

# Hydrogen development in the Republic of Croatia

## Croatian Hydrocarbon Agency Activities

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# Agenda

- CHA-Who we are
- Energy transition in Croatia
- Croatian Hydrogen strategy
  - Study for hydrogen implementation plan and development
- National Recovery and Resilience Plan
- Projects:
  - North Adriatic Hydrogen Valley
  - Geothermal energy

# WE ARE

HYDROCARBONS

01



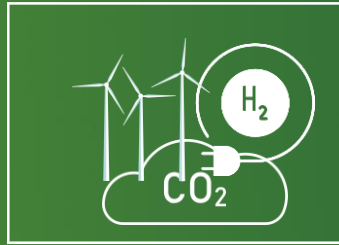
GEOHERM

02



NEW ENERGY

03



## 2014

Established by the Government of the Republic of Croatia as an operational and systematic support to the Ministry of Economy and Sustainable Development

## 2018 - Energy transition - ongoing



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# Energy transition in Croatia

- EU
- THE REPUBLIC OF CROATIA
- CROATIAN HYDROCARBON AGENCY

2018

AMENDMENTS TO THE HYDROCARBONS ACT

Repurposing the oil&gas database in favor of the green transition - geothermal

The first permits for exploration of geothermal water for energy purposes

2019

NATIONAL ENERGY AND CLIMATE PLAN

Promotion of geothermal potential;

Positioning of the Republic of Croatia on the world geothermal map

2020

ENERGY STRATEGY DEVELOPMENT OF REPUBLIC OF CROATIA

The first VIRTUAL DATA ROOM in the EU was opened in the service of the green transition.

A double increase of geothermal portfolio

2021

NRRP 2021-2026

Amendments to the Act on the Croatian Hydrocarbon Agency

NEW TECHNOLOGIES (H2, OFW)

Approved of 30 million € of NRPP funds for geothermal projects (district heating)

2022

CROATIAN HYDROGEN STRATEGY

STUDY OF THE DEVELOPMENT AND IMPLEMENTATION PLAN OF THE CROATIAN HYDROGEN STRATEGY UNTIL 2050

North Adriatic Hydrogen Valley

THE REPUBLIC OF CROATIA FOLLOWS THE LEGAL ACQUIS OF THE EU AND ADOPTED LEGISLATION

THE REPUBLIC OF CROATIA FOLLOWS THE PRACTICE OF THE EU RELATED TO DEVELOPMENT

OPENING AND STRENGTHENING OF NEW MARKETS

EU GREEN DEAL PRESENTATION

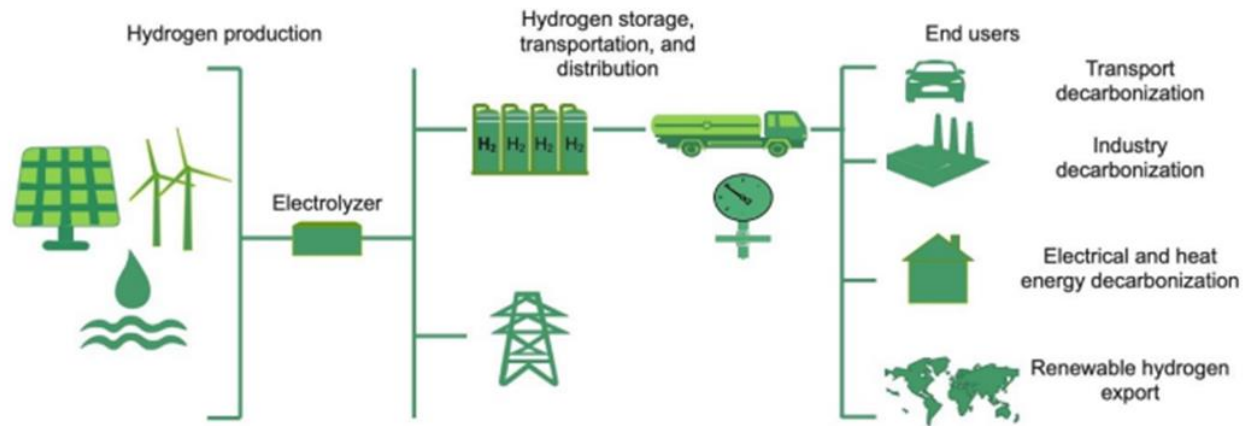
EU GREEN DEAL  
EU Strategy for Energy System Integration and Pure Hydrogen  
EU Strategy for energy from renewable sources at sea - offshore wind  
European climate pact

