



ECTOS Bus Demonstration

Reykjavik, Iceland

The ECTOS project, led by Icelandic New Energy (INE), introduced the first pre-commercial hydrogen refueling station in the world. Located in Reykjavik, Iceland, the station provided hydrogen produced with renewable energy to three fuel cell buses serving the city.

The ECTOS Bus Demo began in March 2001. The European Commission 5th Framework Programme sponsored the project and brought together a team of partners spanning Iceland, Germany, The Netherlands, Norway, and Sweden. The team spent two years conducting preliminary studies on potential social, economic, and environmental impacts.

Reykjavik was chosen to be this project's location because of its metropolitan characteristics—it is the capital of Iceland with a population of approximately 200,000. It comprises a highly educated population with a generally high level of acceptance for a hydrogen infrastructure.

In April 2003, the ECTOS project marked the beginning of the hydrogen production phase with the opening of the hydrogen refueling station. This phase included installing a hydrogen compression, storage, and dispensing system. By October 2003, the three fuel cell buses had arrived and began servicing Reykjavik.

Objectives

The ECTOS project supported the Icelandic government's goal for its country to become the world's first hydrogen-based modern society. The project's primary objective was to find a safe, logical, and clean way to integrate hydrogen into the current energy system.

Approach

Icelandic New Energy took a learning-by-doing approach with the ECTOS project. Through operation of the hydrogen fueling station, INE was able to gain real world experience in using the station to refuel three hydrogen fuel cell buses daily.

Accomplishments

Throughout the ECTOS project, the hydrogen refueling station provided the fuel cell buses with over 17,000 kilograms of hydrogen—the energy equivalent to nearly 17,000 gallons of diesel fuel.

Producing hydrogen and running the fuel cell buses added no greenhouse gases to the environment. The hydrogen used was produced at the refueling station by electrolysis using grid electricity that was generated by geothermal and hydropower.

In addition, since the completion of the ECTOS project, the team has compiled

Project Overview

What

ECTOS Bus Demonstration

Who

Icelandic New Energy Ltd.

When

Started: March 2001

Completed: August 2005

Participants

Lead Country

Iceland

Partner Countries

Germany, The Netherlands, Norway, Sweden

Renewable Technology

This project produced hydrogen using electrolysis from renewable grid energy (geothermal and hydropower).

Application

Buses

Website

www.newenergy.is



lessons learned on hydrogen-based transportation infrastructure that resulted in development of a crisis management plan, an emergency response procedure plan, and an incident reporting system.

Renewable Hydrogen Production

The electricity used to power the electrolyser in order to produce hydrogen at the station came from geothermal and hydropower. Approximately 80% of Iceland's electricity is produced through hydropower with the remaining from geothermal power.

Follow-up Work

The hydrogen refueling station remained in operation after the completion of the ECTOS project, and the buses took part in the HyFLEET:CUTE project, which involved 47 fuel cell buses in 10 cities across three continents. The station was also upgraded to service passenger vehicles as well as buses and now serves 22 hydrogen-powered vehicles in Iceland.

