

STATE OF NEW YORK  
PUBLIC SERVICE COMMISSION

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Proceeding on Motion of the Commission to :  
Implement a Large-Scale Renewable Program : Case 15-E-0302  
and a Clean Energy Standard :  
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In the Matter of Offshore Wind Energy : Case 18-E-0071  
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**VERIFIED JOINT PETITION AND COMMENTS<sup>1</sup> OF CHPE LLC AND H.Q. ENERGY SERVICES (U.S.) INC. SEEKING PROGRAM-WIDE MODIFICATION OF RENEWABLE ENERGY CERTIFICATE PURCHASE AND SALE AGREEMENTS**

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Dated: August 28, 2023

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<sup>1</sup> See Notices of Proposed Rulemaking I.D. Nos. PSC-26-23-00002-P; PSC-26-23-00003-P; PSC-26-23-00004-P (issued June 28, 2023), available at <https://dos.ny.gov/june-28-2023vol-xlv-issue-26>; Notice of Proposed Rulemaking I.D. No. PSC-27-23-00015-P (issued July 5, 2023), available at <https://dos.ny.gov/july-5-2023vol-xlv-issue-27>.

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TO THE PUBLIC SERVICE COMMISSION:

Pursuant to Sections 4, 5, 65, and 66-p of the Public Service Law (“PSL”), CHPE LLC (“CHPE”) and H.Q. Energy Services (U.S.) Inc. (a Delaware corporation, “HQUS”, and together with CHPE, “Petitioners”) submit this joint petition in connection with the Champlain Hudson Power Express Project (“CHPE Project”<sup>2</sup>).<sup>3</sup> This petition requests that the Public Service Commission (“Commission”) implement adjustments on a program-wide basis, or alternatively by tier, for all renewable energy certificate (“REC”) contracts with the New York State Energy Research and Development Authority (“NYSERDA”) entered into before May 2022 (collectively,

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<sup>2</sup> The term “CHPE Project,” as used in this petition, refers to two transmission legs: (1) the construction of approximately 339 miles of high-voltage direct current (“HVDC”) transmission lines connecting the U.S.-Canada border to a to-be-constructed zero-emission converter station in Astoria Queens; and (2) the construction of a new converter station in Quebec and 36 miles of HVDC transmission lines on the Canadian side of the project.

<sup>3</sup> In requesting this relief, HQUS reserves all rights it has under the existing Tier 4 Renewable Energy Certificate Purchase and Sale Agreement, dated November 29, 2021, by and between the New York State Energy Research and Development Authority and H.Q. Energy Services (U.S.) Inc. (“HQUS REC Contract”).

the “Approved Projects”<sup>4</sup>) for those project components that have not yet been placed in service to partially address the significant, unforeseeable increase in construction costs for these projects.<sup>5</sup>

## I. INTRODUCTION

Unprecedented economic factors including rising interest rates, inflation, and supply shortages are jeopardizing all clean energy infrastructure projects needed to achieve New York’s climate goals. With respect to the CHPE Project, the construction costs for its new-build transmission components have increased significantly from the time of the CHPE Project bid submission (in May 2021) to the closing on the financing for the U.S. portion of the CHPE Project in October 2022, shortly after which construction began. Notwithstanding these challenges, Petitioners’ actions allowed the CHPE Project to start construction, and they remain committed to this necessary project and to the HQUS REC Contract.

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<sup>4</sup> The Approved Projects consist of other petitioners’ projects, including those identified in the petitions filed by Alliance for Clean Energy New York (“ACE-NY”), on behalf of solar and land-based wind generation developers; Sunrise Wind LLC; Empire Offshore Wind LLC and Beacon Wind LLC; and Clean Path New York LLC (“CPNY”), as well as the CHPE Project to deliver zero-emissions energy to New York City. As indicated in n.1, *supra*, this submission also responds to the Commission’s notices seeking comments on these parties’ related petitions. See Notices of Proposed Rulemaking I.D. Nos. PSC-26-23-00002-P; PSC-26-23-00003-P; PSC-26-23-00004-P (issued June 28, 2023), available at <https://dos.ny.gov/june-28-2023vol-xlv-issue-26>; Notice of Proposed Rulemaking I.D. No. PSC-27-23-00015-P (issued July 5, 2023), available at <https://dos.ny.gov/july-5-2023vol-xlv-issue-27>.

<sup>5</sup> With respect to the CHPE Project, the relevant price adjustment would only be with respect to the new-build transmission components of the CHPE Project. As explained herein, Petitioners do *not* seek any price adjustment for the generation portion of the HQUS REC Contract, as a portfolio of resources already exists to deliver clean energy over the CHPE Project. The new-build transmission components of the CHPE Project make up 46% of the contract price under the HQUS REC Contract. Any cost adjustment would apply predominantly to construction within the United States, but it would also partially address similar cost increases associated with the smaller Canadian portion of the transmission line. A formula-based upward adjustment to the per-megawatt-hour rate under the HQUS REC Contract for the new-build transmission components (referred to in the HQUS REC Contract as the Associated New Transmission Facility) will allow CHPE to increase its transmission rate with HQUS. Such an increased transmission rate will cover a portion of the construction cost increases that CHPE has experienced on its portion of the CHPE Project.

The CHPE Project is indisputably critical to maintaining reliability while achieving New York State’s longstanding goal of decarbonizing Downstate New York energy consumption.<sup>6</sup> By entering service in Spring 2026 as anticipated, the CHPE Project will create sufficient “reliability margins within New York City” to push off the need to add new generating or other resources for up to five or six years.<sup>7</sup>

Like the other many developers that have filed petitions, Petitioners faced global supply chain shortages and market disruption, and the substantial negative impacts of inflation and interest rate increases on construction costs in both the United States and Canada. For this reason, the CHPE Project is similarly situated to the other major New York renewable energy project petitioners seeking cost adjustments and should be treated equally and consistently with respect to any cost adjustments granted by the Commission.<sup>8</sup>

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<sup>6</sup> With a 95% capacity factor, the CHPE Project can deliver 10.4 terawatt hours (“TWh”) per year of renewable energy, amounting to approximately 20% of New York City’s total power needs. It will reduce carbon emissions annually by about 3.9 million metric tons and reduce local air pollutants from fossil-fueled power plants by nearly 20% by delivering clean energy from HQUS’s portfolio of renewable energy projects to the New York Control Area. It will save New York State’s homes and businesses \$17.3 billion in wholesale energy costs, and it will create \$23 billion in new economic output and \$1.4 billion in new tax revenue statewide. *See* PA Consulting, *Analysis of Economic, Environmental, Resiliency and Reliability Benefits to the State of New York* at 8-9 (May 10, 2021), available at: [https://chpexpress.com/wp-content/uploads/2021/05/PA-Consulting-Tier-4-REC-Bid-Report\\_05-10-2021.pdf](https://chpexpress.com/wp-content/uploads/2021/05/PA-Consulting-Tier-4-REC-Bid-Report_05-10-2021.pdf).

<sup>7</sup> NYISO, *Short Term Assessment of Reliability: 2023 Quarter 2* (July 14, 2023) at 23 (“NYISO 2023 Reliability Assessment”), available at: <https://www.nyiso.com/documents/20142/16004172/2023-Q2-STAR-Report-Final.pdf/5671e9f7-e996-653a-6a0e-9e12d2e41740>. The CHPE Project should also prevent the need for New York to take emergency steps to retain polluting peaker units in order to preserve reliability margins—an outcome with detrimental air quality and environmental justice consequences. *See id.* at 30.

<sup>8</sup> On June 7, 2023, ACE-NY, Sunrise Wind LLC, and Empire Offshore Wind LLC and Beacon Wind LLC submitted separate petitions to modify their respective NYSERDA REC contracts to implement a one-time inflationary adjustment mechanism in the instant proceeding. On June 14, 2023, CPNY submitted a similar petition requesting an adjustment to its Tier 4 REC contract commensurate with any modification granted under ACE-NY’s petition.

Accordingly, Petitioners propose that the Commission authorize NYSERDA to adopt a program-wide cost adjustment formula covering all Approved Projects, based on the inflationary adjustment already provided by NYSERDA for new Tier 1 REC contracts.<sup>9</sup> The adoption of a program-wide, formula-based price adjustment for construction costs for all new-build project components is Petitioners' preference, as it would treat all developers equally.

If the Commission prefers not to move forward with a program-wide cost adjustment but instead to implement specific price adjustments for each REC tier for the portions of Approved Projects not yet in operation, Petitioners provide herein a formula that NYSERDA could use to adjust its payments under Tier 4 to compensate for the dramatic change in the costs of new-build construction of transmission infrastructure.<sup>10</sup>

Either one of these proposals would result in a modest increase to the price under the HQUS REC Contract and strike a balance in achieving New York's climate goals and ensuring affordable electricity rates for New York customers. An adjustment as a result of increased construction costs for the new-build transmission components based on the formula found in the attached Expert Report by Christopher Russo of Charles River Associates ("Russo Report") would result in a slightly higher price adjustment than the project-wide formula based on the inflationary adjustment that NYSERDA has included under new Tier 1 REC contracts.

For the CHPE Project, either type of price adjustment would be applicable *only* to the new-build transmission components of the CHPE Project, which make up 46% of the contract price.<sup>11</sup>

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<sup>9</sup> See Petition section II.B.2.

<sup>10</sup> See Expert Report by Christopher Russo of Charles River Associates annexed hereto as Exhibit A relating to construction cost increases for the new-build transmission components of the U.S. portion of the CHPE Project (the "Russo Report").

<sup>11</sup> As explained in n.5, *supra*, a formula-based upward adjustment to the per-megawatt-hour rate under the HQUS REC Contract for the new-build transmission components (referred to in the HQUS REC Contract

Neither approach would make Petitioners whole for the unforeseeable costs they have incurred with respect to both the U.S. and Canadian portions of the project. And under either approach, the CHPE Project would remain strongly net beneficial for New York customers.

Petitioners' proposed cost adjustment would treat equitably all renewable energy developers facing the same unforeseeable cost increases and meet New York's renewable goals at the lowest possible cost to ratepayers. Fair treatment of and non-discrimination among similarly situated parties is a basic principle that binds the Commission.<sup>12</sup> New York contracting law and procurement guidelines also emphasize the importance of "promot[ing] fairness" in the treatment of program participants, including this program.<sup>13</sup> In its own decisions, this Commission has steadfastly applied uniform and equal treatment to parties facing similar challenges. For example, in establishing the Zero Emission Standard in this docket, the Commission specifically declined to base its cost relief on the severity or impact of financial conditions on each project, but instead thoughtfully embraced an across-the-board, formula-based approach to pricing the environmental attributes.<sup>14</sup> Meeting the Commission's critical renewable energy goals requires the same

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as the Associated New Transmission Facility) would allow CHPE to increase its transmission rate charged to HQUS.

<sup>12</sup> See, e.g., *N.Y. State Elec. & Gas Corp. v. Pub. Serv. Comm'n of State of N.Y.*, 308 A.D.2d 108, 115 (App. Div. 3d Dep't 2003) (expressing the view that the anti-discrimination provisions of the Public Service Law § 66(12)(d) apply with equal force to the Commission) (citing *Matter of Lefkowitz v. Pub. Serv. Comm'n.*, 40 N.Y.2d 1047 (1976) (holding that the anti-discrimination provisions of Public Service Law § 65(2) and (3) apply to the Commission)).

<sup>13</sup> N.Y. State Fin. Law Art. 11 §163; see also New York Office of General Services, *NY State Procurement Guidelines* (May 2014), Section V(E), available at <https://ogs.ny.gov/system/files/documents/2018/08/psnys-procurement-guidelines.pdf>. A more recent draft version provides similarly. See New York Office of General Services, *Draft NY State Procurement Guidelines* (January 2023) Section VI, available at <https://ogs.ny.gov/system/files/documents/2023/01/draft-procurement-guidelines-2023.pdf>.

<sup>14</sup> Case 15-E-0302, *Order Adopting a Clean Energy Standard* (issued and effective August 1, 2016) ("CES Order") at 140 n.99.

equitable approach to solve the problem of unforeseeable construction cost increases faced by all of the petitioners' projects here, including the CHPE Project.

Such an approach also avoids the clear prohibition in New York law against arbitrary and capricious decisions, namely reaching different results or treating parties differently on “essentially the same facts.”<sup>15</sup> Here, it would be both arbitrary and unfair to treat developers differently when all REC program participants prevailed in the same contract award process and became subject to the same unforeseeable construction cost increases. Cost adjustments that benefit only certain REC program participants—while discriminating against others—would be contrary to Article 78 Civil Practice Law & Rules.<sup>16</sup>

To be sure, the viability of different projects before the Commission may vary. But a particular developer's willingness or ability to maintain project viability through proactive management and mitigation efforts, with their attendant costs, or simply by absorbing cost increases to ensure timely progress, should not result in a disadvantage to that developer. Petitioners took significant, costly steps that were necessary to keep the CHPE Project moving forward. It would create an ill-advised precedent and the wrong incentives for future renewable projects if the Commission were to compensate projects that failed to take all necessary steps to

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<sup>15</sup> *Matter of Charles A. Field Delivery Serv. Inc.*, 66 N.Y.2d 516, 517 (1985); *see, e.g., Italian Sons & Daughters of Am., Inc. v. Common Council of Buffalo*, 89 A.D.2d 822, 823 (4th Dep't 1982) (holding that “because the applications in this case were so substantially similar” but treated differently, “the inference arises that common council may have acted arbitrarily.”); *Matter of Buffalo Civic Auto Ramps v. Serio*, 21 A.D.3d 722, 725 (1st Dep't 2005) (in reversing agency decision the court explained, “[w]here two cases are so similar as to require the same treatment, to treat them differently would be evidence that the determination should be considered arbitrary and capricious.”).

<sup>16</sup> N.Y. C.P.L.R. § 7803; *see, e.g., Candrea v. Bd. of Educ. of Yonkers City Sch. Distr.*, 236 A.D.2d 536, 538 (2d Dep't 1997) (finding agency decision to deny deputy superintendent membership into the State Teachers' Retirement System was arbitrary and capricious because, *inter alia*, there was “no rational basis for distinguishing the petitioner's eligibility from that of the others who were found to be eligible.”).



proceed, while choosing not to compensate projects that faced the same unforeseeable cost increases yet took such costly steps to ensure project completion.

Nor can differential treatment of petitioners be justified by the fact that other petitions have sought a price adjustment for new-build generation components, while Petitioners seek a price adjustment for new-build transmission components. Under all of the REC tiers, customers are paying for the delivery of clean energy. A REC is not created until the clean energy is delivered. A new renewable energy source does not help the State achieve its CLCPA goals unless the output can be delivered where it is needed. To obtain the clean energy needed to meet the CLCPA goals, the State must invest in both new generation sources and new transmission facilities that can bring such renewable energy to customers—especially to customers located in New York City, who historically have been unable to access clean energy to the same extent as customers Upstate. This was the rationale for creating the Tier 4 REC program. Nor can it be disputed that the same inflationary and supply chain construction cost increases have impacted new-build generation and new-build transmission. There is no reason to treat the two differently.

For the reasons set forth below, Petitioners respectfully submit that the Commission should authorize the program-wide cost adjustment proposed herein.

## **II. BACKGROUND**

### ***A. Petitioners***

CHPE and HQUS have partnered to deliver renewable energy to New York City via the CHPE Project pursuant to the HQUS REC Contract. CHPE is responsible for the U.S. side of the Project and, accordingly, is overseeing construction of and has obtained financing for that portion comprising approximately 339 miles of HVDC transmission lines connecting the U.S.-Canada border to a new zero-emission converter station in Astoria, Queens. HQUS is financing and

overseeing the construction of a new high-voltage alternating current to HVDC converter station in Québec and 36 miles of new HVDC transmission lines on the Canadian side of the CHPE Project.

As further discussed below, and like the other petitioners, the new-build transmission components of the CHPE Project have experienced significant, unforeseeable construction cost increases from macroeconomic forces beyond Petitioners' control. Thus, Petitioners have an interest in ensuring that the HQUS REC Contract is treated fairly and equitably with respect to price adjustments requested by other project developers in the program. An upward price adjustment to the HQUS REC Contract for the new-build transmission components of the project will allow CHPE to adjust its transmission rate with HQUS to mitigate some of CHPE's construction cost increases for the CHPE Project.

**B. New York's REC Program Has Evolved To Address Unforeseen Cost Increases**

*1. New York's Clean Energy Standard and the Renewable Energy Procurement Through a Competitive Solicitation*

In 2015, as part of its Reforming the Energy Vision initiative to transform New York's energy landscape, the Commission initiated Case 15-E-0302 to separately consider the development of a large-scale renewable framework.<sup>17</sup> In the CES Order, the Commission adopted the State's 50x30 goal and, in furtherance of that goal, established a Clean Energy Standard consisting of two programs: (1) the Renewable Energy Standard ("RES") and (2) the Zero Emissions Credit ("ZEC") program.<sup>18</sup> As further discussed below, the CES also created a framework of competitive solicitations for the State to procure new renewable generation.

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<sup>17</sup> Case 15-E-0302, *et al.*, *Notice Instituting Proceeding, Soliciting Comments and Providing for Technical Conference* (issued and effective June 1, 2015).

<sup>18</sup> CES Order at 12-14.

Through subsequent modifications to the CES framework, the solicitations expanded to offshore wind as well as the delivery of clean energy to Zone J (New York City) under the Tier 4 program.

