SUBMISSION TEMPLATE

Your idea must be submitted by **April 27th 2020 at 23:59 pm**.

Personal Data*:

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1. Team Name:

EnergreeN

2. Title of Your Proposal:

Carbon Capture integrated Biogas Plant with Methanol production

3. Which Track are you tackling?

Capture and recovery of Carbon dioxide &
CO2 re- utilization and products

4. Explain the problem you wish to solve and why you took an interest in it:

Eventhough biogas plant is a commonly accepted and popular solution for the waste disposal, the present utilization of biogas as cooking fuel and fuel for power generation leads to the emission of considerable quantity of CO2 to atmosphere, which makes the technology imperfect. We wish to solve such a situation by integrating carbon capture and utilization with the biogas plants, which provides a much cleaner solution.

Waste disposal is a major concern and important topic around the globe so as CO_2 emission. The purpose is to introduce a clean technology with the production of a value added product so that this can be implemented in any part of the world. We have been suffering waste disposal related problems from childhood, as grow up we started understanding the importance of CO_2 emission control. That compelled us

internally to come up with an idea of addressing both. This is an attempt to come up with a waste disposal scheme with zero CO2 emission by effective capture and utilization.

5. Bring your idea to the point. Give us a quick elevator pitch of your Solution:

Biogas plant integrated with Carbon dioxide capture and Methanol production

6. Please get more detailed regarding your approach:

Kindly go through the attached document – Document 1 and Document 2 attached herewith

7. In what way is your team's solution innovative?

- *The proposed unit produces methanol along with waste disposal making the process revenue generating. Which will help in contributing the operating expenses for the plant.*
- *General usage of biogas such as cooking gas and power generation leads to the emission of CO_2. This integrated approach ensures a cleaner technology by the integration of CO_2 capture and utilization.*
- *The practice of production of bio-methane by removing CO_2 from biogas and enriching the gas with methane is an established area. However, the further the use of bio-methane leads to CO_2 emission. The concept proposed here is not having this problem and also give solution for waste disposal and CO_2 utilization .*
- *The energy required for electrolysis for the production of H2 shall be partially met by power generated from biogas. The excess energy requirement shall be met from renewable energy sources such as solar or wind making the system completely free of fossils.*
- *The Oxygen generated from the electrolysis process (which is used for H2 production for methanol process) shall be used for the oxy-combustion of biogas for the power generation. The complete oxygen demand for the oxy-combustion shall be met internally which leads to efficient combustion and burden of N2 is eliminated*
- *The manure from the biogas plant is also a sellable product as fertilizer , which also generate revenue*

8. Explain the business case behind your approach:

The whole project is not about making profit by selling methanol. The social and environmental benefits of the project makes the process attractive. Waste is being disposed in the most cleanest way avoiding the negative impact to environment to a large extent. CO2 is effectively captured and converted to methanol which also can be a key performance indicator for the plant.

The project can be viewed in two ways, one the conversion of existing biogas plants to carbon capture integrated methanol units. This requires proper assessment of the existing plants and modifications for maximum efficiency. Other is to build new units of suitable capacity as centralized units.

The suggested business model for the project is Public Private Partnership model due to the social importance of the project. The stake of government and private entities are the most important requirement for such a project. A design, built, finance, operate and transfer model (DBFOT) can be adopted. However the final plan shall be based on detailed analysis.

9. How does your approach perform in terms of the CO2 emissions in the overall/ underlying process? Is it a closed loop and is the CO2 balance neutral or even negative?

Our approach is closed loop solution, the CO2 generated from the process is captured and utilized. Hence a Carbon neutral approach.

10. What are the next steps/milestones of your project? Which hurdles may arise?

Next Steps

- *The pilot implementation of the project after conducting detailed design, simulation and lab trials.*
- *Determining more efficient and less expensive carbon dioxide capture solvent*
- *Convincing the Government and investors on the social and environmental benefits of the project*

Hurdles

- *The major hurdle will be in terms of making the project more attractive so that more stake holders will involve for taking up and implementing the project*
- *Feasibility constrains especially due to high energy demand of electrolysis*

11. How can EnBW support you with your plans?

- *Technical supports and arrangements for lab trials and pilot trials*
- *Connecting to stake holders and investors*
- *Drafting a proper project plan*

12. Team description:

Klicken oder tippen Sie hier, um Text einzugeben.

We are enthusiastic and passionate on this technology and highly motivated to work, which is the primary quality we are having to win the challenge.
We both are chemical engineers having good industrial experience with process industries. We have networks with professors, industrialists, etc. who are in a position to help us to go ahead with this project .
To give a better understanding on our capabilities our CV s are attached herewith.

If you have further Materials you can submit (e.g. Video, Pitch Deck, Concept) feel free to submit it additionally to the filled submission template through the platform (app.ekipa.de).