



COUNTRY REPORT CROATIA

Julije Domac, Velimir Šegon and Simona Tršinar

Energy Without Russia

The Consequences of the Ukraine war and the
EU Sanctions on the Energy Sector in Europe

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Energy Without Russia: The Case of the Croatia

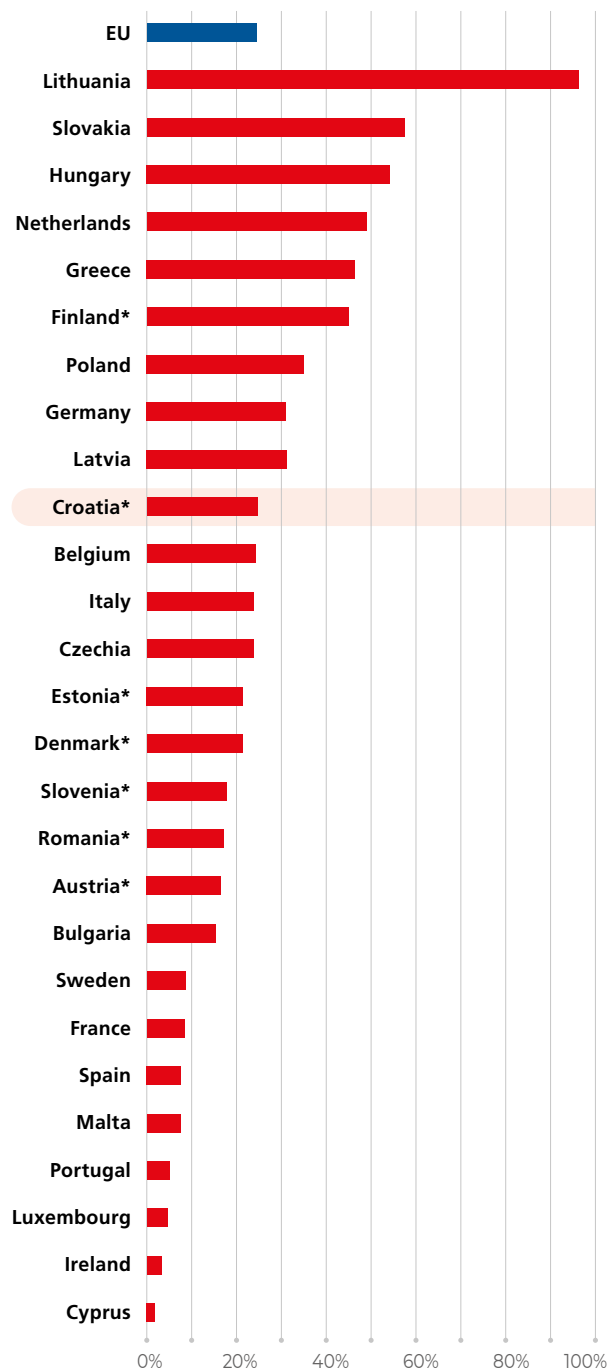
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INTRODUCTION

Croatia has quickly decreased its dependency on imported Russian gas by increasing its own production, stepping up the use of an existing LNG terminal, and significantly reducing gas consumption thanks to the favourable conditions of the mild winter. The main consequence of the Ukraine war and EU sanctions is the heavily regulated energy prices of electricity and natural gas, resulting in the national electricity supply company Hrvatska elektroprivreda (HEP Group) accruing heavy financial losses. The future will bring many challenges, mainly because there needs to be a systematic energy policy based on domestic and renewable energy resources, coupled with the fact that the energy market (electricity, gas, and heat) needs to be developed.

