HEAT PUMPS WATCH

Dr.-Ing. Marek Miara

IEA HPT Project 62 – Final Webinar

—

Heat Pumps in Multi-Family Buildings

Final results Annex 62

Agenda

Time	Subject	Speaker
14:30 – 14:35	Welcome Heat Pump Center	Metkel (HPT TCP)
14:35 – 14:40	Welcome & introduction	Marek Miara (HPW)
14:40 – 14:50	Project background and objectives — what did we do?	Marek Miara (HPW)
14:50 – 15:35	Key findings • General classification • Country reports • Case study database • Solution tool	Marek Miara (HPW) Odile Cauret (EDF) Tom Schulz (HPW) & Nejma Hagen (ISE) Simone Piovesan (Clivet) & Sara Bordignon (Clivet)
15:35 – 15:40	Short break	—
15:40 – 16:00	Project 62 in the public eye — website, communication, dissemination; workshop results	Marek Miara (HPW)
16:00 – 16:20	Future project: “Heat Pumps in Action”	Marek Miara (HPW)
16:20 – 16:30	Closing remarks	Marek Miara (HPW)

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Welcome & introduction

Thank you!!

Fraunhofer ISE

Gefördert durch:

Bundesministerium für Wirtschaft und Energie

aufgrund eines Beschlusses des Deutschen Bundestages

Uni Gent
Uni Brussels
European Heat Pump Association (EHPA)
Daikin Europa
Midea
Clivet
EDF
CETIAT
Fraunhofer IEE
Fraunhofer ISE
EURAC

ITC CNR
Enea
Politecnico di Torino
NCBR
Panasonic
Research Institutes of Sweden
QVANTUM
IKEA
CSD Ingenieure
Uni Geneva
SIG
ORNL

arsnova.eu

WAY97Q

Live-Ansicht:

Zur Lobby

Session-Link kopieren

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Project background and objectives
What did we do?

The problem is no longer finding a solution.

The problem is choosing the right one.

Dense urban situations

Domestic hot water

Noise restrictions

Limited space

Split ownership

Many stakeholders

Building the Knowledge Base for Heat Pumps in Multi-Family Buildings – IEA HPT Project Work

Annex/Project 50 **0** asked:

Which solutions are theoretically possible?

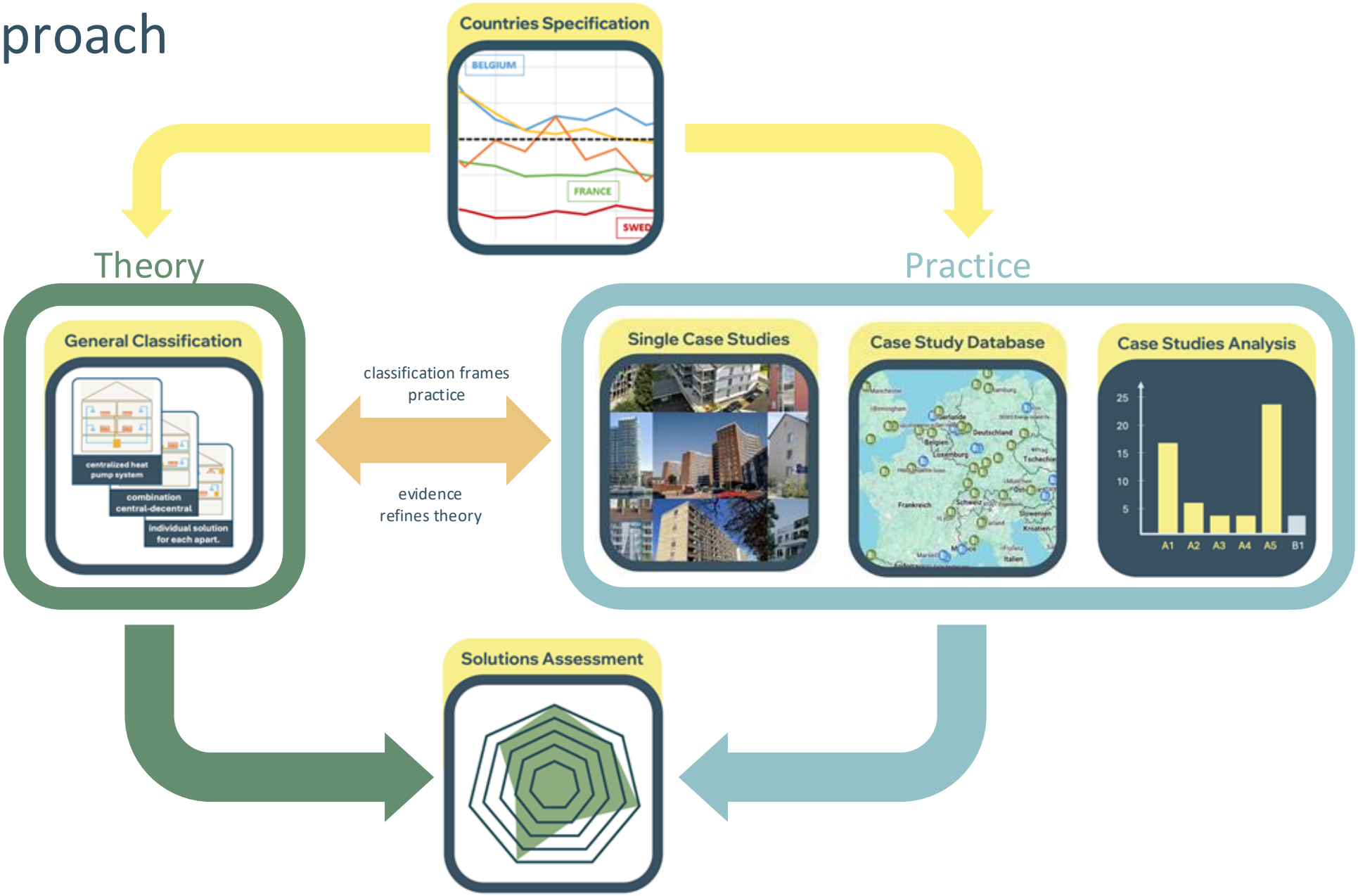
ANNEX 62 asked:

Which solutions fit real urban buildings?

PROJECT 7x asks:

How do we scale heat pumps in practice?

Holistic approach



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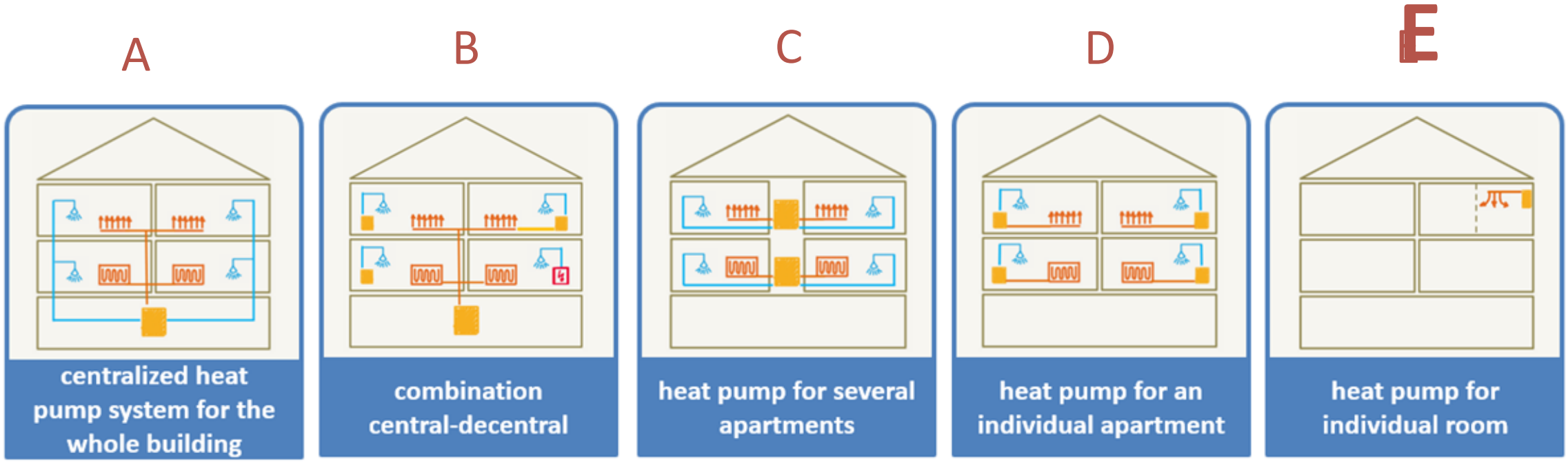
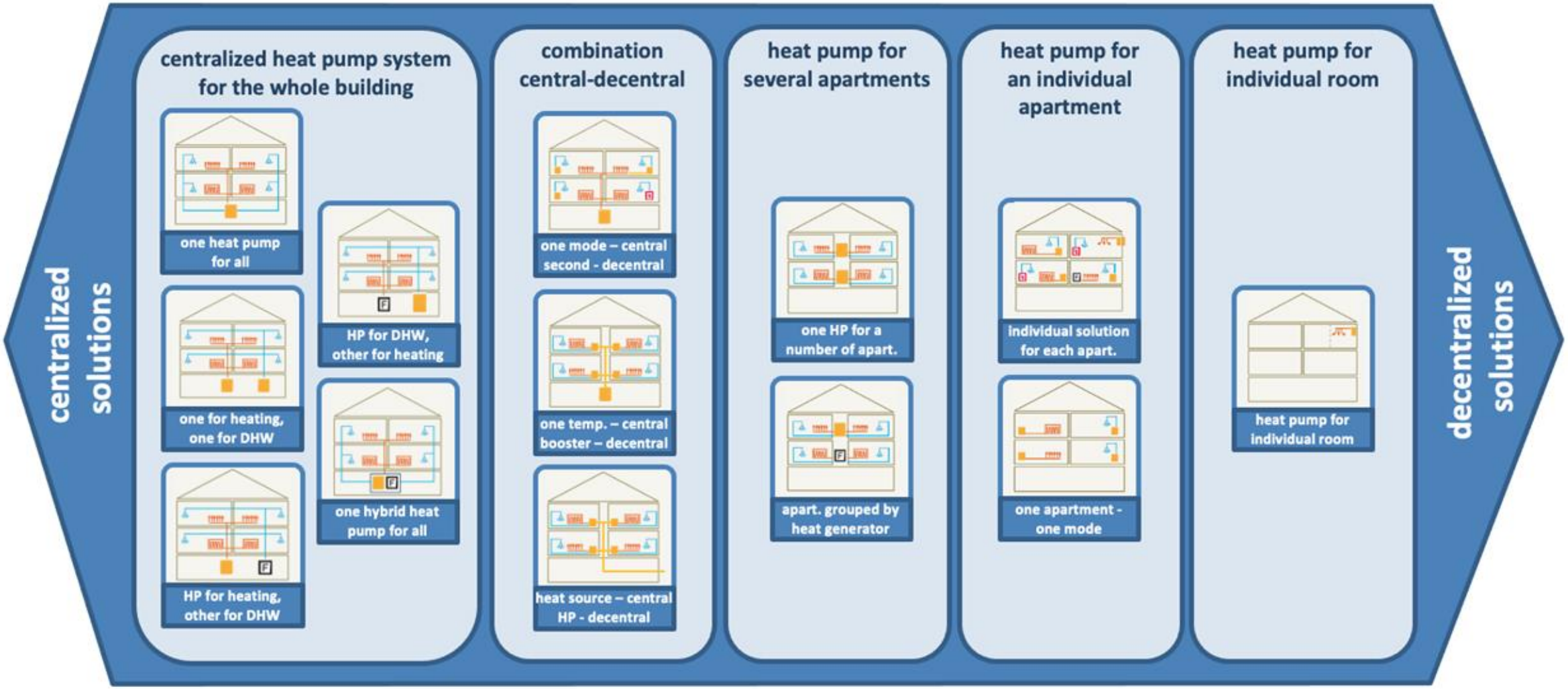
Key findings

