



#InvestEUresearch



# Horizon 2020 Work Programme for Research & Innovation 2018-2020

## Geothermal energy

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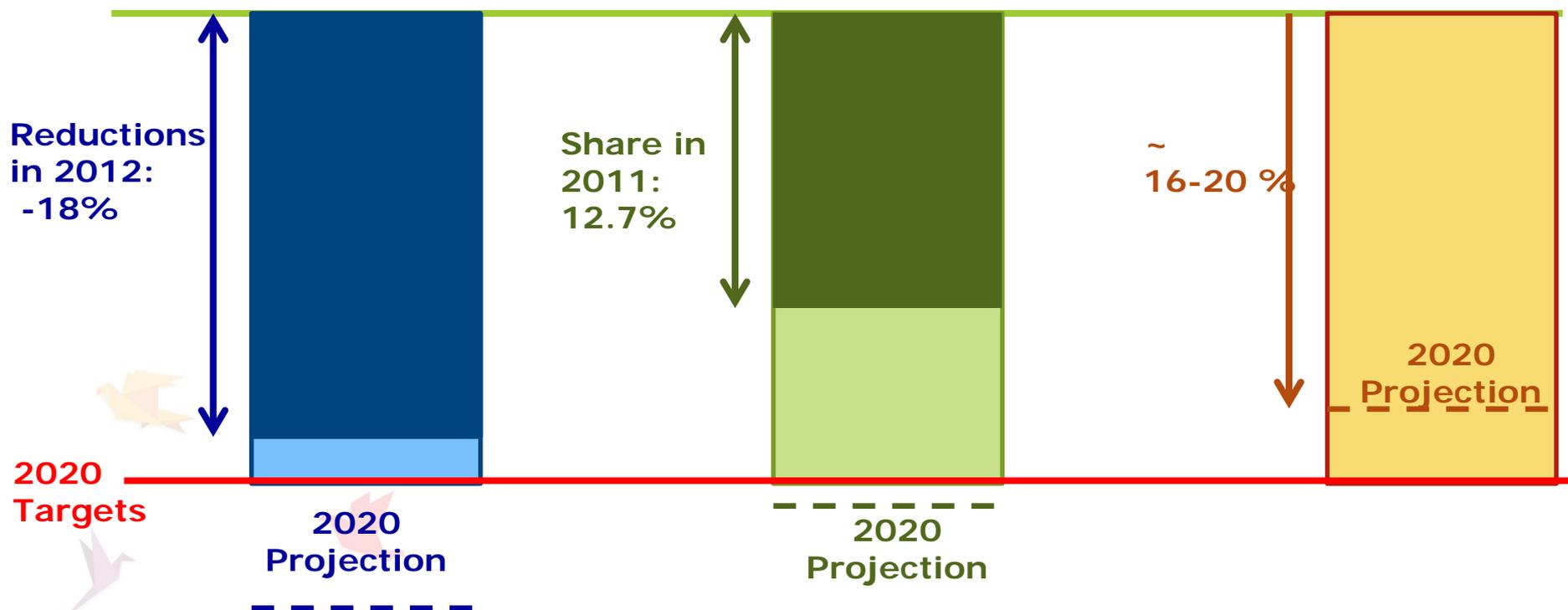
Research and  
Innovation

