STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

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

RESPONSE OF TWENTY-FIVE ORGANIZATIONS TO THE PETITION OF INDEPENDENT POWER PRODUCERS OF NEW YORK, INC., NEW YORK STATE BUILDING AND CONSTRUCTION TRADES COUNCIL AND NEW YORK STATE AFL-CIO FOR THE ESTABLISHMENT OF A SO-CALLED "ZERO" EMISSIONS ENERGY SYSTEMS PROGRAM UNDER THE CLEAN ENERGY STANDARD

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Pursuant to the September 15, 2021, New York State Register notice, Sierra Club, Earthjustice, New York City Environmental Justice Alliance, New York Lawyers for the Public Interest, Clean Energy Group, Environmental Advocates NY, All Our Energy, Alliance for a Green Economy, BK ROT, Church Women United in New York State, Citizens' Environmental Coalition, Climate Solutions Accelerator of the Genesee-Finger Lakes Region, Fossil Free Tompkins, Gas Free Seneca, Long Island Progressive Coalition, Nassau Hiking & Outdoor Club, New Yorkers for Clean Power, Renewable Energy Long Island, Scenic Hudson, Inc., Seneca Lake Guardian, Sisters of Charity Federation, South Shore Audubon Society, Surfrider Foundation, Sustainable Tompkins, Inc., and Syracuse Peace Council respectfully submit these comments in opposition to the Petition of Independent Power Producers of New York, Inc., New York State Building and Construction Trades Council and New York State AFL-CIO for the Establishment of a Zero Emissions Energy Systems Program under the Clean Energy Standard (Petition). As set forth below, the Petition as crafted would subsidize the continued development of fossil fuel-fired generation resources, which would exacerbate climate change and its disproportionate impacts on disadvantaged communities in New York.

I. Introduction

In 2019, New York enacted the pathbreaking Climate Leadership and Community Protection Act (CLCPA or Act) with twin climate mitigation and environmental justice aims. A core component of the CLCPA is its requirement that New York achieve a 100 percent zero emissions electric grid by 2040. This 100 percent zero emissions mandate for electric power was intended to be strictly interpreted: unlike other sectors, for which the CLCPA authorized offsets, offsetting of electric sector emissions was expressly prohibited by the Act. Achievement of the CLCPA's zero emissions mandate promises a host of climate, environmental, public health, and equity benefits.

To effectuate the CLCPA's electric sector requirements, in May 2021, the Power Generation Advisory Panel provided a set of carefully crafted recommendations to the Climate Action Council (CAC) following months of deliberation. Among other things, the recommendations speak directly to the need to expeditiously accelerate deployment of energy storage resources as well as the need to initiate a planning process to extricate New York from its present heavy reliance on fossil fuel generation for electric power. At the same time, the recommendations make clear that technologies such as hydrogen combustion and renewable natural gas (RNG) are unproven and "[f]urther analysis, technical development, and research is needed in order to determine the feasibility, climate impact, and health impacts of advanced fuels prior to infrastructure investment."[1] Moreover, the Panel unanimously found that new fossil

[1] *Power Generation Advisory Panel Recommendations (May 3, 2021)*, *from* N.Y. State Climate Action Council: Meetings and Materials, at Slide 46, https://climate.ny.gov/Climate-Action-Council/Meetings-and-Materials (last visited Nov. 10, 2021).

fuel-fired generation should be built—if at all—only as a last resort and limited to situations of demonstrated reliability need.[2] The New York State Department of Environmental Conservation (DEC) broadly reaffirmed this approach in its October 27, 2021 decisions denying air permits to two proposed gas-fired power plants, explaining that "[t]he construction of a new fossil fuel-fired major electric generating facility, which would otherwise be expected to have a useful life beyond 2040, is inconsistent with the CLCPA's requirement for emission-free electricity generation by 2040."[3]

Section7(3) of the CLCPA requires that all state agencies ensure that their decisions "shall not disproportionately burden disadvantaged communities" and affirmatively "prioritize reductions of greenhouse gas emissions and co-pollutants" in such communities. CLCPA § 7(3). As discussed further below, much of the State's fossil fuel infrastructure is located in low-income communities and communities of color that will likely qualify as disadvantaged when the Climate Justice Working Group[4] releases their recommendations later this year. The extension of operations at fossil-fuel power plants and the combustion of new fuel sources at these plants, which have additional negative air quality and health impacts of their own, are not compliant with Section 7(3) of the CLCPA.

Despite all this, on August 18, 2021, the Independent Power Producers of New York, together with the New York State Building & Construction Trades Council and the New York State AFL-CIO (collectively, IPPNY), submitted a petition (Petition) to the Public Service Commission (Commission or PSC) requesting that the Commission "act quickly" to establish a new tier within the Clean Energy Standard (CES) and initiate a competitive program to procure at least one gigawatt (GW) of "zero emissions energy systems" to commence commercial operation by 2030.[5] The Petition proposed a novel definition of "zero emissions energy systems" and claimed that the proposal was aligned with the CLCPA and the recommendations from the Power Generation Advisory Panel. Yet, as demonstrated in these comments, the Petition is inconsistent with both the CLCPA's mandates, the recommendations from the Power Generation Advisory Panel, and DEC's recent air permitting decisions.

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[2] The Power Generation Advisory Panel recommended that fossil fuel-fired generation only be considered if "[t]he NYISO and local transmission operators confirm that the fossil fuel-fired facility is required to maintain bulk or non-bulk power system reliability and that need cannot be reasonably met with any zero-emissions alternatives or combination of zero-emissions alternatives." *Id.* at Slide 69.

[3] Letter from Daniel Whitehead, Dir. Div. of Env'tl Permits, NYDEC, to Andrew Scano, Astoria Gas Turbine Power, Re: Notice of Denial of Title V Air Permit, DEC ID: 2-6301-00191/00014, at 12 (Oct. 27, 2021) ("Astoria Denial Ltr."), https://www.dec.ny.gov/docs/permits_ej_operations_pdf/nrgastoriadecision102721.pdf.

[4] N.Y. State Climate Action Council: Climate Justice Working Group, https://climate.ny.gov/Climate-Justice-Working-Group.

[5] Petition of Independent Power Producers of New York, Inc., New York State Building and Construction Trades council and New York State AFL-CIO for the Establishment of a Zero Emissions Energy Systems Program under the Clean Energy Standard at 2, 9, Case No. 15-E-0302, Docket No. 878, (NYPSC Aug. 18, 2021). ("IPPNY Pet'n").

Relying on a false sense of urgency, the Petition urges the Commission to rush to adopt a deeply flawed definition of "zero emissions" that would result in electric customers subsidizing additional fossil fuel generation in tension with the mandates of the CLCPA based on misplaced claims of climate mitigation. There is simply no need to consider a request for a new CES tier for non-renewable resources at this time. The CLCPA requires 70 percent renewable energy by 2030. Numerous analyses have found that mature renewable and truly non-emitting energy storage technologies can reliably and cost-effectively supply about 80 percent of the United States' electricity needs by 2030—more than is required by the CLCPA—and 90 percent of electricity needs by 2035.[6] A wide variety of long-duration energy storage resources are currently under development, and it is unclear which ones will succeed in the competition to supply the grid needs that are difficult to cost-effectively meet with today's technology.[7] There is simply no basis for concluding at this time that New York will not be able to fully meet its electric system needs with a combination of renewable resources and energy storage resources that solely charge with renewables.

If analyses later this decade demonstrate that the State will also need grid services from zero-emissions resources not covered by the Clean Energy Standard's current tiers, the Commission should consider *at that time* how best to support those resources and, in any event, must establish a definition of "zero emissions" that is consistent with the plain meaning of those terms and the actual intent of the CLCPA drafters. By supporting the development of new, pollution-emitting resources before true zero emissions technologies are commercially available, many of which would likely be constructed in the same environmental justice communities that already host much of New York's power generation, the Petition would thwart the CLCPA's equity requirements.

Ultimately, IPPNY's Petition is not only premature and its definition of "zero emissions" poorly conceived, but it also threatens to distract the Commission from important near-term actions that it should pursue to effectuate the CLCPA's requirements under Sections 7(2) and 7(3), as well the CAC's Power Generation Advisory Panel's recommendations. For instance, the Commission should focus its resources in the near term on revamping New York's energy storage goals and updating Commission programs to support storage deployment at the scale required in the Power Grid Study's projections. In addition, there is an urgent need to map out how New York can alleviate its current heavy reliance on pollution-emitting fossil fuel power plants. Careful and intentional planning will avoid a reliability need to keep fossil fuel facilities online beyond 2040 in violation of the CLCPA's zero emissions mandate.

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[6] Dan Esposito, Energy Innovation Pol'y & Tech., *Studies Converge on Benefits of a Rapid Clean Energy Transition* 2 (July 2021), https://energyinnovation.org/wp-content/uploads/2021/07/Studies-Converge-on-Benefits-of-a-Rapid-Clean-Energy-Transition.pdf.

[7] *See generally* Nestor A. Sepulveda et al., *The Design Space for Long-Duration Energy Storage in Decarbonized Power Systems*, 6 Nature Energy 506 (2021), https://www.nature.com/articles/s41560-021-00796-8.

