OHIO HOME BUILDERS ASSOCIATION, INC.

To: Members of the House Energy and Natural Resources Committee

From: Vince Squillace, Executive Vice President OHBA Testimony

Date: March 24, 2021

Re: *Proponent Testimony HB 201*

Chairman Stephens, Vice Chair Stewart, Ranking Member Weinstein, and Members of the House Energy and Natural Resources Committee, thank you for allowing me to provide proponent testimony for HB 201 on behalf of the Ohio Home Builders Association. With all due respect, we do not feel the transmission and use of a particular fuel is an issue of municipal concern. In all likelihood, the vast majority of homes in Ohio have furnaces and water heaters which use natural gas or propane as the power source.

Builders across Ohio all agree most consumers choose natural gas to power furnaces and water heaters. I am not aware of any builders who offer only electric as the main power source.

I would like to share some interesting history with gas moratoria in Ohio. For a number of years new gas taps were prohibited in the late 70's and early 80's due to a major under preparedness by a large gas utility to meet heating needs due to severe weather. The governor asked for prayers, as during a stretch of near zero temperatures furnaces may not have been able to provide heat through the night.

Such an event was justification for the PUCO to impose the moratoria.

As a result of the moratoria, homes constructed for a period of years were forced to use electric. Many problems were faced by those all-electric homes, and when the moratoria was lifted just about all converted to gas once the gas mains were lain.

The legislature enacted new mandates requiring gas utilities properly prepare for unforeseen weather conditions and assure adequate supply of gas. Much has

changed through the years with energy use and equipment. Natural gas remains the choice of most consumers.

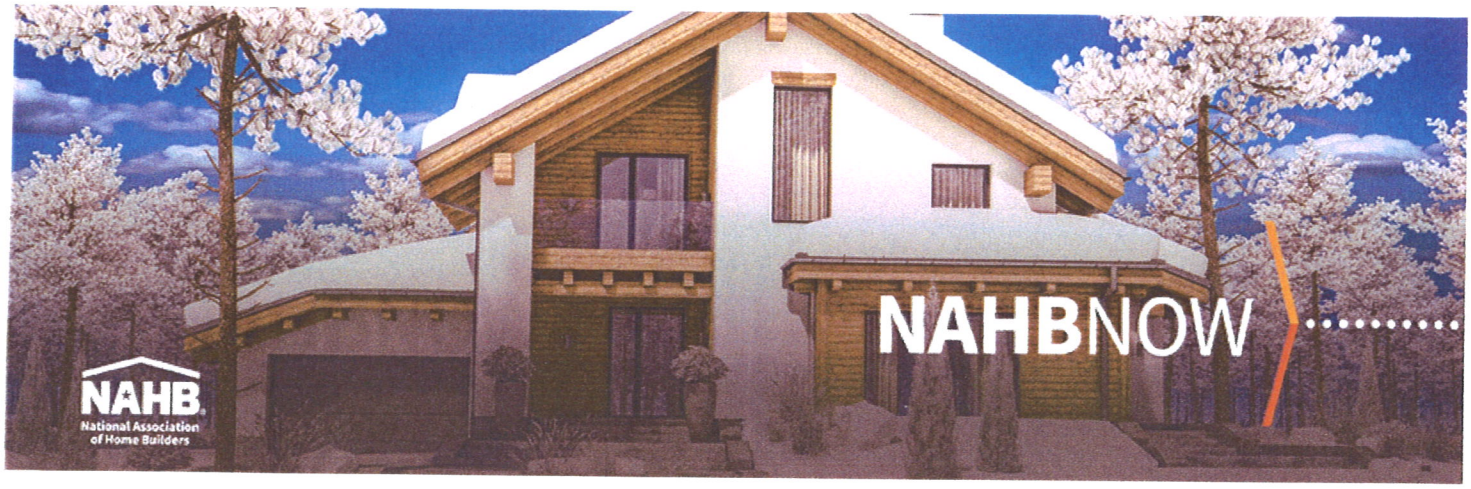
The same concerns would apply to home improvement. If a ban is enacted, hundreds of homeowners will be faced with having to convert existing gas and propane appliances to electric, an expensive venture, indeed. Homes last for decades. Furnaces and water heaters require replacement and maintenance.

With electrification comes costs. New furnaces typically require a heat pump. Heat pumps are most efficient in a mild climate. Most of Ohio is not in a mild climate. As temperature drop, so does a heat pumps efficiency and total electric use rises.

I've attached a workup of costs associated with electrification in new home construction. As you can see, it is expensive.

We understand the current debate regarding the use of fossil fuels. If a major adjustment is deemed necessary, it will come from the federal government not from a few municipalities.

Thanks for your time and opportunity to provide comments on HB 201.



How Much Does Whole-Home Electrification Cost?

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As policymakers look for ways to curtail the use of fossil fuels, new initiatives are being proposed to address not just how much energy is consumed but also how energy is generated and the types of equipment and appliances installed in a home.

Electrification is a strategy for decarbonizing the economy by drawing down the use of fossil fuels in transportation, buildings, and electricity generation. With this type of transition, renewable energy sources are envisioned to continue their growth at utility and community levels, along with an increase in energy storage and expansion of demand management solutions.

Electrification in Residential Buildings

For residential buildings, proposed electrification strategies typically include:

- Replacing gas furnaces with air source heat pumps or ground source heat pumps;
- Replacing gas water heaters with heat pump water heaters;
- Replacing gas ranges with induction or conventional electric ranges;
- Adding electric vehicle charging capabilities to the building or parking spaces; and
- Replacing gas dryers with electric counterparts (conventional or heat pump).

