House Energy and Natural Resources Committee
Chairman Nino Vitale
Opponent Testimony on Substitute House Bill 6
Gary A. Swanson, PE
President, Energy Management Solutions, Inc.
May 7th, 2019

Chair Vitale, Vice Chair Kick, Ranking Member Denson, and Members of the House Energy and Natural Resources Committee, my name is Gary A. Swanson, President of Energy Management Solutions thank you for the opportunity to speak to you today as an opponent to Ohio Substitute House Bill 6.

We have been working with over 500 industrial and commercial customers in Ohio for 8 years and have turned in more rebates than anyone else in the state. We truly know how effective the program has been and importance the program has on future projects. We also know that most of the low hanging fruit is still available for customers. They just need the help of the rebate program to help meet internal hurdle rates like all neighboring states do for their customers.

We oppose the bill and want to share some information that may help you reconsider this bill.

1. **Costs will increase dramatically –** Who will be held accountable for this increase when you have been told this would happen?
    a. A 14% increase or added $154 to each resident is a lot of money.
    b. A 7% increase to industrial customers could force them out of business.
    c. You will be passing one of the most expensive bills in the history of Ohio that has no guarantee it will work. $7.5 Billion, over 25 years, with no sunset date. Companies can submit for a 50+ year credit. Once approved, how do you pull it back?

Customer	Annual Increase	% increase
Residential	**$ 154**	**14.4%**
Com	**$ 2,564**	**1.2%**
Ind 2	**$ 49,339**	**0.7%**
Ind 3	**$ 337,220**	**7.4%**

2. Even though the timetable for rider costs have been moved back a couple of years, the same result will happen just a year later. It has been stated that this approach will reduce costs but this just isn't true. The people stating this will reduce costs are not sharing all of the information. Here are some of the reasons.
    a. **State Taxes will increase by over $1 billion per year (1.5% of State Budget)** This bill will essentially kill the efforts of the state that has proven to be the 2nd best in the country in running EE programs. Also EE is 1/10th the cost of nuclear energy. EE is better than zero emissions because it helps reduce the need to for any generation. With killing the EE effort in the state, you will also kill a reported 81,000 jobs that are in the Ohio EE area alone (2019 Clean Jobs Midwest Report). $500,000,000 of this increase will come directly from the 81,000 good

paying jobs lost. The second $500,000,000 will come from other lost taxes (companies' profits and purchased goods). This could easily be double.

i. **EE in Ohio is 2nd best in the country.**
ii. EE has been very successful and saved over 25% of the energy produced by the nuclear plants.
iii. If EE followed what was already approved, it would save more than the Nuclear plants, resulting in no need to try to bailout the nuclear plants.
iv. EE costs $9/MWh in Ohio vs $95/MWh for Nuclear energy.
    1. Renewables are roughly $50/MWh.
    2. Why would anyone want to keep the most expensive form of zero emissions and know it might not even work?
v. You want to save 1500 nuclear jobs (which would not be lost since they will be needed for decommissioning) and lose 81,000 EE jobs? 2% of the voters?

b. **Capacity Costs will Increase dramatically** – These costs are charged to all customers from PJM. Since the EE program will be dead, utilities will no longer be turning in PJM rebates which will result in a shortage of Capacity. Capacity costs could increase by 15% or more.
c. **Whole Sale Power Costs will increase** – As you can see, the cost for Nuclear energy is much higher than other forms of energy. By cutting EE and limiting renewables, you have to raise the cost of whole sale power.

3. **Saving the EE Programs – This can do so much more for the people of Ohio.**
    a. What's more important?
        i. Trying to save a failed business **that may not even work** or
        ii. Having a program that can save 600% to 2000% more money than the HB 6 rider cost.
        iii. Tons of low hanging fruit still ready to be picked.
        iv. Average customer can still save 30% of their energy costs.
    b. Allowing mercantile customers to opt out in 2020 will essentially kill the Ohio EE program in 2020.
    c. This is not fair for customers who have spent money and time getting ready for projects with rebate help.
        i. Need a min. of 2 full years.

