

Assessing the Costs of the U.P. Energy Task Force Committee Recommendations

By Isaac Orr and Jason Hayes

Introduction

Michigan is the largest consumer of residential propane in the United States, with Minnesota and Wisconsin second and third, respectively.¹ The state's Upper Peninsula, or the U.P., alone uses approximately 34.2 million gallons of propane per year, with about 78% of that going toward residential heating. Approximately 23,000 households in Michigan's Upper Peninsula use propane to heat their homes.

The primary source of this fuel is a fractionator located in Rapid River, Mich. This device distills oil into separate products such as propane and is connected to the Line 5 pipeline that travels through both Michigan peninsulas and crosses the Straits of Mackinac. The Rapid River fractionator produces 87.6% of the propane used by residential, commercial and industrial customers throughout the Upper Peninsula.²

Gov. Gretchen Whitmer requested that the Michigan Public Service Commission assess whether Michigan's energy infrastructure was capable of meeting the state's needs in the face of changing weather and energy demand. This request followed the January

2019 Polar Vortex emergency, when during a period of extreme cold, an explosion at a major natural gas supply source forced one of the state's large monopoly utilities to take the facility offline.

MPSC published the Michigan Statewide Energy Assessment in July 2019. One of the report's recommendations urged the development of a "formal contingency plan" to ensure "the continued supply and delivery of propane, or other energy alternatives, for Michigan residents" in the event of a temporary or permanent disruption of the Line 5 pipeline, a primary source of both light crude oil and natural gas liquids in the region.³

The principal reason residents might experience a disruption of the Line 5 pipeline is an ongoing effort on the part of Michigan's attorney general and governor to permanently decommission Line 5. As part of that effort, Attorney General Dana Nessel and Gov. Whitmer have also both committed to stopping the Line 5 Straits of Mackinac tunnel agreement, which was approved in December 2018. This agreement allows Enbridge Energy, which owns and operates the pipeline, to construct a new, cement-lined tunnel, 100 feet below the bed of the Great Lakes and relocate the pipeline into that tunnel.⁴

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1 Sally A. Talberg, Norman J. Saari and Daniel C. Scripps, "Michigan Statewide Energy Assessment: Initial Report" (Michigan Public Service Commission, July 1, 2019), <https://perma.cc/8F8Z-TR7X>.

2 "Upper Peninsula Energy Task Force Committee Recommendations Part I - Propane Supply" (Department of Environment, Great Lakes, and Energy, April 17, 2020), <https://perma.cc/D85S-S4TJ>.

3 Sally A. Talberg, Norman J. Saari and Daniel C. Scripps, "Michigan Statewide Energy Assessment: Initial Report" (Michigan Public Service Commission, July 1, 2019), <https://perma.cc/8F8Z-TR7X>.

4 "The Great Lakes Tunnel Project" (Enbridge Inc., 2020), <https://perma.cc/5Q37-MVEZ>.

It is important to emphasize that the feared disruption in heating and transportation fuels is not an unavoidable caprice on the part of markets, nature or geography; it is entirely due to a deliberate policy choice on the part of the state government.

Executive Summary

In response to the findings of the Statewide Energy Assessment and under a further directive by Gov. Whitmer, the Michigan Department of Environment, Great Lakes, and Energy released the “Upper Peninsula Energy Task Force Committee Recommendations Part I – Propane Supply” in April 2020. This task force was created by Gov. Whitmer in June 2019 and directed to “consider all available information and make recommendations that ensure the U.P.’s energy needs are met in a manner that is reliable, affordable, and environmentally sound.” Their report on propane supply offered 14 recommendations “to better track and anticipate supply and demand, minimize disruption impact, and provide a more cohesive plan for those who are disproportionately impacted by high energy costs in the U.P.”⁵

We analyze the potential impacts and feasibility of these recommendations in the pages that follow. We also explore the use of alternative fuels to propane such as natural gas and electricity to provide for winter heating needs in the Upper Peninsula. Five key points summarize our review of the task force’s recommendations.

