Industrial Energy-Related Technologies and Systems

A Technology Collaboration Programme established under the auspices of the International Energy Agency

The IETS Technology Collaboration Programme (TCP)

The IETS is a TCP under the IEA, focusing on **energy efficient industrial technologies and systems**.

IETS was established in 2005 as the result of merging, revamping and extending activities formerly carried out by separate industrial IEA Programs.

IETS currently has 10 member countries:
Austria, Canada, Denmark, France, Germany, Italy the Netherlands, Norway, Portugal and Sweden.
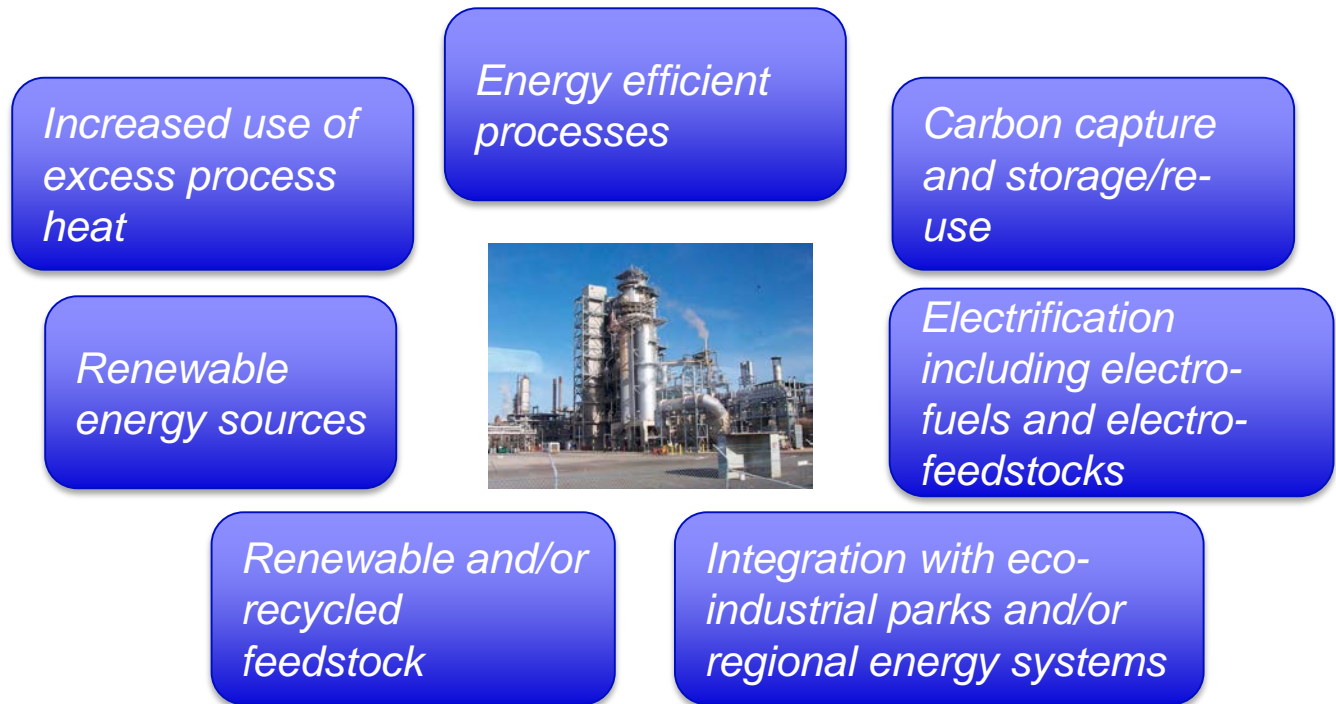
IETS Mission and strategic objectives

"To foster international co-operation among OECD and non-OECD countries for accelerated research and technology development of industrial energy-related technologies and systems"

- To strengthen international cooperation on energy saving and GHG mitigation in industry
- To include all industrial sectors and technologies/systems in the IETS area

- To facilitate cooperation between different industrial R&D disciplines

- To improve knowledge transfer and information between countries, researchers, and industries
- To develop international networks within an industry sector or within cross-cutting technology or system areas

Background

- Deep decarbonization in the industry sector is needed in a short time perspective

- Industry is one of the most important sectors for decarbonization

- A big challenge

- Knowledge transfer and sharing of experiences internationally are extremely and increasingly important

Long-term development of industrial processes for resource-efficient and carbon-lean production

Increased use of excess process heat

Energy efficient processes

Carbon capture and storage/re-use

Renewable energy sources

Electrification including electro-fuels and electro-feedstocks

Renewable and/or recycled feedstock

Integration with eco-industrial parks and/or regional energy systems

The IETS Annexes

The core of the IETS activities is carried out in so called Annexes.