Table 2.0 - What Customer Can Save with EE

Customer	Monthly Savings with EE Projects	% More Savings VS. HB 6 Rider
Residential	$ 17	680%
Com	$ 263	1314%
Ind 2	$ 8,541	3416%
Ind 3	$ 56,940	2278%

4. This bill will also kill the growing CHP market that has been building in Ohio to help customers find more efficient ways to make energy and reduce waste.
5. What has really changed in Ohio since 2009 when the state decided to make Ohio one of the most energy efficient states in the US? How can you abandon a program that has done so much for Ohio? With all of the bills/laws and changes, you send a message to any new project that you can't trust that the legislatures will stand behind what they have already approved. This is a very dangerous precedent.

I would be happy to answer any questions.

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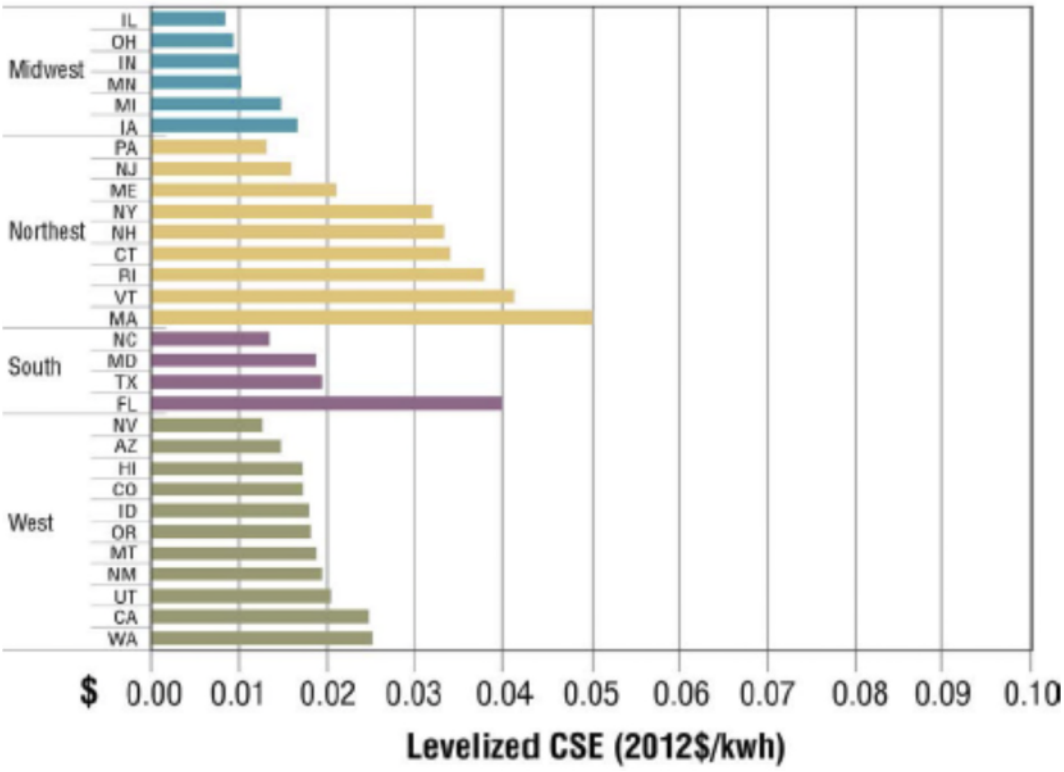
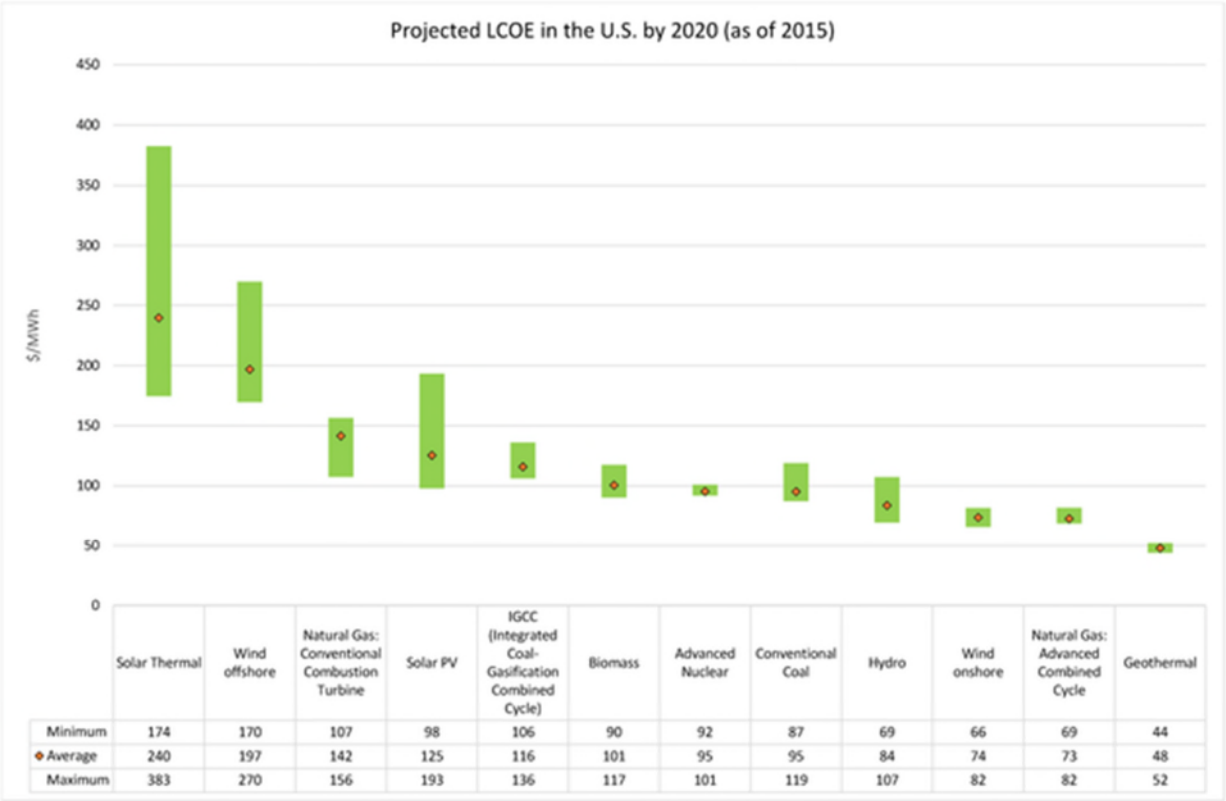
Chart 1.0 - Cost of Energy Efficiency programs in the US.



