



# NATIONAL ENERGY AND CLIMATE PLANS IN THE DANUBE REGION

*Straight or winding?*

## POLICY RECOMMENDATIONS

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# National Energy and Climate Plans in the Danube Region

*Straight or winding?*

Policy Recommendations



**The study was prepared for the Ministry of Foreign Affairs and Trade, Hungary**

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## INTRODUCTION

The study "National Energy and Climate Plans in the Danube Region"<sup>1</sup> published in December 2020 by the Sustainable Energy Priority Area (PA2) of the EU Strategy for the Danube Region (EUSDR) and prepared by the Regional Centre for Energy Policy Research (REKK), provides an in-depth analysis and comparative assessment of the National Energy and Climate Plans (NECPs) of the nine EU member states belonging to the Danube Region (DR) (Austria, Bulgaria, Czechia, Croatia, Germany, Hungary, Romania, Slovakia, and Slovenia) and national energy strategies of the five non-EU Danube Region countries where the NECPs are being developed (Bosnia and Herzegovina, Moldova, Montenegro, Serbia, and Ukraine). The main insights and conclusions related to the future of the electricity and gas markets and the transformation of the transport and heating sectors were summarized in four policy briefs and were subject of two in-depth stakeholder workshops organised in May 2021.<sup>2</sup>

NECPs establish individual member state targets and measures for the 2021-2030 period aligned with the EU-wide 40% reduction goal in greenhouse gas (GHG) emissions stemming

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<sup>1</sup> The study was commissioned by the Hungarian Ministry of Foreign Affairs and Trade. It is available at: <https://energy.danube-region.eu/events/national-energy-and-climate-plans-of-danube-region-countries-targets-policies-and-projections/>

<sup>2</sup> The policy briefs and the summaries of the two workshops can be accessed at <https://energy.danube-region.eu/pa2-organized-two-webinars-about-the-national-energy-and-climate-plans-of-the-danube-region-countries/>

from the 2016 Clean Energy for all Europeans policy package<sup>3</sup>. Then in December 2020 the EU agreed to increase its climate ambition under the European Green Deal, aiming for net zero emissions by 2050, which necessarily has led to the upward revision of 2030 targets, from a 40 to 55% cut in GHG emissions.<sup>4</sup>

The purpose of this report is to provide targeted policy recommendations based on the analysis of DR national strategic documents to address the most significant policy gaps that will unlock the transformation of energy systems and services in line with the Paris Agreement keeping the rise in global temperature at or below 1.5 °C. This should not only support stronger DR climate ambitions manifested in the revision of national strategic documents but should also aim to ensure their delivery.

The report is structured around the following policy areas: 1) decarbonisation across all sectors of the economy, 2) the transformation of the electricity sector, 3) deployment of renewable electricity, 4) greening the heating and cooling sectors, 5) the sustainable use of biomass resources, 6) the future role of natural gas and 7) sector coupling, 8) transition to sustainable mobility and 9) the decarbonisation of industry.

## 1 DECARBONISATION

The 2030 GHG reduction targets and expected outcomes included the NECPs correspond to the EU-wide 43% reduction goal in the ETS, although Germany has already prepared its NECP based on the 55% target for 2030. The individual national targets of EU DR countries in the non-ETS sectors were determined in accordance with the provisions of the Effort Sharing Regulation, except for Slovakia and Slovenia which planned higher emission reductions than their national targets included in the regulation.

- *EU countries will have to **strengthen their ambitions for 2030** to help achieve the increased carbon reduction goal of the EU.*

The need to level-up climate ambition is reinforced by the commitment of all EU DR countries to carbon neutrality by 2050.

West Balkan states, including Bosnia and Herzegovina, Montenegro and Serbia made similar pledges in the Sofia Declaration<sup>5</sup>, but the specific timeline and corresponding targets, as well as the envisaged policy actions have not yet been elaborated. Although all non-EU DR countries have recently submitted revised Nationally Determined Contributions to the

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<sup>3</sup> See [https://ec.europa.eu/energy/topics/energy-strategy/clean-energy-all-europeans\\_en](https://ec.europa.eu/energy/topics/energy-strategy/clean-energy-all-europeans_en). The German NECP already considers the 55% reduction goal.

