Energy Innovations- Opportunities of H2020

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EU 2020 > HORIZON 2020 , the EU Research & Innovation funding for **2014-2020**

- **H2020** - the biggest EU Research and Innovation programme ever with nearly **€80 billion** of funding available over 7 years (2014 to 2020) for research or innovation projects – in addition to the private investment that this money will attract. It promises more breakthroughs, discoveries and world-firsts by taking great ideas from the lab to the market.
- **Regular thematic calls**
- **Public Procurements**

http://ec.europa.eu/research/participants/portal/desktop/en/funding/reference_docs.html#h2020-work-programmes-2014-15-main-wp

http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/index.html

From Strategic Planning to Advisory Groups and Programme Committies

The calls are based on Strategic Planning of EU bodies and on roadmaps of European Technology Platforms.

In energy area the SET plan is the base, plus

1. the ENERGY-EFFICIENT BUILDINGS CONTRACTUAL PPP UNDER HORIZON 2020
2. **Smart Cities European Innovation Partnership**

Agriculture & Forestry Aquatic Resources **Bio-based Industries** Biotechnology **Energy** Environment & Climate Action **Food & Healthy Diet** Funding Researchers **Health** ICT Research & Innovation **Innovation International Cooperation** Key Enabling Technologies **Partnerships with Industry and Member States** Raw Materials **Research Infrastructures** Security **SMEs** Social Sciences & Humanities **Society** Space **Transport**

H2020-Societal Challenges
3. Secure, Clean and Efficient Energy

Regular 3 main topic of calls

- Energy Efficiency -**EE**
- Competitive Low Carbon Energy -**LCE**
- Smart Cities and Communities –**SCC**

SME call

Public Procurements

- the calls= work programmes are avaiable on http://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/main/h2020-wp1415-**energy_en.pdf**

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THE CALLS 2014-2015

- http://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/main/h2020-wp1415-**energy_en.pdf**

- http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/calls/h2020-**eeb-2015.html**
- http://www.h2020.gov.hu/

Things to know about H2020

Organisations eligible to participate
Opened to the following bodies or institutes with legal status established in the covered areas: Any legal organisation

Covered areas
Bodies or institutes must have their registered legal seat in one of the countries taking part in the Programme which are: European Union (EU) and some cooperating e.g agreement on Switzerland's participation in the Horizon 2020 research programme. The agreement covers Switzerland's partial association to the programme between 15 September 2014 and 31 December 2016

Deadline for the presentation of proposals
SME: from 12-17-2014 and later
Others: from **05-05-2014-** see the specific call

National Contact Points:

- http://ec.europa.eu/research/participants/portal/desktop/en/support/national_contact_points.html

Hungary:

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- www.h2020.gov.hu
- Information on smart cities projects that the Commission has funded under previous R&D programmes can be found at http://www.eu-smartcities.eu/ and http://concerto.eu/concerto/.

Main priorities

- The first work programme for "Secure, Clean and Efficient Energy" has the following focus areas:

- **Energy Efficiency**

Energy efficiency is addressed by both short-term and long-term EU policies. The EU is aiming to progressively decrease primary energy consumption by 2020 and 2030. Research and demonstration activities within this area will focus on buildings, industry, heating and cooling, SMEs and energy-related products and services, integration of ICT and cooperation with the telecom sector.

- **Low Carbon Technologies**

It is important to develop and bring to market affordable, cost-effective and resource-efficient technology solutions to decarbonise the energy system in a sustainable way, secure energy supply and complete the energy internal market. Research activities within this area will cover: Photovoltaics, Concentrated Solar Power, Wind energy, Ocean Energy, Hydro Power, Geothermal Energy, Renewable Heating and Cooling, Energy Storage, Biofuels and Alternative Fuels, Carbon Capture and Storage.

- **Smart Cities & Communities**

Sustainable development of urban areas is a challenge of key importance. It requires new, efficient, and user-friendly technologies and services, in particular in the areas of energy, transport and ICT. However, these solutions need integrated approaches, both in terms of research and development of advanced technological solutions, as well as deployment. The focus on smart cities technologies will result in commercial-scale solutions with a high market potential.

