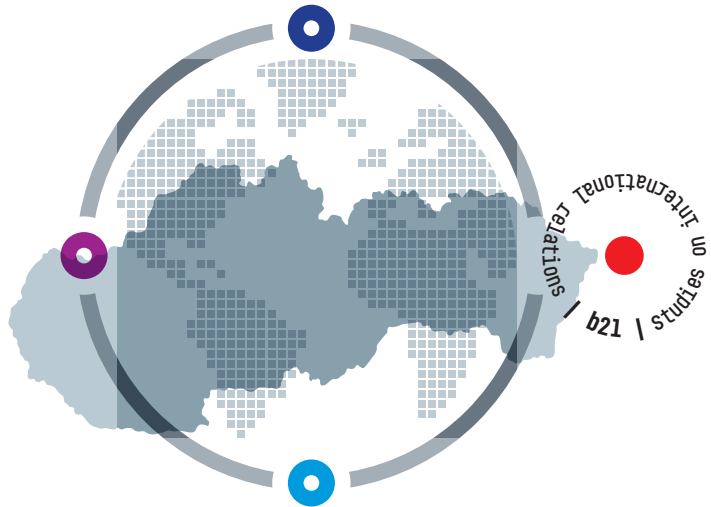





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Thinking beyond national borders for renewable energy solutions in Central Europe

Veronika Oravcová
Alžbeta Gavalcová
Nolan Theisen



Thinking beyond
national borders
for renewable
energy solutions
in Central Europe:
Prospects for
deepening
cooperation
between Austria,
Czechia
and Slovakia

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Thinking beyond national borders for renewable energy solutions in Central Europe: Prospects for deepening cooperation between Austria, Czechia and Slovakia



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1. Introduction



Thinking beyond national borders for renewable energy solutions in Central Europe:
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In May 2022, within a few months of Russia's illegal invasion of Ukraine, the EU announced its landmark RE-PowerEU plan, a collective agreement and guidebook to end the bloc's dependency on Russian energy imports by 2027. This would have been an absolutely inconceivable scenario anytime leading up to 24 February 2022, despite Gazprom's well documented natural gas supply provocations and interruptions over the past decade plus. This new energy reality has changed the narrative surrounding natural gas, which was widely promoted in Europe, especially in the most dependent Central European member states, as a transitional fuel to rapidly phase our coal, despite being an unsustainable methane emitting fossil fuel. With financial ramifications of the historic natural gas price spikes in 2022 still reverberating and facing a new normal of increased volatility with growing exposure to the global LNG market, countries are following the EU lead to focus attention on energy efficiency and domestic renewable energy sources (RES) to reduce and bypass further dependency on natural gas.

In Central Europe, countries like Germany and Austria have been at the vanguard of the EU's wind and solar boom owing to climate conscious and staunchly anti-nuclear societies, while the majority of their eastern periphery committed to nuclear power as the anchor for reliable, secure, carbon free electricity. The region shares a high overall dependency on fossil fuels inputs, particularly natural gas in industrial processes and heating of buildings, the majority of which was piped gas from Russia. This is why multilateral and bilateral energy policy dialogue from

Germany to Romania viewed energy security through the lens of natural gas diversification. This supply-side approach largely ignored the potential of energy efficiency measures and the potential for substituting with renewables, even though this approach could never address the core issue of energy dependence, or climate mitigation for that matter.

The new REPowerEU era completely changes the traditional Central European energy security calculus from protecting and promoting gas consumption to reducing and replacing it with renewable energy. Under the backdrop of this new consensus, this project aims to foster new regional dialogue and cooperation to accelerate the rollout of renewable energy, focusing on three neighbouring Central European countries: Austria, Czechia and Slovakia. The reason is twofold. First, a more coordinated and harmonized approach, especially facilitating cross-border projects, will bring about the most cost-effective RES solutions for each country. Second, these countries face similar underlying challenges — high Russian gas dependency, the dominant position of natural gas in household and industrial sectors, rising oil demand in transport, long RES permitting times, a shortfall of green and digital skills in the workforce — where dialogue and best practices can particularly be beneficial.

The paper is structured as follows: first, a comparison of the current national energy mix, plans for development of the renewable energy sources, and common barriers; second, an overview of past political and project level cooperation in the field of energy and climate issues; third, an overview of regional (local) level cooperation based on cross-border projects under the EU programming period 2014–2020. Based on this, the conclusion provides recommendations for future cooperation.

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2. National energy mix snapshots



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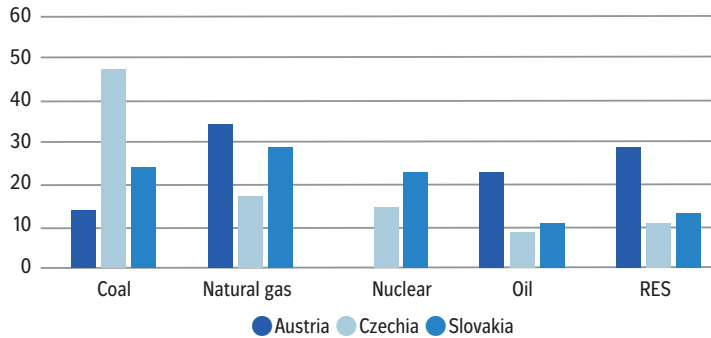
When it comes to the energy mix of Austria, Czechia and Slovakia, there are well-known differences, but also several underlying similarities (see Figure 1). Czechia stands out as by far the most coal dependent, comprising nearly 50% of the total energy mix between energy production and industrial applications. Natural gas is important for all three countries, but especially Austria and Slovakia, where it is the dominant input for the heating sector and industrial processes. Similarly, oil consumption in the transportation sector is high and rising for all three countries, but especially in Austria, where transport is the largest oil-consuming sector, accounting for around two-thirds of the overall demand, followed by the industry, (especially chemical and petrochemical sector) and residential sectors.¹

There is less in common when it comes to the electricity mix, beginning with Austria's large shares of wind and solar in the absence of nuclear energy (which was banned under its constitution in 1999) compared to substantial nuclear capacities and near absence of wind and solar in Czechia and Slovakia (see Figure 2). In fact, this core political-philosophical disagreement over nuclear energy is one of the main reasons that Austria and Slovakia's power systems remain disconnected while Slovakia has strong interconnectivity with all other neighbours including Czechia.

¹ "Austria," International Energy Agency, 2020. Available online: https://iea.blob.core.windows.net/assets/ea419c67-4847-4a22-905a-d3ef66b-848ba/Austria_2020_Energy_Policy_Review.pdf (accessed on October 20, 2023).

