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SMART HY Aware | Action Plan

PP4-Municipality of Delphi

SMART HY AWARE
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ΔΗΜΟΣ ΔΕΛΦΩΝ

General information

Project	SMART-HY-AWARE
Partner organisation	Municipality of Delphi
Other partner organisations involved (if relevant)	
Country	Greece
NUTS2 region	Phocis Region
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Contents

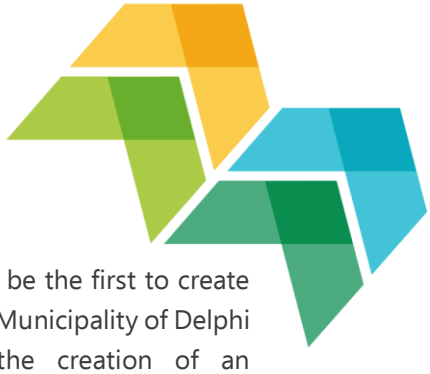
1. Introduction

SMART-HY-AWARE 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.

SMART-HY-AWARE 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 Municipality of Delphi aimed to be the first to create an action plan for HY-mobility in Greece. The SMART-HY-AWARE project gave the Municipality of Delphi the opportunity to improve the policy instrument T04 by prioritizing the creation of an association/ecosystem consisting of public and private bodies at regional and national level to coordinate the deployment of future hydrogen PPPs in the Phocis region. Thus, it will not only investigate the issue of sustainable transport alone. Instead, it will directly incorporate the suggestions of an experienced committee focusing on innovative hydrogen applications such as, the energy required to produce hydrogen from electrolysis using energy production coming from local biomass waste such as olive trees and olive oil refinery waste as well as solar energy.

The Municipality of Delphi has a strong agricultural production with its citizens predominantly working in the sector of cultivating olives. The latter constitutes over 52% of the cultivated land in the Municipality. The city of Amfissa, located in the Municipality, is the largest single olive grove in Greece. With the region of Continental Greece offering satisfactory sun radiance and several hours of sunlight, the Municipality suggests that photovoltaic systems could have further penetration into energy production of the area. These two factors of local biomass capacity and solar energy could offer a strong starting point for generating electric energy from resources with lower carbon footprint than coal. A study carried out to identify the possibility of producing electricity from the aforementioned resources and detailed the suitability of this specific type of biomass including the capital expenditure required for such infrastructure.

Through SMART-HY-AWARE project Municipality of Delphi planned a regional hydrogen action plan that will establish a collaborative stakeholders' cluster ("***Delphi green hydrogen association***") which will evaluate hydrogen mobility applications in the region by informing all regional stakeholders and propose new hydrogen mobility schemes through relevant public-private partnerships (PPPs).

2. Policy context

2.1. Aim of the Action Plan

The Action Plan aims to impact:

· Investment for Growth and Jobs programme

· European Territorial Cooperation programme

X Other regional development policy instrument

Name of the policy instrument addressed: **Delphi Sustainable Urban Mobility Plan (Delphi SUMP)**

Based on the Hellenic National Energy & Climate Action Plan during 2019-2030, renewable energy exploitation strategic actions should be developed in each region to create sustainable green regional economies and promote regional cooperative schemes. These strategic action plans tackle all energy value chain stages (production, storage, distribution, utilisation plan) of electricity produced and should be applied in zero-carbon transportation applications. In this context, **the Municipality of Delphi initialised a Sustainable Urban Mobility Plan (SUMP) aiming to decarbonize the current urban and rural mobility scheme and satisfy the mobility needs of people and businesses in the Phocis region** and their surroundings for a better quality of life.

Delphi SUMP is a dedicated operational scheme to support the implementation of future zero-carbon transport and green energy transition initiatives in the jurisdictional borders of Delphi with special focus and respect in the world heritage site with Natura and CORINE areas by 2030. This strategic implementation action plan operates as a dedicated policy instrument supported financially by the '**Regional Operational Programme (ROP) ERDF 2014-2020 Continental Greece OP-T04 Low carbon economy** as it provides a targeted framework on energy transition projects aiming to decarbonize Greece's energy production in the long-term (by 2050). Plus, the continuation of ROP 2014-2020 will be updated in **ROP ERDF 2021-2027 Continental Greece and will be deployed during 2023.** This assures that all implementation actions defined within the Delphi SUMP framework are totally covered by the Municipality of Delphi annual budget (own funds) and the 'Regional Operational Programme (ROP) ERDF Continental Greece.