Figure 1
Imports from Russia in gross available energy, EU, 2020



Source: Eurostat, Including estimates for non-reported data for countries with*

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STATUS QUO ANTE (AS OF FEBRUARY 2022)

In 2020, oil and petroleum products accounted for 33.7% of Croatia’s energy mix, followed by natural gas (30.3%), renewables and solid biomass (26.4%), electricity (4.8%), solid fossil fuels (4.3%), and non-renewable waste (0.5%).¹ Liquid fuels and natural gas accounted for the highest share in Croatia’s total primary energy supply, 29.1% and 24.7%, respectively² (see Figure 2). Data for 2021 indicate that Croatia produced 15,210.4 GWh of electricity: 7,228.7 GWh by hydropower plants, followed by 5,771.0 GWh from thermal power plants, 2,061.8 GWh from wind power plants, and only 148.9 GWh from solar

power plants.³ The nuclear power plant Krško, jointly owned by Croatia and Slovenia (each owning 50%), produced 2,709 GWh of electricity for Croatian needs. The total electricity consumption in 2021 was 19,171.4 GWh. Thus, the net import amounted to 3,961 GWh or approximately 21% of total consumption. The ratio of total production to consumption was approximately 79%. Dominant consumption by sectors is that of business (10,230,276 MWh), followed by households (6,596,361 MWh) and public lighting (340,395 MWh)⁴ (see Figure 3).

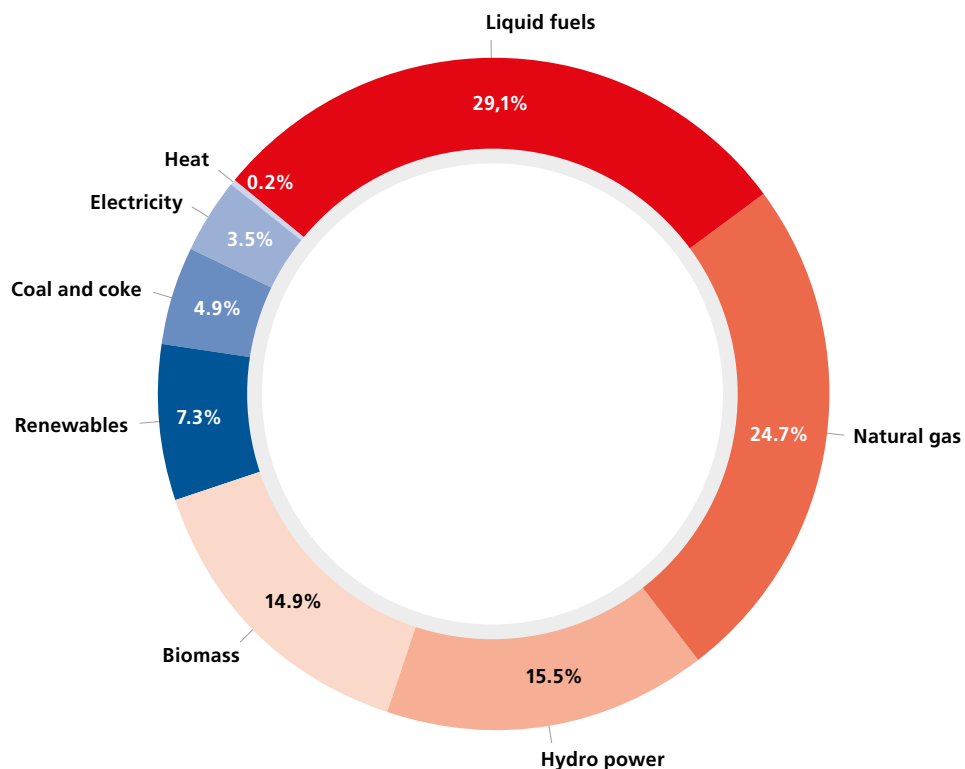
1 Statistical overview of the EU (2020).

2 EIHP, Energy in Croatia, (2021), available at https://eihp.hr/wp-content/uploads/2023/01/Energija%20u%20HR%202021_WEB_LR.pdf

