



European Commission initiatives on the environmental impacts associated with shale gas

"Unconventional Resource Development
Enhanced Recovery and Environmental Stewardship"

Austin, U.S.A., October 12-13, 2016

-International Energy Agency Gas & Oil Technologies- GOT,
The University of Texas

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Research &
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Energy Union



One of the 10 political priorities of the Juncker Commission

Policy Context



Energy Union

- *Energy security, solidarity and trust*
- *A fully integrated internal energy market*
- *Energy efficiency first*
- *Transition to a low-carbon society*
- *An Energy Union for Research, Innovation and Competiveness*



SET-Plan

- *Integrated Roadmap*
- Communication on the Integrated SET-Plan
COM[2015]6317



Shale gas in the SET plan



SET Plan – European Energy Research alliance (EERA) Shale Gas Joint Program

Coordinator : TNO

Members: 22 institutes from 12 European member states

It will establish : a common knowledge platform for research on the potential, impact and safety of shale gas development in Europe.

5 key areas in working: <http://eera-shalegas.eu/program.html>

- Assessment of Shale Gas Potential
- Technology for Safe Exploitation
- Environmental Impact & Footprint
- Energy and Carbon Efficiencies
- Social License to Operate

Policy context : Environmental Aspects of Unconventional Hydrocarbons



- The European Commission- EC (DG ENV in lead) wants to ensure:
 - The environmental integrity of extraction of unconventional hydrocarbons, such as shale gas
 - That risks that may arise are managed adequately in Member States that wish to explore or exploit such resources.
- The EC adopted on 22 January 2014 a Recommendation, to bring clarity and predictability to public authorities, market operators and citizens.
- The Recommendation complements EU existing legislation, and invites Member States to follow minimum principles when using high volume hydraulic fracturing.
- The Recommendation was accompanied by a Communication, and an Impact Assessment that examined the socio-economic and environmental impacts of various policy options.

Policy context : Environmental Aspects of Unconventional Hydrocarbons



The European Commission Recommendation:

- Strategic environmental assessment prior to granting licenses
 - Site specific characterization both surface and underground
 - Baseline reporting (e.g. of water, air, seismicity)
 - Transparency, e.g. the public is informed of fluids used in hydraulic fracturing and waste water composition
 - Well integrity, the well is properly insulated from surrounding geological formations
 - Flaring, venting only in exceptional safety cases
 - Use of best available techniques
- Based on the inputs received in 2015 and 2016 from the Member States, industry stakeholders, NGO's and the public the EC is reviewing the effectiveness of this recommendation,
- Member States are responsible for deciding their energy mix while respecting the need to preserve, protect and improve the quality of the environment.

Political acceptability in Europe towards UH exploration



The Geological Surveys of Europe



European Science and Technology Network on UH Extraction

(1)



- The EC Communication states that it is necessary to continue increasing our knowledge in the EU on unconventional hydrocarbon extraction technologies and practices also in order to further reduce potential health and environmental impacts and risks.
- It is essential that information is open and transparent to the public
- In that context a "European Science and Technology Network on Unconventional Hydrocarbon Extraction" was established, which is bringing together practitioners from industry, research and academia as well as from civil society.
- The Network collected, analysed and reviewed results from exploration and exploitation projects as well as assessing the development of technologies used in unconventional gas and oil projects

European Science and Technology Network UH Extraction

(2)



- It was managed by the JRC on behalf of a steering group constituted by 5 European Commission DGs (ENV, ENER, CLIMA, RTD, GROW)
- Launched on 8th July 2014 <https://ec.europa.eu/jrc/uh-network> had 2 Working groups
 - Working Group 1 (WG1) on the "Exploration and demonstration and production projects in the EU"
 - Working Group 2 (WG2) on "Emerging technologies for well stimulation"

More than 150 persons were registered in WG1 and WG2 representing:

- (1) industries
- (2) research organisations and public bodies with a research/technical role
- (3) academia and
- (4) non-governmental organisations and the civil society



Conclusions

- The Shale Gas drilling activity in the EU remains very low. It accounts for less than 3% of the shale wells drilled outside North America.
- Hydraulic fracturing of horizontal wells was limited, mostly due to difficult geology in the EU, low gas and oil prices and public acceptance issues.
- A total of around 80 shale gas exploratory wells were drilled of which around 16 were fractured with high volumes of fluids
 - Confidentiality issues on the operator's side prevented the availability of technical, environmental and geological data for certain identified wells
- WG2 concluded that water-based hydraulic fracturing is expected to remain the most commonly used technique in the sector in the coming years.

Annual Conference of the UH network



The annual conference of the European Science and Technology Network on UH Extraction was organised by EC on 23/24 February 2016

Presentations included

- the status of the work carried out by the network in 2015
- recent technical and research developments:
 - Findings and synergies of the 4 H2020 Projects on shale gas
 - Non-water based well stimulation technologies – DoE & CAN
- It was announced that no further Working Group meetings will be convened. The Commission will continue to work on the scientific and technical aspects of unconventional hydrocarbons



- Address the environmental risks associated with Shale Gas and Oil from the research and innovation perspective
 - The environmental and social concerns need to be addressed with a sound scientific evidence engaging the citizens along the way
 - Provide a valuable science-based input to the risks associated with shale gas exploration/extraction

- To stimulate international collaborative R & D
 - Explore learnings from the US and Canada and active EU Member states shale gas experience to date
 - Stimulate knowledge sharing in research and innovation in areas of common interest

Ongoing H2020 EU-funded research projects



Acronym	Start date	EC Contribution €	Duration /months	Coord.	Webpage
M4shaleGas	06/2015	2,999,647	30	TNO (NL)	http://www.m4shalegas.eu/home.html
SHEER	05/2015	2,601,720	36	AMRA (IT)	http://www.sheerproject.eu/
FracRisk	06/2015	2,939,998	36	University of Edinburgh (UK)	www.fracrisk.eu
ShaleXenvironmenT	09/2015	2,999,201	36	UCL (UK)	http://shalexenvironment.org/

US participation



- 1) M4ShaleGas:
Advisory Board Members: United States Geological Survey,
Advanced Resources International
- 2) SHEER:
Consortium Member: University of Wyoming
- 3) FracRisk:
Consortium Member: PENN STATE - Marcellus Centre for
Outreach and Research
- 4) ShaleXenvironmentT :
Advisory Board member: University of Oklahoma
Entities associated: Ohio State University
Oak Ridge National Laboratory
Lawrence Berkeley National Laboratory

Conclusions



- In EU we need to provide independent science-based knowledge to decision makers and the public on the potential environmental impacts of shale gas.
- We need to have an open dialogue between stakeholders on how to address the environmental risks of shale gas through worldwide R&D.
- Knowledge sharing has to be ensured at an international level
- Horizon 2020 provides funding opportunities for research and innovation – Look out for the call in 2017.



HORIZON 2020

Thank you
for your attention!

Find out more:
www.ec.europa/research/horizon2020