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ARTICLE

Labor Leading on Climate: A Policy Platform to Address Rising Inequality and Rising Sea Levels in New York State

J. MIJIN CHA*

I. INTRODUCTION

Historically, economic inequality and the climate challenge have been discussed as separate spheres. Discussions around rising economic inequality look to wages, unemployment, and rising income inequality. When discussing climate change, the climate crisis is often measured in terms of greenhouse gas emissions and extreme weather patterns. If there was any overlap between these two spheres, it tended to be in terms of conflict: the false notion that stronger environmental regulations and bold climate policies “kill jobs” and hurt the economy.

Recently, something of a paradigm has shifted the way that policy experts, as well as environmental and economic justice advocates, talk about these two problems and their policy solutions. The economic impact of extreme weather events and the potential for creating good, quality jobs with climate mitigation and adaptation policies have linked the narratives of inequality and climate crises. There is also a growing recognition that the forces causing and exacerbating economic inequality, mainly corporate and fossil fuel interests, also exacerbate climate change and its deadly effects.

These fossil fuel interests are likely to become stronger and more entrenched with the recent presidential election and change

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in administration. The proposed cabinet appointments indicate that the incoming administration will be hostile towards climate policy and measures that decrease economic inequality—such as minimum wage increases, and unionization. In this federal environment, state action becomes even more important, as it has to fill the void left by federal inaction and act as a safeguard against regressive actions.

With the renewed need for state action, this paper presents a case study of a labor-led initiative in New York State that seeks to address both economic inequality and the climate crisis. It discusses how organized labor, which has historically represented fossil fuel workers and has not been seen as a traditional climate ally, put forth a comprehensive climate jobs plan that could meaningfully reduce carbon emissions while also creating good, family-sustaining jobs to reduce income inequality. As the need for a broader coalition to advocate for sensible climate policy increases, this case study provides a road map for states across the country on how non-traditional allies can come together around a policy agenda that fights both inequality and climate change.

II. THE CASE FOR INCREASED STATE ACTION

There is a long history of workers relying on states for employment protections in the absence of federal leadership. In 1867, Illinois passed the eight-hour work day, almost fifty years before the nationwide eight hour workday was adopted.¹ Currently, 29 states, plus the District of Columbia, have a higher minimum wage than the federal minimum wage.² Although there is no federal renewable portfolio standard (RPS), twenty-nine states have a RPS, which “require[s] utilities to sell a specified percentage or amount of renewable energy.”³ States have also experimented with many other carbon policies, including low carbon fuel standards, coal power bans, renewable energy feed-in-

1. 820 ILL. COMP. STAT. 145 / 1 (1867).

2. *Wage Law in the States - January 1, 2017*, U.S. DEPT OF LAB., <https://www.dol.gov/whd/minwage/america.htm> [<https://perma.cc/8WRU-US69>] (last updated Jan. 1, 2017).

3. Jocelyn Durkay, *State Renewable Portfolio Standards and Goals*, NAT'L CONF. OF ST. LEGISLATURES (Dec. 28, 2016), <http://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx> [<https://perma.cc/7PRB-4D6Q>].

tariffs, and greenhouse gas trading programs.⁴ State climate action may also better address local concerns and preferences, which may, in turn, lead to tailoring of climate policies rather than a blanket federal policy.⁵ Finally, state action often prompts federal action.⁶

To be sure, because climate change is a global issue, a state by state action plan may not be aggressive or comprehensive enough to stop the worst impacts of climate change from occurring. There is also the concern that because emissions are global, states that adopt climate policies will bear the costs of emissions reductions while the possible benefits will accrue globally.⁷ This dynamic incentivizes “free riders,” who will benefit from neighboring state emission reduction efforts without having to bear the costs of these reductions.⁸ In the worst case scenario, the free rider phenomenon discourages state action.

However, the 2016 election results place the need for state action in a more pressing light. While it remains to be seen what actions the incoming administration will take, the initial cabinet choices are a clear indication that climate policy is likely to change drastically.⁹ Climate deniers and fossil-fuel interests are heavily represented on both the transition team and the initial choices for the Department of State, Department of Energy, Department of Interior, NASA, and the Environmental Protection Agency.¹⁰ The President also publicly declared his intention of withdrawing from

4. See, e.g., Andrew Topf, *Oregon Becomes First US State to Ban Coal Power*, MINING.COM (Mar. 6, 2016), <http://www.mining.com/oregon-becomes-first-us-state-to-ban-coal-power> [https://perma.cc/9UGM-GJN7]; *Low Carbon Fuel Standard*, CAL. ENVTL. PROT. AGENCY - AIR RES. BD., <https://www.arb.ca.gov/fuels/lcfs/lcfs.htm> [https://perma.cc/YYQ4-J8N6]; *Feed-in-Tariffs*, NAT'L RENEWABLE ENERGY LAB., http://www.nrel.gov/tech_deployment/state_local_governments/basics_tariffs.html [https://perma.cc/JR8T-AT2B]; REG'L GREENHOUSE GAS INITIATIVE, <https://www.rggi.org> [https://perma.cc/F3VS-R7UD].

5. Jonathan H. Adler, *Hothouse Flowers: The Vices and Virtues of Climate Federalism*, 17 TEMP. POL. & C.R. L. REV. 443, 450 (2008).

6. *Id.* at 451.

7. *Id.* at 448.

8. *Id.*

9. Oliver Milman, *Trump's Transition: Sceptics Guide Every Agency Dealing with Climate Change*, GUARDIAN (Dec. 12, 2016), <https://www.theguardian.com/us-news/2016/dec/12/donald-trump-environment-climate-change-skeptics> [https://perma.cc/7FYH-69EX].

10. *Id.*

the Paris Climate Accords, which set targets of limiting global warming to 1.5 °C and eventually phasing out fossil fuel use.¹¹

With this current federal political climate, state action may be the only action taken in the U.S. to reduce greenhouse emissions and attempt to stave off the worst impacts of climate change while also creating good, family sustaining jobs that help rebuild the middle class.

III. BACKGROUND ON NEW YORK STATE

New York is falling far short of its necessary greenhouse gas pollution reduction goals. To stop catastrophic climate change, greenhouse gas emissions must be reduced globally to at least 80 percent below 1990 levels by 2050, which would require four times the current annual emissions reduction rate.¹² Therefore, by 2050, New York State's emissions must be only a fraction of what they are now, if not down to zero.¹³ In the transportation sector, emissions are actually increasing,¹⁴ and energy sector emissions may also be increasing given the likely underestimation of methane emissions from natural gas operations.¹⁵

At the same time, economic inequality in New York is rising. Currently, the state has the second highest level of economic

11. *Trump Seeking Quickest Way to Quit Paris Climate Agreement, Says Report*, GUARDIAN (Nov. 13, 2016), <https://www.theguardian.com/us-news/2016/nov/13/trump-looking-at-quickest-way-to-quit-paris-climate-agreement-says-report> [https://perma.cc/534W-PQW4]; Suzanne Goldenberg et al., *Paris Climate Deal: Nearly 200 Nations Sign in End of Fossil Fuel Era*, GUARDIAN (Dec. 12, 2015), <https://www.theguardian.com/environment/2015/dec/12/paris-climate-deal-200-nations-sign-finish-fossil-fuel-era> [https://perma.cc/9S4E-XFWF].

12. N.Y. ST. ENERGY RES. & DEV. AUTH. [NYSERDA], NEW YORK STATE GREENHOUSE GAS INVENTORY AND FORECAST: INVENTORY 1990-2011 AND FORECAST 2012-2030 (2014), <https://static1.squarespace.com/static/576aad8437c5810820465107/t/5797fdbbcd0f68be0b7d2128/1469578204370/greenhouse-gas-inventory.pdf>, [https://perma.cc/2YBB-3T4J] [hereinafter NYSERDA GHG FORECAST]; see also *New York State Signs Under 2 MOU Climate Agreement*, CA.GOV – OFF. OF GOVERNOR EDMUND G. BROWN JR. (Oct. 8, 2015), <https://www.gov.ca.gov/news.php?id=19157> [https://perma.cc/T5GC-GC37] [hereinafter N.Y. State Signs Under 2 MOU Agreement].

13. See *N.Y. State Signs Under 2 MOU Agreement*, *supra* note 12.

14. See NYSERDA GHG FORECAST, *supra* note 12, at 25.

15. Scott M. Miller et al., *Anthropogenic Emissions of Methane in the United States*, 100 PNAS 20018, 20022 (2013), <http://www.pnas.org/content/110/50/20018.full.pdf> [https://perma.cc/9KZN-XPZP].

inequality in the country.¹⁶ Unequal job growth across the state and stagnant wages in several sectors are two of the main contributors to rising inequality.¹⁷ While the state overall has seen several years of employment growth, these gains are concentrated in New York City.¹⁸ Much of the rest of the state is still suffering from job losses and stagnant employment levels.¹⁹ Additionally, in many sectors, such as construction and manufacturing, wages are not increasing at the same pace as inflation.²⁰

A. Overview of New York State Emissions Sources and Reduction Targets

Greenhouse gas emissions in New York State come primarily from three sectors: residential and commercial buildings, transportation, and energy.²¹ In the chart below, the first column represents emissions in each sector in 1990, the second column represents emissions in 2013, and the third column represents the target emissions level in 2050.²² The transportation sector is the only sector in which emissions have risen since 1990.²³ However, emissions in the building and energy sectors are reducing at only a fraction of the level needed. In 2013, carbon dioxide emissions totaled 180.1 million metric tons of CO₂ equivalent (MMtCO₂e).²⁴ However, methane emissions from natural gas production have

16. AMANDA NOSS, U.S. DEP'T OF COMMERCE, HOUSEHOLD INCOME: 2013 – AMERICAN COMMUNITY SURVEY BRIEFS (2014), <http://www.census.gov/content/dam/Census/library/publications/2014/acs/acsbr13-02.pdf> [<https://perma.cc/SM6J-V3RV>].

17. THOMAS P. DiNAPOLI, OFF. OF THE STATE COMPTROLLER, NEW YORK STATE EMPLOYMENT TRENDS 1, 8 (2015), https://www.osc.state.ny.us/reports/economic/employment_trends_nys_2015.pdf [<https://perma.cc/2C7Z-EJ37>]; see also LAWRENCE MISHEL, CAUSES OF WAGE STAGNATION (2015), <http://www.epi.org/publication/causes-of-wage-stagnation> [<https://perma.cc/8SBF-Y7FV>] (establishing the link between stagnant wages and increasing economic inequality).

18. DiNAPOLI, *supra* note 17, at 14 fig.12.

19. *Id.*

20. *Id.* at 8 fig.6.

