Operating Plasma Gasification Plants

Mihama-Mikata, Japan

The Mihama-Mikata plant processes 20tpd of MSW from the towns of Mihama and Mikata. It also processes 4tpd of sewage sludge. The syngas is used to produce heat which is then used to dry the sewage sludge so it can be gasified.

All of the slag from the Mihama-Mikata plant is used beneficially as aggregate for concrete or paving stones.

The plant consistently meets its emissions requirements.
Pune, India

The MEPL plant processes hazardous wastes from over 30 industries in India. The owner of the plant, SMSIL, is a partner of Alter and together the companies offer plasma gasification into the Indian market.

Like the EcoValley plant, Alter has access to the operational data and the operating staff at the plant. SMSIL also makes the plant available to certain Alter customers for pilot tests and optimization tests. It is access to this type of information that allows Alter to accelerate the optimization of its technology – another advantage Alter has over its competitors.
Shanghai, China

In 2014, GTS Shanghai, a Chinese company, completed construction of a hazardous waste demonstration facility in Shanghai Chengtoun (Shanghai Environmental) in Jiagding. The plant uses the Alter’s plasma reactor design including Westinghouse Plasma torch systems. The project processes a combination of medical waste and incinerator fly ash and is focused on the effective and efficient disposal management of medical waste and its potential environmental hazards and public health risks. Since incinerator fly ash is an increasing disposal issue in China, it has become a high priority environmental concern for the Chinese Government.

The facility is located adjacent to an existing incinerator, is designed to process 30tpd of medical waste, incinerator ash and other difficult, hazardous feedstock. The facility produces steam for use throughout the balance of the process facility, and also converts hazardous incinerator flyash into an environmentally friendly slag, which reduces fly ash disposal costs and increases overall efficiency.

GTS Medical Waste & Bottom Ash Plasma Gasification Plant - Shanghai, China
Retired Plasma Gasification Plants

EcoValley – Utashinai, Hokkaido, Japan

The EcoValley plant, which was located near the small town of Utashinai in a rural area on the island of Hokkaido, could process up to 220tpd of pre-sorted MSW. The plant had two gasifier trains each capable of processing 110tpd.

The plant was closed due to lack of feedstock (loss of long term feed contracts).

Alter has been fortunate to have access to the operational data and operating staff of the plant. Hitachi Metals, the operators of the plant, modified and optimized the gasifier over the first several years of its operation. This commercial experience has been incorporated into the next generation gasifier design begin offered by Alter and purchased by Air Products. By comparison, Alter’s competitors are struggling to build their first reference plants.

The plant consistently met its emissions requirements.

Demonstration Plasma Gasification Plants

Madison, Pennsylvania, USA

Until the end of 2014, Alter/WPC owned and operated a demonstration facility located near Madison, Pennsylvania, USA. The demonstration reactor was built in 1984 and was been the home for countless gasification tests. The incorporation of Alter plasma gasification technology into successful commercial reference plants rendered the demonstration plant in Madison redundant so it was retired in early 2015.

During its operation, Coskata, the owner of a technology that converts syngas to ethanol, completed two years of successful testing at the demonstration plant. Alter/WPC gasified both wood waste and municipal solid waste to create syngas which Coskata successfully converted to ethanol.

The demonstration plant included the downstream gas cleaning equipment and state of the art, real-time gas composition monitoring. The demonstration facility was also equipped with three
distinct feeding systems through which almost any solid or liquid could be fed into the gasifier. Along with the pilot testing data, Alter/WPC utilized its predictive modeling capability, which includes the balance of plant, through VMG simulation software.

During its operation, Alter/WPC gasified a wide range of feedstocks at the demonstration plant including:

- Municipal solid waste
- Refuse derived fuel
- Construction and demolition waste
- Hazardous waste, including PCB contaminated waste and harbor sediment sludge
- Waste water sludge
- Waste wood and clean wood chips
- Bagasse
- Excavated landfill material
- Tires
- Auto Shredder Residue (also known as auto fluff)
- Heavy oil
- Incinerator ash

Alter/WPC continues to refine the core plasma torch and gasification technology based on the results obtained at its demonstration plant and the experience at operating facilities.

Alter NRG Demonstration Plant - Madison, PA (USA)
Yoshii, Japan

Based on the success of their joint development efforts with WPC, Hitachi Metals built a 24tpd commercial demonstration plasma gasification plant in Yoshii, Japan in 1999. Hitachi Metals operated the plant for one year on municipal solid waste and obtained a certification from the Japan Waste Research Foundation (JWRF).

Hitachi Metals leveraged the success of the Yoshii plant into the two commercial plants at Mihama-Mikata and Utashinai, Japan.

Wuhan, China

In December of 2011, Sunshine Kaidi began construction of a new technology park in Wuhan, China. The facility includes a 150tpd plasma gasifier purchased from Alter. This world’s first commercial biomass-to-liquid fuel plant has been in operation since January 20, 2013.
Supranburi Thailand

Uthong has commenced the construction of the UTPE Waste to Energy Facility. 2 x T25 gasifiers from Alter are to be delivered to the site in Q2 2019.

The facility will process 678tpd of pre-sorted MSW and produce electricity through a steam cycle power island configuration. The facility will supply 19.54MW of net power to the grid.

Uthong has received its environmental approval from the Thai government as well as a Feed-in-Tariff (FIT) due to the use of plasma gasification as the key technology for the processing of waste.