ETANOLIX 2.0 – CONVERTING INDUSTRAIAL WASTE TO ETHANOL IN OIL REFINERY

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Abstract

St1 Refinery AB is part of the St1 Group. St1 is an energy company engaged in renewable energy, in the form of the production of biofuels and wind power, as well as in the production and sale of oil-based fuels and fuels. The company operates in Sweden, Finland and Norway.

St1 Refinery AB produces about a fifth of Sweden's demand for fuels. The refinery in Gothenburg has an annual throughput of about 4 million tons of crude oil and has about 200 own employees and about 50 contractors. The refinery is certified according to ISO 14001 and EMAS.

The Gothenburg refinery has been characterized by innovative thinking and practices, especially in the environmental field and in terms of energy optimization. Today, the refinery is one of the most energy efficient in the world. By using waste heat from the refinery, thus minimizing alternative fuel for heat production, large amounts of emissions of CO_2, sulfur, nitrogen oxides and soot are reduced.

Today St1 has a management system concerning “Biofuels” describing how to comply with the Swedish legislation implemented from the European Renewable Energy Directive and the Fuel Quality Directive.

The refinery’s Etanolix 2.0 project is granted by the European Commission, LIFE12 Environmental program; with the main objective for the first time demonstrate the sustainable production of waste to ethanol integrated with the production process at an oil refinery.

The project involves the demonstration of an energy integrated pilot installation which is the first complete system for production of bioethanol using industrial residues as raw-material and based on the proximity principle.

The ethanol plant is a prototype pilot installation, built to enable energy integration with existing oil refinery processes which means that synergies e.g. like heat and cooling from the refinery and water systems can be used from already existing processes. The ethanol is used as a bio component to be blended into transport fuels to be used in vehicles.

Approx. 20% of the EU's total CO_2 emissions originate from road transport. The availability and sufficient quantity of renewable fuel for the transport sector is a crucial step towards reducing our dependence on fossil fuels and stopping global warming and the increase in GHG emissions originating from this sector. The project is addressing this issue as well as the problem of food waste and presents an outstanding solution for “Waste to fuel” based on a wiser resource use, where food waste is seen as a resource for renewable fuel (ethanol) production.