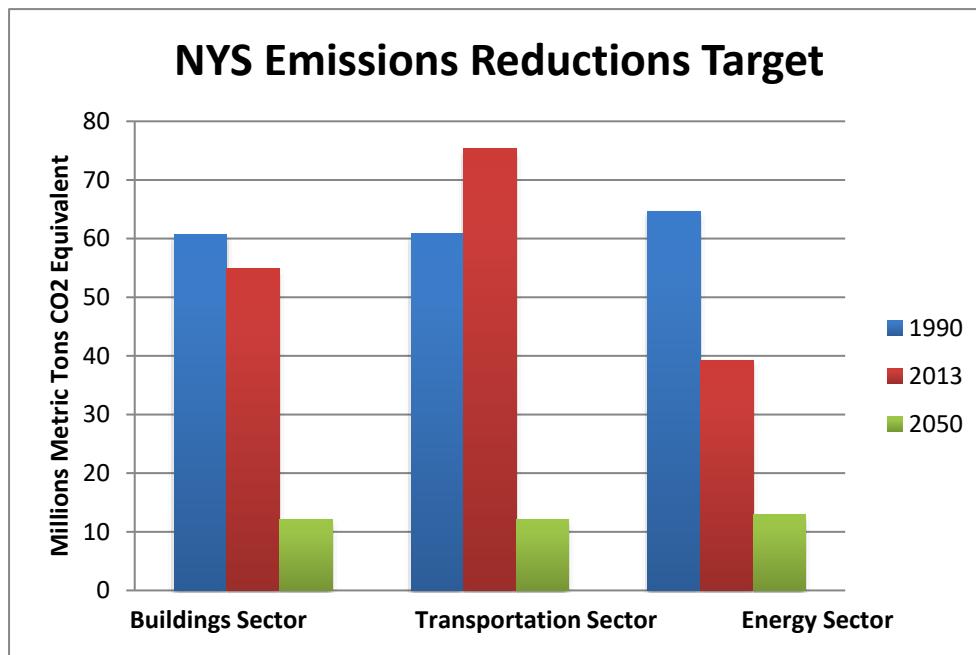
21. See NYSERDA GHG FORECAST, *supra* note 12, at S-5.

22. See *id.* at A-1 tbl.A-1; N.Y. State Signs Under 2 MOU Agreement, *supra* note 12.

23. NYSERDA, PATTERNS AND TRENDS - NEW YORK STATE ENERGY PROFILES: 1999-2013 FINAL REPORT 25 (2015), <https://www.nyserda.ny.gov/-/media/Files/Publications/Energy-Analysis/1999-2013-Patterns-Trends.pdf> [<https://perma.cc/388S-HMHE>] [hereinafter NYSERDA ENERGY PROFILES].

24. *Id.*

been significantly underestimated, which likely negates any decrease in emissions accounting.²⁵



To prevent large-scale, irreversible damage to the climate and communities around the world, the scientific consensus is that global warming must be limited to 1.5 or 2 degrees Celsius.²⁶ So far, the earth's temperature has increased 0.85 degrees Celsius and the negative impacts are already being seen.²⁷ Limiting global warming to two degrees Celsius requires carbon emissions to be reduced 80 percent below 1990 levels by 2050.²⁸ In order to meet

25. Miller, *supra* note 15, at 20020.

26. John Vidal, *World's Scientists to Join Forces on Major 1.5C Climate Change Report*, GUARDIAN (Apr. 14, 2016), <http://www.theguardian.com/environment/2016/apr/14/worlds-scientists-to-join-forces-on-major-1.5c-climate-change-report> [<https://perma.cc/43JL-3M98>].

27. Roz Pidcock, *What Happens if We Overshoot the Two Degree Target for Limiting Global Warming?*, CARBON BRIEF (Dec. 10, 2014), <https://www.carbonbrief.org/what-happens-if-we-overshoot-the-two-degree-target-for-limiting-global-warming> [<https://perma.cc/ULT8-G3ZB>].

28. Joseph Romm, *The United States Needs a Tougher Greenhouse Gas Emissions Reduction Target for 2020*, CTR. FOR AM. PROGRESS (Jan. 13, 2009), <https://www.americanprogress.org/issues/green/reports/2009/01/13/5472/the->

this goal, each sector must reduce its emissions at several times the rate of current efforts, as the chart below shows.

YEAR	TOTAL EMISSIONS (MMTCO ₂ E)	RESIDENTIAL EMISSIONS	COMMERCIAL EMISSIONS	TRANSIT EMISSIONS	POWER SUPPLY AND DELIVERY EMISSIONS
1990	206.1	34.2	26.5	60.8	64.6
2013	180.1	32.3	22.6	75.4	39.2
2050 target	41.22	6.84	5.3	12.16	12.92
Total reduction needed to meet 2050 target	138.88	25.46	17.3	63.24	26.28
Annual reduction needed from 2016-2050	4.09	0.75	0.51	1.86	0.77

B. Background on New York State Buildings Sector

In New York State, the commercial and residential buildings sectors must reduce emissions by 4 million metric tons CO₂ equivalent every year to meet the target reduction by 2050.²⁹ In order to meet this goal, heavy focus must be placed on retrofitting existing buildings because the building stock will largely be comprised of existing, not new, buildings. In New York City, for example, existing buildings will account for at least 85 percent of the building stock in 2030.³⁰ Retrofitting buildings creates a wide array of jobs for boilermakers, HVAC and refrigeration mechanics, plumbers, pipefitters and steamfitters, insulators, sheet metal workers, electricians, cement masons, control system technicians,

united-states-needs-a-tougher-greenhouse-gas-emissions-reduction-target-for-2020 [<https://perma.cc/P8EA-SP6K>].

29. See generally NYSERDA GHG FORECAST, *supra* note 12.

30. N.Y.C. MAYOR'S OFF. OF LONG-TERM PLAN. & SUSTAINABILITY, OVERVIEW OF THE GREENER, GREATER BUILDINGS PLAN 1 (2014), http://www.nyc.gov/html/gbee/downloads/pdf/greener_greater_buildings_plan.pdf [<https://perma.cc/6WC6-6MRE>].

roofers, glaziers, electricians, and construction truck drivers. In addition, many projects would also need hazardous material removal workers, construction equipment operators, architects, and mechanical and electrical engineers.

The amount of carbon savings depends on the depth of the retrofit. Worldwide, buildings account for approximately 40 percent of the world's energy use and simple fixes, such as tuning existing heating and cooling systems or mechanical insulation, would generally improve building energy efficiency by at least 20 percent.³¹ A marquis project underway at the iconic Empire State Building aims to reduce energy consumption by nearly 40%.³² A deep building retrofit that analyzes the whole building and adopts more substantial system changes, such as replacing heating and cooling systems, could reduce energy use by up to 50 percent.³³

For the purposes of this paper, building retrofits are grouped into three categories: municipal, commercial, and residential. Among the roughly eight million buildings in New York State, an estimated 7.6 million are residential,³⁴ 481,206 are commercial, and more than 16,000 are municipal.³⁵ The sections below present

31. David Biello, *Building Retrofits: Tapping the Energy-Saving Potential*, YALE ENV'T 360 (Nov. 7, 2011), http://e360.yale.edu/feature/green_architecture_building_retrofits_tap_energy_saving_potential/2461 [<https://perma.cc/EG7B-8E2B>].

32. *Sustainability & Energy Efficiency*, EMPIRE STATE BUILDING REALTY TR., <http://www.esbnyc.com/esb-sustainability> [<https://perma.cc/X67P-PTGP>].

33. *Deep Energy Retrofit 101*, ROCKY MOUNTAIN INST., http://www.rmi.org/retrofit_depot_101 [<https://perma.cc/LW5S-P4QL>].

34. There are 5.2 million single-family homes and 2.4 million tenant units in multi-family residences for a total of 7.6 million residential units. See NYSERDA, RESIDENTIAL STATEWIDE BASELINE STUDY OF NEW YORK STATE VOL. 1: SINGLE-FAMILY REPORT 6 (2015), <https://www.nyserda.ny.gov/-/media/Files/Publications/building-stock-potential-studies/residential-baseline-study/Vol-1-Single-Family-Res-Baseline.pdf> [<https://perma.cc/7N7T-FKT9>] [hereinafter NYSERDA RESIDENTIAL STATEWIDE BASELINE STUDY VOL. 1].

35. NYSERDA, RESIDENTIAL STATEWIDE BASELINE STUDY OF NEW YORK STATE VOL. 2: SINGLE-FAMILY REPORT (2015), <https://www.nyserda.ny.gov/-/media/Files/Publications/building-stock-potential-studies/residential-baseline-study/Vol-2-Multifamily-Res-Baseline.pdf> [<https://perma.cc/95FS-DX4Y>] [hereinafter RESIDENTIAL STATEWIDE BASELINE STUDY VOL. 2]; N.Y. POWER AUTH., BUILDSMART NY: BASELINE ENERGY PERFORMANCE OF NEW YORK STATE GOVERNMENT BUILDINGS 2 (2013), <http://www.nypa.gov/BuildSmartNY/BaselineEnergyReport08-2013.pdf> [<https://perma.cc/A4BF-2AT5>] [hereinafter BUILDSMART NY BASELINE ENERGY PERFORMANCE]; SMR RES. CORP., ENHANCED COMMERCIAL PROPERTY DATABASE: VALUES OF SELECTED PROPERTIES WITH BUILDINGS, BY STATE, DECEMBER 2014

an overview of the building stock, current programs, and potential energy and cost savings.

1. Municipal Buildings

Retrofitting municipal buildings is a fundamental pillar of any statewide buildings retrofit plan for several reasons. First, there is a history of energy efficiency mandates for public buildings that can be expanded and built upon.³⁶ Second, the energy savings from building retrofits provides much-needed relief for budget-conscious municipalities.³⁷ Finally, public sector retrofits can provide the example and leadership for private sector efforts to follow.³⁸

Recognizing the importance of energy efficiency in municipal buildings, Governor Andrew Cuomo signed Executive Order 88 mandating a 20 percent improvement in energy efficiency above 2011 levels in State government buildings by 2020.³⁹ Given that New York State owns approximately 212 million square feet of real estate,⁴⁰ the Executive Order is an ambitious plan. The chart below shows the six largest government entities.

(2015), <http://www.commbuildings.com/PropertyValuesByState.php> [<https://perma.cc/5LF9-6ZUN>].

36. See, e.g., *Public Building Requirements*, AM. COUNCIL ENERGY-EFFICIENT ECON., <http://database.aceee.org/state/public-building-requirements> [<https://perma.cc/A6E6-NDK3>].

37. ENVTL. FIN. ADVISORY BD., MUNICIPAL ENERGY EFFICIENCY AND GREENHOUSE GAS EMISSIONS REDUCTION: FINANCING AND IMPLEMENTING ENERGY EFFICIENCY RETROFITS IN CITY-OWNED FACILITIES 12 (2014), https://www.epa.gov/sites/production/files/2014-04/documents/efab_report_municipal_energy_efficiency_ghg_emissions_reduction.pdf [<https://perma.cc/97A3-4HWZ>].

38. JEFFREY HARRIS ET. AL., PUBLIC SECTOR LEADERSHIP: TRANSFORMING THE MARKET FOR EFFICIENT PRODUCTS AND SERVICES 1, 4 http://www.ase.org/sites/ase.org/files/public_sector_leadership.pdf [<https://perma.cc/V9JN-4KB2>].

39. BUILDSMART NY BASELINE ENERGY PERFORMANCE, *supra* note 35, at 3.

40. *Id.*, at 7.