II. Factual Background

A. New York's Climate Leadership and Community Protection Act

In 2019, New York enacted a major piece of climate and equity legislation—the CLCPA—that codified, for the first time, statewide climate commitments and established both substantive obligations and procedures intended to benefit disadvantaged communities.

In addition to setting forth a statewide mandate to reduce greenhouse gas (GHG) emissions by at least 40 percent from 1990 levels by 2030 and 85 percent from 1990 levels by 2050, E.C.L. § 75-0107(1), the CLCPA also established a number of electric sector-specific requirements. The Act mandated that "a minimum of" 70 percent of electric generation secured by the State's jurisdictional load-serving entities (LSEs) be generated by renewable energy systems by 2030, P.S.L. § 66-p(2)(a); that the State's LSEs procure "at least" 9 GW of offshore wind electricity generation by 2035 and 6 GW of photovoltaic solar generation by 2025; and that the State support 3 GW of energy storage capacity by 2030. *Id.* § 66-p(5). Notably, the CLCPA set no limits on renewable energy generation; only a floor of at least 70 percent. The Act also mandated that by 2040, "the statewide electrical demand system will be zero emissions." *Id.* § 66-p(2)(b). While the Act authorizes DEC to develop an offset alternative compliance mechanism to be available to certain emissions sources, E.C.L. § 75-0109(4), the statute specifies that "[s]ources in the electric generation sector shall not be eligible to participate in such mechanism," *id.* § 75-0109(4)(f), meaning that by 2040, all generation sources powering New York must be truly non-emitting.

The CLCPA also requires that all state agencies must ensure that their decisions "shall not disproportionately burden disadvantaged communities." CLCPA § 7(3). To this end, agencies must affirmatively "prioritize reductions of greenhouse gas emissions and co-pollutants" in such communities. *Id.* New or increased sources of *either* greenhouse gas or co-pollutant emissions—as IPPNY proposes—in disadvantaged communities would constitute disproportionate and cumulative impacts in violation of CLCPA Section 7(3).

The CLCPA additionally requires that a target of 40 percent and no less than 35 percent of the benefits of programmatic resources for clean energy and energy efficiency programs, projects, or investments in the areas of housing, workforce development, pollution reduction, low-income energy assistance, energy, transportation, and economic development be dedicated to disadvantaged communities. E.C.L. § 75-0117. The Act also requires that 25 percent of investments in residential energy efficiency, including multi-family housing, occur in a manner that will benefit disadvantaged communities, P.S.L. § 66-p(6), and that the Commission ensure that a minimum percentage of energy storage deliver clean energy benefits into NYISO zones

that serve disadvantaged communities. *Id.* § 66-p(7). Nothing in IPPNY's Petition would achieve this.

B. Implementation of the CLCPA to Date

The CLCPA set forth processes for effectuating a number of the Act's requirements, including a planning process for achievement of the Act's GHG reduction mandates. The Act created a 22-member Climate Action Council (CAC) tasked, initially, with making a scoping plan outlining the recommendations for attaining the statewide greenhouse gas emissions limits described above. E.C.L. § 75-0103(11). The CAC, in turn, was required to create sector-specific advisory panels, including a Just Transition Working Group, to work with the CAC on the preparation of the scoping plan. *Id.* § 75-0103(7), (8). In addition, the Act created the Climate Justice Working Group to work with New York State agencies to "establish criteria to identify disadvantaged communities for the purposes of co-pollutant reductions, greenhouse gas emissions reductions, regulatory impact statements, and the allocation of investments related to this article." *Id.* § 75-0111(1)(b).

The sector-specific advisory panels met during the second half of 2020 and the first half of 2021 and a number of panels, including the Power Generation Advisory Panel and the Climate Justice Working Group, provided detailed recommendations to the Climate Action Council in May 2021.[8]

The Power Generation Advisory Panel recommendations in particular covered a wide range of issues in the electric sector, including support for new large-scale renewable generation resources, overcoming barriers to clean energy siting, support for distributed energy resources, support for energy storage, reliability, access and affordability, market solutions, technology solutions, long-duration energy storage, reducing emissions from gas infrastructure and transmission, and retirement of fossil fuel-fired facilities, and the equitable distribution of all the foregoing.[9]

Of particular relevance to the technologies in the IPPNY Petition, the Power Generation Advisory Panel's technology recommendations (Initiative #10) raised a host of questions regarding lifecycle GHG emissions, potential air quality and health impacts, and safety of novel technologies such as RNG and hydrogen combustion and concluded that "[f]urther analysis, technical development, and research is needed in order to determine the feasibility, climate impact, and health impacts of advanced fuels prior to infrastructure investment."[10] The fossil fuel recommendations detailed an iterative planning process and establishment of emission limits

[8] N.Y. State Climate Action Council, Meetings and Materials, available at https://climate.ny.gov/Climate-Action-Council/Meetings-and-Materials.

[9] Power Generation Advisory Panel Recommendations (May 3, 2021).

[10] *Id.* at Slide 46.

to ensure the State is timely and reliably phasing down its reliance on fossil fuel generation to achieve zero emissions electricity by 2040.[11] The IPPNY Petition seeks to sideline these recommendations.

At the July 22, 2021 CAC meeting, presenters noted that the CLCPA accounts for greenhouse gas emissions on a 20-year lifetime, including emissions from biogenic carbon dioxide and including impacts of upstream emissions from fossil fuels.[12] The CAC noted that under the prior Intergovernmental Panel on Climate Change accounting model, "renewable fuels acted as net-zero replacements of fossil equivalents[, but] under the updated CLCPA accounting [model], a renewable fuel can only avoid roughly 20%-40% of a fossil fuel's emissions because it only avoids the upstream emissions associated with the fuel."[13]

Additionally, at the July 22nd meeting, the Climate Justice Working Group presented its feedback on the Power Generation Advisory Panel Recommendations, and emphasized its concern that discussions of RNG and hydrogen combustion were receiving undue attention in comparison to the CLCPA-compliant and readily available renewable energy solutions available, noting that hydrogen combustion and RNG combustion are often carbon intensive, produce co-pollutants that end up concentrated in environmental justice communities, and many are not economically viable.[14]

C. Description of the IPPNY Petition

While the CAC was working to integrate the panel recommendations and develop its initial draft scoping plan, IPPNY filed its Petition with the Commission urging the Commission to "act quickly" to support "zero emissions energy systems." Specifically, IPPNY requests the creation of a new tier of the CES by July 1, 2022, that would be limited to *non-renewable* "zero emissions energy systems," and procurement of at least 1 GW of these resources to commence commercial operation by 2030.[15] IPPNY proposes to define "zero emissions energy systems" as "systems, other than renewable energy systems, that generate electricity or thermal energy through the use of technologies that do not lead to a net increase in greenhouse gas emissions into the atmosphere at any time in the process of generating electricity."[16] The Petition also

[11] *Id.* at Slide 66.

[12] *Climate Action Council Meeting 13 Presentation (July 22, 2021), from* N.Y. State Climate Action Council: Meetings and Materials, at Slide 25, ny.gov, https://climate.ny.gov/Climate-Action-Council/Meetings-and-Materials (last visited Nov. 10, 2021).

[13] *Id.* at Slide 26.

[14] *See id.* at Slide 14 (discussing concerns about undue focus on "false solutions").

[15] IPPNY Pet'n at 9–10.

[16] *Id.* at 2.

requests that the Commission import the labor standards already codified for renewable energy projects to apply to "zero emissions energy systems" as well.[17]

D. DEC's Recent Application of CLCPA Sections 7(2) and 7(3) to Fossil Fuel-Fired Power Plant Proposals

On October 27, 2021, DEC issued letters denying Title V air permit applications for two proposed gas-fired power plants citing the CLCPA as the basis for its denial.[18] DEC's application of CLCPA Section 7(2) and 7(3) is instructive in the Commission's review of the IPPNY Petition. In the denial letters, DEC explained that its analysis of a proposed generation project under Section 7(2) proceeds in three steps: (1) DEC "must consider whether a Title V permit for the Project would be inconsistent with or interfere with the attainment of the Statewide GHG emission limits established in [the CLCPA]"; (2) if DEC answers the first question in the affirmative, then "the Department must also provide a detailed statement of justification for the Project notwithstanding the inconsistency"; and (3) if such a justification exists, DEC "would also have to identify alternatives or GHG mitigation measures to be required for the Project."[19]

Applying this framework, DEC denied the permit applications for both gas plants based on their interference with the CLCPA's statewide GHG emission limits and their lack of compelling justification. In addition to confirming that both direct and upstream emissions must be accounted for in evaluating compliance with CLCPA statewide GHG emission limits,[20] the decisions rejected projected displacement of other electric generation as a basis for concluding that a project's emissions are consistent with the CLCPA.[21] Specifically, DEC noted that CLCPA Section 7(2) analyses require DEC to "make a determination in the context of a permitting action for an individual facility" and in doing so, DEC "does not specifically take into account actions that may or may not occur at other GHG emission sources."[22]

In addition, DEC raised CLCPA compliance concerns with both RNG and hydrogen co-firing. For RNG, in addition to raising a number of technical concerns, DEC explained that "neither the Department nor PSC have yet determined the extent to which RNG combustion may be an acceptable means of meeting the zero-emissions by 2040 requirement of the CLCPA."[23]

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[17] *Id.* at 10–11.