*Study Berkeley National Laboratory 2014.

Chart 2.0 – Future Cost of Generation



	Solar Thermal	Wind offshore	Natural Gas: Conventional Combustion Turbine	Solar PV	IGCC (Integrated Coal-Gasification Combined Cycle)	Biomass	Advanced Nuclear	Conventional Coal	Hydro	Wind onshore	Natural Gas: Advanced Combined Cycle	Geothermal
Minimum	174	170	107	98	106	90	92	87	69	66	69	44
Average	240	197	142	125	116	101	95	95	84	74	73	48
Maximum	383	270	156	193	136	117	101	119	107	82	82	52

- EIA Data

Chart 2.1 Historical summary of EIA's LCOE projections (2010–2019)

Estimate in $/MWh			Coal convent'l	Nat. Gas combined cycle		Nuclear advanced	Wind		Solar	
of year	ref	for year		convent'l	advanced		onshore	offshore	PV	CSP
2010	[61]	2016	100.4	83.1	79.3	119.0	149.3	191.1	396.1	256.6
2011	[62]	2016	95.1	65.1	62.2	114.0	96.1	243.7	211.0	312.2
2012	[63]	2017	97.7	66.1	63.1	111.4	96.0	N/A	152.4	242.0
2013	[64]	2018	100.1	67.1	65.6	108.4	86.6	221.5	144.3	261.5
2014	[65]	2019	95.6	66.3	64.4	96.1	80.3	204.1	130.0	243.1
2015	[60]	2020	95.1	75.2	72.6	95.2	73.6	196.9	125.3	239.7
2016	[66]	2022	NB	58.1	57.2	102.8	64.5	158.1	84.7	235.9
2017	[67]	2022	NB	58.6	53.8	96.2	55.8	NB	73.7	NB
2018	[68]	2022	NB	48.3	48.1	90.1	48.0	124.6	59.1	NB
2019	[69]	2023	NB	40.8	40.2	NB	42.8	117.9	48.8	NB

Nominal change 2010–2019	**NB**	**−48%**	**−49%**	**NB**	**−71%**	**-38%**	**−88 %**	**NB**
***Note*: Projected LCOE are adjusted for inflation and calculated on constant dollars based on two years prior to the release year of the estimate.** **Estimates given without any subsidies. Transmission cost for non-dispatchable sources are on average much higher.** **NB = "Not built" (No capacity additions are expected.)**								

*EIA Data released in 2015

Bio – Gary Swanson

- Worked as energy consultant for 30 years
- Professional Engineer in Ohio
- Office and apartment in New Albany, Ohio
- Presently working with over 500 Industrial and Commercial sites in Ohio
- Saved nearly 1,000,000,000 kWh for customers in Ohio
- Won dozens of energy efficiency awards in Ohio since 2011
- Completed more rebates that anyone else in Ohio
- Completed more rebates for PJM than any non-utility company
- Audited over 10,000 sites

Ohio: Home to 112,000 Clean Energy Jobs

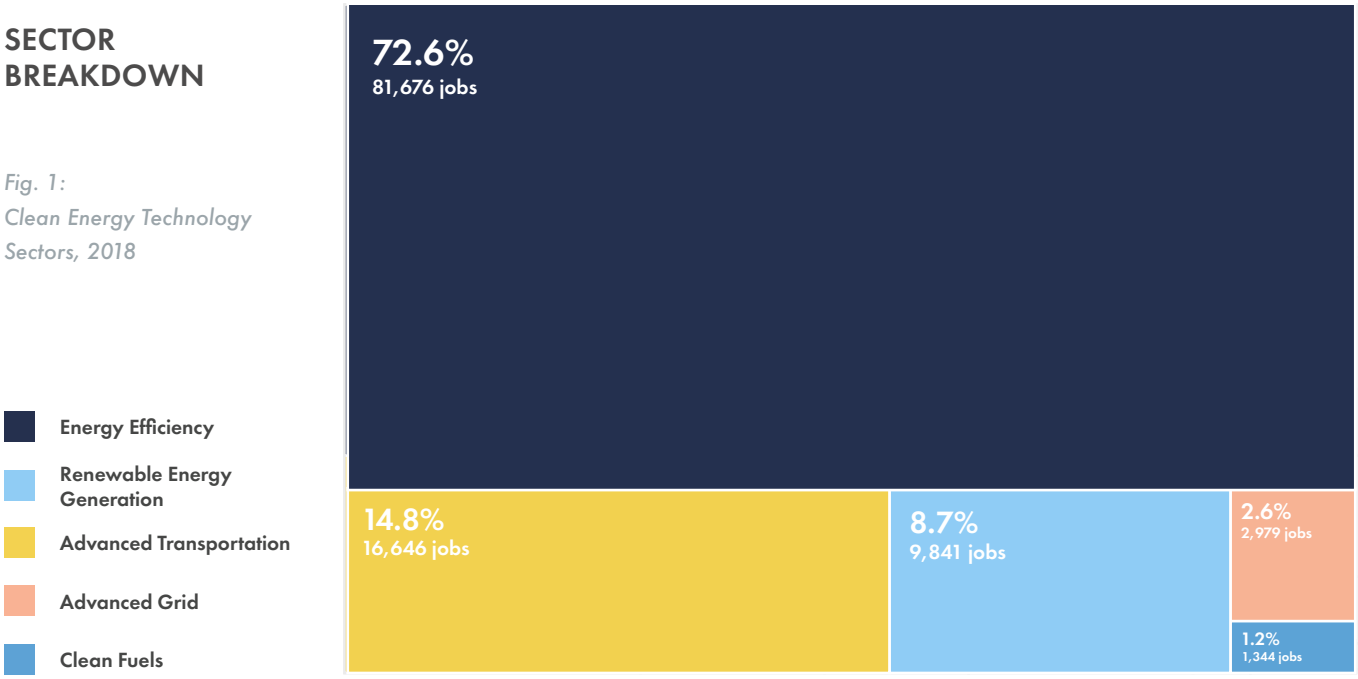
OHIO'S CLEAN ENERGY INDUSTRY ADDS 5,000 JOBS