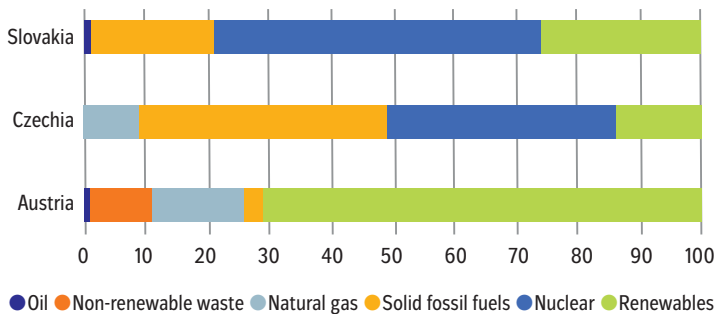
Czechia’s dependency on coal stands out compared to Slovakia and Austria. Not only is the share significantly larger, but Czechia’s phase-out date in 2033 is much later, compared to Slovakia (Upper Nitra region) by the end of 2023.²

Figure 1. Energy mix of Austria, Czechia and Slovakia (2021)



Source: Authors based on European Commission data

Figure 2. Electricity mix of Austria, Czechia and Slovakia (2021)



Source: Authors based on European Commission data

²“Decarbonization and Just Transition in the V4: Experiences of the Visegrad countries,” Europeum, 2022. Available online: <https://www.sfpa.sk/wp-content/uploads/2021/08/Decarbonization-and-Just-Transition-in-the-V4-Experiences-of-the-Visegrad-countries-second-editing-FINAL-xxx.pdf> (accessed on October 20, 2023).

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As for renewables by sector (Figure 3), the vast majority of heating and cooling (H & C) is attributable to biomass or bioenergy, which was scaled up in all three countries over the past decade. For Czechia and Slovakia, this was the key to meeting 2020 RES targets — accounting for 81%³ and 75%⁴ of renewable energy consumption in 2020, respectively — and figured prominently in National Energy and Climate Plans (NECPs) for decarbonizing the H & C sector and meeting 2030 targets.

According to submitted final NECPs in 2020, all three countries are planning to increase biomass-to-heat production. Czechia in particular refers to indirect support measures such as real estate tax exemptions, increasing municipal solid waste landfilling charges to promote selective waste management and prohibition of landfilling recoverable waste. Czechia is also the only of the three with minimum efficiency requirements for household biomass boilers.⁵

However, this could change in the current revision process, with mounting local environmental and sustainability concerns over the sourcing, processing and consumption of biomass and the inevitability of stricter EU regulation, which will curtail its use going forward. Transportation is the poorest performing sector with all three countries near the EU average, but lowest in Czechia. It is clear that

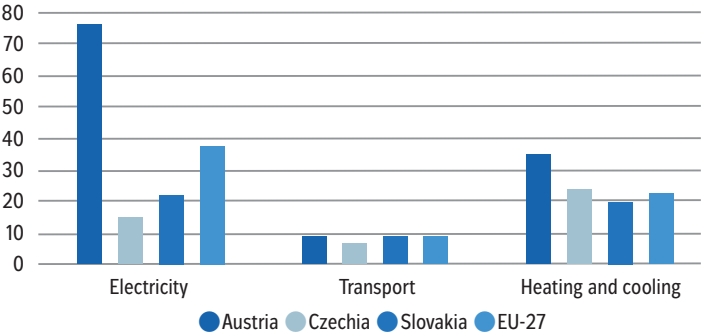
³ “Czechia,” International Renewable Energy Agency, 2023. Available online: https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical_Profiles/Europe/Czechia_Europe_RE_SP.pdf (accessed on October 20, 2023).

⁴ “Slovakia,” International Renewable Energy Agency, 2023. Available online: https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical_Profiles/Europe/Slovakia_Europe_RE_SP.pdf (accessed on October 20, 2023).

⁵ M. Bartek-Lesi, et al., “National Energy and Climate Plans in the Danube Region,” Regional Centre for Energy Policy Research, 2020. Available online: https://energy.danube-region.eu/wpcontent/uploads/sites/6/sites/6/2021/03/NECP_Danube_Region_REKK_2020_final_0215logo.pdf (accessed on October 20, 2023).

renewable energy sources in electricity (RES-E) are the most advanced and first in line with wind and solar.

Figure 3. Share of renewable energy by sector (2021)



Source: Authors based on Eurostat data

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3. Aligning national renewable plans with the European Green Deal



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EU Member States were expected to submit their first National Energy and Climate Plans (NECPs) revisions by June 2023, however most member states announced delays at the time of this writing, including the countries assessed, Austria Czechia and Slovakia. Since preliminary NECPs were submitted in 2019/2020, the EU climate and energy regulatory landscape has changed dramatically, with the introduction of the European Green Deal and the Fit for 55 package. More recently, in May 2023, the renewable energy directive (RED III) set a higher indicative 2030 EU RES target of 42.5%, up from 32%, and a near doubling of the current share in 2023.⁶ This includes a 49% benchmark for buildings, a new binding 42% renewable hydrogen target for industry, and a reinforced 14.5% reduction in greenhouse gas intensity or 29% share of renewables in transport by 2030.⁷ Furthermore, the European Parliament proposed 5% of newly installed RES capacity to be innovative with a further indicative target for storage technologies that can improve demand-side flexibility and deliver 5% reduction in peak

⁶ "REPowerEU at a glance," European Commission, 2023. Available online: https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/repower-eu-affordable-secure-and-sustainable-energy-europe_sk (accessed on October 20, 2023).

⁷ "European Green Deal: EU agrees stronger legislation to accelerate the rollout of renewable energy," European Commission, 2023. Available online: https://cyprus.representation.ec.europa.eu/news/european-green-deal-eu-agrees-stronger-legislation-accelerate-rollout-renewable-energy-2023-03-30_en (accessed on October 20, 2023).

electricity demand by 2030.⁸ The proposal would tighten the sustainability criteria for biomass and require each member state to develop at least two cross-border RES projects by the end of 2025. On top of climate policy, the energy security impetus of REPowerEU aims to end the bloc's dependency on Russian fossil fuels by 2027 in part by relying on a massive scaling and speeding-up of renewable energy.