One of the major steps of the SUMP implementation process is the **active participation and engagement of key public and private stakeholders in the green energy sector** *(specifically in the exploitation of biomass, RES and hydrogen applications in the transport sector*). Taking this into account, the Municipality of Delphi will initialise the formulation of a coordinated hydrogen ecosystem (**"Delphi green hydrogen association")** to make the first step capitalising the good practices, knowledge and expertise gained from SMART HY-AWARE Interreg Europe Project, from relevant previous studies applied in Phocis region and implement new hydrogen mobility schemes through relevant public-private partnerships (PPPs). This regional cluster will operate as a coordinated supporting mechanism towards all interested investors/funders (public bodies and industries) willing to invest in hydrogen mobility applications in the Phocis region.

2.2. Objectives

Delphi SUMP main objectives fall under the ***Axis 4 "Green innovation, conservation and production of energy from renewable energies"*** and specifically **Action 4.2.2** *"Justification for the utilisation of biomass from different sources for energy production"* and **Action 4.4.2** *"Enhancement of technological research and innovation actions focusing on sustainable energy production and storage applications based on renewable energy technologies"* of the '**Regional Operational Programme (ROP) ERDF**

2014-2020 Continental Greece OP-T04 Low carbon economy. T04 states that Greece has energy capacity potential for energy production from renewable energies including biomass.

More specifically, Delphi SUMP main objectives are:

- implementation of future green mobility solutions (infrastructure, hydrogen buses, etc.) in the jurisdictional borders of Delphi with special focus and respect in the world heritage site with Natura and CORINE areas by 2030.
- utilisation of RES and biomass energy potential of Phocis region for green energy production and urban/rural mobility services (i.e. smart energy park).
- active participation and engagement of key public and private stakeholders in the green energy sector.
- creation of sustainable green transport PPPs to assist the local Sustainable Urban Mobility Plan (SUMP) and decarbonize existing local/regional mobility applications.

Energy production from RES and energy storage capacity is stated as a priority objective. There is a high preference to the proposals containing holistic approaches on all energy value chain stages (production, storage, distribution, utilisation plan). **Currently Delphi SUMP emphasises on: (i) *connecting energy production and (ii) sustainable mobility solutions without highlighting specific technologies on priority energy sources installation***. Both objectives are mentioned independently while there is no holistic point of view to address a circular economy starting from energy production from renewable resources to energy used in transport. In this case, very limited reference is made on hydrogen production and mobility approaches.

Within the SMART-HY-AWARE project, the Municipality of Delphi identified through the collaboration with other project partners, the good practices presented, and previous studies applied in the Phocis region, the necessity of creating a strong public-private hydrogen cluster. This initiative will enhance the regional green energy capacity building, inter-regional cooperation and provide an additional mechanism to prioritise green hydrogen future PPPs in the existing Delphi SUMP.

2.3. Interregional exchange and learning approach

As part of SMART-HY-AWARE project, Municipality of Delphi has interacted with the Regional Development Agency of Aragon, Lazio Region, the province of Zuid-Holland, municipality of Delphi and Pannon Business Network Association, and this has fostered exchange of learning and experiences.

- Exchange of good practices
- Mutual learning from progress meetings and steering committee meetings
- Participation in Mid-Term Reviews
- Participation in peer reviews
- Participation in knowledge dissemination meetings
- Participation in inter-regional study visits (virtual and physical)

- Organisation of regional stakeholder workshops

All the aforementioned activities contributed to the dissemination of knowledge among partners and their regional stakeholders and gave them the opportunity to gain the appropriate and useful knowledge on hydrogen technologies, strategies to be implemented both on hydrogen production and hydrogen mobility, exchange of policies addressed from different regions and good practices that could possibly be transferred to other regions.

