



European Commission research initiatives on the environmental impacts associated with shale gas

"Addressing Environmental Risks associated with Shale Gas and Oil through Worldwide R & D"

Brussels 27-28 October 2015

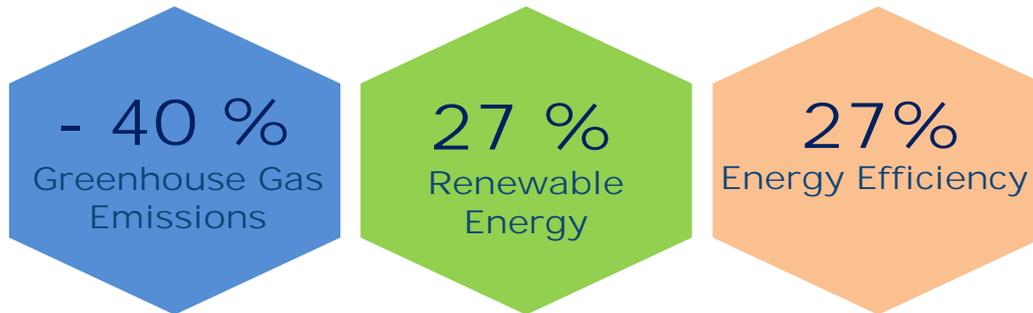
-International Energy Agency Gas & Oil Technologies Initiative, GOT

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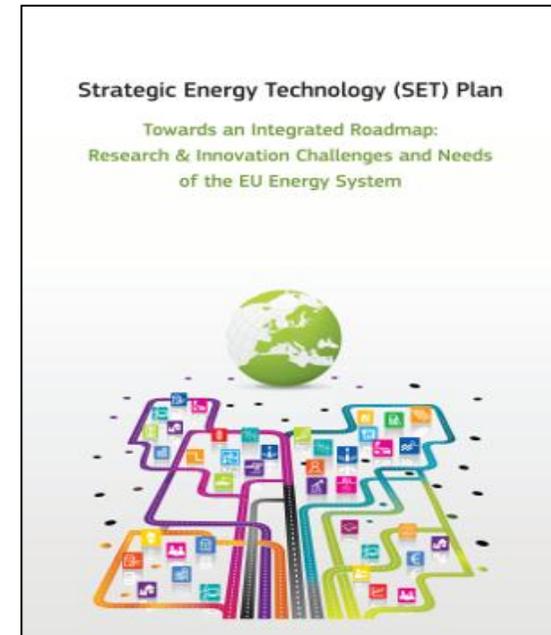
Research &
Innovation

"Towards an Integrated Roadmap"

- links to policy agenda:
2030 updated targets for energy & climate



- From individual technologies to energy system as a whole
- New policy challenges:
 - Consumer at the centre
 - Energy efficiency (demand)
 - System optimisation
 - Technologies (supply)



2015: 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: 24 EU research institutes

It will establish :

- a common knowledge platform for research on the potential, impact and safety of shale gas development in Europe.
- existing technologies and methodologies will be evaluated and improved to establish an independent knowledge basis which is based on sound research by 24 independent research institutes from 15 European member states

Policy context : Environmental Aspects of Unconventional Fossil Fuels



- The Commission (with DG ENV in Tead) 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 Commission 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.
- Member States are invited to inform the Commission annually about measures taken.
- The Recommendation was accompanied by a Communication, and an Impact Assessment that examined the socio-economic and environmental impacts of various policy options.

European Science and Technology Network on Unconventional Hydrocarbon Extraction



- Launched on 8th July 2014
- Managed by the JRC on behalf of a steering group constituted by 5 other European Commission DGs (ENV, ENER, CLIMA, RTD, GROW)
- The Network has 2 Working groups (<https://ec.europa.eu/jrc/uh-network>)
- Working Group 1 (WG1) will work on the "Exploration and demonstration and production projects in the EU".
- Working Group 2 (WG2) will work on "Emerging technologies for well stimulation"
- First working group meetings on 23-24 February 2015, follow-up meetings in June 2015.