## 2. *NYSERDA Has Added Inflationary Adjustment to Tier 1 RECs and ORECs*

The Tier 1 REC framework has evolved over the years to recognize the need to address unexpected obstacles in completion of renewable energy projects. In the earlier solicitations (2017-2019), the prices of Tier 1 RECs were as-bid fixed rates. To help alleviate, among other things, higher financing costs associated with fixed-price projects, NYSERDA obtained Commission approval in 2020 to modify Tier 1 REC contracts going forward by incorporating a pricing structure indexed to energy and capacity market prices for future Tier 1 solicitations.<sup>19</sup> Subsequently, NYSERDA requested authorization to provide developers who had been awarded projects under prior solicitations an option to convert their as-bid fixed REC contract price to an indexed strike price. The Commission also granted the request for a change in the existing contracts, finding that doing so would help foster renewable energy development to achieve the State's ambitious clean energy goals.<sup>20</sup>

More recently, beginning with the 2022 Tier 1 REC solicitation—in recognition of increased costs faced by participants between bidding and the start of construction—NYSERDA has included an option to submit an alternative bid proposal that includes an inflation adjustment in the indexed strike price.<sup>21</sup> This alternative allows for a one-time adjustment to the strike price to account for inflation between the time of the bid and the start of construction.

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<sup>19</sup> Case 15-E-0302, *Order Modifying Tier 1 Renewable Procurements* (issued and effective Jan. 16, 2020).

<sup>20</sup> Case 15-E-0302, *Order Authorizing Voluntary Modification of Certain Tier 1 Agreements* (issued and effective Nov. 20, 2020) at 2.

<sup>21</sup> NYSERDA, *Renewable Energy Standard Purchase of New York Tier 1 Eligible Renewable Energy Certificates Request for Proposals (RFP)* (Jan. 13, 2023), at 12, available at <https://portal.nyserdera.ny.gov/servlet/servlet.FileDownload?file=00P8z000002LTLBEA4>.

Pursuant to Commission orders authorizing Phases 1 and 2 of competitive solicitations for Offshore RECs in 2018 and 2020, respectively, NYSERDA procured ORECs associated with 4,312 MW of offshore wind.<sup>22</sup> The 2018 and 2020 solicitations did not provide for an inflationary cost adjustment mechanism for OREC prices. As with the 2022 Tier 1 REC solicitation, however, NYSERDA’s most recent OREC solicitation in 2022 (Phase 3) contained an alternative bid option to include a one-time adjustment mechanism to account for inflation.<sup>23</sup>

### **C. The Critical Importance of Transmission and the Tier 4 RECs**

#### *1. Establishment of Tier 4 to Address Transmission Needs*

New York’s nation-leading climate initiatives, enhanced by passage of the CLCPA, resulted in significant renewable generation development. But New York State suffers from a lack of transmission facilities between Upstate New York and the densely populated New York City area (Zone J), a situation that the New York Independent System Operator (“NYISO”) has called “the Tale of Two Grids.” Much of Upstate New York’s energy needs are being met by zero-emissions generation, but Downstate New York, which comprises two-thirds of the total energy

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<sup>22</sup> Case 18-E-0071, In the Matter of Offshore Wind Energy, Order Establishing Offshore Wind Standard and Framework for Phase 1 Procurement (issued and effective July 12, 2018); and Order Authorizing Offshore Wind Solicitation in 2020 (issued and effective April 23, 2020); see also NYSERDA’s 2018 and 2020 Offshore Wind Solicitation webpages, available at <https://www.nyserda.ny.gov/All-Programs/Offshore-Wind/Focus-Areas/Offshore-Wind-Solicitations/2018-Solicitation> and <https://www.nyserda.ny.gov/All-Programs/Offshore-Wind/Focus-Areas/Offshore-Wind-Solicitations/2020-Solicitation>.

<sup>23</sup> NYSERDA, Purchase of Offshore Wind Renewable Energy Certificates (July 27, 2023) (ORECRFP22-1) at 66-68, available at [https://portal.nyserda.ny.gov/CORE\\_Solicitation\\_Document\\_Page?documentId=a018z0000000yC6&\\_gl=1\\*19xt7uo\\*\\_ga\\*OTY1Mjg2NzE5LjE2NTY0MjgzMDU.\\*\\_ga\\_DRYJB34TXH\\*MTY5MTk2ODczNC4xNS4xLjE2OTE5NjkyMDQuMC4wLjA](https://portal.nyserda.ny.gov/CORE_Solicitation_Document_Page?documentId=a018z0000000yC6&_gl=1*19xt7uo*_ga*OTY1Mjg2NzE5LjE2NTY0MjgzMDU.*_ga_DRYJB34TXH*MTY5MTk2ODczNC4xNS4xLjE2OTE5NjkyMDQuMC4wLjA).

needs in the State, remains mostly dependent upon fossil-fuel based generation<sup>24</sup> exacerbated by the retirement of Indian Point.

To meet the State’s climate goals, therefore, significant investment in new transmission infrastructure is required to connect the congested areas (*i.e.*, Zone J/New York City) with the plentiful renewable energy available in Upstate New York and elsewhere. In recognition of this need, the Commission modified the CES to establish a Tier 4 REC. NYSERDA conducted a robust competitive solicitation. Developers proposed seven unique projects with a total of 33 related options. NYSERDA evaluated proposals using a societal Benefit Cost Assessment (“BCA”) Framework, which considered, among other things, the value of avoided electricity system investment costs, the value of carbon emission reductions, and public health benefits from improvements in air quality, as well as project cost.

Ultimately, the HQUS REC Contract and the CPNY Project<sup>25</sup> were selected as the top two projects to be awarded Tier 4 REC contracts. In total, these projects will deliver 18 million MWh of additional renewable energy into New York City each year, providing significant economic, environmental, and public health benefits to the State. Together, the two projects provide New York State in excess of \$8.2 billion in net societal benefits, create approximately 10,000 statewide jobs, reduce carbon emissions by 77 million tons, and include \$460 million in community benefit funds.<sup>26</sup>

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<sup>24</sup> See NYISO, *2023 Power Trends: A Balanced Approach to a Clean and Reliable Grid* (Aug. 14, 2023) at 37, available at: <https://www.nyiso.com/documents/20142/2223020/2023-Power-Trends.pdf/7f7111e6-8883-7b10-f313-d11418f12fbf?t=1686132123808>.

<sup>25</sup> The “CPNY Project” refers to the transmission line and solar and wind developments under the Tier 4 Renewable Energy Certificate Purchase and Sale Agreement entered into between CPNY and NYSERDA.

<sup>26</sup> NYSERDA, *During Climate Week, Governor Hochul Announces Major Green Energy Infrastructure Projects to Power New York City With Wind, Solar and Hydropower From Upstate New York and Canada*

## 2. *The HQUS REC Contract and CHPE Project Benefits*

The HQUS REC Contract is a 25-year agreement with NYSERDA under which HQUS will deliver 1,250 MW of hydropower to New York City via the CHPE Project. The resource portfolio consists of 36,910 MW of hydropower in Québec.

The strike price for the HQUS REC Contract is \$97.50 for Contract Year 1. The strike price escalates by 2.5% each year. The REC price paid by NYSERDA is the strike price less wholesale market price indices for energy and capacity. Therefore, the price ultimately paid for the RECs will vary depending on the future energy and capacity markets.<sup>27</sup>

The Commission approved both the HQUS REC Contract and the CPNY REC contract together via a single order at the same meeting with the same public comment period.<sup>28</sup> The Commission found that both projects were necessary to comply with the CLCPA's focus on decarbonizing New York's electric sector and would unlock significant societal benefits.<sup>29</sup>

The CHPE Project received widespread support from a broad spectrum of stakeholders and was an integral component of HQUS's Tier 4 proposal, since the CHPE Project must be constructed in order for HQUS to deliver the energy and Tier 4 RECs from the HQUS portfolio to the delivery point in Zone J. Governor Hochul applauded the approval of both contracts as a "major step forward in achieving New York State's goal of 70 percent of our energy from

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(Sept. 20, 2021), <https://www.nyserdera.ny.gov/About/Newsroom/2021-Announcements/2021-09-20-Governor-Hochul-Announces-Major-Green-Energy-Infrastructure-Projects-to-Power-New-York-City-With-Wind>.

<sup>27</sup> See Section 4.02 of the HQUS REC Contract, provided as Appendix B to NYSERDA's Petition Regarding Agreements for Procurement of Tier 4 Renewable Energy Certificates, filed on November 30, 2021 in Case 15-E-0302.

<sup>28</sup> Case 15-E-0302, *Order Approving Contracts for the Purchase of Tier 4 Renewable Energy Certificates* (issued and effective April 14, 2022).

<sup>29</sup> *Id.* at 126.

renewable resources, while paving the way for thousands of high-quality jobs, spurring billions in economic activity, reducing our dependence on fossil fuels, and ushering in a cleaner, greener New York for all.”<sup>30</sup>

The CHPE Project will deliver substantial benefits that fulfill the purpose of the Tier 4 program, including:

- Delivering over 10 TWh of clean, renewable energy to New York City annually for the 25-year contract term;<sup>31</sup>
- Providing the reliability and stability of a continuously available and geographically diverse baseload supply;
- Commitments that will protect the environmental integrity of the Hudson River and New York’s waterways, and fund new workforce development opportunities for New Yorkers in the clean energy transition; and
- Offering specific economic benefits to disadvantaged communities and improving air quality and health benefits through reduction of harmful pollutants otherwise resulting from high carbon-emitting peaking generation.

The CHPE Project will play an especially important role in meeting reliability needs in New York City. NYISO has emphasized the need for timely completion of the CHPE Project, noting that “reliability margins within New York City may not be sufficient even for expected weather if . . .

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<sup>30</sup> NYSERDA, *Governor Hochul Announces Approval of Contracts to Deliver Clean, Renewable Electricity to New York City* (April 14, 2022), <https://www.nyserda.ny.gov/About/Newsroom/2022-Announcements/2022-04-14-Governor-Hochul-Announces-Approval-of-Contracts>.

<sup>31</sup> Delivering over 10 TWh per year represents a high transmission line utilization of 95 percent, higher than any other CES project, and the HQUS REC Contract includes commitments to deliver renewable energy in both the summer and winter periods.

the CHPE project experiences a significant delay.”<sup>32</sup> Indeed, some fossil-fuel based generation that would otherwise be eliminated by the New York Department of Environmental Conservation’s Peaker Rule<sup>33</sup> may need to remain in service until the CHPE Project is completed to ensure grid reliability in the near term.<sup>34</sup> Once the CHPE Project is in service, it is projected to defer the need to add new NYC In-City generating or other power resources until 2032.<sup>35</sup>

**D. Unforeseeable Economic Conditions Have Significantly Increased the Construction Costs of Generation and Transmission Infrastructure Projects.**

Since the Commission’s approval of the HQUS REC Contract, various significant, unforeseeable external economic conditions have impacted the energy industry in New York and more broadly. In particular, the aftermath of the Covid-19 pandemic and the war between Russia and Ukraine, among other factors, have resulted in significant increases in inflation and interest rates, labor constraints, and shortages of raw materials, specialized components, and various primary and auxiliary power equipment. While the impact has been global, new energy project development, in particular, has experienced significant construction cost increases. These challenges were most intensely felt in the latter part of 2022, shortly after the Commission approved the Tier 4 REC contracts in April 2022.

Inflation. The Covid-19 pandemic resulted in a dramatic increase in inflation, particularly in 2022. At its peak, the inflation rate hit 9.1% in June 2022, which was the highest in over 40

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<sup>32</sup> NYISO, *2022 Reliability Needs Assessment* (Nov. 15, 2022), at 8, available at: <https://www.nyiso.com/documents/20142/2248793/2022-RNA-Report.pdf/b21bcb12-d57c-be8c-0392-dd10bb7c6259>.

<sup>33</sup> The Peaker Rule, adopted by the Department of Environmental Conservation in 2019, limits nitrogen oxides emissions from simple-cycle combustion turbines used as peakers to meet spikes in demand. *See* 6 N.Y.C.R.R. Subpart 227-3. To comply with the emissions reduction requirement, certain generators are expected to deactivate or limit operations by 2025.

<sup>34</sup> *See* NYISO 2023 Reliability Assessment, *supra* n.7, at 23.

<sup>35</sup> *Id.*



years.<sup>36</sup> To avoid delays to the CHPE Project timeline, much of the procurement needed to occur during this volatile inflationary period. In comparison, the average inflation rate in 2021 was 4.7%, and in 2020 was only 1.23%.<sup>37</sup> At the time that HQUS submitted its bid, inflation expectations, as indicated by market-traded inflation swaps with maturities covering the anticipated construction period, were approximately 2.9%. The agreed REC Contract price was based on an expectation by all parties, consistent with market levels of swaps, that the inflation rate would continue at a rate similar to recent history, rather than the actual inflation subsequently experienced in 2022.<sup>38</sup>

Supply Shortages. Supply shortages are a significant contributor to the cost increases that the energy industry, including the CHPE Project, has been experiencing. Spurred by proactive policies to promote a clean energy transition both in the United States and in other countries, the renewable energy sector is facing dramatically higher demand at the same time that traditional sources of European energy have become unavailable due to the war in Ukraine. The result has been higher costs (driven by much higher demand) and reduced supply for equipment and components compared with what was anticipated when HQUS submitted its bid.

Interest Rates. In response to the unprecedented inflationary pressures, the U.S. government has raised interest rates significantly. From the date of the bid to financial close, the

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<sup>36</sup> Trading Economics, “United States Inflation Rate,” available at: <https://tradingeconomics.com/united-states/inflation-cpi#:~:text=Annual%20inflation%20rate%20in%20the%20US%20likely%20accelerated%20to%203.3,highest%20in%20over%2040%20years>.

<sup>37</sup> Macro Trends, “U.S. Inflation Rate 1960-2023,” available at: <https://www.macrotrends.net/countries/USA/united-states/inflation-rate-cpi#:~:text=U.S.%20inflation%20rate%20for%202022,a%200.63%25%20decline%20from%202018>.

<sup>38</sup> Purchase of New York Tier 4 Eligible Renewable Energy Certificates (RECs), Request for Proposals (RFP) No. T4RFP21-1, Section 4.3 (Apr. 20, 2021) (“A nominal discount rate of 5.75% per year and a long-term inflation rate assumption of 2.0% per year will be used in the LNRC calculation procedure.”).

interest rate on 30-Year U.S. Treasury bonds increased from 2.41% to 4.14%, an increase of 72%. This dramatically increased the cost of financing projects, including the CHPE Project.

***E. Specific Impacts of Unforeseeable Cost Increases on the CHPE Project***

Like other clean energy projects, the construction costs for the new-build components of the CHPE Project have been impacted by the cost pressures described above. Yet the CHPE Project managed and absorbed these significant, unforeseeable costs to ensure that it could continue to meet its development timeline. In total, the estimated cost for the U.S. portion of the CHPE Project has increased approximately 35% from the time of the bid submission (in May 2021) to the closing on the financing for the U.S. portion of the CHPE Project in October 2022, when construction began. To be clear, Petitioners are not seeking full recovery of the cost increases the CHPE Project has absorbed over time and will absorb, nor are Petitioners requesting a percentage adjustment to the full HQUS REC Contract price. Instead, Petitioners urge the Commission to adopt a program-wide, formula-based price adjustment covering the construction costs for the new-build components of all projects across the program. For the HQUS REC Contract, that price adjustment would be limited to the component of the strike price related to new-build transmission construction costs—which are 46% of the total.

*1. CHPE Project-Specific Cost Increases*

Supply shortages, in particular, have increased the CHPE Project's construction costs substantially beyond what could have been reasonably foreseen at the time of the bid submission. Certain key equipment items, including transformers and cables, are experiencing significant backlogs. To ensure that the CHPE Project would progress according to schedule despite global supply constraints, Petitioners paid substantial additional dollars to suppliers to maintain schedule and viability. For example, by the time of financial close for the U.S. portion of the CHPE Project

and commencement of construction, the cost of the converter station had increased by more than 40% compared to cost at the time of the bid. This is a result of worldwide shortages after the pandemic, as well as an extreme increase in European demand for HVDC projects as a direct result of the war in Ukraine. Further, due to supply shortages as well as fuel and labor cost escalations, the CHPE Project's contractors required significant price increases for their respective portions of the construction.

Rising interest rates and tighter lending conditions also have had a significant impact on the project cost. By the time of the financial close and commencement of construction of the U.S. portion of the CHPE Project, the CHPE Project's financing costs projected through commercial operations date had increased by more than \$300 million due to (i) higher interest rates, (ii) higher debt amounts, (iii) higher upfront fees charged by banks, and (iv) CHPE entering a committed debt underwriting in advance of financial close.

## *2. Mitigation Efforts*

The CHPE Project is of utmost importance to the State's ability to decarbonize Downstate New York energy consumption while ensuring reliability. Accordingly, the CHPE Project incurred additional costs prior to the U.S. financial close to limit project delays despite supply chain constraints and shortages. It mitigated cost increases to the greatest extent possible, but it still incurred cost increases including the costs of its mitigation efforts. Measures taken by the CHPE Project included:

- Petitioners funded security and pre-payments totaling more than \$115 million to secure HVDC cable manufacturing slots.
- Petitioners paid a premium to execute engineering, procurement, and construction (EPC) contracts (taking on approximately \$590 million at risk if the contracts were cancelled), at

the peak of market disruption (summer 2022), and mobilized contractors, all at significant risk in advance of financial close to avoid significantly delaying the implementation of the CHPE Project.

- In 2022, CHPE executed interest rate hedges, trying to mitigate the impact of persistently rising interest rates, and entered into an advance committed debt underwriting with key relationship banks.

Each of these critical steps came at a cost premium, but CHPE could not have achieved financial close and the CHPE Project would have slipped into a state of limbo, unable to start construction, if Petitioners had not taken these actions.

