

CABINET DE CONSEIL EN STRATEGIE SPECIALISE EN ENERGIES ET TRANSPORT DURABLES

Nos domaines d'expertise



Nos clients



Nos implantations

- Bruxelles (BE) - Siège
- Paris (FR)
- Bogota (CO)

ADEME



Agence de l'Environnement
et de la Maîtrise de l'Energie

Ministry of
Environment

Country: France

Date: 2010

Project: *Support for the elaboration of the French hydrogen and fuel cells roadmap*

Methodology:

- State-of-the-art of hydrogen and fuel cell technologies;
- Assessment of the strengths and weaknesses of the French hydrogen and fuel cell industry;
- Benchmark of hydrogen and fuel cell activities in leading countries;
- Definition of 2020 and 2050 deployment scenarios for hydrogen and fuel cells in France;
- Elaboration of a 2015-2020 action plan.

Our added value:

- Sectorial expertise in hydrogen and fuel cells;
- Global vision on the hydrogen sector;
- Ability to manage a consultation process with a large number of players involved to progressively build consensus around a common vision.

"Thanks to Hinicio for this excellent work [...] I hope it will enable the French hydrogen and fuel cell industry to really take-off. I am very grateful for your commitment and flexibility" (Karine Filmon, ADEME).

"We have shared a common understanding of this fascinating work. At the end of the day, I think we can say that the end-result is really worth it" (Daniel Clément, Deputy Scientific Director, ADEME).

Contact point:

Luc Bodineau, Hydrogen and
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RÉGION
Nord-Pas de Calais

Client: Nord-Pas-de-Calais Regional Council

Country: France

Date: 2010-2011

Contact point:

Marion Veyrières, Department of the Environment

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Project: *Definition of a regional roadmap for the development of hydrogen as an energy carrier with potential to address climate change.*

Methodology:

- State-of-the-art of hydrogen and fuel cell technologies;
- Analysis of the regional hydrogen and fuel cell value chain and market;
- Identification of the most relevant fuel cell applications within the regional energy and industry environment;
- **Elaboration of a long-term regional roadmap** and 2015 action plan.
- 30+ interviews with regional and European players;

Our added value:

- Sectorial expertise in hydrogen and fuel cells;
- Robust and efficient road mapping tools and methodologies;
- Perfect knowledge of the French hydrogen and fuel cell industry and political landscape;
- Extensive network on the hydrogen and fuel cell sector;
- Ability to coordinate a consultation process at the regional level in order to reach consensus on common directions;
- Expertise in regional economic development.



**Client: Conseil
Général de la
Manche**

Territory: France

Date: 2014

Project: A-to-Z management of a hydrogen mobility pilot project in the region of La Manche

Methodology:

- Detailed techno-economic analysis and evaluation of options.
- Project structuring and determination of optimal business model to enable economic profitability, while fulfilling the regional political vision.
- Building of a European consortium including all best in class industry partners
- Support to identify, structure and bid for European subsidies.
- Coordination with all stakeholders.

Our added-value:

- **Demonstrated experience in developing and managing FCH-JU projects**, as a participant or in support to project participants.
- **Hydrogen and fuel cell expertise** ensuring the technical relevance of the project submitted and enhancing the chances of getting selected.
- **In-depth understanding of European funding schemes:** scope, eligibility criteria, constraints, etc.
- **Network of contacts** in Europe within the fuel cell and hydrogen industry to accelerate consortium building
- **Presence in Brussels** facilitate negotiations with the FCH-JU.



Territories:
France

Date: 2016

Project: *Techno-economic and business case analysis for the use of hydrogen as a medium of storage for the distribution grid in France*