<sup>4</sup> The 55% target was set by COM (2020)562

<sup>5</sup> <https://balkangreenenergynews.com/heres-what-western-balkans-committed-to-in-sofia-declaration-on-green-agenda/>

UNFCCC, raising their commitments, the harmonisation with relevant EU legislation and the establishment of the required institutional background is still underway. Montenegro is the most advanced among them, introducing a cap-and-trade system with a floor price in February 2020. The other West Balkan countries face a 2024 deadline to harmonize legislation with the EU ETS.

- *The prospective inclusion of non-EU DR countries into the EU ETS and the imposition of a carbon-border adjustment mechanism (CBAM) adds pressure to economic and energy transformation. It would be important to **set the targets and measures in their NECPs in line with their increased ambitions**. It is necessary that EU countries provide them **assistance to prepare their heavy emitting sectors (industry, energy) for decarbonisation** through cooperation in the field of **knowledge and technology transfer**, and the provision of **financial assistance**.*

Among the most important measures to decarbonize across all sectors are the phase-out of fossil fuel subsidies, the introduction of carbon levies, interventions addressing consumer behaviour, and smarter energy service systems.

Only three Danube Region countries - Austria, Germany, and Slovenia – have committed to phasing out fossil fuel subsidies.

- ***Phasing out fossil fuel subsidies** is an important precondition for decarbonisation; therefore, it is important that the countries identify and gradually remove subsidies and incentives that are counterproductive to achieving climate policy goals. Consumer subsidies that cover all energy sources (including fossil energy) should be replaced by targeted subsidies for the energy poor.*

Only four DR countries have introduced a carbon pricing mechanism outside of the ETS. Germany has established a national fuel emissions trading scheme for the heating and transport sectors that is the model for the new EU-wide emission trading mechanism proposed in the 'Fit for 55' package.

- *There is an urgent need to provide a set of policy measures in all countries to prevent a lock-in of carbon intensive assets and technologies. **Economy-wide carbon pricing** is missing from the policy landscape. The social impacts arising from the increased costs need to be addressed through dedicated support targeting carbon-free solutions (energy efficiency, renewable energy use).*

All DR countries set goals for educating consumers in the residential, business, and tertiary sectors to raise awareness and facilitate knowledge transfer. Interventions promoting energy efficiency and energy sufficiency (absolute demand reduction) by encouraging climate friendly behaviour through incentives, regulation and infrastructure development can result in lower levels of energy demand (e. g. through supporting the use of advanced construction technologies in buildings, developing infrastructure for decarbonized and active transportation, promotion of teleworking, etc.).

- *Promoting actions to **reduce energy demand through energy efficiency and energy sufficiency measures** must be accompanied with **information** on energy-saving solutions and practices and **awareness raising** to **facilitate a shift in social norms favouring sustainable consumption of energy services**.*

## 2 ELECTRICITY

The use of coal will broadly decline across DR countries to 2030 but still remain an important source for many. This would appear to ignore exposure to increasing CO<sub>2</sub> prices and the compromised economic viability of coal and lignite-based generation.

- *The strategy relying on **coal fired power plants for system security needs rethinking** since high CO<sub>2</sub> prices will make coal-based power generation increasingly uneconomical and financially risky.*

A large group of CEE countries intend to retain nuclear capacities to offset diminishing coal-based power generation with five countries proceeding with lifetime extensions of existing reactors or planning for new build.

- ***Nuclear investments** are enormously expensive and extremely risky. New construction projects **cannot be funded, managed, and completed without a supportive regulatory environment**, therefore, policy makers should pay much more attention to design appropriate policy measures.*

A large group of DR countries intend to replace fossil power plants with intermittent renewable energy sources. The growing share of intermittent sources raises serious grid flexibility and balancing challenges.

