

The background of the slide features a microscopic view of cells, with bright green and yellow bokeh effects. A large, semi-transparent green rectangle is overlaid on the left and center of the image, serving as a backdrop for the text.

Dr. Bernhard Drosig



IEA Bioenergy
Technology Collaboration Programme



IEA Bioenergy Technology Collaboration Programme Task 37 - Energy from Biogas

Bernhard Drosig
Task Leader

Lessons for policymakers from last work programme 2022-2024

The IEA Bioenergy Technology Collaboration Programme (TCP) is organised under the auspices of the International Energy Agency (IEA) but is functionally and legally autonomous. Views, findings and publications of the IEA Bioenergy TCP do not necessarily represent the views or policies of the IEA Secretariat or its individual member countries.

IEA Bioenergy TCP

Mission:

To increase knowledge and understanding of bioenergy systems in order to facilitate the deployment of:

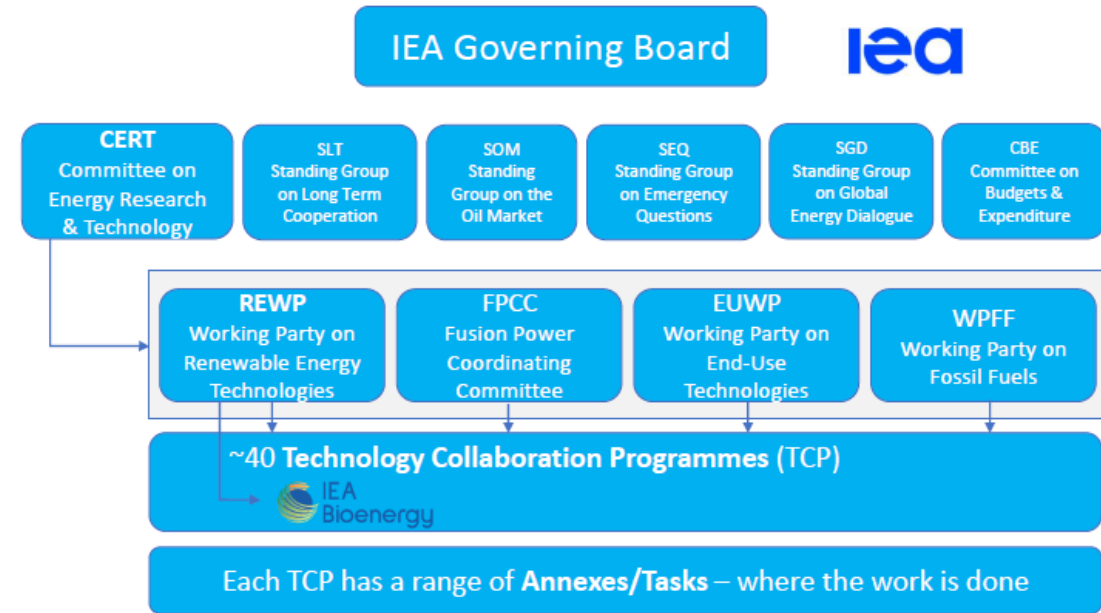
- **environmentally sound**
- **socially acceptable and**
- **cost-competitive bioenergy systems**

Key Role:

Independent collaborative body focused on delivering clear and verified information on bioenergy

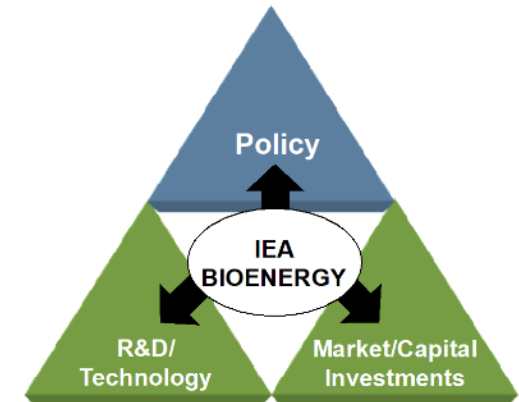
IEA Bioenergy TCP

Technology Collaboration Programme (TCP)
functioning within a framework created by the
International Energy Agency (IEA)

