Renewable Energy: Transition & Training

SPRING 2024

URBAN STUDIES 371W, 373W and Labor Studies 265W

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Renewable Energy: Transition & Training

The transition from fossil fuels to renewable energy is an imperative change for the future of energy and climate change, but it is also a great economic investment. In order to create an easy transition, the renewable energy industry requires skilled workers and pillars to support a transition for a better future. The current fossil fuel industry has plenty of readily available workers, but they must be trained in new skills, on how to work with hydro energy, which will take over the plant, as well as wind power.

Union Jobs at Big Allis, where will they go?

When we think of fossil fuel industry jobs, we think of the workers at the oil plants in the middle of the ocean, foreign workers out in the Middle East, or guys out of West Virginia coal mines rooting for the Republican party—anything but our next-door neighbors. We don’t associate Fossil fuel industries and their sub-industry with our fellow residents or people we might associate with daily right here in New York City.

In our pursuit of a 'just transition,' a concept that emphasizes the need for a fair and equitable shift from fossil fuel to green energy jobs, we must acknowledge and address not only the current oil industry jobs but also workers in their subsectors. How will those individuals transition into green industry jobs, or is there a slight possibility that they will not have a place in the green industry? If so, what will happen to them? This concept of 'just transition' is crucial in ensuring that no worker is left behind during this shift, and it underscores the importance of community involvement in this process.

As we delved into this topic, my research group and I were initially under the impression that there would be no room for these workers to easily transition to Green Jobs, like solar or

hydro. However, we have learned that the opposite is happening. Some sub sectors might be affected and will feel an impact, so as a community, we must play a crucial role in supporting them through this transition.

At a recent community meeting at Queensbridge Housing Community Center, we had the opportunity to meet with some people from LaGuardia Community College as a class. A representative from the Queens County Office, although we did not meet a representative from Local Union 1-2, which is the union that represents all the employees at Big Allis, did meet a representative from the SteamFitters Local Union 638. Their insight was very informative, and we will go into those details shortly.

According to their website, the Steamfitters Union 638 has 10,000 active and retired union members. Local Union 1-2, which is a utility worker union, has 7,500 members, according to a nonprofit website.. Also, a quick fact from the US Borough of Labor Statistics is that New York has one of the highest union membership rates in all 50 states; 20% of all industries, or 1.7 million people, are union members; also, by capital, they have the highest numbers of female employees.

In the following few pages, we will delve into the transition process for workers at Plant Ravenswood in Long Island City. We will explore whether they will have a place to call work, be absorbed by the industry, or merge and continue with their lives. In my optimistic mind, they will have some regrets about not transitioning earlier. This detailed analysis will provide a clearer picture of the potential challenges and opportunities that workers at Big Allis may encounter during their transition to green energy jobs

Big Allis

At its prime, it was a marvel of electrical engineering, built by Allis Charmer. In 1963, Allis-Chalmers announced that ConEdison had ordered the "world's first MILLION-KILOWATT unit, meant to serve 3,000,000 people. As written in many articles then, " The sheer scale helped the plant become popularly known as "Big Allis," and of course due to Allis-Chalmers' role in construction.

Big Allis has experienced turmoil throughout its lifespan. Back in the 1970s, blackouts were so common that the media started tracking its efficiency, and it was found that Ellis would fully work one out of five days. I mention this article because Big Allis has been just like any of us. She has experienced birth, growth, obstacles, and changes, is currently aging, and is about to receive a makeover. As per an article from the Brownstoner, Big Allis has experienced a few changes. The first significant change was when Con Edison was forced to sell the Plant in 1999 to Keyspan Energy, later acquired by National Grid, which sold it to Trans Canada in 2008. Both steam and electrical generators are powered mainly by natural gas, but they also use small amounts of fuel oil and kerosene. Its iconic red and white stacks are nearly always visible from Astoria and Sunnyside, as well as Roosevelt Island and Midtown Manhattan.

The Jobs

As of March 2023, when we visited the Plant, we were informed that 120 plus people work there, and it takes this many people to operate the plane 24/7. While we were there, we saw a few guys working at a particular turbine, and we did see a training class in session with a few guys attending the class. Everybody in the Plant currently works for Rise, Light, and Power and is a member of local Union 1-2.

We have not had a chance to talk to any of the union's representatives. However, they are very transparent with their message and way forward in the “Just Transition” plans. Their website is very forthcoming for any visitor who takes the time to explore the site. On the site, the union said this is not their first rodeo. They kindly explained that this is not the first time they have changed due to new technological innovations. At one time, they had up to 400 employees, just a decade ago, and currently, they have about 120 Employees, as mentioned before.

The Union message warmly welcomes the transition project. It is excited about the change and the opportunity to continue working with the Plant and providing the workforce with the energy to keep it running.

At a local community meeting, as a class, we had the opportunity to meet local stakeholders, a representative from LaGuardia Community College, and a representative from the Steamfitters Union, the Local Union 638.

I want to disclaim that my grandmother lived right next to the Plant, my parents lived two blocks away from the Plant, and I lived a few years in the Community as well. So, regarding this topic, I entered with a slight sense of disbelief and a pessimistic attitude, but later in the paper, my classmates will talk about the training programs in the community and what that looks like as of today.

As I mentioned in the beginning, we must address the jobs the industry will affect, but we must also mention the jobs affected by sub-sectors. Talking to the steamfitter representative was very interesting, as we asked him questions regarding the transition; he was very skeptical and, to be honest, misinformed and not aware that big Allis was going to transition from fossil fuel to green energy; however, on his defense, he failed to tell us, that there is currently a mandate for

all new buildings, regardless that if they are all electric or not, they must gas lines passing through their property.

Local Law 152 mandates these gas lines as part of the construction plan. Under this law, buildings must maintain gas pipelines in service and receive an inspection to determine whether the gas lines are used.

When talking to the steamfitter Union representative, this was something in the back of his mind when I asked him directly, if we go 100%, will they have a job? At first, he said, no, we won't, and then he expressed that transition would not happen, and he went on and expressed his thoughts on the matter, and within a few words, he was all about "Drill, baby, drill" type stance.

Without getting into the politics of Gas Union Jobs, it will be a while before some sectors feel a direct impact due to "just transition." In their defense, it is best to have an alternative to Solar, Wind, or Hydro in case all fails, but unfortunately, setting a gas line within the foundation of a building, it costs millions. However, as of right now, due to Local Law 152, it's mandatory; in summary, the guys from Local Union 638 are quite sure that, for the time being, they have job security.

As for the union guys at 1-2, all the stakeholders are keeping in mind that they already have a plan in place for them. The windmill company, Attentive Energy One (AE1), has ensured they will retain, retrain, and upskill Ravenswood's plant workers, as per an article from Elektrek.com, which is posted on the Rise and Light website. **4.

Also, in the same article, the President of the Union 1-2 expressed the following:

James Shillitto, president of UWUA Local 1-2, said in an interview:

“We are very confident that working with Rise, Total, and Attentive, we will come out the right way.”

“None of us are climate deniers, and we know things must change.”

Reading from the Union President is very comforting, as this is happening as we speak. We have yet to see if companies like AE1 and Rise and Light will keep their word, keep the current workforce, and add workers to their rosters.

My conception has changed, as I have witnessed. Several stakeholders are ensuring that the community is involved, that jobs are being advertised in the local community college, that flyers about future job fairs are placed, and that, above all, the Unions are doing their part to train and prepare for the future.

To answer the original question, where are the jobs going? Well, right now, nowhere. If anything, the jobs will hop on a ferry from Ravenswood renewable power station to the Windmills off the coast of New Jersey, so I would recommend that some of these guys get used to the sea.

Transitioning to Renewable Energy Through Vocational Programs

The transition from fossil fuels to renewable energy is imperative to the livelihood of this planet and climate change as a whole. As we continue to use fossil fuels in our industrial needs and daily life the world begins to show signs of immense strain against climate change. That is why it is a great opportunity to transition to a more renewable and sustainable energy source for

the betterment of all living things and our planet. However, this transition presents challenges to previous workers in the fossil fuel field and puts their livelihoods at risk. Change can be intimidating, especially to someone who has worked over 20+ years in that industry and with the added benefits they already receive it could feel threatening. These benefits are pay, contracts, and pensions that were already given to them. These jobs are specialized and come with competitive benefits many people don't receive at a non-specialized job. That is why this section will focus on the training of those workers to create an easy transition to renewable jobs through vocational programs and ensure their job and benefit security with immense support.

Assessment of Skills and Available Programs

The first step before creating or implementing vocational programs is to assess the skills of the current workforce in the fossil fuel industry. A benefit of transferring the previous workforce is the valuable skills the workers already possess. Assessing the workers' skills will give us better insight into what programs can be offered to cover what they may lack for the new job. Workers in fossil fuel typically carry skills such as operating machinery, equipment maintenance, and leadership roles which can be transferred easily. After assessing their skills, we can then put each worker into certain categories that will describe what skills can be learned or worked on. This will create a faster process and match the appropriate vocational program to the employee.

After assessing the transferable skills of workers, we can then offer and develop vocational programs to train any skills they may need. Many colleges, industries, and unions offer vocational programs that anyone can sign up for. The programs will have certain curriculums that are viable to the renewable energy workforce industry. Some curriculums may

include maintenance, installation of machinery, renewable energy courses, and the operations of said machines. Once the groups of workers are separated based on what they may need to work on we can assign these programs to each group, ensuring a faster and more efficient learning process. This gives an opportunity for those who have been working for years to keep their job security without the need to do repetitive or excessive training for a longer time. The next step is addressing what programs can be obtained and offered. As mentioned, many places offer these renewable vocational programs that anyone can access. A few good choices are the National Renewable Energy Laboratory (NREL), North America's Building Trades Unions (NABTU), and Northwest Renewable Energy Institute (NWREI). These are just some examples of companies and unions that offer vocational programs that can be as long as 8 months. NREL offers a variety of courses to improve and develop the renewable energy workforce and innovation. These programs can be offered to students, teachers, and workers that include great training. NABTU is a union that offers training as well and focuses on wind turbines and green construction. Finally, NWREI offers a 6-month program focusing on wind turbine education and hands-on learning. They will learn technical skills, servicing, repair, and other necessary skills to work in the wind energy industry. These programs are great examples of vocational programs that will both enhance and teach the new skills needed to conduct work in a renewable wind energy industry.

Vocational Training Program Length

Typically, every vocational program has a certain length for the program itself. Some programs can last up to 2 years depending on where you started and what you are looking for in training. However, with the data on the previous workers' assessed skills, it'll be easier to pair the appropriate program with the appropriate worker. The length of training can vary based on

the person's skill set. While one worker may be in the program for one year, another worker can be in a program for 4 months. Every skill is a valuable one that can be transferred into the new renewable field, and this can be applied in the programs as well to ensure a proper length of education. Programs tend to have their own format of courses given at a certain time, almost like phases. NWREI is a good example of vocational program training. NWREI has in total 6 phases that teach a specific course and test to give a completed certificate. Phase 1: Intro to wind and telecom, phase 2: hydraulics, phase 3: Electrical, phase 4: Electronics/Machine Controllers, phase 5: Mechanical, and phase 6: Rigging/ Torque & Tension. Every course gives hands-on experience to dedicate proper knowledge for each specific topic. Phase 1 includes testing that determines who may receive cards and certificates for skills such as CPR/First Aid, X-Collar/Cervical Splint certification, etc. NWREI shows a great foundation for wind turbine/telecom technicians with strong support in education and testing to ensure their students move on with a skill arsenal ready to be used.

Support Services

On top of training and credentials, a vocational program may also want to include a support service for their students. These services would provide services such as Financial Aid, scholarships, and grants to help support fees for the lessons and terms. Certain programs may be recognized by the Department of Education which will open the path for financial help like FAFSA. Pell Grants, Direct Loans, and other programs will be a great help to students on their path to renewable energy jobs. Many of the previous workers may not have the financial means

to take these programs, but these services will be beneficial to ensure their transition and job security. Career counseling will also help those who may want to pursue other means of career paths within the renewable energy industry. A support system is a strong pillar that upholds the transition and education of these workers.

Overall, vocational programs are a great stepping stone to creating a clear and smooth transition for workers on a fossil fuel job. First, we assess the current workforce skills one by one to give a proper assessment of skills. Second, we cultivate a variety of vocational programs that will fit the needs of improvement for workers. Third, workers are paired with the best-matched program to provide growth of their arsenal of skills and lack of. Fourth, enroll them in the programs and provide support systems that will help them financially to take the programs. And finally, certification and proof of graduation from the programs will ensure they are ready to work in the new renewable energy field/industry. These are the needed pillars to create a smooth transition of skills and workers so the new facility may flourish. The previous workforce needs to have a company that will help them every step of the way for a new change. Change is intimidating to many people, especially those with a routine that has lasted years. But these pillars will help them overcome the challenges presented. Vocational programs compared to regular training are a fast and easy solution to help smoothly transition the workforce to their new jobs. And it will help demystify the change and transition to renewable energy for a better and healthier future.