Table 1. RES values and targets from 2019/2020 NECPs (%)

	2020 targets	2020 values	2030 targets draft NECPs	Commission's recommendation	2030 targets final 2020 NECPs
Austria	34	36.5	45–50	46	46–50
Czechia	13	17.3	20.8	23	22
Slovakia	14	17.3	18	24	19.2
EU total	20	22	30.4–31.9	32	33.1–33.7

Source: Authors based on European Commission data

As shown in Table 1, Austria had a much higher share of RES in gross final energy consumption than Czechia and Slovakia in 2020 — in fact placing among the top five in the EU. This is mostly attributable to the near 80% share of RES-E, still anchored by traditional hydropower, but strong growth in wind energy over the last 15 years and solar over the last 5.⁹

⁸ "Legislative Train Schedule," European Parliament, 2023. Available online: <https://www.europarl.europa.eu/legislative-train/theme-a-european-green-deal/file-european-green-deal> (accessed on October 20, 2023).

⁹ According to presentation during the event "Accelerating Central European RES through dialogue and cooperation" organized in Bratislava on June 9, 2023.

Prior to the drafting of the NECP, in 2018 Austria's government already had announced the #mission2030 climate and energy plan to achieve 100% RES-E by 2030. This initial strategy included a roadmap of concrete benchmarks and well elaborated measures that were integrated into the NECP and implemented into policy. Now Austria is facing the formidable challenge of the 'last mile' or 20% by 2030. The government calculated that this requires 27 TWh of additional renewable energy which will be met by 10 TWh from wind, 11 TWh from solar, 1 TWh from biomass, and 5 TWh from hydropower.¹⁰

In contrast, both Czechia and Slovakia entered the NECP drafting with very little renewable energy other than biomass (and hydro for Slovakia) and little appetite to change that over the coming decade with low targets shown in Table 1. The European Commission was critical of these documents for lacking both ambition and detailed measures and benchmarks for policy.¹¹ More recently, Czechia's Ministry of Environment has signalled the country is capable of and committed to a greener and more sustainable energy future that will be reflected in the new NECP. It is hoping to double the original 2030 RES target to at least 31%, with the potential for an even higher range of 32%–35%.¹² This would rely on significant solar and wind capacity additions as opposed to the previous conservative

¹⁰ "Austrian Recovery & Resilience Plan / 1.Sustainable Construction / Climate neutral transformation—Renewable Expansion Act," International Energy Agency, 2023. Available online: <https://www.iea.org/policies/12401-austrian-recovery-resilience-plan-1sustainable-construction-climate-neutral-transformation-renewable-expansion-act> (accessed on October 20, 2023).

¹¹ "Individual assessments," European Commission, 2020. Available online: https://energy.ec.europa.eu/publications/individual-assessments_en (accessed on October 20, 2023).

¹² J. Krčál, L. Otýpková, F. Bold, K. Kolouchová, "Rozvoj obnovitelné energie v Česku do roku 2030 pro posílení bezpečnosti a plnění klimatických cílů EU," Fakta o klimatu, 2023. Available online: <https://faktaoklimatu.cz/studie/2023-rozvoj-obnovitelne-energie-v-cesku-do-2030> (accessed on October 20, 2023).

target which focused on biomass expansion. The government also recognizes the key precondition for achieving this kind of rapid growth, especially in solar (from 3 GW in 2022 to 20 GW in 2030), is to streamline the administrative process following following RED III and REPowerEU guidance.

Similarly, Slovakia's indicative 2030 RES target (19.2%) will need to be raised in accordance with the new overall binding EU target. The national transmission network operator (SEPS) has elaborated plans for a scenario of high RES-E development until 2030,¹³ with the most ambitious projections for wind and solar installed capacities reaching 1,7 and 2,3 GW respectively.¹⁴ Wind potential appears to be more promising than utility scale solar, and large domestic energy players have signalled intentions to build wind farms in local industrial parks.¹⁵ Given the very low levels of wind and solar capacity and the obligation to raise 2030 targets without abundant biomass, Czechia and Slovakia are expected to see some of the highest growth rates of the two technologies in the EU this decade.

¹³ "SEPS umožní pripojenie ďalších obnoviteľných zdrojov do elektrizačnej sústavy, plán uvoľňovania sa zatiaľ plní na 125 percent," SEPS, 2022. Available online: <https://www.sepsas.sk/tlacove-spravy/seps-umozni-pripojenie-dalsich-obnovitelnych-zdrojov-do-elektrizacnej-sustavy-plan-uvolnovania-sa-zatial-plni-na-125-c4ef98c01f3f89d98d946edc4af1ec6376a31004852810700fe7d48aefd162b4/> (accessed on October 20, 2023).

¹⁴ "SEPS uvoľnila pravidlá pre pripájanie nových lokálnych zdrojov elektriny. Pomôcť by to mohlo viac ako tisíce verejných inštitúcií a malých podnikateľov," SEPS, 2022. Available online: <https://www.sepsas.sk/tlacove-spravy/seps-umozni-pripojenie-dalsich-lobnovitelnych-zdrojov-do-elektrizacnej-sustavy-plan-uvolnovania-sa-zatial-plni-na-125-c4ef98c01f3f89d98d946edc4af1ec6376a31004852810700fe7d48aefd162b4/> (accessed on October 20, 2023).

¹⁵ "Veľký veterný park chystá už aj prvá štátna energofirma. Plynári z SPP naň chcú vynaložiť 63 miliónov eur," Denník N, 2023. Available online: <https://e.dennikn.sk/3264667/velky-veterny-park-chysta-uz-aj-prva-statna-energofirma-plynari-z-spp-nan-chcu-vynalozit-63-milionov-eur/> (accessed on October 20, 2023).

4. Key barriers to the rollout of RES



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Each of the three assessed countries face formidable obstacles and challenges to accelerate RES deployment in a relatively short time frame, many of which are shared to some extent.

- **Permitting delays**

The main bottleneck for the rollout of renewables across all assessed countries, which is EU-wide, is excessive permitting times, typically taking years rather than months. This is mostly attributable to administrative understaffing and lack of digitalization, especially endemic to eastern member states. But even in Austria a complex spatial planning and permitting procedure takes on average 5 years for wind infrastructure which creates uncertainty for project promoters and weakens the case for investment.¹⁶

Over the years RED has been instructing member states to streamline permitting procedures and now REPowerEU is taking another step in that direction, for example mandating that wind permits are issued within two years and allowing renewables to override public interest in certain cases. The European Parliament has also proposed a tightened 9-month permitting window for designated 'renewables acceleration areas.' Austria, Czechia and Slovakia are including the new REPowerEU chapter

¹⁶ "2023 Country Report - Austria," European Commission, 2023. Available online: https://economy-finance.ec.europa.eu/publications/2023-country-report-austria_en (accessed on October 20, 2023).

within their Recovery and Resilience Plans in order to address this issue.¹⁷

• Shortage of skilled labour

Another overarching barrier shared by these three countries, and indeed an EU-wide challenge, is the shortage of adequate clean tech labour force, particularly for installing and connecting renewable energy. The reskilling and upskilling of the labour force requires better strategic coordination between the government, universities and energy utilities and companies. The EU Just Transition Mechanism is designed to support this type of labour transformation in carbon intensive industries and should be used as a model.

