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May 24, 2018

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**Re: Request for Sensitivity Case in the California Independent System Operator 2018-2019 Transmission Planning Process – Increased Capabilities for Transfers of Low Carbon Electricity between the Pacific Northwest and California (the “Special Study”).**

Gentlemen:

National Grid USA (“National Grid”)—in partnership with Rye Development, LLC (“Rye”)—are currently pursuing development of two pumped hydro storage projects in

the Pacific Northwest at strategic locations in the backbone high-voltage grid to absorb daily California solar oversupply and return it to the grid during peak hours. Because of the strategic location of these two pumped storage projects near the AC and DC Interties between the Pacific Northwest and California, National Grid and Rye have a keen interest in the Special Study being conducted as part of the California Independent System Operator, Inc.'s ("CAISO") 2018-2019 Transmission Planning Process whereby CAISO is considering the potential for increased transfer capability between California and the Pacific Northwest over the AC and DC Interties.

While National Grid and Rye support the Special Study and believe expanded transfer capability between the Pacific Northwest and California is warranted, National Grid and Rye believe that the Special Study is too narrowly focused on existing, federal hydropower resources. As a result, National Grid and Rye request that the scope of the Special Study be expanded to include other generation in the Pacific Northwest such as pumped storage hydropower, or if CAISO refuses to expand the scope of the Special Study, it should conduct an additional study that considers other generation resources in the Pacific Northwest such as the Swan Lake and Goldendale pumped storage projects.

## **I. Background on National Grid and Rye**

National Grid is a subsidiary of National Grid plc, a Fortune Global 500 company and one of the largest investor-owned energy companies in the world, with a market capitalization of over \$39 billion. National Grid plc has utility operations in both the United Kingdom and the United States. National Grid plc is actively engaged in the development and operation of bulk transmission and bulk storage assets throughout the United States and United Kingdom, including balance-sheet financing of several transmission interconnection development projects in the United Kingdom, valued at over \$1 billion each, that will interconnect the United Kingdom's electric grid with the electric grid of mainland Europe and neighboring countries. National Grid plc also owns and operates the electric grid in the United Kingdom, which is approximately 75% the size of the California Independent System Operator's ("CAISO") service territory. Thus, National Grid plc is a well-capitalized developer that is capable of financing significant development projects without relying on third-party financing.

National Grid operates over 9,000 miles of transmission in the Northeastern United States. As a result of its ownership and operation of significant electric facilities, National Grid has a deep operational understanding and knowledge of how the electric grid operates, including vast experience and expertise in balancing the electricity system and ensuring electric markets run efficiently. National Grid is committed to reliable and affordable decarbonization of the United States' electric grid. To that end, National Grid views pumped storage—particularly closed-loop projects like Swan Lake and Goldendale—as instrumental to a future, carbon-free electric grid. To that end,

National Grid has a corporate, decarbonization commitment that aligns with many of California's policy goals.<sup>1</sup>

Rye is a leading developer of low impact hydropower and energy storage projects in the United States. Like National Grid, Rye is committed to the decarbonization of the electric grid through the responsible development of untapped hydropower resources. Rye has significant development, ownership, and operational experience with hydropower assets throughout the United States and brings a wealth of development, permitting, and operational expertise to its projects.

## **II. National Grid and Rye's Pumped Storage Projects**

As noted in the opening of this letter, National Grid and Rye are currently pursuing two of the most promising pumped storage projects in the Pacific Northwest. The first project, the 400 MW Swan Lake Pumped Storage Project, is a "closed loop" pumped storage project consisting of three 131 MW variable-speed pump-turbine generators that will interconnect at the Malin Substation of the Pacific AC Interties and could be operational as soon as 2024 ("Swan Lake").

The second project, the 1,200 MW Goldendale Energy Storage Project, is a proposed "closed-loop" pumped storage project with three 400 MW variable-speed pump-turbine generators near the John Day Dam at the top of the AC and DC Interties that will interconnect at the John Day Substation and could be operational in 2028 ("Goldendale").

Each of these projects would have minimal system impact on the transmission systems operated by CAISO or owned by the Transmission Agency of Northern California. For example, based on recently-received transmission affected system study results for Swan Lake, the transmission system upgrade costs would be relatively minimal and there would not be a "significant impact" to the California transmission system.

## **III. National Grid and Rye's Request for Additional Study**

Given the location of National Grid and Rye's pumped storage projects near the border of the transmission grids of the Pacific Northwest and California, National Grid and Rye have taken a strong interest in the Special Study whereby CAISO is studying the potential for increased transfers between California and the Pacific Northwest. National Grid and Rye support the objectives of the Special Study, specifically to identify changes needed to:

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<sup>1</sup> See Clean Growth Strategy: Executive Summary, available at: <https://www.gov.uk/government/publications/clean-growth-strategy/clean-growth-strategy-executive-summary>.

