Natural Gas Policy and Public Health in Connecticut
A Yale Center on Climate Change and Health Issue Brief

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Introduction

Natural gas—also called fracked gas or fossil gas—is a fossil fuel composed principally of methane, a climate-warming greenhouse gas.[1] Like all fossil fuels, when natural gas is burned for energy, it releases carbon dioxide—another greenhouse gas.[2] Throughout its life cycle, natural gas causes adverse health effects by contributing to the heat waves, extreme weather events, shifting ecosystems, and reduced agricultural productivity associated with global climate change.[3] Additionally, toxic pollutants are released into the environment throughout the natural gas life cycle, leading to adverse health effects such as premature mortality, increased cancer risk, respiratory diseases, and cardiovascular effects.[1]

In 2018, 41% of total energy-related carbon dioxide emissions in Connecticut were attributable to natural gas.[4] More than half of the natural gas used in Connecticut is burned to produce electric power;[5] natural gas is also commonly used to heat buildings and fuel in-home appliances such as gas stoves. Connecticut has established statewide mandates to reduce emissions of greenhouse gases over the next thirty years.[6] This means that the state must reduce consumption of fossil fuels like natural gas that emit these climate-warming pollutants. However, natural gas consumption has *increased* in recent years, even as the consumption of other fossil fuels has decreased.[1] For example, the total amount of petroleum (another fossil fuel) consumed in the residential, commercial, industrial, and transportation sectors in Connecticut decreased by 27.5% in 2018 from a peak in 2004.[7] On the other hand, natural gas consumption in these sectors *increased* by 37.4% during the same period.[7] These differences have been driven by past false claims that natural gas is a "clean" fuel option to "bridge" between fossil fuels and renewables,[1] by specific incentive programs in Connecticut such as an ongoing natural gas expansion program, and by favorable pricing.

In light of the negative public health impacts of natural gas and the statewide emissions reduction requirements, public policy in Connecticut should drive the elimination of natural gas use as quickly as possible. The same communities that are hit first and worst by climate-exacerbated events—low-income households and communities of color—also experience disproportionate exposure to pollution from the fossil fuel system. Therefore, environmental justice must be a top priority of Connecticut's energy policy changes, to ensure health equity and equal access to clean alternatives to fossil fuels. We recommend the following actions to achieve these goals:

- **Under the next Conservation and Load Management Plan, expand equitable incentives and funding for building retrofits to achieve electrification of end uses**
- **Establish a sunset date for natural gas hookups in new construction**
- **Eliminate the utility rate mechanisms that support the natural gas expansion program, and end the program by the end of its 10-year period, if not sooner**
- **Advocate for the reform of ISO-New England's administration of wholesale electricity markets to enable grid-scale procurement of clean energy resources**
- **Enact a statute requiring 100% zero carbon electric supply and generation by 2035**
- **Enact a statute banning the construction of new fossil fuel electric power plants, including natural gas power plants**

What sectors and policies will drive the elimination of natural gas use?

CROSS-SECTOR EMISSIONS REDUCTION TARGETS

The 2008 Global Warming Solutions Act mandates a statewide 45% reduction in greenhouse gas emissions below 2001 levels by 2030 and upholds the pre-existing target of an 80% reduction by 2050.[6] However, the Intergovernmental Panel on Climate Change has concluded that only by rapidly reducing emissions within this decade, and by achieving net zero emissions by 2050, will the global community be able to avoid potentially catastrophic climate change that would occur if the world exceeds 1.5 °C of warming.[3] Therefore, Connecticut's goal of 80% emissions reduction by 2050 is not ambitious

enough to sufficiently protect public health; instead, 100% carbon neutrality should be reached by 2050 at the latest. Additional interim goals also are needed to ensure accountability.

