The Nature Conservancy

ECO-TEAM
ENVIRONMENTAL PROTECTION

Montenegro's Energy Transition:

The case for renewable energy in Nikšić

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Acknowledgments

We are deeply grateful to many who made this project possible. Our thanks go to Joe Kiesecker, Kei Sochi, Jim Oakleaf and Ash Bhattacharjee of The Nature Conservancy, our dedicated team members Kasandra Zorica Dropuljić, Tijana Simonović, Diana Milev Čavor, Rosa Nedić, the numerous stakeholders and experts who contributed their experience and expertise during the implementation of this project, and the Municipality of Nikšić for their support.

Introduction

We are facing a multitude of challenges: as the consequences of climate change are increasingly felt throughout the world, the pressure is mounting for countries to drastically reduce their greenhouse gas emissions, therefore limiting global warming to 1.5°C over pre-industrial values. In parallel with this, another crisis is unfolding in our biodiversity: we are losing species and habitats at an alarming rate, which is compounded by, and feeds into, climate change.

Fortunately, with the cost of installing solar and wind power decreasing every year, the tools that are needed to tackle this challenge are already here. The European Union's REPowerEU plan seeks to embrace these tools, by facilitating and accelerating renewable energy (RE) permitting. Furthermore, under the REPowerEU plan, member states are expected to designate so-called Renewables Acceleration Areas (RAAs): spaces specifically designated for easier deployment of renewable energy with reduced EIA requirements and shorter permitting times.

Private archive

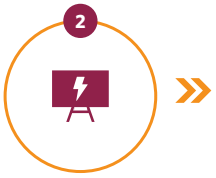
Montenegro's exceptional biodiversity was officially recognized in 1991 in a government declaration proclaiming Montenegro an ecological state. With the country's EU accession ambitions and its membership in the Energy Community, it has also set lofty goals on increasing the share of RE to 50% of its gross energy consumption[1] by 2030 and as part of its membership in the Powering Past Coal Alliance (PPCA)[2], it is expected to phase out the use of coal in the future. Realizing these plans will require the decommissioning of the Pljevlja coal power plant, which currently supplies roughly half of the country's energy needs, and its replacement with a diverse set of renewable energy installations, as well as an ambitious upgrade of the transmission grid, including an expansion of electrical interconnections to many of its neighboring countries, to facilitate balancing of the system and enable the uptake of renewable electricity into the grid.

1 https://www.energy-community.org/implementation/package/CEP.html
2 https://beyondfossilfuels.org/europes-coal-exit/

Our approach

Considering both the large space requirements of RE projects and the massive buildout needed to achieve the necessary global carbon emission reductions, care needs to be taken not to deepen the biodiversity crisis while attempting to solve the climate crisis, It also vital that these projects are accepted by communities and perceived as fair and just. This means that early stages of RE planning need to consider development potential as well as potential conflicts. For this purpose, The Nature Conservancy developed and promotes its smart siting approach, which involves four steps[3] to find the optimal places for wind and solar development, with the lowest potential impact on nature and people:

1. Mapping biophysical and legal constraints, i.e. excluding from further analysis the places where RE projects could not be developed.



2. Assessing the development potential, which includes the availability of solar and wind resources, the proximity to key infrastructure as well as consumption centers.

3. Assessing the conflict potential, including any potential threats to natural, cultural or social values, such as key biodiversity areas or cultural monuments.

4. Bringing it all together, i.e. overlaying the data from steps 1-3 to find the optimal locations for both wind and solar power development.

The input from local experts and stakeholders is crucial during this process. For this study, a stakeholder consultation was conducted involving 43 people from different constituencies, including local communities and independent experts, as well as municipal and national governmental institutions. The results were used to ensure that the final product is relevant and fit for its purpose.

Since the municipality of Niksic is the largest municipality in Montenegro by area, with stunning natural areas as well as a great potential for RE development, it turned out to be a perfect proving ground for our approach and a great place to establish the feasibility of scaling out and doing a nation-wide analysis.

3 https://www.nature.org/content/dam/tnc/nature/en/documents/Europe_Energy_Practitioners_Guide.pdf

Our findings

The results for Nikšić are promising: even when considering only the places with the lowest conflict potential with a medium or high development potential, their total area is roughly 4 km2 for wind power and 50 km2 for solar power, which translates to an estimated potential capacity of about 40 MW of wind and an impressive 2.7 GW of solar.