Costs and methods for training workers

The renewable energy industry has trained the workforce for meeting the demands of the renewable energy transition, but the implementation of the training programs, as well as the costs

and methods of training workers are complex economic circumstances will be discussed below. One particular circumstance is high road labor policies and practices on renewable energy costs, the decarbonization of pathways and the labor outcomes. The high road labor policies include domestic content share requirements, workforce development and training, gender and racial equity hiring requirements, unionization, prevailing wage standards, and local hiring requirements. In America, the U.S. energy system uses the decarbonize pathways by using utility-scale solar, land-based wind, and offshore wind energy to achieve the net-zero emissions goal by the mid 21st century. The high road labor policies would increase and concentrate wages. Wage heterogeneity refers to the differences across wages in different groups of people in American society. Wage heterogeneity is related to factors such as firm practices, industry differentiation, unionization rates, and occupation. Workers who are not represented by a union are generally compensated at a lower wage than unionized workers. Unionized workers' Wage premiums are associated with geography and occupation. Increasing labor productivity can potentially impact higher labor costs and the domestic manufacturing shares.

One way to fund the workforce job training programs is through Governor Kathy Hochul's Tuition Assistance Program (TAP) expansion. In April of 2024, Governor Hochul decided to expand TAP to workforce programs in the SUNY and CUNY colleges. This expansion provides funding to students who are seeking job training before returning to school. It would benefit them because through the job training programs, they helped the students get ready for jobs as well as earning college credits for schools. There are people who think that college is for everyone while providing those job training programs can help people get ready for real-world jobs in the future. TAP mainly targets low- and middle-income families who can work later to colleges' matriculate degree programs. The requirement for TAP is that the student

has to file the Free Application for Federal Student Aid (FAFSA) and TAP application every academic year that they want to receive financial aid. TAP is also available to non-degree students in SUNY campuses who want to get trained so they would qualify for the current workforce jobs.

New York State Energy Research and Development Authority (NYSERDA) is investing in renewable energy for disadvantaged communities, and clean energy job growth. NYSERDA's Building Operation & Maintenance Training Program gives funding to organizations who offer hands-on training for their facilities and maintenance teams. This program helps other organizations save energy and money while improving equipment and transitioning to advancing the building systems. Organizations can connect with a training partner that they choose to develop their unique training programs with small to no out-of-pocket costs. This program is designed in equipping building operations and maintenance workers with the skills they need to operate increasingly electrified, flexible, grid-, and energy-efficient building systems and diminishing the building's contribution to climate change. NYSERDA provided maximum funding of 90% with a cap of $500,000 per application when 75% or more of buildings with employed Operation & Maintenance workers are living in a Disadvantaged community. Additional maximum funding of $500,0000 is awarded to successful projects when funding is available to organizations. Training provider/facility employer's wages for their jobs, and training provider/facility for employee's wages during training programs, and equipment used exclusively for training purposes are eligible costs that the employers paid. Different training covers include Understanding Building Energy Scores, Heat Pumps, Lighting, HVAC (Heating, Ventilation, and Air Conditioning) Equipment Scheduling, Hot Water Heating, Steam Systems, Boilers, and Energy Management Systems. People who are eligible for funding are organized

labor associations, trade groups, business associations, training providers, property management companies, facility managers, and building owners.

The third funding source for renewable energy job training programs is from Utility Workers Union of America (UWUA). UWUA and the Power for America Training Fund have created the apprenticeship program to provide advanced training in skills required to find employment and advance training in skills needed to find jobs in the renewable energy sector, which includes battery storage, solar generation, and both onshore and offshore wind in Michigan. This apprenticeship program offers on-the-job experience, earns salary and benefits to members since the first day of the program. The members who complete this program are job-ready for the renewable energy industry and their skill sets in knowing how to move seamlessly between battery storage, solar, and wind facilities will help them in the future.

The fourth way to fund renewable energy job training programs is through promoting social networks, communication, and increasing investment size for renewable energy projects. Studies in Veronica De Crescenzo et al. article have shown that social networks in renewable energy projects promote fundraising because communication encourages people to participate in renewable energy projects. Studies found that communicating and promoting projects in terms of language used and social networks are relevant factors to strengthen the collective engagement in the renewable energy source fundraising process. Renewable energy projects presented are highly related to citizen engagement. Strong citizen engagement is determined from the use of social networks while limited social networks lead to less citizen engagement. Their studies showed that social networks are important in promoting project campaigns. Investment size can increase through funding energy efficiency and renewable projects are exploited to potentials of collective engagement. Veronica De Crescenzo's studies have also shown that the suitable

business models in funding energy efficiency and renewable projects are exploited to potentials of collective engagement. Citizen's engagement in renewable energy sources play a crucial role in the fundraising process. Energy entrepreneurs use crowdfunding and cooperative methods to promote investment in renewable energy projects.

Oil gas workers require trades apprenticeship credentials, certificates, or college diplomas to work in industries. Some jobs required workers to have a bachelor's degree in a relevant field to act as advanced technical workers, especially engineers, as well as supervisors. Apprenticeship programs required workers to work in the chosen field to work under the supervision of the certified professional where apprentices received payments for their work of their apprenticeship training. Attending colleges for oil gas workers can be costly and they get rewarded by finding their oil industry job. Positions in the oil and gas industry require either minimal training for a number of years of experience in a specialized field or general familiarity with skills, an apprenticeship/training program, a college education, or an undergraduate degree.

Tomorrow's Job Market

LaGuardia Community College's New Renewable Energy Program

An impactful way to drive the changing landscape of energy is to train college students and future employees on the transition to renewable energy sources. This creates an opportunity to reshape economies and job markets in New York City. Not only does the current workforce need to be retrained but equipping future workers with the necessary skills and knowledge to drive renewable energy and to prepare them for this new innovative technology. Partnering with local colleges can play an important role in training individuals for these emerging opportunities.

LaGuardia Community College recently partnered with Rise Light & Power as well as TotalEnergies to invest 16 million dollars in renewable energy training in Western Queens as a sector of it 1,400 MW offshore winds proposal the the New York State Energy Research and Development Authority (NYSERDA) LaGuardia Community College will serve as a Proposed Offshore Wind Training Hub. A $10 million specialized facility, combining classrooms and practical training areas, will be established at LAGCC. Additionally, $6 million in funding will be allocated to community-based organizations active in Western Queens' four NYCHA developments—Queensbridge, Ravenswood, Astoria, and Woodside—to identify, support, and guide candidates to the Training Hub. The announcement was jointly made on Monday, April 24, by Attentive Energy One, LAGCC leadership, and community leaders during a visit to LaGuardia's Long Island City campus, and our very own Professor Casta was in attendance as he played an integral role in the partnership. Community Colleges offer flexibility and affordability to students but mostly minority students.

A smooth transition to renewable energy involves retaining existing union workers and prioritizing employment programs for New Yorkers in environmental justice communities, especially NYCHA residents. Urban Upbound and Jacob A. Riis Neighborhood Settlement will be vital in this workforce pipeline, alongside Variety Boys & Girls Club of Queens, which received proposed funding in March 2023. Extra funding will support BioBus, a mobile science lab focusing on renewable energy, to offer STEM education to public schools and spark the interest of future scientists.

Moving toward renewable energy has various demands and an array of skilled workers, ranging from engineers and technicians to project managers and policy experts. To effectively

meet these demands, workforce training programs must be tailored to equip individuals with both technical expertise and the knowledge of the renewable energy systems.

LaGuardia Community College and other colleges will collaborate with industry experts like Rise Light & Power as well as TotalEnergies to develop comprehensive training programs that cover essential technical skills, such as solar panel installation, wind turbine maintenance, and energy storage systems management. Hands-on training facilities equipped with state-of-the-art equipment can provide students with practical experience, ensuring they are prepared to tackle real-world challenges in the renewable energy realm.

This new job market may also increase student enrollment due to the interest in the new wave of renewable energy. Students pursuing careers in engineering with an interest in the renewable energy field will be attracted to renewable energy programs. These programs can include outreach efforts, scholarships, and career development initiatives. The one main factor that LaGuardia Community College can offer is hands-on experience and practical training built into the curriculum due to this partnership.

Programs at LaGuardia Community College serving metropolitan neighborhoods will greatly impact individuals in minority communities for jobs in transitional energy. It is a crucial step towards achieving economic empowerment, reducing disparities, and promoting social equity and making the resources more accessible to these individuals. The shift to renewable energy offers potential for job growth and economic prosperity. Collaborating with colleges and universities, industry players can craft tailored training initiatives, empowering students with the expertise essential for success in renewable energy. Tackling obstacles like outdated programs

and limited awareness of career paths, we pave the way for a workforce primed to meet the demands of this transition, all while promoting fairness and inclusivity.

Through partnerships with local educational institutions like LaGuardia Community College, Rise Light & Power and TotalEnergies, we secure workforce training, ensuring individuals possess the knowledge to dive into the renewable energy industry.

Making the connection between colleges, college students and the renewable energy workforce is vital for shaping a sustainable future. By linking academia with the industry, we empower students to gain real-world experience, bridge the gap between theory and practice, in renewable energy technologies.

Transitioning into findings & Training of Renewable energy

In my findings on the Ravenswood power generating facility, a portion of the class gave an excellent tour. We saw how they would transform these turbines to renewable energy when the windmills are up and running in later years. We had a great tour guide/facilitator named Will Fisher. He was terrific; he answered all our questions, showed us various parts of the facility, and explained how the transition into renewable energy would be conducted. My main goal was to ask Mr. Fischer how long this training take because when I did my group proposal portion, I conducted a module stating that many modules have many different time lengths for one person to take 18 to 16 months compared to my module I stated 14 to 16 weeks which now I have a better understanding that it's an intensive training that each staff has to go through to understand the transition of renewable energy better. I know the training is supposed to be intensive due to changes in the aspect of helping the community and helping the climate, but also structural change when they update technology and convert the electrical and how "Will" describes how

they also are looking into thermal energy by how the thermal core temperature is steady they can use that to heat the water into converting into steam. How it is released but with the thermal energy converting into steam shows there are processes to it when heating the water, it takes two to three days for that water to become hot and release to the city or wherever the steam has to be released to heating homes water and etcetera. Although this process takes time, I will also explain it will be challenging to have some of the workers on board since the facility only holds 126 workers as of now, but what I found pretty interesting was there are many opportunities for interns and college students due to the fact it is a billion dollar industry they could work in that industry or in that area, so transitioning into renewable energy is a great cause and how the facility is going to convert into renewable energy is fascinating. In the article, there's a diverse way of transitioning to green jobs, or, in other words, transitioning to renewable energy. As Bowen states, rather than directly go into the transition of renewable energy, you must overcome the obstacle of rushing in to have a smooth transition by reimagining the aspect of renewable energy in a different view, but will Bowen also relate it to it's not an easy task to completely jump into something new and broad. "Suggesting that most re-training can happen on-the-job. Network analysis shows that the green economy offers a large potential for short-run growth if job transitions are strategic" (Bowen, 2018). In my part of the proposal, I explained the aspect of renewable energy, the transition into the training method, and how renewable energy can benefit the workforce and the people in their surrounding community. The article explains how green jobs are the new age transition in the green economy, but they can also be too high in transition costs and the economy's inflation. Also, upon my trip to Montreal, Canada, seeing how Canada has been renewed for years, not relying on no fossil fuel to run energy in Quebec, was fascinating. Find I visited the renewable energy facilities at the Control Center of Montreal,

seeing how it is run day by day and seeing a map of how many substations how many stations in the main station where they control their energy by distributing it to different sectors of NYC how New York City is still in the prehistoric fossil fuel energy era. Hydro Quebec was an amazing experience for them to work with the First Nation people, the native Indians, and by helping them due to the company using their land and coming to terms by working with them and providing them with finances to better help the economy in the future was a game changer to me. The most fascinating thing was speaking to the two gentlemen in the Hydro Quebec research facility. They explained how they build batteries with solar power and use fossil fuel energy but nuclei energy in places where hydro and windmill energy can't reach yet, as well as how they can decommission that facility due to it being nuclear energy. The Boralex company was also interested in seeing how they worked hands-on with the First Nation people and gave them training. in Europe, mostly the eastern part of Europe and parts of the United States. This made me see that companies in Canada or in different parts of the world rely on renewable energy, how the economy is failing with the climate crisis, and how the United States can benefit from renewable energy. However, their bureaucracy stops them from moving forward. We will know more energy. You have to go to different bureaus to get different permissions to get different permits, and it all is frustrating that sometimes they can have a setback on things that could be accomplished today instead of holding it off due to their beliefs on the matter and having a project and proposal be on a setback. While visiting Hydro Quebec, they have simulators of how if a situation was to occur with the energy, they would know how to proceed next, basically like a contingency plan, and run many simulations over and over until they have that one right simulation that they can program to if the natural occurrence what's to happen they have a backup and they also have the means to intervene if there was a power outage or an energy crisis.

