

Human Capital Agenda GroenvermogenNL

Exploratory study into further education and development programmes focused on green hydrogen applications



Innovation engine for the
green hydrogen economy

Final report

Commissioned by NRO (part of NWO) for GroenvermogenNL
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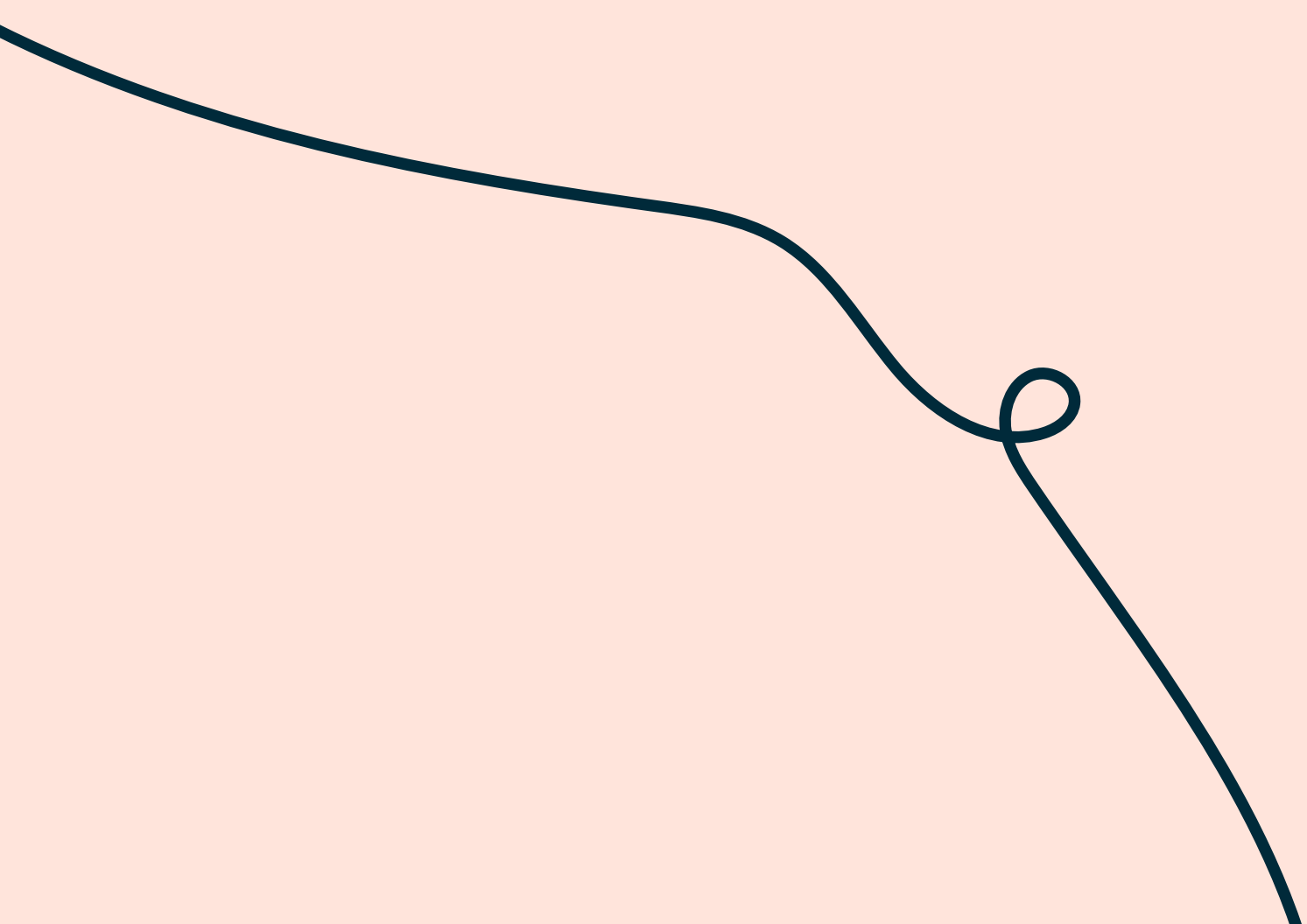
Publisher's details

This exploratory study by KPMG was commissioned by NRO (part of NWO) for GroenvermogenNL. The file number of this project is: 405-00-860-271.