Achieving these targets will require an immediate transition away from all fossil fuels, including natural gas, in all sectors.[8] To reach the existing targets, the Connecticut Governor's Council on Climate Change (GC3) recommends emissions reductions of 34%, 29%, and 71% in the building, transportation, and electric power sectors, respectively, by 2030 (FIGURE 1).[8] Very little natural gas is used in the transportation sector, which is dominated by petroleum.[5] Therefore, this brief focuses on the buildings sector (commercial and residential) and the electric power sector, since most natural gas used in the state is consumed in these two sectors.[5]

The decarbonization of the electric power sector (i.e., switching from fossil fuels to renewable or other zero carbon energy sources) will serve as the foundation for achieving statewide greenhouse gas emissions reductions. First, electric power itself currently accounts for about one-fifth of the state's energy-related carbon dioxide emissions.[4] Second, decarbonization of the building and transportation sectors will require electrification of these sectors, which will increase the demand for electricity. It will be crucial to coordinate decarbonization of electric power and electrification of buildings and transportation, along with measures to improve energy efficiency. Otherwise, the state runs the risk of increased reliance on electric power plants that are powered by fossil fuels before enough grid-scale zero carbon electricity is available to meet the increasing demand. Prolonged reliance on fossil fuels would also perpetuate environmental injustices that impact communities throughout the fuel life cycle.

BUILDINGS SECTOR POLICIES

Connecticut needs solutions that will enable total phase-out of natural gas use (as well as the use of other fossil fuels) in all sectors. As a complement to these long-term solutions, it will be important to ensure that the *minimum* amount of natural gas is used while we transition to a clean energy economy. Demand reduction programs, which include a range of strategies to decrease energy consumption in homes and businesses, are a tool for achieving this goal in the buildings sector, because they

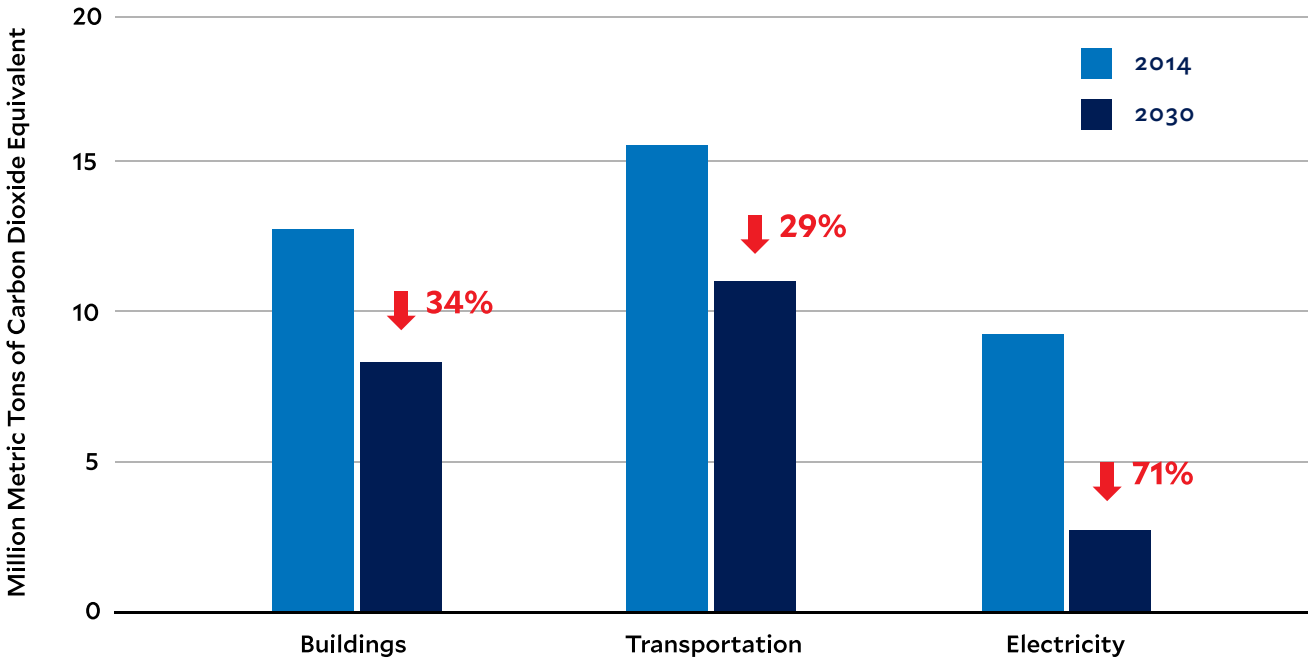

FIGURE 1: Emissions Reduction Targets Compared to 2014 Emissions Levels, by Sector. (Source: 8)

decrease the amount of natural gas (and other fossil fuels) used to meet energy needs.