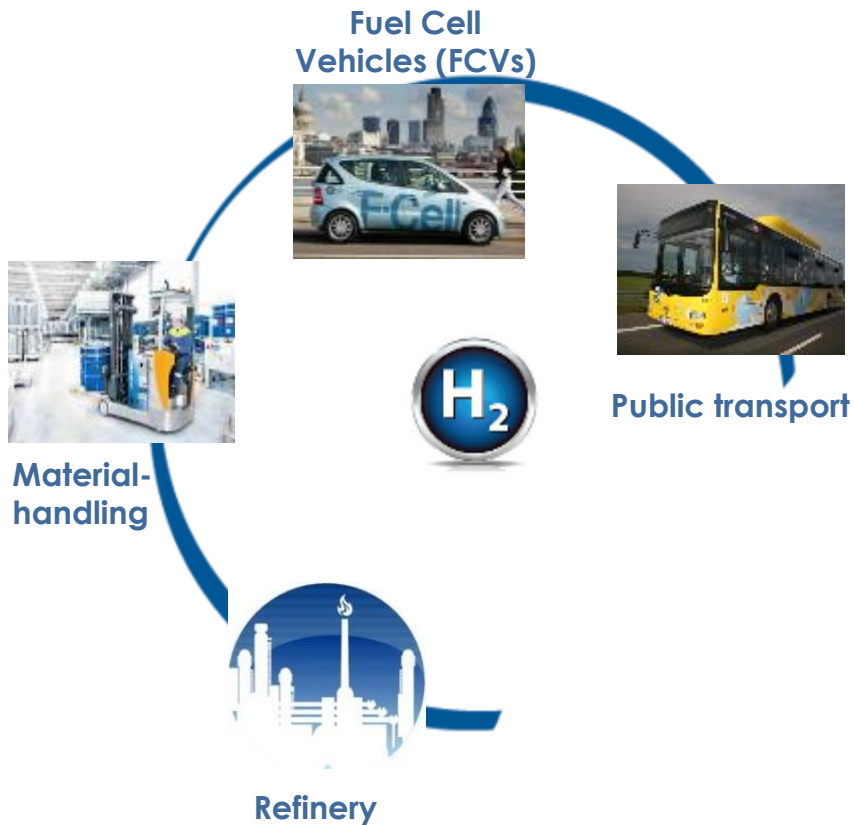
Methodology:

- Two case studies analysed: 1/ wind regions, 2/ solar regions.
- For each of the two case studies, the methodology was as follows:
 - ❑ Definition of generic boundary conditions from the distribution grid perspective
 - ❑ Identification and specification of the distribution grid constraints (congestion, voltage...)
 - ❑ Assessment of the value of flexibility
 - ❑ Technical specification of the Power-to-Hydrogen system: electrolyser, logistics, distribution, etc.
 - ❑ Cost benefit analysis
 - ❑ Business case modeling
 - ❑ Sensitivity analysis (on electricity price, technology cost, FIT, taxes, etc.)
 - ❑ Strategic recommendations: structuration of the value chain, regulation, taxes, etc.

Our added-value:

- **In-depth knowledge of hydrogen technologies, supply chain and markets;**
- **Advanced modeling tool, methods and skills;**
- **Innovative mind-set:** Identify and imagine innovative and differentiating business models for hydrogen energy storage.

Hydrogen-mobility will be a huge **new market opportunity for renewables**



1

The Hydrogen-mobility market is gaining traction in Europe, with ambitious deployment roadmaps in a number of countries, including passenger cars, professional fleets, buses and forklift trucks. Global OEMs stepping up to the plate one after the other (Toyota, Hyundai, Honda, etc.).

2

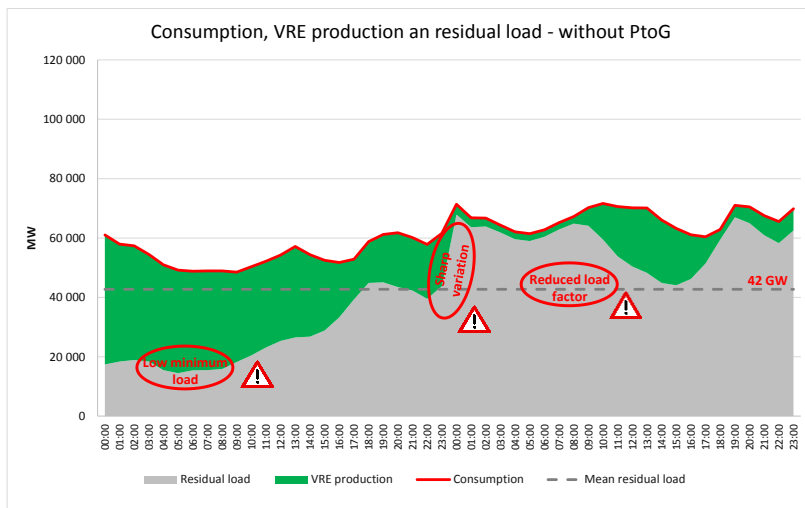
Hydrogen “color” will have progressively to move away from **grey (fossil)** towards **green (renewable)**. Genuine well-to-wheel zero emission must be in the cards at some point in the future for market acceptance.

