CO_2/Sodium Bicarbonate Project

Sodium bicarbonate ('baking powder', $NaHCO_3$), among other things, is used to scrub flue gases in Twence's Energy from Waste plant. In recent years, in collaboration with among others the firm Procede, a University of Twente spin-off, Twence has developed a system for capturing carbon dioxide (CO_2) from the dry flue gas scrubbers of one of the incineration lines, and using it as raw material for producing sodium bicarbonate.

Due to the project's sustainable and innovative nature, it is being subsidised by the Province of Overijssel, the Dutch government and the European Union. The plant is expected to produce around 8,000 tonnes of $NaHCO_3$ annually. This yields an annual reduction in CO_2 emissions of 2,000 to 3,000 tonnes. This is clearly beneficial to the environment. In addition, it is commercially interesting, because sodium bicarbonate is an expensive raw material. Soda is a bulk product that is cheaper and easier to obtain than sodium bicarbonate. Furthermore, 1 tonne of soda is enough for the production of around 1.6 tonnes of sodium bicarbonate, which in turn ensures that less transport mileage is incurred.

Twence

Twence produces raw materials and energy from waste flows and biomass. 99 percent of the waste is converted into raw materials, construction materials and energy. This way, we contribute to avoiding CO_2 emissions and reducing the use of fossil fuels. We extract raw materials that serve as fuel from waste supplied by customers in the Netherlands, Germany and the United Kingdom.

Twence has 15 municipal shareholders and its roots are firmly anchored in the Twente region. With a turnover of € 100 million and more than 220 employees, Twence is a significant employer and an economic motor in the region.

Energy from Waste plant

Twence makes use of non-recyclable residue for generating energy. Partly because Twence also supplies steam and heat alongside electricity from its Energy from Waste plant, the energy efficiency of the plants is considerably higher than that from traditional waste incineration lines. The yield is so high that the Dutch central government has described the power plant as a facility for the 'beneficial use' of waste and not for the 'disposal' of waste.

This so-called R1 status means that the facilities can readily be compared with the current generation of coal-fired electricity power plants as far as yield is concerned. For this reason we refer with justification and pride to 'Energy from Waste plant'.

The plant is expected to produce around 8,000 tonnes of $NaHCO_3$ annually

Facts

Investment	€ 4 million
Grants	Approx € 1 million from the European Union, NL Agency and the Province of Overijssel.
Project start date	1 July 2011
Construction man-hours	25,000
Construction time	1 year
Project realisation	▪ Twence ▪ Procede, Enschede ▪ Bouman, Almelo ▪ Van Lente, Deventer ▪ Imtech, Hengelo ▪ Moekotte, Hengelo ▪ Stork Thermeq, Hengelo
Commissioning	October 2014
Production	8,000 tonnes of sodium bicarbonate per year
CO_2 reduction	2,000 to 3,000 tonnes per year
Transportation movements - savings	40,000 litres of diesel per year = 400,000 m^3 of natural gas
Innovation	First installation in the world that 'mineralises' CO_2 and that reuses it in flue gas scrubbing.
Website	www.co2sbc.eu
Special aspects	▪ Innovation results in environmental gains and is commercially interesting. ▪ To date this innovative project is unique in the world of waste disposal.