1. Closures of Line 5, even if only temporary in nature, will leave the Upper Peninsula vulnerable to price spikes and supply shortages in heating fuels. Shutting down Line 5 will force U.P. residents to rely on a mix of rail and trucking to transport propane from Superior, Wisc. But doing so would leave propane supplies vulnerable to more points of failure,

given the U.P.’s experience of intense winter weather. Even recent reports of the potential reversal of flows in the Michigan Express Pipeline do not change the fact that limiting supply options is undesirable in any system when availability and reliability are essential.

2. Laws designed to limit price increases during shortages are likely to prolong shortages. The task force’s final recommendation encourages Michigan’s Legislature to consider adopting price controls for heating fuels. However, such controls are likely to cause supply shortages by limiting incentives for propane dealers in other regions to ship their product to the U.P.

3. Alternate home heating options will cause a two- to three-fold increase in heating costs. The Michigan Statewide Energy Assessment recommended that alternative heating fuels and methods should be considered for the U.P. But extending natural gas infrastructure would add a minimum of about \$3,500 in upgrade costs for each home and hundreds of millions more in infrastructure expenditures. Electrification of propane-heated homes is also poor choice in an area that already pays relatively high electricity prices. Switching from propane to electric heat would increase costs by between about \$3,400 and \$3,900 each year per household.

4. Transitioning from propane to electric appliances, water heaters and furnaces could cost more than \$25,000 per household. Electrification advocates claim heat pumps can replace propane heaters. But they do not work well below 30 degrees Fahrenheit, so supplemental electric resistance heating must be added. Installing electric resistance heat and switching to electric water heaters for existing propane

⁵ “Upper Peninsula Energy Task Force Committee Recommendations Part I - Propane Supply” (Department of Environment, Great Lakes, and Energy, April 17, 2020), <https://perma.cc/D85S-S4TJ>.

water heaters could impose more than \$25,000 in expenses per household in the U.P.

5. Weatherization Assistance Program upgrades would be prohibitively expensive. Many homes in the U.P. are ineligible for federally funded efficiency upgrades due to structural defects. So even before this program could aid in reducing energy consumption in the U.P., an indeterminate amount would need to be spent to upgrade currently ineligible homes. After those minimum standards were met, upgrading each propane-heated home to meet the energy efficiency standards and reduce energy consumption might cost between \$15 million and \$470 million, depending on how strict a standard is used. Michigan received only \$18 million through the Weatherization Assistance Program in 2019, so this would require a large expansion of this federal program.

A broader concern arising from the task force's recommendations is that they propose several new government incentives or programs, new state spending, increased surcharges and fees, new reporting requirements and increased regulatory control of the existing propane market.

Ostensibly the recommendations for more government intervention are aimed at reducing the negative impacts of decreased supply and increased prices for propane. But those negative impacts would not exist or would be greatly diminished if it were not for the effort on the part of the state government to close Line 5 and stop the construction of the Line 5 Straits of Mackinac Tunnel.⁶ In this case, government action is causing the very problem that they have created the U.P. Energy Task Force to solve.

Closing Line 5

The U.P. Energy Task Force and other proponents of shutting down Line 5 point out that it would be possible to transport propane to Michigan's Upper Peninsula by truck, from a propane fractionating facility in Superior, Wisc., to Michigan's Rapid River facility. An assessment, conducted by Dynamic Risk⁷ and prepared for the Michigan Public Service Commission and the National Wildlife Federation, found this method of transportation would increase the cost of propane by between \$0.10 and \$0.35 per gallon, depending on the supply location.⁸

A second and similar study was completed by London Economics International.⁹ The Dynamic Risk study had assumed the increased costs would all be borne by customers. Using the Dynamic Risk study as its foundation, the LEI study focused on the lowest-cost option of trucking propane from Superior, Wisc. That study reported a price impact of \$0.11 per gallon, but then estimated that consumers would pay only five extra cents per gallon of the expected increases.¹⁰ It is reasonable, however, to expect that these increased costs will eventually be passed on to consumers in one way or another.

Furthermore, both studies assume that the Superior, Wisc., facility would have sufficient "excess fractionation capacity, storage, and loading infrastructure to replace Rapid River production during peak demand." If incorrect, both studies reported they would need to alter their findings.

