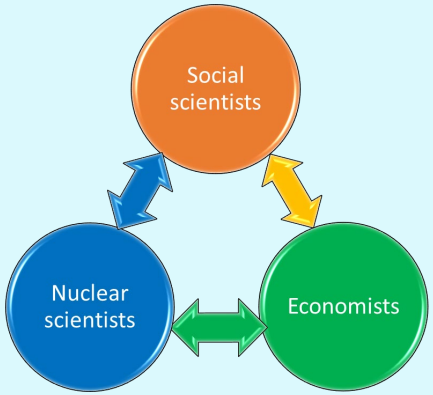
ECOSENS – Economic and Social Considerations for the Future of Nuclear Energy in Society

Objective:

Create a neutral space where specialists in social sciences and humanities and in nuclear energy research and policy meet, exchange views, and collaborate with civil society and other relevant stakeholders to provide:

- **a societal perspective on the development and use of existing and new nuclear technologies**
- **an assessment of nuclear energy sustainability considering the entire life cycle**
- **a radically new economic model, for the assessment of nuclear energy, overcoming the key weaknesses of existing economic models**

to better understanding if and how nuclear energy could be better aligned with society needs.



ECOSENS project duration
1 October 2022 - 30 September 2025

Find us on:
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Work packages

WP 1. A collaborative assessment of (imagined) energy worlds

WP 2. Sustainability assessment of whole nuclear power cycle

WP 3. A System of Provision approach for nuclear power

WP 4. Communication, dissemination and exploitation of results

WP 5. Project management and interdisciplinary collaboration

ECOSENS International Workshops

Researchers, policy- and decision-makers, civil society organizations, NGOs, industry, authorities, local information committees have been engaged in discussing current societal challenges and opportunities, possible and desired energy futures, as well as in the review of proposed assessment approach and its refinement, as part of the international workshops held in Brussels:

The art and science of imagining energy futures, 29 March 2023

Decarbonizing Europe's energy system: Checking and choosing indicators for a sustainability assessment, 30 March 2023.

This project has received funding from the Euratom research and training programme HORIZON-EURATOM-2021 under grant agreement No. 101060920

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Sustainability assessment of nuclear energy over its entire life cycle

To assess the sustainability of nuclear energy over its whole life cycle, an original methodology has been proposed.

It was discussed with a variety of stakeholders. Emerging from existing methodologies NESA-IAEA, KIND-IAEA and LCA/LCIA-JRC, the ECOSENS methodology is based on a set of principles and evaluation criteria co-elaborated by experts in energy and international stakeholders (civil society, academia, industry).

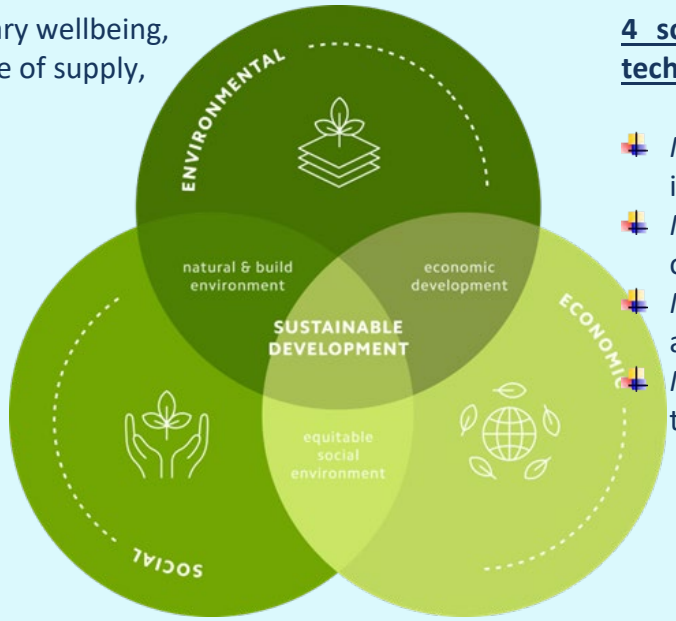
This methodology assesses:

- Environmental life cycle,
- Economic life cycle,
- Social life cycle

based on 3 High Level Objectives:

- Contribution to planetary wellbeing,
- Reliability and resilience of supply,
- Social feasibility

nd 62 indicators and sub-indicators



Role of nuclear energy in the future EU energy market

The role of nuclear energy on medium and long term has been explored based on:

- possible evolutions at the level of society, taking into consideration:
  - driving factors and obstacles
  - potential impact of disruptive technologies (i.e. artificial intelligence, big data, Internet of Things, advanced robotics, material sciences, energy storage, additive manufacturing, drones, biotechnologies, blockchain, and geoengineering.
  - different crisis (pandemic, economic, financial, geopolitical. energy, migration)
- assumptions, based on the quantification of some predictive elements (demographics, GDP, standard of living)

4 scenarios for climate neutral sector based on nuclear new technologies and variable renewables have been proposed:

- *Nuclear Status Quo* - unchanged pace of nuclear, not much influenced by acceleration of renewables
- *Nuclear Phase-Out* - no new nuclear project, progressive phase-out
- *Nuclear and Renewables Synergy* - nuclear to support accelerated implementation of renewables
- *Nuclear Renaissance* - nuclear accelerated by the new reactor technologies

June 2024

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