The clean energy industry in Ohio is a major employer with more than 112,486 jobs. That's the third-most of any state in the Midwest, and it's enough to fill Ohio Stadium to capacity with thousands more people still outside tailgating. In 2018, Ohio clean energy businesses added 4,975 jobs. That's a 4.6 percent growth rate -- higher than the regional average. Advanced transportation added about 2,400 jobs for a 16.6 percent increase, higher than all other clean energy sectors in the state.

Energy efficiency remains Ohio's largest clean energy employer; the sector is home to 72 percent of the state's clean energy jobs. Thousands of different Ohio companies and establishments hire clean energy workers in any given year. Combined, these employers anticipate a 7.4 percent growth rate in 2019, a shade higher than the Midwestern clean energy industry average.

SECTOR BREAKDOWN

Fig. 1: Clean Energy Technology Sectors, 2018



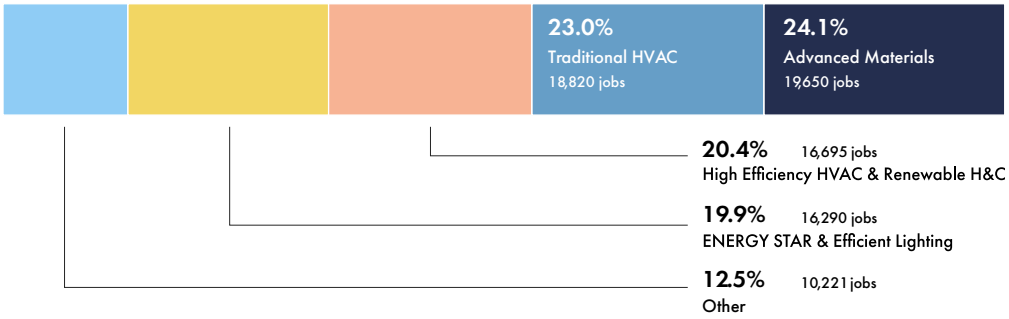
1. Unless otherwise stated, all data is based on the 2019 USEER. Energy Futures Initiative. (2019). The U.S. Energy Employment Report. Washington, DC. www.usenergyjobs.org. The Data provided relies on thousands of data points provided via survey. EFI, NASEO and BWRP have made every effort to supply current and accurate information but assume no responsibility or liability for any decisions based upon the information presented. For more information on the survey methodology see cleanjobsmidwest.com/about.

ENERGY EFFICIENCY REMAINS OHIO'S TOP CLEAN ENERGY EMPLOYER

More Ohioans work in energy efficiency -- 81,676 -- than any other clean energy sector in the state. In 2018, Ohio employers created 2,023 energy efficiency jobs, a 2.5 percent growth rate.

