Special session

Technology Collaboration Programmes

Buildings

Buildings energy efficiency sessions in partnership with:

BEEP

INDO-SWISS BUILDING ENERGY EFFICIENCY PROJECT

IEA #energyefficientworld

Energy Efficiency Training Week: Buildings programme

1. **Where to start:** Energy use in buildings
2. **Where to start:** Energy efficiency potential in buildings
3. **Toolkit:** Energy efficient building design
4. **Toolkit:** Energy efficient building technologies

   Special session. Technology demonstration

   Where do I get help? IEA's Technology Collaboration Programmes
5. **Toolkit:** Energy efficiency policies and target setting
6. **What are the steps?** Enabling investment with energy efficiency policies
7. **What are the steps?** Implementing building energy codes and standards
8. **What are the steps?** Building operations and procurement

   Special session. The multiple benefits of energy efficiency
9. **Did it work?** Evaluation and energy efficiency indicators

   Where do I get help? International and regional energy efficiency initiatives
10. **Energy efficiency quiz:** Understanding energy efficiency in buildings

Where do I get help: IEA's Technology Collaboration Programmes

Trainers: Brian Dean

Purpose: To discuss the international network of experts working on research projects, including Energy in Buildings and Communities (EBC), District Heating and Cooling (DHC), Heat pump technology (HPT), and Energy Efficient End-Use Equipment (4E) TCPs.

IEA Technology Collaboration Programmes

- **1975: IEA founders created a framework for sharing resources and accelerating technology RDD&D**
  - The IEA Implementing Agreements (IAs)
  - Flexible, time-proven, cost-effective mechanism

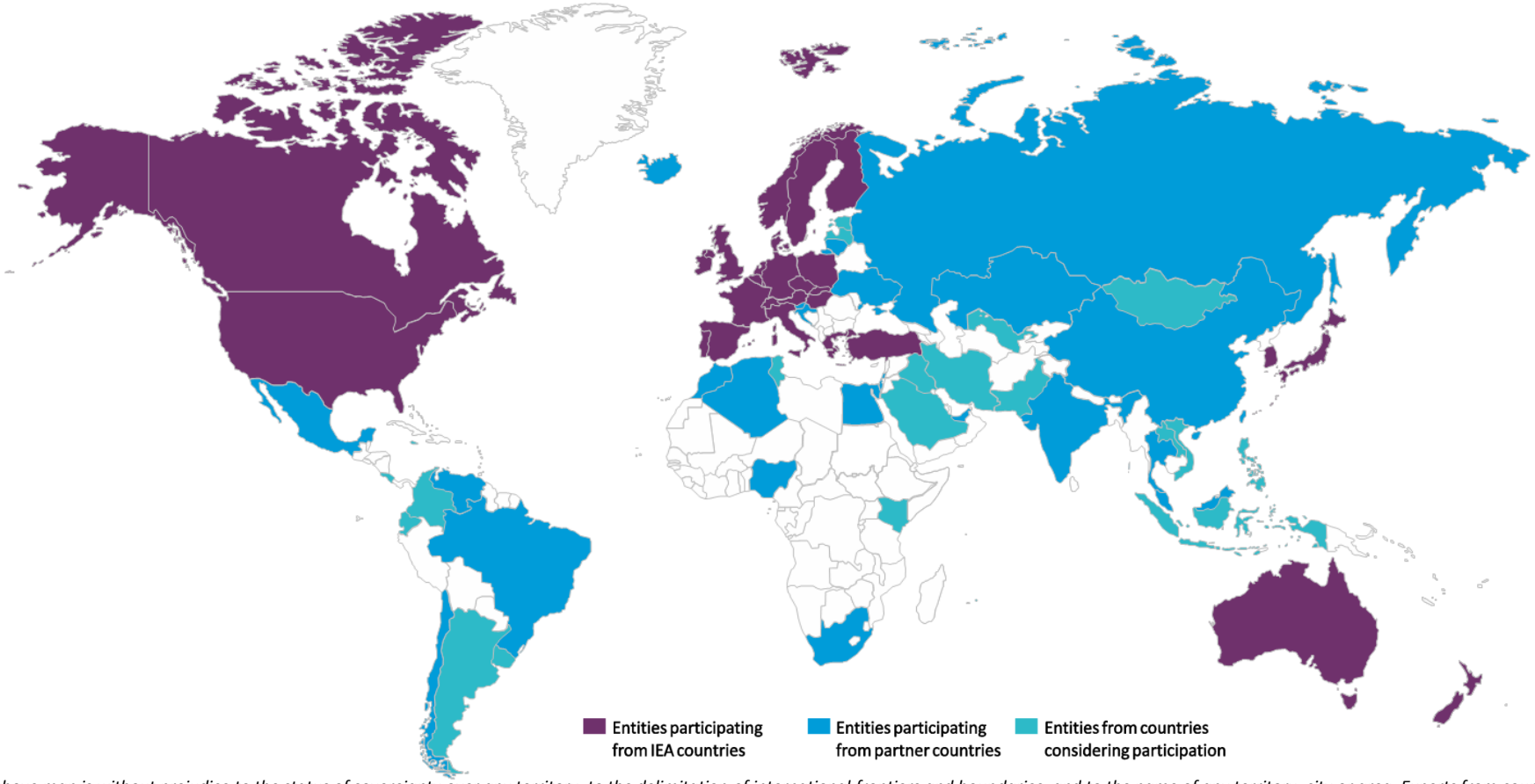
- **Today: more than 40 years in is a new era of technology collaboration**
  - The IEA is providing increased support to and interactions with multilateral initiatives and for CEM, Mission Innovation, LCTPi, UNFCCC, G7 and the G20
  - TCPs have helped the IEA to develop this unique capacity to provide guidance, inputs and coordination for multi-lateral energy technology collaboration

