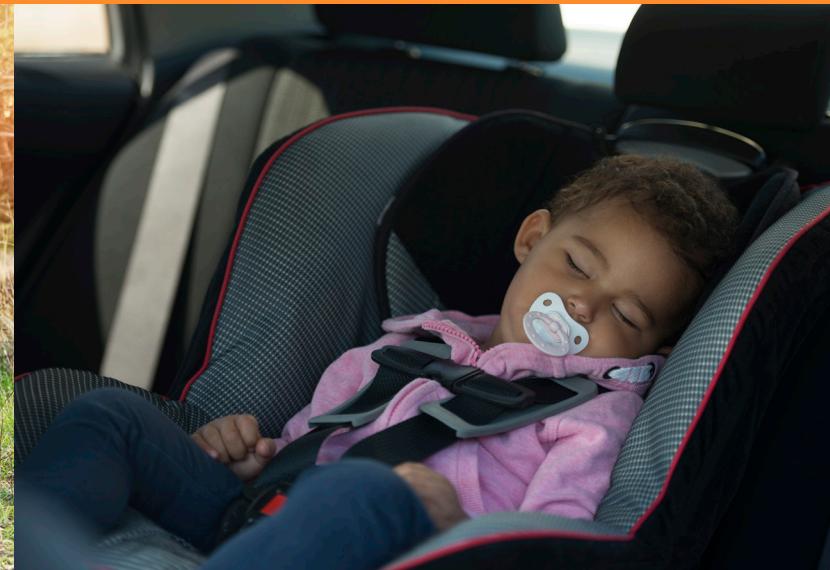




# Families, Communities and Finances:

## The Consequences of Denying Critical Pipeline Infrastructure



A Project of Consumer Energy Alliance

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## Executive Summary

Energy helps make just about everything that touches our lives on a daily basis, including the clothes we wear, the cars we drive, the shampoo we use, the carpet we walk on and the medication we take. It helps power every imaginable American industry, and it's a must-have ingredient for a robust, fast-growing economy – perhaps the most important ingredient.

Most Americans think about energy when they pay their utility bill or fill up their car at the gas pump, but what they don't realize is how their energy is delivered. They may think fuel is brought to local gas stations by tank trucks they see on the road, but in fact, they only take it the last few miles. What many consumers may not fully understand is just how vital pipelines are for moving transportation fuels from the wellhead to the refiner and from the refiner to the consumer.

They also may not realize that about half of the homes in the U.S. use natural gas as their primary heating fuel and that 22% of homes in the Northeast use heating oil. Or how essential pipelines are for delivering natural gas for power generation, since natural gas makes up nearly 40% of the nation's utilities feedstock.

That's why eliminating the energy needed for our nation's electric generation needs would threaten the reliability of our country's electric grid and create more economic hardship via skyrocketing electric rates, especially for the 43 million living on a fixed income or below the poverty line who already spend too much of their disposable income for energy.

Because Americans have become increasingly reliant on natural gas to meet their electricity needs – and continue to rely on oil for heating and transportation fuel – Consumer Energy Alliance (CEA) initiated a report on the U.S. oil and gas pipeline network and the requirements to meet growing domestic energy needs.

CEA seeks to inform its membership, policymakers, and the public about the potential impacts of inadequate pipeline capacity and the critical role that pipelines serve in meeting current and future U.S. energy needs for families, small businesses, and an assortment of industries that include agriculture, manufacturing, energy, mining, transportation, and many others. To that end, the purpose of this CEA assessment is to better understand the implications for its members if infrastructure and pipeline construction were completely curtailed based on the continuation of current trends including permitting delays, litigation, disputes and/or anti-development protests.

The assessment, entitled *Families, Communities and Finances: The Consequences of Denying Critical Pipeline Infrastructure*, examines the impacts on supply by 2030 from (1) the failure to permit and construct new pipeline infrastructure, (2) the inability to obtain necessary permits and approvals for coal, natural gas, nuclear and petroleum fired electricity generation power and maintain existing generation. The assessment utilized energy supply and demand data provided by the U.S. Energy Information Administration (EIA) and made assumptions based on existing policies, such as the Clean Power Plan, and existing challenging market and regulatory barriers to bringing more pipeline projects online. The resulting impacts were then tabulated to determine the supply consequences for America's families and economy on a national and regional (New England, Mid-Atlantic, Southeast, Midwest and Mid-Continent) basis.

*Families, Communities and Finances* found that prematurely shutting off baseload electricity generation and denying new pipeline infrastructure to maintain the nation and economy's basic energy demands would result in:

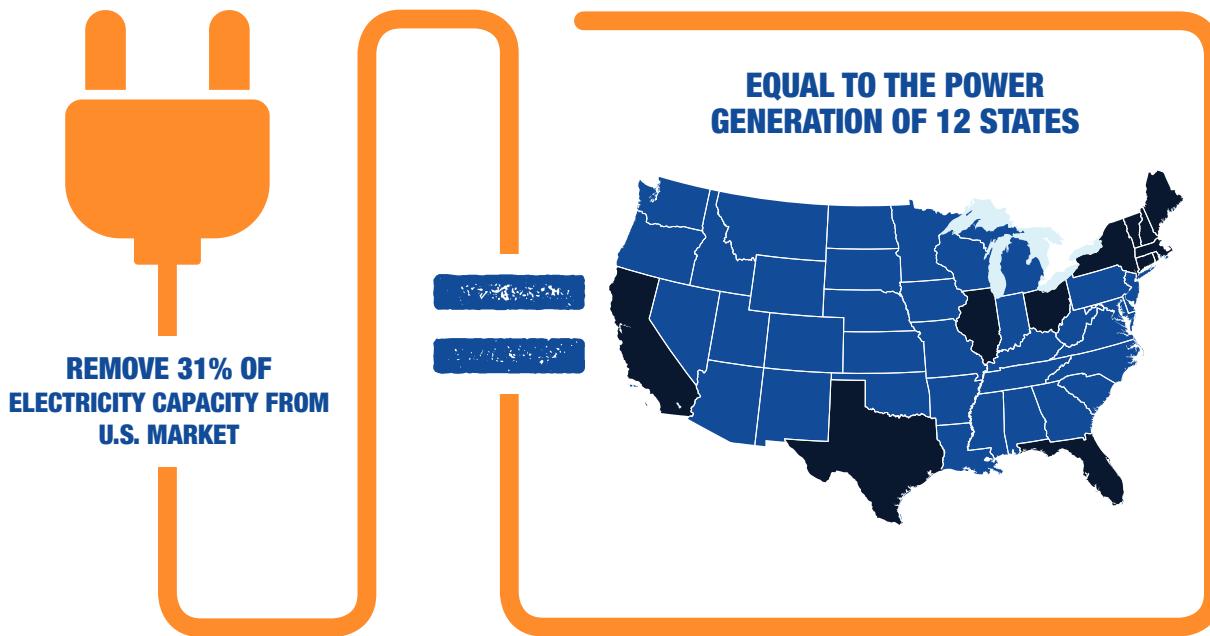


**CEA aims to better understand the implications for consumers if infrastructure and pipeline construction were completely curtailed based on the continuation of current trends including permitting delays, litigation, disputes and/or anti-development protests.**

## NATIONAL IMPACTS:

- Creating a shortfall of one-third of electricity generation needs from the overall U.S. electricity market
  - This is equal to the power generation total of 12 states including: California, Florida, Illinois, Ohio, New York, Texas, and all of New England

## Effects of Shutting Off Electricity Generation and New Pipelines

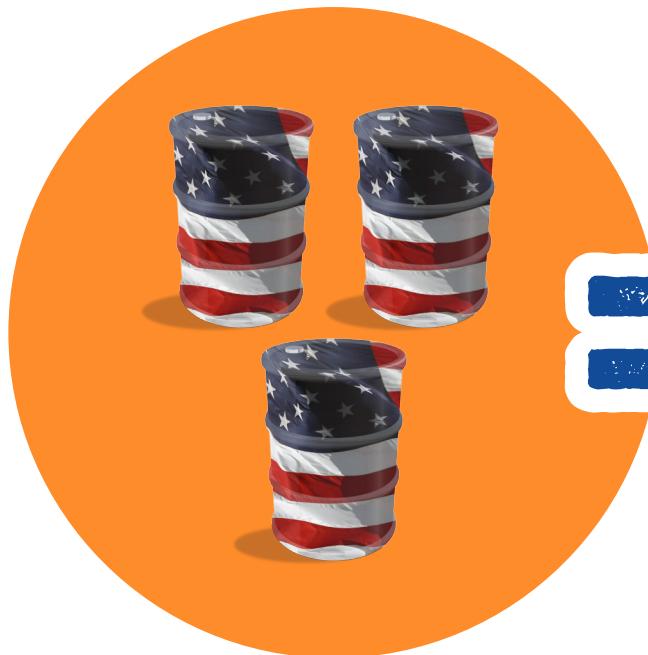


- Threatening the future reliability of electricity supply and the electrical grid due to lack of reliable baseload electricity by 2030
- Increasing costs of energy for consumers and creating significant economic hardship
  - Disproportionate harm to those in poverty, on fixed incomes and society's margins
    - Power plant closures would disproportionately hurt the 43 million people in poverty and those on fixed incomes, including 46 million senior citizens
    - An increase in electricity rates for residential, commercial and industrial users would adversely impact every user's budget
- Lost jobs in manufacturing, energy, transportation, mining, agriculture and other industries
  - Competitive disadvantages with low-cost global competition in areas such as manufacturing, steel production and petrochemicals
  - The prevention, at a minimum, of \$15.38 billion in private capital expenditures and economic development in the U.S. economy due to the halt in construction of petroleum and natural gas liquids (NGL) pipelines<sup>1</sup>
  - Elimination of approximately 40 natural gas midstream and pipeline infrastructure projects with enough potential capacity to power over 1.2 million homes if used for residential electricity<sup>2</sup>