SET PLAN- Policy driver

- Formulation of the energy challenge under Horizon 2020 would not have been possible without the revision of the **Strategic Energy Technology Plan** – so called SET Plan. Since 2008, the SET Plan has been the centre-piece of our research and innovation policy in the field of energy. It is the reference point for European, national, regional and private Investment.
- http://ec.europa.eu/energy/technology/set_plan/set_plan_en.htm
- http://setis.ec.europa.eu/about-setis

Napenergia

- Photovoltaics
- CSP

Szélenergia

- Wind energy

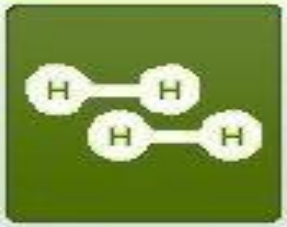
Bioenergia

- Bioenergy

Egyéb megújulók

- Ocean
- Hydro
- Geothermal

Hidrogén és üzemanyagcella



- Fuel cells and hydrogen

Energia hálózatok

- Smart grid

CCS /Tiszta szén

- Clean coal/CCS
- Coal and steel (RFCS)

Energia hatékonyság

- Efficiency and savings

Horizontális aspektus

- Socio-economic research
- Future emerging technologies & materials

Technology Readiness Level

- The Commission definitions of the Technology Readiness Level is in the GENERAL ANNEXES
- http://ec.europa.eu/research/participants/portal/doc/call/h2020/common/1587809-18._general_annexes_wp2014-2015_en.pdf.

Details can be found on page 3 of the Low Carbon Energy Call FAQ at http://ec.europa.eu/research/participants/portal/doc/call/h2020/h2020-lce-2014-4/1595101-faq_1_lce_call_en.pdf

Technology Readiness Level

TRL 2, the technology concept, its application and its implementation have been formulated. The development roadmap is outlined. Studies and small experiments provide aproof of concept" for the technology concepts.

TRL 3 means that the first laboratory experiments have been completed. The concept and the processes have been proven at laboratory scale, table-top experiments.

TRL 4 a small scale prototype development unit has been built in a laboratory and controlled environment. Operations have provided data to identify potential up scaling and operational issues. Measurements validate analytical predictions of the separate elements of the technology. Simulation of the processes has been validated.

TRL 5 the technology, a large scale prototype development unit, has been qualified through testing in intended environment, simulated or actual. The new hardware is ready for first use. Process modelling (technical and economic) is refined. LCA and economy assessment models have been validated. Where it is relevant for further up scaling the following issues have been identified: health & safety, environmental constraints, regulation, and resources availability.

TRL 6, the components and the process, the prototype system, have been up scaled to prove the industrial potential and its integration within the energy system. Hardware has been modified and up scaled. Most of the issues identified earlier have been resolved. Full commercial scale system has been identified and modelled. LCA and economic assessments

have been refined.