- General classification

The five solution families



... And the Family Members



Reality reshaped the theory

- categories merged
- new categories added
- some removed entirely

Real projects continuously reshaped the framework.

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Odile CAURET (EDF)
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Key findings

- Country reports

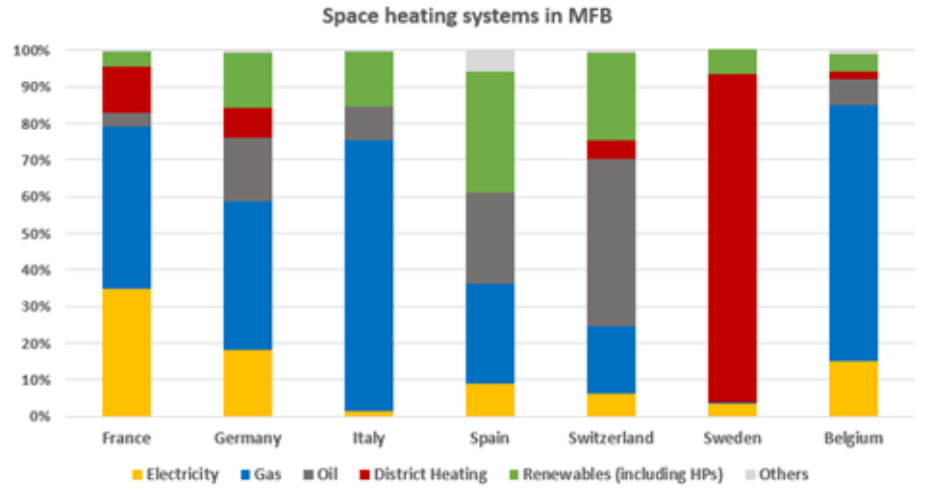
Context

- **In the housing stock, MFB account for:**
  - **around 50% in European participating countries (Belgium, France, Germany, Italy, Spain, Sweden, Switzerland)**
  - **70% in China**
- **MFB are relatively old:**
  - **In European countries, 55% to 65% of MFB were built before the end of 1970s and the first building codes**
  - **In China, significant stock of MFB built before 2000**
- **Energy performance of MFB is relatively low:**
  - **Final energy consumption generally comprised between 150 and 200 kWh/m^2 (except for Spain)**
- **About 80% of energy consumption are dedicated to space and water heating (except for Spain)**

WHAT IS THE PLACE OF HEAT PUMPS IN THAT CONTEXT ?
WHAT ARE THE CONDITIONS OF THEIR DEPLOYMENT IN MFB ?

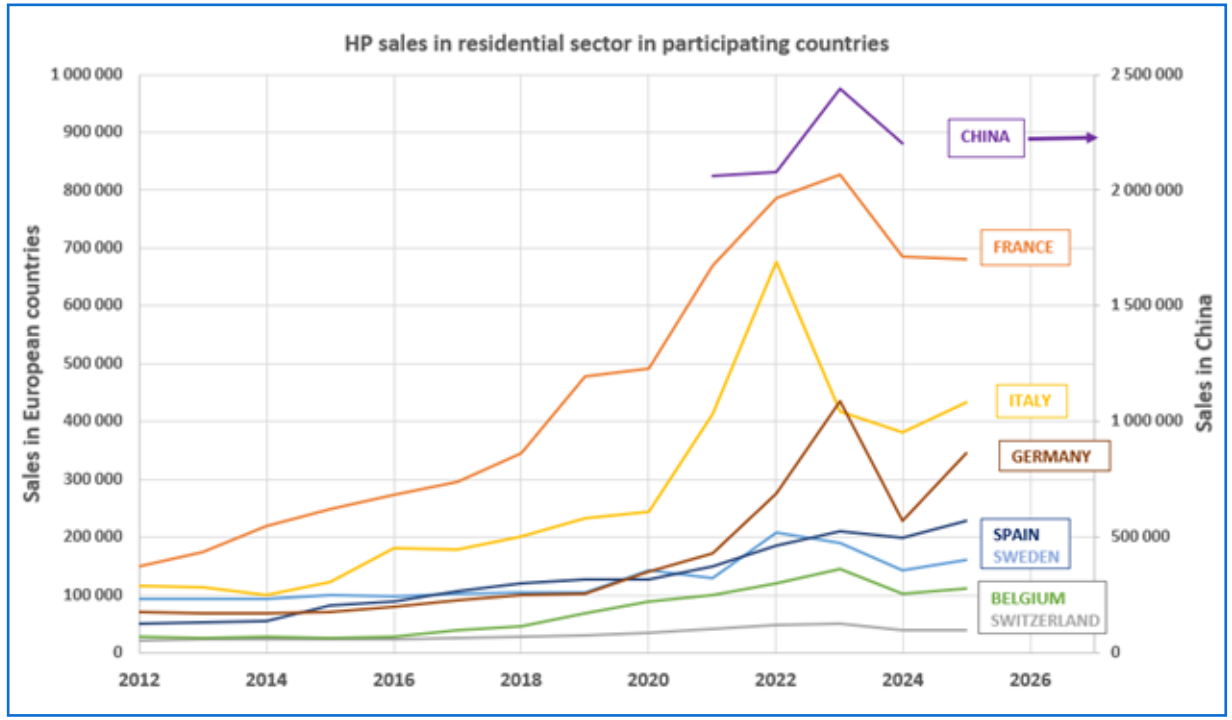
Space (and water) heating systems in MFB