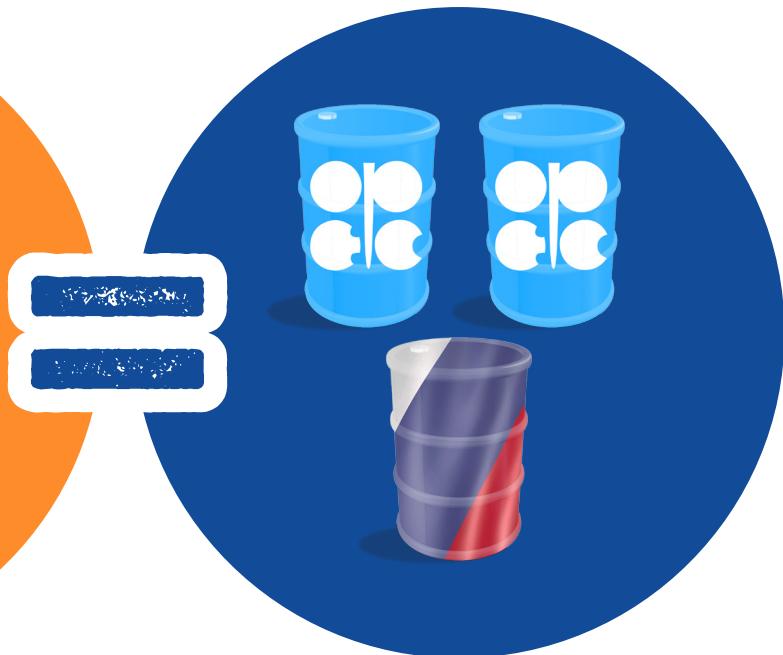
- Increasing the cost of virtually every good and service in the U.S. due to increases in electricity, transportation fuels and utility costs
- Potential public safety and additional environmental impacts associated with delivering needed energy to consumers and markets
- Reducing energy security benefits and geopolitical leverage and increased reliance on imported energy
- The need for the U.S. to import additional energy supplies in order to meet the tremendous shortfall – often at unpredictable prices based on global markets
- Planned petroleum pipeline stoppages that would result in stranding over 3.17 million barrels of oil per day – ***nearly the equivalent of daily imported oil from OPEC and Russia in 2015<sup>3</sup>***

## Shutting Off New Petroleum Pipelines

**Would Strand Over 3 Million  
Barrels Per Day**

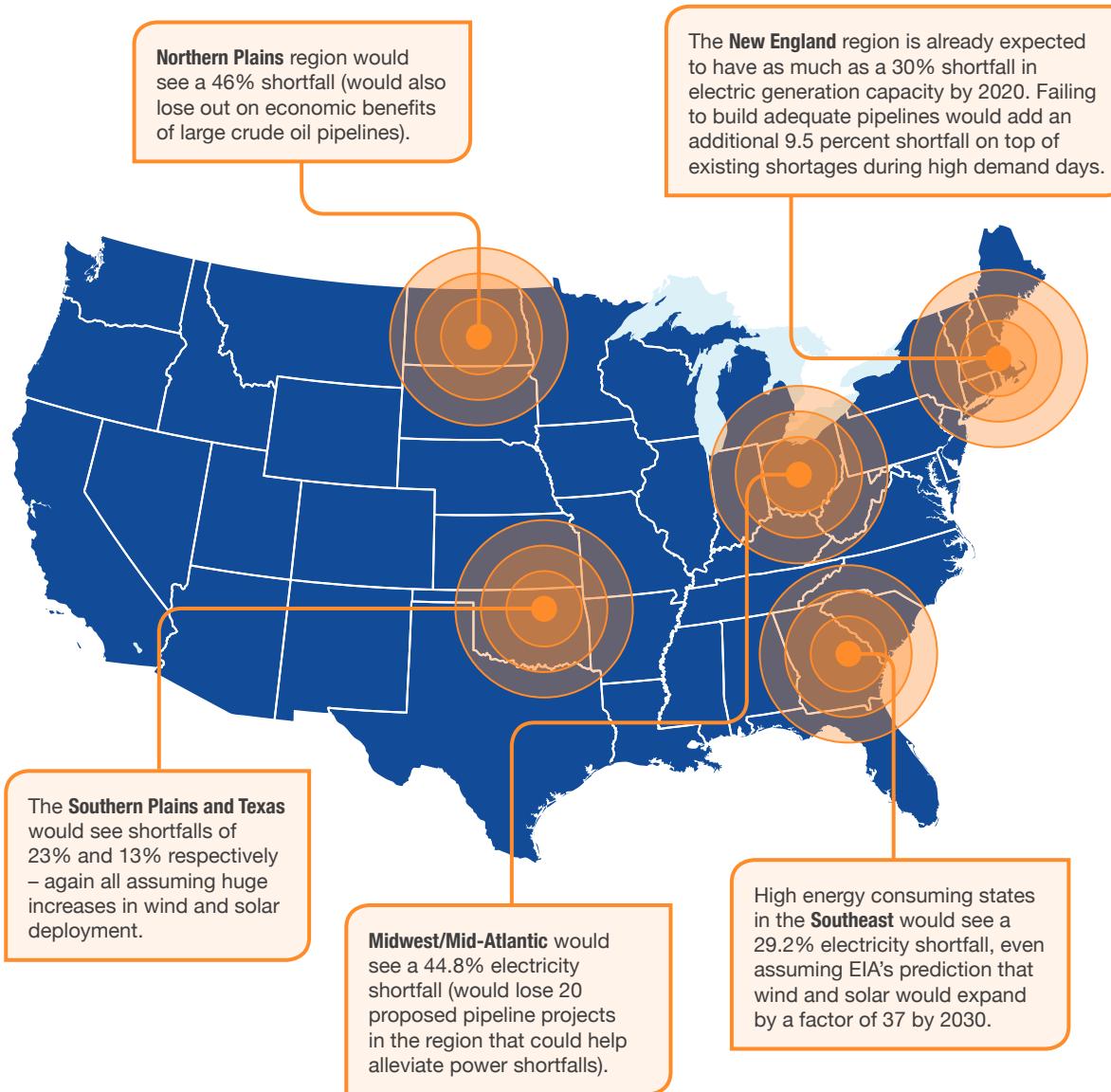


**Equal to the Amount of Oil Imported from  
OPEC and Russia in 2015**



## REGIONAL IMPACTS:

# 2030 Regional Impacts from Shutting off Baseload Electricity and Denying New Pipeline Infrastructure



- Regional electricity shortfalls were found in every examined region, meaning blackouts would occur due to the absence of readily available alternative supplies of energy
- Creating electricity shortfalls by 2030 in geographic regions defined by the EIA:
  - **Mid-Continent**, at just over 46% electricity shortfall (would also lose out on economic benefits of large crude oil pipelines)
  - The **Southern Plains and Texas** would each see shortfalls of 23% and 13% respectively – again, even with huge increases in wind and solar deployment

- **Midwest/Mid-Atlantic**, at a 44.8% electricity shortfall (would lose 20 proposed pipeline projects in the region that could help alleviate power shortfalls)
- Denying petroleum pipelines in the **Mid-Continent** would prevent more than 2.4 million barrels per day of American energy from filling our tanks, planes and trains, and from assisting manufacturers with developing products and reducing our trade deficit.
- High energy-consuming states in the **Southeast** would see a 29.2% electricity shortfall, even assuming EIA's prediction that wind and solar would expand by a factor of 37 by 2030
- The **New England** region is already expected to have as much as a 30% shortfall in electric generation capacity by 2020. Failing to build adequate pipelines would add an additional 9.5 percent shortfall on top of existing shortages during high demand days. This would increase the overall shortfall in New England by 2030 in an alarming way. Note that this would still occur even using EIA assumptions that renewable power capacity will increase by 300% – which is not realistic.