- *Flexibility challenges posed by intermittent distributed generation shall be met with proactive and smart regulation. **In addition to encouraging flexible generation capacities** policy makers are advised to put **more emphasis on demand side issues**, involving active customers, aggregators and energy communities in the energy transition and enabling the uptake of PPAs by **removing legislative barriers**. Dedicated administrative and support policies shall **accelerate the roll-out of storage and smart metering technologies** to enable RES integration.*

Although several NECPs refer to gas as a “transitional fuel” replacing aging coal-fired power plants, there is little evidence of the “coal to gas” switch in DR NECPs. Commercial gas projects can have an important role in the transitional period to net zero by ensuring the availability of flexible peaking capacities that compliment intermittent renewable sources or can be available should there be serious delays in nuclear projects.

Developing effective policy measures to facilitate the grid integration of intermittent renewable capacities is a difficult task for regulators. As to network development, NECPs envisage a clear path for the development of the inter-connected transmission networks with detailed descriptions of planned cross-border lines that spread intermittent renewable generation to a

larger area and get absorbed by a regional market. Development plans for distribution networks, on the other hand, remain ambiguous.

- *Besides setting out policies to facilitate the development of transmission networks, NECPs should outline plans for the implementation of **effective measures at the distribution network level** addressing the concerns raised by the increasing levels of intermittent distributed generation.*

Development of intraday and balancing markets is expected to advance via transnational platforms for sharing and activating balancing energy bids for standard balancing products (mFRR and aFRR). Integrating the electricity markets of non-EU DR countries requires faster progress in electricity market reform.

- *It is important for **all non-EU DR countries to implement EU energy regulation** (unbundling of network operation, opening markets etc.), set up market infrastructure (organizing power exchanges, operating day-ahead and intraday markets), **promote market competition and market integration** (implementation of day-ahead and intraday market coupling and common capacity calculation for cross-border capacities in regional context), and implement price deregulation.*

### 3 RENEWABLE ELECTRICITY

Renewable electricity generation experienced significant growth over the last decade in the EU and DR. While in the past DR renewable electricity (RES-E) generation was dominated by hydro power, the NECPs and strategic documents show that the future will mainly bring investment to wind and solar PV.

Almost all DR countries imposed some type of **operational support** scheme before 2020, typically a feed-in tariff (FiT) scheme, or in Romania a quota scheme. The EEAG State Aid Guidelines<sup>6</sup> and RED II require a shift to market-based feed-in premium (FiP) schemes, prepared for by the NECPs of Bulgaria, the Czechia, Croatia, Germany, Hungary, and Slovenia.

- *In countries that are in a transitional phase between the old FiT and the new FiP schemes, the **legal framework for FiP systems should be finalized** as soon as possible to ensure predictable investment conditions. While premium schemes impose higher risk for RES-E producers, they help the market integration of renewable electricity and ensure market signals.*
- *Auction schemes result in cost-efficient support levels, evidenced by declining support costs in countries with functioning auction schemes (Germany, Croatia, Hungary and Slovenia). DR countries can **learn from the auction designs** of these countries when establishing their own schemes.*

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<sup>6</sup> Guidelines on State aid for environmental protection and energy 2014-2020, (2014/C 200/01) (EEAG Guidelines)

- *DR countries shall publish **long-term auction schedules** in coming years to increase predictability for investors. This is also mandated by Article 6 of RED II.*
- *Premium schemes incur higher risks for project developers and financial institutions. **DR countries experienced** in financing FiP schemes **shall share their expertise and best practices**.*

**Investment support** schemes mainly financed by the state budget, carbon credit revenues (EU ETS mechanism) or EU structural funds are common among DR countries to relieve front loaded RES-E investment costs. Tax exemptions, reductions and preferential loans can also motivate investments.

- *While operating support schemes often favour utility-scale projects, **investment support can successfully bridge the investment gap** for low-income households, municipalities, and energy communities to support their energy transition.*

RED and RED II call upon EU member states to support renewable energy investments with **administrative policies**. These include streamlining permitting and grid connection rights and reducing obstacles to renewable self-consumption and renewable energy communities.