Energy efficiency and demand response are the two most important demand reduction strategies. Energy efficiency programs aim to reduce overall energy demand by modifying or installing equipment and appliances that use less energy to provide the same services. Energy efficiency strategies include appliance recycling and replacement; home or building retrofits; installation of efficient heating, ventilation, and air conditioning (HVAC) equipment; installation of efficient lighting; and learning thermostats.[9,10] Demand response programs aim to decrease electric power use during times of very high system demand or emergencies, with strategies such as time-based rates and direct load control.[9,11] These demand reduction strategies effectively reduce overall consumption of natural gas and other fossil fuels because the least-efficient electric power plants are turned on only during these times. Reducing peak demand avoids utilizing electric generation infrastructure that burns fossil fuels less efficiently.

Connecticut's electric and natural gas utilities deliver energy efficiency and demand response programs, funded by monthly charges on utility bills, to Connecticut's businesses, municipalities, and residents.[12] Additional funds for energy efficiency programs come from revenue of the state's CO_2 Budget Trading Program, under the Regional Greenhouse Gas Initiative.[13] By reducing the use of natural gas and other resources, energy demand reduction also reduces toxic and climate-warming pollutants.[14] Furthermore, energy demand reduction will make it more feasible and affordable to quickly meet statewide energy needs with the development of new grid-scale and distributed zero carbon power supply and energy storage infrastructure.

ELECTRIC POWER SECTOR POLICIES

Connecticut's 2020 energy planning processes established that a target of 100% zero carbon electricity supply by 2040 is feasible and necessary.[15] This target was proposed to the General Assembly in 2021.[16] Currently, the Connecticut Department of Energy and Environmental Protection (DEEP) evaluates progress towards emissions reduction goals exclusively from the perspective of supply. This means that any electricity generated from clean energy resources outside of the state, which is supplied to Connecticut consumers, *will* be accounted for in the emissions evaluation process. On the other hand, any electricity generated from fossil fuels within the state, which is transmitted to consumers outside of Connecticut, will *not* be counted as making a contribution to the state's greenhouse gas emissions. Electric power plants in Connecticut produce more electricity than is needed to provide adequate supply to the state's residents and export the excess power to other states.[15] Therefore, an emissions accounting strategy that only considers consumption, and not all generation, misses a significant amount of emissions generated by electric power plants located in Connecticut.

Connecticut deregulated its electricity sector in 1998.[15] As a result, a regional not-for-profit corporation called Independent System Operator-New England (ISO-NE) ensures the safety and reliability of the electric system, and it coordinates the supply of electricity to Connecticut, along with the rest of the states in the region—Rhode Island, Massachusetts, Vermont, New Hampshire, and Maine.[17,18] The policies and market structure of the electric system administered by ISO-NE play a significant role in determining the feasibility and affordability of meeting the 2040 target.

Every year, ISO-NE administers an auction to procure electricity from available supply resources.[15] Suppliers with the *lowest-priced* offers in the auction are selected to provide electric capacity to the regional grid, regardless of fuel type, technology, or emissions.[15,19] Therefore, Connecticut and the other New England states are limited in their ability to choose preferred, clean sources of electricity generation.[15] Fossil fuel suppliers are often able to offer lower-priced bids in the auction because the market is structured to favor resources with low fixed costs and high variable costs, like natural gas generation.[15] Renewable resources, on the other hand, generally have high fixed costs and very low variable costs, and therefore must bid at higher prices in the auction. Additionally, an auction rule called the Minimum Offer Price Rule requires that all

auction bids reflect the full cost of the infrastructure needed to produce the electric capacity.[15] Effectively, this is a further barrier to regional clean energy procurement because many clean energy suppliers receive state-sponsored contracts, subsidies, and incentives to cover capital costs.[15] These suppliers would be more cost-competitive with fossil fuel suppliers if they could offer bids that cover only the remaining costs not yet covered by other funding sources.

The cost of the electricity-generation capacity purchased through the auction is paid for by electric distribution companies and competitive electric suppliers in each state, in proportion to the state's share of total capacity.[19] Unfortunately, when clean energy resources are procured outside of the regional process, in accordance with state-level public policy mandates to reduce greenhouse gas emissions, electric utility customers have to "pay twice" for electricity supply: once for the natural gas (or other fossil fuel)-powered electric capacity procured in the regional auction, and once for the state-procured clean energy that replaces it.[15]

Additionally, ISO-NE has the power to support the construction of new fossil fuel-powered electricity generation facilities exclusively through funding from regional tariffs. This is the case for 1,300 MW of fossil fuel-powered generating units that have been constructed in Connecticut since 1998, and an additional 650 MW of generation infrastructure that has been proposed but not yet constructed.[15] For context, there are 54 large fossil fuel-powered generating units operating in Connecticut (the majority of which use natural gas as the primary fuel source), comprising 6,937 MW of aggregate capacity.[15] Of the electricity produced, Connecticut consumes only 73%; the rest is exported to other states.[15]

What does this mean for our health?