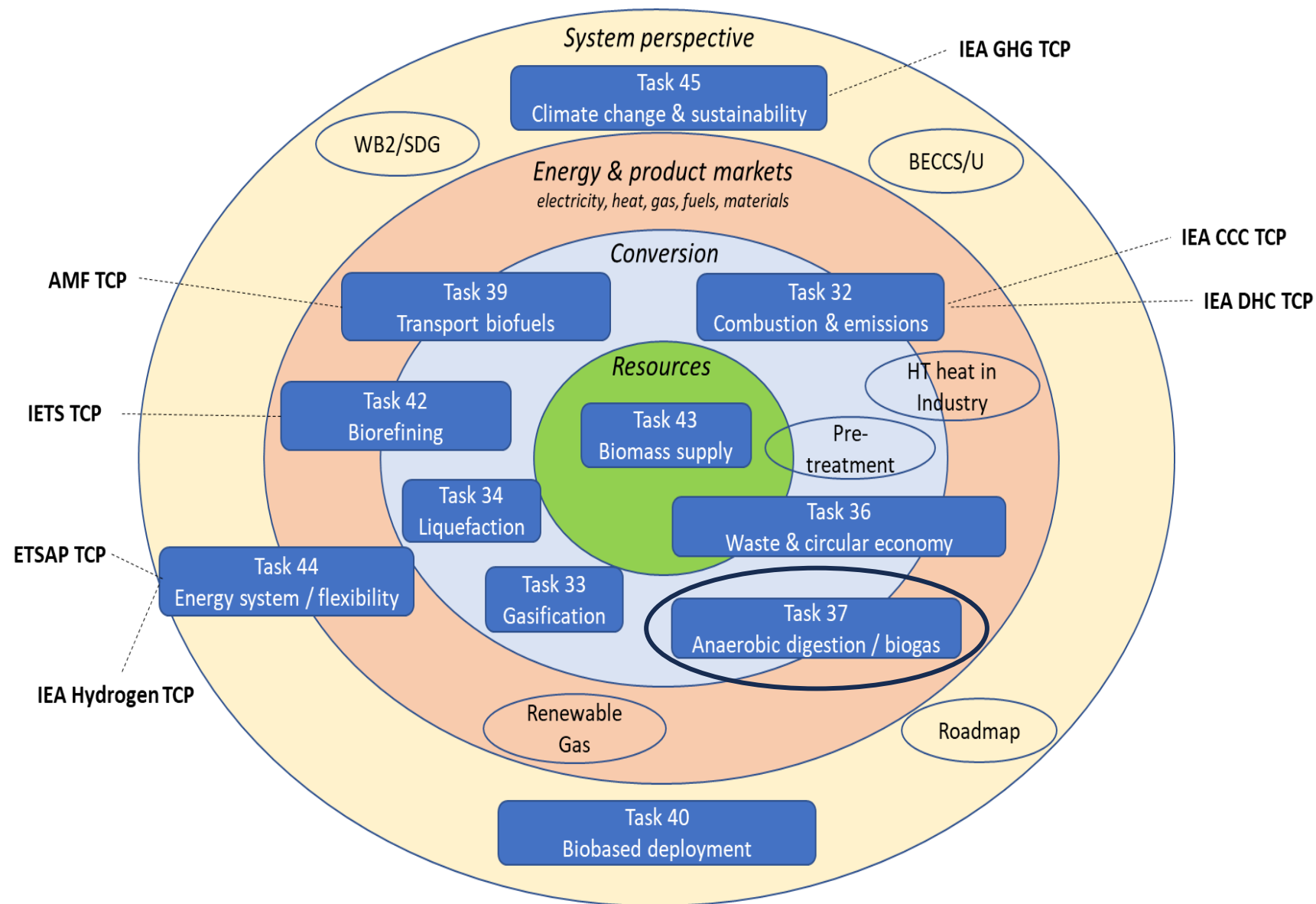


Work programme carried out through **Tasks** and **Special Projects**, covering the full value chain from feedstock to final energy product

26 members: 15 European countries + EC, US, CND, BR, China, India, Japan, Korea, AUS, NZ, SAfr



Activities/Tasks in IEA Bioenergy TCP

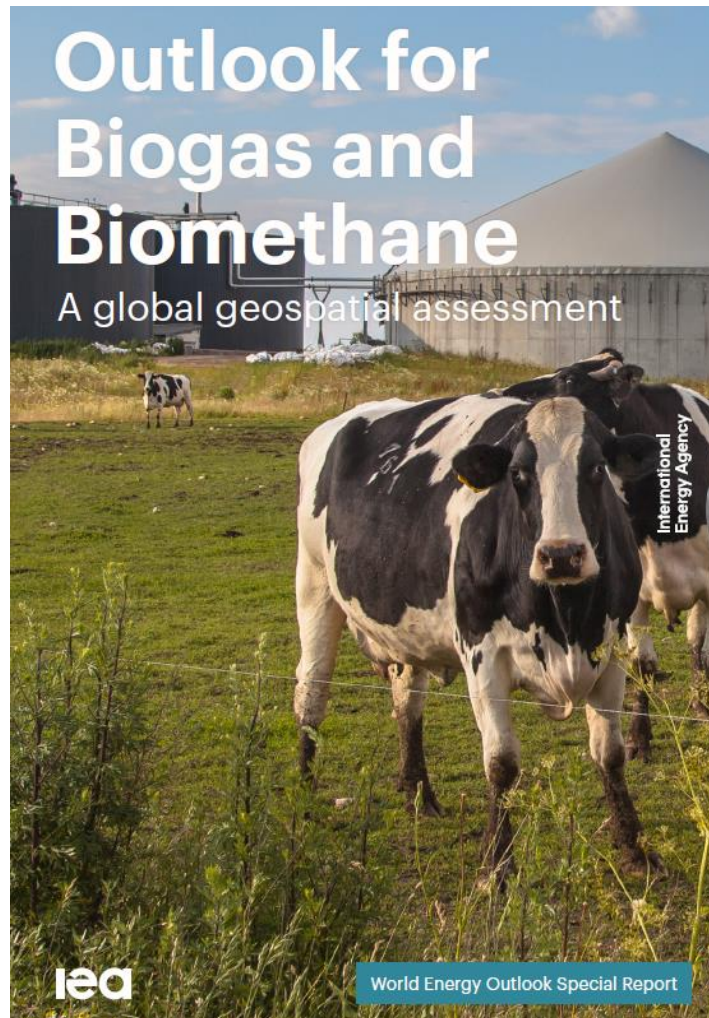


Task 37 Energy from Biogas -

17 Participating Countries in Triennium 2025-2027

- Austria
- Australia
- Brasil
- Canada
- Denmark
- European Commission
- Finland
- France
- Germany
- India
- Ireland
- Italy
- Netherlands
- Norway
- Sweden
- Switzerland
- UK

Messages in IEA headquarter biogas outlook report



“A relatively small share of the untapped potential for biogases is cost-competitive, but more can be unlocked if co-benefits are valued.”