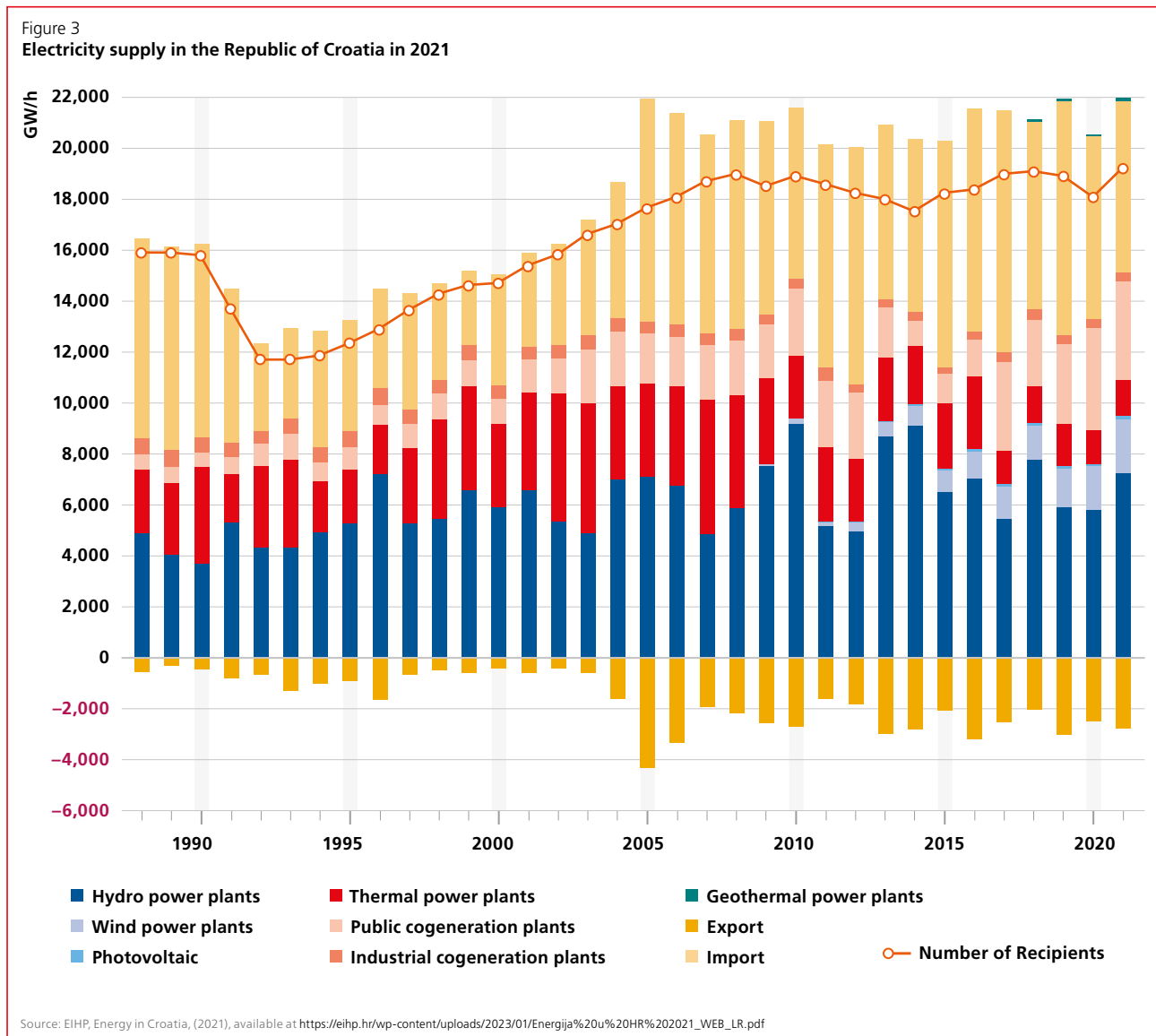
3 EIHP, Energy in Croatia, (2021), available at https://eihp.hr/wp-content/uploads/2023/01/Energija%20u%20HR%202021_WEB_LR.pdf

4 EIHP, Energy in Croatia, (2021), available at https://eihp.hr/wp-content/uploads/2023/01/Energija%20u%20HR%202021_WEB_LR.pdf

Figure 2
Shares in the total primary energy supply



Source: EIHP, Energy in Croatia (2021), S. 54, available at https://eihp.hr/wp-content/uploads/2023/01/Energija%20u%20HR%202021_WEB_LR.pdf



2021 Croatia’s total primary energy supply amounted to approximately 413 GPJ, of which liquid fuels (fossil) covered 120 PJ, natural gas 102 GPJ, and hydropower 64 PJ. Total energy import is 321 GPJ, while total energy export is 123 PJ. Thus, the net energy import amounted to 198 GPJ, approximately 47.9% of the primary energy supply.