AGENCY/AUTHORITY	ACRONYM	GROSS SQ. FT.	% OF TOTAL
State University of New York*	SUNY	85,555,466	40.4%
Department of Corrections & Community Supervision	DOCCS	38,098,538	18.0%
City University of New York*	CUNY	19,701,393	9.3%
Office of Mental Health	OMH	19,025,432	9.0%
Office of General Services	OGS	18,958,038	9.0%
Metropolitan Transportation Authority	MTA	10,574,220	5.0%
All Other State Agency Facilities		19,703,793	9.3%
TOTAL		211,616,880	100.0%

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In the first annual progress report, the state reduced its Energy Use Intensity (EUI) by 4.9 percent, resulting in \$50 to \$60 million in energy cost savings and 130 to 180 thousand tons of greenhouse gas emissions avoided.⁴²

While an excellent start, the scale of municipal retrofits must be greatly increased and expanded. Local municipal buildings must also be a part of a statewide retrofit plan to include CUNY campuses and public schools across the state. There are approximately 4,468 public schools across the state, which adds millions of building square footage that can be retrofitted.⁴³

41. Chart reprinted from BUILDSMART NY BASELINE ENERGY PERFORMANCE, *supra* note 35, at 7 (note that while the City University of New York is a state-owned entity, these buildings are not covered by the Executive Order because community colleges are regulated by local governments).

42. N.Y. POWER AUTH., BUILDSMART NY: 2013 ANNUAL PROGRESS REPORT 3 (2014) <http://www.nypa.gov/BuildSmartNY/BuildSmartNY-2013-Annual-Progres-s-Report.pdf> [<https://perma.cc/A773-UGD9>] [hereinafter BUILDSMART NY ANNUAL PROGRESS REPORT 2013].

43. *Education Statistics for New York State*, N.Y. ST. EDUC. DEP'T, <http://www.p12.nysesd.gov/irs/statistics/public/> [<https://perma.cc/BP6J-Z8ZN>].

2. Commercial Buildings

Half the national building stock is on track to be retrofitted by 2030.⁴⁴ However, the carbon savings from these retrofits is estimated to be only 13.5 million metric tons versus the 179 million metric tons experts recommend.⁴⁵ To meet the expert recommended reduction target, either more building square footage must be retrofit or the space that is retrofitted must achieve significantly higher energy savings.⁴⁶

In New York State, commercial buildings account for 14.8 percent of carbon emissions.⁴⁷ To meet the commercial building emissions reduction target of 17.3 million metric tons of CO₂ equivalent by 2050, both the square footage that is being retrofit must be increased *and* deeper retrofits across all buildings must be implemented.

3. Residential Buildings

Roughly 7.6 million buildings in New York State are residential units.⁴⁸ Residential buildings account for nearly 20 percent of all carbon emissions in the state.⁴⁹ Retrofitting residential units not only reduces carbon emissions, it also lowers household energy costs because less energy is used, delivering economic benefits to families.⁵⁰

There are unique challenges to implementing a wide-scale residential retrofit. Financially, securing capital for residential retrofits can be difficult. For contractors, the scale of an individual residential retrofit can be financially unappealing.⁵¹ Sparse contractor infrastructure makes large-scale residential retrofits

44. Victor Olgyay & Cherlyn Seruto, *Whole-Building Retrofits: A Gateway to Climate Stabilization*, 116 ASHRAE TRANSACTIONS 244, 245 (2010).

45. *Id.* at 2.

46. *Id.*

47. See NYSERDA GHG FORECAST, *supra* note 12

48. NYSERDA RESIDENTIAL BASELINE STUDY VOL. I, *supra* note 34.

49. See NYSERDA GHG FORECAST, *supra* note 12, at S-5.

50. Jennifer Thorne Amann, *Here's How We Scale Up Participation and Savings in Residential Retrofits*, AM. COUNCIL FOR AN ENERGY EFFICIENT ECON. (Oct. 12, 2016), <http://aceee.org/blog/2016/10/heres-how-we-scale-participation-and> [<https://perma.cc/C354-UZZP>].

51. See Olgyay & Seruto, *supra* note 44.

challenging.⁵² These factors make residential retrofits more of a risky business model than basic home improvements.⁵³ With rental stock, the cost of the retrofit is borne by the homeowner while the cost savings are realized by whoever pays the energy bill, which is usually the renter.⁵⁴ In addition, a lack of information leaves homeowners uncertain as to which retrofit measures they should adopt.

That being said, these projects hold great job-creation potential. Residential retrofits have similar job creation numbers to commercial building retrofits.⁵⁵ A comprehensive report from the Rockefeller Foundation and Deutsche Bank Climate Change Advisors estimates that roughly 11.9 direct and indirect job years are created for every \$1 million spent on residential energy efficiency retrofit measures.⁵⁶

C. Background on New York State Energy Sector

Transitioning to power by renewable sources would drastically reduce carbon emissions.⁵⁷ Greenhouse gas emissions from producing and using renewable energy sources generate a fraction of emissions from fossil fuel use.⁵⁸ Moreover, New York State's great capacity for renewable energy generation remains largely untapped.⁵⁹ A meaningful switch to being powered by renewable

52. *See id.*

53. *See id.* at 7.

54. CHRIS NEME, ET AL., REG. ASSISTANCE PROJECT, RESIDENTIAL EFFICIENCY RETROFITS: A ROADMAP FOR THE FUTURE 4 (2011), <http://www.raponline.org/wp-content/uploads/2016/05/rap-neme-residentialefficiencyretrofits-2011-05.pdf> [<https://perma.cc/37BD-HK9E>].

55. ROCKEFELLER FOUND., UNITED STATES BUILDING ENERGY EFFICIENCY RETROFITS: MARKET SIZING AND FINANCING MODELS 31 (2012), [https://assets.rockefellerfoundation.org/app/uploads/20120301221532/United-States-Building-Efficiency-Retrofits.pdf](https://assets.rockefellerfoundation.org/app/uploads/20120301221532/United-States-Building-Energy-Efficiency-Retrofits.pdf) [<https://perma.cc/8MQH-9AUP>].

56. *See id.* (using information based on POLLIN ET AL., *infra* note 90).

57. *Environmental Impacts of Solar Power*, UNION OF CONCERNED SCIENTISTS, http://www.ucsusa.org/clean_energy/our-energy-choices/renewable-energy/environmental-impacts-solar-power.html#.VqaaZ1IfI_s [<https://perma.cc/3452-EKRA>] (last updated Mar. 5, 2013).

58. *See id.*

59. For example, New York could generate 11 times its electricity demand just with solar power. JUDEE BURR ET AL., STAR POWER: THE GROWING ROLE OF SOLAR ENERGY IN NEW YORK 4 (2014), http://environmentnewyork.org/sites/environment/files/reports/NY_Star_Power.pdf [<https://perma.cc/NL67-9LRD>].

energy will allow New York to meet the emissions reductions targets needed for the power sector and create thousands of good, climate jobs. In addition, ensuring that renewable energy is affordable and available to all New Yorkers will help the state achieve a clean energy future more quickly and equitably.

Power supply and delivery emits the most greenhouse gases of any single sector in New York State.⁶⁰ While emissions seem to be decreasing largely due to a shift to an increase in natural gas use, New York's the electricity sector must still reduce emissions by over 1.5 MMtCO₂e every year.⁶¹ In addition, methane emissions from natural gas production have been significantly underestimated, which likely negates any decrease in emissions accounting.⁶² Moving forward, natural gas use must also be curtailed due to the environmental damage caused by hydraulic fracking.⁶³ Moreover, research has shown that switching from coal to natural gas may not reduce global warming, particularly if there are methane leaks from natural gas extraction.⁶⁴

Through 2016, New York installed 927 MW of solar energy.⁶⁵ However, New York has the potential to install solar energy that would meet 11 times its electricity demand.⁶⁶ In comparison, California installed 18.3 GW of solar energy through 2016 – nearly 20 times more solar, making it the U.S. leader in transitioning to a clean energy future.⁶⁷ Meanwhile, worldwide, several countries have shown that being powered by renewable energy is not only rhetoric, it can be reality. For four straight days in May 2016, Portugal had all of its electricity demand met by renewable

60. See NYSERDA ENERGY PROFILES, *supra* note 23, at 26.

61. *Id.*

62. Robert Howarth, *Methane Emissions and Climatic Warming Risk from Hydraulic Fracturing and Shale Gas Development: Implications for Policy*, 3 ENERGY & EMISSIONS CONTROL TECH. 45, 46 (2015), http://www.eeb.cornell.edu/howarth/publications/fEECT-61539-perspectives-on-air-emissions-of-methane-and-climatic-warmin_100815_27470.pdf [<https://perma.cc/B4GZ-Y344>].

63. Alexandra Zissu, *How to Tackle Fracking in Your Community*, NAT'L RESOURCES DEF. COUNCIL (Jan. 27, 2016), <http://www.nrdc.org/energy/gasdrilling> [<https://perma.cc/8ZRM-2PV9>].

64. Tom M.L. Wigley, *Coal to Gas: The Influence of Methane Leakage*, 108 CLIMATIC CHANGE 601, 607 (2011).

65. *Top 10 Solar States*, SOLAR ENERGY INDUS. ASS'N, <http://www.seia.org/research-resources/2014-top-10-solar-states> [<https://perma.cc/SQ4T-DVG6>].

66. BURR, *supra* note 59, at 4.

67. *Top 10 Solar States*, *supra* note 65.

energy.⁶⁸ Denmark and Germany have also seen days where much, if not all, of their electricity needs were met solely with renewable sources.⁶⁹

If New York produced just 20 percent of its total electricity from solar power, it would reduce carbon emissions by 14 million metric tons by 2025—the equivalent of removing 3 million cars from our roads.⁷⁰ In fact, with ambitious and aggressive scaling, New York State could be completely powered by renewables – wind, water, and solar – by 2050.⁷¹

Investing in a clean energy future would create jobs for an array of sectors, including electricians, solar PV installers, construction truck drivers, architects, and mechanical and electrical engineers. On-shore and off-shore wind projects will need cement workers, steelworkers, manufacturers, construction workers, electricians, architects, and general operation and maintenance workers.

In addition, renewable energy is becoming more cost competitive. In some electricity markets across the country, solar is at grid parity with natural gas.⁷² In other words, solar energy produces electricity for the same cost to ratepayers as natural gas. Moving forward, the cost of renewable energy production and deployment is expected to continue to decrease.⁷³

68. Arthur Nelsen, *Portugal Runs for Four Days Straight on Renewable Energy Alone*, GUARDIAN (May 18, 2016), <http://www.theguardian.com/environment/2016/may/18/portugal-runs-for-four-days-straight-on-renewable-energy-alone> [https://perma.cc/42FY-W6KP].

