

JOINT EVENT

2nd World Congress on **Wind and Renewable Energy** & 5th World Congress and Expo on **Green Energy**

June 14-16, 2018 | London, UK



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For sustainable development of the whole world by renewable energy

The atmospheric carbon dioxide concentration has been increasing at the rate of about 1.85 ppm/year since 1970, and exceeded 400 ppm corresponding to the level in 3.5 million years ago. No current all living things have the experience to live in such climate. Extrapolation of recent increase in the world primary energy consumption indicates that all reserves of fossil fuels and uranium will be completely exhausted until the middle of this century. In order to avoid the crisis of intolerable global warming and no fuels for combustion we have to establish and spread the technologies to use only renewable energy by which the whole world can keep sustainable development. There are superabundant renewable energy resources on our planet. We have been performing research and development for about 30 years to supply renewable energy to the world in the form of methane by electrolytic hydrogen generation and subsequent formation of methane from carbon dioxide and hydrogen. We created anodes and cathodes for water electrolysis and catalysts for carbon dioxide methanation. We constructed a prototype plant consisting of solar cell, water electrolyzer, carbon dioxide methanation unit, methane combustor with oxygen and piping connecting methane production and combustion units in 1995. We are recommending the construction of local energy supply system. The power generated from renewable energy will be used directly. The surplus electricity must be used for water electrolysis to form hydrogen and oxygen. Hydrogen will be used to form methane by the reaction with carbon dioxide. Methane will be used for regeneration of steady electricity at a natural gas power plant for covering shortage and leveling of intermittent and fluctuating power generated from renewable energy. For combustion of methane at the power plant oxygen formed by the water electrolysis will be used after dilution with carbon dioxide of exhaust gas, so that the it will be composed of only carbon dioxide after removal of water. Thus, carbon dioxide of the exhaust gas will be recycled for methane formation and oxygen dilution. Hot waste water of the power plant will be used in the local area for heating, farming and industries.

Biography

Koji Hashimoto is a Professor Emeritus of Tohoku University (Institute for Materials Research) and Professor Emeritus of Tohoku Institute of Technology, Japan. He has been working for 30 years for the supply of renewable energy in the form of methane to the world by electrolytic hydrogen production and subsequent methane formation by the reaction of carbon dioxide with hydrogen. He has published more than 560 papers and received various international awards mostly from Electrochemical Society and NACE International.

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