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Abstract

Energy systems analyses provide powerful assessment frameworks for research and development projects involving new energy technologies. These analyses rely on the description of state-of-the-art technologies and incorporate scenarios on future developments in the energy sector in order to identify the benefits and weaknesses of the technologies under consideration. This chapter presents selected assessment highlights relating to hydrogen and fuel cell technologies for transportation. With respect to fuel cell system cost, noble metal requirements are of utmost significance. The corresponding balances for fuel cell vehicles will be introduced. Moreover, the relevance of dynamic powertrain simulation for the evaluation of energy process chains in transportation will be discussed. In a further part, the methodology and results of well-to-wheel analyses of energy use and greenhouse gas emissions will be discussed, followed by an assessment of relevant hydrogen-focused well-to-wheel studies of different world regions as well as a comparison and interpretation of key findings.