If only one third (or around 16 km2) of these low-conflict, high-potential solar areas were developed in Nikšić, the combined production could be around 1300 GWh. For wind power, because of the technology's inherently higher impacts, the result is somewhat lower but still considerable with a conservative estimate of over 100 GWh per year if all the optimal locations were developed.

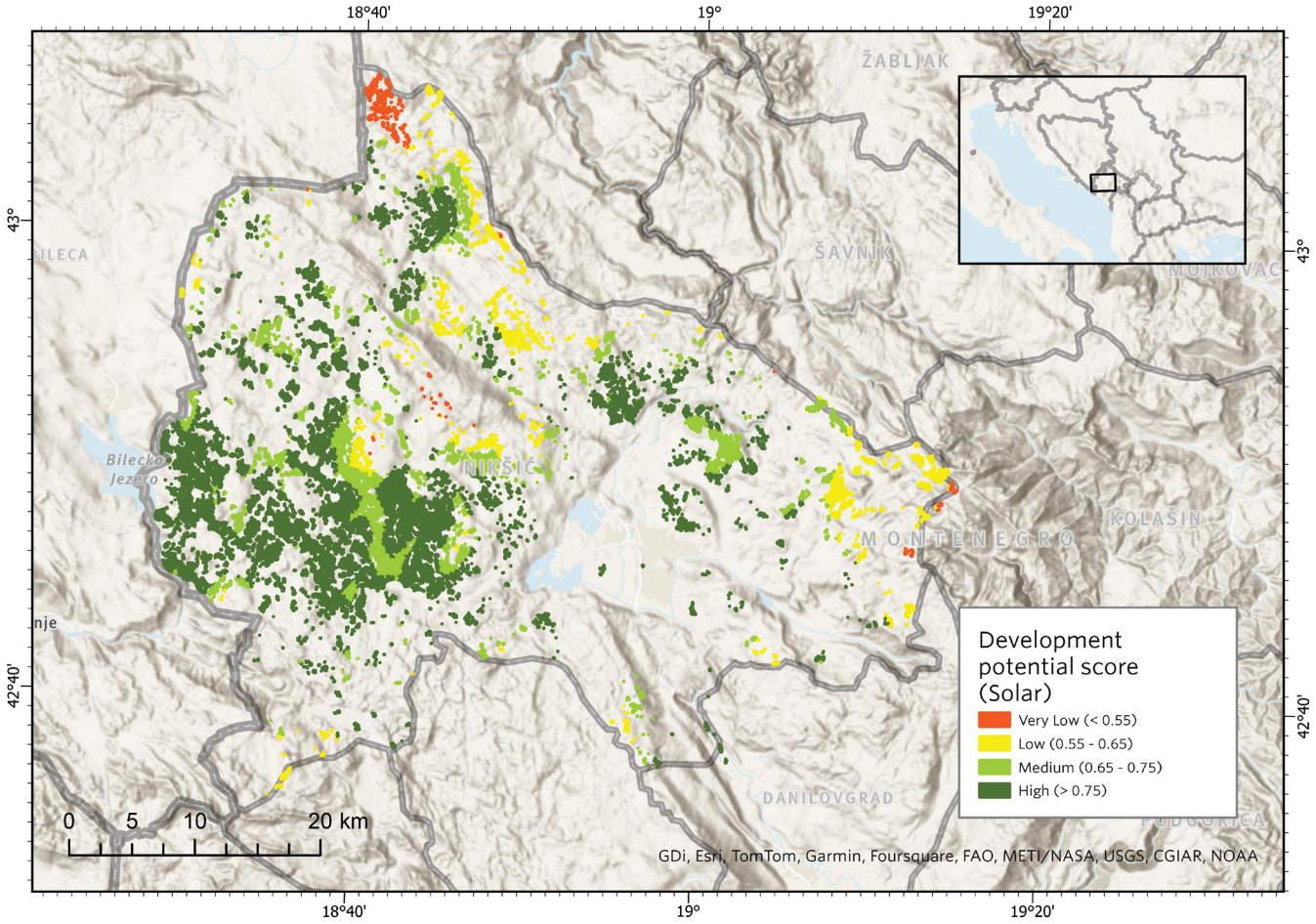


Figure 1: Low-conflict locations for solar power, colour indicates the development potential score

Combined, these two sources could produce around 1400 GWh of electricity – nearly the value of the record production in Pljevlja coal power plant recorded in 2020, which was itself around half the total electricity produced in Montenegro in that year. To put these figures further into perspective: this would cover the total consumption of the residential sector in 2022 (1375 GWh), which includes 380 000 users, including over 200 000 households.

