



## Norway

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The Norwegian national team is represented by **SINTEF Energy Research**

### National team leader



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## Norwegian national project

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Norway has a strong growth in low-energy buildings in the recent years, and about 10.000 low-energy houses are already built, or are in the construction or design phase (state 2008).

Adequate technologies for heating, cooling and ventilation are needed for this rapidly emerging market. Heat pumps are seen as a promising solution for heating and cooling of low-energy buildings due to high energy efficiency, utilization of renewable energy sources, great flexibility with regard to system design and heating capacities, and the fact that relatively high energy prices and low interest rates are favourable when investing in relatively expensive heating technologies.

The focus of the Norwegian national project is a study of heat pump systems suited for low-energy houses. This comprises an evaluation whether heat pump systems already introduced in other countries in low-energy buildings are feasible for Norwegian boundary conditions, e.g. the cold winter climate. In particular, ventilation air heat pumps shall be evaluated. A prototype propane water-to-water heat pump unit for space heating and hot water heating (integrated unit) will also be monitored during one year of operation in a low-energy house.

Investigations on the following subjects will also be conducted:

- Analysis of heat pump water heater systems for low energy block of flats
- Analysis of compact units with heat pumps for low-energy houses and passive houses
- Analysis of a propane water-to-water heat pump system for a low-energy house
  - Theoretical analysis
  - Design and construction of a prototype system
  - Laboratory testing
  - Field testing

The Norwegian participation in IEA HPP Annex 32 is supported by Enova SF.

## Norwegian links

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### Norwegian national Annex 32 website

The Norwegian project website of IEA HPP Annex 32 hosted by SINTEF provides information in Norway and in English related to low energy houses and building technology for low energy houses in connection with the Annex 32 project

  <http://www.energy.sintef.no/prosjekt/Annex32>



### Enova SF

ENOVA SF is public enterprise owned by the Royal Norwegian Ministry of Petroleum and Energy. Enova SF's main mission is to contribute to environmentally sound and rational use and production of energy, relying on financial instruments and incentives to stimulate market actors and mechanisms to achieve national energy policy goals.

Enova financially supports the national project of Norway.

  <http://www.enova.no>



### Website for Norwegian low energy houses by State Housing Bank

The website contains information on low energy buildings in Norway

 <http://www.lavenergiboliger.no>



### The Norwegian Heat Pump Association

The Norwegian Heat Pump Association (NOVAP) is an independent organisation which is working for the implementation of heat pumps in the Norwegian energy system. The members of NOVAP are heat pump manufacturers, wholesale dealers and suppliers. NOVAP's main activities are to advance high quality heat pump systems, be a centre of expertise, represent the heat pump business sector in national and international fora, and provide high quality heat pump information to different target groups.

 <http://www.novap.no>

## IEA HPP Annex 32

IEA HPP Annex 32 is a corporate research project on technical building systems with heat pumps for the application in low energy houses.

The project is accomplished in the Heat Pump Program (HPP) of the International Energy Agency (IEA).

Internet: <http://www.annex32.net>