EU NRRP



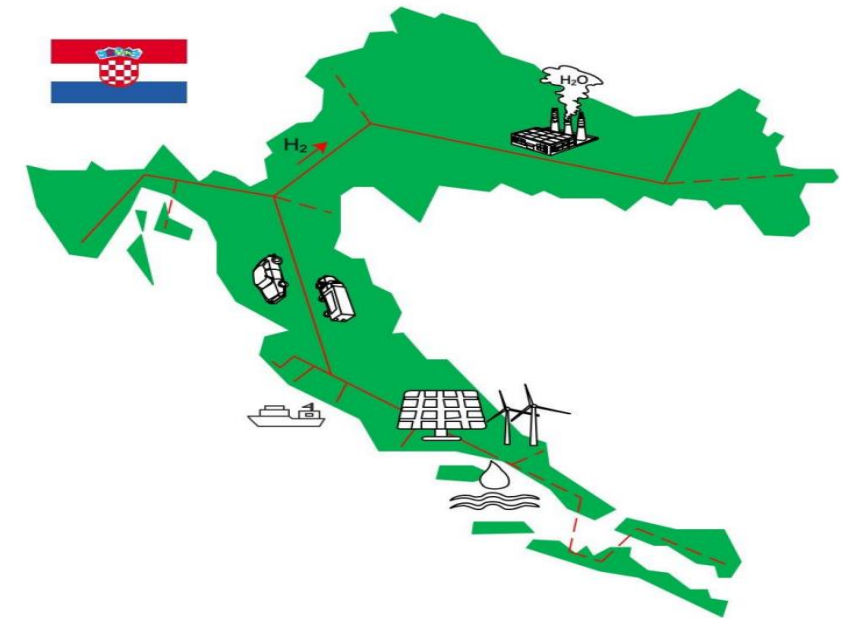
# Croatian Hydrogen Strategy

Strategy highlights the advantages of the Republic of Croatia in developing the potential related to the hydrogen economy and is in line with the objectives of the EU Hydrogen Strategy, as well as with the National Development Strategy of the Republic of Croatia until 2030.



**Figure 1.** General scheme of the hydrogen value chain, from production to end-use

## HYDROGEN STRATEGY OF THE REPUBLIC OF CROATIA UNTIL 2050



Zagreb, March 2022

- SHORT-TERM period until 2026
  - electrolyser capacity **35 MW**
- MEDIUM-TERM period 2027 – 2030
  - electrolyser capacity **70 MW**
- LONG-TERM period until 2050
  - electrolyser capacity **2750MW**

# Study of the development and implementation plan of the Croatian Hydrogen Strategy until 2050

Croatian Hydrocarbon Agency initiated the preparation of the study that will:



ANALYZE hydrogen demand and possibility of green H<sub>2</sub> production



IDENTIFY the potential of the renewable energy sources for hydrogen production, infrastructure and stakeholders;



PROPOSE modification of the existing regulatory framework;



CREATE a portfolio of the hydrogen projects as well as a model for efficient implementation of the projects;



PROMOTE identified hydrogen projects



# National Recovery and Resilience Plan

2024



- 1,500 MW of new sources of electricity from RES

2026



- 27 mil. € to produce **renewable hydrogen** (10 MW electrolyser) and the establishment of infrastructure in transport (6 HRS– 100 % financed)
- 37 mil. € the purchase of new **alternative fuel vehicles** and the development of alternative fuel **infrastructure** in road transport

2030



- 2,500 MW of installed power - ensuring the production of clean energy that should meet its own needs





# The North Adriatic Hydrogen Valley

Croatia, Slovenia and the Italian region of Friuli-Venezia-Gulia

- The North Adriatic Hydrogen Valley is the **first European transnational** project intended to establish a dedicated hydrogen valley.
- 34 organizations covers the entire chain, from production to storage and distribution to the end use of hydrogen in various sectors, mainly industry and transport.
- Key industrial stakeholders from all three countries will develop pilot projects for the production of more than 5,000 tonnes H<sub>2</sub>/Y and its storage, distribution and use.
- The final goal of the project is decarbonization of major industrial sectors, such as steel and cement production, as well as sustainable transport solutions related to reducing the carbon footprint.
- The project will run for 72 months; it starts this year.
- The project has been awarded with 25 million euros in grants.





