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**SMART HyAware | Action Plan
Province of Zuid-Holland**

**SMART
HY AWARE**
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**provincie
Zuid-Holland**

**General information**

Project	SMART-HY-AWARE
Partner organisation	Province of Zuid-Holland
Other partner organisations involved (if relevant)	
Country	The Netherlands
NUTS2 region	Zuid-Holland
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1. Introduction

SMART-HY-AWARE (hereafter: SHA) is an Interreg Europe programme with a budget of €1,359.626, --, running from the 1st of August 2019 to the 31st of July 2023. Its topic is low-carbon economy. The partners comprise: the Regional Development Agency of Aragon, Lazio Region, the province of Zuid-Holland, municipality of Delphi, Aberdeen City Council and Pannon Business Network Association.

SHA aims to promote hydrogen-electric mobility by tackling main infrastructural, technological (range anxiety related) and market uptake barriers related to hydrogen for electro-mobility through the improvement of PI linked to Structural Funds in Europe, addressing the transition to a low carbon economy, as clearly requested by objective 3.1 of the INTERREG EUROPE Programme.

Specific sub-objectives of the project, to reach the main goal, are:

- Exploiting the potential of hydrogen technologies for electro-mobility involving the whole supply chain;
- Improving regional and local strategies which focus on real needs for implementation such as giving impulses for new models of fuel cells integration;
- Increasing efficiency of green propulsion in transport;
- Improving renewable energy grids to cut down electrolysis costs and IT management applications to enable advanced planning of short-to-mid-term power productions and foster use of hydrogen power within distributed networks (Gopalakrishnan Kumar, Serhan Dermici, Chiu-Yue Lin, 2013);
- Increasing the deployment and the accessibility to refuelling infrastructure for both public and private sector in urban and rural areas;
- Supporting the deployment of alternative fuel vehicles in public transport by setting up regional financial support schemes;
- Promoting and assessing new measures favouring public-private partnership (PPP) in the e-mobility sector, by designing suitable PPP business schemes to trigger hydrogen mobility;
- Enhancing the capability of public Authorities in developing effective policies for reducing the carbon footprint of transport activities.

As indicated in the original application form, the province of Zuid-Holland (hereafter: province) has set the goal of implementing 20 hydrogen buses for public transport. The methods of purchasing the 20 buses and the hydrogen refuelling infrastructure were under debate. As the project for the 20 hydrogen buses progressed and SHA was allocated to the province, the subject of buses proved to be no longer a match for SHA as they had already been developed beyond the stage of policy measures (buses are in operation now). In accordance with the Lead Partner, the province adjusted the goal within SHA towards the focus on the application of hydrogen trucks for last-mile transportation of goods. Nonetheless, learnings from the development and implementation of the hydrogen bus project, including the public tender for hydrogen infrastructure, remain valuable for other SHA partners.



2. Policy context

The policy instrument the province intended to address in the Smart Hy-Aware project is 'Kansen voor west II' (hereafter: KvW-II). However, all resources of this policy instrument had been committed by the end of 2020. Its successor, 'Kansen for West III' (hereafter: KvW-III), has recently been formally submitted to the European Commission for approval. We have therefore chosen to address the new policy instrument KvW-III instead, which runs from 2021 - 2027.

CO2 emissions must be reduced in order to meet climate goals. For a geographical area that is as populous and economically active as the western part of the Netherlands (the so called 'Randstad'), this task is all the more urgent. Projects focusing on reducing CO2 emissions using alternative energy sources and energy efficiency deliver a great deal of effort to obtain. Calls for proposals under the KvW-III program are focused on funding projects that are in line with the National Energy Agreement or the European Rural Development Program (POP) and will reduce the share of fossil fuels in total energy consumption in the area of Chances for West II – Reduce energy consumption in urban areas. 30% of the available budget (€ 36 million) is for this purpose.

The policy instrument KvW-III does at this moment not provide in the development of low and zero carbon emission transport and the instrument lacks an integrated vision on the combination of energy transition, transport and economic development. Hydrogen trucks can combine these three objectives and are contributing to the (regional) economy and growth development in Zuid-Holland. This will also solve a bottleneck concerning the connection between regional policy and national policy, since the National government issued a vision on clean energy fuels two years ago, and the regional policy on this has not been updated with regard to the national policy.

