

Feasibility study and project financing on combustion of sediments from TENTO Inc

Regional Energy Management Agency, Slovakia

Summary

The study considered different variants of conjunctive combustion of waste defibred paper sediments with wood waste, produced in the region of the Northwest Slovakia. The priority task of the realizers was to ensure effective energy utilization of waste sediments, which are increasing from year to year.

The study was developed by REMA in cooperation with Biomasa Association, Zilinska Teplarenska Inc. (local heating plant in Zilina), Tento Inc. (local paper mill in Zilina), boiler manufacturers and representatives of important regional institutions. The executor of the study was Energy Research Institute in Bratislava. The costs for the study elaboration reached 14 000 EUR. The industrial plants (Stredoslovenska energetika Inc. and TENTO Inc.) together with REMA Zilina raised the financial resources.

Considering the economic criteria, which were a priority for the further construction, the executor did not recommend to realize the building in the existing economical, environmental and legislative conditions.

End-user area	Target Audience	Technical
<input type="checkbox"/> New buildings	<input type="checkbox"/> Citizens	<input type="checkbox"/> Energy efficiency
<input type="checkbox"/> Refurbishment of buildings	<input type="checkbox"/> Households	<input checked="" type="checkbox"/> Heating
<input type="checkbox"/> Transport and mobility	<input type="checkbox"/> Property owners	<input type="checkbox"/> Cooling
<input type="checkbox"/> Financial instruments	<input type="checkbox"/> Schools and universities	<input type="checkbox"/> Appliances
<input checked="" type="checkbox"/> Industry	<input type="checkbox"/> Decision makers	<input type="checkbox"/> Lighting
<input type="checkbox"/> Legal initiatives (municipal regulations, directives, etc)	<input type="checkbox"/> Local and regional authorities	<input type="checkbox"/> CHP
<input type="checkbox"/> Planning issues	<input type="checkbox"/> Transport companies	<input type="checkbox"/> District Heating
<input type="checkbox"/> Sustainable communities	<input type="checkbox"/> Utilities	<input type="checkbox"/> Solar energy
<input type="checkbox"/> User behaviour	<input type="checkbox"/> ESCOs	<input checked="" type="checkbox"/> Biomass
<input type="checkbox"/> Education	<input type="checkbox"/> Architects and engineers	<input type="checkbox"/> Wind
<input type="checkbox"/> Other	<input type="checkbox"/> Financial institutions	<input type="checkbox"/> Geothermal
	<input checked="" type="checkbox"/> Other	<input type="checkbox"/> Hydro power
		<input type="checkbox"/> Other

Context

The realisation of the study is based on the results of Wood Waste Analysis of Kysuce Region, which was elaborated in September 2001. The analysis mentions significant quantity of the existing usable waste wood biomass potential in the region. In the interest of this volume utilization, the task of REMA was to consider consumption of the waste wood biomass in the Heating Plant of the city for heat and electricity co-generation. This was the way in which the new idea of the project realization

of utilization of the existing paper sediments and other waste biomass in the Northwest Slovakia came into existence.

The Heating Plant covers 49 % of the total heat generation and demand in the city Zilina. In the close neighbourhood of the plant, there is a company – one of biggest producers of hygienic paper in the middle Europe with annual production of paper sediments close to 60 000 tonnes. The vision of the company is to increase the production output, which will consequently increase the sediments to 70 000 tonnes. At present, as the Heating Plant is mostly fuelled by brown coal; the implementation of the project for co-combustion of paper sediments and waste biomass could be beneficial to the environment and social aspect (new working opportunities and establishment of waste wood biomass market).

Objectives

The mission of the Study was to develop a variant proposal of the technical design of sediments combustion, economical evaluation and environmental appraisal of the proposed variants. Construction of a new boiler room or reconstruction and conversion of the existing one to a biomass-fuelled boiler would lead to the increased utilization of sedimentary paper and wood waste, reducing greenhouse gas emissions, creation of new work opportunities, reducing local and global emissions.

Process

The activities lasted 12 months, from November 2001 to October 2002.

Preparation phase

In November 2001, REMA initiated negotiations with representatives of the city, non-profit organizations acting in the city, representatives of the Heating Plant and industrial plant Tento Inc. about options of the Study development. Each party agreed with the necessity of this sort of Study working-out, but the financial provision was an issue. During the conjunctive sessions, three organizations finally agreed with their financial participation in the Study development (Heating Plant, Tento inc. and REMA).

During the first sessions, selection of the Study executor was discussed and selection conditions were agreed and specified. Selection of the executor was realized at the beginning of January 2002 in the offices of REMA. Following three offers by applicants for the Study execution, on the basis of the submitted references and price requested, Research Institute of Energy in Bratislava was finally chosen. The project was titled „Paper waste“ (hereinafter referred to as the Project).