[18] Astoria Denial Ltr.; Letter from Daniel Whitehead, Dir. Div. of Env'tl Permits, NYDEC, to Brenda Colella & Danielle Mettler-LaFeir, Danskammer Energy Ctr., Re: Notice of Denial of Title V Air Permit, DEC ID: 3-3346-00011/00017 (Oct. 27, 2021) ("Danskammer Denial Ltr."), https://www.dec.ny.gov/docs/administration_pdf/danskammer10272021.pdf.

[19] Astoria Denial Ltr. at 7.

[20] *Id.* at 8–10; Danskammer Denial Ltr. at 7–9.

[21] Astoria Denial Ltr. at 13–14; Danskammer Denial Ltr. at 11–12.

[22] Astoria Denial Ltr. at 14.

[23] *Id.* at 13.

And for hydrogen, DEC noted that, apart from a number of technical feasibility, safety, and conventional air pollution concerns, any blend of gas with hydrogen would result in positive GHG emissions "potentially jeopardizing the facility's compliance with the zero emissions by 2040 requirement in the CLCPA."[24]

In sum, DEC's analyses of the Astoria and Danskammer project cast serious doubt on the viability of the resources that are intended to be subsidized by the IPPNY Petition.

III. Argument

The Commission should deny IPPNY's Petition because it is untimely and would hinder rather than advance achievement of an equitable and truly zero emissions electric sector in New York. IPPNY's attempt to effectively redefine "zero emissions" as "not emissions-increasing" plainly contradicts the statutory language and intent of the CLCPA, jeopardizing the ability of the Act to function as intended. The resources that IPPNY seeks to deploy in its Petition—RNG, hydrogen, and CCS—can only be considered "zero emissions" through definitional sleight-of-hand, and IPPNY members have confirmed that fossil gas alternatives such as RNG and hydrogen are not commercially available at this time. IPPNY's capacious definition of "zero emissions" would pull in traditional fossil fuel resources, which would be the primary near-term beneficiaries of IPPNY's petition and continue the disproportional impacts of that fossil fuel infrastructure.

Truly zero-emissions dispatchable resources, such as long-duration storage, are still in the innovation and demonstration stage, and are premature to support through a new CES tier. Approving IPPNY's petition and "zero emissions" definition today would result in New York's electric customers subsidizing the development of additional fossil fuel-fired generation, in direct contravention of the CLCPA's clean energy and climate justice mandates, and in clear tension with the recommendations of the Power Generation Advisory Panel, which urged the development of a plan to extricate the State from its over-reliance on fossil fuel-fired capacity. Moreover, the Petition would risk exacerbating environmental injustices in the siting of power plants and associated emissions, likely prolonging disadvantaged communities' exposure to power sector emissions.

There is no need for an exclusively non-renewable tier of the CES, which would arbitrarily and unhelpfully restrict the amount of renewable generation that can be developed in New York. While we do not know with certainty what zero-emissions dispatchable resources will emerge to support New York's 2040 emissions-free electricity mandate, any future dispatchable resource tier should be open to all truly emissions-free resources that can provide the relevant grid services. For now, however, the Commission should honor the plain language

[24] Astoria Denial Ltr. at 13.

of the CLCPA and focus on implementing Power Generation Advisory Panel recommendations that can be accomplished based on existing technologies and doing so in an equitable manner that will not disproportionately impact or continue to worsen air quality and climate impacts in already-overburdened communities that host most of IPPNY's facilities.

A. IPPNY's Proposed Definition of "Zero Emissions Energy Systems" is Directly Contravened by the Plain Statutory Language of the CLCPA

The flaws with IPPNY's Petition begin with its proposed definition of "zero emissions energy systems." Any proposal to support non-renewable "zero emissions energy systems" today depends on the technology being commercially available at present, and the definition of "zero emissions" being robust. However, as discussed in the following section, the technology highlighted in the Petition is *not* commercially available today, and IPPNY's definition of "zero emissions energy systems" is incompatible with the plain meaning of "zero emissions" and would authorize CES support for new fossil fuel-fired or other carbon- or methane-based generation, a result which DEC recently affirmed is incompatible with the CLCPA.

IPPNY proposes to define "zero emissions energy systems" as "systems, other than renewable energy systems, that generate electricity or thermal energy through the use of technologies that do not lead to a net increase in greenhouse gas emissions into the atmosphere at any time in the process of generating electricity."[25] IPPNY's definition has two fatal flaws.

First, it presumes the only emissions of relevance under the CLCPA are greenhouse gas emissions. IPPNY's definition would ignore non-climate conventional and hazardous air pollutant emissions despite their serious adverse human health and environmental impacts. Nothing in P.S.L. § 66-p indicates that "emissions" was intended to refer only to GHG emissions. Indeed, the statute provides a definition for "greenhouse gas," E.C.L. § 75-0101(7) that the drafters declined to cross-reference in P.S.L. § 66-p(2). Moreover, in a precursor to the CLCPA legislation, the 2040 electric system target was to supply 100 percent of New York's electricity from "clean energy resources,"[26] which were defined to include "electric generation that releases zero or de minimis net greenhouse gas emissions to the atmosphere as a byproduct of generating electricity."[27] The CLCPA drafters' election to abandon the pure climate focus of "clean energy resources" and instead adopt a "zero emissions" requirement suggests a broader focus on pollution.

In addition, as identified above, the CLCPA contains numerous provisions designed to address equity and ensure benefits to disadvantaged communities. These communities are adversely impacted by both climate and conventional air pollution making a broad definition of

[25] IPPNY Pet'n at 2.

[26] 2019 Budget Bill, S.1508/A.2008 (Jan. 18, 2019), Part X, § 5, available at https://legislation.nysenate.gov/pdf/bills/2019/s1508.

[27] *Id*. § 6.

"emissions" most consistent with the salutary goals of the statute. When passing the statute, the legislature mandated that "[a]ctions undertaken by New York state to mitigate greenhouse gas emissions should prioritize the safety and health of disadvantaged communities" and explicitly identified the "exacerbation of air pollution" associated with climate change as one of its concerns. CLCPA § 1. The law requires both the scoping plan developed by the Climate Action Council and regulations developed to implement the scoping plan's recommendation to "maximize . . . reductions of . . . greenhouse gas emissions and co-pollutants in disadvantaged communities." E.C.L. § 75-0103(14)(d); § 75-0109(3)(d). These broader legislative goals related to health and safety are enshrined in P.S.L. § 66-p(2), which states that the zero emissions program should be formulated with an eye towards "safe… electric service." Thus, by looking "to the provisions of the whole law, and to its object and policy," it is clear that the legislature intended to adopt a definition of "zero emissions," that encompassed emissions impacting the health and safety of New Yorkers in general, and disadvantaged communities in particular. *Czyzewski v. Jevic Holding Corp*., 137 S. Ct. 973, 985 (2017) (quoting *Kelly v. Robinson*, 479 U.S. 36, 43 (1986)).

Second, IPPNY's definition would effectively transmute the words "zero emissions" into "not more greenhouse gas emitting than existing resources." Given New York's current fossil fuel-dominated grid, if the Commission adopted the Petition's indefensible definition of "zero emissions" resources, it would potentially authorize a host of fossil fuel-fired or other carbon- or methane-emitting resources to qualify, particularly in the near term while the grid remains heavily reliant on fossil fuel generation. Such a result is plainly in conflict with the intent of the Legislature, which in passing the CLCPA, hoped to expedite New York State's complete decarbonization. To that end, the legislature instructed administrators to play a leadership role in the effort "to reduce greenhouse gas emissions from all anthropogenic sources *100% over 1990 levels*" and to take aggressive interim steps over the next two decades to do so. CLCPA § 1 (emphasis added). In contravention of the legislature's mandate, the IPPNY's proposal would allow a new efficient gas-fired combined-cycle or peaking unit to be deemed a "zero emissions energy system" because, based on NYISO's least cost approach to dispatch, the unit would only be called upon to generate electricity at times when its marginal cost (generally a proxy for its efficiency and emission rate) was at or below that of other units. Indeed, to the extent that unit efficiency correlates with marginal cost and emission rate for fossil fuel generating units, almost any unit could be considered a "zero emissions energy system" under the Petition's framework. The only way a unit could fail to qualify as "zero emissions" under IPPNY's definition would be if it displaced cleaner, more efficient units when it ran. But this is not typically how the grid operates and certainly not what the CLCPA envisioned. Consequently, IPPNY's re-definition of "zero emissions" to simply mean "not emissions-increasing" is irreconcilable with the plain meaning of "zero emissions."