IEA Technology Collaboration Programmes

39 TCPs across a range of sectors

- Cross-cutting activities
- End use and energy efficiency
- Fossil fuels
- Fusion power
- Renewable energy and hydrogen

IEA Technology Collaboration Programme participation



The above map is without prejudice to the status of sovereignty over any territory, to the delimitation of international frontiers and boundaries, and to the name of any territory, city or area. Experts from countries shown above participate in activities of the Technology Collaboration Programmes.

How can my country participate?

- Contact the IEA team and we will guide you through the process:
  - Be invited to Executive Committee meetings
  - Attend meeting as an observer
  - Discuss potential collaboration
  - Be invited to participate as a TCP member country

www.iea-ebc.org/fileadmin/user_upload/images/Pictures/EBC_Joining_the_Programme.pdf

IEA Technology Collaboration Programmes for buildings

Energy Efficiency in Buildings related TCPs:

- Buildings and Communities (EBC-TCP)
- Heat Pumping Technologies (HPT-TCP)
- Energy Efficient End-Use Equipment (4E-TCP)
- Demand Side Management (DSM-TCP)

Energy in Buildings related TCPs:

- District Heating and Cooling (DHC-TCP)
- Energy Storage (ECES-TCP)
- Solar Heating and Cooling (SHC-TCP)

Energy in Buildings and Communities (EBC-TCP) established in 1977

- **Working group.** Materials database
- **Working group.** Building energy codes
- **Working group.** Urban Issues
- **Working Group.** HVAC Energy Calculation Methodologies for Non-residential Buildings
- **Annex 80.** Resilient Cooling
- **Annex 79.** Occupant-centric Building Design and Operation
- **Annex 78.** Supplementing Ventilation with Gas-phase Air Cleaning, Implementation and Energy Implications
- **Annex 77.** Integrated Solutions for Daylight and Electric Lighting
- **Annex 76.** Deep Renovation of Historic Buildings
- **Annex 75.** Building Renovation at District Level
- **Annex 74.** Energy Endeavour
- **Annex 73.** Net Zero Energy Public Communities
- **Annex 72.** Assessing Life Cycle Environmental Impacts
- **Annex 71.** Building Energy Performance Measurements
- **Annex 70.** Energy Epidemiology
- **Annex 69.** Adaptive Thermal Comfort Buildings
- **Annex 68.** High IAQ in Low Energy Buildings
- **Annex 67.** Energy Flexible Buildings
- **Annex 66.** Simulation of Occupant Behavior
- **Annex 65.** Super-Insulation
- **Annex 05.** Air Infiltration and Ventilation Centre

Source: www.iea-ebc.org

Energy in Buildings and Communities (EBC-TCP)

