



## Hydrogen and natural gas : a new energy field:

### The French government supports the GRHYD demonstration project

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The GRHYD project, involving the injection of hydrogen into natural gas networks and the production of Hythane<sup>®</sup> (a fuel composed of hydrogen and natural gas), was recently chosen as part of the Investments for the Future program in answer to ADEME's Call for Expressions of Interest in hydrogen fuel cells, on behalf of the French government.

The purpose of the GRHYD project, led by GDF SUEZ with a 12-member group of partners, is to transform into hydrogen electricity from renewable energy produced outside peak period and to utilize the hydrogen combined with natural gas for heating, hot water production, as a fuel, etc. Providers of intermittent renewable energy will thus have a new application of their energy and a new way to achieve further greenhouse gas reductions.

France has plans to achieve 23% of its total energy consumption via renewable energy by 2020. Wind and solar power sources produce electricity on an intermittent basis at times when consumers do not necessarily need it. It is necessary therefore to find a means to store this energy or make use of it in other ways.

The GRHYD project proposes to transform unused electricity into hydrogen. Injecting hydrogen into natural gas networks opens new ways of utilizing electricity through natural gas applications. The project thus facilitates introduction of a flexible solution coupling electricity and natural gas in the energy chain through hydrogen production while maximizing the share of renewable energy in French energy consumption.

The project will begin with a preliminary study phase lasting roughly two years consisting of two demonstration projects:

- an industrial scale **Hythane<sup>®</sup> fuel** project where a natural gas vehicle (NGV) fueling station will be adapted to a hydrogen/natural gas mixture, with 6% hydrogen at first, then 20%.
- a project involving the **injection of hydrogen into the natural gas distribution network**. A new residential neighborhood of some 200 housing units will be heated using a mixture of hydrogen and natural gas, with the hydrogen content varying up to a maximum volume of 20%.

Over a five-year period, these two pilot projects will provide a basis for evaluating the technical, economic, and environmental soundness of this new energy field and for collaborating with local jurisdictions and neighborhood residents.

The results of these two demonstration projects will make it possible to evaluate the effectiveness of using hydrogen for renewable energy storage to:

- optimize the value of renewable energy;
- produce and market even lower carbon natural gas to meet the environmental standards of municipalities and new eco-districts; and
- provide a new, lower carbon fuel for public transportation and/or municipal vehicles.

The GRHYD project, coordinated by the GDF SUEZ Research and Innovation Division, is a joint effort of twelve partners, including GrDF, GNVERT, AREVA - Hydrogène et Stockage de l'Énergie, CEA, McPhy Energy, INERIS, CETIAT, and CETH2.

*Within 10 to 15 years, the hydrogen market in France is expected to generate estimated revenues of between €5 and €40 billion a year. Today, hydrogen is mainly used in chemical compounds for industrial processes (refining, ammonia production, etc.). In the future, thanks to its potential as an energy vector, it could be used to produce electricity and heat buildings, as a fuel for nomad objects, and to store energy.*

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