



HORIZON 2020

Possibilities for geothermal energy projects in the 2014-2015 Work Programme – LCE call

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Research and
Innovation

New approach to Work Programmes and Calls

- **2-year work programmes**
(2014-2015: > € 15 billion)
- **Less prescriptive calls**
(64 calls in 2014)
 - ✓ **Challenged-based approach,**
broader and fewer topics
 - ✓ **First call deadlines as from**
March 2014
- **Cross-cutting actions**
- **Use of *TRLs***





TRLs - Technology Readiness Levels

TRL 1: basic principles observed - Basic research

TRL 2: technology concept formulated - Concept and application have been formulated.

TRL 3: experimental proof of concept - Applied research. First laboratory tests completed; proof of concept.

TRL 4: technology validated in lab - Small scale prototype built in a laboratory environment ("ugly" prototype).

TRL 5: technology validated in relevant environment - Large scale prototype tested in intended environment.

TRL 6: technology demonstrated in relevant environment - tested in intended environment close to expected performance

TRL 7: system prototype demonstration in operational environment - pre-commercial scale.

TRL 8: system complete and qualified - First of a kind commercial system. Manufacturing issues solved.

TRL 9: actual system proven in operational environment - Full commercial application, technology available for consumers.



MRLs – Manufacturing Readiness Levels

MRL 1: Basic manufacturing implications identified

MRL 2: Manufacturing concepts identified

MRL 3: Manufacturing proof of concept developed

MRL 4: Capability to produce the technology in a laboratory environment

MRL 5: Capability to produce prototype components in a production relevant environment

MRL 6: Capability to produce a prototype system or subsystem in a production relevant environment

MRL 7: Capability to produce systems, subsystems or components in a production representative environment

MRL 8: Pilot line capability demonstrated. Ready to begin low rate production

MRL 9: Low rate production demonstrated. Capability in place to begin full rate production

MRL 10: Full rate production demonstrated and lean production practices in place



Types of Actions

- **Research and Innovation Actions**

Actions primarily designed to establish new knowledge and/or to explore the feasibility of a new or improved technology, product etc, including testing and validating on a small scale laboratory prototype.

TRL2 to TRL3-4 or TRL3-4 to TRL4-5

- **Innovation Actions**

Aimed at producing plans and arrangements or designs for new, altered or improved products, processes or services. May include prototyping, testing, demo, large-scale validation & market replication. **TRL5-6 to TRL6-7**

- **Coordination and Support Activities**

Accompanying measures such as standardisation, dissemination, awareness-raising and communication, networking, policy dialogues, etc.

Work Programme 2014: Funding for calls

Industrial Leadership Pillar: ~ € 1.8 billion

Leadership in Enabling and Industrial Technologies (LEITs)

- **Information and Communication Technologies (ICT)**
(2 calls) € 700 million

- **Nanotechnologies, Advanced Materials, Biotechnology and Production** (5 calls) € 500 million

- **Space** (5 calls) € 128 million

- **Access to Risk Finance (financial instruments)** (2 calls) € 5 million

- *In addition € 300 million for Financial Instruments (not through calls)*

- **Innovation in small and medium-sized enterprises** (1 call)
€ 10 million

Work Programme 2014: Funding for calls

Excellent Science Pillar: ~ € 3 billion

- **European Research Council** (4 calls) € 1 662 million
- **Marie Skłodowska-Curie actions** (6 calls) € 800 million
- **Future and Emerging Technologies (FET)** (4 calls) € 200 million
- **European Research Infrastructures (including e-Infrastructures)**
(4 calls) € 277 million

FET is aimed at radically new technological possibilities and help Europe to grasp leadership in new and emerging tech areas.

Work Programme 2014

Funding for calls

Societal Challenges Pillar: ~ € 2.8 billion

- **Health, demographic change and wellbeing** (2 calls) € 600 million
- **Food Security, Sustainable Agriculture and Forestry, Marine and Maritime and Inland Water Research and the Bioeconomy** (3 calls) € 300 million
- **Secure, clean and efficient energy** (4 calls) € 600 million
- **Smart, green and integrated transport** (3 calls) € 540 million
- **Climate action, environment, resource efficiency and raw materials** (3 calls) € 300 million
- **Europe in a changing world – inclusive, innovative and reflective societies** (5 calls) € 112 million
- **Secure Societies** (4 calls) € 200 million

