

NREL Proposed IREZ Hub in South Dakota – Additional OSPA Comments and Data

Overview

Oceti Sakowin Power Authority (OSPA) recommends that the proposed Interregional Renewable Energy Zone (IREZ) Hub be sited west of the Missouri River to maximize the development of the wind energy potential in the state of South Dakota, reduce the transmission interconnection costs for projects sited in western South Dakota, and ensure that the four largest Indian Tribes by population and land area in South Dakota have reasonable access to transmission facilities for development of the natural resources on their reservations.

Below we provide data demonstrating key regional differences in South Dakota and why the IREZ Hub should be sited in western South Dakota to unlock more renewable resources and benefit more disadvantaged communities, including:

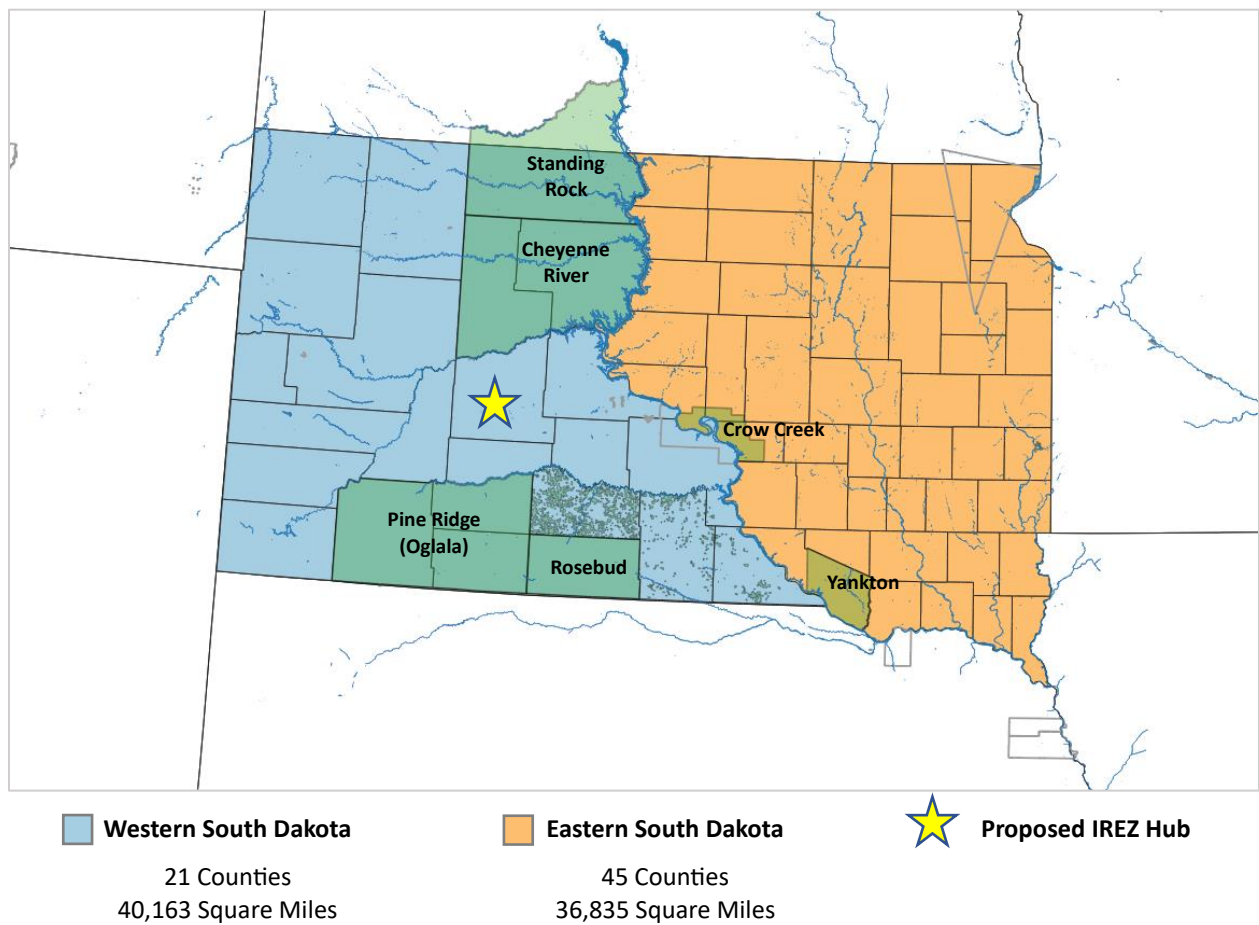
1. **The Missouri River Divides South Dakota into Western and Eastern Regions** – The Missouri River naturally splits South Dakota in half with 52 percent of its land area lying west of the Missouri River.
2. **Western South Dakota Lags in Installed Wind Energy Capacity** – Only one wind farm has been built in the western half of South Dakota to date, just 103 MW (or 4%) of the 2.9 GW installed in the entire state.
3. **Western South Dakota Disproportionately Lacks Transmission Infrastructure** – The western side of South Dakota is grossly underserved by existing and planned transmission lines, compared to the eastern side, impeding renewable energy development.
4. **Project Permitting Burden and Construction Costs Increase Crossing the Missouri River** – If projects in western South Dakota had to individually cross the Missouri River to interconnect to an IREZ Hub, permitting and construction costs would increase significantly.
5. **Less NIMBY Opposition to Renewable Energy Development in Western South Dakota** – To date, all restrictive ordinances and substantial opposition to wind farm development in South Dakota have occurred in counties in the eastern side of the state.
6. **Many Disadvantaged Communities Would Benefit from an IREZ Hub in Western South Dakota** – Many communities in western South Dakota are considered overburdened and underserved, making federal investments in climate, clean energy, and related areas that benefit these communities a priority under the Biden Administration's Justice40 Initiative.

