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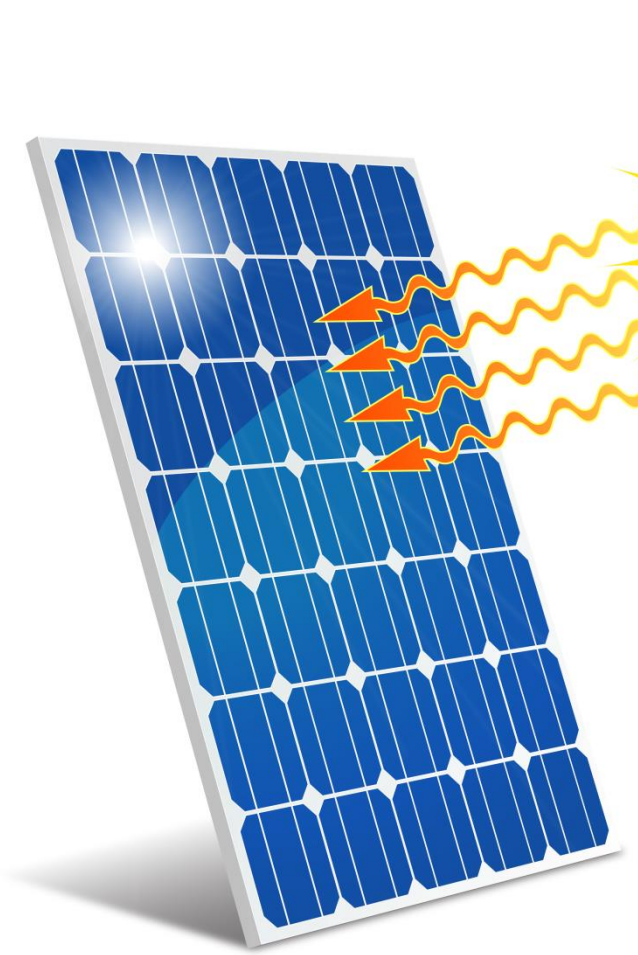
Programas de la UE

MINISTERIO DE ECONOMÍA, INDUSTRIA Y COMPETITIVIDAD

CDTI Centro para el Desarrollo Tecnológico Industrial



H2020: ENERGÍA SOLAR FOTOVOLTAICA EN WP2018-2020*

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24 de enero de 2018

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- Contexto Político y Regulatorio
- Energía en H2020
- WP 2018-2020*
- Resultados