• RES grid integration

In order to capitalize on cheap wind and solar energy, massive and coordinated grid infrastructure investments are needed at the transmission and distribution level in Austria, Czechia and Slovakia, and across the EU. The higher the share of variable renewables, the more flexibility services will be required from a range of energy storage, interconnectivity and demand side response. The European Commission estimates EUR 584 billion of investments will be needed in the European electricity grid by 2030, of which EUR 170 billion would go to digitalization, i.e. smart meters, automated grid management, and digital technologies for metering.¹⁸

¹⁷ "NextGenerationEU: European Commission endorses Slovakia's €6.4 billion modified recovery and resilient plan, including a REPowerEU chapter," European Commission, 2023. Available online: https://ec.europa.eu/commission/presscorner/detail/en/ip_23_3443 (accessed on October 20, 2023).

¹⁸ "Smart Grids," International Energy Agency, 2023. Available online: <https://www.iea.org/energy-system/electricity/smart-grids> (accessed on October 20, 2023).

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The Austrian government estimates total network investment of EUR 18 billion to make the grid fit for 100% RES-E by 2030. This is based its new Integrated Network Infrastructure Plan, published in July 2023 and led by the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology, which follows extensive government led consultations with key stakeholders, and provides a good model for Czechia and Slovakia.¹⁹ Curtailment is already a problem for Czechia and could be in Slovakia because both grid systems were designed for uni-directional baseload power plants and passive consumers rather than variable renewables and active prosumers.²⁰

• Governance and public acceptance

The politics of governance and public acceptance remain significant barriers to RES deployment throughout the EU and for each assessed country. As mentioned earlier in the report, Czechia and Slovakia have lacked political ambition and failed to articulate and implement any kind of roadmap for RES. This can be traced to a similar governance issue in both countries. Slovakia's climate and energy policy competencies are split between the Ministry of Economy, responsible for the NECP structure, and the Ministry of Environment, which advocates for more ambitious targets. These Ministries have different priorities and outlooks and do not cooperate effectively. Similarly in Czechia, the Ministry of Industry and Trade has traditionally been more influential and conservative than the Ministry of Environment. On the other hand, Austria

¹⁹ "Integrated Austrian Network Infrastructure Plan," Federal Ministry of Climate Action, Environment, Energy, Mobility, Innovation and Technology, 2023. Available online: <https://www.bmk.gv.at/themen/energie/energieversorgung/netzinfrastrukturplan.html> (accessed on October 20, 2023).

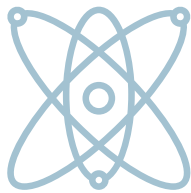
²⁰ A. Zachová, "Czechia unplugs hundreds of solar plants due to sunny weather," Euractiv, 2023. Available online: <https://www.euractiv.com/section/politics/news/czechia-unplugs-hundreds-of-solar-plants-due-to-warm-weather/> (accessed on October 20, 2023).

consolidates everything related to climate and energy strategy into one responsible ministry, the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation, and Technology. However, Austria has its own governance challenge in the form of power struggles between federal and regional authorities. Finally, Austria, Czechia and Slovakia were criticized for lack of full and transparent public consultations in the NECP revision process which is obliged under the Aarhus Convention.²¹

Public acceptance of land use/site location for renewables, especially wind farms, continues to slow progress in each assessed country. For Czechia and Slovakia, local resistance to land use continues to delay early growth, while in Austria the most optimal sites have been developed leaving limited choices for the substantial remaining contribution needed. This also extends to the bigger picture of energy market design and price structure, particularly the socialization of network costs. Both will need to be addressed going forward to ensure the most cost-efficient projects are developed first and the system wide costs are distributed fairly between regulated network operators and consumers.

²¹ A. Gumbau, "EU braces for 'crucial' revision of 27 national energy and climate plans," Energy Monitor, 2023. Available online: https://www.energymonitor.ai/policy/eu-braces-for-crucial-revision-of-27-national-energy-and-climate-plans/?utm_source=cbnewsletter&utm_medium=email&utm_term=2023-07-02&utm_campaign=Daily+Briefing+29+06+2023 (accessed on October 20, 2023).

5. Profiling national energy and climate policy cooperation



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Austria, Czechia and Slovakia established the so-called Slavkov format (Austerlitz; S3) in 2015, ostensibly to strengthen transport and energy infrastructure between the three countries.²² However to date, topics like migration or the Covid-19 pandemic have been featured rather than these sectors or anything related to climate policy. This unwillingness to cooperate on energy issues largely comes down to the fundamental philosophical disagreement over the role of nuclear energy, alluded to earlier in the report. However, this has begun to change following Russia's invasion of Ukraine. First, a meeting was convened in March 2023 to discuss energy security cooperation and alternative sources of natural gas supply.²³ Then in July 2023 in Skopje, respective Ministries of Foreign Affairs signed a new Slavkov Declaration, creating a platform for regional cooperation to help stimulate new projects in areas of common interest, as well as the exchange of information and coordination of positions, especially with regard to the current EU agenda, to strengthen mutual ties in several areas, including energy transition and energy security.²⁴ This is a clear indication that the

²² J. Groszkowski, "Slavkov Declaration in Europe," Centre for Eastern Studies, 2015 Available online: <https://www.osw.waw.pl/en/publikacje/analyses/2015-02-04/slavkov-declaration-a-new-format-regional-cooperation> (accessed on October 20, 2023).

²³ "Kollar: Austerlitz Format Countries Close in Stances Concerning Ukraine", TASR, 2023. Available online: <https://www.tasr.sk/tasr-clanok/TASR:2023031300000144> (accessed on October 20, 2023).

²⁴ "Slavkovská spolupráca," The Ministry of Foreign and European Affairs of the Slovak Republic, 2023. Available online: <https://www.mzv.sk/diplomacia/regionalna-spolupraca/slavkovska-spolupraca> (accessed on October 20, 2023).

countries recognize that climate and energy cooperation needs to be part of the agenda going forward.

