



# IOWA ELECTRIC GENERATION

Condition of the State  
2022

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## Introduction

On April 22, 2021, the U.S. announced a long-term national policy to ensure the U.S. achieves a carbon-free electricity sector by 2035, effectively eliminating electricity produced using coal and fossil gas.<sup>1</sup>

Consistent with this national policy, the Intergovernmental Panel on Climate Change (IPCC) issued [Climate Change 2022: Mitigation of Climate Change](#) in April of 2022.<sup>2</sup> The IPCC report makes clear that in order to limit warming to 1.5°C, global electric generation from coal will require a reduction of 82% from 2019 levels by 2030.<sup>3</sup>

The IPCC report clearly defines the goal of net zero by 2050 to mean that **ALL global greenhouse gases from all sources** released into the atmosphere equals the amount of greenhouse gasses removed. Importantly, the IPCC report shows that the delay or failure to achieve timely reductions in one sector increases the burden to decrease in other sectors.<sup>4</sup>

**The IPCC report and U.S. national policy recognize that achieving net zero by 2050 requires a carbon-free electricity sector by 2035.**

Without a carbon-free electricity sector by 2035, other sectors and sources will not be able to eliminate or reduce their greenhouse gasses, making the goal of net zero by 2050 unlikely or impossible to achieve. Accordingly, Iowa must prioritize and accelerate the transition to a carbon-free electricity sector by 2035.

In April of 2020, the Iowa Environmental Council released [Iowa's Road to 100% Renewable](#), which summarized various pathways for Iowa to meet a 100%



renewable energy goal based on a dozen regional and national studies. We found that this goal is achievable and desirable. In fact, wind energy surpassed coal as Iowa's primary source of electricity in 2019 for the first time ever, and provided 57% of Iowa's electricity in 2021. Yet, MidAmerican Energy is the majority owner of six coal plants in Iowa with no publicly announced retirement dates. This conflicts with the national policy to achieve a carbon-free electricity sector by 2035, fails to recognize the reduction timelines called for by the IPCC, and breaks MidAmerican's promise to accelerate their transition to a low-carbon economy.

It will take additional and rapid investment in clean energy, energy efficiency, and complementary technologies to have a system that is carbon free 24 hours per day, seven days per week. MidAmerican Energy and Alliant Energy must make serious commitments to reach a zero-carbon electricity system by 2035 and be a part of driving the needed innovation to reach critical climate change milestones, starting with plans to retire their expensive, dirty, and unnecessary coal generation.

## Coal Generation and Climate Change

Of coal's many environmental impacts, none are as harmful, long term, and irreversible as climate change. Climate change is driven by emissions of heat-trapping gases, primarily from human activities, that rise into the atmosphere and act like a blanket, warming the earth's surface.

**Carbon dioxide** (CO<sub>2</sub>) emissions from combusting fossil fuels are the main driver of climate change. CO<sub>2</sub> is also the main byproduct of coal combustion: nearly four grams of CO<sub>2</sub> are produced for every gram of carbon burned (depending on its type, coal can contain as much as 60 to 80 percent carbon). Coal generation produces approximately one ton of CO<sub>2</sub> per megawatt hour (MWh).

Consequences of climate change include rising temperatures and accelerating sea level rise as well as growing risks of drought, heat waves, heavy rainfall from intensified storms, and species loss. Left unchecked, climate change will lead to profound human and ecological disruption. We are already seeing impacts from climate change today in Iowa.

These impacts are costing Iowa businesses, families, governments, and taxpayers billions of dollars. For example, the August 10, 2020 derecho,<sup>5</sup> damaged millions of acres of corn and soybeans, devastated the Cedar Rapids tree canopy, and crippled portions of the MidAmerican and Alliant electric system. The resulting damages to Iowans and Midwesterners totaled \$11 billion in just one event. Then on December 15, 2021, a derecho<sup>6</sup> in Iowa totaled \$1 billion in damages. It also marked the first ever derecho recorded in the month of December<sup>7</sup> in the U.S., and was accompanied by at least 61 tornadoes, the largest outbreak in state history.

The social cost of carbon<sup>8</sup> is a measure of the economic harm from these impacts, expressed as the dollar value of the total damages from emitting one ton of carbon dioxide into the atmosphere. The current average social cost of carbon, as established by the federal government's Interagency Working Group on the Social Cost of Greenhouse Gases (IWG), is \$51 per ton in today's dollars. This estimate comes with a range of uncertainty, and the higher end of the range (95th percentile) results in a social cost of carbon of \$152 per ton.<sup>9</sup> Many experts believe this estimated cost is far lower than the true costs of carbon pollution.

**In 2021, MidAmerican and Alliant coal generation in Iowa emitted 19.97 million metric tons<sup>10</sup> of carbon dioxide into the atmosphere representing economic harm ranging from \$1 to \$3 billion dollars.**



*Damage in Cedar Rapids from the August 2020 derecho.*

The IPCC report clearly defines the goal of net zero by 2050 to mean that ALL global greenhouse gasses from all sources released into the atmosphere equals the amount of greenhouse gasses removed.

## Climate Targets

Delay or failure to achieve timely reductions in one sector increases the burden to decrease in other sectors.<sup>11</sup>

The United States is a signatory to the Paris Agreement with a goal to keep global warming below 2 °C and ideally below 1.5 °C compared to pre-industrial levels. [The Paris Agreement](#) calls for countries to make their pledges to reduce emissions – called nationally determined contributions (NDCs) – more ambitious every five years. NDCs are at the heart of the Paris Agreement and critical to the achievement of these long-term goals. NDCs embody efforts by each country to reduce national emissions and adapt to the impacts of climate change.

On April 22, 2021, the U.S. announced a new NDC of a carbon free electricity sector by 2035, effectively eliminating electricity produced using coal and fossil gas.<sup>12</sup>

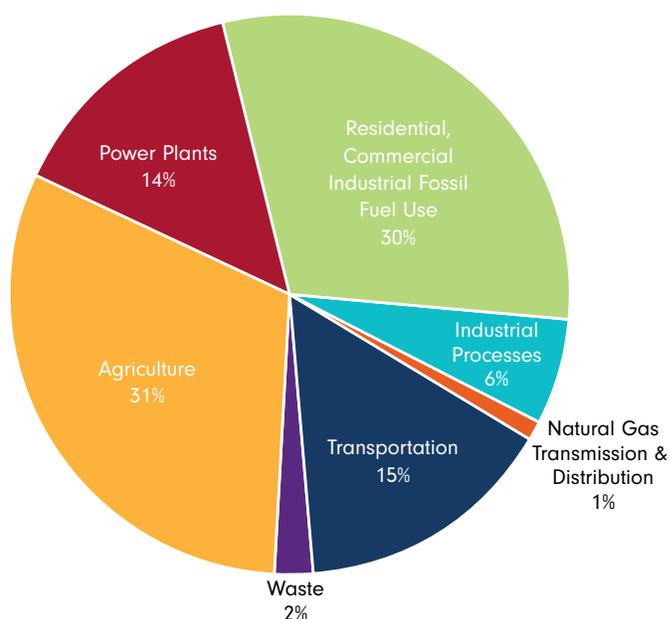
## Iowa's Contribution to Climate Change

The Iowa Department of Natural Resources must report [annual greenhouse gas inventories](#) to the legislature and governor each year. The most recent report calculated greenhouse gas emissions for calendar year 2020.