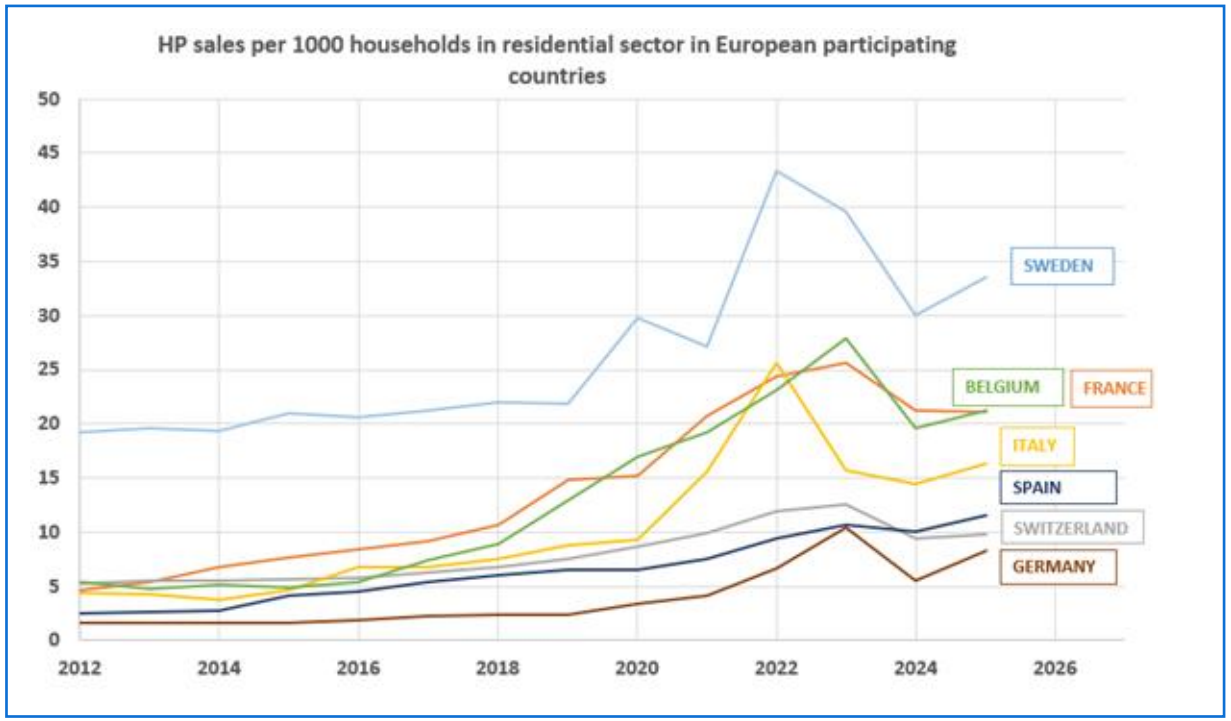
- **In European participating countries:**
  - **Gas and oil predominant, except for Sweden (district heating with renewables)**
  - **Renewables: mainly biomass, HPs in a lesser extent**



- **In China:**
  - **Two distinct zones separated by the Qin-Huai line:**
  - **North: District heating with fossil fuels**
  - **South: Air/Air reversible units and direct electric heating**

Heat pump market





OVERALL MARKET GROWTH, DESPITE SIGNIFICANT FLUCTUATIONS

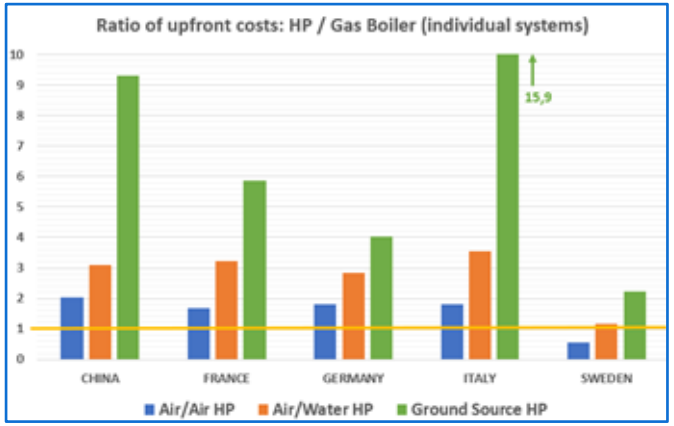
SEVERAL MARKET DRIVERS AND BARRIERS TO EXPLAIN MARKET EVOLUTION

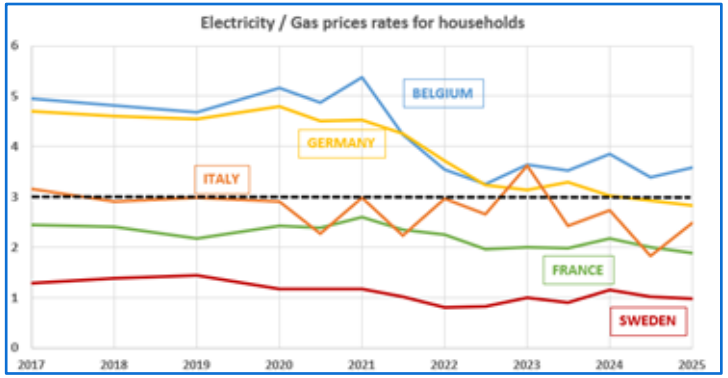
Regulatory drivers

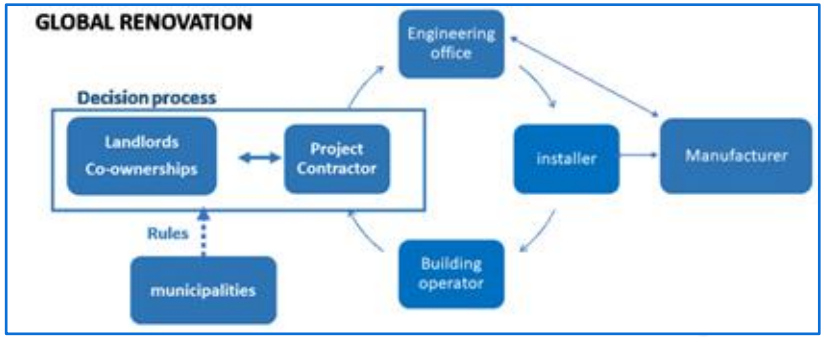
- **Energy and Climate Strategic Plans**
  - Each country has developed specific plans for energy transition and decarbonation, with deployment objectives for renewables
- **Building codes**
  - Almost all countries put in place buildings codes for new buildings, including requirements for energy consumption and/or GHG emissions
  - Rarely, building codes for renovation
- **Energy Performance Indicators for Buildings**
  - Diagnosis of energy performance become mandatory in almost all countries in case of building sale or rent.
  - Buildings are classified, distributed in classes according to their energy consumption and sometimes their GHG emissions
- **Subsidies Programs**
  - Subsidies are often proposed for the retrofit of fossil-fuel boilers by heat pumps, but are very unstable for few years
  - Rarely, subsidies are proposed for new buildings

Barriers for HP development in MFB

- **Capital costs**
  - HPs more expensive than reference solutions (gas boilers in particular)
- **Energy prices**
  - Electricity / gas prices ratio
- **Installers / Sector organisation**
  - Lack of skilled installers
  - Lack of awareness of numerous stakeholders (sensible to preconceived notions about HPs)
- **Dedicated products**
  - For some configurations (replacement of individual boilers, cold areas, etc.), dedicated products are missing
- **stakeholders chain for decision and installation process**
  - Can involve various stakeholders and can imply complexity and delay, in particular for global (building) renovation







Conclusion

- **Despite a global growing market, heat pumps are still not very common in MFB**
- **Due to high capital costs and high energy prices ratios, heat pumps market greatly depends on public policies (regulations, subsidies programs, taxes...)**
- **Some other barriers are still to overcome:**
  - Lack of skilled installers,
  - Lack of awareness of stakeholders
  - Decision and installation process involving various stakeholders
- **However, positive trends that need to be strengthened by increasing awareness and skills of stakeholders**

THANK YOU FOR YOUR ATTENTION

16/07/2026
Odile CAURET (odile.cauret@edf.fr)

HEAT PUMPS WATCH

Tom Schulz (HPW) & Nejma Hagen (ISE)
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Key findings

- Case study database

Projects (Annexes) 50 + 62

- 8 case studies were fully completed in Project 50
  - 22 more were incomplete or merely announced
- Project 62 expanded on this
  - 64 case studies were revised and/or added. The database shows 72 cases now
  - For an additional 15 case studies, so little information was provided that they were removed from the database

Case Study Map (Europe)

