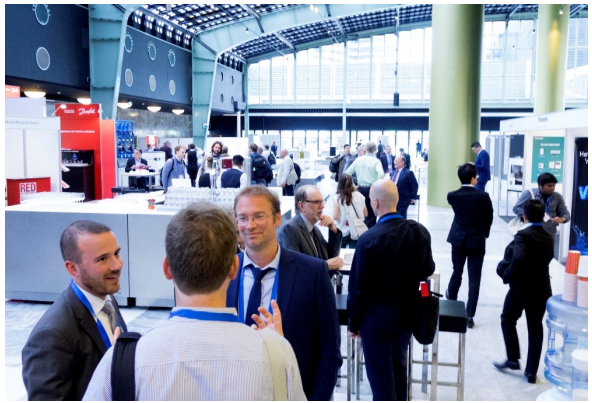
IEA Technology Collaboration Programme on Heat Pumping Technologies (HPT TCP)

Stephan Renz, Chairman IEA HPT TCP

Research, Development, Demonstration, and Deployment of Heat Pumping Technologies

14th IEA HEAT PUMP CONFERENCE
RENAISSANCE CHICAGO DOWNTOWN HOTEL
MAY 15—18, 2023 | CHICAGO, IL

14. Heat Pump Conference 2023, May 16

About Heat Pumping Technologies TCP

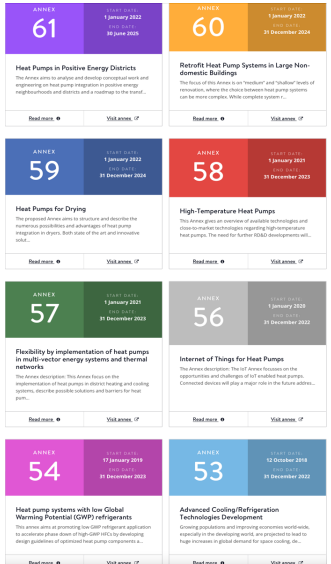
A Technology Collaboration Programme (TCP) within **the IEA** since **1978**

An international framework of **cooperation** and **networking**

A contributor to **technology improvements** by RDD&D projects

Collaboration & **Communication**
A forum to exchange of knowledge and experience

18 member countries



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RENAISSANCE CHICAGO DOWNTOWN HOTEL
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The 13th International Energy Agency HEAT PUMP CONFERENCE
RAMADA PLAZA HOTEL JEJU, KOREA | APRIL 26-29, 2021

12th IEA HEAT PUMP CONFERENCE
2017 | ROTTERDAM

14th IEA HEAT PUMP CONFERENCE
RENAISSANCE CHICAGO DOWNTOWN HOTEL
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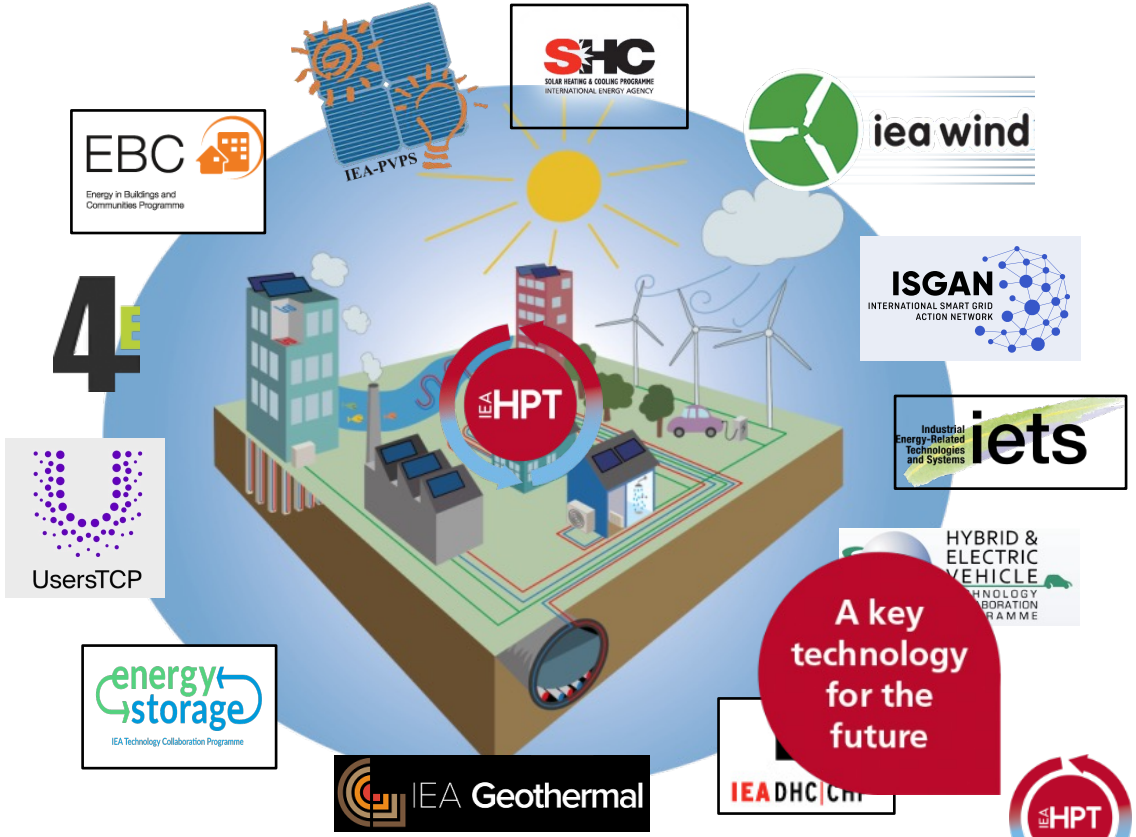
www.heatpumpingtechnologies.org

