

CAETS 2022 Energy Committee report on
DECARBONISATION OF ENERGY END-USES

COUNTRY ANALYSIS QUESTIONNAIRE

Final version validated on 3 May 2021 by the Committee

Overview

This questionnaire focuses on how our various countries are acting to decarbonise their energy end-uses (while taking into account the decarbonisation of electricity and heat productions).

The co-written report based on the answers to this questionnaire and the work of the CAETS Energy committee is intended for an audience of policymakers looking for expert advice. It addresses two questions:

- what existing technologies are being or could be implemented to reduce CO₂ emissions as soon as possible, and how;
- what policy regulations may facilitate the transition for all stakeholders.

Please fill out this questionnaire by 30 September 2021 regarding your country's situation and your Academy's view. *If the relevant data needed to answer some questions are not easily accessible, please don't waste time trying to obtain them.* If some questions are not relevant for your country or if you cannot answer them in a simple way, please don't hesitate to skip them.

From the industries listed below (see part 3), please choose only three or four subjects that are particularly relevant for your country: it will be more interesting to go deeper on a limited number of subjects! Please limit your response to 7-8 pages altogether and give 2- or 3-sentence answers or bullet points for each question. If possible, use charts, tables, references, and other data measures.

Remember that these data and policies are to be juxtaposed to other countries data and policies. If applicable, do not hesitate to indicate where scientific evidence or assessments by your Academy differ from the official national policy. Please indicate areas where your country has a very specific situation and, when possible, don't hesitate to add case studies or best practices you're willing to share.

Thank you very much!

1. Introduction

1.1.National energy profile 2019

In the report, the national energy profiles (GHG emissions, energy mix, electricity mix, energy sources to end-uses...) will be based on the International Energy Agency database to ensure consistency between countries and to avoid taking too much time from each Academy for data collection. Please feel free to comment on this data or to send additional information from other sources if you like.

1.2.Energy perspectives (2030? 2050?)

If possible, give the national perspectives for 2030 and 2050 or the roadmap to 2030 and 2050 if they exist.

The following list of questions should serve as a guide for providing information on this topic. Please feel free to answer in a different manner if you like.

- 1.2.1.Does your country have national roadmaps regarding energy production and GHG emissions? What legal status do these documents have? What is their timeline?
- 1.2.2.Roadmap for the energy mix
- 1.2.3.Roadmap for the GHG emissions (country, per capita)
- 1.2.4.Roadmap for the electricity mix
- 1.2.5.CO₂ emissions from electricity production
- 1.2.6.Energy balance (energy sources to end-uses)

2.Building sector

The following list of questions should serve as a guide for providing information on this topic. Please feel free to answer in a different manner if you like.

2.1.Existing buildings

- 2.1.1.Energy balance 2019 (energy sources to end-uses)
- 2.1.2.Energy partition between single houses, apartment buildings and office buildings
- 2.1.3.Which systems are mostly used for heating?
 - Local systems (Furnaces, electric heating, heat pumps, solar thermal panels, geothermal systems, etc.)?

- Heat networks (hot water, steam). In this case, which energy sources are used? What is the CO₂ content per MWh_{th}?

2.1.4. Which systems are mostly used for cooling? (local systems, cooling networks...)

2.1.5. What are the main choices of the national policy – if there is one – to reduce the emissions from the existing stock of buildings? To make this reduction affordable?

- From a technological point of view? (Insulation, heat pumps, low CO₂ district network, geothermal systems, local PV production, etc.).
- From a regulatory point of view? Through land ownership regulations?
- Through subsidies, different financial mechanisms? Which are the priorities: reducing CO₂ or energy; Better inclusivity.
- Replacing parts of the existing stock of buildings?
- Is there a specific roadmap for this subject?

2.1.6. Is there some roadmap for making existing cities more sustainable?

2.1.7. Are there some case studies or best practices you would like to share?

2.2. New buildings

2.2.1. Does your country have a national policy regarding new buildings? If yes, what are the priorities? (For housing and for office buildings)

2.2.2. Are some technologies prioritised, in particular for heating and cooling? At the building level? At the infrastructure level? (developing district networks, prohibiting connection to the gas network...)

2.2.3. How are they supported? Through regulations? Subsidies?

2.2.4. Are there some recommendations and regulations for sustainable districts and cities?

2.2.5. Are there some case studies or best practices you would like to share?

3. Industry

Please choose three or four industries that are important for your country in the following list:

- Steel industry (including mining),

- Aluminium industry (including mining),
- Cement industry,
- Oil industry (refinery),
- Chemical industry (in particular petrochemicals: ammonia, ethylene, plastic...),
- Information and telecommunication,
- Food and agriculture (from farm to fork),
- Other mining industries: cobalt, copper, rare earth, lithium...
- Transportation.

The following list of questions should serve as a guide for providing information on this topic. Please feel free to answer in a different manner if you like.

For each of these three or four industries:

- 3.1. What is the energy balance (energy sources used)? And the GHG intensity, compared to other countries?
- 3.2. Are the best available low carbon technologies used/considered? If not, is it an economic problem? A matter of regulation? Or some social issues?
- 3.3. Is there a roadmap to decrease GHG emissions for 2030? 2050? If yes, what are the intermediary steps?
- 3.4. Is the implementation of low-carbon technologies helped by the government? For refurbishing or replacing equipment? How are public authorities pushing the transformation? Through benchmarking? Audits?
- 3.5. Are there incentives for carbon capture, utilisation, and storage? How?
- 3.6. If relevant, what about recycling? What percentage is recycled? What are the obstacles to increase recycling? Is a policy to increase recycling already in place or in project?
- 3.7. Are there some case studies or best practices you would like to share?