



The impact of a hydrogen guarantee of origin in the Netherlands

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Background

Currently, 8% of the Dutch emissions originate from non-renewable hydrogen, yet, renewable hydrogen is gaining traction. This research is established in cooperation with GroenLeven. A company in Leeuwarden that specializes in large-scale solar projects. They are now coping with grid congestion; they want to tackle this problem by producing renewable hydrogen on-site. They have built a 1.3MW pilot project to gain experience with this; SinneWetterstof.

Objective

This research aims to determine what "Guarantee of origin (GOO)" certificates mean for large-scale green hydrogen production in the Netherlands. Little research has been conducted regarding this topic. Furthermore, this research will support GroenLeven and other developers of renewable hydrogen projects. To steer toward a future of low emission hydrogen that does not depend on natural gas.

Introduction

Renewable hydrogen is a renewable gas produced from renewable energy through electrolysis. To distinguish renewable hydrogen, a GOO certificate is used, and this certificate can be seen as a digital passport for hydrogen.

Methods

	Type of business	Area of business	Gender	Expertise	Years of experience
P1	Public/private	Knowledge centre	Male	Gas industrie & Innovation	7
P2	Private	Consulting	Male	Hydrogen project development	4
P3	Public/private	Research institute	Male	Hydrogen transition	4
P4	Private	Clean fuels supplier	Male	HBE, Hydrogen project leader	3
P5	Non profit	Energy certification	Female	GOO frameworks	10
P6	Profit	Law Firm	Male	Energy Law	14
P7	Public	Certifier	Male	Hydrogen GOO certification	4
P8	Private	Trading platform	Male	GOO trading	12

Figure 1. Overview of the participants.

For this qualitative research, I performed eight semi-structured interviews with people active in the renewable energy/hydrogen branch. Each of them has specific expertise regarding green hydrogen (certification). All these interviews were then transcribed.

To analyse the transcripts, first-order concepts, second-order themes and aggregate dimensions were created. This method is known as the Gioia Method.

Sinnewetterstof was used as an example case to test the findings were possible.

Results

Governance Mechanisms

- Leading edge position for renewable hydrogen.
- The Netherlands is a front runner on hydrogen certification.
- There are many uncertainties about the hydrogen GOO (scheme).
- Some policies are not clear enough or still in development.
- Creating a non-harmonised environment.

Economic streams

- Lack of price insight and transparency for hydrogen GOO's.
- Premiums improve the market value.
- GOO has a minor role in the business case.
- Companies that can use GOO's for marketing or mobility are prestige buyers.

Market maturity

- The GOO is a precondition in a hydrogen market.
- Streamlining the hydrogen GOO system is further required to create more clarity and make the tool more effective.

Effects for SinneWetterstof

- They also have a leading-edge position since they will enter the hydrogen GOO market as one of the first. Giving them an exemplary role.
- Streamlining the hydrogen GOO system is further required to create more clarity and make the tool itself more effective.

Conclusions

- The implementation of a GOO is part of both the European and the Dutch hydrogen strategy. Its implementation will be helpful in the creation of a well-functioning renewable hydrogen market.
- These economic streams form an interlocking mechanism with the governance mechanism. Because the governance mechanisms effect the economic streams and vice versa.
- The scheme improves trust in hydrogen and forms an important tool for subsidising sustainable hydrogen production.
- Overall, the GOO will be important for developing large-scale renewable hydrogen production projects, which is vital to make renewable hydrogen a success.



Figure 2. The SinneWetterstof project in Oosterwolde.