It was very intriguing when they took us into the control room to see how they distribute power to different sectors, including New York. I also didn't know that Montreal serves energy to New York, and to see this in from New York, not a piggyback on the environmental use of how Canada would deal with hydropower electricity and windmill energy, baffles me. I am completely shocked that instead of New York being so arrogant, move forward to help the people in communities that are redlined with these environmental health issues.

History of a Just Transition

A Brief History and Recommendations

The term *Just Transition* is relatively new and has only recently entered modern policy discussions. The term itself traces back to at least the 1980s, when it was used by several trade unions to protect workers from new water and air pollution regulations (United Nations Development Programme). There are inherent parallels from the original instance of Just Transition to the modern day usage, particularly for the present transition for workers in the fossil fuel industries, to the green energy industry. Such parallels could also be used to create policy decisions at RISE Light and Power and Champlain Hudson Power Express; the focus of this course.

Just Transition in the context of domestic energy production could be considered a form of protectionism. Merriam-Webster defines *Protectionism* as “an advocate of government economic protection for domestic producers through restrictions on foreign competitors”. When considering the current climate goals of the US and New York, in conjunction with vested interests by the workforce currently in place at fossil-fuel power plants, it is easy to see the conflicting goals of each industry, as well as understanding why workforces in fossil fuels would

be inherently resistant to advancing the goals of green energy. Rationally, no one would want to advance the interests of an industry that could potentially place one out of a job.

But in order to fully appreciate the current goals of a just transition, one must understand just the transition's past and how it evolved into its current state.

Just Transition arose out of efforts by labor unions and environmental justice groups who saw the need to phase out the industries that were harming workers, community health, and the planet while also providing just pathways for workers to transition to other jobs (Fairchild and Weinrub 38). Grasping the dichotomy between labor and environmental groups is essential to understanding the history of just transition. Both factions' interests are at odds with one another. Labor groups within the fossil fuel industries inherently want to preserve their own jobs. This interest conflicts with environmental goals set out by interest groups and governments.

Replacing fossil fuels with green energy inevitably puts jobs within polluting industries at risk. Despite being placed within a troubling industry, fossil fuel jobs are often a bastion of union-sector employment that bring with it long sought after benefits such as pensions, excellent healthcare, collective bargaining, and worker protections. These are aspects of the blue-collar jobs that are an anomaly in the 21st century, with very few jobs that currently offer such benefits. Ergo, there is strong counteraction by those within the fossil fuel industries to preserve these jobs based solely on these benefits alone, even if individual workers may understand and agree with the implications that fossil fuels have on the environment.

It is imperative that just transition is understood as a fundamental constructive relationship between two competing interests. Eliminating emissions is a fundamental necessity for the environmental sects. But preserving the workforce at these emission-intensive industries is also a requirement for those on the other end of the fossil fuel debate. Considerable effort must

be made to advance the interests of both parties. This introduces the question: What efforts have been made in the past to achieve the interests of these competing sects? And how can modern efforts to achieve just transition learn from the past?

Finding concrete examples of just transition being implemented has proven to be a difficult task. Plenty has been published by governments of all levels, and prominent politicians promising to create a just transition. But seeking for such examples has proved inconclusive. But several prominent organizations have published recommendations on how to best achieve a just transition.

It is important to keep in consideration that when focusing on just transition policies within the context of renewable energy, that electricity is traded as a commodity, and as such, economic principles surrounding trade and labor policies apply in respects to renewable energy. And given historical examples that involved offshoring industries have often led to loss of domestic jobs and suppressing wages, it is imperative that policies are implemented to ease the economic burden that may be placed on those affected by the transition from fossil fuels to green energy, particularly in the case of projects such as the Champlain Hudson Power Express and Attentive Energy One.

Workers who have changed jobs as a result of their previous job having been offshored, have seen their wages decrease by 4 and 11 percent (International Labour Office 272). Similar losses have also been seen during the adoption of NAFTA. Mexican wages decreased dramatically as industries were fractured. Commodity trading must happen at the *right moment in time* and only for sectors that are ready (International Labour Office, 274-275). Given that the energy sector in New York State is a fully matured industry, concerns about the readiness of a transition can be alleviated. But what must still be considered is the policies that must be

implemented to provide a just transition for the workers directly employed in the energy industry to adequately transition into the new field.

The International Journal of Labour Research's *Just Transition for All* offers several points of consideration for transitioning. To briefly summarize their points:

1. Any transition from one form of production to another will result in employment effects that are dependent on the extent of the reforms and accompanying policies.
2. Negotiations have often been implemented away from democratic governance and trade union involvement. This has resulted in a lack of attention to the impacts on employment, and a lack of attention to accompanying policies that could make any transition smoother.
3. x`General lack of policy coherence where governmental departments do not or insufficiently interact with each other which leads to a lack of cohesive policy implementations.

(International Labour Office, 276)

These issues compounded together offer several items to consider for any organization endeavoring to create a just transition. Many governments have created press proposals for just transitions. The White House through their several cabinet departments have mentioned just transition at least in passing, but hardly any offer direct assistance to laborers. Most incentives are directed towards companies to transition but these incentives do not offer any direct assistance to blue-collar workers.

In addition, many states may also have their own initiatives for facilitating a just transition. But this inherently creates an issue where such initiatives are fractured, meaning that different states may have different qualifications for what satisfies a just transition. Some states

may have more rigorous standards for a just transition, and may offer guidance and incentives, while other states may do none of that.

For instance, the New York State Department of Labor has an office of Just Energy Transition, dedicated to connecting workers to opportunities for jobs and training. But this office does not directly transition workers currently working in the fossil fuel industry to a new job. Rather, it is more akin to a resource hub for those *seeking* a job.

The most effective form of transition would be *direct* assistance from the employing entity to the employees. This would eliminate confusion, and avoid employees from having to navigate external resources to find new employment in the new green industry.

"A just Transition for U.S. FOSSIL FUEL INDUSTRY WORKERS."

According to an estimate, the United Mine Workers of America Health and Retirement Funds will require an outlay of $1.8 billion from the federal government to reach full funding. Over a 20-year period, this equates to $90 million annually. If coal businesses are persuaded to help close their underfunding gap, the figure may be lowered. In contrast, the oil and gas firms still have the capacity to close their underfunding gaps. Therefore, regulatory actions should be used to close these gaps (Pollin and Callaci, 93).

Employers bear the whole cost of investing in and saving money for their employees' retirement under defined benefit pensions (DB) schemes, while some increasingly require employee contributions as well. Furthermore, the amount of a person's pension that they receive each month in retirement is decided by a complex formula that is typically dependent on their pay and years of service (Sahadi, 3-4).

Employers determine whether and how much to contribute to their employees' DC plans (such profit-sharing or 401(k) accounts) and typically place the onus of saving and investing on the employees. However, most businesses do provide matching contributions up to a predetermined proportion of an employee's pay. Those who participate in DC plans must then choose how to invest their retirement funds and establish an annual maximum withdrawal amount in order to avoid running out of money. They might also consider if it makes sense to use all or part of their money to purchase a costly annuity in order to receive a guaranteed monthly income (Sahadi, 3-4).

Using the Worker and Community Transition program as a model, which has been mostly effective, the highest possible amount of support would be approximately $200 million annually. In addition, direct investments in sustainable energy initiatives would be made in every part of the nation. Alternatively, if we apply the Financial Model from the less successful Defense Reinvestment and Conversion Initiative, that would mean spending approximately $12,000 for each worker who is displaced, or approximately $150 million annually. For these programs, $150 million to $200 million per year seems like an acceptable amount (Pollin and Callaci, 93).

After combining these three policy areas, we estimate that the overall expenses over a 20-year transition period will be roughly $600 million annually. This level of federal spending is easily absorbed into the larger, above-described $200 billion yearly U.S. renewable energy investment program, with approximately $50 billion in direct public spending going toward this program each year. We are proposing a Just Transition program that would cost around $600

million annually, or 1.2 percent of the $50 billion in total public spending that will be required to develop a clean energy economy in the United States (Pollin and Callaci, 93).

One possibility for these monies would be to come from the savings the federal government would get from investments to increase efficiency requirements by thirty percent in the majority of the buildings they lease or own, as required by the Energy Independence and Security Act of 2007. The federal government should save around $1.3 billion annually from these building efficiency investments—more than twice as much as would be required for the Just Transition program. In addition, it is feasible to earn roughly $200 billion annually by imposing a carbon price or cap to deter the use of fossil fuels. Thus, the overall expenses of the Just Transition program would equal around 0.3% of the potential revenue from a carbon price or cap (Pollin and Callaci, 93).

To put it briefly, a Just Transition for American workers in the fossil fuel business is incredibly cost-effective. It is also an imperative, both strategically and morally. Without solid commitments to generously support the workers and communities impacted by this change, it will be nearly impossible to proceed at the pace required for a clean energy transformation. To bring back his remarks, "Those who work with toxic materials on a daily basis... in order to provide the world with the energy and the materials it needs deserve a helping hand to make a new start in life" (Pollin and Callaci, 93).

Transitioning unions: what constitutes a just transition for Swedish trade unions?

The fact that the word "just transition" was included in the 2015 Paris Agreement showed how well the environmental and labor organizations worked together to design and promote it.

Many academics have determined that the phrase "just transition" refers to a political union intended to resolve an underlying tension between ecological constraints and economic growth. A progressive alliance between laborers and environmentalists could be formed if the problems surrounding the shift to a fossil-free society are resolved. The disagreement has also been referred to as the "jobs versus climate divide" (Gardebo, 1).

In order to preserve the status quo for their members, local union representatives in the industrial towns of Lysekil, Slite, and Lulea all view the climate "transition" as essentially a means to an end. "It's not a hot topic in the fika room," refers to the location of luncheons and coffee breaks, which double as a natural venue for employees to talk about their ordinary union politics. Talks about transition programs, on the other hand, tend to center around broader ideas such as "industry development," "reskilling" of labor, and "equipment improvements." It is only worthwhile to switch to carbon-captured cement, biofuels, or fossil-free steel if doing so increases the company's global competitiveness, which in turn makes improvements possible for the local workers in the form of continuing jobs or growing salaries (Gardebo, 6).

Second, local officials think that in order for transition policies to be considered "just," they must acknowledge and respect the historical contributions made by Swedes to current environmental laws. Representatives from the SSAB, for instance, assist in promoting Hybrid and disseminating information on steel recycling and decarbonization. Cementa has a long history of training international employees on how to produce cement in a more energy- and environmentally-efficient and clean manner. Preemraff was a pioneer in the development of lead-free fuels, impacted the reduction of sulfur in regulations, and is currently advocating for refineries that are more efficient. Referencing the Swedish industrial paradigm of being the best

—not the biggest—and hence driving competitors to become greener, a Preemraff spokesman states, "we are the real environmental movement" (Gardebo, 6).

Giving industries more sway over how Sweden interprets its national climate policy frameworks is one way to acknowledge the past and current environmental benefits made by the industry, according to municipal representatives from all three towns. An additional acknowledgement, which stands out in Lysekil's comments, is that the transition discussion should avoid using hard-edged binary oppositions. These days, media discourses present an older generation of mostly female urban activists against a newer generation of old, male industrial workers who are mainly concerned with their employment. In the fall of 2020, Preemraff and Lysekil became the epicenter of global climate demonstrations, culminating in the blockade of the refinery's harbor by Greenpeace's ship Rainbow Warrior. This underscored the critical nature of media discourses at that time (Gardebo, 6).

Thirdly, local leaders in all three places say that "time" is the main factor affecting the current climate shift. Retrenching personnel, renovating infrastructure, or even adjusting to new environmental laws could be made more difficult for Swedish industries if a sudden or hurried change occurs. Industries compete with one another for comparable resources when transition time frames are too rigid, as energy production and transmission must keep up with the fast rising energy needs. In light of this, none of the local delegates in Lysekil, Slite, or Lulea think that their respective businesses will have completely eliminated carbon emissions by 2045—the date on which the Swedish government has set for achieving this goal. As such, they believe it is unjust to discontinue domestic or local production in favor of utilizing inferior goods from overseas. Sweden has incurred "foreign climate debt" as a result of reducing its industrial

production and jobs in favor of importing those commodities. Reliance on such foreign climate debts doesn't benefit Swedish workers or the global industrial decarbonization, even though it might help re-elect "environmental populists," as one local representative put it, such as the Green Party (Gardebo, 6-7).

Just Transition in the Energy Sector's history relating to environmental justice and the importance of community engagement.

This section will address the interwoven value of environmental justice within developing just transition initiatives in NYC while reflecting upon the history of just transition.

In 2024, as climate change takes more drastic effects on daily lives globally it has become abundantly clear that a just transition is needed. However, just transition, while conceptualized in the 1970s and 1980s, is still considered a somewhat new and under-tested practice. Sifting through its limited history leaves a lot to still be addressed but a constant point that is highlighted is the importance of keeping justice front of mind as that is what the "just" in "just transition" refers to. At its core lies a steadfast commitment to justice, a principle that must remain forefront in the minds of all stakeholders involved in transitioning to renewable energy.