In 2020 Croatia’s energy dependency rate was 53.6% (whereas in 2021, it was 52.1%), below the EU27 average of 57.5%. It is assumed that 80% of Croatian energy net imports are from Russia, with a dependency of 24.7% on energy imports. In 2020, Croatia had a 74.7% dependency on Russia for coal, 55% on natural gas, and 14.2% on oil.⁵

The national oil and gas company INA is co-owned by the Hungarian oil company MOL (with a 49.08% share), the Croatian government (with a 44.84% share), and institutional and private investors (6.08% share), with MOL having the majority on the Management Board and in effect managing the company. This leaves Croatia in a very de-

pendent and vulnerable situation regarding the production and supply of oil and oil derivatives (dominantly gasoline and diesel), and despite having its own active oil and gas fields and refinery, INA has been constantly decreasing its production. This is especially the case regarding natural gas production and supply, where INA has practically left the dominant position to the company Prvo plinarsko društvo (PPD), which is essentially a local partner of Gazprom and is supplying customers through a ten-year contract with the Russian company.

- The national electricity and heat supply company HEP Group is 100% owned by the Croatian government. The Croatian electricity market has been formally liberalised since 2001; however in practice, the following indicates that the liberalisation has been achieved to only a very limited extent:
- Over 90% of electricity supply to customers (both households and commercial/industrial consumers) is delivered by the state-owned company HEP Group (based on data for 2021 from HERA – the Croatian Energy Regulatory Agency);

5 Statistical overview of the EU (2020).

- HEP Group is largely dominant in installed capacity, electricity production, and sales on the wholesale market, with almost two-thirds of the total;
- The transmission system operator, TSO (HOPS), is nominally an independent company; however, it is owned 100% by HEP Group, and in practice, its operation is considerably influenced by HEP Group senior management; and
- The distribution system operator, DSO (HEP-ODS), is part of the HEP group.

The TSO and DSO both play a critical role in the electricity market by managing the transmission and distribution network and ensuring the safe, secure, and reliable delivery of electricity to consumers.

In practice, neither TSO nor DSO are in a position to ensure transparent, fair, and timely access to the grid to all potential investors/producers.

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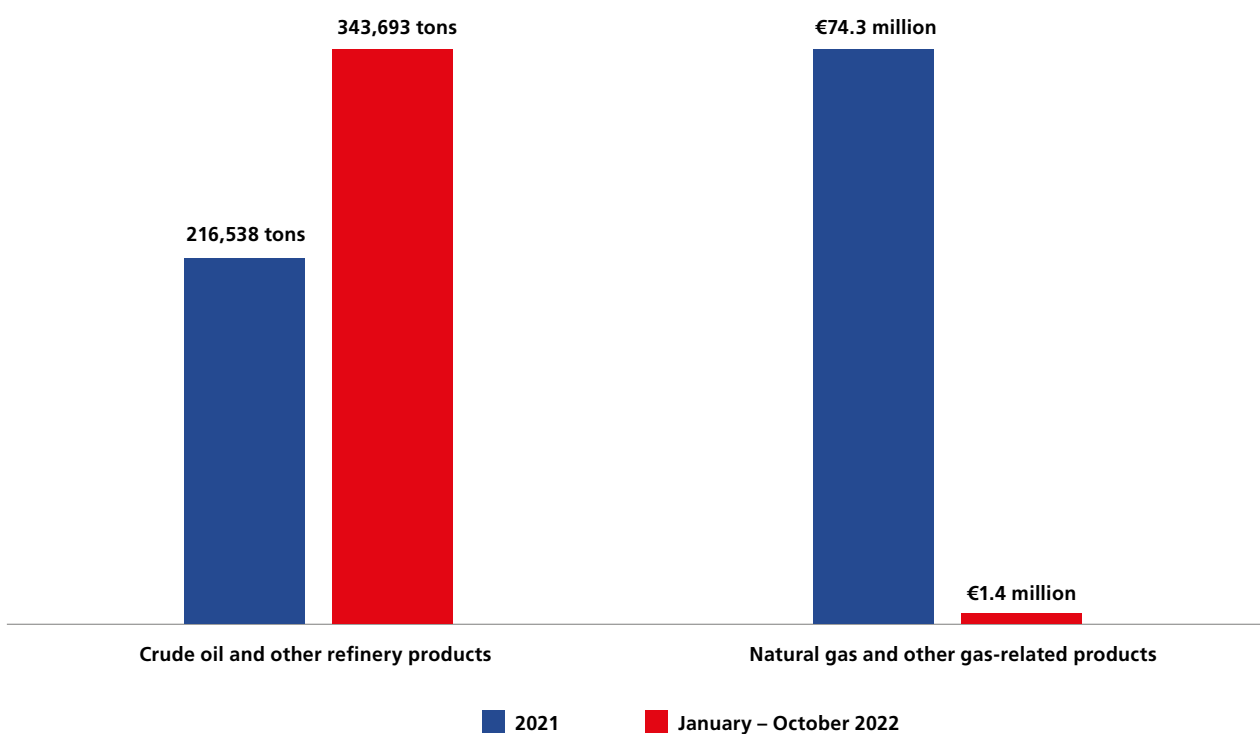
AD HOC RESPONSES AFTER FEBRUARY 2022

