



4th Webinar on Renewable Energy Solutions with a focus on Waste to Energy

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Potential Biogas Market & Practical Experience in Cambodia

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Table of Content



1. Biogas Potential Market

1.1 Existing use of biogas systems

1.2 Issues

1.3 Biogas market potential

2. Practical Experience

2.1 About BTIC

2.2 BTIC Activities



1. Biogas Potential Market



1.1 Existing Use of Biogas Systems

- Domestic biogas systems
 - Mainly used brick type and plastic biodigsters
 - For cooking in households
 - Feedstocks used mainly cattle manure
- Commercial biogas systems
 - Mainly used covered lagoon type biodigesters in cassava starch processing plants and pig farms
 - For boiler and electricity generation in cassava starch processing and mainly electricity generation in commercial pig farms (usually can cover up to around 70% of electricity demand of farm)
 - Use pure biogas (biogas generator or modified generator) or dual fuels (mixing biogas and diesel) and often used second hand generator



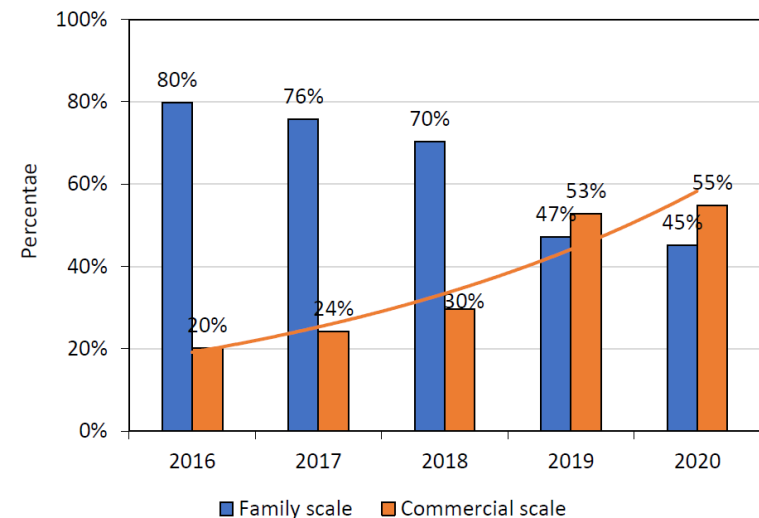
1.2 Issues

- Use of incomplete biogas systems, without proper pre-treatment systems (while H_2S concentration normally more than 2000 ppm resulted in quickly break down of biogas generator) and other accessories such as biogas flow meter and flare
- Limited suppliers of products for commercial biogas systems which lead to use of modified generator or second hand generator; and higher price and limited after sales support for newly imported generators and accessories
- Limited awareness of stakeholders (policymakers, FIs, owners, operators) on commercial biogas systems
- Lack of additional capital investment for biogas systems with low interest rate



1.3 Biogas Market Potential

- For household biodigesters, the trend is decreasing
- For commercial ones, the trend is increasing
- Newly revised biogas policy encourages the use of biogas systems for treatment of waste water from agro-processing plants and commercial animal farms
- Interest of donors and financial institutions (Fi) in supporting the use of green technologies



Source: General Directorate of Animal Health and Production (2021)



Estimated Investment for Biogas Projects

Farm Scale	Number of Farms	Estimated Investment Costs (based on local, second-hand/modified genset)	Amount (US\$)
First potential biogas farms (> 3000 fattening pigs or > 300 sows)	79	98,000	7,742,000
Medium Farms (> 1,500 to 3,000 fattening pigs)	124	61,000	7,564,000
Agro-processors	18	300k to 1M	5,000,000
Total	221		20,306,000

Source: UNIDO (2021)



Biogas project is low risk investment

- Due to the following factors:
 - Farms are profitable with secured revenue (contracted buyers, inputs as well as technical and maintenance provided by buyers, cash flow for operation and subsidy from buyers)
 - Biogas technology is proven
 - Partial payment for electricity from buyers
 - Partial guarantee from Credit Guarantee Corporation of Cambodia (CGCC) (share the risk with lending institutions up to 80% or possibility guarantee 100% of loans providing there are enough justifications)



2. Practical Experiences



2.1 About BTIC





Location

Located in the building of Faculty of Agricultural Engineering,
Royal University of Agriculture, Cambodia





Launching of the Center

- Established with the support of UNIDO through project “Reduction of GHG emission through promotion of commercial biogas plants” funded by GEF
- Officially launched on December 8th, 2016 presided over by H.E. Om Kimsir, the secretary of state, Ministry of Agriculture, Forestry and Fisheries
- Mini-exhibition was organized and around 10 companies joined to display their products and services related to biogas technologies.





