

Media release, 29 March 2022

Hitachi Zosen Inova Starts Green Hydrogen Production Facility

Hitachi Zosen Inova and the Aarau-Lenzburg Regional Waste Disposal Association will produce hydrogen at the Waste to Energy plant in Buchs (canton of Aargau). The main off-taker of the hydrogen will be Messer Schweiz AG in Lenzburg. This is HZI's second innovative project in the canton of Aargau within a very short time span after the delivery of a CO₂ liquefaction plant for a pioneering Swiss project in Nesselbach was announced in September.

Buchs (canton of Aargau), Switzerland. Energy transition to renewable energies will entail Green Hydrogen as high density and reduced carbon footprint energy carrier. Low-cost Green Hydrogen availability is key to facilitating the energy transition, and will be achieved by providing low-cost, surplus electricity to nearby consumers, which also reduces expensive logistical costs. Because Energy from Waste plants are intrinsically recycling facilities, using the electricity generated to produce hydrogen is a further step in enhancing the contribution of such facilities to the circular economy. In addition, hydrogen production can be either base load or fluctuating, in order to best match the availability of other renewable electricity generation, producing more hydrogen when wind and solar energies are high, and vice versa. Because hydrogen can be stored without losses, this chemical storage is more effective and more scalable than battery storage.

A joint venture project has been created for this purpose together with the Aarau-Lenzburg Regional Waste Disposal Association (Gemeindeverband für Kehrichtbeseitigung Region Aarau-Lenzburg or GEKAL) that will involve the Swiss-Japanese cleantech company constructing a first Waste to Hydrogen (WtH₂) small scale commercial plant. HZI will take care of all planning and construction work for the facility at the GEKAL site, and will also be the owner and operator in the first few years. The hydrogen produced will be used as technical gas for industry and for early mobility applications, for example as green fuel for local public transport and private vehicles.

HZI will produce hydrogen and oxygen by electrolysis using electricity from the Buchs Energy from Waste (EfW) plant. The oxygen will be released into the atmosphere, while the hydrogen will be compressed and stored in special tanks.

HZI will use an alkaline electrolysis process that can produce 550 Nm³/h of green hydrogen at 350 bar, meeting both the SAE 2719 and ISO 14687 quality standards for hydrogen fuel. The PtH₂ plant will also include a filling station. Its projected output is around 200 tons of hydrogen per year, equivalent to approximately 10-15 gigawatt hours of electricity. This is enough to keep a hydrogen-powered vehicle running for around 20 million kilometres, or to fuel up to 1'000 fuel cell cars per year. Lenzburg-based Messer Schweiz AG, who entered an agreement to take off the produced hydrogen, specialises in the supply of industrial gases and the new PtH₂ plant will represent a valuable, and above all, local source of green hydrogen, enhancing the circular dimension of the thermal recycling facility.

The new Green Hydrogen production facility will be integrated into the Swissgrid secondary control service framework, a novel concept for steering demand and oversupply within the Swiss power grid. When a primary producer goes offline, secondary producers such as the EfW plant in Buchs are brought online to stabilise the grid. So-called negative compensation is also possible if too much renewable energy is produced compared with the planned volume. In this situation, the hydrogen facility will draw up to 2 MW from the grid, meaning that renewable energy producers such as wind farms will not need to be taken offline immediately or perhaps even at all.

A Cost-Effective and Environmentally Friendly Joint Effort

The construction of the Green Hydrogen facility will bring many benefits, both environmental and economic. GEKAL Chairman Christoph Wasser explains: "Hydrogen production will allow us to

be much more flexible. For example, when demand for electricity is low, rather than feeding electricity into the grid, we can use it to produce hydrogen which can be stored.”

Fabio Dinale, Vice President Business Development at HZI, adds: “The use of the energy produced by the Buchs EfW plant will be significantly improved by the hydrogen plant. This will contribute to reducing the plant's CO₂ balance by offsetting the production of fossil fuels. In this sense, further attractive technical solutions are conceivable going forward, including combining the hydrogen with CO₂ separated from the EfW's flue gases to feed a methanation production cycle.”

Dr Hans Michael Kellner, CEO of the industrial gas specialist Messer Schweiz AG, comments: “For us as a buyer of the hydrogen, the new facility presents an ideal opportunity to effect a considerable increase in the share of Green Hydrogen in our product portfolio. Once the Power to Hydrogen plant is up and running, locally produced, green hydrogen will make up almost a third of our current local trading volume”.

The installation of the hydrogen facility at the EfW plant in Buchs is planned to start in June 2022, with the first hydrogen being produced at the start of 2023. Full operations will commence a few months later in the spring of 2023.



Photo 1: Working together cost-effectively for the environment. HZI will construct a hydrogen production facility at the Energy from Waste plant in Buchs, which is owned by the Aarau-Lenzburg Regional Waste Disposal Association. Messer Schweiz AG will add the facility's output to its product portfolio as green hydrogen.

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Photo 2: Working together cost-effectively for the environment. HZI will construct a hydrogen production facility at the Energy from Waste plant in Buchs, which is owned by the Aarau-Lenzburg Regional Waste Disposal Association. Messer Schweiz AG will add the facility's output to its product portfolio as green hydrogen.

About Hitachi Zosen Inova

Zurich-based Green-tech Hitachi Zosen Inova (HZI) is a global leader in solutions for energy transition and circular economy including Energy from Waste (EfW) and Renewable Gas (RG), operating as part of the Hitachi Zosen Corporation Group. HZI acts as project developer, technology supplier and engineering, procurement and construction (EPC) contractor delivering complete turnkey plants and system solutions for thermal and biological waste recovery. Its solutions are based on efficient and environmentally sound technologies, are thoroughly tested, and can be flexibly adapted to customer requirements. HZI's Service Solutions Group combines its own research and development with comprehensive manufacturing and erection capabilities to provide support throughout the entire plant life cycle. HZI works for customers ranging from experienced waste management companies to up-and-coming partners in new markets worldwide. Its innovative and reliable waste thermal treatment, flue gas treatment, organic waste digestion, biogas gas upgrading and Power to Gas solutions have been part of more than 700 EfW reference projects delivered since 1933.

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About the Aarau-Lenzburg Regional Waste Disposal Association

As it became clear during the 1960s that dumping municipal waste in landfill could no longer be a viable solution in the increasingly heavily populated region of Aargau, 32 communes joined forces in 1969 to form the Aarau-Lenzburg Regional Waste Disposal Association (Gemeindeverband für Kehrichtbeseitigung Region Aarau-Lenzburg or GEKAL). Further communes joined in the years that followed, and over 100 Aargau communes with more than 300,000 inhabitants in total are now members. GEKAL owns and operates the incineration plant in the town of Buchs.

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About Messer Schweiz AG

Messer Schweiz AG owns a state-of-the-art cylinder filling plant with a hydrogen production facility and special gas plant at its main site in Lenzburg as well as an air separation plant for nitrogen, oxygen and argon in Visp. It produces and supplies gases for industry, medicine, pharmaceuticals, food and laboratories as well as for research institutes. Messer Schweiz is a subsidiary of Messer Industries GmbH, the world's largest independent industrial gas company. It is certified according to all major quality standards, including ISO 9001:2015, ISO 13485:2016 with CE certificate under Annex II.3 of EU Directive 93/42/EEC for medical gas supply systems, ISO 17025, ISO Guide 34 and ISO 22000:2018.

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