

STATE OF SOUTH DAKOTA
BEFORE THE
PUBLIC UTILITIES COMMISSION

In the matter of the Petition of Dakota) Consolidated
Renewable Hydrogen, LLC to have) Docket Nos. EL24-024
Kingsbury Electric Cooperative, Inc.) and EL24-025
Assigned as its Electric Provider in the)
Service Area of Otter Tail Power Company

PRE-FILED DIRECT TESTIMONY OF CLAY NORRBOM
ON BEHALF OF DAKOTA RENEWABLE HYDROGEN, LLC
October 11, 2024

1 **Q: Please state your name and business address for the record.**

2 **A:** My name is Clay Norrbom and my work address is 470 West 78th Street, Suite 250,
3 Chanhassen, MN 55317.

4 **Q: Please state your title and responsibilities.**

5 **A:** I am President of Zero6 Energy Inc. and the Managing Member of its wholly owned
6 subsidiary Dakota Renewable Hydrogen, LLC (“DRH”). Zero6 Energy specializes in renewable
7 energy development, ownership and operation and I oversee the company’s engineering, finance,
8 legal, and government affairs related to the construction and production of clean energy. As
9 Managing Member of DRH, I effectively exercise the same responsibilities with respect to DRH’s
10 proposed clean hydrogen production facilities.

11 **Q: On whose behalf are you providing testimony?**

12 **A:** I am testifying on behalf of DRH.

13 **Q: Have you previously testified before the South Dakota Public Service Commission?**

14 **A:** I have not.

15 **Q: What is the purpose of your testimony?**

16 **A:** The purpose of my testimony is to explain DHR’s role in the GEVO Net-Zero 1, LLC
17 Project (“NZ1 Project”) in Lake Preston, South Dakota and explain why DRH is asking the
18 Commission to allow it to be served by Kingsbury Electric Cooperative (“KEC”).

19 **Q: Where is the NZ1 Project going to be located?**

20 **A:** The Project will be located just east of Lake Preston. The pre-filed direct testimony of
21 Chris Ryan, President and Chief Operating Officer of Gevo, Inc. (“Gevo”) and Gevo Net-Zero 1,
22 LLC (“NZ1”) describes in more detail the NZ1 Project’s intended location.

23 **Q: Can you tell the Commission about the proposed DRH hydrogen production project**
24 **(“DRH Project”)?**

25 **A:** DRH intends to be the on-site provider of hydrogen to the proposed NZ1 Project. DRH’s
26 June 28, 2024 Petition for Electric Service includes a number of maps and other exhibits related
27 to the DRH Project and the project site and I incorporate the exhibits by reference into this
28 testimony. The DRH hydrogen facility is intended as a crucial element to the NZ1 Project because
29 of the project’s need for dependable, high-quality hydrogen used in its low carbon, biofuels
30 production process. DRH is asking that it be allowed to be a retail, all requirements electric service
31 customer of KEC under the terms and conditions of the Electric Service Agreement by and between
32 DRH and KEC, which agreement is attached as Exhibit 3 to the DRH petition (marked as trade
33 secret and not subject to public disclosure). DRH will be a separate customer of KEC and
34 separately metered from the NZ1 biorefinery plant.

35 **Q: What role does hydrogen play in the overall NZ1 Project?**

36 **A:** Hydrogen is a necessary raw material used in the production of the NZ1 proposed
37 sustainable aviation fuel production process. Many producers currently have hydrogen shipped in
38 but that is expensive and subject to delivery and reliability constraints. On-site hydrogen

39 production is lower cost and more reliable. The NZ1 Project prefers that its hydrogen production
40 be on-site.

41 **Q: How does DRH intend to produce hydrogen?**

42 **A:** DRH intends to produce hydrogen gas through the electrolysis of processed water. The
43 core component of DRH’s proposed hydrogen production process will be through use of four
44 proton exchange membrane electrolysis cell stacks manufactured by a subsidiary of Cummins
45 Corporation, a global power and technology company in operation for more than 100 years.¹
46 Water electrolysis will occur when de-ionized water is circulated through the cell stack and an
47 electric current is applied. The de-ionized water circulation loop includes a heat exchanger, a break
48 tank with automated replenishing and a polishing skid to ensure high water quality as it enters the
49 cell stack. The de-ionized water will be converted into pure hydrogen and oxygen. Hydrogen is
50 then ready for further purification and use by the NZ1 biorefinery, and the oxygen will be released
51 to the atmosphere via a vent stack. Once fully operational, DRH expects that the DRH hydrogen
52 project will have a retail load of approximately 20-25 MW with a 90% load factor.

53 **Q: Explain how the DRH intends to produce “green” hydrogen.**

54 **A:** DRH intends to be a producer of “green” hydrogen because its electric generation will be
55 considered for purposes of applicable federal tax credits low carbon fuel standards as coming
56 directly from a renewable energy resource. This is also important for the NZ1 Project’s
57 requirement that its renewable fuels be produced on a “net-zero” carbon basis. This effectively
58 means that DRH, like the NZ1 biorefinery, is being designed to so that its monthly electrical energy
59 requirements will be met, on a net basis, by a combination of wind energy to be transmitted directly

¹ <https://www.cummins.com/sites/default/files/2021-08/cummins-hydrogen-generation-brochure-20210603.pdf>

60 from a proposed wind farm being built in conjunction with the project via a 10+ mile 115 kV
61 transmission line to be owned and operated by East River Electric Cooperative, along with the
62 purchase of renewable energy credits tied to other regional renewable energy resources. Under
63 the applicable rules governing such credits, each of DRH and NZ1 will be considered as purchasing
64 100% of its electric energy requirements from renewable resources.