When addressing the importance of best achieving the idealized vision of a just renewable energy transition, it is crucial to address the social aspects of the transition. It is vital to acknowledge the historical context and ongoing challenges faced by marginalized communities in accessing clean energy and participating in the decision-making processes that impact their lives. Many of these communities have experienced disproportionate burdens from fossil fuel industries, leading to distrust and skepticism towards new initiatives, even if they

claim to be "just." Addressing these concerns through meaningful community engagement, transparency, and accountability measures is crucial for building trust and ensuring that the transition truly benefits those who have been historically marginalized.

Just energy transition has been defined as “a long-term technological and socio-economic process of structural shift that affects the generation, distribution, storage, and use of energy… while also ensuring that the desired socioeconomic functions can be accomplished through decarbonized and renewable means of energy production and consumption, safe-guarding social justice, equity and welfare” (Wang and Lo, 6). The safeguarding of social justice is a crucial concern to ensure that the communities that will be most impacted during periods of change are considered.

Just transition has been referred to “as a theory of socio-technical transition” relating to the “deep structural changes in systems that involve long-term and complex reconfigurations of technologies, policy, infrastructure, scientific knowledge, and social and cultural practices” (5). This is important to keep in mind as “technological shifts are more likely to occur alongside radical shifts in society’s structure, values and use of technology…may lead to fundamental changes in life and society” (5). This concept is why it is important for just transition to be strategic and consciously determined to truly be just. To achieve this, it is necessary to address just transition “as an integrated framework” amalgamated of the “three justice frameworks (environment, climate, and energy)” (5).

Energy justice needs to be considered, and the communities where energy production occurs often bear the worst effects of pollution and other hazards while not having the best access to the energy and economic progression that these industries introduce. This directly

relates to climate justice and environmental justice. To bring about a just transition, community concerns and prior instances of exploitation need to be considered. Just transition, specifically within the energy sector, requires active community involvement and environmental considerations to ensure all three justice frameworks are fully realized.

When discussing environmental justice it is necessary to recognize its role of " being at the forefront of fighting for vulnerable groups that are disproportionately impacted by environmental degradation" (3). The environmental justice movement consists of an overarching theme of linking " environmental and other social justice concerns such as the occupational health and safety movement, the indigenous land rights movement, the public health movement, and various social and economic justice movements, through building alliances with labor unions, environmentalists and civil rights groups" (3).

Corporations that look to achieve a transition that is considered just need to build such alliances within the communities that they are a part of to ensure that they are well integrated into the community especially within a "labor-oriented just transition" as in the case of renewable energy development. The Climate Justice Alliance has developed a just transition framework for change that is a "vision-led, unifying and place-based set of principles, processes, and practices that build economic and political power to shift from an extractive economy to a regenerative economy" (JTA).

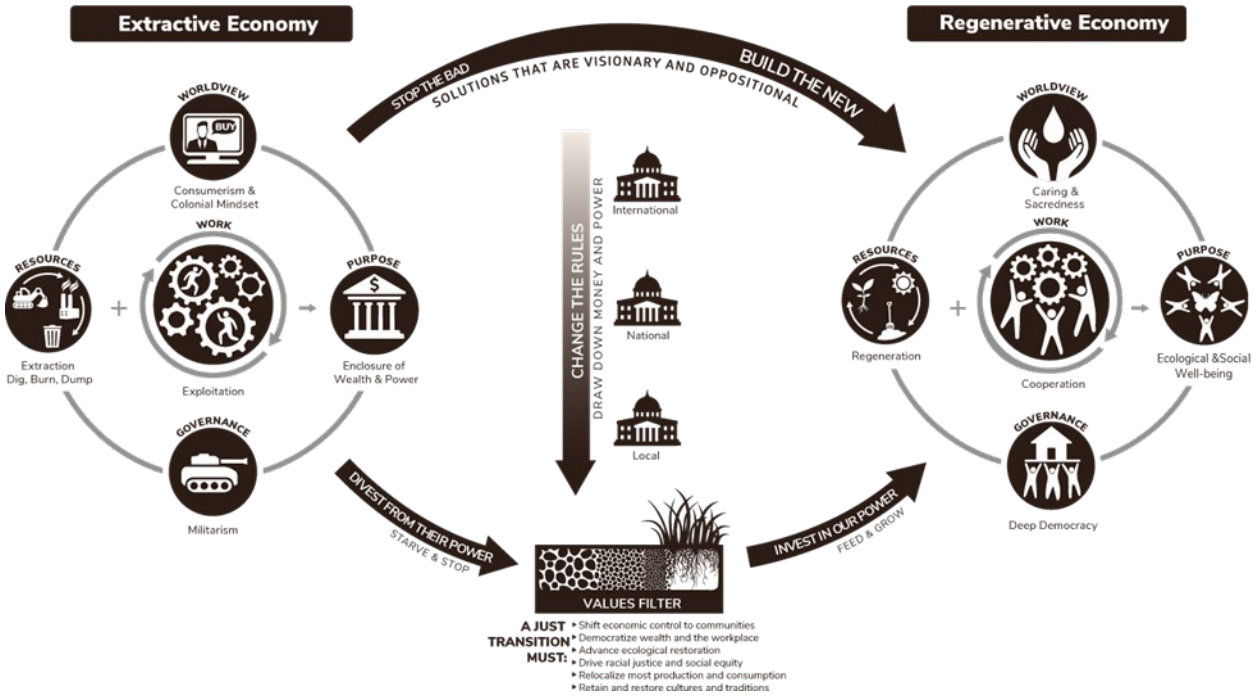

Figure 1: Just Transition Framework

It is suggested that every initiator of a just transition and its collaborative entities must not only engage the neighborhoods, societies, and communal structure but to do so in collaboration with an environmental justice entity local to that community. New York's Department of Labor recently developed an "Office of Just Transition" to spearhead the shift to a clean energy economy and New York City specifically has an "Office of Climate & Environmental Justice" established in 2022 to advance environmental justice (OJET, (Admin, 2023). These two offices are in charge of steering NY(C) climate action with guidance and plans. One such plan is "New York's Leadership & Community Protection Act", a roadmap for "cleaner air and healthier communities" designed to ensure equitable benefits from the energy transition (*Scoping Plan - New York's Climate Leadership & Community Protection Act*, n.d.-b).

As the Champlain Hudson Power Express will be contributing to New York state's transition from fossil fuel to clean energy specifically within the New York City metropolitan area it is imperative to highlight environmental justice organizations within the metropolitan area. This information can best be used to direct collaboration, partnership, and further conversation to ensure best practices.

The New York City Environmental Justice Alliance is a non-profit that was founded in 1991, led by community-based organizations that have a joint mission of addressing environmental justice issues (NYC-EJA). This non-profit is an excellent resource for new leaders of innovation and transition to ensure they effectively engage with the relevant communities. However, it is crucial to recognize that environmental justice organizations may have different priorities and approaches based on the specific communities they serve. Therefore, it is essential to have open and respectful dialogues to understand their unique perspectives and concerns.

Incorporating environmental justice principles and actively engaging with local organizations and community leaders is essential for achieving a truly just transition in the energy sector. It is a complex process that requires a deep understanding of the unique challenges and perspectives of each community, as well as a genuine commitment to addressing historical injustices and ensuring equitable access to the benefits of clean energy. As we forge ahead with the future of just transition within renewable energy, it is imperative to consider the intertwined histories of environmental justice movements and just transition efforts to build upon their cooperation and lessons learned.

Case Studies: Looking into Just Transition Efforts

As the year 2030 fastly approaches, the desire to meet our goals has become urgent. The Paris Agreement, adopted in 2015 by nearly all countries, is a key driver behind these efforts, aiming to limit global warming to well below 2 degrees Celsius above pre-industrial levels, with efforts to limit it to 1.5 degrees Celsuis. The Intergovernmental Panel on Climate Change (IPCC) reports provide scientific assessments of climate change impacts and ways to limit it, shaping goals such as reaching 70% renewable energy by 2030. Therefore, understanding the context of the push for 2030 compliance is crucial. While it is important to look at newer initiatives it's also important to look at the history of these just transition efforts. Delving into the history of just transition is essential in order to fully learn from our predecessors challenges. Therefore, looking at case studies that forthput the concept of just transition it is imperative to ensure success within upcoming initiatives.

A notable aspect of just transition efforts is that they rely on what resource is abundant. In the case of California, it is famously known for being the sunny state. Therefore, when it comes to renewable energy, solar power will be of main interest in this state due its geographic location. A transition program in California is the SOMAH program. SOMAH stands for Solar on Multi-Family Affordable Housing program. The program was initiated in 2017, and has received funding of up to $1 billion, with a target of 300 megawatts (MW) of solar installed through 2032. The program was created through a series of bills that came from Assembly Bill 693 (AB 693) created the Multifamily Affordable Housing Solar Roofs Program, funded annually from investor-owned utilities' share of greenhouse gas (GHG) auction proceeds. Senate Bill (SB) 92 further clarified program funding, and Decision 17-12-022 implemented AB 693 and changed the program name to Solar on Multifamily Affordable Housing program (SOMAH).

SOMAH's primary mission is to provide those who come from low-income backgrounds to be able to save money on their monthly bills. Therefore they have programs and initiatives related to energy efficiency, job training, workforce development, local and targeted hires, and tenant edition and engagement (SOMAH). SOMAH fits what most scholars and experts' definition of just transition is, therefore it wants solar power for all but particularly focuses on environmental justice communities. The program serves environmental justice communities, primarily Latino and African American, which face the highest disparities in air pollution and health vulnerabilities (SOMAH). The program's incentives include tax credits, SOMAH requires incentivized new energy generation systems to lower tenant energy bills. SOMAH targets their installation in California's disadvantaged communities, defined as the top 25% of census tracts statewide in the CalEnviroScreen tool or the highest 5% of the pollution burden (CA.gov). Since the program was initiated in 2017, the anticipated outcomes of the programs won't come until after 2032, the program would then share a report of their results. Due to the program still being in its infancy, there are no empirical findings on whether they are improving the workforce. However, this program does show that it has taken nearly 8 years in planning and funding in order to get to their current point in the program. The program does seem to have a fairly positive reaction from residents of environmental justice communities. Seniors at St Mary's Gardens express their desire for a cleaner environment, expressing the adverse effects of poor air quality caused by wildfires in their well-being (Chang). SOMAH serves as an example of a fairly new transition effort that still has a long road ahead. As there are also other examples that demonstrate the just transition movement in a new light.

When exploring just transition efforts, an important element is how the initiative serves or gives back to the affected workers and or community. In a nuanced alternative to exploring

the concept of just transition, there is a case study of a remote town in Alaska called St.George. St.George is a small community that is located near Alaska's Bering Sea. There are approximately 60 Unangan people who live in St.George (Doyon et.al 1). Their history of injustice begins with the seal fur trade with the United States. It was their main trade up until the U.S decided to withdraw from this trading in 1983 (Doyon et al. 1). Various negative outcomes came from the decision of the U.S withdrawing from this type of trade, it was St.Georges main source of revenue for their economy. Even with the attempted help of the Community Development Quota Program (CDQ), St.George was not able to recover. The CDQ program allowed indigenous groups of Alaska to have certain amounts of quotas of fish from identifiable CDQ fishing groups (Doyon et al. 1). The unemployment rate in 2016 was 39% and the population of Native Unangan people was declining. Due to all of those factors, St.George and EcoPlan International created the development plan called: "Rebuilding our Future Kayutuuxtxin Tanagnangin Igayuusalix angagiimchin agnaxtxichin: St. George's Economic Development Strategy." The plan started in 2018 and was completed in 2020. The main objective with this Economic Development plan was to diversify St.Georges's economy to make it sustainable rather than have it depend on a single sector of industry. In this case study, the analysis of the plan and the processes of the strategy plan is based on 4 forms of justice which include: Distributive, Procedural, Recognition, and Epistemic justice. Each of these forms of justice entails their own definitions, the primary one that encompasses St.George's strategy plan is epistemic justice. Epistemic justice can be defined as including marginalized knowledge systems, acknowledging the impact of historical and ongoing systems on dominant knowledge, and creating a more inclusive and equitable approach to knowledge production and use (Doyon et al. 3). Based on epistemic justice and the other forms of justice, the researchers and

coordinators who worked on the plan, used the process of “listening engagement”. Listening engagement was a key factor when working with the St.George community. The process began with informal meetings and meetings with community leaders, these informal meetings allowed the community members to feel comfortable to work with the planners (Doyon et al. 3). Due to the accommodations that were provided, 80% of St.George’s residents were engaged in the process. (Doyon et al.3). Through their active engagement with the community, the planners were able to overcome challenges efficiently and were able to identify opportunities for the community. A few years after the plan took place, the community has regularly used the reports to access grant funding and keeps projects ongoing (Doyon et al. 7). St.George’s most recent plans included hiring a community coordinator and professional grant writer to receive funding for harbor developments and to repair wind turbines that will reduce energy costs for the community (Doyon et al.7). St.Georges strategy uses the concept of just transition in a nuanced approach. Their definition of just transition was to transition into a more diverse economy that is sustainable, while considering the input of the community and having them involved in the majority of the planning. Although it may not be directly linked to efforts toward a green economy, it underscores the significance of community involvement that should be incorporated into any just transition initiative. While this community embraced the economic transition, others remain hesitant to do so.

