. This process continued until saturation of arguments was reached. In addition, the aim was to ensure that all actor perspectives were covered in the arguments. In the second step, values were allocated to each of the arguments that were put forward in the debate. Values were identified in an iterative process, going back and forth from empirics to ethical theory. Sometimes multiple values were allocated to a single argument. For example, the argument *The fracking fluid of shale gas exploration can bring radioactivity from the subsurface above ground,* refers to both the value 'health & safety' as well as 'environmental friendliness'. The third step entailed an analysis of the value structure in the Dutch shale gas debate. We distinguish two types of values: substantive and procedural values. Both types of values can be subdivided in a number of more specific values (see Figure 1). Building on Van de Poel (forthcoming), a *value hierarchy* is constructed (consisting of public values on the highest level, norms derived from these values at the intermediate level and the very specific design requirements at the lowest level of this pyramid). This is done to see on what level controversies are constituted.
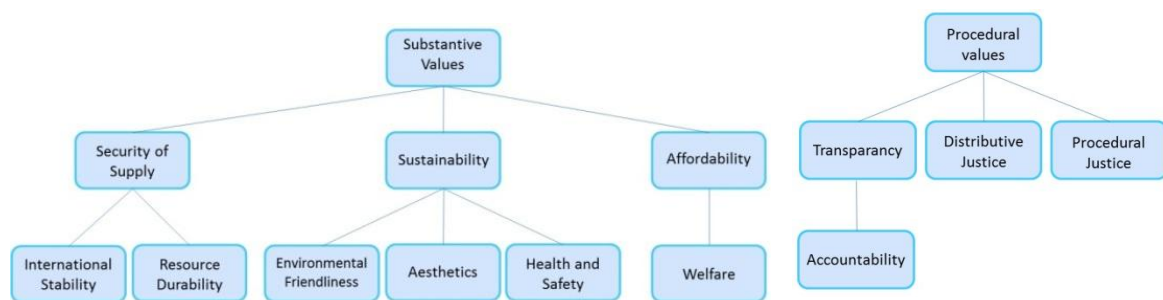

Figure 1 Substantive and procedural values in the Dutch shale gas debate

The second study entailed an analysis of discourses over the course of the debate. A media analysis was performed based on 497 newspaper articles from the LexisNexis database using the search word 'schaliegas' (Dutch for shale gas). The search was limited to a period of 30 months: November 2010 to April 2013. An event history analysis was performed to identify events (physical events such as earthquakes due to natural gas drilling, as well as actions by particular stakeholders, such as sending out a petition) that may have influenced discourse changes. The software package T-lab was used to identify discourses and discourse developments. T-lab uses linguistic and statistical tools to analyse texts, such as newspaper articles. In order to identify the different discourses a thematic cluster analysis was run. The cluster analysis reveals the most important themes of the arguments used over a period of time. The software provides a list of elementary contexts which are typical to a cluster. These contexts were read to identify the most dominant discourse within the cluster. To reveal more developments the dataset was split up into eight separate episodes in the public debate. For each of the eight episodes a thematic cluster analysis was performed. Ten semi-structured interviews with experts on the shale gas debate were conducted to validate and supplement the results.

Findings and implications

Our analysis so far points to at least three findings. First, the controversy on shale gas is not so much a value conflict, but rather a 'value-translation' conflict. That is, proponents and opponents adhere to the same values, yet the way they translate and conceptualize these values differs. Conflict furthermore arises due to different trade-offs between values. Second, the debate on shale gas revolves around a broad range of values, that include not only values with regard to the technology itself, but also with regard to the decision making procedure and the institutions relevant to shale gas development. A range of arguments points for example to the limitations of current deliberative and legislative frameworks. This finding is especially relevant, given that the Dutch government as well as the European Commission positions 'decarbonisation', security of supply, and competitiveness as its pillars for energy policy. These pillars relate to the substantive values 'sustainability', 'security of supply' and 'welfare'. Our findings suggest that these substantive values do not cover all values that are relevant for energy policy. A policy based on these pillars neglects the importance of procedural values, such as fairness and justice, for responsible innovation. Interestingly, these procedural values are present in arguments from both opponents and proponents. Third, the way arguments, and thus values, are articulated in a public debate is a dynamic and emergent process. That means that it is not possible to identify *ex ante* all values that are at stake for the stakeholders involved, as particular values become salient in response to particular events or developments. For example, the analysis shows that the 'Safety and Environment' discourse, which was the basis for the governmental initiated research, impeded actors to learn about the diversity of perspectives and discourses of various actors. As a result, it triggered actors to use a 'Procedural Justice' discourse to get through to policy makers.

Based on our findings we will be able to derive the requirements of an approach for responsible innovation that allows for 1) making explicit the translation of values into norms and design requirements and the conflicts that may occur as a result of this, 2) the inclusion and articulation of procedural values in an early stage, 3) dynamic articulation and translation of values.

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