Energy efficiency workers help consumers around the state reduce the amount of wasted energy as they fuel their lives, homes and businesses. They manufacture ENERGY STAR-rated kitchen appliances; install efficient lighting systems at car dealerships; implement software that optimizes traditional heating, ventilation and air conditioning (HVAC) systems in high schools, and handle advanced building materials at new office towers.

Fig. 2: Energy Efficiency Subsectors, 2018



ADVANCED TRANSPORTATION'S U-TURN

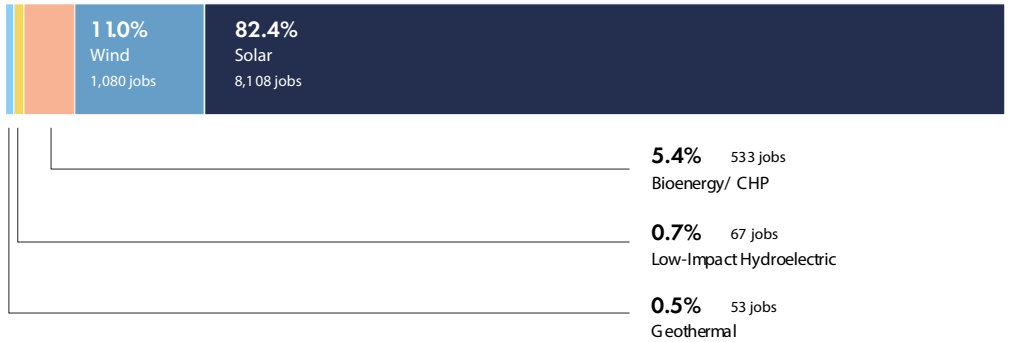
Advanced transportation is Ohio's No. 2 clean energy sector with 16,646 jobs. Following job losses in 2017, employment in the sector in 2018 spiked 16.6 percent, good enough for a gain of 2,374 jobs.

Growth was led by jobs building and developing plug-in hybrid vehicles, electric vehicles (EVs), and hybrid electric vehicles. The hybrid electric vehicle sub-sector now employs 7,243 people, 11 percent more than in 2017. Employment in Ohio's plug-in hybrid vehicle sub-sector grew 31.4 percent to 3,474 jobs, while the EV sub-sector employs 4,462 people, about 24 percent more than a year ago.

NEARLY 10,000 OHIOANS WORK IN RENEWABLES

The third-largest employer in the state's clean energy industry is renewable energy generation with 9,841 workers. Bucking a national downward trend in renewable energy jobs, Ohio's renewables sector employment actually increased 5 percent, adding 472 jobs.

Fig. 3: Renewable Energy Subsectors, 2018



Solar is Ohio's largest renewable energy sub-sector with 8,108 jobs and grew by 0.2% in 2018; the state employs more solar energy workers than any other state in the Midwest.

Fig. 4:
Wind and Solar Jobs, 2018 and 2017 Comparison

Wind, geothermal, bioenergy, and low-impact hydro all grew by double-digits in 2018. There are now 1,733 jobs between these four sub-sectors; wind alone now employs 1,080 Ohioans.

IN ADVANCED GRID SECTOR, ENERGY STORAGE RACKS UP JOBS

The advanced grid sector employs 2,979 Ohioans, 137 more than in 2017 for a 4.8 percent growth rate. Energy storage is the sector's largest employer with 1,303 jobs, 59 more than 2017. As the fourth-largest clean energy employer in the state, the sector also includes jobs in smart grid, microgrid, and other grid modernization work.

CLEAN FUELS JOBS DROP

1,344 Ohioans work in the clean fuels sector. This was a 2.3 percent decrease from 2017, a loss of loss of 31 jobs. The clean fuels sector encompasses non-corn ethanol, non-woody biomass, and other technologies not yet in wide commercial production including algal biofuel, syngas, bioheat blends, landfill gas, and advanced biofuels.