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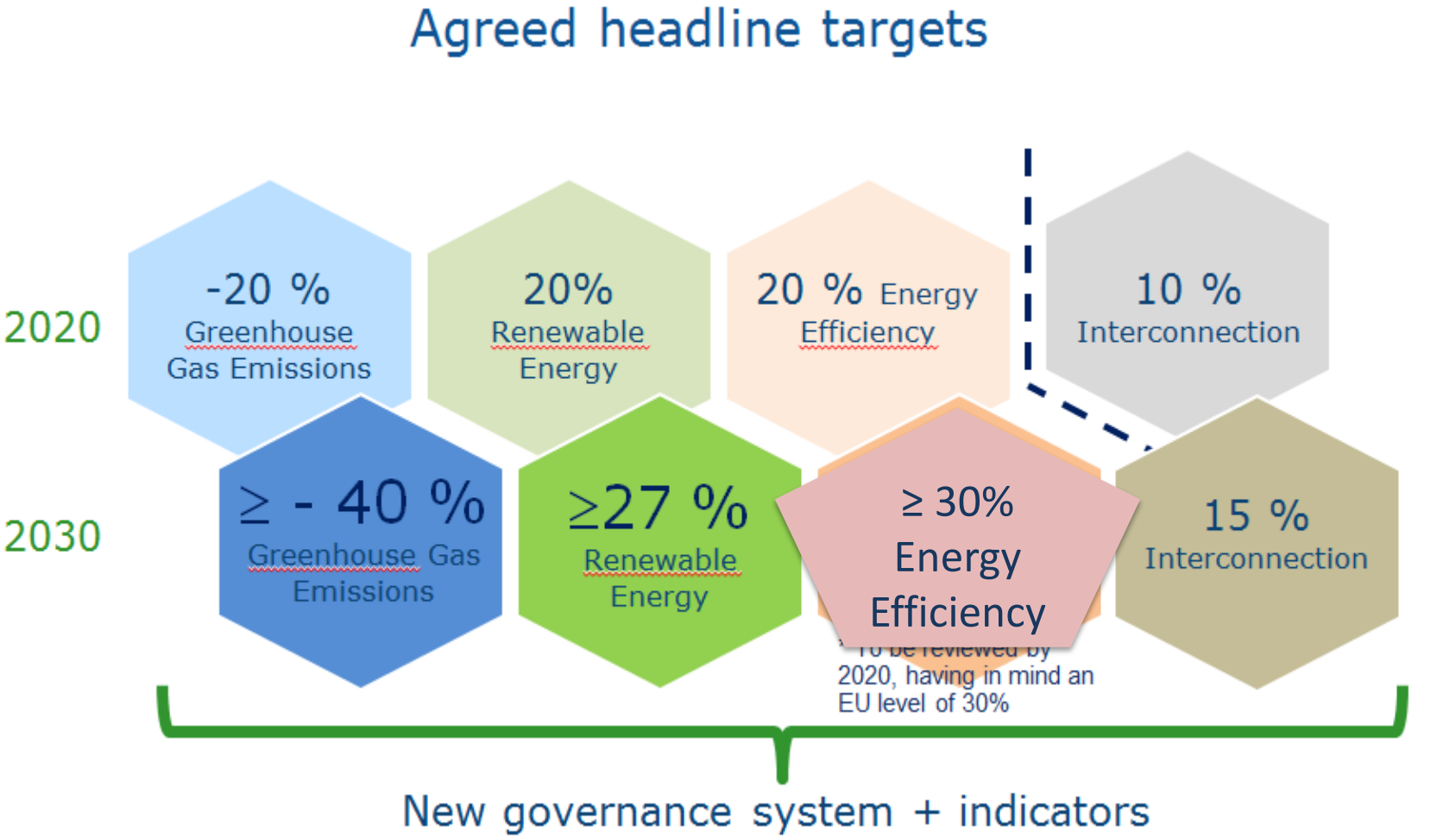
UE: 2030 Framework for Climate and Energy



Political 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*

Political Context

Paris Agreement

*"Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to **limit the temperature increase to 1.5°C** above pre-industrial levels"*

"Accelerating, encouraging and enabling innovation is critical for an effective, long-term global response to climate change and promoting economic growth and sustainable development."