In addition

- **Spreading Excellence and Widening Participation** (3 calls) € 50 million
- **Science with and for Society** (4 calls) € 45 million



Call LCE: areas to be addressed

	AREA	TRL	TYPE
LCE 1	New knowledge and technologies	2 > 3-4	RIA
Renewable electricity and heating/cooling			
LCE 2	Developing the next generation technologies of renewable electricity and heating/cooling	3-4 > 4-5	RIA
LCE 3	Demonstration of renewable electricity and heating/cooling	5-6 > 6-7	IA
LCE 4	Market uptake of existing and emerging renewable electricity, heating and cooling technologies	7-9	CSA

RIA: Research and Innovation Actions

IA: Innovation Actions

CSA: Coordination and Support Activities



LCE 1 - 2014: New knowledge & technologies

- *Aim: accelerating the development of transformative energy technologies or enabling technologies that have reached*
TRL2 → TRL 3-4
- *Activities should also focus on the early identification and clarification of **potential problems to society**, and on the definition of a targeted and quantified **development roadmap***
- **Novel ideas:** *provide impetus to technology pathways and address the energy challenge in Europe & beyond.*

Structure of the call topic

- ***Specific Challenge***
- ***Scope***
- ***Expected Impact***
- ***Type of action***

LCE 1 - 2014: New knowledge and technologies

Specific challenge: The technologies that will form the backbone of the energy system by 2030 and 2050 are still under development. Promising technologies for energy conversion are being developed at laboratory scale and need to be scaled up in order to demonstrate their potential value in our future energy system. These new technologies should provide more flexibility to the energy system and could help adapting to changing climatic conditions. New knowledge and more efficient and cost-competitive energy technologies, including their supply chains, are required for the long run. It is crucial that these new technologies show evidence of promising developments and do not represent a risk to society. Developments in sectors other than energy may provide ideas, experiences, technology contributions, knowledge, new approaches, innovative materials and skills that are of relevance to the energy sector. Cross-fertilisation could therefore offer mutually beneficial effects.

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HORIZON 2020 – WORK PROGRAMME 2014-2015 Secure, clean and efficient energy

Scope: Activities will focus on accelerating the development of transformative energy technologies or enabling technologies that have reached TRL2 (please see part G of the General Annexes). The proposals should bring the proposed technology solutions from TRL 2 to TRL 3-4. A multidisciplinary approach bringing expertise from different scientific disciplines and/or different technological sectors (other than energy or within different areas of energy), in order to cross traditional boundaries is expected to bring forward these game-changer technologies. Innovative solutions and their supply chains such as materials and advanced manufacturing will also be supported as long as the application is clearly energy. New approaches to existing technologies with potential for significant improvements in the overall performance are also allowed. Activities should also focus on the early identification and clarification of potential problems (for example environmental, resource efficiency and safety issues), or concerns to society, and on the definition of a targeted and quantified development roadmap. Proposals should also indicate the current Manufacturing Readiness Level (MRL, see Annex to this work programme) and the activities needed to keep the MRL aligned with the future advances in the TRL of the technology solution proposed to ensure the potential for exploitation.

Novel technology solutions for grid integration, storage – other than integral to the technology solution developed, fuel cells and hydrogen, energy efficiency and smart cities will not be supported under this topic but in the relevant parts of this work programme.

The Commission considers that proposals requesting a contribution from the EU of between EUR 2 to 4 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected impact: The results are expected to move the technology to higher TRL and to provide better scientific understanding and guidance enabling the players concerned (e.g. policy makers, regulatory authorities, industry, interest groups representing civil society) to frame strategic choices concerning future energy technologies and to integrate them in the future energy system. It is also expected that new, out-of-the-box or advanced innovative ideas will emerge that will provide new impetus to technology pathways, to new solutions, and to new contributions to the energy challenge in Europe or worldwide.

Type of action: Research & Innovation Actions



LCE 2: Developing the next generation technologies of renewable electricity & heating/cooling

Deep geothermal energy specific challenges:

2014 - *Develop new drilling technologies and concepts for geothermal energy*

New drilling technologies and concepts are necessary:

2015 - *Develop new technologies and concepts for geothermal energy*

New technologies and concepts for geothermal energy are necessary:

- to increase the number of economically viable geothermal resources, including in hard rock and high temperature/pressure conditions;
- to have a demonstrably smaller environmental footprint.