65 **Q: Tell the Commission more about the proposed wind farm.**

66 **A:** Kingsbury County Wind Fuel, LLC (“KCWF”), a separate, wholly-owned subsidiary of
67 Zero6 Energy, proposes to construct, own, and operate a 99 MWac wind farm to be located in
68 Kingsbury County on private agricultural property. The wind farm itself is standard, and similar
69 to the kinds with which the Commission is familiar. KCWF has an agreement with global wind
70 turbine supplier GE Vernova² for the purchase of 29, 3.4 MWac wind turbines and related
71 equipment. To the extent there is any unique aspect to the wind farm, it because it will be tied
72 directly to a new East River transmission 10+ mile 115 kV transmission line that will connect the
73 wind farm directly to a proposed new East River substation intended serve the NZ1 Project site.
74 The primary driver for this arrangement is the low carbon fuel standards applicable to the biofuels
75 industry and the related impact such rules have on the economics of biofuels, and which standards
76 provide that producers that are tied directly to a renewable energy resource are eligible for more
77 credits than are biofuels production plants that rely solely on blended electric energy from the grid.
78 While the NZ1 Project will be able to receive the wind farm’s renewable energy directly via the
79 East River transmission line, the wind energy itself is being sold under the terms of a wholesale
80 power purchase agreement by and between KCWF, as seller, and Basin Electric Power
81 Cooperative, as purchaser. KCWF has made application to the regional transmission operator

² <https://www.gevernova.com/>

82 Southwest Power Pool to be able to connect its wind farm under the SPP’s standard open access
83 transmission tariff and related processes. Once the wind farm is interconnected to the East River
84 transmission system, Basin Electric will take title to the wind energy at the substation located on
85 site at the wind farm. East River will be the transmission provider for such wind energy, and Basin
86 will include that wind energy in its overall resource mix that it sells and otherwise delivers via East
87 River and its own transmission system to KEC, its other distribution cooperatives and to its other
88 wholesale customers.

89 **Q: How is the DRH Project permitted?**

90 **A:** On January 27th, 2022, the Kingsbury County Board of Adjustment approved by
91 unanimous vote a conditional use permit for the DRH Project. The permit included the right to
92 transfer the permit and NZ1 transferred the part of the permit related to hydrogen production to
93 DRH.

94 **Q: What about the KCWF wind farm?**

95 **A:** Because the wind farm is 99 MW and thus under the Commission jurisdictional siting
96 threshold, the wind farm obtained a conditional use permit to construct, own and operate the wind
97 farm from Kingsbury County. On January 27th, 2022 the Kingsbury County Board of Adjustment
98 originally approved by unanimous vote a conditional use permit for the wind farm. On April 9,
99 2024, the Board of Adjustment further approved by unanimous vote a minor amendment to the
100 conditional use permit.

101 **Q: Please describe the DRH footprint within the overall NZ1 Project.**

102 **A:** DRH’s hydrogen plant will be located within the NZ1 Project site as depicted in Ex. 2-2 to
103 the DRH June 28, 2024 petition. DRH will obtain the right to control the real property necessary
104 for its operations under the terms of a long-term ground lease by and between DRH and NZ1.

105 **Q: Has DRH specifically discussed its specific electrical load requirements for the safe**
106 **and reliable operation of its hydrogen plant?**

107 **A:** Yes. DRH has prepared and communicated its power load requirements to the NZ1 Project,
108 and to KEC and East River Electric based on the estimated need for hydrogen to be supplied to the
109 NZ1 Project. The parties have entered into appropriate agreements under which DRH will be
110 responsible for paying for the upgrades KEC and East River will be required to make to
111 accommodate the new DRH load. The DRH Project expects to have an electrical load of
112 approximately 20-25MW depending on the NZ1 Project's hydrogen needs, again with an expected
113 90% load factor.

114 **Q: Are you confident KEC will be able to provide the DRH Project with reliable and**
115 **economical electric service?**

116 **A:** Yes, we are. As DRH stated in its petition, the combination of KEC, East River, and Basin
117 Electric bring more than 70+ years of reliable service in eastern South Dakota and surrounding
118 areas. The Commission itself has found that the cooperatives provide "very reliable" service. We
119 expect that in its direct testimony, KEC and/or East River will provide additional information on
120 its systems and the proposed build-out necessary to serve NZ1 and DRH, and why its proposed
121 service to the NZ1 Project does not represent an undue duplication of utility infrastructure and is
122 otherwise prudent. We are also satisfied with the rate structure that KEC has proposed. Electric
123 energy will be DRH's highest operating cost and while we are always seeking lower energy costs,
124 we consider KEC's rate proposal fair and reasonable.

125 **Q: Does DRH prefer that KEC provide it with electric service?**

126 **A:** Yes, it does. As the Commission is likely aware, when the NZ1 Project was initially
127 announced, NZ1 and DRH first committed to work with Otter Tail to provide electric service to

128 the project and the parties endeavored for almost 1.5 years to come to terms on service. And while
129 DRH and NZ1 appreciates Otter Tail's efforts in trying to reach agreement on acceptable terms, in
130 the end the terms required by Otter Tail before it would provide service proved unacceptable, and
131 they likely would have prevented the project from being able to secure financing, and certainly on
132 reasonable terms. Since reengaging with the cooperatives, DRH (and NZ1) has appreciated their
133 efforts in developing reasonable terms for this very important part of the overall project. DRH has
134 committed itself to KEC as its service provider and we respectfully request that the Commission
135 approve of that preference by allowing KEC to serve the DRH Project.

136 **Q: Does that conclude your pre-filed direct testimony?**

137 **A:** Yes.