At least in the short-term, restrictions on supply have historically pushed prices higher in the U.P. MPSC reports that a short-term propane shortage, referred to

6 Dana Nessel, "Comments on UP Energy Task Force- Draft Committee Recommendations-Part I-Propane Supply" (Michigan Department of Attorney General, April 6, 2020), <https://perma.cc/RLK5-B8NW>.

7 Dynamic Risk is a strategic consulting firm that focuses on managing and minimizing the risks associated with pipelines. For more information, see: <http://www.dynamickrisk.net/about> Travis Warner and Ethyan Kramer, "UP Propane System" (Michigan Public Service Commission, Aug. 5, 2019), <http://perma.cc/DTC3-L8CA>.

8 Travis Warner and Ethyan Kramer, "UP Propane System" (Michigan Public Service Commission, Aug. 5, 2019), <http://perma.cc/DTC3-L8CA>.

9 London Economics International is a strategic consulting firm with expertise in energy, water and infrastructure. For more information, see: <http://www.londoneconomics.com/about/>.

10 Travis Warner and Ethyan Kramer, "UP Propane System" (Michigan Public Service Commission, Aug. 5, 2019), <http://perma.cc/DTC3-L8CA>.

as the “2013-2014 Propane Emergency,” had substantial supply and price impacts. The emergency caused average Michigan propane prices to “spike” from approximately \$2.10 per gallon in 2012-2013 to \$3.76 in 2013-2014, nearly an 80% increase.¹¹

The state government’s additional litigation to close the pipeline after Enbridge discovered a damaged support also highlighted these costs by once again bringing the loss of supply to the forefront. The Michigan Petroleum Association contends that, “a short-term [Line 5] shutdown of a few days won’t noticeably impact [MPA] members or result in fuel higher prices for consumers. But the longer it lasts, the worse it means for the cost of petroleum products.”¹²

But it isn’t just businesses that operate in the petroleum products industry that are predicting cost and supply impacts. The MPSC’s Michigan Statewide Energy Assessment admits, “In the long-term, migrating away from pipeline supply will remove a layer of redundancy to the system, thus decreasing our resilience to future supply issues or infrastructure outages.”¹³

Reports that Silver Wolf Midstream had purchased the Michigan Express Pipeline with intentions to reverse its current flows are also highlighting the importance of maintaining the Line 5 pipeline.¹⁴ If carried out as it is being envisioned by the pipeline’s new owners, the altered flows would move as much as one million gallons of propane daily from Sarnia, Ontario, to the pipeline’s terminus in Kalkaska.

While this change would certainly help to increase both the amount and reliability of propane supplies and to lower costs across the state of Michigan, the plan would substantially increase demand for natural gas liquids at Sarnia’s refineries. Those refineries are supplied, in large

part, from the Line 5 pipeline. Therefore, closing Line 5 would have a profound negative impact on the viability of this proposed new project.

Any energy infrastructure that has a goal of high availability or reliability must ensure sufficient and affordable supplies. Michigan’s policy of deliberately working to close a primary piece of essential energy infrastructure, and to stifle efforts to relocate this pipeline to a safer location, is regressive, dangerous and undesirable.

Based on the likelihood for supply restrictions and price increases, as reported by both the Dynamic Risk and London Economics International studies, as well as historical and current industry examples, and the state government’s own Statewide Energy Assessment, the task force should re-examine and address the likely price impact of tightened supplies of natural gas liquids to refineries and propane supplies in the region.

Price Ceilings and Price Gouging Laws

The U.P. Energy Task Force’s 14th recommendation encourages the Michigan Legislature to explore the possibility of enacting legislation limiting “price gouging” in case of a disruption in the Upper Peninsula’s propane supply. These sentiments are easy to understand, as no one wants their misfortunes misused as fodder for a predatory business.

At the same time, regulators must realize that prices provide incentives for businesses to supply products that customers want or need. But legislation that places an artificial ceiling on the price of a commodity can prolong the shortage of that product when it is needed most.

The feasibility of shipping propane to distant locations depends on its price. Distant propane suppliers will

11 Travis Warner and Eathan Kramer, “UP Propane System” (Michigan Public Service Commission, Aug. 5, 2019), <http://perma.cc/DTC3-L8CA>.

