CENTER FOR ENVIRONMENTAL ACCOUNTABILITY

COMMENTS OF THE
CENTER FOR ENVIRONMENTAL ACCOUNTABILITY

Comments on
Proceeding on Motion of the Commission to
Implement a Large-Scale Renewable Program and a
Clean Energy Standard.

Notice Seeking Further Comment
CASE 15-E-0302 (October 20, 2023)

SUBMITTED FEBRUARY 20, 2024

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I. Introduction

The New York State Climate Leadership and Community Protection Act ("CLCPA") has given the New York Public Service Commission ("Commission") a difficult—if not impossible—task. While continuing to ensure ratepayers "access to safe, reliable utility service at just and reasonable rates," the Commission must transform New York's grid, replacing current generation with resources that have entirely different characteristics and, in some cases, have yet to be invented. Although just 27 percent of New York's net-electricity generation currently comes from "renewable energy systems,"[1] the Commission is required to source 70 percent of its electricity from those systems within just 6 years. The Commission is required to bring 9 GW of offshore wind online by 2035—but the first big project was just canceled. Most dramatically, the Commission is required to make the full "statewide electrical demand system . . . be zero emissions" by 2040.

The Department of Public Service ("DPS") Staff now asks a particularly important question: what does "zero emissions" mean? Predictably, many wind and solar lobbying groups have urged the Commission to simply read "zero emissions" and "renewable energy systems" together. Sierra Club and Earthjustice advocated for an atextual and self-defeating interpretation of "zero emissions," that would focus the Commission's efforts exclusively on deploying wind, solar, and hydro. John Cropley, *Contentious Commentary on Zero-Emissions Path in NY*, RTO Insider (Aug. 21, 2023), https://perma.cc/QT6P-DE7U. The Alliance for a Green Economy balks at the implications of including nuclear power in a definition of zero emissions. *Id.* And another collection of 43 similar organizations jointly commented that although it was good that the Commission is thinking about the zero-emissions mandate now, it is premature "to water down" the CLCPA to avert a potential resource gap in 2040. *Id.*

All of this misstates the situation. As New York Independent System Operator ("NYISO"), the Independent Power Producers of New York, the New York State Building & Construction Trades Council, the New York State AFL-CIO, and many others have all explained, wind, solar, and other renewable energy resources will be incapable of meeting New York's electrical

[1] The term "renewable" is a misnomer. While the sun, wind, and water which provide the energy which these resources use to generate electricity are practically inexhaustible, the materials that build the equipment which perform the generation are not. Wind turbines, photovoltaic panels, and even the equipment in hydro-electric generators are all built with materials extracted from the ground just like the oil, gas, coal, and uranium which powers "non-renewable" resources. Turbines and photovoltaic panels rarely last more than 20 years, before they must be scrapped and replaced.

demand in 2040. And the consequences of a "renewable energy systems" only approach are likely to be felt much sooner than that.

If the Commission is to meet its statutory obligations to ensure affordable, reliable, and sustainable power, then it must define "zero emissions" in a broad, flexible, and technologically neutral way. Fortunately for the Commission, a technology-neutral approach is precisely what the text of the CLCPA commands.

CEA writes these comments to explain why the best interpretation of "zero emissions"—and the only interpretation that gives the Commission a chance of success—is "net-zero greenhouse gas emissions." This interpretation of the term does not foreclose the use of nuclear power (essential for a feasible, reliable scheme under net-zero constrains), offsetting technologies (such as biomass sequestration or carbon capture and storage), innovative energy carriers (like gray, blue, turquoise, or green hydrogen), or other sensible, electricity generation-technologies. CEA also writes to explain that if "zero emissions" is read in the atextual manner that the solar and wind lobbying groups have suggested, even their own favored "renewable energy systems" would not qualify since those systems emit more lifecycle emissions than several of their "non-renewable" counterparts.

II. Background

In 2019, New York enacted the CLCPA to "create[e] a comprehensive regulatory program to reduce greenhouse gas emissions." CLCPA § 1(12)(g). Aiming to "impact . . . global greenhouse gas emissions and the rate of climate change," the CLCPA announced an ambitious "goal" for the State: "to reduce greenhouse gas emissions from all anthropogenic sources 100% over 1990 levels by the year 2050." CLCPA § 1(3), (4).

As part of the regulatory program, the CLCPA sets formidable targets for decarbonizing the State's electricity-generation sector. The Act directs the Commission to establish a program requiring that (1) by 2030, at least 70% of "the state wide electric generation secured by jurisdictional load serving entities to meet the electrical energy requirements of all end-use customers" in the State "be generated by renewable energy systems"; and (2) by 2040, "the statewide electrical demand system . . . be zero emissions." CLCPA § 4; N.Y. Pub. Serv. Law § 66-p(2). The Act also includes specific targets for solar and offshore wind generation, directing the Commission to establish programs that increase procurement of photovoltaic solar electricity to at least 6 GW by 2025, and of offshore wind electricity to at least 9 GW by 2035. CLCPA § 4; N.Y. Pub. Serv. Law § 66-p(5). The CLCPA does not define "zero emissions," but defines "renewable energy systems" as those "systems that generate electricity or thermal energy

through use of the following technologies: solar thermal, photovoltaics, on land and offshore wind, hydroelectric, geothermal electric, geothermal ground source heat, tidal energy, wave energy, ocean thermal, and fuel cells which do not utilize a fossil fuel resource in the process of generating electricity." CLCPA § 4; N.Y. Pub. Serv. Law § 66-p(1)(b).

The Commission's task under the CLCPA is a difficult one, more than doubling—indeed, almost tripling—"renewable" electricity generation levels by 2030, from 40,623 GWh in 2021 to 106,175 GWh in 2030. *Renewable Energy*, NYSERDA, https://perma.cc/P7LC-JZHZ (last accessed Jan. 19, 2024). In a May 18, 2023 Order, the Commission explained that meeting the 2040 "zero emissions" target might be harder still. Case 15-E-0302, Order Initiating Process Regarding Zero Emissions Target 4–5 (May 18, 2023). The Order noted that although the Commission has already authorized the State Energy Research and Development Authority to "conduct annual offshore wind solicitations in amounts necessary to achieve the CLCPA goal of 9 GW of offshore wind by 2035" and also modified the state's renewable energy standard, "more would be needed to achieve [the CLCPA's] goal[s]." *Id.*

The Order specifically acknowledged numerous studies that "indicate that renewable energy resources may not be capable of meeting the full range of electric system reliability needs that will arise as fossil generation is replaced." *Id.* at 2, 9. "For instance, the Zero-Emissions Electric Grid in New York by 2040 Study identifies the need for a mix of transmission and generation resources that includes 17-23 GW of placeholder 'backstop thermal' generation capacity." *Id.* at 10.

> Similarly, the [New York Independent System Operator, Inc.'s (NYISO's)] 2021-2040 System & Resource Outlook concluded that New York will need 27-45 GW of what the NYISO calls dispatchable emission-free resources (DEFRs) to "provide sustained on-demand power and system stability" after CLCPA requirements prohibit reliance on resources that emit greenhouse gases. This echoes the finding in a 2020 report also commissioned by the NYISO that "the variability of renewable resource output leads to circumstances where . . . there are periods of time that our resource mix is insufficient to meet load in all Zones," thus creating the need for making "dispatchable and emissions-free resources" available to be connected to New York's grid.

