

TERRASTOCK'2000

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**International Energy Agency
Energy Conservation Through Energy Storage
Implementing Agreement**

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International Energy Agency (IEA)

IEA is established in 1974

within the framework of

*Organization for Economic Co-operation and
Development (OECD)*

to implement

an international energy programme.

Goals of IEA

(adopted by OECD ministers in 1993)

- Diversity, efficiency and flexibility within the energy sector for long-term energy security
- Energy systems with ability to respond to energy emergencies
- More environmentally acceptable energy resources
- Improved energy efficiency
- Research, development and market deployment of new and improved energy technologies
- Co-operation among all energy market participants

INTERNATIONAL ENERGY AGENCY

Governing Board

Committee on Research and Technology
(CERT)
5 Working Parties

**Energy End Use
Technologies
Working Party**
17 Implementing Agreements

**Energy Conservation Through
Energy Storage
(ECES)
Implementing Agreement**

Annex 8

Annex 9

Annex 10

Annex 12

Annex 13

Annex 14

**Energy Tech.
Information Center
Working Party**

**Renewable Energy
Technologies
Working Party**

**Fossil Fuel
Technologies
Working Party**

**Nuclear Fusion
Technology
Working Party**

What is an Implementing Agreement?

Framework which facilitates the

- initiation
- implementation
- monitoring
- review

of international collaborative effort.



International Energy Agency

**Implementing Agreement on
Energy Conservation Through
Energy Storage
(IEA-ECES IA)**



Started in 1978.

Mission of IEA ECES IA

- To research, develop, implement, and integrate energy storage technologies to optimize energy utilization by improving overall energy efficiency and economic growth while benefiting the local and global environments.

(Strategy Plan 2000-2005)

Objectives of IEA ECES IA

Technology

Advance the development of thermal energy storage technologies

- **to utilize waste, renewable, ambient energy sources**
- **to supply space heating, space cooling and process cooling**
- **to achieve significantly improved efficiency and cost-effectiveness**

Objectives of IEA ECES IA

Environment

- Evaluate and document the many environmental benefits of energy storage
- Ensure that potential environmental problems are directly addressed
- Avoid potential environmental problems by sound technical analysis and design techniques

Objectives of IEA ECES IA

Market

- Encourage the required steps be taken to achieve the proper application of *proven energy storage technologies* world-wide in various sectors:
 - commercial
 - industrial
 - agricultural

Vision of IEA ECES IA

- **Continue to broaden the scope of activities by**
 - **undertaking research and technology development**
 - **technology transfer activities**
 - **prototyping and deployment of near-market ready and market ready technologies**
- **Emphasize effective matching of energy supply with energy demand through systems integration**
- **Expand collaborative actions with all interested countries and other Implementing Agreements**

Countries in IEA ECES IA

- **Belgium**
- **Canada**
- **Denmark**
- **European
Commision**
- **Finland**
- **Germany**
- **Italy**
- **Japan**
- **The Netherlands**
- **Spain**
- **Sweden**
- **Turkey**
- **United Kingdom**
- **United States**

Previous Annexes

- **Annex 1**, Large Scale Thermal Storage Systems Evaluation
- **Annex 2**, Lake Storage Demonstration Plant in Mannheim
- **Annex 3**, Aquifer Storage Demonstration Plant in Lausanne Dorigny
- **Annex 4**, Short Term Water Heat Storage Systems
- **Annex 5**, Full Scale Latent Heat Storage Installations
- **Annex 6**, Environmental and Chemical aspects of Thermal Energy Storage in Aquifers and Research and Development of Water Treatment Methods
- **Annex 7**, Innovative and Cost Effective Seasonal Cold Storage Applications

Ongoing Annexes

- **Annex 8:** Implementing Underground Thermal Energy Storage (UTES) Systems
- **Annex 9:** Electrical Energy Storage Technologies for Utility Network Optimisation
- **Annex 10:** PCM and Chemical Reactions for Thermal Energy Storage
- **Annex 12:** High Temperature Thermal Energy Aquifer and Duct Storage
- **Annex 13:** Design Construction and Maintenance of UTES Wells and Boreholes
- **Annex 14:** Cooling in All Climates with Thermal Energy Storage

Planned Annexes

- **Annex 15** - Electrical Energy Storage and the Integration of Renewables
- **Annex 16** - Engineering Textbook On Thermal Energy Storage And Renewable Energy
- Marketing Underground Thermal Energy Storage Systems
- An online communication and information platform
- Database formation and computer design

Achievements

- **Data and information base on energy storage technologies**
- **Introduction of the technical and economic risks to implement new energy storage technologies**
- **Development of national and international guidelines for the implementation of ground and aquifer storage systems**
- **Development of design tools and computer models**
- **Continued technology transfer and information dissemination**
- **Deployment of low temperature aquifer storage facilities for heating and cooling on a large scale in various countries, e.g., The Netherlands, Sweden, Belgium, USA and Germany**
- **Internet homepages of the IEA-ECES and various annexes**

Some Examples of Energy Storage Projects

- **Groene Hart Hospital, Gouda, The Netherlands**
- **Stockholm District Cooling, Sweden**
- **CERA Bank Building, Leuven, Belgium**
- **Scarborough Center, Toronto, Canada**
- **Richard Stockton College, New Jersey, USA**
- **Hokkaido Rehabilily, Sapporo, Japan**
- **Reichstag Parliament Building, Berlin, Germany**



Technical Tour to
Reichstag ATES Plant
by IEA ECES ExCo Members
In November 1999

For more information

<http://cevre.cu.edu.tr/eces/>