Transitioning from a carbon-emission energy source to a renewable energy source, will initially have some opposition from the workers of those non-renewable energy sectors. In the case study of the Powder River Basin (PRB), it can serve as an example of what can happen if there is refusal to switch to renewable energy. Powder River Basin is located in Wyoming, which is the largest coal mining region in the U.S, where the energy transition is deeply contested.

Wyoming is one the important coal regions in the U.S with over 1.4 trillion tons in total coal resources, in PRB there are seven of the ten largest coal mines in the U.S (Cha 3). In 2008, the coal mining production peaked in PRB, but has steadily declined since then (Cha 2). In 2019. Coal mining company BlackJewel, filed for bankruptcy, shut down their mines leaving workers unemployed and loss in tax revenue for the community (Cha 1). The unique relationship between coal mines in Wyoming with employees and community allows it to contest an energy transition. PRB heavily depends on the coal mines and is the industry that dominates in Wyoming. There are cultural ties between coal mining companies and the local communities. Therefore there is immense loyalty for these coal mining companies. In Wyoming, specifically the PRB region, the workers are well-compensated in comparison to other coal mining areas in other states. (Cha 5). Unless there is a new employment that pays the workers more than what they currently paid, the likelihood of them voluntarily transition is not probable. The culture within Wyoming's mining industry has discouraged any attempt to assess whether they could meet the high standards set by previous mining compensation standards. Consequently, they represent a unique case in resisting the transition to renewable energy. From the perspective of the workers in PRB, they view transitioning as a means to take away their stability in their communities and local economy, but in this case study, these transitions are exacerbated due to their strong long standing relationship history with the coal mining industry in Wyoming. Therefore, regardless if the coal mining production is declining, they will still continue to use the coal mines and find the means to stop any transitioning, even if it will hinder them. PRB is an example of regions who are strongly dependent on non-renewable energy who can transition, but refuse too.

Of the case studies, a successful just transition effort can be Hydro-Quebec. Hydro-Quebec was established in 1944, when the Quebec government required three companies to sell

their assets to the Hydroelectric Commission of Quebec (Begin 2). In a takeover bid in 1963, the commission acquired almost all Quebec electricity distributors, by 1975 Hydro-Quebec signed the James Bay and Northern Quebec Agreement establishing rights and obligations for the indigenous groups and other parties involved (Begin 2). Hydro-Quebec has had a long withstanding history of transitioning into renewable energy sources that led to having almost all of their energy come from renewable energy. Notably, Hydro-Quebec has entered into numerous agreements with Indigenous communities, as documented on their website. These agreements outline various aspects of collaboration, including consultation processes, environmental protection measures, and benefits sharing arrangements. In addition to these agreements, Hydro-Quebec has adopted a proactive approach to Indigenous relations, as evidenced by their initiatives outlined on their website. In 2019, Hydro-Quebec adopted a policy of systematic consultations with Indigenous communities, aiming to ensure their meaningful participation in the planning and implementation of projects and activities. By engaging in meaningful partnerships with Indigenous groups and adopting a policy of systematic consultations, Hydro-Quebec is taking concrete steps towards promoting equitable and sustainable development, while also respecting the rights and interests of Indigenous peoples in the region. Amongst the case studies, there are common themes and key factors that can be used as shared lessons to be learned for new just transition efforts.

All the case studies were located in different geographic areas, however a commonality amongst all of them is the importance of stakeholders in the decision-making processes. Hearing the needs of the community is essential in order for the transition to be as seamless as possible. Another commonality is the need for economic diversification, if a community is dependent on one industry that is not sustainable, they're community collapses. Analyzing the case studies,

gives a deep dive into what lessons can be learned from the history of just transition projects. Looking at the successes and challenges of these case studies improves the outcomes and effectiveness of these projects and new projects that hope to come into fruition.

III. Rise Light Ravenswood's initiative to NYCHA residents

Introduction

The Rise Light Ravenswood Renewable Energy Power Plant is the power plant responsible for powering electricity across New York City, however, in doing so, it has worsened the health of the surrounding community. The power plant is neighboring 3 NYCHA housing developments, the Queensbridge Houses, Ravenswood Houses and Astoria Houses. Queensbridge Houses is the closest housing development to the power plant and is the largest public housing complex in North America, home to approximately 7000 people (Griffin, 2019). Residents surrounding the power plant have borne the brunt of the fossil fuel power plant for decades. The community has faced a disproportionate exposure to harmful and polluting chemicals that have resulted in one of the highest rates of asthma and other respiratory illnesses in New York City. Therefore, it is vital that the new renewable energy power plant in Ravenswood be focused on addressing past wrongs and working towards both preventing any future possible injustices and encouraging community development through programs and services. Rise Light has committed to this mission through workforce development, investment in community programs, pathways to college, public space development and health equity for the

community. These initiatives are designed to increase Queensbridge residents' access to social mobility, and provide a community that has been negatively affected by the power plant with resources to a healthier and safer community.

Workforce Development

Workforce development is the process of enhancing the skill sets of individuals for the purpose of meeting current and future industry work standards. This is especially important for a just energy transition as most of the current energy sector is not sufficiently trained in renewable energy. For NYCHA residents, a quality job is the stepping stone that lifts them up and out of their current economic status. The median household income for NYCHA is $16,965 per year, in contrast to the NYC average household income of $64,000 per year (Zaveri, 2022). NYCHA residents represent the lowest income bracket across New York City. New job opportunities in the just transition present chances of social upward mobility for NYCHA residents. Furthermore, the demand for renewable energy is rising as the clean energy industry is experiencing rapid job growth as jobs have grown at a 53% faster rate than the rest of the US economy (E2). In 2019, New York state passed the Climate Leadership and Community Protection Act which requires New York state to cut carbon emission by 85% by the year 2050, and that 35% of clean energy profits be invested in marginalized communities. Most importantly, the CLCPA requires energy companies to ensure the creation of thousands of green jobs in communities across the State, from building trades and technicians to engineers and financiers – making New York a hub of clean energy economic growth. This is done through rigorous training programs that introduce a workforce to new machinery and technology which will guide them to properly operate renewable energy systems. These types of initiatives are beneficial for promoting an equitable and effective workforce and economy within a given community such as low income

communities that are often neglected in economic and workforce development. These initiatives are not only limited to workforce development, however, they must also be investments in communities and neighborhoods in order to ensure that workers and their communities are protected during the phasing out of fossil fuel power plants. Therefore, it is vital that the incoming energy firms, Hydro Quebec and Rise & Light play an active role in the workforce and community investment in their surrounding neighborhoods.

The process of designing and implementing a Just Transition program will provide a template for guaranteeing that workers affected by climate change have access to income protection, training and re-employment programs, and initiatives to secure a future for hard-hit communities such as the surrounding NYCHA houses and the Ravenswood power plant workers in Astoria, Queens.

Workforce development in low income urban neighborhoods may be incentivized through the re-introduction of training centers for existing fossil fuel workers, community assistance programs, STEM development programs and local career placement centers. Reintroducing training centers for existing fossil fuel workers allows energy workers to avoid the impact of the upcoming energy transition. There is admittedly a large existing workforce that will be at risk of losing their jobs to the transition. Fossil fuel workers could be left behind and eventually be phased out of the industry if they don't develop the required skill set. This includes all gas, oil, and coal operations, as well as workers in connected industries such as pipeline workers. How can communities who depend on fossil fuels for an income transition to new livelihoods in a post-carbon world? This should ideally start with a survey of the existing workforce to determine the framework from which to construct the retraining programs on, this

will clarify which workers need the most support and which can have a smoother transition based on their existing foundations. The existing fossil fuel labor force will also get an introduction to the new revolutionary principles behind renewable energy and their potential to bolster the climate ambitions of NYC.

The second method is the creation of community assistance programs as an effective method to build positive relationships with local residents that can lead to workforce development, and additionally, mitigate the past wrongs of the power plant. In the Ravenswood power plant, profits for the energy sector have always been concentrated at the top of the hierarchy, and very little wealth has trickled down into the community. In Zone 126, over 20,000 families, or 8000 children are living in concentrated pockets of poverty in Astoria and Long Island City. A child living in poverty faces multiple environmental, social, and physical barriers to academic success. These programs assist residents by providing some economic relief through investments in local businesses and non-profit organizations. This method will not only convey Renewable Ravenswood's image as a socially progressive organization but can be especially effective for NYCHA residents as they are constantly in need of more support systems. These positive practices will help residents be more tolerant and accepting of the upcoming changes in their neighborhood as the organization's commitment to the community is highlighted.

The third method is the implementation of a STEM development program for highschool students. This is especially important for workforce development as unions face challenges in finding workers who are proficient in mathematics and science. In order to get a union job, one must have a strong background in math and science and not enough students have the threshold of a STEM background to get into a union. The creation of after school programs for highschool students to develop basic skills in mathematics and technology will increase their chances of

being qualified for a job in the energy sector, whether it is HVAC, building automations or working in the main power plant itself. These programs additionally benefit the community youth by steering them away from bad choices and directing them towards different pathways such as college or a skilled blue collar career. If permitted, we suggest introducing scholarships opportunities with local highschools and community colleges that eventually lead to the renewable energy sector. For instance, college degrees in Civil Engineering and Mechanical Engineering are extremely useful in the energy sector and will help develop a future labor force. These scholarships will attest to the long term commitment on behalf of the organization for a truly just energy transition. We recommend sponsoring educational college trips to Hydro Quebec's facilities in Canada. This was recently done in Queens College, when students accompanied by Professor Costa Constantinides exposed the vast industry of renewable energy. During the trip, many Queens College students inquired about job opportunities with Hydro Quebec as they witnessed how to apply the principles they have been studying in their classes.

Lastly, is the creation of a local career placement center, which would be used as a convenient access point for the community to careers at the power plant. Currently, there are existing career placement centers such as Urban Upbound in the community surrounding the power plant. Urban Upbound is dedicated to connecting low income people to various workforce opportunities. In the last 3 years, over 1500 individuals have secured a job through Urban Upbound branches. Renewable Ravenswood has the potential to increase workforce development by opening an office in Astoria, Queens that is dedicated to connecting residents and transitioning fossil fuel workers to jobs and pathways in renewable energy. These centers can be useful as they can help existing fossil fuel workers have a smoother transition as some workers may have skills that can be utilized immediately in practices such as solar installation and pipeline maintenance. The career placement center will be a great asset for workforce

development as it can create customized career pathways for in demand jobs that the industry is currently looking for, such as building automation, the career placement centers would expose community members and workers to these programs. In other New York City neighborhoods, similar programs such as Sustainable South Bronx, and Green City Force are working to address the environmental injustices found across New York City.

Economic Empowerment

In recent months, Governor Hochul has demonstrated her strong support for workforce training and development in New York State through state grants and strategic partnerships with NGOs, unions, and colleges. Most notably, she led a $350 million investment in workforce development across New York by creating the Office of Strategic Workforce Development which aims to highlight industries that have a high demand for workers, specifically New Yorkers (New York State). $150 Million of this investment will go towards the making of new grant programs that will support high skilled workforce training. This will consolidate various programs previously administered by different state entities, streamlining the process to make for a more unified strategy toward boosting the state workforce.

Likewise, former Governor Cuomo also promoted New Yorkers workforce development. He promoted workforce development through firstly, public-private partnership to enhance the infrastructure and technology of CUNY and SUNY with the help of private companies to invest in in-demand programs. This can be done through apprenticeship, customized curriculum development, and job training programs. Secondly, NYS Department of Labor and Empire State Development has funded employee training and internships for entry level workers. Thirdly, is the investment in innovative workforce development projects in emerging fields with growing

job demands. This will address a worker shortage and increase workforce development. This is especially needed for the just transition to renewable energy.

In addition to the required components above, Governor Hochul has presented a set of best practices that apprenticeships should strive for to maximize their value to clientele. This includes providing apprentices with at least a living wage upon starting the program, setting measurable equity goals, engaging in intentional recruitment efforts, and providing a transferable credential like an associate's degree. This report refers to several different types of apprenticeships, including those that are registered with the United States Department of Labor (US DOL) and New York State Department of Labor (NYSDOL), unregistered programs, pre-apprenticeship programs that prepare individuals for apprenticeships, as well as youth and adult apprenticeships that target particular age groups. This threshold definition will serve as a method of counting apprenticeships and determining a baseline quality standard across different apprenticeships.

In the energy sector, especially in green jobs or environmentally friendly initiatives, a full array of programs provides training and work placement to New Yorkers. As an example, in the New York State Energy Research and Development Authority (NYSERDA), there are multiple programs and grants, including the 'Building Operations and Maintenance Training Program' (Pon 5357), which aims to reduce energy use and associated carbon emissions while saving building operators and owners money by developing and strengthening the skills of operations and maintenance (O&M) staff and managers across the state. The program is designed to equip building O&M workers with the skills to operate increasingly energy-efficient, grid-flexible, and electrified building systems that reduce buildings' contribution to climate change. The goal is to support building owners, facility managers, property management companies, business

associations/trade groups, and organized labor associations in creating the talent development strategy, corporate culture, on-site training framework, and tools needed to advance building O&M workers beyond classroom training.