Facilities and Tools

- 3 pilot digesters to conduct research on biogas production from different feedstocks and gas quality upgrading (using air injection to remove H_2S)
- Portable gas analyzer
- Powerlogger





Services

1. Training and capacity building (in cooperation with partners such as ERDI, and BIOMA)
2. Information Gathering and Dissemination (database of farms/plants, suppliers, handbooks)
3. Consulting (Feasibility Study, performance monitoring)
4. R&D (mini-grants for students)



2.2 BTIC Activities





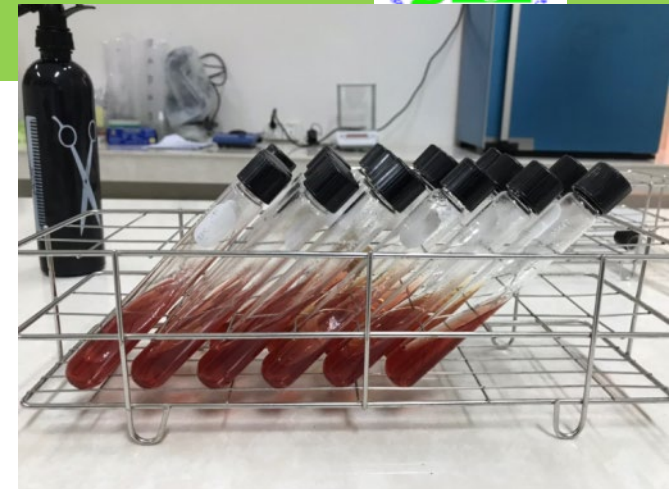
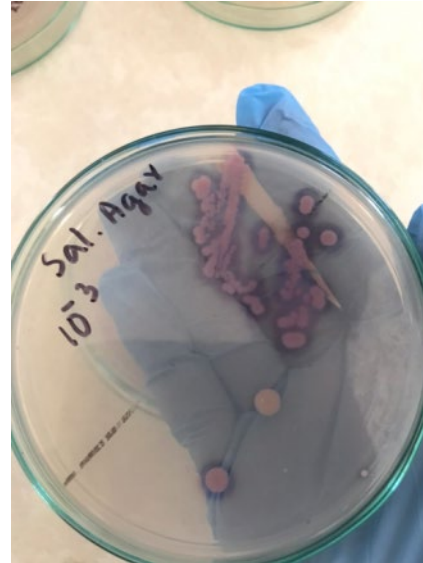
Trainings



- Jointly organized by BTIC and partners (BIOMA, ERDI, GDAHP)
- Offered to stakeholders such as farm owners, policy makers, financial institutions, project developers, etc.



R&D





Research Priorities

1. Biogas / biomethane production potential test
2. Experiment with agitation
3. Experiment with high-rate digestion
4. Internal gas treatment
5. External gas treatment
6. Gas utilisation equipment
7. Effluent management



Biogas Promotion



- Website: <http://www.btic-rua.org>
- Facebook: <https://www.facebook.com/BTIC.Cambodia>
- Flyers, public announcement/media campaign
- Promotion videos

បច្ចេកវិទ្យា និងព័ត៌មានជីវឧស្ម័នខ្នាតធំនៅកម្ពុជា - BTIC Cambodia added 7 new photos.

15 Nov 2019 at 8:46 am

សកម្មភាពបន្តនៃការតំឡើងប្រព័ន្ធចម្រោះជីវឧស្ម័ន នៅកសិដ្ឋានចិញ្ចឹមជ្រូក M's Pig នាថ្ងៃទី១៥ ខែវិច្ឆិកា ឆ្នាំ២០១៩ !!