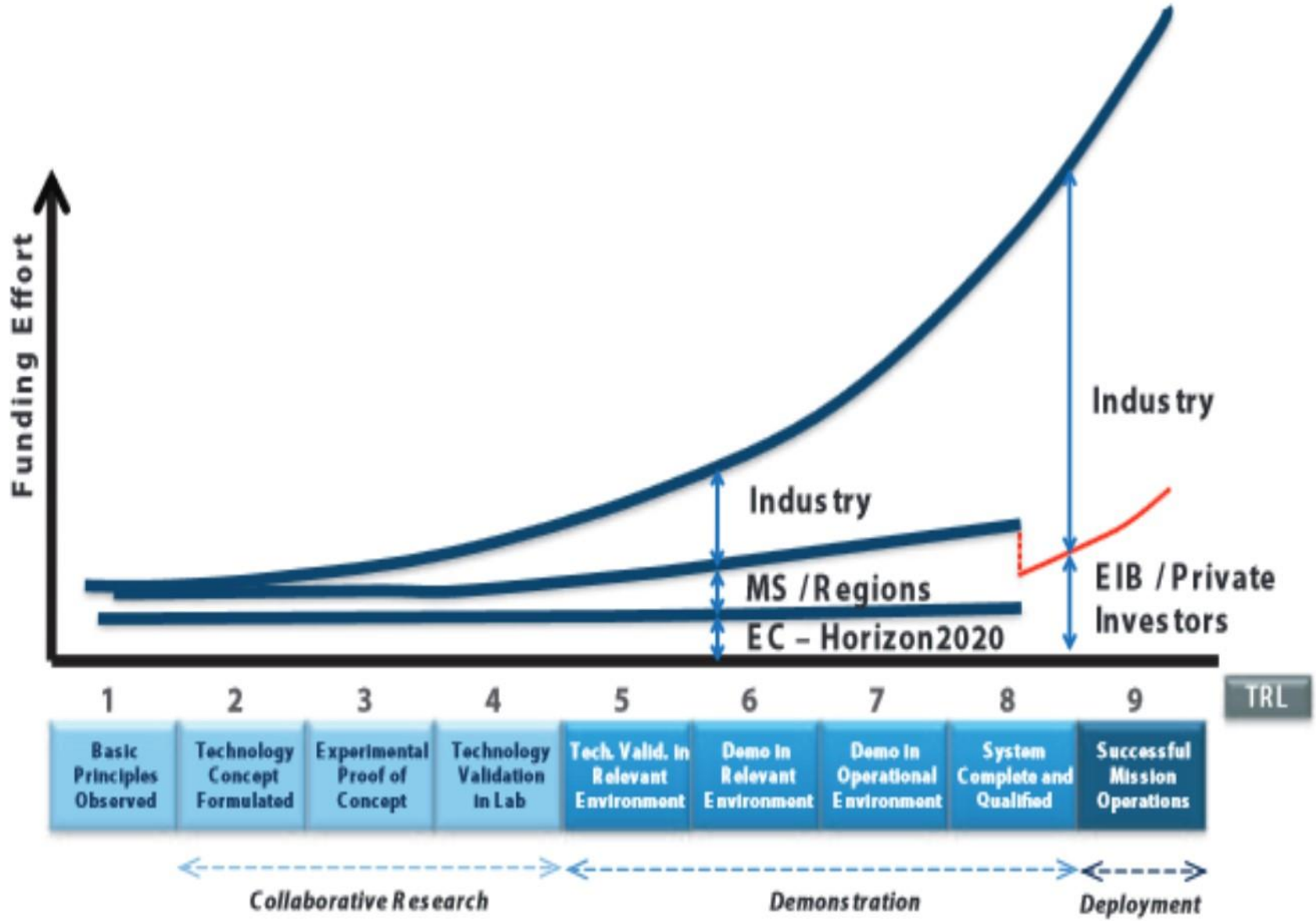
TRL 7, the technology has been proven to work and operate a pre-commercial scale – ademonstration system. Final operational and manufacturing issues have been identified.

Minor technology issues have been solved. LCA and economic assessments have beenrefined.

TRL 8, the technology has been proven to work at a commercial level through a full scaleapplication. All operational and manufacturing issues have been solved.

TRL 9 means that the technology has been fully developed and is commercially available forany consumers.

Overall synergy between private and public investments, highlighting industry leverage factor



Funding sources evolve from public to private moving along the TRL

- **Structural Funds** are indeed needed to complement financial needs in terms of **deployment and replication** of the developed technologies.
- Once a solution fit for use can be specified, based on the demonstration and validation actions within the PPP, **there is still a need for an European wide implementation of the results.**
- The present Structural and Cohesion Funds are highly **suited to alleviate the financial risk taken by the early adapters of new technology.**
- The fast followers, taking less risk, could be stimulated to invest in innovative technology by implementing European Investment Bank instruments **mitigating the financial risks with favourable loan conditions.**
- Ultimately it would be the industry that would make the major part of the total project investment for scaling up and going to market **(TRL 7 to 9),** exploiting additional mechanisms(beyond Horizon 2020), as cohesion funds or eventually EIB instruments.
- The expected leverage factor (excluding the direct leverage coming from real life demonstrations which would support the real life validation of innovative technologies and processes) is therefore evaluated to be **conservatively a factor 4.**
- This is confirmed if we analyse the funding evolution as projects evolve, tracing both private and public investments.

