



**SHEER WP7 Report, 11.11.2015  
for the Progress / PMT Meeting in Katowice, Poland  
(WP Leader, A. Garcia)**

**Short summary of the progresses of the period May – June 2015**

Please provide a concise overview of the progress of the work in line with the structure of Annex I to the Grant Agreement (DoA)

- **List of the staff actively involved in the WP**

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- **Objectives expected after 6 Month**

The main objective of WP7 during the first 6 months of the project has been to identify and outline risk pathway scenarios associated with shale gas development. Those scenarios constitute the background knowledge over which the SHEER multi-risk framework will be built over. At the current state, in total, 56 pathway scenarios have been identified divided by project stage as follows: 11 scenarios were identified for the site development and drilling preparation phase, 7 scenarios for the drilling activities, 21 scenarios for the hydraulic fracturing and well completion phase, 11 scenarios for the production and operation phase, and 6 scenarios for the well abandonment and post-abandonment phase. The screening of possible scenarios constitutes the first step of the activities in the road towards the general framework for scenario structuring (D7.1, in month 12) and quantitative model development (D7.2, in month 24). A milestone (M13) is associated to this activity which, therefore it has been successfully reached.

- **A summary of progress towards objectives and details for each task in the first six months**

The risk pathway scenarios were identified considering risks associated with both routine activities and extreme events. This activity of scenario screening has been developed mainly by Task 7.1, nevertheless it has been performed collecting also useful information for the positive outcome of the other two tasks.

**- Task 7.1: Identification and structuring multi-risk scenarios**

As a first step for the scenario identification process, we have collected and analysed literature in order to put in evidence scenarios frequently claimed as of priority for risk assessment in shale gas development. We have found that there exist a considerable amount of peer- and (mostly) non peer-reviewed literature in which a number of possible environmental impacts have been identified. To identify the risk pathways in a multi-risk approach we take into account possible Source Mechanism Receptor (SMR) linkages. After a detailed filtering of the collected literature, we have identified documents considered as relevant for potential environmental impacts associated with shale gas development giving precedence, in order of importance, to peer-reviewed papers, peer-reviewed reports, and non peer-reviewed reports. The following Table summarizes the number of publications considered for the scenario screening process and the typology of impacts and risk receptors that were identified.

	Primary Receptor				Final Receptor		Number of references
	Surface water (%)	Ground water (%)	Air quality (%)	Soil quality (%)	Community disruption (%)	Ecosystem disruption (%)	
Peer-reviewed papers and reports	19.5	28.7	20.7	3.4	12.6	5.7	37*
Non peer-reviewed reports	21.1	23.7	15.8	10.5	13.2	10.5	10

*\*37 documents, from where 32 peer reviewed papers and 5 peer-reviewed reports*

As output of this process, a preliminary screening of risk scenarios has been performed considering the most significant risks evidenced in literature. Those scenarios will be subject of deep analyses in a later stage in the project to find mechanisms for quantitative assessments. The identification of scenarios has been performed for 5 different stages of a project, namely: (1) Site development and drilling preparation; (2) Drilling activities; (3) Fracturing and well completion; (4) Production and operation; (5) Well abandonment and post-abandonment. In total, 57 pathway scenarios were identified divided as follows: 11 scenarios were identified for the site development and drilling preparation phase, 8 scenarios for the drilling activities, 21 scenarios for the fracturing and well completion phase, 11 scenarios for the production and operation phase, and 6 scenarios for the well abandonment and post-abandonment phase. These activities are oriented towards the fulfillment of the objectives of D7.1 due in month 12.

In this task also socio- economic aspects of shale gas operations have been analysed. The following activities have been carried out:

- Identification of socio-economic indicators to portray the socio economic context in which shale gas operations take place. The aim is to understand local communities' values (with a key focus on environmental attitudes) and factors that are likely to contribute to lack of acceptance of shale gas in a community. Collection of data about the identified indicators will be made for two test cases: Wysin (Poland) and Blackpool (UK).
- Literature review with a focus on fiscal, social, and economic benefits and risks for local communities. Particular attention have been paid to the European public perceptions on shale gas. Furthermore, the research included studies of the European citizens perceptions also on other energy sources.

### **- Task 7.2. Development of a probabilistic framework**

In parallel with the scenario screening and structuring activities of Task 7.1, Task 7.2 has been active in gathering information about the main characteristics of the scenarios identified in order to explore possible parameterizations for each specific problem and their possible utility for the quantitative framework. Regarding the seismic risk assessment associated with induced seismicity, in particular, an inventory data has been created in order to classify buildings (RC and Masonry buildings) according to the SYNER-G taxonomy. Activities to collect Information for building/infrastructure typology classification and seismic vulnerability of the case studies has been started (at the moment, data is available for the Blackpoll case study).

### **- Task 7.3. Comparative analysis of the impacts of shale gas operations with the impacts associated to conventional gas and oil sources**