While a training organization or trade association may be the applicant, it must partner with a specified entity or entities employing building O&M workers. Applications must be for training activities connected with specific buildings or portfolios/campuses of buildings named in the application. This can include partnerships of businesses with everyday training needs and skills gaps with total annual energy expenditures of $1 million or more (all fuels and uses.) NYSERDA will support eligible projects by providing funding for programs and activities such as, but not limited to, the creation of on-site training laboratories, curriculum development, in-person and virtual training, coaching/mentorships, and training trainers within an organization.

Aiding social mobility is all about creating pathways for those from disadvantaged backgrounds so they can fulfill their potential. Education and social mobility are inextricably connected. If we want to reduce inequality, we need to get more people from disadvantaged backgrounds into higher education and then the workplace. The problem is that there are a lot of barriers for those from lower socio-economic backgrounds. Primarily, they don’t have the same access to education or preparation for the working world as those from more privileged backgrounds. If we want a fairer society where everyone has equal opportunities to succeed, then it’s important that everyone has access to some form of higher education or training. Social mobility is an important part of a successful society. We all want to live in a world where everyone has the same opportunities and no one is left behind because of their background. Social mobility is not just about the rich getting richer and the poor getting poorer. It's not just about race or gender. Social mobility affects everyone. It's an important indicator of how well an

economy is performing - and it can also be a way to measure your company's success in hiring top talent from diverse backgrounds. The more diverse your talent pool, the better chance you have of finding strong candidates who can add value to your organization. One way to do this is by looking for candidates who are underrepresented in your industry. For example, if you're a technology company and the majority of your employees have university qualifications, consider placing more attention on relevant skills-based hiring, rather than education. Social mobility can be improved by creating pathways for those from disadvantaged backgrounds, but it will take time and effort from everyone involved in order to achieve this goal.

Workforce training is a mutually beneficial undertaking, benefitting both employees and employers. A well-trained workforce enhances productivity and contributes to the overall prosperity of the state and the nation. By securing better-paying jobs in strategic sectors, individuals experience upward mobility, improving their quality of life for themselves and their families. The ripple effects of a skilled workforce would boost economic productivity and, in turn, result in a population that can contribute more to the nation’s tax base, which would be transformative to the support of the public education system, social services, infrastructure, and public transportation. Governor Hochul’s support for workplace training in New York State is an essential first step in the right direction and could prove an excellent example for other states to follow.

Community Investment

The presence of a high profile organization in low income communities is known for its many adverse effects such as rising living costs, resident displacement, and gentrification. However, organizations such as Rise Light; Renewable Ravenswood are necessary for the greater sustainability goals of New York City, because of this it is important that these

organizations recognize their potential impact on the communities surrounding them whilst still striving to achieve sustainability goals. This is especially true for the community surrounding the Ravenswood Power Plant that has faced the brunt of the negative environmental impacts for decades. The renewable energy power plant has committed to invest in the community through generous investments in existing community programs, as well as, new programs that improve the living conditions of residents.

Investments are important for a community as they are a good method for the social mobility of lower income residents. This is because investments into a community provide residents with greater opportunities. However, it is rare that organizations will invest into a community without an incentive as "CCI (Corporate Community Investment)…which refers to the obligation firms have to try, often outside of their primary economic role, to improve society and offset any negative impacts of their operations (Glavas, 2016)" (Gibson). It is clear from this that the investments by Rise Light are necessary from a corporate perspective, as a method to mitigate past wrongs of the fossil fuel power plant. Investments in communities are often subject to much criticism as "case study analysis indicates that a large part of the local reaction to community development efforts consists of frustration at which projects get funded and on what timeline" (Gibson). Therefore, it is crucial that organizations participate in an extensive research into the community receiving investments to ensure investments are made where the residents find them to be most needed.

Rise Light's Investment Research

Attentive Energies has partnered with Hester Street in an extensive research project to conclude the best methods to community investments that address past injustices and ensure that

the benefits of the new renewable energy power plant be felt by the entire community. Hester Street did this through a series of ArcGIS projects and public engagement forums to both qualitatively and quantitatively evaluate the community's needs. Hester Street explained that they intend to ensure "deep community engagement into the Renewable Ravenswood process, not only informing the community about the proposed energy transition from fossil fuel to offshore wind, but also ensuring that the benefits of the project accrue to those who bear a disproportionate burden from environmental injustices" (Hester Street). An interactive map of Hester Street's findings can be found online. Their findings include a wide variety of topics including air pollution averages, health insurance coverages and many other indicators.

Community Organizations and Programs

Using the data collected by Hester Street, Rise Light has selected organizations focused on increasing accessibility and justice for the community. These issues address concerns related to health, the environment, workforce development, education and much more.

Below are a complete list of Rise Light's community investments that will be highlighted throughout the remainder of this paper:

- City Harvest Food Drive Program
- Rise Light & Power's Food Insecurity Program
- Rise Light & Power's Turkey & Food Giveaway
- Rise Light & Power's Coat Drive
- NYCHA (Jacob A. Riis, QueensBridge Housing)
- 108th, 114th and PSA Precincts

- Share for Life: Lower Queens Women's Empowerment Group
- Carter Burden Network
- Light Up LIC
- Queens Area Housing
- Island Kids Inc.
- Energy Tech High School's STEM Program
- LaGuardia Community College
- Girl Scouts
- Youth Step USA

Attentive Energy has formed partnerships with NYCHA Community Centers, Jacob A. Riis and Queens Bridge Housing to host interactive events and forums for residents to gain information about the new power plant. This is important as it raises awareness within the community of upcoming changes that they may see, and gives them time to adapt and prevent 'root shock', the psychological reaction to community change (McAllister,Thomas, Wilson, Green, 2009). Rise Light has also partnered with local NYPD precincts, namely 108th, 114th and PSA precinct.

CHPE has also committed to investments in the community, specifically seen in the education sector through their Laundry Service for students program which provides support to many low income families to keep their clothes clean. This additionally benefits the youth as they are able to have clean clothes to wear to school that will boost their self esteem and keep them in school. Other organizations that they have partnered with include Share for Life which addresses workforce development for women, which is especially important in a sector where women are often not included in the workforce development and Carter Burden Network which

is a senior living center, this addresses health impacts of residents who grew up with fossil fuel. They have also collaborated with Light up LIC and Queens Area Housing.

Rise Light has taken the initiative to create their very own programs in an attempt to address the most pressuring issues found within the community. These programs include, firstly, the City Harvest Food Drive Program and the Rise Light & Power Food Insecurity Program which both seek to increase residents' access to food products as a method to address food insecurity within the community. A report by CUNY Urban Food Policy Institute reported that 1 in 5 elderly NYCHA residents experienced food insecurity, and 55% of these food insecure residents did not receive food stamps as assistance. Therefore, it is crucial that NYCHA residents, especially Queensbridge residents receive alternative forms of food assistance.

Secondly, Rise Light's program 'Rise Light & Power's Turkey & Food Giveaway' aims to provide the community with an opportunity to create a memorable holiday with their family. 25% of NYCHA residents are under 18 years old (NYCHA March 2022 Report), therefore, it is vital that they be given the opportunity to celebrate holidays so that they do not feel isolated from the rest of the community.

Lastly is Rise Light & Power's Coat Drive which additionally with Attentive Energy's installed heat pump in the community, work to combat the cold temperatures of the winter. Rise Light is committed to helping NYCHA residents to stay warm in the colder months where NYCHA developments have been infamous for their unstable indoor temperatures. In 2019, NY Post reported that "87% (of NYCHA homes) lost heat or hot water at some point during the winter season" (NY Post). In 2024, this is an issue that is still impacting NYCHA residents, more specifically on 04/18/2024, Astoria Houses residents experienced an unplanned hot water outage as seen in a service outage report published by NYCHA (NYCHA). Colder temperatures have

been proven to result in worsened asthma (Asthma and Allergy Foundation of America). Therefore, it is vital that Rise Light energy continue working towards protecting residents from colder temperatures to avoid asthma flare ups.

Rise Light & Power's new programs will provide a much needed resource for the community to access food throughout the year, and celebrate holidays. This initiative allows the benefits of the new powerplant to be felt by everyone within the community, even those who are not working with the facility.

Pathways to College

A huge barrier for low income people in accessing the workforce is a lack of a college degree. It is significantly more difficult for lower income people to access a college degree as shown by the 2023 Brookings study that states that only about half of students from low income families attended college (Brookings, 2023). It is crucial that Renewable Ravenswood enhances the accessibility to college degrees for students as a method to encourage workforce development.

NYCHA and LaGuardia Community College partnered up to start their own program known as the "Clean Energy Academy" (Streich 2023), which is designed to train people for work within the renewable energy sector. This not only secures students with a job in renewable energy but also more than likely gives them a job working anywhere else within the energy field as getting people into this field is time and training intensive as the job requires many precise skills. This partnership includes a $2 Million investment by LaGuardia Community College towards the workforce training program. $10 million alone is being spent on LaGuardia to build classrooms and have a hands-on learning space.

Additionally, Attentive Energy One has also invested into the just transition. Attentive Energy One is a joint venture between Rise Light & Power and TotalEnergies that has proposed 16 million dollars to train people in renewable energy. $10 million alone is being spent on LaGuardia to build classrooms and have a hands-on learning space. The other $6 million is going to other NYCHA projects including the Ravenswood plant. At LaGuardia the Queens Offshore Wind Training Hub will include short term certificate programs in fields like a offshore wind technician, Global Wind Organization (GWO) Basic Technical Training, GWO Basic Safety Training, and Construction Management, as well as academic programming for degree students in engineering, environmental sciences, energy, and business degrees.

LaGuardia Community College is the training site for the program. LaGuardia Community College believes that the just transition must include "both retraining for existing union workers along with employment programs that prioritize New Yorkers living in environmental justice communities – particularly NYCHA residents" (Streich, 2023). Although the focus is on training residents, the existing union members must also be considered with every decision. Investments and a safe learning environment are essential for training prospective workers. LaGuardia Community College ensures this in their campus and additionally, they have another location in Harlem where people can receive HVAC training in a 10,000 sq. ft. facility.

Besides this, it would be beneficial for the Ravenswood generating plant to have an additional training facility next to the power plant. Currently, in Renewable Ravenswood, there is a small training center with about 10 different equipment that is used for further developing the skills of current workers. Expanding this training center to both better cater to the just transition and a higher capacity of people would be useful. The Ravenswood generating plant needs somewhere to train the residents. LaGuardia Community College is very ideal as they can

support having people take classes on their campus. However, when we went for a tour of the power plant facility, it became clear that an expanded training center for both current and prospective workers was necessary. There were areas and buildings in the facility that were unused and would be ideal for our prospective training center . While on the tour we passed by a room that actually had a class going on that was training employees. LaGuardia is overseeing the training for the residents because they are gonna be working on NYCHA projects in general and not somewhere specific. The Ravenswood generating plant is gonna need to train people to have them work at that plant, so we believe it would be easier to just train them on the site. It would be an easy commute for residents nearby as once they are done with their training, they can quickly return to their other responsibilities at home.

Additionally, Renewable Ravenswood should look to branch out to other NYCHA residents who aren't as close, but want an opportunity to get into renewable energy. 'The Clean Energy Academy' is trying to train people to simply hire them for NYCHA's renewable energy projects. The residents go from getting trained by NYCHA and then get hired by the same people. It's a great system and guarantees residents jobs. The Academy is also being funded by New York State Energy Research and Development Authority ($385,000), National grid ($345,000), New York Power Authority ($75,000), Trinity Church Wall Street Philanthropies ($100,000), NorthLight Foundation ($50,000), Rise Light and Power ($50,000), and NYCHA is also providing 1 million dollars for this project (Streich, 2022). The current funds are meant to train 100 residents in the clean energy field by a two year goal. The prospective workers will need to be paid for their training, transportation costs, and for any other additional costs.

Another concern when addressing training is the residents' need for babysitting while they are conducting their training. It would be beneficial for NYCHA residents to have a safe

and reliable place to send their children for babysitting while they are training. A childcare program in the plant or in the surrounding community would help alleviate a barrier parents might face in workforce development. A child care center would most definitely give prospective workers a smooth and just transition to renewable energy as they would have significantly higher chances of working for the power plant.

Likewise, KingsBorough Community College (KBCC) has a program regarding offshore wind. KBCC serves as an example for the LaGuardia Community College training as they are also going through a transition period. In June of 2023 NYCEDC hosted “a free event series that educated Staten Islanders, including families, local businesses, and community institutions, about the existing and future opportunities that the offshore wind (OSW) industry will bring to Staten Island communities and the local economy.”(KBCC,2023) They also hosted their fourth OSW and Maritime Career Awareness Fair where industry representatives spoke to about 500 high schooler students regarding the importance of OSW. Events like this are great for communities and the Ravenswood generating plant could benefit greatly from this. Not only would it educate more people on climate change but also inform people of work opportunities. Similarly, Rise & Light has held their own workshops to acquire community input, however, additional meetings to inform residents on work opportunities is necessary. This type of outreach is important because it informs people early on so when things begin to change there is less of a chance of them feeling uprooted.

