



**Ministry of  
Technology and  
Science**

## **TECHNOLOGY ASSESSMENT ON ENERGY AND AGRICULTURE**

ZAMBIA - UNCTAD COLLABORATION ON TA PROJECT ON ENERGY AND AGRICULTURE SECTORS, USING SCIENCE, TECHNOLOGY AND INNOVATION AS CATALYST - 2021 TO JUNE 2024

**TECHNOLOGY ASSESSMENT ON THE ENERGY SECTOR - BIOGAS TECHNOLOGY ASSESSMENT  
IN ZAMBIA T**

Geneva Switzerland, 17 April 2024

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# Technology Assessment (TA) in the Energy Sector in Zambia

## Objective

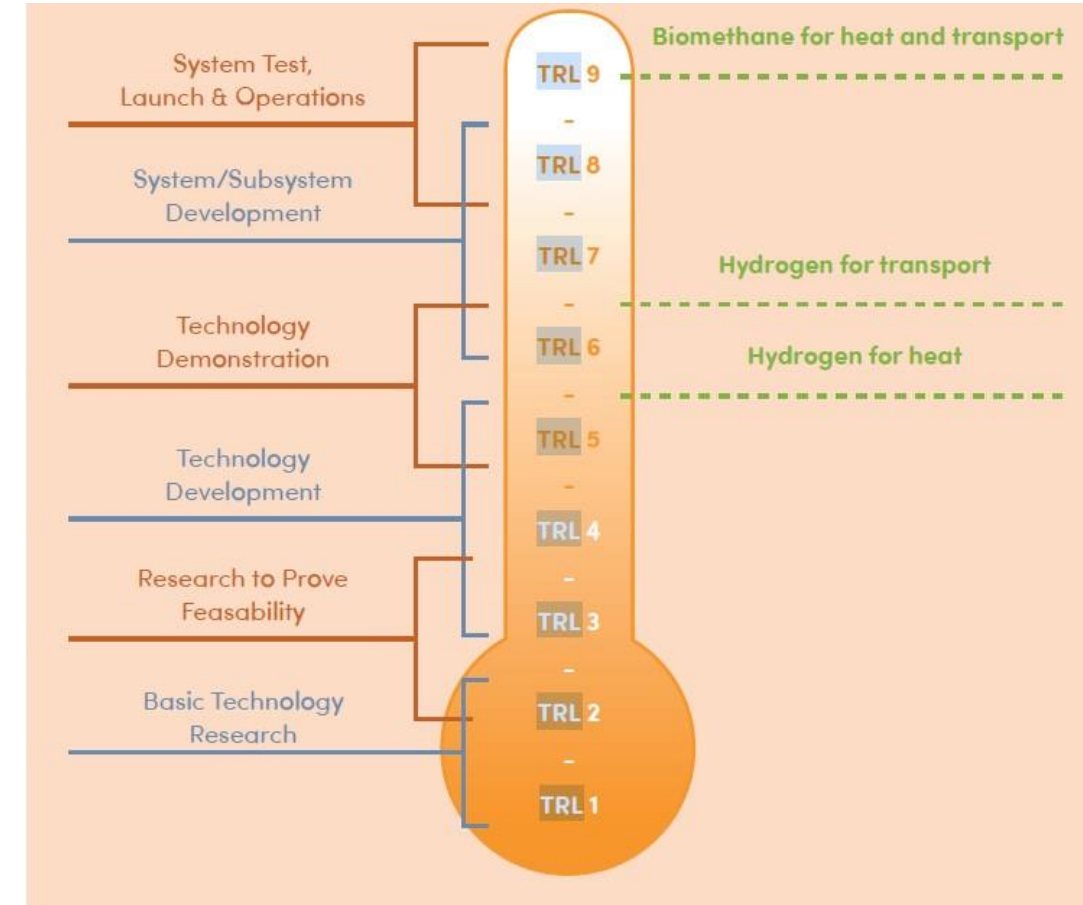
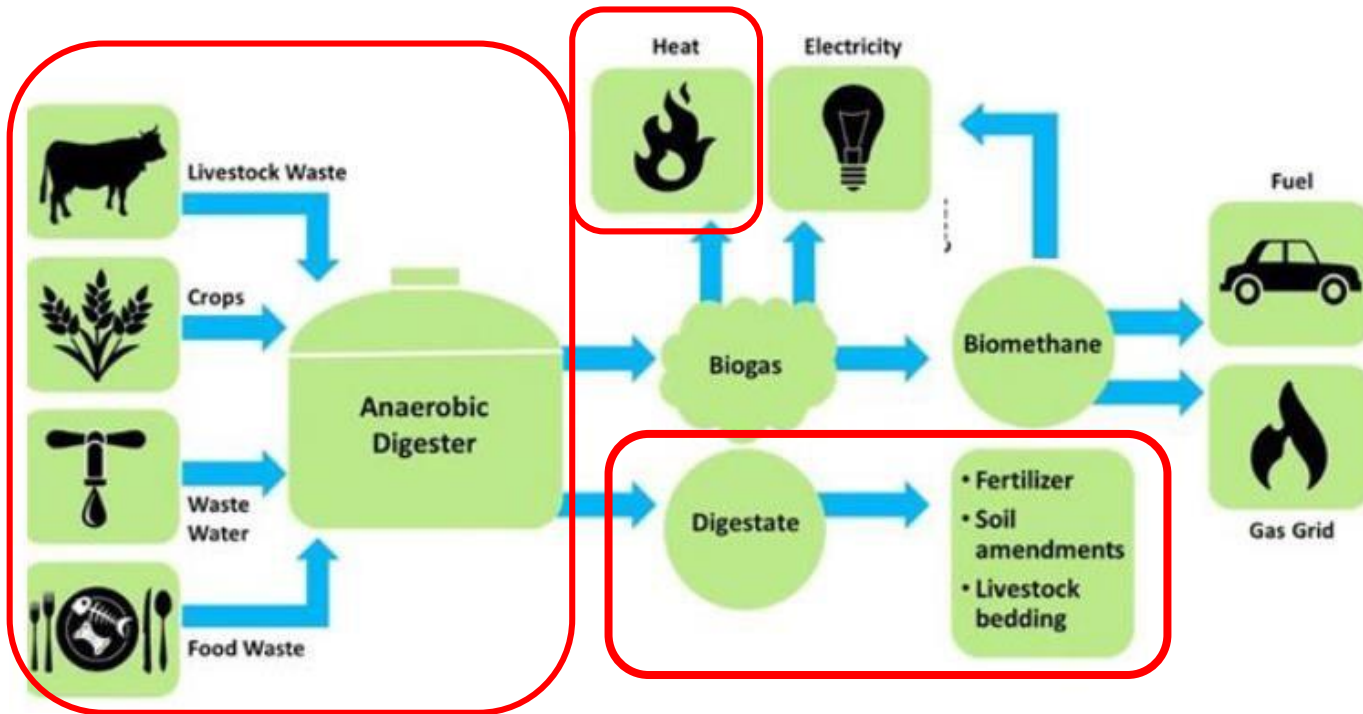
- The objective of this project is to **strengthen capacities of national STI policymakers and other stakeholders in selected developing countries in Africa in designing and implementing policies that support the learning, diffusion and adoption of technologies in the energy and agricultural sectors**