Municipality of Delphi actively participated in all the aforementioned activities and contributed to the dissemination of knowledge especially in the field of green hydrogen production, through the study held in order to investigate the potential of green hydrogen production from biomass and other renewable energy sources in the region of Phocis and indicated a new perspective on how the use of biomass could be a major factor on the deployment of green hydrogen production.

During the SMART HY AWARE interregional collaboration with other project stakeholders and during the evaluation of potential GPs identified by Municipality of Delphi, it has been noted that the policy instrument addressed has to be supported by a strong regional hydrogen "association" (stakeholders pool) which will be established by the mutual agreement between regional public authorities (coordinated by Municipality of Delphi) and industrial stakeholders specialised in hydrogen production and/or mobility technologies.

3. Action 1

Title: "Creation of Delphi green hydrogen association"

3.1. The background

During the investigation of the energy potential from biomass and renewable energy sources (i.e. solar, wind) in the Phocis region, the outcomes showed the high potential of hydrogen production from olive by-products and solar energy approved the initial thoughts of exploiting these energy sources for hydrogen production as it was stated in the SMART HY AWARE Application Form. However, findings from this study showed the exploitation of wind energy as a valuable alternative source for hydrogen production.

Following the first study, during the SMART HY AWARE project implementation, several good practices were examined and assessed by the Municipality of Delphi in close collaboration with the Hellenic Institute of Transport (external expert - research institute accompanying in the GP study execution). Specifically, two good practices, from Bolzano (Italy) and Arnhem (Netherlands) city respectively highlighted the importance of establishing close consultation between involved stakeholders in hydrogen projects to create public-private partnerships (PPPs). Furthermore, the presentation of a Regional Hydrogen Master Plan (Aragon) during IRSW in Budapest (November 2021) validated the importance of a public-private partnership scheme in a structured cluster coordinated by the respective authority (in our case the SMART HY AWARE partner). In addition, Municipality of Delphi could use the methodology of the ***"Regional Action Plan in Aragon"*** as a guidance on how Municipality could influence the policy instrument in order to capitalise the implementation of hydrogen technologies in

the Region of Phocis, by proposing a strategic plan with specific goals, indicators and exclusive funds (ERDF ROP).

Therefore, the creation of **Delphi green hydrogen association** with the participation of public authorities, Special Management Authority of Regional Operational Plan of Continental Greece (regional policy maker entity), research institutes/universities and industry enterprises with knowledge in hydrogen applications is a key action to ensure the launch of low-carbon energy production and mobility projects in the Phocis region. In this way, it can be assured that the Municipality of Delphi could be the linkage between public and private funding schemes to promote hydrogen initiatives in the Phocis region and provide the appropriate knowledge background to all local/regional communities engaged during structured workshops/meetings. This association will be an addition to the existing SUMP, adapting green hydrogen future projects in its core objectives.

3.1.1. Link with interregional learning and exchange of experiences

Interregional learning and exchange of experience was successfully achieved through a variety of activities carried out during the project. Through the exchange of experience that partners gained through the implementation of Good Practices in their region, Municipality of Delphi acquired the appropriate tools to focus on targeted actions that will influence regional policy instrument in such a way as to achieve the desired change in the political context that will bring closer the application of hydrogen in the region of Phocis. The policy instrument addressed and its objectives were basically influenced from the Good Practices below:

- Policy Engagement with Hydrogen Technology in Aberdeen.
- North East Scotland Hydrogen Ambition (Aberdeen)
- Population Engagement with Hydrogen Technology in Aberdeen.
- Methodology to create a Regional Hydrogen Master Plan (Aragon).
- Italian Hydrogen and Fuel-Cell Association - H2IT
- Elaboration of Hungary's National Hydrogen Strategy 2030 and its approval by the State

These Good Practices showed a new perspective on how Municipality of Delphi could engage the population to develop a greater understanding and acceptance of hydrogen technologies, how could the hydrogen technologies will be embedded in all relevant areas of policy and will be supported at a national level with the engagement of a variety of public and private stakeholders. In addition, Municipality of Delphi could use the methodology followed for the creation of a Regional Action Plan in Aragon as a guidance on how Municipality could influence the policy instrument in order to adopt financing exclusively for the implementation of hydrogen technologies in the Region of Phocis, by proposing a strategic plan with specific goals and indicators.