# Methodology

CEA applied the following methodology for the assessment:

**Assumptions:**

- Future fossil fuel-based electricity generation and fossil fuel pipeline transportation projects are blocked by delays, litigation, disputes, and anti-development protests
- EIA 2016 Long Term Energy Outlook data<sup>4</sup>
  - CEA utilized EIA 2016 Long-Term Outlook Modeling Tables on U.S. electricity generation and consumption as a baseline for the assessment.<sup>5</sup>
- The 2030 end date was chosen to dovetail with CPP objectives and EIA assessment data
  - Consistent with Clean Power Plan assumptions and bullish assessments for energy efficiency and renewable deployment
- Per activist group demands to shut down baseload electricity, zero out coal and petroleum electric generation and assume that existing nuclear units up for re-licensing are denied as well as recently announced plant closures are put in place by 2030
- Summer 2016 nuclear plant closures and plants up for re-licensing through 2030 do not receive new operating licenses
- Natural gas electricity generation levels remain at 2015 levels, without approval of natural gas pipelines
- Any proposed or planned interstate petroleum and natural gas pipeline without final approval and construction
- Everything else kept constant in EIA modeling reference case
  - Assumes extension of Production Tax Credit
  - Assumes ambitious estimates of future renewable production continues

**Inputs:**

- EIA source data
- Existing natural gas pipeline throughput, with no expansions from 2015 levels
- Proposed pipeline data/information at Federal Energy Regulatory Commission (FERC) and industry sources

**Outputs:**

- Solve/predict natural gas capacity shortfalls
  - Nationally
  - Regionally (New England, Mid-Atlantic, Southeast, Midwest and Mid-Continent)
- Calculate the % of electricity shortfalls by 2030 based on our assumptions/inputs
  - Nationally
  - Regionally

## Introduction

America's national pipeline grid is a critical part of the nation's energy lifeline, much like blood vessels and arteries are vital to the functioning of the human body. As the continued retirement of coal-fired generation facilities occurs, domestically produced natural gas is expected to play a larger role in meeting our future energy needs through electricity generation and other critical uses.<sup>6</sup> Similarly, continued use of petroleum for commercial goods, manufacturing, fuel, gasoline and diesel will continue to be needed to meet expanded demand.

EIA data forecasts that natural gas will meet 37% of U.S. electricity needs by 2030.<sup>7</sup> This reliance on natural gas will help reduce our nation's vulnerability to imports, clean our air and help meet greenhouse gas (GHG) emission reduction targets.<sup>8</sup> However, in order to deliver that volume of natural gas to power plants, factories, homes and farms, natural gas pipeline delivery infrastructure must be upgraded and expanded.<sup>9</sup> Real energy security is not just the presence of abundant natural resources – it is the ability to readily access and deliver those resources at an affordable price.<sup>10</sup> Thus, approving new projects and upgrading existing petroleum pipeline and natural gas pipeline networks will also enhance the nation's energy security, with the energy revolution that produces those fuels continuing to provide enormous benefits to families and businesses.

Blocking proposed midstream and pipeline infrastructure would deny American families, households and industries the energy benefits of over 3.1 million barrels per day of domestic petroleum products and feedstocks and 44.5 billion cubic feet of natural gas supplies that are vital to keeping our economy moving and provide the building blocks for a myriad of consumer staples – critical medicines, food packaging, fertilizers, jet fuel, chemical feedstocks to make computers, smartphones and more. It would also deny jobs to hard-working high wage earners in fields such as construction and the building trades, as well as other high wage earners such as electricians, welders and steel fabricators. At the same time, it would significantly raise fuel prices, increase foreign oil import dependency and forfeit hundreds of millions of state and local tax dollars and billions in capital expenditures.

CEA performed an assessment of national and select regional pipeline and infrastructure needs and the potential impacts that failing to properly plan, permit and construct needed pipelines would have on CEA's members, including families and small businesses and the agriculture, manufacturing and transportation sectors.

The title of the assessment is *Families, Communities and Finances: The Consequences of Denying Critical Pipeline Infrastructure*.

In recent years, projects that enable the development and delivery of fossil fuels have become highly vulnerable to delays and disruptions due to litigation, disputes, complex and often lengthy federal permitting processes<sup>11</sup> and anti-development protests premised on curtailing energy development and delivery projects, all of which present obstacles to the benefits of expanded pipeline capacity and energy supply. Coal-fired power generation and mining, natural gas development, natural gas and petroleum transportation through pipelines, natural gas-fired power generation and emissions-free nuclear power facilities have been and will continue to be susceptible to such risks in the months and years ahead.

At the same time, numerous independent analyses and studies predict that baseload power and energy provided by fossil fuels and nuclear power will form the backbone of electricity generation for decades to come.<sup>12</sup> While promising options like wind and solar continue to expand at a very significant rate, they alone will not be able



**America's national pipeline grid is a critical part of the nation's energy lifeline, much like blood vessels and arteries are vital to the functioning of the human body.**

to meet future demand.<sup>13</sup> Even so, the reality of the current environmental landscape reflects that carbon emissions, the target of many activist organizations, are down to their lowest levels since 1991 due to increased U.S. natural gas production.<sup>14</sup>

The findings from the assessment pose several important questions for regulatory and policymaking bodies regarding the impacts of a halt to new pipeline construction:

- How would an extreme scenario of denying proposed pipeline projects and prematurely removing large amounts of fossil fuels and nuclear baseload electricity coexist with real-world realities of providing the fuel and energy that power every aspect of over 120 million households in this country?
- What are the grid reliability implications and impacts to standards of living in the U.S.?
- How would a halt affect the day-to-day lives of ordinary citizens who must focus on the challenges of paying ever-more expensive housing, childcare, healthcare and utility bills?
- Who would be the real victims of decisions that deny projects and affordable energy options?
- Where would the energy imports come from to make up deficits in the states and regions of the country?
- Considering that sources like liquefied natural gas (LNG) are globally traded commodities and shipments go to the highest bidder, would alternatives even be available at all, and at what price?
- What additional public safety and environmental impacts would arise from moving more energy products on other modes of transportation?
- Are there recent lessons learned and unintended consequences from other countries (e.g. Germany or Japan) that took reactionary measures to shut off entire modes of baseload electricity?
- Does it make sense for the U.S. to reverse the economic, social and geopolitical benefits it has realized from the Energy Revolution?

This assessment examines the practical implications of shutting down critical future U.S. pipeline infrastructure and the affordable and reliable energy options that currently exist. Should this scenario come to fruition, American families and our nation would suffer lost jobs and economic development, higher utility and home heating bills. Small business will also suffer. In other words, an increasing burden will be borne by those least able to afford it – those living on fixed incomes and struggling to make ends meet.



**The reality of the current environmental landscape reflects that carbon emissions, the target of many activist organizations, are down to their lowest levels since 1991 due to increased U.S. natural gas production.**

## US Poverty/Economic Data

The sheer number of Americans living on the margins of society is an often overlooked component of the energy policy discussion. For far too many, paying for the basic necessities of food, clothing, shelter and monthly utility bills is a continual challenge. Denying energy infrastructure projects that bring more abundant supplies of low cost energy places additional burdens and difficulties on those with the least amount of resources.<sup>15</sup>

The official U.S. poverty rate in 2015 was 13.5%, down 1.2 percentage points from 14.8% in 2014.<sup>16</sup> In 2015, there were 43.1 million people living in poverty, 38% of whom are children and seniors 65 and older.<sup>17</sup> Real median household income in the United States was \$56,516 in 2015 - this is the first annual increase in median household income since 2007 according to the U.S. Census Bureau.<sup>18</sup> In 2014, median household income was \$53,657.<sup>19</sup>

Regional poverty data (at or below poverty) in 2015 was as follows:<sup>20</sup>

- Northeast – 6.89 million people
- Midwest – 7.84 million people
- South – 18.3 million people
- West – 10.07 million people

The U.S. Department of Agriculture(USDA) Food and Nutrition Service reports that as of October 2016, there were approximately 43.3 million individual (over 21 million households) food stamp recipients.<sup>21</sup> For a family of four, those earning \$31,596 per year are eligible for assistance.<sup>22</sup> Across the five regions selected for this study, the breakdown of food stamp recipients is as follows:<sup>23</sup>

- New England – over 1.7 million people
- Mid-Atlantic – over 7.8 million people
- Southeast – over 10.2 million people
- Midwest – over 6.8 million people
- Mid-Continent – over 8.4 million people

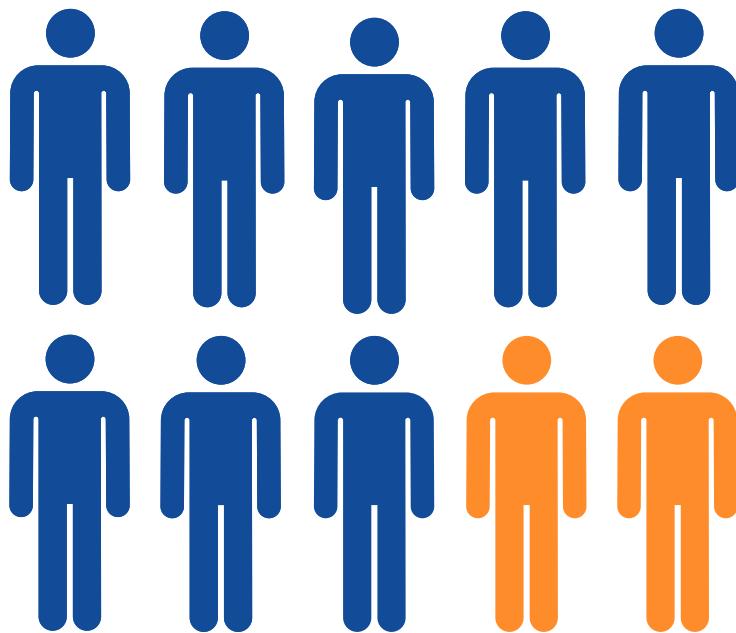


**Denying energy infrastructure projects that bring more abundant supplies of low cost energy places additional burdens and difficulties on those with the least amount of resources.**

