

## Economical heating and cooling systems for low energy houses



### Japan

Japan is represented by a large national team where 4 Universities, 3 utilities and 16 companies are taking part in the Japanese national activities in the frame of IEA HPP Annex 32. In the following the national team leaders of the **University of Hokkaido** and **TEPCO** are given as contact persons.

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### Japanese national project

The Japanese national project in Annex 32 deals with the redesign and further development of heat pump systems for low energy houses in two different climatic zones of Japan. (Fig. 1).

In the cold region of Hokkaido area, most of today's heating systems are using fuel oil. For this area, adequate heat pump solutions shall be developed for the low energy houses field. A ground-coupled system is in field-monitoring conducted and evaluated by Hokkaido university.

However, 80% of the Japanese people live in the medium climate zone IV (Region Tokyo, Osaka, Fukuoka), where heat pumps in reverse operation for space heating in winter and air-conditioning in summer are very popular.

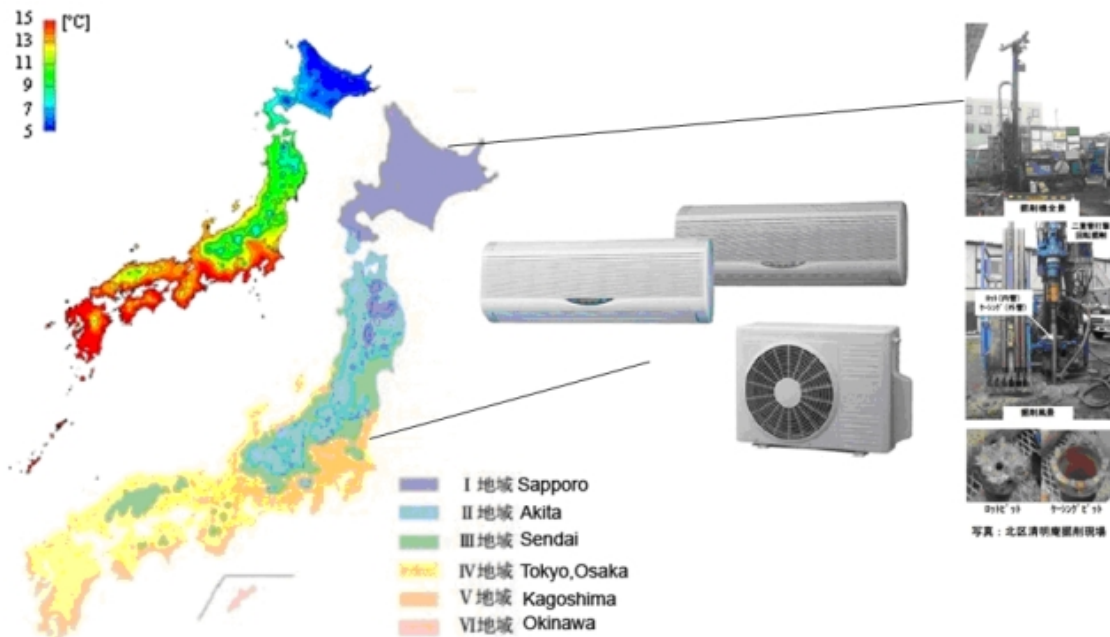


Fig. 1 Example of online visualisation with measurement points for heat flows, electricity inputs and temperatures

These systems have a large market share in Japan. They shall be further developed for the application in low energy houses with regard to capacity range and control issues for different building types. Therefore, currently a load analysis by TRNSYS simulations is done and comparison to a central heating system with exhaust air heat pump and floor heating distribution is accomplished.

## Japanese links



### Heat Pump and Thermal Storage Centre of Japan (HPTCJ)

HPTCJ hosts the Japanese National Team, which cooperates on an international level with the IEA Heat Pump Programme and the IEA Energy Conservation through Energy Storage Programme.

The website includes news, publications, etc. in Japanese and parts in English at

  <http://www.hptcj.or.jp>



### NEDO

NEDO is Japan's largest public R&D management organisation for promoting the development of advanced industrial, environmental, new energy and energy conservation technologies.

The website is in Japanese and parts of the information are in English at

  <http://www.nedo.go.jp>