Similarly, the more well known Visegrad Group format (V4), in which Czechia and Slovakia are joined by Hungary and Poland, has not traditionally been a platform for energy or climate policy dialogue. While energy security has climbed the V4 agenda in response to the energy crisis, internal divisions appear to be hardening and precluding any serious cooperation. A V2+2 dynamic has emerged at the Council level, with Czechia and Slovakia aligned against growing anti-democratic tendencies in Hungary and Poland. Since the Russian invasion of Ukraine, Hungary's obstructionist position towards EU aid for Ukraine and continued coziness with the Putin regime — Minister of Foreign Affairs Péter Szijjártó visited Moscow in July and in October 2022 — further soured relations.

On a bilateral level, climate and energy discussions have made headlines but there has been little in the way of tangible agreements. Slovakia and Austria had numerous discussions on renewable energy at the presidential level given the shared interest in green and environmental topics. In August 2019, Slovakia's new president Zuzana Čaputová made her inaugural visit to Austria, where she and Alexander van Der Bellen held discussions on ecology and climate change.²⁵ In September 2020, President Čaputová accepted Austria's invitation to the Austrian World Summit, where climate matters were discussed.²⁶ In January 2023 after his re-election, Alexander Van der Bellen's returned the favour making his first state visit to

²⁵ "V totalite bolo pre nás Rakúsko pohľadom na slobodný svet," TASR, 2019. Available online: <https://www.teraz.sk/slovensko/caputova-s-rakuskom-nas-spaja/415672-clanok.html> (accessed on October 20, 2023).

²⁶ "Prezidentka chce Slovensko vidieť na špici EÚ vo výrobe ekologickej energie," Zväz výrobcov elektrickej energie v malých vodných elektrárnach, 2020. Available online: <https://zvazmve.sk/2020/09/17/prezidentka-chce-slovensko-vidiet-na-spici-eu-vo-vyrobe-ekologickej-energie/> (accessed on October 20, 2023).

Slovakia. The meeting primarily focused on climate change, energy diversification, and wind energy, with President Zuzana Čaputová expressing belief in the potential for closer cooperation in the areas of electricity production and green technologies between the two countries.²⁷

With the former Czech president Miloš Zeman openly critical of the European Green Deal there were no such meetings at the presidential level between Czechia and Slovakia. Furthermore, at the Prime Minister's level, energy related engagements have been limited to nuclear and energy security in recent years.

Another way to evaluate energy cooperation between these countries is through Projects of Common Interest (PCIs), which are cross-border projects supported by the EU in an effort to achieve a fully integrated common EU energy market.²⁸ However as shown in Table 2, only four projects have been implemented between the three countries, three of which are related to fossil fuels. Contextual research has shown that the countries were not united on energy projects, and the national approach to infrastructure development often prevailed.²⁹

²⁷ "Zuzana Čaputová hovorila s prezidentom Rakúska o zelených technológiach, ale aj ochrane hraníc," *Trend*, 2023. Available online: <https://www.trend.sk/spravy/caputova-hovorila-prezidentom-rakuska-zele-nych-technologiach-ale-aj-ochrane-hranic> (accessed on October 20, 2023).

²⁸ "A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy," The Official Journal of the European Union, 2015. Available online: https://eur-lex.europa.eu/resource.html?uri=cellar:1bd46c90-bdd4-11e4-bbe1-01aa75ed71a1.0001.03/DOC_1&format=PDF (accessed on October 20, 2023).

²⁹ V. Oravcová, M. Mišík, "EU funds and limited cooperation: energy infrastructure development in the Visegrad Group," *International issues & Slovak foreign policy affairs*, 2018. Vol. 27, no. 3-4, pp. 11-26. Bratislava: Research Centre of the Slovak Foreign Policy Association.

Table 2. Projects of Common Interest (PCIs) between Austria, Czechia and Slovakia

2013	2015	2017	2019	2021	Area	Country	Project
X	X	X			Natural gas	AT-CZ	PCI Bidirectional Austrian–Czech interconnection (BACI) between Baumgarten–Reinthal–Breclav
X					Natural gas	AT-CZ	PCI Connection to Oberkappel from the southern branch of the Czech transmission system
X	X	X	X		Oil	AT-SK	PCI Bratislava–Schwechat–Pipeline: pipeline linking Schwechat and Bratislava
		X	X	X	Electricity	CZ-SK	ACON (Again COnnected Networks) aims to foster the integration of the Czech and the Slovak electricity markets

Source: Authors based on European Commission data

The priority corridor “Oil Supply Connections in Central Eastern Europe” was used to connect the only two refineries in Austria and Slovakia—located in Bratislava and Schwechat (near Vienna), however, the contracting parties did not reach final agreement on the routing, in spite of strong political support on both sides,³⁰ mostly owing to environmental opposition and disagreement over the routes, and it is unlikely to be completed.

There were also disagreements between the countries over the the BACI (Bidirectional Austrian–Czech interconnection) project within priority corridor “North–South gas interconnections in Central Eastern and South Eastern Europe”. This came about because Austria and Czechia did not have gas direct gas connection, but Slovakia’s national

³⁰ “Pre ropovod Bratislava – Schwechat sa trasa ešte nenašla,” Pravda, 2018. Available online: <https://ekonomika.pravda.sk/ludia/clanok/480355-pre-ropovod-bratislava-schwechat-sa-trasa-este-nenasla/> (accessed on October 20, 2023).

operator, eustream, was concerned that BACI would undermine its role as a transit country for Russian gas from Nord Stream (1 and 2).³¹ The project was also opposed by the Czech Energy Regulatory Office on the basis that NET4GAS (Czech TSO) did not provide sufficient evidence of how it would benefit Czech energy security.³² Although the project was withdrawn from the PCIs list in 2019, the Czech Regulatory Office changed its opinion and permitted the construction after criticism from Czech and Austrian governments and a lawsuit initiated by NET4GAS.³³

While fossil fuel cross-border cooperation has not been successful, there have been some positive examples to build on with renewables. The Czechia–Slovakia distribution level ACON project (Again Connected Networks) within “Smart Grids Deployment” priority area aims to integrate electricity markets using smart technologies to optimize networks, the deployment of renewable sources, and access to digital infrastructure for more active consumers.³⁴

³¹ “Eustream: Snaha o diverzifikáciu zdrojov plynu v Európe je iluzórna,” Energia, 2017. Available online: <http://energia.sk/dolezite/zemny-plyn-a-ropa/eustream-snaha-o-diverzifikaciu-zdrojov-plynu-v-europe-je-iluzorna/23198/> (accessed on October 20, 2023).