LCE2: From TRL3-4 to TRL4-5 – Research and Innovation Action – EU contribution EUR 3 to 6 million – 2 stages call

- Significantly **increased technology performance**.
- **Reducing life-cycle environmental impact**.
- Improving **EU energy security**.
- Making variable renewable electricity **generation more predictable and grid friendly**.
- Increasing the attractiveness of renewable heating and cooling technologies by **improving cost-competitiveness, reducing complexity and increasing reliability**.
- Bringing **cohesion, coherence and strategy in the development of new renewable energy technologies**.
- Nurturing the development of the **industrial capacity** to produce components and systems and opening of new opportunities.
- **Strengthening the European industrial technology base**, thereby creating growth and jobs in Europe.
- **Reducing renewable energy technologies installation time and costs**.
- Increasing the **reliability and lifetime** while decreasing operation and maintenance costs.
- Contributing to **solving the global climate and energy challenges**.

Expected impact



LCE 3: Demonstration of renewable electricity and heating/cooling technologies

2014 Renewable Heating and Cooling (shallow geothermal energy):

Improved vertical borehole drilling technologies to enhance safety and reduce costs

- *reduction of installation costs are needed to increase deployment of these geothermal systems for the heating & cooling market*

2015 Deep geothermal energy:

Testing of enhanced geothermal systems in different geological environments

- *new and improved models and innovative solutions are needed to routinely create EGS reservoirs with sufficient permeability, fracture orientation and spacing*





LCE3: From TRL5-6 to TRL6-7 –Innovation Action – EU contribution EUR 5 to 20 million – 1 stage call

- **Bringing costs of renewable energy down** by increasing technology performance, decreasing costs of production, installation time and costs, decreasing of operation and maintenance costs, and increasing reliability and lifetime.
- **Reducing life-cycle environmental impact.**
- Improving **EU energy security.**
- Making variable **renewable electricity generation more predictable and grid friendly**, thereby allowing larger amounts of variable output renewable sources in the grid.
- Increasing the attractiveness of renewable heating and cooling technologies by **improving cost-competitiveness, reducing complexity and increasing reliability.**
- Nurturing the development of the **industrial capacity** to produce components and systems and opening of new opportunities.
- Strengthening the **European industrial technology base**, thereby creating growth and jobs in Europe.
- Contributing to **solving the global climate and energy challenges.**

Expected impact



LCE 4: Market uptake of existing and emerging renewable electricity, heating & cooling technologies

CSA: *focus on best practices and quantified indicators of the market impacts of future policy*

- *Ensuring sustained **public acceptance** of RE projects;*
- *Speedy and user friendly **permitting procedures**;*
- *Implementing **RE policies**, codes and legislations at EU, national, regional and local levels in a **coordinated way**;*
- ***Capacity building** and further development of policy;*
- *Deployment of improved **business models** and innovative **financing schemes***



4 Calls (topics)

- 1. Energy efficiency**
- 2. Smart cities & communities**
- 3. Competitive low-carbon energy**
- 4. SME's and Fast Track to Innovation for Energy**

+

- 5. Euratom Fission**



Call Competitive low-carbon energy Deadlines

Topics*	2014		2015
LCE1, LCE2, LCE11, LCE15, LCE16	01/04/2014 (Stage 1)	23/09/2014 (Stage 2)	
LCE22	01/04/2014		
LCE4, LCE7, LCE8, LCE10, LCE14, LCE18	07/05/2014		
LCE1, LCE2, LCE11, LCE15, LCE17	03/09/2014 (Stage 1)		03/03/2015 (Stage 2)
LCE3, LCE12, LCE19, LCE20	10/09/2014		
LCE3, LCE12, LCE19, LCE21 LCE4, LCE5, LCE6, LCE9, LCE14			03/03/2015
LCE18			28/04/2015
LCE13			05/05/2015

■ 2014 call ■ 2015 call



Call Competitive low-carbon energy : Budget (M€)

Topics*	Short-hand Description	2014	2015
LCE1	New knoweldge & tech.	20	
LCE2, LCE11	RES – Research	60*	59*
LCE3, LCE12	RES - Demonstration	73*	80*
LCE4, LCE14	Market uptake	20	20
LCE5, LCE6, LCE7	Smart grids	60	71,48
LCE8, LCE9, LCE10	Storage	44,15	26
LCE13	Joint topic with Brazil		10
LCE15, LCE16, LCE17	CCS & other	33	35
LCE18	ERANET	34,25	57,85
LCE19	Coordination of MS	3	3
LCE20	Socio-Eco.	10,5	
LCE21	Socio-Eco.		10
LCE22	NCP Network	1,5	

