



European
Commission



Overview of support activities and projects of the European Union on energy efficiency and renewable energy in the

heating & cooling sector

*Horizon 2020, Framework Programme 7
and Intelligent Energy Europe programmes
of the European Union*

This publication has been drafted with contributions from the Executive Agency for Small and Medium Enterprise (EASME), the Innovation and Networks Executive Agency (INEA), the Directorate General for Energy (DG ENERGY) and the Directorate General for Research and Innovation (DG RTD).

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EXECUTIVE SUMMARY

What is the European Union supporting?

Heating and cooling consume half of the EU's energy and much of it is wasted. The lion's share of heating and cooling is still generated from fossil fuels, mainly natural gas, while only 18% is generated from renewable energy. In order to fulfil the [EU's climate and energy goals](#), the heating and cooling sector must therefore sharply reduce its energy consumption and cut its use of fossil fuels. To this end the European Commission adopted a heating and cooling strategy in February 2016 as part of the wider Energy Union Package. A number of activities and projects funded by the programmes of European Union are supporting this new EU heating and cooling strategy.

This document provides an **overview of the EU-funded projects in the area of heating and cooling**. It focuses on the Horizon 2020 programme for research and innovation (2014-2020) and its predecessors: the former Seventh Framework (FP7) and Intelligent Energy Europe (IEE) programmes. For practical reasons, the scope of the programmes has been limited to the following: Horizon 2020 Calls 2014-2015, FP7 Smart Cities Calls 2012 to 2013 and the IEE Calls 2011 to 2013.

Actions supported by these programmes include **research, innovation and demonstration** of energy efficient and renewable heating and cooling solutions. Support is also provided for the demonstration of innovative approaches and for the **integration of sustainable heating and cooling infrastructure in EU cities**. Via market uptake actions, support is being provided to **overcome the non-technological barriers hindering the uptake of energy efficiency and renewable heating and cooling solutions**. Finally public and private bodies are being supported in developing bankable sustainable energy investments through projects financed by dedicated **technical assistance** facilities. A number of these projects aim at launching investments for large scale heating and cooling infrastructure including district energy projects using local low carbon and renewable energy sources.

The dedicated **SME instrument** of Horizon 2020 supports close-to-market activities, with the aim to give a strong boost to breakthrough innovation. Highly innovative SMEs with a clear commercial ambition and a potential for high growth and internationalisation are the prime target. A

number of projects are currently being supported in the heating and cooling sector.

In addition to the activities above mentioned the EC is also managing a number of tenders in support of the Heating and Cooling sector including a [study](#) on the current and future (2020 - 2030) heating/cooling fuel deployment. Besides, the EC is providing support to the key activities of the **European Technology Platform on Renewable Heating and Cooling**.

Overall funding figures

As shown in this report, present day support to heating and cooling from the European Union's research and innovation programmes is significant. **A total of circa EUR 166 million of EU funding is allocated to research, demonstration and market uptake of energy efficient, low carbon and renewables heating and cooling solutions**. A breakdown is provided in the table below.

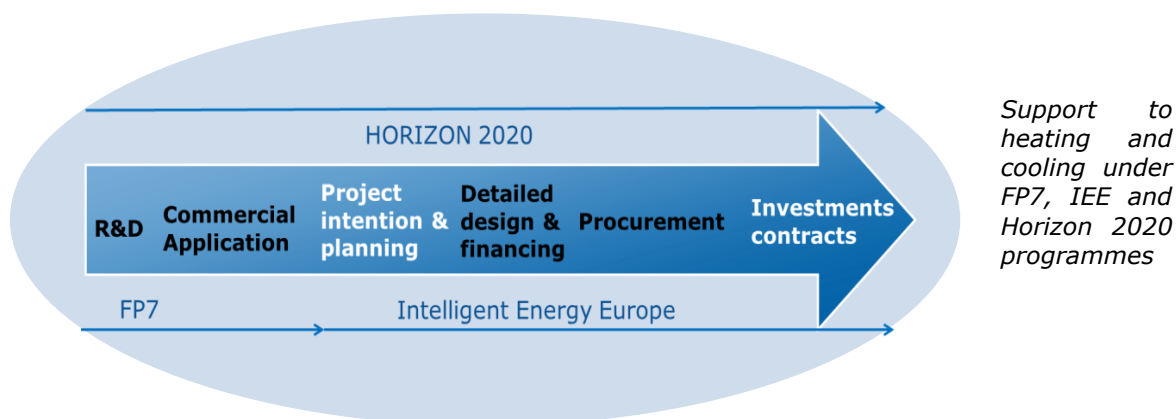
Why heating and cooling?

With 50% of final energy consumption in 2012 (546 Mtoe) **heating and cooling accounts the EU's biggest energy use** and it is expected to remain so. The Commission heating and cooling strategy makes clearly the case that demand reduction and the deployment of renewable energy and other sustainable sources, such as waste heat, have a great potential to reduce fossil fuel import and ensure energy supply security, while ensuring affordable provision of energy for the end consumer. 45% of energy in heating and cooling in the EU is used in the residential sector, 36% in industry and 18% in services. Each of these sectors has the potential to reduce demand, increase efficiency and shift to renewable sources. Bearing in mind that 75% of the fuel this sector uses still comes from fossil sources, the decarbonisation of the heating and cooling sector is essential to reach the energy and climate change objectives. It is however a fragmented sector, characterised by an ageing and inefficient building and appliance stock and with a high unused potential in industry.

More research and innovation is required to further improve and develop technologies and solutions that allow exploiting the full potential of low carbon and renewable energy sources for heating and cooling. There is already a **wide range of proven technologies and solutions** available on the market although more is needed to increase their market share. Against this background, the programmes of the EU come to provide direct support to the objectives of

the heating and cooling strategy supporting actions in the following areas:

- i. Research and development of new and improved heating and cooling supply technologies using renewable energy sources for applications in buildings and industry.
- ii. Research and development of innovative concepts, as well as of improved controls, for district heating and cooling networks to maximise the uptake of residual and renewable sources of thermal energy.
- iii. Development of integrated solutions of thermal energy storage for applications in the building sector.
- iv. Research and development of heat recovery solutions in industrial processes.
- v. Demonstration of innovative solutions related to smart grids.
- vi. Support to the acceleration in the market of proven and mature energy efficiency and renewable heating and cooling technologies.



Type of Action	EU funding
Research and Innovation (H2020 2014-2015 Energy Efficiency)	EUR 40.1 million
Research and Innovation (H2020 2014-2015 Low Carbon Energy/Renewables)	EUR 29.3 million
Innovation (H2020 2014-2015 Low Carbon Energy/Renewables)	EUR 18.3 million
Smart Cities (FP7 Call 2012,2013)	EUR 41.6 million ¹
Market uptake (IEE Calls 2012,2013, H2020 2014,2015 Energy Efficiency)	EUR 15.6 million
Market uptake (H2020 2014-2015 Low Carbon Energy/Renewables)	EUR 5.3 million
Technical assistance and innovative financing (IEE Calls 2011-2013, H2020 2014,2015)	EUR 5.6 million
SME Instrument (H2020 2014-2015 Phase 1 and 2)	EUR 10.3 million
Total*	EUR 166.1 million
<i>Smart Cities and Communities (H2020 Calls 2014-2015)</i>	<i>EUR 174.1 million</i>

*Summary of EC funding in the area of heating and cooling including the following: Horizon 2020 Calls 2014/2015, Smart Cities FP7 Calls 2012/2013, IEE Calls 2011/2012/2013. * Note that the total excludes the Horizon 2020 Smart Cities and Communities Calls 2014, 2015 as only a fraction of the activities are related to heating and cooling.*

¹ This includes FP7 Smart Cities Call 2012 on H&C and the main H&C related project from the 2013 SCC call. Additional funding of EUR 174.1 million has been allocated to Smart Cities Call of Horizon 2020 2014-2015. A fraction of the activities supported here includes support to heating and cooling.

Supporting sustainable heating and cooling in IEE, FP7, and Horizon 2020

Research & Innovation (FP7, Horizon 2020)	Innovation & Demonstration (FP7, Horizon 2020)	Market uptake (IEE, Horizon 2020)	Technical assistance (IEE and Horizon 2020 Project Development Assistance)
<p>District heating and cooling optimisation</p> <p>Energy efficient and renewable energy sourced heating and cooling technologies.</p>	<p>Innovative integration of sustainable heating and cooling infrastructure at district and city levels</p> <p>Energy efficient and renewable energy sourced heating and cooling technologies.</p>	<p>Policy support to national, regional and local authorities, heating and cooling planning, capacity building for market actors, training for installers, quality labelling of products, market analyses, streamlining of administrative and authorisation procedures, etc.</p> <p>SME instrument</p>	<p>Support to public and private actors for launching large scale investment for energy efficiency in buildings and sustainable H/C infrastructure</p> <p>Support includes feasibility studies, stakeholder and community mobilisation, financial engineering, business plans, technical specifications, procurement procedures, etc.</p> <p>Technical assistance facilities include PDA support under the Energy Efficiency part of the Horizon 2020 Energy Challenge and the European Local ENergy Assistance (ELENA)</p>

Areas of support of the European Union on energy efficiency and renewable energy in the heating and cooling sector (scope: IEE, FP7 and H2020 programmes).

Support for heating and cooling also exists under the [LIFE](#) programme and under the [European Structural and Investment funds](#). The [European Fund for Strategic Investments](#) (EFSI) could also be used to support heating and cooling infrastructure projects. EFSI is an initiative launched jointly by the European Investment Bank Group and the European Commission is designed to help overcome the current investment gap in the EU by mobilising private financing for strategic investments.

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1. SUPPORT TO RESEARCH, INNOVATION AND DEMONSTRATION

Support to research and demonstration in the area of heating and cooling is being provided under the projects of the 7th Framework Programme (FP7) and also under the Horizon 2020 programme of the European Union. This section covers the projects supported under the Horizon 2020 Calls 2014-2015. For an overview of other heating and cooling projects of the FP7 programme please refer to the European Commission Community Research and Development Information Service (CORDIS). Dedicated building projects in the area of heating and cooling can be found in the EeB PPP Project Review² covering funded projects within the EeB PPP under the 7th Framework Programme for 2010, 2011, 2012 and 2013.

The so-called **research and innovation actions** (RIA) in Horizon 2020 are actions primarily consisting of activities aiming to establish new knowledge and/or to explore the feasibility of a new or improved technology, product, process, service or solution. These actions may include basic and applied research, technology development and integration, testing and validation on a small-scale prototype in a laboratory or simulated environment. Projects may contain closely connected but limited demonstration or pilot activities aiming to show technical feasibility in a near to operational environment.

The so-called **Innovations actions** (IA) in Horizon 2020 are actions primarily consisting of activities directly aiming at producing plans and arrangements or designs for new, altered or improved products, processes or services. For this purpose they may include prototyping, testing, demonstrating, piloting, large-scale product validation and market replication. In this context a 'demonstration or pilot' aims to validate the technical and economic viability of a new or improved technology, product, process, service or solution in an operational (or near to operational) environment, whether industrial or otherwise, involving where appropriate a larger scale prototype or demonstrator. Projects may include limited research and development activities.

Also important to understand the type of actions funded is the definition of **Technology Readiness Level** (TRLs) use under Horizon 2020. This is provided below:

TRL 1	TRL 2	TRL 3	TRL 4	TRL 5	TRL 6	TRL 7	TRL 8	TRL 9
basic principles observed	technology concept formulated	experimental proof of concept	technology validated in lab	technology validated in relevant environment	technology demonstrated in relevant environment	system prototype demonstration in operational environment	system complete and qualified	actual system proven in operational environment

The first Call of the Horizon 2020 programme was launched in 2014. For the Call 2014 a total of 9 projects including Research and innovation (RIA) and Innovation Actions (IA) have been awarded funding in the sector of heating and cooling under the energy efficiency and low carbon energy areas of the Energy Challenge work programme. **This amounts to a total EUR 40.1 million EU funding. For the Call 2015 a total of 13 projects have been awarded with funding amounting a total of EUR 50.3 million of EU funding.**

1.1 SUPPORT TO LOW CARBON ENERGY HEATING AND COOLING

Under the Horizon 2020 Call 2014³ two Research and Innovation actions were selected looking at the Research and Innovation of **new and improved technologies for the generation of heating and cooling** using renewable energy sources:



- "**FlexiFuel-SOFC**" is investigating the development of an innovative micro-scale fuel-flexible biomass combined heat and power (CHP) technology based on gasification and solid oxide fuel cell.
- "**Bio-HyPP**" aims to develop a full scale technology demonstrator of an hybrid power plant using biogas as main fuel and using a combination of micro gas turbine (MGT) and a solid oxide fuel cell (SOFC).

² http://www.ectp.org/cws/params/ectp/download_files/36D3335v2_EeB_Project_Review_4.pdf

³ Topic LCE 2 – 2014: Developing the next generation technologies of renewable electricity and heating/cooling

Also under the H2020 Call 2014⁴, three innovation actions have received support with a focus on the **demonstration of renewable heating/cooling technologies**:



- "**Cheap GSHPs**" and "**GEOTECH**" are working on the improvement and cost reduction of actual drilling/installation technologies for shallow geothermal energy systems and thus making the use of earth's natural temperature to heat and cool buildings more economically and environmentally attractive.
- "**ORC-PLUS**" is focused on the integration of thermal storage and an existing small-scale concentrated solar power plant, coupled with an organic Rankine cycle system.

Under the Call 2015, the following four **Research and Innovation actions** dealing with heating or cooling were funded under the topic LCE-2:



- "**FlexiFuel-CHX**" is developing a new fuel flexible and highly efficient residential biomass heating condensing and low-emission technology (20 - 130 kW) fuelled by wood chips and biomass pellets.
- "**Residue2Heat**" aims at enabling the utilization of fast pyrolysis bio oil from various biomass residue streams in residential heating applications in a sustainable manner.
- "**CHPM2030**" is developing a novel technological solution that can help satisfy the European needs for energy and strategic metals in a single interlinked process. This should decrease the cost of geothermal energy used for heating and power production.
- "**SOLPART**" aims at supplying totally or partially the thermal energy requirements for CaCO₃ calcination by high temperature solar heat.
-

These projects build on the results and outcomes of a number of FP7 projects. More information on these projects can be found on the Community Research and Development Information Service ([CORDIS](#)) database.

1.2 SUPPORT TO ENERGY EFFICIENT HEATING AND COOLING SOLUTIONS

DISTRICT HEATING

Under the H2020 Calls 2014 and 2015⁵ a total of seven projects are researching and developing new concepts for the **optimisation of District Heating and Cooling (DHC) energy networks** including new approaches aiming at maximising the use of locally available waste heat and renewable energy sources in district energy networks through innovative network configurations and advanced "intelligent" network controllers. Altogether EU funding amounts to **EUR 14.2 million**. The actions being supported are targeting the development of new and innovative concepts at TRLs 4-6:

⁴ Topic LCE 2 – 2014: Demonstration of renewable electricity and heating/cooling technologies

⁵ Topic EE13 – 2014/2015: Technology for district heating and cooling



- **"OPTi"** is developing a novel methodology to control and optimize DHC systems using advanced modelling, optimization and control techniques. The project will investigate the use of passive thermal storage usage and automated demand response to reduce and shift peak loads of district heating networks. Two pilot projects are foreseen in Lulea (Sweden) and Mallorca (Spain).



- **"STORM"** is developing and demonstrating an advanced self-learning controller for district heating and cooling (DHC) networks. The controller will be demonstrated in 2 sites: Mijnwater in Heerlen (The Netherlands) and Växjö (Sweden).



- **"Flexynets"** is developing and demonstrating a new generation of intelligent district heating and cooling networks that reduce energy transportation losses by working at "neutral" temperature levels.



- **"INDIGO"** aims at the development of an efficient, intelligent and cheaper generation of District Cooling systems by improving system planning, control, and management. This will be done by actuating at the building, generation and distribution levels. The control system developed in the proposal will be first validated in laboratory conditions (simulations) and finally validated in a hospital campus located in Bilbao (Spain).



- **"E2District"** aims to develop, deploy, and demonstrate a novel cloud based District Management and Decision Support framework for next generation DHC systems.



- **"H-Disnet"** aims at the development and demonstration of a thermo-chemical (TC) network technology of heating and cooling based on new thermo-chemical carrier fluids (TCF) to allow loss-free energy storage and transport.



- **"InDeal"** aims to improve efficiency of district heating and cooling networks by improving analysis of heating and cooling demand, fore and now casting weather prediction, development of innovative insulation material for pipes and means to actively involve the end consumers.

TECHNOLOGY FOR BUILDINGS AND DISTRICTS

The Energy-efficient Buildings contractual Public Private Partnership EeB-cPPP⁶ was launched at the start of Horizon 2020 following the successful implementation of the EeB PPP in FP7⁷, as one of the three PPPs launched within the Recovery Package in 2008 and with an indicative budget of €1 billion (matching public and private funds).

The objective of the partnership is to help European construction enterprises, in particular SMEs, to adapt to global competitive pressures, by improving their technological base, while making the construction sector more energy-efficient and sustainable. The partnership's research priorities are based on a multi-annual strategic research roadmap drawn up by industry in close cooperation with the European Commission, and after a public consultation.

Under FP7 the initiative was jointly supported by DG RTD, DG ENER and DG CONNECT and 4 calls for proposals were issued, with funding from the Nanotechnologies, Materials and Production technologies (NMP), the Environment (ENV), the Energy (ENER) and the Information and Communication Technologies (ICT) themes. The content of those calls has been discussed with the

⁶ http://ec.europa.eu/research/industrial_technologies/energy-efficient-buildings_en.html

⁷ http://www.ectp.org/cws/params/ectp/download_files/36D3335v2_EeB_Project_Review_4.pdf

private sector to make sure that topics are industry-relevant. Of the 498 proposals submitted in response to the Calls for Proposals, 114 projects were selected for implementation, receiving a total EU contribution of €547.5 million. They include 1459 participations, with strong involvement by industrial (54 %) and SME (27 %) partners.

The partnership continues under Horizon 2020 (2014-2020) with an indicative EC contribution of 600 M€ for the 7 years; the Contractual Arrangement was signed on 17 December 2013. The private stakeholders of the cPPP are represented by the E2BA aisbl, an international non-profit association which was set up to act as the private side of the partnership; it involves individual businesses, industry associations and research organisations. More industry and research stakeholders are encouraged to join.

Projects supported under the Horizon 2020 call 2015 on the area of heating and cooling⁸ amount to **EUR 10.2** million of EU funding:



- **"CREATE"**: The main aim of CREATE is to develop and demonstrate a heat battery, i.e. an advanced thermal storage system based on Thermo-Chemical Materials, that enables economically affordable, compact and loss-free storage of heat in existing buildings. The CREATE concept is to develop stabilized storage materials with high storage density, improved stability and low price, and package them in optimized heat exchangers, using optimized storage modules. Full scale demonstration will be done in a real building, with regulatory/normative, economic and market boundaries taken into account.
- **"Tesse 2B"**: The target of TESSe2b is to design, develop, validate and demonstrate a modular and low cost thermal storage technology based on solar collectors and highly efficient heat pumps for heating, cooling and domestic hot water (DHW) production. The idea is to develop advanced compact integrated Phase Change Materials (PCM) Thermal Energy Storage (TES) tanks exploiting Renewable Energy Sources (solar and geothermal) in an efficient manner coupled with enhanced PCM borehole heat exchangers (BHEs) that will take advantage of the increased underground thermal storage and maximize the efficiency of the ground coupled heat pumps (GCHP). The two TES tanks developed within TESSe2b project will be integrated with different PCM materials; (i) enhanced paraffin PCM, (ii) salt-hydrates PCM, while in both of them a highly efficient heat exchanger will be included.



The above mentioned projects build on the research work of the demonstration projects supported under FP7, developing compact seasonal thermal storage applications for buildings. [COMTES](#)⁹, [SOTHERCO](#)¹⁰ and [MERITS](#)¹¹ are using different chemical materials aiming at the demonstration of real scale compact storage systems. The [SAM.SSA](#)¹² project focused on the development of adequate and affordable phase change materials for seasonal storage applications based on sugar alcohols. Further information on these projects can also be found in CORDIS.

WASTE HEAT RECOVERY IN INDUSTRY

Supporting the European industry the contractual public private partnership on Sustainable Process Industry (SPIRE-cPPPS) focuses on a number of sectors which are key to the European

⁸ Topic EeB6 – 2015: Integrated solutions of thermal energy storage for buildings applications

⁹ COMTES: <http://comtes-storage.eu/comtes-project> ; http://cordis.europa.eu/project/rcn/103641_en.html

¹⁰ SOTHERCO: <http://www.sotherco.eu> ; http://cordis.europa.eu/project/rcn/107960_en.html

¹¹ MERITS: <http://www.merits.eu/project> ; http://cordis.europa.eu/project/rcn/107963_en.html

¹² SAM.SSA: <http://www.samssa.eu> ; http://cordis.europa.eu/project/rcn/103643_en.html

manufacturing value chain: cement, ceramics, chemicals, engineering, minerals and ore, non-ferrous metals, steel and water. Among other areas, SPIRE supports the development and demonstration of new technologies or innovative solutions for the recovery of residual heat in large industrial systems.

