

Energy Technology Systems Analysis Programme (ETSAP)

an IEA Technology Collaboration Programme

Welcome to ETSAP Winter Workshop 2025

Prof. Brian Ó Gallachóir

Chair IEA ETSAP Technology Collaboration Programme

24 November 2025

ETSAP TCP Strategic Objectives (2025 -2030)

1. Collaborative Analysis Informing and Underpinning Energy Policy

- guide policymakers in >60 countries with evidence-based analyses of energy security and energy transition pathways to underpin global transition to zero-carbon energy systems
- collaborate with TCP Coordinating Groups on critical minerals, hydrogen, energy system flexibility, thermal networks, carbon management and heat pumps.
- collaborate with IEA, TCPs, IRENA, Clean Energy Ministerial, World Bank, etc.

2. Collaborative Research and Innovation

- extend capabilities in TIMES tools in infrastructure, investment, critical minerals and low energy demand scenarios.
- explore interactions between energy system and social systems, structural change, circular economy and SDGs

3. Build Capacity and Engagement

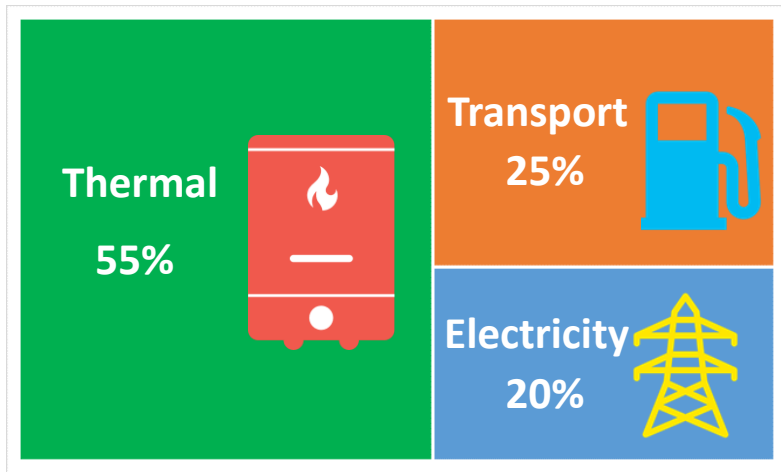
- improve transparency, documentation, results visualisation and educational materials associated with TIMES energy systems modelling
- provide basic, advanced and competency training in ETSAP tools

What is IEA-ETSAP?

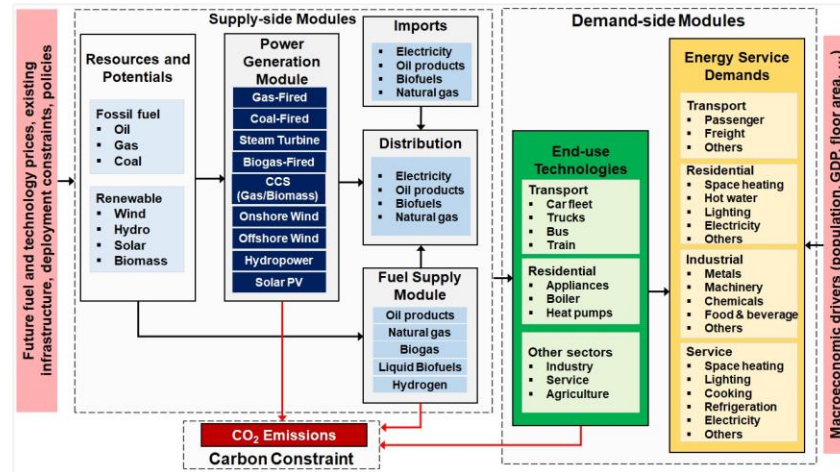
- One of 38 **IEA Technology Collaboration Programmes**
- 49 years international **cooperation** on energy **systems** modelling
- **Develop and maintain** (MARKAL and TIMES) tools (**model generators**)
- **Build** national, regional and global energy systems **models**
- **Assist policy makers** to model future **energy pathways** (63 countries)
- Focus on key role of **technology** to meet goals ('000s of technologies)
- **Two workshops & four training sessions p.a.** – capacity building (60 trainees p.a.)
- Collaborative **research & analyses** (100 publications, mostly 50 journal p.a.)

Why energy systems modelling for decision making?

- Energy policy and planning is more and more **complex** and **uncertain** (urgency of climate action, security of supply, impacts on economy and society).
- Energy systems **optimisation** modelling seeks least cost evolution of **whole** energy system using **TIMES** – technology rich (i.e. > 1,000 technologies).

