Overview of IEA HPT Annex 50



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Fraunhofer Institute for
Solar Energy Systems ISE

Joint Workshop IEA HPT Annex 49/50
and IEA EBC Annex 67

Heat pumps for nZEB, retrofit and energy flexibility

Rotterdam, 15. May 2017

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„Heat Pumps in Multi-Family Buildings for space heating and DWH”



Kick-off Meeting 24.01.2017, Freiburg, Germany

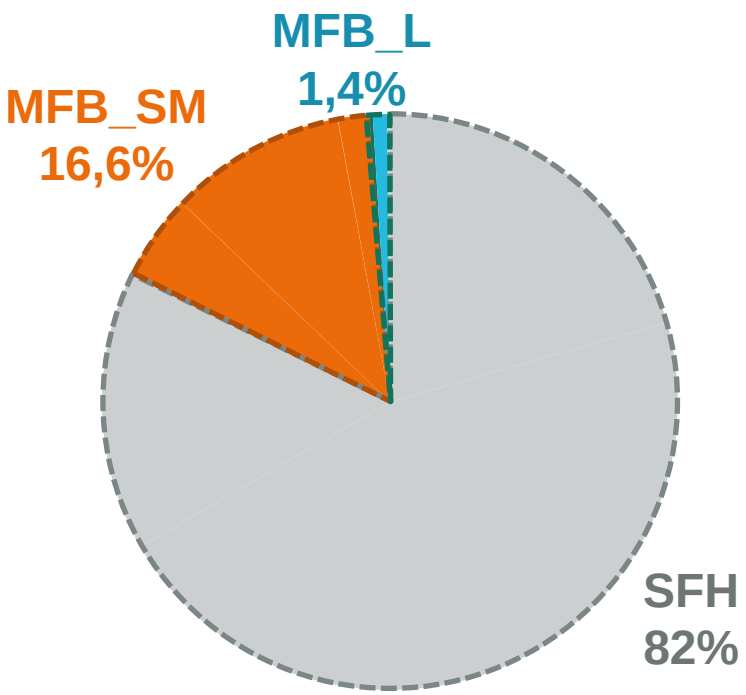
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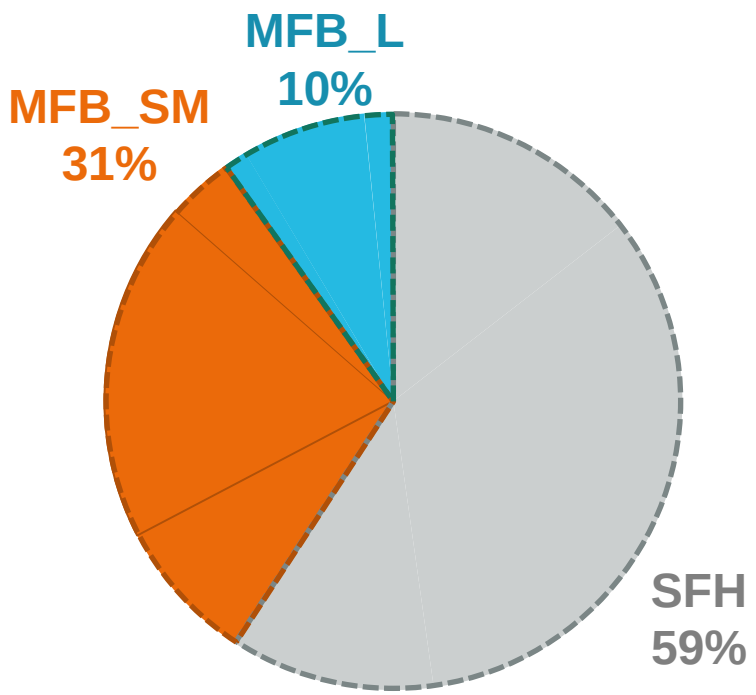
German Housing Stock Characteristics