On-going:

- Annex XI – Industry-based Biorefineries
- Annex XIV – Energy efficiency in the iron and steel industry
- Annex XV – Industrial Excess Heat Recovery
- Annex XVI – Energy Efficiency in SME´s
- Annex XVII – Membrane Processes in Biorefineries
- Annex XVIII – Digitalization, Artificial Intelligence and Related Technologies for Energy Efficiency and GHG Emissions Reduction in Industry

Starting up:

- Annex XIX – Electrification in Industry

Finished:

- Annex IX – *Energy Efficient Separation Technologies Systems*
- Annex XII – *Membranes as Energy-Efficient Technologies for Separation of Hydrocarbons*
- Annex XIII – *Industrial Heat Pumps*

Workshops and Conferences - Examples

- Joint workshop with IEA, Bioenergy on Industrial Biorefineries, Gothenburg, May 2017

- "The role of process integration for greenhouse gas mitigation in industry", Expert Workshop in Berlin 2017

- Workshop in connection to the conference Industrial Processing, co-arranged with Dutch ISPT, June 2016 in The Hague.

- Several workshops in different Annexes

- Joint workshop on Industrial Carbon Capture and Storage, CCS, with IEA Greenhouse Gas (IEAGHG) TCP, Lisbon March 2015

- International Jubilee Process Integration Conference, Gothenburg March 2013

- Joint workshop on System Aspects of Biomass Based Gasification, with Bioenergy TCP, Task 33, Gothenburg November 2013

Contact

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http://www.iea-industry.org

Technology Collaboration Programme
by iea

Some Key Measures

--System energy efficiency and process integration

--Energy efficient energy and process technologies

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-Electrification

--CCS/CCU (including biogenic)

--Industrial biorefineries

Some key measures cont.

--Excess heat and industrial/societal symbiosis

--Circular economy solutions

--Digitalization and Big Data/AI

Annex XI: Industrial Biorefineries
Decision Support Systems and Ex-ante Research

Understanding the complex decision-making needs of industry related to bioeconomy transformation

Identifying DSSsoftware that assists in addressing the complex decision-making

Understanding of ex-ante research related to energy policy, in the overall decision-making context

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Assessment of Biorefinery Concepts

- Biorefineries will be introduced and have a life time in a situation with other conditions than today

- Both economy and climate consequences will change with changing conditions

- New methods must be developed

- Prospective Life Cycle Assessment

- Energy market scenarios

- Improve knowledge base for strategic decisions

Annex 15 Industrial Excess Heat Recovery-Task 2
Finished

Participating countries:
Norway, Sweden, Denmark, Germany, Austria, Portugal
Canada, France and Italy

Subtasks in Annex 15, Task 2

Subtask 1: In-depth evaluation and inventory of excess heat levels

Subtask 2: Methodology on how to perform an inventory in practice

Subtask 3: Possible policy instruments and the influence on future use of excess heat

Subtask4: Technology development

Report available

Annex XV, Task 3

- Combination of methods for excess heat identification and quantification

- Consequences for excess heat levels of future changes in industrial energy systems

- Operational aspects in industrial energy systems

- Opportunity and risk assessment for excess heat projects

Actual work started in October

Task manager: Professor Rene Hofmann, TU Wien and AIT

Annex XVIII
 AI and Digitalization for Energy Efficiency
and GHG emissions reduction

Started late spring 2019

Annex manager:
CanmetENERGY
Natural Resources Canada

Aims

To create an International network and information infrastructure for stakeholders to exchange knowledge in the area of Big Data and digitalization technologies

● To facilitate joint development of new knowledge and expertise on Big Data and Digitalization

● To support and accelerate the deployment of Big Data and Digitalization practices in the energy-intensive process industries.

