

Developing an approach for best risk governance practices of shale gas production in Europe

N. Arnold¹, K. Gufler¹, G. Giersch²

¹ *Institute of Security/Safety- and Risk Sciences, University of Natural Resources and Life Sciences, Vienna, risk@boku.ac.at, www.risk.boku.ac.at*

² *Organisation for International Dialogue and Conflict Management – IDC, Vienna, info@idialog.eu, www.idialog.eu*

ABSTRACT: The conference contribution will provide an overview to an approach towards a transparent risk governance framework for shale gas development, integrating the levels of politics, economics, stakeholders and possible environmental impacts, such as methane leakage, ground and surface water contamination, or induced seismic activities. The approach broadens the knowledge base on shale gas extraction technologies and the scientific understanding of its impacts. This allows:

- linking specific technologies and governance practices to environmental impacts and risks
- comparing best available technology options and best governance practices
- providing guidance for the industry and policy makers in view of minimizing the environmental footprint
- ensuring wider social sustainability and acceptance through adapted risk governance and
- providing guidance for the innovation and technological development agenda.

Keywords: shale gas, risk governance, unconventional resources

1. INTRODUCTION

Technological progress, notably the combination of horizontal drilling and high volume hydraulic fracturing, together with regulatory exemptions for the exploration and extraction industry, has stimulated disruptive growth of unconventional hydrocarbons in North America. Meanwhile the EC has highlighted its commitment to further GHG emission reduction and to ensure the EU is on a cost-effective track towards meeting its objective of cutting emissions by at least 80% by 2050. For this long term ambition, the EC has proposed its Energy Roadmap 2050 and has developed a Strategic Energy Technology Plan (SET-Plan). Both, the Roadmap and the SET-Plan take notice of the potential implication of shale gas for the EU. At the same time, various related environmental impacts, risks and uncertainties are challenging the idea that developing European shale gas deposits could serve as a bridge towards a decarbonised European energy system, while a scattered and changing regulatory landscape in Europe leaves it widely uncertain when unconventional resources might become significant.

Due to diverging interests of member states, the EC has so far stepped away from comprehensive EU regulation. Nonetheless some of the risks are clearly transboundary in nature and therefore a matter for the ESPO Convention while other impacts are at least relevant for EU policy objectives.

The huge potential of shale gas, Europe's most important unconventional hydrocarbon resource, is contrasted by significant public concerns [1], mainly due to environmental impacts and risks of related

exploration and exploitation techniques. While environmental impacts may be assessed through measurements and models, any evaluation of risks is inevitably bound to a specific social context and has to consider social perception and stakeholders' perspectives, including community concerns. Thus understanding environmental impacts and risks necessarily has to go beyond their mere empirical assessment and the description of risks in terms of technological failure. For any European socially sustainable shale gas development, best risk governance practices and transparent risk evaluation mechanisms have to be identified, elaborated and compared.

2. SUGGESTED APPROACH FOR BEST RISK GOVERNANCE PRACTICES

In order to achieve best practices, both in shale gas E&P and in governing associated risks and concerns, it is essential to understand impacts, risks and uncertainties of shale gas development in Europe and its specific exploration & production (E&P) technologies. To contribute towards minimising the environmental footprint and making shale gas E&P socially and environmentally sustainable in Europe a threefold approach is suggested (Fig. 1).

- (A) Understanding impacts: Extending the knowledge base on environmental impacts and risks.
- (B) Analysing technology governance: Understanding governance practices and regulatory environments.
- (C) Matching between impacts and governance: Analysing fits and misfits of regulatory approaches and governance practices in view of criteria development for best available technologies and best risk governance.

