

# Technology Collaboration Programmes

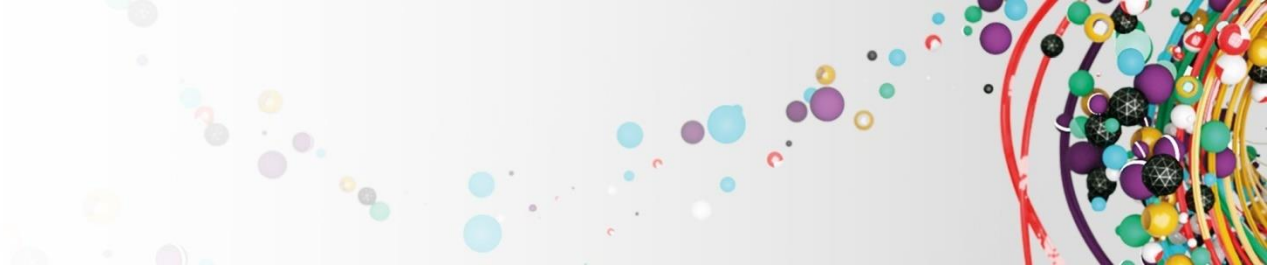
**78<sup>th</sup> Meeting of the Committee on  
Energy Research and Technology  
10 – 11 October 2017**

**Working Party on Energy End-Use  
Technologies**

**Annual Report**

***Gudrun Maass, EUWP Chair***





## **Key Message**

**Using the full potential for the reduction of energy end-use consumption can lead to a reduction of CO<sub>2</sub> emissions of about 35 %.**

**Urgently needed to achieve the goal of a “well-below” 2 degrees scenario.**

# EUWP Portfolio

- **Very broad, concerning four sectors: Industry, Buildings, Electricity, Transport**
- **14 TCPs in the above sectors**



# Ongoing and Planned Activities of the EUWP

# New RfE Procedure

- New RfE procedure partly applied with extensions last year, in particular new WP feedback form submitted to CERT
- New RfE procedure fully applied this year, documents submitted according to new guidelines and instructions, WP feedback form used
- Experience: New structure of submission facilitates evaluation by WP, much easier to read and to understand

# New CERT Communication Framework

- Overall good experience
- New form for Annual Briefs (2-pager) already used for the last 3 years
- CERT workshop with TCPs: format of February 2017 with a thematic focus appreciated, involvement of EUWP Vice-Chairs positive
- Strategic Information 18 – 12 months before end – of - term difficult timing: 12 months absolute limit; therefore this information will be collected for the first time for the CERT meeting in February 2018 for 5 TCPs



# Other instruments of interaction between EUWP and TCPs

- **Workshops with TCPs prior to March meetings; example: Gaps and Barriers in March 2017**
- **Roundtable with TCPs to address their concerns at March meeting**
- **Close interaction between Chair, Vice-Chairs and TCPs, Coordination Groups as an important platform for this interaction**

# Ongoing activities

- Advise TCPs on strategic objectives and possibilities, example: Guidelines for Policy Briefs
- Mapping of TCPs' activities (in-kind contribution from Austria); results available in March 2018
- Evaluation of EUWP strategy (achievements and challenges concerning objectives); results available for CERT June meeting 2018



# Planned future activities and priorities

- **Identify practical means to enable TCPs to contribute to Mission Innovation and the Clean Energy Ministerial**
- **Include TCPs proposals into WP workplan**
  - **Discuss ways to facilitate joint TCP activities**
  - **Intensify efforts to establish a joint TCP platform for education activities**



# TCPs' achievements and challenges

# Industry

- **Responsible Vice-Chair: Position vacant, presently managed by EUWP Chair**
- **Brainstorming meeting of Coordination Group held in May 2017; further planning with new VC**
- **Only one TCP in this area with a very broad portfolio: Industrial Energy-related Technologies and Systems (IETS TCP)**



- **10 members; new: Austria, Canada to join in January 2018**
- **High-level Expert Workshop on Process Integration in Berlin, April 4-5, 2017. 30 people with expertise and experience in the field. Results about to be published.**
- **BioEnergy Week in Gothenburg May 15 - 19, 2017, co-arrangement between the BioEnergy TCP and IETS; programme included a joint workshop on industrial biorefineries.**
- **New theme: Industrial automation and digitalization, Workshop in Canada, November 2017**