MISSION INNOVATION
Accelerating the Clean Energy Revolution

http://mission-innovation.net/

http://unfccc.int/paris_agreement/items/9485.php

Political Context

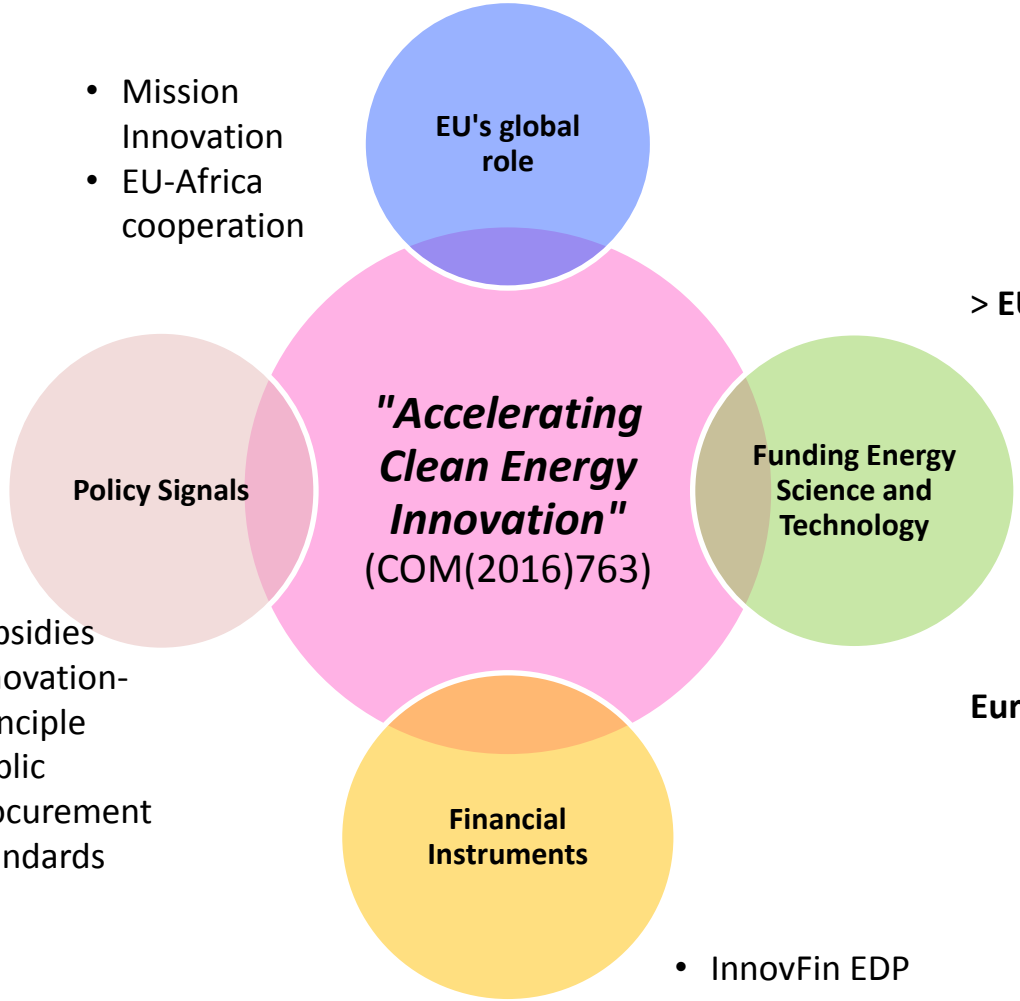
"Clean Energy for all Europeans“

- *Putting energy efficiency first*
- *Demonstrating global leadership in renewables*
- *Delivering a fair deal for consumers*

https://ec.europa.eu/energy/en/news/commission-proposes-new-rules-consumer-centred-clean-energy-transition

Political Context

- Mission Innovation
- EU-Africa cooperation



- Subsidies
- Innovation-principle
- Public Procurement
- Standards

- InnovFin EDP
- EFSI

> **EUR 2.2 billion** in H2020 (2018-2020) on:

- Decarbonising EU building stock by 2050
- Strengthening EU leadership in renewables
- Affordable and Integrated energy storage
- E-mobility and more integrated urban transport systems

European Innovation Council

Political Context

Overall objective: Accelerating the development and **deployment of low-carbon technologies through cooperation among EU countries, companies, research institutions, and the EU itself**, based on common priorities and targets.

Priority Actions:

1+2. Improving performance and reducing cost of renewable energy (Action 1, 2)

3. Smart solutions for consumers
4. Smart Resilience and Secure Energy System
5. Energy Efficiency in Buildings
6. Energy Efficiency in Industry
7. Batteries and e-Mobility
8. Renewable Fuels and Bioenergy
9. Carbon Capture Utilisation and Storage
10. Nuclear Safety