12 Kelly House, “Enbridge Line 5 Shutdown Prompts Michigan Debate over Risks vs. Economic Harm” (Bridge Magazine, June 25, 2020), <https://perma.cc/F6R8-BN2T>.

13 Sally A. Talberg, Norman J. Saari and Daniel C. Scripps, “Michigan Statewide Energy Assessment: Initial Report” (Michigan Public Service Commission, July 1, 2019), <https://perma.cc/8F8Z-TR7X>.

14 Chad Livengood, “Deal will reverse pipeline, provide propane to Michigan” (Crain’s Detroit Business, Aug. 30, 2020), <https://perma.cc/LF8V-SF78>.

not enter the market if mandates force them to sell at a loss. But as shortages push prices up, those suppliers may find it worthwhile to meet this demand. This is how prices efficiently allocate resources to where they are needed most. Artificial limits on prices disrupt this mechanism and ensures that less propane will be available than otherwise would be.

Alternative Fuels and Electrification

Some advocates of permanently closing Line 5 are proposing the U.P. Energy Task Force examine substitute fuels, alternative methods of electricity generation or other methods of home heating. For example, the Michigan Statewide Energy Assessment recommended that the state carry out a “comprehensive alternatives analysis,” that included, among a list of other options, “the use of electric heat sources, including heat pumps ... for residential propane customers.”¹⁵

The primary heating sources in the Upper Peninsula are natural gas, propane, electricity and wood. Natural gas is the lowest-cost source of fuel for home heating, but it requires expensive infrastructure, which the U.P. currently lacks. The Michigan Statewide Energy Assessment suggests extending natural gas infrastructure for home heating. But many of the homes that use propane are located in rural areas with low population density. The upfront costs associated with building natural gas infrastructure to these remote residences is cost prohibitive.

For example, homeguide.com — a website that connects homeowners with home repair contractors in their area — estimates that the cost to install a new gas line from the home to the street — in a location where existing natural gas infrastructure is already present — is \$2,000 per household.¹⁶ Homeguide.com also notes that installing a line within the home to serve a furnace

and water heater costs on average about \$1,500. It might cost then about \$3,500 per household in infrastructure costs to expand the use of natural gas in the U.P. That adds up to over \$80 million for the 23,000 households currently using propane in the U.P.

But those costs only account for an area where there is an existing gas supply for these homes. A recent BTU Analytics report analyzed the projected and actual costs of new gas pipeline construction in 12 locations. The costs ranged from \$2.9 million to \$13.1 million per mile.¹⁷ For a back-of-the-envelope calculation, imagine that a single natural gas pipeline could be built across the Upper Peninsula at the lowest-cost estimate of \$2.9 million per mile. Then also suppose that this pipeline could supply the entire population of propane-using households across the Upper Peninsula if it were laid along the 160 miles of highway between St. Ignace and Marquette. That single stretch of pipeline would add \$464 million in additional costs on top of the \$80 million in household costs noted above. Even using these unreasonably low cost estimates, it would easily cost the U.P. over half a billion dollars to make natural gas the dominate heat source.

Electrification

Electrification is another idea recommend by the task force, but this is also clearly cost prohibitive. Electrification would require significant infrastructure costs for each U.P. household as they trade the investments they have already made in propane infrastructure and appliances for similar investments in electric options. Compounding this expensive problem, the U.P. has some of the highest electricity rates in the country.

15 Sally A. Talberg, Norman J. Saari and Daniel C. Scripps, “Michigan Statewide Energy Assessment: Initial Report” (Michigan Public Service Commission, July 1, 2019), <https://perma.cc/8F8Z-TR7X>.

16 “How Much Does It Cost To Install Or Repair A Gas Line?” (HomeGuide), <https://perma.cc/XL9H-LDYT>.

17 Andrew Bradford, “Gas Pipeline Costs Run Higher” (BTU Analytics, Sept. 7, 2018), <https://perma.cc/3UJT-G2BR>.

Electricity Rates in the Upper Peninsula

In 2019, residential customers of the Upper Peninsula Power Co. paid 22.23 cents per kilowatt hour, which is higher than the 19.22 cents per kWh paid by the average residential customer in California, one of the most expensive areas in the nation for electricity supply.¹⁸ U.P. electricity rates are almost double the 2019 national average residential rate of 13.04 cents per kWh. These high rates make the U.P. uniquely unsuitable for transitioning from propane to electric heat.

