



## Position Paper for Sanitation Unit.

### **Preface**

The EU Interreg 5a project Groene Kaskade (Green Cascade) facilitates small and medium companies and knowledge institutes in Germany and the Netherlands to develop innovative technologies for the biogas value chain. The focus is on the improvement of the economic viability and better utilisation of the input- and output materials. The framework of the project is the development of the biobased economy in the German-Dutch border region.

Adverio BV participates in the sub-project Refitting that aims to renovate existing biogas installations with innovative plugin technical modules.

This fact sheet is one of a series of seven, it presents a modular unit for digestate sanitation.

### **Project principle.**

A stand-alone modular unit for digestate sanitation by heating linked to a mono manure AD facility. The proposed modular unit allows not only to deliver enough heat for the anaerobic digestion process, but also supplies primary and secondary heat for digestate sanitation using produced biogas as sole fuel. Unit can be built for small and middle size mono manure AD facilities.

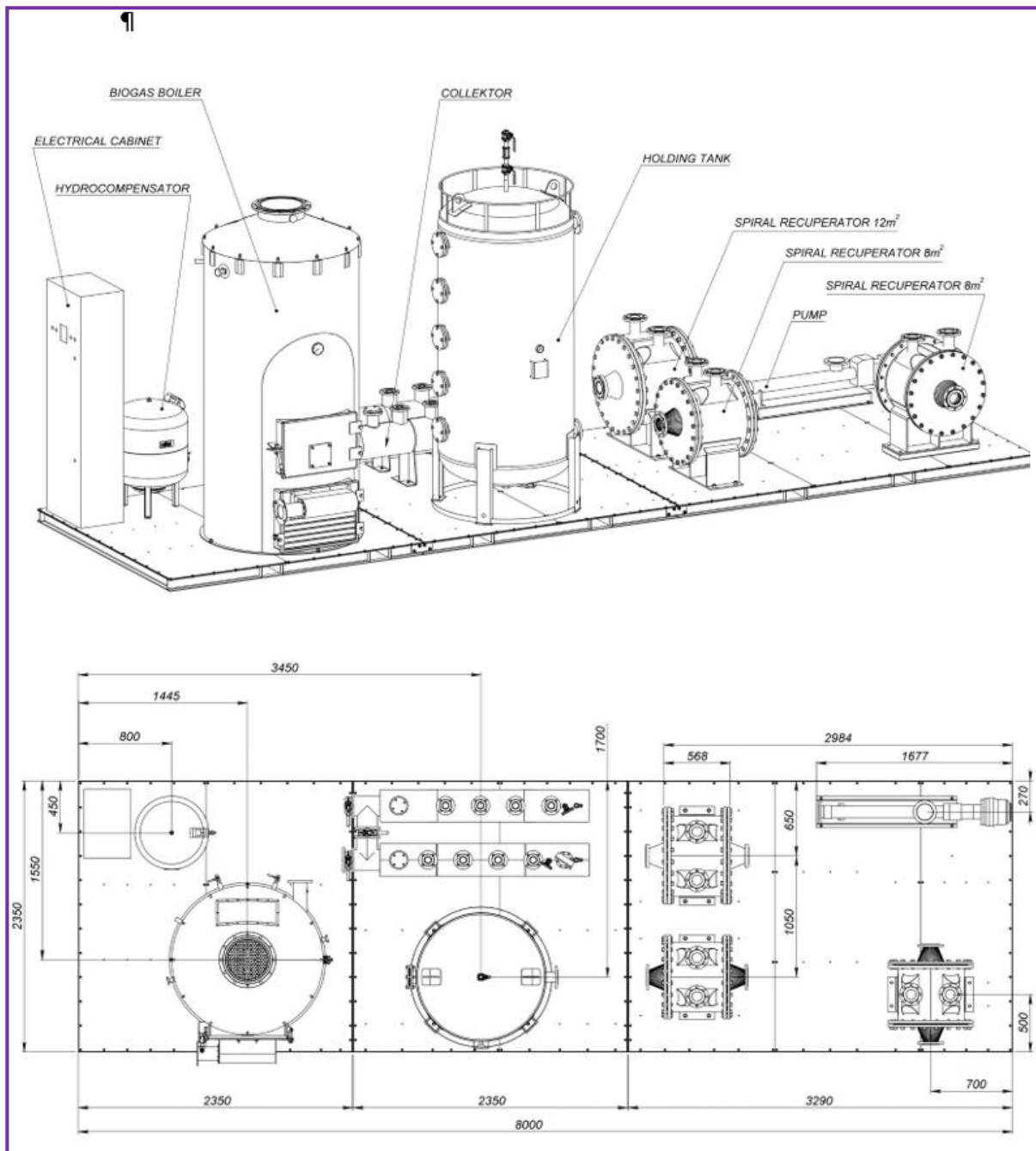
### **Market opportunity.**

The dairy cattle farm does have a manure offset problem in the Netherlands. The manure production amount (10 times) exceeds the available arable land. One of the solutions is to sanitize (European Law) the manure so it can be exported abroad for instance to Belgium and Germany.