The objective of today's event



- To 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
 - Discussions will 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
 - Be informed of the Horizon 2020 on-going projects and future openings



Horizon 2020

The EU Framework
Programme for
Research and Innovation

2014-2020

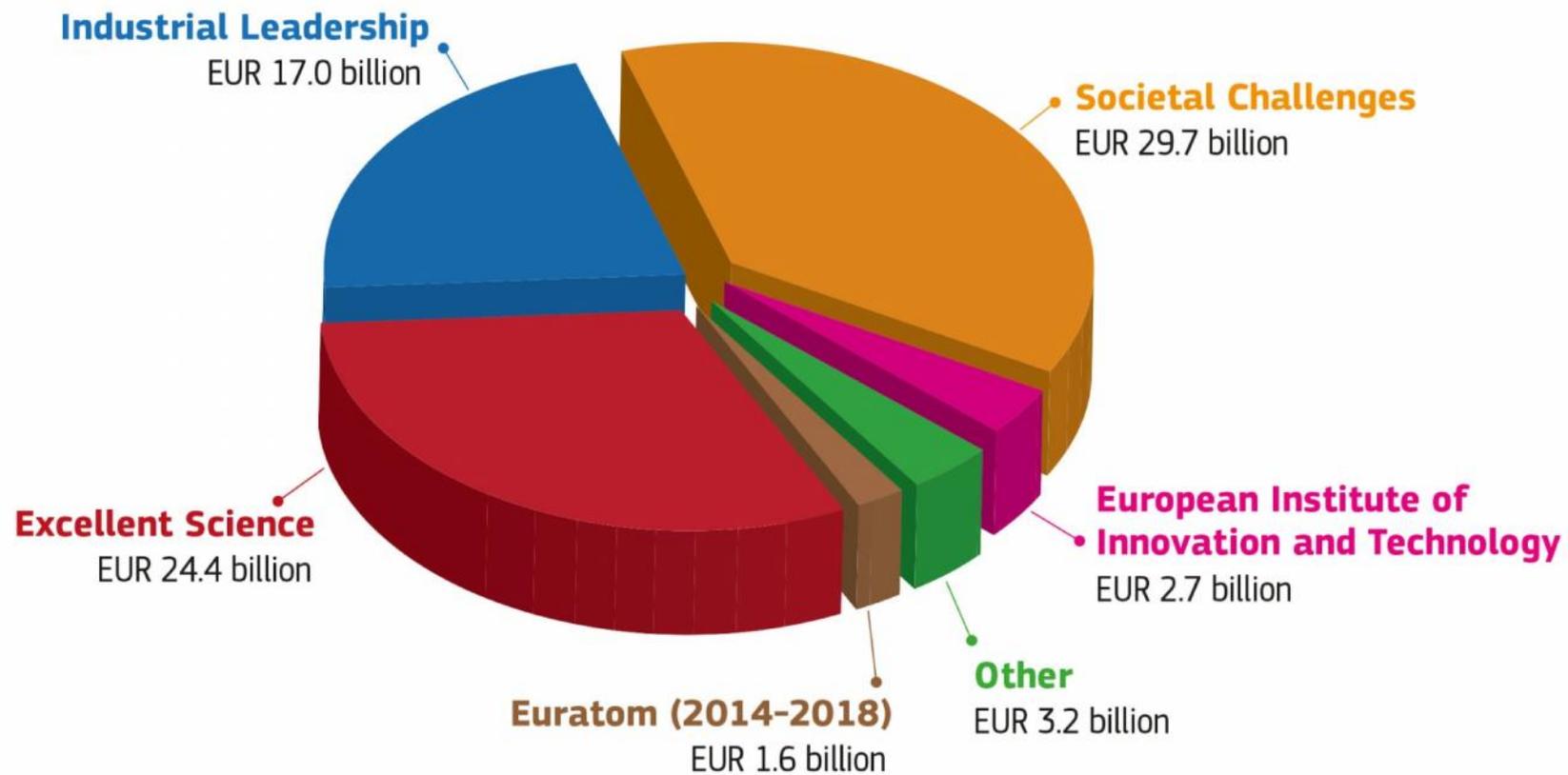
A large graphic for Horizon 2020. The word "HORIZON" is written in white, uppercase letters, with a small globe of the Earth replacing the letter "O". The word "2020" is also written in white, uppercase letters. The background is a vibrant blue with a glowing horizon line and radiating light beams. The globe is positioned in the center, and the text is spread across the width of the image.