The Intergovernmental Panel on Climate Change concluded that carbon dioxide emissions from human activities must reach net zero by 2050 in order to avoid overshoot of 1.5 °C of warming—a benchmark that is projected to significantly increase climate-related risks to health, livelihoods, food security, water supply, human security, and economic growth.[3] Greenhouse gas emissions from fossil fuel use are the main driver of climate change. As a result, the expansion of natural gas use in Connecticut contributes to a range of climate change impacts that have adverse health effects globally. In Connecticut, health concerns stemming from climate change include increased illness and death due to more frequent and/or intense heat waves, hurricanes, floods, and droughts; increased transmission and spread of infectious diseases by mosquitoes and ticks; diminished air quality; adverse mental health impacts caused by climate disruptions; reduced agricultural productivity and soil health; increased water insecurity due to drought; and disproportionate impacts on the state's poorest and most vulnerable populations.[8,20,21]

In addition to greenhouse gases, other toxic pollutants are emitted across the natural gas life cycle from extraction, to processing and transport, to combustion.[2] These toxic pollutants cause a wide range of adverse health impacts, and are often disproportionately released in low-income communities and communities of color. FIGURE 2 summarizes the risks that occur throughout the natural gas life cycle.

Connecticut does not have any fossil fuel reserves of its own and therefore relies on natural gas resources and extraction operations in other states.[5] Three interstate natural gas pipelines cross Connecticut and support essentially all of the region's natural-gas-fired electricity generation, and there are five compressor stations in Connecticut.[15,30] Twenty-five of the operating electric power plants in Connecticut use natural gas as the primary fuel, and an additional four operating oil-fired power plants use natural gas as a secondary fuel.[31] Therefore, the toxic exposures associated with compression, transmission, and combustion of natural gas, in particular, pose direct health risks to Connecticut residents.

CARCINOGENS

Benzene, formaldehyde, and other volatile organic chemicals are commonly released into the environment or indoor air when natural gas is used.[25,26,32] Benzene, emit-