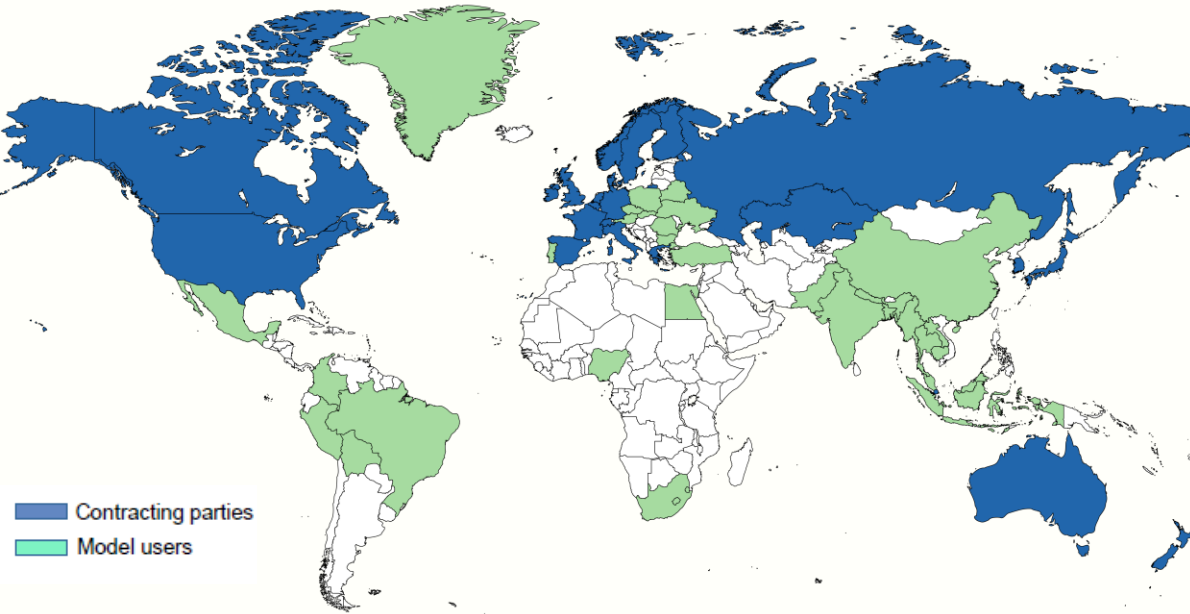


Global Energy Use



TIMES reference energy system

Who is IEA-ETSAP?



www.iea-etsap.org

Unique network of Energy Modelling teams from over 60 countries use MARKAL & TIMES models analyse energy systems and support decision making in energy policy.

Annex	Timeframe	Title
XVI	2023-25	Aligning energy security with zero emissions energy systems
XV	2020-22	Energy System and Sustainable Development Goals
XIV	2017-19	Facilitating Energy Transition to well below 2°C
XIII	2014-16	Tools for Analysis of a Future Energy Revolution
XII	2011-13	Policy Analyses Tools for Global Sustainability
XI	2008-11	JOint STudies for New & Mitigated Energy Systems
X	2006-07	Global Energy Systems and Common Analyses
IX	2004-05	Energy Models User's Group
VIII	2002-03	Exploring Energy Technology Perspectives
VII	1999-01	Contributing to the KYOTO Protocol
VI	1996-98	Dealing with uncertainty together
V	1993-95	Energy options for sustainable development
IV	1990-92	Greenhouse gases and national energy options
III	1987-89	International forum on energy environment studies
II	1984-86	Information exchange project
I	1981-83	Energy technology systems analysis programme
	1978-80	MARKAL Model generator development (BNL, KFA)
	1976-77	Analysis of tools for evaluating R&D strategies

Key Achievements 2020-2025

- **supported energy transition in >60 countries** despite challenges of Covid and conflicts.
- played a pivotal role in guiding policymakers with **evidence-based analyses of energy security** and achieving low-carbon energy systems.
- launched **open access ETSAP book** *Aligning the Energy Transition with the Sustainable Development Goals* (Published by Springer) at IEW2024
- advanced TIMES model generator, in **ancillary services markets, demand-response** mechanisms, and **energy storage** technologies
- increased **transparency** of TIMES model generator (**CC 4.0**) and TIMES models
- built **significant additional energy modelling capacity globally** via 10 workshops, 16 training sessions and 11 webinars

