



Heat Pump R&D in Austria

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IEA Activities

Other Projects

R&D Needs

Conclusions

Contents

- **IEA Heat Pump Activities @ IWT-TU Graz & AIT**
(Contributions to Current Annexes)
- **Other Projects Related to Heat Pumping**
- **Research Needs**
- **Conclusions**

IEA Activities

Current IEA Projects Related to Heat Pumps

Other Projects

R&D Needs

HPP Annex 34: Thermally-Driven Heat Pumps

Conclusions

HPP/IETS Annex 35/13: Industrial Heat Pumps

SHC Task 44: Solar and Heat Pump Systems

Austrian IEA participations are financially supported by



IEA Activities

HPP Annex 34 - Thermally-Driven Heat Pumps

Other Projects

R&D Needs

Duration: 10/2007 – 11/2009 + optional extension: → 12/2011

Conclusions

Main Contributions of AIT & IWT:

- State-of-the-art evaluation (AIT & IWT)
- Development of testing and performance evaluation procedures – Subtask lead (AIT)
- Investigation of corrosion and ammonia decomposition phenomena at high temperatures (IWT)
- Demo-Project Gas-AHP (IWT)

Related National Project

- InnoGEN: Development of a highly efficient direct gas-fired generator for a NH₃/H₂O AHP & investigation of corrosion and ammonia decomposition phenomena (AIT, IWT, Heliotherm)



Source: Helioplus, 2008

IEA Activities

HPP Annex 35 - Industrial Heat Pumps

Other Projects

Duration: 05/2010 – 04/2013

R&D Needs

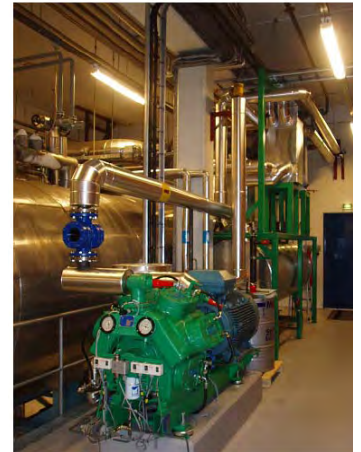
Conclusions

Main Contributions of AIT & IWT

- Evaluation of HP market and existing application in Austria
- Analysis of available software tools
- Case studies of existing applications
- Participation in meetings and dissemination of findings in Austria

Related National Project

- Applied for “Promise Demo IF”: Case study - Integration of a high temperature HP in an industrial company (IWT & others)



Source: <http://www.hybridenergy.no>

IEA Activities

SHC Task 44 – Solar and Heat Pump Systems

Other Projects

Duration: 05/2010 – 04/2013

R&D Needs

Conclusions



Main Contributions of AIT & IWT

- State-of-the-art investigation (AIT & IWT & Others)
- Development of testing and performance evaluation procedures as well as a proposal for labelling schemes – Subtask lead (AIT)
- Analysis of different concepts for the combination HP & Solar (system simulations) (IWT)

Related National Projects

- WRGpot: Waste water heat recovery in low energy buildings – potential and concepts in combination with solar energy and HPs (AEE Intec, IWT & Others)
- SolPumpEff: Efficient combinations of solar thermal systems and HPs incl. field tests (AEE Intec, IWT, Solution & Ochsner)

IEA Activities

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Other Heat Pump Projects @ IWT (1/4)

Title: "ThermoPump"



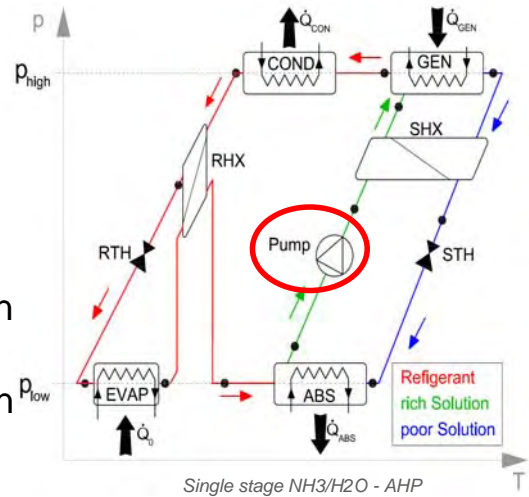
Thermally Driven Solution Pump for Small-Capacity NH₃/H₂O-Absorption Heat Pumping Systems (AHPs)