69. *Id.*

70. BURR, *supra* note 59, at 5.

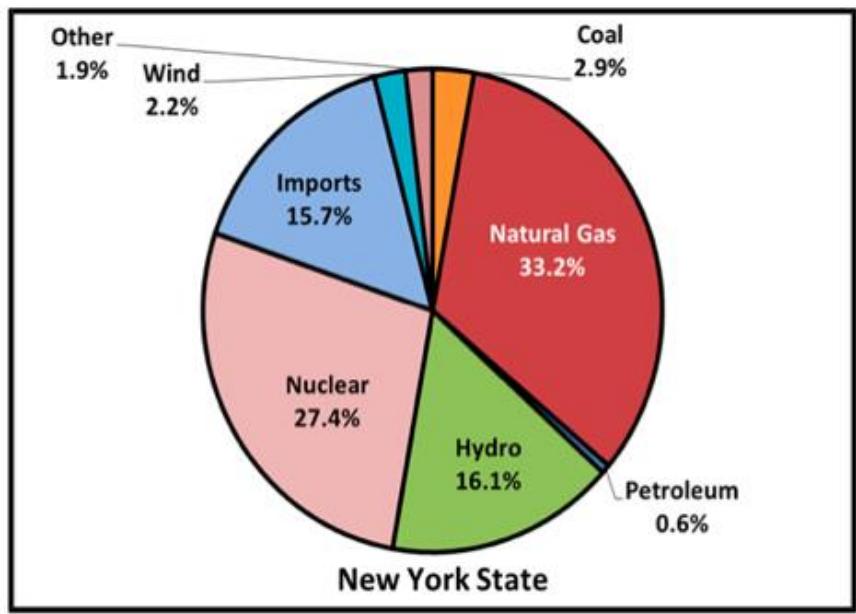
71. Compare Mark Jacobson et al., *Examining the Feasibility of Converting New York State's All-Purpose Energy Infrastructure to One Using Wind, Water, and Sunlight*, 57 ENERGY POL'Y 585, 586 (2013) [hereinafter Jacobson et al., *Converting N.Y. to Wind, Water and Sunlight*], with Nathaniel Gilbraith et al., *Comments on Jacobson et al.'s Proposal for a Wind, Water, and Solar Energy Future for New York State*, 60 ENERGY POL'Y 68, 69 (2013) (critiquing Jacobson et al.'s projections)., and Mark Jacobson et al., *Response to Comment on Paper Examining the Feasibility of Changing New York State's Energy Infrastructure to One Derived from Wind, Water, and Sunlight*, 62 ENERGY POL'Y 1212, 1212 (2013) (Jacobson et al.'s response to Gilbraith et al.'s critique).

72. Katherine Tweed, *Utility-Scale Solar Reaches Cost Parity With Natural Gas Throughout America*, GREENTECH MEDIA (Sept. 30, 2015), <http://www.greentechmedia.com/articles/read/Utility-Scale-Solar-Reaches-Cost-Parity-With-Natural-Gas-Throughout-America> [https://perma.cc/T5Q7-ZUGF].

73. INT'L RENEWABLE ENERGY AGENCY, SUMMARY FOR POLICY MAKERS: RENEWABLE POWER GENERATION COSTS 3 (2012), <https://www.irena.org/Document>

1. New York's Energy Mix

As presented by the chart below, the overwhelming majority of power in New York State is currently generated from non-renewable sources.⁷⁴ In 2013, less than 20 percent of overall power generation came from renewable sources.⁷⁵



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The amount of renewable energy produced currently is insufficient to meet New York State's greenhouse gas reduction target. Without substantial policy changes, it will remain insufficient. The chart below shows the amount of energy generated by source in GWh and the average annual growth in production of each energy source. The decrease in the use of polluting fuels, such as coal and petroleum, going forward through 2030 is a step in the right direction. However, if these energy predictions come true and there is a significant reliance on natural

Downloads/Publications/Renewable_Power_Generation_Costs.pdf [<https://perma.cc/RU3C-6DKW>].

74. NYSERDA ENERGY PROFILES, *supra* note 23, at 4.

75. *See id.*

76. Pie chart reprinted from NYSERDA ENERGY PROFILES, *supra* note 23, at 14.

gas, New York State will fail to meet its emissions reductions target.

Based on the chart below,⁷⁷ the amount of energy produced from renewable sources (hydropower plus “other”) by 2030 will be roughly 22 percent of the total energy produced.⁷⁸ While this is a slight increase from the current energy mix, it falls far short of where New York State must be in 2030. For meaningful emissions reductions, New York State must be completely powered by renewables by 2050. To ensure this, by 2030, at least half of the state’s electricity must come from renewable sources.

Energy Source	1990	2010	2030	Average % Annual Growth 1990 – 2011	Average % Annual Growth 2011 – 2030
Coal	25,913	9,426	8,864	-4.70	-0.32
Natural Gas	22,724	50,805	73,391	3.91	1.95
Petroleum	33,885	1,189	502	-14.74	-4.44
Hydropower	28,188	28,355	27,750	0.03	-0.11
Nuclear	23,623	42,695	42,622	2.86	-0.01
Net Imports of Electricity	4,519	25,202	22,523	8.53	-0.59
Other	0	5,651	12,083	NA	4.08
Total	138,853	163,323	187,735	1.49	0.74

IV. CLIMATE INVESTMENTS AND ECONOMIC BENEFIT

Investments to reduce carbon emissions in New York State have many environmental benefits. New York State is the ninth highest carbon dioxide emitter.⁷⁹ As such, reducing carbon pollution in New York State helps reduce nationwide carbon pollution and fights against climate change.⁸⁰ Reducing carbon pollution from fossil fuel plants also reduces other pollutants,

77. Chart reprinted from NYSERDA GHG FORECAST, *supra* note 12, at 38 tbl.4-1.N (The “other” category includes any energy generated from solar, wind, wood, landfill gas, and waste).

78. *Id.*

79. *Energy-Related Carbon Dioxide Emissions at the State Level, 2000-2014*, U.S. ENERGY INFO. AGENCY (Jan. 17, 2017), <http://www.eia.gov/environment/emissions/state/analysis/> [<https://perma.cc/KV4T-R47D>].

80. *Id.*

especially particulate matter, that are harmful to human health.⁸¹ Beyond the climate benefits, investments in policies that decrease greenhouse gas emissions are smart from an economic standpoint. Numerous studies show reducing greenhouse gas emissions and transitioning to a low-carbon, sustainable economy has major job creation potential.⁸² Moving towards a low-carbon or zero-carbon economy requires substantial improvement and expansion of public transportation systems, the manufacturing and deployment of renewable energy sources, modernization of electricity, water and gas infrastructure, comprehensive energy efficiency retrofits of residential, commercial and industrial buildings, and the development of more sustainable food, waste, and agricultural systems.⁸³ Ensuring job quality within these policies can improve quality of life and deliver family sustaining jobs.

A. Job Creation and Economic Benefits

Investments in energy efficiency, for example, create jobs and result in energy cost savings.⁸⁴ Job creation estimates are a

81. Allen Chen, *New Research Quantifies Health Benefits of Reducing Greenhouse Gas Emissions*, BERKLEY LAB (Nov. 18, 2014), <http://newscenter.lbl.gov/2014/11/18/new-research-quantifies-health-benefits-of-reducing-greenhouse-gas-emissions/> [https://perma.cc/JLD9-QRMR].

82. See generally U.N. INDUS. DEV. ORG. [UNIDO] & GLOB. GREEN GROWTH INST., GLOBAL GREEN GROWTH: CLEAN ENERGY INDUSTRIAL INVESTMENTS AND EXPANDING JOB OPPORTUNITIES (2015), https://www.unido.org/fileadmin/user_media/Services/PSD/GLOBAL_GREEN_GROWTH_REPORT_vol1_final.pdf [https://perma.cc/2HCX-8G8G]; Ethan Pollack, *Counting Up to Green, Assessing The Green Economy and Its Implications for Growth and Equity* (Econ. Pol'y Inst., Briefing Paper No. 349, 2012), <http://www.epi.org/files/2012/bp349-assessing-the-green-economy.pdf> [https://perma.cc/PZ5B-M8HP]; OFF. OF THE VICE PRESIDENT, CORNELL UNIV. ILR SCH., GREEN JOBS: A PATHWAY TO A STRONG MIDDLE CLASS (2009), http://digitalcommons.ilr.cornell.edu/cgi/viewcontent.cgi?article=1743&context=key_workplace [https://perma.cc/5RQD-MXGV].

83. ROBERT POLLIN ET AL., GREEN RECOVERY: A PROGRAM GUIDE TO CREATE GOOD JOBS AND START BUILDING A LOW-CARBON ECONOMY 1-2 (2008), <http://community-wealth.org/sites/clone.community-wealth.org/files/downloads/paper-pollin-et-al.pdf> [https://perma.cc/R8VQ-WFPQ].

84. Casey J. Bell, *Understanding the True Benefits of Both Energy Efficiency and Job Creation*, 10 COMMUNITY DEV. INV. REV. 109, 109 (2014), http://www.frbsf.org/community-development/files/cdir_vol10issue1-Understanding-the-True-Benefits-of-Energy-Efficiency-and-Job-Creation.pdf [https://perma.cc/KTU5-TEVE].

combination of direct, indirect, and induced job numbers.⁸⁵ Adding to these economic benefits, the money saved from lower energy bills is then put back into the economy and stimulates ongoing job creation.⁸⁶

The same economic benefits arise from investments in clean energy development and deployment. Renewable energy investments create, on average, more than twice the number of jobs as investments in natural gas and coal per million dollars invested.⁸⁷ Fossil fuel extraction is typically mechanized and capital intensive while renewable energy production is more labor-intensive, which creates more jobs.⁸⁸

1. Energy Efficiency Job Creation

For example, investing in a large-scale building retrofit plan that decreases carbon emissions creates more jobs than similar investments in fossil fuel industries. On average, investing \$1 million in commercial building retrofits creates 10-17 direct, indirect, and induced jobs.⁸⁹ In contrast, only five jobs are created per \$1 million invested in natural gas, and only seven jobs are created per \$1 million invested in coal.⁹⁰

85. Direct job creation is the employment that results from implementing climate policies, such as workers employed to retrofit buildings or build solar thermal energy plants. See HEIDI GARRETT-PELTIER, POL. ECON. RES. INST., EMPLOYMENT ESTIMATES FOR ENERGY EFFICIENCY RETROFITS OF COMMERCIAL BUILDINGS 2 (2011), https://www.peri.umass.edu/media/k2/attachments/PERI_USGBC_Research_Brief.pdf [<https://perma.cc/6CZ6-SHUA>]. Indirect job creation is the employment that arises from providing intermediate goods for these measures, such as the lumber or steel needed for retrofit work or wind turbines. *Id.* Induced job creation refers to the jobs that are created as a result of the money spent by workers on other products or services. *Id.* Unless stated otherwise, the job creation estimates in this report will be a combination of direct, indirect, and induced.

86. *See id.*

87. Zachary Shahan, *Over 3 Times More Green Jobs Per \$1 Invested Than Fossil Fuel or Nuclear Jobs*, CLEAN TECHNICA (Mar. 20, 2013), <https://cleantechnica.com/2013/03/20/over-3-times-more-green-jobs-per-million-than-fossil-fuel-or-nuclear-jobs> [<https://perma.cc/6PXJ-6BTN>].

88. *Benefits of Renewable Energy Use*, UNION OF CONCERNED SCIENTISTS (Apr. 8, 2013), http://www.ucsusa.org/clean_energy/our-energy-choices/renewable-energy/public-benefits-of-renewable.html#bf-toc-3 [<https://perma.cc/5PZN-MAT8>].