KBCC puts a huge emphasis on outreach and extensive training. More people should also be educated on climate change as it’s a real problem that will affect all of our daily lives if we don’t start making changes. KBCC has already started training people to offer workforce programs to students who want to learn more about the OSW industry. They offer maritime

career training, welding training for OSW, and “certification for the Global Wind Organization (GWO) training”. In June of 2023 NYCEDC hosted “Summer of OSW on Staten Island " to educate Staten Islanders, businesses, and community institutions about the benefits of OSW (KBCC, 2023). Seasonal programs such as these are beneficial for outreach especially to students or recent graduates who may have the summer time off to receive extensive training and certification.

A partnership with the broader CUNY to train people in all different fields, would greatly enhance the just transition to renewable energy. Queens College, for example, would be a great place to train people if there are enough resources for it. It is not too far from the Ravenswood plant and could renovate spaces for training. Additionally, the just transition to renewable energy is important for a wide variety of jobs such as project management, urban studies, etc. On top of all this Townsend Harris High School and NYCHA Pomonok Houses are neighboring Queens College and would bring a wide reach of students to the training center.

All of these opportunities give people freedom to do what they want with their career. LaGuardia Community College plans on holding workshops that talk about Clean Energy careers for the local middle and high school students. All of these programs including the ones at KBCC are important because not only does it provide outreach, but also further normalizes clean energy. Clean energy currently is not the norm, and many people still just only care about gas. Programs like these are just the beginning and will help change future generations' perspective on climate change.

Public Space, the Environment and Health Equity

Focusing on more of the environmental and health equity side of this transition, it is important to understand the global affects climate change is having on the environment. When

approaching this issue, it is important to make sure that the necessary changes are implemented as quickly as possible, as well as focusing on areas that have been unequally impacted by these impacts. With the NYCHA housing developments constantly dealing with some of the worst effects of the Ravenswood power plant for decades, there must be genuine steps taken to protect the neighborhood residents and to improve the quality of life. With New York City already having the highest percentage for heat island effects, living near the Ravenswood power plant creates exposure to even higher temperatures.These power plants constantly release heat waste further adding to the already high UHI. Power plants, like Ravenswood were primarily run by the burning of fossil fuel and other natural gasses, which have been proven to increase climate change and intensify the risk and outcomes of potential harms on people. Living in close proximity to these factories is not good for your health, which is why changes need to be taken to protect those living in the surrounding areas, as well as ensuring that residents feel that their voices are heard and changes are genuine.

While power plants are not the main cause of urban heat island effects, they highly contribute to neighborhoods they are located in and pose increased health risks. This being said, by switching to renewable energy, the urban heat island effect will be reduced in the area, leading to a decrease in the average temperature and a start to make a healthier environment to live in. New York City has relied on the burning of fossil fuels as its energy source for so long, causing climate change, elevated pollution levels and other climate related issues, as well as the nickname of the neighborhood surrounding the plant as “Asthma alley”. With city plans focused on a future of renewable energy, this will put a stop to one of the major contributors of climate change, and create a more just environment, starting with those living near the Ravenswood plant.

The Ravenswood plant aims to give back to the affected community by implementing free, clean heating and cooling for up to 15,000 local residences. (NYC.gov 2020) With NYC aiming to reduce carbon emissions by 80% by 2050, a plan known as RetrofitNY, focuses on implementing the first new, Net Zero Energy (NZE) in building 12 of Ravenswood Houses. Using a model known as the Energiesprong model which was developed in the Netherlands, “new exterior insulated panels and HVAC systems will bring heating and cooling costs to almost zero with minimal disruption to residents” creating a more habitable and comfortable living conditions year round. The NYCHA board states that with this new system in place, “Residents will feel more comfortable thanks to improved and efficient heating, cooling, and ventilation systems, updated insulation, and high-performing windows—all while living a net zero-energy life” (NYC gov 2020). With this newer system in place, it can later be implemented throughout NYC, further decreasing carbon emissions and further increasing more comfortable living conditions city wide.

Lastly, the Renewable Ravenswood donated 1.5 million dollars to Randall's Island (Randall's Island Park Alliance). This donation will allow Randalls island to continue, as well as enhance the role it has on surrounding communities. One of the main goals is to expand space in an existing historic building on the Island into classrooms, an information center, and other park-related amenities (CHPE). Randalls Island already offers free and essential programs for children and families, and the new nature center building aims to offer “a summer camp; the Urban Farm program, which educates students about gardening and healthy meals; the Waterfront Stewardship program, which provides hands-on environmental education for local school groups; and the Park-as-Lab program, which focuses on collaborative science and urban ecology”(CHPE 2022). These overall goals of increasing educational services and other outdoor services for children can be and will be extremely beneficial now, and in the future. It is

important that these beneficial actions and processes continue to take place, to ensure a healthier and more environmentally just future for everyone.

Conclusion

The community surrounding the powerplant have taken the brunt of powering New York City for decades. It is vital that the transition to renewable energy brings about positive change to the community, unlike it did many years ago. This just transition must have a focus of NYCHA residents and the retraining of employees. Renewable Ravenswood has taken the necessary steps in addressing the community's most pressing concerns, in terms of investments in pathways to college, public space and community programs. Renewable Ravenswood's projects and programs have already had a positive impact on the community, however, there is still much work to be done especially in terms of workforce development and health. Both a lack of work opportunities and health has stunted the community from future opportunities, it is important that the community be given a priority in work opportunities and health improvement opportunities.

How are the two projects differing in their approaches to workforce development and hiring in the community? What are their differing needs?

Moving towards renewable energy is essential in combating climate change, however this shift affects more than just power sources; it significantly impacts the job market and local communities. This analysis examines strategies employed by the Hydro-Quebec / Champlain Hudson Power Express (CHPE) and the Rise Light & Power / Attentive Energy One project (AEO) regarding workforce development and community engagement. The goal is to explore methods that are consistent with ensuring a Just Transition.

With New York City currently running on about 85% of all its energy from fossil fuels according to The Mayor’s Office of Climate & Environmental Justice as of 2021, there is an immense focus on jobs regarding the technical and financial sides of that industry within the city. New York City being the major financial hub that it is, energy trading is an important aspect of the fuel industry here. Similarly, analysts, brokers ,and consultants handle the monitoring of energy markets, investment and risk management regarding fossil fuels, transactions and connections between buyers and sellers, and expert advice regarding all kinds of energy related issues, efficiency and compliance. On the renewable energy side of things, job opportunities commonly display themselves across differing stages of innovation, production, and distribution. From wind turbine technicians who repair and maintain wind turbines, hydrologists who study water sources and make assessments on the workability of dam construction and generating hydropower, as well as environmental scientists who monitor the effects on ecology of these renewable energy projects, to energy analysts who accurately identify opportunities for integration and improvements of renewable energy using energy usage data. It is therefore entirely possible to transition from a career in fossil fuels to one in renewable energy with the appropriate skill development. The most important step toward transitioning is relevant training and education which both plants have planned on providing to the local workforce who will need to make the transition over to renewable energy to be available to job opportunities.

The Ravenswood Generating Plant and Hydro-Québec have implemented distinct yet complementary workforce development strategies to build a skilled and diverse pipeline of talent

for the energy sector. The Ravenswood Generating Plant#39;s focus on local hiring and community partnerships, combined with Hydro-Québec emphasis on apprenticeships and technical training, demonstrate a multifaceted approach to cultivating a sustainable energy workforce The combination of these strategies has the potential to create lasting benefits for local communities, ensuring equitable access to clean energy jobs and a just transition towards a more sustainable energy future. Ravenswood generating plant says that it is entirely possible for workers to transition to renewable energy, “We have a lot of skilled people,” Shillito said. “And you know, just because right now they produce power with fossil fuels, doesn’t mean they can’t learn to produce it in a cleaner energy way, whatever way it is.” (S. Kerson and C. Bennett, 2022). With Attentive Energy One’s commitment to fund training initiatives 100%, the workers are then left with the project of attending and committing themselves to the training sessions and the full transition.

The good news is that many engineering and production jobs carry transferable skills in their requirements that workers can use in their training and job searching in the transition. Many tools and programs used in these fields are common denominators that are mandatory to learn and then later apply to the specialty that a worker hopes to enter further in their career. So, when companies like Rise Light and Power and Hydro Quebec make plans to switch over and make changes to a preexisting industry in the way that they are working towards renewable energy goals in New York City, it is easier for the workers to adapt to this whole new system and learning how to work with completely different mediums than they are used to. In a similar fashion, the Champlain Hudson Power Express Line (CHPE) project’s specifically tailored programs target local communities where their power line will pass through. Selected by New

York State to partner with Hydro-Quebec, it can play an important role in the state's transition to clean energy. The construction of a 339-mile underground and underwater transmission line which will lead 1250 MW of clean hydropower from Canada to New York City is the highlight of the project and will create job opportunities along the entirety of its path, through the local municipalities it will pass through. This brings with it numerous social and economic advantages such as the $40 million green economy fund which is designed to support disadvantaged residents at the forefront of underprivileged communities. This aligns with New York's vision of a just transition, ensuring that the shift towards renewable energy creates equitable access to clean energy jobs (International Water Power & Dam Construction, 2021). In addition, the $117 million Environmental Trust Fund associated with the CHPE project will focus on maintaining the health of the Champlain Lake and the Harlem and Hudson rivers which underscore the project's commitment to environmental protection and advocacy, as well as opening the surrounding job markets to environmental and marine specialists who will be glad to have a part in the decisions made to maintain any wildlife and water safety.

The CHPE project has seen its share of support from a wide variety of stakeholders, including labor unions, business organizations, elected officials, municipalities, environmental organizations, and academics. Notably, the Mohawk Council of Kahnawake, an Indigenous communities located south of Montreal, will share ownership of the transmission line in the province of Quebec, securing long-term economic benefits for their community (International Water Power & Dam Construction, 2021). This is a significant step in ensuring that the transition to renewable energy can be both inclusive and equitable, and not be at the expense of marginalized communities.

As all things go, the transition from fossil fuels to renewable energy is not without its challenges, as evidenced by the case of the Philadelphia Energy Solutions oil refinery. The sudden closure of the refinery in 2019, following a series of explosions, left workers and the surrounding community in a state of uncertainty and disruption (Kerson & Bennett, 2022). Highlighting the importance of a well-planned and inclusive transition is a priority for the needs and concerns of local residents and workers. As Doreen M. Harris, President and CEO of the New York State Energy Research Development Authority (NYSERDA), stated, "Building New York grid of the future with major green energy infrastructure projects like Champlain Hudson Power Express will strengthen the State economic recovery and help to responsibly power New York City with clean, renewable wind and hydropower from Canada by 2025" (International Water Power & Dam Construction, 2021).

CHPE's goal is to provide job opportunities through its workforce development initiatives as well as support the community. CHPE has created The Green Economy Fund (GEF) which dedicates $40 million to a green jobs training fund intended to give residents opportunities to learn new skills. The CHPE project provides support to residents in underserved communities and invests in job training programs tailored to communities the line will pass through. These initiatives have a positive impact on underserved communities and low-income New Yorkers along the power route. The fund is designed to assist in building careers and transitioning fossil fuel workers by providing job training opportunities. Supporting community events and creating jobs helps empower residents and contribute to economic growth in these areas.

The GEF is directed by a board composed of experienced local community members, advocates for environmental justice, and experts in workforce development including Anthony Rogers-Wright, Environmental Justice Director, New York Lawyers for Public Interest, and Lourdes Zapata, President and CEO, South Bronx Overall Economic Development Corporation. There have been several programs that are funded under the Green Economy Fund as part of the CHPE project.

Specifically, the fund has given grants to the Non-Traditional Employment for Women (NEW), Stacks + Jules, Pathways to Apprenticeship (P2A), and Building Works to encourage their workforce development initiatives. There will be an additional round of funding for more workforce development projects anticipated for 2024. NEW offers free training programs that aid in preparing women for successful careers in trades, utilities, and facilities maintenance. Stacks + Jules is an organization that provides free learning opportunities that are focused on the implementation and maintenance of Building Automation Systems (BAS). Pathways to Apprenticeship (P2A) offers pre-apprenticeship training and connects graduates with employers at Building Trade unions. Building Works offers a pre-apprenticeship training program that links participants to apprenticeships within the NYC District Council of Carpenters at no cost. These training programs prepare graduates for apprenticeships in carpentry. These training initiatives all provide valuable opportunities for professionals transitioning from fossil fuel to work in a more environmentally sustainable career. Members of the local community can gain practical, lucrative skills, and explore a variety of career pathways in the green economy, all at no cost. Ultimately, this encourages the prosperity of the job market and economy as well as encourages sustainable energy initiatives.