³² “Stát zařizl sporný plynovod do Rakouska,” E15.cz, 2018. Available online: <https://www.e15.cz/byznys/prumysl-a-energetika/stat-zarizl-sporny-plynovod-do-rakouska-1343373> (accessed on October 20, 2023).

³³ “Česko-rakouský plynovod má po letech odkladů a obstrukcí kladné vyjádření regulátora,” Ekonomický deník, 2021. Available online: <https://ekonomickydenik.cz/cesko-rakousky-plynovod-ma-po-letech-odkladu-a-obstrukci-kladne-vyjadreni-regulatora/> (accessed on October 20, 2023).

³⁴ “ACON: Project of common interest,” ACON, 2023. Available online: <https://www.acon-smartgrids.cz/#GeneralInformation> (accessed on October 20, 2023).

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6. Profiling local and regional energy and climate policy cooperation



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Regional level cross-border cooperation between the three countries has tremendous potential for further development in support of renewable energy. European Cross-Border cooperation, (Interreg A) supports cooperation between regions from at least two different Member States lying directly on the borders or adjacent to them aiming to tackle common challenges, exploiting the growth potential in border areas, while enhancing the cooperation process for the purposes of the overall harmonious development of the Union.³⁵ When it comes to the organization of cross-border cooperation in European countries, it is based on the principles of partnership, subsidiarity and complementarity. The essence of the partnership is that different economic agents, focusing their actions on official strategies and programs, achieve common goals together in close cooperation. The territorial location and proximity of the administrative units to the countries of the above-mentioned program and the existence of memorandums and agreements on cooperation between local state authorities create the best conditions for cooperation between partners and project implementation.

This section provides an overview of this type of regional cooperation between Austria, Czechia and Slovakia within the three cross-border programmes. First, the

³⁵ "Interreg A—Cross-border cooperation," European Commission, 2023. Available online: https://ec.europa.eu/regional_policy/policy/cooperation/european-territorial/cross-border_en (accessed on October 20, 2023).

methodology is presented, followed by the analysis of projects within the stated climate and energy framework.

6.1. Methodology

Past research on regional project cooperation suggested that Slovakia made limited use of Transnational Cooperation³⁶ (Interreg B) and almost no use of EU Horizon programmes or Interregional Cooperation (Interreg C) by local and regional actors. Regional cooperation is mainly based on cross-border programmes under INTERREG A. Although such a methodological choice could be limiting, since it does not encompass all regions from the three countries shown in Table 3, it still provides a basis for future cooperation and development in renewable energy and a starting point for recommendations.

Table 3. Eligible regions for cross-border cooperation

AT-CZ	AT-SK	CZ-SK
Lower Austria (NUTS 2)	Lower Austria (NUTS 2)	Moravian-Silesian Region (NUTS 3)
Upper Austria (NUTS 2)	Burgenland (NUTS 2)	South Moravian Region (NUTS 3)
South Bohemian Region (NUTS 3)	Vienna (NUTS 2)	Zlín Region (NUTS 3)
South Moravian Region (NUTS 3)	Bratislava Region (NUTS 3)	Trenčín Region (NUTS 3)
Vysočina Region (NUTS 3)	Trnava Region (NUTS 3)	Trnava Region (NUTS 3)
		Žilina Region (NUTS 3)

Source: Authors based on Interreg programmes data

³⁶ "Zlepšenie európskej spolupráce VÚC za účelom zefektívnenia územnej samosprávy," Research Centre of the Slovak Foreign Policy Association, 2021. Available online: <https://www.sfpa.sk/sk/project/zlepsenie-europskej-spoluprace-vuc-za-ucelom-zefektivnenia-uzemnej-samospravy/> (accessed on October 20, 2023).

The current (2014–2020) Interreg programming period closing at the end of 2023 was used as the basis for evaluation and recommendations for the upcoming (2021–2027) Interreg programming period. All projects carried out within this framework were divided among the selected priority axes of cross-border cooperation shown in Table 4.

Table 4. Priority axes of cross-border cooperation in 2014–2020

	AT-CZ	AT-SK	CZ-SK
Priority axis 1	Strengthening research, technology development and innovation	Contribution to building a knowledge-based cross-border region	Utilization of innovation potential
Priority axis 2	Environment and resources	Support of natural and cultural heritage and biodiversity	Quality environment
Priority axis 3	Development of human resources	Support of sustainable solutions in transport	Development of local initiatives
Priority axis 4	Sustainable networks and institutional cooperation	Strengthening cross-border institutional cooperation	Technical assistance
Priority axis 5		Technical assistance	

Source: Authors based on national information on cross-border cooperation

The national websites of relevant ministries overseeing the distribution of EU funds were used to collect project information. In Slovakia this is the Ministry of Investments, Regional Development and Informatization (MIR-RI), and in Czechia the Ministry of Regional Development. The final dataset consists of 284 projects which have been organized according to the date of execution, number and type of project partners, and area of focus. Out of the 284 projects, 113 were found to have climate and energy relevance.

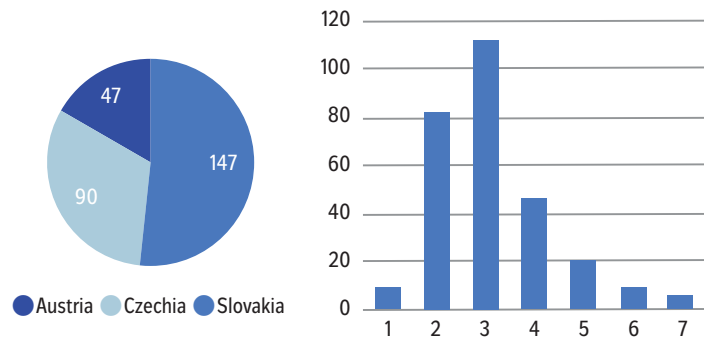
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6.2. Project analysis

As shown in Figure 4, the majority of the 284 projects were Czech–Slovak (147), followed by Austria–Czechia (90) and Austria–Slovak (47). The strong cooperation between Czechia and Slovakia could be explained by close historical and language ties. Figure 5 illustrates that most of the 284 project were three years or less in length.