## After-Tax Dollars on Energy

Several studies and federal data highlight the disparate impact that higher energy prices have on the working poor in the United States. According to Bureau of Labor Statistics (BLS) data, in April 2016 the bottom quintile of U.S. households spent 22% of their after-tax income on residential utility bills and gasoline compared to just 5% by the top quintile.<sup>24</sup>

Renewable energy advocacy group Groundswell conducted a recent analysis which found that the bottom 20% of earners spend almost 10% of their income solely on electricity, more than seven times the portion of income that the top quintile pays, and 50% of all families that spend 10% of income on power bills being African-American. In addition, the report found that more than half of those energy-insecure households are below the federal poverty level.<sup>25</sup>



**Bottom 20% of earners spend almost 10% of their income solely on electricity.**

**This is more than seven times the portion of income that the top quintile pays.**

Many of these individuals live in older, less energy efficient multifamily housing in more urban areas of the country or in manufactured housing in rural areas that can also see tremendously expensive energy bills relative to overall take-home pay and compared to other demographics living in single-family housing. The U.S. Department of Housing and Urban Development found that 88% of multifamily households are renters with an average annual income (\$31,000) that is just over half that of average homeowners (\$61,000). In other words, the burden of those living in older and less energy-efficient multifamily housing is being borne by families with the fewest financial resources. Consequently, renters typically pay a higher percentage of their income for energy use and utilities, with the resulting reduction in discretionary income making them much more vulnerable to harsh swings in energy prices. In fact, energy prices increased faster than housing costs between 2001 and 2009, with renters in multifamily units experiencing an average rent increase of 7.6% and a 22.7% increase in energy costs.<sup>26</sup>

The problem of high energy bills disproportionately hitting the poor has been acute and lingering for many years, so much so the federal government has a dedicated funding stream that is appropriated to states through the Low Income Home Energy Assistance Program (LIHEAP).<sup>27</sup> In 2016, Congress spent well over \$3 billion to provide LIHEAP assistance to families to help pay energy and heating bills.<sup>28</sup> To be eligible for assistance, families must have incomes at or below 150% of the federal poverty level (about \$30,000 annually for a family of three), or 60% of the state's median income level. As recently as 2011, roughly 9 million households, or 23 million people, received LIHEAP assistance.<sup>29</sup> Currently, nearly 7 million households depend on LIHEAP to help pay high home heating and cooling bills.<sup>30</sup> According to a coalition of groups supporting increased programmatic LIHEAP funding, at least 90% of all LIHEAP recipients have at least one household member who is a child, elderly or disabled.<sup>31</sup>

**Average Price of Electricity to Ultimate Customers by End-Use Sector (October 2016 EIA Electricity Report)<sup>32</sup>**

Census Division and State	Residential		Commercial		Industrial		All Sectors	
	Aug. 2016	Aug. 2015	Aug. 2016	Aug. 2015	Aug. 2016	Aug. 2015	Aug. 2016	Aug. 2015
<b>New England</b>	18.23	18.06	15.10	14.89	12.28	12.02	16.05	15.76
Connecticut	18.76	19.23	15.36	15.10	12.80	12.56	16.70	16.66
Maine	16.12	15.49	12.33	12.65	9.76	8.87	13.23	12.70
Massachusetts	18.32	17.99	15.70	15.39	13.36	13.35	16.45	16.13
New Hampshire	18.23	17.13	14.30	14.04	12.32	12.26	15.62	15.00
Rhode Island	18.57	18.86	14.63	14.47	13.46	12.93	16.35	16.25
Vermont	17.27	17.11	13.97	14.40	9.95	10.11	14.21	14.33
<b>Middle Atlantic</b>	16.02	16.46	13.24	13.66	7.26	7.38	13.37	13.64
New Jersey	16.22	16.66	13.19	13.75	10.81	11.33	14.40	14.83
New York	18.00	18.41	15.57	15.95	6.28	6.24	15.55	15.78
Pennsylvania	13.81	14.24	9.08	9.42	7.06	7.20	10.39	10.57
<b>East North Central</b>	12.90	13.17	9.90	10.04	7.07	7.08	10.18	10.18
Illinois	11.94	12.42	8.88	9.05	6.61	6.65	9.40	9.59
Indiana	11.35	11.16	9.74	9.44	7.13	6.62	9.34	8.83
Michigan	15.87	15.43	10.74	10.94	7.31	7.46	11.80	11.51
Ohio	12.20	13.09	9.78	10.05	6.80	7.10	9.89	10.25
Wisconsin	14.33	14.64	11.08	11.39	8.04	8.08	11.15	11.25
<b>West North Central</b>	12.81	12.60	10.30	10.16	7.83	7.54	10.55	10.25
Iowa	14.28	13.92	11.24	10.92	7.95	7.05	10.72	9.92
Kansas	13.17	12.44	10.41	10.11	7.43	7.45	10.76	10.31
Minnesota	13.11	12.97	10.16	10.05	7.62	7.54	10.41	10.24
Missouri	12.40	12.37	10.52	10.46	7.96	7.40	11.07	10.77
Nebraska	12.02	12.19	9.35	9.48	7.78	8.25	9.63	9.87
North Dakota	11.38	11.16	9.57	9.46	8.71	8.33	9.66	9.40
South Dakota	11.93	11.72	9.57	9.31	7.50	7.54	9.95	9.76
<b>South Atlantic</b>	11.99	12.04	9.28	9.50	6.69	6.85	10.17	10.24
Delaware	13.00	13.55	9.87	10.00	8.08	8.13	11.00	11.18
District of Columbia	12.48	13.03	11.47	11.49	8.94	9.31	11.64	11.72
Florida	11.47	11.77	9.05	9.54	7.99	8.58	10.33	10.69
Georgia	12.52	12.20	9.70	9.78	6.07	6.39	10.27	10.17
Maryland	13.83	13.95	10.75	11.07	7.86	9.01	11.99	12.23
North Carolina	11.36	11.63	8.88	8.90	6.73	6.75	9.63	9.68
South Carolina	12.76	12.59	10.36	10.32	6.35	6.27	10.19	9.87
Virginia	11.74	11.69	7.85	8.13	6.69	6.98	9.36	9.41
West Virginia	11.57	10.63	9.20	8.70	6.54	6.27	9.04	8.41
<b>East South Central</b>	10.91	10.88	10.09	10.28	6.11	6.54	9.33	9.41
Alabama	12.22	12.05	11.03	11.02	6.43	6.60	10.01	9.86
Kentucky	10.31	10.27	9.21	9.45	5.66	5.82	8.46	8.39
Mississippi	10.31	10.96	9.30	10.21	6.06	6.90	8.78	9.59
Tennessee	10.54	10.28	10.26	10.27	6.23	7.13	9.62	9.63

Average Price of Electricity to Ultimate Customers by End-Use Sector (October 2016 EIA Electricity Report) <sup>32</sup>								
Census Division and State	Residential		Commercial		Industrial		All Sectors	
	Aug. 2016	Aug. 2015	Aug. 2016	Aug. 2015	Aug. 2016	Aug. 2015	Aug. 2016	Aug. 2015
<b>West South Central</b>	10.65	11.01	7.84	7.97	5.44	5.83	8.43	8.72
Arkansas	10.38	10.39	8.28	8.58	6.50	6.82	8.62	8.80
Louisiana	9.43	9.60	8.51	8.64	5.23	5.58	7.79	8.06
Oklahoma	10.51	10.27	8.16	8.22	5.20	5.62	8.48	8.47
Texas	10.94	11.51	7.65	7.76	5.37	5.78	8.54	8.90
<b>Mountain</b>	12.10	12.29	10.01	10.18	7.25	7.15	10.09	10.14
Arizona	12.56	12.64	11.10	11.17	8.46	6.83	11.51	11.22
Colorado	12.79	12.47	10.20	10.18	7.37	7.34	10.36	10.25
Idaho	10.51	10.29	8.02	8.13	7.13	7.20	8.33	8.38
Montana	11.50	11.31	10.16	9.98	5.44	5.52	9.10	8.95
Nevada	10.83	12.36	7.98	9.12	7.84	8.67	9.25	10.27
New Mexico	13.02	13.35	10.64	11.13	5.89	6.45	9.97	10.41
Utah	11.89	11.45	9.18	9.12	6.87	6.62	9.52	9.17
Wyoming	11.75	11.50	9.45	9.12	7.07	6.75	8.34	8.00
<b>Pacific Contiguous</b>	16.38	15.68	14.78	15.40	10.59	10.31	14.45	14.31
California	18.88	18.24	17.01	18.14	14.07	13.87	17.15	17.29
Oregon	10.86	10.68	8.87	8.58	6.43	6.23	8.93	8.68
Washington	9.57	9.36	8.27	8.06	4.64	4.53	7.64	7.42
<b>Noncontiguous Pacific</b>	25.08	26.67	22.20	23.18	19.55	21.95	22.13	23.76
Alaska	21.07	21.01	18.70	18.26	15.02	15.19	18.49	18.35
Hawaii	27.45	29.87	25.01	27.28	21.17	24.07	24.20	26.72
<b>U.S. Total</b>	12.90	12.93	10.70	10.90	7.23	7.33	10.83	10.86