Key is breaking the "chicken and the egg" dilemma when it comes to deploying larger numbers of hydrogen vehicles and scaling up the availability of refuelling infrastructure. Deploying larger numbers of fuel cell vehicles is not possible without an upscaling of the number of refuelling stations, and vice versa. At European, national and regional level efforts are currently made to break this gridlock. However, these efforts could be coordinated better. With the implementation of the 20 hydrogen buses the province broke the "chicken and the egg" dilemma by realizing infrastructure and vehicles hand in hand. In addition, the dimensioning of the hydrogen refuelling station has taken into account a future uptake of additional vehicles (i.a. trucks) and the modular design of the station allows for easy scale up if needed. In addition, plans are being made on national level to layout a network of hydrogen refuelling stations covering the Netherlands, with focus on heavy duty applications.

The application of hydrogen trucks is still in its early start-up phase and the connecting link to this subject was found in the Dutch NewWays Zuid-Holland program. NewWays aims at realizing a modal shift from road transport to water- and rail transport including a green form of transportation. It's therefore connected to the RH2INE project that aims at the implementation of hydrogen inland shipping. For SHA the province will use the NewWays Zuid-Holland program to select a number of use cases where the last-mile transportation from inland ships to the final transport destination can be carried out by hydrogen trucks. And by doing so, making the complete logistic chain more sustainable.



2.1. Aim of the Action Plan

KvW-III allows for investments in the development and promotion of hydrogen-electric mobility in two ways. Under Priority (1) Innovation, the policy instrument i.a. aims to stimulate the development of innovative mobility concepts. Under Priority (2) Climate, the policy instrument i.a. aims to stimulate the implementation of alternative (more sustainable) fuel applications such as hydrogen, through showcases, fieldlabs or demonstration projects.

KvW-III works with calls for proposals, and although content wise the policy instrument has now been finalised, specific calls will have to be devised in the upcoming years. Through Smart Hy-Aware our aim is to identify possible infrastructural, technological and/or market uptake barriers for the introduction of hydrogen trucks as a means of last-mile transportation in order to design a KvW-III call that aims to tackle one or more of these issues as a necessary step towards implementation.

The aim of the Action Plan is therefore to design a call for proposals in KvW-III to support (financing new projects) the development of hydrogen truck applications in the Zuid-Holland area. The achievement for this action plan is to have official approval of the terms of references of the call for proposals and therewith securing the launch of the call. Each year there will be 2 moments (spring and fall) for new calls for proposals to be launched. For the current reign of the provincial executive the launch of calls for proposals has to a large extent already been determined. It is therefore most realistic to launch a call for proposals regarding last-mile hydrogen trucks by autumn 2023.

2.2. Objectives

The general objective of the project is to increase learnings of hydrogen application in logistic trucks among carriers and to explore specific use- and business cases for the application of hydrogen trucks in the last-mile transportation of goods. Awareness of- and the results of several use- and business cases can act as a knowledge base for other logistic sites with last-mile transportation that needs to be sustainable.

The specific objectives of the action plan are:

- Understand regulatory, tendering and financial needs for hydrogen truck application in last-mile transport;
- Define scope and objective of demonstration projects for hydrogen truck application in last-mile transport;
- Set-up a call for proposals text;
- Implement the call for proposals under the KvW-III program.

2.3. Interregional exchange and learning approach

During the project interregional exchange and learning activities have been carried out that link to actions in this action plan. Firstly, there has been an exchange of good practices. By the SHA consortium around 35 good practices related to hydrogen applications in the mobility sector have been developed. In addition, there mutual learning has taken place within the SHA consortium by conducting project meetings and specific knowledge exchange meetings. And finally, peer assessments on specific topics have taken place between 2 or several SHA partners. During these Peer Assessments, specific topics have



been addresses aiming at the exchange of knowledge from a knowledge holder / experience expert towards a SHA partners (in this case the province) that is in search for this knowledge in order to better execute her actions in as described in this action plan. Knowledge exchange has been taken place on the topics of the implementation and use of HRS's and the set up and implementation of truck projects.