Home Innovation Research Labs recently released a new study on the impact of electrification on an average-size single-family home. The study evaluates construction costs and annual energy use costs when compared to a house with gas equipment and appliances in Houston (CZ2), Baltimore (CZ4), Denver (CZ5), and Minneapolis (CZ6). The analysis was conducted for several basic electrification scenarios without onsite generation or storage and using local utility rates. Annual energy use costs were modeled using DOE/NREL-developed BEopt software.

Several themes were highlighted in the study (also see cost tabulations below):

- **Climate zone** had a strong influence on both construction costs and energy use costs. In colder climates (CZ 5 and 6), heat pumps with variable refrigerant flow rated for operation during low outdoor temperatures are needed. Often referred to as cold climate heat pumps, these systems are more expensive: $8,000-$9,000 more compared to a gas furnace. The total added cost for an all-electric package modeled in the study ranged from $10,886 to $15,100 in colder climates (Denver and Minneapolis).

- **Annual energy use costs** were found to be higher in colder climates (by about $275 in Denver and by $650 in Minneapolis). Therefore, unlike electric cars which have a higher price tag but are less expensive to "fuel," all-electric homes in these locations are more expensive to operate.
- **In warmer climates** (like Houston, CZ 2) where heating is less of a factor and standard heat pumps can be used, the incremental cost of constructing an all-electric house ranged from $4,000 to $11,200, and the energy use costs were on average comparable between a gas and an all-electric house.
- **In moderate climates** (Baltimore, CZ 4), the study evaluated costs for a range of heat pump options including variable refrigerant flow and standard systems. The specific heat pump choice affects the cost and the heating performance of the system during colder months.
- A larger capacity **heat pump water heater** (80 gallon) with a mixing valve is needed to match the performance of a gas water heater, particularly in mixed or cold climates. These HPWH units can cost as much as $2,800 more compared to a standard gas water heater.
- Adding a **single Level 2 circuit for an EV charger** costs about $600-650 to the consumer on average, not including the cost of the charger/connector. The price will be higher for homes where the electric panel is located more than 50 feet from the charging receptacle and/or when the electric panel needs to be upsized.
- An **induction range** could add $1,000 to the price of the house compared to a gas range, plus the cost of compatible cookware. The induction range is intended to provide cooking performance more resembling a gas range.
- There are potential savings in all-electric homes by avoiding **community gas infrastructure.** Other studies noted in the report estimated average savings of about $1,400 per house. These costs can vary significantly depending on the local utility tariffs.
- With the higher electric demand, an **upgrade in the electric service** on the utility side may be needed. Depending on the local utility tariffs, these costs may be significant and need further evaluation.

Range of Electrification Construction Costs Relative to a Baseline Gas Reference House

Electric Reference House Component	Houston		Baltimore		Denver		Minneapolis	
	Low	High	Low	High	Low	High	Low	High
Heat Pump	$2,114	$5,528	$1,901	$8,655	$8,259	$9,088	$7,866	$8,655
Heat Pump Water Heater	$1,257	$2,632	$1,295	$2,711	$2,516	$2,791	$2,397	$2,658
Electric Vehicle charger circuit(s)	$617	$2,040	$635	$2,102	$654	$2,163	$623	$2,060
Induction cooktop range	$0	$997	$0	$1,027	$0	$1,057	0	$1,007
Total added construction cost, $	**$3,988**	**$11,196**	**$3,832**	**$14,495**	**$11,430**	**$15,100**	**$10,886**	**$14,381**
Electrical service upgrade surcharge	Varies by Utility Territory							
Community gas infrastructure savings	Varies by Utility Territory							

Incremental Annual Energy Use Savings for Electrified Homes

	Houston	Baltimore	Denver	Minnesota
Electrified Package 1: Heat Pump 14 SEER/ 8.2 HSPF & 80g HPWH (3.75 UEF)	$57	($14)		
Electrified Package 2: Heat Pump 2-stage 18 SEER/ 9.3 HSPF & 80g HPWH (3.75 UEF)	($10)	($127)		
Electrified Package 3: Heat Pump with variable speed inverter 19 SEER / 10 HSPF & 80g HPWH (3.75 UEF)	$78	($23)	($274)	($650)
Electrified Package 4: Heat Pump with variable speed inverter 20 SEER / 13 HSPF & 80g HPWH (3.75 UEF)			($238)	($583)
Electrified Package 5: Ductless Heat Pump 19 SEER / 11 HSPF + 80g HPWH (3.75 UEF)	$85	($105)	($408)	($630)

*Electric Package 1 is compared to 80AFUE/13SEER furnace/AC and 50 gal 0.58 UEF water heater; other electric packages are compared to 96AFUE/16 SEER furnace/AC and 0.93 UEF tankless water heater.

** **Red values in parenthesis indicate more energy is used.** Green **values indicate energy savings.**

Based on study findings, all-electric homes cost more upfront in comparison to gas homes. Electric homes in cold climates were also found to have higher ongoing utility costs. Jurisdictions considering electrification should evaluate these impacts on consumers and work with stakeholders to develop supporting economic measures.

For more information on electrification in homes and other energy code issues, contact Vladimir Kochkin.

Related

The Impact Embodied Carbon Can Have on a Home's Environmental Footprint
September 29, 2020
In "Sustainability and Green Building"

New Standard to Affect More Water Heaters
February 21, 2015
In "Codes and Standards"

Water Woes: What the California Drought Means for Home Building
April 17, 2015
In "Environment"