- *In revising NECPs, DR countries shall put more focus on their activities to **streamline authorisation and grid connection procedures**.*
- *EU energy policy aims to put the consumer at the centre of the energy transition, which should be better reflected in NECPs, especially with dedicated policies for **renewable self-consumers**. With the exception of Romania, all DR EU member states state the aim to develop a framework for **renewable energy communities** but NECPs often miss clear agendas and measures.*
- *With growing renewable electricity deployment, increasingly scarce site selection for new installations is becoming a central issue, due to environmental concerns and grid connectivity issues. DR countries shall engage in **regional energy planning** to assure that local and regional characteristics are considered when planning and authorising new projects.*
- *With wind and solar PV becoming cost competitive, NECPs shall incorporate measures to facilitate corporate **power purchase agreements** (cPPAs).*
- *In EU member states that adopted support schemes earlier the first wave of installations will reach the end of support periods shortly after 2020. Frameworks for **repowering** or (where economically justified) follow-up support can keep RES-E generators operational until the end of their lifetimes.*

Dedicated sections of the NECPs ask governments to assess the possibilities for **regional cooperation** in the fields of climate and energy. Our recommendations for renewable electricity projects are the following:

- *DR countries shall actively engage in **exploring cooperation opportunities** in the fields of renewable electricity to reduce the cost of meeting climate and energy targets. Joint projects, open support schemes and agreements on statistical transfers among DR countries can result in developing RES-E projects in the most suitable and economically viable areas.*
- *Regional cooperation opportunities for exchanging **information and best practices need to be prioritized**.*



Due to the intermittent electricity production of wind and solar, the questions of **renewable integration and grid balancing** are emphasized in almost all national strategic documents. Research in advanced technologies that enable RES integration ranks highly among the research priorities listed in the NECPs of DR countries.

- *DR countries shall develop legislative and market design frameworks that allow intermittent RES-E producers to gain access to **balancing markets**.*
- *Support schemes shall target solar PV and wind investments in combination with **storage options** to reduce the need for grid balancing.*
- *DR countries shall **diversify their RES-E portfolios** by adding technologies that produce baseload energy, like solid biomass, biogas, geothermal and hydro. Safeguards to environmental protection shall be key to ensure a sustainable utilisation of these resources.*
- *In addition to financial and administrative measures, **awareness raising campaigns** are needed to share information about the benefits and challenges of renewable electricity production, to increase the social acceptance of the energy transition.*

## 4 RENEWABLE HEATING AND COOLING

RES consumption in the DR. Without an exogenously defined sectoral RES-H target set in the EU, each DR country defines its own ambition. Most of the DR countries aim to increase RES-H&C until 2030 according to their current NECPs and plan the introduction of new measures alongside existing ones. However, with the more ambitious EU-wide 55% GHG reduction goal by 2030, more renewable deployment will be required in the H&C sector, combined with a reduction in energy use.

The following policy recommendations are structured around three important topics impacting the share renewable H&C: support schemes, composition of heating energy by source, and heating demand reduction.

Despite its strategic importance, the H&C does not have nearly the level of **applied support schemes and policies** as sectors like power and transport. Investment support is the most common measure, though usually unevenly offered, while only Czechia provides operational support. The introduction of guarantees of origin is planned in Austria and Bulgaria.

- *It is essential to increase the **predictability of support** for renewable heating and cooling, both in terms of timing and budget size.*
- *Pilot schemes and knowledge sharing on **operation support** based on the Czechia case or cases from outside the region can contribute to higher RES H&C utilization.*

**Regarding the composition of RES fuels and the deployment of district heating**, biomass will continue to be dominant across DR countries. Although geothermal energy has strong potential to contribute to decarbonisation goals and reduce fossil fuel import dependency, it receives little attention. Solar heat and heat pumps are expected to remain at 30% or lower in 2030.