Consideration of displaced emissions as a basis for establishing CLCPA consistency is also directly contravened by the recent DEC decisions denying Title V air permits to the Astoria

and Danskammer proposed gas plants. In those decisions, DEC addressed arguments by both project developers that the projects furthered the emissions goals of the CLCPA by displacing more emissions-intensive generation when they operated.[28] DEC expressly rejected those arguments, finding that the "projected displacement of other GHG emission sources across the State is not itself sufficient for the Department to determine consistency with the Statewide GHG emission limits established" by the CLCPA.[29] Rather, DEC looked to the fact that each "[p]roject itself would result in substantial direct and upstream GHG emissions due to the production, transmission, and combustion of fossil fuels," and declined to "specifically take into account actions that may or may not occur at other GHG emission sources."[30] The same considerations apply in evaluating IPPNY's proposed definition. Like the developers of Astoria and Danskammer, IPPNY urges the Commission to look beyond the direct (and upstream) impacts of a technology to consider whether it will "lead to a net increase in greenhouse gas emissions into the atmosphere at any time in the process of generating electricity."[31] But this netting of a generator's emissions against hypothetical emission reductions from other sources is precisely what DEC rejected in denying the air permit applications for Astoria and Danskammer.

Moreover, it is clear from the CLCPA's broader context that the "zero emissions" definition for the electric sector was intended to be stricter than IPPNY contends. For example, while the CLCPA authorizes DEC to create an emissions-offset program as part of an alternative compliance mechanism for up to 15 percent of statewide GHG emissions, E.C.L. § 75-0109(4), the Act expressly precludes the use of offsets for sources in the electric sector. *Id.* § 75-0109(4)(f) ("Sources in the electric generation sector shall not be eligible to participate in such mechanism."). The CLCPA also explicitly bars the use of biofuels, like RNG produced from agricultural feedstocks, in this alternative compliance mechanism. *Id.* § 75-0109(4)(g) ("The following types of projects shall be prohibited: … ii. biofuels used for energy or transportation purposes."). The CLCPA intended for "zero" to mean zero as applied to emissions from the electric sector. The PSC should not approve a definition of the term that undermines the legislature's manifest intent.

The CLCPA does not support the Petition, and so IPPNY attempts to find "support" for its request in the New York State Senate's vote on an end-of-session bill, S.6497-A.[32] This bill had no co-sponsors in the Senate or Assembly, did not pass the Assembly and was never signed into law by the Governor. Therefore, it does not diminish the Commission's duty to implement the plain language of the CLCPA.

[28] *See* Astoria Denial Ltr. at 13–14; Danskammer Denial Ltr. at 11–12.

[29] Astoria Denial Ltr. at 14.

[30] *Id.* at 14.

[31] IPPNY Pet'n at 2.

[32] *Id.* at 5.

B. The Commission Should Not Rush to Subsidize Polluting Combustion-Based Technologies Today that Are Neither Zero Emissions Nor Commercially Available, When More Promising, Truly Zero-Emission Technologies Are Being Developed

IPPNY's plea for the Commission to "act quickly" notwithstanding,[33] there is no need for the Commission to rush to develop a CES tier to support non-renewable non-emissions-increasing energy systems.

IPPNY's Petition creates an artificial sense of urgency by conflating the CLCPA's distinct 2030 and 2040 requirements for the electric sector. The Petition states: "By establishing the 70 by 30 Target for renewable energy systems *and requiring the remaining percentage of load be served with electricity generated by 'zero emission sources,'* the Legislature intended that zero emissions sources include sources other than renewable energy systems."[34] This statement is inaccurate because the 70 percent renewable generation minimum requirement applies in 2030, P.S.L. § 66-p(2)(a), whereas the zero-emissions resource mandate applies ten years later in 2040, *id.* § 66-p(2)(b). In 2030, the CLCPA includes no requirement that the non-renewable "remaining percentage of load" be served with zero emissions generation. IPPNY ignores the fact that New York's electric generation mix already contains huge amounts of dispatchable resources, including some, like hydropower, that are renewable, zero-emissions, and dispatchable. Indeed, in 2020, hydropower supplied nearly a quarter of New York's utility-scale net generation.[35] The CLCPA does not mandate that these be replaced with zero emissions resources on the same time frame as the State increases renewable energy penetration to 70 percent.

Moreover, IPPNY's suggestion that 70 percent of New York's future electricity be generated by renewable resources and the remaining 30 percent come from *non-renewable* zero-emissions resources finds no support in the CLCPA. Nothing in the Act suggests the legislature meant to carve out a large portion of the electricity market for non-renewable electricity sources, as evidenced by the 2030 requirement that *at least* 70 percent of New York's electricity come from renewable resources and the CLCPA drafters' election not to impose any cap on renewable generation. Further, the Power Generation Advisory Panel clearly understood that intent and incorporated recommendations prioritizing "emissions-free resources (e.g., storage, energy efficiency, renewable energy)" "where feasible."[36]

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[33] *Id.* at 9.

[34] IPPNY Pet'n at 6 (emphasis added).

[35] *New York: State Profile and Energy Estimates*, Energy Info. Admin, https://www.eia.gov/state/analysis.php?sid=NY (last updated Oct. 21, 2021).

[36] Power Generation Advisory Panel Recommendations (May 3, 2021), at Slide 46.

C. IPPNY Fails to Identify a Single "Zero Emissions" Technology That Is Actually Zero Emissions, Commercially Available Today, And Not Covered by an Existing CES Tier.

1. Hydrogen For Electricity Generation Is Not A Zero Emissions Technology Regardless of How The Hydrogen Is Produced

Hydrogen fuel sourced only from solar and wind power, at some future unknown date when both technically and commercially feasible, may be a source of zero-carbon electricity, but it will never be emissions-free electricity if generators rely on combustion. As several studies and industry sources show, hydrogen combustion creates significant amounts of nitrogen oxide (NOx) emissions, which are a precursor of both ground-level ozone and fine particulate matter, both of which disproportionately impact disadvantaged communities. Any CES tier incentivizing technology that significantly degrades local air quality and public health will likely run afoul of Section 7(3) of the CLCPA.

a) Hydrogen combustion produces NOx emissions, a tremendously problematic local air quality and public health issue, in contravention to Section 7(3) of the CLCPA.

NOx emissions leading to ozone and fine particulate formation is a major health concern for New Yorkers. Any increase in NOx emissions from hydrogen combustion and the resulting ozone and fine particulate formation is hugely problematic for public health and environmental equity, in direct contravention to CLCPA Section 7(3). As DEC has stated, Section 7(3) requires the Department "to prioritize reductions of GHG emissions and *co-pollutants* in… disadvantaged communities."[37] Most fossil fuel infrastructure is located in communities of color and low-income communities. As such, the cumulative impact of diminished air quality from hydrogen combustion will continue to fall disproportionately on low-income New Yorkers and New Yorkers of color. For example, the state's Department of Health has identified the reduction of air pollution including ozone as a key indicator to drive improvements in asthma rates and public health outcomes throughout the state. The New York State Prevention Agenda 2019-24 notes the "extensive evidence" linking ozone with respiratory and cardiovascular illness and death and establishes a goal to "reduce exposure to outdoor air pollutants," with an emphasis on vulnerable groups.[38]

Yet, local air quality impacts and local public health will only worsen with hydrogen fuel combustion, absent significant advances in NOx emission control technology. Seeming to acknowledge as much, DEC itself recently denied a Title V permit for a proposal to build a hydrogen and natural gas-fired power plant in Astoria, Queens County, noting that the project

[37] *See* Astoria Denial Ltr. at 17 (emphasis added).

[38] N.Y. Dep't of Health, *New York State's Health Improvement Plan: Prevention Agenda 2019–24* 72–73 (updated Sept. 2, 2021), https://www.health.ny.gov/prevention/prevention_agenda/2019-2024/docs/ship/nys_pa.pdf.

"may have a disproportionate burden on DACs pursuant to Section 7(3)."[39] Concerns about NOx emissions from hydrogen are supported by a study conducted by General Electric on its combustion turbines, which found that a 50/50 mixture of hydrogen and fossil gas (by volume) increased concentrations of NOx in gas exhaust *by 35 percent*.[40] A recent report by a gas turbine industry association warned that these higher flame temperatures will produce more health-harming NOx emissions "if no additional measures are undertaken."[41] The trade association was so skeptical of its members' ability to market hydrogen combustion turbines that complied with air quality standards that it recommended "[s]ome flexibility might be needed on NOx limits."[42] This approach would be impermissible in New York, where the legislature has demanded a zero-emissions electric sector and no additional adverse impacts on communities already overburdened with these polluting facilities.

Moreover, New York is under a separate obligation to reduce NOx emissions pursuant to the Clean Air Act. Areas of the state remain in nonattainment for both the 2008 and 2015 ozone National Ambient Air Quality Standards (NAAQS). As a key step to reducing NOx emissions within the state, the DEC recently adopted NOx emissions limits for simple cycle combustion turbines, 6 N.Y.C.R.R. Subpart 227-3, and revised its State Implementation Plan accordingly. New York cannot not take a step backward to allow increased NOx emissions when portions of the state remain in nonattainment status.

Comprehensive reviews of the adequacy of any power plant's emission controls and emissions monitoring program is needed before any hydrogen combustion can begin. Building peaker plants that run on hydrogen would threaten to create a perfect storm for NOx emissions. That is, high-priced fuels would make these facilities expensive to operate and the last to run under New York's economic dispatch, raising the risk that these facilities would spend a large portion of their operational hours cycling. This operational profile could lead to increased emissions because gas turbine NOx emissions often spike during startup, before their pollution controls have warmed up. No state incentives should be made available to projects that increase harmful NOx emissions.

b) Hydrogen is an indirect GHG and can leak

Hydrogen is a smaller molecule than methane and has been shown to leak as much as three times the rate of natural gas.[43] Hydrogen is an indirect GHG, which will itself contribute to

[39] *See* Astoria Denial Ltr. at 17.