In 2022, energy security became a priority in the EU, with ambitious targets set by the RePowerEU plan to make Europe’s energy independent from Russia. In response to the energy crisis, the Croatian government introduced four packages of measures in February 2022. The measures were focused mainly on mitigating energy prices, reducing the VAT rate for heating energy to 5%, reducing excise duties on petroleum products, and leaving unchanged the unit price of thermal energy for all heating systems.⁶ Overall, the presented measures ensured that in Croatia, the average gas price for households increased only by 13% (compared to 92% in the rest of Europe) and that citizens have the lowest price for electricity in all EU Member States except Hungary.

In 2022, the capacity of the Krk LNG terminal was expanded with a technical upgrade from 2.6 to 2.9 billion cubic meters of gas/year. The main financial burden of the regulated prices of natural gas fell on the HEP Group, which by governmental decision, had to purchase approximately 300 million m3 of natural gas and fill the domestic gas storage tanks before the 2022/2023 heating season. With government approval and backing, HEP Group had to take a one-billion euro loan. The decision was justified as the ad hoc response to the crisis, and the only option to fill the natural gas storage tanks was to force HEP Group to do it, as no other gas suppliers were willing to do so. Consequently, HEP Group is taking financial losses, since the price at which it bought the gas when the storage tanks had to be filled is lower than the current price (prescribed for households and the public sector by governmental decision).

⁶ E-Gradani (2023), available at <https://vlada.gov.hr/vijesti/vladin-odgovor-na-globalnu-energetsku-krizu-1-7-milijardi-eura-za-zastitu-kucanstava-i-gospodarstva-od-rasta-cijena/37964>

Figure 4
Croatian energy imports from Russia



Source: Euractiv.hr, (2023), available at <https://euractiv.hr/energetika/a239/Hrvatska-je-u-2022.-godini-povecala-uvoz-ruske-nafte-no-smanjila-je-uvoz-plina-iz-Rusije.html>

Croatia fulfilled its gas storage obligations, reaching 97.03% by 1 November 2022, and ended the heating season with a filling level of gas storage at 73.04% by 2 May 2023.

In addition, the ad hoc response includes regulating electricity prices (for households, the public sector, and the commercial sector and industry) prescribed again by government decision in September 2022 and valid until September 2023.

At the same time, there were no clear signals and messages to consumers indicating the date until which the decision on regulated energy prices would be in effect. Consequently, there needed to be coherent saving strategies for energy consumption reduction or an official message about the necessity to save energy, either national or regional/city level, as in many other EU countries.

The impact of the energy crisis is still being evaluated, but early data show that Croatia's oil imports from Russia in the first ten months of 2022 (343,693 tons) exceeded those in 2021 (216,538 tons).⁷ The EU sanctions on Russian oil were activated only in December 2022. However, the import of Russian natural gas amounted to only €1.4 mil in the first ten months of 2022, while in 2021, the import of natural gas amounted to around €74.3 million (see Figure 4). This is attributed to Croatian in-house production and the increased use of the Krk LNG terminal. Also, a decrease in electricity imports and an increase in RES production could be seen in 2022 and the first three months of 2023 in Croatia.⁸ Therefore, even though the data is still being processed for 2022 and 2023, early monitoring indicates a positive trend toward reducing energy dependency on Russia.