3.2. Action

- Bilateral meetings between Municipality of Delphi and potential public and private stakeholders defining their participation and roles/responsibilities within Delphi green hydrogen association and during the implementation of Delphi SUMP.
- Signing of an official document between the cluster members (MoU), for the establishment of the Delphi green hydrogen association.

- An expert committee (3-5 members of the Delphi green hydrogen association) will be formed and in close cooperation with the Municipality of Delphi will be in charge for the supervision, coordination and implementation of the "Hydrogen Mobility" pillar's strategic actions defined in the existing Delphi SUMP
- Two open consultation meetings with the participation of external stakeholders (outside cluster) to gather recommendations related to hydrogen mobility for the development of a written recommendation report to align proposed actions and KPIs with existing Delphi SUMP objectives.
- Delphi green hydrogen association will include targeted lines of action in the "Hydrogen Mobility" pillar of Delphi SUMP, with regards to support and promotion actions of the hydrogen value chain and communication.
- Delphi green hydrogen association will define and finalise a set of KPIs to evaluate and monitor the implementation steps of the "Hydrogen Mobility" pillar's actions defined in the existing Delphi SUMP.

3.2.1. Objectives

- Creation of hydrogen mobility PPPs to assist the local Sustainable Urban Mobility Plan (SUMP) and decarbonize existing local/regional mobility applications.
- Utilisation of RES and biomass energy potential of Phocis region for green hydrogen production and urban/rural mobility services (i.e. smart energy park).
- Implementation of future green hydrogen mobility solutions (infrastructure, hydrogen buses, etc.) in the jurisdictional borders of Delphi with special focus and respect in the world heritage site with Natura and CORINE areas by 2030.
- Increase awareness about hydrogen mobility policy measures and Good Practices in the regional stakeholders' pool.

3.2.2. Target Group

The creation of **Delphi green hydrogen association** with the participation of public authorities, Special Management Authority of Regional Operational Plan of Continental Greece (regional policy maker entity), research institutes/universities and industry enterprises with knowledge in hydrogen applications is a key action to ensure the launch of low-carbon energy production and mobility projects in the Phocis region. Future projects will benefit all parties located within the jurisdictional borders of Phocis region with highest priority its inhabitants and local/regional entrepreneurs and employees. Plus, awareness of hydrogen mobility applications and presentation of current Good Practices about new green energy value chain technologies to the involved stakeholders and general public will potentially trigger changes in the local/regional environment and life quality.

3.2.3. Content

The creation of **Delphi green hydrogen association** with the participation of public authorities, Special Management Authority of Regional Operational Plan of Continental Greece (regional policy maker entity), research institutes/universities and industry enterprises with knowledge in hydrogen applications is a key action to ensure the launch of low-carbon energy production and mobility projects in the Phocis region. The Municipality of Delphi could be the linkage between public and private funding schemes to promote hydrogen initiatives in the Phocis region and provide the appropriate knowledge background to all local/regional communities engaged during structured workshops/meetings.

3.3. Partners and players involved

Special Management Authority of Regional Operational Plan of Continental Greece (regional policy maker entity), Public Authorities (Ministry of Transport, Ministry of Environment and Energy, Ministry of Tourism, Ministry of Maritime Affairs and Insular Policy, Region of Continental Greece), Research Centres & Universities (Centre for Research and Technology Hellas, Centre for Renewable Energy Sources and Saving, University of Thessaly, University of Piraeus, Aristotle University of Thessaloniki), Professional Associations (Technical Chamber of Greece, Hellenic Institute of Transportation Engineers, Hellenic Institute of Electric Vehicles), Local community groups, Industry stakeholders (MOTOR OIL, Hellenic PPC, Protergia, Solaris, etc.).

Public authorities will be involved in the elaboration of the Action Plan and the implementation and update of their planning and programming instruments related to hydrogen-electric mobility. Research Centres and Professional Associations will provide expertise, data information and knowledge. Industry stakeholders experienced in hydrogen production, storage and mobility solutions will bring new innovative ideas and assist in the regional development of a holistic energy transition approach with their expertise and funds. Local community groups will comment on the Municipality needs regarding the hydrogen-electric mobility.