Continue the installation of biogas treatment system at M's Pig Farm on 15th November 2019

Email: btic@rua.edu.kh

Website: <http://bt...> See More





Promoting the Use of Complete Biogas Systems



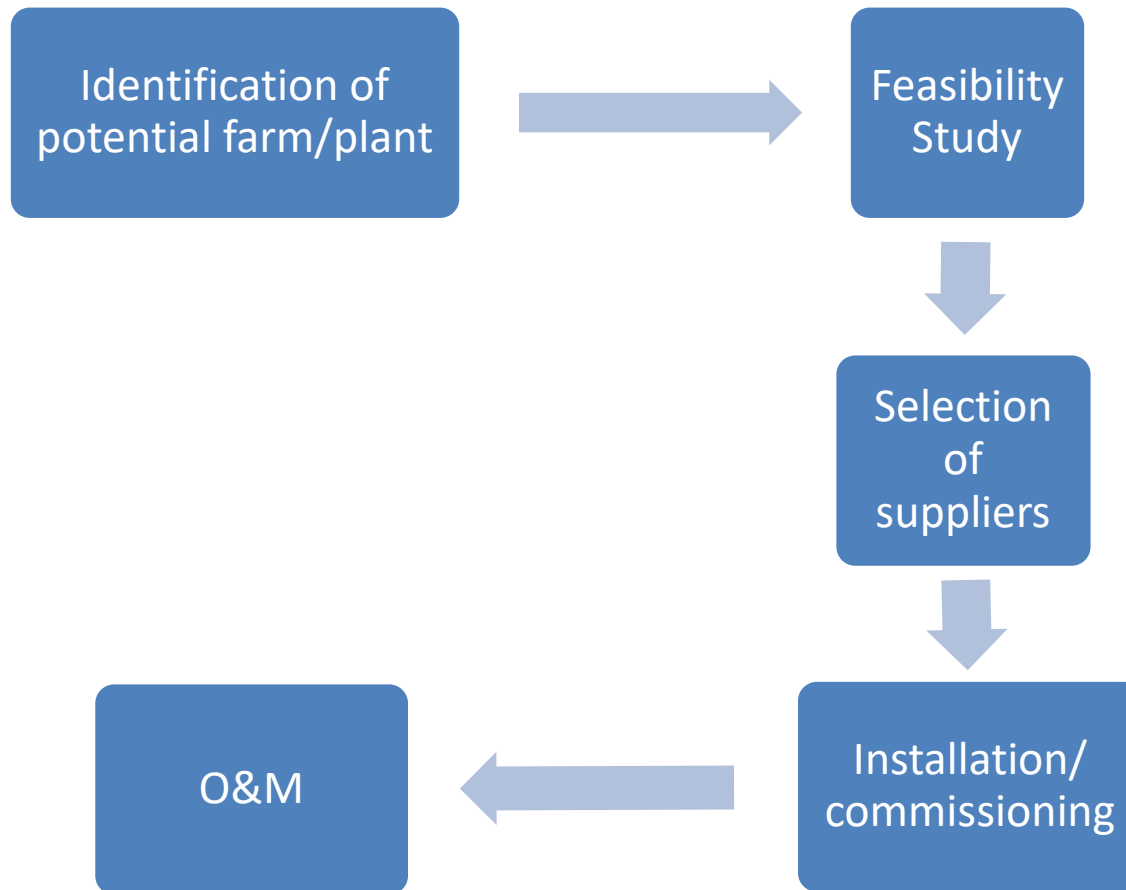
electricity

Surplus biogas

3. Biogas Flow Meter



Process of Supporting Farms/Plants





Feasibility Study



- Including technical and financial aspects and project teaser
- Provided the service to mainly pig farms, and cassava processing plants, dairy farms





Installation of biogas system and monitoring





Facilitate Loans for Biogas Projects





Revision of Technical Norms for Biogas

- Revising technical norms for domestic biodigester and covered lagoon digester in cooperation with BIOMA supported by UNIDO for General Directorate of Animal Health and Production, Ministry of Agriculture, Forestry and Fisheries
- Involving in translation, collecting related local norms and standards, review and organization consultative meetings

Thank You

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Biogas Technology and Information Center (BTIC)

Under the framework of Project on Reduction of Greenhouse Gas
Emissions through Promotion of Commercial Biogas Plants



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08 December 2016

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