IEA HPT

IEA HPT-Vision *and* Collaboration with other TCPs

"Heat pumping technologies are the cornerstone

- for a secure, affordable, high-efficiency, clean and net-zero energy system
- for heating, cooling and refrigeration across multiple applications and contexts."



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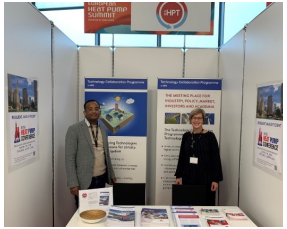
HPT TCP Organization and Management

Executive Committee

Heat Pump Centre

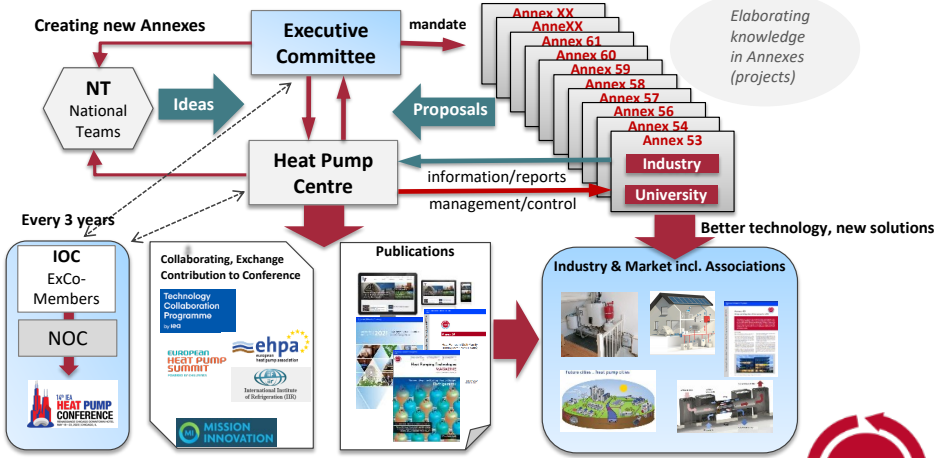


National teams

National experts meeting

Annexes

- **Executive Committee:** The board of HPT TCP - one vote per member country
- **The Heat Pump Centre:** The central program office and communication center of HPT TCP
- **National Teams:** Organizations representing national HPT activities. A forum for discussion networking and creation of new ideas. Meet at joint National Experts meetings.
- **Annexes:** Elaborating new knowledge through collaborative RDD&D work



RDD&D Priority Areas 2018 – 2023: Applications

Finalized **Ongoing** **Proposal and ideas**

Annex = Project with international collaboration of member countries. Duration is typically 3 - 4 years

Affordable and competitive technologies for heating

- Annex 46: Domestic hot water heat pumps
- Annex 50: Heat Pumps in Multi-Family Buildings for heating +DHW
- Annex 51: Acoustic Signature of Heat Pumps
- Annex 52: Long-term performance of GSHP Systems
- Annex 55: Comfort and Climate Box – Mission Innovation
- Annex 60: Retrofit Heat Pump in Larger Non-domestic Buildings
- Heat Pumps in residential multifamily buildings in cities

More efficient cooling and air-conditioning

- Annex 53: Advanced Cooling/Refrigeration Technologies
- CCB for warm and humid climates

Flexible, sustainable, and clean system solutions

- Annex 47: Heat Pumps in DHC systems
- Annex 49: Design and integration of heat pumps for nZEB
- Annex 57: Heat pumps in multi vector energy systems
- Heat Pumps for Positive Energy Districts
- Sector Coupling - Survey of practical examples