Defining priorities
- SET-Plan Communication 2015

Setting targets
- Declaration of Intents

Implementation Plans (IP)
- Temporary Working Groups

Execution of IPs

https://setis.ec.europa.eu/low-carbon-energy-technologies

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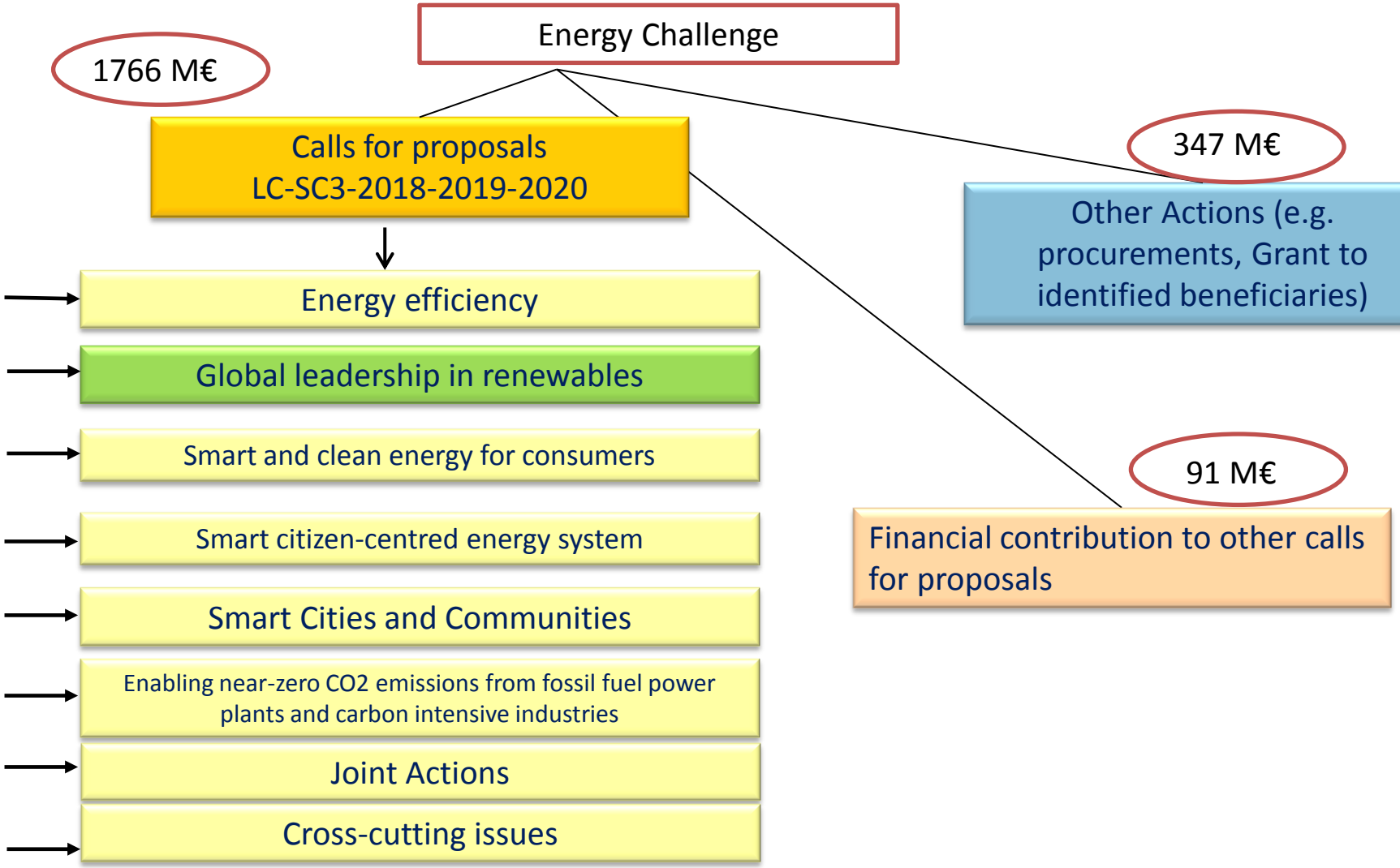
Societal Challenge 3 - Secure, clean and efficient energy



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Societal Challenge 3 - Secure, clean and efficient energy

* Budget figures for **2018-2019** only (2020 to be confirmed at a later stage)

Calls for proposals LC-SC3-2018-2019-2020

- Energy efficiency
- Global leadership in renewables
- Smart and clean energy for consumers
- Smart citizen-centred energy system
- Smart Cities and Communities
- Enabling near-zero CO2 emissions from fossil fuel power plants and carbon intensive industries
- Joint Actions
- Cross-cutting issues

Global leadership in renewables

	2018	2019	2020
Next renewable energy solutions	RES-2	RES-1	RES-3
Renewable energy solutions at consumer scale	Energy generation at building scale RES-4, RES-5, RES-6	Renewable energy solutions at district level and for industrial processes RES-7, RES-8	RES-9, RES-10
Renewable energy solutions for energy system implementation	Reduce costs of key technologies for renewable energy conversion RES-11, RES-12, RES-13	Optimize processes and manufacturing RES-14, RES-15 Provide flexibility to the energy system RES-16, RES-17	RES-18, RES-19, RES-20
Renewable fuels for transport	Drop-in fuel solutions for fossil-fuel substitution RES-21, RES-22	Upscaling renewable fuels production RES-23 RES-24	RES-25, RES-26, RES-27
Market Uptake Support	RES-28	RES-28	RES-28