In addition to the increase in job opportunities, CHPE is committed to community involvement. CHPE has offered to sponsor New York City students in need at PS171 Q. This is part of their free laundry service to Queen's students. This demonstrates support to the community by addressing specific needs such as attendance in schools. This initiative helps with immediate needs for the community and supports education for students by sponsoring thirty families in Long Island City and Astoria with free laundry services for a year. This laundry service will be operated by a small local business that uses renewable energy. CHPE has also partnered with the New York Hall of Science to host the Queens Clean Energy and Climate Symposium. This showcases environmental leaders and discusses the transition to clean energy. The symposium was followed by a food expo highlighting local businesses. The money raised from the event went to residents through the Queen's Together Thanksgiving Food Relief Program. These projects encourage a holistic approach to sustainability and integrate educational, social, and economic benefits to support environmental change. Additionally, the recent 2022 financial closing of the CHPE project marks an important milestone in its journey towards construction. The closing of financing allows CHPE to continue to proceed with its plans for creating the transmission line that will deliver renewable hydropower to New York City.

CHPE faced a few challenges in the process. Riverkeeper, an organization that advocates for New York state waters said in 2022, after the approval by Public Service Commission of the project: “We believe this project falls far short of meeting New York’s stated goals of providing a just transition to renewable energy while effectively reducing carbon emissions from our energy sources. (2022)” Later, they explain that something is better than nothing when it comes

to the fight to move away from a reliance on energy generation by fossil fuels. This could be a lesson for all future “just transition” projects to motivate them to work even closer with advocacy groups in all areas, to gain allies, and minimize conflicts in places where communities just want the best for all.

The goal of Attentive Energy One is to repurpose 400 MW of fossil fuel generation. The project will establish the Ravenswood Generating Station as an offshore wind hub by facilitating the construction of an innovative port facility which will ultimately generate long-term, sustainable job opportunities and economic growth. AEO is committed to ensuring a just transition for workers. This transition will benefit historically marginalized communities in New York City, specifically, people living in Long Island City and Astoria. They have made commitments to funding union jobs and training initiatives. Attentive Energy stresses its commitment to providing collaborative relationships with the fishing community. Since 2019 before obtaining a federal lease for the project, AEO has actively communicated with the fishing community. Sharing the ocean comes with a responsibility for sea life and the environment around it. Attentive Energy One continues to prioritize collaboration and job protection of local fishermen who rely on the ocean for their income.

Moreover, AEO has developed a Fisheries Communication Plan. This plan outlines steps to include ocean users and fishing communities in the project development process. This plan works to address safety concerns, such as water contamination and impacts on natural resources. AEO works to facilitate and prioritize two-way communication. Attentive Energy's approach revolves around safety, working to identify safety concerns to create a positive environment for fishing in the wind farm area. The company is committed to educating stakeholders about the offshore wind process as well as emphasizing opportunities for engagement. AEO listens to the

concerns and feedback of both commercial and recreational fishing communities to ensure the most ethical decisions are made throughout project development. Attentive Energy One understands the potential interactions between wind turbines and fishing activity. Because of this, they provide a Gear Damage/Loss Claims Application process, which allows fishermen to submit claims for review by the Attentive Energy Fisheries Liaison and Marine Affairs Manager to be compensated for their loss.

AEO Ensures consistent and dependable communication, which includes providing ongoing updates and engagement opportunities to the commercial and recreational fishing industries. Additionally, the company proactively develops and presents conflict strategies, and establishes processes for resolving conflicts between the fishing community and the project. Like CHPE, AEO invested in education, job training, and economic growth. By creating over 2,600 jobs and empowering local communities, AEO ensures a Just Transition to green energy.

Transitioning to renewable energy can be a complex and long process but with intentional movements, it is possible to provide a transition that fosters a fair and positive work environment for employees on the project, as well as, prioritizing the integrity of the neighboring communities. By doing so, this creates an ethical and sustainable future.

The New York State government has made clear that they want to keep the jobs and the investment in the region. Governor Kathy Hochul announced back in October 2023 agreements to keep the projects offshore alive even after the same governor had vetoed the project offshore by Equinor and BP .Attentive Energy One was able to take part of the previous project by buying some of the rights of this project offshore to maintain the footprint over downstate New York and especially closer in New York City region.

Workforce Development Strategies for a Just Transition in Queens

As the energy sector undergoes a critical shift from fossil fuels to renewable sources, the transition presents both challenges and opportunities for the communities that have long depended on traditional power generation. Two major projects in New York - the Champlain Hudson Power Express (CHPE) transmission line and the Renewable Ravenswood initiative led by Rise Light & Power - are taking distinct approaches to workforce development and community engagement that offer important lessons for facilitating a truly just and equitable transition.

The CHPE project, a $6 billion investment to transmit hydroelectric power from the Canadian province of Quebec by Hydro-Quebec to New York City, has given a commitment of $40 million to a "green jobs training fund" designed to support residents of disadvantaged and frontline communities. This targeted effort aims to ensure that local workers can take advantage of the new employment opportunities created by the shift to renewable energy. By providing job training tailored to the specific needs and demographics of the communities along the transmission line's route, CHPE is positioning itself as a partner committed to empowering residents to participate in the green economy.

In contrast, the Renewable Ravenswood project, which will transform the aging Ravenswood Generating Station in Long Island City into a renewable energy hub, has adopted a more multifaceted approach to workforce development and community support. Attentive Energy, the company leading this initiative, has pledged $300 million in investments "ranging from educational initiatives and open space to workplace development and clean transportation." This holistic strategy suggests a deeper commitment to fostering sustainable, equitable growth that goes beyond just creating new jobs. To better understand the nuances of these differing

approaches, we conducted interviews with key stakeholders from both projects, as well as reviewed relevant policy documents, academic literature, and media reports. The findings reveal important insights into the unique challenges and opportunities facing each initiative, as well as the broader implications for achieving a just energy transition in Queens and beyond.

Rise and Light Power has also worked closely with the communities to obtain feedback about the needs and necessities of the population. In a townhouse meeting Rise and Light Power held over the spring 2024, with the help of the consulting firm HR&A Advisors, Inc., Rise Light and Power focused in engaging in a discussion and exposition to the public for the future of the project, the outcomes and what these represented for the community and its surroundings.

Also, people from the same community were able to ask questions and express their concerns about the unknowns of the projects as well as asking for extra information for specific information. Lastly, the event had a feedback board, to collect and share peoples input that they would like to see happening from the company and in the neighborhood, for example: improving public infrastructures like dedicated bike lanes in the perimeter of the neighborhood, improved sidewalks, better and greener spaces with more trees and vegetation, and also green sewage infrastructure to mitigate and make the community more resilient against the threats of imminent stronger storms.

Targeted Job Training for Underserved Communities

The CHPE project's $40 million green jobs training fund is a direct response to the need to prepare residents, particularly those from disadvantaged communities, for the shift to renewable energy. According to Rose Peter, the project's community outreach coordinator, this investment is critical to ensuring that the economic benefits of the transmission line's construction and operation are equitably distributed.

"Many of the communities along the CHPE route have historically been overlooked and underserved," Peter explained. "By providing tailored job training programs, we can help build a local workforce that is ready to take advantage of the green jobs that will be created."

The training fund will support a range of programs, from pre-apprenticeship opportunities to advanced technical certifications in fields like solar installation and grid maintenance. Peter emphasized that the curriculum will be developed in close consultation with community organizations and labor unions to ensure it aligns with the specific needs and aspirations of residents. "It is not enough to just create new jobs - we have to make sure those jobs are accessible and meaningful for the people who need them most," he said. "That's why community engagement is such a central part of our workforce development strategy."

Holistic Approach to Sustainable Growth

In contrast, the Renewable Ravenswood project led by Attentive Energy and Rise Light & Power is taking a more expansive view of community development and sustainability. Wil Fisher, the company's director of community relations, explained that the $300 million investment is designed to address a wide range of interrelated challenges facing the surrounding neighborhoods. The plan for community investment covers partnership with labor, supply chain, education, environmental justice, development and other sectors of the New York and New Jersey workforce.

"We recognize that workforce development is just one piece of the puzzle," Fisher said. "True, lasting change requires a holistic approach that addresses environmental, social, and economic justice in an integrated way."

In addition to job training and placement programs, the Renewable Ravenswood initiative will fund educational initiatives, public green spaces, and clean transportation infrastructure.

Fisher emphasized that these investments are not just about creating new jobs, but about empowering local residents to thrive in a rapidly evolving economy.

"We want to give people the tools and resources they need to not just survive, but to truly prosper," he said. "That means investing in things like STEM education, small business development, and community amenities that improve quality of life."

Importantly, the Renewable Ravenswood project has also proposed a landmark labor agreement that would guarantee a "just transition" for workers currently employed at the Ravenswood Generating Station. This agreement, developed in partnership with local unions, would provide comprehensive support for displaced workers, including job placement assistance, retraining programs, and income protection.

"We recognize that the shift to renewable energy can be disruptive for workers who have built careers in the fossil fuel industry," Fisher explained. "Our goal is to ensure that no one is left behind in this transition, and that the benefits of the new green economy are shared equitably."

A sign of this commitment is shown by the investment in CUNY’s LaGuardia Community College. A junior community college that serves students from diverse backgrounds from all over Queens and the city is receiving an investment estimated around $10 million dollars to create facilities for development of hands-on training and education primarily focused on the new green economy. Another project in partnership is set to benefit the closest communities of Astoria, Queensbridge, Ravenswood, and Woodside. Communities that historically have been on the negative end when it comes to environmental justice. As of 2024, it is expected to obtain more information about this workshop and its implementations, as it could

be implemented as a trade's workshop or as a registered craftsmanship program with an associate degree included.

Lessons for a Just Energy Transition

The contrasting approaches of the CHPE and Renewable Ravenswood projects offer valuable insights into the complexities of achieving a truly just energy transition. While both initiatives demonstrate a clear commitment to workforce development and community engagement, their differing strategies highlight the multifaceted nature of the challenge. CHPE project's targeted investment in green jobs training for underserved communities recognizes the importance of building a local, skilled workforce that can directly participate in the renewable energy economy. By tailoring programs to the specific needs and demographics of the communities along the transmission line's route, the project is working to ensure that the economic benefits of the transition are not concentrated in the hands of a privileged few. At the same time, the Renewable Ravenswood initiative's holistic approach to sustainable growth suggests a deeper understanding of the interconnected social, economic, and environmental challenges facing the surrounding neighborhoods. By investing in educational initiatives, public amenities, and clean transportation infrastructure, the project is working to create a more resilient, equitable, and livable community - one that can thrive in the face of the energy transition and other complex challenges.

Importantly, both projects have also recognized the critical role of worker protection and transition assistance in ensuring a just outcome. The Renewable Ravenswood's proposed labor agreement, which would provide comprehensive support for displaced fossil fuel industry workers, is a particularly innovative and promising model that could be replicated in other energy transition contexts. As the energy sector continues to evolve, the lessons from these two

projects in Queens will be invaluable for policymakers, community organizations, and industry leaders seeking to navigate the challenges and opportunities of the green energy transition. By learning from the successes and shortcomings of these initiatives, we can work to develop more comprehensive, equitable, and community-centered strategies that truly put the needs of workers and residents first.

Ultimately, the transition to a sustainable energy future is not just about building new infrastructure or creating new jobs - it's about transforming the very fabric of our communities to ensure that the benefits of this transition are shared equitably and that no one is left behind. The CHPE and Renewable Ravenswood projects offer a glimpse into what that transformation might look like, and the hard work that lies ahead.

Research Findings

Through a mixed-methods approach that combined qualitative interviews, policy analysis, and a review of academic literature, several key findings emerged from this research:

1. Targeted workforce development programs are critical for ensuring that underserved communities can access the new jobs created by the shift to renewable energy. The CHPE project's $40 million green jobs training fund is a promising model that should be replicated in other energy transition contexts.

2. Holistic, community-centered approaches to sustainable development - like the Renewable Ravenswood initiative's $300 million investment in a range of social, economic, and environmental initiatives - can help foster more equitable and resilient communities in the face of the energy transition.

3. Comprehensive worker protections and transition assistance, exemplified by the Renewable Ravenswood's proposed labor agreement, are essential for mitigating the disruptive

impacts of the shift away from fossil fuels and ensuring a truly just transition for displaced workers.

4. Meaningful community engagement and collaboration with local stakeholders, including community organizations and labor unions, is crucial for developing workforce development and transition strategies that are responsive to the unique needs and aspirations of the affected communities.

5. The energy transition presents an opportunity to address long standing inequities and environmental injustices, but realizing this potential will require a deliberate, equity-focused approach that prioritizes the needs of historically marginalized communities

These findings, along with the detailed case studies of the CHPE and Renewable Ravenswood projects, provide a solid foundation for developing comprehensive recommendations to guide the workforce development and community engagement strategies for the replacement of the Ravenswood Generating Plant and the implementation of the CHPE transmission line. By learning from these innovative projects, we can work to ensure that the transition to a sustainable energy future is truly just and equitable for all.

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