# Electricity

- **Responsible Vice-Chair: Michele de Nigris, Italy**
- **Three TCPs in this area:**
  - **Demand-Side Management (DSM TCP)**
  - **High-Temperature Superconductivity (HTS TCP)**
  - **Smart Grids (ISGAN TCP)**
  - **All of the above TCPs have intensive activities for education and capacity building**
  - **Joint Workshop: Energy Efficiency in Future Electricity Systems, 31 January 2017**
  - **Joint session on collaboration at ISGAN International workshop in Genk – 12 september 2017**



- 15 members, 3 sponsors
- Important for DSM TCP: increasing renewable options, electrification, increasing ICT possibilities
- Challenge: addressing questions of social sciences and financial schemes
- Task „Integration of Demand Side Management, Distributed Generation, Renewable Energy Sources and Energy Storage Phase III completed in October 2016
- New task proposals: Active Prosumer Networks, Data Analytics
- Presently problems on future strategy and TCP development, VC is advising

- **9 members; request from France received**
- **Aim: Advance superconductivity in order to improve generation, transmission, distribution and use of electric power**
- **HTS FCLs improve system reliability for highly meshed grids and also when renewables and distributed generation are added to the grid. One company sold its first commercial FCL product in 2016.**





- **Joint endeavour of IEA and Clean Energy Ministerial**
- **24 countries participating, UAE to sign, Malaysia invited**
- **Focus for 2017 is flexibility and digitalisation**
- **Activities showcase good practices for development and implementation of smart grids pilots, demonstrations and deployment, identify areas for increased attention and investment, improve international collaboration on smart grids testing and evaluation and enable a global community of smart grid practitioners**
- **A number of tools have emerged to evaluate progress on smart grids, but there are still persistent gaps in standard metrics and data collection internationally to be filled.**

# Buildings

- **Responsible Vice-Chair: Sabine Mitter, Austria**
- **Five TCPs in this area:**
  - **Buildings and Communities (EBC TCP)**
  - **District Heating and Cooling including Combined Heat and Power (DHC TCP)**
  - **Energy Efficient End-Use Equipment (4E TCP)**
  - **Energy Storage (ECES TCP)**
  - **Heat Pumping Technologies (HPT TCP)**
- **Coordination Group meeting in February 2017, joint activity discussed: urban systems; next meeting in January 2018**

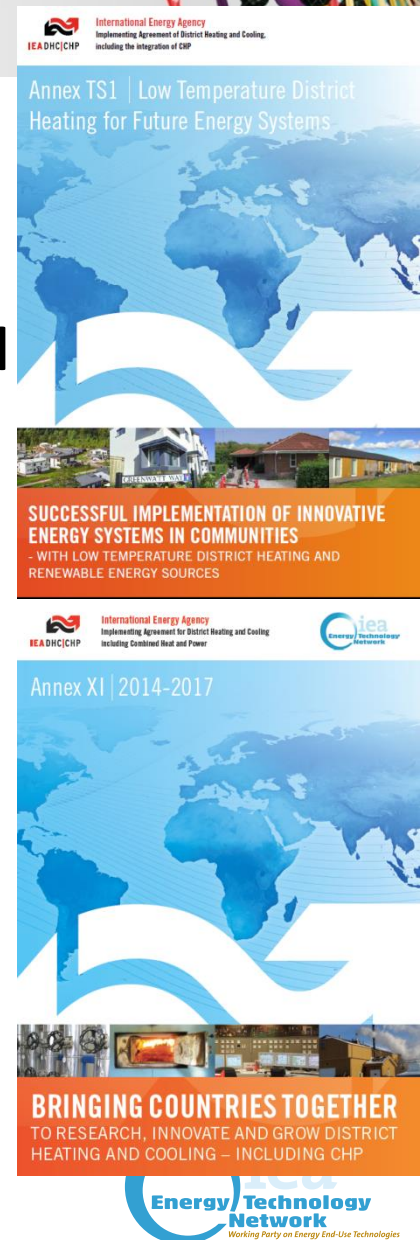
# Energy in Building and Communities

- 26 members (FIN new)
- Mid-Term Assessment of Strategy
- Annual Report 2016 and Newsletter printed and on Website: [www.iea-ebc.org](http://www.iea-ebc.org) (project reports, 2pager Factsheets...)
- 19 ongoing projects (task-shared, joint task experience)
- Crosscutting Working Group Smart Cities and Communities
- Future Building Forum in Singapore  
24-25th Oct 2017, EBC, ECES, HPT, DHC, SHC, PVPS, 4E, DSM, ISGAN, EUWP