[40] Jeffrey Goldmeer et al. at 5.

[41] Mirko Bothien et al., ETN Global, *Hydrogen Gas Turbines: The Path Towards a Zero-Carbon Gas Turbine* 9 (2020), https://etn.global/wp-content/uploads/2020/01/ETN-Hydrogen-Gas-Turbines-report.pdf.

[42] *Id.*

[43] M.W. Melaina et al., Nat'l Renewable Energy Lab'y, *Blending Hydrogen into Natural Gas Pipeline Networks: A Review of Key Issues* (Mar. 2013), https://wwwnrel.gov/docs/fy13osti/51995.pdf.

climate change. Unburned, leaked hydrogen is a potent GHG with a 20-year global warming potential that is likely more than 5 times greater than that of carbon dioxide (CO_2).[44]

As discussed further below, there is a false narrative that existing pipeline infrastructure could deliver hydrogen to industrial users. The potential for leakage during routine operations is one additional reason why this is not feasible. New York's aging pipeline infrastructure already leaks a significant amount of total gas, and that leakage rate would only compound with hydrogen gas. Moreover, hydrogen can corrode and embrittle materials that are commonly used in pipeline systems, threatening pipeline integrity and elevating the risk of failures and catastrophic releases.[45]

c) Turbines that combust exclusively "green" hydrogen are not commercially available today

No commercially available power plant turbines can burn pure hydrogen while controlling NOx. Without this technology, even power plants that have access to green hydrogen will continue to burn a mixture of hydrogen and fossil gas. And even if the logistical challenges can be overcome to allow gas-fired power plants to burn a gas blend with 50 percent green hydrogen, a 50 percent hydrogen blend can only achieve a 20 percent CO_2 reduction in CO_2 emissions.[46] Such meager reductions in CO_2 emissions, in the face of increased NOx emissions, exorbitant costs, immense logistical hurdles, and potential local safety and flammability concerns is not only CLCPA-non-compliant,[47] but entirely infeasible today.

Even if technological improvements enabled a power plant to burn pure hydrogen, there will be no pipelines to deliver the hydrogen for the foreseeable future. Despite the fossil fuel industry's false narratives, pure hydrogen gas is not a drop-in fuel that can easily use existing gas

[44] Richard Derwent et al., *Global Environmental Impacts of the Hydrogen Economy*, 1 Int'l J. Nuclear Hydrogen Prod. & Applications 57, 57 (2006), https://www.geos.ed.ac.uk/~dstevens/Presentations/Papers/derwent_ijhr06.pdf.

[45] Justin Mikulka, *Decoding the Hype Behind the Natural Gas Industry's Hydrogen Push*, Desmog Blog (Jan. 14, 2021), https://www.desmogblog.com/2021/01/14/decoding-hype-behind-natural-gas-industry-hydrogen-push (citing Zahreddine Hafsia et al., *Hydrogen embrittlement of steel pipelines during transients*, Procedia Structural Integrity, Vol. 13 (2018)); Patrick Verdonck & Martha Kammoun, *Is Hydrogen a Viable Alternative to Lithium Under the Current Energy Storage Regulatory Framework?*, 18 Oil, Gas & Energy Law Intelligence (2020), https://www.lexology.com/library/detail.aspx?g=e908442d-8b33-462c-ae23-9c1dcb917127.

[46] Jeffrey Goldmeer et al., Gen. Elec., *Hydrogen as a Fuel for Gas Turbines* 3 (2021), https://www.ge.com/content/dam/gepower-new/global/en_US/downloads/gas-new-site/future-of-energy/hydrogen-fuel-for-gas-turbines-gea34979.pdf.

[47] *See, e.g.*, Astoria Denial Ltr. at 12–13 (noting that "if a blend of hydrogen and natural gas is combusted, some amount of GHG emissions would still be generated from the natural gas component of the fuel mixture . . . .").

infrastructure.[48] Hydrogen has unique molecular properties that cause it to attack and "embrittle" steel and other materials that are commonly used in pipes. Its higher flammability and leakage rates also create safety risks.[49] Conventional gas pipelines do not have systems for detecting leaks of hydrogen.[50] Transitioning from fossil gas to hydrogen (or even a gas blend with at least 40 percent hydrogen by volume) will require replacement of the compressors on a pipeline system.[51] Transitioning any pipeline system from delivering fossil gas to hydrogen would require a system-specific analysis of materials and equipment to determine what upgrades would be necessary. No gas pipeline company can feasibly study and implement a strategy for safely transitioning its pipes to deliver pure hydrogen by 2030. Gas distribution utilities in California recently estimated that it would take five years to study the feasibility of injecting a blend of just 20 percent hydrogen by volume on a "controlled and isolated" segment of a distribution system.[52]

The regulatory and contractual obstacles to repurposing gas infrastructure would also be significant. Even if a gas transmission company wanted to remove a pipeline from gas service (an ambition that no New York pipeline owners have ever publicly stated), it is unclear how long it would take to secure approval from the Federal Energy Regulatory Commission (FERC) to abandon methane gas service. Gas transmission companies routinely enter long-term contracts to deliver methane gas, obligating them to deliver this gas past 2030. For instance, the FERC-approved tariff for one gas transmission pipeline in New York includes the general term and condition that: "The gas shall not contain any elements, compounds or components beyond those normally found in gas in its naturally occurring state."[53] In 2019, Con Ed entered a 15-year contract with that pipeline company to deliver gas that requires it to provide gas in accordance

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[48] *See, e.g.*, Emma Penrod, *Will Hydrogen Usher in a New Era of Collaboration Between Gas and Electric Utilities?*, Utility Dive (Aug. 19, 2021) ("'We are a bread truck, and molecules are the bread,' said Kimberly Denbow, AGA's managing director of security and operations. 'Different molecules will have different impacts on materials and compatibility, and that is something we need to get into with research, but looking at it from a bigger perspective, we really are just delivering bread.'"), https://www.utilitydive.com/news/will-hydrogen-usher-in-a-new-era-of-collaboration-between-gas-and-electric/604830/.

[49] *See* Erin M. Blanton et al., Colum. Ctr. on Glob. Energy Pol'y, *Investing in the US Natural Gas Pipeline System to Support Net-Zero Targets* 39 (Apr. 2021), https://www.energypolicy.columbia.edu/sites/default/files/file-uploads/GasPipelines_CGEP_Report_042221.pdf.

[50] *Id.*

[51] Christopher Findlay, *What's Your Purpose? Reusing Gas Infrastructure for Hydrogen Transportation*, Siemens Energy, https://www.siemens-energy.com/global/en/news/magazine/2020/repurposing-natural-gas-infrastructure-for-hydrogen.html (last visited Nov. 9, 2021).

[52] Joint Application of Southern California Gas Company, San Diego Gas & Electric Company, Pacific Gas and Electric Company, and Southwest Gas Corporation Regarding Hydrogen-Related Additions or Revisions to the Standard Renewable Gas Interconnection Tariff at 10, Case No. A.20-11-004 (Cal. Pub. Utils. Comm'n Nov. 20, 2020), https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M351/K622/351622423.PDF.

[53] FERC Gas Tariff: Original Volume No. 1 of Millennium Pipeline Company, L.L.C. filed with the Federal Energy Regulatory Commission at 210, Docket No. RP09-633-000 (Fed. Energy Regul. Comm'n July 1, 2009), https://www.ferc.gov/sites/default/files/2020-05/011561_000100__contents.pdf.

with the general terms and conditions in the FERC-approved tariff.[54] Consequently, if this pipeline operator decided to transition to supplying hydrogen instead of its current gas blend, it would need to unwind this long-term contract and others like it. Ultimately, the notion that existing infrastructure could transition to delivering hydrogen by 2030 appears just as fanciful as the notion that industry could build a new network of dedicated hydrogen pipelines by that time.

Storage of hydrogen—the universe's smallest and lightest molecule—is another significant logistical challenge. The vast majority of New Yorkers live in areas where underground storage of hydrogen is not an option. Pressurized containers could in theory be built anywhere, but their footprint and cost would limit their ability to provide meaningful volumes of storage for a power plant.[55] One strategy to avoid devoting enormous amounts of space to hydrogen storage is to convert hydrogen gas into ammonia, although it would require additional energy to convert the hydrogen into ammonia and back again. In recent modeling for the Los Angeles Department of Water and Power, the National Renewable Energy Laboratory assumed that converting hydrogen into ammonia for storage would be necessary to use hydrogen for electricity generation in the Los Angeles metropolitan area, despite acknowledging the potential community opposition to storing ammonia in densely populated areas.[56] Ammonia is a toxic gas.[57]

The Commission should not promote the combustion of hydrogen in power plants without considering the safety risks of handling this flammable and leak-prone gas in pipelines, storage facilities, and the power plants themselves. Hydrogen is much more flammable than methane gas. It requires less air to burn than methane and when hydrogen ignites the flames have the potential to spread much faster. Comprehensive studies of the safety and flammability of hydrogen fuel must be undertaken to fully understand the risks posed by transporting, storing, and combusting it at power plants.