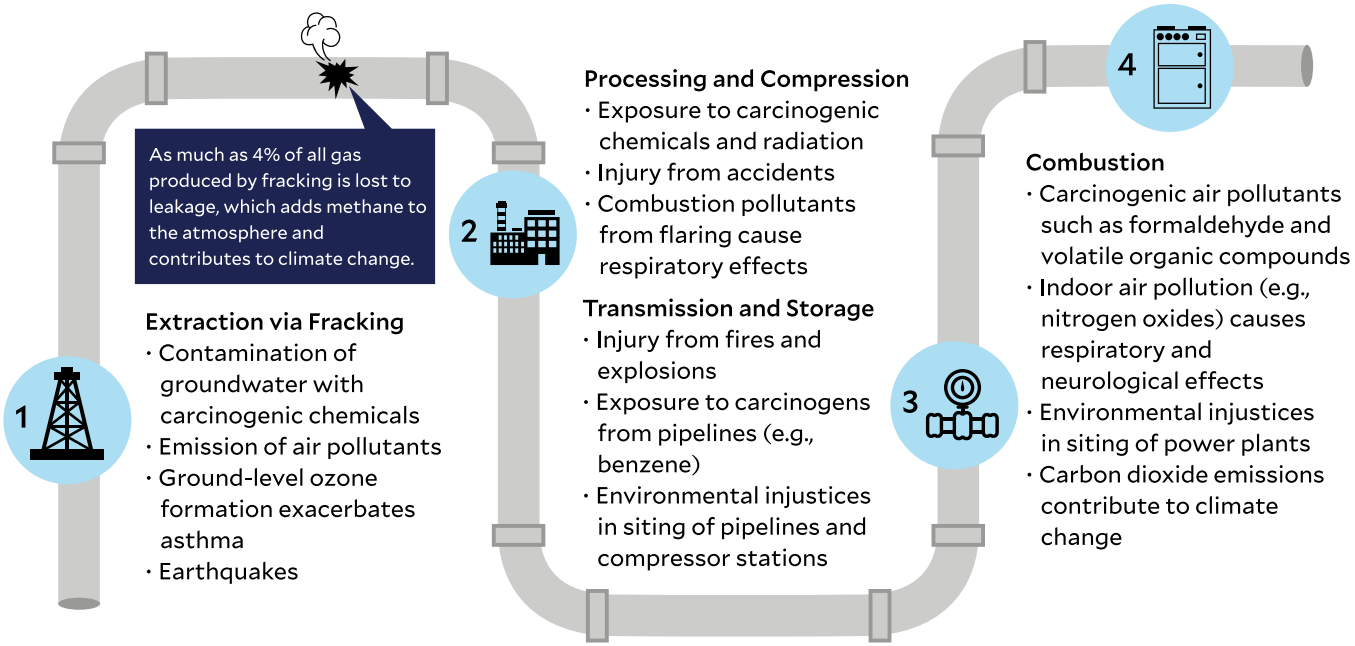

FIGURE 2: Adverse Health Impacts of the Natural Gas Life Cycle. (Sources: 1–2, 22–29)

ted from gas wells, production tanks, compressors, and pipelines, is a carcinogen also linked to serious respiratory outcomes in infants and children, including pulmonary infections in newborns.[25,32] Formaldehyde, also a known carcinogen, is commonly produced during the combustion of natural gas, such as in gas cookstoves.[26,28] The rate at which volatile organic compounds are produced during the combustion of natural gas depends on the combustion efficiency of the boiler or furnace.[33] Generally, human exposure to volatile organic compounds is associated with effects ranging from cancer, to kidney and liver damage, to memory impairment.[34]

NITROGEN OXIDES

Nitrogen oxides form during the combustion of natural gas.[28] These compounds are emitted from electric power plants, home heating furnaces, gas stoves, and any other end use that burns natural gas for energy. Human exposure to nitrogen oxides is associated with respiratory effects, cardiovascular effects, and mortality.[28] The risk of these adverse outcomes is especially high in indoor environments when air quality is compromised by emissions from appliances such as cookstoves that burn natural gas.[28]

OZONE

Ground-level ozone, or "smog," forms from a chemical reaction between nitrogen oxides and volatile organic compounds, catalyzed by sunlight and heat. Not only do nitrogen oxides and volatile organic compounds from natural gas operations contribute to ozone formation, but leaked methane gas (itself a volatile organic compound), also contributes. Studies show that exposure to ground-level ozone is associated with worsened asthma, increased emergency room visits, more hospital admissions, and greater mortality rates.[2] In a 2016 study, the Clean Air Task Force estimated that over 750,000 asthma attacks for children and over 500,000 lost school days during the summer ozone season in the U.S. could be attributed to natural gas emissions.[35]

INJURY

At fracking sites, along natural gas pipelines, and at natural gas-powered electric power plants, explosions can cause injury and death.[1] For example, in 2010, six workers were fatally injured from an explosion at the Kleen Energy natural gas plant in Middletown, Connecticut.[36]

HOUSEHOLD ENERGY AFFORDABILITY

In 2017, the average low-income household in Connecticut had an annual energy expenditure that was $1,400 more than the affordable level (defined as 6% of median annual income).[37] Unaffordable household energy costs can lead to multiple adverse health effects. To save money, residents may operate their homes at unhealthy temperatures or shut off ventilation systems,[37] increasing the risk of heat stress, hypothermia, respiratory disease, cardiovascular illness, and mental disorders.[38,39] To mitigate health disparities along socioeconomic lines, energy affordability must be a primary consideration in establishing policies to eliminate the use of natural gas in Connecticut.

Who is most at risk in Connecticut?