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1) The Missouri River Divides South Dakota into Western and Eastern Regions

The total land area of South Dakota is approximately 77,000 square miles and is bifurcated by the Missouri River running from the northern border to the southern border of the state. While more than two-thirds of the counties of South Dakota are east of the Missouri River, more than half of the land area of South Dakota lies west of the Missouri River. The reservations of the four largest OSPA Tribes – Cheyenne River, Oglala, Rosebud and Standing Rock – are located west of the river and account for almost a third of the total land area in western South Dakota. A centrally located hub in western South Dakota would finally open up that half of the state to significant wind energy development.

Map 1: South Dakota Counties Located East and West of the Missouri River



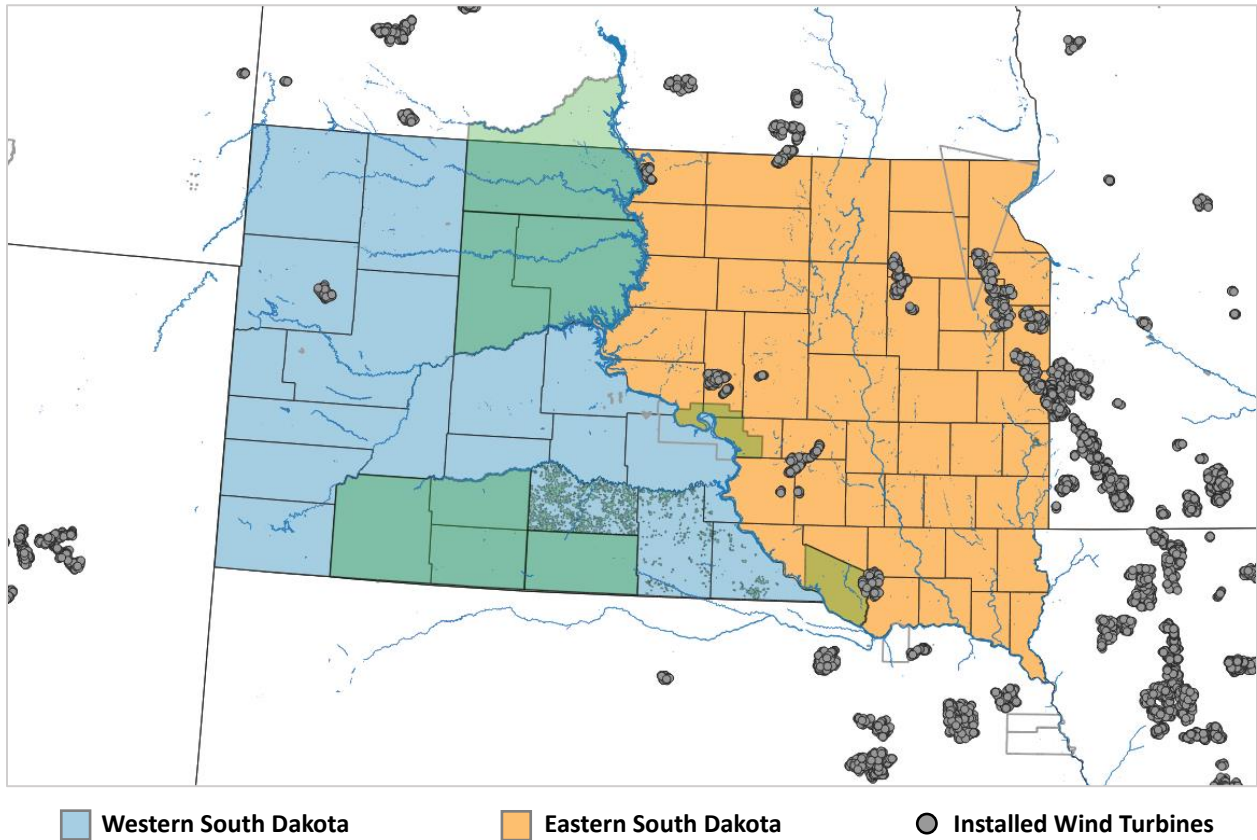
Data Source: United States Census Bureau¹

¹ <https://www.census.gov/geographies/mapping-files/time-series/geo/carto-boundary-file.html>

2) Western South Dakota Lags in Installed Wind Energy Capacity

South Dakota currently has more than 2,895 MW of wind energy installed.² Only one project – the 103 MW Willow Creek Wind Farm in Butte County – is located west of the Missouri River. The OSPA Tribes have been trying to develop utility-scale wind farms for more than 15 years, so the limited installations in western South Dakota are not due to a lack of desire or initiative by the local communities.

Map 2: Installed Wind Turbines in South Dakota for Utility-Scale Projects (>= 10 MWs)