## EIA Gas Consumption and Price Trends

In the fall of 2016, EIA projected that families and households can expect to pay the highest natural gas prices in six years as cold weather forecasts led to predictions that prices for home heating, using primarily natural gas, could jump 22% or an increase of \$116 from 2015 levels, which is a significant number with almost 50% of Americans using natural gas for home heating. According to the EIA Winter Fuels Outlook, the average household can also expect an increase of 26% for propane costs and a 38% increase in home heating bills.<sup>33</sup>

The Agency's U.S. natural gas summary found that production fell from 79.7 billion cubic feet per day (Bcf/d) in September 2015 to 76.5 Bcf/d in July 2016. EIA expects marketed natural gas production to average 77.5 Bcf/d in 2016, a decrease of 1.6% from 2015 levels, which would mark the first annual decline since 2005.<sup>34</sup>

The spot price at the Henry Hub (distribution center for the nation's natural gas pipeline system) is forecast to average \$3.04/million British thermal units (MMBtu) in Q4 2016 and \$3.07/MMBtu in 2017. Natural gas futures contracts for January 2017 delivery traded during the five-day period ending October 6 averaged \$3.34/MMBtu. At the New York Mercantile Exchange, futures contracts for January 2017 delivery traded during the five-day period ending October 6 suggested a price range from \$2.28/MMBtu to \$4.88/MMBtu, reflecting a market expectation of increased Henry Hub natural gas prices in January 2017.<sup>35</sup>

U.S. Natural Gas Summary				
	2014	2015	2016	2017 projected
<b>Prices (dollars per thousand cubic feet)</b>				
Henry Hub Spot	4.52	2.71	2.59	3.16
Residential Sector	10.94	10.36	10.18	11.10
Commercial Sector	8.88	7.89	7.38	8.27
Industrial Sector	5.61	3.91	3.61	4.30
<b>Supply (billion cubic feet per day)</b>				
Marketed Production	75.34	78.78	77.51	81.19
Dry Gas Production	70.93	74.14	72.49	76.23
Pipeline Imports	7.22	7.20	7.97	7.34
LNG Imports	0.16	0.25	0.22	0.20
<b>Consumption (billion cubic feet per day)</b>				
Residential Sector	13.94	12.63	12.08	12.60
Commercial Sector	9.50	8.76	8.54	8.88
Industrial Sector	20.95	20.64	21.04	21.33
Electric Power Sector	22.32	26.50	28.06	27.44
Total Consumption	72.86	74.81	75.97	76.73

## Petroleum Trends

In its November 2016 Energy Outlook, EIA estimates that U.S. domestic energy production will average 8.8 million barrels per day in 2016 and 8.7 million barrels per day in 2017.<sup>36</sup> In 2015, domestic production averaged 9.4 million barrels per day. At the same time, total global demand for oil consumption is expected to expand in 2017 by 1.5 million barrels per day.<sup>38</sup>

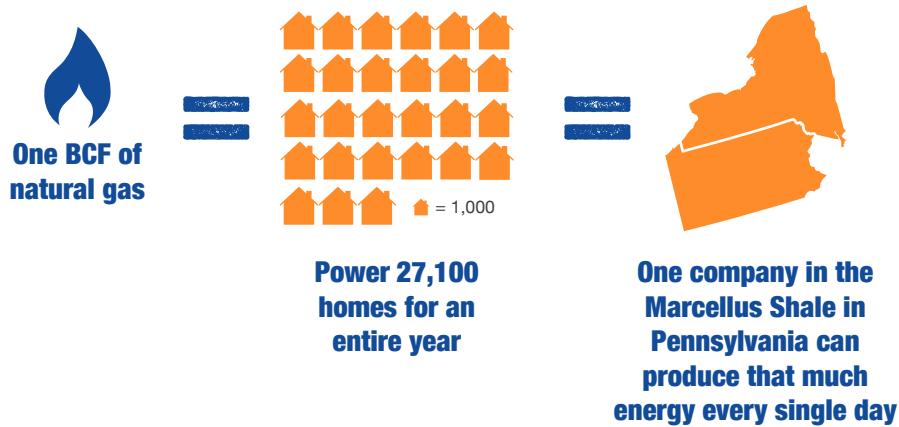
Global Petroleum and Other Liquids (Projected million barrels per day)				
	2014	2015	2016	2017 projected
<b>Supply &amp; Consumption</b>				
Non-OPEC Production	55.90	57.49	56.88	57.20
OPEC Production	37.45	38.31	39.28	40.23
OPEC Crude Oil Portion	30.99	31.75	32.54	33.26
Total World Production	93.35	95.80	96.16	97.43
OECD Commercial Inventory (end-of-year)	2688	2967	3054	3088
Total OPEC surplus crude oil production capacity	2.08	1.60	1.30	1.17
OECD Consumption	45.86	46.41	46.59	46.79
Non-OECD Consumption	46.72	47.66	48.81	50.13
Total World Consumption	92.58	94.07	95.40	96.92

## Expected Future Pipeline Needs and Development

In April 2016, the consulting firm ICF International prepared an analysis of future North American pipeline infrastructure construction needs through 2035. The study examined two market scenarios (high and low case), and concluded the following:

- U.S. and Canadian natural gas transportation capacity addition by 2035 is projected at 44 to 58 billion cubic feet (Bcf) per day for both scenarios, with a midpoint value of 51 Bcf per day.

- To put these numbers in perspective, 1 Bcf of gas can power over 27,100 homes for an entire year. One company in the Marcellus Shale in Pennsylvania can produce that much every single day.<sup>39</sup> Thus, the midpoint value in the study estimates that enough gas capacity could come online to power over 1.2 million homes in Canada and the U.S.



- U.S. and Canadian natural gas liquids (NGL) transportation capacity addition is projected to be 1.1 to 2.3 million barrels per day (BPD) for both scenarios, with a midpoint of 1.7 million BPD.
- U.S. and Canadian oil pipeline capacity addition is projected at 4.5 to 6.9 million BPD, with a midpoint value of 5.7 million BPD.
- Capital expenditure (CAPEX) for new midstream infrastructure will range from \$471 billion to \$621 billion over the next 20 years (or an average \$22.5 to \$30 billion per year), with a midpoint expenditure of \$546 billion.
- Investment in pipelines (including both transmission and gathering lines and compression and pumping) will range from \$183 billion to \$282 billion, with a midpoint CAPEX of \$232 billion.<sup>40</sup>

## Pipelines Completed and Underway – Benefits

IHS Economics and the National Association of Manufacturers (NAM) developed a study examining the macroeconomic impacts that increased energy production will have for job creation and growth for the country. It found:

- Expanded access to energy access created 1.9 million jobs economy-wide in 2015
- Shale gas production put an extra \$1,337 in the wallets of an average American family
- New pipeline construction meant more than 347,000 jobs, with 60,000 alone for manufacturing
- Total natural gas demand was poised to increase by 40% over the next decade, and our domestic production is expected to increase by 48% over the next decade to meet new demand
- In 2015 and 2016, **13,252 miles of new crude oil transmission pipelines will be constructed in the U.S.** at a cost of \$25.6 billion
- From both construction and maintenance in 2016, crude oil pipelines will contribute **243,167** jobs, including **28,438** manufacturing jobs
- U.S. economic output was estimated to grow by **\$91.7 billion** from combined economic output between 2015 and 2016 - considering direct spending and indirect and induced multipliers
- From 2015 to 2016, construction and operation of crude oil pipelines contributed a combined **\$46.9 billion** to gross domestic product (GDP), including **\$7.6 billion** in manufacturing.
- **\$31.8 billion** in combined domestic labor income in 2015 and 2016.<sup>41</sup>

### EXPANDED ENERGY ACCESS

**1.9 million**

Number of jobs created in 2015

**\$1,337**

Amount provided to the average American family in extra income

### PROJECTED JOBS FROM NEW PIPELINES

**347,000**

Jobs created

**60,000**

Manufacturing Jobs created

As these statistics above clearly show, halting the construction of pipelines would have an immediate impact on consumers, families, manufacturers and energy-intensive industries. If all pending and planned projects were canceled, the ripple effects would be enormous.

Roughly 44.5 Bcf in total natural gas deliveries are currently awaiting final approval at the FERC. If all those projects were used primarily for residential electricity use, it could power over 1.2 million homes a year.<sup>42</sup> Proposed petroleum and natural gas liquids projects under development today represent approximately 4.6 million barrels per day of domestic, American-made energy waiting to be transported to domestic refineries and applied to industrial uses.<sup>43</sup> For comparison purposes, the federal government estimated the U.S. imported 2.89 million barrels per day from OPEC nations.<sup>44</sup> These projects thus present an opportunity to significantly reduce if not eliminate U.S. imports from unstable and hostile regimes.<sup>45</sup>



**Halting the construction of pipelines would have an immediate impact on consumers, families, manufacturers and energy-intensive industries. If all pending and planned projects were canceled, the ripple effects would be enormous.**

## Recent Trends in Pipeline Safety

Transporting energy over long distance pipelines in the United States is remarkably safe. Federal data continue to show that pipelines are the safest and most environmentally favorable way to move oil and natural gas across the country.<sup>46</sup> A recent analysis for the petroleum pipeline found that 99.999% of all crude oil and refined products reached their destination safely in 2015.<sup>47</sup> Interstate natural gas pipelines have equally similar and impressive safety numbers with 99.999997% of the gas moved nationwide reaching its destination safely in 2014.