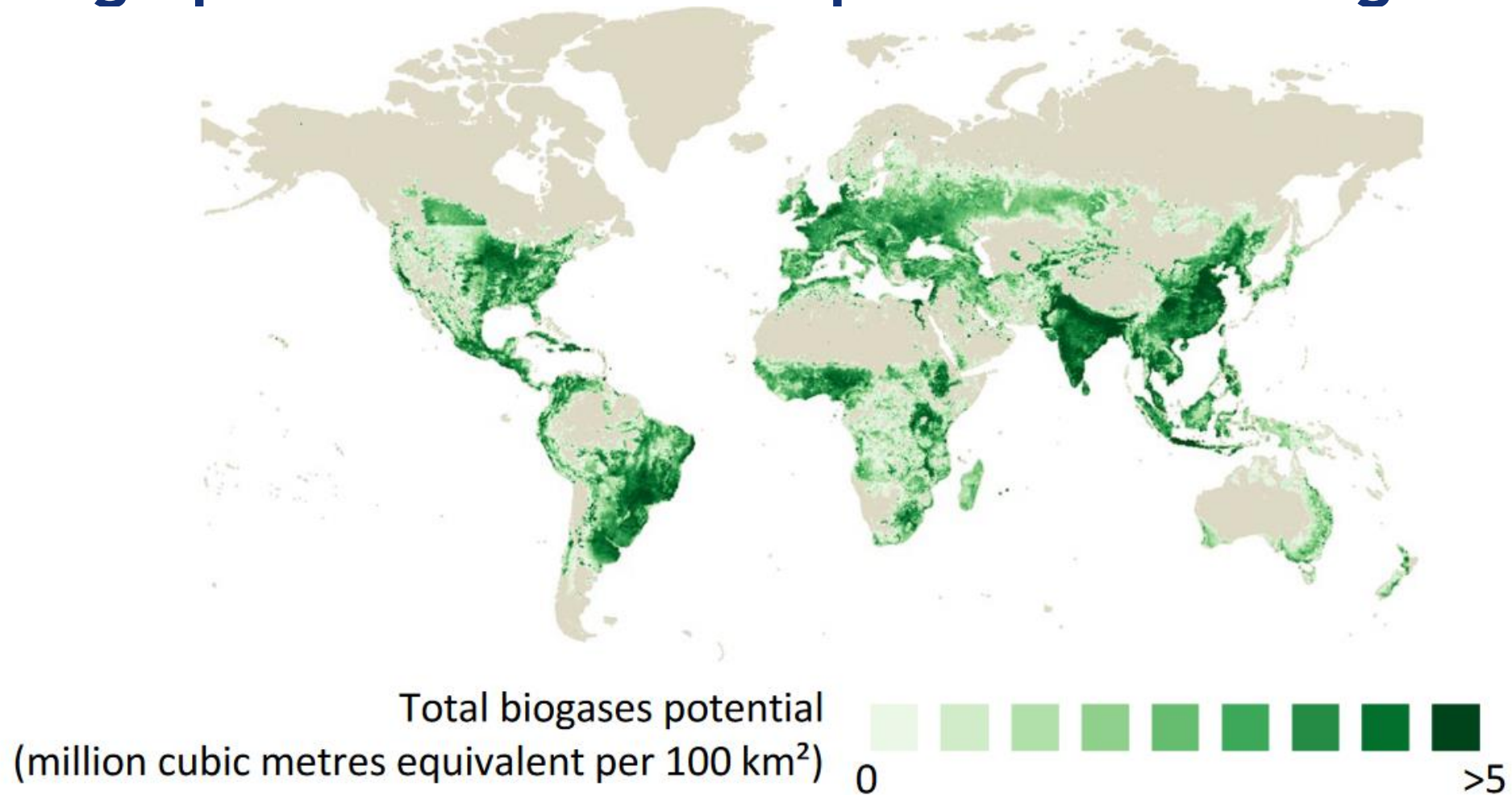
“The investment case for biogases is strongest when local economic development is a priority.”

“Logistical hurdles and complex permitting procedures have held back increases in biogases production in many countries.”

“Consistent and robust policy support is essential”

IEA – International Energy Agency (2025) Outlook for Biogas and Biomethane - A global geospatial assessment, <https://www.iea.org/reports/outlook-for-biogas-and-biomethane>

Geographic distribution of potential for biogases



IEA – International Energy Agency (2025) Outlook for Biogas and Biomethane - A global geospatial assessment
<https://www.iea.org/reports/outlook-for-biogas-and-biomethane>