Data Source: *The United States Wind Turbine Database, 5/31/2023 dataset*³

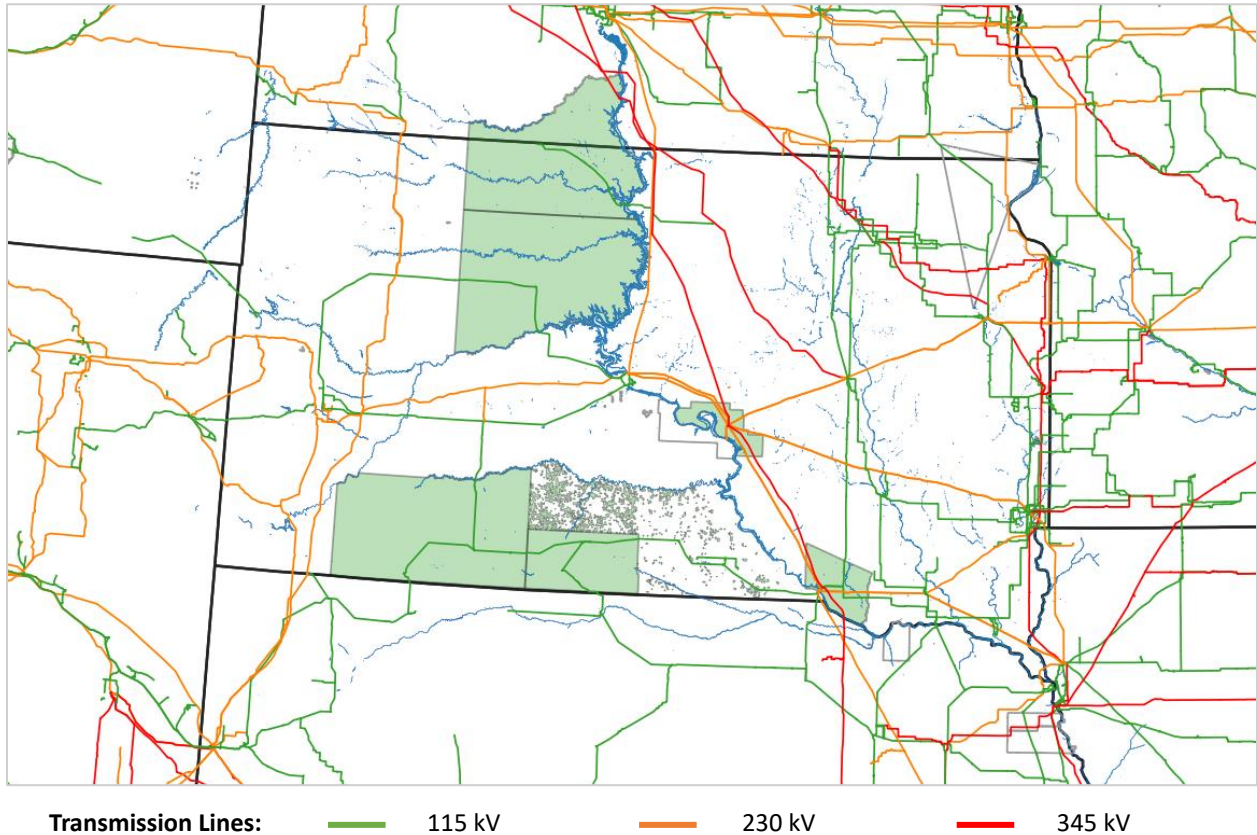
² <https://puc.sd.gov/energy/Wind/project.aspx>

³ <https://eerscmap.usgs.gov/uswtdb/>

3) Western South Dakota Disproportionately Lacks Transmission Infrastructure

The lack of transmission infrastructure is the key reason for the discrepancy in wind energy installations between eastern and western South Dakota. Eastern South Dakota is much more developed with approximately 890 miles of 345 kV and 875 miles of 230 kV transmission lines, while western South Dakota does not have any 345 kV lines and only about 595 miles of 230 kV lines.

Map 3: High Voltage Transmission Lines in South Dakota



Data Source: Homeland Infrastructure Foundation-Level Data, 12/14/2022 dataset⁴

In addition, SPP and MISO recognize that the transmission system is at capacity along the SPP-MISO seam. This is contributing to interconnection queue delays as the upgrades needed to relieve the congestion are too costly for small groups of interconnection customers. SPP and MISO conducted a Joint Targeted Interconnection Queue (JTIQ) study that identified four 345 kV transmission projects along the SPP-MISO seam that would support 28 GWs or more of new generator interconnection projects near the seam. The SPP-MISO seam generally runs along the eastern and northeastern borders of South Dakota.

⁴ <https://hifld-geoplatform.opendata.arcgis.com/>

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The JTIQ projects are targeted to come online in 2028 through 2030, and SPP and MISO are seeking DOE Grid Resilience and Innovation Partnerships grant funds to support the projects.⁵ This new transmission capacity will unleash significantly more wind energy potential in eastern South Dakota, but will only have a minimal impact on wind energy development in western South Dakota.