***F. Recent Petitions for a Price Adjustment***

On June 7, 2023, ACE-NY submitted a petition, on behalf of solar and land-based wind developers that have been awarded Tier 1 REC contracts but have not yet completed their projects, to modify their contracts to include an adjustment mechanism to account for cost increases in certain key cost categories.

The same day, offshore wind developer Sunrise Wind LLC (which is a joint venture between an Orsted subsidiary and an Eversource subsidiary) filed a petition requesting authority for NYSERDA to amend the OREC contract with Sunrise Wind LLC to incorporate inflation and interconnection cost adjustment mechanisms similar to those included in NYSERDA's most recent offshore wind solicitation. Also on the same day, two other offshore wind development entities Empire Offshore Wind LLC and Beacon Wind LLC (both indirectly owned by Equinor ASA and BP plc) filed a similar petition requesting similar revisions to their respective OREC agreements. Seven days later, on June 14, 2023, CPNY submitted a petition requesting that the Commission authorize NYSERDA to amend the Tier 4 REC purchase and sale agreement between CPNY and

NYSERDA to provide relief commensurate to any relief granted to Tier 1 generators pursuant to ACE-NY's June 7, 2023 petition.

These petitioners all argued for an inflation adjustment to their strike prices, citing the same inflationary and supply chain pressures described above.

### III. ARGUMENT

#### A. *Authorization from the Commission To Allow REC Contracts To Be Modified To Include an Inflation and Cost Adjustment Should Apply To All REC Contracts.*

The Commission should authorize NYSERDA to modify contracts for the Approved Projects to include a cost adjustment mechanism for new-build components of Approved Projects on a program-wide basis, or alternatively by tier. For the avoidance of doubt, the relief proposed below would not be sufficient to make Petitioners whole for the construction cost increases they have incurred and will incur.

##### 1. *The Commission Has Authority to Grant an Adjustment.*

As other petitioners have set forth in their petitions, the Public Service Law grants the Commission broad statutory authority and discretion to authorize NYSERDA to modify the REC contracts. Pursuant to PSL §5(1), the “jurisdiction, supervision, powers and duties” of the Commission extend to the “manufacture, conveying, transportation, sale or distribution of . . . electricity.”<sup>39</sup> Further, PSL Section 5 mandates that the Commission “encourage all persons and corporations subject to its jurisdiction to formulate and carry out long-range programs . . . for the performance of their public service responsibilities with economy, efficiency, and care for the

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<sup>39</sup> N.Y. Pub. Serv. Law § 5(1).

public safety, the preservation of environmental values and the conservation of natural resources.”<sup>40</sup> The Commission relied on that provision to create the Clean Energy Standard.<sup>41</sup>

Additionally, PSL Section 66-p (enacted pursuant to the CLCPA) adopts specific statutory clean energy goals—including that at least 70% of state-wide electric generation would be supplied by renewable generation by 2030 and that 100% of state-wide electric generation would be supplied by zero-emission generation by 2040—and directs the Commission to “establish a program to require” achievement of those goals.<sup>42</sup>

PSL §4(1) also expressly provides the Commission with “all powers necessary or proper to enable [the Commission] to carry out the purposes of [the PSL]” including, without limitation, to ensure electric corporations furnish safe and adequate service at just and reasonable rates in accordance with PSL Section 65.<sup>43</sup>

These sections grant the Commission the authority to grant the program-wide relief discussed herein.

## *2. Uniform Adjustment of REC Contracts Must Be Applied on a Program-Wide Basis.*

The Commission should direct NYSERDA to adopt, on a program-wide basis, the same type of price adjustment formula for the new-build components of the Approved Projects as NYSERDA has adopted for post-2022 Tier 1 projects, or a similar formula. This approach would allow an adjustment equal to 75% of the contract price multiplied by the U.S. Bureau of Labor Statistics (BLS) Producer Price Index (PPI) changes between the dates associated with the bid and

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<sup>40</sup> N.Y. Pub. Serv. Law § 5(2).

<sup>41</sup> CES Order at 66-67.

<sup>42</sup> N.Y. Pub. Serv. Law § 66-p(2).

<sup>43</sup> N.Y. Pub. Serv. Law § 65(1).

the Final Investment Decision.<sup>44</sup> NYSERDA has already endorsed this formula, and it is simple to apply. For the avoidance of doubt, in the case of the CHPE Project such increase would apply only to the new-build component, *i.e.*, 46% of the HQUS Index Tier 4 REC Strike Price. Other petitioners have requested an adjustment based on specific price indices (*e.g.*, construction, copper, etc.) weighted to reflect their relative share of project costs. Petitioners also support that framework, and in the attached Russo Report propose an approach that could be applied to the new-build transmission components of Tier 4 REC contracts.

Irrespective of the specific formula adopted, the Commission must adopt the same framework for all parties. All developers of unbuilt projects are similarly situated in that they all face similar unprecedented cost increases caused by the same global factors. It would be unfair and contrary to established New York law to change the contracts that were proposed and awarded for renewable energy projects for some parties but not for others, or to adopt one framework for some contracts and a different framework for other contracts, based on perceived levels of financial need. The viability of many projects may be at risk to varying degrees, but a particular developer's willingness to maintain project viability and incur additional costs—due to proactive management and mitigation efforts, or otherwise—should not result in a disadvantage to that developer.

Fair treatment of and non-discrimination among similarly situated parties is a basic principle that binds the Commission.<sup>45</sup> New York law clearly establishes that it is arbitrary and capricious to reach different results on “essentially the same facts.”<sup>46</sup> A Commission decision treating one entity differently from the Commission's treatment of others is arbitrary absent

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<sup>44</sup> *See supra* at n.211.

<sup>45</sup> *See supra* at n.122.

<sup>46</sup> *See supra* at n.155.

“circumstance[s] peculiar” to the entity, and is subject to annulment.<sup>47</sup> If the Commission fails to follow its precedent and permits some but not all developers to recover their increased costs without providing a “reason for reaching a different result on essentially the same facts,” such a failure would be “arbitrary and capricious.”<sup>48</sup>

New York contracting law and procurement guidelines also emphasize the importance of procurement procedures that “promot[e] fairness.”<sup>49</sup> It would be both arbitrary and unfair to treat developers differently when all REC program participants went through the same contract award process and are subject to the same economic conditions materially impacting their contracts. Accordingly, project-specific adjustments that benefit only certain REC program participants—while discriminating against others—would be contrary to Article 78 Civil Practice Law & Rules.<sup>50</sup>

### *3. Program-Wide Adjustments Are Good Policy.*

A program-wide, formula-based price adjustment for new-build project components, applicable to all developers, is also more prudent from a policy perspective than any adjustments based on individual project circumstances.

A program-wide approach is necessary to avoid creating perverse incentives for the future. If the Commission were to authorize price adjustments only when developers threaten to abandon their projects, that would incentivize brinkmanship that is not conducive to meeting CLCPA or other public policy goals in the future. Awarding price adjustments only upon project-specific

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<sup>47</sup> See *Nat’l Fuel Gas Distrib. Corp. v. Pub. Serv. Comm’n.*, 154 A.D.2d 31, at 36 (3d Dep’t 1990); see also *Long Island Lighting Co. v. Pub. Serv. Comm’n.*, 137 A.D.2d 205 (3d Dep’t 1988).

<sup>48</sup> *Matter of Charles A. Field Delivery Serv., Inc.*, 66 N.Y.2d 516, 517 (1985); see also *Knight v. Amelkin*, 68 N.Y.2d 975, 978 (1986) (agency acted arbitrary and capricious where the “earlier determinations by the Zoning Board with sufficient factual similarity” had different result); *Matter of Klein v. Levin*, 305 A.D.2d 316, 320 (1st Dep’t 2003) (annulling agency’s decision as arbitrary and capricious where different result on similar facts without “adequate explanation”).

<sup>49</sup> See *supra* at n.133.

<sup>50</sup> See *supra* at n.166.



showings of financial need would promote and reward unrealistic, low-ball, and speculative bids (which are not in the State’s interest and which the Commission has stated it wants to discourage<sup>51</sup>) and promote and effectively reward suboptimal project management during challenging conditions. By contrast, a program-wide adjustment applied to all projects recognizes that all renewable energy project developers face the same economic pressures, treats all such developers equally, and does not perversely disadvantage those developers who deal with these pressures most effectively, absorbing increased costs, and work to keep their projects on schedule.

A program-wide remedy is also consistent with the Commission’s approach to similar problems in the past. For example, in establishing the Zero Emission Standard in this docket, the Commission’s goal was to procure environmental attributes from nuclear plants for a price sufficient to prevent nuclear retirements.<sup>52</sup> But the Commission specifically declined to evaluate the cost of each nuclear plant and declined to develop a unit-specific pricing mechanism sufficient to give each unit exactly what it needed and no more—even though such information had been filed in the record.<sup>53</sup> Instead, the Commission reasonably favored an across-the-board, formula-based approach to pricing the environmental attributes, recognizing that the result could be adequate to cover the costs of some plants, while insufficient to cover the costs of others.<sup>54</sup> The

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<sup>51</sup> See, e.g., Order Authorizing Additional Main Tier Solicitations and Directing Program Modifications, Case 03-E-0188 (Jan. 26, 2006) at 17-18; Order Approving Phase 1 Implementation Plan, Case 15-E-0302 (Feb. 22, 2017) at 22-23.

<sup>52</sup> CES Order at 119-52.

<sup>53</sup> See *id.* at 119 (rejecting initial Staff Proposal, which would have compensated nuclear plants “at a price administratively set by the Commission” based on “the anticipated operating costs of the units,” as determined “by a Staff examination of the books and records of the facility,” in favor of a formula-based price tied to the social cost of carbon, without regard to the costs of any individual plant); *id.* at 123 (adopting Revised Staff Proposal which “does not rely on a detailed finding of the exact costs to operate the affected nuclear plants”).

<sup>54</sup> See *id.* at 140 n.99.

Commission should employ similar logic here by adopting a formula-based price adjustment applicable to all projects across the program.

4. *The CHPE Project Will Remain Strongly Net Beneficial for Ratepayers Notwithstanding an Adjustment.*

A formula-based price adjustment would still produce substantial net benefits to New York State. Adding a new supply of hydropower into the New York system will help reduce market prices in Zone J, resulting in lower electricity costs to ratepayers over time and mitigating the rate impact of Tier 4 program costs. A 2021 study by PA Consulting opined that the CHPE Project will bring significant benefits, including that the CHPE Project will decrease costs for residential, commercial, and industrial customers in New York City and across the State by over \$17 billion over the first 25 years of operation.<sup>55</sup> Among the other substantial benefits considered under the BCA were grid reliability, job creation, and emissions reductions.<sup>56</sup> Further, the Commission highlighted that a significant portion of the benefits would accrue to disadvantaged communities,<sup>57</sup> which remains equally important and true today. The NYISO recently highlighted the substantial benefits that would accrue from completing the CHPE Project on schedule.<sup>58</sup> Indeed, the CHPE Project continues to be the least-cost option to decarbonize New York City.

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<sup>55</sup> PA Consulting, *Champlain Hudson Power Express, Analysis of Economic, Environmental, Resiliency and Reliability Benefits to The State of New York* (May 10, 2021) at 13, available at: [https://chpexpress.com/wp-content/uploads/2021/05/PA-Consulting-Tier-4-REC-Bid-Report\\_05-10-2021.pdf](https://chpexpress.com/wp-content/uploads/2021/05/PA-Consulting-Tier-4-REC-Bid-Report_05-10-2021.pdf).

<sup>56</sup> CES Order at 31-32.

<sup>57</sup> *Id.*

<sup>58</sup> For example, the NYISO reported in its 2022 Reliability Needs Assessment that the electric grid “reliability margins within New York City may not be sufficient even for expected weather if ... the CHPE project experiences a significant delay[.]” and further that getting the CHPE Project into commercial operation on time is necessary to have adequate reliability margins in Zone J given that “current plans significantly rely on a single project for the future reliability of the New York City grid.” *See supra* n.32 at 8.

**B. The Commission Should Rule on This Petition in October To Promote a Fair, Efficient, and Orderly Proceeding.**

Assuming the Commission grants the other petitioners' requests to rule by October 12, 2023, and in light of the sensitivities they cite, Petitioners request that the Commission expedite its decision on the instant filing to rule at the same time, given the interrelationship of this petition and the pending REC program price adjustment petitions. Ruling on the related petitions at the same time will "promot[e] the fair, orderly, and efficient conduct of the case" consistent with the Commission's regulations.<sup>59</sup>

In accordance with Section 202 of the State Administrative Procedure Act and Section 3.5(i) of the Commission's regulations, 16 N.Y.C.R.R. § 3.5(i), a draft notification for publication in the New York State Register is annexed hereto as Exhibit B.

**IV. CONCLUSION**

For the reasons set forth herein, Petitioners respectfully request that the Commission order NYSERDA to adopt a program-wide cost adjustment formula covering construction costs for all new-build project components of all of the Approved Projects, based on the inflationary adjustment already provided by NYSERDA for new Tier 1 REC contracts.<sup>60</sup> Alternatively, if the Commission prefers instead to implement specific price adjustments for projects in each REC tier, Petitioners request that the Commission order NYSERDA to adopt a cost adjustment formula applicable to new-build construction costs for transmission projects in Tier 4 such as that formula set forth in the Russo Report.<sup>61</sup>

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<sup>59</sup> 16 N.Y.C.R.R. §3.3(a)(1).

<sup>60</sup> See Petition section III.B.2.

<sup>61</sup> See Russo Report.

Respectfully submitted,

/s/ Jeremy Creelan

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*Attorneys for CHPE LLC*

Dated: August 28, 2023

/s/ Christopher Hilbert

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STATE OF NEW YORK  
PUBLIC SERVICE COMMISSION

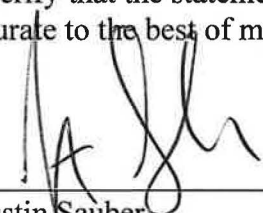
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Proceeding on Motion of the Commission to :  
Implement a Large-Scale Renewable Program : Case 15-E-0302  
and a Clean Energy Standard :  
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In the Matter of Offshore Wind Energy : Case 18-E-0071  
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**VERIFICATION**

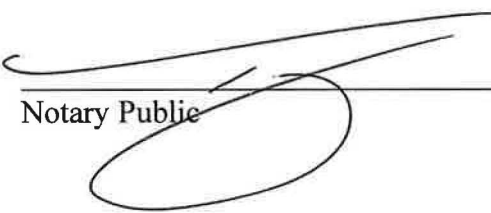
STATE OF NEW YORK )  
 ) ss:  
COUNTY OF NEW YORK )

I, Justin Sauber, being duly sworn, depose and state as follows:

1. I am the Chief Executive Officer of TDI-USA Holdings LLC
2. I have read the foregoing Petition and hereby verify that the statements therein contained, as they pertain to CHPE LLC, are true and accurate to the best of my knowledge and belief.

  
\_\_\_\_\_  
Justin Sauber  
Chief Executive Officer  
TDI-USA Holdings LLC

Sworn to before me this 28<sup>th</sup> day  
of August 2023

  
\_\_\_\_\_  
Notary Public

**TARIQ K. GEORGE**  
NOTARY PUBLIC-STATE OF NEW YORK  
No. 01GE0001572  
Qualified in Kings County  
My Commission Expires 02-15-2027



STATE OF NEW YORK  
PUBLIC SERVICE COMMISSION

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Proceeding on Motion of the Commission to :  
Implement a Large-Scale Renewable Program : Case 15-E-0302  
and a Clean Energy Standard :  
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**VERIFICATION**

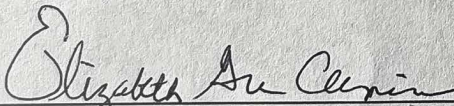
STATE OF NEW YORK )  
 ) ss:  
COUNTY OF ESSEX )

I, Serge Abergel, being duly sworn, deposes and states as follows:

1. I am the Chief Operating Officer of H.Q. Energy Services (U.S.) Inc. ("HQUS").
2. I have read the foregoing Petition and hereby verify that the statements therein contained, as they pertain to HQUS, are true and accurate to the best of my knowledge and belief.

  
\_\_\_\_\_  
Serge Abergel  
Chief Operating Officer  
H.Q. Energy Services (U.S.) Inc.

Sworn to before me this 28th day  
of August 2023

  
\_\_\_\_\_  
Notary Public

ELIZABETH GREEN CERMINARA  
Notary Public, State of New York  
No. 01CE4919700  
Qualified in Franklin County  
Commission Expires April 4, 2026



**Exhibit A**

**Expert Report by Christopher Russo of Charles River Associates**



**Prepared For:**

CHPE LLC

600 Broadway

Albany, NY 12207

# Expert Report of Christopher Russo on behalf of CHPE LLC

New York State Public Service Commission  
Cases 15-E-0302 & 18-E-0071

**Prepared By:**

Charles River Associates

200 Clarendon Street

Boston, Massachusetts 02116

Date: August 28, 2023

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CRA Project No. D66640



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## 1. Introduction

### *Purpose of this Report*

1. I have been asked by Jenner & Block LLP (“Jenner”), acting on behalf of its client, CHPE LLC (“CHPE”), to provide my opinion regarding an adjustment mechanism to reflect changes in costs faced by the Champlain Hudson Power Express Project (“CHPE Project”).
2. This report represents my independent opinion on the topics on which I have been asked to opine. In preparing my report, I was assisted by team members at Charles River Associates (“CRA”) who worked under my direction. The opinions and conclusions included in this report represent my true and complete professional opinion. Neither I nor CRA have any stake in the outcome of these proceedings and my opinion is solely my own. My hourly billing rate for this engagement is \$735 per hour. For the avoidance of doubt, I am offering no legal opinions in my report.