89. POLLIN ET AL., *supra* note 83, at 6; GARRETT-PELTIER, *supra* note 85, at 2.

90. ROBERT POLLIN ET AL., CTR. FOR AM. PROGRESS, THE ECONOMIC BENEFITS OF INVESTING IN CLEAN ENERGY (2009), [<https://digitalcommons.pace.edu/pelr/vol34/iss2/5>](https://cdn.americanprogress.org/wp-</p></div><div data-bbox=)

The chart below shows the job creation average for a \$1 million investment in various retrofit items for commercial buildings.⁹¹

<i>EE technology group</i>	<i>Direct employment per \$1 million</i>	<i>Indirect employment per \$1 million</i>	<i>Induced employment per \$1 million</i>	<i>Total employment per \$1 million</i>
Lighting	5.1	4.2	3.7	12.9
HVAC	5.3	4.2	3.8	13.3
Motors and drives	4.5	3.9	3.4	11.9
Water heating	5.0	4.1	3.6	12.6
Office equipment	3.8	3.7	3.0	10.5
Environmental controls	5.0	4.3	3.7	13.0
Envelope improvements	7.7	3.9	4.7	16.3
<i>Straight average</i>	5.1	4.0	3.7	12.8
<i>Weighted average</i>	5.7	4.1	3.9	13.6

2. Renewable Energy Job Creation

The increased usage of renewable energy has tremendous job creation potential. Currently, approximately only 20 percent of New York State's electricity comes from renewable sources.⁹² To reach the goal of being 100 percent powered by renewable energy, New York State would have to generate the remaining 80 percent of the energy needed from a mix of several renewable energy sources, including rooftop solar (PV and solar thermal), commercial and utility-scale PV and solar thermal plants, on-shore and off-shore wind generation, and geothermal energy. This level of expansion means the sector has great potential for growth and expansion.

content/uploads/issues/2009/06/pdf/peri_report_execsumm.pdf [https://perma.cc/NCW9-2TDU].

91. Chart reprinted from GARRETT-PELTIER, *supra* note 85, at 2 tbl.1.

92. NYSERDA ENERGY PROFILES, *supra* note 23, at 4 fig.1-2a.

3. Renewable Energy Job Potential in New York State

In 2012, New York State's retail electricity demand was 16.34 GW.⁹³ Subtracting the current renewable production, to be completely powered by renewable sources, the State would need to produce 13 GW of renewable energy per year. This estimate errs on the side of more electricity production than may be necessary, as it does not take into consideration any reduction in energy use that would occur as a result of more ambitious energy efficiency measures or reductions in energy use.

While some previous analyses predicted that solar would not provide a cost-effective energy source at the scale needed, the most credible estimates indicate that solar energy could provide a significant percentage of the renewable production needed to power the State.⁹⁴ Much, if not all, of this generation can be accomplished through the public utility, the New York Power Authority ("NYPA").

NYPA is already undertaking solar production, but, to date, the K-Solar program, targeted specifically at public schools across the state, has only installed one solar array.⁹⁵ However, NYPA estimates that the solar production potential from solar installations solely on the top of schools could exceed 3,000 MW (3GW), over three times the current total solar production in the state.⁹⁶ Through the solar production from school rooftops alone, the state would produce a quarter of the electricity needed. Assuming 14 jobs are created for every \$1 million spent on solar energy installation,⁹⁷ between 72,100 and 210,000 jobs would be created in the construction and installation of solar. In addition,

93. New York State retail electricity demand in 2012 was 143,163 GWh (16.34 GW assuming 1 MW= 8.76 GWh). *New York Electricity Profile 2015*, U.S. ENERGY INFO. ADMIN. (Jan. 17, 2017), http://www.eia.gov/electricity/state/new_york [<https://perma.cc/3QP3-SAT4>].

94. Jacobson et al., *Converting N.Y. to Wind, Water and Sunlight*, *supra* note 71.

95. N.Y. POWER AUTH., 2016 YEAR IN REVIEW 22 (2016), <http://www.nypa.gov/-/media/nypa/documents/document-library/annual-reports/nypa-2016-year-in-review.pdf> [<https://perma.cc/BFS5-TMKX>].

96. New York has generated a total of 927 MW of solar through 2016. *See id.* *Top 10 Solar States*, *supra* note 65.

97. Shahan, *supra* note 87.

for every \$1 million spent on solar, 5.5 jobs are created in operation and maintenance.⁹⁸

New York State could install utility-scale solar thermal or solar PV installations to generate an additional 1 GW of solar production. An additional 24,000 to 70,000 jobs could be created through utility-scale solar production. These job estimates include direct, indirect, and induced employment.

The remaining balance of renewable energy needed for a 100 percent clean energy economy could come from a combination of onshore wind, offshore wind, and residential solar installations. Over 61,300 full-time jobs would be created from the development of onshore wind with nearly \$4 billion in earnings in wages, services, and supply-chain impacts during construction.⁹⁹ After construction, the onshore wind production will create 2,260 annual full-times jobs and \$162 million from wages, local revenue, and local supply chain impacts.¹⁰⁰ Offshore wind will create nearly five times that much with 320,000 full-time jobs and \$21.4 billion in earnings during construction.¹⁰¹ Post-construction, 7,140 annual full-time jobs and \$514 million in annual earnings could be generated.

V. THE RELATIONSHIP BETWEEN THE LABOR AND ENVIRONMENTAL MOVEMENTS

The success of any climate jobs initiative requires a strong partnership between the environmental movement and the labor movement. Historically, these two movements have been seen to be at odds with each other. A common rhetorical phrase, “jobs versus the environment,” increases the distrust between workers and environmentalists by emphasizing the class divide between working class union members and middle-class

98. ROBERT POLLIN ET AL., CTR. FOR AM. PROG., GREEN GROWTH: A U.S. PROGRAM FOR CONTROLLING CLIMATE CHANGE AND EXPANDING JOB OPPORTUNITIES 211 (2014), <https://cdn.americanprogress.org/wp-content/uploads/2014/09/GreenGrowthReport.pdf> [https://perma.cc/87QJ-JU54].

99. Jacobson et al., *Converting N.Y. to Wind, Water and Sunlight*, *supra* note 71, at 594.

100. *See id.*

101. *See id.*

environmentalists.¹⁰² Within the “jobs versus the environment” frame, “unions and other labor organizations are interested primarily in protecting existing employment opportunities . . . Environmental protection and regulation, which arguably can limit economic growth and potentially eliminate existing employment opportunities, are perceived as a threat to jobs.”¹⁰³

In reality, the relationship is more complex. One, the labor movement is not a monolithic institution and there are deep divides within the movement when it comes to fossil fuel interests and infrastructure.¹⁰⁴ Recent disputes of tar sands oil pipeline projects have seen the AFL-CIO, a federation of labor unions, come out in support of pipeline construction, most recently in support of the Dakota Access pipeline.¹⁰⁵ However, unions within the AFL-CIO have opposed pipeline construction. For example, within the AFL-CIO, the National Nurses Union and the Communications Workers of America Committee on Human Rights came out with statements supporting those opposing the Dakota Access Pipeline.¹⁰⁶ In addition, the Service Employees International Union publicly opposed the Dakota Access Pipeline.¹⁰⁷

Two, while there was no official position, there was considerable labor support for the People’s Climate March, the largest climate march in history.¹⁰⁸ Nearly every union in New York City joined the march.¹⁰⁹ The march came on the heels of Hurricane Sandy, an extreme weather event that brought the reality of climate change home to many workers and union members. Beyond living in communities that will be impacted by extreme weather events, unionized workers repaired the destroyed infrastructure after the storm and “unionized nurses and

102. Brian Mayer et al., *Labor-Environmental Coalition Formation: Framing and the Right to Know*, 25(4) Soc. F. 746, 747 (2010).

103. *Id.*

104. See *Unions Weigh in on the Dakota Access Pipeline*, NEW LAB. F., (Sept. 30, 2016), <http://newlaborforum.cuny.edu/2016/09/30/unions-weigh-in-on-the-dakota-access-pipeline/> [<https://perma.cc/2NGG-QVSY>].

105. *Id.*

106. *See id.*

107. *See id.*

108. Antonia Domingo, *Labor Supports the People’s Climate March*, ON LABOR (Nov. 12, 2014), <https://onlabor.org/2014/11/12/labor-supports-the-peoples-climate-march> [<https://perma.cc/NQY5-YNZN>].

109. *Id.*

healthcare workers cared for patients” during the blackouts and power shortages caused by the superstorm.¹¹⁰ The president of the Connecticut State Council of Machinists, John Harrity, said, “Let’s be clear, climate change is the most important issue facing all of us for the rest of our lives.”¹¹¹

However, in order to move to a low-carbon economy, there will be employment losses in fossil fuel industries, which have higher rates of unionization than other sectors including the emerging renewable energy sector.¹¹² The renewable energy sector has lower rates of unionization for many reasons, including a geographically diverse workforce, jobs that are particularly vulnerable to outsourcing and relocation, and resistance to unionization from renewable energy companies.¹¹³ These job losses will increase tensions between labor unions and environmentalists. The concerns of workers at risk of losing their family-sustaining jobs cannot be dismissed, particularly given the rate at which unionized jobs are disappearing. To strengthen the labor-environment coalition, job creation and job quality must be as important as carbon-reducing climate policies.

VI. JUST TRANSITION

Ensuring workers employed in the fossil fuel industry are able to transition to new employment that still provides family sustaining wages is a fundamentally important part of building trust between the environmental movement and the labor movement. This effort is commonly referred to as “just transition” assistance.¹¹⁴ The AFL-CIO has also developed strong policy

110. *Id.*

111. *Id.*; Jenny Brown, *Climate Campaign Tipping Point? Unions Get on Board*, LABOR NOTES (July 21, 2014), <http://www.labornotes.org/2014/07/climate-campaign-tipping-point-unions-get-board> [https://perma.cc/6BFZ-LD9Y].

112. Betony Jones & Carol Zabin, *Are Solar Energy Jobs Good Jobs?*, CTR. FOR LAB. RES. & EDUC. (July 2, 2015), <http://laborcenter.berkeley.edu/are-solar-energy-jobs-good-jobs> [https://perma.cc/3FJV-93DG]; Tom Prugh, *Jobs in Renewable Energy Expand in Turbulent Process*, WORLDWATCH INST. (Apr. 16, 2014), <http://www.worldwatch.org/jobs-renewable-energy-expand-turbulent-process-2> [https://perma.cc/UH2E-NHQM].

113. Kate Aronoff, *Making Green Jobs Good Jobs*, IN THESE TIMES (July 1, 2016), <http://inthesetimes.com/article/19199/making-green-jobs-good-jobs> [https://perma.cc/P98Q-NK3M].

114. Alexandra Bradbury, *How Do We ‘Change Everything’ without Pitting Workers against the Planet?*, LABOR NOTES (Sept. 8, 2015), <http://labornotes.org/>

proposals for protecting workers who are impacted by climate protection policy.¹¹⁵ These proposals include 70 percent wage replacement and 80 percent health benefit replacement for up to three years, as well as “bridge to retirement” funding for workers who are near retirement.¹¹⁶ A “just transition” program should also include re-training and education funds for workers who would like to shift to other sectors.