Young children, people with asthma, and people with heart or lung disease are especially vulnerable to the toxic effects of combustion pollutants.[27] Factors linked to low socioeconomic status can result in increased exposure to indoor air pollution produced by natural gas-powered water heaters, stoves, ovens, furnaces, and other indoor heating devices.[28] Those factors include: the presence of old and unmaintained appliances, small home size and overcrowding, and challenges faced by renters to control appliance choices or afford maintenance.[40] These issues can compound the disproportionate cumulative health and environmental injustices faced by populations of low socioeconomic status, leading to widening disparities in health along socioeconomic lines.[40]

Connecticut's energy efficiency programs include opportunities with no income eligibility requirements, and a complementary set of opportunities targeted to low-income households.[41,42] Past investments suggest that, among low-income households, gas-powered energy efficiency replacements are more common than electric energy efficiency replacements.[43] This raises the concern that these households will face a greater burden of negative health impacts from in-home natural gas use.

Additional health, safety, and legal barriers—such as asbestos, lead, gas leaks, and mold—may prevent homeowners from being permitted to complete home energy audits and from pursuing full weatherization, an important energy efficiency strategy.[44] Furthermore, building owners have access to energy efficiency incentives but may have little motivation to take advantage of them since the renters pay the energy bills.[37] Because of these barriers, low-income renters may be among the most impacted by high energy cost burdens or adverse indoor air quality from inefficient systems powered by natural gas.[37]

Twenty-three of the 54 large fossil fuel-powered electric power plants operating in Connecticut are located in environmental justice communities.[15] These are census block groups for which 30% or more of the population consists of low income persons, and/or areas of high unemployment and poverty, aging housing stock, and low or declining rates of growth in job creation, population and per capita income.[45] Exposures to toxic emissions from the combustion of fossil fuels, mainly natural gas, increase the risk of widening health disparities in communities that are characterized by socioeconomic vulnerability and often impacted by environmental racism.

Recommendations

1 **Under the next Conservation and Load Management Plan, expand equitable incentives and funding for building retrofits to achieve electrification of end uses**[a]

To meet the state's greenhouse gas emissions reduction goals, even *efficient* appliances powered by natural gas must be replaced by electric alternatives as the amount of clean energy on the electric grid increases. This coordination between the decarbonization of electric power and the electrification of buildings is critical for ensuring that fossil fuel use is minimized in all sectors, even as demand

a Aligns with Recommendation 3 from *The Air Quality Health Benefits of Climate Action in Connecticut: A Yale Center on Climate Change and Health Issue Brief*

for electricity increases. Additional efforts to educate the public and incentivize action are also essential to the success of energy efficiency and electrification programs.

Heat pumps are an electric, energy-efficient alternative to furnaces, air conditioners, and water heaters.[46] Connecticut utilities have increased consumer rebates to incentivize heat pump installations as part of a pilot program under the most recent Conservation and Load Management Plan.[12] This program specifically targets oil and propane heating consumers with extra incentives in addition to those that are available to all consumers.[12] By targeting households with the oldest, least-efficient, and most-polluting heating appliances with incentives to install electric heat pumps, the pilot contributes to air quality improvements and greenhouse gas emissions reductions. Additionally, this program plays an important role in increasing the proportion of end uses that are powered by electricity.

In the 2022–2024 Conservation and Load Management Plan, this program should be renewed and expanded to serve significantly more households, including natural gas customers. Doing so will provide multiple health benefits and will serve as an important tool for eliminating natural gas use. In the past two years, Vermont and Maine have established rebate and incentive programs for heat pump installations, with special opportunities available for low-income households.[47,48] Connecticut should follow this example by expanding its pilot program.

In addition, during the ongoing Conservation and Load Management planning process, DEEP should look into other opportunities to implement financial incentives that make electric appliances accessible to communities of all income levels. Incentive programs must include outreach to low-income communities about retrofits, as well as training opportunities for installers. Furthermore, the state currently does not include natural gas cooking appliances in any of its residential energy incentive programs. All cookstoves must be converted to electricity in order to fully transition away from natural gas in the buildings sector and to achieve the public health benefits from improved indoor air quality. As a result, DEEP should establish programs and funding sources with the specific aim of installing efficient, all-electric cooking appliances.

Affordability may pose a barrier to electrification of energy end uses. For example, a study of the economic feasibility of heating electrification of buildings in Rhode Island, a state with similar demographic and geographic characteristics to Connecticut, found that electric heat pumps are generally more cost-effective and reduce carbon emissions, *except* in the scenario where they are replacing existing natural gas systems.[49] Specifically, the study notes that "leaky homes" require high electricity usage to run heat pumps, which reduces their cost-effectiveness.[49] This demonstrates the critical importance of accessible weatherization programs—to address the "leaky home" problem—in coordination with opportunities to install electric appliances such as heat pumps.