## 2008 Energy & Climate package

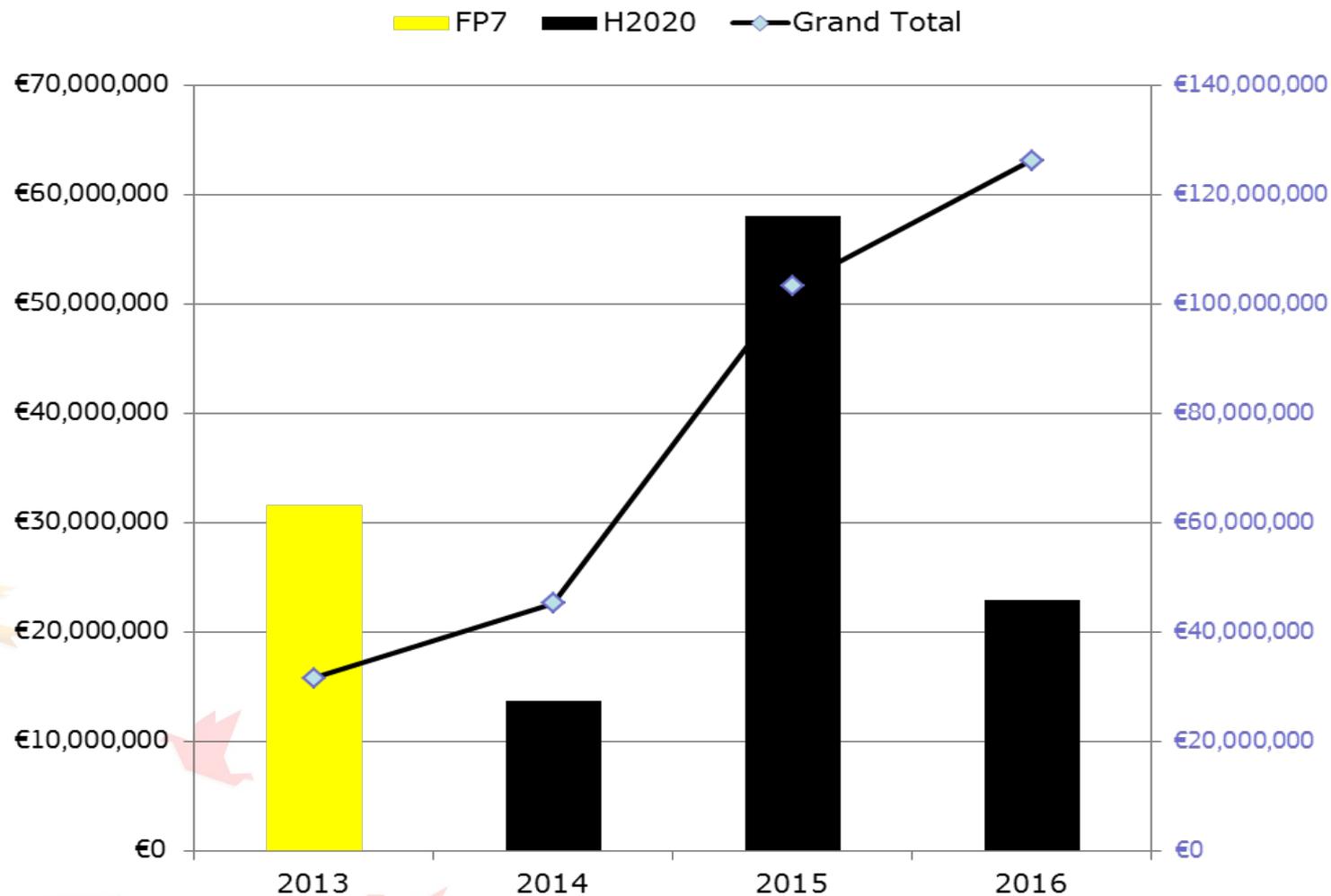
Reduce Greenhouse Gas Emissions levels by 20%

Increase share of Renewables to 20%

Reduce energy consumption by 20%



# Support to R&I via the FPs



# Ongoing geothermal energy projects

2014 call  
21.8MIL (12MIL)




**GEOCOND**  
2016 call - 4MIL

**GEMex**  
2016 call - 20MIL

2015 call budget  
15MIL



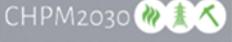
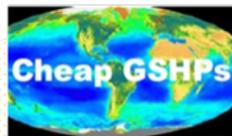



IMAGE  
FP7  
10MIL

LCE-06-2017  
New Technologies

LCE-07-2017  
Materials

**GEO THERMICA**  
2016 call  
~30MIL (8.6)




2015 call budget  
14.8MIL (12MIL)

LCE-18-2017  
EGS




2015 call budget  
69MIL (31MIL)

LCE-17-2017  
Retrofitting



2014 call budget  
1.7MIL

LCE-21-2017  
Market Uptake

*Research*

*Demonstration*

*Market*

*Bringing these new energy conversion solutions, new renewable energy concepts and innovative renewable energy uses faster to commercialization*

**To TRL 3 to 4**

**RIA**

**EUR 20 million**

## **Developing the next generation of renewable energy technologies**

Beside the development of the technology, the proposal will have to clearly address the following related aspects: the potential lower environmental and climate impact on a life cycle basis, the better resource efficiency, issues related to social acceptance or resistance to new energy technologies, related socioeconomic and livelihood issues.

Support will be given to activities which focus on converting renewable energy sources into an energy vector, or the direct application of renewable energy sources.

