

CAETS ENERGY COMMUNITY REPORT 2025

TOWARDS LOW-GHG EMISSIONS FROM ENERGY USE IN SELECTED SECTORS: LOOKING BEYOND 2040

‘SEQUEL PROJECT’

Final Draft
September 2025

CAETS Council Presentation

Brisbane, Australia, Sep 9, 2025

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Overview

A. Purpose of the Project

B. Sectors & Working Groups

C. Project Methodology: Foresight

D. Key Strategies – Example: Forestry

E. Project Completion Schedule

F. Next Project (INAE Lead)

A. Purpose of the Project

To Answer the 'Focal Question'

What actions need to be taken now, and in the near future, so that sufficient technologies are available and realistically deployable to ensure low-GHG emissions from energy use in selected sectors beyond the year 2040?

B. Industry Sectors & Working Groups

Forestry Industry

Tom Brown, Canada

Peter Axegård, Sweden

Ludo Diels, Belgium

Richard Kerekes, Canada

Esa Vakkilainen, Finland

Ian de la Roache, Canada

Agriculture & Food

Snow Barlow, Australia

Martin Fraguio, Argentina

Chris (Hyung-Sool) Lee, Korea

Oil & Gas Industry

Godwin Igwe, Nigeria/USA

José Luis Aburto, Mexico

Vaughan Beck, Australia

Manuel Bravo, Spain

Henrik Frandsen, Denmark

Erwin Fritz de la Orta, Mexico

Dirk Smit, Netherlands

Joe Zhou, Canada

Chemical Industry

Frank Behrendt, Germany

Oscar Vignart, Argentina

Tony Bi, Canada

Funmi Coker, Nigeria

Henrik Frandsen, Denmark

Rita Hofmann, Switzerland

Hyunjoo Lee, Korea

Chinho Park, Korea

Cement Industry

Rui Cai, China

Kim Kurtis, USA

Neven Duić, Croatia

Wang Lan, China

Ravindra Gettu, India

Paulo J.M. Monteiro, USA

R. Douglas Hooton, Canada

CCS

Vaughan Beck, Australia

Esa Vakkilainen, Finland

Iron & Steel Industry

Karl Buttiens, Belgium

IL Sohn, Korea

Eloy Álvarez, Spain

Mansheng CHU, China

Kejiang Li, China

Chinho Park, Korea

Martin Pei, Sweden

Yasuo Kishimoto, Japan

Takeo Hoshino, Japan

Louise Grondin, Canada

Buildings & Smart Cities

Tom Leahy, Ireland

Christy Adelowo, Nigeria

Yves Bamberger, France

Seung Lee, Korea

Vishaal Lutchman, South Africa

Rasmus Bramstoft, Denmark

Hydrogen

Henrik Frandsen, Denmark

Dirk Smit, Netherlands

ICT & Data Centres

Erol Gelenbe, UK

Yves Bamberger, France

Robert Crawhall, Canada

Tadeusz Czachorski, Poland

Franco Davoli, Italy

Michaela Meo, Italy

Albert Zomaya, Australia

Coupling

Rasmus Bramstoft, Denmark

Yves Bamberger, France

Pradeep Chaturvedi, India

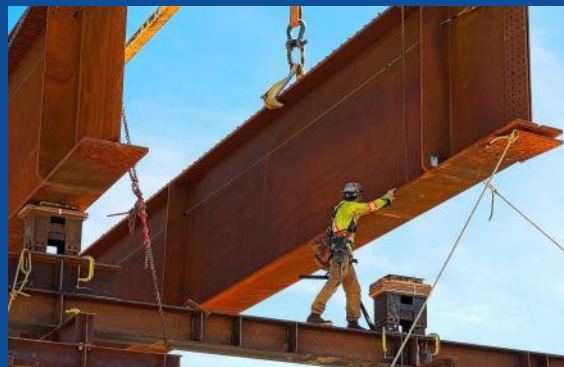
Henrik Frandsen, Denmark

Franco Davoli, Italy

Tim Lieuwen, USA

Report Structure

- 1 Executive Summary
- 2 Introduction
- 3 Forestry Industry
- 4 Agriculture & Food Industry
- 5 Oil & Gas Industry
- 7 Hydrogen
- 6 Carbon Capture & Storage
- 8 Chemical Industry
- 9 Cement Industry
- 10 Iron & Steel Industry
- 11 Buildings & Smart Cities
- 12 Coupling
- 13 Conclusions