The specific links between the action in this action plan and the exchange of knowledge within the SHA consortium is addressed in paragraph 3.1.1.

3. Action: design of a subsidy call for H2 trucks demonstration project

3.1. The background

The Netherlands, and specifically the Zuid-Holland region with the Port of Rotterdam, is characterized by a dense transportation of goods over road, water and rail. In order to meet climate goals, all 3 transportation infrastructures need to lower their carbon emissions. Several national and regional strategies and plans aim at lowering carbon emission.

3.1.1 Link with interregional learning and exchange of experiences

In order to find the most fruitful cases for hydrogen trucks in the last-mile transportation of goods, we searched for methods in doing so that have been applied by the SHA partners. Especially in Aberdeen we have learned that the step towards hydrogen is complex and the transition towards a full hydrogen truck fleet should be a step by step approach. Furthermore, Aberdeen used a hydrogen internal combustion engine (HICE) as the first (small) step towards a hydrogen fuel cell solution. However, the current technological development level of hydrogen fuel cells has increased which might allow for a path direct towards this technology.

Considering the hydrogen infrastructure we have learned there are different approaches for role that Aberdeen plays in the project development and/or the operation of the refuelling infrastructure (owner, operator, tenderer, financier). Furthermore, key considerations are:

1. Choose a strategic location for the HRS and roads towards the HRS for hydrogen delivery;
2. Distant to housing and buildings regarding safety;
3. Involve safety regions in an early stage of development;
4. The average availability of the HRSs in Aberdeen in 90%.

Aberdeen has also shown us the advantages of having 2 HRS's available. With the different approaches in governance and ownership that have been applied for developing the HRS's. Aberdeen shows us the practical advantages and disadvantages of the way these HRS's are set up.

The fleet study of Aberdeen is also a good learning experience as Aberdeen conducted a broad study. For this moment the learnings from this study are not directly applicable in our action plan. However, we expect that the study can be of value in the execution phase of the action plan, when fleet owners come into play.

The Aragon region has experience in cross border collaboration (Spain and France) for setting up an HRS with multiple pressures. We've learned that the combination of different pressures must be taken



into considerations to extend the possibilities of refuelling different types of vehicles. The project in Aragon has been set up as a research institution where as Zuid-Holland has a more practical approach. As much as the research approach in Aragon is interesting, it also confirms that a more practical approach fits our region better as we feel that commercial parties (carriers) in the province are more market-ready.

Besides the technical learnings we gained in the exchange of experiences, feel that it is of equal importance to learn about how partners approached the process of working towards a hydrogen application in mobility. A site-visit to Hungary has taught us the crucial role the government should play in developing hydrogen applications in mobility as both regulation and tendering are needed to scale up. The learnings from Hungary confirm and justify the active role that the province of Zuid-Holland wants to take when it comes to hydrogen in mobility.

Link with good practices

The below shows the link between the action in our action plan and 3 of the good practices for SHA partners.

Good Practice	SHA Partner	Link to action
Policy Engagement with Hydrogen Technology in Aberdeen (link)	Aberdeen, Scotland	<ul style="list-style-type: none"> Engagement with community partners Connect local call for proposal initiative to national programs and developments
Hydrogen fuel cell refuse truck development (link)	Dél-Dunántúl, Hungary	<ul style="list-style-type: none"> The importance of clear regulation and tendering and the role regional governments should play in this. Initiation of hydrogen truck application in private companies
GetHyGa: Paving an Energy and Technology way on Hydrogen along Aragon (link)	Aragon, Spain	<ul style="list-style-type: none"> Cross border collaboration; first/last mile transport in neighbouring countries, enabling to make the full transport chain sustainable

3.2. Action

Based on the needs that are indicated by the transporters that have been involved in phase 1 of the SHA project, the province will design a draft call for proposals that could be opened under the KvW-III policy instrument. In addition, the province will liaise with potential future beneficiaries (carriers and shippers) and the managing authority of KvW-III in order to prepare for the implementation of a new calls for proposals in the KvW-III policy instrument.

3.2.1 Objectives

The objective of this action is to design one or multiple calls for proposals aiming at hydrogen truck application for last-mile transportation.