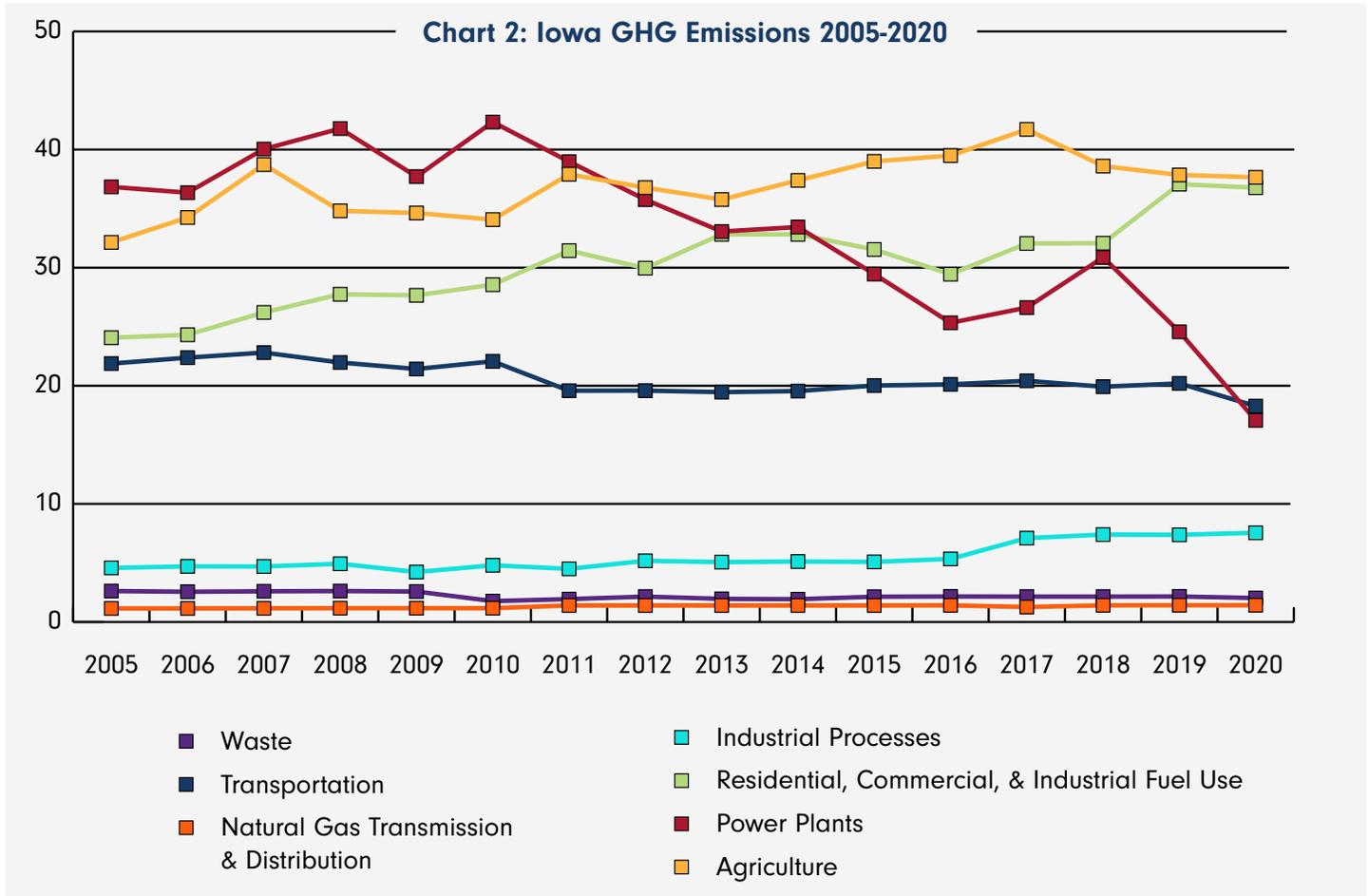
The 2020 GHG Inventory is a “top-down” inventory based on statewide activity data from agriculture, fossil fuel combustion, industrial processes, transmission and distribution of natural gas, transportation, solid waste, and wastewater treatment. It also includes carbon sequestered or emitted from land use, land use change, and forestry. GHGs included in the inventory are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), perfluorocarbons (PFC), hydrofluorocarbons (HFC), and sulfur hexafluoride (SF<sub>6</sub>).

The majority of GHG emissions in Iowa in 2020 were from the agriculture sector (31%), followed by emissions from the residential/commercial/industrial (RCI) sector (30%), transportation (15%), and fossil fuel use by power plants (14%), as shown in Chart 1.<sup>13</sup>

**Chart 1**  
**2020 Iowa GHG Emissions by Sector**



In 2020, total gross Iowa greenhouse gas emissions were 120.77 million metric tons carbon dioxide equivalent (MMtCO<sub>2e</sub>).<sup>14</sup> The trend in Iowa from 2005 through 2020 for each of the sectors is shown in the Chart 2.<sup>15</sup>



Although power plant emissions have declined in the past 15 years, no other sector has made much progress and in fact the agriculture, RCI (residential, commercial, and industrial fuel use), and industrial process use sectors have increased over the same time frame. It is critical to note that the sectors do not operate independently.

**In order to achieve net zero by 2050, the RCI and transportation sectors depend on electrification and a carbon-free electricity sector to provide them clean power by 2035.**



On July 27, 2015, MidAmerican Energy signed the following pledge:<sup>16</sup>

### THE AMERICAN BUSINESS ACT ON CLIMATE PLEDGE

*We applaud the growing number of countries that have already set ambitious targets for climate action. In this context, we support the conclusion of a climate change agreement in Paris that takes a strong step forward toward a low-carbon, sustainable future.*

**We recognize that delaying action on climate change will be costly in economic and human terms, while accelerating the transition to a low-carbon economy will produce multiple benefits with regard to sustainable economic growth, public health, resilience to natural disasters, and the health of the global environment.**

Both MidAmerican and Alliant have established goals for their electric generation to be net zero by 2050.<sup>17 18</sup> Based on filings by MidAmerican, the company plans to retire its coal plants between 2035 and 2049.<sup>19</sup> Alliant has established 2040 as the date for retiring its last coal plant.<sup>20</sup> The MidAmerican and Alliant coal plant retirements would occur in the following years based on their average remaining operating life:<sup>21</sup>

**Table 1**

Plant	Walter Scott 3	Walter Scott 4	Neal 3	Neal 4	Louisa	Ottumwa
Potential Retirement Year	2040	2049	2035	2040	2040	2040

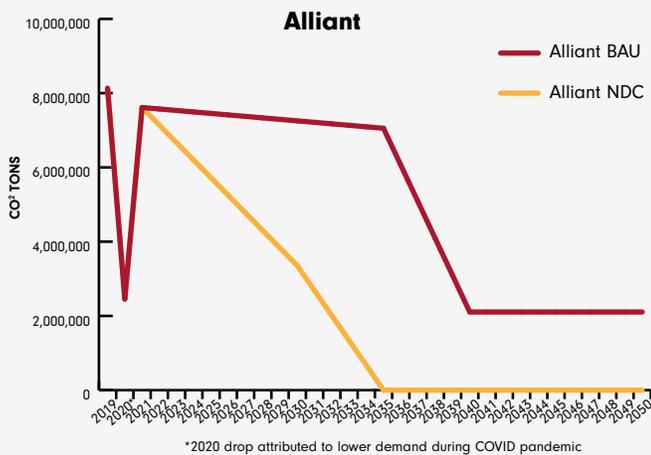
However, the *Sixth Assessment Report, Climate Change 2022: Mitigation of Climate Change, the Working Group III contribution* found that:

*Scenario evidence suggests that without carbon capture, the worldwide fleet of coal and gas power plants would need to retire about 23 and 17 years earlier than expected lifetimes, respectively, in order to limit global warming to 1.5°C and 2°C.<sup>22</sup>*

Based on the IPCC finding in order to limit global warming to 2°C, only Walter Scott 4 should continue to operate after 2023.