Realization phase

The partners designated REMA as a Project Process Manager. Following submission of the requested details essential for the Study development, a number of sessions, resolving step-by-step progress of the Project realization, took part. Partners agreed to the number of four variants (co-firing sediments with coal, gas, wood chips and pellets) to be considered in the first phase. Options of the sediments dehydrating, transport of raw material (fuel and sediments) to the Heating plant were considered; technical conditions of new boiler construction a solution of the individual variants were consulted in conjunction with possible impacts on the environment. During the project performance, it was essential to provide for a quantum of data (chemical composition of the sediments, prices of raw material, quality marks of the proposed fuels, costs for the sediments storage, development of the heat balances, etc), two excursions - both to the Heating plant and Tento Inc. took part. On the basis of the processed information, the partners e agreed more detailed elaboration of the individual variants in the second phase. During further meetings, requirements and aspects of final results completion were specified. Final version of the Study was finished in August 2002.

Valuation phase

The executor of the Study, following the economic criteria, did not recommend solving the liquidation of the sediments through constructing a new boiler room in the Heating plant. During the further period, negotiations held in the interest of supporting the project implementation from home and foreign funds. Considering the time intensity of funds raising, the Heating plant postponed its decision to implement the project for the time, when feasible legislative and environmental condition, essential for realization this size project, are adopted in Slovakia. Progress and results of the Study were processed to the form of electronic presentation.

Financial resources and partners

Total costs for the Study elaboration reached 14 000 EUR.

The study was co-financed by REMA in co-operation with Stredoslovenske energeticke zavody (former owner of the Heating Plant) 7 500 EUR a paper mill TENTO Inc. 5 000 EUR.

Partners of REMA, co-operating together on the Study elaboration, were Biomasa, Association, the Heating Plant Zilina, and paper mill TENTO Inc. Zilina. Research Institute of Energy became an executor of the Study.

The mission of REMA in the project was to convince the partnership organization about the need of the Study implementation, to raise funds for the realization, to select an executor of the Study. Other important and responsible task was managing preparation and process of the Study elaboration – through organisational and operational provision of the meetings and communication of the individual partners, realization of excursion to the enterprises.

Results

The result of the Study offered records and details for the final decision about construction of a new boiler for combustion of paper sediments.

Considering the economical effectiveness, the most convenient variants were chosen: variant I. (co-firing sediments with coal or wood biomass) and variant III. (co-firing sediments in the form of briquettes with waste wood biomass and coal) conditioned to. Payments of TENTO Inc for this service at 1000, - Sk/t, which is five times more expensive in comparison to the present fee for the sediments liquidation. Concerning the technical and operational criteria, the most feasible was again variant I., in view of the environmental criteria, the most acceptable was variant III (co-firing paper sediments with waste wood biomass met the best the original objectives of the project – reducing production of emissions, ensuring energy effectiveness and elimination of local and global emissions. Unfortunately, the investment costs for implementation of both variants extremely high.

With emphasis to the economic criteria, which were priority for the investor's decision, the Study did not recommend to solve the liquidation of sediments through constructing a new boiler for the sediments combustion in the Heating plant (Annex.2). Providing the legislative, economic and environmental changes towards the restriction of the present process of the sediments utilization, the Study recommended to apply fluid technology of combustion.

Lessons learned and repeatability

The biggest barrier of Slovakia, as a post-communist country, is, in particular, people's thinking. Most of the companies still work in system that "everything is a problem" or "nothing can be done due to the lack of money". Organizations like REMA make an effort to convince the competent people about the need of co-operation and conjunctive progress in the interest of successful realization of projects and raising funds essential for implementation of those projects, which are vital for the further existence of the country in view of tightening environmental requirements, measurements and regulations.

Contribution of our work can also be affected thinking of the competent representatives who started to consider other than usual possibilities of their community development. REMA also recommend other Slovak and European cities to evaluate the feasibility of alternative fuels utilization for the central heating purposes. We presume that the project could be replicated wherever in Europe.

The Heating plant was not willing to consider implementation of the project with financial support of European funds considering time-consuming process of raising this sort of resources – this fact became an impassable barrier for the further progress of the project. In Slovakia, the process is in pioneering stage. Those companies, which could succeed in getting the financial resources, are not agreeable to undergo such a long-term process of raising resources. Considering this fact, before the beginning or realizing this sort of project, we recommend to convince the representatives of the concerned institutions about the necessity of support through grant sources.

Contact for more information:

Organization/Agency: Regional Energy Management Agency

Main contact:

Address: Nam. A. Hlinku 7, 010 01 Zilina, Slovakia

Tel: 00421 41 5643 022

Fax: 00421 41 5643 022

E-mail: remazilina@stonline.sk

Web Site: www.remazilina.sk