Further, the generation of green hydrogen through electrolysis requires large amounts of renewable energy. Creating green hydrogen to power fuel cells could be a sensible use of surplus renewables, which are not yet plentiful on New York's grid. But deploying combustion resources at the scale contemplated in the Petition would require significant dedicated renewables to create hydrogen, is not currently a reasonably cost-effective decarbonization

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[54] Contract of Consolidated Edison Company of New York, Inc. with Millennium Pipeline Company, LLC §§ 2–3, Contract No. 2019 – Gas – Contract No.27 (effective April 1, 2019), https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7B82EAFBA7-061F-425D-A047-F2B27DC27042%7D.

[55] *See* BloombergNEF, *Hydrogen Economy Outlook: Key Messages* 3 (Mar. 30, 2020), https://assets.bbhub.io/professional/sites/24/BNEF-Hydrogen-Economy-Outlook-Key-Messages-30-Mar-2020.pdf.

[56] Nat'l Renewable Energy Lab'y & L.A. Dep't of Water & Power, *Chapter 6: Renewable Energy Investments and Operations*, *in* LA100: The Los Angeles 100% Renewable Energy Study at 60 & 129, https://www.nrel.gov/docs/fy21osti/79444-6.pdf.

[57] *Medical Management Guidelines for Ammonia*, Agency for Toxic Substances & Disease Registry, https://wwwn.cdc.gov/TSP/MMG/MMGDetails.aspx?mmgid=7&toxid=2 (last updated Jan. 12, 2017).

strategy for the electric grid; the energy from new renewable resources could be used more efficiently to power the grid. For instance, producing enough green hydrogen to fuel a single 45 MW turbine with the low-capacity factor of a peaker would require about 245 MW of dedicated wind capacity.[58] The diversion of New York's limited supply of wind and solar energy towards the energy-intensive production of this much green hydrogen for the Project would make it much harder to meet the CLCPA's target of a 70 percent renewable grid by 2030.

d) The Commission's CES tier for renewable resources already includes zero-emissions green hydrogen resources in the form of hydrogen fuel cells.

The Commission can support the deployment of non-polluting green hydrogen resources—that is, fuel cells that operate solely on green hydrogen—without subverting the statutory meaning of "zero emissions" resources. The CLCPA's definition of renewable energy resources includes "fuel cells which do not utilize a fossil fuel resource in the process of generating electricity." Fuel cells do not emit greenhouse gases or criteria air pollution. This is because fuel cells generate electricity without burning their fuel, unlike combustion turbines.[59] Fuel cells operating on green hydrogen are already being deployed to meet megawatt-scale energy needs.[60] Thus, the Petition's request to create new opportunities for hydrogen resources narrowly benefits the developers of combustion resources, which burden neighboring communities with health-harming pollution.

2. RNG Combustion is Not Zero Emissions

a) RNG is not a zero-emissions fuel or even a low-emission fuel and there is no analysis and analytic framework to certify any RNG as "zero emissions" at this time

Even if RNG were available in commercially relevant quantities in New York, significant further analysis would be required to ascertain its true emissions impacts and what, if any, RNG could properly be considered "zero emissions."

Because RNG is chemically just methane, it emits as much CO_2 when burned and leaks as much methane when transported as gas produced from non-biological sources like hydraulic

[58] Capacity required for a 6B.03 turbine configured as a simple cycle unit with 2,700 annual operating hours calculated using GE's tool at *Hydrogen Fueled Gas Turbines*, General Electric, https://www.ge.com/gas-power/future-of-energy/hydrogen-fueled-gas-turbines#.

[59] For an explanation of how fuel cells use the chemical energy in hydrogen to produce electricity, *see* Hydrogen and Fuel Cell Technologies Office: Fuel Cells, Off. of Energy Efficiency & Renewable Energy, https://www.energy.gov/eere/fuelcells/fuel-cells (last visited Nov. 9, 2021).

[60] Press Release, Ballard, *Ballard & HDF Energy Announce World's First Multi-Megawatt Scale Baseload Hydrogen Power Plant* (Oct. 7, 2021), https://www.ballard.com/about-ballard/newsroom/news-releases/2021/10/07/ballard-hdf-energy-announce-world-s-first-multi-megawatt-scale-baseload-hydrogen-power-plant.

fracturing (fracking). Given methane's large, adverse climate impacts during transport and combustion—methane's global warming potential is approximately 87 times that of CO_2 over a 20-year time horizon—the full lifecycle emissions implications of RNG must be carefully scrutinized before drawing any conclusions about its consistency with the CLCPA's "zero emissions" mandate. Moreover, because it is chemically methane, it emits as much conventional air pollution (NOx, CO, VOCs (including methane)[61]) when burned as any other methane gas.

As noted above, RNG can come from a variety of sources. Some sources, such as wastewater treatment, involve capturing and collecting methane that is produced from the anaerobic breakdown of biosolids, and using that methane as a fuel rather than venting it, which can have a positive climate impact.[62] Other sources, such as forestry residues, gasify biomass that would otherwise decompose aerobically without conversion to potent methane gas,[63] so risk *increasing* climate pollution, especially if any gas is leaked during transport. Moreover, many sources of RNG have other non-climate adverse environmental and land use impacts that offset potential climate benefits. For example, energy crops grown for biomass often compete with food production or biodiverse landscapes and strain water resources, and confined animal feeding operations create a host of air and water pollution problems.[64] Incentivizing RNG production could also jeopardize achievement of emissions reductions towards a 2050 net-zero emission economy-wide goal from the Agriculture and Forestry sector. The Agriculture and Forestry Advisory Panel recommended reducing current Agriculture Emissions at least 15 percent by 2030 and 30 percent by 2050, returning to 1990 levels, with the additional ambition to further reduce to 13 MMt CO_2e by 2050.[65]

Given the wide-ranging climate and environmental impacts associated with different sources of RNG , the Power Generation Advisory Panel identified the need to "[d]etermine the lifecycle GHG accounting framework of RNG."[66] DEC echoed this concern in its denial of the Astoria and Danskammer air permits, observing that "neither the Department nor PSC have yet determined the extent to which RNG combustion may be an acceptable means of meeting the zero-emissions by 2040 requirement of the CLCPA."[67] Developing the necessary framework is complicated because it entails a host of counterfactual assumptions about what would happen in the absence of creating or collecting the RNG in a wide range of contexts. Until such a

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[61] EPA, *Natural Gas Combustion* (Sept. 2020), https://www.epa.gov/sites/default/files/2020-09/documents/1.4_natural_gas_combustion.pdf.

[62] NRDC at 3.

[63] *Id.* at 2.

[64] *See id.* at 3.

[65] *Agriculture and Forestry Advisory Panel Recommendations (March 16, 2021), from* New York Climate Action Council: Meetings and Materials, at Slide 8, ny.gov, https://climate.ny.gov/Climate-Action-Council/Meetings-and-Materials (last visited Nov. 10, 2021).

[66] Power Generation Advisory Panel Recommendations (May 3, 2021), at Slide 46.

[67] Astoria Denial Ltr. at 13; see also Danskammer Denial Ltr. at 11.

framework is in place and detailed lifecycle analyses of each source of RNG are completed, it would be premature to certify any RNG as "zero emissions" within the meaning of the CLCPA.

b) RNG is not currently produced in relevant quantities for power generation in New York today

Renewable natural gas or RNG is pipeline-quality methane that is produced from biological sources such as landfills, confined animal feeding operations, or gasification of biomass. According to Argonne National Laboratory, as of 2020, there were 157 operating RNG projects in the United States, involving food waste (11), landfill gas (67); livestock or agriculture (58); and wastewater treatment plants (21).[68] Total operational production from these facilities was 59.5 TBtu (58.0 Bcf).[69]

Existing quantities of RNG are far too small to support a new CES tier at this time. Developer NRG recently analyzed the potential to power its proposed 437 MW combustion turbine in Astoria, Queens, with RNG. According to NRG, the combustion turbine would require 3.9 MMcf of natural gas per hour to operate at full load.[70] On an annualized basis, if the facility operated at a 100 percent capacity factor, that single gas turbine would require 34.2 Bcf of RNG, or *more than half of current total US RNG production*. Indeed, NRG notes that the Fresh Kills Landfill on Staten Island was the largest landfill in the world prior to its closure in 2001 and produces only 62,500 cubic feet of methane per hour.[71] Thus, powering a single medium-sized gas turbine would require 62 times as much RNG as is produced by the world's largest landfill. RNG simply cannot support a new CES tier at this time.

Furthermore, what little RNG supply is available should be directed towards more applications that, unlike CES, may require decarbonized gas because they presently lack a pathway to direct electrification. For example, the production of high industrial heat and steel, which requires sustained temperatures greater than 200°C, could benefit in the short term by switching from fossil gas to RNG. RNG may also be useful in fueling heavier categories of

[68] *Database of Renewable Natural Gas (RNG) Projects: 2020 Update*, Argonne National Laboratory (Oct. 2020), https://www.anl.gov/es/reference/renewable-natural-gas-database.

