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# Development of Alternative Fuels Technologies: Compressed Natural Gas Home Refueling Station

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**Abstract :** Compressed natural gas (CNG) represents an excellent compromise between the availability of a technology that is proven and relatively easy to use in many areas of the automotive industry and incurred costs. This fuel causes a lower corrosion effect due to the lower content of products causing the potential difference on the walls of the engine system. Natural gas powered vehicles (NGVs) do not emit any substances that can contaminate water or land. The absence of carcinogenic substances in gaseous fuel extends the life of the engine. In the longer term, it contributes positively to waste management as well as waste disposal. Popularization of propulsion systems powered by natural gas CNG positively affects the reduction of heavy duty transport. For these reasons, CNG as a fuel stimulates considerable interest around the world. Over the last few years, technologies related to use of natural gas as an engine fuel have been developed and improved. These solutions have evolved from the prototype phase to the industrial scale implementation. The widespread availability of gaseous fuels has led to the development of a technology that allows the CNG fuel to be refueled directly from the urban gas network to the vehicle tank (ie. HYGEN - CNGHRS). Home refueling installations, although they have been known for many years, are becoming increasingly important in the present day. The major obstacle in the sale of this technology was, until recently, quite high capital expenditure compared to the later benefits. Home refueling systems allow refueling vehicle tank, with full control of fuel costs and refueling time. CNG Home Refueling Stations (such as HYGEN) allow gas value chain to overcome the dogma that there is a lack of refueling infrastructure allowing companies in gas value chain to participate in transportation market. Technology is based on one stage hydraulic compressor (instead of multistage mechanical compressor technology) which provides the possibility to compress low pressure gas from distribution gas network to 200 bar for its further usage as a fuel for NGVs. This boosts revenues and profits of gas companies by expanding its presence in higher margin of energy sector.

**Keywords :** alternative fuels, CNG (compressed natural gas), CNG stations, NGVs (natural gas vehicles), gas value chain
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