Under the Horizon 2020 Calls 2014-2015 support has been provided at RIAs placed at TRL 4-7 with the aim of researching and demonstrating technical and operational approaches to recover waste heat from industrial processes, from material flows originating in industrial processes (e.g. waste streams, by-products, intermediates) or plant perimeters and to transform it into useful energy forms.



- Under the H2020 Call 2014 a single project was awarded amounting to a total EU contribution of nearly EUR 4 million. This project, "**TASIO**", is working on the demonstration of solutions to recover the waste heat produced in processes of industrial sectors such as cement, glass, steelmaking and petrochemical and transform it into useful energy. The waste heat recovery system being investigated is based on the Organic Rankine Cycle (ORC) technology

Three additional projects have been supported under the H2020 Call 2015 which are also researching on new technologies for utilization of heat recovery in large industrial systems. **Altogether these projects amount EUR 11.6 million of EU funding:**



- "**ITherm**" aims to develop and demonstrate technologies and processes for efficient and cost effective heat recovery from industrial facilities in the temperature range 70°C to 1000°C and the optimum integration of these technologies with the existing energy system or for over the fence export of recovered heat and generated electricity if appropriate.



- In "**SUSPIRE**" new Heat Transfer Fluids (HTF) and Phase Change Materials (PCM) will be the base for manufacturing high efficiency heat exchangers in terms of energy capture and storage. Two Borehole Thermal Storage (BTE) areas (low temperature range (30-50°C) and medium (50-80°C) will support an energy cascading concept where energy will be sequentially used and finally stored for further use or commercialized to third parties



- "**Indus3E**" aims at the development and demonstration of an innovative, adaptable compact and economically competitive system based on absorption heat transformer (AHT) technology for recovering and revaluing low-exergy waste heat from industrial processes. The developed system is expected to be easily adapted into various industrial process and sources.

Altogether EU funding to the projects being supported under the energy efficiency and low carbon energy sections of the work programme amount for circa EUR 88 million. A summary of these projects can be found in the table below.

Project	Description	Type of action	Call	Budget (EUR)	EU funding (EUR)
FlexiFuel-SOFC	Development of a new highly efficient and fuel flexible micro-scale biomass CHP technology consisting of a gasifier and a solid oxide fuel cell (SOFC). The technology shall be developed for a capacity range of 25 to 150 kW (fuel power).	RIA	LCE-02-2014	5.988.163	5.982.101
Bio-HyPP	Development of a combined hybrid heat and power plant combining a micro gas turbine (MGT) and a solid oxide fuel cell (SOFC).	RIA	LCE-02-2014	5.775.868	5.775.868
OPTi	Development of a novel methodology to control and optimize DHC systems using advanced modelling, optimization and control techniques. The project will investigate the use of passive thermal storage usage and automated demand response to reduce and shift peak loads of district heating networks. Two pilot projects are foreseen in Luela (Sweden) and Mallorca (Spain).	RIA	EE-13-2014	2.100.130	2.100.130
Storm	The aim of this project is to develop, demonstrate and deploy an advanced self-learning controller for district heating and cooling (DHC) networks. The controller will be demonstrated in 2 sites Mijnwater at Heerlen (The Netherlands) and Växjö (Sweden).	RIA	EE-13-2014	1.972.126	1.972.126
Flexynets	Development, demonstration and deployment of a new generation of intelligent district heating and cooling networks that reduce energy transportation losses by working at "neutral" temperature levels.	RIA	EE-13-2014	1.999.364	1.999.364
INDIGO	Development of an efficient, intelligent and cheaper generation of district cooling systems by improving system planning, control, and management. This would be done by actuating at the building, generation and distribution levels. The control system developed in the proposal would be first validated in laboratory conditions (simulations) and finally validated at a relevant environment in a hospital campus in Basurto located in Bilbao (Spain).	RIA	EE-13-2015	2.878.860	2.237.500
E2District	Development, deployment and demonstration of a novel cloud enabled management framework for DHC systems, which will deliver compound energy cost savings through development of a District Simulation Platform	RIA	EE-13-2015	1.999.850	1.999.850
H-Disnet	It aims at the development and demonstration of a thermo-chemical (TC) district network technology of heating and cooling based on new thermo-chemical carrier fluids (TCF) to allow loss-free energy storage and transport.	RIA	EE-13-2015	2.699.895	2.009.697
InDeal	It aims at improving efficiency of district heating and cooling networks by improving analysis of heating and cooling demand, fore and now casting weather prediction, development of innovative insulation material for pipes and means to actively involve the end consumers.	RIA	EE-13-2015	1.992.726	1.992.726
TASIO	Development and demonstration of solutions to recover the waste heat produced in processes of industrial sectors such as cement, glass, steelmaking and petrochemical and transform it into useful energy. The waste heat recovery system is based on the Organic Rankine Cycle (ORC) technology	RIA	EE-18-2014 (SPIRE)	3.989.248	3.989.248
Itherm	The overall aim of the project is to develop and demonstrate technologies and processes for efficient and cost effective heat recovery from industrial facilities in the temperature range 70°C to 1000°C and the optimum integration of these technologies with the existing energy system or for over the fence export of recovered heat and generated electricity if appropriate. It is projected that technologies developed used alone or in combination with the HP technologies	RIA	EE-18-2015 (SPIRE)	3.996.169	3.996.169

Project	Description	Type of action	Call	Budget (EUR)	EU funding (EUR)
SUSPIRE	New Heat Transfer Fluids (HTF) and Phase Change Materials (PCM) will be the base for manufacture high efficiency heat exchangers in terms of energy capture and storage . Two Borehole Thermal Energy Storage (BTE) areas (low temperature range (30-50°C) and medium (50-80°C) will support an energy cascading concept where energy will be sequentially used and finally stored for further use or commercialized to third parties		EE-18-2015 (SPIRE)	3.722.018	3.722.018
Indus3E	The overall objective of the project is the development and demonstration of an innovative, adaptable compact and economically competitive system based on absorption heat transformer (AHT) technology for recovering and revaluing low-exergy waste heat from industrial processes . The developed system would be easily adapted into various industrial process and sources.		EE-18-2015 (SPIRE)	3.858.500	3.858.500
CREATE	To develop and demonstrate a heat battery , ie an advanced thermal storage system based on Thermo-Chemical Materials, that enables economically affordable, compact and loss-free storage of heat in existing buildings. Full scale demonstration will be done in a real building, with regulatory/normative, economic and market boundaries taken into account. Full scale demonstration will be done in a real building, with regulatory/normative, economic and market boundaries taken into account.	RIA	EeB6- 2015 (PPP)	5.914.658	5.914.658
Tesse2b	The target of TESSe2b is to design, develop, validate and demonstrate a modular and low cost thermal storage technology based on solar collectors and highly efficient heat pumps for heating, cooling and domestic hot water (DHW) production.	RIA	EeB6- 2015 (PPP)	4.311.700	4.311.700
Cheap GSHPs	Aims at reducing the total cost of low enthalpy geothermal systems by 20-30 % the project intends to improve actual drilling/installation technologies and designs of Ground Source Heat Exchangers (GSHE's).	IA	LCE-03-2014	5.804.847	4.844.652
Geotech	GEOT€CH aims at employing a different drilling concept that is based on dry auger methods that requires less capital-intensive equipment, enhances safety and avoids the environmental risks. Another key concept is to use the foundation structures as heat exchange elements, but also to develop innovative heat exchanger designs , as well as to integrate them into hybrid geothermal systems.	IA	LCE-03-2014	9.025.458	7.136.663
ORC-PLUS	ORC-PLUS aims to develop an optimized combination of innovative Thermal Energy Storage (optimised for the CSP scale 1-5 MWe) and engineering solutions useful to improving the dispatchability (production on demand) and number of hours of production of an existing small CSP plant , located in a desert areas and coupled with an ORC system .	IA	LCE-03-2014	7.297.148	6.339.316
Residue2Heat	The overall objective is to enable the utilization of various biomass residue streams in residential heating applications in a sustainable manner. Within Residue2Heat, a two-step approach is followed in which biomass residue streams are first converted into a uniform, 2nd generation liquid biofuel via fast pyrolysis . Secondly, existing residential heating systems are tailored and optimized to allow the use of this standardized biofuel.	RIA	LCE-02-2015	5.466.478	5.465.728
CHPM2030	The strategic objective of CHPM2030 is to develop a novel and potentially disruptive technological solution that can help satisfy the European needs for energy and strategic metals in a single	RIA	LCE-02-2015	4.235.567	4.235.567

Project	Description	Type of action	Call	Budget (EUR)	EU funding (EUR)
	interlinked process. In the CHPM technology vision the metal-bearing geological formation will be manipulated in a way that the co-production of energy and metals will be possible, and may be optimised according to the market demands at any given moment in the future.				
FlexiFuel-CHX	Development a new biomass boiler (power range 20 – 130 kW) for fuel-flexible operation of non-wood fuels with integrated flue-gas condensation .	RIA	LCE-02-2015	4.309.610	3.514.398
SOLPART	The main objective is to develop, at pilot scale, a high temperature (950°C) 24h/day solar process suitable for particle treatment in energy intensive industries (e.g. cement or lime industries). The project aims at supplying totally or partially the thermal energy requirement for CaCO ₃ calcination by high temperature solar heat.	RIA	LCE-02-2015	4.558.687	4.366.562
				93.897.070	87.764.541

Table 1: Funding for RIA and IA for heating and cooling in the Energy Challenge of Horizon H2020 Calls 2014-15.

2. SMART CITIES AND COMMUNITIES

In the framework of the Smart Cities and Communities Initiative of the European Union, cities are expected to develop innovative and highly replicable measures to substantially reduce greenhouse gas emissions through improved energy efficiency, integrated planning and by accelerating the deployment of low carbon technologies.

The first Smart Cities call was launched in 2012 to support demonstration of innovative solutions for buildings, for heating and cooling and for smart grids. Under heating and cooling, the efficient heat recovery from industry and reuse of the recovered waste heat in the city DH network, the optimization of the DHC network and uptake of renewables were targeted. The 2 selected projects in this field were [CELSIUS](#) and [PITAGORAS](#).



- "[CELSIUS](#)" is developing 10 new innovative demonstrations and monitors 20 existing ones in order to give a broad range of smart district heating and cooling solutions for replication. In the frame of this project the first passenger ship has been connected to the district heating network of Gothenburg while at harbour; saving energy, reducing CO2 emissions and noise. Other examples of very innovative demonstrations include the use of district heating driven washing machines and dryers and heat recovery from the London underground ventilation.
- "[PITAGORAS](#)" project demonstrates the waste heat recovery at a steel foundry in Brescia. The Organic Rankine Cycle (ORC) system in demonstration has the potential to be replicated in other heat intensive industries allowing the recovery of the waste energy either by the industry itself or - if in the proximity of a city (here Brescia) - producing useful heat for the city heat network.



These two projects amount for a total of EUR 22.4 million EU funding.



In 2013 the Smart Cities calls made an important step towards integration requiring the demonstration of innovative solutions integrating buildings, heating and cooling and smart grids. One of the selected projects is [READY](#) with an important H&C dimension. READY aims at demonstrating an overarching approach towards district refurbishment including: 1) low temperature DH with smart ICT system; 2) flexible grid balancing and storage solutions integrating new photovoltaic thermal hybrid solar collectors (PVT) systems, electric vehicles charging and reuse of their 2nd life batteries in buildings; 3) innovative and energy smart solutions for kitchens; 4) solutions for water efficiency and waste water energy recovery; and 5) new industrial equipment for use of RES and integration of demand and supply mechanism. **The project is receiving a total of EUR 19.2 million** although not all of this is allocated to specific heating and cooling interventions.

The European Commission also supports the [Smart Cities Information System](#) project (SCIS) which collects and monitors the progress and results of the different Smart Cities projects along the time, starting with CONCERTO and then continued under FP7 and H2020.

Building on the support of FP7, Horizon 2020 is providing also support to Smart Cities projects. The Smart Cities projects funded under Horizon 2020 Calls 2014-15 aim at implementing large scale solutions in buildings, infrastructure and transport that can be replicated in other cities. The measures targeted are innovative integrated solutions above TRL 7.



The Calls 2014 and 2015 granted a total funding of EUR 174 million for seven Smart Cities and Communities projects which also include activities on sustainable heating and cooling infrastructure including district energy. These projects are [GrowSmarter](#), [Triangulum](#), [Remourban](#), [REPLICATE](#), [SMARTER TOGETHER](#), [SmartEnCity](#) and [SHAR-LLM](#).

The measures that all projects intend to implement in order to obtain nearly zero emissions buildings include (1) efficient and smart climate shell refurbishment; (2) use of smart systems for better information of tenants; (3) waste heat and local heat integration in district heating and cooling networks through new business models; (4) Increased used of RES (mainly solar and geothermal) or more efficient technologies such as CHP and (5) deployment of Buildings Management Systems at district scale.

Projects	Description	Demonstrators / Lighthouse Cities (in H2020)	Call	Budget (EUR)	EU funding (EUR)
CELSIUS	The CELSIUS project illustrates how cities can save energy and create a more self-sustaining energy economy through the deployment of smart district heating and cooling (DHC) systems . CELSIUS demonstrates 10 ground-breaking applications for district heating in 5 cities, Cologne, Genoa, London, Gothenburg and Rotterdam	Gothenburg (SE), Cologne (DE), Genoa (IT), London (UK), Rotterdam (NL),	2012 FP7	26.009.670	14.074.931
PITAGORAS	The project is focused on efficient integration of city districts with industrial parks through smart thermal grids . The main focus of the project is medium (150-600°C) and low (30-150°C) temperature waste heat recovery from industry and its use for energy supply to cities. The concept of the project will be demonstrated in Brescia (Italy) including an Organic Rankine Cycle for heat and power generation based on the waste heat produced by a steel foundry and heat supply to the city district heating net.	Brescia (IT)	2012 FP7	14.357.143	8.364.785
READY	Based on thorough integrated climate planning the READY project will demonstrate a Whole City Approach including the development and demo of new solutions for low-temperature district heating , components and management ICT systems and the development and demo of flexible combined grid balancing /energy storage solutions for buildings and RES systems including combined heat pumps for heating and cooling, electrical vehicles charging, new PVT systems and 2nd life reuse of EV batteries in buildings. The concept of the project will be demonstrated in the cities of Aarhus (Denmark) and Växjö (Sweden).	Aarhus (DK), Växjö (SE)	2013 FP7	33.340.202	19.213.448
GrowSmarter	These Smart Cities projects funded under Horizon 2020 aim at implementing large scale solutions in the buildings, infrastructure and transport areas that can be replicated in other cities. The measures targeted are innovative solutions at TRL 7-9 . The measures that the projects intend to implement in order to obtain nearly zero emissions buildings are for instance: (1) Efficient and smart climate shell refurbishment; (2) Use of Smart Systems for better information of owners/tenants; (3) Waste heat and local heat integration in district heating and cooling networks through new business models; (4) Increased used of RES (mainly solar and geothermal) or more efficient technologies such as CHP; and (5) deployment of Buildings Management Systems at district scale.	Stockholm (SE), Cologne (DE) and Barcelona (ES)	SCC-1- 2014	34.498.064	24.820.974
Triangulum		Eindhoven (NL), Manchester (UK), Stavanger (NO)	SCC-1- 2014	29.621.430	25.420.602
Remourban		Valladolid (ES), Nottingham (UK), Tepebasi (TK)	SCC-1- 2014	23.790.404	21.541.949

Projects	Description	Demonstrators / Lighthouse Cities (in H2020)	Call	Budget (EUR)	EU funding (EUR)
REPLICATE	The main objective of the REPLICATE project is the development and validation in three lighthouse cities (San Sebastián – Spain, Florence – Italy and Bristol – UK) of a sustainable City Business Model to enhance the transition process to a smart city in the areas of the energy efficiency, sustainable mobility and ICT/Infrastructure, in order to accelerate the deployment of innovative technologies, organisational and economic solutions to significantly increase resource and energy efficiency, improve the sustainability of urban transport and drastically reduce greenhouse gas emissions in urban areas	San Sebastián (ES), Florence (IT), Bristol (UK)	SCC-1-2015	29.250.563	24.965.263
SMARTER TOGETHER	SMARTER TOGETHER’s overarching vision is to find the right balance between smart technologies and organizational/ governance dimensions in order to deliver smart and inclusive solutions and to improve citizen’s quality of life. SMARTER TOGETHER delivers 5 clusters of co-created, smart and integrated solutions : (1) Living labs for citizen engagement, (2) District heating and RES for low energy districts, (3) Holistic refurbishment for low energy districts addressing public and private housing, (4) Smart Data management platform and smart services (5) E-mobility solutions for sustainable mobility.	Lyon (FR), Munich (DE), Vienna (AT)	SCC-1-2015	29.119.448	24.742.978
SmartEnCity	SmartEnCity’s main Objective is to develop a highly adaptable and replicable systemic approach towards urban transformation into sustainable, smart and resource-efficient urban environments in Europe through the integrated planning and implementation of measures aimed at improving energy efficiency in main consuming sectors in cities, while increasing their supply of renewable energy, and demonstrate its benefits.	Vitoria-Gasteiz (ES), Tartu (EE), Sonderborg (DK)	SCC-1-2015	32.201.606	27.890.138
SHAR-LLM	The project vision is a more agile and more collaborative smart cities market that dramatically increases the speed and scale at which smart solutions are implemented across Europe cities, engaging society in new ways to cause them to play an active role in the transformation of their communities – delivering more vibrant, liveable, economically active, and resource efficient cities.	London (UK,) Lisbon (PT), Milan (IT)	2015 SCC1	28.045.835	24.753.945
				280.234.365	215.789.013

Table 2: Funding for Smart Cities for heating and cooling in the FP7 Calls 2012-2013 and in the Energy Challenge of Horizon H2020 Calls 2014-15.

3. SUPPORT TO MARKET UPTAKE ACTIVITIES

The Intelligent Energy Europe (IEE) programme has and is still supporting a number of projects with the concrete objective of **accelerating the market uptake of best available technologies**. All in all projects have supported the market uptake of sustainable heating and cooling technologies including solar thermal, bio-energy, shallow and deep geothermal as well as combined heat and power and district energy systems. Examples of the actions supported include development and implementation of standards for the quality of products and installations, market analyses, streamlining of administrative and authorisation procedures, capacity building activities and dedicated actions supporting heating and cooling planning at all governance levels. **EU funding for these project for the Calls 2011,2012 and 2013 adds up to EUR 10.8 million.** Support to market uptake type of actions continues under Horizon 2020 through the so-called Coordination and Support Actions (CSA). **Under the Horizon 2020 Calls 2014 and 2015 an additional EUR 10.1 million have been granted.**

3.1 SUPPORTING HEATING AND COOLING PLANNING

IMPLEMENTATION OF THE ENERGY EFFICIENCY DIRECTIVE

A number of ongoing projects on heating and cooling planning at national, regional and local levels, funded by the Intelligent Energy Europe (IEE) Programme, are assisting EU Member States in the practical aspects of the implementation of Article 14 of the Energy Efficiency Directive on efficiency in heating and cooling. Examples of these projects include [STRATEGO](#), [RES H/C SPREAD](#) and [SmartReflex](#).



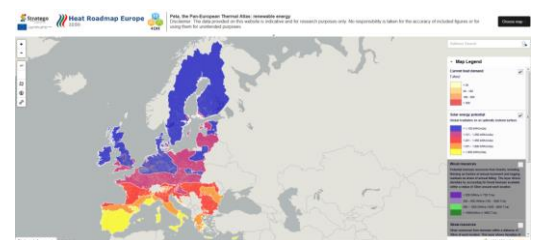
SUPPORTING NATIONAL AUTHORITIES

Building on the results of the Heat Roadmap Europe studies, the IEE funded STRATEGO project is supporting national authorities in the preparation of National Heating and Cooling Plans (NHCP). The project has so far quantified the impact of implementing various energy efficiency measures in the heating and cooling sectors of five EU Member States: Czech Republic, Croatia, Italy, Romania, and the United Kingdom.