GERMAN DWELLING STOCK IN 2009

Number of buildings



Living area



MFB_SM: 3 - 12 FLATS, MFB_L: >12 FLATS, SFH: 1, 2 FLATS

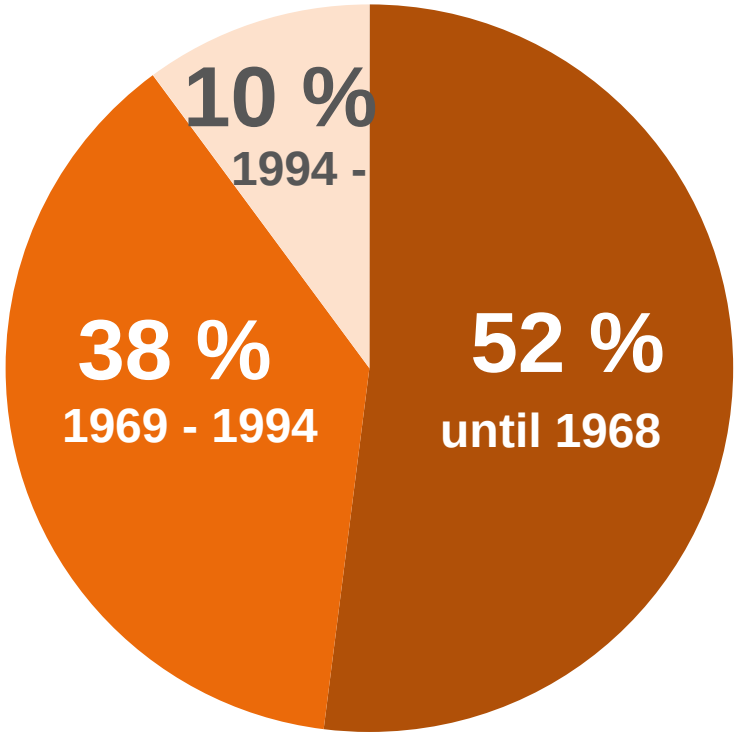
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Bürger, V.; Hesse, T.; Quack, D.; Palzer, A.; Köhler, B.; Herkel, S.; Engelmann, P. (2015): Klimaneutraler Gebäudebestand 2050. CLIMATE CHANGE 06/2016. Umweltbundesamt (Hrsg.). Dessau-Roßlau. (ISSN: 1862-4359)

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German Housing Stock Characteristics

