

Breakthrough on the fuel front

Silicon Fire develops an economic system solution for methanol production from "green" energy

***Meggen/Switzerland, April 2011.* The Swiss company Silicon Fire AG has developed an innovative system with which regenerative energy can be converted to methanol. The underlying technology resolves three pressing problems in one go: It acts as an efficient energy store, binds the greenhouse gas carbon dioxide and produces methanol which can be used as a fuel. Industry and politicians have discovered the potential of the process developed under the direction of the Technical University of Munich and are planning its widespread application.**

The Swiss company Silicon Fire, in Meggen, has developed the first mobile refinery in the world that can use "green" energy, regeneratively produced hydrogen and carbon dioxide to produce the fuel methanol. The modular system is the result of a five year research program and is technologically based on a process that was developed at the Technical University of Munich under the supervision of Professor Dr. Roland Meyer-Pittroff. The Silicon Fire mobile station currently has a production yield of 1000 litres methanol per day. It can be flexibly configured and directly coupled with wind and solar power plants.

Methanol is one of the most commonly used chemicals. The idea of using this biologically degradable substance as a fuel is not a new one. The octane number of this colourless liquid is 133 (four star petrol has 95/98 octane). It has long been used in motor sports and by the boat industry. Large-scale tests in the 90's had already proved its suitability as a bulk fuel. Methanol is also used as an energy supply for power stations and as a clarifier in waste water technology. China is currently starting to introduce methanol as a vehicle fuel - however the methanol they are using is fossil methanol!

Consistently regenerative

This innovative achievement by Silicon Fire, together with the TU Munich, is based on having brought a completely novel and economic process combination for the production of methanol right up to production stage. Hydrogen, produced from water through electrolysis with the aid of regeneratively produced power, serves as the energy carrier for the Silicon Fire methanol. And the carbon for the methanol synthesis (low-pressure technology) is not obtained - as was previously the case - from fossil fuels, but from carbon dioxide taken from industrial sources (e.g. industrial process exhaust gases). This carbon dioxide can then no longer act as a greenhouse gas in the atmosphere. This means: Silicon Fire methanol is regenerative, biocompatible and CO₂ neutral! In contrast to other fuels labelled as bio-fuels, it does not compete with farming or food production.

The Silicon Fire mobile station also fulfils the function of an efficient energy store. According to Professor Meyer-Pittroff, the electrolysis carried out by the system can "adapt to the availability of the regenerative energy, contribute towards integrated grid stability by immediate switch off and can even be used for frequency control of the grid". Electric energy, regardless of the source, can be stored at any time in the form of hydrogen methanol and can be tapped as required. In addition, the modular designed refinery (which fits into two 40-foot containers) can be integrated directly into the infrastructure of wind and solar power plants; it can of course also be operated with conventional energy.

International interest

More than 150 scientists, engineers and managers across the world have provided valuable contributions towards the development and realisation of the new process method for regenerative methanol production over the past few years on behalf of Silicon Fire AG.

"Neither public subventions nor research funds have been used for this purpose. We have made use of our strategic alliances and partnerships with leading companies for this project", said Dr. Peter Grauer, president of the Silicon Fire AG executive board. The scientific principles, patents and expert evaluations regarding the technology, energy efficiency, CO₂ balance and economic efficiency of the Silicon Fire mobile station were drawn up by the Technical University of Munich on behalf of the Swiss company under the supervision of Professor Dr. Roland Meyer-Pittroff. Research results from other international universities were also used.

The management at Silicon Fire AG is currently in intensive negotiations with government representatives from several industrial countries who are looking at a widespread application of this new technology. The operators of wind and solar power plants, and investors in the utilities industry, are also showing an increasing interest in the mobile Silicon Fire refineries.

The Swiss company is already planning their next steps: The transfer of the new technology for regenerative methanol production to the conditions of large-scale power stations. In this respect, Silicon Fire is currently concentrating on the production of industrial hydrogen from regeneratively produced silicon, which offers great advantages for the long-distance transport of "green" energy.

Backgrounder:

Silicon Fire AG, headquartered in Meggen, Switzerland, is dedicated to the global development, structuring and marketing of processes and products that reduce the output of CO₂. The company carries out independent research and development. Its sole obligation is to the principles of sustainability and environmental compatibility. Its aim is always to find the best approach for mankind and the environment. The company builds on existing research results around the world to develop new processes and products that can provide an answer to current environmental issues. They also systematically explore opportunities for a paradigm shift in the energy industry. This is implemented in cooperative partnerships with decision carriers and institutions.