A PAN EUROPEAN THERMAL ATLAS

The [STRATEGO](#) project has also produced a [pan European thermal atlas](#) containing information on the heating and cooling demands and potential supply sources across the European Union. It comprises the EU28 with a 1km² grid resolution. For each cell of the grid, the map contains the modelled heat and cooling demand, the local density of both demands, the basic geometry of district heating and cooling (DHC) supply, the available waste heat resources and the potential for renewable energy sources (solar thermal, geothermal, relative accessibility of biomass). The project team is also working with over 20 cities and regions across Europe in a more detailed mapping of their local heating and cooling demand and supply in order to identify areas of priority for intervention.



Building on the aforementioned activities concerning the Heat Roadmap Europe and STRATEGO projects, [Heat Roadmap Europe 4](#) is a recently started project supported under Horizon 2020 Call 2014 (Topic EE14 Removing market barriers to the uptake of efficient heating and cooling solutions). This study will refine the already existing pan European thermal atlas by including the industrial sector in the calculations. In



addition the project foresees to undertake a comprehensive study of the heating and cooling sectors in the 14 largest EU countries.

Also under the Horizon 2020 Call 2014, the project [ProgressHeat](#) is assisting policy makers at the local, regional, national and EU levels in developing and implementing integrated, effective and efficient policy strategies for the promotion of energy efficiency and renewables in heating and cooling.



On the use of cogeneration, the project [CODE2](#) (2012-2014) has developed national Cogeneration Roadmaps for 27 MS and one European Cogeneration Roadmap. The project has also identified the potentials for micro-CHP and bio-energy CHP across 27 EU MS.



3.2 PROMOTING DISTRICT HEATING AND COOLING SYSTEMS

The [SmartReFlex](#) project is working on the promotion of district heating and cooling (DHC) systems, using high shares of renewable energy sources (RES), across 6 regions in 4 countries in Europe (Germany, Ireland, Italy and Spain). Key to the project is the development and implementation of legislative and organisational measures for promoting high-RES DHC. In order to facilitate the adoption of the measures proposed and the initiation of projects regional task forces are active in each of the participating regions. Know-how transfer from the Danish experience into the project activities is central to this project.



Another IEE project, [RESCUE](#) (2012-2014) has worked with a number of cities across Europe and has developed a methodology, toolset and practical guidance for decisions makers for the adoption and implementation of district cooling using locally available low carbon and renewable energy sources.



In addition the Horizon 2020 [CoolHeating](#) project (2016-2018) is supporting the implementation of "small modular renewable heating and cooling grids" for communities in South-Eastern Europe.



3.3 CAPACITY BUILDING IN REGIONS

Capacity building activities are taking place for key actors and stakeholders in different regions. The [RES H/C SPREAD](#) project is also assisting 6 regions in Europe (Austria, Bulgaria, Greece, Italy, Latvia and Spain) in the development and adoption of heating and cooling strategies with a high share of renewable energy sources.



3.4 REMOVING ADMINISTRATIVE AND FINANCIAL BARRIERS

STREAMLINING OF ADMINISTRATIVE AND AUTHORISATION PROCEDURES

The [REGEOCITIES](#) (2012-2015) project has brought together 11 Member States with the objective of facilitating know-how and best practice exchange on the



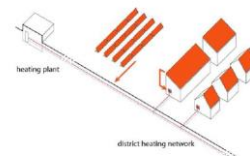
regulation and administration of shallow geothermal in cities. As an example Stockholm has an online service for handling planning applications for closed vertical collectors. Through the implementation of this service the application period is limited from 2 to 6 weeks depending on whether a permitting process is required. The project has also developed a training manual for local and regional administrations to support them on the regulation of shallow geothermal systems.

NEW BUSINESS MODELS

In close liaison with industry and district heating suppliers, the project **SDHPLUS** (2012-2015) has promoted existing and developed new and innovative business opportunities for solar thermal district heating, such as decentralised feed-in of solar heat into district heating networks. The project has also developed 39 case studies looking at the technical and economical feasibility of solar thermal integration in district heating networks



Building on this project **SDHp2m** supported under the Horizon 2020 Call 2015 is addressing market uptake challenges for a wider use of district heating and cooling systems (DHC) with high shares of RES, specifically the action focuses on the use of large-scale solar thermal plants combined with other RES in DHC systems.



The project **BiogasHeat** (2012-2015) has been looking at efficient uses for biogas in the generation of heat. New strategies and business models for enhanced heat use from biogas plant have been proposed. In addition 20 good practice examples of heat use from biogas plants in several European countries were identified and described. As a result a Handbook on "Sustainable heat use from biogas plants" has been drafted. The handbook addresses current and future biogas plant operators as well as other interested stakeholders such as policy makers and investors. It provides general information on the characteristics of heat produced in biogas plants and focuses on general technical solutions for the efficient use of heat.



The project **GEODH** (2012-2014) has been working with decision makers with the objective of removing the administrative and financial barriers affecting the further development of deep geothermal district heating systems. The project has provided an in-depth analysis of the potential for geothermal district heating and developed an online viewer that allows visualising the deep geothermal resource for district heating across 14 MS. In addition, a comprehensive training course for public authorities has been developed covering the organisational, technical and financial aspect of projects.



3.5 SUPPORTING DECISION MAKING: EMPOWERING CONSUMERS AND ENERGY LABELLING

EMPOWERING END-CONSUMERS TO TAKE INFORMED DECISIONS

The project **FRONT** aims at increasing transparency of heating and cooling costs using renewable heating and

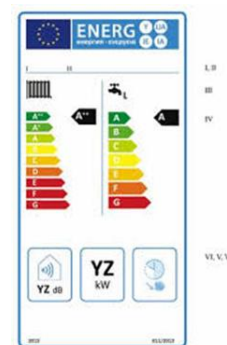


cooling technologies relative to the use of fossil fuels. The project team is developing a methodology to compare the costs of generating heating with a number of technologies using fossil fuels and renewable energy technologies.

Using these results, a tool targeting end-consumers will be developed and be made publicly available to provide an easy-to-use manner to compare the prices of heat generation with different options. To support this, the FRONT project is also setting-up national consultation platforms in 6 Member States i.e., Austria, Spain, Netherlands, Poland, Portugal and the UK, in order to bring together stakeholders representing industry, public authorities, consumers and national energy agencies across 6 Member States.

ENERGY LABELLING DIRECTIVE COVERING HEATING PRODUCTS

Supported under the Horizon 2020 Call 2014, the project [LabelPack A+](#) is supporting industry in the implementation of the energy labelling directive for combined heating and solar thermal systems. The project addresses one of the main challenges related to the energy labelling process: the issuing of 'package labels' by installers, including the communication to the final consumer. Package labels will give consumers an indication of the overall energy efficiency of heating systems that combine conventional and renewable heating systems such as solar thermal. Label Pack A+ will provide clarification, interpretations and validation to all actors of the supply chain on the preparation and implementation of the package label, including clarification on their respective roles, in order to remove market barriers and increase acceptance. The project will provide suppliers and dealers a validated, tested and operational set of tools, information and training to support those in charge of issuing the package label. In addition, the project will set up and run six national pilots and National Stakeholder Platforms in Austria, Germany, France, Italy, Portugal and the United Kingdom, to pilot the implementation of the package label and reach out to consumers to promote and explain the package label.



Another Horizon 2020 project in the Call 2015 (Topic EE14), [SuperSmart](#), has only recently started and is being supported under Horizon2020. During the next 3 years the project will support the uptake of energy efficiency in the supermarket sector across Europe with a special emphasis on heating and cooling. The project will provide guidelines and trainings to stakeholders in the sector and across the entire value chain including equipment manufacturer, designers, consultants, energy managers and decisions makers.



Call year	Project acronym	Title	EU Contribution (EUR)	Project website	Start date	Duration (months)
2011	BIOGASHEAT	Development of sustainable heat markets for biogas plants in Europe	€1,020,953	www.biogasheat.org	Apr 2012 (closed)	36
2011	CODE2	Cogeneration Observatory and Dissemination Europe 2	€893,492	www.code2-project.eu	Jul 2012 (closed)	30
2011	GEODH	Promote Geothermal District Heating Systems in Europe	€760,920	www.geodh.eu	Apr 2012 (closed)	30
2011	REGEOCITIES	Regulations of geothermal heat pumps systems at local and regional level in Europe	€1,264,933	www.geodh.eu	May 2012 (closed)	36
2011	RESCUE	Renewable Smart Cooling for Urban Europe	€957,048	www.rescue-project.eu	Jun 2012 (closed)	30
2011	SDHPLUS	New Business Opportunities for Solar District H/C	€1,410,566	www.solar-district-heating.eu	Jul 2012 (closed)	36
2013	SmartReflex	Smart and Flexible 100 % RES DHC in Eu cities	€1,065,818	www.smartreflex.eu	Mar 2014 (ongoing)	36
2013	RES H/C Spread	RES H/C - Strategic Actions Development	€928,657	www.res-hc-spread.eu	Mar2014 (ongoing)	30
2013	STRATEGO	Multi-level actions for enhanced H/C plans	€1,512,012	www.stratego-project.eu	Apr 2014 (ongoing)	32
2013	FRONT	Fair RHC Options & Trade	€985,933	www.front-rhc.eu	Apr 2014 (ongoing)	30
			€ 10.800.332			

Table 3: Support to heating and cooling projects under the Intelligent Energy Europe (IEE) programme¹³ 2011-2013¹⁴

¹³ IEE project database <https://ec.europa.eu/energy/intelligent/projects/>

¹⁴ Excluding technical assistance projects under MLEI-PDA

Project	Description	Type of action	Call	Budget (EUR)	EU funding (EUR)
LabelPackAPlus	The project aims at supporting the practical implementation of the energy labelling directive affecting heating appliances, in particular labelling package systems in combination with solar thermal systems. Central to the action is the development and implementation of 6 national pilot projects and setting-up of National Stakeholder Platforms that will cover around 50% of the solar market: Austria, Germany, France, Italy, Portugal and United Kingdom.	CSA	2014 EE 14	1.385.798	1.385.798
HRE	Heat Roadmap Europe 4 will refine the already existing pan European thermal atlas produced by the STRATEGO project by including the industrial sector in the calculations. In addition the project foresees to undertake comprehensive study of the heating and cooling sectors in the 14 largest EU countries.	CSA	2015 EE 14	2.113.482	1.946.042
SuperSmart	The project supports the uptake of energy efficiency in the supermarket sector across Europe with a special emphasis on heating and cooling. The project will provide guidelines and trainings to stakeholders in the sector and across the entire value chain including equipment manufacturer, designers, consultants, energy managers and decisions makers.	CSA	2015 EE 15	1.467.907	1.467.907
progRESsHEAT	The project aims at assisting local, regional, national and EU policy makers in developing and implementing integrated, effective and efficient policy strategies achieving a fast and strong penetration of RES and EE in heating and cooling.	CSA	LCE-04-2014	1.728.305	1.728.305
SDHp2m	The project is focussed on developing and implementing advanced policies and support measures for the use of large-scale solar thermal plants combined with other RES in district heating and cooling systems.	CSA	LCE-04-2015	2.087.297	1.919.297
CoolHeating	The objective of the project is to support the implementation of small modular renewable district heating and cooling grids for communities in South-Eastern Europe through knowledge transfer and mutual activities in the focus countries.	CSA	LCE-04-2015	1.644.340	1.644.340
				€10.427.129	€10.091.689

Table 4: Funding for market uptake (CSA) for heating and cooling in the Energy Challenge of Horizon 2020 Calls 2014-15.

4. TECHNICAL ASSISTANCE AND INNOVATIVE FINANCING FOR HEATING AND COOLING

Public authorities - regions, cities, municipalities or groupings of those - and public bodies are being supported in **developing bankable sustainable energy projects** through the Mobilising Local Energy Investment (MLEI) initiative of the Intelligent Energy Europe (IEE) Programme. MLEI is a technical assistance facility¹⁵ aiming at bridging the gap between sustainable energy plans and real investment through supporting all activities necessary to prepare and mobilise investment into sustainable energy projects (see figure below). These include feasibility studies, stakeholder and community mobilisation, financial engineering, business plans, technical specifications and procurement procedures. This type of support continues under the Horizon2020 programme as Project Development Assistance (PDA).

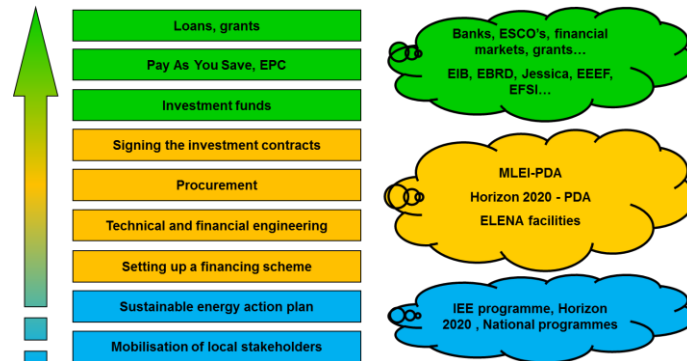
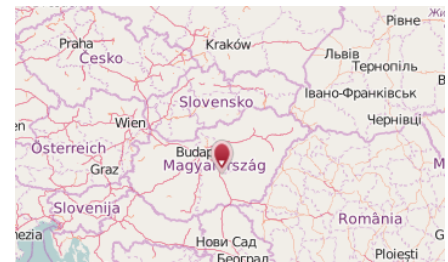


Figure 1: Project development assistance. From action plans to investments

A number of these projects aim at **launching investments for large scale heating and cooling infrastructure** projects including district energy projects using local excess heat and renewable energy sources. As an example, in project [MLEI GeoKec](#) project development assistance has been granted to the City of Kecskemét in Hungary for the retrofitting of the city district heating network to deep geothermal what would result in a geothermal share of over 80% in the overall city wide district heating network. The total investments expected to be triggered by this action are in the order of EUR 30 million.



In Spain, [MLEI EFIDISTRICT](#) is supporting the housing association of the Region of Navarra for the deep renovation of condominiums including the retrofitting of the existing district heating network, which will be extended to neighbouring public buildings and switched to biomass. The expected investment adds up to EUR 11 million. A more comprehensive list of the projects under MLEI supporting investments in heating and cooling infrastructure is provided in the Annexes. Overall in excess of EUR 100 million are expected to be launched by the projects being supported.



Support for technical assistance is continuing under Horizon 2020 where beneficiaries may include not only public authorities but also private project developers. As an example, the project [BEenerGi](#) is providing technical assistance provided to the County Council of Girona in Spain in the preparation of the investments associated to the installation of collective



¹⁵ Support to technical assistance is provided also through the ELENA facility and the European Energy Efficiency Fund.

heating systems in public buildings and to the energy efficient retrofitting of street lighting.

In addition support is being provided under H2020 to projects for the development and **market roll-out of innovative energy services and financial schemes for sustainable energy**. One of these projects, [TrustEE](#), aims at establishing an investment fund, including a dedicated guarantee facility, for energy efficiency investments in general and "process heat efficiency and sustainability investments" in particular, enabling third party financing due to risk reduction based on the structure of the facility.

Project	Territory	Investment investments	Programme	Call year	EU Contribution	Investment triggered ¹⁶
BOWEN	Hengelo, NL	District heating	MLEI-PDA	2011	€1,000,000	€24,189,288
Energy4Flexibility	Greenpark Venlo, NL	District heating	MLEI-PDA	2011	€1,131,748	€54,634,857
GeoKec	Kecskemet, HU	District heating	MLEI-PDA	2011	€ 284,471	€30.375.000
SOLROD	Solrød, DK	Biogas plant	MLEI-PDA	2012	€ 478,086	€12,467,000
EFIDISTRIC	Pamplona, ES	Urban regeneration	MLEI-PDA	2013	€374,221	€8,263,691
BEenergi	Girona, ES	Urban regeneration	H2020-PDA	2014	€ 922.399	€ 9.400.00
TrustEE	AT		H2020	2015	€ 1.409.995	N/A
				total	€ 5.600.920	

Table 5: Support to Project Development Assistance projects on heating and cooling under the Intelligent Energy Europe (IEE) programme 2011-2013 and Horizon 2020 Calls 2014-2015.

5. SME INSTRUMENT

In the framework of Horizon 2020, SME Instrument (SMEI) is dedicated to Small and Medium-sized Enterprises based in EU or in associated countries. The prime targets are highly innovative SMEs with a clear commercial ambition and a potential for high growth and internationalisation. SMEI allows them to get EU funding and support for high-potential innovation projects that will help them grow and expand their activities into other countries. Provided with about € 3 billion in funding over the period 2014-2020, the SMEI helps high-potential SMEs to develop breakthrough innovation for products, services or processes that are ready to face global market competition.

The SME Instrument offers:

- Business innovation grants for feasibility assessment purposes (Phase I)
- Business innovation grants for innovation development & demonstration purposes (Phase II)
- Access to innovation support services and facilitated access to risk finance
- Free-of-charge business coaching.

¹⁶ MLEI-PDA project should have at least a leverage factor of 15

Phase 1 is optional and the funding is available for exploring and assessing the technical feasibility and commercial potential of a breakthrough innovation that a company wants to exploit and commercialize. Activities funded could be: risk assessment, design or market studies, intellectual property exploration; the ultimate goal is to put a new product, service or process in the market, possibly through an innovative application of existing technologies, methodologies or business processes. The amount of the funding is a lump sum of €50,000 per project and the duration is typically around 6 months. The outcome is a feasibility study (technical and commercial), including a business plan.

Should the conclusion of the study be that the innovative concept has the potential to be developed, but requires additional funding in view of commercialisation, the SME can apply for Phase 2 support.

Phase 2 funds several types of activities: prototyping, miniaturisation, scaling-up, design, performance verification, testing, demonstration, development of pilot lines, validation for market replication... Funding is available for innovation projects underpinned by a sound and strategic business plan (potentially elaborated and partially funded through phase 1). The amount of the funding is in the indicative range of €500,000 – € 2.5 million or more (covering up to 70% of eligible costs, or in exceptional, specific cases up to 100%) and the duration is typically around 1 to 2 years. The outcomes are a new product, process or service that is ready to face market competition and a business innovation plan incorporating a detailed commercialisation strategy and a financing plan in view of market launch.

Phase 3 Commercialisation

With the view of facilitating the commercial exploitation of the innovation activities resulting from phase 1 or phase 2, specific activities will be proposed. These can include support for further developing investment readiness, linking with private investors and customers through brokerage activities, assistance in applying for further EU risk finance, and a range of other innovation support activities and services offered via the Enterprise Europe Network (EEN).

Coaching is offered in parallel throughout phases 1 (2 days) and 2 (10 days) to help SMEs enhance the company's innovation capacity, align the project to the identified business development strategy and develop the commercial/economic impact and long term sustainability. Coaching is provided by experienced business coaches, selected through the Enterprise Europe Network (EEN).