⁷ Euractiv.hr (2023), available at <https://euractiv.hr/energetika/a239/Hrvatska-je-u-2022.-godini-povecala-uvoz-ruske-nafte-no-smanjila-je-uvaz-plina-iz-Rusije.html>

⁸ Lovrić, Marko, Report on electricity conditions in HR for the month of March 2023 (2023).

3

MAIN CONSEQUENCES OF THE CONFLICT AND SANCTIONS SO FAR

The main impact of the Ukraine war and the EU sanctions on Croatia's energy sector so far have been related to the drastic increase/fluctuation of energy prices (natural gas, electricity) which negatively affected the overall economy. In September 2022, the Croatian government adopted a decision through which regulated energy prices were prescribed for October 2022 to March 2023, and this decision was renewed in April and is valid until September 2023. The main burden of the regulated energy prices has fallen on the national energy company HEP Group, which estimated its resulting losses for the period October 2022 to March 2023 at approximately €800 million, while a similar estimation of losses has been announced due to the renewal of the regulated prices. In April 2023 the government announced that due to this situation, it would subsidise HEP Group in the amount of €900 million.

At the time of this writing (mid 2023), this situation has not resulted in any considerable practical impacts on Croatia's electricity production (the majority of which comes from HEP Group). Even before the Ukraine crisis, HEP Group announced its plans to expand its portfolio of PV plants. However, the targets and dynamics have not increased considerably in the last year. Due to the relatively mild 2022/2023 winter, natural gas consumption has generally decreased. There were no major problems with supply, while due to the very good hydrology in the same period (that is, since HEP Group produces most of its electricity from hydropower plants, the favourable hydrology has considerably increased electricity production), the overall impacts of the Ukraine crisis on Croatia have been relatively mild.

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MEDIUM- AND LONG-TERM ANSWERS

The Croatian government has announced its decision to increase the capacity of the LNG terminal on Krk from 2.9 to 6.1 billion cubic meters of gas, which is twice Croatia's current demand. Possible options include an onshore terminal with a capacity of 15 billion cubic meters of gas, with an estimated price of €1.75 to 2 billion, or a floating terminal at €1.2 billion, with a capacity of 9.6 cubic meters per year. The expansion will also include the construction of the Plinacro gas pipeline between Zlobin and Bosiljevo, whereby a total investment of €180 million is foreseen, of which 25 million must be invested in the LNG terminal itself and 155 million for the new Zlobin-Bosiljevo gas pipeline. The construction of the gas pipeline will enable the increase of gas transport from the LNG terminal to its current technical capacity of about 3.5 billion cubic meters per year. This will significantly increase the security of gas supply to consumers in Croatia, and also create a basic prerequisite for the further development of the gas pipeline system and the increase of gas transport to Slovenia and Hungary, thereby reducing their dependence on Russian gas.

The Adriatic-Ionian gas pipeline project from the Albanian city of Fieri to the Croatian city of Split, with a total length of 511 km, is again under consideration. It was initially envisioned in 2012 when the Croatian natural gas transport company Plinacro and the Ministry of Economy began to participate in meetings of interested countries. The implementation was not started as planned because gas from Russia was cheaper, and the amount of gas from Azerbaijan was limited. However, recently, it was announced that the project could be reactivated, with a completion date estimated at 2025, but this development is still very early.

The Croatian government has on several occasions announced that it is seriously considering building the second block of the Krško nuclear power plant, which would be done as a joint investment between Croatia and Slovenia. However, currently, there is no further information regarding the implementation.

Croatia has considerable geothermal potential, but current production and utilisation are insignificant. The greatest potential lies within the Pannonian basin, and the potential utilisation includes electricity production (to a lesser extent, as temperatures are not sufficient), heating, agriculture, and balneology. There have been positive movements lately, especially connected to the energy crisis, as

the Croatian government, through the Hydrocarbon Agency, has announced plans to increase geothermal energy utilisation in the country. There is dedicated funding for some projects in the National Recovery and Resilience programme. Apart from national vision and targets, increased interest is visible at regional and local levels, where a dominant application would be in the district heating sector, balneology, and agriculture. Several projects are under development in various phases, with some also including innovation in relation to the extraction of hydrocarbons from the geothermal stream and CO₂ capturing and storage in the process.