Figure 4. Number of projects by cooperation

Figure 5. Total duration of the projects with neighbouring countries



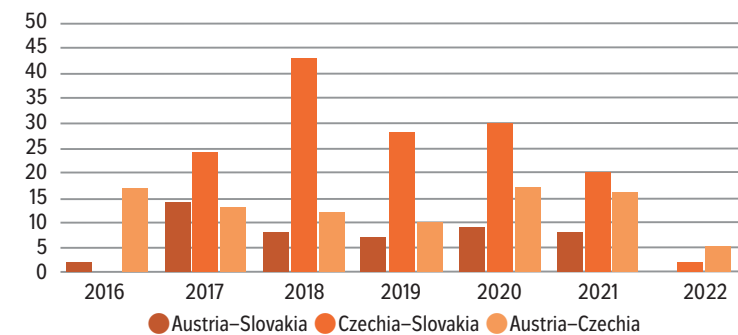
Source: Authors

Figure 6 shows the volume of projects by year, depicting a declining trend since 2018. The most projects occurred in 2018 (63) and 2020 (56), compared to the lowest in 2016 (18) and in 2022 (7).

Figure 7 shows the share of the projects according to the core topic it is associated with. Most (56 projects) are in the category of Education, dedicated not only to children, students and youth, but also employees, delivering mainly educational activities and exchange programmes. This is followed by Climate, Nature and Environment (46 projects) mostly dedicated to nature protection (biodiversity, forest management), but also water management and climate change adaptation. The Public Policy and Administration category (24 projects) includes those related to

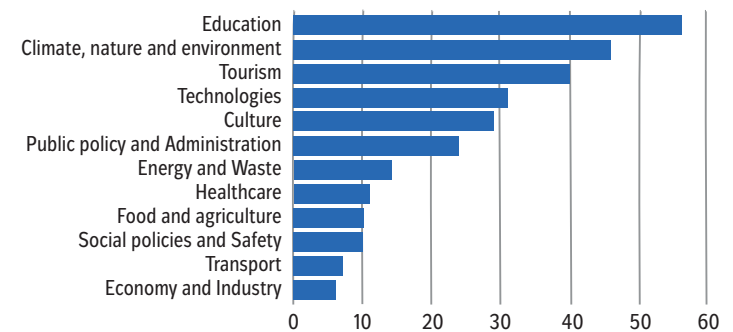
deepening cross-border cooperation, regional planning and institutional improvements of local administration. The Energy and Waste category (14 projects) focused on recycling, circular economy and biowaste use. The Transport and Economy and Industry categories had the fewest projects, with 7 and 6, respectively. For the latter category, several areas are included Education and Technologies (entrepreneurial potential, business training, knowledge transfer and information sharing, although).

Figure 6. Number of projects by year



Source: Authors

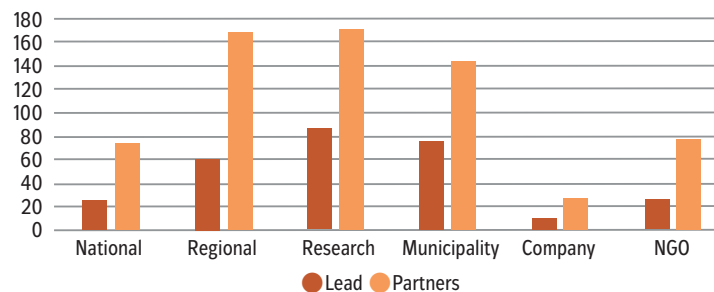
Figure 7. Cross-border projects by topic



Source: Authors

It is also important to know more about the project promoters and actors to provide the best recommendations. While most projects (138) were carried out between two project partners, there were 5 projects with a consortium of 10 or more project partners. Altogether, 941 project partners participated in the projects, including those that participated more than once. Project partners were mostly comprised of regional authorities and universities or research institutions, as shown in Figure 8. Regional authorities include schools and hospitals, non-governmental organisations include churches and charities and companies include chambers of commerce.

Figure 8. Cross-border projects by type of project partners



Source: Authors

Climate and energy topics

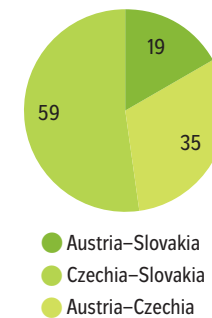
Altogether 113, or more than one third of the total projects, contain some climate and energy related element, shown in Figure 9. The majority of the projects were again between Czechia–Slovakia, followed by Austria–Czechia, and the fewest between Austria–Slovakia. Again, the majority of projects were three years or less, shown in Figure 10.

As shown in Figure 11, most of these projects are affiliated with Climate, Nature and Environment (45), dealing mainly with nature and forest protection and biodiversity, which

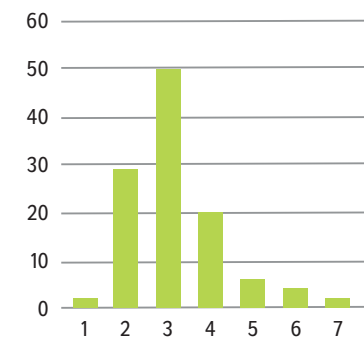
are crucial parts of climate change adaptation, and therefore included in this part of the analysis. However, when focused exclusively on adaptation measures and green infrastructure development, only four projects within Austria–Czechia framework were identified (“Adaptation to climate change using green infrastructure”; “Crossborder Habitat Network and Management – Connecting Nature AT–CZ”; “Crossborder Network for Climate Adaptation AT–CZ and Evaluation of green spaces”) involving all kinds of partners, especially regions (NUTS 2 and 3 level) and regional institutions.

Figure 9. Number of bilateral green projects

Figure 10. Total project duration



Source: Authors

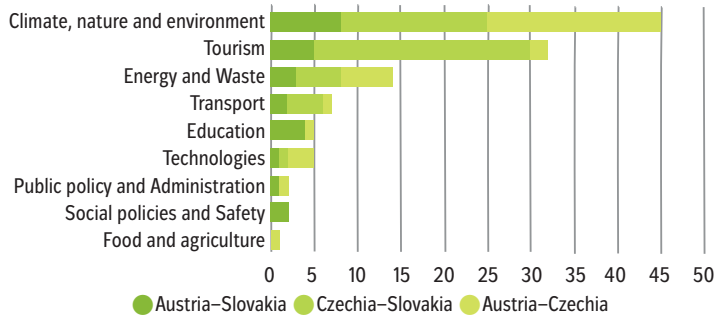


The next biggest climate related category is Tourism (32 projects) connected to development of cycling infrastructure to the historical monuments. While these projects are primarily motivated by tourism, they contribute to sustainable transport, which is one of the most important areas for climate change. These projects motivate people to use more sustainable means of transport and provide a good basis for future cooperation (most of the projects were carried between two municipalities within Czech–Slovak cooperation).