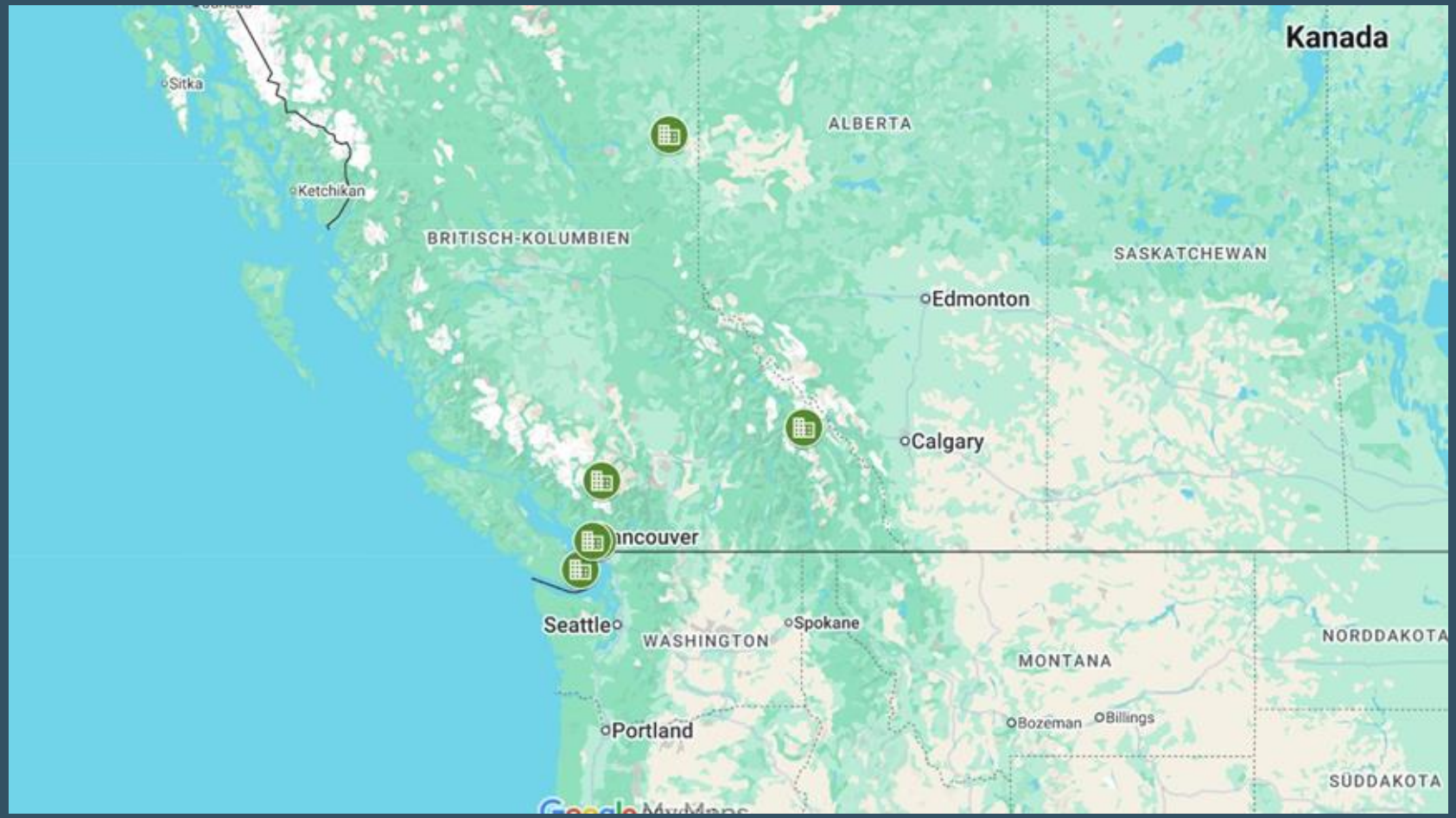
BLUE =Project 50

- All from Western/Central Europe

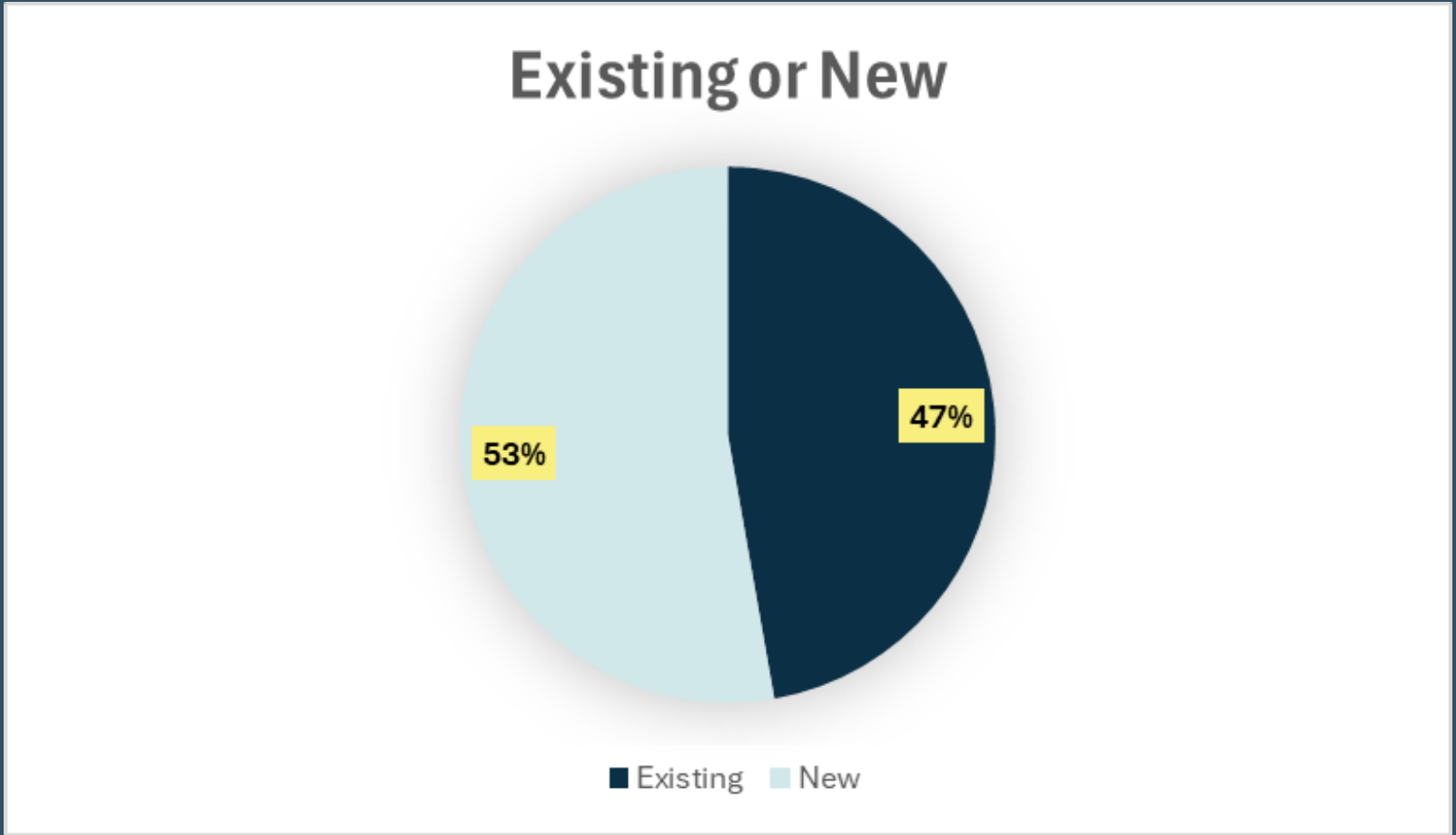
GREEN = Project 62

- Now including Eastern, Nordic and Mediterranean countries, and North America

Case Study Map (Canada)



Project 62



The database shows that heat pumps can successfully be used in both newly built and retrofitted buildings.