Digitalisation and Internet of Things

- Annex 56: Internet of Things for Heat Pumps
- Common communication protocols for heat pumps
- Using data to improve technology

New or special markets and applications

- Annex 48: Industrial Heat pumps – second phase
- Annex 58: High Temperature Heat Pumps
- Annex 59: Heat Pumps for Drying

New, alternative or natural refrigerants with lower global warming potential

- Annex 54: Heat Pump Systems with low GWP Refrigerants
- Safety Measures on Flammable Refrigerants

Horizontal themes

- Placement Impact on Heat Pump Acoustics
- Heat Pumps in a Circular Economy
- New or alternative business models

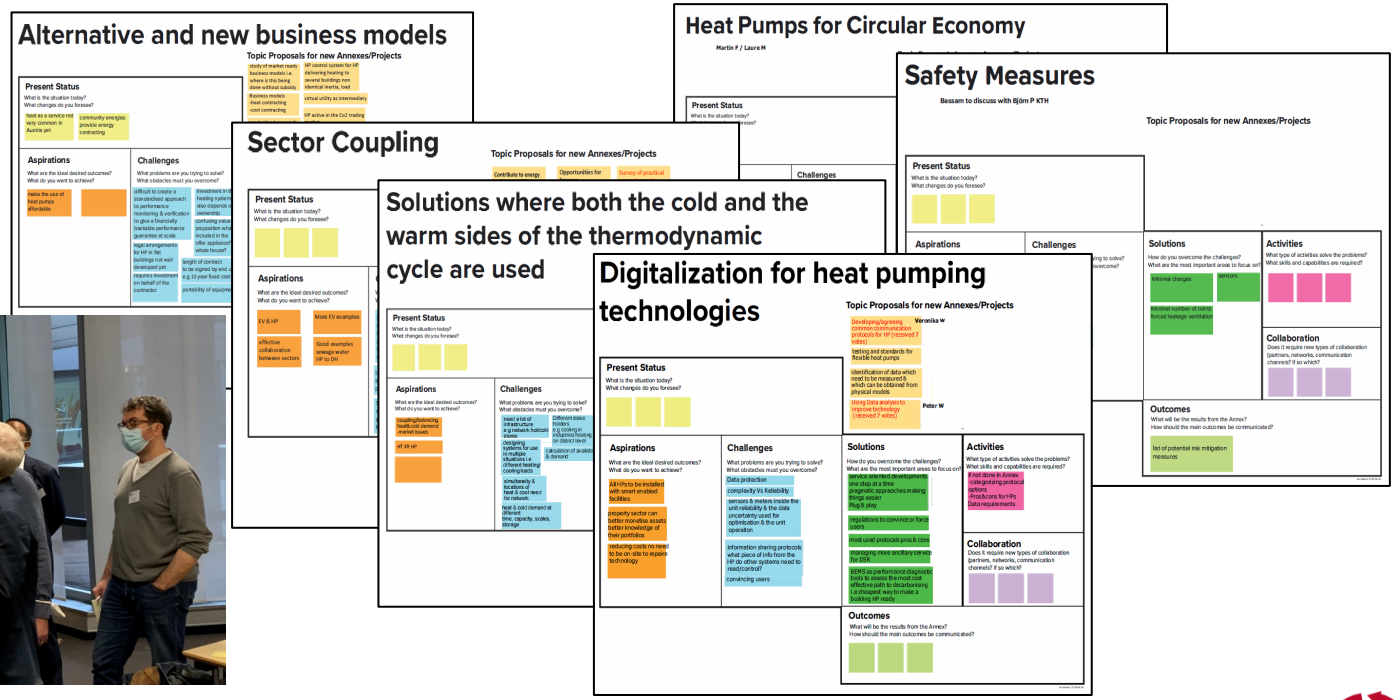
RDD&D Priority Areas 2023 - 2028

System integration	Robust, sustainable and affordable value chains	Extending operation range and applications	New technologies and refrigerants
			 
