Job Market Impacts of Natural Gas - Policy Memo

1. Introduction:

This policy memo is presented to the City Council of Cambridge, Massachusetts to help inform decisions regarding natural gas infrastructure in new construction buildings in the city. This memo will convey the job market possibilities from electrification and a clean energy transition in Cambridge and highlight the opportunities for job creation. Investing in natural gas energy in any new construction building will commit the City of Cambridge to further reliance on fossil fuels and further delay the city from reaching their climate action goals. In order to reach carbon neutrality by 2050, any building with natural gas will need to be transitioned to electric energy therefore encouraging electrification from the onset will expedite the city's climate agenda. Protecting current gas workers and providing proper training and job security will be crucial in implementing electrification that services all concerned stakeholders. Additionally, to ensure a just transition for all communities, incorporating a commitment to job training and economic development support for those likely to be negatively impacted by an energy transition is key.

2. Research Question & Methodology

The goal of the following policy memo is to convey the job market growth opportunities of building electrification in Cambridge. Reducing reliance on natural gas and promoting electrification throughout the city's built environment would diminish greenhouse gas emissions associated with fossil fuel energy and push the city in the direction of carbon neutrality by 2050.[1] Data to inform this policy brief was compiled from environmental economic research, interviews with industry professionals, and a review of the published peer-reviewed literature. A keyword search was completed using a variety of peer-review journal databases, such as Web of Science and Science Direct, as well as citations collected from the author's 4 years of research in the field of natural gas energy. Keywords and papers were selected for their focus on the politics and economic impacts of electrification and energy transition at the municipal level. Additional data was collected through publicly available databases.

3. Key Findings

A transition to electrification and a clean energy economy is challenging to envision because of the variety of jobs that could be created as an outcome. An energy transition at the municipal level could be associated with dramatic job loss and an increase in unemployment. However, research has shown that a just energy transition can occur that maintains well-paying jobs, continues to provide for workers and their families, and promotes a healthy and sustainable energy future that is beneficial for all. The key findings from this research included two main takeaways: 1) how to incorporate and partner with the current gas infrastructure work force and related stakeholders in creating and implementing an energy transition plan that works for everyone, and 2) how to retrain workers and create new jobs to build and manage electrified infrastructure.

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[1] Cameron & van der Zwaan, 2015.

However, before diving into the literature of how an energy transition off of natural gas could take shape, it is important to review the state of the science on energy equality and just transition from areas around the world in the midst of transitioning their energy supply. Commonly, when imagining stakeholders who would be ill-affected by an energy transition, legacy workers from the fossil fuel industry come to mind. While those legacy workers would be adversely affected, it is important to realize that energy transition can also affect low-income communities and communities of color by worsening issues of energy insecurity and failing to educate and engage these disadvantaged groups in the transition process.[2] Scholars recognize that research on how to address these disparities is generally under-developed but for stakeholders and decision makers planning energy transitions, incorporating these disadvantaged communities will be integral in making any energy transition plan equitable.[3] A piece published in Nature argues that decision makers at the forefront of energy transition policies need to,

> work to redistribute welfare so as to avoid undue burden on any specific population and provide sufficient energy services to all, and… provide an adequate safety net for all populations, especially those most marginalized or burdened.[4]

Incorporating these themes of a just energy transition is important when considering the job market possibilities in a Cambridge energy transition plan.

3.1 Coordinating an energy transition plan

In partnership with the Natural Resources Defense Council (NRDC), a study out of the University of California highlighted the importance of protecting gas workers in a transition off of natural gas energy.[5] Important to remember when considering an electrification plan for the City of Cambridge is that such a transition does not occur overnight, meaning that for some current gas workers their job requirements will not change. Gas infrastructure projects will still occur and home service calls will require expert repair.

However, maintaining the gas infrastructure during a phase of electrification will not require the full force of the gas workers that exist today, meaning some workers will face a transition in their career. A major concern for governments considering an energy transition or electrification plan is backlash from displaced gas workers. Therefore, a robust municipal plan to transition off of gas must be created in collaboration with gas workers. This will not only ease the concerns of the gas workers but ensure that a transition plan will provide the job security and economic benefits workers deserve.

Key findings out of a report conducted in California, a state considering a gas ban and push towards electrification, found the following components to be essential to a comprehensive transition plan:

1. Establishment of a buyout program that could cover the costs of retirement systems for older workers
2. Establishment of a committee that could address how to best manage a shrinking gas workforce, while still safely maintaining any existing gas infrastructure throughout the transition period
3. Wage protection for transitioning workers

[2] Healy & Barry, 2017.
[3] Oppenheim, 2016.
[4] Carley & Konisky, 2020.
[5] Borgeson, 2019.

4. Provide funding and training/retraining for gas workers looking to transition to clean energy or electrification positions.[6]

Prioritizing communication with gas workers throughout the planning and implementation of an electrification and gas transition plan is crucial for maintaining job security and incorporating the existing skilled workforce into a clean energy workforce.[7] In addition to engaging with gas workers throughout the planning phase, stakeholder groups such as residents can help develop a transition plan tailored to tbe communities' specific needs. A recent study in Michigan found that when citizens and other stakeholders were involved in the planning process, they were more likely to perceive the positive benefits of energy transition, in this case wind turbine installation, than communities not at all included in the planning process.[8]