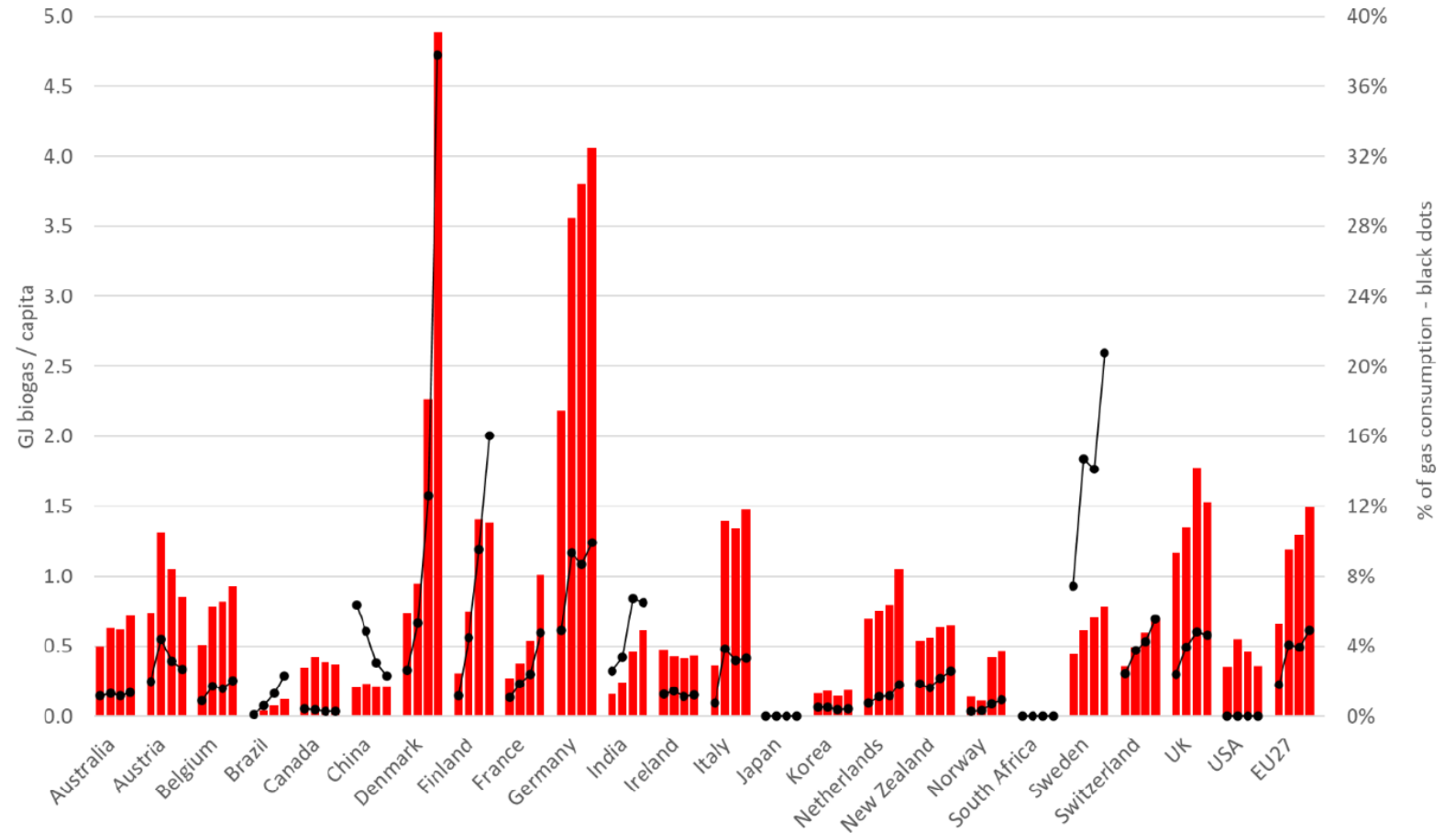
Biogas use in the IEA Bioenergy member countries



IEA Bioenergy: Countries' Report - update 2024

Implementation of bioenergy in the IEA Bioenergy member countries

IEA Bioenergy ExCo
December 2024



IEA Bioenergy: Countries' Report – update 2024 - Implementation of bioenergy in the IEA Bioenergy member countries (2024) https://www.ieabioenergy.com/wp-content/uploads/2025/01/CountriesReport2024_final.pdf

The role of biogas and biomethane in pathway to net zero



The role of biogas and biomethane in pathway to net zero

Biogas is produced as the main product of anaerobic digestion (AD) of wet biomass. Biogas can be used locally for heat purposes or for power and heat production (CHP); as an alternative, biogas can be upgraded to bio-methane to replace natural gas. As such, it is one of the means to reduce the consumption of fossil fuels and contribute to the transition towards a net zero energy system.

This position paper - developed by members of IEA Bioenergy Task 37 ("Energy from Biogas") - provides a holistic perspective on the roles of biogas and biomethane. The main conclusion is that biogas and biomethane have a range of options which can be employed in pathways to net zero. They provide sustainable flexible systems that play essential roles in circular economy, energy, and environmental systems.

PERSPECTIVES OF BIOGAS AND BIOMETHANE

Pathway to Net Zero

The pathway to net zero requires far more than provision of renewable electricity. We must employ renewable hydrocarbons in the form of liquid and gaseous fuels with minimum carbon intensity. Indeed, we must go beyond energy and employ renewable green hydrogen in the production of chemicals such as ammonia (NH_3) and methanol (CH_3OH), and for steel. When we produce biomethane (CH_4) or green hydrogen (H_2), we are in both cases producing renewable hydrogen molecules within a renewable gas. We need these renewable gases and renewable hydrocarbons for dispatchable electricity, for long term energy storage and for sectors where electricity has limited applications. These applications (termed the hard to abate sectors) include: heavy-duty, long-distance transport (trucks, ships and planes); high temperature industrial heat (food and beverage sector, steel production, glass production); agriculture (renewable fertiliser such as green ammonia and biofertiliser); and chemical production (such as methanol).