EBC Newsletter

www.iea-ebc.org/publications/ebc-news/

EBC Annual Report

www.iea-ebc.org/publications/annual-reports/

EBC Project Reports

www.iea-ebc.org/publications/summary-reports

Source: www.iea-ebc.org

Heat Pumping Technologies (HPT-TCP) established in 1978

- **Annex 54.** Heat pump systems with low GWP refrigerants
- **Annex 53.** Advanced Cooling/Refrigeration Technologies Development
- **Annex 52.** Long term performance of commercial GSHP systems
- **Annex 51.** Acoustic signature of heat pumps
- **Annex 50.** Heat pumps for multifamily heating and water heating
- **Annex 49.** Heat pumps for nZEB
- **Annex 48.** Industrial Heat Pumps
- **Annex 47.** Heat pumps in District Heating and Cooling Systems
- **Annex 46.** Heat Pumps for Domestic Hot Water
- **Annex 45.** Hybrid Heat Pumps
- **Annex 44.** Performance indicators for energy efficient supermarket buildings pumps
- **Annex 43.** Fuel-driven sorption heat pumps

Source: www.heatpumpingtechnologies.org

Heat Pumping Technologies (HPT-TCP)

HPT Newsletter

www.heatpumpcentre.org/en/newsletter/

HPT Publications:

www.heatpumpcentre.org/en/hpppublications/

Source: wwww.heatpumpcentre.org

Energy Efficient End-Use Equipment (4E-TCP) established in 2008

- G20 Energy Efficiency Action Plan: Networked Devices
- International Mapping and Benchmarking
- Monitoring Verification and Enforcement Workshop
- Smart Metering Infrastructure
- Technology Forcing Standards for Energy Efficiency
- Policy Driven Innovation (PDI)
- Engagement with International Standardisation Organisations

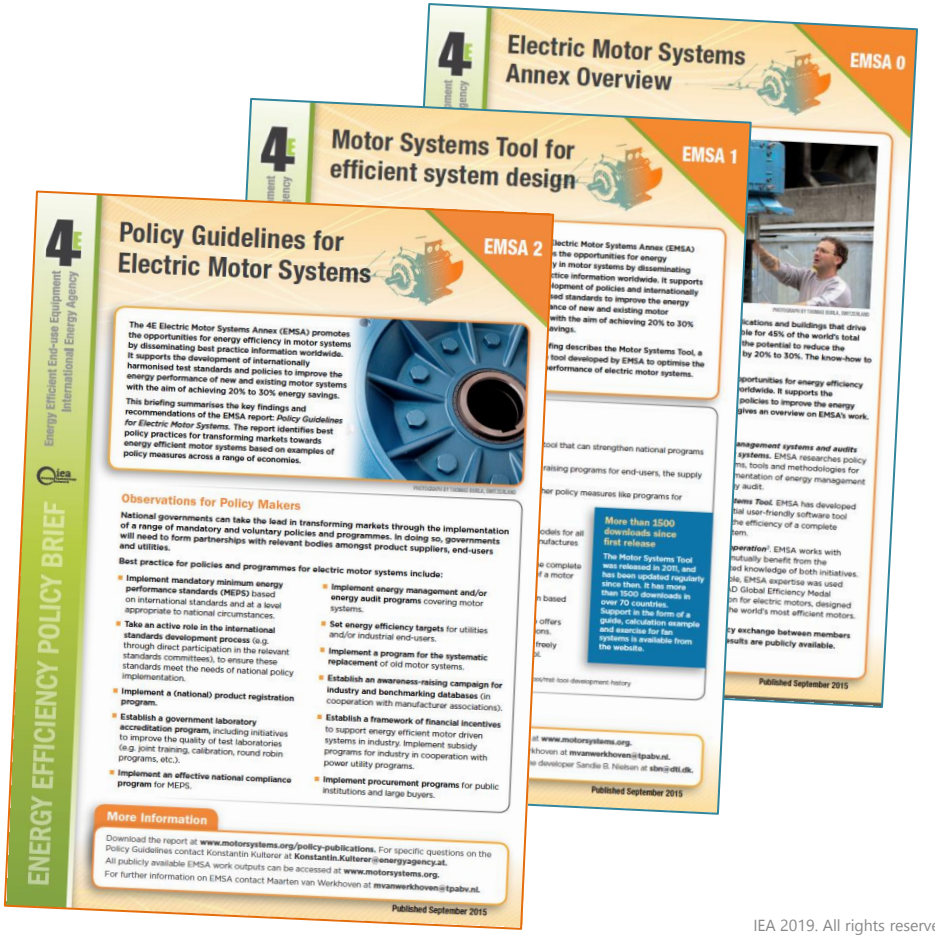
Source: www.iea-4e.org

Energy Efficient End-Use Equipment (4E-TCP)