- *Measures towards **technological and fuel diversification** must be a key priority to open the possibility for a wider, more significant RES expansion in the H&C sector. Modern individual*

*and collective heating systems (e. g. heat pumps or utilization of excess renewable electricity in district heating) shall be positioned to replace fossil-fuel based heating by creating a level playing field for biomass alternatives.*

- *There are several countries in the region where the operation of biomass markets is not transparent. If the role of biomass remains significant, support must be conditional on meeting strict **sustainability criteria of biomass sourcing**.*
- *The dense structure of district heating infrastructure in CEE would be well suited to **utilize geothermal energy**. The potential for geothermal energy needs to become a higher priority where it can be exploited at a reasonable cost.*

The path towards decarbonization can be strengthened not only with higher RES shares but the overall reduction of H&C energy inputs through energy efficiency and demand reduction via home design elements, smart technology, and limiting the excessive growth of floor space.

DR NECPSs contain incomplete data for expected energy consumption of the building sectors in 2030. Only Czechia, Germany, Hungary, and Slovenia expect significant (over 10%) reduction compared to 2017. Consequently, there is room to increase ambitions in the region through the revision and expansion of measures that are in place.

- ***Financial instruments for energy efficiency** investments (investment grants, preferential loans, tax incentives) and building standards exist in all EU DR countries, but as currently constructed will not lead to significant demand reduction. A review of these instruments will be beneficial in most of the DR countries.*
- ***Nearly-zero building** energy requirements are under revision in many member states that aim to make the standards stricter and extend to building renovations. Consideration of **stricter regulation**, such as size limitation for new dwellings would be beneficial in all DR countries.*
- *Several DR countries do not have a **large-scale program for building renovation**. Without such schemes, consumption reduction is very hard to achieve.*
- *Energy efficiency obligation schemes have been introduced in four EU DR countries (AT, BG, HR, HU). **Energy savings contracting** is also a widely available option. Both tools should be implemented region wide.*
- *Almost all countries have introduced **detailed billing and information disclosure** on previous consumption levels. Supporting digitalization and innovative methods is planned in less than half of the EU DR countries. Non-EU DR countries place emphasis on awareness raising and information sharing, the upgrading of their district heating systems, and the renovation of public buildings. **Installation of smart and digital solutions** that track consumption profiles and inform consumers is essential in all countries of the region.*

## 5 BIOMASS UTILIZATION

Biomass-to-heat has been the single largest renewable energy segment in DR countries. On average three-quarters of total renewable energy comes from biomass, and roughly two-thirds of that are consumed by households for space heating. And this is set to grow further in the DR, about 24% by 2030.

Biomass heating in municipal areas is a significant contributor to poor local air quality and many DR countries face infringement procedures from the European Commission for failing to implement EU air quality standards for exceeding PM10 limits.

- *Since poor air quality is a leading factor in premature deaths in the DR, governments are encouraged to revisit **the balance of social costs and benefits related to biomass heating sectors**.*
- *Governments should increase their capacities to **fight energy poverty**, which is closely linked to the lowest efficiency biomass heating and the worst air pollution. Household biomass in old, **outdated stoves and furnaces should be phased-out with support for modern heating devices and energy efficiency improvements**.*

The DR national strategic documents set even more ambitious plans for biomass in electricity, with a combined growth of 168% (21.5 TWh in 2018 to 57.7 TWh in 2030).

- *Governments should **reconsider** commitments to **zero carbon emission factors** provided for biomass combustion. They are encouraged to consult academic experts and keep up with the international debate within the climate community.*
- *Government administrations are advised to consider **the lengthy carbon payback time of biomass-to-energy** compared to other renewable energy sources and the critical thresholds and tipping points of climate action to rethink biomass programs.*

Investments into biomass for electricity are expected to increase by 15% across the DR. Absent Germany, aggregate EU DR investment in biomass will be 35% more in 2030 than 2020. Similarly, non-EU DR countries seek to further increase their biomass electricity.