Disclaimer

This report was produced in consultation with GroenvermogenNL and various external public and private parties mentioned in the report. For this exploratory study, we worked closely with the parties responsible for the exploratory study into initial education and development programmes in the field of green hydrogen applications (Technopolis B.V. and Hutspot) and with the NRO and GroenvermogenNL steering committee established for the purposes of these studies.

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Introduction and background to the exploratory study

The Netherlands faces major challenges in the transition from a fossil-based society and industry to a sustainable energy system. Green hydrogen has proven its potential to accelerate this transition. As the market conditions for green hydrogen are rapidly changing, it is important to ensure that there are sufficient highly trained and flexible professionals who can contribute to accelerating the green hydrogen economy. GroenvermogenNL, a national growth fund aimed at driving the scale-up of green hydrogen applications, is firmly committed to achieving this through their Human Capital Agenda (HCA).

Aim of the exploratory study

The Netherlands Initiative for Educational Research (NRO), part of the Dutch Research Council (NWO), hereafter 'the client', commissioned KPMG to carry out an exploratory study for GroenvermogenNL into further education programmes as part of the fourth Workstream of the GroenvermogenNL HCA (i.e., the 'National Education and Training Package for Hydrogen'). KPMG conducted the study in close coordination with the steering committee and the parties responsible for the exploratory study into the regular education programme, being Technopolis B.V. and Hutspot.

The following objectives are central to this exploratory study:

1. Develop a clear and accessible analytical framework of further education and development programmes in the area of green hydrogen.
2. Identify education and development programmes related to the analytical frameworks and determine the extent to which the training providers maintain quality standards.
3. Create an overview that identifies, categorises and analyses the full education and development programme and provides insight into current quality assurance measures.
4. Present clear conclusions and recommendations regarding the portfolio of programmes identified (and the variation therein), highlighting any blind spots, bottlenecks and areas of concern.

Context and scope of the exploratory study

A number of elements influenced the context and scope of this exploratory study:

- First, there are as yet no national databases and regional overviews of further education programmes, so a fully exhaustive overview could not be made. Further to this, businesses do not always make their own in-house training and development programmes public and/or transparent, so it is sometimes unclear whether they actually exist or what they offer. As a result, this exploratory study should primarily be seen as a 'convenience sample', based on the information that was available to us.
- Furthermore, there proves to be a wide variety of further education and development programmes in the field of green hydrogen. Certain providers have a clear and established programme of education and training specifically focused on green hydrogen, while the programmes of other organisations are more varied. This makes it impossible to systematically compare the various programmes.
- We further note that further education and development is interpreted differently by different parties. The distinctions between regular education and further education, and between formal and informal education and development, are not always clear to everyone. As a result, relevant parties may have been excluded due to the terminology applied or the scope of this study.
- Finally, a large number of providers and businesses do not keep up-to-date records of numbers of participants who have completed a course or training programme, or participants who have participated in informal education and development activities, and can often only provide estimates. As a result, we do not discuss numbers of participants per provider or business in this exploratory study.



Survey method

This exploratory study roughly consists of two parts: first, a quantitative survey was carried out on the basis of desk research and input received from GroenvermogenNL's regional liaisons. This involved studying the education and development programmes of a total of 82 organisations (annexes E and F). Second, in-depth interviews were conducted with a selection of 28 representatives of the 82 organisations (qualitative survey). A representative group of public and private training providers and businesses was sought for the qualitative survey, spread across the various GroenvermogenNL regions (Annex G). During the exploratory study, various coordination and validation meetings were held between the client, GroenvermogenNL, members of the steering committee, and experts from the field to discuss the scope, research instruments, data analyses and reports.

Clear and accessible analysis framework

An analysis framework was developed for the exploratory study consisting of three interrelated components, providing insight into the general characteristics of the education and development programmes (including target group, duration, professional level and entry requirements), the content and design of the education and development programme (including curriculum, practical applicability and teacher quality), and the maturity and ambition level of the providers of the education and development programme in the field of green hydrogen. A maturity scan was developed for the latter component to reveal the difference between the current maturity level and the desired ambition level of the education and development programme.

Quantitative survey

The quantitative survey resulted in a complete overview of 82 organisations, including 23 training providers (public and private), 34 businesses (some with in-house and education and development programmes), 17 public-private partnerships (e.g. Field Labs or Learning Communities) and 8 industry associations. This survey revealed that 30 out of 82 organisations (37%) offer further education and development programmes in the field of hydrogen (including green hydrogen). These include formal courses, training programmes or other forms of education.

