



## SDG 7: AFFORDABLE AND CLEAN ENERGY

Universitas Sumatera Utara (USU) is dedicated to advancing Sustainable Development Goal (SDG) 7—Affordable and Clean Energy—through impactful community engagement programs. These initiatives focus on harnessing renewable energy sources and promoting sustainable energy practices. Key activities include training the community in Tadukan Raga Village, Deli Serdang, on biogas production from organic waste and revitalizing local biogas facilities. The programs aim to enhance waste management skills, provide infrastructure for biogas generation, and demonstrate biogas as a cleaner, affordable alternative to traditional fuels. These efforts contribute to improved environmental conditions, reduced reliance on non-renewable energy, and the promotion of sustainable economic practices, fostering resilience and community empowerment.

No.	Title	Abstract	Outcome	Attachment
1.	Development of Biogas Plant and Mushrooms Grumpy in a Biomass Waste Utilization Facility at Tadukan Raga Village, STM Hilir District, Deli Serdang Regency	Community service is a form of movement in making a real contribution to society which aims to provide solutions to real problems that occur in society. Most of the Indonesian population still relies on the agriculture, plantation and livestock sectors to drive the economy. By-products in the form of waste are generally used as fertilizer which can actually be used as an alternative energi source. Biogas is a renewable energy produced through the process of anaerobic digestion of organic materials which is currently widely used by the community as an alternative energy to replace LPG for cooking and generator fuel to produce electricity. One of the utilization of non-hazardous biomass waste into energy in the form of biogas has been implemented in Tadukan Raga village in Sinembah Tanjung Muda (STM) Hilir District, Deli Serdang Regency which has been operated since 2018 and is equipped with a barn for mushroom cultivation. However, problems arise where the facility is abandoned where there is a lack of maintenance of biogas generation facilities and mushroom barns, lack of human resources and low	<ol style="list-style-type: none"> <li>1. Enhanced Waste Management Skills in the Community: Training in Tadukan Raga Village equipped community members with practical skills in biogas production and mushroom cultivation, helping them transform agricultural and organic waste into renewable energy and agricultural products.</li> <li>2. Increased Use of Biogas as a Sustainable Energy Source: By modifying stoves for biogas compatibility and demonstrating its use for cooking, the program promoted biogas as a viable alternative to LPG, making clean energy more accessible and affordable for local households.</li> <li>3. Improved Local Economy through Mushroom Cultivation: The revitalization of the mushroom barn provided additional income opportunities for residents, with mushrooms grown on decomposed palm waste being harvested, packaged, and sold, thus supporting economic growth.</li> <li>4. Provision of Organic Fertilizer from Mushroom By-products: The program introduced composting techniques, enabling the community to use leftover mushroom media as organic fertilizer, which benefits local agriculture by enhancing soil quality.</li> </ol>	<a href="https://drive.google.com/open?id=1ou8rf5plrMyOJglSEwSEAd-XC7hiUCBX">https://drive.google.com/open?id=1ou8rf5plrMyOJglSEwSEAd-XC7hiUCBX</a>

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		<p>understanding of the community, especially BUMDes in the management, development and business maintenance of this facility. Therefore, it is necessary to provide counseling and training to the community in the operation of biogas facilities, revitalize mushroom barns in biomass non-b3 waste utilization facilities and modify LPG stoves into biogas stoves and install stoves in residents' homes around Tungkusan hamlet. Tadukan Raga Village itself is a fostered village that has been used as a place for counseling and service from the University of North Sumatra to the community because there are still several things that need to be improved, so counseling is again carried out in this village.</p>	<p>5. Community Engagement and Commitment to Sustainable Practices: Community members, with support from Universitas Sumatera Utara, actively participated in program evaluations and expressed enthusiasm for maintaining and expanding these sustainable practices, contributing to environmental preservation and economic resilience in the village.</p>	
2.	<p>Pemberdayaan Masyarakat Pengolahan Sampah Organik Biomassa Sebagai Bahan Baku Pembuatan Biogas</p> <p>(Community Empowerment Processing Biomass Organic Waste as Raw Material for Biogas Making)</p>	<p>Problems related to waste have not been resolved properly, especially organic waste. One strategy to reduce organic waste is to process it to use it as biogas energy. Therefore, through this service, training activities will be carried out on processing biomass organic waste into biogas. This activity received direct assistance from the initiator, trainer and experts at the Research and Community Service Institute, University of North Sumatra. The aim of this activity is to strengthen and empower and increase community knowledge and skills in processing organic biomass waste as raw material for making biogas in Tadukan Raga Village, Sinembah Tanjung Muda Hilir Subdistrict, DeliSerdang to realize</p>	<p>1. Enhanced Community Knowledge and Skills in Organic Waste Management: Training in Tadukan Raga Village increased residents' understanding and skills in processing organic biomass waste into biogas, offering a sustainable solution for waste reduction and energy generation.</p> <p>2. Provision of Necessary Infrastructure for Biogas Production: The program provided essential equipment, such as waste collection tools and bioreactors, to facilitate the collection and processing of organic waste, enabling the community to produce biogas effectively.</p> <p>3. Improved Environmental Conditions: By utilizing organic waste as a resource, the program contributed to waste reduction, helping the village improve its environmental cleanliness</p>	<p><a href="https://drive.google.com/open?id=1etbdDZ649QeCcNSMh8PZsSM481og3ssv">https://drive.google.com/open?id=1etbdDZ649QeCcNSMh8PZsSM481og3ssv</a></p>



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		<p>community welfare through community empowerment. The method is carried out by strengthening the community. Tadukan raga in processing biomass organic waste as raw material for making biogas and carrying out community service activities. The results of this activity were the cleaning of the biogas plant land, the installation of name signs, and discussions to prepare for the FGD. After the FGD was carried out, there were results, namely the need for a practical stage and system for processing biomass organic waste that could be filled in the reactor for the next step.</p>	<p>and reduce the harmful effects of waste accumulation.</p> <ol style="list-style-type: none"> <li>4. Support for Sustainable Energy Usage: The biogas produced from organic waste provided an alternative energy source for the community, reducing reliance on traditional fuels and promoting sustainable energy practices in Tadukan Raga.</li> <li>5. Positive Community Engagement and Future Collaboration: The project fostered active community participation and garnered support from local leaders, with plans for ongoing collaboration with Universitas Sumatera Utara to expand biogas usage and waste management practices in the village.</li> </ol>	