# District Heating and Cooling

- 10 members (AUT new)
- 4 Cost-shared Projects of “Annex XI” to be finalised
- “Annex XII” Cost-shared call for 2017-2019 launched decision made in May 2017
- 15<sup>th</sup> DHC Symposium in Seoul, 6 awards for “Excellence in district heating research”
- Introduction Video on [www.iea-dhc.org](http://www.iea-dhc.org)
- New Task-Shared Annexes to be started (Hybrid Energy Networks, Low Temperature DH-Systems)





# Energy Conservation through Energy Storage

- 18 members
- New communication plan (incl. newsletter, website relaunch) in progress
- Website: <https://iea-eces.org/>
- 4 ongoing Annexes
- Annual Report 2016
- Storage Workshop in Munich at March 2016
- EUWP Meeting



# 4<sup>E</sup> Energy Efficient End-Use Equipment

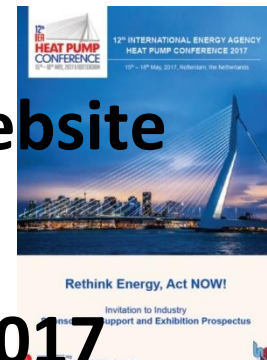


- 12 members
- Annual report 2016, „Bright Spark“ Newsletter
- Website: [www.iea-4E.org](http://www.iea-4E.org) (Reports, Fact-Sheets, ...)
- new activities under Electronic Devices and Networking Annex (e.g. Efficiency of Electric Vehicle Supply Equipment, Always On Devices)
- Introductory Video <https://edna.iea-4e.org/about>
- Collaboration with other Efficiency Policy Networks (SEAD - Super-efficient Equipment and Appliance Deployment, Connected Devices Alliance)
- *“The energy efficiency of major appliances in countries with Energy Efficiency Standards and Labelling programs have increased at more than three times the underlying rate of technology improvement”*

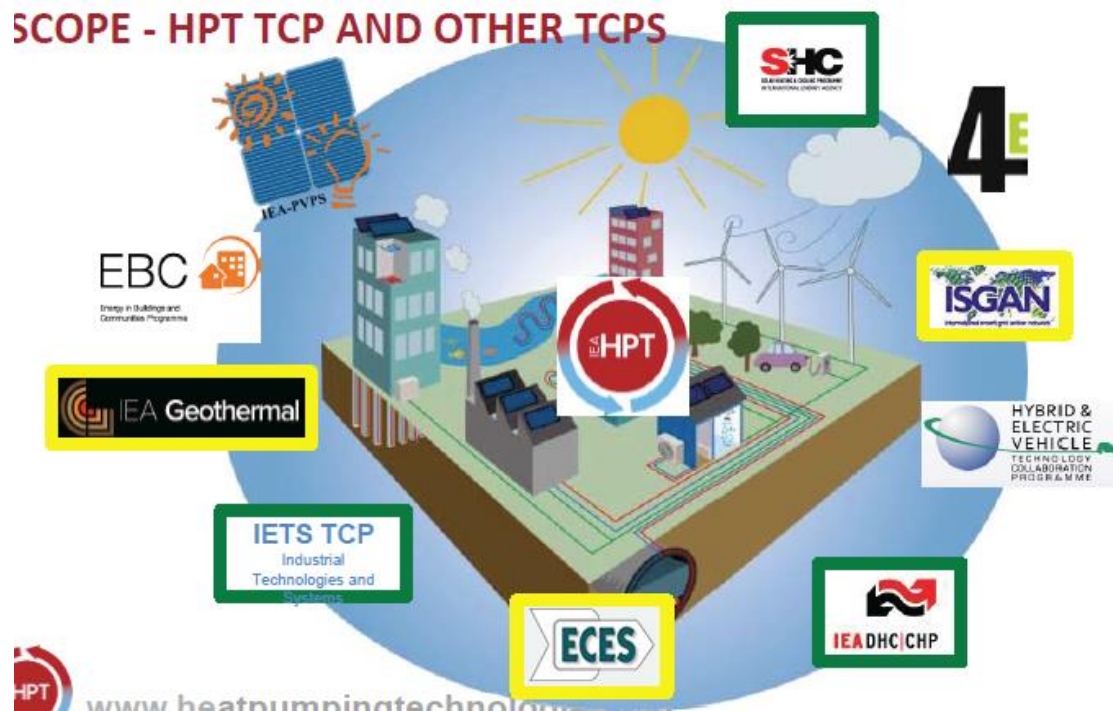


# Heat Pumping Technologies

- 16 members
- New Communication Strategy, new Logo, new Website
- <http://heatpumpingtechnologies.org/>
- 12th Heat Pump Conference in Rotterdam May 2017  
incl. Peter Ritter von Rittinger Award
- Annual Report 2016
- Heat Pumping Magazin
- 11 ongoing Annexes
- New - Acoustic Signatures Annex,  
2 Page Summaries