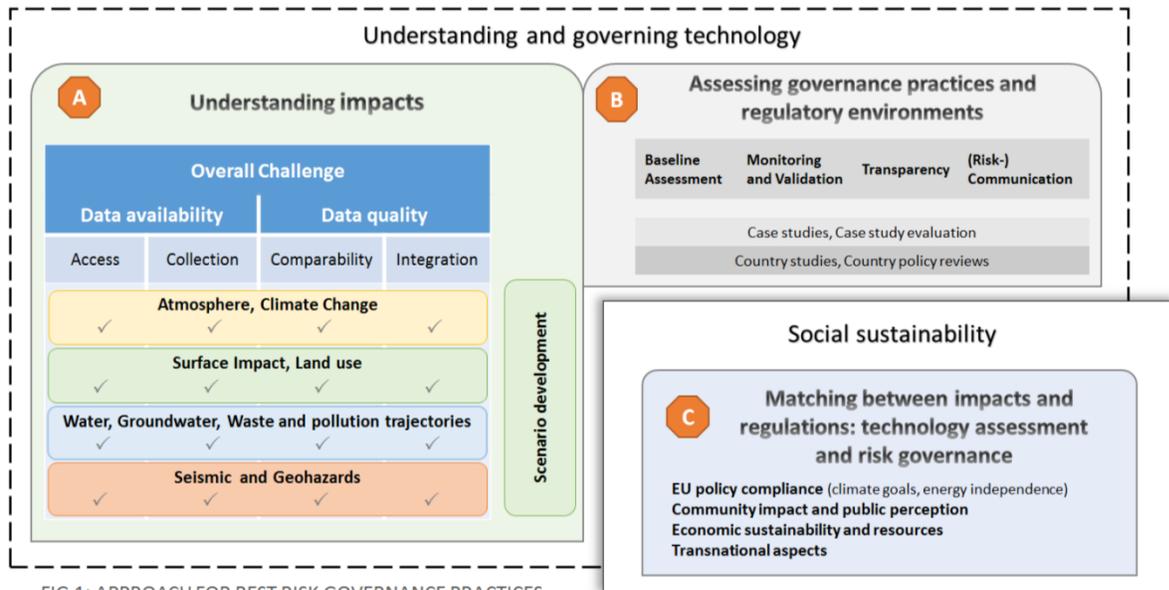


FIG 1: APPROACH FOR BEST RISK GOVERNANCE PRACTICES

As shale gas E&P technology has seen numerous improvements, in terms of safety and cost efficiency, the approach starts from two focused assessments (A)+(B), to specify environmental impacts resulting from shale gas production and the related governance, including the development of rules and regulations. Matching the findings from both assessments in a second level of analysis (C) will allow delivering scientific recommendations that go beyond BAT identification. Best risk governance practices

are about both, minimizing the environmental footprint of shale gas extraction and enabling its sustained social acceptability.

In relation to part (A) the environmental issues involved can be broadly distinguished as (i) GHG emissions and air quality [2-7], (ii) surface impacts, land use and footprint [8-10], (iii) water and groundwater related risks, including water treatment issues [11-12], and (iv) geological and seismic uncertainties and risks. However most of the specific issues are interlinked and are related technological and contextual frame conditions, whereas some of the pathways of risks and impacts are still unknown. Site specific impacts, risks and uncertainties require specific attention and should be distinguished from more general implications. They can be assessed by scenario based regional case studies and by site specific assessment activities. In addition, comparing technological choices in view of their environmental impacts is prerequisite for pointing out best available technologies (BAT).

In relation to part (B) it is necessary to assess various relevant regulatory and governance based on a comparative analysis of various parameters derived from well-established risk governance frameworks [15,16]. The assessment should be structured along the analysis of the following aspects:

- Environmental baseline assessment practices, requirements and standards;
- Environmental monitoring and compliance oversight, as well as methods and regulatory approaches to impact data and data comparability;
- Transparency requirements, transparency practices and transparency demands;
- Risk communication approaches, dialogue and community participation.

The matching approach (C) is directed towards the elaboration of criteria for the identification and evaluation of risks and impacts, best available technologies (BAT) and best risk governance practices. While the results will depend on data and valuations of stakeholders, the objectives of such a transparent risk evaluation framework can be pointed out as follows:

- specify fits and misfits between environmental impact (and impact scenarios) and regulatory provisions or (existing) risk governance practices;
- find out potentials to shape related technology and regulation practice in order to reduce environmental risks and to provide governance strategies for the implementation of best available technologies (BAT);
- elaborate checklists and criteria for the evaluation of best practices in risk management.

Within this process of valuation the contextual and technological specifications provide useful guidance to differentiate various economic, social and community perspectives and take into account different spatial (local, regional, transnational) and temporal (short term vs. long term) aspects and issues. Matching impacts against EU policy objectives and risk governance practices and in particular involving interested stakeholders for criteria development requires a transdisciplinary approach. Such approaches are well-established and validated in TA and risk evaluation processes [17,18].

Altogether, the approach is directed to European best practices in risk governance in view of mitigating environmental impacts and fostering the social sustainability and acceptance of shale gas development. An appropriate governance framework for shale gas development has to consider more than impact assessments and existing national rules and regulations. It is influenced by the questions of economic impacts, resource availability and competition with alternative energy carriers. In the EU-context it will face transboundary issues and different grades of public acceptance as well as different standards for data gathering and validation, thus a lack of comparability. In this regard various assessment criteria have to be analysed and evaluated and their comparability assessed. In addition they have to be related to EU-guidelines and recommendations.

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