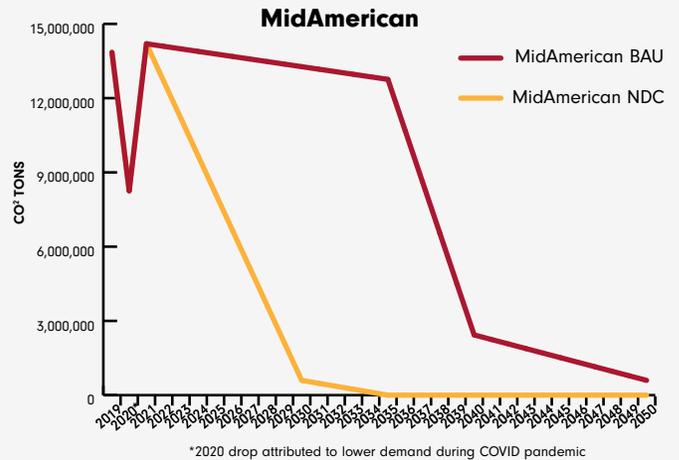
If we compare the business-as-usual (BAU) case for both companies to the new NDC of carbon free electricity by 2035, it is apparent in Chart 3 on page 6 that both companies need to accelerate their planning and implementation to carbon-free electricity for Iowa to meet carbon emission drawdown goals in time. (BAU represents a projection of operating the plants similar to their 2021 operation, and the stated retirement plans incorporating the remaining operational lives. NDC represents a path for carbon free electricity with no fossil fuel generation after 2035.)

**Chart 3: Business As Usual (BAU) vs Nationally Determined Contributions (NDC)**



\*2020 drop attributed to lower demand during COVID pandemic

BAU CO <sub>2</sub> Tons	NDC CO <sub>2</sub> Tons	CO <sub>2</sub> Tons Difference	BAU % Increased CO <sub>2</sub> Tons
156,947,759	68,059,841	88,887,919	57%



\*2020 drop attributed to lower demand during COVID pandemic

BAU CO <sub>2</sub> Tons	NDC CO <sub>2</sub> Tons	CO <sub>2</sub> Tons Difference	BAU % Increased CO <sub>2</sub> Tons
264,094,236	90,347,919	173,746,317	66%

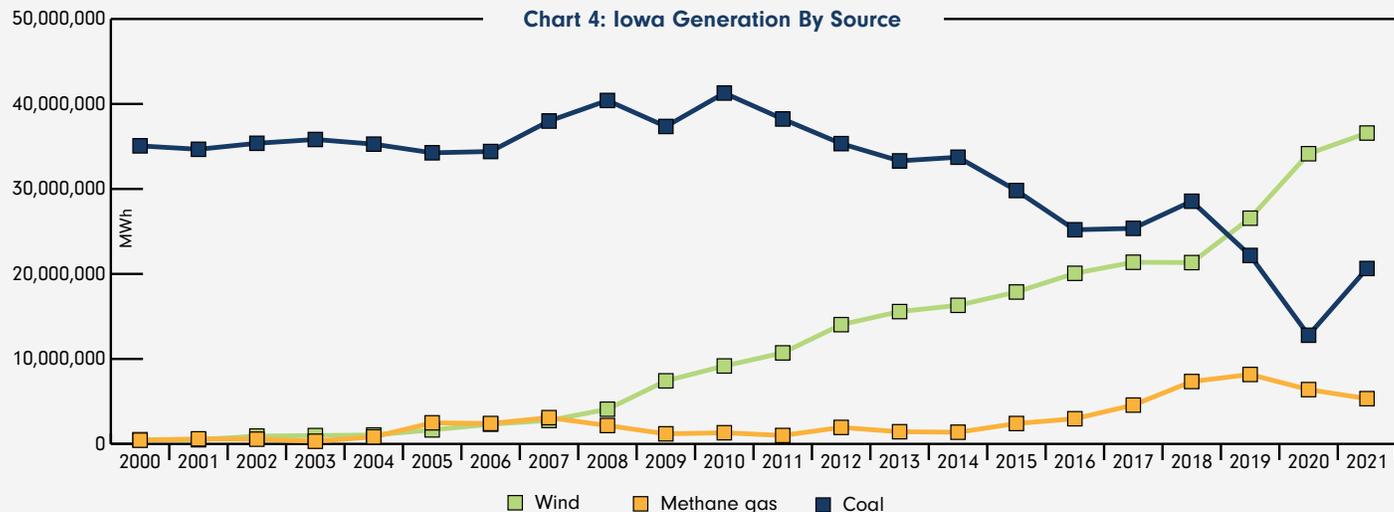
**Both companies appear to believe that the BAU scenario is consistent with the Paris Agreement, failing to acknowledge or understand that net-zero by 2050 is for ALL global greenhouse gasses from all sources.** Rather, the utilities appear to have applied the goal to their electric generation, and failed to address the fact that the Paris Agreement goals were intended to change over time, and that it also applies to their fossil gas operations.

It is clear that both companies need to immediately recognize that a business-as-usual approach will harm customers with both short-term and long-term consequences. Iowa is already experiencing the impacts from climate change, and a failure to take actions to eliminate fossil generation by 2035 is a breach of social responsibility, a likely breach of fiduciary responsibility, and in the case of MidAmerican, a breach of its 2015 Climate Pledge. Iowa industrial, agriculture, business, residential, and transportation sectors cannot and will not meet the necessary greenhouse gas reductions if the utilities fail to meet the 2035 target.



### Iowa Generation Since 2000

Iowa’s progress in developing renewable energy over the past twenty years has resulted in a significant reduction in carbon emissions in the electric generation or power sector. Iowa has made progress in reducing generation from coal-fired power plants since 2000 and has seen a significant increase in generation from wind. The decrease in generation from fossil gas over the past two years has coincided with higher fossil gas prices.



Source: Net Generation by State by Type of Producer by Energy Source (EIA-906, EIA-920, and EIA-923)

The 2016 to 2021 timeframe is especially noteworthy because renewable generation from wind not only exceeded coal generation for the first time, but rose to 60% of Iowa’s generation in 2020 – the most of any state in the U.S. Energy generation from wind increased from 2020 to 2021, but fossil generation in Iowa increased even more as a percentage of total generation.

**As a result, fossil fuel generation in Iowa increased from 33% in 2020 to 41% in 2021 while wind generation decreased from 60% in 2020 to 57% in 2021.**

The 2021 Iowa resource mixes for Iowa’s two largest utilities, Alliant Energy and MidAmerican Energy, are shown in Charts 5 and 6.<sup>23</sup> Wind represented 57% of the MidAmerican Energy generation and 32% of the Alliant Energy generation. While Alliant had a larger share of coal generation, it has since converted Burlington to fossil gas and is retiring Lansing 4 by the end of 2022.