When weatherized homes are retrofitted with an electric heat pump, the equipment cost may be reduced, if a smaller unit is sufficient to heat or cool the amount of space that would have required a larger, more expensive unit in a non-weatherized home. Additionally, the cost to operate the heat pump over time will be reduced because weatherization ensures that the electric power will be used more efficiently. Support from the federally-funded Low Income Home Energy Assistance Program, Connecticut weatherization programs, and other targeted subsidies, as well as low-cost financing from the Connecticut Green Bank, are required to assure that switching from natural gas and other fossil fuels in buildings to cleaner, electric end uses does not result in greater annual household energy costs and associated adverse health effects for low-income households.

2 Establish a sunset date for natural gas hookups in new construction

Many cities across the country have set a "sunset date" for natural gas hookups in new buildings. For example, in New York City, this mandate is planned to go into effect by 2030 at the latest.[50] Berkeley, California and Seattle, Washington have also passed similar measures.[51,52] Connecticut should establish a mandated phase-out date for natural gas hookups in new construction across the

state. The Department of Administrative Services, which establishes the state building code,[53] should amend the code to mandate electric-only new construction. This action would provide health benefits of air quality improvements and greenhouse gas emissions reductions associated with reduced natural gas consumption. It would also advance the imperative of phasing out natural gas in favor of electrification in a cost-effective way: installing electric appliances in newly constructed buildings is more cost-effective than installing natural gas hookups and then retrofitting five or ten years later to achieve complete electrification.[49]

3 Eliminate the utility rate mechanism that supports the natural gas expansion program, and end the program by the end of its 10-year period, if not sooner

The Public Utilities Regulatory Authority (PURA) reviews and approves the natural gas utilities' 10-year plan for expanding the gas distribution network to buildings in Connecticut.[54,55] The plan was originally approved by PURA in 2013, and each year since then, PURA has re-approved the system expansion reconciliation mechanism —a rate charged to natural gas customers to recover the costs of expansion.[55] PURA should begin phasing down the rate mechanism, as well as the overall expansion plan immediately, such that they end in 2023.

PURA should take these actions because the natural gas expansion plan is inconsistent with the state's public policy objectives of energy efficiency and carbon reduction. As emphasized in Recommendation 2, installing electric appliances in newly constructed buildings is more cost efficient than converting from natural gas to electricity later on. If the expansion plan is allowed to continue, it will ultimately cost the state more to achieve complete building electrification, which is necessary to reach long-term emissions reduction goals. The adverse health impacts of natural gas use in the buildings sector further reduce its cost efficiency relative to electric alternatives. Health risks of exposure to combustion pollutants in indoor air include cardiovascular and respiratory diseases, neurological effects, and cancer.[28]

Instead of a rate charged to customers to support natural gas expansion, PURA should establish a rate to fund the installation of electric stoves and heat pumps (see Recommendation 1). This funding can mitigate the cost barriers to electrification, support the health of individuals in low-income households, and further drive the elimination of natural gas use in Connecticut.

4 Advocate for the reform of ISO-New England's administration of wholesale electricity markets to enable grid-scale procurement of clean energy resources

All six New England states have adopted economy-wide greenhouse gas emissions reduction targets of at least 80% by 2050.[56] Furthermore, the states are unified in advocating for greater regional coordination toward clean energy goals, including electric capacity market reform.[57] This unity is reflected in joint statements from the governors and the vision statement developed by the New England States Committee on Electricity.[57,58]

Despite this, ISO-NE's policies and market structure favor natural gas generation in theory and in practice. Over the past 20 years, the proportion of electricity generation powered by natural gas on the ISO-NE grid has increased from less than 20% to more than 50%.[59] Moreover, ISO-NE's projected electric capacity procurements for the next ten years do not reflect a decrease in the amount of electricity generated from natural gas.[60] Wholesale markets need to be redesigned to allow fair competition by zero carbon renewable resources, to support the decarbonization mandates of New England states, to accommodate contracts for clean energy resources, and to incorporate direct state involvement in market design and implementation.[57] Furthermore, procurements and transmission planning must ensure that whatever fossil-fueled power generation remains operating in Connecticut (and all of New England) is the minimum needed to maintain reliability on the state's and the region's path to decarbonization.[15]