### *Qualifications*

3. I am a Vice President and the head of the Energy Practice at CRA. I hold a BS in Mechanical Engineering from Tufts University and a MS in Technology and Policy from the Massachusetts Institute of Technology (“MIT”) with a focus in Energy and have more than twenty years of professional experience as an energy economist in the electricity sector. Subsequent to my academic training, I held an academic appointment as a Visiting Scientist at the MIT Energy Laboratory.
4. Since beginning my career as a power plant engineer, my academic and professional career has been focused on the economic analysis of electricity markets. I also served on the board of Neuco, a software firm headquartered in Boston which provides software to enable the neural-network control of power plants. A great deal of my work has focused on economic analysis and valuation of energy assets and companies in commercial contexts, and providing expert testimony for corporations, utilities, generation owners, and governments in organized power markets.
5. I have advised clients on a wide range of issues associated with power markets. This has involved evaluation of generating assets, the value of energy companies, transmission pricing and analysis, contract analysis, litigation support and other matters. Much of my work consists of developing and utilizing pricing models to support such analyses.
6. During my career, I have been an independent market advisor on over one hundred different transactions of energy assets, including renewable and conventional generating assets, transmission lines, energy technology companies, and intellectual property associated with generation. In this role, I have often prepared market forecasts and offered opinions (in a proprietary commercial context) as an advisor to banks, private equity and infrastructure funds, and other investors.
7. I have very extensive experience with the power system in New York State and New York City. I was the lead author of the New York City Master Transmission Plan in 2008; I was the lead author of the Indian Point Retirement Analysis; I first analyzed

the economics of the CHPE Project as early as 2009; and I have been retained by Hydro-Quebec in the past to analyze various projects to export power into the United States. I have also performed work adverse to Hydro-Quebec on numerous occasions. I have analyzed or examined nearly every generation or transmission asset in NYC and NYS throughout the course of my career.

8. CRA is a leading global consulting firm with approximately 1,000 employees that offers economic, financial, and business management expertise to law firms, utilities, industries, accounting firms, companies, and governments around the world. CRA specializes in applying economic principles to industries. Formed in 1965 from academic roots at MIT and Harvard, CRA has been engaged by clients for our unique combination of functional expertise and industry knowledge, and objective solutions to complex problems. CRA combines economic and financial analysis with expertise in litigation and regulatory support, business strategy and planning, market and demand forecasting, and policy analysis. Charles River Associates is a registered trade name of CRA International, Inc.

#### *Report Structure*

9. My report is structured as follows:
  - Section 2 describes how the economic climate changed from 2021 to 2022, and the consequent effects on the CHPE Project and other projects.
  - Section 3 describes my proposed approach for cost adjustment for the CHPE Project and other comparable transmission projects.
  - Section 4 contains the Conclusion of my report.
  - Section 5 sets forth my *curriculum vitae*.
10. My analysis and opinions herein are based on the record made available to me as of the date of this report. I reserve the right to update my report if new information becomes available through the course of this proceeding.

#### *Summary of Conclusions*

11. Over the period from May 2021, when the bid for the CHPE Project was submitted to NYSERDA, to October 2022, when the CHPE Project reached its U.S. financial close, economic conditions changed materially with regard to the cost of raw materials and labor essential to construct the project, as well as financing costs. Specifically, commodity costs, labor costs, and interest rates all increased during this period in response to macroeconomic conditions and affected the economics of renewable generation projects and transmission projects throughout New York, and globally.
12. These same forces affected the CHPE Project, increasing its development and expected construction costs during the period from bid submission to financial close. Because the REC payments from NYSERDA did not change, the CHPE Project's projected financial returns consequently were impacted materially.
13. To address these changes, I have proposed in my report a formulaic approach for NYSERDA to adjust its payments in connection with new-build transmission projects

like the CHPE Project to compensate for the increased costs of new-build construction of transmission infrastructure.

14. Using my assumptions, if NYSERDA were to adopt my proposed formula, H.Q. Energy Services (U.S.) Inc's ("HQUS") Index Strike Price under the Tier 4 REC Contract for the CHPE Project would increase by approximately 11%.

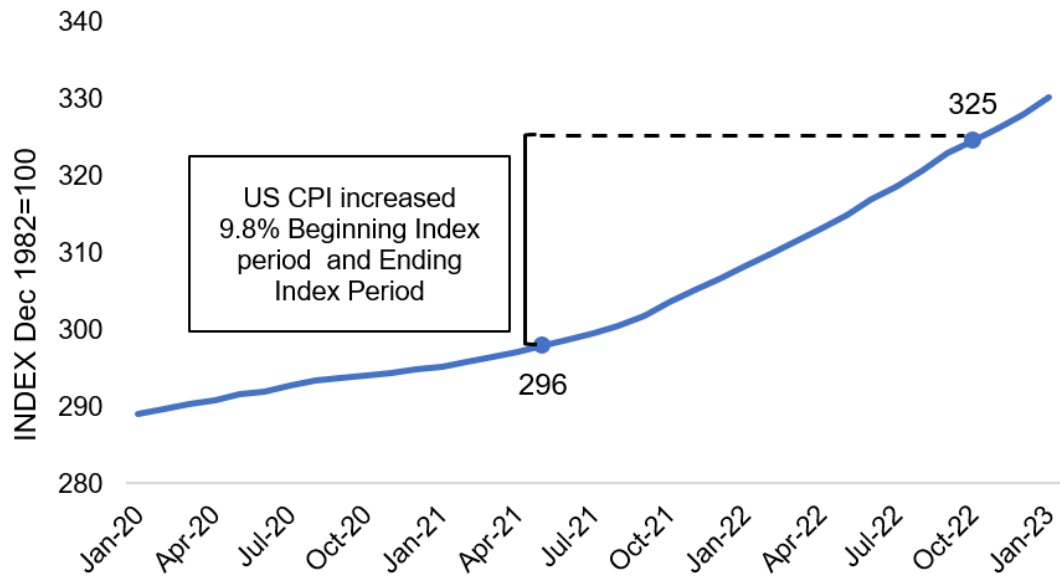
## 2. Background

### *Review of Economic Conditions*

15. The period between Tier 4 Project bid submission (May 2021) and U.S. financial close of the CHPE Project (October 2022), which was also the approximate timing for start of construction, was one of volatility and unprecedented economic conditions. Global issues such as COVID-19 and the war in Ukraine affected key aspects of renewable project development, such as financing costs and supply delays. Additionally, domestic matters such as interest rate hikes and inflationary pressures increased the cost of developing projects. I go into further detail on specific factors below.
16. When infrastructure project bidders determine a bid price, they typically seek price quotes from subcontractors in the months leading up to the bid; as such I use the simple average of the 6 months prior to the Tier 4 Project bid submission in May 2021 as the starting point for my escalation analysis (the "Beginning Index Period"). I use financial close (October 2022) as the ending point for my escalation analysis (the "Ending Index Period").

**General Economic Inflation**

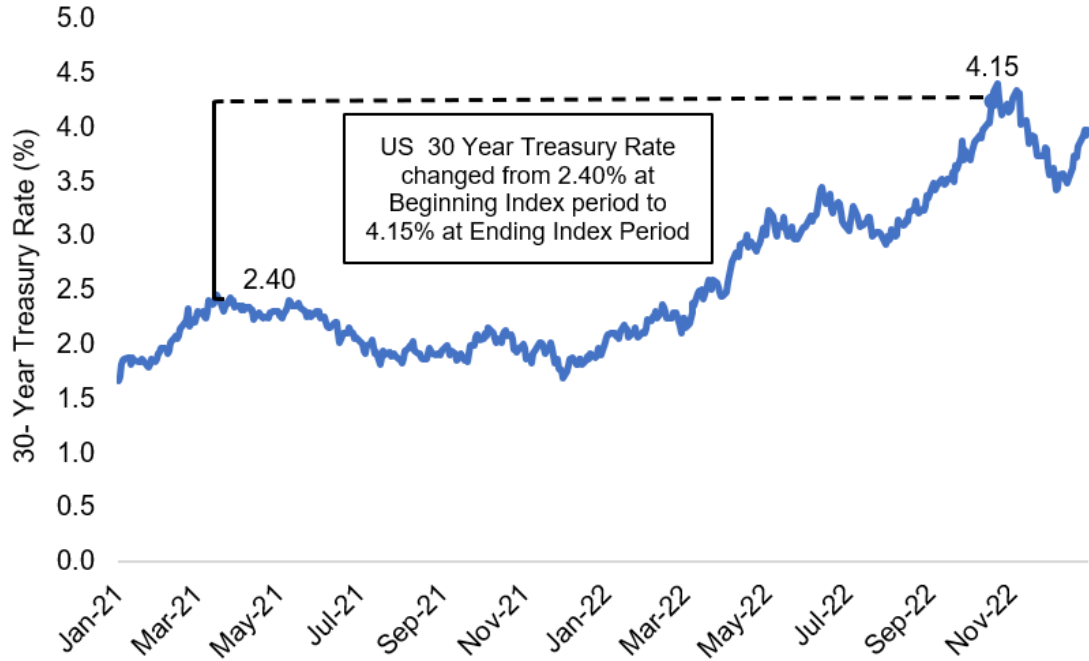
17. The Consumer Price Index<sup>1</sup> (“CPI”) is a tool used to measure the average change over time of the prices of various consumer goods and services. As such, it is a commonly accepted way to measure inflation. As seen in Figure 1, the US CPI increased by 9.8% between the Beginning Index Period and the Ending Index Period. Inflation for this period was higher than historical levels.



**Figure 1 – Consumer Price Index**

<sup>1</sup> U.S. Bureau of Labor Statistics (BLS): Consumer Price Index

18. As seen in Figure 2 below, 30-year Treasury Rates increased from 2.40% to 4.15% between May 12, 2021 and October 28, 2022.<sup>2</sup> This impacted project financing because typical energy or infrastructure projects use 60-85% debt financing and are required by lenders to lock in long-term rates. Higher interest rates make debt more costly. The interest rates nearly doubled during this period, and as a result, this has impacted the cost of debt required for projects to move forward.



**Figure 2 – Market Yield on U.S. Treasury Securities at 30-Year Constant Maturity, Quoted on an Investment Basis**

<sup>2</sup> U.S. Bureau of Labor Statistics (BLS): Market Yield on U.S. Treasury Securities at 30-Year Constant Maturity, Quoted on an Investment Basis.

19. The Producer Power Index (“PPI”) for Electric Power and Specialty Transformer Manufacturing<sup>3</sup> (“EPSTM”) measures the average movements of prices received by domestic establishments engaged in manufacturing power, distribution, and specialty transformers. As seen in Figure 3, there was an increase of 53.8% between the Beginning Index Period and the Ending Index Period.

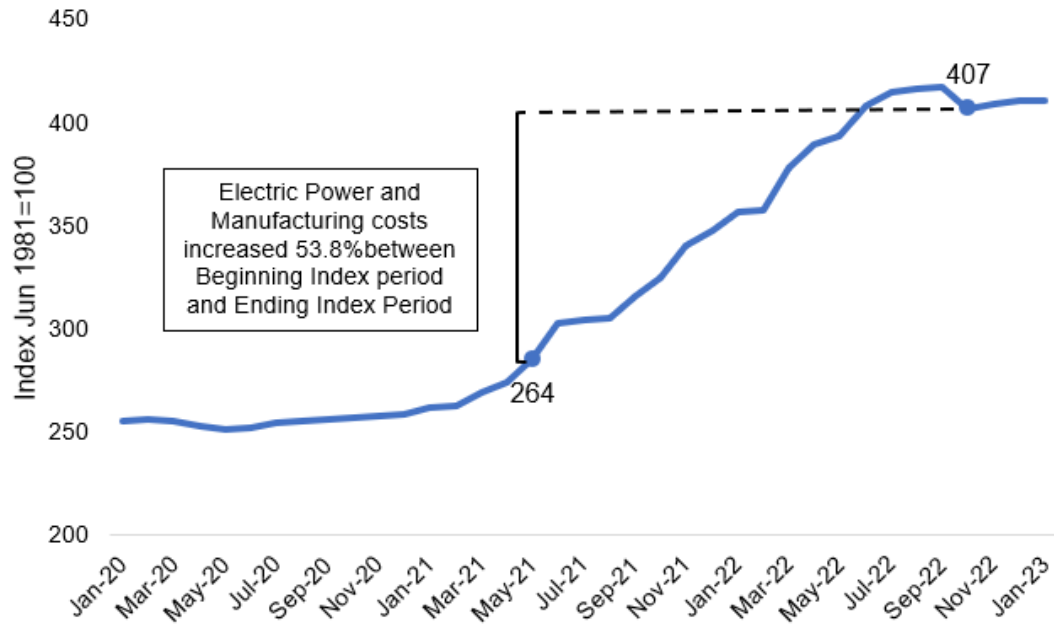
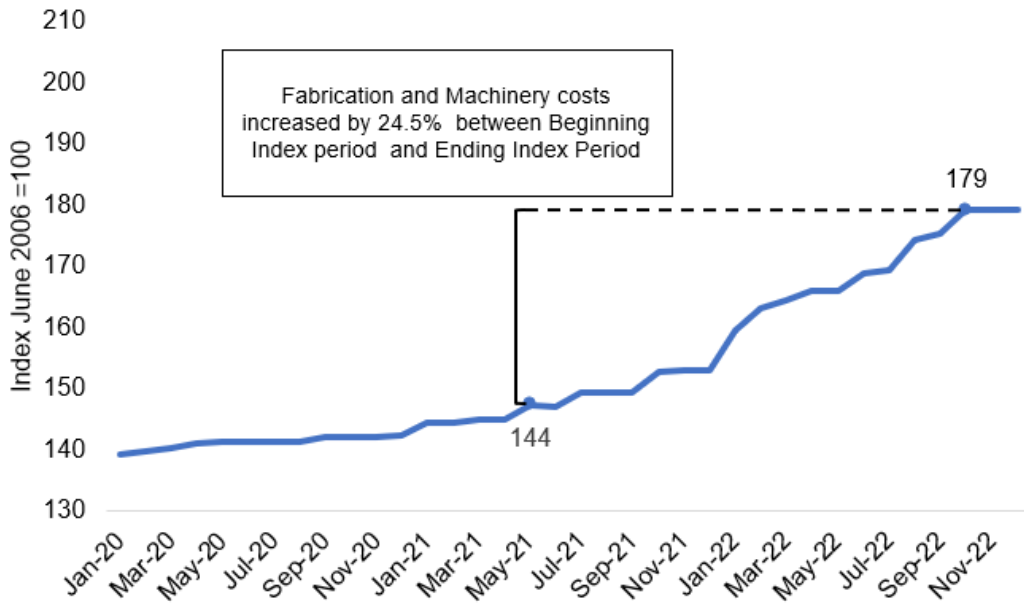


Figure 3 – Electric Power and Specialty Transformer Manufacturing Index (EPSTM)

<sup>3</sup> U.S. Bureau of Labor Statistics (BLS): PPI Electric Power and Specialty Transformer Manufacturing Index (EPSTM).

20. The PPI for Commercial Machinery Repair and Maintenance Index<sup>4</sup> measures the average movements of prices received for providing the services of machinery repair and maintenance. As illustrated by Figure 4, the index shows a 24.5% increase between the Beginning Index Period and the Ending Index Period.



**Figure 4 – Fabrication & Machinery Index**

21. The PPI for New Non-residential Building Construction measures the changes in output prices for new non-residential building construction.<sup>5</sup> This index is a reasonable proxy for EPC service costs. As seen in Figure 5, these costs increased by 33.2% between the Beginning Index Period and the Ending Index Period.

<sup>4</sup> U.S. Bureau of Labor Statistics (BLS): PPI Commercial machinery repair and maintenance. Alternatively, referred to as the Fabrication and Machinery Index.

<sup>5</sup> U.S. Bureau of Labor Statistics (BLS): PPI New Non-residential Building Construction.



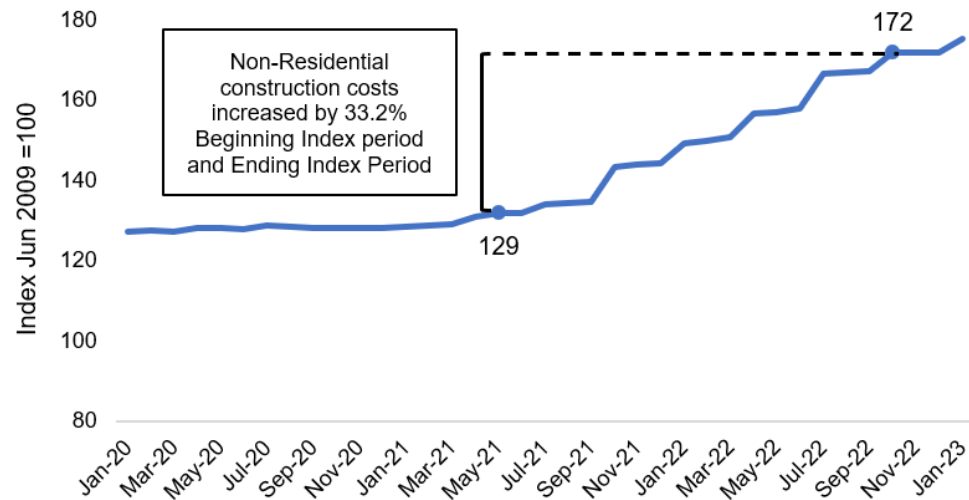


Figure 5 – Non-Residential Building construction index

### 3. Proposed Formula Approach for Cost Adjustment

#### *Introduction*

22. In this section I describe a proposed formula to adjust the REC price to account for increased construction costs and interest rates during construction. My proposed formula is neither based solely upon, nor designed exclusively for application to, the CHPE Project. Rather, I propose a project-neutral approach suitable for renewable energy transmission projects more generally.
23. Conceptually, the Index REC structure functions as a true-up payment to support the construction of the project and provide price certainty. With respect to the CHPE Project, HQUS pays a fee to CHPE to reserve capacity on the CHPE transmission line. HQUS then sells its energy and capacity in Zone J at prevailing market rates. NYSEERDA then pays HQUS a contractually specified REC Price, also known as an Index Strike Price, for each MWh of energy it delivers to Zone J, from which it deducts prevailing market electricity prices, plus some other adjustments. Depending on the electricity prices, the net amount may be owed from or to NYSEERDA in any given period.
24. This REC price was fixed at the time of the bid, and that REC price is intended to remunerate HQUS for its energy sales into Zone J, in addition to providing funds to HQUS sufficient to purchase long-term transmission rights.
25. A formulaic approach will not capture every detail of every individual project, nor should it be expected to. Rather, it is a straightforward, generalized, and transparent approach NYSEERDA could employ that will capture most of the variance in costs for transmission projects. In my analysis, I utilize publicly available, regularly updated indices.