3

With **small regulatory changes in the FQD**, refineries could be interested to **switch from carbon-intensive to low-carbon or renewable hydrogen**, unlocking huge investment in electrolysis, driving the cost price of technology down.

Increasing demand in green hydrogen will imply massive expansion of wind and solar capacities

More renewable without Power-to-Gas = More strain on existing system



Power consumption during two days in France in Jan and Feb 2013. Actual VRE production on these days multiplied by 10

1

Problem 1: reduced minimum load factor for conventional generation

In moments of high renewable production, more conventional plants are nearing or reaching their minimum technical load, which makes dispatching more technically challenging

2

Problem 2: reduced average load factor for conventional generation

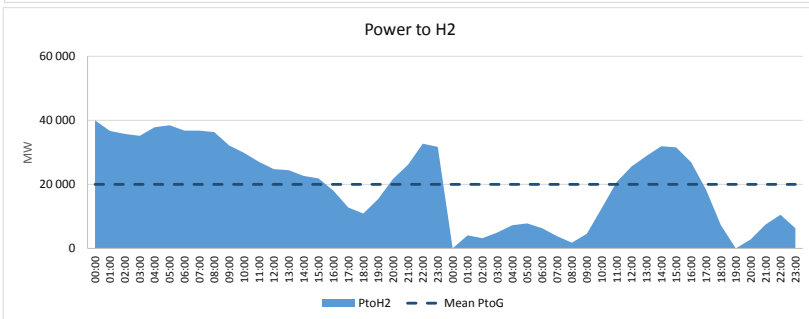
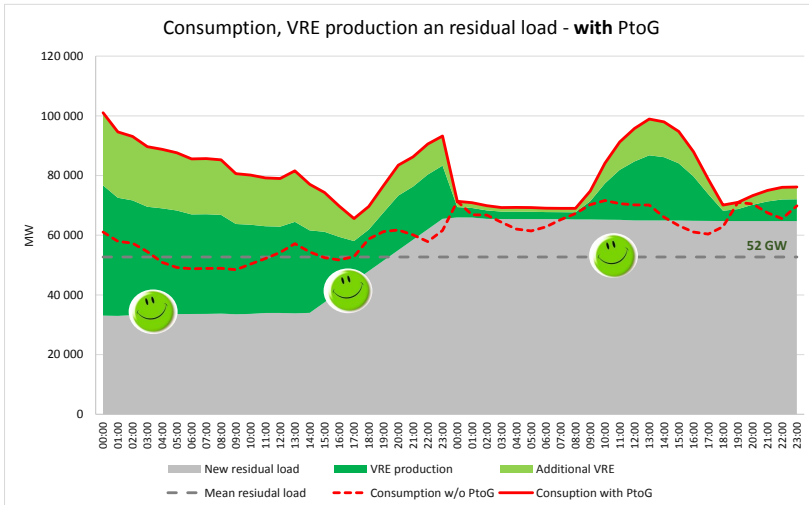
The average load factor of the conventional part of the mix is reduced. Profitability stumbles.

3

Problem 3: sharp variations imposed on conventional generation

Renewable intermittency requires very flexible operation of either under utilized assets (e.g. CCGT) or non-flexible asset (e.g. nuclear).

More renewable with Power-to-Gas = Less problems



1

New flexible load in the power system

Power-to-Hydrogen is a highly reactive totally dispatchable new electricity demand that can be ramped up and down instantly on demand.

2

Absorption of all renewable intermittency

As a flexible load, Power-to-Hydrogen can absorb 100% of renewable intermittency, reducing the need for fast ramp ups and downs for conventional assets.

3

Improved operation and economics for conventional assets

Electrolyser consumption can be adjusted upward to ensure higher minimum and average load factor of the conventional part of the mix.