A summary of the projects being supported by the SMEI in the area of heating and cooling is included in the tables below:

SME SUPPORT



Project	Description	Country	Call	Phase	Budget (million EUR)	EU funding (million EUR)
HEALEX	"HEALEX – High Efficiency Air Liquid Heat Exchanger□An innovative, new heat exchanger that improves energy efficiency in cooling and ventilation systems"	SE	H2020-SMEINST-2-2014	2	1,470,776	1,029,543
HTPush	Universal and compatible system for plumbing and heating	ES	H2020-SMEINST-2-2014	2	4,886,700	3,420,690
SMARTCIM	Smart interoperable electronic active valve, control eco-system and service to achieve superior building efficiency and user awareness	IT	H2020-SMEINST-2-2015	2	2,302,000	1,611,400
V-TeX Multi	Demonstration and optimisation of a highly innovative beverage cooling system that will deliver up to 90% energy savings		H2020-SMEINST-2-2015	2	1,936,657	1,355,497
Polarsol	Polarsol - a disruptive hybrid heat management solution for global markets	FI	H2020-SMEINST-2-2016-2017	2	2,941,500	2,059,050
					13,537,633	9,476,180

Table 6: Support to heating and cooling projects under Horizon 2020 SME Instrument Calls Phase 2 Calls 2014 to 2017

Project	Description	Country	Call	Phase	Budget (EUR)	EU funding (EUR)
Climate	Climate Advanced Demand Management of Heating and Cooling	IE	H2020-SMEINST-1-2014	1	71,429.00	50,000.00
LCSAC	Low cost solar absorption cooling	UK	H2020-SMEINST-1-2015	1	71,429.00	50,000.00
COOL POWER	Efficient microgeneration combined with food cooling systems in trade, crafts and service companies	DE	H2020-SMEINST-1-2014	1	71,429.00	50,000.00
ECOOOL	Evaporative Cooling Technologies for dry and humid climates	NL	H2020-SMEINST-1-2016-2017	1	71,429.00	50,000.00
Hi-ThermCap	High-capacity and high-performance Thermal energy storage Capsule for low-carbon and energy efficient heating and cooling systems	DE	H2020-SMEINST-1-2015	1	71,429.00	50,000.00
ReHeat	Heat Recovery System for Professional Laundry Equipment	IT	H2020-SMEINST-1-2015	1	71,429.00	50,000.00
VaporPV	Low cost PV cooling system for ground-mounted and rooftop systems - VaporPV	UK	H2020-SMEINST-1-2015	1	71,429.00	50,000.00
ACT4INFRA	Innovative Actuators for empowering smart pipeline infrastructures towards secure water, gas and heating supply	DE	H2020-SMEINST-1-2014	1	71,429.00	50,000.00
CHP	Upscaling and commercialization of a highly efficient wood pellets fired steam engine CHP for heat and power generation	DE	H2020-SMEINST-1-2014	1	71,429.00	50,000.00
GEO PAC RET	GEO PAC RET an Innovative Heat Pump for Geothermal district heating in Europe	FR	H2020-SMEINST-1-2014	1	71,429.00	50,000.00
HEATBOOST	Sorption Heat-pump Component Boosting Energy-efficiency in Gas-fired Boilers	SE	H2020-SMEINST-1-2014	1	71,429.00	50,000.00
PLACTHERM	SMART MODULAR UNDERFLOOR HEATING SYSTEM FOR ENERGY AND THERMAL COMFORT OPTIMIZATION	ES	H2020-SMEINST-1-2016-2017	1	71,429.00	50,000.00
SmartCOMBI	Energy savings in residential buildings using a modular platform to control an all-in-one unit for water heating, climate control, and ventilation	DK	H2020-SMEINST-1-2015	1	71,429.00	50,000.00
SUN4GREEN	MAXIMISING SUNLIGHT RESOURCES FOR COST, ENERGY AND YIELD EFFICIENT GREENHOUSES	ES	H2020-SMEINST-1-2015	1	71,429.00	50,000.00
eTAG	Thermoacoustic- based residential mCHP system	IL	H2020-SMEINST-1-2014	1	71,429.00	50,000.00
C-Heat	Condensed Heat - Optimization and scaling up of an energy efficient, long-during biomass condensation boiler with curved heat exchanger	ES	H2020-SMEINST-1-2015	1	71,429.00	50,000.00
Drygair20	Energy efficient greenhouse dehumidifier for warm climate operating at wide temperature ranges (4-40° C) and free of fluorinated gases	IL	H2020-SMEINST-1-2016-2017	1	71,429.00	50,000.00
					1,214,293	850,000

Table 7: Support to heating and cooling projects under Horizon 2020 SME Instrument Calls Phase 1 Calls 2014 to 2017.

6. OTHER STUDIES

There are also ongoing studies in support of the Heating and Cooling sector. The Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables) tender¹⁷ gathers important data about H&C supporting a better understanding of the sector. Another tender is working on the drafting of guidelines for sub-metering of thermal energy in multi-unit buildings¹⁸. This work comes in support of the implementation of Articles 9-11 of Energy Efficiency Directive¹⁹.

Within the context of the Strategic Energy Technology Plan, the relevant Heating and Cooling research and industrial actors have formed the **Renewable Heating and Cooling Technology and Innovation Platform** (RHC ETIP)²⁰. It is the main platform representing the RHC sector with more than 800 members in 5 technology panels: Biomass, Geothermal, Solar Thermal, Heat Pumps and Cross-cutting panels. The platform identified the required technological advancements for the RHC sector and issued technology roadmaps based on the defined research, development and demonstration priorities. In the frame of the tender "Support to key activities of the European Technology Platform on Renewable Heating and Cooling" the RHC platform monitors the implementation of the different technology roadmaps and also analysis the progress of the heating and cooling industry and its consumers.

¹⁷ Reports are available at: https://ec.europa.eu/energy/en/studies?field_associated_topic_tid=All&page=2


¹⁸ Guidelines available at https://ec.europa.eu/energy/en/studies?field_associated_topic_tid=All&page=1

¹⁹ Directive 2012/27/EU on energy efficiency <http://europa.eu/!nT49xf>


²⁰ RHC platform website: <http://www.rhc-platform.org>

**ANNEX 1 – RESEARCH AND INNOVATION – ENERGY
EFFICIENCY: PROJECT FACTSHEETS**


STORM TECHNOLOGY FOR DHC

H2020 EE-13-2014 Technology for district heating and cooling	Self-organising Thermal Resource Management Operational
Project coordinator:	VITO (BE)
Summary: 	<p>Develop, demonstrate and deploy an advanced self-learning controller for district heating and cooling (DHC) networks.</p> <p>The controller will be demonstrated in 2 sites Mijnwater at Heerlen (The Netherlands) and Växjö (Sweden).</p>
Other information:	<p>The project is expected to result in the following:</p> <ul style="list-style-type: none"> • Developing an innovative controller for district heating & cooling (DHC) networks • Balancing supply and demand in a cluster of heat/cold producers and consumers • Integrating multiple efficient generation sources (renewable energy sources, waste heat and storage systems) • Including three control strategies in the controller (peak shaving, market interaction, and cell balancing). • Present generic applicability by demonstration on two demo-sites • Developing innovative business models needed for the large-scale roll-out of the controller at reduced costs • Designing a scalable and performing self-learning control approach requiring limited external experts • Increasing awareness on the need to control DHC networks in a smart way
EU contribution:	EUR 1.972.126
Project start:	April 2015
Project end:	September 2018
Contact person:	Johan Desmedt, johan.desmedt@vito.be
Further information:	<p>http://storm-dhc.eu</p> <p>http://cordis.europa.eu/project/rcn/194614_en.html</p> <p>Twitter: @sustainplaces</p> <p>Project reference: 649743</p>

OPTi TECHNOLOGY FOR DHC

H2020 EE-13-2014 Technology for district heating and cooling	Optimisation of DHC systems
Project coordinator:	Lulea Technical University (SE)
Summary: 	<p>Development of a novel methodology to control and optimize DHC systems using advanced modelling, optimization and control techniques</p> <p>Optimisation of district heating and cooling network would be done by:</p> <p>automated demand response to reduce and shift peak loads of district heating networks in combination with the use of passive thermal storage capabilities</p>
Other information:	<p>The project is expected to result in the following.</p> <p>For utility companies and service providers:</p> <ul style="list-style-type: none"> • Integrated tool set and framework for optimization and reengineering of DHC systems (TRL-7 maturity). • Methodologies for passive thermal storage usage and automated demand response to reduce and shift peak loads <p>For consumers:</p> <ul style="list-style-type: none"> • Incentive models that promote user engagement in heat demand response. • User-centric optimization methods for improved comfort
EU contribution:	EUR 2.100.130
Project start:	March 2015
Project end:	Nov 2017
Contact person:	Arne Gylling, arne.gylling@ltu.se
Further information:	<p>http://www.opti2020.eu</p> <p>http://cordis.europa.eu/project/rcn/196635_en.html</p> <p>Project reference: 649796</p>

FLEXYNETS TECHNOLOGY FOR DHC

H2020 EE-13-2014 Technology for district heating and cooling	Fifth generation, Low temperature, high EXergy district heating and cooling NETWORKS
Project coordinator:	EURAC (IT)
<p>Summary:</p> 	<p>Development, demonstration and deployment of a new generation of intelligent district heating and cooling networks working at "neutral" temperature levels.</p> <p>The concepts developed in the project are expected to contribute to:</p> <ul style="list-style-type: none"> reducing energy distribution losses integrating multiple energy generation sources exploiting innovative thermal capacity / storages approaches
Other information:	<p>The project is expected to result in the following:</p> <ul style="list-style-type: none"> • FLEXYNETS-LOOP: an optimised hardware and control strategy to integrate solar thermal collector fields into DH networks • FLEXYNETS-SUBSTATIONS: Production Substations entail energy generation devices and local, short term thermal storages • FLEXYNETS-PLANNING: different configurations of a DHC network, providing recommendations for their replication • FLEXYNETS-CONTROL: Control strategies will be provided at i) Substation, ii) centralised, iii) grids integration level • FLEXYNETS-TRADING: Trading strategies must stimulate energy production from local RESs and waste heat, and during peak hours. Moreover, they must boost energy storage practices and off-peak drawing from the network
EU contribution:	EUR 1.999.364
Project start:	July 2015
Project end:	July 2018
Contact person:	Roberto Fedrizzi, roberto.fedrizzi@eurac.edu
Further information:	<p>http://www.flexynets.eu/en/</p> <p>http://cordis.europa.eu/project/rcn/194622_en.html</p> <p>Project reference: 649820</p>


INDIGO TECHNOLOGY FOR DHC

H2020 EE-13-2015 Technology for district heating and cooling	New generation of Intelligent Efficient District Cooling systems
Project coordinator:	GIROA SOCIEDAD ANONIMA (ES)
<p>Summary:</p> 	<p>The project aims at developing an efficient, intelligent and cheaper generation of district cooling systems by improving system planning, control, and management at all system levels.</p> <p>The intelligent and innovative component controllers are to be developed at all DC system levels (building, generation and distribution level) and it will include embedded self-learning algorithms, allowing components to respond appropriately to the set-points established.</p> <p>The control system developed would be first validated in laboratory conditions (simulations) and finally validated at a relevant environment in a hospital campus in Basurto located in Bilbao (Spain).</p>
Other information:	<p>The DC system management strategy to be developed intends to focus mainly on energy efficiency maximization but also on energy cost minimization. Its main characteristics is the predictive management but it also will address other challenges such:</p> <ul style="list-style-type: none"> • Integration of Renewable Energy Sources dealing with different types of cooling sources • Suitable coupling between generation, storage and demand <p>The project is expected to develop two open-source tools:</p> <ul style="list-style-type: none"> • planning tool for DC systems with the aim of supporting their optimal design • a library with thermo-fluid dynamic models of DC System components which will provide the designers detailed information about their physical behaviour
EU contribution:	EUR 2.237.500
Project start:	March 2016
Project end:	Aug 2019
Contact person:	Jose Alonso Urquijo, jose.alonsourquijo@veolia.com
Further information:	<p>www.indigo-project.eu</p> <p>http://cordis.europa.eu/project/rcn/200194_en.html Project reference: 696098</p>


E2DISTRICT TECHNOLOGY FOR DHC

H2020 EE-13-2015 Technology for district heating and cooling	Energy Efficient Optimised District Heating and Cooling
Project coordinator:	CORK INSTITUTE OF TECHNOLOGY (UK)
<p>Summary:</p> 	<p>E2District aims to develop, deploy, and demonstrate a novel cloud enabled management framework for district heating and cooling (DHC) systems.</p> <p>This would be done by developing a District Simulation Platform to optimise DHC asset configuration, development of intelligent adaptive DHC control and optimisation methods including flexible production, storage and demand assets, and system-level fault detection and diagnostics, development of behaviour analytics and prosumer engagement tools to keep the end user in the loop.</p>
Other information:	<p>The work in the project would also the:</p> <ul style="list-style-type: none"> • development, deployment and demonstration of a behaviour analytics tool for learning and continuously refining the demand behaviour models used in the energy demand prediction, and to develop prosumer engagement tools with specific user interfaces that keep the human end user in the loop, allow them to control equipment that is not accessible by the operator, and help influence and control actual energy demand • development of novel business models for DHC Operators, Integrators and Designers as well as validation, evaluation, and demonstration of the E2District platform <p>The demonstration work in the project is expected to take place in a real-life district heating and cooling demonstration site at the Cork Institute of Technology Bishopstown campus in Cork, Ireland.</p>
EU contribution:	EUR 1.999.849
Project start:	Feb 2016
Project end:	Jan 2019
Contact person:	Martin Klepal , Martin.Klepal@cit.ie
Further information:	<p>http://e2district.eu/</p> <p>http://cordis.europa.eu/project/rcn/200001_en.html</p> <p>Project reference: 696009</p>

H-DISNET TECHNOLOGY FOR DHC

H2020 EE-13-2015 Technology for district heating and cooling	Intelligent Hybrid Thermo-Chemical District Networks
Project coordinator:	University of Leuven (BE)
<p>Summary:</p>  <p>H-DisNet</p>	<p>The overarching objective of the project is to establish Hybrid District energy Networks (H-DisNet). The Innovative thermo-chemical (TC) network technology to be developed would contribute to next-generation district energy networks.</p> <p>The main innovation is the use of thermo-chemical carrier fluids (TCF) that allow loss-free storage and transport of energy potential.</p> <p>The technology will exploit high chemical potential of absorption processes for loss-free transport and storage of energy potential. It will be applied to form an intelligent district network with thermal, electric and gas networks and is expected to:</p> <ul style="list-style-type: none"> • increase energy efficiency of heat transport and storage, • increase utilization of waste heat and renewables at low temperature • contribute to a wider usage of district networks by allowing heating and cooling in one multifunctional network and by adding the additional services drying and humidity control.
Other information:	<p>The project intends to gain the required knowledge about processes, components and network applications and to demonstrate the feasibility to allow the industrial R&D to pick up the technology and to bring it to the market</p> <ul style="list-style-type: none"> • The partners would develop the TC components and intelligent network technology and demonstrate it in a residential area and in an industry environment to proof the technology's feasibility. • Modelling of TC components serves to carry out simulation of networks. On this basis, smart control strategies and a network identification tool are developed. • Based on simulation, an economic and environmental assessment determines the potential of the technology and allows defining the path to market.
EU contribution:	EUR 2.009.697
Project start:	June 2016
Project end:	May 2019
Contact person:	Philipp Geyer, philipp.geyer@kuleuven.be
Further information:	<p>http://cordis.europa.eu/project/rcn/202664_en.html</p> <p>Project reference: 695780</p>


INDEAL TECHNOLOGY FOR DHC

H2020 EE-13-2015 Technology for district heating and cooling	Energy Efficient Optimised District Heating and Cooling
Project coordinator:	City University London (UK)
<p>Summary:</p> 	<p>The project aims at improving the efficiency of district heating and cooling networks by improving analysis of heating and cooling demand, forecasting weather prediction, development of innovative insulation material for pipes and means to actively involve the end consumers.</p> <p>Two case studies are foreseen in order to test the sub-systems and the final system of InDeal in operational conditions:</p> <ul style="list-style-type: none"> • Real Case Study A in an area with District Heating System in Vrankska Municipality, Slovenia • Real Case Study B in area with District Heating and Cooling System in France
Other information:	<p>The project expects to</p> <ul style="list-style-type: none"> • develop of innovative insulating materials, innovative pipe design and intelligent piping system • develop a weather forecast tool for forecasting weather parameters • develop an energy demand prediction tool • develop a storage management and monitoring tool • develop an automated decision Support System for DHCS • develop a central monitoring and control platform for DHCS using a web based platform accessible for mobile devices permitting the users to monitor the network's operation and its properties. • undertake life cycle analysis of the system during the lab tests and the real case studies for life cycle cost assessment and quantification of the economic and environmental impact
EU contribution:	EUR 1.992.726
Project start:	June 2016
Project end:	Feb 2019
Contact person:	Kostas Chrysagis, kostas.chrysagis.1@city.ac.uk
Further information:	<p>www.indeal-project.eu http://cordis.europa.eu/project/rcn/202665_en.html Twitter: @InDeal_H2020 Project reference: 696174</p>


TASIO WASTE HEAT RECOVERY IN INDUSTRIAL PROCESSES

<p>H2020 EE-18-2014 - New technologies for utilization of heat recovery in large industrial systems</p>	<p>Waste Heat Recovery for Power Valorisation with Organic Rankine Cycle Technology in Energy Intensive Industries</p>
<p>Project coordinator:</p>	<p>TECNALIA (ES)</p>
<p>Summary:</p> 	<p>The main objective of the project is to develop solutions to recover the waste heat produced in energetic intensive processes of industrial sectors such as cement, glass, steelmaking and petrochemical and transform it into useful energy.</p> <p>The solutions will be designed after an evaluation of the energetic situation of these four industries and will deal with the development of Waste Heat Recovery Systems (WHRS) based on the Organic Rankine Cycle (ORC) technology.</p> <p>This technology is able to recover and transform the thermal energy of the flue gases of EII into electric power for internal or external use. Furthermore, a WHRS will be developed and tested to recover and transform the thermal energy of the flue gases of EII into mechanical energy for internal use (compressors). In order to reach this objective several challenging innovative aspects will have to be approached by the consortium.</p>
<p>Other information:</p>	<p>It is planned to design and develop a multisectorial direct heat exchanger to transfer heat directly from the flue gases to the organic fluid of the ORC system and to develop new heat conductor and anticorrosive materials to be used in parts of the heat exchanger in contact with the flue gases.</p> <p>These aspects will be completed by the design and modelling of a new integrated monitoring and control system for the addressed sectors. The consortium consists of 8 partners from 4 European countries. They cover several relevant sectors of the energy intensive industry, namely cement, steel, glass and petrochemical sectors. The industrial involvement in the project is significant and the project addresses the implementation of a full demonstration of the WHRS for electrical energy generation in one of the industrial partners and a semi-validation of the WHRS for air compressors energy supply system at pilot scale.</p>
<p>EU contribution:</p>	<p>EUR 3.989.248</p>
<p>Project start:</p>	<p>December 2015</p>
<p>Project end:</p>	<p>May 2018</p>
<p>Contact person:</p>	<p>Pedro.egizabal@tecnalia.com</p>
<p>Further information:</p>	<p>http://cordis.europa.eu/project/rcn/193472_en.html http://www.tasio-h2020.eu/ Project reference: 637189</p>


SusPIRE WASTE HEAT RECOVERY IN INDUSTRIAL PROCESSES

<p>H2020 EE-18-2015 - New technologies for utilization of heat recovery in large industrial systems</p>	<p>Sustainable Production of Industrial Recovered Energy using energy dissipative and storage technologies</p>
<p>Project coordinator:</p>	<p>PRECICAST BILBAO SA (ES)</p>
<p>Summary:</p> 	<p>SusPIRE addresses its efforts to energy intensive industries and within this segment market to energy recovery from residual heat streams. To achieve this goal two clearly differentiated working areas are addressed:</p> <ul style="list-style-type: none"> • Technology area will include the development of materials and equipment. New Heat Transfer Fluids (HTF) and Phase Change Materials (PCM) will be the base for manufacture high efficiency heat exchangers in terms of energy capture and storage. • Two Borehole Thermal Energy Storage (BTE) areas (low temperature range (30-50°C) and medium (50-80°C) will support an energy cascading concept where energy will be sequentially used and finally stored for further use or commercialized to third parties.
<p>Other information:</p>	<p>The methodology aspects of the project aim at establishing a framework to foster the energy commercialization of surplus energy.</p> <p>The coordination of the manufacturing and the energy recovery processes will be carried out by means of a smart methodology. A protocol definition software will deploy actions to create best practices in terms of process adjustment and operating instructions. Management concepts based on energy recovery rate as key Process Indicator (KPI), will be integrated into the decision making mechanism of the company assuring permanent advances in this field of activity in forthcoming years.</p>
<p>EU contribution:</p>	<p>€ 3,722,016</p>
<p>Project start:</p>	<p>October 2015</p>
<p>Project end:</p>	<p>November 2018</p>
<p>Contact person:</p>	<p>Fernando Santos, fsantos@azterlan.es</p>
<p>Further information:</p>	<p>http://suspire-h2020.eu</p> <p>http://cordis.europa.eu/project/rcn/198357_en.html</p> <p>Project reference: 680169</p>

IThERM WASTE HEAT RECOVERY IN INDUSTRIAL PROCESSES


<p>H2020 EE-18-2015 - New technologies for utilization of heat recovery in large industrial systems</p>	<p>Industrial Thermal Energy Recovery Conversion and Management</p>
<p>Project coordinator:</p>	<p>Brunel University (UK)</p>
<p>Summary:</p> 	<p>The main aim of the project is to investigate, design, build and demonstrate innovative plug and play waste heat recovery solutions and the optimum utilization of energy within and outside the plant perimeter for selected applications with high replicability and energy recovery potential in the temperature range 70 degC- 1000 degC.</p>
<p>Other information:</p>	<p>Some specific objectives of the project include:</p> <ul style="list-style-type: none"> • Identify and quantify streams of waste heat from industrial processes in the EU 27 and potential for energy recovery • Use the 'EINSTEIN' toolkit to carry out energy audits in selected industrial sites and analyze the technical potential and economic viability of application of specific heat recovery technologies • Develop further the 'EINSTEIN' tool-kit which was developed for fast and high quality thermal energy audits in industry • Develop heat recovery technologies and equipment in packaged or easily customizable plug and play forms that can readily be selected and applied in industry. • Develop an intelligent system for monitoring and on-line integration and control of the operation of these technologies • Investigate and evaluate organisational, technoeconomic and socioeconomic barriers to the adoption of advanced heat recovery technologies and ways of overcoming these barriers. • Implement, monitor and evaluate the performance of heat recovery applications
<p>EU contribution:</p>	<p>EUR 3.996.169</p>
<p>Project start:</p>	<p>October 2015</p>
<p>Project end:</p>	<p>March 2019</p>
<p>Contact person:</p>	<p>Prof. Savvas Tassou, Savvas.Tassou@brunel.ac.uk</p>
<p>Further information:</p>	<p>http://suspire-h2020.eu http://cordis.europa.eu/project/rcn/198373_en.html Twitter: @ithermproject Project reference: 680599</p>