Global leadership in renewables

Technology area	Research activities (RIA)	Innovation activities (IA)
Solar energy (PV, CSP)	RES-1-2019, RES-2-2018, RES-4-2018, RES-7-2019, RES-11-2018, RES-14-2019	RES-6-2018, RES-8-2019, RES-13-2018, RES-15-2019, RES-17-2019
Wind energy	RES-1-2019, RES-4-2018, RES-11-2018	RES-13-2018
Ocean energy	RES-1-2019, RES-11-2018, RES-14-2019	
Biofuels / alternative fuels	RES-1-2019, RES-2-2018, RES-16-2019, RES-21-2018, RES-23-2019	RES-17-2019, RES-22-2018, RES-24-2019
Geothermal energy	RES-1-2019, RES-4-2018, RES-11-2018, RES-14-2019	RES-8-2019, RES-13-2018
Heating / cooling, CHP	RES-1-2019, RES-4-2018, RES-11-2018	RES-5-2018, RES-8-2019, RES-12-2018
Hydro energy	RES-1-2019, RES-11-2018, RES-16-2019,	RES-17-2019
Virtual Power Plant	RES-16-2019	

- Topics for 2018 in black font; for 2019 in purple font; topics for 2020 not included (added as of mid-2018)
- Market-uptake activities (CSA, RES-28) cover all areas

Next renewable energy solutions

RES-1-2019: Developing the next generation of renewable energy technologies

- *Bring technologies that form be the backbone of the energy system in 2050 to TRL 3 to 4*
- *Recommended EU contribution per project: EUR 2-5 million*
- *Indicative topic budget: EUR 20 million, RIA*

RES-2-2018: Disruptive innovation in clean energy technologies

- *Accelerate technology development for Photovoltaic windows and bionic leaf from TRL3 to at least TRL5*
- *Stage-gate approach based on milestones and periodic reviews.*
- *Recommended EU contribution per project: EUR 2-3 million*
- *Indicative topic budget: EUR 12 million, RIA*

RES-3-2020: International Cooperation with USA on alternative renewable fuels for energy and transport

- Text, budget and deadlines to be decided as of mid-2018

Next renewable energy solutions

LC-SC3-RES-1-2019

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

From TRL 3 to 4

RIA

EUR 2-5 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 very high efficiency thin-film photovoltaics concepts considering advanced, sustainable and low-cost materials and processes.

Next renewable energy solutions

LC-SC3-RES-2-2018

Boosting the breakthrough of particular promising technologies … to secure that investment brings innovation that is taken up by the market

From TRL 3 to 5

RIA

EUR 20 million

Disruptive innovation in clean energy technologies

- Photovoltaic windows ('transparent' solar cells): development of transparent and economically viable PV cells for integration in building applications
- Bionic leaf technology: advanced renewable fuel production through biological conversion of CO2 and renewable hydrogen in the presence of inorganic catalysts. The process is based on first using solar energy to split water molecules and then using bacteria to consume the hydrogen together with CO2 to produce fuels

➔ Projects selected under this pilot will follow a stage-gate approach based on milestones and periodic reviews.

Renewable energy solutions for implementation at consumer scale

2018: Energy generation at building scale

- **RES-4:** Renewable energy system integrated at the building scale
  - *RIA, TRL 3/4 -> TRL 4/5, EUR 2-5 million/project, topic budget: EUR 27.5 million, 2-stage submission*
- **RES-5**: Increased performance of technologies for local heating and cooling solutions
  - *IA, TRL 5/6 -> TRL 6/7, EUR 3-10 million/project, topic budget: EUR 10 million*
- **RES-6**: Demonstrate significant cost reduction for Building **Integrated PV (BIPV) solutions**
  - *IA, TRL 5/6 -> TRL 6/7, EUR 6-10 million/project, topic budget: EUR 30 million*