Id. at 11.

Recognizing this same technology gap, several groups petitioned the Commission in 2021 to establish a program to encourage private sector investment in 1 GW of new "zero emissions energy systems," that is, "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." *Id.* at 5 (emphasis added). The petitioners indicated these systems could include, for example, bioenergy, hydrogen, carbon capture and sequestration, and nuclear. *Id.*

Following receipt of public comments on the petition, the Commission issued its May 18, 2023 Order to "initiat[e] a process to identify technologies that can close the gap between the capabilities of existing renewable energy technologies and future system reliability needs, and . . . [to] identify the actions needed to pursue attainment of the . . . 2040 Target." *Id.* at 2. In addition to seeking public comment, the Commission directed DPS Staff to "examine the issues and questions" surrounding the technologies necessary to attain a reliable zero-emissions grid by 2040. *Id.* at 15–17.

In response to the initial comments received, on October 20, 2023, DPS staff solicited public comment on several additional questions:

1. "Does the CLCPA, the [Public Service Law], and other relevant sources of authority argue for reading 'emissions' in the term 'zero emissions' as encompassing all air pollutants, greenhouse gas emissions only, or some other subset of air pollutants"?

2. "[W]hether the Commission must read ['zero emissions' and 'net zero emissions'] as distinct, and if so, how [should] the Commission . . . characterize and apply the distinction between them"?

3. "[W]hether [the Department of Environmental Conservation's] emissions accounting regulations [which count emissions from biomass combustion on a gross rather than net basis] constrain or otherwise inform the Commission's definition of the phrase, 'by the year [2040] the statewide electrical demand system will be zero emissions'"?

4. "[W]hat discretion the CLCPA leaves for the Commission when it specifies" "which elements of the lifecycle of a given emissions source are to be counted, and the threshold level above which emissions from that source are impermissible or disqualifying"?

5. "[The CLCPA] designates 'fuel cells which do not utilize a fossil fuel resource in the process of generating electricity' as a 'renewable energy system.' What significance, if any, does this designation have for characterizing fuel cells that consume hydrogen, biogas, renewable natural gas, or other non-fossil fuels as 'zero emissions'?"

6. "As some commenters point out, the 'statewide electrical demand system' is not defined in the CLCPA or elsewhere. Staff asks for further comment on the meaning of this term. What

definitions does the law support, and how do those definitions relate to electricity generated by resources that are located: (a) outside of New York State, or (b) behind-the-meter?"

CEA submits the following comments in response to these questions.

III. The Only Reasonable Reading of "Zero Emissions" is "Net Zero Greenhouse Gas Emissions."

The only reasonable reading of the CLCPA's mandate that "the statewide electrical demand system . . . be zero emissions" by 2040, is that the systems which generate the electricity consumed in the state of New York must, themselves, collectively generate "net zero greenhouse emissions" by that date.

"In order to resolve ambiguity," New York courts "inquire into the spirit and purpose of the legislation" by, for example, "examining the statutory context of the provision." *Simmons v. Trans Express Inc.*, 37 N.Y.3d 107, 113 (2021) (cleaned up); *see also Jacobs v. Monaton Realty Investing Corp.*, 212 N.Y. 48, 54 (1914) ("when used in a statute [a term's] significance must be gathered from and governed by the purpose and context of the enactment"). The CLCPA's purpose and the context of the Commission's mandate demonstrate that "zero emissions" in N.Y. Pub. Serv. Law § 66-p(2) means "net zero greenhouse gas emissions."

"Emissions" are "greenhouse gas emissions."

The CLCPA's express purpose is to "creat[e] a comprehensive regulatory program to reduce *greenhouse gas* emissions," CLCPA § 1(12)(g) (emphasis added), with the "goal . . . to reduce *greenhouse gas* emissions from all anthropogenic sources 100% over 1990 levels by the year 2050," *id.* § 1(4) (emphasis added). The Act's findings and declaration make clear that the Act is concerned only with "greenhouse gas" (or, similarly, "carbon dioxide") emissions. *See, e.g.*, CLCPA § 1 (2)(a), (2)(b), (3), (4), (6), (7), (12)(a), (12)(c), (12)(d), (12)(g). And the Act repeatedly references, and directs state officials to take, actions related to "greenhouse gas" emissions. *See, e.g.*, CLCPA § 2, N.Y. Env't Conserv. Law § 75-0105(1) (officials "shall issue a report on statewide greenhouse gas emissions"); CLCPA § 2, N.Y. Env't. Conserv. Law § 75-0107(1) (officials "shall . . . establish a statewide greenhouse gas emissions limit"). Accordingly, in the context of the CLCPA, "emissions" in N.Y. Pub. Serv. Law § 66-p(2) is most naturally read to mean "greenhouse gas emissions."

New York courts also consider the way in which a term "is used throughout the statute" when construing an ambiguous term. *Witherstine v. Employers' Liab. Assurance Corp.*, 235 N.Y. 168, 172–173 (1923). "[W]here the same word or phrase is used in different parts of a statute, it will

be presumed to be used in the same sense throughout, and the same meaning will be attached to similar expressions in the same or a related statute." *People v. Bolden*, 81 N.Y.2d 146, 151 (1993) (citation omitted). Elsewhere, the CLCPA equates "emissions" with "greenhouse gas emissions" and distinguishes non-greenhouse gas emissions as "co-pollutants." *See* CLCPA § 2, N.Y. Env't Conserv. Law § 75-0101 (defining "[e]missions reduction measures" as "programs, measures and standards . . . that are designed to reduce *emissions of greenhouse gases*" (emphasis added); *id.* (defining "[c]o-pollutants" as "hazardous air pollutants produced by greenhouse gas emissions sources"); *see also id.* at § 75-0103(14)(d) (distinguishing "greenhouse gas emissions and co-pollutants"). The CLCPA offers no reason to depart from this distinction when construing N.Y. Pub. Serv. Law § 66-p(2).

Interpreting "emissions" to mean "greenhouse gas emissions" would also align New York with other States that have adopted similarly ambitious goals to reduce the climate-impact of their electricity delivery systems. *See, e.g.*, Cal. Pub. Util. Code § 454.53 ("It is the policy of [California] that eligible renewable energy resources and *zero-carbon resources* supply . . . 100 percent of all retail sales of electricity . . . by December 31, 2040" (emphasis added)); 20 Ill. Comp. Stat. 3855/1-5(1.5) ("it is the policy of [Illinois] to rapidly transition to 100% clean energy by 2050"); 20 Ill. Comp. Stat. 3855/1-10 ("'Clean energy' means energy generation that is *90% or greater free of carbon dioxide emissions*" (emphasis added)).

Interpreting emissions in an overly literal way would lead to absurd results. Everything emits. While wind turbines and photovoltaic cells don't emit criteria pollutants during their electricity generation phase, emissions are generated while their materials are mined, refined, and transported; while their components are built and shipped to the site; while the land that the systems are built on is cleared and the components assembled; when the trees are cleared for the high-voltage transmission lines they require; when maintenance is performed; and when after fifteen years they are scrapped and thrown into a landfill.