All of this could be powered from the candidate wind power locations and from only a third of the candidate solar power locations in Nikšić municipality alone.

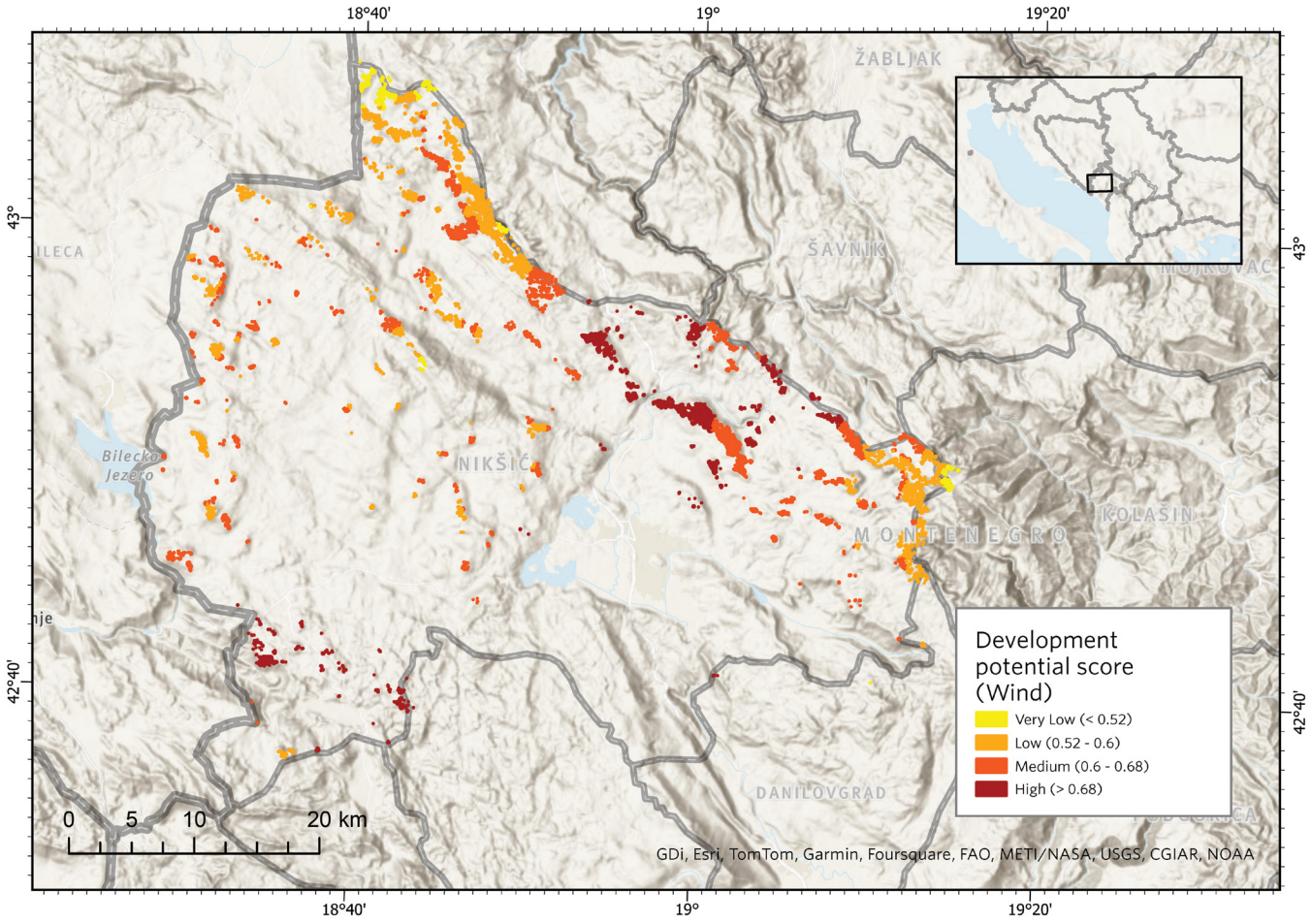
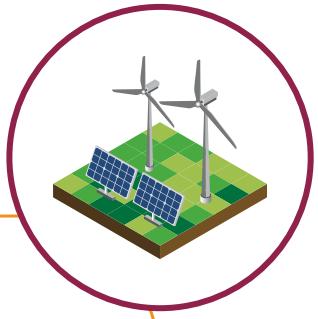