Fig. 5:
Top 3 MSAs in Clean Energy Employment, 2018

Metro Area (MSA)	Total Clean Energy Employment	Renewable Energy Employment	Energy Efficiency Employment
Cleveland-Elyria-Mentor, OH MSA	22,125	1,568	16,268
Columbus, OH MSA	17,049	672	13,142
Cincinnati-Middletown, OH-KY-IN MSA	15,901	1,191	11,706

CLEAN ENERGY INDUSTRY OUTLOOK

Ohio clean energy employment grew 4.6 percent in 2018, a gain of about 5,000 jobs as the renewable energy, advanced grid, energy efficiency, and alternative transportation sectors all experienced growth. The industry now accounts for more than 2 percent of all jobs in the state. The alternative transportation sector experienced the most dramatic year-over-year increase in Ohio -- nearly 17 percent growth. This was due in part to the increased popularity of EVs. In 2018, EV sales increased 80 percent.

Clean energy job growth in Ohio is expected to continue. Clean energy employers in the state project a 7.4 growth in jobs in 2019, slightly higher than the regional average.

COMPARING CLEAN ENERGY JOBS TO FOSSIL FUEL JOBS

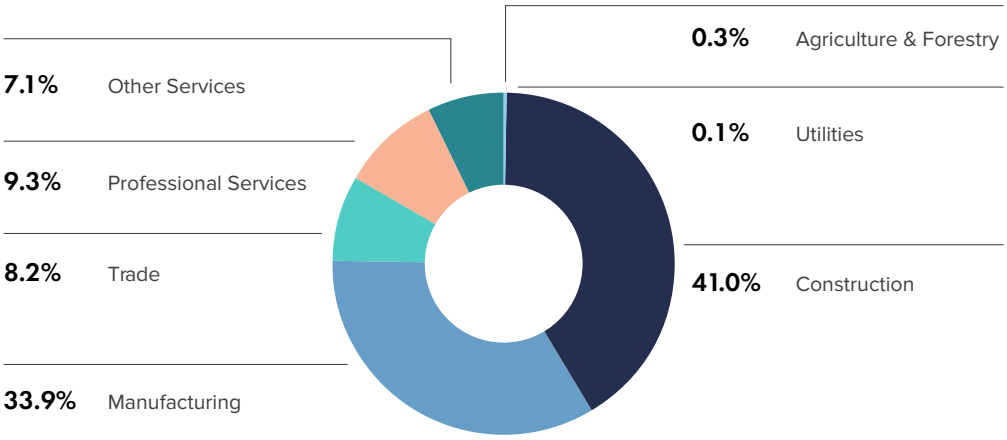
In 2018, more than 38,000 Ohioans worked in fossil fuel energy jobs in industries like coal, natural gas, and oil.[2] Jobs in the coal industry dropped by 9.8 percent, while renewable energy jobs grew by 5 percent.

2. U.S. Bureau of Labor Statistics Local Area Unemployment Statistics, 2018 Preliminary Data

VALUE CHAIN

In addition to breaking down clean energy jobs by industry, jobs can also be categorized by their function in the value chain. This report divides the clean energy jobs value chain into the following categories: agriculture, utility, construction, manufacturing, trade, professional service, and other service jobs. Each value chain category captures jobs from multiple clean energy sectors and industries.

Fig. 6: Clean Energy Jobs Value Chain, 2018



When Ohio clean energy jobs are broken down by their placement in the value chain, construction is home to 41 percent of the jobs, while manufacturing is home to 33.9 percent.

DEMOGRAPHICS

Throughout the state, 11.4 percent of the state's clean energy workers are military veterans. By comparison, veterans make up 6 percent of the national labor force.[3] The large ratio of military veterans transitioning to clean energy jobs is partially the result of the U.S. Department of Defense's long-standing commitment to investing in renewable energy, energy efficiency and training programs that prepare veterans for private-sector employment in industries like solar.

Small businesses drive the state's clean energy sector – 63 percent of Ohio's clean energy businesses employ fewer than 20 individuals.