Electricity in the U.P. is also much more expensive than propane on a per-unit of energy basis. According to propane retailers in Upper Michigan, a gallon of propane in the U.P. retails for \$1.20 to \$1.60 per gallon. A recent price listed for the state of Michigan by the Energy Information Administration is \$1.66 per gallon.¹⁹ One gallon of propane contains approximately 91,502 British thermal units, but one kWh of electricity contains just 3,412 Btus. This means a gallon of propane contains 26.8 times more energy than a kWh of electricity.

The average household using propane in the U.P. consumes 991 gallons of propane per year, which amounts to annual expenses of \$1,189 at \$1.20 per gallon and \$1,645 at \$1.66 per gallon. After accounting for the fact that electric heating systems are generally 14% more efficient than propane systems, and based on recent average electricity prices, U.P. residents would need to spend \$5,081 on electricity bills to provide similar heating outcomes as propane does — an increase of between \$3,436 and \$3,892 each year. Electrification, therefore, could result in a two- to three-fold increase in energy costs for Upper Peninsula households.²⁰

Electric Air Source Heat Pumps

Electric Air Source Heat Pumps, referred to as “heat pumps” for the remainder of this report, are often discussed as an alternative technology to natural gas, propane and electric heat sources. Heat pumps efficiently transfer existing heat that occurs naturally outside of the home into houses.

For these reasons, heat pumps are often selected as the heating system of choice in mild to moderate climates, such as the southern United States where heating needs are limited. However, heat pumps become far less effective at providing adequate heat for homes when temperatures are below 25-30 degrees Fahrenheit.²¹

At lower temperatures, supplemental heating systems will be required to adequately heat homes. In the U.P., these supplemental systems will most likely consist of propane or electric heat. As a result, U.P. residents would incur the additional costs of purchasing and operating heat pumps, along with the necessary backup heating systems.

Installation Costs for Electric Heat Sources

The cost of installing heat pumps varies based on the type of unit installed. According to EnergySage.com — an online source for matching homeowners with solar energy installers — ductless air source heat pumps cost \$3,500 to \$5,000 per indoor unit installed. In these instances, each room in the house often has an indoor unit. Central heat pump systems cost between \$12,000

18 “Comparison of Average Rates For MPSC-Regulated Electric Utilities in Michigan” (Michigan Public Service Commission, Aug. 1, 2020), <https://perma.cc/V8HL-KE7M>. Average rate for Jan-Dec 2019 rates (250, 500 and 1,000 kWh) for Upper Peninsula Power residential customers. “Average Retail Price of Electricity, United States, Annual” (U.S. Energy Information Administration, 2020), <https://perma.cc/L9E9-GEJY>.

19 “Weekly Heating Oil and Propane Prices” (U.S. Energy Information Administration, April 1, 2020), <https://perma.cc/E6LC-2QZ3>.

20 There are 91,502 British thermal units in a gallon of propane compared to 3,412 Btus per kilowatt hour. This calculation assumes an efficiency of 83% for propane furnaces and a 97% efficiency, meaning electric users would require 14% fewer Btus to provide an equivalent level of heating if they used electric resistance heat.

21 “Is A Heat Pump Right For Your Home?” (Trane Technologies), <https://perma.cc/25GS-MFQE>.

and \$20,000, varying based on the size of the house and the capacity of the heating system.²²

In the U.P., supplemental heating systems will be required as the temperature regularly dips below 25 degrees Fahrenheit. If there is an inadequate supply of propane, electric baseboard heaters would need to be used as this supplemental heat source. These systems cost between \$525 to \$675, with the average homeowner spending approximately \$600 installing a single, 800-watt 240-volt electric baseboard heater to heat a 100-square-foot room.²³

The average newly built American home in 2018 was 2,435 square feet, 45% had four or more bedrooms, 36% had 3 or more bathrooms, another 25% had a full or partial basement.²⁴ For the sake of simplicity, we will only consider the costs of installing electric baseboards heaters for five 100-square-foot rooms: a kitchen, a living room and three bedrooms. We will also include two 50-square-foot bathrooms. We will ignore basements, hallways, entryways, dining rooms and other areas.