In addition, pipeline leaks on natural gas lines are down 94% from 1984-2012 according to the Interstate Natural Gas Association of America.<sup>48</sup> Release statistics for the liquids pipeline industry are also trending downward significantly with reportable incidents (anything over five barrels) to the Pipeline and Hazardous Materials Safety Administration declining 52% since 1999.<sup>49</sup>

These statistics are all the more impressive as safety has improved while volumes and miles have increased. Total pipeline mileage and barrels of crude oil and petroleum products have increased by 13% and 20% respectively since 2011.<sup>50</sup> During the initial stages of the significant expansion of oil and natural gas production in areas like the Bakken Shale, there was very limited pipeline capacity and storage in the region. The result was a major increase in rail and truck traffic – often on rural roads – to get oil to markets and refineries. While current crude by rail volumes are down significantly, as late as October 2014, volume was roughly 1 million barrels per day according to EIA data.<sup>51</sup> As a consequence of denying additional pipeline infrastructure, communities may face the impacts from increased rail, barge, and truck traffic. An August 2015 study by the Fraser Institute found that rail is 4.5 times more likely to experience a release or spill compared to pipeline transportation.<sup>52</sup>

## The Reality

The rapid development of renewables has been a welcome sign of growth and expansion for the economy and the trajectory of its rise is truly impressive. (Although renewable energy is not immune from protests and permitting obstacles.<sup>53</sup> According to the Solar Energy Industries Association, there are now 32 gigawatts of installed solar with enough capacity to power 6.2 million homes.<sup>54</sup> Similar strong growth patterns have been occurring for wind as well, with the American Wind Energy Association estimating enough wind capacity to power 20 million homes. Installed wind capacity has nearly tripled since 2008, from 25,000 megawatts to over 75,000 megawatts.<sup>55</sup>

These are important and positive developments, but the hard truths remain. America will depend on baseload electricity and fossil fuels to meet its energy for many years and decades to come. EIA notes that coal, natural gas and nuclear power made up 86 percent of our nation's electricity in 2015, with just 5.3 percent supplied by wind and solar.<sup>56</sup> Could a \$16 trillion a year economy be powered solely on intermittent sources of energy that need to be available, affordable, and easily dispatched 24 hours a day, seven days a week?

For the sake of argument, CEA investigated beyond the headlines and rhetoric to examine the practical implications for the American power delivery system of shutting down new pipeline projects and removing fossil fuels and baseload electricity. Every demand made by anti-development groups was extrapolated and compared to data from the 2016 EIA Energy Outlook, using its baseline assumptions for expanded renewable energy generation premised on implementation of the Obama Administration's Clean Power Plan, as well as assumptions that favorable tax treatment would remain in place. The scenario removes the existing coal fleet, excludes the use of petroleum for electric generation, and assumes no new or relicensed nuclear power plants and no new additional natural gas capacity additions by 2030.

As illustrated below, CEA's analysis revealed that a staggering electricity generation shortfall would result:

Generation	2015	Reference	EIA CPP Rate	Shortfall Case
Incremental energy efficiency	0.00	72.39	75.97	75.97
Oil and other	43.08	38.14	38.26	0.00
Solar	37.62	226.82	301.60	301.60
Wind	189.63	456.66	528.08	528.08
Other renewables	319.11	404.88	407.34	407.34
Nuclear	797.69	789.09	789.09	631.13
Coal	1,354.90	972.49	995.04	0.00
Natural gas	1,348.27	1,702.09	1,531.18	1,348.27
<b>Total (billion/kwh)</b>	<b>4,090.29</b>	<b>4,662.57</b>	<b>4,666.67</b>	<b>3216.42</b>
<b>Deficit (billion/kwh):</b>				<b>1,450.25<sup>57</sup></b>
<b>Electricity Shortfall:</b>				<b>31%</b>

The shortfall would be the equivalent of all the power generated in the states of California, Florida, Illinois, Ohio, Texas and every state in New England, combined.<sup>58</sup>

State	Net summer capacity (MW)	Net generation (MWh)	Total KWh	Net generation (Billion KWh)
California	74,646	198,807,622	198,807,622,000	199
Connecticut	8,832	33,676,980	33,676,980,000	34
Florida	59,440	230,015,937	230,015,937,000	230
Illinois	44,727	202,143,878	202,143,878,000	202
Maine	4,470	13,248,710	13,248,710,000	13
Massachusetts	13,128	31,118,591	31,118,591,000	31
New Hampshire	4,418	19,538,395	19,538,395,000	20
New York	40,404	137,122,202	137,122,202,000	137
Ohio	31,507	134,476,405	134,476,405,000	134
Rhode Island	1,810	6,281,748	6,281,748,000	6
Texas	112,914	437,629,668	437,629,668,000	438
Vermont	650	7,031,394	7,031,394,000	7
<b>Total</b>				<b>1,448</b>

The results dovetail with other independent analyses, including the recently released Clean Power Progress initiative by the Laborers' International Union of North America (LIUNA). That analysis found that combining the President's Clean Power Plan, the closure of nuclear power plants and retirements of coal units will take enough electricity off the grid to power 18 million homes. LIUNA found that by 2030, there will be a 21 percent electricity generation deficit, or a 1.1 billion megawatt/hour energy shortage, which is more electricity than the US industrial sector consumed in 2015 for agriculture, assembly lines and construction combined.<sup>59</sup>



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## Profiles on Select Regions

Below are the regional implications from this projected electricity generation shortfall and the denial of pipeline infrastructure projects to bring more affordable, reliable energy to families, households and businesses.

### NEW ENGLAND

New England is very (and increasingly) reliant on natural gas, which provides nearly half the region's electricity – up from just 15% in 2000.<sup>60</sup> Yet infrastructure and pipeline construction have not kept pace with the increase in demand for more natural gas supplies.

ISO New England, the region's independent grid manager, has repeatedly warned of future reliability and price impacts due to a lack of natural gas capacity to reduce bottlenecks and supply shortages.<sup>61</sup> The region simply does not have enough gas pipelines to meet home heating and electricity needs on high energy demand days such as those experienced during the Polar Vortex. With expected shutdowns of existing coal and nuclear power plants, experts predict that in the near future New England will lose the electrical capacity to power more than 9 million homes.<sup>62</sup>

Officials from ISO recently stated that the region's power system "continues to be in a precarious position during extended periods of extreme cold" – and that this would "continue until New England's natural gas infrastructure is expanded to meet the demand for gas."<sup>63</sup> New England already experiences a shortfall on high demand days and relies on LNG terminals and starting up older, inefficient generation units with higher emissions and generation costs at spot market prices. The largest state in New England – Massachusetts- only receives roughly 9% of its electricity from renewables.<sup>64</sup>

Adding more natural gas could save already stretched New England ratepayers over \$1.2 billion annually in lower energy costs. These substantial savings could be used to take a vacation, pay bills, buy holiday gifts and manage the region's expensive cost of living. Yet, policymakers continue to avoid taking the action necessary to construct or even upgrade pipeline infrastructure in New England. Here are the consequences of the lack of progress on the region's natural gas infrastructure and status quo decision-making:

- U.S. Census data estimates nearly 7 million people in the Northeast live in poverty<sup>65</sup>
- Of the 43.3 million people reliant on food stamps nationwide, over 1.7 million are in New England (CT – 425,511, ME – 186,372, MA – 772,573, NH – 95,967, RI – 169,373 and VT – 77,456); in Rhode Island, 16% of the population depends on food stamp benefits to support themselves or their family<sup>66</sup>
- Reliability gap of 9.5% (including very optimistic assumptions about the deployment of renewable power and a growth rate of 300% by 2030) that the poor, young people, seniors and hard-working families simply can't afford
- The New England region is already expected to have as much as a 30% shortfall in electric generation capacity by 2020. Failing to build adequate pipelines would add an additional 9.5 percent shortfall on top of existing shortages during high demand days. This would increase the overall shortfall in New England by 2030 in an alarming way. Note that this would still occur even using EIA assumptions that renewable power capacity will increase by 300% - which is not realistic.
- The most expensive residential electricity rates on average in the Lower 48 States – only Hawaii and Alaska have higher average residential rates<sup>67</sup>
- Based on EIA's most recent analysis - every state in New England would be in the top 10 for the most expensive residential rates<sup>68</sup>
- According to media reports, the cost of living in Boston is over 40% higher than the national average<sup>69</sup> and the city has one of the least affordable housing markets in the country<sup>70</sup> (Zillow average price for a single family home is over \$505,000)