## Intended outcomes

- **Shared understanding among** policy makers and other stakeholders of participating countries, of the implications for their STI policies of rapid technological changes in the energy and agriculture sectors;

- **Improved capacity** of policy makers to design and implement technological capabilities upgrading strategies and policies in the selected sector

## Biogas Technology overview



**Biogas: energy - agriculture nexus**

**Biogas Technology  
Readiness Levels (TRLs)**

## **Beneficial Aspects of Biogas Technology**

### **Renewable Energy Generation:**

Biogas production from organic waste provides a renewable energy source that can replace fossil fuels for cooking, heating, electricity generation, and transportation, thereby reducing reliance on non-renewable energy sources and mitigating greenhouse gas emissions.

### **Waste Management:**

Biogas technology provides a sustainable solution for managing organic waste, such as agricultural residues, animal manure, and food waste. It helps divert organic waste, where it would otherwise generate methane and contribute to greenhouse gases. The sludge makes good organic fertilizer.

### **Methane Emission**

**Reduction:** By capturing methane, a potent greenhouse gas emitted from organic waste decomposition, biogas technology helps mitigate climate change by reducing methane emissions into the atmosphere.

Biogas technology offers a multifaceted solution to energy, environmental, and socioeconomic challenges, making it a promising and sustainable energy source for the future.

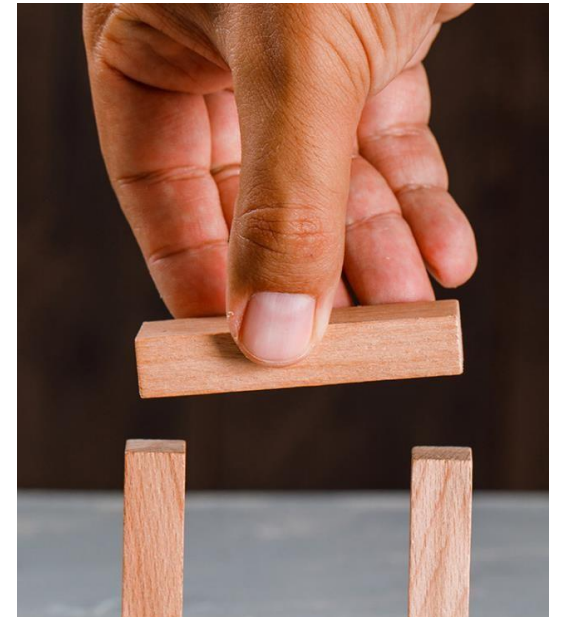
# Technology Assessment (TA) in the Energy Sector in Zambia (Steps for the TA Methodology)

- Step 1: **Governance and Identification of National Project**

**Sponsor:** Relevant

Zambia's Ministry of Technology and Science (MoTS) - identified as the national project sponsor during **Preliminary Discussions with UNCTAD**: Initial consultations and discussions with UNCTAD on the national TA project

- **Formation of Steering Committee and Expert Group:** Establishment of a steering committee to coordinate, and an expert group to oversee and implement the TA process.



# Technology Assessment (TA) in the Energy Sector in Zambia

- Step 2: Priority setting on the Selection of Energy Technologies:  
Expert group meetings to select energy technologies for assessment based on criteria
  - **Criteria for Technology Selection:** Criteria included resource availability, existing policy, practicality, and renewable nature of the technology
- Step 3: Framing project questions involved mapping of actors involved in of the technology
- Step 4: Setting project goals - biogas Energy
- Step 5: Project implementation (Technology assessment report and implementation framework)



# Structure of TA Report

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# Accelerating Biogas adoption and “upscaling”: Policy recommendations

- 1. Educational and Training Programs:** clear that knowledge and attitudes towards biogas in the general population remains poor
- 2. Research and Development Incentives:** R&D initiatives to enhance the use and adoption of the technology in Zambia
- 3. Financial Support Mechanisms:** setting up and installation of biogas systems had a high upfront cost to which small scale farmers and the rural population could not afford

- 4. Policy Framework for Feedstock management:** addressing issues such as waste management, agricultural residues, and energy crops.
- 5. Grid Connection Policies:** Formulating policies that enable the integration of biogas systems into the national energy grid, allowing for the sale of excess biogas-generated electricity



# Accelerating Biogas adoption: Summary of Recommendations

6. **Community Engagement and Awareness:** Promote community engagement and awareness programs on the benefits of biogas technology
7. **Quality Standards and certification:** establish quality standards and certification processes for biogas systems and components through relevant ministries and regulators
8. **Incentives for Agricultural Sector:** encouraging integration of biogas systems in the agricultural process would lead to a higher adoption of biogas systems.

9. **Capacity Building for Government Agencies:** government institutions may not be fully equipped with information related to biogas especially around the regulation and promotion of the technology
10. **Inclusion of Women, Youth and Marginalized Groups:** create an inclusive and supportive environment for the adoption of biogas among women, youth, and marginalized groups, fostering sustainable development, gender equality, and social equity

# Conclusion

Technology assessment can play a vital role in Developing Countries and Zambia in particular for guiding the development, implementation, and management of biogas energy projects, ensuring their sustainability, reliability, and contribution to energy security and environmental conservation. Thus support attainment of SGDs and mitigation of Climate Change



# Acknowledgements

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