~100 case studies from 14 countries

74% 21 or more apartments

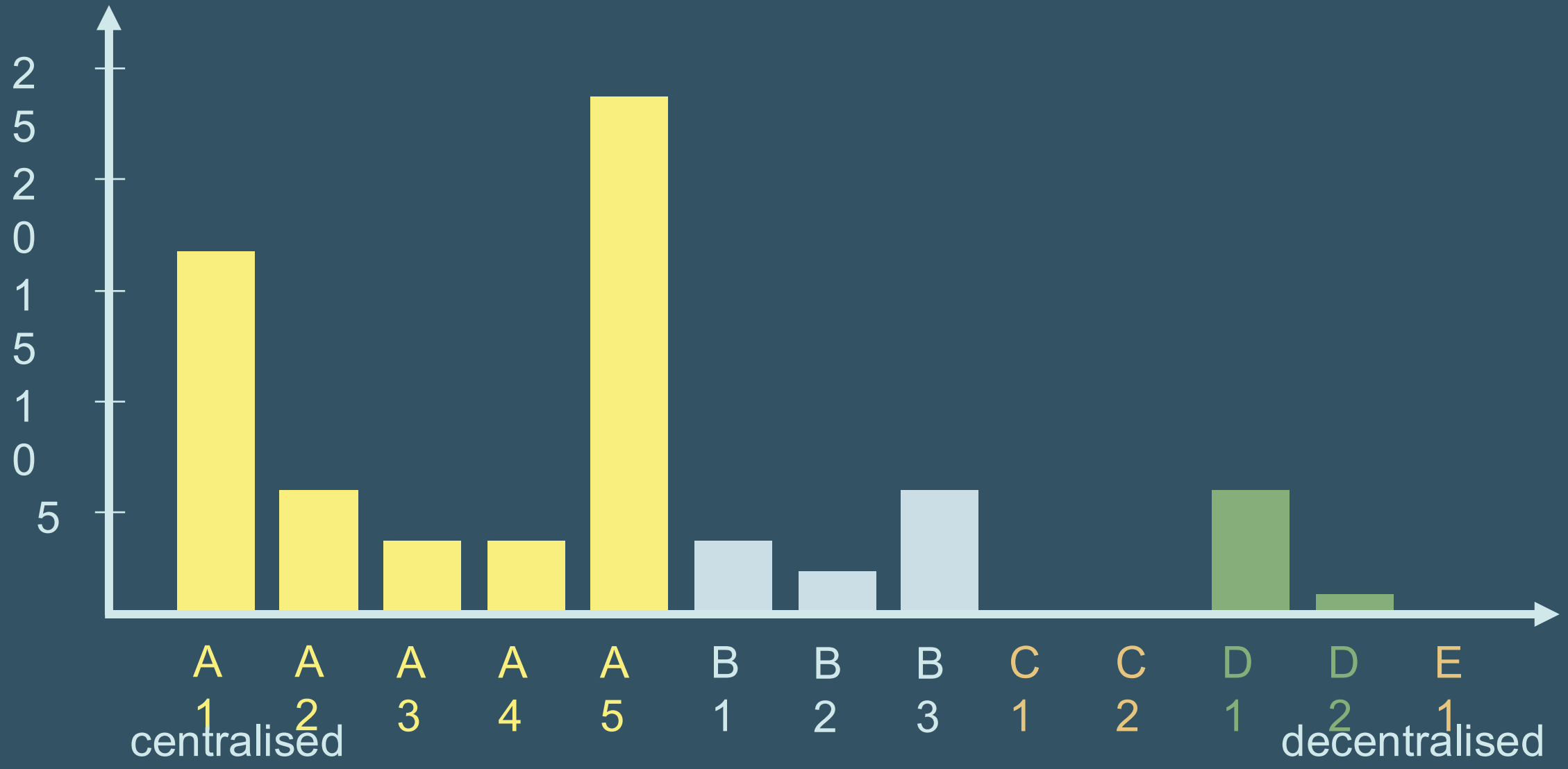
55 projects centralized solutions 76%

50% hybrid systems

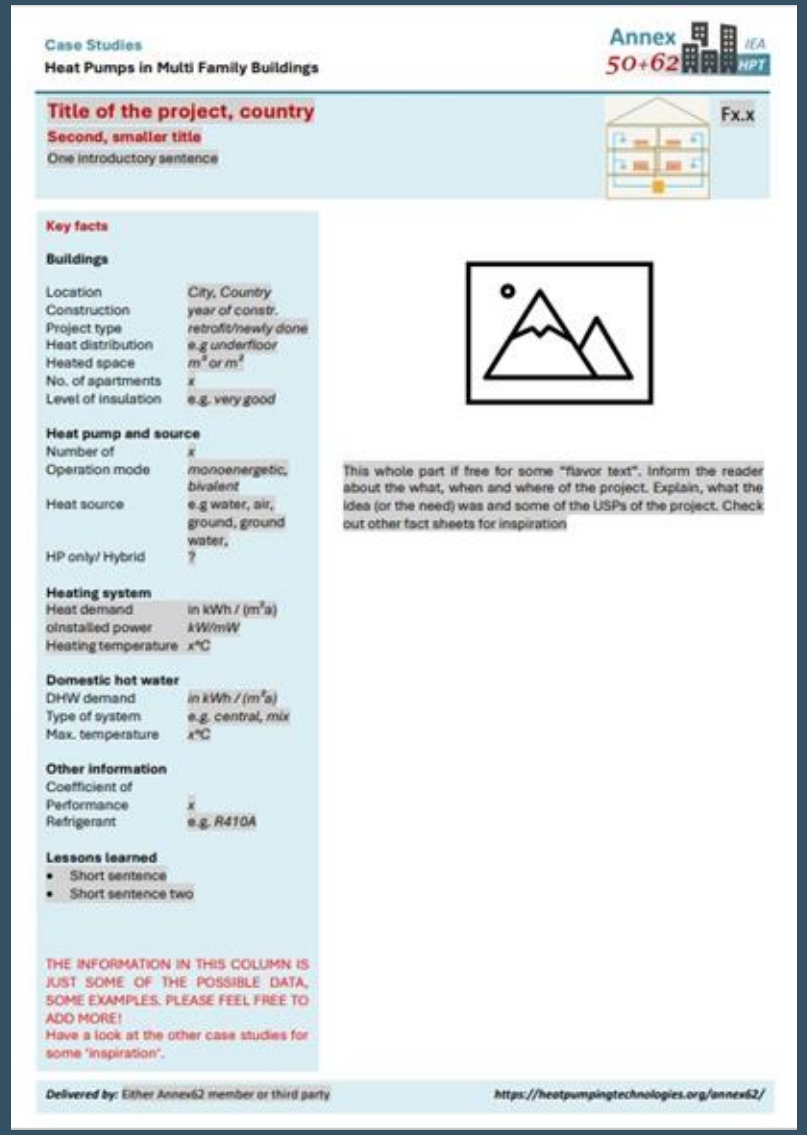
72 analyzed statistically

73% well insulated

Number of case studies per family category



Fact Sheet



Case Studies
Heat Pumps in Multi Family Buildings

Annex 50+62 IEA HPT

Title of the project, country

Second, smaller title

One introductory sentence

Fx.x

Key facts

Buildings

Location	*City, Country*
Construction	*year of constr.*
Project type	*retrofit/newly done*
Heat distribution	*e.g underfloor*
Heated space	*m^2 or m^2*
No. of apartments	*x*
Level of insulation	*e.g. very good*

Heat pump and source

Number of	*x*
Operation mode	*monoenergetic, bivalent*
Heat source	*e.g water, air, ground, ground water,*
HP only/ Hybrid	*?*

Heating system

Heat demand	*in kWh / (m^2a)*
oInstalled power	*kW/mW*
Heating temperature	*x°C*

Domestic hot water

DHW demand	*in kWh / (m^2a)*
Type of system	*e.g. central, mix*
Max. temperature	*x°C*

Other information

Coefficient of Performance	*x*
Refrigerant	*e.g. R410A*

Lessons learned

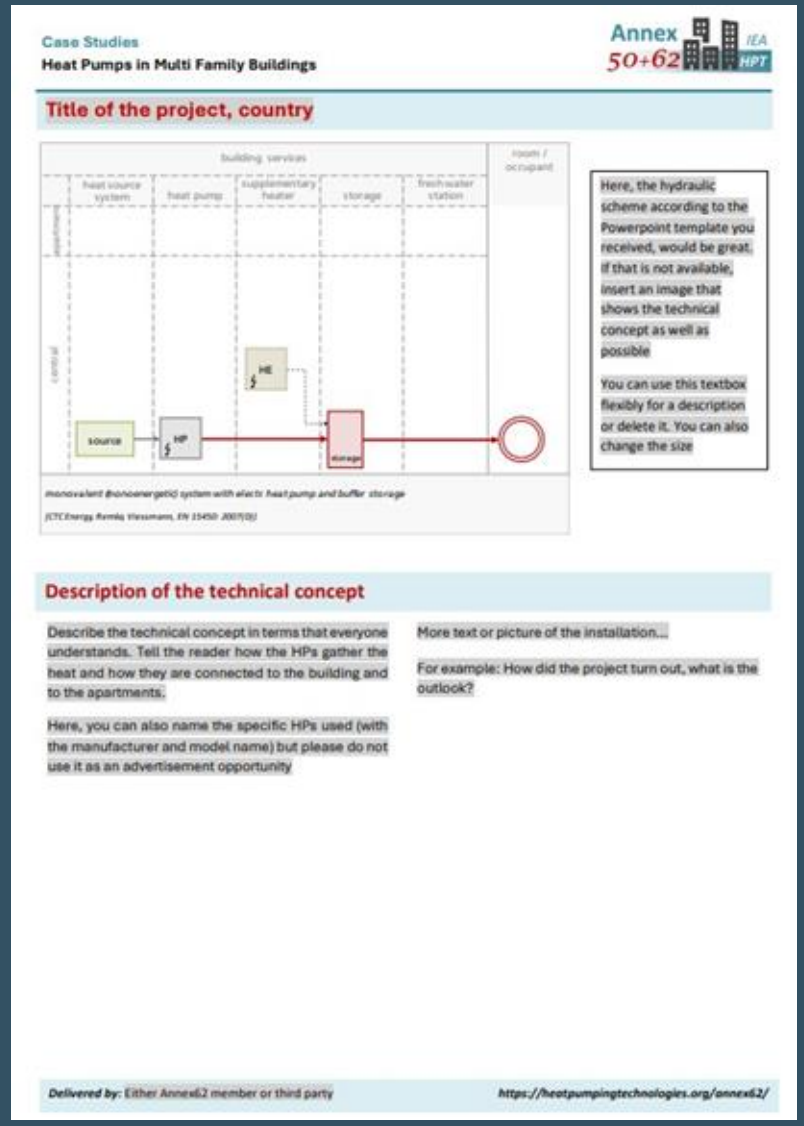
- Short sentence
- Short sentence two

THE INFORMATION IN THIS COLUMN IS JUST SOME OF THE POSSIBLE DATA, SOME EXAMPLES. PLEASE FEEL FREE TO ADD MORE!
Have a look at the other case studies for some 'inspiration'.

This whole part if free for some "flavor text". Inform the reader about the what, when and where of the project. Explain, what the idea (or the need) was and some of the USPs of the project. Check out other fact sheets for inspiration

Delivered by: Either Annex62 member or third party

https://heatpumpingtechnologies.org/annex62/



Case Studies
Heat Pumps in Multi Family Buildings

Annex 50+62 IEA HPT

Title of the project, country

monovalent (monoenergetic) system with electr. heat pump and buffer storage

(CTC Energy, formly Viessmann, EN 15450: 2007(3))

Here, the hydraulic scheme according to the Powerpoint template you received, would be great. If that is not available, insert an image that shows the technical concept as well as possible

You can use this textbox flexibly for a description or delete it. You can also change the size

Description of the technical concept

Describe the technical concept in terms that everyone understands. Tell the reader how the HPs gather the heat and how they are connected to the building and to the apartments.

Here, you can also name the specific HPs used (with the manufacturer and model name) but please do not use it as an advertisement opportunity

More text or picture of the installation...

For example: How did the project turn out, what is the outlook?