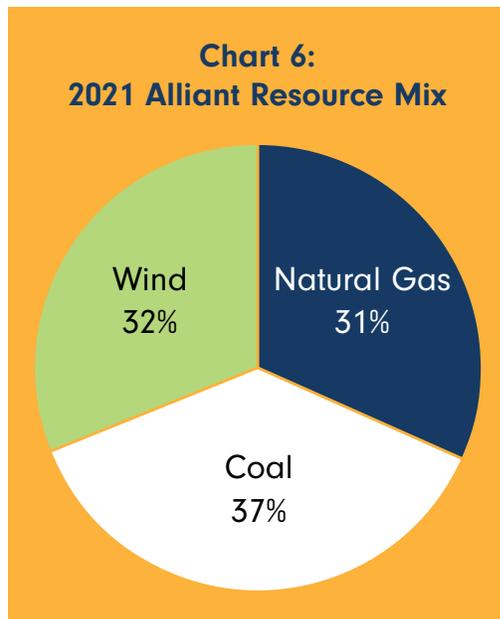
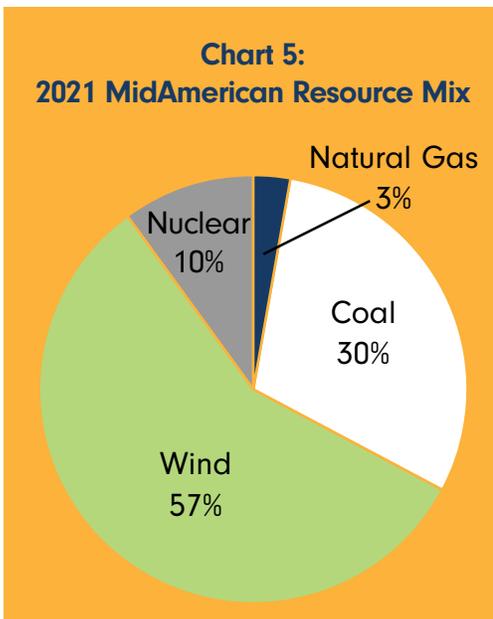
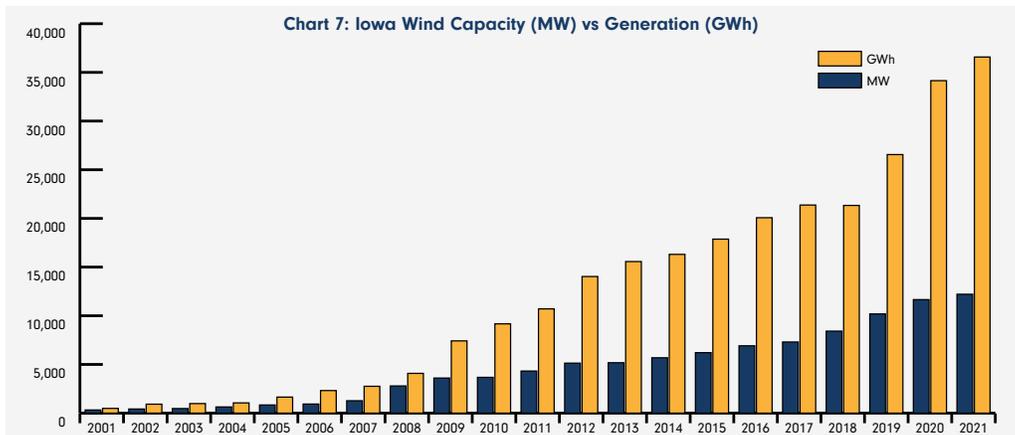


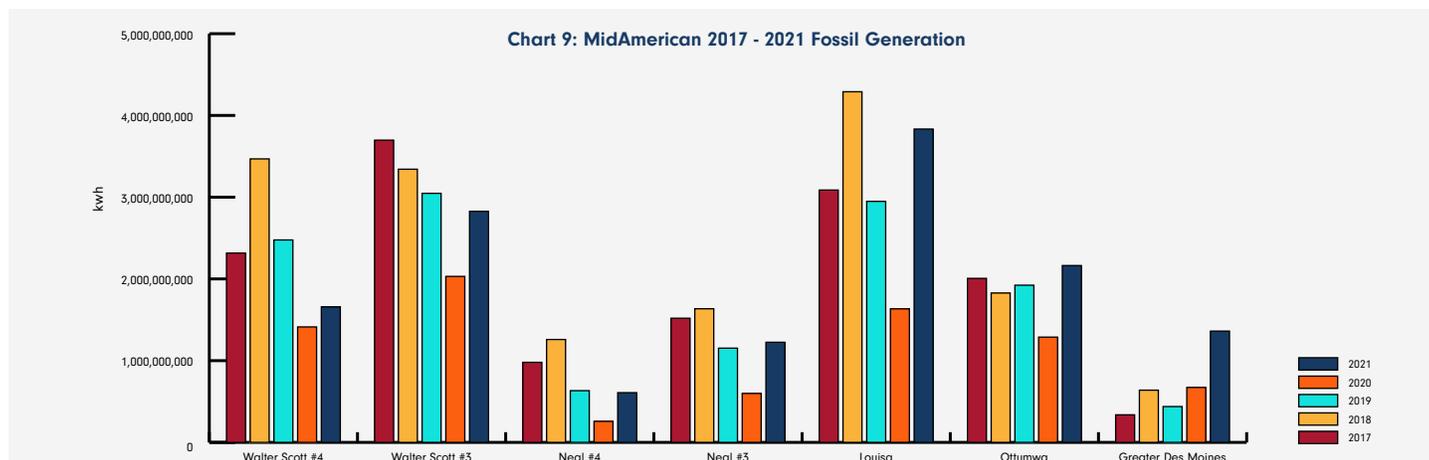
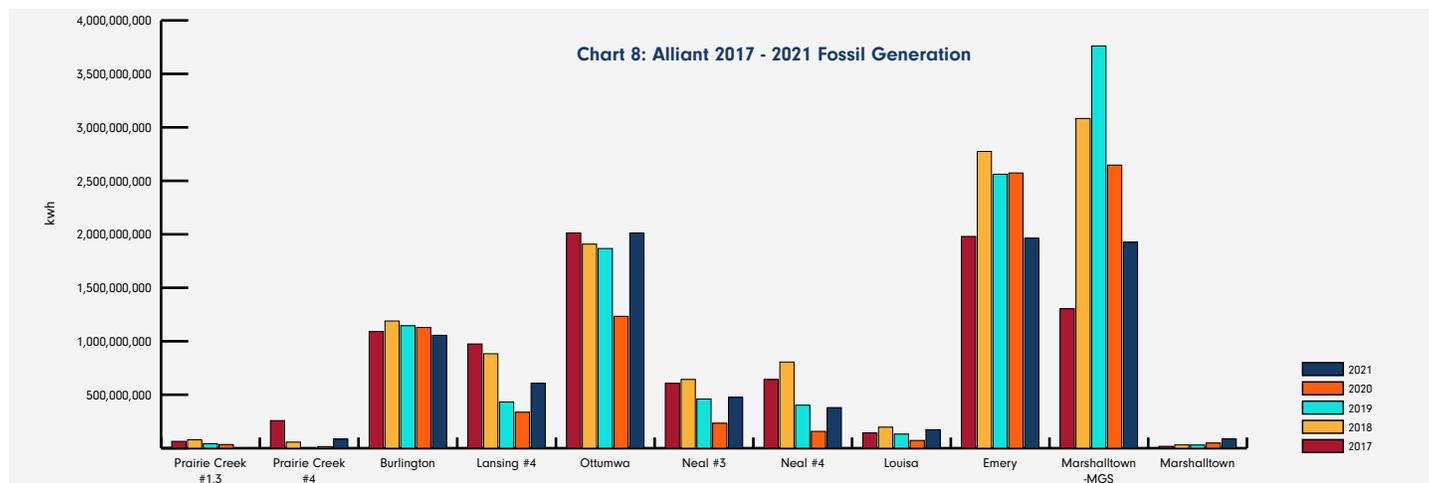
Chart 7 shows the total wind capacity (MW) in Iowa since 2001, and the generation (GWh) from those wind turbines, including the notable 2016 to 2021 timeframe. <sup>24 25</sup>

From 2016 to 2021, wind capacity increased by over 80% (an additional 5,440 MW) in Iowa, and wind generation increased by over 82%.