This level of heating represents a low-end cost estimate of installation costs of electric heating units. Based on the current cost estimates, it would cost at minimum \$3,600 per house to install these supplemental heaters. Supplying the average-sized American home with this electric heat would at least double this cost estimate.

Lastly, many of the homes that currently heat with propane also use propane as a source of energy for their water heaters. As a result, a switch from propane to electric heat may require the purchase of an electric water heater. These systems have higher operating

costs than propane water heaters and have upfront costs of \$620 to \$1,035 for parts, labor and permits.²⁵

This would bring the total cost of switching from propane heating systems to electric heating systems to between about \$15,000, to \$25,000 per household.

Weatherization Assistance and Energy Efficiency Programs

Other recommendations of the Upper Peninsula Energy Task Force discuss increasing funding for weatherization assistance programs to reduce the long-term need for propane in the Upper Peninsula. The feasibility of these recommendations is evaluated below.

Determining Eligibility for Weatherization Assistance Programs in the Upper Peninsula

As noted in the task force report, “Many homes are ineligible for weatherization assistance due to related structural defects (such as the need for a new roof).”²⁶ Therefore, it is not possible to properly calculate the full costs of weatherization.

To determine the improvements necessary to allow Upper Peninsula households to qualify for weatherization programs, each home would need to go through a home inspection, which can cost up to \$400. Simply completing inspections on the 23,000 UP homes that use propane for heating would require an expenditure of \$9.2 million. From there, an undetermined amount would need to be spent to fix these structural defects before disqualified homes could become eligible for weatherization assistance.

22 “Costs and Benefits of Air Source Heat Pumps” (EnergySage, LLC., Sept. 27, 2019), <https://perma.cc/H3EL-X8XR>.

23 “Install Electric Baseboard Heater Cost” (Fixr), <https://perma.cc/PKK8-4YT7>.

24 Peter Andrew, “Is Your Home the ‘Typical American Home?’” (HSH, Jan. 26, 2020), <https://perma.cc/WE7R-66YT>.

25 “Electric Water Heater Installation Cost” (Fixr), <https://perma.cc/AW5B-PDZ2>.

26 “Upper Peninsula Energy Task Force Committee Recommendations Part I - Propane Supply” (Department of Environment, Great Lakes, and Energy, April 17, 2020), <https://perma.cc/D85S-S4TJ> (accessed Sept. 2, 2020). The task force report explains that the Michigan Weatherization Assistance Program is a “federally funded, low-income residential energy efficiency program.” WAP subsidizes energy efficiency upgrades for homeowners and renters.

The Cost of Weatherization in Upper Michigan

To determine the potential for weatherization and energy efficiency upgrades to reduce propane consumption in the Upper Peninsula, we evaluate the findings of a report prepared by the Department of Housing and Urban Development.²⁷ This report evaluated the potential for energy efficiency to reduce energy consumption in a new 1,296 square foot townhouse, located in Akron, Ohio. The report found that the “bronze standard,” or base, efficiency standard would have an initial upfront “energy efficiency” cost of \$647 for a new home. This level of efficiency would reduce energy consumption by 15% compared to a traditional home. In contrast, the emerald standard, the “greenest” of the standards evaluated, would have an initial upfront “energy efficiency” cost of \$20,445 for a new home. This level of energy efficiency would reduce energy consumption by up to 60%.

We expect that installation costs for upgrading energy efficiency in the Upper Peninsula would be higher as a result of attempting to retrofit existing structures rather than building new. Retrofitting existing homes requires additional time and labor for the demolition and disposal of existing building materials and replacing these with newer, more energy efficient materials. Therefore, it is reasonable to assume that both the \$647 Bronze efficiency upgrades and the \$20,445 Emerald efficiency upgrades would be a floor for the cost of retrofitting U.P. homes.

As a result, the cost of retrofitting each of the 23,000 propane-heated homes in the U.P. to the bronze standard might require \$14.9 million in upfront costs. Retrofitting to the emerald standard would cost \$470.2 million. In practice, however, the actual costs of these upgrades would be larger, as most would be paid for through borrowing, which would add interest costs.