The third is Energy and Waste (14 projects), mostly carried out by the universities and research institutions with few municipalities and regions were involved. The research focused primarily on innovative materials in recycling, material use and circular economy development. This included seven projects focused on clean mobility and smart transport systems, including project “Innovative monitoring and analysis of traffic on the cross-border road network”.

Education and Technologies contained five projects related to the energy sector. Within the Czech–Slovak framework, this included, “Preparing students for practice in the field of sustainable buildings,” targeting high-school students, and “Innovation of educational programs in the field of energy” targeting universities. Under the Technologies category, energy related projects were focused on innovations in biomass processing carried out by universities and research institutes. The “Digital Village” project focused on smart technologies for more efficient use of resources. The last three categories (Public Policy and Administration, Social Policies and Safety and Food and Agriculture) focused on cooperation within strategic green planning, managing wildfires due to climate change, and sustainable agriculture.

Figure 11. Cross-border green projects by topic



Source: Authors

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Czechia was the project leader for most climate and energy related projects, as shown in Table 5. These were primarily municipalities, universities and research institutions. Most projects with municipal consortium leaders were Slovak, mainly focused on the development of cycling paths. Austria universities and research institutions or regional institutions were able to lead large project consortiums.

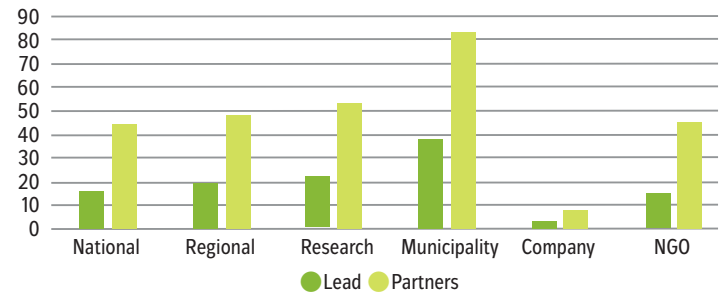
Table 5. Lead green project partners

	Austria-Slovakia	Austria-Czechia	Czechia-Slovakia	All
Austria	14	16	N/A	30
Czechia	N/A	19	27	46
Slovakia	5	N/A	32	37

Source: Authors

As shown in Figure 12, altogether 394 project partners participated in green projects (including those that participated more than once). Contrary to the overall picture of cross-border cooperation, municipalities and regions were very active in cooperation for the development of cycling paths for tourism.

Figure 12. Cross-border green projects by type of project partners



Source: Authors

7. Conclusions and recommendations



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Although Member States have the right to determine their own energy mix as stipulated by the Lisbon treaty, this must comply with EU energy and climate goals elaborated under the European Green Deal. Member States therefore set their own national decarbonisation pathways based on national conditions, including energy mix, infrastructure, geography, and political and social acceptance. Nonetheless, decarbonisation poses several common challenges that are best resolved through cross-border dialogue and cooperation.

While climate and energy cooperation between Austria, Czechia and Slovakia has been at times overshadowed by fundamentally opposing political views on nuclear energy, there has been encouraging high-level dialogue between Presidents of Austria and Slovakia calling for cooperation in the deployment of renewable energy and energy efficiency measures.

At the local project level, there remains untapped potential for climate and energy projects. Although several include energy and climate topics elements, few were dedicated to developing clean energy solutions, and instead were mostly focused on nature protection or development of sustainable tourism. However, there are several examples of successful projects in these areas that, and these established networks should be further developed for these projects in the upcoming programming period (2021–2027).

Recommendations for national cooperation

- Deployment of renewable energy could be a new vector for cross-border cooperation between the three countries. This should be less political and more at the technical/institutional level for systematic knowledge sharing, regulatory harmonization and best practices. This includes overcoming common barriers like long permitting times and training of skilled workers, and harmonizing national policy, legal and financial frameworks for all aspects of RES cross-border projects including planning and permitting, grid connection schemes, financing conditions, and project planning risks and site restrictions.
- There should be more clean tech research, innovation, and deployment collaboration within EU framework, such as Horizon Europe. For example, all three countries have Important Projects of Common European Interest (IPCEIs) in batteries and/or hydrogen that can be the basis for future cooperation among universities and research institutions and companies.

Recommendations for regional cooperation

- The new Interreg programming period calls for greater engagement between regions for climate and energy purposes, especially within the programme's priority areas of Smarter Europe, Greener Europe and More Connected Europe. This should allow for the further development of past successful projects, building upon the existing networks from past cooperation.
- Beyond the INTERREG A program, INTERREG B and INTERREG C programs, as well as the sector-oriented EU Horizon programs represent untapped opportunities that Central European regions could use more for

sustainable regional development. This would allow for more cooperation with Austrian regions that are more developed.

- The climate and energy cooperation between the regions has been ad-hoc and is not the result of any holistic strategic planning. Long-term regional cooperation for clean energy and climate change adaptation and mitigation could be more systematic and included in policy planning for cross-border regions. However, it is important not only to set the strategy for sustainable regional development, but also to provide the tools for cooperation between foreign partners to share knowledge, best practices and focus on innovation. Slovak regions can follow the example of Austrian and Czech local and regional agencies actively engaging in project such as the Energy Agency of Vysočina – Energetická agentura Vysočiny.

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About SFPA

Slovak Foreign Policy Association (SFPA), founded in August 1993, is an independent, non-partisan and non-profit organization whose activities are devoted to active contribution to the integration of the Slovak Republic to the community of democratic states and their political and security structures. It is the oldest foreign policy think-tank in Slovakia. Through its programs of meetings, seminars, workshops and publications, the SFPA spreads objective information about international relations from primary sources. Its research center (RC) was established in 1995. In accordance with its status, the RC SFPA provides:

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- publishes periodical and non-periodical expert publications serving to increase awareness in the field of international relations and foreign policy and to serve as a source of qualified information for both, the expert and general public;
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- contributes to the fostering of the expert discourse on international relations and foreign policy;
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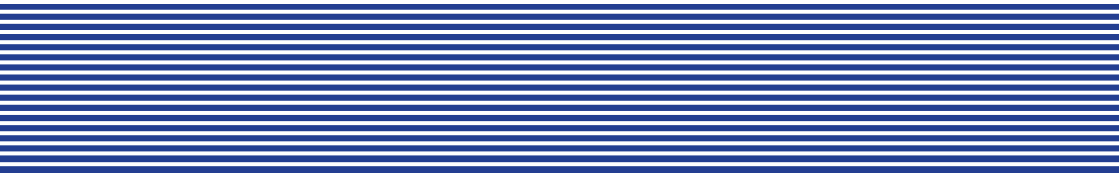
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