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# AHPD IS AN INNOVATIVE BIOTECHNOLOGY FOR DIRECT BIOMETHANE PRODUCTION FROM WASTEWATER; AHPD CAN BE COMBINED WITH AH<sub>2</sub>PD FOR BIOTIC CO<sub>2</sub> FIXATION WITH HYDROGEN IN ONE SINGLE STEP GREEN GAS REACTOR

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**A**utogenerative high pressure digestion (AHPD) generates 20 bar of biotic pressure in a closed vessel by anaerobic CH<sub>4</sub> and CO<sub>2</sub> production from organic waste, waste water and WWTP sludge. According to Henry's law, CO<sub>2</sub> will dissolve into the water phase, resulting in 90% of CH<sub>4</sub> in the production gas phase: green natural gas quality. The AHPD process specifically selects hydrogenotrophic methanogenic archaea that will reduce the dissolved CO<sub>2</sub> by adding hydrogen: the so called AH<sub>2</sub>PD process (bio-Sabatier). The AHPD/AH<sub>2</sub>PD processes can easily and economically be combined in a continuous green gas production plant for waste water treatment. Therefore, it can be used to stabilize the sustainable power grid, as hydrogen is produced from excess power. The existing natural gas grid will subsequently be used for large scale seasonal power storage, much more efficient than electrical batteries. AHPD/AH<sub>2</sub>PD was intensively tested with a single stack large scale pilot plant in cooperation with several Dutch universities, waterboards and energy companies.

**Biography**

Christiaan Emanuel Zagt (MSc) has completed his MSc in Biotechnology from Wageningen University and Research, the Netherlands. He is the Director of Bareau Group, a R&D and green gas production organization. He has developed several innovative technologies for waste water treatment and sustainable energy production and brought into operation.

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