And while the Alliance for a Green Economy is correct that nuclear generation "emits" radiation, this reading of the term is too clever by half. Cropley, *supra*. Many, many things emit nuclear radiation, including each of the members of the Alliance for a Green Economy. *Are Our Bodies Radioactive?*, Health Physics Soc'y, https://perma.cc/E75J-LD55 (last accessed Jan. 26, 2024) ("Q: Are our bodies naturally radioactive? A: Yes …"). As the Nuclear Regulatory Commission explains, "a person who spends a full year at the boundary of a nuclear power plant site would receive an additional radiation exposure of less than 1 percent of the radiation that everyone receives from natural background sources." *Frequently Asked Questions (FAQ) About Radiation Protection*, U.S. Nuclear Regul. Comm'n (last updated June 8, 2020), https://perma.cc/NV4S-

ZUKL. Natural variation in background radiation means than many people throughout the United States receive a much higher—and still safe—level of radiation from the land they live on than others who live and work adjacent to a nuclear power plant. Comm. on the Analysis of Cancer Risks in Populations near Nuclear Facilities–Phase I, Nuclear and Radiation Stud. Bd., Div. on Earth and Life Stud., Nat'l Rsch. Council, Analysis of Cancer Risks in Populations Near Nuclear Facilities: Phase I, ch. 3, 97–143 (2012), https://perma.cc/SYP8-LFRV.

And if "emissions" must be read to include nuclear radiation, why not more? Everything emits electromagnetic radiation (for the reader, primarily in the infrared), acoustic radiation (wind turbines about 35–45 dB when heard from 300 meters away), and gravitational radiation.

These are, of course, not the emissions that the text of the CLCPA intends. The CLCPA is intended to address climate change and so "emissions" must mean "greenhouse gas emissions."

"Zero" means "net-zero."

The CLCPA also makes clear the reason for its focus on greenhouse gases: the law was enacted to "impact . . . the rate of climate change," reduce "climate pollution," and "avoid the most severe impacts of climate change." CLCPA § 1(3)–(4). For purposes of climate, only *net* greenhouse gas emissions matter. Greenhouse gases can remain in the atmosphere for years or more and mix readily, so that the concentration of greenhouse gases is approximately constant across the globe. *Overview of Greenhouse Gases*, EPA, https://perma.cc/ZN29-GXM3 (last accessed January 26, 2024). New York is affected as much by greenhouse gases emitted last year in Singapore as by those emitted last week in Syracuse.

Reductions in greenhouse gas emissions output by a power source operating in New York are meaningless—in terms of climate impact—if there are significant greenhouse gases created while the source is manufactured, decommissioned, or at some other time in its lifecycle. On the flip side, power sources that emit greenhouse gases during operation can have net-positive effects on the global greenhouse gas concentration if, on a lifecycle basis, they remove more greenhouse gases than they emit. Indeed, because only *net* greenhouse gas emissions matter for climate impact, reading "zero emissions" in N.Y. Pub. Serv. Law § 66-p(2) to mean only emissions output during source operation would result in "an unreasonable or absurd application of the law," *Bank of America, N.A. v. Kessler*, 39 N.Y.3d 317, 324 (2023) (quoting *Lubonty v. U.S. Bank N.A.*, 34 N.Y.3d 250, 255 (2019)), that contravenes the CLCPA's purpose: the law would permit power sources that, though emitting no greenhouse gases during operation nonetheless increase global greenhouse gas concentrations, while prohibiting other power

sources that, though emitting some greenhouse gases during operation, reduce global greenhouse gas levels on net. Such a construction cannot stand.

Moreover, interpreting "zero emissions" to mean only those sources that emit no emissions (including nuclear radiation) during operation would effectively equate "zero emissions" with "renewable energy systems," as the technologies that the CLCPA defines as "renewable"—including solar-, wind-, and water-based systems, N.Y. Pub. Serv. Law § 66-p(1)(b). "Under ordinary statutory construction, [different terms] cannot mean the same thing." *People v. Bac Tran*, 80 N.Y.2d 170, 176 (1992). Had the New York State Assembly intended the 2040 grid to be composed entirely of renewable energy systems, it would have said so directly rather than imposing a "zero emissions" target.

"Statewide electrical demand system" means the "systems which generate the electricity consumed in the state of New York."

To our knowledge, and responsive to question six of the notice, the term "statewide electrical demand system" has no established meaning in New York state law or elsewhere, and so must be given its plain meaning, with any ambiguity resolved by "examining the statutory context of the provision." *Simmons*, 37 N.Y.3d at 113 (cleaned up). [2]

Here, "statewide electrical demand" most naturally refers to the electrical energy demanded (read: consumed) within the state of New York and "system" most naturally refers to the sources which generate the power to satisfy this demand. Moreover, the CLCPA's goals (to "impact . . . the rate of climate change," reduce "climate pollution," and "avoid the most severe impacts of climate change") preclude any reading of the term that would allow arbitrary exclusion of emissions associated with that demand. This means that if a source generates electricity to satisfy New York's electrical demand, that source must be included in the "statewide electrical demand system," even if the source is situated outside of New York State or behind-the-meter. Indeed, an alternative reading that would exclude out-of-state sources would perversely incentivize the Commission to import as much power as possible, allowing the CLCPA's goals to be met without substantially changing the carbon footprint of New York's electricity consumption. This is not what the CLCPA intends.

This interpretation of "statewide electrical demand system" does, however, highlight the challenges the Commission faces in implementing its CLCPA mandate. Once generated,

[2] The New York legislature's use of obscure language suggests that they do not understand how modern grids operate. This is a serious concern given the significant changes in New York's system that the CLCPA mandates, as discussed more in the Conclusion of this comment.

electricity is fed onto the grid where it "mixes" with electricity from every other connected source. That "mixed" electricity is then provided to satisfy the demand of connected consumers. When New York operators import electric power from interconnected, out-of-state sources, they cannot control which source generated that power. Instead, they import some fraction of the power that was generated by whatever combination of sources feeds the interconnected grid. This means that the emissions of imported electric power can only be estimated by a weighted average of the emissions of the sources that contribute to the interconnected grid.

But New York has no regulatory authority over these out-of-state sources, and so cannot require that they, too, transition to renewable or zero-emissions technology. Instead, any emissions generated by out-of-state sources will have to be offset by negative-emission in-state sources.

At present, the interconnected grid surrounding New York is nowhere near "zero emissions," and New York imports a tremendous amount of electricity. *New York State Profile and Energy Estimates*, Energy Info. Admin., https://perma.cc/N79Y-Y7WP. Indeed, New York's share of imports is increasing. *See* David B. Patton et al., Market Monitoring Unit for the N.Y. ISO, Potomac Economics, 2021 State of the Market Report for the New York ISO Markets 10 fig.4, 95 tbl.16, https://perma.cc/K3ME-HQP4. As a result, if New York is to produce a "zero-emissions" "statewide electrical demand system" by 2040, the state must significantly throttle its imports or implement sufficient in-state carbon-negative generation sources to bring the overall net greenhouse gas emissions to zero. This is a tall order. Moreover, as detailed in the next section, even if possible, both approaches would undermine the Commission's ability to "ensure access to safe, reliable utility service at just and reasonable rates." *About DPS and PSC*, NYSDPS, https://perma.cc/LA8A-GZUN (last accessed Jan. 26, 2024).

IV. "Zero Emissions" Cannot Be Interpreted as "Renewable Energy Systems" Without Interfering with the Commissions Other Legal Obligations.