Robert Pollin, distinguished professor at UMass Amherst, has written extensively on the green economy. Pollin proposes a Just Transition framework that would cost roughly \$500 million per year.¹¹⁷ This framework is part of the \$50 billion annual public investment to transition the U.S. to a low-carbon economy.¹¹⁸ Pollin’s proposed plan includes wage and benefit insurance, retraining and relocation, and fully funded pensions for workers that are retiring.¹¹⁹ In addition to workers directly employed by the fossil fuel industry, workers that provide “support activities,” such as clerical jobs, cleaning services, transportation, etc., will also need to be transitioned away from being dependent on the fossil fuel industry.¹²⁰ These job functions can more easily be transitioned to supporting clean energy development but they may still require wage and benefit insurance, as well as retraining and relocation support.¹²¹

Just transition programs have successfully advanced at the state level. In the 2016 New York State legislative session, The Western NY Area Labor Federation, in partnership with the Clean Air Coalition, secured \$30 million in support for the Town of

blogs/2015/09/how-do-we-change-everything-without-pitting-workers-against-planet [<https://perma.cc/HCV3-AFB7>]. “Just transition,” was coined because if there can be a superfund for dirt, there can be a superfund for workers. *Id.*

115. See ELENA FOSHAY ET AL., APOLLO ALLIANCE & CORNELL UNIV. GLOBAL LAB. INST., MAKING THE TRANSITION: HELPING WORKERS AND COMMUNITIES RETOOL FOR THE CLEAN ENERGY ECONOMY (2009), http://www.climatechange.ca.gov/eaac/comments/2009-12-11_California_Labor_Federation_attachment_2.pdf [<https://perma.cc/W4A8-AY2S>].

116. *See id.* at 5.

117. Robert Pollin & Brian Callaci, *A Just Transition for U.S. Fossil Fuel Industry Workers*, AM. PROSPECT (July 6, 2016), <http://prospect.org/article/just-transition-us-fossil-fuel-industry-workers> [<https://perma.cc/PN5C-KNNY>].

118. *See id.*

119. *Id.*

120. *Id.*

121. *Id.*

Tanawanda to develop alternative economic development plans after the Huntley coal-fired power plant was shut down.¹²²

Just transition should also apply to the communities that are dependent upon fossil fuel plants and industries for their main economic opportunity. The California Public Utilities Commission (CPUC) generated a revenue stream from a closed power plant in order to assist a community that was negatively impacted from the closing of the plant.¹²³ The Mojave Generating Station in Nevada was operated by Southern California Edison and provided 30 percent of the neighboring Hopi nation's entire revenue and 10-13 percent of the neighboring Navajo General Fund.¹²⁴ Ninety-three percent of the jobs at the mine that provided coal to Mojave were held by Native Americans.¹²⁵ While necessary in the fight against climate change, closing Mojave and the coal mine were economically damaging to the Hopi and Navajo nations.¹²⁶ The CPUC found a way to create a revolving fund for renewable energy projects and helped transition away from fossil fuels in a manner that mitigated the negative economic consequences the transition could have caused to these communities.¹²⁷ Pollin's Just Transition framework also includes support for communities that are economically dependent on fossil fuels.¹²⁸

VII. LABOR LEADING ON CLIMATE: MOVING FROM RHETORIC TO REALITY

The push for a green economy or a climate jobs plan is not a new idea. However, there has been little success in moving from "rhetoric to reality," when it comes to transitioning to a low-carbon economy. Renewable energy development, building retrofits, public transit expansion and other aspects of a low-carbon economy remain relatively limited in scale. In turn, these projects are falling short of their potential for driving climate job creation and

122. A. 9008, 2015 Gen. Assemb., Reg. Sess. (N.Y. 2015).

123. Alan Remo & Deborah Behles, *Transitioning a Community Away from Fossil Fuel Generation to a Green Economy: An Approach Using State Utility Commission Authority*, 15 MINN. J.L. SCI. & TECH. 505, 506 (2014).

124. *Id.* at 509, 515.

125. *Id.* at 515.

126. *Id.*

127. *Id.* at 525-26

128. See Pollin & Callaci, *supra* note 117.

emissions reductions. While jobs in the renewable energy sector are rising, the prevalence of non-union jobs in the limited existing sectors, such as solar and residential retrofitting, have dampened enthusiasm for the “clean, green economy” among workers and the broader labor movement.

A. Development of Labor Leading on Climate

An initiative of the Worker Institute at Cornell University looked to overcome this skepticism and engage the labor movement in creating a pro-active climate jobs agenda. In the Spring of 2015, the Worker Institute launched a climate jobs initiative called, “Labor Leading on Climate.”¹²⁹ The goal of the initiative was to create a climate jobs initiative led by the labor movement that would present a proactive vision for transitioning to a low-carbon future.¹³⁰ The initiative focused on the sectors that would be most impacted by this transition, including the building trades, transit, and public sector unions.¹³¹

These unions were chosen because the building trades could see much of the job creation spurred on by the transition to a low-carbon economy as they do much of the work that is created by infrastructure upgrades and renewable energy build out.¹³² Within the building trades are unions that represent fossil fuel industry workers, and therefore job losses that would come from the transition away from fossil fuels will need to be offset. Transit expansion is fundamental to any transition to a low-carbon economy. Finally, grounding the climate jobs initiative in the public sector will ensure more opportunity for creating good, family-sustaining jobs, and provide an example for the private sector to follow.¹³³

129. The author was the primary researcher and co-organizer of the initiative. The observations are from her experience leading the initiative.

130. J. MIJIN CHA & LARA SKINNER, A CLIMATE JOBS PROGRAM FOR NEW YORK STATE: REVERSING INEQUALITY, COMBATTING CLIMATE CHANGE (2016), https://www.ilr.cornell.edu/sites/ilr.cornell.edu/files/NYSClimateJobsProgram-Reccommendations_0-1.pdf [<https://perma.cc/VML5-UTTQ>].

131. *Id.*

132. *Id.*

133. *See generally, id.*

Over the course of 18 months, a series of one-on-one meetings with key labor stakeholders and several group meetings generated a series of proposals to meaningfully reduce carbon dioxide emissions in the state and substantially reduce economic inequality in the state through family-sustaining job creation.¹³⁴ As a first stage, the initiative focused on the energy, building, and transportation sectors because these are the most carbon intensive sectors.¹³⁵ Follow up initiatives will look at other sectors, including food and agriculture, that also need to reduce carbon emissions and create good jobs.¹³⁶ This paper will focus only on the buildings and energy sector work, for brevity, and because the two sectors are closely linked.

B. Guiding Principles and Priorities

In addition, the Worker Institute effort focused on three main priorities: ambition, reversing economic inequality through creating high-quality jobs, and rooting work in the public sector.¹³⁷ To deliver meaningful job creation from low-carbon sectors, *climate protection policy must be sufficiently ambitious* to address the scale of the climate crisis and drive investment in low-carbon sectors. To date, climate policy at all levels has not been ambitious enough to significantly reduce emissions and create many jobs.

Equally important, those *jobs must be high quality*. To ensure that new climate jobs are high-road jobs that reverse economic inequality in New York State, strong job and training quality standards are needed. Depending on the funding mechanism for the job creation programs, appropriate standards include prevailing wage, state-approved apprenticeship job training requirements, project labor agreements, and best value contracting. Many of the industries that produce the highest levels of carbon dioxide – extraction of coal, oil, and natural gas and carbon intensive manufacturing – have higher rates of

134. *Id.*

135. *Id.*

136. *Id.* (The initial recommendations look specifically at the buildings, energy, and transport sector with a mention of other sectors. Through working on the project, food and agriculture were two sectors that were mentioned as a logical stage 2 of research and recommendation).

137. *See Id.*

unionization than the renewable energy sectors.¹³⁸ These unionized, family sustaining jobs help anchor the economies of communities throughout New York State and the U.S. Without smart and deliberate policies, the much-needed transition to a low-carbon economy could be used as an opportunity to eliminate existing, good union jobs.

Finally, the initiative felt that projects must be *for the public good*. The final principle of grounding the work in the public sector is based on the notion that reducing emissions through the development of solar and wind, building retrofits, and expansion of transit is a public good -- the well-being of all people depends on reducing emissions to avoid the worst impacts of climate change. Historically, private-sector, pro-market approaches to reducing emissions have been dominant. From a climate, job creation, and equity perspective, this approach has proven ineffective.¹³⁹ The fundamentals of an equitable approach to climate job creation require family-sustaining wages and equal access to renewable energy production for all communities, regardless of wealth. These considerations are not compatible with a market approach that looks to maximize private corporate profit. Under a pro-market approach, renewable energy production, for example, must be competitive with fossil fuel output.¹⁴⁰ However, this approach ignores the economic realities of scaling up renewable energy production and the need for renewable energy to be a public good that is available to all, and not just those that can afford solar panels.

The culmination of the first stage of *Labor Leading on Climate* was a set of recommended policy proposals that would maximize job creation and greenhouse gas emissions reductions in the buildings, energy, and transportation sectors.¹⁴¹ The preliminary recommendations were released in the Spring of 2016 and the full report was unofficially released in July 2016.¹⁴² Many of the proposals expand and build on existing policies, which makes

138. Jones & Zabin, *supra* note 112; Prugh, *supra* note 112.

139. Kylie Benton-Connell et al., *Power to the People: Toward Democratic Control of Energy Generation* 2, 3-7 (Cornell Univ. Worker Inst., Working Paper No. 4, 2015), <http://unionsforenergydemocracy.org/wp-content/uploads/2015/06/TUED-Power-to-the-Peoplefinal.pdf> [<https://perma.cc/CH4V-EFEP>].

140. *Id.* at 4.

141. See CHA & SKINNER, *supra* note 130.

142. See *id.*

adopting them an easier lift than new ideas that require more organizing and educating around the benefits. The specificity of the recommendations provides a guide for legislators when drafting the corresponding legislation.

VIII. LABOR LEADING ON CLIMATE POLICY RECOMMENDATIONS

A. Labor Leading on Climate Recommendation for the Building Sector in New York: Retrofit all public schools around the state to reach 100 percent of their energy efficiency potential by 2025

Retrofitting schools is an easy way to reduce energy use and create good, family-sustaining jobs. Schools are often hubs within communities and making them as energy-efficient as possible is good for students, families, and communities. Schools were seen as an “easy entry” into the retrofit discussion because they are universally supported and the potential for both carbon emissions reductions and job creation were great.¹⁴³ In addition, retrofitting public schools would base the work in the public sector, thereby ensuring more opportunity for the creation of good, family-sustaining jobs.

The New York Power Authority (NYPA) is already retrofitting schools. To date, NYPA has completed 641 total retrofit and solar projects in 1,286 primary and secondary schools, thereby installing 330 kW of solar capacity.¹⁴⁴ These projects have saved nearly \$37 million annually with a project cost of \$404 million.¹⁴⁵

However, the potential for energy savings is much greater than what has been accomplished to date and efforts must be drastically scaled up to meet carbon emissions and job creation goals. Energy use in public schools within the state of New York can be reduced by 500-1,200 giga-watt hours (GWh), which would remove 1.4 million metric tons of CO₂ and create between 12,800-

143. As discussed in an initial strategy meeting that was attended by the author.

144. N.Y. POWER AUTH., BEST PRACTICES FOR ENERGY COST SAVINGS IN NEW YORK STATE SCHOOLS 2, 6 (2013), http://www.nypa.gov/PDFs/NYPA_NEW_YORK_STATE%20Schools%20Report.pdf [<https://perma.cc/4G3S-C6Q3>].