*Overall Percentage of Project Costs Related to Construction*

26. As reflected in the Petition itself, any cost adjustments authorized by NYSERDA would only be applied to the portion of the CHPE Project that consists of new transmission build, which CHPE states is 46% of the overall contract strike price.<sup>6</sup>

*Construction Costs*

27. Costs for transmission projects, including the CHPE Project, fall into several broad categories, including but not limited to:
- EPC costs (e.g., cable supply, marine and terrestrial installation, converter station construction)
  - HVDC converter costs
  - Transmission system upgrades
  - Interest during Construction (“IDC”)
  - Contingency costs
28. HVDC cable and marine installation costs have been strongly affected by raw materials costs and consist of a significant marine construction component. I have identified the Fabrication and Machinery index as a proxy for those cost increases, which is the same index that NYSERDA proposed for offshore wind. I have used the Non-Residential Construction Index as a proxy for terrestrial construction cost increases. The Non-Residential Construction index encompasses all new non-residential constructions and as such is a reasonable proxy for the terrestrial construction related costs.
29. Similarly, the cost of the HVDC converter in Astoria has been affected by raw materials and manufacturing costs. I have used the EPSTM as a proxy for the increased converter costs.
30. As a part of the CHPE Project construction, the NYISO required certain improvements to the grid, known as System Upgrade Facilities, in order to interconnect the transmission project. I used the EPSTM index as a proxy for these cost increases.<sup>7</sup>
31. Russo Exhibit 1 reflects CHPE’s breakdown of projected costs for the major cost components of the CHPE Project, which appear representative of comparable projects based on my experience. These cost allocations are shown in Table 1. This table summarizes the cost categories I considered, the adjustment factor I applied, and the overall increase in costs.

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<sup>6</sup> The CHPE Project entails new construction predominantly in the United States, though a small portion is in Canada. The portion in Canada is relatively short (approximately 36 miles) and draws from a substantially similar labor pool and supplier pool as the US portion. I have thus included the costs associated with that portion in my adjustment formula.

<sup>7</sup> EPSTM is a reasonable proxy for specialized electric and power equipment because converter and transmissions system fall under specialized electric and power equipment.

Project Element	Adjustment Index	% of Project Costs	Index Change (May 2021 – Oct 2022)
<b>Cable supply and marine installation</b>	Fabrication & Machinery	29.7%	24.5%
<b>Terrestrial installation and converter station construction</b>	Non-Residential Construction	27.7%	33.2%
<b>Converter costs</b>	EPSTM	7.0%	53.8%
<b>Transmission system upgrades</b>	EPSTM	4.9%	53.8%
<b>IDC<sup>8</sup></b>	Interest Rates	8.0%	33.0%
<b>Other<sup>9</sup></b>		22.7%	33.0%
<b>Weighted Average Total<sup>10</sup></b>		<b>100%</b>	<b>33.0%</b>

**Table 1 – CHPE Cost Elements & Adjustments**

32. Applying these indices, weighted by the proportion of budgeted project costs allocated to each of these components, yields an overall estimated cost increase of 33% for the transmission construction costs.

33. Using the REC price for the NYSEERDA contract of \$97.50/MWh, the formula to determine the impact of these cost increases for the CHPE Project would thus be:

$$(97.50 \text{ \$/MWh}) \times (0.46) \times (0.75) \times (0.33) = 11.10 \text{ \$/MWh}$$

34. In this calculation each term represents:

- 97.50 \$/MWh – energy strike price prior to adjustment
- 46% - portion of the HQUS Tier 4 REC index strike price allocable to new build transmission

<sup>8</sup> As reflected in Russo Exhibit 1, CHPE has informed me that the percentage of IDC of overall costs is 8%. I have therefore adopted the assumption that this increases at the weighted average overall non-interest increase of 33%. CHPE's capital costs largely consist of construction costs; it is reasonable to assume that the amount of increased debt should roughly match the increase in capital costs if the debt/equity ratio remains constant.

<sup>9</sup> Weighted average of all other non-interest construction period costs.

<sup>10</sup> Represents the weighted average of all cost components in the table.

- 75% - portion of the new build transmission component of the HQUS Tier 4 REC that is allocable to project cost<sup>11</sup>
- 33% - increase in the project cost component of transmission new build costs due to the aforementioned cost increases
- \$11.10 – proposed increase in HQUS Tier 4 REC index strike price attributable to increases in the construction costs associated with transmission new build

35. Though this example is specific to the CHPE project, it could be applied to other similar transmission projects.

#### *A Note on Interest Rates*

36. In addition to the increases in capital costs, the increase in interest rates between the bid date and financing date has also adversely affected the financial prospects for all projects which carry a debt load. To the extent that projects borrow money to finance construction, their costs to service that debt will increase, reducing returns. In this section, I propose a framework for estimating the increase in debt service costs after COD. I have been advised that that Petitioners are not seeking to include the impact of these long-term interest rate changes in the cost adjustment they are requesting.

37. I have constructed a model of the impact of interest rate increases on project economics based on the amount of capital borrowed. My analysis is necessarily simplified and does not contain assumptions regarding taxes, hedges, and refinancing, but it provides a straightforward method for NYSERDA to make adjustments to reflect changing economic conditions. I calculated the debt payment for a given interest rate and loan duration based on a 100 bps increase. The illustrative results of this analysis are shown below in Table 2. The results indicate, for example, that if the interest rate on 30 year debt increased from 6% to 7%, the overall increase in debt repayment would be 10.9% per annum. Different assumptions would obviously yield different results, but the approach is simple, straightforward, and easily replicated.

Prior Interest Rates	Loan Duration (years)			
	10	20	30	40
2.00%	5.3%	9.9%	14.3%	18.3%
3.00%	5.2%	9.5%	13.3%	16.8%
4.00%	5.0%	9.1%	12.5%	15.3%
5.00%	4.9%	8.7%	11.7%	14.0%
6.00%	4.8%	8.3%	10.9%	12.9%

<sup>11</sup>75% is my approximation of the ratio of the transmission new build component of the HQUS Tier 4 REC index strike price assumed to be allocated for repayment of project costs. The remaining portion of the index strike price is assumed to be allocated for payment of operating costs (and therefore this remaining 25% is not adjusted by this formula). This assumed ratio is consistent with my experience with similar projects of this nature.

<b>7.00%</b>	4.7%	7.9%	10.2%	11.8%
<b>8.00%</b>	4.6%	7.6%	9.6%	10.9%
<b>9.00%</b>	4.4%	7.2%	9.0%	10.0%
<b>10.00%</b>	4.3%	6.9%	8.4%	9.3%

**Table 2 - Interest Rate Adjustment Example**

38. I set forth below a generic example of how this would work. In doing so, I have made the following assumptions:

- I used 30-year U.S. Treasuries, to reflect the fact that debt for large capital projects often has a long tenor.
- I have assumed an interest rate of 6%, which increases to 7%.
- I have assumed that the project is financed with 60% debt.
- I have assumed that 50% of the construction costs are associated with new transmission build.
- I have assumed that 75% is the portion of the new build transmission component of the HQUS Tier 4 REC that is allocable to project cost.

39. Performing the calculation with these assumptions yields an increase in debt service costs of 10.9% during the period in question because of increased interest rates.

40. Applying this adjustment to the strike price using these assumptions would yield the following upward cost adjustment if such an adjustment for interest rates were applied:

$$(97.50 \text{ \$/MWh}) \times (0.50) \times (0.75) \times (0.109) \times (0.6) = \$2.39/\text{MWh}$$

41. This analysis demonstrates that the adjustment for solely new-build construction costs proposed by Petitioners in this proceeding would not compensate Petitioners or any other transmission project developer fully, as it would not include the impact of interest rate increases during the period.

## 4. Conclusion

42. The analysis presented herein represents opinions rendered according to the facts known to me in this case and according to my professional judgment.

Respectfully Submitted,



Christopher Russo  
Boston, Massachusetts  
August 28, 2023

## 5. Curriculum Vitae of Christopher Russo

### Christopher J. Russo

Energy Practice Leader & Vice President

MS, Technology & Policy (Energy)  
Massachusetts Institute of Technol-  
ogy

BS, Mechanical Engineering  
Tufts University

Christopher Russo is a Vice President and CRA's Global Energy Practice Leader. He advises domestic and international clients in the electricity and gas industries in the areas of investment strategy and economic analysis, asset valuation, energy technology, and generation and transmission development. His expertise covers electricity and gas markets in North America, Europe, the Middle East, and worldwide.

He has testified in litigation and regulatory matters on issues regarding the economics, planning, operation, and manipulation of energy markets and has testified numerous times at trial in numerous countries. Mr. Russo also served on the Board of Directors of Neuco, a Boston-based company which provides software to enable neural network control of thermal power plants.

Prior to joining CRA, Mr. Russo was a senior consultant with Cambridge Energy Research Associates in Paris, and prior to that, owned his own energy consulting firm as well as working for ABB Corporate Research in the US and Switzerland. He started his career at MIT as the Plant Engineer for the campus cogeneration power plant, and later held an academic appointment as a Visiting Scientist at the MIT Energy Laboratory where he investigated electricity technology and energy policy.

#### *Areas of Expertise*

Mr. Russo is an energy economist and consultant with expertise in the following areas:

- The dynamics of electricity and gas markets in North America, Europe and worldwide, including market operations, regulatory economics, system planning, physical and economic grid characteristics, generation/dispatch system operations, power systems, and power plant operations. His experience covers nuclear, coal-fired, gas, hydroelectric and renewable (including solar, wind and hydro) generation resources and transmission projects.
- Expert witness testimony and reports related to energy disputes in multiple venues
- Strategic planning and advice for companies engaged in energy markets
- Financial valuations and assessments of generation and transmission assets

- Master planning for energy systems, including assessments of upstream supply sources, energy conversion, transmission, and demand sectors, and sustainability measurement and analysis.

### *Professional History*

- 2007–Present      *Vice President & Practice Leader*, Charles River Associates, Boston  
*(Previously held positions as Associate Principal, Principal and Vice President)*
- 2006                *Senior Consultant*, Cambridge Energy Research Associates (CERA), Paris
- 1999–2006        *Principal*, Russo & Associates LLC, Boston
- Worked with numerous market participants and regulators in markets in the US and abroad on the operations and software for restructured energy markets.
  - Provided economic analysis for market participants and regulators on generation and transmission assets.
- 1998–2002        *Consultant*, Department of Energy & Global Change, ABB Corporate Research Center, Baden-Dättwil, Switzerland
- Investigated CO<sub>2</sub> reduction strategies, new generation, and end-use technologies for decarbonization and helped to initiate the China Energy Technology Program. Acted as liaison between ABB and MIT. Worked closely with researchers from ETHZ and PSI. Held a Visiting Scientist appointment at the MIT Energy Laboratory.
- 1995–1998        *Plant Engineer*, MIT Cogeneration Project, Massachusetts Institute of Technology, Cambridge, MA
- Managed gas turbine and cogeneration plant operations, negotiated environmental permits, managed gas market purchases and contracts, and performed regular performance analyses for a cogeneration and district energy plant. Was a guest lecturer in the Department of Aeronautics teaching students about gas turbine technology.

### *Testimonial History, Litigation Consulting & Major Public Reports (Prior Ten Years)*

- *Confidential JAMS Arbitration*. Testimony on behalf of a defendant in a damages case related to financial/virtual power purchase agreements and swaps for a wind power project. My testimony related to custom and practice for power trading in US electricity markets, dynamics of power pricing, and mechanics of the swap agreement. Expert report submitted May 2023, direct and cross examination at hearing, June 2023

- *NECEC Transmission LLC et al. v. Maine PUC and NextEra Energy Resources, State of Maine Civil Action BCD-CIV-2021-00058*. Testimony on behalf of NextEra on issues of transmission line construction and economic decisions. Deposition March 2023
- *NRG South Texas LP v. Matagorda County, District Court of Matagorda County, Case No. 21-F-0473*. Testimony on behalf of NRG and the South Texas Project nuclear powerplant on topics of electricity market modeling, and the ERCOT market. Expert report submitted November 2022, Deposition December 2022.
- *Power Distribution Services Ghana Ltd v. Electricity Company of Ghana (ECG) Ltd.*, UNCITRAL arbitration. Expert report prepared on behalf of ECG in international arbitration on the quantum related to the cancellation of a transmission and distribution concession in Ghana. Prepared jointly with Ms. Laura Sochat, expert report submitted September 2022.
- *Sjunde AP-Fonden and the Cleveland Bakers and Teamsters Pension Fund v. General Electric Company and Jeffrey Bornstein, United States District Court for the Southern District of New York, Case No. 17 Civ. 08457 (JMF) (GWG)*. Expert report prepared on behalf of General Electric in securities class action litigation on topics of global energy markets, the market for gas turbines, customer service agreements, and factoring of receivables. Expert report submitted May 2022, deposition June 2022.
- *Rainbow Energy Marketing Corporation v. DC Transco, LLC, United States District Court for the Western District of Texas, Austin Division, Civil Action 1:21-cv-313*. Expert report prepared on behalf of Rainbow Energy Marketing on the topics of energy management agreements, ISDA agreements, controllable transmission lines, and the ERCOT market. Expert report submitted April 2022, rebuttal report submitted May 2022.
- *Superior Court of Nassau County, Long Island Power Authority v. Nassau County, 403754/2016, 403760/2016, 403222/2017, 403227/2017, 402338/2018, 402348/2018, 403044/2019, 403046/2019, 401265/2020, 401267/2020 403757/2016, 403225/2017, 402347/2018, 403045/2019, 403739/2016, 403226/2017, 402354/2018, 403047/2019, 401264/2020*, Expert Report on behalf of the Long Island Power Authority in tax litigation projecting revenues and costs for the E.F. Barrett and Glenwood powerplants on Long Island. Expert Report filed October 2021.
- *Buckthorn Wind Project, LLC v. JPMorgan Chase Bank, N.A, United States District Court for the Northern District of Texas, Fort Worth Division, Civil Action No. 4:21-cv-562*. Expert report prepared on behalf of JP Morgan on the topic of wind power purchase agreements, ISDA hedges, and the ERCOT market. Expert report submitted August 2021, deposition October 2021.
- *Confidential AAA Arbitration*. Lead expert on electricity markets in a case involving costs associated with coal plant shutdowns and coal fuel supply contracts. Expert report submitted January 2021. Case settled during hearing.



- *Confidential JAMS Arbitration*. Lead expert on damages and electricity markets in a case involving wake effects on wind turbines and PPA and merchant market revenues in California. Expert report submitted December 2020. Direct and cross examination at trial, February 2021.
- *Confidential AAA Arbitration*. Lead economic expert in a dispute related to miscalculation of payments under a power purchase agreement (PPA) between a US powerplant and an offtaker. Expert report submitted August 2019. Direct and cross-examination at trial November 2019.
- *Market Design Issues in the Alberta Capacity and Energy Markets*, Proceeding 23757, Application 23757-A001, *Alberta Utilities Commission*. Expert testimony filed on behalf of the Alberta Market Surveillance Administrator (MSA), February 2019, filed jointly with Dr. David Patton and Mr. Jordan Kwok. Cross-examination at hearing May 2019.
- *In the matter of Trina Solar Limited, Cause No. FSD 92 of 2017 (NSJ), Grand Court of the Cayman Islands*. Expert testimony related to the solar energy industry, solar manufacturing, and project development, submitted on behalf of Maso Capital Investments Limited and Blackwell Partners LLC in dissenting-shareholder litigation related to valuation of Trina Solar. Expert report submitted October 2018, rebuttal report January 2019. Cross-examination at trial May 2019.
- *Offer Behaviour Guidelines Prior to the Implementation of a Capacity Market*. Report prepared on behalf of the Alberta Market Surveillance Administrator (MSA), December 2018. Filed jointly with Dr. Adonis Yatchew, Dr. David Hunger, and Mr. Jordan Kwok. Presentation and oral appearance at Stakeholder Meeting January 2019.
- *Petition of Eversource & National Grid et al., for approval of long-term contracts for renewable energy, pursuant to Section 83D of An Act Relative to Green Communities, dockets DPU 18-64, 18-65 and 18-66, Massachusetts DPU*. Testimony related to the proposed Quebec- Maine New England Clean Energy Connect transmission line and power purchase agreement on behalf of NextEra Energy. Testimony filed jointly with Robert Stoddard and Stephen Whitley, December 2018. Cross-examination at hearing February 2019.
- *Affidavit on behalf of Vistra Energy Corp. & Dynegy Marketing & Trade, Docket Nos. EL16-49-000, ER18-1314-000, ER18-1314-001, EL18-178-000, Federal Energy Regulatory Commission*. Testimony related to proposed PJM capacity market reforms. Affidavit filed October 2018, answering affidavit filed November 2018
- *Hydro One Networks Inc. Lake Superior Link Project Leave to Construct Application, Ontario Energy Board, Docket EB-2017-0364 and EB-2017-0182*, Expert testimony submitted on behalf of NextBridge Infrastructure. Expert report filed April 2018. Testimony at hearing May 2018 and February 2021.