Under New York law, the Commission has "all powers necessary or proper to enable it to carry out the purposes of [the Public Service Laws]." N.Y. Pub. Serv. Law § 4(1). Where "the Legislature . . . specif[ies] only the goals to be achieved and policies to be promoted, while leaving the implementation of a program to be worked out by an administrative body," the Commission possesses particularly broad discretion. *Consol. Edison Co. v. Pub. Serv. Comm'n*, 47 N.Y.2d 94, 102 (1979), *rev'd on other grounds* 447 U.S. 530 (1980). The CLCPA's target of achieving a "zero emissions" grid by 2040 fits comfortably in this rubric and means that the Commission has significant discretion in construing and implementing its mandate, consistent with the goals of the CLCPA and the Commission's other statutory obligations.

The CLCPA does not relieve the Commission of its obligation "to ensure access to safe, reliable utility service at just and reasonable rates." *About DPS and PSC*, NYSDPS, *supra*.; CLCPA § 11 ("Nothing in this act shall relieve any . . . public agency of compliance with other applicable federal, state, or local laws or regulations, including state air and water quality requirements, and other requirements for protecting public health or the environment."); N.Y. Pub. Serv. Law § 64, *et seq*. (Commission's obligations under state law). At the minimum, this obligates the Commission to ensure (1) that there is sufficient electricity generation capacity, (2) that electricity is affordable, (3) that electricity is reliable, and (4) that the sustainability goals of the CLCPA are actually achieved. As detailed below, interpreting "zero emissions" in a way that confines it to "renewable energy systems" will make it impossible for the Commission to fulfill its mandate, because of the inherent limitations of a system built with these sources.

There will not be sufficient "renewable energy system" capacity.

The Commission's task under the 70 by 2030 goal of the CLCPA is a difficult one: almost tripling renewable electricity generation levels by 2030. *Renewable Energy*, NYSERDA, *supra*. Extending this to 100 percent by 2040 would be impossible. Take for example, the implausible development that the New York State Energy Research and Development Authority ("NYSERDA")'s Scenario 3 Analysis—the most frequently discussed of their model scenarios—envisions:

Source[3]	2022 Capacity (MW)	2040 Capacity (MW)	New Capacity Required (MW)	Percentage Increase
Existing Nuclear	3,305	3,355	50	1.5
Hydro	4,265	4,612	347	8.1
Solar	3,914	40,163	36,249	926
Onshore Wind	2,191	7,573	5,382	246
Offshore Wind	-	14,400	14,400	Infinite
DEFR	-	17,788	17,788	Infinite
Battery Storage	194[4]	22,144	21,950	11,314
Renewable Imports	-	8,179	8,179	-
Biomass	258	-	-	-
Gas or Oil	25,666	-	-	-
Total	39,599[5]	118,214	104,345	264

The Scenario requires a whopping 926% increase in solar sources, 246% increase in onshore wind sources, 11,314% increase in battery storage capacity, and the implementation of currently non-existent offshore wind and unidentified DEFRs. And although the numbers are shocking, these projections are an underestimate. New York's plan to simultaneously electrify vehicles and buildings will dramatically increase the electrical energy that the average New York home consumes. And as the NYISO's 2023–2032 Comprehensive Reliability Plan explains, additional economic development like the new Micron semi-conductor plant in central New York will cause significant increases to power demand. Jack Arpey, *Report Outlines Potential Challenges to New York's Electrical Grid Over Next Decade*, Spectrum News 1 (Dec. 4, 2023), https://perma.cc/HSD9-LM5H. Even if the NYSERDA plan contains nominally enough, it is unlikely to make a grid that consistently works. *See, e.g.*, Leonard Rodberg et al., Nuclear N.Y., Filling the Gap in New York's Decarbonization Plan: A New View of the Electric Grid (Dec. 2023).

But these projections will not be attained. To begin with, NYSERDA's estimates suggest that they will need to require nearly 18,000 MW of DEFR capacity but doesn't even identifying what

[3] *See, e.g.*, Leonard Rodberg et al., Nuclear N.Y., Filling the Gap in New York's Decarbonization Plan: A New View of the Electric Grid (Dec. 2023), *available at* https://www.nuclearny.org/resources/ (last accessed Feb. 6, 2024).
[4] This number reflects capacity as of November 2023. *U.S. Battery Storage Capacity Expected to Nearly Double in 2024*, Energy Info. Admin. (Jan. 9, 2024), https://perma.cc/8798-SEZV.
[5] It should be noted that New York Currently imports roughly 19 percent of its energy from ISONE, PJM, and Canada, this number is not easily translatable to a capacity factor, and so has been omitted.

this capacity will be. And NYSERDA's estimates are more than 10,000 MW short of the 27,000 to 45,000 MW of DEFR capacity that NYISO estimates will be required to maintain grid reliability. NYISO, 2021–2040 System & Resource Outlook (The Outlook) (Aug. 8, 2022), https://perma.cc/VC2G-X5XK. Without identifying some suitable resource, it's not clear how these numbers can be plausibly relied on.

Even the projections of capacity for more conventional resources like wind, solar, and batteries are unlikely to come to fruition. Wind and solar construction throughout the U.S. have frequently been stymied by objections over land use. Wind turbines require approximately three times more land than solar panels and one hundred times more land than natural gas or nuclear generation. John van Zalk & Paul Behrens, *The Spatial Extent of Renewable and Non-renewable Power Generation*, 123 Energy Pol'y 83, 86–87 (2018), https://doi.org/10.1016/j.enpol.2018.08.023.

As a result, wind and solar construction has frequently been rejected by locals who would prefer to keep that land for something else. The plan to build America's largest solar farm in Nevada was scrapped because it would deface the top of a local mesa. Gabriella Angeleti, *Plans Scrapped for Solar Project that would Disrupt Michael Heizer's Double Negative*, Art Newspaper (July 26, 2021), https://perma.cc/YNK2-3MBC. The town of Swanton, Vermont, voted 731 to 160 to reject a seven-turbine wind project that would have disrupted a skyline view. Robert Bryce, *The Windmills of Bernie's Mind*, Wall St. J. (Feb. 7, 2016), https://www.wsj.com/articles/the-windmills-of-bernies-mind-1454880639. As of January 2024, more than 600 wind and solar projects have been rejected across the United States. *Renewable Rejection Database*, Robert Bryce, https://perma.cc/GS8K-JSR6 (accessed Jan. 26, 2024).

New York itself has recently seen just how difficult it is to build new renewable energy sources. Off-shore wind is intended to be the backbone of New York's renewable portfolio because it has a higher capacity factor and is far less likely to run into the same local land-use objections than its on-shore cousin. This is why the CLCPA calls for the development of 9,000 MW of off-shore wind capacity by 2035. But at the beginning of this year Equinor and BP announced it had terminated its agreement to build the 1,260 MW Empire Wind 2, citing "changed economic circumstances on an industry-wide scale" and "commercial conditions driven by inflation, interest rates and supply chain disruptions that prevented Empire Wind 2's existing OREC agreement from being viable." Press Release, Empire Wind, Empire Wind 2 Offshore Wind Project Announces Reset, Seeks New Offtake Opportunities (Jan. 3, 2024), https://perma.cc/6B2N-GBXV.

These same difficulties will also jeopardize the "wind imports" that the 2040 plan relies on.[6] Canada and neighboring states are likely to face similar challenges in building their own wind and solar capacity, and what capacity is built is unlikely to be shared if it would jeopardize the state meeting its own renewable energy goals.