- A typical Boston resident must earn more than \$120,000 a year to afford the rent of an average two bedroom apartment, which was over \$2,800 in the summer of 2016<sup>71</sup>; a Boston Globe study found half of the city's residents make less than \$35,000 a year<sup>72</sup>
- Two major pipeline and infrastructure expansion projects are currently planned for the region that backers say would provide well over \$3 billion in economic investment to New England, create over 2,300 jobs, and generate roughly 6,850 MW of much-needed clean natural gas for electricity (enough power for more than 6 million homes)<sup>73</sup>

Northeast Region <sup>74</sup>			
Fuel Type	EIA 2015 Baseline	EIA CPP Rate	Shortfall Case
Nuclear	76	63	49.93
Coal	7	6	0
Natural Gas	130	134	130
Wind/Solar	9	24	24
Other <sup>75</sup>	45	51	47.6
<b>Total</b>	<b>267</b>	<b>278</b>	<b>251.53</b>
<b>Deficit (billions of kwh):</b>			<b>26.47</b>
<b>Electricity Shortfall:</b>			<b>9.5%</b>

## MID-ATLANTIC

Denying new pipeline projects from the Utica and Marcellus Shale would stop the significant revitalization of manufacturing in Ohio, Pennsylvania, West Virginia and its neighbors – in addition to the benefits they are receiving from stable, low-cost supplies of natural gas and NGLs. The region has seen recent surges in prices for electricity and is already struggling with lost baseload capacity due to a myriad of new Environmental Protection Agency (EPA) Clean Air rules.<sup>76</sup>

In 2015, the generation capacity auction price for power on the PJM Interconnection (a regional grid manager) increased by 37%.<sup>77</sup> Under new reliability rules established to cope with weather events like the Polar Vortex, consumers will have to pay an additional \$3.4 billion to ensure reliability in 2018/19.<sup>78</sup> Residential electricity prices in the region already exceed the national average by 7%, without the energy shortfall created by the Shortfall Case scenario.<sup>79</sup> Here are the consequences, and those affected most, by the denial of new pipeline infrastructure and the premature removal of large amounts of baseload electric generation for the region:

- Of the 43.3 million people on food stamps nationwide, over 7.8 million reside in the Mid-Atlantic (DE- 147,477, DC-131,545, MD- 722,228, NJ- 865,632, NY-2,941,315, PA-1,854,367, VA -813,726, and WV 359,665)<sup>80</sup>
- According to USDA data, the District of Columbia (19.6%) and West Virginia (19.5%) have the 3rd and 4th highest percentages of populations dependent on food stamp benefits<sup>81</sup>
- Reliability gap of 44.8% that the poor, young people, seniors and hard-working families simply can't afford
- Based on EIA data, the Midwest/Mid-Atlantic regions would be two of the most severely impacted by the Shortfall Case scenario, with a 44.8% energy shortfall by 2030 due to prematurely retiring nuclear units, zeroing out coal and prohibiting the use of new natural gas
- Activists prodded Governor Cuomo to deny the Constitution Pipeline, which would have provided over 2,400 construction jobs and \$13 million in annual property tax revenue for communities in New York<sup>82</sup>

- The region is home to significant NGL production, which has led to the single largest investment in Pennsylvania since WWII with a new ethane cracker plant near Pittsburgh that is estimated to create over 6,000 construction jobs and 600 full-time jobs upon completion<sup>83</sup>; project will require 105,000 barrels per day of ethane to meet demand<sup>84</sup>
- Another project opposed by activists would prohibit the revitalization of the Marcus Hook refinery complex in Philadelphia and prevent nearly 800,000 barrels a day of NGLs from reaching the facility – jeopardizing \$4.2 billion in potential economic activity and over 30,000 construction jobs<sup>85</sup>
- There are at least 17 projects before FERC in the Mid-Atlantic region totaling 21,302 MMcf/day of gas that could help consumers, families and small businesses deal with energy shortfalls<sup>86</sup>

Mid-Atlantic/Midwest Region <sup>87</sup>			
Fuel Type	EIA 2015 Baseline	EIA CPP Rate	Shortfall Case
Nuclear	275	242	200.17
Coal	467	270	0
Natural Gas	177	308	177
Wind/solar	25	145	145
Other	27	33	24.4
<b>Total</b>	<b>971</b>	<b>998</b>	<b>546.57</b>
<b>Deficit (billion kwh):</b>			<b>451.43</b>
<b>Electricity Shortfall:</b>			<b>44.8%</b>

## SOUTHEAST

As in many other parts of the country, market and regulatory forces have led to tremendous changes in the Southeast region's electricity generation portfolio in just a short period of time. According to the 2016 Southern States Energy Board's (SSEB) Regional Energy Profiles, the 16 member states and two member territories in its region consumed 46% of the total energy used in the United States.<sup>88</sup> Natural gas is the second largest source of total energy consumed by SSEB members and makes up 40% of the member states' electricity generation.<sup>89</sup> The Southeastern states have a 12% lower residential electricity rate than the national average, but it is home to many high-use energy states with very hot and humid summers.<sup>90</sup>

Shutting down currently planned pipeline projects in the Southeast would have tremendous negative impacts for prices and grid reliability – especially as the Southeast continues to add significant population growth. U.S. Census Data shows that from 2010-2015, the states of Georgia, Florida, North Carolina, and South Carolina added 2.6 million new residents.<sup>91</sup> The Florida Chamber of Commerce has estimated that the state's population is projected to increase by six million people for a total population of nearly 26 million by 2030.<sup>92</sup> To put it in perspective, that is larger than the current population of Australia.<sup>93</sup> Without new infrastructure construction, it is unclear how future energy demand in the Southeast can be effectively met. Here are the consequences, and those affected most, by the denial of new pipeline infrastructure and the premature removal of large amounts of baseload electric generation for the region:

- U.S. Census Bureau data estimates that over 18.3 million people in the Southeast live at or below the poverty line<sup>94</sup>
- Of the 43.3 million people on food stamp benefits nationwide, over 10.2 million reside in the Southeast (AL-825,198, FL-3,262,475, GA-1,677,279, KY-649,388, MS-554,866, NC-1,475,489, SC-740,443, and TN-1,082,601)<sup>95</sup>

- Mississippi has the fourth highest percentage in the country (18.5%) of residents reliant on food stamps<sup>96</sup>
- Reliability gap of 29% that the poor, young people, seniors and hard-working families in the Southeast simply can't afford
- Based on results of the Shortfall Case scenario, the Southeast could see an electricity shortfall of 29% by 2030; this outcome includes the extremely ambitious, if not unrealistic, assumption made that wind and solar electricity generation would increase 37-fold from 2015 levels.
- Numerous proposed pipeline projects that would bring much needed natural gas and petroleum to the Southeast have been opposed by protest movements and delayed by legislative action; construction of one project in North Carolina could generate \$680 million in total economic activity, support over 4,400 jobs, and provide an average \$6 million a year in local property tax revenue for schools, roads and more<sup>97</sup>
- Another large project for Alabama, Georgia and Florida would employ over 5,600 people during construction and produce \$755 million in related economic activity<sup>98</sup>
- The Southeast could also see repurposing of existing pipeline systems to move NGLs from the Mid-Atlantic to the Gulf Coast refinery complex; one project could move up to 430,000 barrels per day and require \$4 billion in capital expenditures<sup>99</sup>
- There are at least eight major projects awaiting consideration by FERC totaling 5,202 MMcf/day gas that could help consumers, families and small businesses deal with energy shortfalls<sup>100</sup>

Southeast Region <sup>101</sup>			
Fuel Type	EIA 2015 Baseline	EIA CPP Rate	Shortfall Case
Nuclear	253	291	224.58 <sup>102</sup>
Coal	230	248	0
Natural Gas	418	438	418
Wind/solar	3	112	112
Other	60	66	63.1
<b>Total</b>	<b>964</b>	<b>1155</b>	<b>817.68</b>
<b>Deficit (billions of kwh):</b>			<b>337.32</b>
<b>Electricity Shortfall:</b>			<b>29.2%</b>

## MIDWEST

Consumers and families in the Midwest are seeing significant changes now in their electricity generation fleet. Large-scale coal retirements are creating a tremendous need for additional new pipeline capacity to bring natural gas into markets to meet existing and future demand.<sup>103</sup> The state of Michigan alone is expected to retire 25 coal plants by 2020 – largely to meet EPA regulatory requirements and market requirements.<sup>104</sup> Two utilities recently predicted the possibility of an electricity shortage starting in 2016 and the loss of enough generating capacity to power Detroit, Grand Rapids and Lansing.<sup>105</sup> The region is also home to many large nuclear power plants that are under threat of closure, and activists have been very vocal in opposition to promoting nuclear power.<sup>106</sup>

Without bringing in more natural gas for electricity deliveries, it will be virtually impossible to maintain the reliability of the electric grid. Here are the consequences, and those affected most, by the denial of new pipeline infrastructure and the premature removal of large amounts of baseload electric generation for the region:

- U.S. Census Bureau data estimates that over 7.8 million people in the Midwest live at or below the poverty line<sup>107</sup>
- Of the 43.3 million people on food stamps nationwide, over 6.8 million reside in the Midwest (IL-1,924,612, IN-714,806, MI-1,445,487, OH-1,556,937, MN-476,536, and WI-713,065)<sup>108</sup>
- In Illinois, 15% of residents depend on food stamps to make ends meet<sup>109</sup>
- Reliability gap of 44.8% that the poor, young people, seniors and hard-working families in the Midwest simply can't afford
- The region's residential electricity prices are 13% higher than the national average, according to EIA data<sup>110</sup>
- Based on information from EIA , the Midwest/Mid-Atlantic region would be two of the most impacted by the Shortfall Case scenario, with a 46%+ energy shortfall by 2030 due to prematurely retiring nuclear units, zeroing out coal and prohibiting the use of new natural gas
- The region has several proposed NGL pipeline projects that could bring over 215,000 barrels per day in feedstocks for uses such as industrial applications and propane, with the Utopia project alone injecting over \$1 billion in state and local economic activity<sup>111</sup>
- There are at least five major projects totaling 3,200 MMcf/day waiting final consideration at FERC that could help consumers, families and small businesses deal with energy shortfalls<sup>112</sup>

Midwest/Mid-Atlantic Region			
Fuel Type	EIA 2015 Baseline	EIA CPP Rate	Shortfall Case
Nuclear	275	242	200.17
Coal	467	270	0
Natural Gas	177	308	177
Wind/solar	25	145	145
Other	27	33	24.4
<b>Total</b>	<b>971</b>	<b>998</b>	<b>546.57</b>
			Deficit (billion kwh): 451.43
			Electricity Shortfall: 44.8%

## MID-CONTINENT

Energy production has greatly expanded in the nation's Mid-Continent region – especially in regions like the Bakken, Eagle Ford and Permian Basin in West Texas and Eastern New Mexico. For example, production in North Dakota has more than tripled from 2010 to 2014, with over 1 million barrels per day of production.<sup>113</sup> One of the major challenges these regions are facing is a dearth of pipeline infrastructure and storage required to bring this surge in American energy production to our nation's refinery centers where families, businesses and industries can utilize more of our domestic resources to displace foreign imports.<sup>114</sup> The result is that much of this crude oil must be placed on trucks and railcars, which can add a layer of transportation cost and stress to infrastructure. A lack of storage and pipelines can also cause increased emissions from venting and flaring of methane at the wellhead.<sup>115</sup>

Further, the Midcontinent Independent System Operator (the independent grid manager for 15 states) stated in June 2016 that the region could have a power generation shortfall starting in 2018 due to significant power plant retirements.<sup>116</sup> While reserve margins were adequate in Texas in summer 2016, ERCOT set a record demand for electricity use in August 2016.<sup>117</sup> Here are the consequences, and those affected most, by the denial of new pipeline infrastructure and the premature removal of large amounts of baseload electric generation for the region:

- Of the 43.3 million people on food stamps nationwide, over 8.4 million reside in the Mid-Continent (AR-401,980, CO-469,090, IA-377,379, KS-247,976, LA – 925,861, MO-778,698, OK-614,993, NE-176,130, NM-486,098, ND-54,330, SD-95,654, TX-3,796,484)<sup>118</sup>
- As of October 2016, New Mexico has the highest percentage of residents in the nation (23.3%) reliant on food stamps<sup>119</sup>
- Reliability gap of 46% in some areas of the Mid-Continent that the poor, young people, seniors and hard-working families in the simply can't afford
- The 12 state region has a residential electricity rate that is roughly 9% lower than the national average of 12.90 kwh; however, it is home to high residential use states like Texas, where the average monthly bill (\$136.00) is 17% higher than the national average (\$114.03)<sup>120</sup>
- Several major petroleum pipelines are proposed to transport crude oil from this region to help meet consumer demands in refineries across the country
- The Obama Administration denied the Northern Leg of the Keystone XL Project that would have brought an additional 100,000 barrels per day of oil from the Bakken region in Montana and North Dakota to domestic refineries and would have displaced crude oil imported by the U.S. from unfriendly regimes like Venezuela<sup>121</sup>
- The Administration supported allowing the Southern Leg of the Keystone XL Pipeline to move forward, which provided:
  - Over \$5.7 billion into the local economies of Oklahoma and Texas, as well as \$72 million in new local tax revenues
  - More than 11 million hours of labor completed by 4,844 workers in the United States — heavy equipment operators, welders, laborers, transportation operators and supervisory personnel (including environment, safety and quality control inspectors) and
  - Initial delivery of over 700,000 barrels per day of crude oil from storage in Cushing, OK to the Gulf Coast to be refined for consumers across the country<sup>122</sup>
- The high-profile Dakota Access Pipeline – currently being delayed by the Obama Administration despite it having secured all required federal and state permits – would transport 470,000 barrels per day of domestic production from North Dakota to the Illinois refinery complex; this translates to roughly ½ of the entire daily production from the Bakken region that could be moved by pipeline from an area now heavily reliant on rail and truck traffic to transport energy to marketplaces
  - Project backers estimate the pipeline could create up to 12,000 jobs and nearly \$3.8 billion in investments, that in turn would generate \$156 million in state and local taxes and \$55 million in annual state tax revenue<sup>123</sup>
- Denying petroleum pipelines in the Mid-Continent would prevent more than 2.4 million barrels per day of American energy from filling our tanks, planes and trains, and from assisting manufacturers with developing products and reducing our trade deficit<sup>124</sup>
- There are at least 11 major projects at FERC waiting final consideration totaling 12,718 MMcf/day in natural gas that could help consumers, families and small businesses deal with energy shortfalls<sup>125</sup>

Northern Plains Region <sup>126</sup>			
Fuel Type	EIA 2015 Baseline	EIA CPP Rate	Shortfall Case
Nuclear	53	54	49.15
Coal	261	169	0
Natural gas	10	33	10
Wind and solar	54	155	155
Other	18	22	20
<b>Total</b>	<b>396</b>	<b>433</b>	<b>234.15</b>

Deficit (billions kwh): 198.85  
Electricity Shortfall: 46%

Texas			
Fuel Type	EIA 2015 Baseline	EIA CPP Rate	Shortfall Case
Nuclear	40	40	20.72
Coal	84	90	0
Natural gas	214	195	214
Wind and solar	36	111	111
Other	3	4	1.4
<b>Total</b>	<b>367</b>	<b>399</b>	<b>347.12</b>

Deficit (billions kwh): 51.88  
Electricity Shortfall: 13%

Southern Plains Region			
Fuel Type	EIA 2015 Baseline	EIA CPP Rate	Shortfall Case
Nuclear	41	40	40
Coal	108	81	0
Natural Gas	173	176	173
Wind/Solar	25	81	81
Other	20	21	12.5
<b>Total</b>	<b>367</b>	<b>399</b>	<b>306.5</b>

Deficit (billions kwh): 92.5  
Electricity Shortfall: 23.1%

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- <sup>120</sup> <https://www.misoenergy.org/Library/Repository/Meeting%20Material/Stakeholder/Workshops%20and%20Special%20Meetings/2016/OMS-MISO%20Survey/2016OMSMISOSurveyResults.pdf>
- <sup>121</sup> <http://www.reuters.com/article/us-usa-texas-power-heatwave-idUSKCN10F202>
- <sup>122</sup> <http://frac.org/wp-content/uploads/2011/01/snapdata2016-jul.pdf>
- <sup>123</sup> <http://frac.org/wp-content/uploads/2011/01/snapdata2016-jul.pdf>
- <sup>124</sup> [http://www.eia.gov/electricity/sales\\_revenue\\_price/pdf/table5\\_a.pdf](http://www.eia.gov/electricity/sales_revenue_price/pdf/table5_a.pdf)
- <sup>125</sup> <http://www.cnn.com/2015/11/06/politics/keystone-xl-pipeline-decision-rejection-kerry/>; <http://www.energyxxi.org/benefits-keystone-xl>
- <sup>126</sup> <http://buildkxlnow.org/gulf-coast-pipeline-study/>
- <sup>127</sup> [http://www.daplipelinefacts.com/docs-dapl/08092016/DAPL\\_FactSheet33-8\\_09\\_16.pdf](http://www.daplipelinefacts.com/docs-dapl/08092016/DAPL_FactSheet33-8_09_16.pdf)
- <sup>128</sup> <https://rbnenergy.com/midi>
- <sup>129</sup> See <https://www.ferc.gov/industries/gas/indus-act/pipelines/pending-projects.asp>
- <sup>130</sup> EIA lists several states as “Northern Plains” to include: ND, SD, MT, MN, WI, IA, KS, MO, and IL. <http://www.eia.gov/outlooks/aoe/cpp.cfm>

## About Consumer Energy Alliance

Consumer Energy Alliance (CEA) is a national consumer advocacy organization that brings together families, farmers, small businesses, producers and manufacturers to engage in a meaningful dialogue about America's energy future. With more than 400,000 members nationwide, CEA's mission is to help ensure stable prices and energy security for households across the country. CEA believes energy development is something that touches everyone in our nation, and thus it is necessary for all consumers to actively engage in the conversation about how we develop and diversify our energy resources and energy's importance to the economy. CEA promotes a thoughtful dialogue to help produce our abundant energy supply, and balance our energy needs with our nation's environmental and conservation goals. Learn more at ConsumerEnergyAlliance.org.

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