



# Introduction of Hydrogen into the Croatian Maritime Sector: National Strategic Framework

TransH2 | Regional Energy Agency Kvarner | Vedran Krušvar

Workshop:

**“Challenges and Opportunities from Hydrogen  
for Cross-Border Maritime Mobility”**

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## Hydrogen in Croatia's strategic documents

- The purpose of this presentation is to give a short overview of Croatia's key strategic documents envisioning the introduction of hydrogen-based technologies and solutions on a national level
1. National Development Strategy of the Republic of Croatia
  2. Low-Carbon Development Strategy of the Republic of Croatia for the period up to 2030 with a view to 2050
  3. Croatian Hydrogen Strategy until 2050



## National Development Strategy of the Republic of Croatia

- Adopted by Croatian Parliament in February 2021
- Vision: make Croatia a competitive, innovative, and safe country, with a recognizable identity and culture, a country with preserved resources, good living conditions and equal opportunities for all, by 2030



## National Development Strategy of the Republic of Croatia

- Four strategic development areas:
  1. Sustainable economy and society
  2. Strengthened resilience to crises
  3. Green and digital transition
  4. Balanced regional development
- A total of 13 strategic objectives and 23 impact indicators were defined under these development areas



## National Development Strategy of the Republic of Croatia

- Hydrogen is mentioned under development area „green and digital transition”, strategic objective no. 8 „Ecological and energy transition to climate neutrality”:
- Encouraged innovation and investment in research and development in the energy sector will contribute to developing a circular economy and energy self-sufficiency, and investments in clean hydrogen-related technologies are acknowledged here as an example of this approach



## National Development Strategy of the Republic of Croatia

- Eight priorities in energy policy are defined within the same strategic objective, two of them mention encouraging hydrogen-based technologies:
- Promotion of advanced biofuels, as well as electricity and hydrogen from renewable energy sources
- Promoting investment in hydrogen-related clean technologies



## National Development Strategy of the Republic of Croatia

- Transport and mobility: the strategy is not explicit when it comes to the introduction of hydrogen-related technologies and solutions
- Within the strategic objective no. 10 „Sustainable mobility” it is declared that environmentally friendly means of maritime transport will be financed, and the development and improvement of ports and waterways is recognized as one of two existing priorities under the same strategic objective



## Low-Carbon Development Strategy of the Republic of Croatia for the period up to 2030 with a view to 2050

- Adopted by Croatian Parliament in June 2021
- Purpose: initiate changes in Croatian society that will contribute to the reduction of greenhouse gas emissions, which will allow for the separation of economic growth from greenhouse gas emissions
- Hydrogen is mentioned in both policies and measures for low-carbon development of the transport sector, and in the guidelines for the low-carbon development of transport in Croatia





## Low-Carbon Development Strategy of the Republic of Croatia for the period up to 2030 with a view to 2050

- Transport sector – measures:
- Hydrogen is recognized among others alternative low-CO<sub>2</sub> fuels, and the strategy states that a prerequisite for successfully introducing alternative fuels is the development of infrastructure and encouraging the replacement or purchase of new vehicles
- In addition, when it comes to measures concerning the maritime sector, it is mentioned that “For ships in transition, the alternative fuel is liquefied natural gas, followed by hydrogen and synthetic fuels.”



## Low-Carbon Development Strategy of the Republic of Croatia for the period up to 2030 with a view to 2050

- „significant investments are needed in the hydrogen distribution network, which has been identified as one of the key means towards the wider adoption of hydrogen as a fuel for transport, while the availability of hydrocarbons is not considered an obstacle. The use of hydrogen in vehicles does not require special adjustments in terms of travel and vehicle charging habits. Although technologies for hydrogen production already exist today, considerable efforts are needed to establish the infrastructure for filling vehicles with hydrogen. The advantage of hydrogen is that due to its high energy value it is suitable for use in trucks and for propulsion of ships.”



## Low-Carbon Development Strategy of the Republic of Croatia for the period up to 2030 with a view to 2050

- Transport sector – guidelines:
- The strategy recognizes that in order to achieve the national decarbonization goals by 2050 “Alternative fuels will be needed to reduce emissions in heavy goods vehicles, in particular the use of hydrogen using fuel cells”



## Croatian Hydrogen Strategy until 2050

- Adopted by Croatian Parliament in March 2022
- Provides a framework for hydrogen production and use with a focus on renewable hydrogen as a substitute for fossil fuels and increasing the stability of the RES-based electricity system for energy self-sufficiency and clean energy transition and sustainable mobility
- “In the transport sector, hydrogen is one of the alternative and complementary solutions for electro-mobility, in particular for road freight transport, including urban logistics, road and rail transport for passengers and goods, maritime, river and air transport”



## Croatian Hydrogen Strategy until 2050

- Four pillars:
  1. Hydrogen production
  2. Storage and transport of hydrogen
  3. Use of hydrogen
  4. Education, research and innovation



## Croatian Hydrogen Strategy until 2050

- Third pillar „Use of hydrogen” covers the transport sector, and the strategy recognizes it as a leading sector when it comes to CO2 emissions
- Strategy states that hydrogen can be introduced as motor fuel into all segments of traffic, maritime transport included
- It is further emphasized that maritime transport has great potential for hydrogen use, especially when it comes to traffic related to connecting the mainland and the islands



## Croatian Hydrogen Strategy until 2050

- Another important aspect concerning maritime transport is related to the supply of electricity to ships at berth (cold ironing)
- This is an important element, especially in ports that receive a large number of cruisers (Dubrovnik, Split, Zadar)
- It is necessary to decarbonise this segment of port operations as soon as possible and to establish either direct supply from RES or the use of hydrogen through fuel cells to ensure a sufficient amount of electricity for vessels in ports



## Conclusion

- As demonstrated, the potential of hydrogen is gradually being recognized in Croatia's key strategic documents
- However, as stated in the Croatian Hydrogen Strategy until 2050, a regulatory and normative framework is required to for faster implementation and safe use of hydrogen

### LINKS:

- [Low-Carbon Development Strategy of the Republic of Croatia for the period up to 2030 with a view to 2050](#)
- [Croatian Hydrogen Strategy until 2050](#)





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