Stakeholders

ENERGY-EFFICIENT BUILDINGS

CONTRACTUAL PPP

In the H2020 NMBP Programme

developing breakthrough affordable solutions at building and district scale, connecting them at a larger scale to future smart cities

Multiannual Roadmap:
http://www.ectp.org/cws/params/ectp/download_files/36D2981v1_Eeb_cPPP_Roadmap_under.pdf

a broader framework with all suitable instruments and initiatives along the innovation chain to create impact

The European Innovation Partnership for Smart Cities and Communities

(consists of the **High Level Group** supported by its Sherpa Group and the **Smart Cities Stakeholder Platform**.)

http://ec.europa.eu/eip/smartcities/about-partnership/how-does-it-work/index_en.htm

Publications:

http://eu-smartcities.eu/publications

eg: about Financing models for smart cities and FINANCE WORKING GROUP's **GUIDANCE DOCUMENT USING EU FUNDING MECHANISMS FOR SMARTCITIES**

Energy Efficiency Call

A. Buildings and consumers

B. Heating and cooling

C. Industry and products

D. Finance for sustainable energy

- EE call will complement the EeB PPP (LEIT pillar H2020 Leadership in Enabling Industrial Technologies/NMBP Programme; Nanotechnologies, advanced materials, advanced manufacturing and Industrial biotechnology))

European Construction Technology Platform has set up the Energy Efficient Building European Initiative (E2B EI), steered by the Energy Efficient Buildings Association (E2BA)

- Both technology and non-technology related topics (market uptake, support policy implementation, financing, …)

Energy Efficiency Goals by 2020

Europe is not on track to achieve its energy efficiency goals by 2020

Two recent studies (e.g Climate fundation) indicate that the cost-effective energy savings potential in the building sector

(i.e. covering both residential and non-residential buildings estimated to be **65 Mtoe - tonne of oil equivalent**)

corresponds to a cumulated investment need of approximately **EUR 587 billion** for the period 2011-2020. This translates into an investment need of around **EUR 60 billion per year** to realise this savings potential.

- Worth at least **EUR 1.2 trillion** of yearly turnover (2011), the European construction sector,including its extended value chain (e.g. material and equipment manufacturers, construction and service companies), is the largest European single activity **(9.6% GDP**) and biggest industrial employer (**14.6 million direct operatives**, 30.7% of industrial employment, 43.8 million indirect workers). The built environment affects the quality of life and work of all EU-citizens.
- **As the construction sector is in general highly locally oriented,** this means that job creation in this sector would have a high impact on **local employment. And** every job created in the construction sector generates two further jobs in related sectors

ENERGY EFFICIENCY I

Budget 2014: 92.50 MEUR 2015: 98.15 MEUR

A – Buildings and consumers

- EE 1 – 2014: Manufacturing of prefabricated modules for renovation of building
- EE 2 – 2015: Buildings design for new highly energy performing buildings
- EE 3 – 2014: Energy strategies and solutions for deep renovation of historic buildings
- EE 4 – 2014: Construction skills
- EE 5 – 2014/2015: Increasing energy performance of existing buildings through process and organisation innovations and creating a market for deep renovation
- EE 6 – 2015: Demand response in blocks of buildings
- EE 7 – 2014/2015: Enhancing the capacity of public authorities to plan and implement sustainable energy policies and measures
- EE 8 – 2014: Public procurement of innovative sustainable energy solutions
- EE 9 – 2014/2015: Empowering stakeholders to assist public authorities in the definition and implementation of sustainable energy policies and measures
- EE 10 – 2014/2015: Consumer engagement for sustainable energy
- EE 11 – 2014/2015: New ICT-based solutions for energy efficiency
- EE 12 – 2014: Socioeconomic research on energy efficiency

B – Heating and cooling

- EE 13 – 2014/2015: Technology for district heating and cooling
- EE 14 - 2014/2015: Removing market barriers to the uptake of efficient heating and cooling Solutions

Energy Efficiency Call : C. Industry and Products

- This focus area will complement **the SPIRE PPP** and **the FoF PPP** (LEIT pillar H2020) ***Sustainable Process Industry through Resource and Energy Efficiency,*** Factories of Future – in the NMBP Programme
- Development and demonstration of energy-efficient products, processes and services by SMEs (2015, SME instrument)
- Organisational innovation to increase energy efficiency in industry (2014/15, CSA)
- Ensuring effective implementation of EU product efficiency legislation (2014/15, CSA)
- Driving energy innovation through large buyer groups (2015, CSA)

Energy Efficiency Call : D. Finance for sustainable energy

- Improving the financeability and attractiveness of sustainable energy investments (new business models, financial products) (2014/15, CSA)
- Project development assistance for innovative bankable and aggregated sustainable energy investment schemes and projects (2014/15, CSA)
- Development and market roll-out of innovative energy services and financial schemes for sustainable energy (2014/15, CSA)

Financing is the Key

The use of the financing instruments like the Risk Sharing Financing Facility, the European Investment Bank (EIB) and the European Bank for Reconstruction and Development (EBRD) would be reinforced as well as private industrial banks at European, national and regional level.

http://europa.eu/youreurope/business/funding-grants/access-to-finance/ general tools for financing

Pre-commercial Procurement, Procurement of Innovation and Sustainable Procurement in the Energy Efficient Buildings market, is a major driver for increasing the innovation level in the Energy Efficient Buildings market, where advanced procurement models have to established, implemented and used, mainly by Public Administrations.