INDUS3ES WASTE HEAT RECOVERY IN INDUSTRIAL PROCESSES


<p>H2020 EE-18-2015 - New technologies for utilization of heat recovery in large industrial systems</p>	<p>Industrial Energy and Environment Efficiency</p>
<p>Project coordinator:</p>	<p>TECNALIA (ES)</p>
<p>Summary:</p> 	<p>The overall objective of the INDUS3ES project is the development and demonstration of an innovative, adaptable compact and economically competitive system based on absorption heat transformer (AHT) technology for recovering and revaluing low-exergy waste heat from industrial processes. The developed system would be easily adapted into various industrial process and sources.</p>
<p>Other information:</p>	<p>The project is expected to:</p> <ul style="list-style-type: none"> • analyse safety and security requirements that are present in different industry sectors and should be considered in the Indus3Es system to be developed. • develop the best solution for the integration of the Indus3Es system into the different industrial processes. Different operation modes will be analysed and the best control and operation strategy will be developed. An advanced control will be developed in order to be able to automatically disconnect from the industrial process. • develop the conceptual design of the engineering solution of the Indus3Es system for different industry sectors. <p>The project will also demonstrate the developed Indus3Es System in a real environment. A pilot plant of a scaled heat transformer system will be built. It will be installed in a real industrial process in a Petrochemical plant at Tüpraş (Turkey). This pilot plant and its performance will be monitored at least during six months. The objective of the project is to reach a TRL 7 of the developed technology.</p> <p>In parallel, the system and boundary conditions will be studied for a second plant at REPSOL.</p>
<p>EU contribution</p>	<p>€3.858.500</p>
<p>Project start:</p>	<p>October 2015</p>
<p>Project end:</p>	<p>June 2019</p>
<p>Contact person:</p>	<p>Eduardo Miera Zabalza, eduardo.miera@tecnalia.com</p>
<p>Further information:</p>	<p>www.indus3es.eu http://cordis.europa.eu/project/rcn/198373_en.html Project reference: 680599</p>

ANNEX 2 – RESEARCH AND INNOVATION – ENERGY EFFICIENCY IN BUILDINGS: PROJECT FACTSHEETS

CREATE TECHNOLOGY FOR THERMAL STORAGE FOR EEB

<p>H2020 EeB6-2015 Technology for Thermal Energy Storage for building applications</p>	<p>Compact Retrofit Advanced Thermal Energy storage</p>
<p>Project coordinator:</p>	<p>TNO (NL)</p>
<p>Summary:</p> 	<p>Main objective is to develop and demonstrate a heat battery, i.e. an advanced thermal storage system based on Thermo-Chemical Materials (TCMs), that enables economically affordable, compact and loss-free storage of heat in existing buildings</p>
<p>Other information:</p>	<p>The heat battery targets three breakthrough elements:</p> <ul style="list-style-type: none"> • Economical affordability: for the existing building stock it intends to reach at least a reduction of 15% of the net energy consumption with a potential Return-On-Investment shorter than 10 years. • Compactness: novel high-density materials will be used in order to limit the use of the available space to a maximum of 2.5 m³ thermochemical material. On a system level, 1.5 GJ/m³ (417 kWh/m³) is the targeted system energy storage density; on a material level 2-3 GJ/m³ (555-833 kWh/m³) • No heat losses during storage: this is an intrinsic material property of thermochemical storage technology, thereby enabling long-term storage.
<p>EU contribution:</p>	<p>EUR 5.914.658</p>
<p>Project start:</p>	<p>October 2015</p>
<p>Project end:</p>	<p>September 2019</p>
<p>Contact person:</p>	<p>Christophe Hoegaerts, christophe.hoegaerts@tno.nl</p>
<p>Further information:</p>	<p>www.createproject.eu http://cordis.europa.eu/project/rcn/198366_en.html Project reference: 680450</p>

TESSE2B TECHNOLOGY FOR THERMAL STORAGE FOR EeB


H2020 EeB6-2015 Technology for Thermal Energy Storage for building applications	Thermal Energy Storage Systems for Energy Efficient Buildings
Project coordinator:	Instituto Politecnico de Setubal (IPS)
<p>Summary:</p> 	<p>To develop advanced compact integrated PCM TES tanks exploiting renewable energy sources (solar and geothermal) in an efficient manner coupled with enhanced PCM borehole heat exchangers (BHEs) that will take advantage of the increased underground thermal storage and maximize the efficiency of the ground coupled heat pumps (GCHP).</p>
Other information:	<p>Main goals/ objectives:</p> <ul style="list-style-type: none"> • Exploit nanotechnology to develop a new nano-composite enhanced paraffin PCM - Development of a protective thin film coating against the corrosivity of salt-hydrates to the heat exchanger • Design& develop of compact modular TES tanks including a high performance HE and a smart model-based control system • Demonstration, on-site monitoring and technology validation of prototypes of a single building in three pilot sites. in Austria, Spain and Cyprus
EU contribution:	EUR 4.311.700
Project start:	1/10/2015
Project end:	30/09/2019
Contact person:	Luis Coelho, luis.coelho@estsetubal.ips.pt
Further information:	<p>http://www.tesse2b.eu http://cordis.europa.eu/project/rcn/198369_en.html @TESSe2b_Project, TESSe2b facebook, youtube https://goo.gl/KetEmi Project reference: 680555</p>

ANNEX 3 – RESEARCH AND INNOVATION – LOW CARBON ENERGY: PROJECT FACTSHEETS


FLEXIFUEL-SOFC MICRO COMBINED HEAT AND POWER

<p>LCE-02-2014 - Developing the next generation technologies of renewable electricity and heating/cooling</p>	<p>Development of a new and highly efficient micro-scale CHP system based on fuel-flexible gasification and a SOFC (FlexiFuel-SOFC)</p>
<p>Project coordinator:</p>	<p>WINDHAGER ZENTRALHEIZUNG TECHNIK GMBH (AT)</p>
<p>Summary:</p> 	<p>The project will develop a new way to turn different types of solid biomass (e.g. wood pellets, wood chips) into gas that can be used to produce heat and electricity by developing an innovative micro-scale fuel-flexible biomass combined heat and power (CHP) technology consisting of:</p> <ul style="list-style-type: none"> • a fixed-bed updraft biomass gasifier with ultra-low particulate matter and condensed alkaline compound concentrations, • an integrated gas cleaning approach for dust and HCl removal, desulphurisation and tar cracking, • a solid oxide fuel cell (SOFC) system which tolerates certain amounts of tars. <p>The solution aims to reach very high performance (40% gross electric and 85-90% overall) which will mean cleaner energy without cost increase, as well as almost zero gaseous and PM emissions. As the technology shall be developed for small scale applications (25 to 150 kWe) and will be highly-efficient it could be used for residential buildings.</p>
<p>Other information:</p>	<p>The novel technology is expected to result in a significant improvement of the performance of micro-scale biomass-based CHP systems.</p> <p>For the end user (private building owners, public buildings, small industries), the main advantages will be the lower generation costs for CHP, high electric and overall efficiency with nearly zero emissions as well as flexibility regarding the biomass fuels to be applied.</p> <p>The massive deployment of this technology would significantly reduce emissions as the project intends to be carbon neutral in terms of CO₂ and achieve the nearly zero emissions objective for the rest of gases. Moreover, as energy production is local, electricity transmission losses are significantly reduced with the accompanying environmental and economic benefits.</p>
<p>EU contribution:</p>	<p>5,982,101.25 €</p>
<p>Project start:</p>	<p>01/05/2015</p>
<p>Project end:</p>	<p>30/04/2019</p>
<p>Contact person:</p>	<p>Michael KERSCHBAUM, michael.kerschbaum@windhager.com</p>
<p>Further information:</p>	<p>http://flexifuelsofc.eu/ http://cordis.europa.eu/project/rcn/193794_en.html Project reference: 641229</p>


Bio-HyPP COMBINED HYBRID HEAT AND POWER

<p>LCE-02-2014 - Developing the next generation technologies of renewable electricity and heating/cooling</p>	<p>Biogas-fired Combined Hybrid Heat and Power Plant</p>
<p>Project coordinator:</p>	<p>DEUTSCHES ZENTRUM FUER LUFT- UND RAUMFAHRT EV (DE)</p>
<p>Summary:</p> 	<p>Bio-HyPP is developing a full scale technology demonstrator of a hybrid power plant, integrated by a micro gas turbine (MGT) and a solid oxide fuel cell (SOFC), using biogas as main fuel in lab environment. The project is then improving the efficiency of Combined Heat and Power (CHP) systems and simultaneously widening the biomass feedstock base. Because of the scale and modularity of the technology, it would be suitable for common residential buildings.</p> <p>The focus of the technology demonstration plant is to prove the functional capability of the plant concept, followed by detailed characterization and optimization of the integration of both subsystems, moving the technology beyond the state of the art. In addition an integrated control system is being developed and implemented to achieve a reliable operation of the coupled subsystems.</p>
<p>Other information:</p>	<p>The project targets an electrical efficiency of >60% at base load conditions, which is similar to that obtained in industrial combined power plants, and total thermal efficiencies of >90%. An operational flexibility ranging from 25% to 100% electric power is being pursued as well as emission levels lower than 10 ppm NO_x and 20 ppm CO. The large-scale deployment of this type of technology will entail a significant reduction of greenhouse gases emissions and a reduction of electricity transmission losses. In addition, the system should allow the use of biogas with methane contents varying from 40 to 75%, thus covering the biogas qualities from the fermentation of the entire biomass feedstock range.</p>
<p>EU contribution:</p>	<p>5,775,868.50 €</p>
<p>Project start:</p>	<p>01/06/2015</p>
<p>Project end:</p>	<p>31/05/2019</p>
<p>Contact person:</p>	<p>Andreas HUBER, andreas.huber@dlr.de</p>
<p>Further information:</p>	<p>http://www.bio-hypp.eu/system/ http://cordis.europa.eu/project/rcn/196804_en.html Project reference: 641073</p>

RESIDUE2HEAT RESIDENTIAL HEATING FUELLED BY FPBO

<p>LCE-02-2015 - Developing the next generation technologies of renewable electricity and heating/cooling</p>	<p>Renewable residential heating with fast pyrolysis bio-oil</p>
<p>Project coordinator:</p>	<p>RHEINISCH-WESTFAELISCHE TECHNISCHE HOCHSCHULE AACHEN (DE)</p>
<p>Summary:</p> 	<p>Residue2Heat is tackling the utilization of sustainable, ash rich biomass and residues in residential heating applications (20-200 kWth) to provide sustainable heat at a competitive price. Various 2nd generation agricultural and forestry residue streams are converted into a liquid energy carrier near the biomass origin at an economic viable scale of 15-30 MWth using the fast pyrolysis process. Subsequently, the fast pyrolysis bio-oil (FPBO) is distributed to a large number of residential end-users. The FPBO obtained fulfils at least the draft CEN-specification for replacement of domestic heating oil and comply with REACH regulation, as well as quality control aspects include the removal of extractives and solids.</p> <p>The final outcome is fuelling modified residential heating systems with FPBO, for which manufacturing capabilities, market development and product distribution are already in place. The emission control and energy efficiency of the heating systems are being optimized by dedicated modelling of FPBO atomization and combustion kinetics, supported by single droplet combustion tests and spray characterization.</p>
<p>Other information:</p>	<p>The main target of the project is to enable the production of standardized FPBO at a maximum price of 15 €/GJ (or 240 €/t, LHV basis), aiming at a heat price between 65 and 100 €/MWhth. In addition, a total reduction of over 50 kt/year of SO₂ is theoretically possible assuming the lower sulphur content in the fuel oil.</p>
<p>EU contribution:</p>	<p>5,465,728.00 €</p>
<p>Project start:</p>	<p>01/01/2016</p>
<p>Project end:</p>	<p>31/12/2019</p>
<p>Contact person:</p>	<p>Herbert PFEIFER, pfeifer@iob.rwth-aachen.de</p>
<p>Further information:</p>	<p>www.residue2heat.eu/ http://cordis.europa.eu/project/rcn/199298_en.html Project reference: 654650</p>


CHPM2030 COMBINED HEAT, POWER AND METAL EXTRACTION

LCE-02-2015 - Developing the next generation technologies of renewable electricity and heating/cooling	Combined Heat, Power and Metal extraction from ultra-deep ore bodies
Project coordinator:	MISKOLCI EGYETEM (HU)
<p>Summary:</p> 	<p>CHPM2030 is developing a pilot level technology which combines geothermal resource development, minerals extraction and electro-metallurgy in a single process. The project investigates technologies for manipulating metal-bearing formations with high geothermal potential at a depth of 3-4 km in order to co-produce energy and metals. This could be optimised according to the market demands in the future and should improve the economics of geothermal energy production.</p> <p>The project results deliver blueprints and detailed specifications of a new type of future facility for "Combined Heat, Power and Metal extraction" (CHPM), complemented by a Roadmap in support of the pilot implementation of such system before 2025, and full-scale commercial implementation before 2030.</p>
Other information:	CHPM2030 not only serves as background for a new generation geothermal development in Europe, but it will also have a substantial contribution in satisfying Europe's needs for critical minerals (including metals that are indispensable for Europe's energy industry, such as Cadmium, Nickel, Molybdenum, Vanadium or Niobium).
EU contribution:	4,235,567.50 €
Project start:	01/01/2016
Project end:	30/06/2019
Contact person:	Eva HARTAI, foldshe@uni-miskolc.hu
Further information:	<p>http://chpm2030.eu/</p> <p>http://cordis.europa.eu/project/rcn/199012_en.html</p> <p>Project reference: 654100</p>

FLEXIFUEL-CHX LOW EMISSION CONDENSATION RESIDENTIAL HEATING FUELLED BY SOLID BIOMASS

<p>LCE-02-2015 - Developing the next generation technologies of renewable electricity and heating/cooling</p>	<p>Development of a fuel flexible and highly efficient ultra low emission residential-scale boiler with coupled heat recuperation based on flue gas condensation</p>
<p>Project coordinator:</p>	<p>WINDHAGER ZENTRALHEIZUNG TECHNIK GMBH (DE)</p>
<p>Summary:</p> 	<p>The project aims at the development of a new fuel flexible and highly efficient residential biomass heating technology (20 - 130 kW). It is based on an innovative concept that can produce gas from wood chip and biomass pellets. This gas is then used in a low-emission burner to produce hot water.</p> <p>Moreover, a compact flue gas condensation system capable to operate with highly aggressive gases from agricultural fuel combustion is being developed to increase the efficiency of the whole system up to 110%. An advanced control system as well as measures for improved system integration shall additionally increase the annual utilisation rate up to 95%.</p>
<p>Other information:</p>	<p>The main impacts of the project will be a highly efficient and fuel flexible residential heat production at almost zero CO and OGC emissions, a reduction by 50% of the harmful NOx emissions and ultra-low particles emissions below 13 mg/MJ.</p> <p>Fuel flexibility as well as high efficiencies and therefore reduced operation costs are excellent arguments in order to increase the attractiveness of biomass based heating systems. Therefore, the biomass sector for residential heating could significantly grow over the coming years.</p>
<p>EU contribution:</p>	<p>3,514,397.50 €</p>
<p>Project start:</p>	<p>01/01/2016</p>
<p>Project end:</p>	<p>31/12/2018</p>
<p>Contact person:</p>	<p>KERSCHBAUM Michael, michael.kerschbaum@windhager.com</p>
<p>Further information:</p>	<p>http://flexifuelchx.eu/ http://cordis.europa.eu/project/rcn/199622_en.html Project reference: 654446</p>

SOLPART HIGH TEMPERATURE SOLAR-HEATED REACTORS FOR INDUSTRIAL PROCESSES

LCE-02-2015 - Developing the next generation technologies of renewable electricity and heating/cooling	High Temperature Solar-Heated Reactors for Industrial Production of Reactive Particulates
Project coordinator:	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS (FR)
<p>Summary:</p> 	<p>The main objective of the SOLPART project is to develop, at pilot scale, a high temperature (950°C) solar process suitable for particle treatment in energy intensive industries, such as the cement or lime industries. The main idea is to supply, totally or partially, the thermal energy requirement for limestone calcination by high temperature solar heat, thus reducing the life cycle environmental impacts of the process and increasing the attractiveness of renewable heating technologies in process industries.</p> <p>To this goal, the project merges three advanced technologies: high temperature solar reactor, transport of high temperature solid materials and high temperature thermal storage. The synergy between these technologies lies in using the solar-treated particles as storage medium.</p> <p>In order to demonstrate the proposed concept, the project is building a pilot scale solar reactor suitable for calcium carbonate decomposition and to simulate at prototype scale a 24h/day industrial process thereby requiring a high-temperature transport and storage system. The system will operate at 950°C and will include a 30 kWth solar reactor producing 30 kg/h CaO and a 16h hot CaO storage.</p>
Other information:	The development of a such innovative technology for continuous particle processed by concentrated solar energy at about 950°C is unique in the world. Thanks to the solar unit integration in the industrial process (potentially combined with CO ₂ capture), this will result in the considerable reduction of the carbon footprint of the CO ₂ emitter industries and open a new market for renewable energies.
EU contribution:	4,366,562.50 €
Project start:	01/01/2016
Project end:	30/06/2019
Contact person:	FLAMANT Gilles, gilles.flamant@promes.cnrs.fr
Further information:	<p>http://solpart-project.eu/</p> <p>http://cordis.europa.eu/project/rcn/199440_en.html</p> <p>Project reference: 654663</p>

ANNEX 4 - INNOVATION / DEMONSTRATION – LOW CARBON ENERGY: PROJECT FACTSHEETS

CHEAP GSHPs DRILLING/INSTALLATION FOR SHALLOW GEOTHERMAL

LCE-03-2014 - Demonstration of renewable electricity and heating/cooling technologies	Cheap And Efficient Application Of Reliable Ground Source Heat Exchangers And Pumps
Project coordinator:	Consiglio Nazionale delle Ricerche (IT)
<p>Summary:</p> 	<p>Cheap GSHPs project focuses on reduction of capital and operating costs of shallow geothermal installation for heating and cooling and on improvement of their safety during installation and operation.</p> <p>To achieve these goals Cheap-GSHPs is improving drilling & installation machines and is developing new designs of Ground Source Heat Exchangers (GSHEs), in combination with a holistic approach for optimum selection, design and implementation of complete systems across different underground and climate conditions. This is being accomplished by drastically improving an existing, innovative vertical borehole installation technologies and methodology. Additionally, Cheap-GSHPs is also developing a decision support system covering the geological aspects, feasibility and economic evaluations based on different plant set-up options, selection, design, installation, commissioning and operation of low enthalpy geothermal systems. These tools are publicly available to users. Finally, a novel heat pump for high temperatures is being developed within the project.</p>
Other information:	Cheap-GSHPs will reduce the total cost of low enthalpy geothermal systems by 20-30%, which will favour wider application of shallow geothermal systems for heating and cooling. In the new built market, this could shift at least 1% of the planned conventional heating technologies towards shallow geothermal systems. In the retrofit market of existing buildings, this will contribute to the EU ambition to achieve 3% deep retrofits of the building stock.
EU contribution:	4,844,652.00 €
Project start:	01/06/2015
Project end:	31/05/2019
Contact person:	Adriana BERNARDI, a.bernardi@isac.cnr.it
Further information:	<p>http://cheap-gshp.eu/ http://cordis.europa.eu/project/rcn/195533_en.html Twitter: @Cheapgshp, facebook: Cheap-GSHPs Project reference: 657982</p>