* Corresponds to the topic code in the work-programme



Call Competitive low-carbon energy : Budget

The share of the EU contribution benefitting one single technology area:

- 1) from topics LCE 2 and LCE 11 (biofuels), research & innovation actions in the field of renewables (electricity, heat, cooling and fuels), shall not exceed 25% of the total budget dedicated to these topics,
- 2) from topics LCE 3 and LCE 12 (biofuels), innovation actions in the field of renewables (electricity, heat, cooling and fuels), shall not exceed 33% of the total budget dedicated to these topics.



Conditions for Participation

Minimum conditions

- ✓ **Standard collaborative actions**

At least three legal entities each established in a different Member State or an Associated Country;

- ✓ **ERC, SME instrument, programme co-fund, coordination and support, training and mobility actions:**

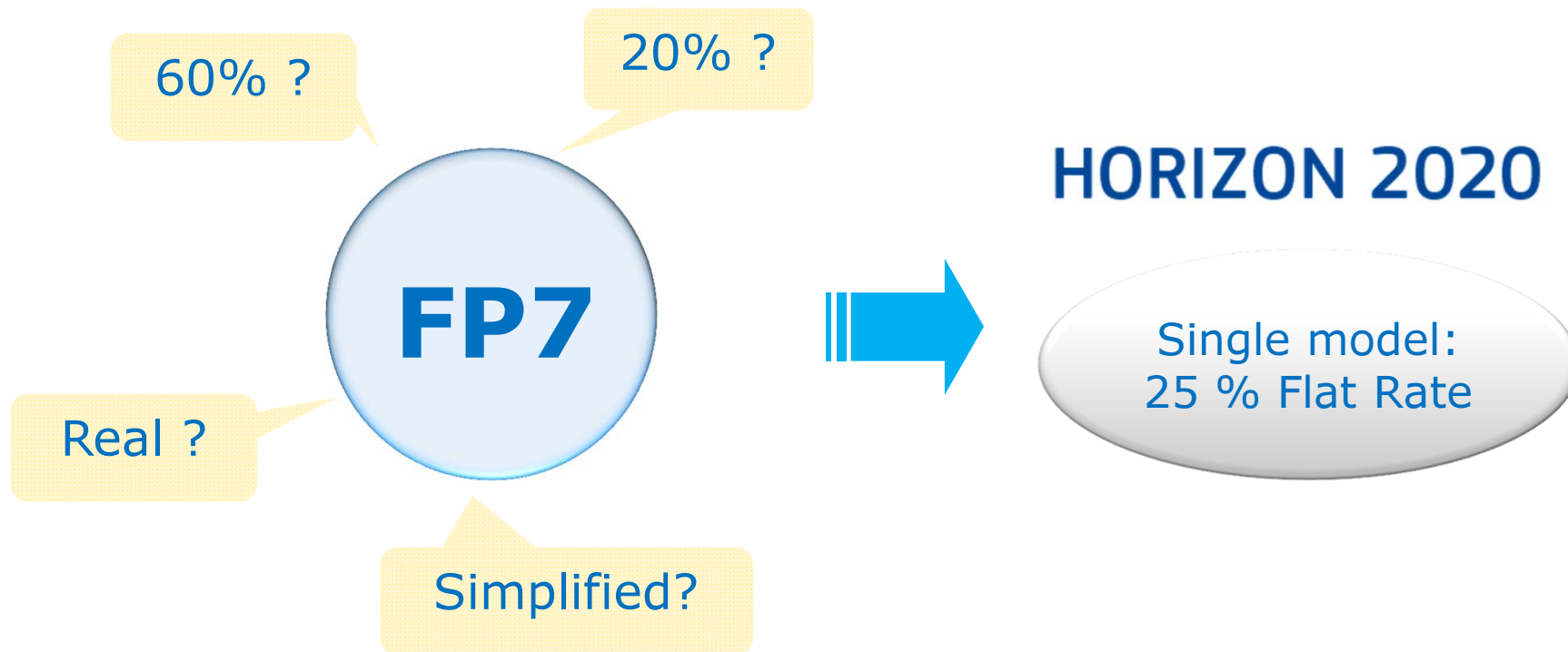
One legal entity established in a Member State or in an Associated Country.