145. *Id.* at 6.

18,400 jobs.¹⁴⁶ By NYPA's own calculations, an additional 500-1,200 GWh of additional energy efficiency savings could be realized through a large-scale school retrofit plan.¹⁴⁷

NYPA estimates that between 12,800-18,400 jobs will be created by pursuing 100 percent of the energy efficiency potential.¹⁴⁸ To meet these job creation targets, any cap on the number of public sector employees must be expanded or lifted to prevent energy efficiency and solar installation work from being sub-contracted. Using public employees will keep expertise and experience in these fields in-house and ensure a trained and ready workforce is able to complete future work more quickly and efficiently. In addition, a set number of new staff must be dedicated to energy efficiency work. The total cost for reaching the total projected energy efficiency potential would be between \$794 million.¹⁴⁹ In addition to the thousands of jobs created, this level of investment would remove 1.4 million metric tons of CO₂ annually, the equivalent of removing 300,000 cars from the road and reaching the amount of CO₂ emissions reductions needed for the entire commercial sector.¹⁵⁰

Addressing the climate crisis and reducing emissions and pollution is a common good and necessary for the health and well-being of all New Yorkers. Therefore, NYPA is the ideal entity to pay for and carry out this retrofit and solar installation work because this work should be done through the public sector, with citizen oversight and direction, so the assets of energy efficiency and solar generation can be held collectively, not privately. NYPA also has the ability to raise its own funds by issuing low-interest bonds.

B. Labor Leading on Climate Recommendation for the Building Sector in New York: Reduce energy use in all public buildings by 40 percent by 2025

To reach New York State's carbon emissions reduction target, all buildings, public and private, must be retrofit within a short

146. *Id.* at 2, 17.

147. *Id.* at 3.

148. *Id.* at 17.

149. *Id.* at 16.

150. *Id.* at 3.

time period. Governor Cuomo's Executive Order 88 calls for a 20 percent improvement in energy efficiency in all State Executive government buildings by 2020.¹⁵¹ The second recommendation from *Labor Leading on Climate* doubles the Governor's target and aims to achieve a 40 percent reduction in energy use by 2020 in all public K-12 schools.¹⁵²

Currently, the Build Smart NY program requires public buildings to reduce their energy use by 20 percent below 2011 levels by 2020.¹⁵³ The cost of the retrofits will depend on building type and can be based off the state's comprehensive energy audit. Ultimately, the retrofits will be a cost savings measure as they decrease the state's electricity costs. The state spends \$500 million annually on electricity costs.¹⁵⁴ A 40 percent reduction would save the state \$200 million annually. State-owned buildings consume 3,000 GWh per year, which should be reduced by 1,200 GWh by 2020.¹⁵⁵

In one fiscal year, the state reduced its energy use-intensity by 4.7 percent, which saved \$50-\$60 million and cut 130-180 thousand tons of greenhouse gas emissions.¹⁵⁶ By accelerating the rate of energy reduction, the state can easily reduce overall energy use in public buildings by 40 percent below 2011 levels by 2020. In addition, the state would save hundreds of millions of dollars in energy costs, create over 12,000 jobs, and reduce the level of greenhouse gas emissions by over 16 million tons.¹⁵⁷

151. BUILDSMART NY BASELINE ENERGY PERFORMANCE, *supra* note 35, at 1.

152. CHA & SKINNER, *supra* note 130, at 3.

153. *Governor Cuomo Launches "Build Smart NY" Initiative with Executive Order*, N.Y. STATE (Dec. 28, 2012), <https://www.governor.ny.gov/news/governor-cuomo-launches-build-smart-ny-initiative-executive-order> [https://perma.cc/7AM-B-3SE7].

154. *See id.*

155. *About*, BUILDSMART NY, <http://www.buildsmart.ny.gov/about> [https://perma.cc/QL6U-EPKC].

156. BUILDSMART NY ANNUAL PROGRESS REPORT 2013, *supra* note 42, intro. note.

157. A 20 percent reduction is estimated to create 6,400 job and reduce greenhouse gas emissions by 8.1 million tons. *Id.* at 13. A 40 percent reduction is estimated to double those numbers. *Id.*

C. Labor Leading on Climate Recommendation for the Building Sector in New York: Streamline and expand access to residential retrofit programs

Retrofitting just half of New York City's small homes would save homeowners \$255 million annually and create 1,500 jobs.¹⁵⁸ However, the complexity of residential retrofits prevents wide-scale adoption of retrofit programs and measures. Programs like the Pratt Center's Retrofit Standardization Initiative bundle efficiency work and provide a simple package of five energy efficiency measures that can be implemented in hundreds of thousands of similar small homes.¹⁵⁹ Such packages minimize cost, time, and complications, achieving the scale of emissions reductions necessary to address the climate crisis.¹⁶⁰

For New York City, the starter retrofit packages were estimated to cost on average \$3,312, and generate a 14 percent annual utility savings.¹⁶¹ The *Labor Leading on Climate* initiative proposed a similar package, which should be adopted for homes in upstate New York to achieve statewide residential retrofits. The housing stock in upstate New York is different from that of New York City, therefore cost estimates will have to be adjusted accordingly.

D. Labor Leading on Climate Recommendation for the Energy Sector in New York: Install 3 GW of solar energy on 100 million square feet of public school rooftops by 2025 through the New York Power Authority, the public power utility

The New York Power Authority (NYPA) is already undertaking solar production, but, to date, NYPA has installed

158. *Retrofit Standardization Initiative*, PRATT CENTER FOR COMMUNITY DEV., <http://prattcenter.net/projects/energy-efficiency/retrofit-standardization-initiative> [<https://perma.cc/FXC8-QXWW>].

159. *Id.*

160. *Id.*

161. PRATT CENTER FOR COMMUNITY DEV., RETROFIT STANDARDIZATION INTERIM REPORT: A PROMISING NEW APPROACH TO EXPANDING RESIDENTIAL ENERGY EFFICIENCY 2 (2014), <http://prattcenter.net/sites/default/files/standardmeasures/interimreportcompressed.pdf> [<https://perma.cc/NCX3-F6XE>].

only 4.1 MW of solar.¹⁶² Significantly expanding programs like the K-Solar program, which creates a purchasing pool and uses the large scale of work to increase cost efficiency, would save school districts money and reduce greenhouse gas emissions.¹⁶³

NYPA estimates the solar production potential from solar installations on the top of schools could exceed 3 GW, over 30 times the current cumulative solar production in the state.¹⁶⁴ These school rooftop installations will produce enough energy to meet a quarter of New York State's energy needs. Assuming 14 jobs are created for every \$1 million spent on solar energy installation,¹⁶⁵ at least 72,100 jobs would be created, with the potential for over 200,000 additional in ten years.

Any additional electricity generated through NYPA's installations could be sold to utilities across the state. NYPA, or the appropriate oversight agency, must also ensure that the solar installation work is done by public employees for proper oversight and accountability.

Energy from solar installed and operated by the public sector can be provided more cheaply and reliably than private utilities because public utilities can run at cost, opening up space to provide electricity service with community members' and workers' interests and needs in mind.¹⁶⁶ A public sector approach to this work also opens up the opportunity to pay for this important work through low-interest, general obligation bonds.

162. *NYPA and Solar Power*, N.Y. POWER AUTH., <http://www.nypa.gov/solar/solarprojects.htm> [<https://perma.cc/68WX-UTU7>].

163. *About K-Solar*, N.Y. POWER AUTH., http://www.nypa.gov/k-solar/About_K-Solar.html [<https://perma.cc/G5AK-FTSB>].

164. New York generated approximately 927 MW of solar cumulatively. *Top 10 Solar States*, *supra* note 65.

165. Shahan, *supra* note 87.

166. DAVID HALL ET AL, PUB. SERVS. INT'L RES. UNIT, ENERGY LIBERALIZATION, PRIVATIZATION AND PUBLIC OWNERSHIP 2-5 (2013), http://www.world-psi.org/sites/default/files/en_psiru_ppp_final_lux.pdf [<https://perma.cc/FRE8-RX39>].

E. Labor Leading on Climate Recommendation for the Energy Sector in New York: Install an additional 1GW of solar projects through the New York Power Authority

To move closer to 100 percent renewable energy, NYPA should install 1 GW of solar energy in addition to the solar energy generated on top of public schools within ten years for a total of 4.1 GW, which is roughly one quarter of all electricity demand in the state.¹⁶⁷ In addition to on-site building solar installations, New York State will need utility-scale solar arrays or solar thermal plants to meet the state's energy needs. NYPA can install large solar arrays or build large solar thermal plants throughout the state. The cost of utility-scale solar installations has fallen by 50 percent.¹⁶⁸ An estimated 24,000-67,000 jobs could be created.¹⁶⁹

F. Labor Leading on Climate Recommendation for the Energy Sector in New York: Install 7.5 GW of Offshore Wind by 2050 through the New York Power Authority

The Atlantic Ocean off the coast of New York State has the potential to support up to 39 GW of clean, wind-driven energy.¹⁷⁰ The Long Island offshore wind project could generate 700 MW at a cost of \$821 million and prevent 1.08 million tons of CO₂ from being released annually.¹⁷¹ The 700 MW project is estimated to create

167. New York State retail electricity demand in 2012 was 143,163 GwH (16.34 GW assuming 1 MW= 8.76 GWh). *New York Electricity Profile 2012*, U.S. ENERGY INFO. ADMIN. (May 1, 2014), <https://www.eia.gov/electricity/state/archive/2012/newyork> [<https://perma.cc/NEK4-LUE7>].

168. MARK BOLINGER & JOACHIM SEEL, LAWRENCE BERKELEY NAT'L LAB., UTILITY-SCALE SOLAR 2014: AN EMPIRICAL ANALYSIS OF PROJECT COST, PERFORMANCE, AND PRICING TRENDS IN THE UNITED STATES i (2015), <https://emp.lbl.gov/sites/all/files/lbnl-1000917.pdf> [<https://perma.cc/X4TZ-DB2U>].

169. Based on the assumption that 3GW creates between 72,000 and 200,000 jobs, as stated in the previous recommendation, 1GW of electricity produced is estimated to create 24,000- 67,000 jobs. *See also* Shaham, *supra* note 87 (for the calculation of 14 jobs created per \$1 million spent on solar energy installation).

170. NYSERDA, BLUEPRINT FOR THE NEW YORK STATE OFFSHORE WIND MASTER PLAN 4, <https://www.nyserda.ny.gov/-/media/Files/Publications/Research/Biomass-Solar-Wind/New-York-State-Offshore-Wind-Blueprint.pdf> [<https://perma.cc/2WSH-XKBB>].

171. 350MW of offshore wind generated is estimated to prevent 540,000 tons CO₂ equivalent. *See Frequently Asked Questions, LONG ISLAND – N.Y.C. OFFSHORE WIND PROJECT*, <http://www.linycoffshorewind.com/faq.html> [<https://perma.cc/F2>

17,000 job-years (a job-year equals one year of one job), and \$1 billion in wages.¹⁷² A ten-fold increase in offshore wind generated would result in 7 GW of electricity, nearly half of New York State's annual electricity demand, and result in the creation of 170,000 job-years and \$10 billion in wages.