HORIZON 2020

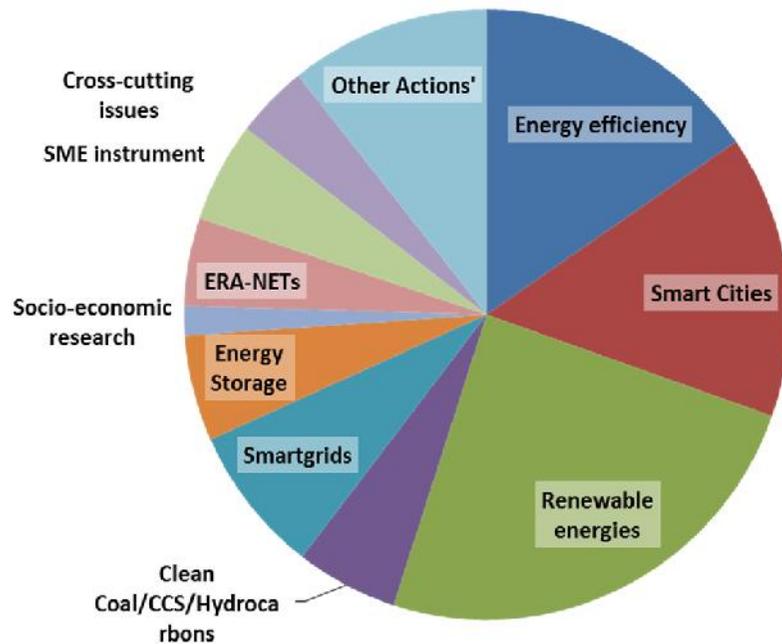
Research and
Innovation

€ 79 billion from 2014 to 2020

HORIZON 2020 BUDGET (in current prices)



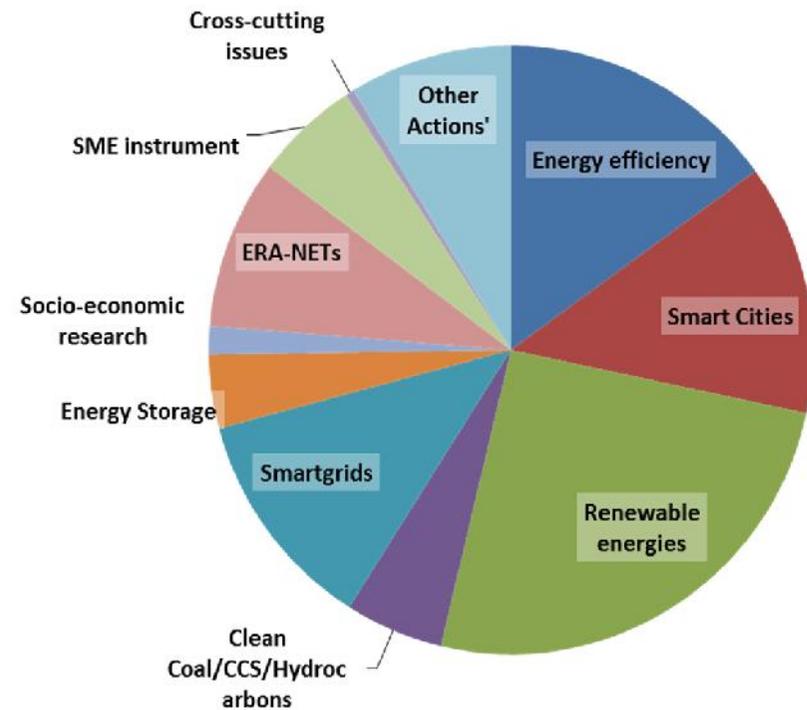
Budget allocation of the Energy WP (2014)