Annual maintenance costs required to maintain the national green building standard rating would also increase overall costs.

The high cost of these upgrades would take up almost all the federal funds available from federal weatherization programs in the case of the bronze standard, and vastly exceed those federal funds in the case of the emerald standard. According to the U.S. Department of Energy, the entire state of Michigan was designated to receive approximately \$17.9 million dollars for weatherization assistance in 2019.²⁸

The Potential Impact of Weatherization on Propane Demand

Despite the costs, increasing the energy efficiency of homes in the Upper Peninsula would reduce the amount of propane needed to heat homes.

Assuming these energy efficiency upgrades reduce propane consumption by 15% for the bronze standard and 60% for the emerald standard, the average household would see the following impacts on their annual propane use displayed in Table 1.

Table 1: Estimated Energy Cost Savings From Weatherization Upgrades

	Current	Bronze standard (15% more efficient)	Emerald standard (60% more efficient)
Annual propane use (gallons)	991	842.35	396.4
Annual propane expense (\$1.20/gal)	\$1,189	\$1011	\$476
Annual savings	--	\$178	\$713
Annual propane expense (\$1.66/gal)	\$1,645	\$1,398	\$658
Annual savings	--	\$247	\$987

It is also important to reiterate that these upgrades, to any standard, could only be completed after \$9.2 million was spent to complete property assessments.

²⁷ “An Evaluation of Affordable Housing Using the National Green Building Standard” (U.S. Department of Housing and Urban Development, Oct. 2012), <https://perma.cc/JQK2-BF4Q>.

²⁸ AnnaMaria Garcia, “Weatherization Program Notice: Program Year 2019 Grantee Allocations” (U.S. Department of Energy, Dec. 18, 2018), <https://perma.cc/4UK6-HP4T>.

That payment would then need to be followed by unknowable amount to repair structural defects on disqualified homes in order for them to qualify for the weatherization program.

Upgrading residential homes to the bronze standard of energy efficiency would reduce the need for propane in the U.P. by approximately 3.4 million gallons per year. Upgrading homes to the higher emerald standard would reduce the need for propane in the U.P. by 13.7 million gallons per year. However, it is important to remember that the Upper Peninsula consumes 34.2 million gallons of propane annually, with this consumption split among residential, commercial and industrial customers.

After energy efficiency measures have been implemented, the Upper Peninsula would still need between 20.5 and 30.8 million gallons of propane annually to satisfy the need for winter heating. This amounts to between 67% and 101% of the annual propane output of the Rapid River fractionator, which produces approximately 30.6 million gallons per year.

Conclusion

The Line 5 pipeline was constructed in 1953 to help provide essential energy to Michigan and the Great Lakes region. It also reduced threats posed by tanker traffic on the Great Lakes.²⁹ The pipeline has operated safely for over 65 years, but concerns over the potential for an accident have grown. The state now has an opportunity to support the relocation of the pipeline from the waters of the Great Lakes to a proposed tunnel, 100 feet below the bed of the lakes. The proposed tunnel option would address environmental concerns about potential damage to the lakes from a spill at the same time as it maintains a piece of Michigan's essential energy infrastructure. But the ongoing campaign against

Line 5 by the state of Michigan is threatening the closure of this infrastructure.

The information in this report demonstrates that readily available, affordable energy sources such as propane are clearly the superior home heating option for residents of Michigan's Upper Peninsula. A temporary or permanent shutdown of the Line 5 pipeline would have serious consequences for the availability and affordability of heating fuels in the U.P. The state should not deliberately seek to implement regressive energy policies that will require expensive tradeoffs and leave U.P. residents paying more for less reliable energy.

The state of Michigan should reject the recommendations put forward by the U.P. Energy Task Force Committee, cease its attempts to immediately close Line 5, and begin to actively support the construction of the Line 5 tunnel.

²⁹ Jason Hayes, "The Value of Pipelines (and Line 5) to Michigan" (Mackinac Center for Public Policy, March 16, 2017), <https://perma.cc/A65L-GULE>.

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