Annex XIX: Industrial Electrification

The annex will start in October 2019

Annex manager: Professor Andrea Ramirez, TU Delft, the Netherlands

Electrification options for the chemical industry
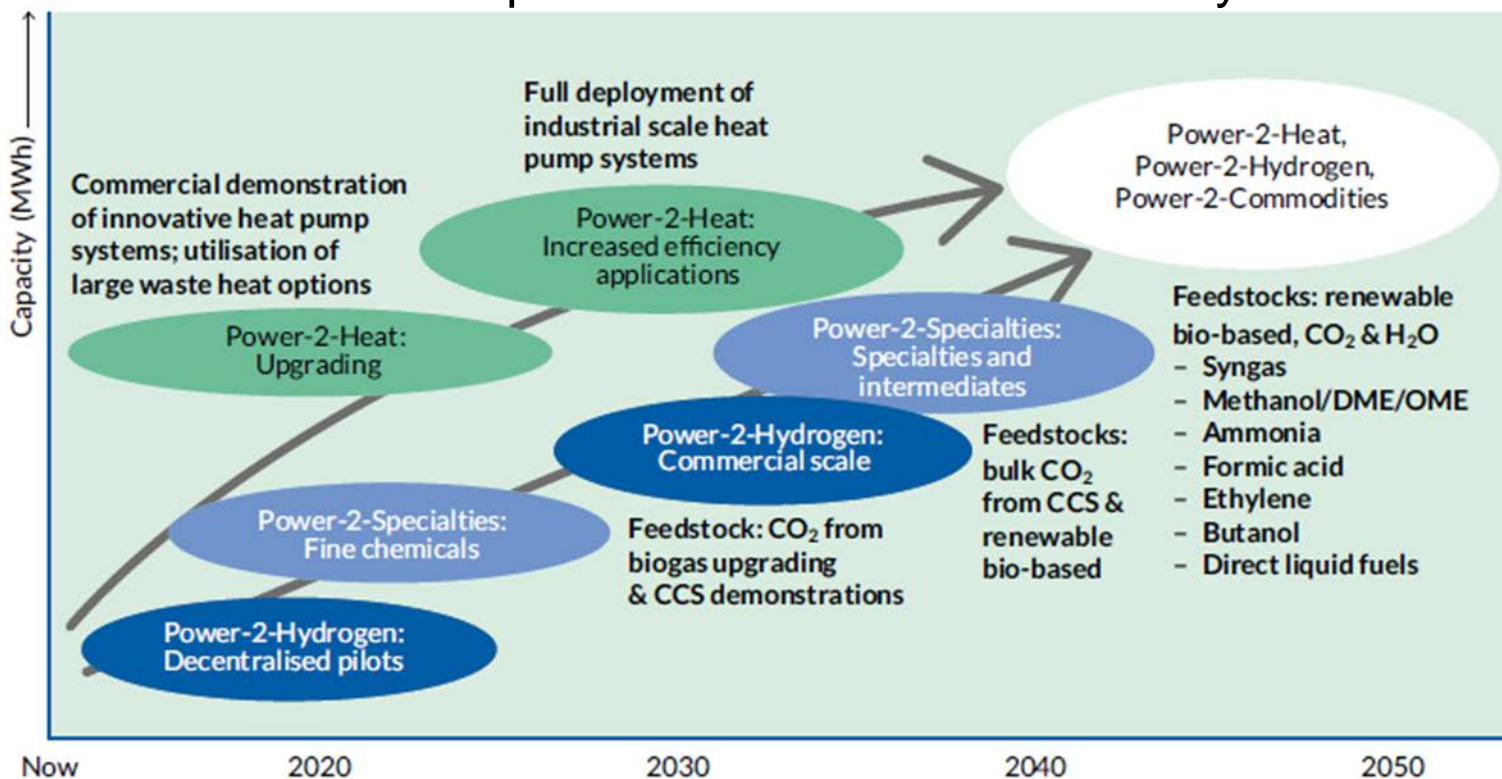
Source: ECN

Workshop on Deep Decarbonization in Industry

- IETS international expert workshop

- By invitation only

- Vienna 9-11 October

- Austria hosting the workshop

- 45-50 participants, including 25 speakers

Aims with the Workshop

- To give leading international experts in different disciplines the opportunity to meet
- To identify needs/opportunities to cooperate more closely
- To identify need for further work
- To distribute findings to industry, national authorities, etc

Sessions

- Session 1: Roadmaps

- Session 2: Technologies

- Session 3: Industrial Systems

- Session 4: Industry in a Circular Economy

- Session 5: Innovation, Business Models, Risk

- Session 6: Policy, Strategy, International Cooperation