3.2.2 Target Group

Target group of this action plan is the transportation sector, specifically where it concerns last-mile transport of goods. In addition, a secondary target group are organisations that use hydrogen vehicles. Through the possible development of hydrogen infrastructure, other users can benefit from the



established infrastructure that comes from the stimulation of hydrogen truck application in last-mile transportation.

3.2.3 Content and timeframe

In preparation to the execution of the action plan, we organise workshops with several last-mile transportation sites (carriers and shippers) in semester 6 of the SHA project. We gain insight in the needs and willingness to start up demonstration projects and gather information that forms the input for a future call for proposals.

Start-off phase (begin august 2022 – end October)

We start off the execution of the action plan by conducting a collaborative workshop with last-mile transportation sites. We use the outcome of the individual workshops held in semester 6 to define the scope and structure of a new call for proposals.

Setting-up the call for proposals (November – February)

Having a concept call for proposals in place we discuss this with the other KvW-III programme partners (P4, Randstad provinces and G4, biggest municipalities) and check for possible synergies. In parallel we also conduct a matchmaking study with other EU and national subsidy programs for hydrogen in mobility (e.g. EU Clean Hydrogen Partnership trucks call, Dutch national Action Plan for Hydrogen in Mobility). By doing so, we align different subsidy programs with the new call for proposals under the KvW-III program and secure complementarity between the programs.

Finalisation (February - June)

In the finalisation phase we formalise the new call for proposals and conduct a formal workshop where we invite a wide range of carriers and shippers to inform them on the publication of the call for proposals. We also discuss the proposed call for proposals with the managing authority of KvW-III to secure we meet the requirements and fit the program and to make sure that the legal aspects of the call for proposals are in line with the KvW-III program. The aim of this action plan is achieved by the official approval of the terms of reference of the call and therewith improving the policy instrument. The formal publication of the call for proposals will be in autumn 2023

During the execution of the action plan we put effort in networking and liaise with carriers and shippers where and when needed.

3.3. Partners and players involved

In order to connect with last-mile carriers we involve the program manager of NewWays Zuid-Holland who is in close contact with these transportation sites. Also, there are the carriers and shippers involved. We have a variety of possible ‘last-mile sites’ in vision (see table below). Part of the action will be to gain insight in their needs to set up hydrogen trucks demonstrations. This is then input for the call for proposals that we want to create under the KvW-III program. A list of possible last-mile transportation sites is given in the table below.

1. Maasvlakte Rotterdam – Bergambacht (water)	11. Rotterdam Botlek-RSC (Rail)
2. Pernis Rotterdam – Spanje (rail)	



3. Botlek Rotterdam – Wenen (rail)	12. Maasvlakte – Alphen a/d Rijn Groene Corridor (water)
4. Botlek – Antwerpen (Barge)	13. Maasvlakte – Venlo/Born Limburg Express (water)
5. Herstart Coolpoort Maasvlakte – Barendrecht (barge)	14. Maasvlakte – Venlo Venlo Express (rail)
6. RSC Rotterdam – Malmo (rail)	15. Maasvlakte naar München en Neurenberg Bayern Express (rail)
7. RSC Rotterdam -Denemarken (rail, fresh)	16. Maasvlakte – Alblasserdam (water)
8. RSC Rotterdam – Rzepin (rail, fresh)	17. Vlissingen, Rotterdam city – Lelystad Agrifood+ Express (water)
9. Westland (RSC) naar UK (rail, Fresh)	18. Bergambacht OTB - Haastrecht (water)
10. Maasvlakte – Botlek Rotterdam Corridor (water)	19. Rotterdam – Nijmegen (water)

3.4. Costs

For the implementation of this action only internal costs (hours) from the province are involved, which are expected to be around € 25.000.

3.5. Funding sources

Funding comes from the province of Zuid-Holland.

3.6. Expected impact

The expected impact of this action is the launch of a call for proposals for hydrogen truck application in last-mile transport. This enables the possibility for carriers and/or shippers to apply for local funding. Therewith it is expected that the hydrogen truck market will be strengthened as well as the development of necessary hydrogen infrastructure.