Eighteen organisations (22%) either did not have an education and development programme, or it was not clear from the quantitative survey whether they provided any formal training. However, these parties are all committed to the green hydrogen transition in one way or another, so they may well organise education and development activities in the field of green hydrogen in the future.

The remaining group of 34 organisations (41%) do not offer a formal further education and development programme, but they are regionally active in various ways to drive the green hydrogen transition and organise education and development activities. These include businesses active in public-private partnerships (e.g. experimentation labs, Field Labs and Learning Communities) focussed on co-creation and knowledge sharing in the field of green hydrogen. Some of these businesses may contribute to further education and development programmes, or their employees may actively participate in research projects. In addition, these businesses may also offer informal forms of on-the-job learning, such as mentoring by a colleague, knowledge sharing and brainstorming sessions.

Qualitative survey

Based on 28 in-depth interviews with public parties (N=12), private training providers (N=5) and businesses (N=11), we zoomed in on the form and content of the education and development programmes on offer. A striking conclusion based on these interviews is that the education and development programmes on offer are mostly short-term and exploratory in nature and focus on the entire green hydrogen chain (albeit concisely). A limited number of training providers offer more in-depth programmes (in both time and focus).

Key conclusions

1. Further education and development programmes still in their infancy

Hydrogen is not new. Yet still, there are few further education and development programmes focussed specifically on hydrogen (and green hydrogen in particular), and most of the existing programmes are in a start-up or pilot phase. Many programmes have only recently started or have been running for a few years at most. Businesses with in-house education and development programmes are less concerned with establishing new in-house courses in the field of green hydrogen than with knowledge sharing and co-creation in cooperation with public parties. Businesses appear somewhat reluctant to invest in new in-house education and development programmes in this area.

2. Large diversity in education and development programmes

Further education and training in the field of green hydrogen mainly consists of short-term (one or multi-day) orientation courses that discuss what green hydrogen is, how it works, how the green hydrogen supply chain functions, and what policy and other developments are taking place in this field. Businesses' in-house training programmes often involve a combination of formal and informal education and development activities that are often not clearly defined. These include on-the-job knowledge sharing, ad hoc master classes, contributions to research projects or supervising work placements, and participation in Learning Communities.

3. Training providers ambitious; some scepticism among businesses

In regard to their education and development programmes and activities, the average level of ambition of all survey respondents was high. Several of them have plans to further develop and scale up their programmes, and many also have ambitions to develop, provide and evaluate education and development programmes in closer collaboration with other public and/or private parties on an ongoing basis. Many businesses do not have very high ambitions, while a few actually view developments relating to education and development programmes with some scepticism.

4. Further education and development programmes focus on the broader picture

Most of the further education and development programmes for green hydrogen are currently still mainly broad and exploratory in scope. These education and development programmes cover the entire green hydrogen supply chain (albeit concisely) and so are accessible to a wide audience. Few training providers focus specifically on green hydrogen production (upstream) or transport and storage (midstream). Some parties focus mainly on green hydrogen applications in the built environment and mobility.

5. The future: training provided through public-private partnerships

The majority of survey respondents believe that education and development programmes for green hydrogen will develop rapidly and that they must be able to adapt flexibly to labour market developments. Several respondents suggested that formal, long-term further education and development programmes with a specific focus on green hydrogen are therefore undesirable, among others because such programmes tend to be less agile (due to accreditation requirements), while adapting these curricula often takes some time. A more fitting solution could be to create regional education and development hubs where learning and experimentation can take place in co-creation partnerships between businesses and educational and knowledge institutions.





Recommendations

KPMG prepared several recommendations based on this exploratory study that can help the client and GroenvermogenNL to further expand and scale up the application of green hydrogen and the associated demand for sufficient well-trained and agile professionals.

- Commit to scaling up Learning Communities.
- The demand perspective (the labour market) should be the starting point.
- Explore opportunities for national certification and accreditation, including for short-term programmes.
- Align with existing training programmes that focus on the energy transition.
- Make it attractive for businesses to participate as main drivers of green hydrogen education.
- Develop education and development programmes that are practically applicable and meaningful.