- *Request for Approval of CPCN for the New England Clean Energy Connect Consisting of a 1,200 MW HVDC Transmission Line from Québec-Maine Border to Lewiston (NECEC) and Related Network Upgrades, State of Maine Public Utilities Commission, Docket 2017-00232.* Direct testimony on behalf of NextEra Energy Resources filed April 2018. Testimony and cross-examination at technical conference and hearings, June 2018, August 2018, and January 2018.
- *Massachusetts Superior Court,* Expert report submitted on behalf of a plant owner calculating damages from operational limitations on a district energy plant in the ISO-New England Market. Expert report submitted March 2018.
- *State of New Hampshire,* expert report submitted on behalf of a plant owner and operator in a tax certiorari proceeding in February 2018. Case was settled before hearing.
- *In re: Request for Advanced Ratemaking Principles by Interstate Power & Light Company, Docket RPU-2017-0002, Iowa Utilities Board.* Direct Testimony on behalf NextEra Energy Resources commenting on IPL's resource plan and the Duane Arnold Energy Center nuclear power plant. Direct, rebuttal and sur-rebuttal written testimony, and cross-examination at hearing, November 2017.
- *ABB AB v. Alstom Grid AB, Alstom Grid SAS and Alstom Grid UK Ltd., Stockholms Tingsrätt (Stockholm District Court), Cases 7403-15 and 11527-15.* Expert testimony submitted on behalf of Alstom related to economic damages resulting from the alleged IP infringement of HVDC technology. Expert report filed August 2017. Direct and cross-examination (in English with translation) at trial, October 2017.
- *State of California v. Coral Power LLC et al., Docket EL02-71-057, Federal Energy Regulatory Commission.* Testimony on behalf of Shell Energy North America (f/k/a Coral Power) related to the causes of the 2000-2001 California Power Crisis and alleged energy market manipulation. Written testimony filed February 2017, deposition March 2017, direct and cross-examination at trial April 2017.
- *Confidential AAA Arbitration,* Lead economic expert in a dispute related to the economics of environmental regulations, coal-fired power plants, and coal supply contracts in the US. Expert report filed September 2016, deposition November 2016, direct and cross-examination at trial December 2016.
- *In re: Direct Application of MidAmerican Energy Company For The Determination Of Ratemaking Principles, Docket RPU-2016-001, Iowa Utilities Board.* Direct Testimony on behalf of Google Inc., Facebook Inc., and Microsoft Corporation related to the economics of MidAmerican's Wind XI proposal, filed June 2016. Case was settled before hearing.
- *MAG Energy Solutions Inc. v. TEC Energy Inc. et al., Province de Québec, Cour Supérieure, Case No. 500-17-087823-152.* Expert report submitted on behalf of TEC Energy on issues related to energy trading and transmission scheduling in Canada and the United States, filed May 2016. Joint report with opposing expert filed June 2019

- *Northern States Power Company, Southern Minnesota Municipal Power Agency, Aegis Insurance Services et al., v. General Electric Company, State of Minnesota, Tenth Judicial District, Case 71-CV-13-1472*, Expert report submitted on behalf of GE calculating damages related to the outage of the Sherburne county coal-fired power plant, filed March 2016. Deposition June 2016.
- *Entergy Nuclear FitzPatrick, LLC v. Town of Scriba, et al., Supreme Court of the State of New York*, Expert report of behalf of Entergy in a tax certiorari case projecting electricity revenue and nuclear fuel cycle costs for the James A. FitzPatrick Nuclear power plant, expert report filed January 2016. Case was settled before trial.
- *NRG v. State of Maryland, Case 09-RP-CH-261-265; 09-RP-CH-280-284; and 09-RP-CH-294-298*. Expert report on behalf of NRG projecting energy and capacity revenues for the coal-fired Mirant Mid-Atlantic Dickerson facility, 2014. Deposition March 2014, direct and cross-examination at trial, May 2014
- *In the Matter of Entergy Nuclear Indian Point 2, LLC & Entergy Nuclear Indian Point 3, LLC, DEC: 3-5522-00011/00004, SPDES: NY-0004472, DEC: 3-5522-00011/00030, DEC: 3-5522-00011/00031*, Direct and rebuttal pre-filed testimony on behalf of the City of New York related to the operations and economic impact of the Indian Point nuclear power plant, filed March 2014. Direct and cross-examination at hearing April 2014
- *NRG v. State of Maryland, Case 09-RP-CH-261-265; 09-RP-CH-280-284; and 09-RP-CH-294-298*. Expert report on behalf of NRG, jointly filed with Robert B. Stoddard, projecting energy and capacity revenues for the coal-fired Mirant Mid-Atlantic Morgantown facility, January 2014
- *ThyssenKrupp Companhia Siderúrgica do Atlântico v. CITIC Group, ICC Arbitration*, expert report for international arbitration submitted on behalf of CITIC group related to damages from improper operation of a coal-fired power plant in Brazil, filed July 2012. Case was settled before hearing.
- *Indian Point Energy Center Retirement Analysis*, Prepared for the City of New York, August 2011
- *Summary of economic effects for proposed Spectra NJ-NY gas pipeline*, Memo prepared for Spectra Energy, and submitted to the New Jersey Bureau of Public Utilities, March 2011
- *Confidential Arbitration*, Expert report provided on behalf of a power plant investor regarding the appraised value of a coal-fired power plant in the PJM market, August 2011. Case was settled before hearing.
- *Proceedings before the New York State Assembly on the economic and reliability impact of the potential closure of the Indian Point Nuclear Energy Center*. Direct testimony at hearing January 2012
- *Confidential Arbitration*, Expert report related to the valuation of a hydroelectric plant in California, which was settled before hearing, June 2013.

- *Coordination between Natural Gas and Electricity Markets, Docket AD12-12-000, Federal Energy Regulatory Commission, Comments filed jointly with Dr. Richard Tabors and Scott Englander, 2012*
- *In the Matter of Hudson Transmission Partners, LLC Case 08-T-0034, direct and rebuttal pre-filed testimony on behalf of the City of New York before the New York State Public Service Commission in the Article VII proceeding for the proposed Hudson Transmission Partners HVDC cable. Direct and cross-examination at hearing April 2010*
- *A Master Electrical Transmission Plan for New York City, Prepared for the City of New York, May 2009*
- *Public Utility Commission of Texas proceedings Cost-Benefit Analysis of the Texas Nodal Market. Expert report on behalf of the Public Utilities Commission of Texas filed jointly with Alex Rudkevich and Ellen Wolfe December 2008. Direct testimony at hearing January 2009*
- Mr. Russo is currently acting as an expert in civil litigation related the 2021 Texas Winter Storm on issues of market dynamics. He has not yet been disclosed as a witness.
- Mr. Russo prepared an expert report calculating damages from the delayed construction of a gas-fired combined cycle power plant in the United States for a civil litigation matter. The case settled before his report was submitted and he was disclosed and thus remains confidential.
- Mr. Russo prepared testimony and analysis on behalf of a client accused of electricity market manipulation before the FERC. The case relates to alleged cross-product manipulation involving renewable and thermal assets and financial instruments. The case was settled before his testimony was submitted.
- Mr. Russo acted as an expert in a case concerning coal mines and fuel contracts with coal-fired power plants. The case was settled before his report was submitted and he was disclosed and thus remains confidential.
- Mr. Russo assisted in the damages analysis for a case litigated in federal court related to damages associated with renewable power plant revenue as a result of market rule changes in the MISO market.
- Mr. Russo assisted in analyzing how transmission upgrade costs were allocated in Quebec for new development in support of testimony before the Régie d l'Énergie.
- Mr. Russo performed analysis on behalf of a party in FERC litigation resulting from the California energy crisis, including simulation of the CAISO market clearing process and trading strategies employed by different parties.
- Mr. Russo is currently engaged as an as-yet-undisclosed expert witness in US Federal litigation related to cross-product manipulation of electricity markets.

***Selected Commercial Consulting Experience***

- Mr. Russo has directed the analysis of over one hundred generation, transmission, and district energy assets for utilities, equity and debt investors, infrastructure funds, regulators and market operators. He has analyzed assets in all major power markets, including ISO-NE, PJM, ERCOT, SPP, SERC, NYISO, CAISO, IESO, AESO, MISO and the Pacific Northwest. These include thermal (gas, coal, nuclear, oil), renewable (solar, wind, biomass), hydro, and storage (pumped, CAES, and battery) assets.
- Mr. Russo led an engagement for an investor developing a market entry strategy for investments in the US hydrogen market.
- Mr. Russo led a team investigating the difference in financing approaches that exist between different-sized nuclear reactors and construction approaches.
- Mr. Russo led the team to help an advanced Gen IV nuclear reactor technology company develop a commercial strategy for market entry and commercialization.
- Mr. Russo directed the team assisting a client in its efforts to bid battery storage into utility-sponsored RFPs in the Northeast US.
- Mr. Russo directed the diligence efforts for the purchase of two large district energy facilities in the Northeast US.
- Mr. Russo led the analysis for a major foreign investor entering the North American gas pipeline, processing and midstream market, consisting of strategic guidance and the analysis and due diligence of numerous North American and Mexican midstream assets.
- Mr. Russo supervised the analysis for the Alberta Electric System Operator on the development of new capacity market mechanisms in the provincial electricity market.
- Mr. Russo directed and led due diligence efforts related to nuclear technology and power markets for a major private equity investor acquiring a nuclear fuel and services vendor in bankruptcy.
- Mr. Russo led the financial and transactional analysis for a group of investors on a combined heat and power gas-fired cogeneration plant.
- For a major renewable energy and transmission developer, Mr. Russo led the analysis of market impacts of proposed projects and assisted in developing commercial and regulatory strategy in New England and New York.
- Mr. Russo led the analysis for a major transmission project in PJM, including analysis of costs and benefits, production cost modeling, regulatory implications of FERC Order 1000 and other rules, and strategic advice on project development.
- For a transmission developer, Mr. Russo designed and directed the economic and technical analysis of a 2,000 MW HVDC project in the northeast US with detailed analysis of ISO-NE and NYISO markets.
- Mr. Russo directed the economic and technical analysis for a major offshore wind developer connecting into the NYISO and PJM markets for several proposed projects.

- For a worldwide operator of data centers, Mr. Russo directed a risk exposure analysis of multiple markets, commodities and assets to assess the company's exposure to global trends.
- For a private equity investor, Mr. Russo led the diligence on a potential acquisition of the services business of a gas turbine manufacturer. The work involved the analysis of the market for services, the market for service agreements, and an analysis of competitors.
- Mr. Russo directed the analysis of new regulatory approaches and energy technologies for a large African electric utility.
- Mr. Russo assessed the economic and technical suitability of large-scale photovoltaic technologies for a large Middle Eastern utility.
- Mr. Russo directed the analysis of renewable energy (solar and wind) procurement options for one of the largest renewable energy purchasers in the world. This evaluated technical, financial, and economic factors affecting the renewable technologies.
- Mr. Russo directed the analysis of capacity need and market conditions related to the siting of new capacity on Long Island for a client.
- Mr. Russo led a major review of new nuclear development strategy, including technical reviews, risk analyses, economic forecasts and prudence reviews for a US-based electric utility.
- Working for the mayor and city council of a major US city, Mr. Russo managed a due diligence effort to determine the feasibility of supporting new nuclear licensing applications for a municipally owned utility. This included a review of nuclear technology, market conditions, Nuclear Regulatory Commission (NRC) resource constraints, and federal regulatory policy related to nuclear loan guarantee programs.
- Mr. Russo led the analysis for a large industrial client of how electricity market rules related to reliability affected prices in installed capacity markets, including analyses of resource-adequacy and short-term grid contingency events.
- For a major municipal utility, Mr. Russo provided an independent review of the utility's investment analysis to retrofit emissions control equipment to a coal-fired power plant to comply with pending environmental regulations.
- For a transmission developer, Mr. Russo advised on the open-season transmission requirements and FERC process for a new merchant transmission line.
- Mr. Russo directed the analysis of the socioeconomic benefits of advanced coal technology in European, Chinese and South Asian markets, focusing on market effects, induced and indirect benefits and social impacts.
- Mr. Russo led the effort to develop an electrical market model for Europe for a Paris-based client. Working with the production-cost modeling software and his team, he assembled databases of resources, demand, fuel prices, and transmission network characteristics to build a comprehensive model of the EU grid.

- Mr. Russo designed and conducted a series of workshops to assist a major foreign investor with a market-entry strategy for offshore wind into the Northeast US.
- Mr. Russo directed and led a project to synthesize and summarize the nuclear technology risk and seismic hazard data for a two-unit nuclear reactor in North America.
- Mr. Russo directed an engagement for a client to assist in the purchase and contracting of large amounts of electricity to support aluminum smelting operations. This consisted of financial analysis of North American power markets including the MISO and PJM and financial evaluation of proposed contract structures.
- Mr. Russo managed a major effort for the City of New York to develop a Master Electrical Transmission Plan to address economic and reliability needs in the context of a multi-stakeholder process, incorporating the Mayor's Office, Economic Development Corporation, NYISO, ConEd, and the NYS Public Service Commission. The program addressed the economic and technical factors associated with AC and HVDC transmission, as well as the policy and financial impacts of public-private partnerships and equity investment strategies.
- For a major power development company, Mr. Russo led several projects to determine the optimal strategy for entering the gas-fired development market under pending environmental constraints and regulations. In a related project, he led efforts to investigate the feasibility of new and waste coal development in the PJM energy market.
- For the City of New York, Mr. Russo led a major effort to investigate the reliability and economic and environmental impact of the closure of the Indian Point Nuclear Energy Center on consumers and the economy. This comprised a report as well as testimony before various commissions.
- For a private equity firm, Mr. Russo directed the due diligence assessment of an energy storage technology manufacturer, focusing on the analysis of market opportunities for energy storage.
- For a major global semiconductor manufacturer, Mr. Russo led an effort to develop a global energy procurement strategy, analyze potential power contracts, and benchmark procurement activities against other similar firms.
- Mr. Russo directed the review of the internal technical and financial modeling processes for an investor in the liberalized UK energy market.
- For a gas pipeline developer, Mr. Russo directed the analysis of a new pipeline project's impact on gas basis differentials.
- For a major European utility, Mr. Russo designed and managed a process to develop internally consistent analysis scenarios to enhance corporate planning. The effort involved soliciting input from different groups throughout the enterprise, designing scenarios, analyzing the results, and presenting the results to internal and external stakeholders.

- For a major Internet search provider, Mr. Russo directed the evaluation of potential sites for data centers in Europe and the US.
- For a major Asian utility, Mr. Russo managed an engagement to develop a growth strategy for a subsidiary of the parent firm, including a review of current operations, market positioning, potential risks, and strategic alliances, culminating in a concrete division growth plan.
- Working for the Executive Office of Sheikh Mohammed of Dubai, Mr. Russo was a principal in a major study examining the effectiveness of Dubai's current electric utility, petrochemical resources, and water resources. Working closely with local personnel, he spent significant time interviewing Dubai Electricity and Water Authority (DEWA) and Dubai Supply Authority (DUSUP) personnel, Emirati leaders, and stakeholders; evaluating petrochemical and water resources; and developing a comprehensive multi-attribute, multi-scenario energy system model of the emirate for evaluation of future energy strategies.
- Mr. Russo was a principal in a project to restructure a major utility in the United Arab Emirates, including long-term planning functions, regulatory efforts, customer service systems, IT architecture, and financial systems.
- Mr. Russo led a project for a major Hong Kong-based utility to help them adapt their management processes, planning infrastructure, and IT systems to pending emissions and energy trading regulations through performing needs assessments, sourcing strategies, and drafting RFPs.
- While with ABB, Mr. Russo helped design and organize the China Energy Technology Program, a joint ABB/AGS program to investigate sustainable energy systems in China, which included Electric Generation Expansion Analysis (EGEAS) modeling of the eastern China power network to identify long-term, cost-effective strategies for environmental improvement. The project was conducted in conjunction with the Swiss Federal Institute of Technology (ETHZ) and the Paul Scherrer Institut (PSI).
- Working with the MIT Cogeneration Plant, Mr. Russo provided continuing guidance and expertise on cogeneration plant and gas turbine operations, as well as conducting several economic cost-benefit analyses to plan future plant expansion.
- For a major software firm and federal clients, Mr. Russo helped prepare and develop a wide-area synchronized phasor measurement system to measure phase angle and frequency perturbations across the Eastern Interconnection to enhance grid stability.
- For PJM, Mr. Russo developed software and systems to visualize market participant bidding behavior to assist market monitors and dispatchers.
- For New York ISO, Mr. Russo designed and implemented a PI data historian system for tracking all operational data. He also trained system operators on its use, played an integral part in the standard market design to implementation and EMS development and developed various software applications to analyze system operations.