Figure 2: Low-conflict locations for wind power, colour indicates the development potential score

1/3 OF THE **OPTIMAL SOLAR LOCATIONS + OPTIMAL WIND LOCATIONS** CAN SUPPLY THE TOTAL RESIDENTIAL SECTOR WITH ELECTRICITY, WHICH INCLUDES **200 000 HOUSEHOLDS**



1/3 OF THE **OPTIMAL SOLAR LOCATIONS + OPTIMAL WIND LOCATIONS** COULD REPLACE THE ENTIRE **PRODUCTION** FROM **TE PLJEVLJA**

Next steps

The results of the pilot study are unambiguous: firstly, Nikšić has real potential for the development of low conflict renewables. The product of this study can be readily used for scoping new locations both for prospective developers and the spatial planning community, which is why it is being made openly available for any interested parties to use.

Secondly, given the abundant natural resources in Montenegro, a smart siting approach like the one used in this pilot is key to avoid undue impacts on nature and people.

Finally, this project proves that this approach is feasible, necessary, and timely in Montenegro at the national level. The next step is therefore to apply the lessons learned in this pilot to cover the entire territory of Montenegro and help realize its full potential as a green energy powerhouse in the Balkans.

Recommendations

The Nikšić municipality project, developed with local government collaboration, will have immediate implications for local planning and policy. While it addresses local needs, it's also a template for national rollout across Montenegro, requiring political endorsement and strategic alignment. This approach aims to transform it into a practical, policy-shaping document. In light of this, we present the following recommendations:

Local government:
We advise the local government in Nikšić to incorporate maps identifying areas with high potential and low conflict areas for solar and wind energy into the Draft Amendments to the Spatial and Urban Plan of the Municipality of Nikšić or any future versions of the Spatial and Urban Plan, e.g. following the adoption of Montenegro's National Spatial Plan up to 2040. We believe integrating these maps from the earliest project stages will minimise future conflicts for solar and wind projects. Additionally, we suggest using the environmental, social and cultural sensitivity mapping layers as a supplementary tool for the Municipal Departments to evaluate the micro-locations for future solar and wind facilities.

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National government:
We recommend scaling the Nikšić pilot methodology to the national level, with a national study to be conducted under cross-sectoral collaboration. The national study should involve strategic oversight and endorsement from the Ministries responsible for Energy, Spatial Planning, and the Environment - each bringing unique regulatory and policy perspectives. Additionally, forming an implementation team comprising representatives from these Ministries and relevant Agencies will ensure comprehensive institutional support. We also advocate for close cooperation with the Transmission System Operator and Distribution System Operator to guarantee that the delineation of solar and wind energy zones with high potential and low conflict is harmonised with existing and planned grid infrastructure.

The Energy Community Secretariat:
We acknowledge Montenegro's potential to be among the first in the region to embrace Renewable Acceleration Areas, as introduced in the latest EU Renewable Energy Directive revision. The approach developed in Nikšić could guide other Contracting Parties in comprehensive wind and solar resource assessments. We urge the Secretariat to consider Montenegro's progress, assist in executing the national study, align it with EU and Energy Community frameworks like the National Energy and Climate Plan, and advocate this methodology to other Contracting Parties.

European Bank for Reconstruction and Development, and other financial institutions:
We invite financial institutions to consult the maps when considering financing projects in the Municipality of Nikšić and to engage in potential scaling to the national level. We believe the delineated municipal and future national zones can be integrated into market-based strategies to enhance renewable energy deployment, including site-specific renewable energy auctions.

Renewable energy project developers:
By incorporating insights from our maps and methodologies early in project planning and execution, developers can better anticipate and address potential challenges. This can lead to smoother project timelines and ensures that developments consider environmental and community needs. Such proactive planning helps to minimize delays and align projects more closely with the interests of nature and local communities.

NGOs and expert communities:
We welcome engagement from organizations and experts to work with us, aiming to enhance our methodology and foster creative solutions for the energy transition. Additionally, we encourage civil society to engage with our maps to initiate projects and energy cooperatives that leverage our analysis for community benefit.

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