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## Nonthermal Plasma for Hydrogen Production

**Meisam Babaie**<sup>1</sup>, Ibrahim Bakoji<sup>1</sup>, Rasool Erfani<sup>2</sup>, and Amir Nourian<sup>1</sup>

<sup>1</sup>School of Science Engineering and Environment, University of Salford, Manchester, UK

<sup>2</sup>Department of Engineering, Manchester Metropolitan University, Manchester, UK

Methane (CH<sub>4</sub>) and carbon dioxide (CO<sub>2</sub>) and these greenhouse gases together represent 29 gigatons of emission per year, with a projection of 36 to 43 gigatons/year. At these levels in the atmosphere, these gases contribute to the global climate change. Innovative methods need to be developed that will decrease these emissions to zero. Plasma reforming of natural gas that converts CO<sub>2</sub> and CH<sub>4</sub> to hydrogen fuel can be an effective solution since it contributes towards reduction of two major greenhouse gases as well as producing clean hydrogen fuel. Plasma is an ionised gas consisting of a mixture of equal number of positively charged ions and negatively charged electrons produced by an electric field. Reforming with plasma is conducted using a dry reforming reaction, with plasma or catalyst and CH<sub>4</sub> and CO<sub>2</sub> are used to produce Syngas with other products such as hydrogen (H<sub>2</sub>). In this study, the applicability of non-thermal plasma for hydrogen production is discussed and the benefits and challenges are thoroughly investigated. The results of this work can help in developing the awareness of the industries and other relevant stakeholders towards the potential of plasma on hydrogen production and CO<sub>2</sub> reduction.