- Increase the capacity of AC and DC Interties;
- Increase dynamic transfer capability;
- Automate operational controls; and
- Assign resource adequacy value to energy imports to California.

National Grid and Rye also believe that a foundational study of this type is long overdue and could provide an implementation roadmap for large-scale renewable energy development in California, Oregon, and Washington, given the West Coast states' strong alignment on decarbonization goals and the significant existing high-voltage transmission system between California and the Pacific Northwest vis-a-vis the AC and DC Interties. While National Grid and Rye support expanding the transfer capability across the AC and DC Interties, National Grid and Rye also recognize that affordability and maintaining reliability are key factors to consider in this process.

A. The Special Study Incorrectly Focuses on Existing, Federal Hydropower Resources in the Pacific Northwest

Recent trade and mainstream press suggest that, if left unaddressed, California may be facing significant reliability issues akin to those encountered during the energy crisis.<sup>2</sup> The issues identified in recent media coverage will not be solved without strategic consideration and evaluation of competitive, grid-scale options. While the Pacific Northwest has significant amounts of existing and potential zero carbon energy generating resources from the Federal Columbia River Power System that could help California meet its energy policy goals, some of these options are older resources, built decades ago, and are not designed to provide the level of flexibility necessary over a long period of time to the extent needed for high penetration levels of renewable generation. These antiquated assets have increased (and continually increasing) operating costs and non-routine, extraordinary maintenance, considering these resources are not being used in the manner originally intended.

Additionally, the federal investment in these facilities requires several hundreds of millions of dollars in capital annually to curb their deterioration and to prevent lost generation capability. The Army Corps of Engineers and Bureau of Reclamation, which own and operate the facilities, are subject to federal policy directives and Congressional budgeting authority. Similarly, the Bonneville Power Administration is facing significant financial issues that may require it to seek Congressional approval to raise the limit on

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<sup>2</sup> See, e.g. California Regulators See Signs of a New Energy Crisis – Can they Prevent It?, Utility Dive, available at: <https://www.utilitydive.com/news/california-regulators-see-signs-of-a-new-energy-crisis-can-they-prevent-i/523414/>; California Warns of a Second Energy Crisis, Bloomberg, available at: <https://www.bloomberg.com/news/articles/2018-05-03/california-warns-of-a-second-energy-crisis-as-customers-defect>; As California's Energy Markets are Disrupted, Regulators Want to Avoid an Enron-Like Fiasco, Forbes, available at: <https://www.forbes.com/sites/kensilverstein/2018/05/08/as-californias-energy-markets-are-disrupted-regulators-want-to-avoid-an-enron-like-fiasco/1#5a4d76b15c2e>.

its borrowing authority.<sup>3</sup> Thus, the federal entities involved in owning and operating much of the Pacific Northwest hydropower are beholden to Congressional budgets and Federal energy policies, which are not necessarily aligned with the Western states' renewable energy goals. Further, and most importantly, these existing conventional hydropower resources on the Lower Columbia River have little (if any) storage available, nor do they have capability to address some of California's existing oversupply issues, whereas National Grid and Rye's pumped storage resources are specifically intended to address that issue, among others.

Another issue with the Pacific Northwest's existing, federal hydropower generation facilities is that they are subject to significant operational constraints that further hinder their ability to alleviate California's solar oversupply issues. For example, much of the existing hydropower capacity in the Pacific Northwest is encumbered by constraints associated with fish passage and protection, flow and flood control requirements, and preference power obligations, making these resources expensive to maintain and unable to provide the flexible capacity needed by California's electricity grid.

As noted above, some media outlets have suggested that California could be facing another energy crisis. In the 2000-2001 energy crisis, a significant contributing factor was that California's hydropower resources were largely unavailable due to bad snowpack and a lack of stored water. Relying on the Pacific Northwest's federal hydropower fleet would be repeating these same mistakes of the past, as these resources and their water supplies are similarly suffering from changing conditions due to climate change. When considering the changing availability of water as fuel for the Pacific Northwest's federal hydropower resources, coupled with the other constraints imposed on these resources noted above, the existing, federal hydropower resources in the Pacific Northwest are not a reliable alternative to help address California's solar oversupply issues. As such, focusing on only these resources in the Special Study is both unwise and unreliable.

B. National Grid and Rye's Pumped Storage Hydropower Resources are a Better Alternative to Solve California's Solar Oversupply Issues

In contrast, the Pacific Northwest also has significant potential for very attractive large-scale energy storage projects—like Swan Lake and Goldendale—that can absorb surplus energy from California and return it to California consumers later in the day, in a much more efficient and economical manner than some of the other, existing resources in the Pacific Northwest. To that end, National Grid and Rye believe that large-scale pumped storage is a potential solution to address some of California's existing and future reliability concerns, given its large capacity and ability to absorb significant

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<sup>3</sup> See, e.g. BPA Heading for a "Financial Cliff," Steve Kern Presentation before the Northwest Power and Conservation Council, available at: <https://www.nwcouncil.org/news/bpa-heading-financial-cliff>.

amounts of solar overgeneration, while also providing grid reliability services such as spinning reserves and inertia. Also, pumped storage has the unique capability to support regionalization, whereas the existing resources in the Pacific Northwest are not capable of supporting this effort.