- *Governments are urged to recognize that net efficiency rate for electricity production averages 30-40% compared to 70-85% for heat production. Thus, the amount of **biomass input is significantly higher for electricity compared to heat**. This **needs to be reflected in the next revision** of DR national strategic documents.*

Considering both heat and electricity, biomass-to-energy will grow from 1027 PJ in 2018 to 1383 PJ in 2030 (35% increase, WAM). This scale of consumption risks loss of forest carbon stocks to the atmosphere. Forestry is typically the one subsector of LULUCF (land use, land use change and forestry) with negative carbon inventory as a net sink. Several DR countries anticipate deteriorating forestry sequestration due to the combination of intensive harvesting and disruptions to natural increments of live forest stock (climate change and aging).

Comparing NECP biomass strategies with the LULUCF baseline emissions projected by the National Forest Accounting Plans (NFAPs) makes the policy picture look even more unsustainable, with 70% loss of LULUCF carbon sinks projected by 2030 (WEM). Despite the high ambitions for reducing GHG emissions across the DR, the massive potential of LULUCF to cheaply sequester and store carbon is not taken seriously enough with climate policy measures.

- *There is a one-sided climate policy outlined by these strategic documents: supporting biomass-to-energy while ignoring the **climate economic value of forest sequestration** and carbon storage. Without integrated climate policy instruments targeting biomass resources, any further support for biomass-to-energy should be reconsidered.*
- *Governments are encouraged to develop climate policy planning with the inclusion of forest sequestration potential for **optimal allocation of forest resources** between biomass-to-energy and carbon sequestration.*
- *Administrations should build capacity to design and implement appropriate policy instruments that provide **incentives for the forest sector to participate more efficiently in broader climate efforts**. New policy instruments should indicate the value of an additional ton of CO<sub>2</sub> sequestered by forests and fairly distribute the benefits of forest carbon sequestration between forest owners and the rest of society.*

## 6 NATURAL GAS

DR national strategic documents do not provide many details on the future role of natural gas and there is *no clear vision of how to decarbonize* any of the sectors with a significant share of natural gas (power production, industry or household). Total DR gas consumption is expected to fall by 3% in the 2020-2030 period (~6 bcm/yr). Countries with mature gas markets plan to reduce their natural gas consumption by 2030 (AT, CZ, HU, DE) while others anticipate stagnation (HR, SK, BA, SI) or growth (UA, RS, BG, RO,) and two countries plan to introduce gas into the energy mix in the future: Kosovo and Montenegro.

DR national strategic documents reveal that production of declining domestic resources will be rapidly maximized. Those with considerable natural gas resources (BG, RO, HR, HU, UA) plan to accelerate production in the upcoming years, from 43 bcm/yr in 2018 to 50 bcm/yr by 2030.

EU DR NECPs show a clear contradiction between plans to reduce gas consumption (AT, CZ, DE, HU, HR) while still investing EUR 9.5 billion into gas infrastructure. Most of this investment and capacity is linked to the Russian diversification strategy.

There are some new projects providing additional sources of natural gas for the Balkans via TAP from Azerbaijan and the Krk terminal in Croatia for LNG. With a few additional and long planned projects, new DR markets will be able to access natural gas, but the timing of these plans is highly uncertain, therefore there is a risk that the new investments result in stranded assets.

It is therefore recommended to avoid leaving this part of Europe behind in the fossil fuel age based on outdated visions of “gas as a bridging fuel” that sets the wrong incentives for potential investors. Messaging should be clear:

- ***No subsidies should be provided to fossil fuels and those in operation should be phased out. A clear signal should be sent to project promoters not to invest into assets that will be unprofitable after 10-15 years.***

Because natural gas is still a very important heating fuel for many countries in the DR, a tailor-made plan is needed to provide decarbonized alternative heating at affordable prices for low-income consumers. In those DR WB6 countries that do not use natural gas in the household heating sector, coal, biomass, and other fuels should be switched to direct electrification and renewable solutions.