EIT KIC Innoenergy initiative considers links with the innovation triangle to enable synergy and possible future closer collaborations which leverage on new skills and entrepreneurship to take advantage of the huge market opportunities which could be generated by ajoint long term strategy between **industry and the public side.**

- http://www.kic-innoenergy.com/innovationprojects/call-for-innovation-proposals/
-

Materials for building

Energy-efficient Buildings

- EeB 1 –2014: Materials for building envelope
- EeB 2 –2014: Adaptable envelopes integrated in building refurbishment projects
- EeB 3 –2014: Development of new self-inspection techniques and quality check measures for efficient construction processes
- EeB 4 –2014: Support for the enhancement of the impact of EeB PPP projects
- EeB 5 –2015: Innovative design tools for refurbishment at building and district level
- EeB 6 –2015: Integrated solutions of thermal energy storage for building applications
- EeB 7 –2015: New tools and methodologies to reduce the gap between predicted and actual energy performances at the level of buildings and blocks of buildings
- EeB 8 –2015: Integrated approach to retrofitting of residential buildings

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LCE calls

Actions foreseen within this call for proposals include the following topics:

deadline from 05-05-2015

- **LCE-02-2015: Developing the next generation technologies of renewable electricity and heating/cooling.**
- **LCE-11-2015: Developing next generation technologies for biofuels and sustainable alternative fuels.**
- **LCE-15-2015: Enabling decarbonisation of the fossil fuel-based power sector and energy intensive industry through CCS.**
- **LCE-17-2015: Highly flexible and efficient fossil fuel power plants.**
- **LCE-12-2015: Demonstrating advanced biofuel technologies**
- **LCE-19-2015: Supporting coordination of national R&D activities.**
- **LCE-03-2015: Demonstration of renewable electricity and heating/cooling technologies.**
- **LCE-04-2014: Market uptake of existing and emerging renewable electricity,** heating and cooling technologies.
- **LCE-07-2014: Distribution grid and retail market.**
- **LCE-08-2014: Local / small-scale storage.**
- **LCE-09-2014: Local / small-scale storage (Ice-08 csak 2014-ben volt)**
- **LCE-10-2014: Next generation technologies for energy storage.**
- **LCE-14-2014: Market uptake of existing and emerging sustainable bioenergy.**
- **LCE-18-2014: Supporting Joint Actions on demonstration and validation of innovative energy solutions.**

Smart cities

- **SCC-01-2015: Smart Cities and Communities solutions integrating energy, transport, ICT sectors through lighthouse (large scale demonstration - first of the kind) projects.**
- **SCC-03-2015: Development of system standards for smart cities and communities solutions.**

SME-s

- *Specific Challenge:* SMEs play a crucial role in developing technology solutions to decarbonise and make more efficient the energy system in a sustainable way.

1. **SIE 1 – 2014/2015: Stimulating the innovation potential of SMEs for a low carbon and efficient energy system**

The SME instrument consists of two separate phases and a coaching and mentoring service for beneficiaries. Participants can apply to phase 1 with a view to applying to phase 2 at a later date, or directly to phase 2.

In phase 1, a feasibility study shall be developed

In phase 2, innovation projects will be supported that address the specific challenges outlined in the legal base of the Horizon 2020 Societal Challenge 'Secure, Clean and Efficient Energy' and that demonstrate high potential in terms of company competitiveness and growth underpinned by a strategic business plan.

2. Fast track to Innovation - Pilot

Other H2020 opps for SME-s

- EIT KIC-s

http://cip2014.kic-innoenergy.com/

- Eureka-eurostars

https://www.eurostars-eureka.eu/

National Project Coordinator: Szonja Csuzdi, E-mail: szonja.csuzdi@nih.gov.hu Tel: 484-2958

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- Thank you for your attention!

- Thank you for your partnership, for the cooperation to the common projects and to the results of the participant countries!