## Fossil Generation

From 2017 to 2021, Alliant reduced its overall fossil electricity production by 4% while MidAmerican reduced its fossil electricity production by 2%. In 2021, fossil generation represented 33% of MidAmerican generation and 68% of Alliant generation. Charts 8 and 9 offer a comparison of the generation from each fossil power plant over time; it is easy to see both the variability in deployment of fossil resources but also the clear increased use of coal plants in 2021.<sup>26</sup>



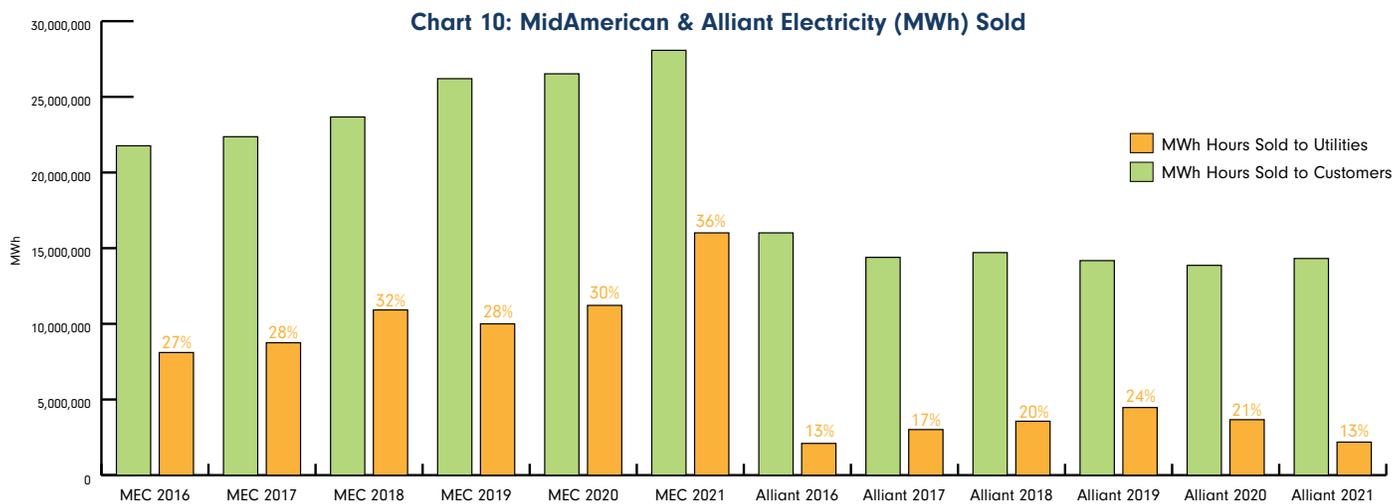
## Iowa Retail Load

To meet a 100% renewable goal, the understanding of most people is that you will use renewable generation to provide all of your generation in every hour of the day, year-round. However, as covered in [Iowa Electric Generation, Condition of the State, October 2020](#),<sup>27</sup> this is not how MidAmerican is defining its goal to deliver 100% renewable energy to Iowa customers.

MidAmerican is not being transparent on defining the goal, and is simply creating enough renewable energy credits to “offset” 100% of their Iowa retail customer load overall, regardless of when the electricity is produced and when it is consumed. In addition, MidAmerican and Alliant also sell electricity to other utilities across the region, not just Iowa customers, and these sales are not accounted for in MidAmerican’s renewable energy goal.

By looking at the electric generation produced in Iowa by MidAmerican and Alliant for the years 2016 through 2021, we can see in Chart 10 what portion of the generation is serving Iowa customers, and what portion is serving the financial interests of MidAmerican and Alliant.<sup>28</sup> From 2016 to 2021, MidAmerican sales to utilities increased by 98% while customer sales increased by 29%. Over the same time frame, Alliant sales to utilities increased by 4% while customer sales decreased by 2%.

**MidAmerican is not being transparent on defining the (100%) goal, and is simply creating enough renewable energy credits to ‘offset’ 100% of their Iowa retail customer load.**



For 2021, MidAmerican sold 28 million MWh to its customers and Alliant sold 14.3 million MWh to its Iowa customers. For MidAmerican and Alliant, the portion of the electricity they generate in Iowa being sold to other utilities is substantial, with 36% of MidAmerican's 2021 generation being sold to utilities and 13% of the Alliant 2021 generation being sold to utilities. MidAmerican sold more than 16 million MWh to utilities in 2021 for just under \$303 million, while Alliant sold almost 2.2 million MWh to utilities for \$104.9 million.

In total, MidAmerican and Alliant generated the following in 2021, categorized by the type of generation:

	MidAmerican 2021 MWh
Coal	12,314,143
Fossil Gas	1,397,071
Nuclear	3,934,145
Other	38,916
Wind	23,335,780
<b>Total</b>	<b>41,020,054</b>

	Alliant 2021 MWh
Coal	4,789,520
Fossil Gas	3,977,641
Other	11,074
Wind	4,088,085
<b>Total</b>	<b>12,866,321</b>

As noted above, the electricity sold to Iowa customers (retail load) was only a portion of the 2021 generation in Iowa. Given that the utilities - MidAmerican in particular - export a significant portion of their generation, the timing is ideal to consider what actually makes the most sense for Iowa customers. It is well-understood that coal is the most environmentally damaging fuel to use for electricity generation due to air and water pollution and high carbon emissions. If we consider the true cost of environmental externalities from health impacts and a changing climate, as well as the overall cost, coal should be the last resort.

### Impacts to Iowans from Coal Generation

Unlike renewable generation, all fossil electricity generation impacts Iowa's environment. Coal generation degrades the air we breathe and drives climate change, and also produces a substantial amount of solid waste that is landfilled in Iowa, primarily near major waterways. In 2021, the coal generation from the coal plants operated by MidAmerican and Alliant was 21,419,038 MWh, resulting in harmful emissions released into the air we breathe.

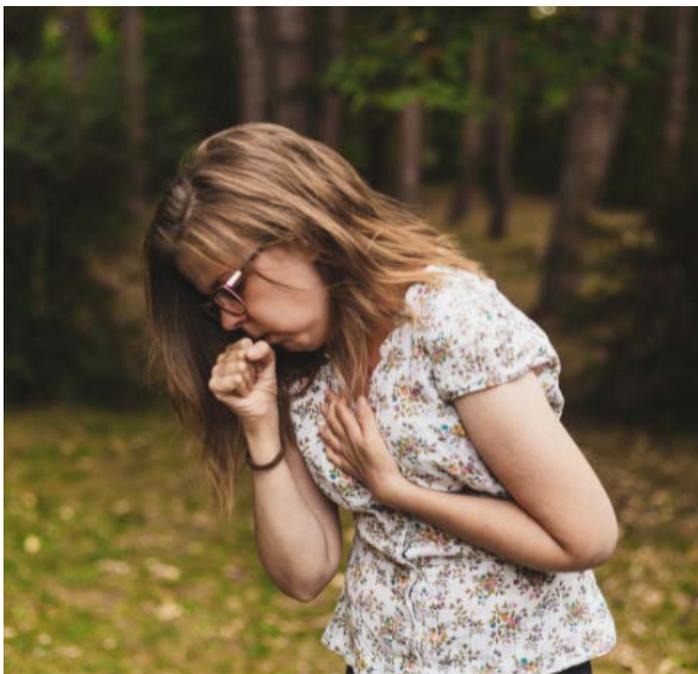
Table 4 shows the Alliant, MidAmerican and total emissions from the coal plants in 2021.