GEOTECH DRILLING CONCEPT FOR GEOTHERMAL

LCE-03-2014 - Demonstration of renewable electricity and heating/cooling technologies	Geothermal Technology for Economic Cooling and Heating
Project coordinator:	SOLINTEL (ES)
<p>Summary:</p> 	<p>GEOTECH is testing a different drilling concept that is based on dry auger methods that requires less capital-intensive equipment, enhances safety and avoids the environmental risks, complexity and costs of dealing with water supplies and contaminated waste, in comparison to the currently used technologies for installation of vertical borehole heat exchangers. GEOTECH is also tackling a better integration between heat exchange elements during installation by developing an innovative heat exchanger allowing achieving a better performance compared to conventional devices. In addition, the GEOTECH's approach seeks the use as effective geothermal heat exchangers of the foundation structures that are otherwise required, exclusively, for structural and geotechnical purposes in tertiary buildings.</p> <p>GEOTECH will develop optimized hybrid solutions that will integrate the different geothermal systems in small and large buildings market. The optimization of geothermal system operation will be achieved with the Energy Management System and the development of a dual source heat pump capable of making optimal use of ground and/or air environmental heat sources. The GEOTECH's geothermal heating and cooling standard will be more attractive to design professionals and construction companies.</p>
Other information:	<p>The expected impacts of GEOTECH are mainly related to lower the cost of Ground Source Heat Pumps systems:</p> <ul style="list-style-type: none"> • By developing small scale plug-and-play installations, the cost will be reduced by a 25% due to the improved borehole heat exchanger effectiveness. • By implementing foundation heat exchanger costs are expected to be 72% lower than an equivalent borehole array so that the whole GSHP system will be 33% more cost effective. • Significant energy savings and CO2 emissions reduction can be achieved, with a reduced payback compared to current state-of-the-art.
EU contribution:	7,136,662.88 €
Project start:	01/05/2015
Project end:	30/04/2019
Contact person:	Juan Manuel MIERES ROYO, jmieres@solintel.eu
Further information:	<p>www.geotech-project.eu http://cordis.europa.eu/project/rcn/195351_en.html Twitter: @GEOTECH_EU, Project reference: 656889</p>

ORC-PLUS THERMAL SOTORAGE, CSP AND ORC


LCE-03-2014 - Demonstration of renewable electricity and heating/cooling technologies	Organic Rankine Cycle - Prototype Link to Unit Storage
Project coordinator:	Agenzia Nazionale per le Nuove Tecnologie, l'Energia e lo Sviluppo Economico Sostenibile (IT)
<p>Summary:</p> 	<p>ORC-PLUS focuses on increasing the technological performance of renewable energy systems, reducing costs and improving dispatchability. The project is developing an optimized combination of innovative Thermal Energy Storage- TES (specialized for Concentrated Solar Power-CSP scale 1-5 MWe) and engineering solutions to improve the number of production hours of an existing small concentrated solar power (CSP) plant, located in a desert area and coupled with an Organic Rankine Cycle-ORC system.</p> <p>The technology proposed is based on a solar field, using a thermal oil as Heat Transfer Fluid and an ORC power unit coupled with an innovative TES. The experimental demonstration of two different industrial prototypes of TES systems is being performed in a relevant environment. For each prototype, a simulation model of the pilot processes is being developed, with prototypes of TES systems. With an optimized TES solution, it is possible to extend periods of energy production of a CSP plant (also during non-solar radiation), eliminating or minimizing the need to burn fossil or renewable fuels in hybrid or back-up systems.</p>
Other information:	<p>The final result is an industrial pilot plant used to validate the technology in a real operational environment and to demonstrate its feasibility.</p> <p>By means of the main results of ORC-PLUS the levelized cost of electricity will be decreased between 30 and 40%, and the life-cycle environmental impact will be reduced using mineral oils (almost no relevant polluting effect on the soil) and dry cooled ORC system (zero water consumption for cooling).</p>
EU contribution:	6,339,316.00 €
Project start:	01/05/2015
Project end:	30/04/2019
Contact person:	Walter GAGGIOLI, walter.gaggioli@enea.it
Further information:	<p>http://www.orc-plus.eu, http://cordis.europa.eu/project/rcn/195491_es.html LinkedIn: https://www.linkedin.com/groups/8419883/profile Project reference: 657690</p>

ANNEX 5 – SMART CITIES AND COMMUNITIES: PROJECT FACTSHEETS


GROWSMARTER DEMONSTRATION OF INTEGRATED SMART SOLUTIONS

H2020: SCC-01-2014 - Smart Cities and Communities solutions integrating energy, transport, ICT sectors through lighthouse	GrowSmarter
Project coordinator:	STOCKHOLMS STAD (SE)
<p>Summary:</p> 	<p>The project brings together the cities of Barcelona, Cologne and Stockholm. GrowSmarter will demonstrate 12 smart, integrated solutions as a way of preparing for a wider market rollout. These solutions are integrated in specially chosen sites making demonstration easy to reach and take part of for the 5 follower cities and other European and international study groups. All the smart solutions are fit into the Lighthouse-cities strategic development plans and the follower cities replication plans.</p> <p>The solutions solve common urban challenges such as:</p> <ul style="list-style-type: none"> • Renewal of existing buildings by demonstrating the cost efficient refurbishment of 100.000 square meters of Nearly Zero or low energy districts reducing energy demand by 70-90%. • Integrated infrastructures for ICT, street lighting, smart grids district heating and smarter waste handling • Sustainable urban mobility for both passenger and goods integrated in smart grids, biofuels from household waste thus reducing local air quality emissions by 60%.
Other information:	The consortium includes industrial and research partners that will convert the solutions adopted into Smart Cities Business case to be replicated in other EU cities.
EU contribution:	24,820,974.38 €
Project start:	01/01/2015
Project end:	31/12/2019
Contact person:	Gustaf LANDAHL, gustaf.landahl@stockholm.se
Further information:	<p>http://www.grow-smarter.eu</p> <p>http://cordis.europa.eu/project/rcn/194441_en.html</p> <p>Twitter: @EUGrowSmarter, YouTube https://goo.gl/idaXdc</p> <p>Project reference: 646456</p>


TRIANGULUM INTEGRATED INFRASTRUCTURES AND SUSTAINABLE MOBILITY

<p>H2020: SCC-01-2014 - Smart Cities and Communities solutions integrating energy, transport, ICT sectors through lighthouse</p>	<p>The Three Point Project / Demonstrate. Disseminate. Replicate.</p>
<p>Project coordinator:</p>	<p>FRAUNHOFER GESELLSCHAFT ZUR FORDERUNG DER ANGEWANDTEN FORSCHUNG EV (DE)</p>
<p>Summary:</p> 	<p>The cities of Manchester, Stavanger and Eindhoven (complemented by follower cities Prague, Leipzig and Sabadell) are deploying smart city solutions which integrate energy, mobility and information & communication technologies in city districts. The synergic demonstration of activities will reduce energy use and carbon emissions; enhance quality of life and stimulate economic development.</p> <p>The project will demonstrate that this model, integrating existing technologies in the field of energy, transport and ICT, can be replicated throughout Europe. The action selected a district in each of the three cities, which integrate different solutions, for example local renewable power generation and energy storage, such as biomass, geothermal pumps or storage batteries integrated in the electricity grid; use electric mobility, such as e-cars, or e-bikes; as well as refurbish over 100,000m² of housing to use less energy, reduce carbon emissions, and improve air quality in cities.</p>
<p>Other information:</p>	<p>The suite of project developed will be based around zero/low energy districts, integrated infrastructures and sustainable urban mobility designed to deliver a range of cross-cutting outcomes across different sectors and stakeholders. This will provide the basis to 'road test' the European Commission's SCC Strategic Implementation Plan (SIP) and provide recommendations to the Commission on how it could be improved to facilitate wider replication.</p>
<p>EU contribution:</p>	<p>25,420,602.30 €</p>
<p>Project start:</p>	<p>01/02/2015</p>
<p>Project end:</p>	<p>31/01/2020</p>
<p>Contact person:</p>	<p>Damian WAGNER, damian.wagner@iao.fraunhofer.de</p>
<p>Further information:</p>	<p>http://www.triangulum-project.eu/ http://cordis.europa.eu/project/rcn/194459_en.html Twitter: @Triangulum_EU Project reference: 646578</p>


REMOURBAN SUSTAINABLE URBAN REGENERATION

<p>H2020: SCC-01-2014 - Smart Cities and Communities solutions integrating energy, transport, ICT sectors through lighthouse</p>	<p>REgeneration MOdel for accelerating the smart URBAN transformation</p>
<p>Project coordinator:</p>	<p>FUNDACION CARTIF, UK</p>
<p>Summary:</p> 	<p>In the lighthouse cities Valladolid (ES), Nottingham (UK) and Tepebasi (TR) more than 190 electric vehicles, coupled with recharging points, will be introduced and more than 1000 flats retrofitted, increasing their energy efficiency. Photovoltaic and biomass energy production will produce clean energy and reduce dependency on the electricity grid. An ICT city platform will provide information from all of these to public authorities and citizens allowing a real-time monitoring, such as vehicle locations and energy consumption monitoring, facilitating users' decisions and encouraging changes in their behaviour.</p>
<p>Other information:</p>	<p>REMOURBAN aims at the development of a sustainable urban regeneration model that leverages the convergence area of the energy, mobility and ICT sectors in order to increase resource and energy efficiency, improve the sustainability of urban transport and reduce greenhouse gas emissions in urban areas.</p>
<p>EU contribution:</p>	<p>21,541,949.13 €</p>
<p>Project start:</p>	<p>01/01/2015</p>
<p>Project end:</p>	<p>31/12/2019</p>
<p>Contact person:</p>	<p>Miguel Ángel GARCÍA FUENTES, miggar@cartif.es</p>
<p>Further information:</p>	<p>http://www.remourban.eu/ http://cordis.europa.eu/project/rcn/194449_en.html Twitter: @Remourban_EU, Youtube http://goo.gl/9uhm52 Project reference: 646511</p>


CELSIUS SMART DHC DEMONSTRATORS

<p>FP7-ENERGY-SMART CITIES-2012 Large Scale systems for urban area heating/cooling</p>	<p>Combined Efficient large Scale integrated Urban Systems</p>
<p>Project coordinator:</p>	<p>GOTHENBURG CITY, Sweden</p>
<p>Summary:</p> 	<p>The CELSIUS project illustrates how cities can save energy and create a more self-sustaining energy economy through the deployment of smart district heating and cooling (DHC) systems.</p> <p>CELSIUS demonstrates 10 ground-breaking applications for district heating in 5 cities, Cologne, Genoa, London, Gothenburg and Rotterdam: such as the world first's connection of a passenger ship in regular service to a heating grid, district heating driven washers and driers, innovative technologies for recovering and reusing waste heat from sewage water or from the London underground ventilation system.</p> <p>Besides building up and demonstrating innovative technologies, CELSIUS also monitors 20 existing demonstrators and addresses social issues and interests.</p> <p>The project promotes the roll-out of Smart DHC in Europe. CELSIUS is committed to present the best practices and to demonstrate cost-effective and energy efficient district energy systems in 50 cities, offering practical support for replication and further deployment of efficient DHC systems.</p>
<p>Other information:</p>	<p>With successful replication in 50 CELSIUS cities the use of primary energy is expected to fall by 100 TWh annually and the CO₂ emissions by 20 M ton across Europe. The Celsius project has summarised its expertise and experience in a toolbox, already available to all member cities. As a wiki platform, the toolbox follows the structure of Wikipedia. It is divided in categories by topics, which can be easily browsed, and it also has a demonstrator page for inspiration.</p>
<p>EU contribution:</p>	<p>14 074 931 EUR</p>
<p>Project start:</p>	<p>01/04/2013</p>
<p>Project end:</p>	<p>31/03/2017</p>
<p>Contact person:</p>	<p>Ms Katrina FOLLAND, Gothenburg city, katrina.folland@stadshuset.goteborg.se</p>
<p>Further information:</p>	<p>http://celsiuscity.eu http://cordis.europa.eu/project/rcn/186979_en.html CITYFIED and CELSIUS join forces to extend tools for a smarter, more energy efficient future to European cities</p> <p>Twitter: @celsiuscity YouTube https://goo.gl/eH5KiB Project reference : 314441</p>


READY SMART CITY DEMONSTRATOR

<p>FP7-ENERGY-SMART CITIES-2013 Demonstration of optimised energy systems for high performance energy districts</p>	<p>Resource Efficient cities implementing ADvanced smart city solutions</p>
<p>Project coordinator:</p>	<p>COWI, Denmark</p>
<p>Summary:</p> 	<p>Based on thorough integrated climate planning the READY project will demonstrate a Whole City Approach including:</p> <ol style="list-style-type: none"> 1) Demo of a balanced and holistic approach towards affordable retrofitting of residential buildings and offices 2) Development and demo of new solutions for low-temperature district heating, components and management ICT systems 3) Development and demo of flexible combined grid balancing /energy storage solutions for buildings and RES systems including combined heat pumps for heating and cooling, electrical vehicles charging, new PVT systems and 2nd life reuse of EV batteries in buildings 4) Resource and energy smart solutions for kitchens 5) Solutions for water efficiency and waste water energy recovery 6) Demo of new innovative industrial equipment for use of RES and integration of demand and supply, - based on business plans, and follow-up by promotion and dissemination activities. <p>The concept of the project will be demonstrated in 2 cities: Aarhus (Denmark) and Växjö (Sweden). The follower city is Kaunas (Lithuania).</p>
<p>Other information:</p>	<p>The above measures will demonstrate how the demand of energy and particularly the needs for fossil fuels and release of CO2 can be considerably reduced to nearly zero, and show a sustainable way to go for other European cities.</p>
<p>EU contribution:</p>	<p>19 213 448 EUR</p>
<p>Project start:</p>	<p>01/12/2014</p>
<p>Project end:</p>	<p>30/11/2019</p>
<p>Contact person:</p>	<p>Mr Reto Michael Hummelshøj, COWI, RMH@cowi.com</p>
<p>Further information:</p>	<p>http://www.smartcity-ready.eu/ http://cordis.europa.eu/project/rcn/197826_en.html Project reference : 609127</p>


REPLICATE SMART CITY TECHNOLOGIES IN ENERGY, TRANSPORT AND ICT

<p>H2020: SCC-01-2015 - Smart Cities and Communities solutions integrating energy, transport, ICT sectors through lighthouse</p>	<p>REnaissance of Places with Innovative Citizenship and TEchnolgy</p>
<p>Project coordinator:</p>	<p>AYUNTAMIENTO DE DONOSTIA SAN SEBASTIAN (ES)</p>
<p>Summary:</p> 	<p>The cities of San Sebastian, Bristol and Florence are deploying smart city solutions which integrate energy, mobility and information & communication technologies in city districts. Their objectives are to address urban complexities, specific to these cities, and to develop a model which will be replicated in other cities throughout Europe after the project. The synergic demonstration of activities will reduce energy use and carbon emissions, improve the air quality in cities a; enhance quality of life and stimulate economic development.</p> <p>The action selected a district in each of the three cities, which integrate different solutions and activities, and also generates replication plans in other districts and in follower cities of Essen, Nilufer and Lausanne.</p> <p>In particular they will demonstrate the use of local renewable power generation and energy storage, the use of 'intelligent lighting', able to adjust automatically the amount of light needed; the retrofitting of 'intelligent buildings' which use the latest domotic solutions able to decrease energy consumption, and integrated with the electricity grid; use electric mobility, such as e-cars, or e-bikes, but also solutions for deliveries; last, but not least, they will put the people at the heart of their project. They will analyse the complexities of the cities, and propose solutions to get tangible benefits for the citizens. All the proposed solutions will be supported by the latest ICT technologies and platform, accessible to all the citizens.</p>
<p>Other information:</p>	<p>Main challenges for cities are to increase the overall energy efficiency, to exploit better local resources in terms of energy supply and demand side measures. The 3 pillars implemented in the pilots with the engagement of citizens, private actors and authorities are: Low energy districts, Integrated Infrastructure and Urban mobility.</p>
<p>EU contribution:</p>	<p>24,965,263.09 €</p>
<p>Project start:</p>	<p>01/02/2016</p>
<p>Project end:</p>	<p>31/01/2020</p>
<p>Contact person:</p>	<p>Elisabeth JORGE, Elisabeth_Jorge@donostia.eus</p>
<p>Further information:</p>	<p>http://replicate-project.eu http://cordis.europa.eu/project/rcn/200256_en.html Project reference: 691735</p>


SMARTER TOGETHER SMART TECHNOLOGIES AND GOVERNANCE DIMENSIONS

<p>H2020: SCC-01-2015 - Smart Cities and Communities solutions integrating energy, transport, ICT sectors through lighthouse</p>	<p>Smart and Inclusive Solutions for a Better Life in Urban Districts</p>
<p>Project coordinator:</p>	<p>LYON CONFLUENCE (FR)</p>
<p>Summary:</p> 	<p>SMARTER TOGETHER's overarching vision is to find the right balance between smart technologies and organizational governance dimensions in order to deliver smart and inclusive solutions and to improve citizen's quality of life.</p> <p>The project gathers the European Lighthouse cities Lyon, Munich, Vienna, the Follower cities Santiago de Compostela, Sofia, Venice and Kyiv and Yokohama as observer cities bringing the perspective of East Europe and Asia.</p> <p>SMARTER TOGETHER delivers 5 clusters of co-created, smart and integrated solutions: Living labs for citizen, engagement, district heating and RES for low energy districts, Holistic refurbishment for low energy districts addressing public and private housing, Smart Data management platform and smart services, and E-mobility solutions for sustainable mobility.</p>
<p>Other information:</p>	<p>Large-scale replication of the results of the project will be prepared in the lighthouse cities, the Follower cities, which already selected their target area and a group of 15-20 cities ensuring a broad geographical and climate coverage.</p> <p>Commercial exploitation will be enhanced by the development of new business models for widespread use by the stakeholders.</p>
<p>EU contribution:</p>	<p>24,742,978.64 €</p>
<p>Project start:</p>	<p>01/02/2016</p>
<p>Project end:</p>	<p>31/01/2020</p>
<p>Contact person:</p>	<p>Maxime VALENTIN, mvalentin@lyon-confluence.fr</p>
<p>Further information:</p>	<p>http://cordis.europa.eu/project/rcn/199963_en.html</p> <p>http://smarter-together.eu/</p> <p>Project reference: 691876</p>

SMARTENCITY INTEGRATED PLANNING AND IMPLEMENTATION

<p>H2020: SCC-01-2015 - Smart Cities and Communities solutions integrating energy, transport, ICT sectors through lighthouse</p>	<p>Towards Smart Zero CO2 Cities across Europe</p>
<p>Project coordinator:</p>	<p>FUNDACION TECNALIA RESEARCH & INNOVATION (ES)</p>
<p>Summary:</p> 	<p>SmartEnCity's is testing smart solutions in the areas of energy, transport and ICT, demonstrating that their synergic use foster a sustainable, smart and resource-efficient urban environments in cities. The project integrated a planning and implementation of measures aimed at improving energy efficiency in several consuming sectors in cities, while increasing their supply of renewable energy. In addition, the project is developing a highly adaptable and replicable systemic approach towards urban transformation, which can be adapted in all the European cities.</p> <p>The underlying concept of the proposal is the Smart Zero Carbon City concept, where city carbon footprint and energy demand are kept to a minimum through the use of advanced ICT technologies that save energy and promote raised awareness; energy supply is entirely renewable and clean; and local energy resources are intelligently managed by aware citizens, as well as coordinated public and private stakeholders.</p> <p>This approach will be implemented in the three selected cities Vitoria- Gasteiz in Spain, Tartu in Estonia and Sonderborg in Denmark. The three cities will develop a number of coordinated actions aimed at reducing energy demand of the existing residential building stock through cost-effective low energy retrofitting actions at district scale, increase the share of renewable energies and deploy clean mobility solutions.</p>
<p>Other information:</p>	<p>The three cities will develop a number of coordinated actions aiming at:</p> <ul style="list-style-type: none"> • significant demand reduction of the existing residential building stock through cost-effective low energy retrofitting actions at district scale. • increase in RES share of energy supply, through extensive leveraging of local potentials. • enhance the use of clean energy in urban mobility, both for citizens and goods, by means of extensive deployment of green vehicles and infrastructure.
<p>EU contribution:</p>	<p>27,890,138.75 €</p>
<p>Project start:</p>	<p>01/02/2016</p>
<p>Project end:</p>	<p>30/06/2020</p>
<p>Contact person:</p>	<p>Francisco RODRIGUEZ, francisco.rodriguez@tecnalia.com</p>
<p>Further information:</p>	<p>http://cordis.europa.eu/project/rcn/200259_en.html http://smartencity.eu/ Project reference: 691883</p>