[69] *Id.*

[70] AECOM, *Draft Supplemental Environmental Impact Statement: Astoria Replacement Project* 4-21 (June 2021), https://www.nrg.com/assets/documents/legal/astoria/00_2021/astoria-draft-dseis-06-30-2021.pdf ("Astoria DSEIS").

[71] *Id*. at 4-21.

transportation, namely aviation and marine transportation. To instead waste scarce RNG resources on CES would not be socially optimal.[72]

3. Carbon Capture and Storage is Not a Zero Emissions Technology

While identified in the IPPNY petition, carbon capture and storage (CCS) is notably absent from the Power Generation Advisory Panel recommendations. The absence from the Panel recommendations is unsurprising because CCS technology is not consistent with the CLCPA's 2040 zero emissions mandate: it results in non-zero GHG emissions and significant conventional air pollution emissions as well.

CCS technology does not target conventional pollutants and, consequently, does not zero out emissions of pollutants such as NOx from gas plants. Indeed, a recent study found that implementation of CCS technology likely *increases* total air pollution.[73] If the CLCPA's zero emissions mandate extends to non-GHG pollutants, CCS plainly would not qualify.

Moreover, CCS technology is also not capable of eliminating direct GHG emissions, and does nothing to eliminate upstream emissions from gas extraction and transportation.[74] Even industry executives, in discussing so-called "blue hydrogen" (i.e., hydrogen produced from gas using CCS), have acknowledged the impossibility of fully eliminating CO_2 emissions. As Equinor's vice president recently conceded, the upper limit for how much carbon could be captured in "blue hydrogen" production is about 98 percent of CO_2 emissions because "you can never get 100% conversion, that is more or less impossible when it comes to the laws of nature."[75] Further, the Equinor vice president explained that such high capture rates were possible in "blue hydrogen" production because it is less difficult to capture carbon from the flue gas of hydrogen production facilities than the flue gas of power plants, which is lower pressure,

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[72] *See* NRDC, *Issue Brief: A Pipe Dream or Climate Solution? The Opportunities and Limits of Biogas and Synthetic Gas to Replace Fossil Fuels* 2 (June 2020), https://www.nrdc.org/sites/default/files/pipe-dream-climate-solution-bio-synthetic-gas-ib.pdf (recommending that "biogas and synthetic gas should be used sparingly and strategically to meet on-site gas and electricity needs (to avoid transporting methane and building new pipelines), and to reduce emissions from activities that are most difficult to power with renewable electricity, such as industrial processes, aviation, long-distance transportation, and electricity generation to balance seasonal wind and solar resources.").

[73] Mark Z. Jacobson, *The Health and Climate Impacts of Carbon Capture and Direct Air Capture*, 12 Energy & Envtl. Sci. 3567 (2019).

[74] Hisham Eldardiry & Emad Habib, *Carbon Capture and Sequestration in Power Generation: Review of Impacts and Opportunities for Water Sustainability*, 8 Energy, Sustainability & Soc'y 6 (2018), https://energsustainsoc.biomedcentral.com/articles/10.1186/s13705-018-0146-3.

[75] Leigh Collins, *Upstream Emissions Risk 'Killing the Concept of Blue Hydrogen,' says Equinor Vice-President*, Recharge (July 15, 2021), https://www.rechargenews.com/energy-transition/upstream-emissions-risk-killing-the-concept-of-blue-hydrogen-says-equinor-vice-president/2-1-1040583.

while the UK's Hydrogen and Fuel Cell association reports that capture rates up to 90 percent are possible with the standard method of producing hydrogen from gas.[76]

Flue gas desulfurization technology (i.e., scrubbers) are capable of achieving similar levels of sulfur dioxide emissions control from coal-fired power plants, yet no one would suggest that coal plants have zero sulfur dioxide emissions. Given that a medium sized gas plant like the proposed Danskammer combined cycle plant in Newburgh, New York, can emit approximately two million tons of CO_2 per year,[77] a 90 percent capture rate would leave the plant emitting two hundred thousand tons of CO_2 per year and a 98 percent capture rate would still result in emissions of tens of thousands of tons of CO_2 emissions. Plainly, plants equipped with CCS do not qualify as "zero emissions" based on the plain meaning of that term.

D. IPPNY's Petition Raises Serious Environmental Justice Concerns Because It Would Incentivize Further Adverse and Disproportionate Impacts on Disadvantaged Communities

The CLCPA requires that all state agencies must ensure that their decisions "shall not disproportionately burden disadvantaged communities." CLCPA § 7(3). Indeed, agencies must affirmatively "prioritize reductions of greenhouse gas emissions and co-pollutants" in such communities. Granting IPPNY's Petition would fly in the face of this statutory mandate.

As discussed above, given that IPPNY's proposed alternative-fuel technologies are not commercially available, and commercially available dispatchable non-renewable resources are overwhelmingly fossil-fuel based, there is a significant risk that IPPNY's petition will result in support for additional fossil fuel-fired resources, as authorized by IPPNY's overbroad definition of "zero emissions." Since power generation resources in New York today—and therefore the infrastructure to interconnect new resources—are disproportionately located in low-income and environmental justice communities, it is likely that new generation resources that IPPNY's petition would support would be built on or near existing generation sites. If these resources are not truly zero-emitting, new generation supported by IPPNY's petition would increase and prolong emission burdens in these disadvantaged communities.

Moreover, even if non-fossil hydrogen power plants were commercially available today and received support under IPPNY's petition, there would still be environmental justice concerns. As described above, the combustion of hydrogen can generate significant NOx emissions, adversely impacting local air quality and contributing to ground-level ozone, which can cause serious health problems—often in already-overburdened communities. The New York

[76] *Id.*

[77] *See, e.g.*, Danskammer Energy Center Exhibit 17: Air Emissions at 27 tbl. 17-6, Case No.18-E-0325, Docket No. 74 (NYPSC Dec. 11, 2019), (identifying the annual CO_2 potential to emit for the combustion turbine at 1,925,594 tons).

metro area remains in nonattainment under the NAAQS for ozone and the state recently adopted new regulations to curb NOx emissions from single-cycle combustion turbines among other sources. IPPNY's Petition would further the disproportionate and cumulative impacts of power generation resources on communities of color and low-income communities, not decrease them as required by the plain language of the CLCPA.

The State should carefully examine the potential and impact of NOx emissions from hydrogen combustion prior to incentivizing (or even allowing) any power plant to burn hydrogen. If green hydrogen eventually becomes cost-effective in volumes that are usable for renewable integration and power generation, it is best used in fuel cell generators which are zero-emission, rather than converting existing power plants to hydrogen combustion, which has harmful local co-pollutants. In addition, there are significant safety and flammability concerns with hydrogen infrastructure highlighted above.

Section 7(3) of the CLCPA prevents the imposition of disproportionate burdens on disadvantaged communities when considering and issuing permits, licenses and other administrative approvals and reductions of greenhouse gas emissions and co-pollutants in disadvantaged communities must be prioritized. Increased localized air impacts from hydrogen combustion and the risks of explosion and fire in hydrogen infrastructure in environmental justice communities, which have for decades suffered disproportionate impacts of fossil fuel combustion at power plants and congested highways, cannot be reconciled with the requirements of the CLCPA. Likewise, NYSDEC Commissioner's Policy 29 (CP-29) requires a full analysis of cumulative and disproportionate adverse impacts under SEQRA.[78]

E. The Commission Should Not Subsidize the Non-CLCPA Compliant Technologies that IPPNY Favors, But Instead Follow the Power Generation Advisory Panel's Recommendation to Research Promising Technologies that are Truly Zero-Emissions.

IPPNY fails to make a compelling case for creation of a dispatchable non-emissions-increasing CES tier. None of the resources IPPNY seeks to support could operate past 2040 because they emit both health-harming pollution and greenhouse gases. Truly zero-emissions long-duration dispatchable resources are rapidly moving toward commercialization, but not yet widely commercially available, and the CLCPA allows nineteen years to build out these resources.

Today's commercially available combustion technologies involve co-firing fossil gas with, at most, some amount of lower-emissions alternative fuel. NRG, the developer of the proposed gas peaking plant in Astoria, has expressly disclaimed the commercial viability of

[78] DEC, *DEC Policy: CP-29 Environmental Justice and Permitting* §V(J) (Mar. 2003), https://www.dec.ny.gov/docs/permits_ej_operations_pdf/cp29a.pdf.

RNG or hydrogen at this time, stating that an RNG or hydrogen alternative "is not technically feasible because currently there are no commercially available sources of either green hydrogen or RNG on the high pressure natural gas pipeline system."[79] NRG's proposed turbine, the GE H-class cannot burn more than a 50 percent hydrogen blend, and a "complete replacement of the combustion system in the gas turbine" would be required sometime in the next 15 to 20 years in order to use hydrogen at higher blends.[80] Gas plants with at most a limited ability to co-fire lower-carbon fuels (while still emitting significant amounts of NOx), are not the resources New York needs to be investing in to meet its 2040 zero emissions CLCPA obligations.