Map 4: SPP-MISO JTIQ Transmission Line Projects



⁵ <https://www.misoenergy.org/link/75f3a570ebc64179a07787d2cebf07e8.aspx?epslanguage=en;>
<https://cdn.misoenergy.org/JTIQ%20Report623262.pdf>

4) Project Permitting Burden and Construction Costs Increase Crossing the Missouri River

Transmission lines crossing major rivers add significant permitting and construction costs to a project. Thus, it would be more cost-effective for one high-voltage transmission line from an IREZ Hub to cross the Missouri River than to have separate collection lines from many individual projects from western South Dakota cross the river to reach the IREZ Hub.

- Permitting – A Missouri River crossing would require the US Army Corps of Engineers to be involved in permitting under Section 10 of the Rivers & Harbor Act and Section 404 of the Clean Water Act. It may also trigger additional involvement by the US Fish & Wildlife Service under the Endangered Species Act. The Missouri River is also widely used for recreational and tourism activities within South Dakota, and excessive building of infrastructure on its shores may lead to public resistance over time.
- Construction – The generation tie line for OSPA’s 450 MW Ta’teh Topah wind energy project on the Cheyenne River Reservation is currently planned to cross the Missouri River to tap into a 345 kV line in eastern South Dakota. OSPA’s original development partner Apex Clean Energy estimated that the approximate ½ mile river crossing would add an estimated \$11M to the construction costs for the project. This estimate is in line with the costs of a couple of other projects with publicly available data:
 - Excel Energy – The CapX2020 project constructed in 2015 had a 345/161/69 kV transmission line spanning 1.3 miles of the Mississippi River. Excel Energy estimated that the river crossing cost \$20M.⁶
 - Duke Energy – In 2021, Duke Energy replaced 6 towers and 4 miles of 345 kV line that connected the Miami Fort Generation Station in Ohio to Boone County, Kentucky and then to Tanners Creek Substation in Indiana. The replacement line crossed the Ohio River twice, each span about ½ mile, for a total cost of \$20M.⁷