Delivered by: Either Annex62 member or third party

https://heatpumpingtechnologies.org/annex62/

Fact Sheet

Case Studies
Heat Pumps in Multi Family Buildings

Annex 50+62 IEA HPT

Wholly Renovated with Apartment Transfer Station, Germany

C1

In an 85-year-old building, heat pumps now provide Space Heating (SH) and Domestic Hot Water (DHW)

Key facts

Buildings

Location	*Cuxhaven, Germany*
Construction	*1938*
Project type	*retrofit 2023*
Heat distribution	*underfloor*
Heated space	*560 m²*
No. of apartments	---
Level of insulation	*good*

Heat pump and source

Number of	*2*
Operation mode	*monoenergetic*
Heat source	*air*
HP only/ Hybrid	*HP only*

Heating system

Installed Power	*2 x 16kW*
Model	*NIBE F2120-16*

Domestic hot water

Type of system	*central-decentral*

Other information

SCOP (35/55)	*5.1/3.9**
Refrigerant	*R410A*

**according to NIBE product flyer*

Lessons learned

- Static reconfiguration of the building was necessary in order to accommodate the additional weight from the underfloor heating in the upper levels.

The "*Eigentümergemeinschaft Cuxhaven-Döse*" (owners' association Cuxhaven-Döse) initiated a full refurbishment of a two-part multi-family building (MFB). It had originally been built in the span of 1935 to 1938 and received a complete thermal renovation.

The External Thermal Insulation Composite System (envelope/façade) has been brought up to date, the thermal insulation of the roof was renewed, all the windows and doors were replaced, and electrical sun blinds were installed. All these measures in combination led to the building conforming with the *Effizienzhaus 70* standard.

The statics of the building had to be adapted so that the added weight from the underfloor heating systems in the upper level apartments would not pose a threat.

Picture credits: Bundesverband Wärmepumpe bwp

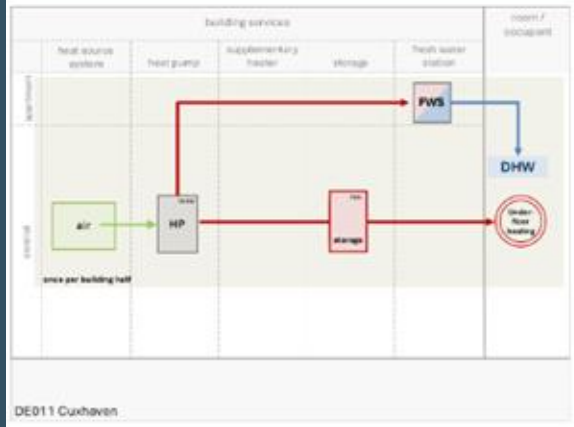
Delivered by: Bundesverband Wärmepumpe bwp

https://heatpumpingtechnologies.org/annex62/

Case Studies
Heat Pumps in Multi Family Buildings

Annex 50+62 IEA HPT

Wholly Renovated with Apartment Transfer Station, Technical details



DE011 Cuxhaven

The building is divided into two halves. For each, a central air-to-water heat pump with a control unit was installed and connected to a 700l buffer storage.

For domestic hot water (DHW), each single dwelling was equipped with Clage fresh-water transfer stations.

Pictures

Picture credits: Bundesverband Wärmepumpe bwp

Project 7x Heat Pumps in Action

- **Complete information for database and fact sheets on existing cases**
- **Define a threshold of minimal required information from the onset of Project 7x**
- **Define chances and “no-go’s” for case providers**
  - No advertising
  - Company logos?
  - Links?
  - …
- **China Case Studies**

HEAT PUMPS WATCH

Simone Piovesan (Clivet) & Sara Bordignon (Clivet)
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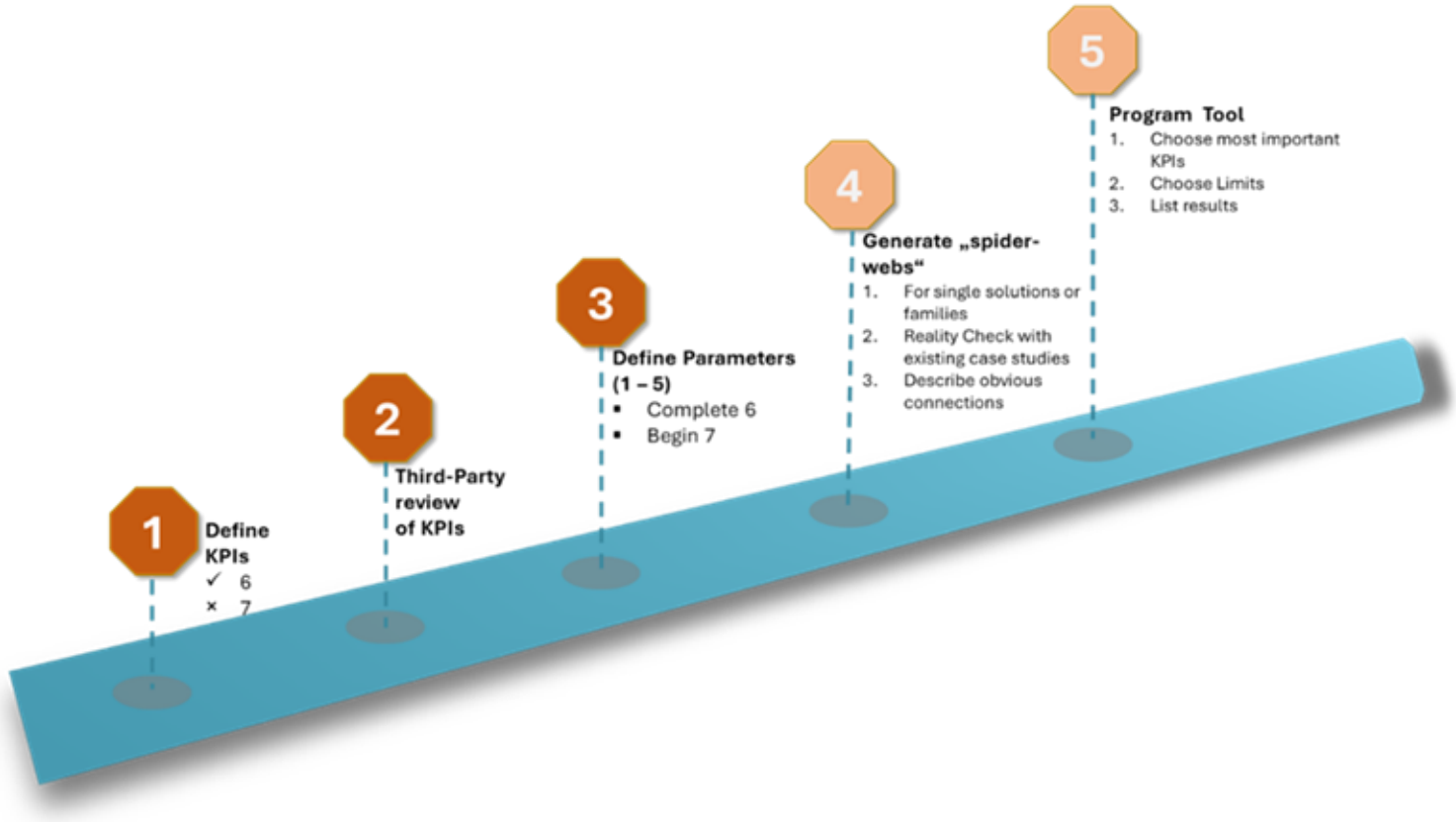
Key findings

- Solution tool

From *Solution Matrix* to *Solution Finder* - Bridging Deliverables

The Solution Finder tool serves as a **high-level pre-planning** framework, addressing the user to a possible pool of **technical solutions depending on** the characteristics of **the building** on which to apply the multi-family heat pump system, for the provision of space heating and domestic hot water production



Target groups

System Designers

Filter through several possibilities and adopt a fresh perspective on non-traditional design processes

Building Owners

Demonstrate that existing dwellings can be equipped with HP systems based on real-life success scenarios

Building Tenants

Increase awareness and acknowledge the possibilities for installation even without property ownership

HP Prospects

Guiding technical information toward effective selection processes based on specific boundary conditions

Solution tool’s key parameters definition

- **Primary Goal:** Effectively **differentiate** matrix classes (in the Classification Matrix) to ensure they **cover real-world cases** while remaining distinct from one another

- **Requirement:** Quantify suitability so the final tool can accurately categorize solutions without being overly complex

- **Selected Method:** The **Spider Chart** (where each axis equals one parameter), chosen for three main reasons:
  1. *Flexible* - New parameters can be easily integrated by adding new axes
  2. *Visual* - Differences between solutions are instantly recognizable and self-explanatory
  3. *Measurable* - The geometric area inside the chart generates a quantifiable, computational score for each class under specific conditions

Parameters

Metric Name	Classification Criteria	Value Scale (1-5)
Building Size	Large (>21), Medium (11-20), Small (<10 units)	Intuitive scaling for each criteria
Building Insulation Quality	Good (<60 kWh/m²), Average, Poor (>120 kWh/m²)	Intuitive scaling for each criteria
System Complexity	Number of interacting components (HP, boiler, tanks)	5 = Simplest: smallest number of interacting components 1 = Highest: smallest number of interacting components
Space Requirements	Inside dwelling/apartment, ouside the dwelling	5 = No space needed 1 = Dedicated/separate space needed
Fossil Energy Dependence	On-site percentage of fossil vs renewable heat	5 = 0% Fossil 1 = 51-71%
Heat Source Flexibility	Air, water, ground, ice storage, PVT potential	5 = All heat sources possible 1 = Single heat source possible

Note: Technical aspects like distribution system (floor heating, radiators, etc.) and DHW preparation method (direct, with storage, etc.) are identified for future refinement.

