



# **EU Research and Innovation towards an integrated approach on district heating and cooling**

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4<sup>th</sup> Generation District Heating**

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# Outline

- **DHC in previous Framework Programmes**
- **DHC in Horizon 2020**
- **EU energy research policy**
- **Future approaches**
- **Final remarks**



**The first Framework Programme (FP) for Research and Technological Development was launched in 1984.**

**Eight FPs until now. Horizon 2020 (H2020) will run until 2020.**

**DHC was also addressed in the Competitiveness and Innovation (CIP) Framework Programme (2007-2013) with the Intelligent Energy Europe programme.**

### **The focus was on:**

- **specific technologies**
- **research and demonstration activities**
- **market uptake measures**
- **specific areas (e.g., solar or geothermal or biomass, etc.)**

**With regard to heating and cooling, after FP5 (1998-2002) demonstration activities and market uptake measures were prevalent.**



**As the energy system has substantially evolved from the 1980s and it continues to evolve, the "silo" approach of the previous FPs has shown its limits.**

**There is now a clear need to have an "integrated energy system" approach and to give adequate visibility to each component of the system.**

**In the definition of H2020 the "integrated energy system" approach has already started to be addressed.**

**For example, in several topics of the 2014-2015 "Secure, clean and efficient energy" Work Programme a level playing field is established for different technologies and addressing more than one technology with the same work is encouraged.**

### With H2020:

- **Three programmes (FP + CIP + EIT) are merged into one**
- **Research is clearly linked to innovation (e.g., new products, novel applications of existing products, social innovation)**
- **The focus is on societal challenges facing EU society (e.g., clean energy, health, transport, etc.)**

## **Further aspects of H2020**

- **2-year work programme**
- **Challenge-based approach: definition of specific challenges to be tackled**
- **Integration of cross-cutting issues (social sciences, international cooperation, etc.)**
- **Use of TRLs to specify scope of activities**

## **DHC projects have been funded:**

- **under Topic EE13 (Technology for district heating and cooling) and Topic EE14 (Removing market barriers to the uptake of efficient heating and cooling solutions) of the "Secure, clean and efficient energy" Work Programme**
- **under Topic "Stimulating the innovation potential of SMEs for a low carbon energy system" of the SME Instrument**

CALL ID	PROJECT ACRONYM	PROJECT TITLE	EU FUNDING (million €)
H2020-EE-2014-2-RIA	<b>FLEXYNETS</b>	<b>Fifth generation, Low temperature, high EXergy district heating and cooling NETworkS</b>	<b>2,0</b>
H2020-EE-2014-2-RIA	<b>OPTI</b>	<b>Optimisation of District Heating Cooling systems</b>	<b>2,1</b>
H2020-EE-2014-2-RIA	<b>STORM</b>	<b>Self-organising Thermal Operational Resource Management</b>	<b>1,9</b>
H2020-EE-2014-3-MarketUptake	<b>LABELPACK APLUS</b>	<b>Promotion and support to the implementation of the energy labelling for Space, Combi Heaters and Water Heaters with a focus on the “Package label”</b>	<b>1,4</b>
H2020-SMEINST-2-2014	<b>HEALEX</b>	<b>HEALEX – High Efficiency Air Liquid Heat Exchanger. An innovative, new heat exchanger that improves energy efficiency in cooling and ventilation systems</b>	<b>1,0</b>
H2020-SMEINST-1-2014	<b>COLDPEAK</b>	<b>PCM-based cold storage as peak shaving for air conditioning units</b>	<b>0,05</b>

**Competitiveness**

Smart infrastructure

Competitive markets

Diversified supply

Energy efficiency

Renewable sources

**Security of  
supply**

**Sustainability**

## A reinforced SET-Plan:

- **Energy efficiency**
- **Flexible and secure energy system**
- **Continuity of supply**
- **Active consumer**
- **Interfaces with other sectors**
- **Fostering innovation in real environments**

**→ Toward an Integrated Roadmap and Action Plan of public investments**

## Integrated Roadmap specifically addresses DHC:

- **Under "Increasing Energy Efficiency in Heating and Cooling (for Industrial and Consumer Uses), in Combination with Renewables Energy Use"**
- **Under "Increasing Energy Efficiency of Energy-related Products and Systems" (white goods)**
- **Under "Ensuring Energy System Integration"**

## Energy Union:

- **Energy security, solidarity and trust**
- **A fully integrated energy market**
- **Energy efficiency**
- **Decarbonising the economy**
- **Research and Innovation:**
  - **World leader in developing the next generation of renewable energy technologies,**
  - **Participation of consumers**
  - **Efficient energy systems**
  - **Energy systems integration**
  - **A forward-looking approach to carbon capture and storage (CCS) and carbon capture and use (CCU)**
  - **Nuclear energy**

## Energy research strategy:

- **Support the transition to reliable, sustainable and competitive energy system**
- **Increase the competitiveness of the European industry**
- **Building a European research area in the field of energy**

## Challenges of the energy system:

- **The integration of an increasing share of renewable energy into the energy system requires that we need to rethink the "system"**
- **How to manage the system with non-traditional service providers?**
- **What are the "generation-side" solutions?**

### Challenges for DHC:

- **Optimise integration of "sources"**  
→ "an all renewable system"
- **Integration of "technologies"**  
→ **Generation**  
→ **Distribution**
- **Optimise "outputs"**  
→ **heat & cooling and power**

### Challenges for DHC:

- **Optimise integration of "users"**
  - **Households, services and industries**
  - **Human factors (behaviour, cultural, ...)**
- **More flexibility**
  - **Storage (short and long time)**
  - **Supply and demand management**



# HORIZON 2020

**Thank you  
for your attention!**

**Find out more:**  
[www.ec.europa/research/horizon2020](http://www.ec.europa/research/horizon2020)