

Methane production from Renewable Sources and Carbon Dioxide

Dr. Emilio D'Alessandro

RDPower s.r.l.

In 2009 the EU commission with the Directive RED (Renewable Energy Directive) fixed a target of minimum 10% of renewable fuels within 2020. In 2011 the International Food Policy Research Institute (IFPRI) concluded that the ILUC (Indirect land-use change) of most Biofuel is not negligible and quite significant. So the EU commission limited the target for first generation Biofuels to 7% and fix the remaining 3% from advanced Biofuels. The GLOBIOM (Global Biosphere Management Model) reviewed by the association Transport & Environment highlighted that the majority of the wide used Biofuels has CO₂ emission (direct + indirect) higher than fossil fuels with the resounding case of Biodiesel from palm oil that shows emission 3 times higher than fossil fuels. In this scenario a technology that actually shows Zero Emission with a Carbon Neutral cycle is strongly required to meet the target fixed by EU.

Sabatier reaction allow to produce Carbon Neutral Methane from Electric Energy and if this electric energy come from a carbon neutral technology like PV or Wind the obtained Methane is actually at Zero Emission. Methane is moreover widely used energy source with an increasing outlook, used in household heating, industrial power, vehicle fuel. Power to Gas process based on Sabatier reaction, also called Methanation process allow for converting exceeding Power into Methane gas in a fast and tuneable way with compact, small, efficient and industrial scalable plants. The Methanation process allow for obtaining Methane from low price Power also allowing for a Power Grid balance managing production peaks. The Methanation process is also investigated for future Mars missions as life supporting reaction capable to produce Oxygen and Fuels and Water from the abundant Carbon Dioxide of the Mars atmosphere.