

Decarbonisation of the use of fossil fuels

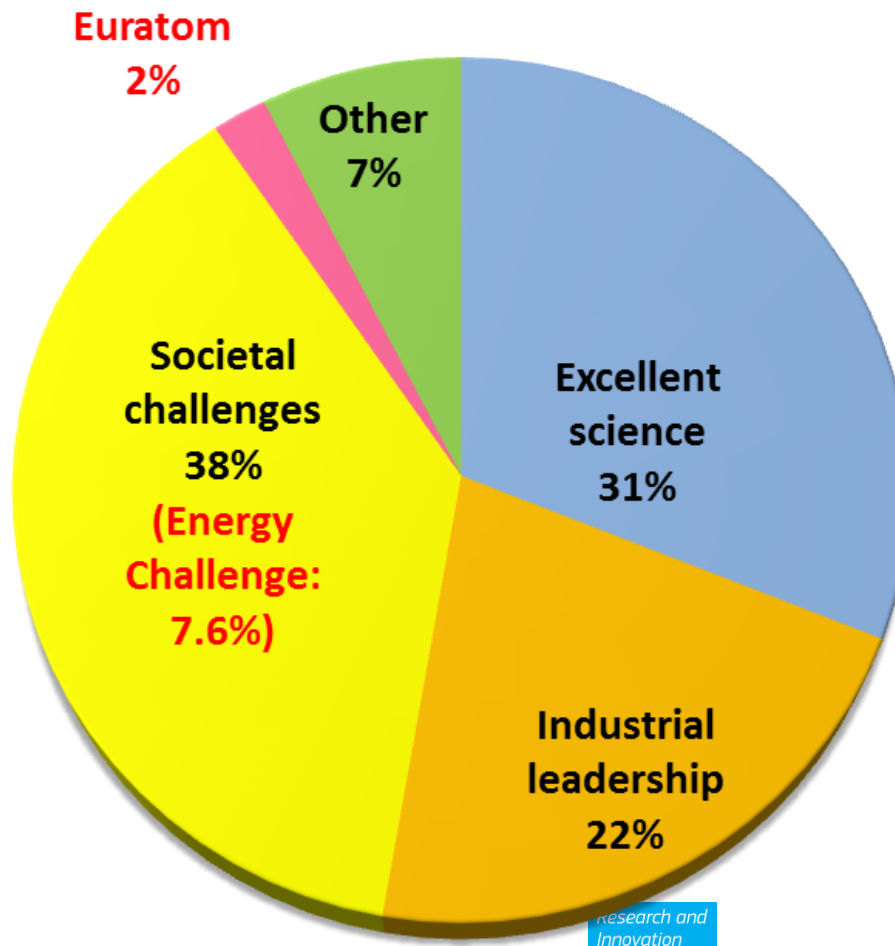
Horizon 2020 Energy 2017 Call



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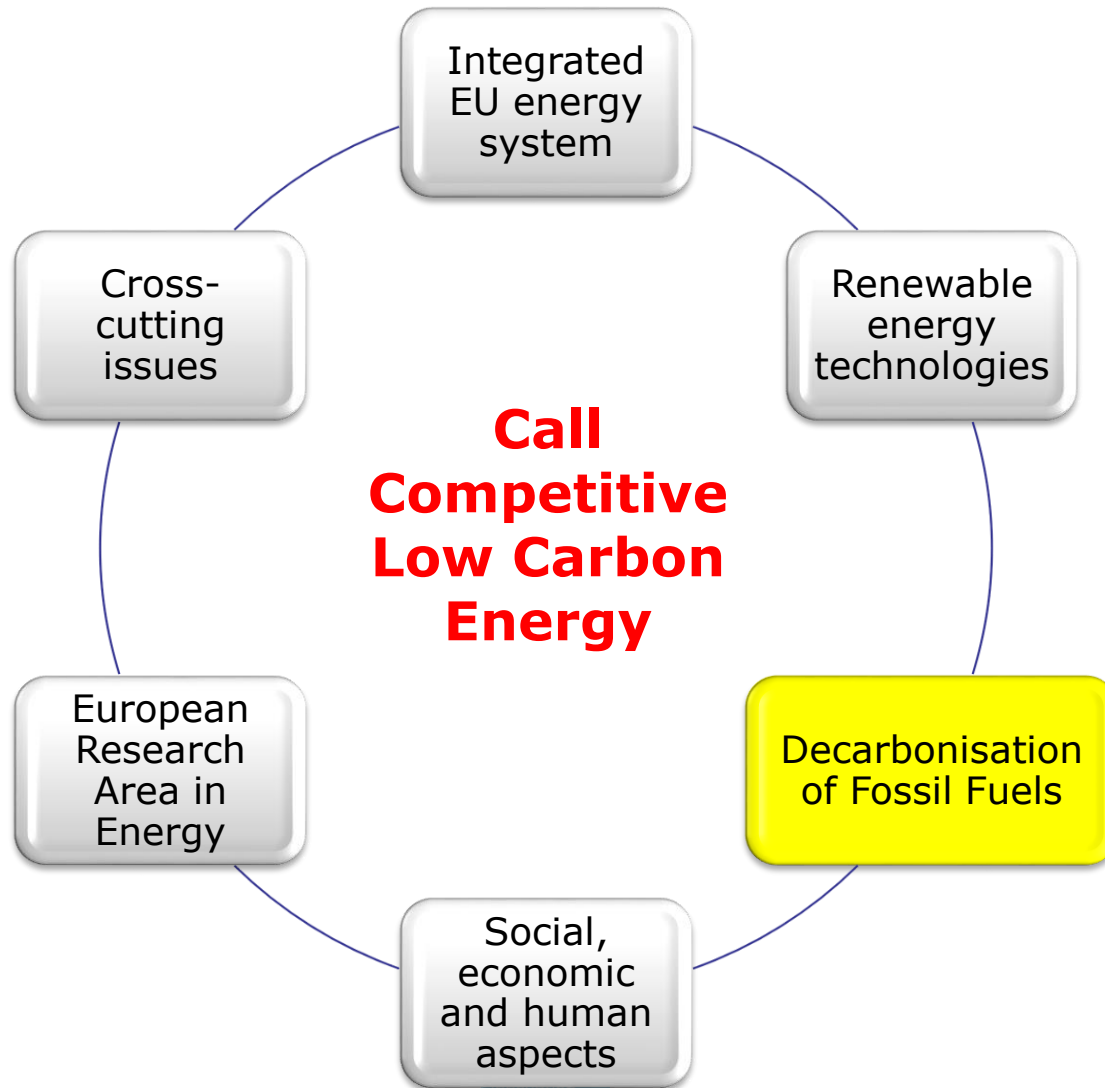
Horizon 2020 – Overall budgets