Duration: 05/2010 – 10/2012

Project Partners: IWT + Pink & Heliotherm

Main Contents of the Project:

- Theoretical and experimental analyses of different concepts for "thermally driven" solution pumps
- Development of a cost-efficient thermally driven solution pump for small-capacity AHPs



IEA Activities

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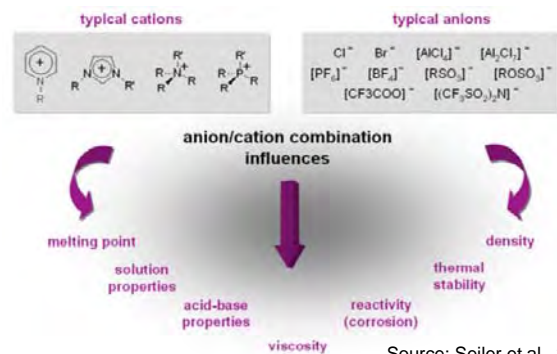
Other Heat Pump Projects @ IWT (2/4)

Title: "IonA" – Feasibility Study of Absorption Heat Pumping-Processes with Ionic Liquids

Duration: 05/2010 – 07/2011

Main Contents of the Project:

- Search for most promising ionic liquids and property data
- Carry out thermodynamic simulations
- Identify possible follow-up projects & partners



IEA Activities

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R&D Needs

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Other Heat Pump Projects @ IWT & AIT (3/4)

Title: “Solar Cooling Opt” – Primary Energy Optimization of Solar Thermal Cooling Applications with Efficient System Equipment and Innovative Control Strategies

Duration: 10/2010 – 12/2013

Project Partners: AEE Intec, AIT, IWT... (15 project partners)

Main Contents of The Project:

- Development of improved component models for simulation studies
- Generation of load profiles
- Development of optimized system concepts and control strategies



Source: Pink GmbH, 2010 (<http://www.pink.co.at>)

IEA Activities

Other Projects

R&D Needs

Conclusions

Other Heat Pump Projects @ IWT (4/4)

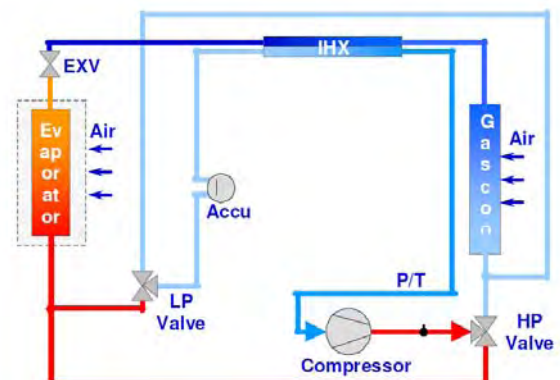
Title: HEKH 744 – Highly Efficient A/C & Heating System for Electrical & Hybrid Vehicles

Duration: 01/2010 – 12/2011

Project Partners: Virtual Vehicle Competence Centre, Obrist, IWT

Main Contents of the Project:

- Component Development
- System integration & control strategies
- Simulation & experimental analysis (focus on heating mode)





IEA Activities

R & D Needs

Other Projects

R&D Needs

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- **Alternative Cycles/Systems**
- **Alternative Refrigerants: Low-GWP fluids**
- **High Temperature Applications (industrial, retrofit)**
- **Cost-efficient Heat Source Systems**
- **Low-cost Components**
- **Reduction of Parasitic Power Consumption**
- **Capacity Control**
- ...



IEA Activities

Conclusions

Other Projects

R&D Needs

Conclusions

- **Austria is participating in several IEA Annexes & Tasks related to Heat Pumping (HPP Annex 34 & 35, SHC Task 44)**
- **Other R&D projects deal e.g. with thermally driven systems, ionic fluids, mobile applications**
- **Further R&D topics are defined**

Thank You for Your Attention!