- The pathway to net zero requires far more than provision of renewable electricity
- Biomethane as replacement for natural gas - can be fed into existing gas infrastructure
- Biogas and biomethane systems are mature and multi-functional
- Biogas systems can contribute to energy security since the whole production chain can be set up and operated locally
- Biogas production can utilize a wide variety of organic feedstocks

The role of biogas and biomethane in pathway to net zero II

- Often the driver for biogas solution is reduction in fugitive emissions from waste
- Biogas systems provide the by-products digestate and carbon dioxide
- A detailed region-specific analysis of availability, costs and impact of specific feedstock utilization is recommended in order to ensure an effective and sustainable biogas sector
- Biomethane is cheaper than green hydrogen and is expected to remain so for some time in future
- Biogas and biomethane are sustainable flexible systems that play essential roles in circular economy, energy and environmental systems

https://task37.ieabioenergy.com/wp-content/uploads/sites/32/2023/05/2022_12_12-IEA_Bioenergy_position-paper_Final2.pdf

Sustainability effects associated with biogas solutions



Identification and assessment of sustainability effects associated with biogas solutions

-Literature review and perspectives from five countries

IEA Bioenergy: Task 37
March 2025



Technology Collaboration Programme
by IEA

“It is of utmost importance that decision-makers, including planners, developers and policymakers, and the public develop a comprehensive understanding of the broad system effects of biogas solutions and their highly cross-sectoral nature involving waste management, energy, industry and agriculture.

Unlike mono-functional systems which are easier to understand and manage, biogas solutions contribute to multiple sectors and sustainability goals, and require a great deal of cross-sectoral collaboration to create industrial-urban-rural symbiosis.”

Ammenberg J., Baier, U., Lyng, K-A., Nägele, H-J., Thual, J., Wellisch, M. (2025). Identification and assessment of sustainability effects related to biogas solutions - Literature review and perspectives from five countries. Ammenberg, J; Wellisch, M, Liebetrau, J. (Ed.) IEA Bioenergy Task 37, March 2025. ISBN 979-12-80907-62-2
<https://task37.ieabioenergy.com/technical-reports/identification-and-assessment-of-sustainability-effects-associated-with-biogas-solutions/>

Key externalities

Environment

- GHG impact (+/-)
- Change in soil health
- Impact on N pollution of water

Economy, society

- Improved energy security
- Organic waste processing costs
- Provision of biogenic CO₂
- Job Creation
- Contribution to resilience of agriculture

Agriculture

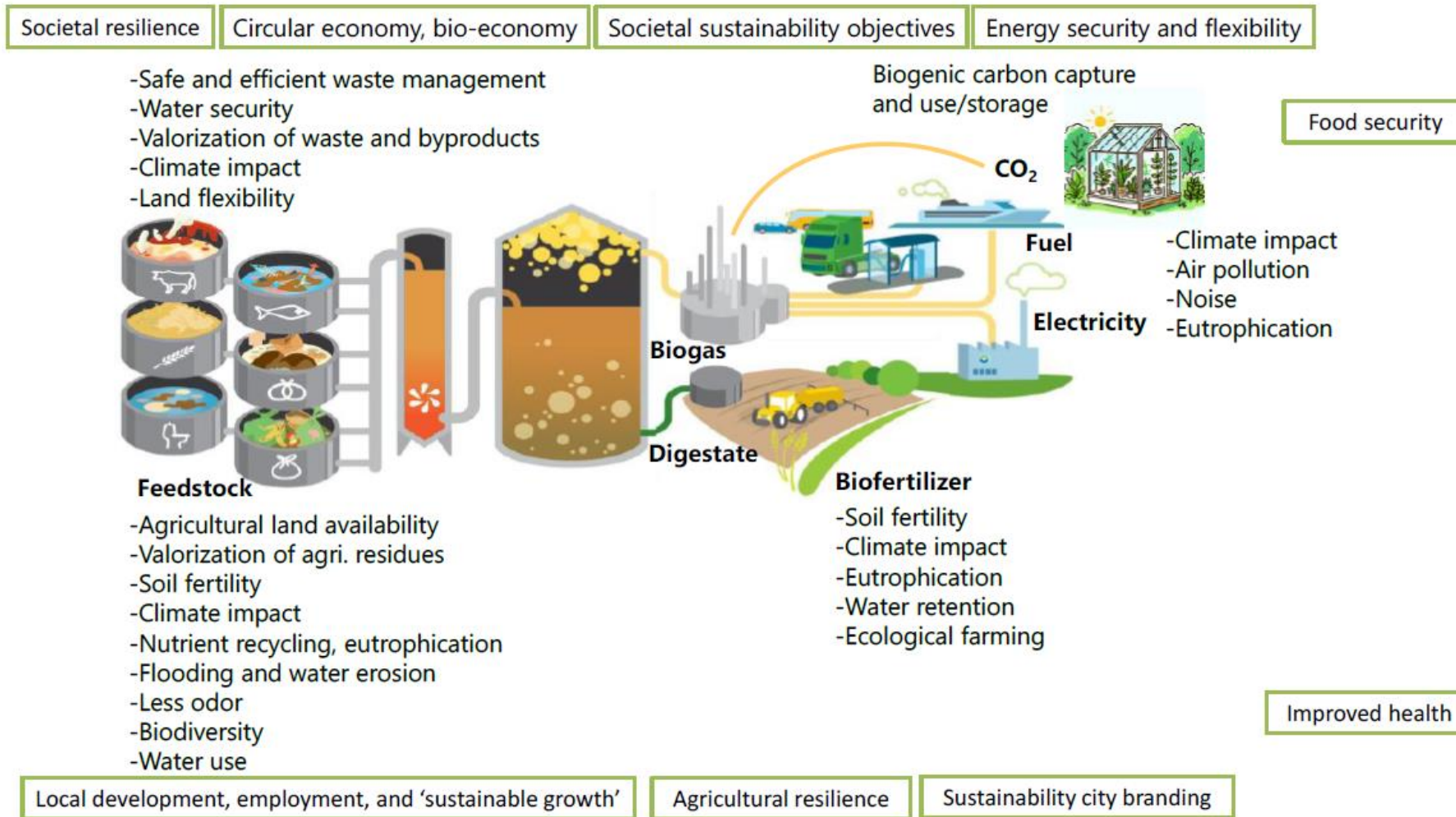
- Reduction in use of synthetic fertilizer
- Impact of intermediate crops

Energy

- Use of existing gas infrastructure
- Production of renewable energy - stable and storable
- Contribution to energy transition and regional circular economies
- Elimination of fossil fuel energy

The report highlights 53 sustainability effects of biogas solutions.