Innovative materials for **geothermal** heat exchangers to maximize energy transfer and improve the overall conversion efficiency of a geothermal system

# LC-SC3-RES-11-2018

*Achieving or maintaining global leadership in renewable energy technologies requires cost reductions*

**TRL 3-4 to 4-5**

**RIA**

**EUR 2 to 5 million**

*Reduce the CAPEX and/or OPEX of energy generation*

## Developing solutions to reduce the cost and increase performance of renewable technologies

**Floating Wind** Technology development including reliable, cost efficient anchoring and mooring system, dynamic cabling, installation techniques, and O&M concepts;

**Onshore Wind** Disruptive technologies for the rotor, generator, drive train and support structures;

**Ocean** New integrated design and testing of tidal energy devices;

**Geothermal** Novel drilling technologies to reach cost-effectively depths in the order of 5 km and/or temperatures higher than 250°C;

**CSP** Novel components and configurations for linear focusing and point focusing technologies;

**Hydropower** Novel components for hydropower hydraulic and electrical machinery;

**Bioenergy** Improve small and medium-scale combined heat and power (CHP) from biomass

*Progressive replacement of fossil fuels used in the heat and power sectors by means of renewable energy sources*

**TRL 5 to 7-8**

**IA**

**EUR 15 to 20 million**

*Reduce the cost of combined heat and power generation from renewable sources, making it competitive to fossil fuel based solutions*

**Demonstrate highly performant renewable technologies for combined heat and power (CHP) generation and their integration in the EU's energy system**

**Biomass** based combined heat and power (CHP) Demonstration of technically feasible and cost-effective installation of medium to large-scale CHP through retrofitting of existing fossil-fuel driven CHP or power plants >10 MW electrical to CHP plants with the use of sustainable biomass feedstock. Commercial operation of the plant with biomass after the end of the project is to be envisaged;

**Geothermal** Demonstration of geothermal plants to respond cost-effectively to the heat and to the power demand of the network. Proposals are expected to propose technologies for more flexible or more efficient geothermal plants or a combination of these two aspects. Associating other renewable heat sources to geothermal and adding storage would increase its flexibility (not a necessary condition).

*Reduce the cost of energy generation from renewable energy sources*

**TRL 5 to 7**

**IA**

**EUR 15 to 20 million**

*Reduce the cost of energy generation rendering the renewable energy technologies competitive*

## **Demonstrate solutions that significantly reduce the cost of renewable power generation**

**Offshore wind** Development and validation of new manufacturing, installation and/or operation and maintenance techniques, introduction of new materials. Health and environmental impact issues will be taken into account;

**Deep geothermal** Demonstration of cost efficient technologies to limit emissions and/or to condense and re-inject gases. Turning the emissions into commercial products could contribute to cost reduction (not a necessary condition);

**CSP** Demonstration in operational environment of CSP solutions based on novel heat transfer fluids and/or of solutions which make an innovative use of a heat transfer fluid that is already used in other CSP applications.

*Optimisation of several key processes in their respective value chains*

**TRL 3-4 to TRL 4-5**

**RIA**

**EUR 3 to 5 million**

*Increased efficiency of the system and/or reduced operational costs of the renewable energy technologies*

## Optimising manufacturing and system operation

**Marine** energy (ocean and offshore wind)  
Development of a new monitoring system (intelligent sensors, fault detection and communication) for accurate condition and structural health monitoring to enable predictive and preventive operation and preventive maintenance processes;

**Geothermal** Develop a better understanding of the chemical and physical properties of geothermal fluids (including hot and super-hot fluids) as transport media, in order to optimize site development and operation;

**Photovoltaics** Development of innovative crystalline silicon wafer growth techniques to produce high-efficiency solar cells and modules.



**CSA**

**EUR 1 to 3  
million**

The proposal will develop solutions which can be easily implemented for overcoming barriers to the broad deployment of renewable energy solutions. Introducing and deploying at large scale new and improved technologies entails a number of challenges, notably as regards their initial high cost, the consumer acceptance and the legal and financial barriers arising from bringing novel solutions to a technical environment with already reliable solutions in place

Development of insurance schemes to be available to developers in Europe and worldwide to mitigate risks, such as in **geothermal** drilling and offshore installation

# Opening date(s), deadline(s), indicative budget(s)

Topic	Opening	Deadline	Budget
LC-SC3-RES-1-2019	01 Aug 2018	16 Oct 2018 (First Stage) 25 Apr 2019 (Second Stage)	€20M
LC-SC3-RES-11-2018	31 Oct 2017	31 Jan 2018 (First Stage) 23 Aug 2018 (Second Stage)	€30M
LC-SC3-RES-12-2018	31 Oct 2017	13 Feb 2018	€30M
LC-SC3-RES-13-2018	31 Oct 2017	13 Feb 2018	€45M
LC-SC3-RES-14-2019	01 Aug 2018	16 Oct 2018 (First Stage) 25 Apr 2019 (Second Stage)	€20M
LC-SC3-RES-28-2018-2019-2020	05 Sep 2018	11 Dec 2018	€15M

# Thank you!

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Participant Portal [www](http://www)

