H_2-BARBEQUE & H_2-CREMATION, BYPASSING FUEL-CELL CONVERSION ON ROUTE TO STAND-ALONE & SUBSIDIES FREE HYDROGEN ENERGY ECONOMY.

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Almost 10 years ago, Zoz was nominated for the German Environmental Award (2013) with Power-to-Gas-Fuel (P2G2F®). Since gasoline and diesel represent the cost-peak in fossils, P2G2F® was and is expected to becoming one of the first economic applications in hydrogen energy technology. Still today, this is not achieved, the diesel- engine remains the most economic and ecologic drive system of mankind. P2G2F® particularly fails at the still too high reconversion cost utilizing fuel-cells. Hydrogen for fueling combustion engines fails on the cost of the required pre-compression, the hydrogen turbine additionally on the high-temperature materials that are either not or only available at very high cost. ODS/NFA materials from nuclear fusion (19YAT, 20YAl and 14YWT, namely Zoz-PM2000, PM2017 and PM2018) may help in near future. Hydrogen transportation sector, even after decades, does not see any significant products that can stand without permanent subsidies and/or political market interventions, which is not acceptable. No matter if the CO_2-scenario is true or fairytale, fossils are too costly and too valuable to just burn away.

Power Plant + Hydrogen = H2F2Go = human, efficient and environmentally friendly cremation

If reconversion is still too costly, for the time being, technologies where this is not required, are most attractive. In result, the inventions Power Plant and H2F2Go (DE 10 2022 122 862 + 863 # 08.09.2022) describing CO_2-free Hydrogen cremation, were claimed where Hydrogen is replacing fossil gas in a burner to producing heat. Since late 2022, modern industrial countries such as Germany are worried about "getting through winter", which also describes an unprecedented high demand for energy self-sufficient systems for all areas of life.

HydrogenGasgrill + Electrolyser + H2Tank2Go® = Power to Gas to Heat + Power

Addressing this additional eco-market demand, the invention Hydrogen Gasgrill with Electrolyser (H2Grill2Go # 07.12.2022) was claimed where again Hydrogen is replacing fossil fuel to producing heat but also provides energy for mobility and home-heating from multiple small solid-state tanks H2Tank2Go®. Power is provided by photovoltaic and wind energy via a buffer battery, rainwater quality is sufficient, only sun, wind and rain are needed. Once applying ideal H2 combustion, even rainfall is converted into purest water. All three inventions require neither electricity for an electric drive motor nor a fuel gas at correspondingly high volumetric energy density in order to feed a combustion engine. Pressurized storage of hydrogen in these cases is not an option due to high compression cost. Stand-alone clean replacement is not expected to require any economic subsidies, given market-drivers should be sufficient.

Fig. 1 Powder manufacturing installations at ZOZ

Virtually bypassing so far insuperable barriers, the combination of a thermoprocessing plant with regenerative energy generation, electrolysis, H2-solid-state storage (virtually pressureless) and H2-burner (P2G2H, H=heat), H2-Cremation and H2-Grill can therefore serve as an economically operated bridging technology at enormous importance.

References

[1] joint patent-applications 08.09.2022: https://gmbh.zoz.de/patents/

[2] joint patent-application 07.12.2022: https://gmbh.zoz.de/patents/

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Dr. (IPN) Henning Zoz was born 1.4.1964, is the CEO of Zoz Group, headquartered at Wenden. ZOZ manufactures process engineering equipment as well as nanostructured materials for nanotechnology from nuclear to hydrogen and so in electromobility. Zoz was Professor in Mexico & Japan till 2014, in 2011 elected in South Westfalia as the Manager of the Year and holds multiple patents & awards. Zoz is married, 58 years old and father of five children.

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