Valorising sustainability effects / co-benefits of biogas



<https://task37.ieabioenergy.com/technical-reports/identification-and-assessment-of-sustainability-effects-associated-with-biogas-solutions/>

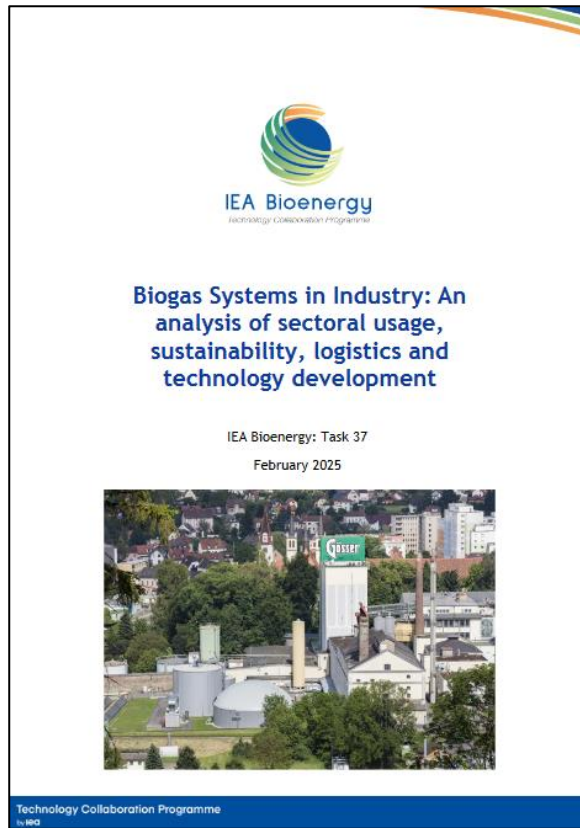
Promote More Holistic Understanding and Perspectives

- Use science-based, multi-criteria sustainability assessments to inform decisions on technical alternatives.
- Recognize the cross-sectoral benefits of biogas solutions in waste, wastewater, agriculture, energy, transport, and various industrial sectors.
- Encourage greater cross-sector collaboration, shared decision-making and support solutions that contribute to a circular economy. Include different sized solutions and solutions that are co-created with local communities.
- Shift the focus toward integrated strategies that combine multiple renewable technologies to deliver desired functions while addressing urgent sustainability challenges.

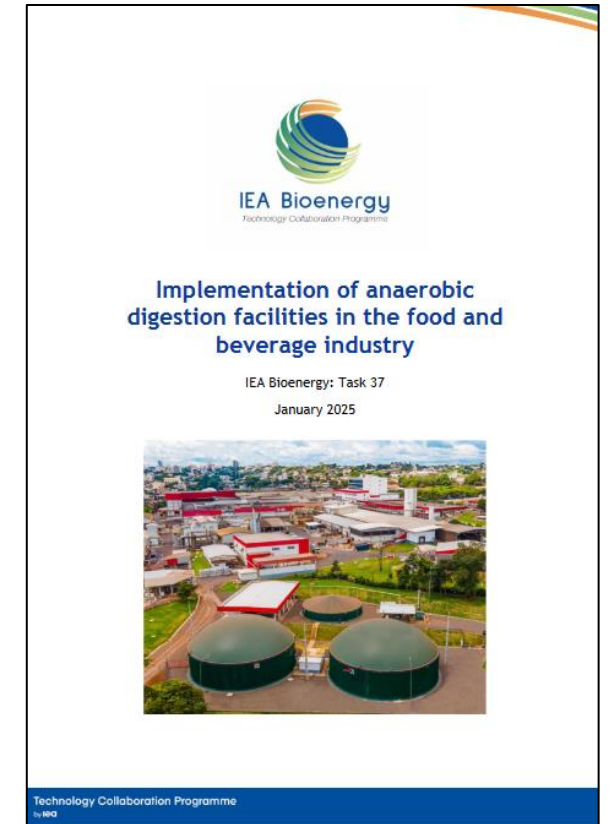
Adopt Coherent and Effective Policy Frameworks

- Harmonize lifecycle and value chain perspectives across relevant policies.
- Enable biogas value chain actors to capture the full societal value of their contributions.
- Remove regulatory and administrative barriers, such as restrictions on sustainable crop-based biogas and lengthy approval processes for mature technologies.
- Set clear targets for the production and use of biogas, biomethane, digestate/biofertilizers, and biogenic CO₂, and ensure the development of supporting infrastructure and access to land to make these targets achievable.
- Balance top-down strategies with local adaptability to facilitate effective and implementation.