2019: Renewable energy solutions at district level and for industrial processes

- **RES-7:** Solar Energy in Industrial Processes
  - *RIA, TRL -> TRL 4/5, EUR 3-5 million/project, topic budget: EUR 10 million*
- **RES-8**: Combining Renewable Technologies for a Renewable District Heating and/or Cooling System
  - *IA, TRL -> TRL 6, EUR 8-15 million/project, topic budget: EUR 15 million*

Renewable energy solutions for implementation at consumer scale

Decarbonisation of the building sector (heating, cooling, electricity)

Further integration of energy technologies (and storage)

Highest possible share of RES in buildings, considering costs and implications for the user

TRL to 4-5

RIA

EUR 2 to 5 million

LC-SC3-RES-4-2018

Renewable energy system integrated at the building scale

- Solutions combining different renewable energy technologies to cover the highest possible share of electricity, heating and cooling needs
- Multi-family residential or commercial or public or industrial buildings (in the case of the industrial buildings, energy needs of the industrial process should not be addressed)
- Needs and requirements of users and installers to be addressed (**SSH expertise**)
- Reduction of air pollutants

→

✓ Mission Innovation
✓ EeB cPPP

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Renewable energy solutions for implementation at consumer scale

Use of RES available locally to supply heating & cooling

Innovation needed also in resource mapping, monitoring & control tools

Reduce investments and operation costs & increase the systems' performance

TRL to 6-7

IA

EUR 3 to 10 million

LC-SC3-RES-5-2018

Increased performance of technologies for local heating and cooling solutions

- One or more of the following aspects to be addressed:
  - ✓ Optimisation components of renewable heating & cooling system
  - ✓ Tools to optimize design and monitoring of components heating & cooling system
  - ✓ Integrated control for smart operation heating & cooling system
- Residential (single house and apartment blocks) and commercial buildings
- Reduction of air pollutants

→

- ✓ Mission Innovation
- ✓ EeB cPPP

Renewable energy solutions for implementation at consumer scale

BIPV to satisfy multiple building functions

Architectural and aesthetic aspects

Control system for building management functions, grid-feeding, self-consumption and local storage

TRL to 6-7

IA

EUR 6 to 10 million

LC-SC3-RES-6-2018

Demonstrate significant cost reduction for Building Integrated PV (BIPV) solutions

- Address new BIPV concepts and cost-efficient production techniques reducing additional cost by 75% by 2030 compared to 2015 levels
- Demonstrate the concepts into a BIPV energy system (life-cycle basis)
- Multidisciplinary consortia including the PV manufacturing industry (and building materials industry, certification bodies and market actors where relevant)
- Standardization issues to be addressed

- ✓ Mission Innovation
- ✓ EeB cPPP

Renewable energy solutions for implementation at consumer scale

LC-SC3-RES-8-2019

Large potential to integrate substantial shares of renewable energy generation in district heating and/or cooling systems

RE technologies can be combined

Reliable with limited installation and running costs

TRL to 6

IA

EUR 8 to 15 million

Combining Renewable Technologies for a Renewable District Heating and/or Cooling System

- Cost-effective solutions for district heating and/or cooling systems which allow satisfying at least 50% of the energy demand of the system by the use in the district of one or more renewable energy technologies
- Otherwise wasted excess heat is in the scope
- Solutions should be demonstrated in real conditions within an operational district heating and/or cooling system
- Operators and final users to be engaged, their requirements to be considered

Renewable energy solutions for energy system level implementation

2018: Reduce costs of key technologies for renewable energy conversion

- **RES-11:** Developing solutions to reduce the cost and increase performance of renewable technologies
  - *RIA, TRL 3/4 -> TRL 4/5, EUR 2-5 million/project, topic budget: EUR 30 million, 2-stage submission*
- **RES-12:** Demonstrate highly performant renewable technologies for combined heat and power (CHP) generation and their integration in the EU's energy system
  - *IA, TRL 5 -> TRL 7/8, EUR 15-20 million/project, topic budget: EUR 30 million*
- **RES-13:** Demonstrate solutions that significantly reduce the cost of renewable power generation
  - *IA, TRL 5 -> TRL 7, EUR 15-20 million/project, topic budget: EUR 45 million*