3. 2018 Bureau of Labor Statistics Current Population Survey (CPS) https://www.bls.gov/cps/demographics.htm

SUMMARY

The businesses and establishments that constitute Ohio's clean energy industry added about 5,000 jobs in 2018, a 4.6 percent growth rate. This means clean energy jobs in Ohio are growing slightly faster than the Midwestern regional average, and three times faster than the country as a whole. Taken together, the clean energy industry in Ohio is home to about 112,000 jobs, which is about 2 percent of all the jobs in the state.

While energy efficiency remains the dominant employer with nearly three out of every four Ohio clean energy jobs, 2018 also saw big job gains in advanced transportation, renewable energy, and smart grid. While solar jobs in Ohio slipped, the sub-sector nonetheless remains a bigger employer in the Buckeye State than in any other state in the entire Midwest.

Looking toward the future, Ohio's clean energy employers seem to have a bullish outlook -- they anticipate adding workers at 7.4 percent clip in 2019, higher than the Midwest's regional clean energy industry average.

Table 1.0 - Clean Air Bill Impact to Rates

Customer	New Rider Per Month	Monthly kWh	kW	Capacity Average $/kW	Existing Capacity Cost	Capacity Costs (15%)	Increased Taxes	Existing Wholesale Cost	Increased Wholesale Costs	Total Increased Bill	Increased Cost (Increased cost-Nuke rider)	Rate ($/kWh)	Monthly Increase	Annual Increase	Total $	% increase
Residentia	$ 2.50	892	4	$ 38.51	$ 13	$ 2	$ 8	$ 0	$ 4	**$ 17**	**$ 12**	$ 0	$ 13	**$ 154**	**$ 89**	**14.4%**
Com	$ 20.00	21,900	50	$ 38.51	$ 160	$ 24	$ 67	$ 0	$ 99	**$ 123**	**$ 107**	$ 0	$ 214	**$ 2,564**	**$ 1,533**	**1.2%**
Ind 2	$ 250.00	876,000	1,500	$ 38.51	$ 4,814	$ 722	$ 833	$ 0	$ 3,329	**$ 4,051**	**$ 2,778**	$ 0	$ 4,112	**$ 49,339**	**$ 56,940**	**0.7%**
Ind 3	$2,500.00	5,840,000	10,000	$ 38.51	$ 32,092	$ 4,814	$ 8,333	$ 0	$ 19,272	**$ 24,086**	**$ 14,768**	$ 0	$ 28,102	**$337,220**	**$350,400**	**7.4%**

Table 2.0 - What Customer Can Save with EE

Customer	New Rider Per Month	Monthly kWh	kW	Capacity Average $/kW	Existing Capacity Cost	Capacity Costs (15%)	Increased Taxes	Existing Wholesale Cost	Increased Wholesale Costs	Total Increased Bill	Increased Cost (Increased cost-Nuke rider)	Rate ($/kWh)	Monthly Increase	Monthly Savings with EE Projects	Total $	% More Savings VS. HB 6 Rider
Residentia	$ 2.50	892	4	#DIV/0!	#DIV/0!	$ -	$ -	$ 0	$ 4	**$ 7**	**$ 4**	$ 0	$ 6	$ 17	$ 89	680%
Com	$ 20.00	21,900	50	#DIV/0!	#DIV/0!	$ -	$ -	$ 0	$ 99	**$ 99**	**$ 79**	$ 0	$ 119	$ 263	$ 1,533	1314%
Ind 2	$ 250.00	876,000	1,500	#DIV/0!	#DIV/0!	$ -	$ -	$ 0	$ 3,329	**$ 3,329**	**$ 3,079**	$ 0	$ 3,579	$ 8,541	$ 56,940	3416%
Ind 3	$2,500.00	5,840,000	10,000	#DIV/0!	#DIV/0!	$ -	$ -	$ 0	$ 19,272	**$ 19,272**	**$ 16,772**	$ 0	$ 21,772	$ 56,940	$350,400	2278%