3.2 Job creation in the transition stage

A major component of electrification and energy transition at the municipal level will be creating jobs and retraining utility workers, often unionized labor, to provide well-paying career opportunities.[9] Researchers and non-profits are working to develop energy transition plans that not only serve the planet but also the work force required for such robust implementation. One such organization, based in Cambridge, MA, HEET (Home Energy Efficiency Team) has been researching the feasibility of a GeoMircoDistrict project.[10] The GeoMicroDistrict would replace aging natural gas distribution infrastructure with ground-source heat pumps that could service a small group of homes and businesses in a micro-district. Installation of the ground-source heat pumps may need specialized skills but all maintenance could easily be handled by the existing gas workers. Geothermal infrastructure carries water, not gas, under and through city streets to deliver heating and cooling services so a switch from natural gas to water maintenance would not only require minimal training but also promote a healthier and safer work environment.[11] [11]

Research from around the world suggests that a energy transition and shift towards renewable and more efficient low-carbon energy will lead to employment opportunities, ranging from manufacturing, construction, and installation to fuel extraction, supply, and transmission.[12] The U.S. Bureau of Labor Statistics recently reported that solar photovoltaic installers (51%) and wind turbine service technicians (61%) will be two of the three fastest growing occupations in the country in the coming decade, trailed only by nurse practitioners at 52% .[13]

To address concerns about achieving energy efficiency and transitions to renewable energy throughout marginalized communities, various programs from municipalities are developing. Some examples include Colorado's community solar program that reserved 5% of all projects for low-income residents,

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[6] Gridworks, 2019.
[7] Bayulgen, 2020.
[8] Mills et al. 2019.
[9] BuroHappold Engineering, HEET
[10] *Id.*
[11] *Id.*
[12] Carley & Konisky, 2020.
[13] US Bureau of Labor Statistics, 2020.

Community Energy Scotland which engages and educates affected communities during the community energy project development phase, and the community programs run by the Inclusive Financing for Energy Savings program which aims to provide financing and host sessions for community members and utilities to build demand for energy efficiency and/or renewable energy investments for their communities.[14,15,16]

4. Recommendations / Next Steps

While the job market implications of a clean energy transition take multiple forms, it is crucial to realize that a clean energy economy enables significant job creation, both directly and indirectly, and may produce more jobs per unit of installed capacity than fossil fuel based energy.[17] Additionally, in a report published by Environmental Entrepreneurs (E2), nationwide clean energy jobs outnumbered fossil fuel based jobs nearly 3:1 at the end of 2018.[18] These numbers are encouraging and demonstrate the job creation possibilities brought forward by a just transition to clean energy.

However, at the local scale, there are real and significant fears brought to light by gas workers and unions concerned about their futures were gas energy to be phased out. Therefore, incorporating these parties in the decision making process and ensuring security, retraining, and funding opportunities throughout the transition will be crucial to success. Implementing clean energy alternatives that utilize the existing skills of the gas workforce, such as the GeoMircoDistrict heating and cooling plan, will lower costs and time associated with retraining and could provide for healthier working conditions.[19] Additionally, ensuring an equitable and just energy transition across low-income and communities of color by engaging and educating these communities throughout the planning and implementation processes will be crucial to provide a healthier and more energy efficient city for all residents.

[14] CO Energy Office, 2020.
[15] Bomberg & McEwen, 2012.
[16] Carley & Konisky, 2020.
[17] Cameron & van der Zwaan, 2015.
[18] E2, 2019.
[19] BuroHappold Engineering, HEET

References

Bayulgen, O. 2020. Localizing the energy transition: Town-level political and socio-economic drivers of clean energy in the United States. Energy Research & Social Science 62:101376.

Bomberg, E., N. McEwen. 2012. Mobilizing community energy. Energy Policy 51:435-444.

Borgeson, M. 2019. Protecting workers and communities requires gas planning. Natural Resources Defense Council. Last updated: September 19, 2019. URL: https://www.nrdc.org/experts/merrian-borgeson/protecting-workers-and-communities-requires-gas-planning accessed: September 3, 2020.

BuroHappold Engineering. Geo Mirco District Feasibility Study. HEET MA. URL: https://heetma.org/wp-content/uploads/2019/11/HEET-BH-GeoMicroDistrict-Final-Report-v2.pdf accessed: September 3, 2020.

Cameron, L., B. van der Zwaan. 2015. Employment factors for wind and solar energy technologies: A literature review. Renewable and Sustainable Energy Reviews 45:160-172.

Carley, S., D.M. Konisky. 2020. The justice and equity implications of the clean energy transition. Nature Energy. Last updated: June 12, 2020. URL: https://www.nature.com/articles/s41560-020-0641-6 accessed: September 3, 2020.

Colorado Energy Office. 2020. Community Solar. Last updated: 2020. URL: https://energyoffice.colorado.gov/community-solar accessed: September 8, 2020.

E2. 2019. Clean Jobs America 2019. E2. Last updated: March 13, 2019. URL: https://e2.org/reports/clean-jobs-america-2019/ accessed: September 3, 2020.

Gridworks. 2019. California's Gas System in Transition. Last updated: September, 2019. URL: https://gridworks.org/wp-content/uploads/2019/09/CA_Gas_System_in_Transition.pdf accessed: September 3, 2020.

Healy, N., J. Barry. 2017. Politicizing energy justice and energy system transitions: Fossil fuel development and a "just transition". Energy Policy 108:451-459.

Mills S., D. Bessette, H. Smith. 2019. Exploring landowners post-construction changes in perceptions of wind energy in Michigan. Land Use Policy 82:754-762.

Oppenheim, J. 2016. The United States regulatory compact and energy poverty. Energy Resources & Social Science. 18:96-108.

United States Bureau of Labor Statistics. 2020. Occupational Outlook Handbook. Fastest Growing Occupations. Last updated: September 1, 2020. https://www.bls.gov/ooh/fastest-growing.htm accessed September 8, 2020.