Building sufficient battery storage is also likely to be difficult. The battery energy storage facility located at Moss Landing in California is currently the largest in operation in the country, with 750 MW. New York would need to build a new Moss Landing every 7 months to stay on track to meet its 2040 goals. And these facilities would need to compete for battery resources with electric vehicles—which also face material shortages over the same time span. *See, e.g.*, Joe McDonald, *Threatened by Shortages, Electric Car Makers Race for Supplies of Lithium for Batteries*, AP News (June 27, 2023), https://perma.cc/6RNB-JXLN.

Even if these new generation facilities can be built, they will also require the building of new high voltage transmission lines to connect them to the rest of the grid. If anything, these transmission projects are even harder to locate than the generation facilities themselves, as residents risk losing forests and agricultural land for projects that only send power to a distant city. One recent example is the rejection of the $1 billion New England Clean Energy Connect by an overwhelming 59 percent of voters in Maine, which hamstrung Massachusetts's renewable importation plans. David Iaconangelo, *$1B Transmission Smack Down May Upend Northeast Renewables*, E&E News (Nov. 12, 2021), https://subscriber.politicopro.com/article/eenews/2021/11/12/1b-transmission-smack-down-may-upend-northeast-renewables-282991.

A grid with a high fraction of "renewable energy systems" will not be affordable.

Even if these renewable resources could be built, the result will be prohibitively expensive electric service. Because of the way these resources interact with restructured electricity markets, regions with higher penetration of wind and solar energy have much higher wholesale electricity prices. Severin Borenstein & James Bushnell, *The US Electricity Industry After 20 Years of Restructuring*, 7 Ann. Rev. Econ. 437 (2015), https://doi.org/10.1146/annurev-economics-080614-115630. The mechanisms are somewhat complicated, but in short, the intermittency of these resources makes market clearing prices more vulnerable to the price of high-cost marginal resources: currently natural gas and in the future for New York, DEFRs. One study calculated

[6] As noted above, when New York operators import electric power from interconnected, out-of-state sources, they cannot control which source generated that power. The power they import is some fractional and indistinguishable blend of power from every source that feeds the interconnected grid. The most realistic assumption about imports is that they have a carbon footprint equivalent to a weighted average of all sources feeding into that grid.

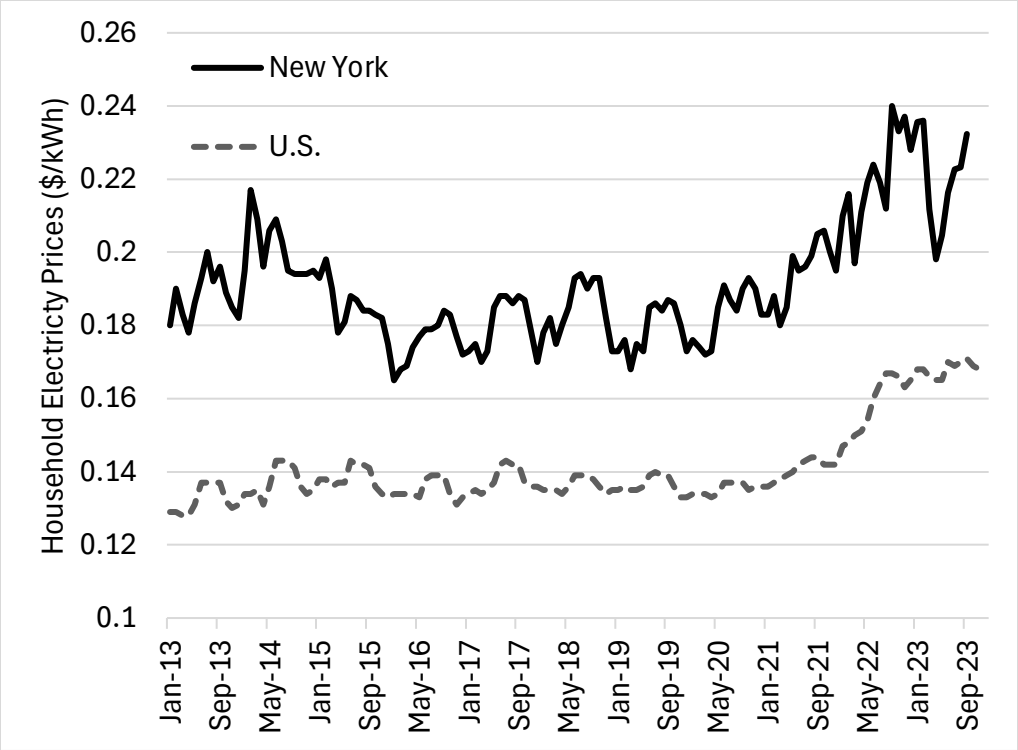
that from 2006 to 2016, consumers in these markets have seen an average price increase of 8.0 percent and annual loss of $11.7 billion. Alexander MacKay & Ignacia Mercadal, *Deregulation, Market Power, and Prices: Evidence from the Electricity Sector* (MIT Ctr. Energy & Env't Pol'y Rsch., Working Paper No. 2022-008, Apr. 2022), https://perma.cc/4XA9-QPJN.

In 2022, electricity prices in every region except Texas were higher than in 2021, and even Texas saw prices on an upward trend after excluding the spike caused by Winter Storm Uri in February 2021. *Wholesale U.S. Electricity Prices Were Volatile in 2022*, Energy Info. Admin. (Jan. 10, 2023), https://perma.cc/A7E8-Z245. Prices in PJM, ISO-NE, and MISO during Summer 2022 were more than double the previous year's prices. *Id.*

The price consequences of this shift are not unique to the United States. Both Australia and the U.K. have introduced market mechanisms into their electric utilities, but both have recently expressed doubts about their long-term sustainability. Australia has faced surging energy prices despite being a net exporter of coal and natural gas. *Australia to Lift Electricity Market Suspension as Prices Ease*, BBC (June 21, 2022), https://perma.cc/8PMN-PB4J. High prices in June 2022 forced the Australian Energy Market Operator to take the unprecedented step of suspending the market and setting wholesale prices directly. *Id.* Although the markets were restored, the suspension has prompted serious reconsideration of the market system in general.

The U.K. has also decided that its current electricity market arrangements need to be reformed. Simon Skillings, *Electricity Market Reform: It's Not What You Do, It's The Way That You Do It*, Util. Week (Jan. 9, 2022), https://perma.cc/FAF4-2E7V. Former Prime Minister Boris Johnson suggested abolishing the single clearing price market: "people are being charged for their electricity prices on the basis of the top marginal gas price, and that is frankly ludicrous." Donal Griffin, *Boris Johnson Hints at UK Energy Market Reform Amid Inflation Surge*, Bloomberg (June 25, 2022), https://www.bloomberg.com/news/articles/2022-06-25/johnson-hints-at-uk-energy-market-reform-amid-inflation-surge#xj4y7vzkg.

The projections for New York's future are similarly bad. As shown in the figure below, New York has consistently had power prices far above that of the rest of the nation. *Compare Electricity Per KWH in U.S. City Average, Average Price, Not Seasonally Adjusted*, U.S. Bureau of Lab. Stat., https://perma.cc/6APQ-MRRZ (last accessed Feb. 6, 2024) *with Monthly Average Retail Price of Electricity – Residential*, NYSERDA, https://perma.cc/MG7R-4GZH (last accessed Feb. 6, 2024). And prices have been consistently increasing since the adoption of the CLCPA in 2019.