Parameters

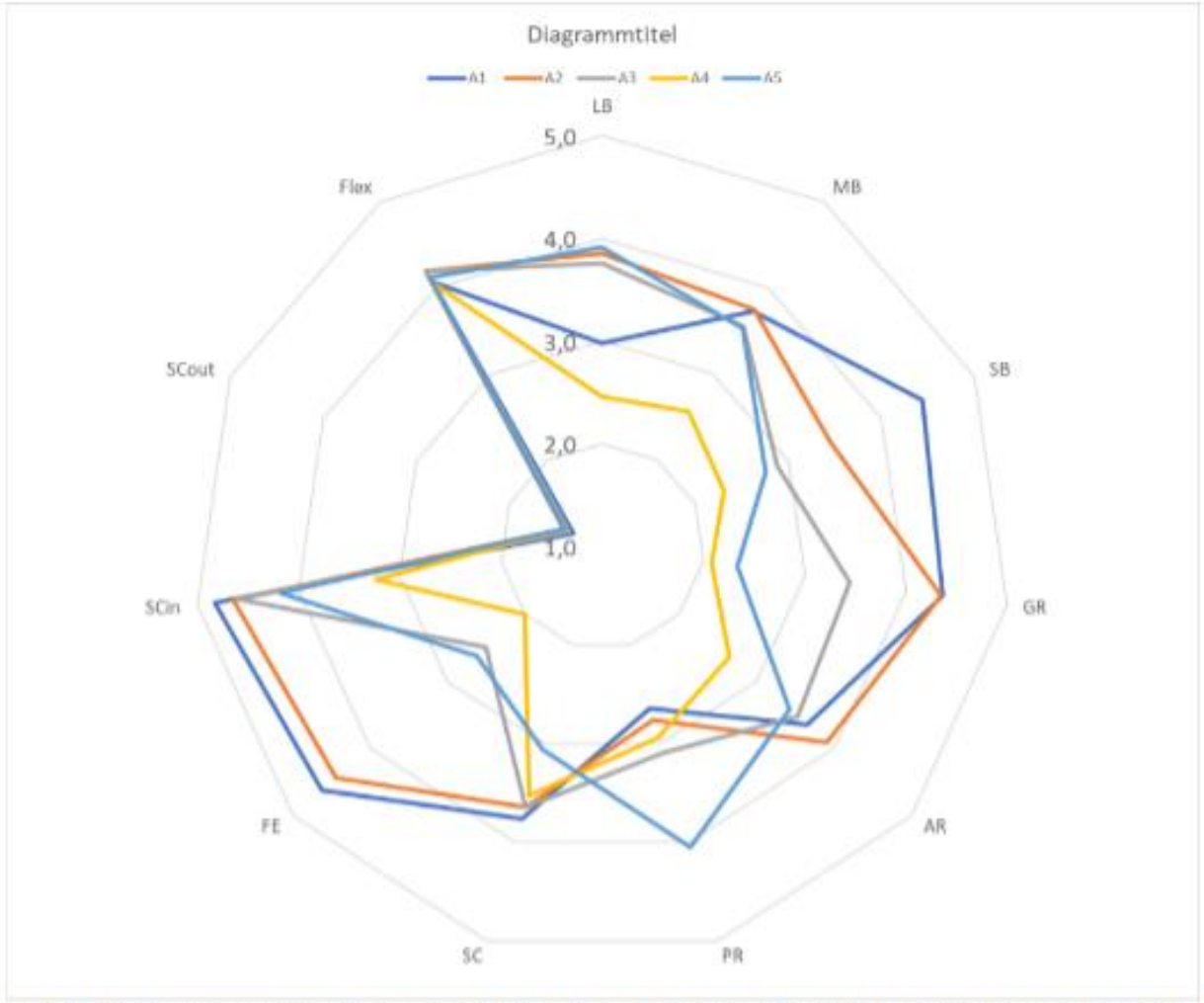


Figure 23: Visualization of the results for the Solution Tool in a spider map (Family A)

Parameter Testing & Validation

- **Validation Process:** The Spider Chart approach was tested through internal exercises and external expert workshops (including a July 2025 collaboration with Project 61) to establish a stable, statistical scoring method
- **Positive outcomes:**
  - *Improved Usability* - Initial feedback led to the removal of ineffective parameters
  - *Successful Differentiation* -The tests confirmed that the parameters and Spider Chart effectively distinguish between the various multi-family heat pump classes in the matrix
- **Identified limitations:**
  - *Knowledge Gaps* - Participants often lacked deep familiarity with the project's scope, tool targets, and user scenarios
  - *Misinterpretations* - Statistical outliers suggested that some participants misunderstood certain parameters or exhibited bias
  - *Small Sample Size* - The overall number of participants was too low to generate a scientifically robust, statistical pool of data

CLIVET

Thanks!

MBT Climate

Back to our quiz….

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Short Break (5 Min)

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Project 62 in the public eye

website, communication, dissemination; workshop results Heat Pump Conference

HPT TCP Project 62 Website

← Go to HPT TCP Website

Project 62 | About | Case Studies | Solution Matrix | Deliverables | Work structure

Ongoing

Welcome to the Project 62 of HPT TCP

Heat pumps for multi-family residential buildings in cities

This Project (formerly known as Annex) focuses on heat pump solutions for multi-family houses in high-density cities. In response to the demand of the participating countries new buildings and retrofit will be considered, as well as buildings with higher specific heating demand.

About the project

News About Project 62.

25 Jun 2026

Project 62 - Final Webinar

After 3 years, Project 62 is wrapped. The participating countries (Belgium, China, France, Germany, Italy, Spain, Sweden, and Switzerland) spent their efforts on exploring heat pump solutions for multi-family buildings in high density cities. Through a number of different tasks (see image), the findings of Project 62 offer insights on a holistic framework that couples a refined General Classification of heat pump solutions with an expanding case-study database and a decision-support tool to...

14 Nov 2025

Heating Cities in Transition 📍 Sweden

Across Europe and much of the industrialized world, cities are grappling with one of the largest energy transitions of our time: how to decarbonize the heating of homes and buildings. Heating represents a significant share of global energy use and greenhouse gas emissions, particularly in urban areas where multi-family residential...

07 Nov 2025

Heating transition made accesible and engaging through an infographic colouring book

Heating is political, complex, and crucial for Europe's climate goals. Although the sector is responsible for almost half of Europe's energy consumption, its necessary decarbonization is often overshadowed by dry debates. The heating transition book combines strong technological and political messages with a playful comic style – because the book...

17 Oct 2025

Heat the Streets - 21st Century version of the gas network

In Cornwall, the southest tip of the United Kingdom, a new project showcases a twenty-first century modern heating vision with networked heat pumps. The Heat the Streets initiative has provided practical evidence that networked ground source heat pumps offer a viable and scalable alternative to the UK's traditional gas infrastructure....

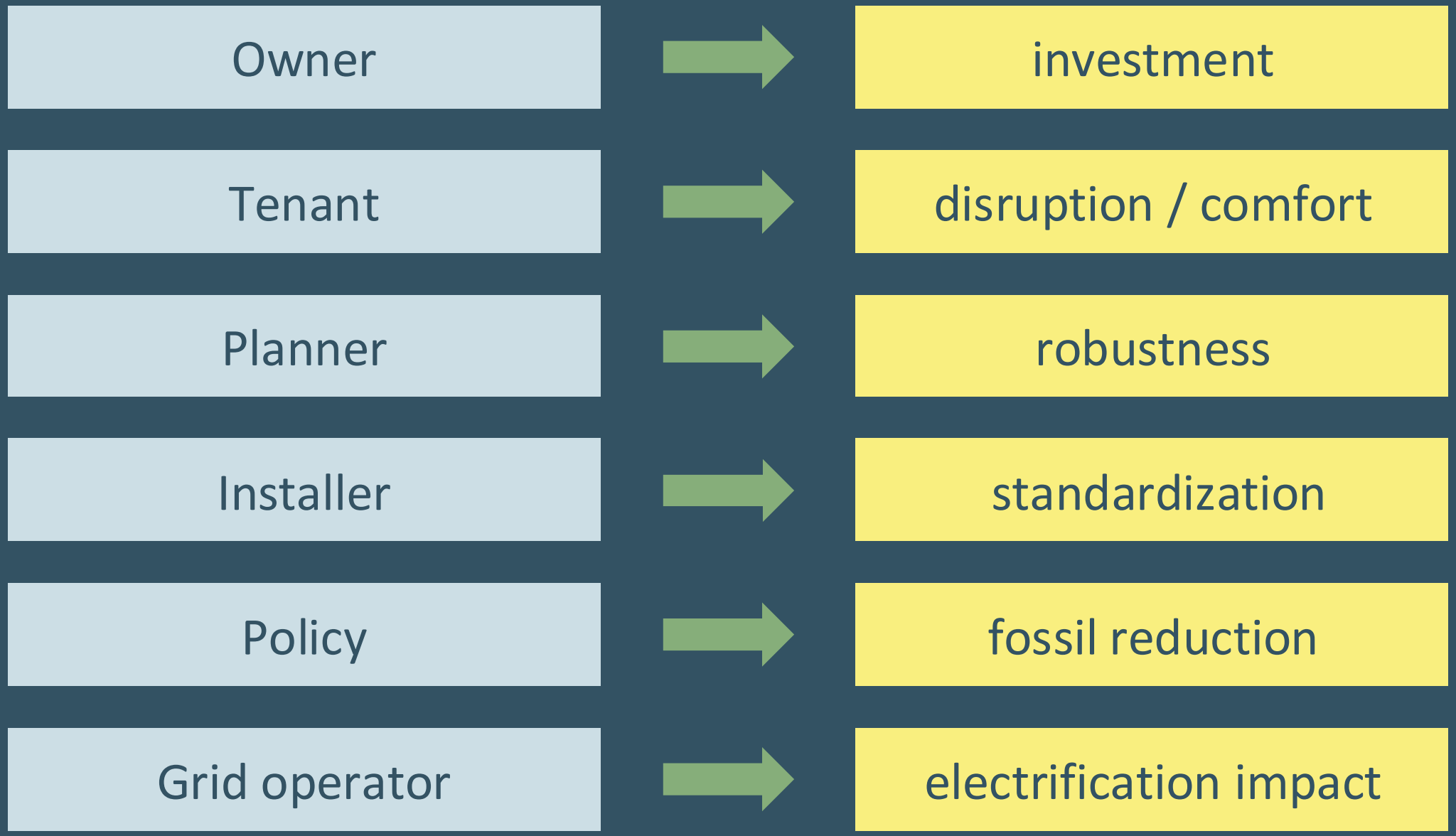
View all project news

New ways of communication

Extensive dissemination (±100 presentations in 3 years)