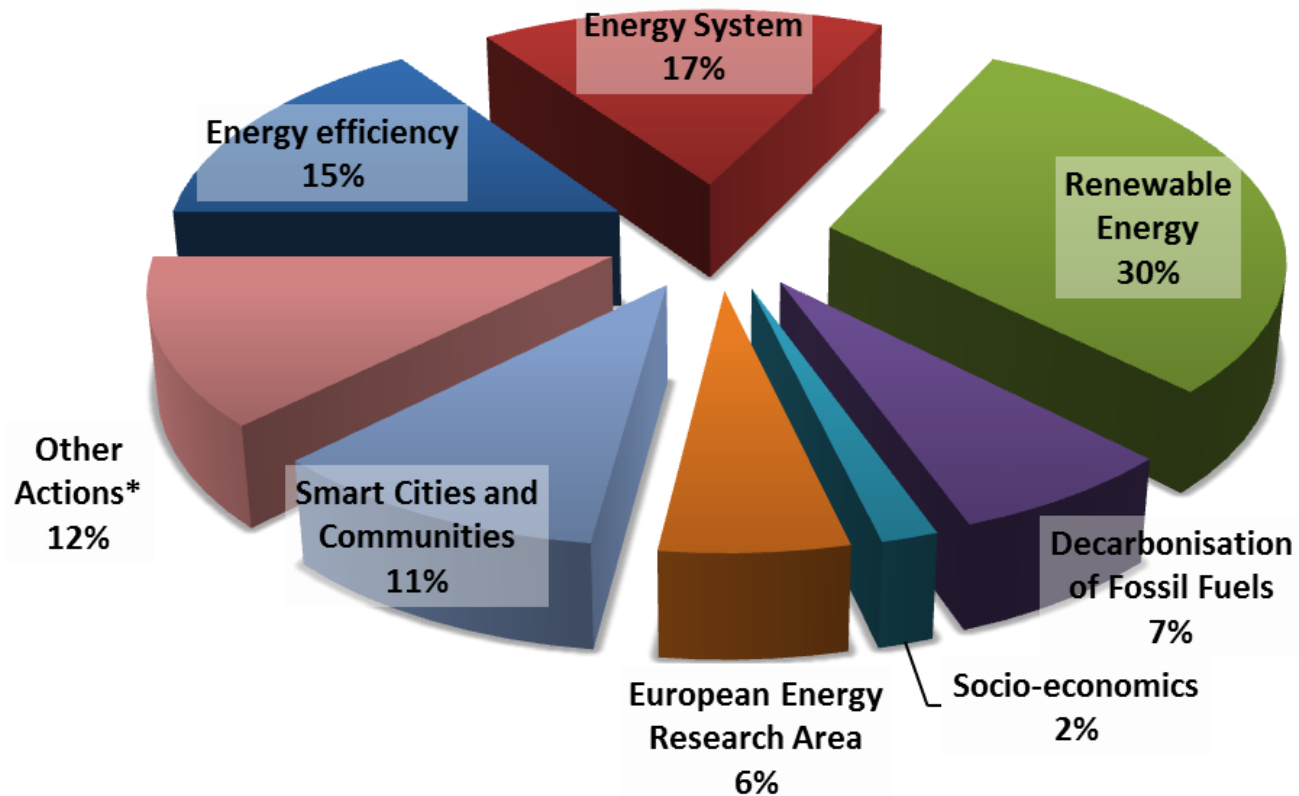
Total budget H2020:
EUR 74,83 billion

Budget of the
Energy Challenge:
EUR 5,69 billion

Horizon 2020 Energy Challenge



Indicative budget distribution per area for Energy calls 2016-2017



Total budget 2016-2017: EUR 1 344 million

Decarbonisation of fossil fuels, The Challenges

- Fossil fuels will be used in Europe's power generation as well as in industrial processes for decades to come.
- Meeting our 2050 climate target requires an evolution towards a **decarbonised** yet **robust** and **secure** energy system.
- A forward-looking approach to **carbon capture and storage (CCS)** and **carbon capture and use (CCU)** for the power and industrial sectors will be critical to reaching the 2050 climate objectives in a cost-effective way.
- The integration of (fluctuating) renewable electricity generation in our energy system requires new solutions for fossil fuel power plants to provide **highly flexible yet efficient back-up power** to stabilise the grid.
- **Shale gas** can contribute to our energy security, provided that all issues around the **environmental impact** are adequately addressed.

Overview of topics for 2017

Deadline 05/01/2017

<p><i>LCE-27-2017</i></p> <p>Measuring, monitoring and controlling the potential risks of subsurface operations related to CCS and unconventional hydrocarbons</p>	<p>€ 15</p>
<p><i>LCE-28-2017</i></p> <p>Highly flexible and efficient fossil fuel power plants</p>	<p>€ 15</p>
<p><i>LCE-29-2017</i></p> <p>CCS in industry, including Bio-CCS</p> <p><i>LCE-30-2017</i></p> <p>Geological storage pilots</p>	<p>€ 20</p>

LCE 27 (2017): Measuring, monitoring and controlling the potential risks of subsurface operations related to CCS and unconventional hydrocarbons

RATIONALE

- **CCS and shale gas development (and even geothermal) share some of the same challenges and risks**
- **Groundwater contamination is an important public concern**
- **Induced seismicity is a show-stopper in densely populated regions**
- **Research is needed to better understand natural and engineered leakage pathways**
- **Highly sophisticated measuring and monitoring are required to manage the subsurface processes, and to mitigate and remediate any negative environmental impacts**

LCE 27 (2017): Measuring, monitoring and controlling the potential risks of subsurface operations related to CCS and unconventional hydrocarbons

SCOPE:

- **An integrated and multidisciplinary R&I project with focus on:**
 - Groundwater, soil, air and biodiversity
 - Detection and monitoring of induced seismicity
 - Detection and monitoring of stray gases
 - Mitigation and remediation of negative impacts
 - Combination of laboratory measurements, modelling and field investigations
 - Could include observation wells

