

## The project manager's future vision: SMARTH example

Icelandic New Energy aims to promote the use of hydrogen as a fuel in the transportation sector in Iceland and test both the fuel and the infrastructure. This will make it possible to head for an economy that is only run on renewable, local energy sources. The company's vision is to see the total conversion to hydrogen in the country by 2050. This is to be done according to the principles of sustainability; hence, research is needed to assess total benefits and costs on a life cycle basis. Right now the proportion of renewables in the country's grid mix is 70%. The transport sector uses almost all the imported fossil fuels to Iceland, biomass forms very slowly and is thus the main focus in introducing hydrogen. The fishing fleet consumes about half the oil products that are imported today, but the economy depends to a large extent on the fisheries. To support the conversion to hydrogen in the transport sector, real tests have to be implemented on seagoing vessels and land-based vehicles.

Two things that are used to make hydrogen can be found in abundance: electricity from renewable sources and water.

But as the project developed and communication was opened at the first vision workshop, new contexts were suggested. The most influential was that participants found it important to see the government more active in stating policies and funding to test alternative fuels for the Icelandic market.

In the future, the demonstrations conducted within SMART H2 are envisioned to extend from public transport, service vehicles and company cars to other kinds of land-based vehicles: taxis, lorries, tour buses and the entire public transport system, as well as mountain jeeps. At sea, the tests that are started on the whale watching tour operator boat Elding will contribute to large scale adoption of hydrogen as an energy carrier in the tourism service as well as the fisheries including, angling tourist boats, ferries, trawlers, purse seiners, liners and cargo ships. Integrating the hydrogen demonstrations into tourism will also create awareness of the Icelandic hydrogen economy abroad.

The SMART-H2 demonstrations will contribute to this development by gradually adapting the equipment and infrastructure base for the conversion to hydrogen. Drivers, ship crews, maintenance providers, fuel station operators and the general public will also be supported in training and learning to use hydrogen and live in a hydrogen economy. Health, safety, maritime inspection and other administrative practices will need to be developed. The government will also need to learn how it could best support the development of the hydrogen economy in Iceland. Table 2 provides an overview of the future vision of the project in terms of its interactions with its context.

**Table 2: Interactions of the project with its context: future vision**

Analytical Dimension	Impacts of the future vision
Techno-Scientific Pole	Hydrogen vehicles and vessel in use Nation-wide fuel production and delivery infrastructure
Political-Regulation Pole	Policy that supports the hydrogen economy in local settings for local use – less fuel transportation
Economic Pole	Full-blown market for Icelandic energy Full-scale national energy independence
Socio-Cultural Pole	Users and society accept hydrogen and have learned to use it
Environment-Sustainability Pole	CO <sub>2</sub> and other emissions from road and sea traffic reduced / virtually eliminated Hydrogen economy is designed to meet sustainability principles

## Synthesis writing the SMARTH example

### Storyline to start the stakeholder vision building (based on PM future vision)

Energy farmer and operations manager Norbert Werum looks at his surroundings with a sense of satisfaction. "The machine has been operating well for 2 months without malfunction or complaint, all of the teething problems that we had with the new unit have finally been solved. The district heating customers can rely on us." Norbert W. is one of the pioneers from the early

2000s who as made the transition from farmer to energy farmer. In addition to his farm, he has built a certified biogas plant together with four other farmers in the near vicinity and inhabitants of the neighbouring village. "Financially, so it must have been around the end of 2009," Werum recalls. "Then it suddenly seemed like a good idea to cultivate energy crops and produce electricity from them. In the meantime we've had to upgrade our first unit. "He and his colleagues have been successful energy entrepreneurs for 10 years now; as a result of fair contracts with their neighbours, they are not dependent on world market prices. "This new branch of business has also safeguarded livelihoods in agriculture," says Werum's colleague Freidbert Kaiser of the farmer's union.

### **Creating a vision title**

***"Reducing Icelandic carbon footprint; all power and fuel from renewable energy by 2050"***