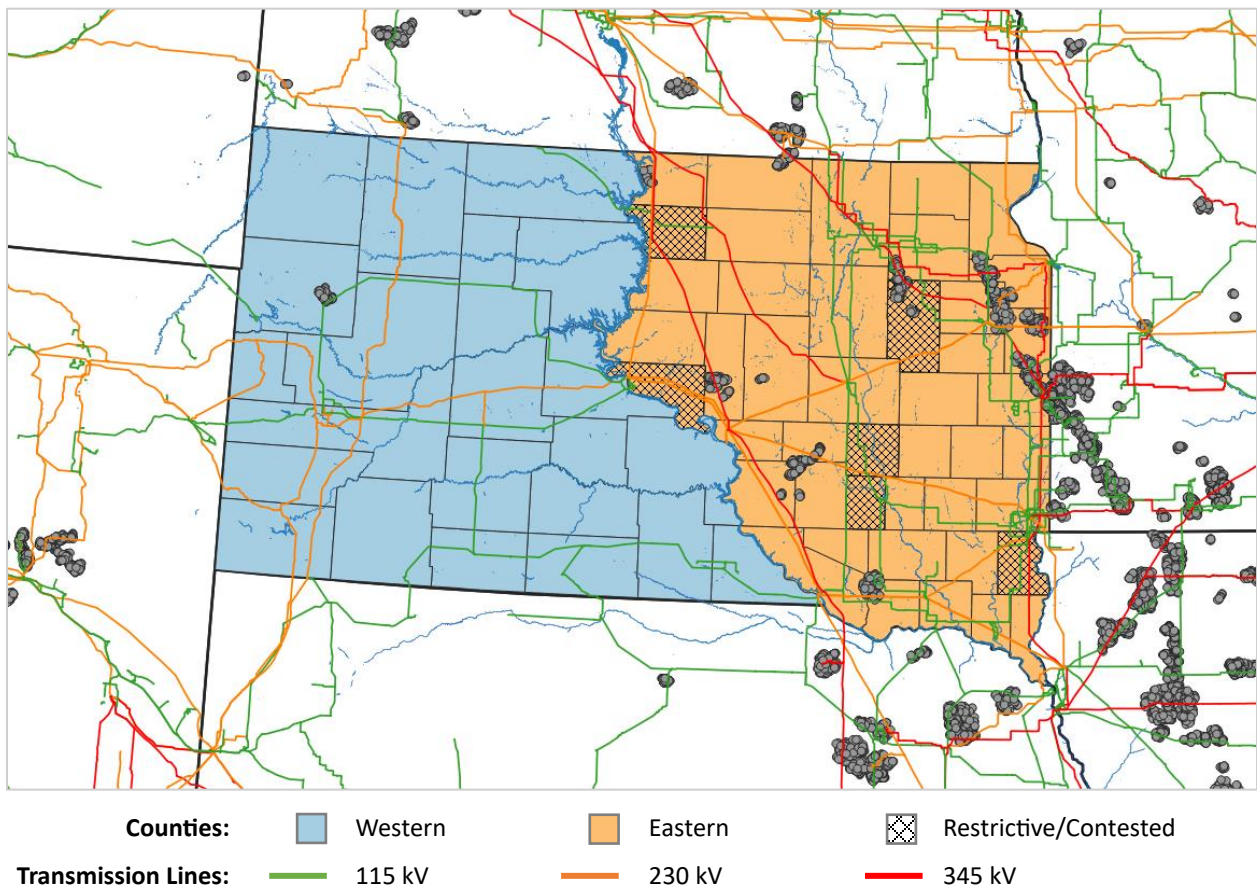
⁶ <https://www.tdworld.com/grid-innovations/transmission/article/20965302/electricity-crosses-the-mississippi-river>

⁷ <https://illumination.duke-energy.com/articles/how-duke-energy-rebuilt-major-transmission-lines-across-the-ohio-river>

5) Less NIMBY Opposition to Renewable Energy Development in Western South Dakota

The OSPA Tribes and Tribal communities fully support the development of wind farms on their reservations, and the public reception to the OSPA projects and other projects proposed in western South Dakota has been positive. Wind farm development in eastern South Dakota, however, has become increasingly contentious. According to a recent study by the Sabin Center for Climate Change Law, four counties in South Dakota have implemented restrictive zoning ordinances for wind energy projects and 4 projects were significantly reduced in size or cancelled altogether due to public opposition.⁸

Map 5: South Dakota Counties with Restrictive Ordinances and/or Contested Wind Energy Projects