The increase in intermittent energy associated with NYSERDA's plan is likely to exacerbate the issue. Rodberg et al. found that the system cost of electricity would rise from $0.088/kWh in 2022 to $0.238/kWh in 2040. Leonard Rodberg et al., *supra*. This analysis does not include the effects of inflation or the cost of an expanded transmission network necessary "to connect the thousands of solar and wind facilities that would need to be built" or the "recent substantial cost increases in solar and wind installations" like the ones that caused Empire 2 to be canceled. *Id.* at 10 n.24. When multiplied by 2022 ratio between household prices and the system price, *see Monthly Average Retail Price of Electricity – Residential*, NYSERDA, *supra*, this would mean that residential electricity prices could rise as high as $0.60/kWh before inflation over the next 16 years.

A grid with a high fraction of "renewable energy systems" will not be reliable.

If it can be built at all, a grid with a high fraction of intermittent energy systems will have serious reliability problems. Wind energy generates on average about 35 percent of its total nameplate capacity and solar less than 25 percent. NYSERDA's Scenario 3 attempts to compensate for this by increasing the total capacity of generation commissioned. But because reduced generation for wind and solar is largely dependent on the weather, this lack of capacity isn't randomly distributed, but tends to be correlated, like when the sun goes down or when a major weather event disrupts wind and solar power.

When power supply drops but demand doesn't, other generation sources must fill the gap. If those sources are unable to perform, grid outages are possible. That's why regions with increased penetrations of wind and solar have faced increasing concerns about grid reliability. The North American Electric Reliability Corporation ("NERC")'s Long-Term Risk Assessment for 2023–2027 found that most of the country is at elevated risk of blackouts, with the Midwest and California having a high-risk of adequacy shortfall during even normal peak conditions. NERC, *2022 Long-Term Reliability Assessment* (Dec. 2022), https://perma.cc/T8AJ-V6B7.

New York is not far behind. In its 2023–2032 Comprehensive Reliability Plan, NYISO says that there are "growing risks to electric system reliability, including: projected increases in peak demand due to electrification of the transportation and building sectors; additional generator deactivations; delayed implementation of planned infrastructure projects; and extreme weather." Press Release, NYISO, NYISO Issues Comprehensive Reliability Plan Detailing Reliability Risks Over the Next Decade (Nov. 29, 2023), https://perma.cc/7END-MQ7F.

While the reliability plan does not find any long-term reliability violations, it notes that this is based on several assumptions that could be undermined by other risk factors including "climate, economic, regulatory, and policy drivers." NYISO, 2023–2032 Comprehensive Reliability Plan 6, 48 (Nov. 28, 2023), https://perma.cc/G2RD-8F9S. A few of those are worth highlighting here.

The report notes that, as discussed above, "[t]here is a clear upward trend forecasted in peak demand over the next ten years, with significant uncertainty driven by electrification of heating and transportation coupled with the development of multiple high-electric demand facilities (e.g., microchip fabrication and data centers). As the demand on the grid grows at a rate greater than the build out of generation and transmission, deficiencies could arise within the ten-year planning horizon." *Id.* at 9–10, 48, 86. This imbalance in supply and demand wouldn't buck the trend. The report explains that in recent years, "[t]he pace of generation retirements has exceeded the pace of resource additions to date" and "[s]hould this trend continue, reliability needs will be identified both locationally and statewide." *Id.*

As a result, "New York's current reliance on neighboring systems is expected to continue through the next ten years. Without emergency assistance from neighboring regions, New York would not have adequate resources throughout the next ten years." *Id.* This reliance on imports during emergency situations is not necessarily a safe bet. The same weather that reduces New York's generation capacity is likely to affect its neighbors as well.

And there is a substantial chance that imports will be less than expected. The NYISO Press Release explains that "the timely completion of planned transmission projects – primarily the

Champlain Hudson Power Express (CHPE) project – [are necessary] to maintain system reliability. Without the CHPE project in service by May 2026 or other offsetting solutions, reliability margins within New York City would be deficient beginning in 2026." Press Release, NYISO, *supra*.

Even without delays or cancellations that NYISO isn't expecting—like the cancellation of Empire Wind 2—the situation is still precarious. "The New York statewide grid is projected to become a winter-peaking system in the mid-2030s, primarily driven by electrification of space heating and transportation. The New York statewide grid is reliable for normal weather in the winter for the next ten years, but deficiencies would arise as early as winter 2027-2028 for an extreme 1-in-100-year winter cold snap coupled with a shortage of gas fuel supply. This deficiency would grow to a 6,000 MW shortfall by winter 2032-2033. Additional deactivations of dual-fuel generation beyond what is planned will exacerbate the winter reliability risk." 2023–2032 Comprehensive Reliability Plan, *supra*, at 10.

These are not risks that the Commission is permitted to take.

A grid with a high fraction of "renewable energy systems" will not be sustainable.

The risks of inadequate grid capacity, affordability, and reliability all lead to the fourth risk of over-reliance on intermittent resources: sustainability. Author Robert Bryce explains that there is an Iron Law of Electricity: "People, businesses, and countries will do whatever they have to do to get the electricity they need." Robert Bryce, *Coal At $200 A Ton And Soaring Use Of Oil For Power Proves 'The Iron Law Of Electricity'*, Forbes (Oct. 8, 2021), https://perma.cc/HE9C-W8DR.

If renewable resources cannot be built or if these resources create an electrical system that the people of New York cannot tolerate, then the Commission will be forced to rely on other higher emitting resources "to ensure access to safe, reliable utility service at just and reasonable rates," *About DPS and PSC*, NYSDPS, *supra*. This will inevitably lead to worse emissions performance than if the Commission adopted a broader definition of "zero emissions" to begin with. This is surely not what the CLCPA intends.

V. Emissions Accounting Must Include Full Lifecycle Emissions.

As explained above, the goal of CLCPA—reducing the impacts of climate change for New Yorkers, CLCPA § 1(6)—requires a reduction in *net* greenhouse gas emissions. And because climate change is the result of the gradual accumulation of carbon dioxide in the upper atmosphere, the relevant metric for emissions is not only the emissions produced during the

process of generating electricity, but those produced throughout the *full lifecycle* of the source. Neglecting lifecycle emissions would not only be counterproductive to CLCPA's goals; it would be "without sound basis in reason or regard to the facts." *Peckham v. Calogero*, 12 N.Y.3d 424, 431 (2009) (explaining when an agency "action is arbitrary and capricious").

There are many different electrical generation systems, and each system produces greenhouse gases in varying quantities through fuel production, construction, operation, and decommissioning. For conventional fossil-fueled generation systems, like coal fired power plants, the majority of greenhouse gas emissions are produced during operation. For other systems, like wind and nuclear, most emissions are released during construction and decommissioning. And for some systems, like biomass, the emissions released during combustion are offset by the carbon sequestered while the fuel grows. All these emissions—whether generated during operation, construction, deconstruction, or fuel production—impact global greenhouse gas concentrations in the same way and so excluding emissions from one or more stages is irrational. The Commission should thus account for emissions across the lifecycle of each system while normalizing on a per kilowatt-hour basis, which provides the fairest comparison of emissions from generation systems and the best indication of the systems' ultimate climate impact.