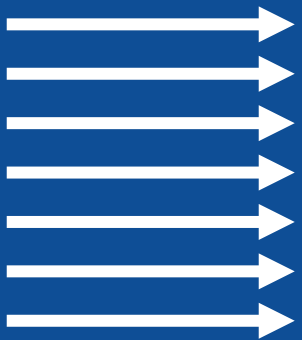


C. Project Methodology: Foresight (Scenario Creation)

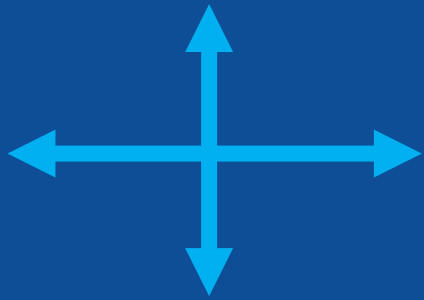
1. Define the 'focal question' and relevant timeframe

2. Review past events and current knowledge

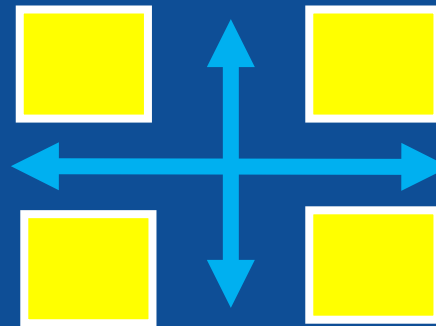
3. Identify Drivers



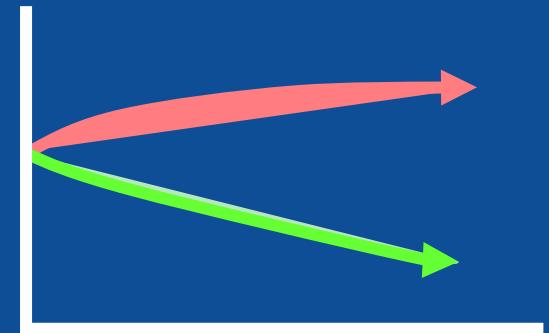
4. Identify Critical Uncertainties



5. Develop Scenario Characteristics



6. Determine Implications & Strategies



Key Strategies: Example - Forestry Industry

Enhance Forest Value and Carbon Storage

- Enhance forest productivity and minimize losses from fires, droughts, and pests
- Increase carbon storage capacity through enhanced forest management
- Improve and expand forest land for harvesting of wood and storing carbon

Develop Sustainable, Circular Products

- Pursue innovative uses of lumber products, especially in building construction
- Pioneer and commercialize new products based on wood constituents
- Use sustainable energy across the full lifecycle of products

Maximize Use of Residuals

- Extract value from all wood residuals, especially lignin
- Minimize waste in all production, use, and end-of-life operations

Ensure Availability of Expert Personnel

- Secure and retain outstanding leaders, experts, professors, and students

F. Project Completion Schedule

Task	End Date
Chapter adjustments based on external reviews	Sep 2025
Presentation in CAETS Brisbane meetings	Sep 2025
Review by CAETS Academies and endorsement	Nov 2025
Final editing	Dec 2025
Release of report	Jan 2026

Next Project: Security of Energy Supply - Towards Reliable Low-carbon Energy for All



Security: Reliability, affordability, and sustainability under normal and abnormal conditions from all energy sources

Perspectives: citizens, companies, communities and cities, countries; local, regional, national, and international considerations and collaboration



Focus: Innovative engineering contributions to improving energy security for all, including residential and corporate users

Outcomes: Pathways and strategies for improving current and developing new technologies to achieve energy security; new ideas for citizens, businesses, investors, governments, regulators, and academics



Next Project: Security of Energy Supply - Towards Reliable Low-carbon Energy for All

Start date: Q4 2025 or Q1 2026

Project Lead: Indian National Academy
of Engineering (INAE)

Working Group Participants: CAETS Members
plus other experts



CAETS ENERGY COMMUNITY