# Croatia: Geothermal potential

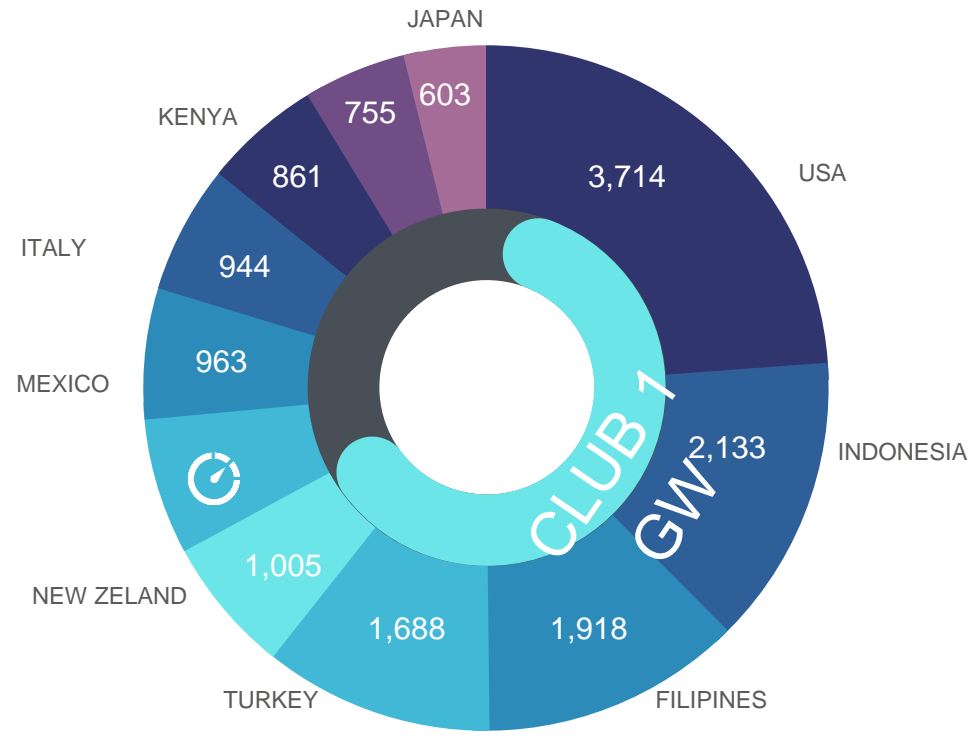
We have tradition of oil and gas production since 1940's. During the decades, production has been declining and at the time we are on the path to employ our remaining oil and gas potential in transition period and striving to utilize great knowledge and tradition into producing renewable energy from geothermal waters.

Medium geothermal gradient of the Croatian part of the Pannonian Basin is **60% higher than the European average.**

According to current conservative estimates, geothermal power plants with a total capacity of about 1 GW could be built at the Croatian geothermal sites identified so far.