3.4. Timeframe

- Bilateral meetings between Municipality of Delphi and potential public and private stakeholders defining their participation and roles/responsibilities within Delphi green hydrogen association and during the implementation of Delphi SUMP: October 2022
- Signing of an official document between the cluster members (MoU), for the establishment of the Delphi green hydrogen association.: December 2022
- An expert committee (3-5 members of the Delphi green hydrogen association) will be formed and in close cooperation with the Municipality of Delphi will be in charge for the supervision, coordination and implementation of the "Hydrogen Mobility" pillar's strategic actions defined in the existing Delphi SUMP: February 2023
- Two open consultation meetings with the participation of external stakeholders (outside cluster) to gather recommendations related to hydrogen mobility for the development of a written recommendation report to align proposed actions and KPIs with existing Delphi SUMP objectives: March 2023
- Delphi green hydrogen association will include targeted lines of action in the "Hydrogen Mobility" pillar of Delphi SUMP, with regards to support and promotion actions of the hydrogen value chain and communication.: April 2023
- Delphi green hydrogen association will define and finalise a set of KPIs to evaluate and monitor the implementation steps of the "Hydrogen Mobility" pillar's actions defined in the existing Delphi SUMP.: July 2023

3.5. Costs (if relevant)

The costs that will occur during Phase 2 will be covered by own funds and be supported by the Local Mobility Plan 'SUMP'. These costs are related to the aforementioned actions that should take place for the establishment of the Delphi green hydrogen association.

Below some indicative costs may occur during Phase 2:

- Staff costs:15.600,000€
- External experts, technical assistance:15.000,00€
- Marketing, Communication:3.000,00€
- Project management¨17.000,00€
- Other costs that are directly connected to the actions

3.6. Funding sources (if relevant):

The establishment and deployment of **Delphi green hydrogen** association will start **during Phase 2** of the SMART HY AWARE project. Costs related to the activities that will take place during this Phase will

mainly come from the SUMP funding and from Municipality's own funds. Sustainable Urban Mobility Plan (SUMP) is addressed and funded by the ERDF 2014-2020-T04 Low Carbon Economy.

After SMART HY AWARE Phase 2 is completed and finalised (July 2023), all operational costs of Delphi green hydrogen association will be covered by own funds (Municipality of Delphi annual budget) and will be co-funded from the EU under the Regional Operational Programme continental Greece from the addressed policy instrument (Delphi SUMP).

3.7. Expected impact

Smart HY Aware project will fundamentally ensure a starting point for the implementation of hydrogen policies in the Phocis region, by creating a supportive collaborative scheme consisting of public and private national stakeholders. The creation of **Delphi green hydrogen association will enhance the existing policy instrument (Delphi SUMP)** by expanding the existing regional green energy capacity building, assuring inter-regional cooperation between key energy stakeholders and providing an additional mechanism to prioritise green hydrogen future PPPs in the existing Delphi SUMP.

This association will create a regional green energy cluster aiming to provide a coordinated supporting mechanism towards all interested investors/funders (public bodies and industries) willing to invest in hydrogen mobility applications in the Phocis region, whether these stakeholders are coming from inside the Delphi green hydrogen cluster (internal) or external stakeholders. In this way, this "hydrogen public-private cluster" will ensure the active participation and engagement of key public and private stakeholders in the green energy sector and increase awareness in other interested stakeholders (general public, regional NGOs, etc.) about hydrogen mobility policy measures and Good Practices.

The collaboration between Delphi green hydrogen association's members will create a strong regional public-private partnership (PPP) framework boosting the regional green energy capacity building and providing an additional mechanism to prioritise green hydrogen future PPPs in the existing Delphi SUMP. The expertise of Delphi hydrogen association's members and the active participation of external stakeholders during the bilateral meetings and open consultation meetings will be capitalised in the final written proposal submission for Delphi SUMP, which will be submitted by July 2023. As a final outcome, these actions will initialise new important green mobility projects in the Phocis region utilising the biomass and renewable energy potential identified from previous studies in the region, plus giving special focus and respect in the world heritage site with Natura and CORINE areas.