The government adopted the National Energy and Climate Action Plan (NECP) for Croatia in December 2019. The document is currently undergoing a revision; however, there needs to be more information publicly available, and there have been no activities involving a wide group of stakeholders in the process.

Croatia has considerable potential for PV installations. Unfortunately, this potential is still mostly unutilized. According to the EurObserv'ER publication Photovoltaic Barometer, which compares data for PV installations for EU countries, at the end of 2021 Croatia had 26.9 W/capita of installed PV systems, which ranked it second worst in the EU (only Latvia was below that), with the Netherlands (815.4 W/capita) and Germany (706.2 W/capita) being the EU leaders. Unofficial data for 2022 indicate that Croatia has approximately doubled its capacity, which is still very small in terms of W/capita compared to other EU countries.

The main limitation to the widespread installation of PVs in Croatia is the capability of the distribution system operator and the transmission system operator to integrate PV plants. As mentioned, the investments in the electricity network at DSO and TSO levels need to be improved. However, if the same amount of installed PV plants in terms of W/capita were achieved in Croatia as in advanced countries such as the Netherlands and Germany, the total PV capacity would have to be between 3 and 4 GW.

The dominant policies related to reducing demand/consumption are those focused on increasing energy efficiency in buildings, as stated in the Long-Term Strategy for National Building Stock Renovation by 2050, adopted by the government in December 2020. The Strategy provides clear

goals and targets for the energy retrofit of buildings for all sectors (public, private, commercial) and outlines specific measures and activities to achieve the targets.

In practice, the energy retrofit of buildings has been carried out mostly through public calls for subsidies managed by the Ministry of Physical Planning, Construction and State Assets. However, the implementation is rather slow because allocations for calls (i.e., total subsidies) are relatively low. For example, the current public call (ending on 23 May 2023) for public buildings has a total allocation of €40 million for the entire public sector in Croatia, while according to the Program of Energy Retrofit of Public Buildings (adopted by the government in March 2022) the total needs to achieve targets for public buildings by 2030 amount to approximately €1.2 billion. In addition, there needs to be a clear indication of future calls and their allocations, which would contribute to the predictability and stability of the overall retrofit scheme. The current lack of predictability harms the construction industry, and it is questionable whether the industry will be able to implement all construction work needed to achieve the set targets within a reasonable timeframe and budget.

5

FORESEEABLE CONSEQUENCES CONCERNING EU CLIMATE GOALS/TARGETS?

The awareness of the need to reduce energy consumption and the benefits of using renewable energy sources is increasing among Croatia's general population and entrepreneurs. Both sectors are expressing their wishes and demands for opportunities to invest in green energy projects and exert pressure to remove administrative and legal barriers, including simplifying procedures for obtaining permits for electricity grid connections. Croatia has the potential to become a net exporter of green energy, especially with a focus on solar PV

Croatia's local and regional authorities and their energy agencies are very active in starting and implementing sustainable energy projects, especially the deep energy retrofit of public buildings and the use of local renewable energy.

In 2022, the Croatian Parliament adopted a National Hydrogen Strategy until 2050, in which hydrogen was recognised as a significant energy source with a high potential to contribute to the decarbonisation objectives. The potential of hydrogen in Croatia derives primarily from an increasingly RES-based electricity production, which can support the production of green hydrogen. Due to Croatia's high solar energy potential, the uptake of the integration of PV systems with hydrogen technology is expected. Integrating RES with hydrogen systems could ensure the storage of surplus electric energy, addressing one of the greatest challenges of RES-based energy production.

The uncertainty in the future energy supply from Russia offers an opportunity to accelerate the energy transition in Croatia. Croatia is highly exposed to climate change and natural disasters, a fact which could be used to stress the importance of switching to renewable energy as, despite the recent expansion of renewables, fossil fuels continue to dominate Croatia's energy consumption mix. Energy efficiency improvements should also remain a priority. Future Croatian climate and economic strategies should align with the energy strategy to ensure energy independence and stability.

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