LCE 27 (2017): Measuring, monitoring and controlling the potential risks of subsurface operations related to CCS and unconventional hydrocarbons

TO BE ADDRESSED:

- **Characterisation and analysis of leakage pathways**
- **Chemical and microbial interaction (w. host rock, seals, groundwater, soil)**
- **Improve detection limits for CO₂, natural gas and chemicals**
- **Optimal spatial and temporal resolution of monitoring techniques**
- **Sophisticated baselining techniques**
- **Groundwater remediation methods and protocols**
- **Multi-actor and public engagement**

LCE 27 (2017): Measuring, monitoring and controlling the potential risks of subsurface operations related to CCS and unconventional hydrocarbons

TO BE ESTABLISHED:

- **One or more field sites for deployment of a suite of monitoring techniques**
- **Programme for international cooperation with focus on the US and Canada**
- **Best practices for baselining, monitoring, mitigation and remediation**
- **Continuous training programme for researchers and students**

LCE 27 (2017): Measuring, monitoring and controlling the potential risks of subsurface operations related to CCS and unconventional hydrocarbons

IMPORTANT TO NOTE:

- **The drilling of exploration and production wells, hydraulic fracturing or other well stimulation and intentional subsurface release of fluids or gases to the groundwater or the atmosphere are strictly outside the scope of this topic**
- **This applies to projects funded under this Call only; it does not apply to cooperation with other ongoing field experiments**
- **Projects should comply with all relevant environmental legislation, in particular the Water Framework Directive, the enforcement of which is the responsibility of permitting authorities in the concerned Member States**



LCE 27 (2017): Measuring, monitoring and controlling the potential risks of subsurface operations related to CCS and unconventional hydrocarbons

ADDITIONAL INFORMATION:

- **Industry participation is important for access to existing sites and data**
- **Project duration ideally limited to 3 years**
- **The Canadian Containment and Monitoring Institute (CaMI) is open to new international cooperation at their Field Research Station (<http://www.cmc-nce.ca/business-units/cami/>)**
- **Ongoing Horizon 2020 projects: FracRisk, SHEER, M4ShaleGas, ShaleXEnvironment**

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 into H2020 Shale Gas projects



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) **ShaleXenvironment :**

Advisory Board member: University of Oklahoma
Entities associated : Ohio State University
Oak Ridge National Laboratory
Lawrence Berkeley National Laboratory



HORIZON 2020

**Thank you
for your attention!**

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