- For the California ISO, Mr. Russo worked as a consultant during the startup, developing systems to track generator dispatch operations and identify anomalous generator behavior to assist market surveillance personnel. During the power crises and rolling blackouts, he managed and maintained a critical system in use by all ISO personnel and developed a system to analyze results of Stage 2 and 3 events.
- Mr. Russo began his career in power as an intern for the Trigen Energy Corporation analyzing the operations and economics of Trigen's fleet of cogeneration plants.

#### ***Additional Professional Training***

- New York ISO Market Operations Course
- New York ISO DSS Market Participants Course
- California ISO Market Participants Course

#### ***Selected Books***

*"Climate policies and investment: implications for disputes"*, co-authored with Rebecca Rowden and Laura Sochat. *Arbitration Review of the Americas 2023* (forthcoming).

*"Economic Evidence of Market Manipulation,"* chapter in the *Guide to Energy Market Manipulation* with Robin Cohen, David Hunger and Brian Rivard. Published by Global Competition Review, March 2018.

*"Data Collection,"* chapter in *Integrated Assessment of Sustainable Energy Systems in China: The China Energy Technology Program*. Baldur Eliasson. Kluwer Academic Publishers, 2003.

#### ***Citizenship and Languages***

Mr. Russo is a dual citizen of the United States and Italy.

- English (native)
- Italian (proficient)
- German and French (basic)

# **EXHIBIT 1**

Project Element	% of Project Costs	Index	Index Change
Cable supply and marine installation	29.7%	Fab & Machinery	24.5%
Terrestrial Installation and Converter Station Construction	27.7%	Non-res const	33.2%
Converter Costs	7.0%	EPSTM	53.8%
Transmission System Upgrades	4.9%	EPSTM	53.8%
Other	22.7%	Weighted Average	33.0%
Interest During Construction	8.0%	Interest Rates	33.0%
	100.0%		33.0%

**Construction Cost Changes**

Tariff	\$97.50
Percent New Build	46.0%
Percent of tariff for construction	75.0%
Index Change	33.0%
	\$11.10

Cells shaded yellow indicate data received at my request from CHPE

**Interest Rate Changes**

Tariff	\$97.50
Percent New Build	50.0%
Percent of tariff for construction	75.0%
Leverage Ratio	60.0%
Interest Rate Expense	10.9%
	\$2.39

## Increase in debt costs for 100 bps increase in interest rate by debt tenor

	10	20	30	40
2.00%	5.3%	9.9%	14.3%	18.3%
3.00%	5.2%	9.5%	13.3%	16.8%
4.00%	5.0%	9.1%	12.5%	15.3%
5.00%	4.9%	8.7%	11.7%	14.0%
6.00%	4.8%	8.3%	10.9%	12.9%
7.00%	4.7%	7.9%	10.2%	11.8%
8.00%	4.6%	7.6%	9.6%	10.9%
9.00%	4.4%	7.2%	9.0%	10.0%
10.00%	4.3%	6.9%	8.4%	9.3%

# **EXHIBIT 2**

FRED Graph Observations  
 Federal Reserve Economic Data  
 Link: <https://fred.stlouisfed.org>  
 Help: <https://fredhelp.stlouisfed.org>  
 Economic Research Division  
 Federal Reserve Bank of St. Louis

PPIACO                      Producer Price Index by Commodity: All Commodities, Index 1982=100, Monthly, Not Seasonally Adjusted

Frequency: Monthly

observation_date	PPIACO
2019-10-01	198.600
2019-11-01	199.000
2019-12-01	199.000
2020-01-01	199.300
2020-02-01	196.700
2020-03-01	193.100
2020-04-01	185.500
2020-05-01	188.600
2020-06-01	191.200
2020-07-01	193.000
2020-08-01	194.300
2020-09-01	195.500
2020-10-01	196.500
2020-11-01	198.300
2020-12-01	200.500
2021-01-01	204.800
2021-02-01	210.600
2021-03-01	215.000
2021-04-01	217.900
2021-05-01	224.900
2021-06-01	228.900
2021-07-01	231.850
2021-08-01	233.415
2021-09-01	235.678
2021-10-01	240.465
2021-11-01	243.287
2021-12-01	241.338
2022-01-01	246.453
2022-02-01	252.660
2022-03-01	260.014
2022-04-01	265.310
2022-05-01	273.251
2022-06-01	280.251
2022-07-01	272.274
2022-08-01	269.546
2022-09-01	267.898
2022-10-01	265.061
2022-11-01	263.157
2022-12-01	257.897
2023-01-01	260.227
2023-02-01	258.669
2023-03-01	257.062
2023-04-01	256.908
2023-05-01	253.746
2023-06-01	253.951
2023-07-01	253.300

Analysis	
IndexB Average bid submission/ 6 months prior to bid sub	207.850
IndexT Oct value	265.061
Proposal	1.2753

27.53%

FORMULA is  $(0.25+0.75*(indexT/indexB))$   
 IndexT= PPI All Commodities index established at the commencement of Construction Activities  
 IndexB= PPI All Commodities index established prior to the Bid Proposal Submission Deadline

**5.2 Pricing for Alternate Bid Proposals**

**5.2.1 Inflation Risk Adjusted Bid Proposal**

For Alternate Bid Proposals in which Proposers opt to include an Inflation Adjusted Bid Proposal, the Index REC Strike Price or Fixed REC Price will be adjusted to account for inflation between the Bid Proposal Submission Deadline and the commencement of Construction Activities related to the Bid Facility. This adjustment, governed by Section 5.03 and Exhibit L of the Agreement, will be based on the PPI All Commodities index.<sup>58</sup> The Index REC Strike Price or Fixed REC Price for the Inflation Adjusted Bid Proposal will be calculated as:

$$REC_{adj} = REC_{bid} \times \left( 0.25 + 0.75 \times \frac{Index_T}{Index_B} \right)$$

where:

$REC_{adj}$  is the Index REC Strike Price or Fixed REC Price after adjustment

$REC_{bid}$  is the Index REC Strike Price or Fixed REC Price as submitted with the Bid Proposal

$Index_B$  is the value of the PPI All Commodities index established prior to the Bid Proposal Submission Deadline

$Index_T$  is the value of the PPI All Commodities index established at the commencement of Construction Activities

0.75 is the share of the Index REC Strike Price or Fixed REC Price to which the inflation adjustment will be applied. The remainder of the Index REC Strike Price or Fixed REC Price (25%) will not be adjusted.

$Index_B$  will be the average of the last six months or two quarters of published data available prior to the Bid Proposal Submission Deadline. For informational purposes only, as of the date of RESRFP22-1 issuance, this value is 269.998. NYSERDA will publish the final  $Index_B$  value that will be used in the Agreement prior to the Bid Proposal Submission Deadline.

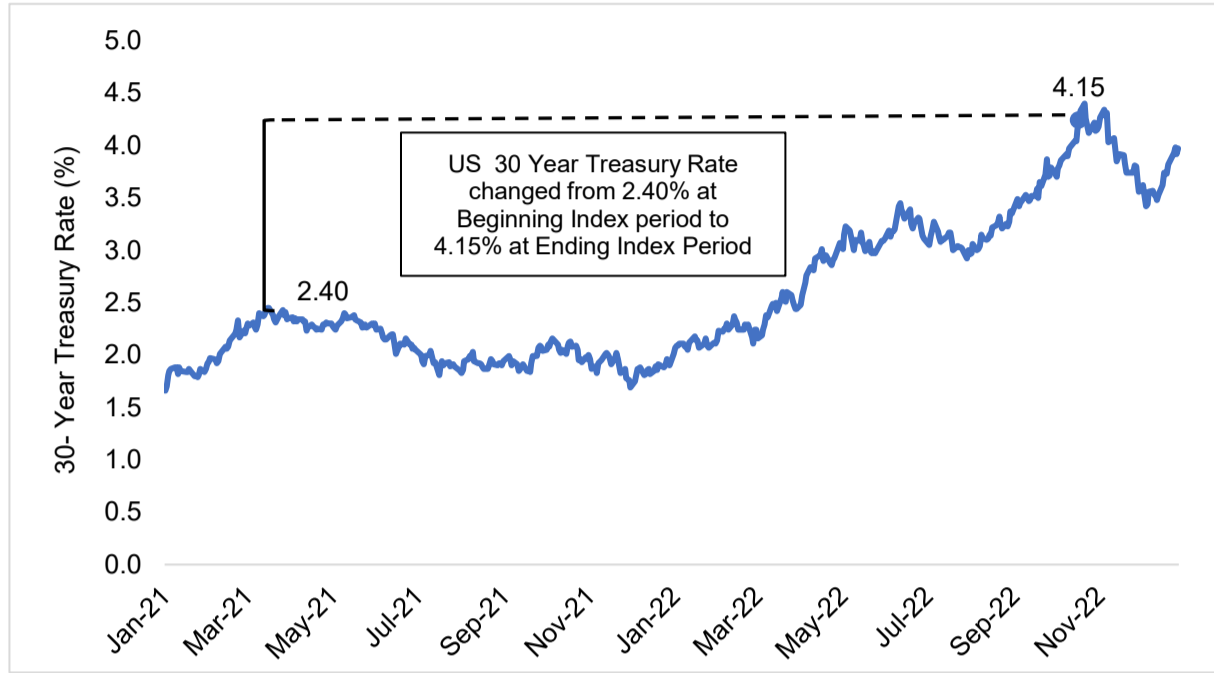
$Index_T$  will be calculated as the average of the monthly or quarterly values for the six-month period comprising the three months prior to and following the commencement of Construction Activities.  $REC_{adj}$  will therefore be calculated when the published monthly prices or indices become available, but no earlier than 6 months after the commencement of Construction Activities.<sup>59</sup>

FRED Graph Observations  
 Federal Reserve Economic Data  
 Link: <https://fred.stlouisfed.org>  
 Help: <https://fredhelp.stlouisfed.org>  
 Economic Research Division  
 Federal Reserve Bank of St. Louis

DGS30 Market Yield on U.S. Treasury Securities at 30-Year Constant Maturity, Quoted on an Investment Basis, Percent, Daily, Not Seasonally Adjusted

Frequency: Daily

observation_date	DGS30
2020-06-08	1.65
2020-06-09	1.59
2020-06-10	1.53
2020-06-11	1.41
2020-06-12	1.45
2020-06-15	1.45
2020-06-16	1.54
2020-06-17	1.52
2020-06-18	1.47
2020-06-19	1.47
2020-06-22	1.46
2020-06-23	1.49
2020-06-24	1.44
2020-06-25	1.43
2020-06-26	1.37
2020-06-29	1.39
2020-06-30	1.41
2020-07-01	1.43
2020-07-02	1.43
2020-07-06	1.45
2020-07-07	1.38
2020-07-08	1.39
2020-07-09	1.32
2020-07-10	1.33
2020-07-13	1.33
2020-07-14	1.30
2020-07-15	1.33
2020-07-16	1.31
2020-07-17	1.33
2020-07-20	1.32
2020-07-21	1.31
2020-07-22	1.29
2020-07-23	1.24
2020-07-24	1.23
2020-07-27	1.25
2020-07-28	1.22
2020-07-29	1.24
2020-07-30	1.20
2020-07-31	1.20
2020-08-03	1.23
2020-08-04	1.19
2020-08-05	1.22
2020-08-06	1.20
2020-08-07	1.23
2020-08-10	1.25
2020-08-11	1.32
2020-08-12	1.37
2020-08-13	1.42
2020-08-14	1.45
2020-08-17	1.43
2020-08-18	1.40
2020-08-19	1.42
2020-08-20	1.38
2020-08-21	1.35
2020-08-24	1.35
2020-08-25	1.39
2020-08-26	1.41
2020-08-27	1.50
2020-08-28	1.52
2020-08-31	1.49
2020-09-01	1.43
2020-09-02	1.38
2020-09-03	1.34
2020-09-04	1.46
2020-09-08	1.43



2020-09-09	1.45
2020-09-10	1.43
2020-09-11	1.42
2020-09-14	1.42
2020-09-15	1.43
2020-09-16	1.45
2020-09-17	1.43
2020-09-18	1.45
2020-09-21	1.43
2020-09-22	1.42
2020-09-23	1.42
2020-09-24	1.40
2020-09-25	1.40
2020-09-28	1.42
2020-09-29	1.41
2020-09-30	1.46
2020-10-01	1.45
2020-10-02	1.48
2020-10-05	1.57
2020-10-06	1.56
2020-10-07	1.60
2020-10-08	1.57
2020-10-09	1.58
2020-10-13	1.52
2020-10-14	1.50
2020-10-15	1.52
2020-10-16	1.52
2020-10-19	1.55
2020-10-20	1.60
2020-10-21	1.62
2020-10-22	1.67
2020-10-23	1.64
2020-10-26	1.59
2020-10-27	1.57
2020-10-28	1.56
2020-10-29	1.62
2020-10-30	1.65
2020-11-02	1.63
2020-11-03	1.66
2020-11-04	1.55
2020-11-05	1.54
2020-11-06	1.60
2020-11-09	1.73
2020-11-10	1.75
2020-11-12	1.64
2020-11-13	1.65
2020-11-16	1.66
2020-11-17	1.62
2020-11-18	1.62
2020-11-19	1.58
2020-11-20	1.53
2020-11-23	1.56
2020-11-24	1.60
2020-11-25	1.62
2020-11-27	1.57
2020-11-30	1.58
2020-12-01	1.66
2020-12-02	1.70
2020-12-03	1.67
2020-12-04	1.73
2020-12-07	1.69
2020-12-08	1.67
2020-12-09	1.69
2020-12-10	1.65
2020-12-11	1.63
2020-12-14	1.63
2020-12-15	1.65
2020-12-16	1.66
2020-12-17	1.68
2020-12-18	1.70
2020-12-21	1.68
2020-12-22	1.65
2020-12-23	1.70
2020-12-24	1.66
2020-12-28	1.67
2020-12-29	1.67



2020-12-30	1.66
2020-12-31	1.65
2021-01-04	1.66
2021-01-05	1.70
2021-01-06	1.81
2021-01-07	1.85
2021-01-08	1.87
2021-01-11	1.88
2021-01-12	1.88
2021-01-13	1.82
2021-01-14	1.88
2021-01-15	1.85
2021-01-19	1.84
2021-01-20	1.84
2021-01-21	1.87
2021-01-22	1.85
2021-01-25	1.80
2021-01-26	1.80
2021-01-27	1.79
2021-01-28	1.81
2021-01-29	1.87
2021-02-01	1.84
2021-02-02	1.87
2021-02-03	1.92
2021-02-04	1.93
2021-02-05	1.97
2021-02-08	1.96
2021-02-09	1.95
2021-02-10	1.92
2021-02-11	1.94
2021-02-12	2.01
2021-02-16	2.08
2021-02-17	2.06
2021-02-18	2.08
2021-02-19	2.14
2021-02-22	2.19
2021-02-23	2.21
2021-02-24	2.24
2021-02-25	2.33
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2021-03-02	2.21
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2021-06-09	2.17
2021-06-10	2.15
2021-06-11	2.15
2021-06-14	2.19
2021-06-15	2.20
2021-06-16	2.20
2021-06-17	2.11
2021-06-18	2.01
2021-06-21	2.11
2021-06-22	2.10
2021-06-23	2.11
2021-06-24	2.10
2021-06-25	2.16
2021-06-28	2.10
2021-06-29	2.10
2021-06-30	2.06
2021-07-01	2.07
2021-07-02	2.05
2021-07-06	2.00
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2021-07-08	1.91
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2021-07-12	2.00
2021-07-13	2.04
2021-07-14	1.98
2021-07-15	1.92
2021-07-16	1.93
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2021-07-29	1.91
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2021-08-03	1.85
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2021-08-09	1.96
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2021-08-12	2.03
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2021-08-18	1.91
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2021-08-20	1.87
2021-08-23	1.87
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2021-08-25	1.96
2021-08-26	1.94
2021-08-27	1.91
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2021-09-17	1.91
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2021-09-21	1.86
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2021-10-13	2.05
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2021-10-15	2.05
2021-10-18	2.01
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2022-05-03	3.03
2022-05-04	3.01
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2022-05-16	3.09
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2023-03-21	3.73
2023-03-22	3.68
2023-03-23	3.66
2023-03-24	3.64
2023-03-27	3.77
2023-03-28	3.77
2023-03-29	3.78
2023-03-30	3.74
2023-03-31	3.67
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2023-04-07	3.61
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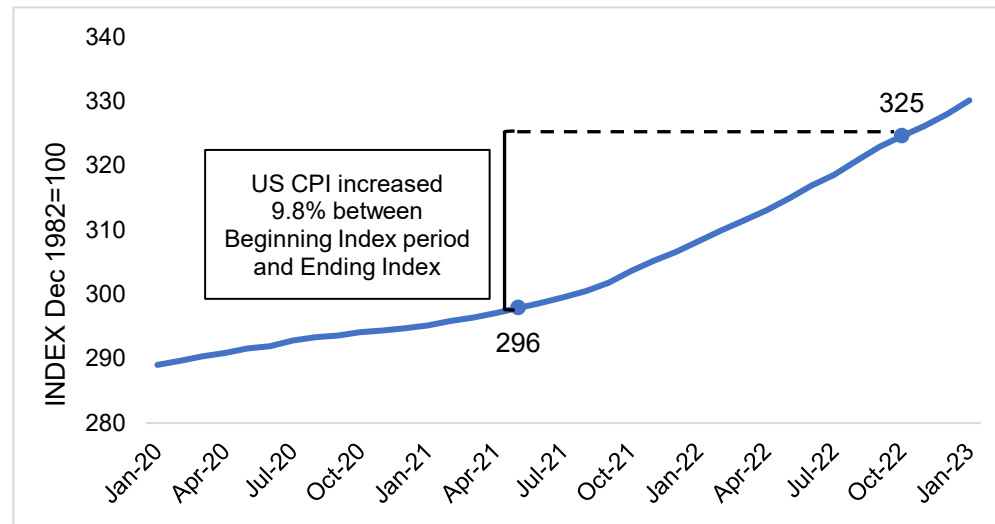
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2023-08-21	4.45
2023-08-22	4.42
2023-08-23	4.27
2023-08-24	4.30