SHAR-LLM AGILE AND COLLABORATIVE SMART CITY MARKET

<p>H2020: SCC-01-2015 - Smart Cities and Communities solutions integrating energy, transport, ICT sectors through lighthouse</p>	<p>Sharing Cities</p>
<p>Project coordinator:</p>	<p>GREATER LONDON AUTHORITY (UK)</p>
<p>Summary:</p> 	<p>The project will allow the cities of London, Lisbon and Milano to develop and implement 10 goals that will turn them into Smart Cities and help roll out the concept all over Europe. Sharing Cities has four key objectives:</p> <ol style="list-style-type: none"> 1. To achieve scale in the European smart cities market by proving that properly designed smart city solutions can be integrated in complex urban environments. This will be done in a way that exhibits their true potential and allows for the significant scale-up and consequent increase in social, economic and environmental value. 2. Adopt a digital first approach which proves the extent to which ICT integration can improve and connect up existing infrastructure, as well as the design and running of new city infrastructure. This will also allow for the creation of a new set of next stage digital services which will help citizens make better and beneficial choices around energy efficiency and mobility. 3. Accelerate the market to understand, develop and trial business, investment and governance models, essential for the true aggregation and replication of smart city solutions in cities. 4. Share and collaborate for society in order to respond to increasing demand for participation, to enhance mechanisms for citizens' engagement and to improve local governments' capacity for policy making and service delivery through collaboration and co-design. This will result in outcomes that are better for citizens, businesses and visitors.
<p>Other information:</p>	<p>The project aims to engage 100 cities, trigger €500 million investment funds, and bring 100 new jobs in each of the three districts. It intends to move city data to the next stage and make real inroads into proving and sharing its utility; sharing replicable, innovate solutions to the benefit of citizen, government and the market alike.</p>
<p>EU contribution:</p>	<p>24,753,944.98 €</p>
<p>Project start:</p>	<p>01/01/2016</p>
<p>Project end:</p>	<p>31/12/2020</p>
<p>Contact person:</p>	<p>Nathan PIERCE, Nathan.Pierce@london.gov.uk</p>
<p>Further information:</p>	<p>http://cordis.europa.eu/project/rcn/200153_en.html http://www.sharingcities.eu/ Project reference: 691895</p>

ANNEX 6- MARKET UPTAKE – ENERGY EFFICIENCY AND LOW CARBON ENERGY: PROJECT FACTSHEETS

LABELPACKPLUS ENERGY LABELLING

<p>H2020: EE-14-2014 - Removing market barriers to the uptake of efficient heating and cooling solutions</p>	<p>Promotion and support to the implementation of the energy labelling for Space, Combi Heaters and Water Heaters with a focus on the “Package label”</p>
<p>Project coordinator:</p>	<p>ESTIF (EU)</p>
<p>Summary:</p> 	<p>The project is supporting the practical implementation of the energy labelling directive affecting heating appliances, in particular labelling of package systems in combination with solar thermal systems.</p> <p>Partners include EU and national solar thermal associations, one energy agency and one consumer association</p>
<p>Other information:</p>	<p>Six national pilot projects and National Stakeholder Platforms will be set-up in AT, DE, FR, IT, PT and UK, covering around 50% of the EU solar thermal market The national pilot projects will include the provision of information, training materials, the execution of trainings etc. These activities shall be bundled as a so called National Pilot Projects.</p> <p>The work completed by the consortium partners will be complemented with National Stakeholders’ Platform (NSP). In each of the National Pilot Project countries a platform gathering all relevant stakeholders will be constituted, with a participative free membership. This platform will allow identifying, gathering and addressing in a targeted efficient manner all the relevant organizations involved in the implementation of the energy labelling of packages.</p>
<p>EU contribution:</p>	<p>EUR 1.385.798</p>
<p>Project start:</p>	<p>March 2015</p>
<p>Project end:</p>	<p>March 2018</p>
<p>Contact person:</p>	<p>Pedro Dias, Pedro.Dias@estif.org</p>
<p>Further information:</p>	<p>http://cordis.europa.eu/project/rcn/194633_en.html http://www.label-pack-a-plus.eu/ Project reference: 649905,</p>


PROGRESsHEAT HEATING AND COOLING PLANNING

<p>H2020: LCE-04-2014 - Market uptake of existing and emerging renewable electricity, heating and cooling technologies</p>	<p>Supporting the progress of renewable energies for heating and cooling in the EU on a local level</p>
<p>Project coordinator:</p>	<p>Technische Universität Wien (AT)</p>
<p>Summary:</p> 	<p>progRESsHEAT will assist local, regional, national and EU policy makers in six target countries across Europe (Austria, Germany, Czech Republic, Denmark, Portugal, Romania) in developing and implementing integrated, effective and efficient policy strategies achieving a fast and strong penetration of RES and EE in heating and cooling.</p> <p>The activities include the analysis of cross-sectorial effects between RES and EE measures in industry, buildings and DHC as well as the link to the electricity system. Together with the authorities heating and cooling strategies will be developed through a deep analysis of their specific situation including barriers & drivers and a model based assessment of policy intervention in scenarios up to 2050.</p> <p>A key part of the project is the communication and capacity building process with policy makers, administrative staff and other stakeholders at the local, regional and national level including the setup of policy group meetings, expert consultations, experience sharing and capacity building workshops as well as webinars.</p>
<p>Other information:</p>	<p>Heating and cooling strategies will be developed through a thorough analysis of (1) heating and cooling demand and future developments, (2) long-term potential of renewable energies and waste heat in the regions, (3) barriers & drivers and (4) a model-based assessment of policy intervention in scenarios up to 2050.</p>
<p>EU contribution:</p>	<p>1,728,305.00 €</p>
<p>Project start:</p>	<p>01/03/2015</p>
<p>Project end:</p>	<p>31/10/2017</p>
<p>Contact person:</p>	<p>Marcus HUMMEL, hummel@eeg.tuwien.ac.at</p>
<p>Further information:</p>	<p>http://www.progressheat.eu/</p> <p>http://cordis.europa.eu/project/rcn/194458_en.html</p> <p>Project reference: 646573</p>


COOLHEATING MODULAR DISTRICT HEATING GRIDS

<p>H2020: LCE-04-2015 - Market uptake of existing and emerging renewable electricity, heating and cooling technologies</p>	<p>Market uptake of small modular renewable district heating and cooling grids for communities</p>
<p>Project coordinator:</p>	<p>WIRTSCHAFT UND INFRASTRUKTUR GMBH & CO PLANUNGS KG (DE)</p>
<p>Summary:</p> 	<p>The objective of CoolHeating is to support the implementation of small modular renewable district heating and cooling grids for communities in South-Eastern Europe</p> <p>The objective of the project is achieved through knowledge transfer and mutual activities of partners in countries where renewable district heating and cooling examples exist (Austria, Denmark, Germany) and in countries which have less development (Croatia, Slovenia, Macedonia, Serbia, Bosnia-Herzegovina).</p> <p>Besides techno-economical assessments, core activities of the CoolHeating project include measures to stimulate the interest of communities and citizens to set-up renewable district heating and cooling systems as well as the capacity building about financing and business models. The outcome will be the initiation of new renewable heating and cooling grids in the target countries.</p>
<p>Other information:</p>	<p>CoolHeating expects to mobilize about 98 GWh heat or cooling per year in the 5 target communities. This would create about 100 direct and 100 indirect jobs and stimulate 44 M€ investments.</p>
<p>EU contribution:</p>	<p>1,644,340.00 €</p>
<p>Project start:</p>	<p>01/01/2016</p>
<p>Project end:</p>	<p>31/12/2018</p>
<p>Contact person:</p>	<p>Dominik RUTZ, dominik.rutz@wip-munich.de</p>
<p>Further information:</p>	<p>http://www.coolheating.eu</p> <p>http://cordis.europa.eu/project/rcn/200840_en.html</p> <p>Project reference: 691679</p>


BIOENERGY4BUSINESS HEAT FROM BIOMASS

LCE-14-2014 - Market uptake of existing and emerging sustainable bioenergy	Uptake of Solid Bioenergy in European Commercial Sectors (Industry, Trade, Agricultural and Service Sectors) – Bioenergy for Business
Project coordinator:	Austrian Energy Agency (AT)
<p>Summary:</p> 	<p>The goal of this project is to support and promote the (partial) substitution of fossil fuels (coal, oil, gas) used for heating, by available bioenergy sources (industrial wastes, forest biomass, straw and other agricultural biomass) in industrial heating plants (private or district heating).</p> <p>This objective will be achieved by means of information about market potentials, capacity building/training, decision-support tools and communication activities targeted at relevant stakeholder, tools to support the careful assessment, planning and implementation of such projects, and dissemination of “best-practice” business models.</p> <p>Target groups are, on the one hand, owners and operators of industrial heating plants (for private or district heating). On the other hand, actors who play an important role with regard to the value chain and to framework conditions crucial for the use of bioenergy heat will also be involved.</p>
Other information:	The project partners include a combination of energy agencies, national biomass associations and research-oriented partners with specialized knowledge on biomass from Northern, Southern, Central and Eastern Europe (Finland, Denmark, the Netherlands, European Biomass Association (AEBIOM), Germany, Austria, Slovakia, Croatia, Greece, Poland, Romania, Bulgaria and Ukraine).
EU contribution:	EUR 1,540,713.75
Project start:	January 2015
Project end:	September 2017
Contact person:	Mr Herbert Tretter, herbert.tretter@energyagency.at
Further information:	<p>http://www.bioenergy4business.eu/</p> <p>http://cordis.europa.eu/project/rcn/194448_en.html</p> <p>@Bioenergy4B</p> <p>Project reference: 646495</p>

SUPERSMART ENERGY LABELLING IN SUPERMARKETS

<p>H2020: EE-14-2015 - Removing market barriers to the uptake of efficient heating and cooling solutions</p>	<p>Expertise hub for a market uptake of energy-efficient supermarkets by awareness raising, knowledge transfer and pre-preparation of an EU Ecolabel</p>
<p>Project coordinator:</p>	<p>SINTEF ENERGI AS (NO)</p>
<p>Summary:</p> 	<p>SuperSmart tackles different barrier categories, both short-term (awareness and knowledge) and long-term (organizational, political, social) affecting the uptake of energy efficiency and renewable in the supermarket sector.</p> <p>The purpose of the SuperSmart hub is to establish a knowledge transfer and a promotion platform targeting the supermarket sector to educate/train and crosslink stakeholders of various backgrounds to promote the uptake of energy-efficient heating and cooling solutions.</p>
<p>Other information:</p>	<p>Some of the project objectives include:</p> <ul style="list-style-type: none"> • reduce environmental impact of supermarkets and bring economic advantages to the supermarket sector by lowering the energy demand • supporting the introduction of a new European Ecolabel for supermarkets • sketching, systematizing and reporting the main technical and non-technical challenges to the eco-energy supermarkets in liaison with owners/chains, manufacturers, installers and technical experts in different regions of Europe • capacity building among both the non-technical staff (management, shop owners, consultants, etc.) and technical staff (design engineers, construction engineers, consultants, operation & maintenance engineers, servicemen, etc.)
<p>EU contribution:</p>	<p>EUR 1.467.907</p>
<p>Project start:</p>	<p>Feb 2016</p>
<p>Project end:</p>	<p>Jan 2019</p>
<p>Contact person:</p>	<p>Armin Hafner, Armin.Hafner@sintef.no</p>
<p>Further information:</p>	<p>http://www.supersmart-supermarket.info/</p> <p>http://cordis.europa.eu/project/rcn/200072_en.html</p> <p>Project reference: 696076</p>

HRE HEATING AND COOLING PLANNING

<p>H2020: EE-14-2015 - Removing market barriers to the uptake of efficient heating and cooling solutions</p>	<p>Heat Roadmap Europe (HRE): Building the knowledge, skills, and capacity required to enable new policies and encourage new investments in the heating and cooling sector</p>
<p>Project coordinator:</p>	<p>Aalborg University (DK)</p>
<p>Summary:</p> 	<p>The overall objective of the project is to provide new capacity and skills for lead-users in the heating and cooling sector, including policymakers, industry, and researchers at local, national, and EU level, by developing the data, tools, methodologies, and results necessary to quantify the impact of implementing more energy efficiency measures on both the demand and supply side of the sector.</p> <p>Building on the results of former studies (including the IEE supported STRATEGO project) this project will refine an already existing pan European thermal atlas and will among other things include the industrial sector in the calculations. In addition the project foresees to undertake comprehensive study of the heating and cooling sectors in the 14 largest EU countries.</p> <p>HRE4 plans to cover the 14 countries in the EU ranked largest by heat demand covering around 85-90% of the heating and cooling demands in Europe BE, CZ, DE, ES, FR, IT, HU, NL, AT, PL, RO, FI, Sweden SE and UK.</p>
<p>Other information:</p>	<p>The project is expected to develop the following:</p> <ul style="list-style-type: none"> • high resolution thermal maps of 14 EU countries. • energy models and scenarios looking towards 2050 of 14 EU countries. • business strategies identifying current barriers and proposing solutions looking forward. • local and a European Heat Roadmap to help countries identify next steps and optimal solutions to decarbonise the heating sector
<p>EU contribution:</p>	<p>EUR 2.113.482</p>
<p>Project start:</p>	<p>March 2016</p>
<p>Project end:</p>	<p>Feb 2019</p>
<p>Contact person:</p>	<p>David Connolly, david@plan.aau.dk</p>
<p>Further information:</p>	<p>http://www.heatroadmap.eu/</p> <p>http://cordis.europa.eu/project/rcn/200265_en.html</p> <p>Twitter: @HeatRoadmapEU</p> <p>Project reference: 695989</p>


STRATEGO HEATING AND COOLING PLANNING

IEE Call 2013, RES H/C	Multi-level actions for enhanced heating & cooling plans
Project coordinator:	Euroheat and Power (EHP), EU
<p>Summary:</p> 	<p>The STRATEGO project aims at supporting national authorities in the preparation of National Heating and Cooling Plans (NHCP). For this, the consortium will use the results of the studies Heat Roadmap Europe under which an assessment of the European potential for efficiency in heating and cooling has been carried out together with the mapping of thermal resources and demands. At the EU level, the project will fine tune the results of the Heat Roadmap studies so that they can also inform the development of national heating and cooling plans. For this purpose a thermal atlas of the EU28 including demand and supply sources for heating and cooling has been produced and is already available.</p> <p>At national level, an in-depth assessment of the potential of efficient heating and cooling will be undertaken for 5 countries (CZ, HR, IT, RO and UK). Moreover, national advisory groups will be set-up in a total of 8 countries (CZ, HR, IT, RO, UK, BE, AT, DE). In these 8 countries, the project will also support 23 cities/regions to map their local heating and cooling demand and supply and to define areas of priority for intervention. Moreover a coaching scheme will be established between 23 learning regions/cities and 8 experienced regions/cities.</p>
Other information:	<p>Participant countries, regions and cities include:</p> <ul style="list-style-type: none"> • AT: City of Vienna and its surrounding, Oberösterreich • BE: City of Antwerp, City of Kortrijk, City of Brussels Capital Region • CZ: Moravian-Silesian region • DE: Erfurt • HR: City of Velika Gorica, City of Osijek, City of Zagreb, City of Topusko, Karlovac county • IT: Lombardy Region • RO: City of Alba Iulia, City of Tulcea • UK: Aberdeen, Dundee, Edinburgh, Glasgow, Inverness, Perth and Stirling
EU contribution:	EUR 1,519,062
Project start:	April 2014
Project end:	December 2016
Contact person:	Alessandro Provaggi, ap@euroheat.org
Further information:	<p>http://ec.europa.eu/energy/intelligent/projects/en/projects/stratego www.stratego-project.eu Project reference: IEE/13/650 Twitter: @STRATEGOpject</p>

RES H/C SPREAD HEATING AND COOLING PLANNING

IEE Call 2013, RES H/C	RES Heating and Cooling - Strategic Actions Development
Project coordinator:	Institute for Studies of the Integration of Systems (IT)
<p>Summary: (project closed)</p> 	<p>The project aims at developing six regional pilot plans using a high share of heating and cooling with renewable energy sources. The project involves six pilot regions representing the EU main climatic zones, with a prevalence of the Mediterranean conditions.</p> <p>The planning exercise aims at setting harmonized and standard baselines to better allow the developers to set their targets and policies. In each Region, Country Governance Committees will be constituted to support implementation of the plans and to help reach a consensus on the proposed policies among the Regional Authorities, key stakeholders and citizens representatives.</p> <p>The plans will then be developed in accordance with the regional demand for heating and cooling and will facilitate the utilization of locally available residual and waste sources of heat, cooling and RES through the use of district heating & cooling networks in areas of sufficient heat and cooling demand.</p>
Other information and sample of outputs:	<p>The 6 pilot regions and counties are Region of Castilla y Leon (ES), Region of Emilia Romagna (IT) , Region of Riga (LV), Region of Rodophe (BG), Region of Western Macedonia (EL) and Region of Salzburg (AT)</p> <p>Thye 6 regional plans developed and the methodology and handbook on cost-benefit analysis can be found in http://www.res-hc-spread.eu/en_GB/resources/reports/</p>
EU contribution:	EUR 928,661
Project start:	April 2014
Project end:	October 2016 (closed)
Contact person:	Stefano Faberi, sfaberi@isis-it.com
Further information:	<p>www.res-hc-spread.eu http://ec.europa.eu/energy/intelligent/projects/en/projects/resh-cspread Project reference: IEE/13/599</p>


SMARTREFLEX PLANNING AND IMPLEMENTATION OF RES DHC

IEE Call 2013, RES H/C	Smart and Flexible 100 % Renewable District Heating and Cooling Systems for European Cities
Project coordinator:	Ambiente Italia (IT)
<p>Summary:</p> 	<p>The SmartReFlex project aims at increasing the use of smart and flexible district heating and cooling (DHC) systems, based on high shares of renewable energy sources (RES), in European cities.</p> <p>Know-how transfer from the Danish experience into the project activities is central to this project. A total of 6 regions in 4 countries (DE, IE, IT, ES) will develop and implement legislative and organisational measures for promoting high-RES DHC including:</p> <ul style="list-style-type: none"> • improvement in regional legislation, in support of high-RES DHC; • integration of high-RES DHC in heat planning at regional and local level; • creation of cooperatively-owned companies for managing high-RES DHC systems; • study, planning and supporting new high-RES DHC projects locally <p>In order to facilitate the adoption of the measures proposed and the implementation of projects a regional task force on high-RES DHC will be set up in each of the participating regions. Moreover, a number of capacity building activities will be carried out, aiming at involving the key stakeholders in the regions and also at national level.</p>
Other information:	<p>The participant countries and regions are:</p> <ul style="list-style-type: none"> • DE: State of Schleswig-Holstein, State of Baden-Wurttemberg • IT: Region of Emilia Romagna • ES: Region of Catalonia • IE: County of Kerry, County of Tipperary
EU contribution:	EUR 1.065.820
Project start:	March 2014
Project end:	March 2017
Contact person:	Riccardo battisti, riccardo.battisti@ambienteitalia.it
Further information:	<p>http://www.smartreflex.eu/ http://ec.europa.eu/energy/intelligent/projects/en/projects/smartreflex Project reference: IEE/13/434</p>

FRONT SUPPORT SCHEMES AND END USER SUPPORT ON RES H/C

IEE Call 2013, RES H/C	Fair RHC Options & Trade
Project coordinator:	ESTIF (EU)
<p>Summary</p> 	<p>The project aims at promoting a level playing field for Renewable Heating and Cooling (RHC) in Europe and to develop strategies for RHC deployment in Europe.</p> <p>An improved understanding of the costs of RHC vs fossil fuel use, as well as analyses of existing support schemes and end user decision factors will help establish strategic policy priorities for RES-H&C. This will also help to establish a framework for more efficient and effective support schemes and to facilitate a clear and transparent communication with European consumers.</p> <p>Led by a consortium gathering representatives from industry and national energy agencies, the project activities will involve stakeholders from industry and public authorities from several EU Member States. This will be done through the setting-up and running of national consultation platforms in the participant countries. The participant countries include AT, ES, NL, PL, PT and UK.</p>
Other information	<p>Some of the project expected results include:</p> <ul style="list-style-type: none"> • to identify and propose strategic policy priorities aimed at exploring the potential of RHC in Europe until 2020 • to facilitate the setting-up of improved and sustainable RHC integrated support schemes, stressing the value of the energy provided. This is done by means of a structured dialogue between the RHC industry, energy agencies and other experts • to support a better insight of the value of the energy supplied by RHC systems, promoting transparency and clarity for end-users and other stakeholders. A number of tools will be developed for this purpose. • to devise a common methodology for estimating the value of energy supplied by RHC systems and an assessment of Levelised costs for heating and cooling (renewable and conventional).
EU contribution:	EUR 985,936
Project start:	April 2014
Project end:	December 2016
Contact person:	Pedro Dias, pedro.dias@estif.org
Further information:	<p>http://www.front-rhc.eu/ http://ec.europa.eu/energy/intelligent/projects/en/projects/front Project reference: IEE/13/848/</p>