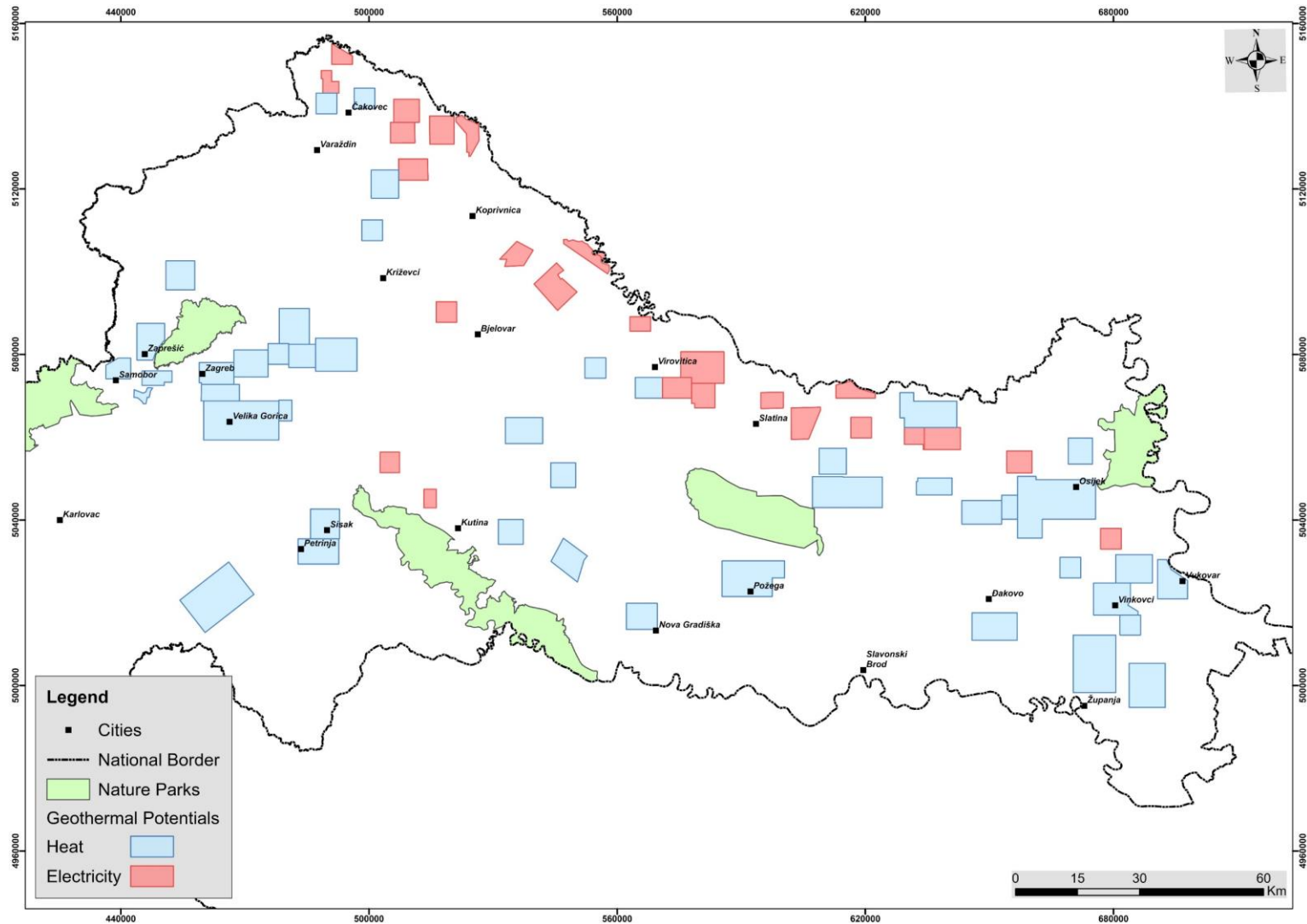
Based on National Recovery and Resilience Plan, the Agency has nominated 6 areas suitable for the use of geothermal waters for heating purposes. Using EU funds, the Agency can significantly reduce the geological risk by drilling new wells in estimated areas of geothermal potential and eliminate a large share of CAPEX. The value of approved projects is EUR 30 million.

Geothermal energy provides a consistent power output, making it the perfect energy supplier for environmentally friendly hydrogen plants.



# Croatian Geothermal Potential

- geothermal potential based on analyses and evaluation of geological, well, geophysical and seismic data.

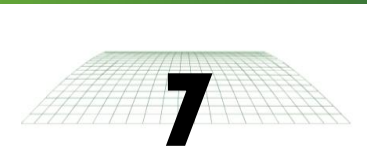


**43**  
heat generation

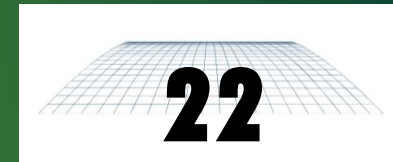


**32**  
electricity generation

## Geothermal Portfolio



**7**  
production fields



**22**  
exploration blocks

# Vision & next steps for CHA

*Based on Law on Renewable Energy Sources and High-Efficiency Cogeneration (OG 83/2023), article 58a:*

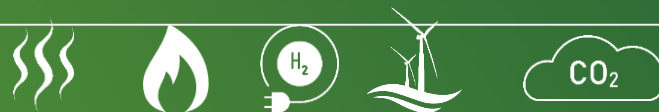
CHA is appointed as national coordinating body with main tasks:

- Programming and implementation of strategic planning acts as technical assistance to the Ministry and other state administration bodies responsible for individual issues of hydrogen application
- Preparation of complex and innovative projects of national interest
- Implementation of projects in relevant funds
- Communication with other EU member states & Stakeholder mapping

**For a hydrogen-based economy, cross-sector cooperation and dialogue of all stakeholders is necessary in order to ensure adequate regulatory conditions based on best practices.**



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# Thank you for your attention!



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