SCOPE - HPT TCP AND OTHER TCPS





# Transport

- **Responsible Vice-Chair: Carol Burelle, Canada**
- **Five TCPs in this area:**
  - **Advanced Fuel Cells (AFC TCP)**
  - **Advanced Materials for Transportation (AMT TCP)**
  - **Advanced Motor Fuels (AMF TCP)**
  - **Hybrid and Electric Vehicles (HEV TCP)**
  - **Clean and Efficient Combustion (Combustion TCP)**
  - **Coordination Group meeting in September 2017, main discussion item: collaboration between TCPs in the sector and with the IEA Secretariat**



# Advanced Fuel Cells

- 12 member countries and 1 sponsor, China and Spain to join
- Dissemination/Example: Bi-annual newsletter, approx. 500 addressees
- Within the last 2-3 years major Asian automakers (Toyota, Honda, and Hyundai) have introduced fuel cell electric vehicles (Mirai, Clarity, and Tucson) for limited commercial lease or sale to consumers. More widespread commercialization of FCEVs will require increased durability of membrane electrode assemblies (5000-8000h) at acceptable Pt loadings (0.125 mg/cm<sup>2</sup>) and lower fuel cell system costs (<\$30/kWe).
- Renewable H<sub>2</sub> production and fuel cell vehicles can combine to reduce German GHG emissions by 80% in 2050.

# **Advanced Materials for Transportation**

- **10 member countries, Austria and Brazil invited**
- **Results/Examples:**
  - **Fuel economy improvement of Internal Combustion engines is the key to reduce CO2 emission and achieve energy savings. About 1.2B vehicles operating in the world and 85M new vehicles are being produced annually. Electric vehicles will remain a small fraction of the total vehicle population by 2030.**
  - **Demonstrated friction surface technology can achieve 2% fuel economy improvement.**
  - **Intensive exchange of personnel between participating institutions**

# Advanced Motor Fuels

- **16 member countries (specific: Chile, Israel, China, Thailand), France and Italy withdrew**
- **Results/Examples:**
  - **Advanced renewable fuels will help to reduce greenhouse gas emissions in applications for which electrification is not feasible.**
  - **First and foremost, the emission control technology and not the fuel, determines the regulated emissions of a vehicle.**
  - **The carbon intensity of the fuel or the energy carrier is decisive for well-to-wheel CO2 emissions, not vehicle technology.**

# Hybrid and Electric Vehicles

- **17 members; 1 sponsor, various countries invited**
- **Messages are on vehicle deployments:**
  - **Hybrid and electric vehicles contribute energy saving, CO2 reduction and energy security because of their high fuel economy and diversity of electricity sources.**
  - **Several countries have taken results into account for their energy policy. As examples, Spain, Scotland, Turkey, and South Africa used information from HEV-TCP to guide the development of their electric vehicle roadmaps.**
  - **Over 12 million hybrid electric vehicles have been sold worldwide.**
  - **Over 2 million plug-in electric vehicles have been sold worldwide.**

- **11 members, withdrawal of Italy and Belgium**
- **Messages by annex with a high level of detail. Examples include:**
  - **Laser based diagnostic techniques provide knowledge needed for improving combustion processes to reduce CO<sub>2</sub> and other environmentally harmful emissions.**
  - **Enhanced injection and spray technologies will enable future high efficiency and nearly zero emission low temperature combustion engines through enhanced control of the formation of the air/fuel mixture.**
  - **Low Temperature Combustion (LTC) strategies hold potential for both significant reductions in fuel consumption as well as reduced pollutant emissions.**
  - **Assessment of the GHG reduction potential of advanced combustion strategies coupled with renewable fuels, and comparison with the potential of other transportation de-carbonization options, informs policy makers regarding appropriate transportation energy policies.**



**Thanks to support from Vice-Chairs. Without them  
complex portfolio could not be handled**

**Thanks to colleagues from the Secretariat to keep the  
EUWP going**