CODE 2 COGENERATION

IEE Call 2011, Industry	Cogeneration Observatory and Dissemination Europe 2
Project coordinator:	COGEN Europe, EU
<p>Summary (project closed)</p> 	<p>The project has developed national Cogeneration Roadmaps for 27 MS and one European Cogeneration Roadmap. The roadmaps propose actions on several fronts in close interaction with the key stakeholders (policy-makers, industry and civil society). In a number of pilot countries (BE, DE, EL, IE, IT, PO, and SI) the roadmaps will be supported with detailed action plans</p> <p>The project has identified the potentials for micro-CHP and bio-energy CHP across 27 EU MS.</p> <p>A number of how-to-do guides have been produced for the food, paper, hospitals and commercial buildings sectors to guide businesses, local authorities or other professional groups interested in CHP deployment</p>
Sample of outputs:	<p>National Cogeneration roadmaps EU27 http://goo.gl/OyjBQ5</p> <p>Bio-energy CHP Potential Analysis, July 2013 http://goo.gl/fegtMj</p> <p>Micro-CHP potential analysis. EU level report http://goo.gl/9Z46Kd</p> <p>cogeneration best practice cases EU 27 http://goo.gl/IMhDwh</p> <p>How-to-do guidliens http://goo.gl/ZqeBYh</p> <p>European Cogeneration Roadmap http://goo.gl/e0yJRV</p>
EU contribution:	EUR 893,495
Project start:	June 2012
Project end:	January 2015 (closed)
Contact person:	Fiona Riddoch, Fiona.riddoch@cogeneurope.eu
Further information:	<p>www.code2-project.eu</p> <p>http://ec.europa.eu/energy/intelligent/projects/en/projects/code2</p> <p>Project reference: IEE/11/910</p>


SDHPLUS SOLAR THERMAL DISTRICT HEATING

IEE Call 2011, RES H/C	New Business Opportunities for Solar District Heating and Cooling
Project coordinator:	SOLITES, DE
<p>Summary (project closed)</p> 	<p>Solar district heating (SDH) plants are a large-scale solar thermal technology supplying renewable, zero-emission heat from large solar collector fields via district heating networks to residential and industrial areas. Long term experience is available from demonstration projects in Sweden, Denmark, Germany and Austria and the commercial application of SDH is presently growing in some countries</p> <p>This project has bene working at promoting, creating and pilot implementing new and innovative business opportunities and market strategies for solar thermal district heating.</p> <p>The project has relied on know how transfer from experienced to newcomer countries and in the drafting of case studies targeted to the starting point of each of the participant countries concerning the integration of solar thermal in district heating networks. The project has also provided guidance to urban planners on the planning aspects and implications of impending SDH in urban contexts.</p> <p>The SDHplus project builds on the previous IEE project SDHtake-off. Participant countries have included: expert countries (AT, DE, DK, SE), learning countries (CZ, IT) and newcomers countries (ES, FR, HR, LT, PL, SI).</p>
Sample of outputs:	<p>SDH Business models http://solar-district-heating.eu/Documents/SDHBusinessmodels.aspx</p> <p>Case studies on introduction of SDH in new or existing district heating systems in practical cases http://solar-district-heating.eu/Documents/SDHCasestudies.aspx</p> <p>SDH guidelines for urban planners http://solar-district-heating.eu/Documents.aspx</p> <p>Proceedings of international SDH conferences and workshops http://solar-district-heating.eu/Documents.aspx</p>
EU contribution:	EUR 1,410,572
Project start:	July 2012
Project end:	July 2015 (closed)
Contact person:	Thomas Pauschinger, pauschinger@solites.de
Further information:	<p>http://www.solar-district-heating.eu/, http://ec.europa.eu/energy/intelligent/projects/en/projects/sdhplus Project reference: IEE/11/803</p>


GEODH GEOTHERMAL DISTRICT HEATING

IEE Call 2011, RES H/C	Promote Geothermal District Heating Systems in Europe
Project coordinator:	European Geothermal Energy Council (EGEC), EU
<p>Summary: (project closed)</p> 	<p>The deep geothermal potential for district heating applications is significant and competitive. However the market share of this technology is still limited as there are a number of non-technological barriers which hinder its further in the market.</p> <p>Working alongside decision makers the project has worked in removing the administrative and financial barriers affecting the further development of deep geothermal district heating (geoDH) systems. The target countries include: juvenile geothermal DH markets (NL, UK, IE, BG, RO), in transition (HU, SI, SK, CZ, PL, DK) and mature(DE, FR, IT)</p> <p>Know-how transfer based on best practices on how to implement, finance and deliver (deep) geothermal district heating systems was key to the project activities and this has been provided to regional and local authorities in 14 target countries.</p>
Sample of outputs:	<p>Map viewer of geothermal resource for DH across 14 EU-28 countries http://map.mfgi.hu/geo_DH/</p> <p>Report on recommendations for a Regulatory Framework for Geothermal DH in EU (Feb 2014) http://goo.gl/gKXkt1</p> <p>Guide on Project Management for geothermal DH (June 2014) http://goo.gl/BsSTww</p> <p>Manual for implementing sustainable support schemes for GEODH (Oct 2014) http://goo.gl/6Ksihu</p> <p>Report on business models for geothermal DH (March 2014) http://goo.gl/k5p0IK</p> <p>Training manual on Geothermal District Heating http://goo.gl/DOZxkm</p>
EU contribution:	EUR 760,920
Project start:	April 2012
Project end:	November 2014 (closed)
Contact person:	Philippe Dumas, p.dumas@egec.org
Further information:	<p>http://geodh.eu/, http://ec.europa.eu/energy/intelligent/projects/en/projects/geodh Project reference: IEE/11/813</p>

RESCUE SMART DISTRICT COOLING

IEE Call 2011, RES H/C	Renewable Smart Cooling for Urban Europe
Project coordinator:	Technical University of Dresden, DE
Summary: (project closed) 	<p>The future cooling energy demand in Europe, especially in urban regions is expected to rise. The use of district cooling could contribute to reduce primary energy consumption and greenhouse gas emissions associated to the provision of cooling, when used in the right applications. The current market share of district cooling is as low as 2%. This shows that this is a market with high expansion potential.</p> <p>The aim of the proposed project is to address key challenges that affect the further development and implementation of district cooling. For this purpose the project has developed a methodology, toolset and practical guidance for decisions makers which has been pilot implemented in a series of target cities across Europe.</p>
Sample of outputs:	<p>Guidelines for Local Governments and energy utilities: taking DC from feasibility to implementation http://goo.gl/lho0F3</p> <p>District cooling: report for For utilities, building owners and local municipalities http://goo.gl/2bnKyB</p> <p>EU district cooling markets and trends (EU27) http://goo.gl/tpoBWS</p> <p>District cooling best practices http://goo.gl/nVWbFf</p>
EU contribution:	EUR 957, 048
Project start:	June 2012
Project end:	May 2015 (closed)
Contact person:	Clemens Felsmann, Clemens.Felsmann@tu-dresden.de
Further information:	www.rescue-project.eu , http://ec.europa.eu/energy/intelligent/projects/en/projects/rescue Project reference: IEE/11/977

BIOGAS HEAT HEAT FROM BIOGAS

IEE Call 2011, Bioenergy	Development of sustainable heat markets for biogas plants in Europe
Project coordinator:	Ekodoma, LV
<p>Summary: (project closed)</p> 	<p>The BiogasHeat project addresses the problem of how to efficiently use the heat from biogas plants. Thereby a set of different activities such as policymakers information and support, best practice exchange, pre-feasibility checks, field tests and business cases are implemented.</p> <p>New and existing plants in emerging European biogas markets are targeted and concrete solutions to efficiently use the heat will be proposed and demonstrated. The project builds on existing frameworks and market analysis on the use of biogas heat, developing promising business models and entrepreneurial strategies for the use and recovery of biogas heat.</p> <p>These models and strategies are field tested in cooperation with relevant key actors, like for example farmers, biogas operators, municipalities and district heating companies.</p> <p>The target countries of the project are AT, CZ, DE, DK, IT, HR, LV, PO, and RO.</p>
Sample of outputs	<p>Handbook on "Sustainable Heat use from Biogas Plants" and case studies report can be found in http://goo.gl/jYh3kW</p> <p>Good Practice Examples of Biogas Heat Use http://goo.gl/X1vMJe</p> <p>Documentation on initial feasibility studies http://www.biogasheat.org/documents/</p>
EU contribution:	EUR 1,020,953
Project start:	April 2012
Project end:	April 2015 (closed)
Contact person:	Ilze Dzene, ilze@ekodoma.lv
Further information:	<p>www.biogasheat.org/ http://ec.europa.eu/energy/intelligent/projects/en/projects/biogasheat Project reference: IEE/11/025</p>

REGEOCITIES SHALLOW GEOTHERMAL ENERGY REGULATIONS

IEE Call 2011, RES H/C	Regulation of Geothermal HP systems at local and regional level in Europe
Project contact:	European Geothermal Energy Council (EGEC), EU
<p>Summary:</p> <p>(project closed)</p> 	<p>The overall objective of the project is to address and overcome the barriers concerning the regulation of shallow geothermal resources and to simplify and clarify the administrative procedures affecting shallow geothermal energy (SGE) systems. Best practices from mature countries have been used to produce recommendations on how to develop a common pre-normative framework for the regulation of SGE.</p> <p>The project includes targeted collaboration with a number of regional and local administrations in order to validate and start the implementation of the project results. A complete training program targeting public authorities and policy makers has been developed and implemented that have provided these groups with the skills and tools that are needed to facilitate and assist during the regulatory process of SGE systems.</p> <p>Participant countries have included DE, DK ,FR, NL, SE, BE, IE, IT, ES, EL and RO.</p>
Sample outputs:	<p>Report of the Best Practices on the regulation of SGE Systems</p> <p>Tool for local and regional administrations for the regulation and registration SGE systems</p> <p>Recommendation guideline for local geothermal regulatory frameworks</p> <p>Training for staff in local administrations for the regulation of SGE systems</p> <p>All outputs are available in http://regeocities.eu/results/</p>
EU contribution:	EU 1, 264, 934
Project start:	June 2012
Project end:	May 2015 (closed)
Contact person:	Philippe Dumas, p.dumas@egec.org
Further information:	<p>http://regeocities.eu/,</p> <p>http://ec.europa.eu/energy/intelligent/projects/en/projects/regeocities</p> <p>Project reference: IEE/11/041</p>

ANNEX 7 - TECHNICAL ASSISTANCE – PROJECT FACTSHEETS

H2020 PDA – BEENERGI, ES COLLECTIVE HEATING SYSTEMS

Territory:	Girona (Spain)										
Beneficiaries:	Diputació de Girona, Catalunya, ES										
Planned investments:	Girona Provincial Council's BEenerGi programme provides the necessary technical, legal and financial assistance for municipalities in the Province of Girona . The aim is to mobilise investments to promote energy efficiency in public lighting and in municipal buildings including district heating network investments.										
Main activities: 	<p>The assistance provided by the BEenerGi programme covers the following five areas:</p> <p>Technical assistance for creating planning instruments for producing and distributing forest biomass.</p> <p>Technical assistance needed to improve energy efficiency in public building and in street lighting by signing contracts with energy service companies (ESCO) or through other financing schemes.</p> <p>Technical assistance needed to install forest biomass boilers or heating networks or boilers that combine the use of other sources of renewable energy, and carry out other installations to obtain greater energy efficiency in buildings, by signing contracts with ESCOs or through other financing schemes</p> <p>Legal advice</p>										
Expected results:	<table> <tr> <td>Energy savings:</td> <td>541 toe/year</td> </tr> <tr> <td>RES production:</td> <td>1.269 toe/year</td> </tr> <tr> <td>GHG reduction:</td> <td>3,993 tCO₂e/year</td> </tr> <tr> <td>Investments:</td> <td>EUR 15 million</td> </tr> <tr> <td>Project costs:</td> <td>EUR 498,962</td> </tr> </table>	Energy savings:	541 toe/year	RES production:	1.269 toe/year	GHG reduction:	3,993 tCO ₂ e/year	Investments:	EUR 15 million	Project costs:	EUR 498,962
Energy savings:	541 toe/year										
RES production:	1.269 toe/year										
GHG reduction:	3,993 tCO ₂ e/year										
Investments:	EUR 15 million										
Project costs:	EUR 498,962										
Market replication potential:	The project aims to establish a restoration protocol replicable to residential districts with similar problems. Investments will be tendered to ESCOs. The project will also explore the possibility to tender investments and energy services in a bundle.										
EU contribution:	EUR 922.399										
Project duration:	30 months										
Project status:	Started in February 2014 (ongoing)										
Further information:	Ms Anna Camp acamp@ddgi.cat http://beenergi.ddgi.cat/										

MLEI EfiDISTRICT, ES URBAN REGENERATION WITH DH

Territory:	Pamplona (Spain)										
Beneficiaries:	Land and Housing Corporation of Navarre, Region of Navarre										
Planned investments:	Integral energy renovation of the Chantrea district of the City of Pamplona including the construction of a new district heating network run on biomass, renovation of an existing district heating network and refurbishment of connected residential and public buildings.										
Main activities: 	<p>Creation of a new thermal grid fed by biomass to supply the entire district comprising a new generation plant and distribution grid to public and private buildings</p> <p>Renovation of existing district heating network with old inefficient installations, and complementary works for inclusion of control and regulation systems and renewable energy resources</p> <p>Integrated energy renovation of 6 district buildings, including thermal cladding, targeting homes built between 1950 and 1980 with inefficient systems.</p>										
Expected results:	<table> <tr> <td>Energy savings:</td> <td>541 toe/year</td> </tr> <tr> <td>RES production:</td> <td>1.269 toe/year</td> </tr> <tr> <td>GHG reduction:</td> <td>3,993 tCO₂e/year</td> </tr> <tr> <td>Investments:</td> <td>EUR 10.9 million</td> </tr> <tr> <td>Project costs:</td> <td>EUR 498,962</td> </tr> </table>	Energy savings:	541 toe/year	RES production:	1.269 toe/year	GHG reduction:	3,993 tCO ₂ e/year	Investments:	EUR 10.9 million	Project costs:	EUR 498,962
Energy savings:	541 toe/year										
RES production:	1.269 toe/year										
GHG reduction:	3,993 tCO ₂ e/year										
Investments:	EUR 10.9 million										
Project costs:	EUR 498,962										
Market replication potential:	The project aims to establish a restoration protocol replicable to residential districts with similar problems. Investments will be tendered to ESCOs. The project will also explore the possibility to tender investments and energy services in a bundle.										
EU contribution:	EUR 374,221										
Project duration:	30 months										
Project status:	Started in February 2014 (ongoing)										
Further information:	<p>Mr Patxi Ruano Varas, NASUVINSA</p> <p>pruanova@nasuvinsa.es</p> <p>www.efidistrict.eu/</p>										

MLEI ENERGY4FLEXIBILITY, NL SUSTAINABLE ENERGY INFRASTRUCTURE FOR AGRO-INDUSTRIAL AREAS

Territory:	Greenport Venlo Area (Netherlands)
Beneficiary:	Development Company Greenport Venlo (CV WOM K4)
Planned investments:	Renewable energy infrastructure to supply the energy needs of a commercial and agro-industrial development , including photovoltaics and district heating and cooling networks using deep geothermal sources.
Main activities: 	<p>Setting up special purpose companies for the different projects and securing financing for the investments</p> <p>Detailed engineering of concepts, design of the investments and procurement through works contracts.</p> <p>Securing contracts with energy customers (users) and heat suppliers</p> <p>Capitalisation and communication on the lessons learnt at national and European level</p>
Expected results:	<p>Energy savings: 7 523 toe/year</p> <p>RES production: 14 087 toe/year</p> <p>GHG reduction: 150 802 tCO₂e/year</p> <p>Investments: 54 634 857 EUR</p> <p>Project costs: 1 793 582 EUR</p> <p>Leverage factor: 30</p>
Market replication potential:	Lead by a regional development company, the project will result in the implementation of renewable energy infrastructure to enable the use of locally available energy sources. The project will illustrate how the use of optimised tendering processes and co-operation among public authorities and commercial actors (energy suppliers and customers) can lead to bankable approaches for the supply of energy using low carbon energy sources in agro industrial areas.
EU contribution:	1,131,748 EUR
Project duration:	36 months
Project status:	Started in April 2013 (ongoing)
Contact person:	Raymond Roeffel, Project Director, Etriplus r.roeffel@etriplus.nl / http://www.etriplus.nl

MLEI GEOKEC, HU GEOTHERMAL DISTRICT HEATING

Territory:	City of Kecskemét (Hungary)
Beneficiary:	City of Kecskemét
Planned investments:	28 MWth of deep geothermal capacity including the drilling of production and rejection wells and required infrastructure to feed heat into an existing district heating network supplying the city.
Main activities: 	<p>Licensing and permitting for the use of geothermal energy</p> <p>Drilling and well testing</p> <p>Securing financing for the investments</p> <p>Technical and financial engineering and procurement of works</p> <p>Capitalisation and communication on the lessons learnt at national and European levels</p>
Expected results:	<p>Energy savings: 9 126 toe/year</p> <p>RES production: 9 126 toe/year</p> <p>GHG reduction: 22 015 tCO₂e/year</p> <p>Investments: EUR 30.4 million</p> <p>Project costs: 379 295 EUR</p> <p>Leverage factor: 80</p>
Market replication potential:	Driven and partially financed by the City of Kecskemét, a special purpose company has been set-up to deliver the project. The project will provide other municipalities across Europe and especially in Hungary with a technically and financially viable plan to convert (retrofit) existing fossil fuel fired district heating networks to geothermal energy. This is of special relevance to countries with large amounts of district heating infrastructure supplied with inefficient technologies but that have (deep) geothermal resources available.
EU contribution:	284,471 EUR
Project duration:	36 months
Project status:	Started in March 2013 (closed)
Further information:	Balogh Zoltán, Municipality of Kecskemét balogh.zoltan@kecskemet.hu / www.kecskemet.hu

MLEI BOWEN, NL WASTE HEAT DISTRICT HEATING

Territory:	City of Hengelo (Netherlands)
Beneficiary:	Municipality of Hengelo
Planned investments:	Creation of a district heating network based on waste heat and biomass
Main activities:	<p>Setting up a special purpose company financed by the municipality of Hengelo and the Province of Overijssel, and securing financing for the investments</p> <p>Securing contracts with building owners and heat suppliers (waste heat, biomass and biogas)</p> <p>Design of the investments and procurement through works contracts.</p> <p>Capitalisation and communication on the lessons learnt at national and European level</p>
Expected results:	<p>Energy savings: 1,185 toe/year</p> <p>RES production: 2,079 toe/year</p> <p>GHG reduction: 3,170 tCO₂e/year</p> <p>Investments: EUR 24 million</p> <p>Project costs: EUR 1,583,903</p> <p>Leverage factor: 15</p>
Market replication potential:	The project has a high replication potential as a large number of medium-sized cities are interested in the development of district heating.
EU contribution:	1,000,000 EUR
Project duration:	36 months
Project status:	Started in June 2012 (closed)
Further information:	<p>Raymond Frank, Project manager – Warmtenet Hengelo</p> <p>r.frank@hengelo.nl</p> <p>http://www.warmtenethengelo.nl/en-gb/home.aspx</p>

MLEI SOLROD, DK BIOGAS CHP

Territory:	Solrod Municipality (Denmark)
Beneficiary:	Solrod Municipality
Planned investments:	Biogas CHP plant using cast seaweed, organic waste from local pectin and carrageen factory, and manure from local farms
Main activities: 	<p>Design and preparation of tender Financial and legal external advice</p> <p>Financial and legal external advice</p> <p>Procurement through competitive dialogue to identify turnkey contractor</p> <p>Dissemination and communication of lessons learnt at national and EU level</p>
Expected results:	<p>Energy savings: N/A</p> <p>RES production: 60 GWh/year</p> <p>GHG reduction: 40,100 tCO_{2e}/year</p> <p>Investments: EUR 12,747,827</p> <p>Project costs: EUR 627,840</p> <p>Leverage factor: 20</p>
Market replication potential:	<p>The project will increase the level of renewable energy in heat and power generation within the inter-municipal district heating network. It will also deliver a range of environmental benefits by using cast seaweed from the local Køge bay, which currently causes high nitrogen levels endangering the aquatic status and marine life; prohibits recreational use of the areas along the bay, causes odour to neighbours and releases methane into the atmosphere during decomposition.</p> <p>The innovative use of seaweed as well as the overall project setup will deliver valuable experiences and opportunities regarding bio-energy production, particularly for coastal communities in Europe. The company Solrod Biogas A/S, which will be running the plant, was founded by Solrod Municipality. Construction works have started in September 2014 and the plant will be operational from 2015.</p>
EU contribution:	EUR 470,880
Project duration:	36 months
Project status:	Closed (June 2014)
Contact person:	Mr Mikkel Busck - Solrød Municipality mbu@solrod.dk , www.solrodbiogas.dk

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