Summary of key publications

Clear, concise guidance for policy makers

Available in English, French, German, Korean & Japanese



Source: www.iea-4e.org

Demand Side Management (DSM-TCP) established in 1993

Current tasks:

- **Task 25 Phase I.** Business models for a more effective market uptake of DSM energy services
- **Task 25 Phase II.** Business models for a more effective market uptake of DSM energy services for SMEs and communities

Recent tasks:

- **Task 24 Phase I.** Closing the Loop: Behaviour Change in DSM – From Theory to Practice
- **Task 24 Phase II.** Behaviour Change in DSM – Helping the Behaviour Changers
- **Task 23.** The Role of Customers in Delivering Effective Smart Grids
- **Task 22.** Energy Efficiency Portfolio Standards
- **Task 21.** Standardisation of Energy Savings Calculations
- **Task 20.** Branding of Energy Efficiency
- **Task 19.** Micro Demand Response and Energy Saving
- **Task 18.** Demand Side Management and Climate Change
- **Task 17.** Integration of Demand Side Management, Energy Efficiency, Distributed Generation and Renewable Energy Sources
- **Task 16.** Innovative Energy Services

Source: www.ieadsm.org

Demand Side Management (DSM-TCP)

1. The Logic of DSM

- Behavioural changes are necessary to get the full impact on energy efficiency. What works and what doesn't
- Capturing the Multiple Benefits of Energy Efficiency
- "Do not take away their steering wheel!" How to achieve effective behavioural change in the transport and SME domain"
- Energy Efficiency: A strategy at the heart of the G20
- DSM for the 21st century
- Changing energy behaviour – what works? DSMU
- Energy Consumption in Europe – why is it increasing and what are the policy implications?

2. Governance

- Impact evaluation of Energy Efficiency and DSM programmes
- Energy Efficiency Labels. What can be learnt from the Europe
- Involving people in Smart Energy: A toolkit for utilities, energy agencies and smart city developers
- Advancing Utility Sector Energy Efficiency in the U.S
- Energy savings and greenhouse gas emissions: international standards & harmonised savings calculations in practise
- Energy Efficiency Obligations – A Toolkit for success
- The IEA Energy Efficiency Market Report 2016 – What it means for DSM!
- From programmes to markets – how to leverage market forces for energy efficiency
- Perform, Achieve and Trade (PAT) – An Innovative Programme for Promote Industrial Energy Efficiency
- Irish public sector programme

3. Efficiency – Load Level

- ESCo market development: A role for Facilitators to play
- Best Practices in Designing and Implementing Energy Efficiency Obligation Schemes
- Customized, Systemic, Strategic – the way to succeed with energy efficiency in industry
- Taking Stock – 40 years of Industrial Energy Audits
- Improving energy efficiency in SMEs – an interdisciplinary perspective
- Simplified Measurement & Verification for Energy Savings
- Energy-Intensive Industries – energy efficiency policies and evaluations
- Big data for greater energy efficiency
- How to design, implement and evaluate behaviour change interventions in hospitals.
- Key findings from the IEA's Energy Efficiency 2017
- The IEA's Efficient World Scenario

4. Flexibility – Load Shape

- Spotlight on Demand Management
- Using Demand-Side Management to Support Electricity Grids
- Smart Grid Implementation – how to engage consumers?
- Demand Response in US Markets: Lessons for a low-carbon transformation
- Demand Flexibility as a Resource

5. Integration

- Managing Variability, Uncertainty and Flexibility in Power Grids with High Penetration of Renewables
- Integrating renewables and enabling flexibility of households and buildings – results and experiences from successfully implemented projects
- Integration of energy efficiency and renewable energy – multiple benefits!
- Blockchain applications for peer-to-peer community energy trading.
- Energy Efficiency for Municipalities

6. Business Models

- How to make the best technology even better, BAT becomes BAT+
- Consequences of learning curves for energy policy
- From selling Energy Efficiency to creating value
- Energy efficiency: a profit center for companies! A strategic and financial discussion of the multiple benefits of energy efficiency
- Mind your business, towards a more user-centered business model
- Innovative Business Models for Scaling up Energy Efficiency
- Building Deep Energy Retrofit: Using Dynamic Cash Flow Analysis and Multiple Benefits to Convince Investors
- Installer Power: unlocking low carbon retrofit in private housing
- Better Homes: a cooperative business solution

Source: www.ieadsm.org

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