2019: Optimize processes and manufacturing

- **RES-14:** Optimising manufacturing and system operation
  - *RIA, TRL 3/4 -> TRL 4/5, EUR 3-5 million/project, topic budget: EUR 20 million, 2-stage submission*
- **RES-15:** Increase the competitiveness of the EU PV manufacturing industry
  - *IA, TRL 5/6 -> TRL 6, EUR 10-13 million/project, topic budget: EUR 25 million*

2019: Provide flexibility to the energy system

- **RES-16:** Development of solutions based on renewable sources that provide flexibility to the energy system
  - *RIA, TRL 3/4-> TRL 4/5, EUR 3-5 million/project, topic budget: EUR 15 million*
- **RES-17:** Demonstration of solutions based on renewable sources that provide flexibility to the energy system
  - *IA, TRL 5-> TRL 7, EUR 12-15 million/project, topic budget: EUR 40 million*

Renewable energy solutions for energy system level implementation

Optimisation of several key processes in their respective value chains

TRL 3-4 to 4-5

RIA

EUR 3 to 5 million

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

LC-SC3-RES-14-2019

Optimising manufacturing and system operation

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

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Renewable energy solutions for energy system level implementation

LC-SC3-RES-15-2019

Improve competitiveness of the EU PV manufacturing industry

TRL 5-6 to 6-7

IA

EUR 10 to 13 million

New investments in the EU PV industry, via the establishment of pilot lines for innovative/optimised production processes/equipment

Increase the competitiveness of the EU PV manufacturing industry

- Demonstrating manufacturing/product innovation for highly performing PV technologies (e.g. crystalline-silicon, thin-film and concentration PV). Demonstration at pilot-line level, showing the potential to be scaled up to GW-size, high-yield-throughput and cost-effective industrial production.
- New production routes for cells and modules based on innovative materials and/or architectures (e.g. perovskite/crystalline-silicon tandem cells);
- Optimization of one or more steps in the value chain (by e.g. increased automation, laser processing, etc.);
- Tailored development of production equipment;
- Enhanced durability and/or recyclability of the final product.

Market Uptake

LC-SC3-RES-28-2018-2019-2020

Challenges for large-scale deployment of RES: initial high cost, consumer acceptance, legal and financial barriers, competition with incumbent solutions

CSA

EUR 1 to 3 million

Market Uptake support

Support for a broad range of issues, including:

- Recommendation for harmonisation of regulations, life cycle assessment approaches, environmental impact methodologies of renewable energy solutions;
- Development of additional features for RES to be compliant with the electricity market requirements, making them 'market fit';
- Sharing of best practice between public funding bodies for the cross-border participation in RES electricity support schemes
- Increasing the use of the 'RES co-operation mechanisms'
- Development of insurance schemes
- Development of innovative financing mechanisms/schemes
- Support tools to facilitate export markets
- …

Engagement of relevant stakeholder and market actors is crucial!

Deadlines 2018

Topics

RES-5

RES-6

RES-12

RES13

RES-21

RES-28

Deadline

13 February 2018

Topics

RES-4

RES-11

Deadline

1st stage: 31 January 2018

2nd stage: 23 August 2018

Topics

RES-22

5 April 2018

RES-2

19 April 2018

Deadlines 2019

Topics

RES-1

RES-14

Deadline

1st stage: 16 October 2018

2nd stage: 25 April 2019

Topics

RES-8

RES-15

RES-17

RES-24

RES-28

Deadline

11 December 2018

Topics

RES-7

RES-16

RES-23

Deadline

27 December 2019

De interés…

ESHORIZONTE2020
Portal español del Programa Marco de Investigación e Innovación de la Unión Europea

WP 2018-2020:
http://ec.europa.eu/research/participants/data/ref/h2020/wp/2018-2020/main/h2020-wp1820-energy_en.pdf

Information Day Bruselas:
https://ec.europa.eu/easme/en/horizon-2020-secure-clean-and-efficient-energy-info-day?pk_campaign=energy-nwl-2017-10

Partner Search:
http://www.partnersearch.c-energy2020.eu/

C-Energy2020

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