Workshop Annex 62, 26.05 15th IEA HPC

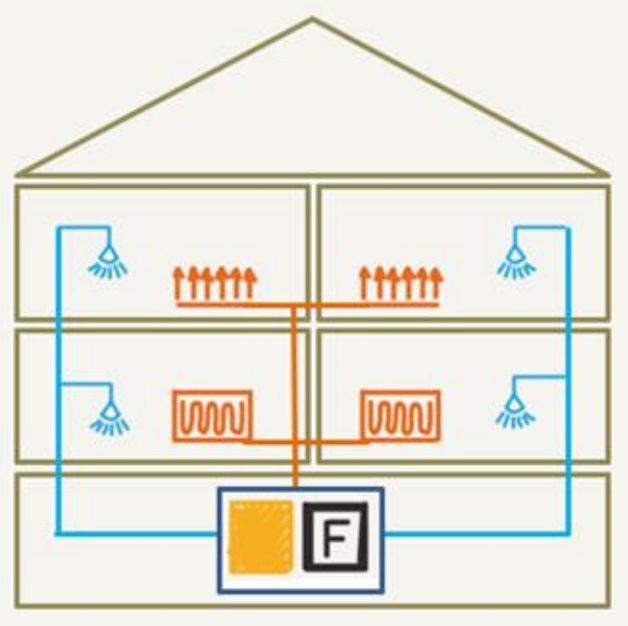
Different stakeholders optimize for different things



Existing MFB without renovation of the building envelope in Geneva, CH

2 central HPs (2x156kW), 4000 m² heated area, 53 apartments

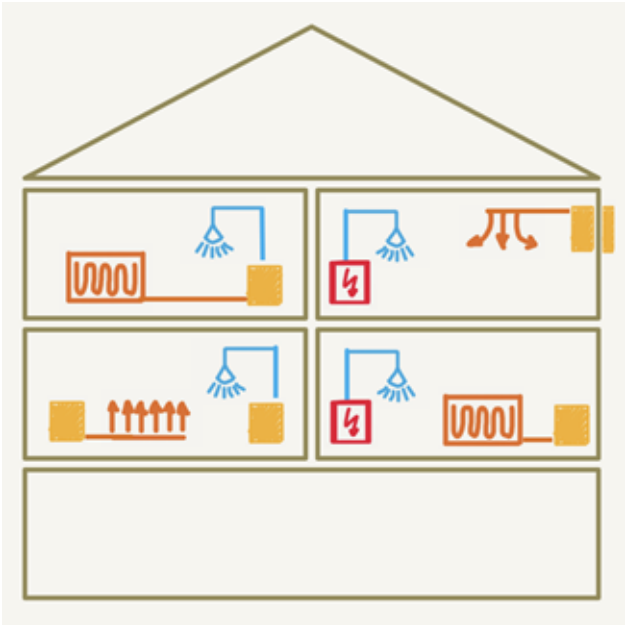
A.5 -> A.1



Exhaust Air Heat Pump per Apartment in Flers, FR

112 decentral heat pumps in each flat, compact all-in-one units with no outdoor units

D.1



Results Workshop

Setup

- ~60 participants, 5 stakeholder groups
- Reference building: 1968 apartment block, 32 units, end-of-life oil heating, condominium ownership, restricted noise zone

Priorities by role

- Each group weighted the seven Project 62 parameters differently
- Some priorities overlapped, others diverged sharply – lively debate

Solution recommendation

- Solution families A (centralised) and B (central-decentral) dominated
- Consistent with the actual distribution in the Annex 62 database

Back to our quiz….

HEAT PUMPS WATCH

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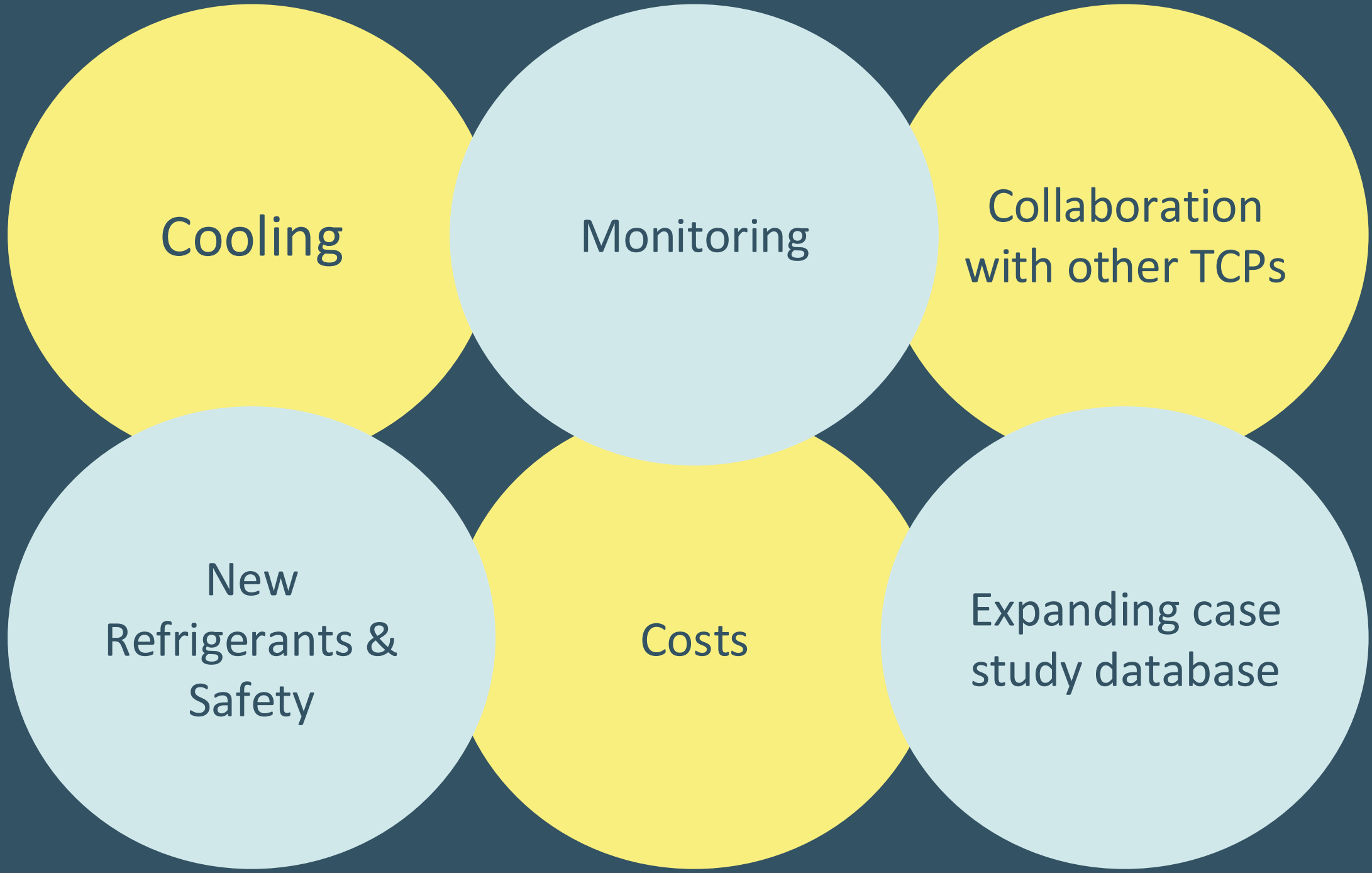
Future project: “Heat Pumps in Action”

The problem is no longer
“Can it work?”

The question is
“How can it scale?”


Cooling
Monitoring
Collaboration with other TCPs
New Refrigerants & Safety
Costs
Expanding case study database

Building the Knowledge Base for Heat Pumps in Multi-Family Buildings – IEA HPT Project Work

ANNEX 50 asked:

Which solutions are theoretically possible?

ANNEX 62 asked:

Which solutions fit real urban buildings?

PROJECT 7x asks:

How do we scale heat pumps in practice?

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Thank you!

Project 62 Family

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