**Table 4: Alliant & MidAmerican 2021 Emissions from Coal Generation<sup>29</sup>**

2021	Sulfur Dioxide (tons)	Nitrogen Oxides (tons)	Mercury (lbs)	Carbon Dioxide (tons)
Alliant	6,434	3,186	23	5,831,500
MEC	16,572	10,231	52	13,605,810
<b>Total</b>	<b>26,367</b>	<b>15,494</b>	<b>97</b>	<b>22,333,177</b>

Four of the coal plants operated by MidAmerican and Alliant are jointly owned with cooperatives and municipal utilities. The minority ownership by cooperatives and municipal utilities in Neal South, Louisa, Walter Scott 3, and Walter Scott 4 is 28%, 8%, 20% and 36% respectively. MidAmerican and Alliant own the majority of the coal plants, but the cumulative generation capacity held by the minority ownership (743 MW) is larger than the capacity of Walter Scott 3 (725.8 MW).<sup>30</sup>

Air pollution from coal-fired power plants is linked with asthma, cancer, heart and lung ailments, neurological problems, acid rain, climate change, and other severe environmental and public health impacts. Air pollution and climate change are two of the most serious.



## Coal Generation and Public Health

When coal burns, the chemical bonds holding its carbon atoms in place are broken, releasing energy. However, other chemical reactions *also* occur, many of which carry toxic airborne pollutants and heavy metals into the environment.

### THIS AIR POLLUTION INCLUDES:

**Mercury:** Coal plants are responsible for **44 percent of US mercury emissions**.<sup>31</sup> Mercury is a toxic heavy metal that can damage the nervous, digestive, and immune systems, and is a serious threat to the healthy development of young children.<sup>32</sup> Just 1/70th of a teaspoon of mercury deposited on a 25-acre lake can make the fish unsafe to eat. In 2021, the coal generation in Iowa from the MidAmerican and Alliant Energy operated coal plants was responsible for emitting **656 teaspoons** of mercury into Iowa's air, enough to contaminate 1.148 million acres of surface water – more than four times the amount of surface water in Iowa.

**Sulfur dioxide (SO<sub>2</sub>):** Produced when the sulfur in coal reacts with oxygen, SO<sub>2</sub> combines with other molecules in the atmosphere to form small, acidic particulates that can penetrate human lungs. It is linked with asthma, bronchitis, smog, and acid rain, which damages crops and other ecosystems, and acidifies lakes and streams.<sup>33</sup> In 2021, the coal generation in Iowa from the MidAmerican and Alliant Energy-operated coal plants was responsible for emitting **26,637 tons** of sulfur dioxide into Iowa's air.

**Nitrogen oxides (NO<sub>x</sub>):** Nitrogen oxides are visible as smog and irritate lung tissue, exacerbate asthma, and make people more susceptible to chronic respiratory diseases like pneumonia and influenza.<sup>34</sup> In 2021, the coal generation in Iowa from the MidAmerican and Alliant Energy-operated coal plants was responsible for emitting **15,494 tons** of nitrogen oxides into Iowa's air.

**Particulate matter:** Better known as “soot,” this is the ashy grey substance in coal smoke, and is linked with chronic bronchitis, aggravated asthma, cardiovascular effects like heart attacks, and premature death.<sup>35</sup>

Coal plant emissions significantly impact our health, and are silent killers. In economics, an externality is a cost or benefit that is imposed on a third party who did not agree to incur that cost or benefit. When the captive customers of MidAmerican and Alliant pay for their power, they certainly are not agreeing to negative health impacts or death as a part of the agreement. Yet, the externalities of MidAmerican and Alliant burning coal can be quantified in terms of the impacted population and the economic impact using the EPA CO-Benefits Risk Assessment (COBRA)<sup>36</sup> screening tool. When the EPA model is run for the coal plants in Iowa, the results are shown in Table 5.

**Table 5: COBRA Results for Iowa Coal Generation**

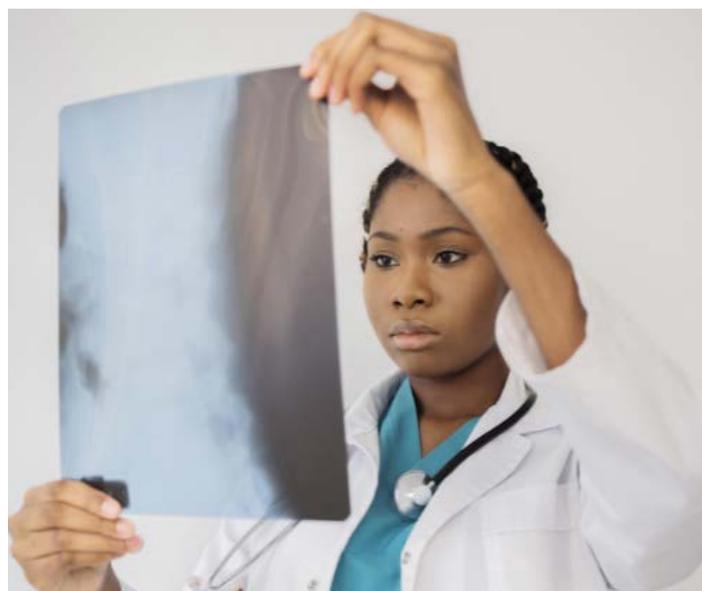
Health Endpoint	Change in Incidence (cases, annual)		Monetary Value*** (dollars, annual)	
	Low	High	Low	High
Mortality *	2.462	5.565	\$26,943,040	\$60,894,975
Nonfatal Heart Attacks *	0.248	2.310	\$39,668	\$368,727
Infant Mortality	0.010	0.010	\$125,623	\$125,623
Hospital Admits, All Respiratory	0.644	0.644	\$25,236	\$25,236
Hospital Admits, Cardiovascular **	0.459	0.459	\$23,381	\$23,381
Acute Bronchitis	3.192	3.192	\$1,970	\$1,970
Upper Respiratory Symptoms	57.529	57.529	\$2,458	\$2,458
Lower Respiratory Symptoms	40.536	40.536	\$1,095	\$1,095
Emergency Room Visits, Asthma	0.733	0.733	\$413	\$413
Asthma Exacerbation	60.149	60.149	\$4,464	\$4,464
Minor Restricted Activity Days	1,578.871	1,578.871	\$138,412	\$138,412
Work Loss Days	266.366	266.366	\$53,323	\$53,323
<b>Total Health Effects</b>			<b>\$27,359,081</b>	<b>\$61,640,075</b>

\* The Low and High values represent differences in the methods used to estimate some of the health impacts in COBRA. For example, high and low results for avoided premature mortality are based on two different epidemiological studies of the impacts of PM<sub>2.5</sub> on mortality in the United States.

\*\* Except heart attacks.

\*\*\* Based on 2017 dollars.