Sector coupling, energy efficiency, flexibility, resilience, storage, digitalization, positive energy districts	Improving affordability, securing value chains, circular economy, removing barriers for mass deployment	To fulfill demand from all climate zones, new markets, new applications and new demand. Refrigeration in emerging countries.	Non-traditional heat pumping technologies (for heating and cooling) Refrigerants (low GWP, safety etc.)
• Annex 56: IoT for Heat Pumps • Annex 57: Heat pumps in multi-vector energy systems • Annex 61: Heat Pumps in Positive Energy Districts **NEW** • CCB for cooling and dehumidification • Sector Coupling - Survey of practical examples • Digital Services for Heat Pumps	• Annex 63 Placement Impact on Heat Pump Acoustics **NEW** • Heat Pumps in a Circular Economy • New or alternative business models for heat pumps	• Annex 60: Retrofit Heat Pump in Larger Non-domestic Buildings • Annex 58: High Temperature Heat Pumps • Annex 59: Heat Pumps for Drying • Annex 62 Heat Pumps in residential multifamily buildings in cities **NEW**	• Annex 53: Advanced cooling and refrigeration technology development • Annex 54: Heat Pump Systems with low GWP Refrigerants • Annex 64: Safety Measures on Flammable Refrigerants **NEW**

Ideation according to the Strategic Work Plan of HPT TCP

Outcome from last National Experts Meeting October 2021 in Nuremberg

Next meeting in October 2023



Progress of Recognition of Heat Pumping Technologies

ETP2008

Heat pumps **first mentioned** in ETP

ETP2017

Heat pumping technologies are a **critical enabler** to reach **climatic ambitions**

ETP2020

Heat pumps need to **become the norm** for heating in buildings, contribute to decarbonization of the industrial sector and DH grids

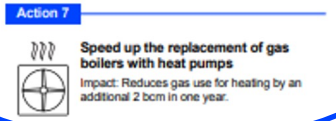
ETP2023

Heat pumps one of six, **most important clean** energy technologies analysed

IEAs NZE by 2045 Roadmap:

"In 2045 50% of the heating demand should be met by heat pumps"

IEAs 10-point plan to reduce dependance on Russian gas



REPowerEU

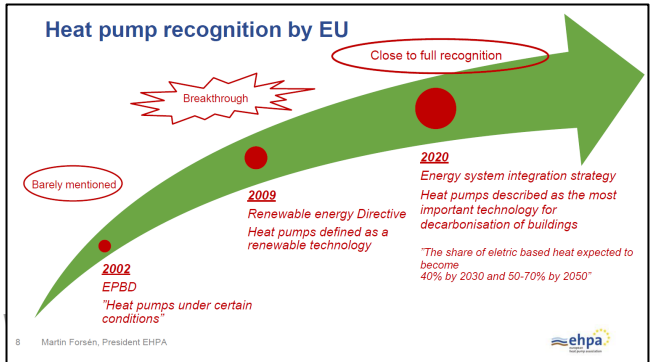
"Double the planned yearly pace of deployment of heat pumps"

Net Zero Industry Act

Heat Pump Action Plan

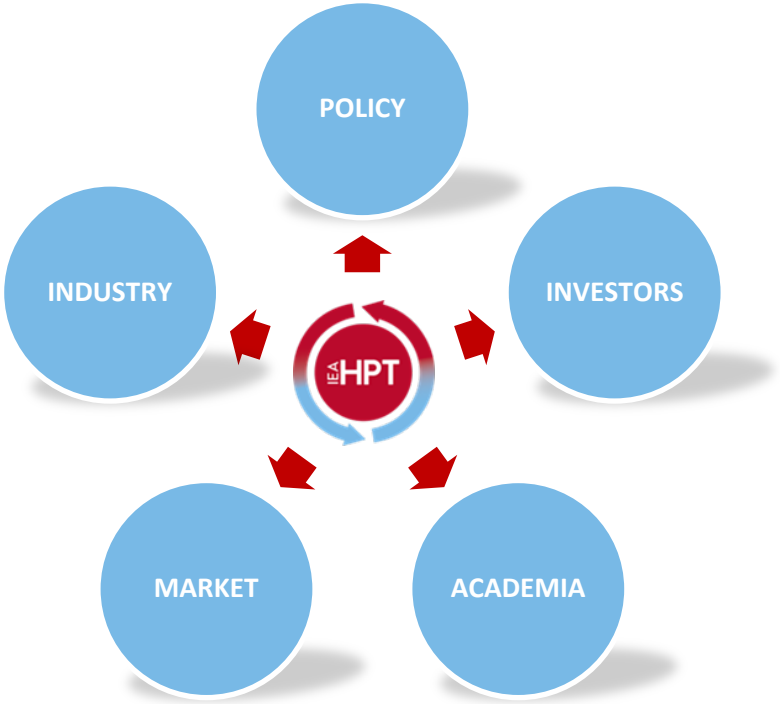
Heat Pumps prioritized in US Inflation Reduction Act (IRA) Defence Production Act (DPA)

From Martin Forsén's (EHPA) plenary lecture at the 13th IEA Heat Pump Conference 2021



Similar trends for recognition of heat pumps in other regions of the world

Contacts



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