In the vision statement of the New England States Committee on Electricity, ISO-NE is recognized as the entity ultimately responsible, subject to stakeholder feedback and federal approval, for determining resource adequacy and system planning and operation requirements for the region.[57] Therefore, ISO-NE is also the entity that the Committee holds ultimately responsible for developing new market frameworks, transmission system plans, and stakeholder processes that will allow for a clean energy transition at the regional level.[57] DEEP has criticized the role that ISO-NE has played in making regional grid decarbonization more difficult and more costly for Connecticut residents.[61] Connecticut policymakers and regulators should continue to advocate for reforms in the management of the regional energy supply, in coordination with colleagues from other states in the region. The implementation of the New England States Committee on Electricity's recommendations will be critical for Connecticut to achieve cost-effective elimination of the use of natural gas.

5 Enact a statute requiring 100% zero carbon electric supply and generation by 2035[b]

Connecticut's current approach to emissions accounting considers only the emissions produced by the generation of electricity that is *supplied* to customers in Connecticut, rather than including the emissions from electricity generated in Connecticut and exported to customers in other states.[15] The state's emissions reduction targets must encompass the elimination of all natural gas use in the state, not just in natural gas-fueled electricity that is supplied to Connecticut residents. For this, generation-based accounting must be incorporated into emissions targets.

Connecticut's failure to apply generation-based accounting for emissions from electric power plants not only permits these facilities to emit greenhouse gases if they export their electricity to consumers outside of the state, but it also actually *encourages* the development of fossil fuel electricity generating units in the state. Since 2017, an in-state cap on carbon emissions from power plants that Massachusetts applies within its borders has contributed to making Connecticut a comparably lower-cost location for operating new and existing fossil-fueled generation.[15] The cumulative air quality impacts of such facilities lead to environmental injustices when comparing Connecticut to other states in the region. Furthermore, if these trends continue and more natural gas power plants are constructed in Connecticut, then there is a risk that they will be sited in environmental justice communities and lead to disproportionate toxic exposures and adverse health effects.

In March 2021, the Biden administration announced a nation-wide target of zero carbon electricity by 2035 within the proposed American Jobs Plan.[62,63] Connecticut should align its electricity sector decarbonization goals with the Biden administration's by committing to zero carbon electricity supply *and generation* by 2035, rather than 2040, with shorter-term interim goals included as well to ensure accountability. These enforceable targets should be required under state law.

6 Enact a statute banning the construction of new fossil fuel power plants, including natural gas power plants[b]

Connecticut should aim to achieve a 100% zero carbon electric sector by 2035 or sooner. Furthermore, the state should prioritize environmental justice by accounting for emissions from electric generation, as well as supply (see Recommendation 5). To achieve these goals, the construction of new fossil fuel power plants, including natural gas power plants, should be prohibited. This can be achieved through legislation in the Connecticut General Assembly. Massachusetts' action to cap in-state carbon emissions from power plants pushes that state towards 100% zero carbon electricity generation. Connecticut should go further than its neighbor and lead the region on greenhouse gas emissions reductions planning in the electric power sector by fully banning the construction of any new fossil fuel power plants within the state.

b Aligns with Recommendation 6 from *The Air Quality Health Benefits of Climate Action in Connecticut: A Yale Center on Climate Change and Health Issue Brief*

About the Yale Center on Climate Change and Health

The Yale Center on Climate Change and Health utilizes research, education, and public health practice to help safeguard the health of human populations from adverse impacts of climate change and human activities that cause climate change. To protect health, we work with academic, government, and civil society partners to utilize science to contribute toward sharply reducing greenhouse gas emissions and building resilience to the climate change impacts that continue to occur. We aim to make local, national, and international impact and to integrate social justice into all of our work.

This report is a product of the **YCCCH Program on Climate Change and Health in Connecticut**. The Program launched in September 2020 with the release of *Climate Change and Health in Connecticut: 2020 Report*, which tracks 19 indicators on climate change and health in Connecticut across four domains: temperature, extreme events, infectious diseases, and air quality. The Program publishes issue briefs and reports on topics of climate change, public health, and equity in Connecticut, so as to provide analysis and policy recommendations that inform decision makers, health professionals, advocates, and residents.

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More information about YCCCH and the Program on Climate Change and Health in Connecticut can be found at

https://publichealth.yale.edu/climate

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ENDNOTES: NEXT PAGE

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