When the economic impacts of coal burned by MidAmerican and Alliant are quantified, Iowans are being burdened with health care costs ranging from **\$27,359,081 to \$61,640,075 million per year.**



## Coal Generation and Crop Yields

As covered in more depth in [Iowa Electric Generation, Condition of the State, October 2020](#),<sup>37</sup> another potentially significant consequence of MidAmerican and Alliant's coal plants is the negative impact on crop yields. A recent study looked at the increases in crop yields that occurred when coal plants shut down.<sup>38</sup> The study found that counties in the U.S. that experienced a coal plant closure in their immediate vicinity not only reduced mortality rates, but increased corn yields by 1.1% over the study period of 2005 to 2016. The study then estimated the impacts of the remaining coal-fired units still operating, assuming that their impacts are the same as those that have been decommissioned.

The study concluded that mortality rates would decrease by rates consistent with the results from the EPA COBRA model discussed previously, and corn production would increase. More than two-thirds of Iowa counties experienced annual production losses ranging from 1 million to 5 million bushels due to the continued operation of the MidAmerican and Alliant coal plants. The estimated annual corn production loss from the remaining 4,384 MW of coal is quantified in Table 6.

**Table 6: Estimated Annual Corn Lost Because of Operating 4,384 MW of Coal**

	Ten Year Corn Production Loss (MBu)	Annual Loss/County (MBu)	2/3 of Counties	Annual Statewide Corn Loss (Bu)	Value Based on 2021 Avg of \$6.94/bu <sup>39</sup>
<b>Minimum Loss</b>	10	1	66	66 Million	\$458,040,000
<b>Average Loss</b>	50	5	66	330 Million	\$2,290,200,000



Iowans are paying with their lives, health, and safety and farmers are paying a significant corn production penalty from coal plant pollution. As covered in [Iowa Electric Generation, Condition of the State, October 2020](#), the case is clear that shutting down Iowa's remaining coal plants and replacing them with wind and solar would be a net positive for corn production even when accounting for land that will be shifted into producing renewable energy. Such a shift would result in net increased corn production between 21 and 285 million bushels statewide annually. The increase in corn production and farm revenue makes the retirement of MidAmerican and Alliant's remaining coal fleet a no-brainer for Iowa's agricultural economy.<sup>40</sup>

## The True Cost of Coal Generation

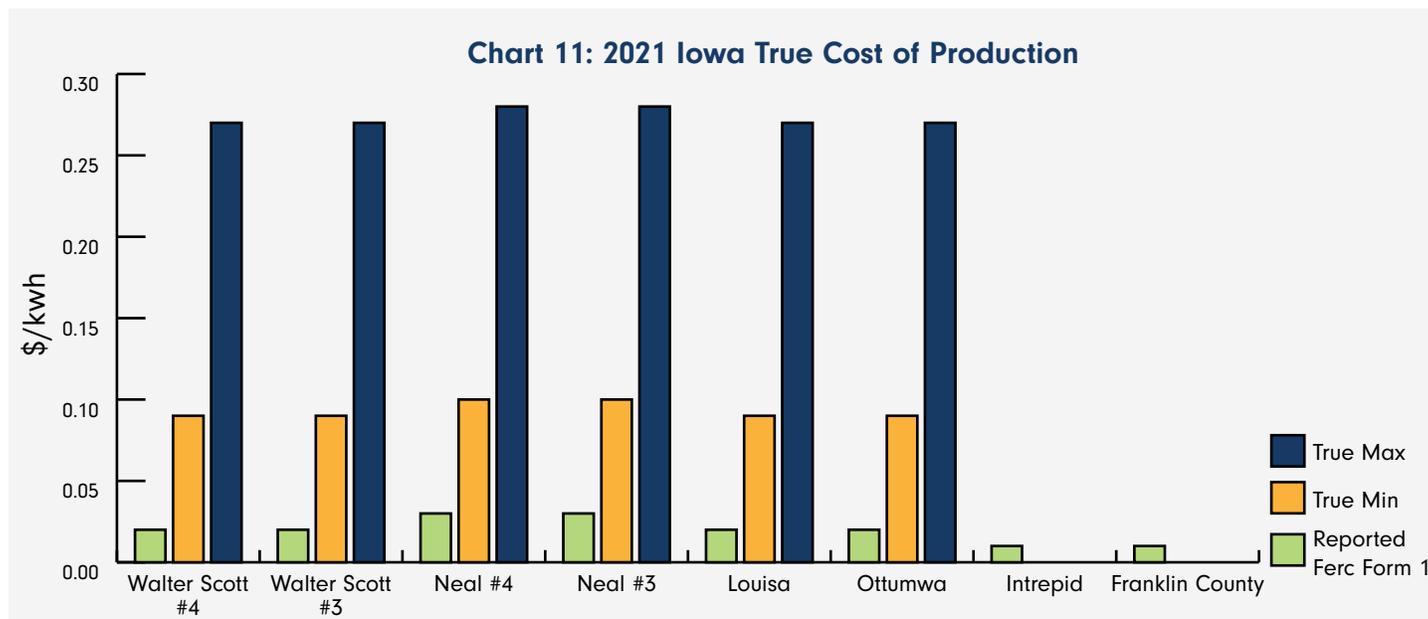
As discussed previously, the continued burning of coal by MidAmerican, Alliant, and the minority owners negatively impacts the financial well-being of every Iowan and does not account for the impacts on Iowans' health and wealth – the externalities of burning coal. These impacts are real and quantifiable. The financial impact to Iowan's health, crop loss, and climate impact is summed in Table 7.

By not accounting for the externalities of burning coal, MidAmerican, Alliant, and the minority plant owners burden their captive customers with clear financial impacts. The true costs of production at the MidAmerican and Alliant operated coal plants are shown in Chart 11, and contrasted with the cost of production from the wind farms.

**Table 7: Cost of Externalities from Operating 4,384 MW of Coal**

	Minimum	Maximum
<b>Health Costs</b>	\$27,359,081	\$61,640,075
<b>Corn Loss Costs</b>	\$458,040,000	\$2,290,200,000
<b>Social Cost of CO<sub>2</sub></b>	\$1,018,515,893	\$3,035,576,778
<b>TOTAL</b>	\$1,503,914,974	\$5,387,416,853
<b>\$/kwh*</b>	\$0.07	\$0.25

*\*The total costs of the externalities divided by the 21,419,038,000 kwh of coal generation.*



A true and transparent accounting by MidAmerican and Alliant would consider the broader range of costs borne by their captive customers of generating power using coal. The MidAmerican and Alliant coal plants are clearly not cost-competitive when compared to the MidAmerican and Alliant renewables. Wind is the lowest-cost source of generation even without accounting for health and crop losses. It is dramatically lower than the true costs of the MidAmerican and Alliant coal plants and represents an unrecognized and unreasonable financial burden on captive utility customers.<sup>41</sup>

## Conclusion

The IPCC and U.S. national policy recognize that achieving net zero by 2050 requires a carbon-free electricity sector by 2035. Without a carbon-free electricity sector by 2035, other sectors and sources of greenhouse gasses will not be able to eliminate or reduce their greenhouse gasses, making the goal of net zero by 2050 unlikely or impossible to achieve. Accordingly, Iowa must prioritize and accelerate the transition to a carbon-free electricity sector by 2035.

Iowa has been a leader on clean energy for the past 20 years, deploying significant amounts of wind energy and, as a result, reducing electric-sector greenhouse gas emissions. We have the natural wind and solar resources to reach 100% renewable energy.<sup>42</sup> Unfortunately, due to misleading utility marketing efforts, many Iowans believe we are already at or approaching 100% renewable energy. The truth is that Iowa utilities have a long way to go to achieve a true 100% renewable vision and, in the meantime, the continued use of coal generation has consequences that impact every Iowan.