There are more promising, actually zero emission dispatchable technologies moving toward commercialization, including long-duration storage. The Power Generation Advisory Panel specifically recommends several types of support for long-duration storage including "[f]ocus[ing] State programs and funding on research and demonstration projects for the development of large scale and longer duration storage" and "[d]evelop[ing] and expand[ing] a Storage Center of Excellence so that new technologies can be matured and deployed on the grid for large scale testing."[81] However, the Panel did not recommend support for this resource through creation of a new CES tier at this time. The Commission should heed the wisdom of the Panel and defer consideration of a new CES tier for "zero emission" resources until such time as truly zero emission resources become commercially available.

F. IPPNY's Petition Directly Conflicts with the Power Generation Advisory Panel's Recommendations to the Climate Action Council, Which Do Not Provide a Basis for Approving IPPNY's Petition

IPPNY claims support for its Petition from the recommendations of the Power Generation Advisory Panel.[82] This reliance is misplaced. Properly read, the Power Generation Advisory Panel recommendations do not support IPPNY's request, which in fact has the potential to interfere with multiple initiatives outlined by the Panel.

IPPNY seeks to support its Petition by citing to the Panel's Initiative #10 regarding Technology Solutions. IPPNY points to the statement in Initiative #10 that the State should "[i]dentify, explore, evaluate and develop dispatchable technologies and solutions as they emerge,"[83] and the Panel's observation in one of its meeting slides that, if a substitute is needed for natural gas, "advanced green hydrogen and possibly [renewable natural gas] could fill this

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[79] Astoria DSEIS at 4-21.

[80] AECOM, *DSEIS Appendix L: Information from General Electric Regarding Use of Green Hydrogen* (2021), https://www.nrg.com/assets/documents/legal/astoria/00_2021/appendices-e-m-06-30-21.pdf.

[81] Power Generation Advisory Panel Recommendations (May 3, 2021), at Slide 50.

[82] IPPNY Pet'n at 9.

[83] *See* Power Generation Advisory Panel Recommendations (May 3, 2021), at Slide 45, available at https://climate.ny.gov/Climate-Action-Council/Meetings-and-Materials (although the petitioners fail to grapple with the words "as they emerge").

gap to maintain reliability, if scalability, feasibility, and environmental impact and air quality issues can be addressed."[84] IPPNY misinterprets the Panel's recommendations in Initiative #10, which do not encourage the Commission to begin subsidizing these technologies at this time.

Rather than urging the State to rush to subsidize unproven technologies, Initiative #10 makes clear that considerable further study of those technologies is required. The Panel expressly states that "[f]urther analysis, technical development, and research is needed in order to determine the feasibility, climate impact, and health impacts of advanced fuels *prior to infrastructure investment*."[85] The Panel urges additional research into determining:

- The lifecycle GHG accounting framework of RNG and advanced green hydrogen.
- The potential air quality and health impacts of producing and using these fuels and best practices/end-uses to minimize these impacts; and
- The safety of advanced green hydrogen, storage, and pipeline operation.[86]

The Panel concludes that "[t]echnological innovation, development, and scaled-deployment is needed in order to prove the effectiveness and economics of the technologies."[87] Rather than following these pragmatic steps, IPPNY's Petition would have the Commission skip them all and jump right to asking electric ratepayers to subsidize these unproven and potentially unsafe and climate harmful technologies.

In addition, IPPNY's Petition is in direct tension with the Power Generation Advisory Panel's Initiative #14 regarding Retirement of Fossil Fuel-Fired Facilities. As discussed above, based on IPPNY's definition of a "zero emissions energy system," the Petition could support the development of new fossil fuel-fired generation. However, the majority of members of the Power Generation Advisory Panel supported at least a temporary moratorium on new or repowered fossil fuel-fired facilities,[88] and the entire Panel unanimously recommended construction of new fossil fuel-fired facilities occur only as a last resort: "after alternative solutions (or combination thereof) such as storage (of any duration), zero-emissions resources, transmission upgrades or construction, energy efficiency, or demand response, are fully analyzed and determined to not be able to solve the identified grid reliability need."[89] In addition, adding new fossil fuel-fired generation at this juncture would fly in the face of the Panel's carefully crafted iterative strategy for phasing down reliance on fossil fuel generators to ensure the electric grid remains on track to achieve zero emissions by 2040.[90] With a grid already greatly over-

[84] Power Generation Advisory Panel Recommendations (May 3, 2021), at Slide 46.

[85] *Id.* (emphasis added).

[86] *Id.*

[87] *Id.*

[88] *Id.* at Slides 62–63.

[89] *Id.* at Slide 69.

[90] *See id.* at Slides 65–68.

reliant on fossil fuels, any new fossil generator additions unnecessarily complicates the weaning process.

G. The Importance of Strong Labor Standards is Not a Reason to Grant IPPNY's Petition Because Strong Labor Standards Exists with Actually Zero-Emissions Renewable Energy Technologies

Commenters share petitioners' interest in ensuring quality-based contracting and labor provisions for energy development in New York. Indeed, many of the undersigned groups have been strong advocates for inclusion of these provisions for offshore wind development and in the Clean Energy Standard, including supporting language in the 2021 State budget bill that codified requirements regarding prevailing wage, project labor agreements, and Buy American provisions for renewable energy projects.[91] These recently codified labor protections appropriately focus on the resources that are the greatest near-term priority for New York: renewable energy projects. If and when the time comes for a new dispatchable, zero-emissions tier of the CES, the tier should be open to all dispatchable zero-emissions resources and consistent labor standards should apply to both the renewable and non-renewable resource technologies.

H. Rather than Creating a New CES Tier to Subsidize Fossil Fuel Resources, the Commission Should Expeditiously Move to Consider Other Timely Recommendations by the Power Generation Advisory Panel

The Power Generation Advisory Panel included a number of urgent actions in its recommendation package to the CAC in May. Some of these—e.g., identifying key transmission and distribution upgrades, improvements, and new line construction needed to deliver renewable energy from where it is built, to where it is needed—are actively being addressed by the Commission through ongoing processes such as the Tier 4 RFP. Other urgent recommendations have not been addressed.

In particular, Commenters draw the Commission's attention to the Power Generation Advisory Panels' recommendation in Initiative #4 to "[p]rovide increased funding for energy storage deployment" and to "initiate a new docket that establishes new binding targets and creates a dedicated funding mechanism similar to the clean energy standard for storage as soon as practicable and no later than the end of 2022."[92] Energy storage is critical to supporting an emissions-free grid and, unlike the technologies identified in IPPNY's Petition, is commercialized but struggling to find a workable business model in New York. Although Brattle's Power Grid Study anticipates the need for at least 15 GW of 4-hour duration storage by 2040, New York is presently targeting only 3 GW by 2030.[93] As the Panel's recommendations

[91] Codified at P.S.L. 66-r; Lab. L. 224-d.

[92] Power Generation Advisory Panel Recommendations (May 3, 2021) at Slide 20.

[93] *Id.* at Slide 19.

make clear, the Commission has a key role to play in unlocking the immense potential for energy storage and should consider implementing the Panel's storage recommendations as soon as possible, not more fossil-fuel based technology as the Petition seeks.

In addition, the Panel recognized that a proactive approach is required to wean New York from its present over-dependence on fossil fuel generation. In Initiative #14, the Panel outlined a multi-step process involving, initially, "[a] planning process to determine emissions reduction targets to reach zero emissions by 2040,"[94] then promulgation of emission limits by the Department of Environmental Conservation based on the initial assessment,[95] and, after that, "[a]n iterative planning process in which the progress, the reduction targets, the regulations, and the other mechanisms being utilized are evaluated and revised as necessary in order to reach the 2040 goal."[96] The Commission's resources are finite, and we are concerned that diverting attention to IPPNY's petition will undermine the Commission's efforts to carefully implement the Panel's more pressing recommendations.

IV. Conclusion

We appreciate the Commission's efforts to promote achievement of the CLCPA's 70 percent renewable energy by 2030 mandate through its CES Order from October 2020. Rapidly accelerating the development of renewable energy in New York, including offshore wind, and ensuring that New York's clean energy is deliverable into New York City are critical near-term priorities to meet the CLCPA's 2030 deadline. Battery storage and energy efficiency are also critical near-term priorities. Likewise, maximizing energy efficiency is going to be critical to the cost-effective achievement of many of the CLCPA's greenhouse gas reduction requirements.

IPPNY's petition is a distraction from the pressing near-term work that the PSC needs to lead. With a system that is already composed primarily of dispatchable fossil generation resources, there is simply no urgent need to create a new CES tier to subsidize additional similar resources, particularly because current commercially available technologies are not compliant with the CLCPA's zero emissions mandate. The PSC should deny IPPNY's petition and defer consideration of support for dispatchable zero emission technologies until there are truly zero emission dispatchable technologies to support. Instead, the PSC should advance other time-sensitive priority recommendations from the Power Generation Advisory Panel including a revamped docket to support rapid deployment of energy storage at the scale contemplated in the Power Grid Study and a docket to reliably phase down the State's reliance on fossil fuels.

[94] *Id.* at Slide 66.

[95] *Id.* at Slide 67.

[96] *Id.* at Slide 68.

Thank you for your consideration.

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