

Sustainable Landscapes 4 New Energy

Development Plan Summary (Groote Heide, Netherlands)

Overview: The Achelse Kluis is a monastery dating back to 1656. It is located in the middle of a natural forest – the Groote Heide – and consists of multiple old buildings located on a 31 acre natural reserve belonging to the Achelse Kluis. Since the monastery is a listed site it needs to be partially heated all year round, which is currently very costly. The monastery is occupied by four monks and includes a brewery. The BioenNW project worked with Achelse Kluis to determine whether to create a biomass plant using wood chips from forest management which would generate heat and electricity for the monastery in an environmentally friendly and cost efficient way.

Project detail

A research study undertaken by Technical University Eindhoven together with all stakeholders (Achelse Kluis, an area development agency, a forest management agency and municipalities) showed the proposed project to be economically viable. The return on investment would be high and the payback period a relatively short time of 7.5 years. The earned profits (cost savings) could in turn be used to renovate the monastery, invest in the surrounding nature reserve and reduce the energy demand of Achelse Kluis. Additionally, the heat could also be utilised in the monastery's brewery.

The monastery was provided with a report highlighting available technologies to turn the biomass into energy – including combustion, gasification, pyrolysis and torrefaction – together with details of the associated costs to take into consideration.

A situation analysis showed that the plant could be run by the monks themselves and complemented by a contract with a biomass boiler supplier. The

surrounding forest would be able to supply a constant and consistent amount of feedstock.

Investment for the project would be able to be secured from the local municipality (already contributing to the monastery's energy bill), the European Union and investors with an interest in the local environment.



This initiative has the support of six local municipalities, the City Region of Eindhoven, the local water board and the province of Noord Brabant, all of whom aim to benefit the local environment. The implementation of a biomass plant would require the approval of the Flanders Heritage Agency as well as local governments in both Belgium and the Netherlands. It has been identified that good communication with key stakeholders will be essential for the success of this project.

Two potential locations have been identified for the biomass plant within a non-profit and profit scenario, the former being currently favoured. If built next to the monastery itself, the heat generated by the plant would be used exclusively by the monastery. This would enable savings on the electricity and heating bills but would not generate profit as it would not be cost effective to export electricity due to the processing cost. In this scenario the plant would be on a small scale to exclusively meet the monastery's heat and electricity requirements.

The alternative is to build a larger biomass plant at another location adjacent to a nearby Wellbeing centre, a theatre, hotel and restaurant which have a greater energy requirement. In this scenario, the plant would run on a profit basis with the energy being sold to companies and organisations in the area. Due to the number of stakeholders involved, marketing and communication costs would need to be taken into consideration.

In the first scenario around €500,000 would be saved over a 15 year period and this could be re-invested into the local environment or the restoration of the monastery. The return on investment over the 15 year period would be 13.7%.

This initiative has currently been put on hold following Achelse Kluis's Abbot support withdrawal. It is hoped that this decision could change to allow the project to progress. The monks are elderly and it may be that the Achelse Kluis may be designated (partly) for other purposes. Once the future of the monastery is decided, the situation will become much clearer. At this point, this initiative and the business case will be reconsidered. In the meantime Achelse Kluis has been advised to consider storing dry woody biomass in its outbuildings to insure against future rises in energy prices.

This development plan has been produced through BioenNW – a €7.9m strategic initiative of the European Union INTERREG IVB North West Europe Programme (2011-2015). BioenNW is led by the European Bioenergy Research Institute at Aston University, UK and sees 11 partners working together to deliver small-scale bioenergy schemes throughout North West Europe.



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