The threats to air quality and potential contamination of groundwater are known, quantifiable, and unnecessary. The direct damages to agricultural productivity are just beginning to be understood.

**The severe threats we face from climate change in our state are already evident and cannot be allowed to expand.**



A true and transparent accounting by MidAmerican and Alliant would consider the full range of costs borne by their captive customers of generating power using coal.

It is clear that the owners of Iowa coal plants need to immediately recognize that a business-as-usual approach will harm customers with short term and long-term consequences. Iowa is already experiencing the impacts from climate change, and a failure to take actions to eliminate fossil generation by 2035 is a breach of social responsibility, a likely breach of fiduciary responsibility, and a breach by MidAmerican of its 2015 Climate Pledge.

Right now, Iowa utilities are burning coal for profit at the cost of Iowans' health, livelihoods, and our children's future. An accelerated switch to clean energy would reduce pollution and consumer costs, while increasing farm income and productivity. The pursuit of 100% renewable energy starts with an honest accounting, full disclosure, and the complete elimination of coal generation by 2030. Only then can Iowa move forward on the path we're blazing toward 100% renewable energy.

## Endnotes

- <sup>1</sup> Fact Sheet: Biden Sets Greenhouse Gas Reduction Targets; Fossil gas also referred to as methane or natural gas.
- <sup>2</sup> Climate Change 2022; Mitigation of Climate Change
- <sup>3</sup> Id.
- <sup>4</sup> Id.
- <sup>5</sup> <https://siouxlandnews.com/news/local/derecho-damage-adjusted-to-11-billion#:~:text=NOAA%20estimates%20the%20damage%20left%20by%20the%20destructive,This%20remains%20the%20costliest%20thunderstorm%20in%20US%20history>
- <sup>6</sup> <https://www.kcrg.com/2021/12/17/initial-analysis-shows-wednesday-severe-weather-meets-derecho-criteria/>
- <sup>7</sup> [https://www.kcrg.com/2021/12/20/national-weather-service-confirms-dec-15-derecho-first-ever-reported-december/#:~:text=15%20derecho%2C%20first%20ever%20reported%20in%20December,-Close&text=CEDAR%20RAPIDS%2C%20Iowa%20\(KCRG\),since%20severe%20weather%20records%20began](https://www.kcrg.com/2021/12/20/national-weather-service-confirms-dec-15-derecho-first-ever-reported-december/#:~:text=15%20derecho%2C%20first%20ever%20reported%20in%20December,-Close&text=CEDAR%20RAPIDS%2C%20Iowa%20(KCRG),since%20severe%20weather%20records%20began)
- <sup>8</sup> <https://news.climate.columbia.edu/2021/04/01/social-cost-of-carbon/>
- <sup>9</sup> [FAQ - What is the SCC? - The Cost of Carbon Pollution](#)
- <sup>10</sup> Based on Acid Rain Program Continuous Emissions Monitors at Iowa Coal Plants for 2021
- <sup>11</sup> Id.
- <sup>12</sup> [Fact Sheet: Biden Sets Greenhouse Gas Reduction Targets](#)
- <sup>13</sup> Iowa Department of Natural Resources, "2020 Iowa Statewide Greenhouse Gas Emissions Inventory Report," Dec. 31, 2021, available at <https://www.iowadnr.gov/Portals/idnr/uploads/air/ghgemissions/>
- <sup>14</sup> id., page 3.
- <sup>15</sup> id., page 6.
- <sup>16</sup> <https://www.utilitydive.com/news/as-berkshire-signs-obama-climate-pledge-subsidiary-midamerican-targets>
- <sup>17</sup> [Environmental Outlook: Berkshire Hathaway Energy \(brkenergy.com\)](#)
- <sup>18</sup> [Alliant Energy - Alliant Energy Responsibility Report | Clean Energy Vision and Goals](#)
- <sup>19</sup> [EX-99.1 \(sec.gov\)](#)
- <sup>20</sup> [Alliant Energy - Alliant Energy Responsibility Report | Clean Energy Vision and Goals](#)
- <sup>21</sup> [SPU-2021-0005, Response to Board Order Opening Docket to Review Revenue Sharing Mechanism and Address Motion to Remove Depreciation Deferral Cap on June 25, 2021, Attachment 3](#)
- <sup>22</sup> [IPCC AR6 WGIII FinalDraft TechnicalSummary.pdf](#) page TS-53
- <sup>23</sup> 2021 Q4 FERC Form 1
- <sup>24</sup> <https://windexchange.energy.gov/maps-data/321>
- <sup>25</sup> <https://www.eia.gov/electricity/data/browser/>
- <sup>26</sup> 2016, 2017, 2018, 2019 and 2020 Q4 FERC Form 1, Alliant and MidAmerican
- <sup>27</sup> [Iowa Electric Generation, Condition of the State, October 2020](#)
- <sup>28</sup> 2016, 2017, 2018, 2019 and 2020 Q4 FERC Form 1, Alliant and MidAmerican
- <sup>29</sup> [EPA Air Market Program Data](#)
- <sup>30</sup> Minority owners Corn Belt Power Cooperative (132 MW), Northwest Public Service (60 MW), Algona Municipal Utilities (20 MW), Webster City Municipal Utilities (18 MW), Cedar Falls Utilities (54 MW), Nimeca Cooperative (24 MW), Central Iowa Power Cooperative (209 MW), Cities of Waverly, Harlan, Tipton, Eldridge, and Geneseo (28 MW), Atlantic Municipal Utilities (17 MW), Lincoln Electric System (117 MW), Municipal Energy Agency of Nebraska (64 MW)
- <sup>31</sup> <https://www.epa.gov/so2-pollution/sulfur-dioxide-basics#effects>
- <sup>32</sup> <https://www.epa.gov/mercury/basic-information-about-mercury>
- <sup>33</sup> <https://www.epa.gov/so2-pollution/sulfur-dioxide-basics#effects>
- <sup>34</sup> <https://www.epa.gov/no2-pollution/basic-information-about-no2#Effects>
- <sup>35</sup> <https://www3.epa.gov/region1/airquality/pm-human-health.html>
- <sup>36</sup> [CO-Benefits Risk Assessment \(COBRA\)](#)
- <sup>37</sup> [Iowa Electric Generation, Condition of the State, October 2020](#)
- <sup>38</sup> "The downstream air pollution impacts of the transition from coal to natural gas in the United States", Jennifer A. Burney, School of Global Policy and Strategy, University of California, San Diego., <https://www.nature.com/articles/s41893-019-0453-5>; "Author Correction: The downstream air pollution impacts of the transition from coal to natural gas in the United States", <https://www.nature.com/articles/s41893-020-0548-z>
- <sup>39</sup> [Corn Prices - 59 Year Historical Chart | MacroTrends](#)
- <sup>40</sup> [Iowa Electric Generation, Condition of the State, October 2020, page 15](#)
- <sup>41</sup> Vibrant Clean Energy, Energy Innovation, The Coal Cost Crossover: Economic Viability of Existing Coal Compared to New Local Wind and Solar Resources (2019) at [https://energyinnovation.org/wp-content/uploads/2019/03/Coal-Cost-Crossover\\_Energy-Innovation\\_VCE\\_FINAL.pdf](https://energyinnovation.org/wp-content/uploads/2019/03/Coal-Cost-Crossover_Energy-Innovation_VCE_FINAL.pdf)
- <sup>42</sup> [Iowa's Road to 100% Renewable](#)



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