Quantifying lifecycle emissions from a system type is difficult, however, as there are many variations from plant to plant even within a single generation system. But some generalizations can be made. The National Renewable Energy Laboratory ("NREL")'s Life Cycle Assessment Harmonization Project provides reasonable emissions factors from different generation systems, derived from a review of approximately 3,000 published lifecycle assessment studies. NREL, Life Cycle Greenhouse Gas Emissions from Electricity Generation: Update (Sept. 2021), https://perma.cc/59P8-SDYG. The studies include analysis of utility-scale electricity generation from wind, solar photovoltaics, concentrating solar power, biopower, geothermal, ocean energy, hydropower, nuclear, natural gas, and coal technologies, as well as the carbon-footprint for storage technologies—lithium-ion battery, pumped storage hydropower, and hydrogen storage technologies—which although not capable of generating electricity themselves, are necessary to make use of intermittent generation technologies like solar and wind and high penetrations. *Id.* The median emission factors in grams of carbon dioxide equivalent per kilowatt-hour (g CO_2e/kWh) is documented in Table 1 below. *Id.*

Table 1. Median Published Life Cycle Emissions Factors for Electricity Generation Technologies, by Life Cycle Phase

	Generation Technology	One-Time Upstream	Ongoing Combustion	Ongoing Non Combustion	One-Time Downstream	Total Life Cycle	Sources
Renewable	Biomass	NR	—	NR	NR	52	EPRI 2013 Renewable Electricity Futures Study 2012
	Photovoltaic[a]	~28	—	~10	~5	43	Kim et al. 2012 Hsu et al. 2012 NREL 2012
	Concentrating Solar Power[b]	20	—	10	0.53	28	Burkhardt et al. 2012
	Geothermal	15	—	6.9	0.12	37	Eberle et al. 2017
	Hydropower	6.2	—	1.9	0.004	21	DOE 2016
	Ocean	NR	—	NR	NR	8	IPCC 2011
	Wind[c]	12	—	0.74	0.34	13	DOE 2015
Storage	Pumped-storage hydropower	3.0	—	1.8	0.07	7.4	DOE 2016
	Lithium-ion battery	32	—	NR	3.4	33	Nicholson et al. 2021
	Hydrogen fuel cell	27	—	2.5	1.9	38	Khan et al. 2005
Nonrenewable	Nuclear[d]	2.0	—	12	0.7	13	Warner and Heath 2012
	Natural gas	0.8	389	71	0.02	486	O'Donoughue et al. 2013
	Oil	NR	NR	NR	NR	840	IPCC 2011
	Coal	<5	1010	10	<5	1001	Whitaker et al. 2012

Notably, although renewable technologies like wind and nuclear have the lowest greenhouse gas emissions factors, even they are not "zero emissions" sources, as emissions are generated in the construction and decommissioning stages. Consequently, additional sequestration or offsets will be necessary to reach the CLCPA's goal of 100 percent zero emissions by 2040, even if the 70 percent renewable energy systems by 2030 goal is met. Indeed, several of the most promising zero emissions energy systems—capable of the net negative emissions necessary to offset the emissions from renewable sources—are not included in the CLCPA's catalog of renewable energy systems, underscoring the need to interpret "zero emissions" systems more broadly.

One such system—capable of net negative lifecycle emissions—is nuclear paired with direct air capture. After accounting for the usage of some storage technology for intermittent sources like solar and wind, nuclear power has by far the lowest emissions factor of any energy generation system. When paired with atmospheric carbon capture and storage technology, nuclear reactors are likely to be the cheapest net-zero emissions technology. A recent U.S. Department of Energy ("DOE") report suggests that pairing advanced reactors with direct air capture technologies could lower the levelized cost of carbon capture by up to 13 percent compared to non-nuclear-powered

systems. Nicolas Stauff et al., Sys. Analysis and Integration Campaign, DOE, Assessment of Nuclear Energy to Support Negative Emission Technologies, at iii, 45, 51 (Sept. 7, 2023), https://perma.cc/MG8K-YKQU. In the study, researchers analyzed solid direct air capture systems using nuclear heat and electricity as well as a combination of natural gas heat and nuclear electricity for liquid direct air capture plants.

A second promising category of system is bioenergy with direct carbon capture and storage ("BECCS"). Because biomass sources sequester carbon during the fuel acquisition phase and emit carbon primarily during the combustion phase BECCS has the greatest potential to be a dramatically net-negative electricity generation source. *Bioenergy with Carbon Capture and Storage*, Int'l Energy Agency, https://perma.cc/SA7C-A2SL (last accessed Jan. 26, 2024). Further, hybrid pyrolysis-combustion processes can produce heat or energy as well as carbon-rich byproducts like biochar or bio-oil. A report from Lawrence Livermore National Laboratory found that biomass carbon removal and storage ("BiCRS") "carbon-removal potential exceeds 800 million tonnes of CO_2 per year at a cost less than $100/tonne CO_2, with no impact on cropland or commodity prices. . . . These results indicate that BiCRS has the potential to be among the most significant carbon removal pathways in the United States, due to removal rates that exceed those of forests and soils at costs that are lower than direct air capture [ ] with storage." Jennifer Pett-Ridge et al., Lawrence Livermore Nat'l Lab'y, Roads to Removal: Options for Carbon Dioxide Removal in the United States 6-5 (Dec. 2023), https://perma.cc/L4F5-PH66. One study, cited by NREL, calculated that after the inclusion of avoided greenhouse gas emissions, a well-designed BECCS system could "lead[ ] to a significant negative life cycle GHG impact of -1,487 g CO_2eq/kWh." D. O'Connor, Elec. Power Rsch. Inst., Literature Review and Sensitivity Analysis of Biopower Life-Cycle Assessments and Greenhouse Gas Emission 6-15 (Jan. 30, 2013), https://perma.cc/M8SA-XXFB.

A third promising net-negative system is the storage of energy in so-called "turquoise hydrogen" produced by the pyrolysis of methane. Molecular hydrogen—the most abundant molecule in the universe—can be a useful, low-carbon way to store energy. Like coal, oil, and natural gas, it is transportable and has a high energy density. But unlike coal, oil, and natural gas, the combustion of hydrogen with air or the electrochemical oxidation of hydrogen in a fuel cell does not produce greenhouse gases in the process of generating electricity. This means that all the lifecycle greenhouse gas emissions associated with hydrogen come from the upstream construction of hydrogen storage and reaction mechanisms, and the upstream mechanisms of producing hydrogen itself.

The different methods of producing hydrogen have acquired a catalog of colorful names with varying costs and emissions intensities. Currently, 96% of hydrogen is produced from fossil fuels either through steam methane reforming of natural gas into—"grey hydrogen"—or coal gasification—"brown hydrogen." Jad Diab et al., *Why Turquois Hydrogen Will Be a Game Changer for the Energy Transition*, 47 Int'l J. of Hydrogen Energy 25831 (July 2022), https://doi.org/10.1016/j.ijhydene.2022.05.299. A third option—"blue hydrogen"—uses the same steam methane reforming process as "grey hydrogen" but sequesters the resulting carbon dioxide emissions using carbon capture and storage. *Id.* "Green hydrogen" refers to hydrogen produced by electrolysis powered by solar, wind, or hydro energy, *id.*, and "pink hydrogen" to hydrogen produced through electrolysis powered by nuclear energy.

