Chapter 4

Hydrogen Production From Biogas Reforming: An Overview of Steam Reforming, Dry Reforming, Dual Reforming, and Tri-Reforming of Methane

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4.1 INTRODUCTION

The present context of climate change, fossil resource scarcity, and environmental issues imposes the development of renewable energy, such as solar, wind, geothermal, and biomass. In France, 24.5 million metric tons of oil equivalent of renewable energy were produced in 2013, which corresponds to 17.6% of the total energy amount produced this year (ADEME, 2014a). According to the last report of ADEME (agence de l'environnement et de la maîtrise de l'énergie, France) on the "*lightened environmental footprint*" scenario, the objective is to reduce by 17% the carbon footprint in France by 2030 (ADEME, 2014b). This energy transition dynamic is also being conducted in many other countries, such as Germany, the United Kingdom, the United States, Sweden, Norway, Switzerland, and China (IEA, 2017).

In the transport domain, much effort has been devoted to the development of electric vehicles. In parallel, the development of hydrogen vehicles is also very attractive. Up-to-date, hydrogen vehicles present some major advantages compared to electric vehicles, namely, a shorter charging time and a higher autonomy. The use of hydrogen as a clean fuel starts now, and hydrogen can become a strategic energy vector in the near future.

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