With the addition of the 25 percent of additional solar generated from NYPA, the existing 20 percent of renewable energy currently being generated, and 7.5 GW of offshore wind, New York State would be almost completely powered by renewable energy by 2050. Onshore wind production and residential solar installation could provide the remaining 1.3 GW needed for a 100 percent clean energy-fueled economy.

G. Labor Leading on Climate Recommendation for Just Transition: New York State “Just Transition” Task Force

In building a strong, fair economy based on clean energy, New York State should give special attention to workers and communities negatively impacted by the transition away from high-carbon industries and sectors. Thousands of workers are currently employed in these sectors in high-paying jobs that support their families and communities. The development of new low-carbon economic sectors also provides an opportunity to link low-income communities to good jobs and address historic, long-term economic inequities in the investment and development patterns of New York State. In building a new, just green economy, both the needs of workers currently employed in high-carbon sectors and the needs of communities who have been excluded from jobs and prosperity for decades should be considered.

A Climate Jobs program for New York State that includes the establishment of a “Just Transition” Task Force could ensure a fair and equitable transition to a new, clean energy economy. Support for impacted workers and communities can include wage and health benefit replacements, “bridge to retirement” funding for

K5-B3UB]. Therefore, 700 MW is estimated to prevent 1.6 million tons CO₂ equivalent.

172. N.Y. ENERGY POL'Y INST., OFFSHORE WIND ENERGY AND POTENTIAL ECONOMIC IMPACTS IN LONG ISLAND 2 (2014), <http://www.aertc.org/docs/SBU%20OSW%20Eco%20Dev%20Final%2011-25.pdf> [https://perma.cc/BY4E-5NQC].

workers near retirement age, re-training and education support for workers who would like to shift to other sectors, and alternative economic development support for communities. This Task Force can also examine the job and training quality standards that are necessary to ensure jobs in the new, low-carbon economy are good, high-road jobs that help address growing inequality, rather than exacerbate it. These standards include prevailing wage, state-approved apprenticeship job training requirements, project labor agreements, best value contracting, and targeted local hire programs.

A number of studies have shown that more jobs are being created in low-carbon sectors than in high-carbon sectors and employment in renewable energy sectors will surpass employment in the fossil fuel industry in absolute numbers.¹⁷³ Building energy efficiency, renewable power generation, and public transportation are all more labor-intensive than capital-intensive sectors such as oil, coal, and gas. Moreover, major improvements need to be made to New York State's electricity, gas, and water infrastructure to stop leaks and improve efficiencies. These infrastructure upgrades are another source of many good jobs.

However, climate policy could be implemented in a way that union jobs are replaced by lower-wage, non-union jobs. Businesses could move to regions with weaker climate protection policy. Polluting industries could be concentrated in low-income

173. See e.g., INT'L RENEWABLE ENERGY AGENCY, RENEWABLE ENERGY AND JOBS, ANNUAL REVIEW 2016, at 5 http://www.irena.org/DocumentDownloads/Publications/IRENA_RE_Jobs_Annual_Review_2016.pdf [<https://perma.cc/5S6Z-CQRV>]. Employment in renewable energy sectors reached 769,000 jobs in 2015. *Id.* This employment growth can be contrasted with Bureau of Labor Statistics employment numbers for the gas and oil industry, which demonstrated a peak of 198,700 jobs in January 2015 for oil and gas extraction, and 206,100 jobs in non-oil and gas mining, for a total of 404,800 jobs. *All Employees, Thousands, Oil and Gas Extraction, Seasonally Adjusted*, BUREAU OF LAB. STATS. (Feb. 28, 2017), https://data.bls.gov/timeseries/CES1021100001?amp%253bdata_tool=XGtable&o_utput_view=data&include_graphs [<https://perma.cc/2978-VRFR>]. The numbers for the oil and gas industry are for extraction only. Some oil and gas industry-backed employment estimates include gas station employees as part of their overall employment estimates, which increases employment to 1.9 million. Mari Hernandez, *Big Oil, Small Jobs: A Look at the Oil Industry's Dubious Job Claims*, CTR. FOR AM. PROGRESS (Jan. 22, 2014), <https://www.americanprogress.org/issues/green/news/2014/01/22/82571/big-oil-small-jobs-a-look-at-the-oil-industrys-dubious-job-claims/> [<https://perma.cc/GS8Y-6U6H>].

neighborhoods. And, higher energy costs could disproportionately impact low-income families.

A Just Transition Task Force is key to ensuring the new low-carbon economy is equitable. With a coordinated, state-wide approach, the Task Force can identify and provide the support workers and communities need in this transition. The Task Force can also build in mechanisms that ensure the clean energy transition helps to reverse inequality in the state by creating good, high-road jobs.

IX. ANALYSIS

The Worker Institute initiative was not the first to attempt a pro-active climate, or green, jobs agenda. In 2009, a similar process was undertaken on the city level in New York City with measured success.¹⁷⁴ The *Green Collar Jobs Roadmap* brought together over 170 stakeholders to provide a proactive green collar economic vision for the city.¹⁷⁵ The *Roadmap* was the culmination of the *Green Collar Jobs Roundtable*, which was a collaborative process over 1.5 years that resulted in the recommendations in the *Roadmap*.¹⁷⁶ However, several years on, the *Roadmap* recommendations have not been adopted.

In addition, green jobs were one of the sectors that received support in the aftermath of the Great Recession.¹⁷⁷ However, the job creation and success of climate initiatives fell short of expectations for many reasons, including the politicization of green jobs and the green economy, generally, in the months after the

174. J. MIJIN CHA & JACK DAFOE, CTR. FOR AM. PROGRESS, NEW YORK CITY GREEN COLLAR JOBS ROADMAP (2009), https://cdn.americanprogress.org/wp-content/uploads/issues/2009/10/pdf/ny_green_jobs_execsum.pdf [https://perma.cc/P22N-C9XR].

175. See *id.* at 1.

176. GREEN COLLAR JOBS ROUNDTABLE, BRIEFING PACKET (2008), http://www.alignny.org/wp-content/uploads/2011/04/GCJ_RoundtableBriefingPacket.pdf [https://perma.cc/36JK-ZBUN].

177. Brad Plumer, *A Closer Look at Obama's "90 Billion for Green Jobs,"* WASH. POST (Oct. 4, 2012), <https://www.washingtonpost.com/news/wonk/wp/2012/10/04/a-closer-look-at-obamas-90-billion-for-clean-energy> [https://perma.cc/2NCR-G9H2].

Great Recession.¹⁷⁸ There is a risk that the Worker Institute initiative will also fail. However, there are several factors that distinguish the Worker Institute initiative from previous efforts.

One, while climate change has been a threat for years, it acutely manifested the potential danger in New York state in 2011 and 2012. The destructive impact of successive hurricanes, Hurricane Irene in 2011 and Hurricane Sandy in 2012, cannot be overstated. New York state is not a hurricane prone area and the damage done by the superstorms was substantial. New York state estimates that the cost of rebuilding and replacing the damage caused by Sandy will be \$41.9 billion.¹⁷⁹ These extreme weather events brought the reality of what a climate changed induced future could be. Climate change went from being a polarized issue to one that saw broad support, as was evidenced by the record-breaking People's Climate march that had an estimated 400,000 participants, including several unions.¹⁸⁰

Moreover, politically, the tide in New York is turning toward being more receptive to climate change proposals. In October 2015, Governor Andrew Cuomo announced major climate change commitments, including a pledge to reduce greenhouse gas emissions by 80 percent by 2050, a commitment to bring solar to 150,000 homes and businesses, and installing renewable energy at every State University of New York campus by 2020.¹⁸¹ While these are ambitious climate goals, it is important to note that there is no commitment to job quality under these goals.

In addition to the Governor's actions, in June 2016, the New York state Assembly passed a bill to reduce carbon emissions to

178. Mijin Cha, *New York to the Nation: Here's How to Create Green Jobs*, MIC (July 26, 2013), <https://mic.com/articles/56645/new-york-to-the-nation-here-s-how-to-create-green-jobs#.tYoCdEPg3> [<https://perma.cc/F7BM-WY4Q>].

179. OFFICE OF THE CHIEF ECONOMIST, U.S. DEPT OF COMMERCE, *ECONOMIC IMPACT OF HURRICANE SANDY: POTENTIAL ECONOMIC ACTIVITY LOST AND GAINED IN NEW JERSEY AND NEW YORK* vii (2013), <http://www.esa.gov/sites/default/files/sandyfinal101713.pdf> [<https://perma.cc/NC57-U7MG>].

180. 2014 PEOPLE'S CLIMATE MARCH, <http://2014.peoplesclimate.org/wrap-up> [<https://perma.cc/K3HB-KUFM>].

181. *Governor Cuomo, Joined By Vice President Gore, Announces New Actions to Reduce Greenhouse Gas Emissions and Lead Nation on Climate Change* (Oct. 8, 2015), N.Y. ST., <https://www.governor.ny.gov/news/governor-cuomo-joined-vice-president-gore-announces-new-actions-reduce-greenhouse-gas-emissions> [<https://perma.cc/7D9U-4HRX>].

zero by 2050.¹⁸² The New York State Climate and Communities Protection Act also had a strong emphasis on environmental justice and creating good, family sustaining jobs.¹⁸³ While the bill did not make headway in the Senate, the ambition of the bill and its ability to pass the Assembly is notable. A broad coalition that includes labor, environmental justice, community, and traditional environmental groups called NY Renews was a driving force behind the Climate and Communities Protection Act.¹⁸⁴ With more than 40 organization in the coalition, NY Renews has the potential to amass the power needed to push legislators to adopt a comprehensive climate agenda that addresses both the climate crisis and the inequality crises.

X. CONCLUSION

The uncertainty that faces climate change efforts in the wake of the 2016 presidential elections will force advocates to turn to state and local leaders to take action in the absence of federal leadership. If there is little to no action on climate proposals on the federal level or a concerted effort to repeal and roll back existing climate protections, state action will become even more important and the Worker Institute initiative could provide a proactive vision that would put New York state as a nationwide leader in fighting climate change and rising inequality.

Taken together, there is substantial momentum in the state to adopt a bold, comprehensive climate action plan. However, any climate plan must also include strong protections for workers and communities. The two climate crises and the inequality crises have the same underlying root causes and any attempt to address one and not the other will not be successful.

182. Zahra Hirji, *New York Assembly Approves Climate Bill That Would Cut Emissions to Zero*, INSIDECLIMATE NEWS, <https://insideclimateneWS.org/news/01062016/new-york-climate-change-legislation-zero-emissions-2050> [https://perma.cc/7TFT-W7PV] (last updated June 2, 2016).

183. New York State Climate and Community Protection Act, A. 10342, 2016 Gen. Assemb., Reg. Sess. (N.Y. 2016) (as delivered to Senate, June 1, 2016). As of publication, this bill has not yet been signed into law. *Assembly Bill A10342*, N.Y. ST. SENATE, <https://www.nysenate.gov/legislation/bills/2015/A10342> [https://perma.cc/PQ4D-D4TK].

184. *Our Policies*, N.Y. RENEWS, <https://www.nyrenews.org/what-we-do> [https://perma.cc/Y87Z-5PMB].