Biogas and the producing industries



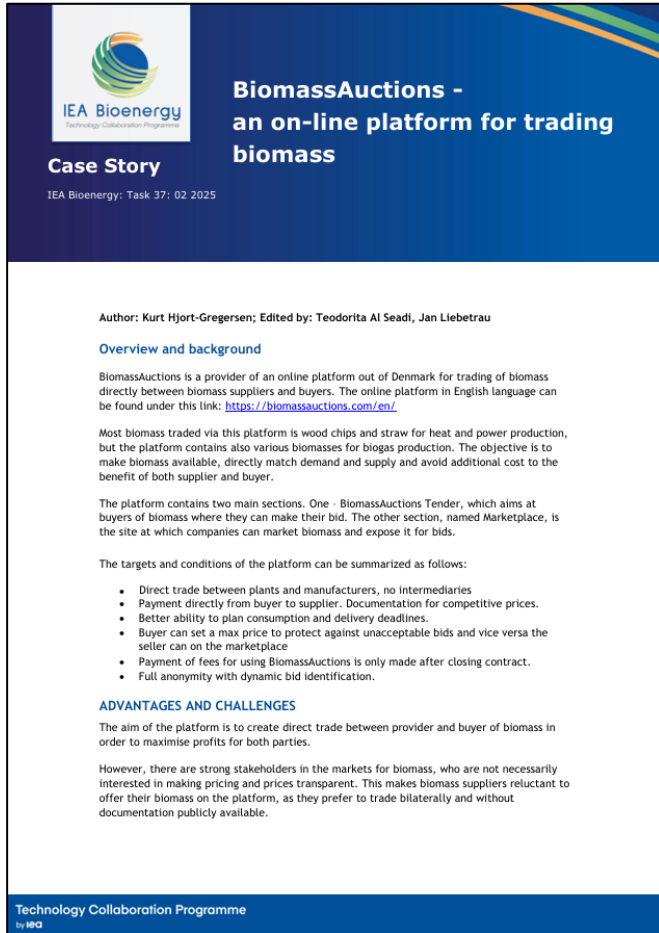
- Producing industries can address their Scope 1 and Scope 2 emissions by biogas / biomethane.
- The food and beverage industries have a vast range of byproducts and wastes which can be used as feedstocks onsite.



Wall, D.M., O'Shea, R. (2025) Biogas Systems in Industry: An analysis of sectoral usage, sustainability, logistics and technology development, Murphy, J.D. (Ed.) IEA Bioenergy Task 37, 2025:1.

Pesta G., Hanseemann E., Bochmann G., Drosch B., Gabauer W. (2025) Implementation of Anaerobic Digestion facilities in the Food and Beverage Industry. Liebetrau, J (Ed.) IEA Bioenergy Task 37, 2025, ISBN 979-12-80907-60-8

Case story - a Danish online platform for trading biomass

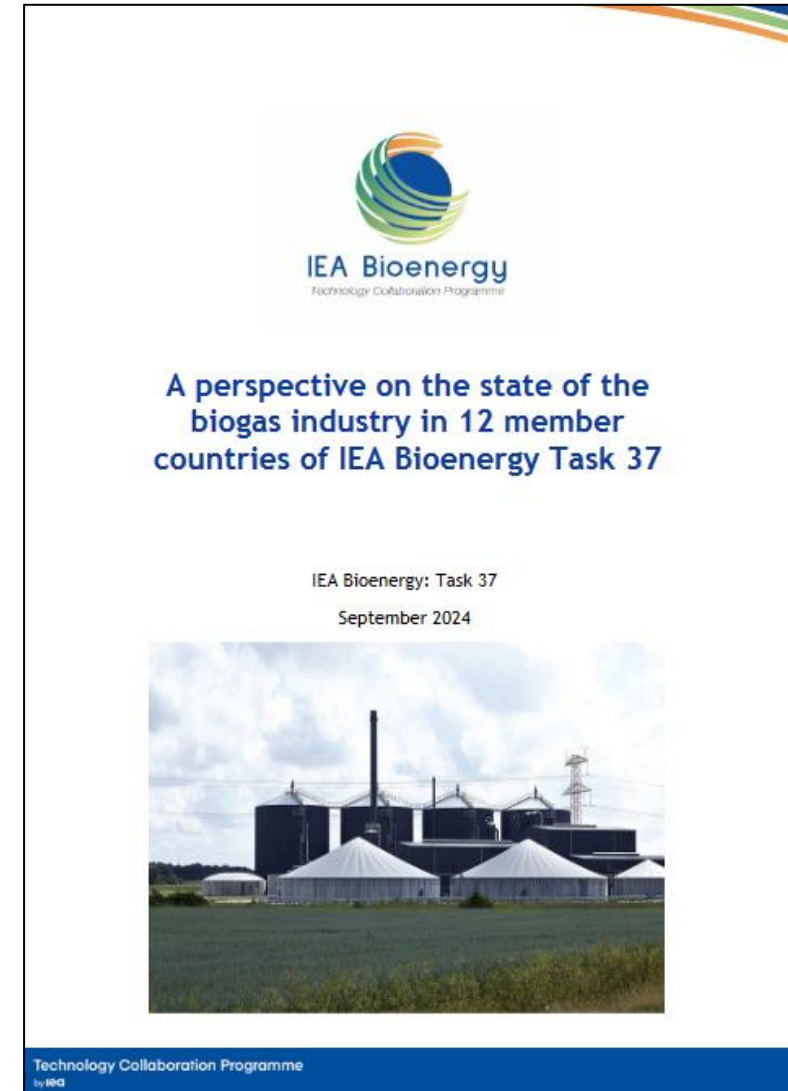
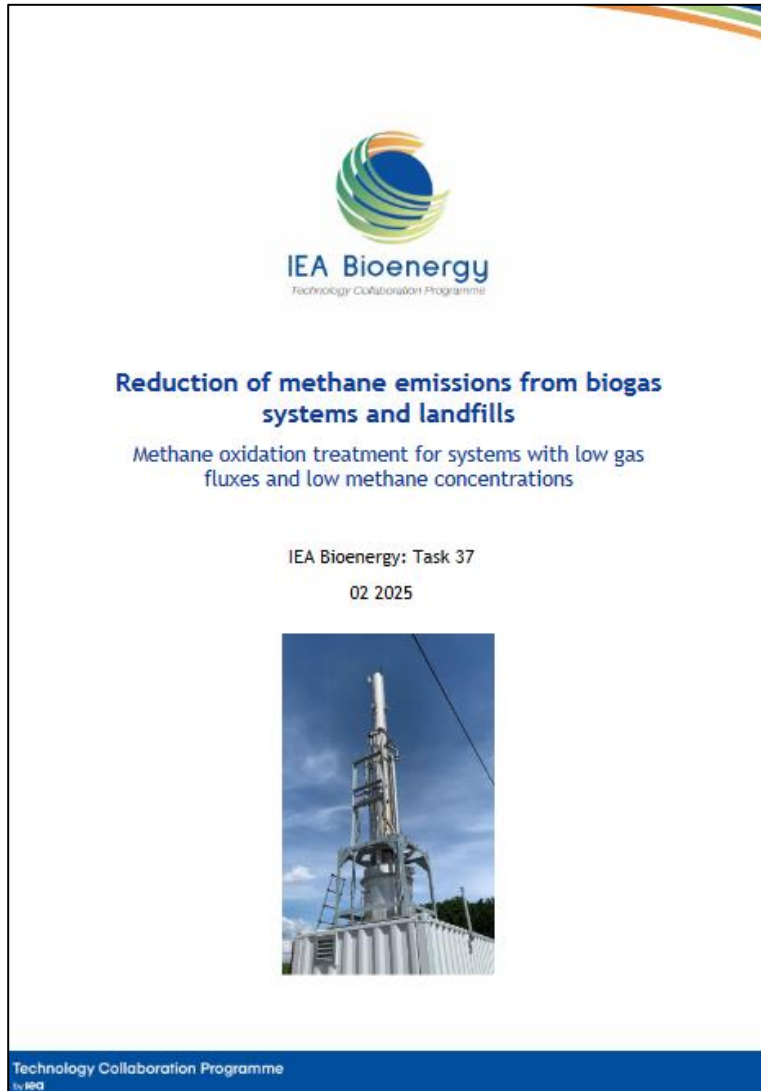