- ***Introducing natural gas to new markets should not be supported. Energy efficiency and building renovation plans must be supported through training and education of skilled workers and by setting up reliable and independent advisory services transparently.***

Gas can be a bridging fuel where the infrastructure already exists, mostly in the power sector, but in the other segments (industry services and household) and in countries with no gas infrastructure in place the renewable solutions should be the way forward.

## 7 SECTOR COUPLING

Sector coupling refers to the integration of power, heat, and transport sectors with the gradual introduction of renewables to meet energy needs. As most of the policies related to sector coupling are cross cutting and related to multiple sectors, no specific targets were found in NECPs related to sector coupling with most DR countries taking a wait-and-see approach.

Four main areas of sector coupling plans were identified in the NECPs: (i) electrification in transport (ii) heat pumps in the building sector (iii) power-to-X and hydrogen technologies (iv) electrification in industry. Measures already implemented were primarily related to the electrification of transport, present in nearly all DR countries. Sector coupling policies were found in Germany, Austria and to some extent in Czechia.

- ***Identify the potential and costs:*** *With considerable differences between DR countries in the electricity generation mix, carbon intensity, and primary energy balance, there is not a one-size-fits all solution for sector coupling. However, most NECPs identified the importance of better integration of electricity, heat, and transport sectors. A **thorough assessment of sector coupling possibilities** is encouraged in all countries to pinpoint untapped efficiency gains. Sector coupling **should be considered a possibility for cost-efficient decarbonisation**, rather than a goal in itself.*
- ***Do not over-regulate and let the sector develop:*** *Some technologies related to sector coupling policies (hydrogen economy, e-mobility) are not economically viable and a market still needs*

*to develop. Setting targets too early might adversely affect the development of these markets and may send the wrong signals. Instead of elaborating targets, **flexible and tailor-made regulation** should aid the development of sector coupling.*

## 8 TRANSPORTATION

Transportation is the only upward trending sector in emissions over the last two decades, growing faster in the DR than the EU average (except for Germany). RED II requires a minimum of 14% RES-T in EU member states by 2030, but with multipliers this can be met with a lower actual share. Most DR countries have set this minimum share as a target, with Germany, Slovenia and Hungary committed to a significantly higher RES-T share.

The analysis of the DR EU NECPs showed that the best practices for achieving the main policy goals are fuel switching, modal shift, and efficiency improvements (of the conventional technologies). Most countries consider electromobility to be the key for the decarbonisation of the sector, using (and planning to expand) purchase subsidies, tax allowances and charging network development as central policy measures and objectives. Rail and bicycle infrastructure development are also mentioned as important tools.

Our policy recommendations address both the concrete measures related to sufficiently covered areas and areas that are not adequately addressed in the DR NECPs:

- *For charging infrastructure, coverage in dense residential areas and apartment buildings is a must. Following the Austria and Slovenia models, measures related to the development of the charging network should not only focus on network coverage of rest stops on motorways and expressways but also on **private e-charging points in dense residential areas** and apartment blocks with standardized connections. In the absence of appropriate development, these areas can be a bottleneck limiting the growth of EVs.*
- *Although the current system of **subsidies** (purchase premium) and allowances (tax allowances, exemption from parking fees) is extensive and widespread, most of these measures are **not sufficiently targeted** and therefore do not provide a truly effective incentive for the spread of electromobility. In the case of purchase premiums, the introduction of a price cap for eligible cars would be a good start. Austria and Germany provide an indirect incentive in the form of **CO2 emission-based taxes**, driving both the business sector and households towards lower or zero emission vehicles that differentiate between full-electric and plug-in hybrid vehicles.*

Within the goal of fuel-switching, advanced biofuels should also be addressed:

- *Instead of increasing mandates for first-generation biofuel blending rates, DR countries should implement **support schemes for advanced biofuels** and related blending requirements, focusing on the gradual replacement of conventional biofuels.*

Modal shift should receive more attention in DR national strategic documents:

- *Modal shift should be facilitated with **support for rail transport through price discounts**. Germany is a good example, where in addition to raising the tax on airline tickets, the VAT on long-distance train tickets has been reduced.*
- *The development plans for **non-motorised transport modes** should also cover pedestrian infrastructure. Only Austria and Slovenia **include pedestrian infrastructure** in their plans for supporting non-motorised transport modes.*

Importantly, consumer awareness campaigns can facilitate the social justification for climate protection goals and policies:

- ***Consumer awareness campaigns** should be widespread and fundamental in sustainable mobility strategies. There are many options in this area, such as the promotion of cycling (Slovakia, Germany, Austria), walking, and use of public transportation, as well as training for eco-driving (Austria, Croatia).*

The upward trend in transport emissions will likely only be reversed by reducing demand:

- *Supporting home-office work and facilitating online administration can contribute to the **indirect reduction of demand for transport**, including car traffic. Spatial planning with more services and shops available near residential areas can have a similar effect.*
- *In addition, **speed reductions and the introduction of low-traffic zones** have a dampening effect on emissions within cities. These measures will only be effective if public transport and infrastructure for non-motorized transport modes (biking and walking) are developed in parallel.*
- ***Cooperation between DR countries** to remove physical and non-physical barriers along the main transport corridors is essential for the establishment of seamless, modern, and clean transportation systems throughout the region.*

The Transport Community Action Plan<sup>7</sup> agreed between WB6 and EU member states is a good example of this type of an initiative for improving and modernizing transport capacities and infrastructure with joint border operations.

## 9 INDUSTRY DECARBONISATION

While the industrial sector represents a high share of DR economic output, few countries have defined industry-specific targets in their NECPs. Less than half EU DR NECPs provide numerical estimates for the expected level and composition of industrial energy consumption in 2030. Among non-EU DR countries, only Serbia and Moldova outline expected final industrial energy consumption by 2030 as part of their (re)industrialization strategy.

The assessed NECPs contain only a few industry-specific measures, such as investment support to industrial pilot projects in Austria and Germany, financial initiatives in Austria and Romania, and regulatory obligations in Croatia, Germany, and Austria. For non-EU DR countries, the level

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<sup>7</sup> <https://www.transport-community.org/>

of industrial decarbonisation efforts seems to be highly dependent on the prospective EU accession.

For the most part, EU DR industrial decarbonisation policies rely on the Emission Trading Scheme (EU ETS) as a tool to achieve industry emission reductions rather than nationwide measures. The suppressed European Emission Allowance (EUA) prices prevailing from the end of 2012 to the beginning of 2018 failed to provide adequate mitigation incentives for the sector and did not encourage the development or application of new technologies and production processes in the 'hard-to-abate' sectors, such as steel, chemical, cement.

- *Although EUA prices have increased substantially recently and are expected to remain at higher levels due to the revision of the EU ETS, strengthened by the Carbon Border Adjustment Mechanism (CBAM) and the phase out of free allocations, it is important that EU DR countries **set out targets and supplementary measures for their industrial sectors** to determine an explicit pathway for decarbonisation. Clear targets and supplementary measures, such as **project-based carbon contracts for difference (CCfD)**, can contribute to the adoption of new, innovative technologies through a market-driven approach, mitigating the risk of uncertain carbon prices, and offering a hedge against regulatory risks.*
- *Non-EU DR countries first need to establish the institutional foundation for carbon pricing, which West-Balkan countries have already committed to under the Sofia Declaration. The process of implementing the relevant EU regulation will ensure the **harmonization of the cost of emissions under EU and non-EU regimes** with **CBAM** ensuing that production relocation to countries with less rigorous environmental legislation is avoided. Another tool supporting industrial pilots and demonstrational projects can be the implementation of national systems of **project-based carbon contracts for difference**.*
- *The deployment of new innovative industrial products and processes should be facilitated by the implementation of **green public procurement** mechanisms. Nationwide programs for assessing the environmental impacts of products and services in public procurement can stimulate the climate-friendly product design, efficient manufacturing, and usage of less emitting materials.*