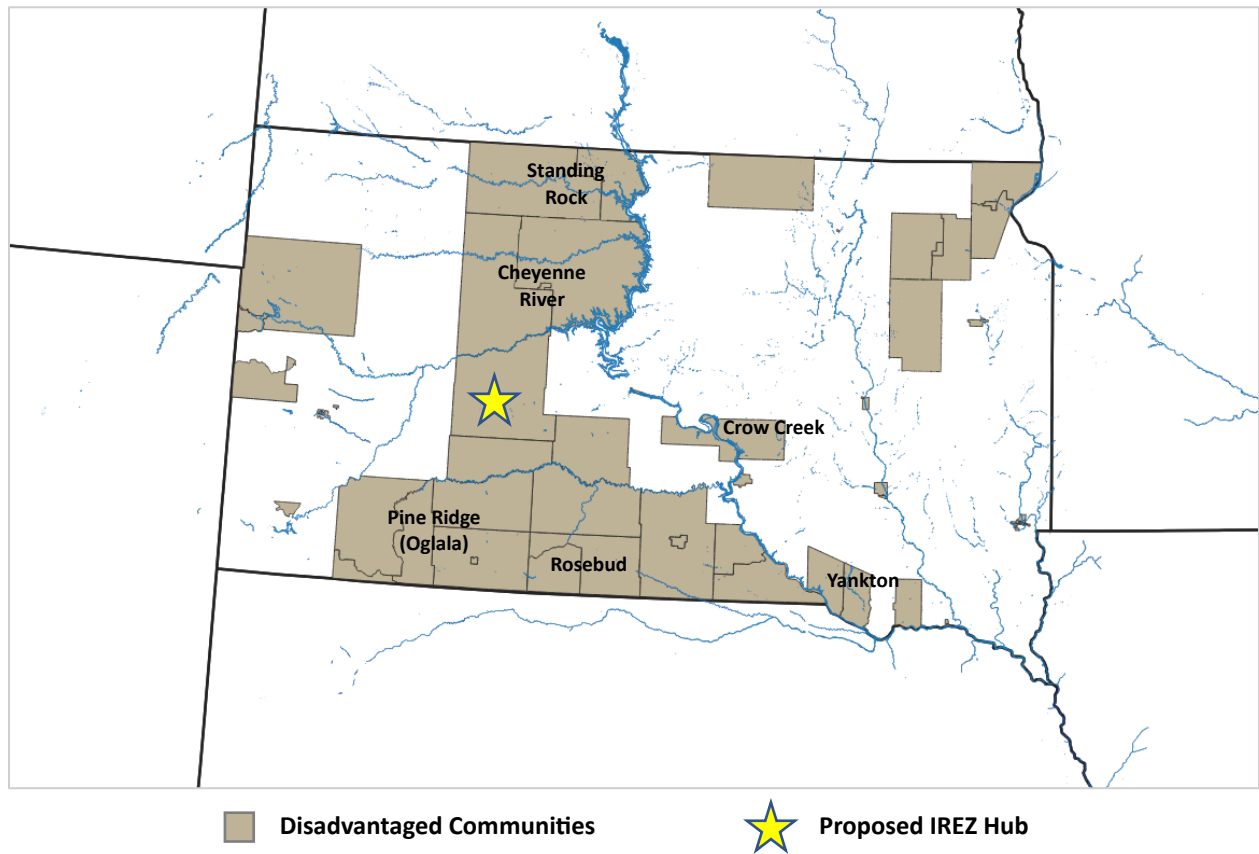
Data Source: Sabin Center for Climate Change Law, May 2023

⁸ https://scholarship.law.columbia.edu/cgi/viewcontent.cgi?article=1201&context=sabin_climate_change

6) Many Disadvantaged Communities Would Benefit from an IREZ Hub in Western South Dakota

The Biden Administration recognizes that addressing climate change can also be a means to secure environmental justice and spur economic opportunity for disadvantaged communities that have been historically marginalized and overburdened by pollution and underinvestment in the infrastructure of their communities. With this priority in mind, the Administration’s Justice40 Initiative seeks to deliver 40% of the overall benefits of federal investments in climate, clean energy, and related areas to disadvantaged communities.⁹ A centrally located IREZ Hub in western South Dakota would be consistent with the Administration’s policy goals as a catalyst for significant wind energy development in the western half of the state that will also bring new economic opportunities, improved infrastructure, and jobs to these disadvantaged communities.

Map 6: Designated Disadvantaged Communities in South Dakota



Data Source: White House Council on Economic Justice, Climate and Economic Justice Screening Tool, 11/22/2022 dataset ¹⁰

⁹ <https://www.federalregister.gov/documents/2021/02/01/2021-02177/tackling-the-climate-crisis-at-home-and-abroad>; <https://screeningtool.geoplatform.gov/en/about#3/33.47/-97.5>

¹⁰ <https://screeningtool.geoplatform.gov/en/downloads#5.34/20.213/-68.304>