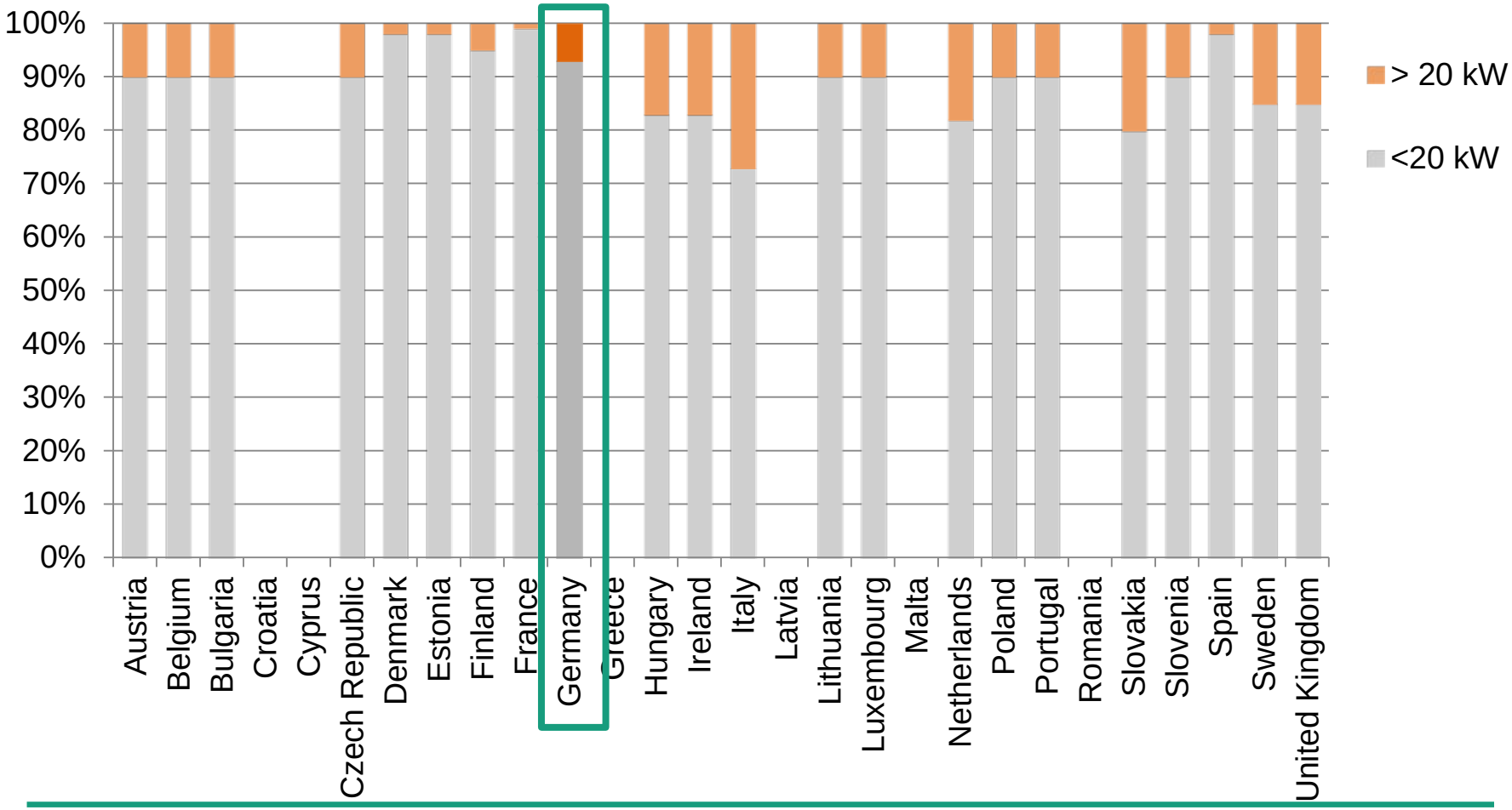
Age of MFB, percent of buildings



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Bürger, V.; Hesse, T.; Quack, D.; Palzer, A.; Köhler, B.; Herkel, S.; Engelmann, P. (2015): Klimaneutraler Gebäudebestand 2050. CLIMATE CHANGE 06/2016. Umweltbundesamt (Hrsg.). Dessau-Roßlau. (ISSN: 1862-4359)

Distribution of Installed Heat Pumps

Ground-Source HP (2012)

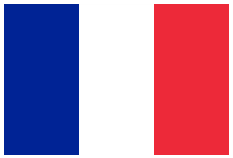
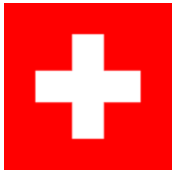


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Ragwitz, M. et al. (2016): Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/ renewable) – Work package 2: Assessment of the technologies for the year 2012 (Final report March 2016). European Commission (ed.). Brussels.

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Participation in the Annex

Germany		**Fraunhofer ISE, (Operating Agent)** Bosch Thermotechnik GmbH,
Austria		AIT – Austrian Institute of Technology Graz University of Technology
France		EDF – Research & Development,
UK		Glen Dimplex
Switzerland		CSD INGENIEURE AG

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Objectives and scope

How to stimulate an increased use of heat pumps in multi-family houses?

Finding the optimal bivalence temperature for bivalent or hybrid systems

Recommendations for the optimal (multi) heat source and operating mode (fuel driven, electric driven, hybrid) solutions depending on building type and ecologic-economic situation and climatic zone

Enhancement of heat pump systems and/or heat pump components for their adaptation in multi-family buildings