FRED Graph Observations  
 Federal Reserve Economic Data  
 Link: <https://fred.stlouisfed.org>  
 Help: <https://fredhelp.stlouisfed.org>  
 Economic Research Division  
 Federal Reserve Bank of St. Louis

MEDCPIM094SFRMedian Consumer Price Index, Index Dec 1982=100, Monthly, Seasonally Adjusted

Frequency: Monthly

observation_date	MEDCPIM094SFRBCLE
2018-11-01	279.48
2018-12-01	280.15
2019-01-01	280.90
2019-02-01	281.60
2019-03-01	282.34
2019-04-01	282.87
2019-05-01	283.46
2019-06-01	284.35
2019-07-01	284.93
2019-08-01	285.50
2019-09-01	286.24
2019-10-01	286.84
2019-11-01	287.65
2019-12-01	288.27
2020-01-01	289.03
2020-02-01	289.67
2020-03-01	290.38
2020-04-01	290.85
2020-05-01	291.54
2020-06-01	291.95
2020-07-01	292.81
2020-08-01	293.35
2020-09-01	293.63
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2021-12-01	306.55
2022-01-01	308.28
2022-02-01	309.91
2022-03-01	311.50
2022-04-01	313.02
2022-05-01	314.92
2022-06-01	316.93
2022-07-01	318.57
2022-08-01	320.74
2022-09-01	322.90
2022-10-01	324.60
2022-11-01	326.12
2022-12-01	327.97
2023-01-01	330.12
2023-02-01	332.21
2023-03-01	333.54
2023-04-01	334.88
2023-05-01	336.15
2023-06-01	337.35
2023-07-01	337.98



Analysis	
% Change between M	9.81%
Price -May 2021	295.60
Price-October 2022	324.60

FRED Graph Observations  
 Federal Reserve Economic Data  
 Link: <https://fred.stlouisfed.org>  
 Help: <https://fredhelp.stlouisfed.org>  
 Economic Research Division  
 Federal Reserve Bank of St. Louis

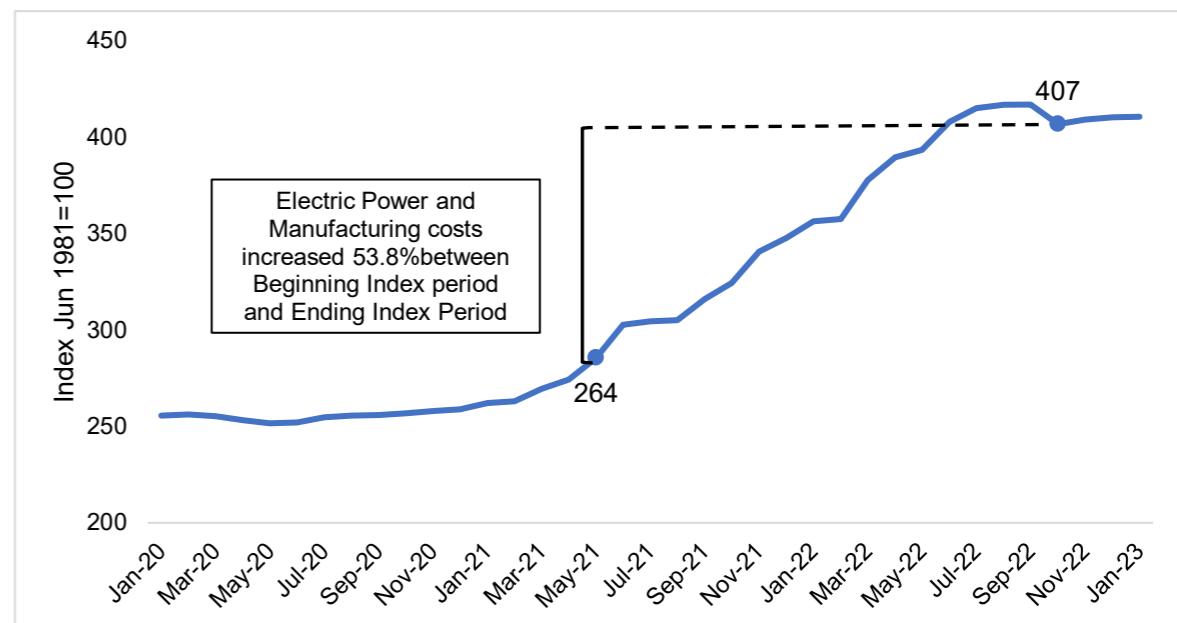
PCU33531133 Producer Price Index by Industry: Electric Power and Specialty Transformer Manufacturing, Index Jun 1981=100, Monthly, Not Seasonally Adjusted

Frequency: Monthly

observation\_date PCU335311335311

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 4/1/2017 235.5  
 5/1/2017 235.9  
 6/1/2017 234.7  
 7/1/2017 234.1  
 8/1/2017 233.6  
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 10/1/2021 324.4  
 11/1/2021 340.6  
 12/1/2021 347.7  
 1/1/2022 356.3  
 2/1/2022 357.5  
 3/1/2022 377.6  
 4/1/2022 389.5  
 5/1/2022 393.4  
 6/1/2022 407.8  
 7/1/2022 414.9  
 8/1/2022 416.6  
 9/1/2022 416.8  
 10/1/2022 406.6  
 11/1/2022 408.9  
 12/1/2022 410.3  
 1/1/2023 410.6  
 2/1/2023 411.2

Analysis	
% Change	53.84%
Price -May 2021	264.2667
Price-October 2022	406.555



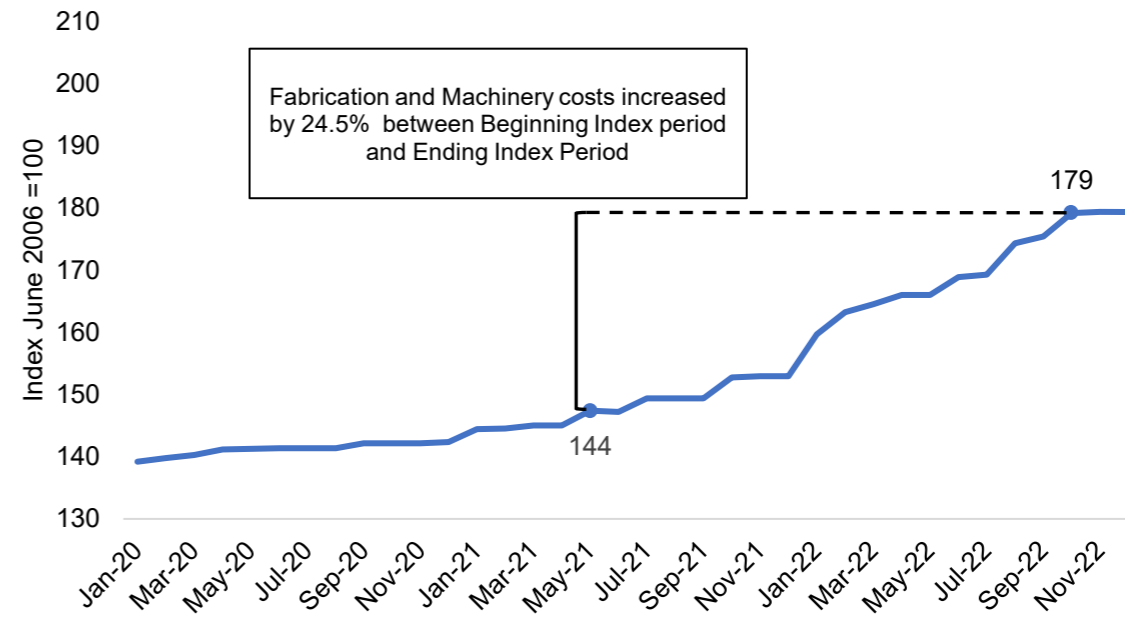
3/1/2023	413.6
4/1/2023	414.7
5/1/2023	415.9
6/1/2023	419.3
7/1/2023	429.6

<https://beta.bls.gov/dataViewer/view/timeseries/PCU811310811310>

Series Title	PPI industry data for Commercial machinery repair and maintenance, not seasonally adjusted
Series ID	PCU811310811310
Seasonality	Not Seasonally Adjusted
Survey Name	PPI Industry Data
Measure Data Type	Commercial machinery repair and maintenance
Industry	Commercial machinery repair and maintenance
Item	Commercial machinery repair and maintenance

Year	Period	Label	Observation Value
2020	M01	1/1/2020	139.2
2020	M02	2/1/2020	139.8
2020	M03	3/1/2020	140.3
2020	M04	4/1/2020	141.2
2020	M05	5/1/2020	141.3
2020	M06	6/1/2020	141.4
2020	M07	7/1/2020	141.4
2020	M08	8/1/2020	141.4
2020	M09	9/1/2020	142.2
2020	M10	10/1/2020	142.2
2020	M11	11/1/2020	142.2
2020	M12	12/1/2020	142.4
2021	M01	1/1/2021	144.4
2021	M02	2/1/2021	144.5
2021	M03	3/1/2021	145.0
2021	M04	4/1/2021	145.0
2021	M05	5/1/2021	147.4
2021	M06	6/1/2021	147.2
2021	M07	7/1/2021	149.392
2021	M08	8/1/2021	149.417
2021	M09	9/1/2021	149.417
2021	M10	10/1/2021	152.704
2021	M11	11/1/2021	152.968
2021	M12	12/1/2021	152.968
2022	M01	1/1/2022	159.668
2022	M02	2/1/2022	163.246
2022	M03	3/1/2022	164.548
2022	M04	4/1/2022	166.002
2022	M05	5/1/2022	166.026
2022	M06	6/1/2022	168.895
2022	M07	7/1/2022	169.298
2022	M08	8/1/2022	174.307
2022	M09	9/1/2022	175.432
2022	M10	10/1/2022	179.193
2022	M11	11/1/2022	179.348
2022	M12	12/1/2022	179.359
2023	M01	1/1/2023	180.646
2023	M02	2/1/2023	180.649
2023	M03	3/1/2023	184.260
2023	M04	4/1/2023	185.806
2023	M05	5/1/2023	185.933
2023	M06	6/1/2023	185.936
2023	M07	7/1/2023	188.027

Analysis	
Price May Av 2021	143.9
Price Oct 2022	179.193
% Change	24.5%



FRED Graph Observations  
 Federal Reserve Economic Data  
 Link: <https://fred.stlouisfed.org>  
 Help: <https://fredhelp.stlouisfed.org>  
 Economic Research Division  
 Federal Reserve Bank of St. Louis

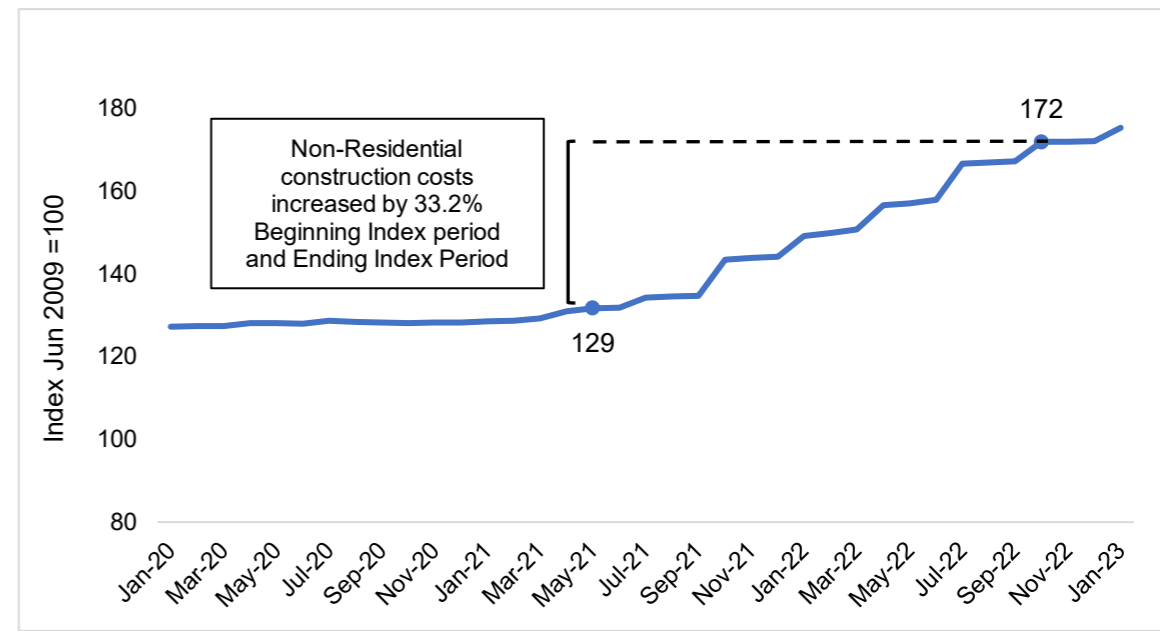
WPU801 Producer Price Index by Commodity: Construction (Partial): New Nonresidential Building Construction, Index Jun 2009=100, Monthly, Not Seasonally Adjusted

Frequency: Monthly

observation\_date WPU801

7/1/2019	125.7
8/1/2019	125.7
9/1/2019	125.9
10/1/2019	126.3
11/1/2019	126.4
12/1/2019	126.6
1/1/2020	127.2
2/1/2020	127.4
3/1/2020	127.3
4/1/2020	128.1
5/1/2020	128.1
6/1/2020	127.9
7/1/2020	128.7
8/1/2020	128.4
9/1/2020	128.2
10/1/2020	128
11/1/2020	128.2
12/1/2020	128.2
1/1/2021	128.5
2/1/2021	128.7
3/1/2021	129.2
4/1/2021	131
5/1/2021	131.7
6/1/2021	131.8
7/1/2021	134.165
8/1/2021	134.465
9/1/2021	134.664
10/1/2021	143.336
11/1/2021	143.811
12/1/2021	144.087
1/1/2022	149.081
2/1/2022	149.884
3/1/2022	150.744
4/1/2022	156.556
5/1/2022	157.006
6/1/2022	157.82
7/1/2022	166.53
8/1/2022	166.79
9/1/2022	167.172
10/1/2022	171.805
11/1/2022	171.907
12/1/2022	171.97
1/1/2023	175.235
2/1/2023	175.277
3/1/2023	175.455
4/1/2023	175.135
5/1/2023	175.308
6/1/2023	175.329
7/1/2023	172.926

Analysis	
Price May 2021	128.9667
Price Oct 2022	171.805
% Change	33.22%



**Exhibit B**  
**Draft SAPA Notice**

**STATE OF NEW YORK  
PUBLIC SERVICE COMMISSION  
PROPOSED RULE MAKING  
NO HEARING(S) SCHEDULED**

PURSUANT TO THE PROVISIONS of the State Administrative Procedure Act, NOTICE is hereby given of the following action:

***Proposed Action:*** The New York Public Service Commission is considering whether to approve or reject, in whole or in part, a joint petition filed by CHPE LLC and H.Q. Energy Services (U.S.) Inc. (“Petitioners”) seeking a program-wide modification of Renewable Energy Certificate (“REC”) Purchase and Sale Agreements.

***Statutory Authority:*** Public Service Law, Sections 4, 5, 65, and 66(p).

***Subject:*** Request for program-wide modification of Renewable Energy Certificate Purchase and Sale Agreements.

***Purpose:*** To approve or reject Petitioners’ request seeking program-wide modification of REC agreements.

***Substance of the proposed rule:*** The New York Public Service Commission (“Commission”) is considering a joint petition filed by CHPE LLC and H.Q. Energy Services (U.S.) Inc. (“HQUS”) requesting that the Commission implement adjustments on a program-wide basis, or alternatively by tier, for all renewable energy certificate contracts with the New York State Energy Research and Development Authority entered into before May 2022 for those project components that have not yet been placed in service to partially address the significant, unforeseeable increase in construction costs for these projects, which include the projects identified in the pending petitions filed by Alliance for Clean Energy New York, on behalf of solar and land-based wind generation developers; Sunrise Wind LLC; Empire Offshore Wind LLC and Beacon Wind LLC; and Clean Path New York LLC; as well as the Champlain Hudson Power Express Project to deliver zero-emissions energy to New York City in which CHPE LLC and HQUS are partners.

***Text of proposed rule and any required statements and analyses may be obtained by filing a Document Request Form (F-96) located on our website <http://www.dps.ny.gov/f96dir.htm>. For questions, contact:*** John Pitucci, Public Service Commission, 3 Empire State Plaza, Albany, New York 12223-1350, (518) 486-2655, email: [john.pitucci@dps.ny.gov](mailto:john.pitucci@dps.ny.gov).

***Data, views or arguments may be submitted to:*** Michelle L. Phillips, Secretary, Public Service Commission, 3 Empire State Plaza, Albany, New York 12223-1350, (518) 474-6530, email: [secretary@dps.ny.gov](mailto:secretary@dps.ny.gov).

***Public comment will be received until:*** 60 days after publication of this notice.

***Regulatory Impact Statement, Regulatory Flexibility Analysis, Rural Area Flexibility Analysis and Job Impact Statement***



Statements and analysis are not submitted with this notice because the proposed rule is within the definition contained in Section 102(2)(a)(ii) of the State Administrative Procedure Act.