TOTAL budget for 2014: EUR 607 million

Contribution to fossil fuels in 2014: EUR 33 million

Budget allocation of the Energy WP (2015)



TOTAL budget for 2015: EUR 647 million

Contribution to fossil fuels in 2015: EUR 35 million

International cooperation

Principle of general openness
the programme will remain the
most open funding programme in
the world but EU interests will be
protected better.

Open to the associated
countries

Targeted actions to be
implemented taking
a strategic approach to
international cooperation





Understanding, preventing and mitigating the potential environmental impacts and risks of shale gas exploration and exploitation

- Challenge: Address environmental concerns through a better understanding and monitoring of the fracturing process and its environmental effects (including in the long term)
- Scope: Data collection (including satellite observation data), model development and identification/assessment of environmental impacts and risks and establishment of scientific recommendations for best practices. International cooperation was encouraged, with relevant US and Canadian partners.
- Expected impact: The resulting knowledge base and scientific recommendations for best practices will contribute to efforts aimed at minimising the environmental impacts of shale gas extraction.

LCE 16 – 2014 Outcome (1)



- The LCE16 call has generated a very good response and has led to four promising projects of overall EU funding EUR 11.6 million
- These projects will establish cooperation with a number of leading universities and research institutes from the US
- These projects will address the research and innovation bottlenecks on the environmental impacts of shale gas
- The projects will provide the necessary scientific evidence, help to define the challenges and to propose solutions.

LCE 16 – 2014 Outcome (2)

Successful 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/

LCE 16 – 2014 Outcome (3)



- 1) M4ShaleGas: focuses on reviewing and improving existing best practices and innovative technologies for measuring, monitoring, mitigating and managing the environmental impact of shale gas exploration and exploitation in Europe
- 2) SHEER: will develop a probabilistic procedure for assessing short and long-term risks associated with groundwater contamination, air pollution and induced seismicity
- 3) FracRisk: central to the project is the modelling of six exemplary scenarios selected to represent the highest risk environmental impact scenarios
- 4) ShaleXenvironmentT : will assess the environmental footprint of shale gas exploitation in Europe in terms of water usage and contamination, induced seismicity, and fugitive emissions by using experiments and modelling.

LCE 16 – 2014 Outcome (4) 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

European Commission Shale Gas Conference on R&D



The Commission organised a Shale Gas conference on R&D on 23/02/2015 in Brussels

- A R&I event on the benefits and risks of shale gas
- This event, was organised by DG RTD with the Horizon 2020 shale gas projects, U.S. (DoE) and Canadian speakers.
- The event had two sessions: (1) research and innovation to address the shale gas challenge, and (2) an evidence- and science-based policy for shale gas exploitation.



LCE 27 (2017): Measuring, monitoring and controlling the risks of CCS, EGS and unconventional hydrocarbons in the subsurface

CCS, EGS (enhanced geothermal systems) and shale gas development share some of the same challenges and risks); groundwater contamination is an important public concern

Research is needed to better understand natural and engineered leakage pathways and the impacts that leakage can have on fresh groundwater resources, soil and biodiversity

Highly sophisticated measuring and monitoring are required to manage the subsurface processes, and to mitigate and remediate any negative environmental impacts

Earmarked budget EUR 15 million; deadline 05/01/2017

This topic will provide EU and North American researchers with a platform to enhance transatlantic dialogue on these environmental and public health issues

Conclusions



- 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