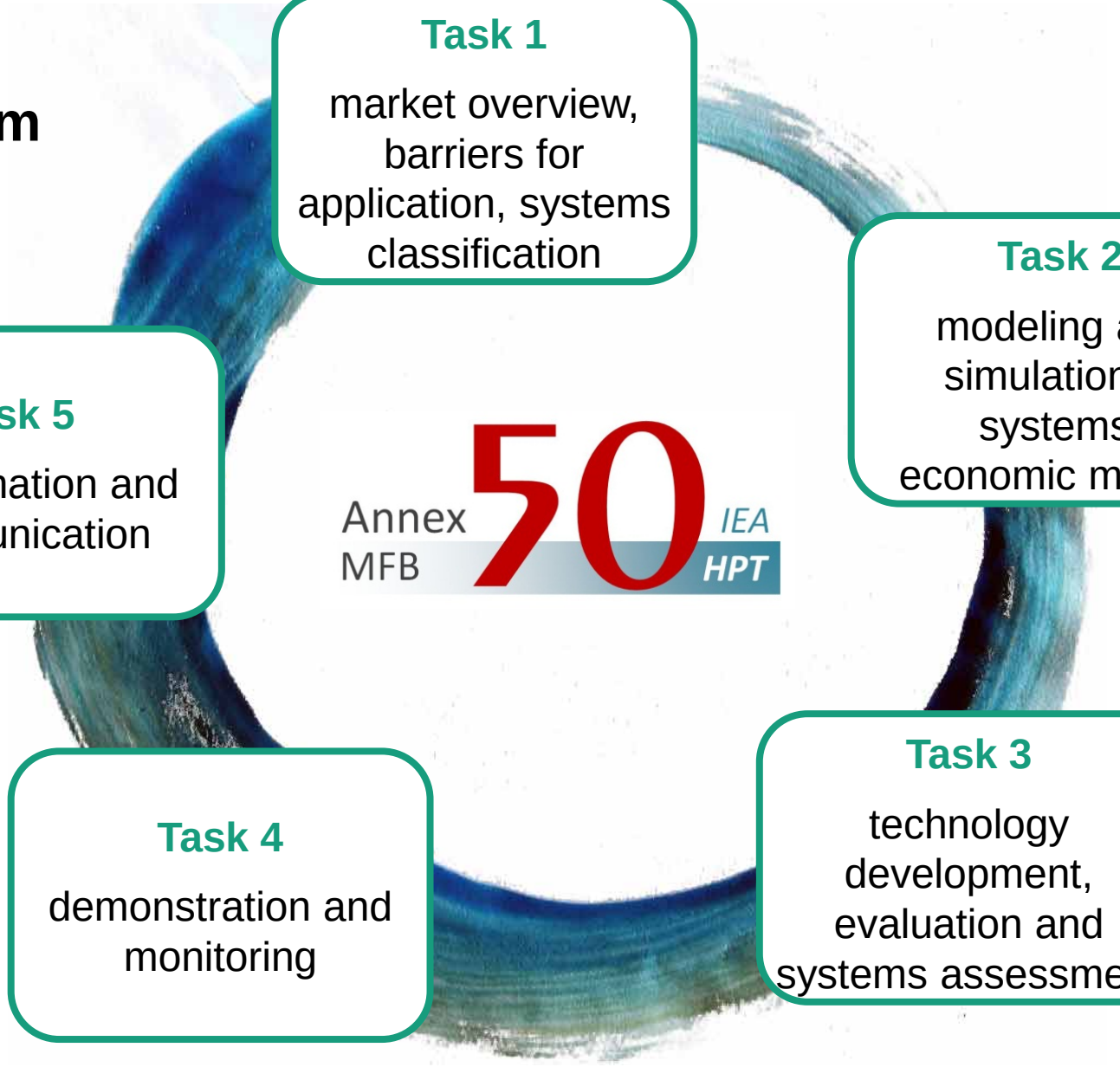
Demonstration and monitoring of technical solutions

Development and demonstration of concepts for application of HP in energetically renovated buildings and in buildings without improved building envelope

Close cooperation with companies in all relevant technology areas, as well as with the housing societies

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Work program



Task 1

market overview, barriers for application, systems classification

Task 2

modeling and simulation of systems, economic models

Task 3

technology development, evaluation and systems assessment

Task 4

demonstration and monitoring

Task 5

dissemination and communication

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The Annex will pay particular attention to the following technology topics:

Distribution and heat transfer system

using existing systems (often requiring high temperature) vs. installation of a new system (taking into account costs and inconveniences of the installation process for the residents)

Thermal driven heat pumps

smaller heat source (notably geothermal) could be beneficial in cases of restricted space in multi-family buildings

Central vs. decentral domestic hot water production

(connection to the Annex 46)

Connection of a heat pump to an existing heating system

both to the existing heat generation and the distribution system

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Example of existing products

Product Management

Heat pump solutions for multifamily houses



a) Central heating, hot water and heat recovery

- F1345 with capacity range 24 - 540kW (heating) or ASHP with capacity range 30 – 800kW (heating) per master controller for heating
- AS Greenmaster for exhust ventilation heat recovery

b) Central heating, individual hot water and heat recovery

- Central F1345 with capacity range 24 - 540kW (heating) or ASHP with capacity range 30 – 800kW (heating) per master controller for heating
- Individual Aquabooster for hot water
- Individual ECO 190 for balanced ventilation heat recovery





b) Individual heating, hot water and heat recovery

- Individual F750/F730 for heating, hot water and ventilation heat recovery
- Individual Combi 185 for hot water, limited heating and balanced ventilation heat recovery



NIBE

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Quelle: Sustainable indoor comfort for a broader customer base
Peter Jocic, NIBE, HP Forum 2016

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German project about retrofit of Multi family houses with heat pumps

„LowEx Bestand“ – Housing companies team up with HP manufacturers







Demonstration of new heat pumps

Development of HP for Multi family retrofit

Bosch
Gas heat pump



Stiebel Eltron
Focus hot water



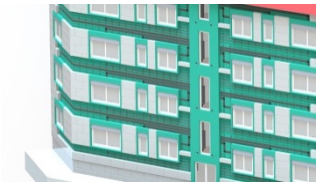
Vaillant
Hybrid



Viessmann
Central HP



FIHLS
Ventilation



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Thank you!

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