The targets and conditions of the platform:

- Direct trade between plants and manufacturers, no intermediaries
- Payment directly from buyer to supplier. documentation for competitive prices
- Better ability to plan consumption and delivery deadlines.
- Buyer can set a max price to protect against unacceptable bids and vice versa the seller can on the marketplace
- Payment of fees for using the platform is only made after closing contract
- Full anonymity with dynamic bid identification.

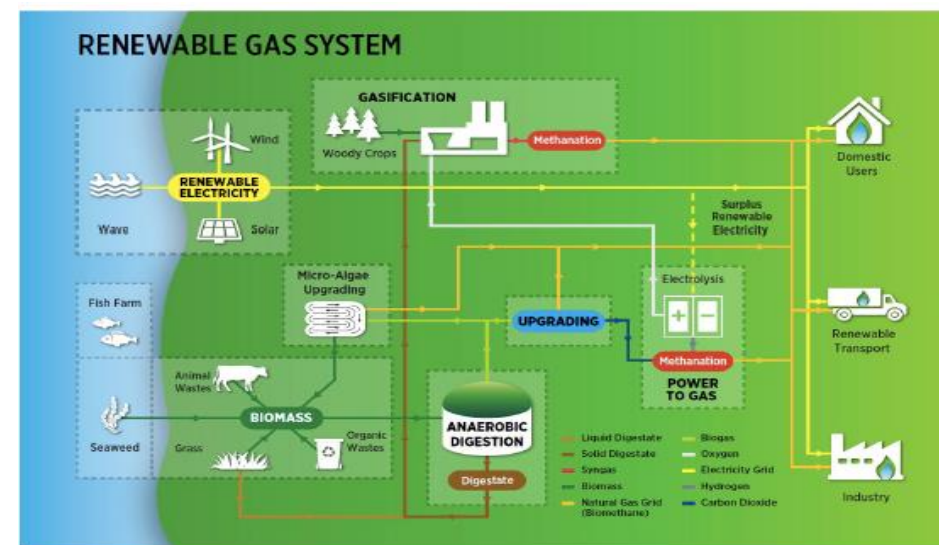
https://task37.ieabioenergy.com/wp-content/uploads/sites/32/2025/03/IEA-Bioenergy-case-story-BiomassAuctions_2025.pdf

Task 37 Energy from Biogas - Other reports



Topics of ongoing work programme 2025-2027

- Assessment of sustainability effects of biogas in a circular economy system
- Field application of digestates in agricultural production: standards, regulations, policies, best practices and challenges
- Monitoring microbial cultures in biogas plants
- Economics and GHG marginal abatement costs
- Small scale biogas systems - Home Biogas Systems
- Biogas systems and synergies with E-fuel production
- Case stories (2-4 pagers)
- Country report summary
- Intertask: BECCU/S, Synergies of bioenergy
- Newsletter



All information is available under:
<https://task37.ieabioenergy.com/>

Task 37 Energy from Biogas

- Newsletter - <https://task37.ieabioenergy.com/newsletter.html>
- Country Reports - <https://task37.ieabioenergy.com/country-reports.html>
- Case Stories - <https://task37.ieabioenergy.com/case-stories.html>
- Webinars and Workshops - <https://task37.ieabioenergy.com/events/>
- Technical Reports - <https://task37.ieabioenergy.com/technical-brochures.html>

Thank you for your attention!

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