Added Value of ETSAP 2020-2025

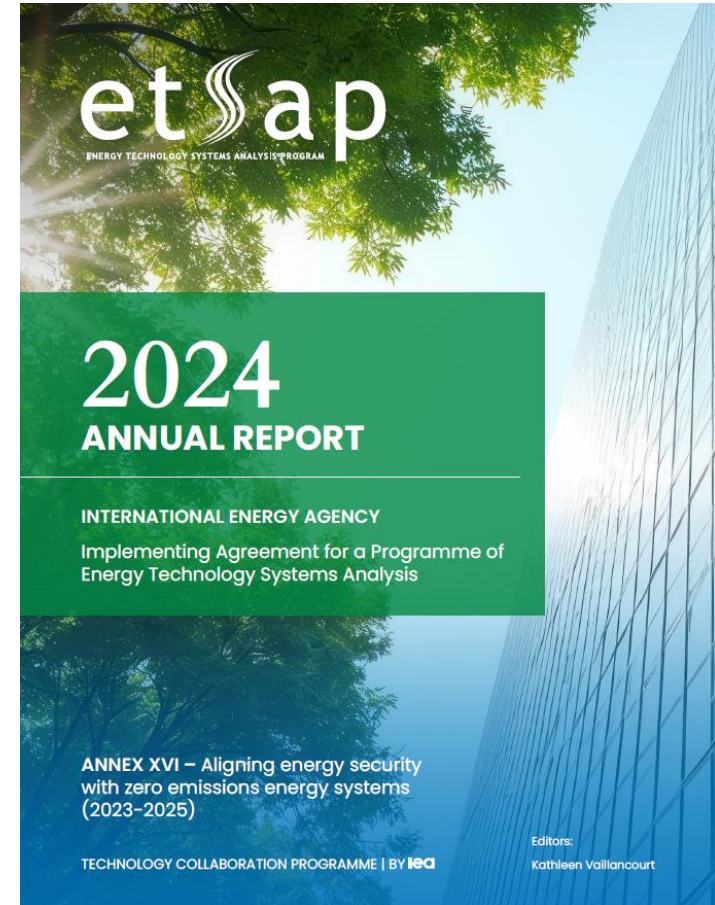
- **remains most advanced energy system model generator** globally now with improved representation of flexibility
- **plays a key role in training and capacity building** of energy professionals, researchers, and policymakers globally.
- **fosters collaboration** among ETSAP participants, with IEA, other IEA TCPs, CEM Long-Term Energy Scenarios (LTES) Initiative and the Energy Modelling Forum (EMF) in North America.
- **promotes openness and transparency** in energy modelling negative emissions technologies (NETs / CDR) have a **crucial role**
- **underpins policy development** including energy and climate plans, energy planning and renewable integration, policy evaluation for carbon neutrality, and the quantification of carbon budgets

Key Indicators 2020-2025

- **actively collaborated with 5 TCPs** (Combustion, Hydrogen, Storage, Bioenergy and IETS)
- organised **10 workshops** with 60 participants on average
- delivered **28** training sessions and trained **~300** energy systems modellers.
- published **open access book** in May 2024 that has **69,000 downloads**
- secured and allocated **>€400,000** per annum
- funded **20 collaborative** research projects in period to date
- added **3 new contracting parties** (New Zealand, Canada and Singapore)

Recent Policy Impacts

1. **Japan** – 7th Strategic Energy Plan
2. **US** – 1st Climate Budget in New York City
3. **Singapore** – Centre for Energy & Emissions Modelling
4. **Ireland** – State of the Environment Report
5. **Sweden** – EU Fit for 55 impacts on transport
6. **Denmark** – Improved competitiveness of district heating
7. **Canada** – Implications of Clean Energy Regulations
8. **Spain** – Update of Energy & Climate Plan



Programme Overview

MONDAY 24TH NOVEMBER 2025 (09:00-17:30)

ETSAP Regular Workshop Day 1

TUESDAY 25TH NOVEMBER 2025 (09:00-13:00)

ETSAP Regular Workshop Day 2

TUESDAY 25TH NOVEMBER 2025 (14:00-18:00)

ETSAP Executive Committee

(Participation restricted to ETSAP Delegates, officers, and invited experts)

Agenda and attachments are sent separately

WEDNESDAY 26TH NOVEMBER 2025 (09:00 - 12:30)

Transformation pathways in the industrial sector

Workshop within the "Modeling of the industry sector and material efficiency" ETSAP funded project

Registration link: https://www.lyyti.fi/reg/etsap_workshop_finland

26TH-28TH NOVEMBER 2025 (09:00-17:00)

Basic training course on VEDA-TIMES

26TH-27TH NOVEMBER 2025 (09:00-17:00)

Advanced training course on VEDA-TIMES

Winter Workshop 2025 Structure – Day 1

- 09.00 Welcome – Dr. Antti Arasto (VTT), Prof. Brian Ó Gallachóir (ETSAP Chair)
- 09.15 Session 1 Energy Systems Modelling in Finland – Dr. Kari Espegren (Norway)
- 10.30 Coffee
- 11.00 Session 2 ETSAP Tools Development - Prof. Brian Ó Gallachóir (ETSAP Chair)
- 13.00 Lunch
- 14.00 Session 3 Modelling Tools and Practices - Dr Jonas Forsberg (Sweden)
- 15.30 Coffee
- 16.00 Session 4 National Studies and Models - Dr Erik Ahlgren (Sweden)
- 17.30 Close of Day 1

Winter Workshop 2025 Structure – Day 2

- 09.00 Session 5 ETSAP TCP and Bioenergy TCP - Anna-Krook Riekkola (Sweden) and Fabian Schipfer (IIASA)
- 10.00 Session 6 Sectoral Modelling - Dr Kristina Haaskjold (Norway)
- 11.00 Coffee
- 11.30 Session 7 Nuclear, Communities and Pathways – Dr. James Glynn (Ireland)
- 12.30 Session 8 ETSAP R&D Project Proposals
- 13.00 Lunch
- 14.00 Close of Workshop

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