Additional Conditions

- ✓ **In the work programme or work plan.**



Single indirect cost model





SELECTION CRITERIA

a) Financial capacity – In line with the Financial Regulation and the Rules for Participation. At the proposal stage, coordinators will be invited to complete a self-assessment using an on-line tool.

a) Operational capacity – As a distinct operation, carried out during the evaluation of the award criterion 'Quality and efficiency of the implementation', experts will indicate whether the participants meet the selection criterion related to operational capacity, to carry out the proposed work, based on the competence and experience of the individual participant(s).



AWARD CRITERIA

STANDARD AWARD CRITERIA

EXCELLENCE

IMPACT

QUALITY &
EFFICIENCY
OF THE ACTION

Proposal evaluated by the experts "as it is"
and not as "what could be" = **no need for negotiation**



PROPOSAL SCORING (half point scores may be given)

- 0** Proposal fails to address the criterion or cannot be assessed due to missing or incomplete information
- 1 Poor.** The criterion is inadequately addressed, or there are serious inherent weaknesses
- 2 Fair.** Proposal broadly addresses the criterion, but there are significant weaknesses
- 3 Good.** Proposal addresses the criterion well, but a number of shortcomings are present
- 4 Very Good.** Proposal addresses the criterion very well, but a small number of shortcomings are present
- 5 Excellent.** Proposal successfully addresses all relevant aspects of the criterion. Any shortcomings are minor.



Part B

Excellence

- 1.1 Objectives*
- 1.2 Relation to the workprogramme*
- 1.3 Concept and approach*
- 1.4 Ambition*

Impact

- 2.1 Expected impacts*
- 2.2 Measures to maximize impact*
 - a) Dissemination and exploitation of results*
 - b) Communication activities*

Implementation

- 3.1 Project Plan*
- 3.2 Management Structure and procedures*
- 3.3 Consortium as a whole*
- 3.4 Resources to be committed*



A maximum TTG of 8 months

5 months
for informing all applicants
on scientific evaluation

3 months
for signature of GA

Time to grant: speeding up the process





How to speed up the process

- ✓ **No more negotiations:**
each proposal evaluated 'as it is',
not as 'what could be';
- ✓ **Legal entity validated in parallel.**
- ✓ **No more paper:**
e-communication & e-signature of grants.

The screenshot shows the top part of the European Commission's Research & Innovation Participant Portal. At the top right, there are links for '(A-Z) Sitemap', 'About this site', 'Contact', 'Legal Notice', and 'English'. Below this is the 'RESEARCH & INNOVATION Participant Portal' header with the European Commission logo. A navigation bar includes 'HOME', 'FUNDING OPPORTUNITIES', 'HOW TO PARTICIPATE', 'EXPERTS', 'SUPPORT', 'LOGIN', and 'REGISTER'. The main content area features a welcome message: 'Welcome to the Research and Innovation Participant Portal'. It is divided into two columns: 'About the Participant Portal:' and 'Using the Participant Portal:'. The 'About' section explains that the portal is the entry point for EU-funded research and innovation projects, managed through the 7th Framework Programme for Research and Technological Development (FP7) and the Competitiveness and Innovation Framework Programme (CIP). The 'Using the Portal' section lists actions for guest users (searching for funding, downloading documents, searching for PICs, contacting support) and registered users (personalized services for proposal submission, negotiation, and project management). At the bottom, there is a row of six icons with labels: 'WHATS NEW', 'FUNDING OPPORTUNITIES', 'HOW TO PARTICIPATE?', 'WORK AS AN EXPERT', 'ACCESS MY PERSONAL AREA', and 'INFORMATION AND SUPPORT'.





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**Thank you very much
for your attention!**

Find out more:

<http://ec.europa.eu/programmes/horizon2020/>

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Other actions – Heating and cooling

B.1.2: Heating and cooling (Studies – including planning, cost-benefit and energy system analyses – for the development of an EU heating and cooling (including ventilation) framework for the transition towards efficient heating and cooling in line with long-term (2050) EU objective) - 2 direct service contracts;

B.2.14.: Support to key activities of the European Technology Platform on Renewable Heating and Cooling (to provide support to those activities of the European Technology Platform on Renewable Heating and Cooling (RHC), which are of interest for the RHC community as a whole, and for the general public) – 1 direct service contract;



- <http://ec.europa.eu/research/participants/portal/desktop/en/organisations/lfv.html>