"Turquoise hydrogen" uses pyrolysis, or the high temperature decomposition of methane in the absence of an oxidizer to produce hydrogen and solid carbon or carbon black. A recent study suggests that if produced using conventional natural gas, turquoise hydrogen produces fewer carbon emissions than both grey and blue hydrogen, but more than green hydrogen. *Id.* "However, when using renewable natural gas, turquoise hydrogen is the 'greenest' production method, performing largely better than wind electrolysis, removing 5.22 kg of GHGs from the atmosphere for every kilogram of hydrogen produced." *Id.* "This leads to a negative carbon intensity for turquoise hydrogen compared to a close-to-zero carbon intensity for green hydrogen using wind electrolysis."

This process also has the potential to be far more energy efficient than traditional means of producing hydrogen. Because of the energy inefficiencies of electrolysis, a typical hydrogen powered turbine will expend around 5 times as much energy to generate the hydrogen as it will generate when it subsequently consumes the hydrogen. For example, the 90 MW General Electric 7E Gas Turbine requires 487.7 MW of continuous electrical output to generate enough hydrogen to power the turbine. *Hydrogen and CO2 Emissions Calculator,* General Electric, https://www.ge.com/gas-power/future-of-energy/hydrogen-fueled-gas-turbines/hydrogen-calculator (last accessed Feb. 14, 2024). This is the equivalent of 646 1.5 MW nameplate-capacity wind turbines. *Id.* Because far less energy is required to generate hydrogen from methane, a pyrolysis mechanism would have an energy-in to energy-out ratio far closer to 1. *See* Mary Katebah, et al., *Analysis of Hydrogen Production Costs in Steam-Methane Reforming Considering Integration with Electrolysis and CO_2 Capture,* 10 Cleaner Engineering and Technology 100552 (Oct. 2022), https://doi.org/10.1016/j.clet.2022.100552.

These technologies are not necessarily the only route to zero emissions electric generation system, but they illustrate that the clear purpose of the CLCPA cannot be met if the Commission

adopts a definition of "zero emissions" focused narrowly on the stack of a power plant or on a catalog of renewable energy systems. Instead, a technologically neutral definition that accounts for emissions through the entire lifecycle of the source is necessary to harmonize the Commissions interpretation the greenhouse gas reductions intended by the statute.

VI. Other Comments

The Commission should not adopt the interpretations of other agencies that would limit its ability to fulfil its statutory mandate.

The Commission asks if the Department of Environmental Conservation's "emissions accounting regulations [which count emissions from biomass combustion on a gross rather than net basis] constrain or otherwise inform the Commission's definition of the phrase, 'by the year [2040] the statewide electrical demand system will be zero emissions." They do not. The Commission has an independent obligation to construe its mandate under the CLCPA consistent with the responsibilities already entrusted to it by the Assembly, CLCPA § 11, which includes "guarantee[ing] to the public safe and adequate service at just and reasonable rates," *In re Int'l Ry. Co. v. Pub. Serv. Comm'n*, 264 A.D. 506, 510 (1942). The Commission will have the best chance at meeting the CLCPA's targets while ensuring sufficient reliable and affordable electricity if it counts emissions from biomass combustion on a net, rather than gross, basis, consistent with the only reasonable reading of the CLPCA's "zero emissions" mandate.

As explained above, biomass is particularly well suited to reducing the emissions of electrical generation because it has the potential to be a dramatically net-negative source. There are several successful biomass electricity generation projects in New York, and more could quickly be developed to fill the role of DEFRs if they were adequately credited with their lifecycle emissions reductions. Where "the Legislature . . . specif[ies] only the goals to be achieved and policies to be promoted, while leaving the implementation of a program to be worked out by an administrative body," the Commission possesses particularly broad discretion. *Consol. Edison Co. v.*, 47 N.Y.2d at 102. Here, the Commission has broad discretion to accept or reject the Department of Environmental Conservation's interpretation when it is implementing its own regulatory program.

Beyond this single topic, the Commission should also take this opportunity to identify other rules and policies that limit its ability to comply with the CLCPA and its other statutory obligations and amend them. The CLCPA's requirements are burdensome enough all by themselves.

Fuel cells that consume hydrogen, biogas, renewable natural gas, or other non-fossil fuels are zero emissions insofar as they produce net-zero greenhouse gas emissions.

The CLCPA's designation of "fuel cells which do not utilize a fossil fuel resource in the process of generating electricity" as a "renewable energy system", CLCPA § 4; N.Y. Pub. Serv. Law § 66-p(1)(b), has no significance for the characterization of these systems as "zero emissions." As explained above, a system is "zero emissions" only if its lifecycle net-greenhouse gas emissions are zero. With that said, there is no reason that—with sufficient offsets—that fuel cells consuming hydrogen, biogas, renewable natural gas, other non-fossil fuels or even fossil fuels could not be "zero emissions" systems. Indeed, a fuel cell using turquois hydrogen has the potential to be net-carbon negative.

VII. Conclusion

While the comments above are intended to provide the Commission with guidance on the legal interpretation of the CLCPA, we would be remiss if we did not highlight, again, just how remarkably bad a piece of legislation the CLCPA is. As the Commission is aware, the text of the Act is riddled with undefined and ambiguous terms. The language used in the Act and the targets it sets suggest that the legislature only has the dimmest understanding of how the bulk power system (or the global climate!) works. This ignorance, coupled with an overweening confidence in their ability to re-engineer by fiat the most complicated machine ever built, will result in disaster.

This hubris is shown in nearly every aspect of the Act. The "statewide electrical demand system" that the CLCPA has planned cannot be built. If the Commission earnestly attempts to comply with the Act's dictates, it will cost New York's rate payers hundreds of billions of dollars, ravage reliability, and strand New Yorkers with reliance on a power system less sustainable than the one they started with.

And for what? Even if the emissions from electricity generation in New York could be brought to zero, those 25 million metric tons of CO_2 are a drop in the bucket of world's 37 *billion* metric tons per year. *See* NYSDEC, 2023 NYS Greenhouse Gas Emissions Report, Sectoral Report #1 (2023), https://perma.cc/6XWV-DVH4; Hannah Ritchie et al., *CO_2 and Greenhouse Gas Emissions*, Our World in Data (2023), https://ourworldindata.org/co2-and-greenhouse-gas-emissions. Even if these reductions were allowed to accrue to the end of the century, New York

would have only managed to reduce projected temperature rise by about 0.001 C.[7] This is a rounding error.

At the least, to comply with its other statutory obligations, the Commission must conduct a thorough feasibility study to show what the true impacts of the CLCPA will be. The alternative would leave New Yorkers in the dark.

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[7] Based on the reduced-complexity Model for the Assessment of Greenhouse Gas Induced Climate Change (MAGICC) and a reference scenario of SSP3—7.0, which the Intergovernmental Panel on Climate Change (IPCC) describes as a high emissions scenario that assumes no successful, comprehensive global actions to mitigate greenhouse gas emissions. MAGICC, *available at* https://perma.cc/9GX8-WYVX (last visited Jan. 26, 2024). Because comprehensive global actions to mitigate greenhouse gas emissions are already underway, this is an overestimate, and the real impact of the CLCPA would be smaller.