National Grid and Rye note that the proposed Special Study will consider generation resource additions in California (*i.e.*, 40 GW of solar by 2030) based on the California Public Utility Commission's Integrated Resource Plan; however, the Special Study will not fully consider the future generating mix in the Pacific Northwest. Even though the Special Study will take planned coal retirements in the Pacific Northwest into account, it appears it will consider only existing hydropower resources in the Pacific Northwest. In particular, the Special Study fails to consider Washington and Oregon Renewable Portfolio Standards and carbon policies, which will have a dramatic impact on the future generation mix in the Pacific Northwest, thereby impacting the ability of the Pacific Northwest's generation fleet to assist in meeting California's capacity and reliability needs. The evolving nature of the Pacific Northwest generation mix to align with the region's energy policy goals only further underscores the need for a significant capacity resource such as new pumped storage. The Special Study should underscore for readers that the study's assumptions are highly conservative and that the benefits resulting from the increased transfers between California and the Northwest are bounded by those very conservative assumptions, as well as other artificial constraints.

Investment in modern, highly flexible "closed-loop" pumped hydro storage and generation would yield additional benefits to both California and the Pacific Northwest, not only by expanding the seasons and conditions when those benefits are available, but also by increasing utilization of the high-voltage transmission system for more effective coordination of regional low-carbon generation resources, flexible generation resources, and storage.

C. National Grid and Rye Request the CAISO Expand the Scope of the Special Study, or, At Minimum, Conduct Further Study That Considers a More Robust Mix of Pacific Northwest Generation Resources

National Grid and Rye request that the CAISO consider revising the scope of the Special Study to take into account a more robust set of generation resources in the Pacific Northwest, particularly including pumped storage projects. To the extent CAISO refuses to modify the scope of its Special Study, then additional studies should be conducted that consider the benefits of pumped storage resources and whether they have the capability of further expanding the transfer capability between the Pacific Northwest and California. While there is significant transmission capacity between the Pacific Northwest and California on the AC and DC Interties, there are several man-made constraints that could also be addressed, optimizing utilization of this infrastructure and enhancing transfer capability without the need for major capital upgrades. As part of any future study, National Grid and Rye recommend that CAISO

be directed to also evaluate removal of the various charges imposed on imports or exports of generation from resources located outside of California, which would make Pacific Northwest resources more competitive and available to economically assist with California's overgeneration issues, reliability concerns, and regionalization efforts.

National Grid and Rye hope that the current study is not the final analysis of the potential benefits for increased use of the transmission system for transfers between California and the Pacific Northwest. National Grid and Rye also request that any subsequent studies explore a likely future mix of generation resources for the Pacific Northwest that is fully consistent with the carbon policy goals of Oregon and Washington. National Grid and Rye look forward to a study program which will fully evaluate the likely significant benefits associated with additional flexible generation and storage located near the Celilo Converter Station, John Day, and Malin Substations in enhancing reliability and flexible transfer capability of the AC and DC Interties, as well as absorbing surplus generation and facilitating transfers of energy between the Pacific Northwest and California.

As mentioned above, the existing resources in the Pacific Northwest are expensive to maintain and many of these resources have limited storage capability, given their current operating conditions and the myriad constraints imposed on these resources. Furthermore, these resources are not capable of alleviating California's solar oversupply problems. Unlike these resources, however, National Grid and Rye's pumped storage projects would not be subject to similar constraints and would be strategically located near high-voltage transmission with the express goal of reliably, efficiently, and economically coordinating with California to provide the flexible capacity needed to maintain a reliable and economic electricity grid within the state, while also absorbing some of California's solar oversupply.

#### **IV. Conclusion**

National Grid and Rye would be happy to provide technical data to support a future study focused on the generation mix in the Pacific Northwest. Furthermore, to the extent resources would otherwise hinder the performance of such a study, National Grid and Rye are willing to be a paying, participating party for such additional study. Given the regional need for this expanded study, National Grid and Rye suspect that other parties would similarly be willing to contribute.

Although the goal of the Special Study is laudable and addresses a much-needed issue, National Grid and Rye remain concerned about the narrow scope of resources being considered in the Pacific Northwest and the lack of consideration given to modern, flexible, economic, and efficient resources like modern pumped storage hydropower. Therefore, National Grid and Rye specifically request that CAISO broaden the scope of the Special Study, or, at minimum, conduct an additional foundational



study that considers a broader mix of Pacific Northwest generation resources, specifically including pumped storage resources such as Swan Lake and Goldendale.

Thank you for your attention. Feel free to contact us with any questions.

Very truly yours,



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