By utilizing the biogas from the manure, the renewable energy from biogas is produced and utilised so the environmental impact is reduced to a minimum.

### **Project overview.**

The mono digester reactor in the project processes 10.000 ton/yr of liquid cattle manure and 4.000 ton/yr of solid cattle manure. The reactor produces 475.000 Nm<sup>3</sup>/yr of biogas. The 400 kWth biogas boiler, is heating the water circuit connected to the reactor and sanitation unit. The incoming manure is heated and digestate is sanitized with a buffer vessel and 3 heat exchangers. The project has been commissioned in week 48, 2019.



Concept design sanitation unit.



Project Partners

Adverio RNK, (Ukraine) is specialist in the production of Bio-diesel, Bio-ethanol, Alcohol and Animal feed from renewable sources. They are specialists in energy saving technology and their implementation in the agro-industry (sugar etc.) Furthermore they have extensive experience production of biogas from sugar industry wastes. The specialists are advanced users of analytical equipment and can train the operators to handle the installations designed by Adverio. They provide professional experience as an engineers in chemistry technology for more than 15 Years. and hand-on management in the projects to support construction and start-up activities.

Technology Providers  
Proven technology



Adverio employs full time engineers and project managers, and has a broad network of partners and experts to offer a complete service to its customers. With a primary focus on methanisation and ethanol production from biodegradable materials. Adverio has built and supported development of more than 35 projects a ranging from 340kW to 15 MW (7000 Nm3 biogas / hr.



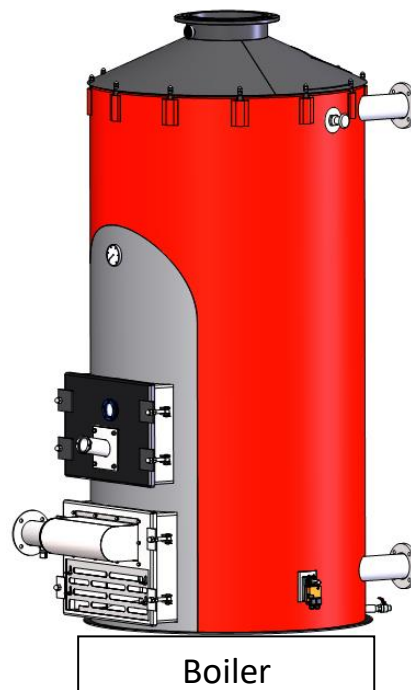
UTC is a multi-sectoral enterprise operating in the market of industrial services especially in the agroindustry in Ukraine, as well as in other countries of the EU, Eastern Europe and Asia. Focusing on food processing, microbiological processes and alcohol industry.

Feedstock Supplier

The Dairy Farm of Hanenberg is the owner of the AD facility and supplier of digestate/manure and biogas for the sanitation process.

### **Project Location.**

The sanitation unit is installed at the Hanenberg Dairy Farm in Oss. The farm can supply the fresh manure/digestate and biogas from the mono manure digester.



### **Project status.**

The sanitation unit engineering, construction and testing completed. The start-up phase and fine tuning is ongoing.

Once the project is successful finalized, Adverio and partners will develop and sell sanitation units for similar projects.

### **Project timeline.**

- The development team is targeting towards a fully operational plant before end of Q1 2020.
- Project concept ready for market implementation by mid of 2020.
- Project and business development, update of design and manual Q2 2020 – Q3 2020;
- Permit application period for 2<sup>nd</sup> project Q2 2020 – Q3 2020;
- Start Construction 2<sup>nd</sup> project Q4 2020;
- Commission 2<sup>nd</sup> project and start-up Q1 2021 and Operational from Q2 2020 onwards.



## **Investment**

The complete sanitation unit will require an investment between €75.000 - €85.000 (depending on final configuration). The investment range is depending on configuration, permit requirements, start-up costs and after sale costs.

The project can be separated in phased activities: 1. Engineering, 2. Shop Construction, 3. Transport and on site installation. 4. Project Management, 5 Operator Manual, 6 Start-up costs, 7 after sale costs.

For the yearly operations an average estimated budget of € 2.000 for maintenance and staff costs is required. The operational project risks are low once the boiler is continuous operating on the same biogas quality.

Target for main economic indicators:

Decrease the investment on hardware through standardisation and improve the quality / standardisation of the manuals for new clients.

## **Economic benefits:**

- This project will provide cost reduction and additional income opportunities for farmers.
- This project opens new opportunities and alternative use of manure / digestate and biogas utilisation.
- In addition the emissions of GHG-gases will be reduced and a potential for qualified emission certificates.