STATE OF INDIANA

INDIANA UTILITY REGULATORY COMMISSION

PETITION OF SOUTHERN INDIANA GAS AND ELECTRIC COMPANY D/B/A VECTREN ENERGY DELIVERY OF INDIANA, INC. FOR APPROVAL OF A TARIFF RATE FOR THE PROCUREMENT OF EXCESS DISTRIBUTED GENERATION PURSUANT TO IND. CODE § 8-1-40 ET SEQ.	))))))))	**CAUSE NO. 45378**

DIRECT TESTIMONY OF BRAD MORTON ON BEHALF OF INDIANA DISTRIBUTED ENERGY ALLIANCE

Indiana Distributed Energy Alliance ("Indiana DG") hereby submits the Direct Testimony Brad Morton in the above captioned Cause.

Respectfully submitted,
/s/ *R. M. Glennon*
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Introduction

Q: Please state your name and business address

A: My name is Brad Morton and I am the President and Owner of Morton Solar. My business address is 2166 E. Morgan Ave, Evansville, IN 47711.

Q: Please describe your business activity.

A: Morton Solar was originally founded in 2003 as Industrial Control Engineering, LLC ("ICE"). Prior to entering the solar business in 2005, ICE supported manufacturers and the automation industry. We have installed some of the earliest grid-tied solar energy systems in Indiana and have been 'first' in numerous categories of projects and milestones. We were the first to commercially install solar in the Vectren service area. Our projects are listed in multiple databases including Siren Solar and National Renewable Energy Laboratories Open PV Project.

Q: Please describe your educational background and specific additional technical training.

A: I have a BSEET from University of Southern Indiana and an ASMET from Western Kentucky University. I am a licensed master electrician in Vanderburgh and Monroe counties in Indiana and the State of Kentucky and NABCEP certified. I currently serve on the Vanderburgh County licensing board and have attended numerous solar related training programs. I have also attended numerous business leadership and training programs and recently became a Certified B Corporation, i.e. a corporation that uses business as a force for good.

Q: Please describe your professional background.

A: Much of my engineering career was spent in the automation and manufacturing industries. I worked for Rolls Royce Aerospace and at Caterpillar's Decatur Plant as a manufacturing engineer. This career gave me enough courage and financial resources to start my own business which eventually became Morton Solar.

Much of my early childhood was spent in Gibson and Pike Counties, so I am intimately familiar with the coal mining industry. I, myself, benefited from the economic prosperity provided by those jobs since many of my family and friends were miners.

But, as an engineer, I can also perform the math that indicates humanity is emitting more carbon than the planet can process naturally, and now climate change is inevitable.

During my solar career, I have worked to educate the public about solar energy and have advocated for better energy policies in Indiana.

A long term goal of Morton Solar is to promote 'solar' reclamation of un-reclaimed coal mines, brownfields, and coal ash ponds, with the end goal to replace Indiana lost mining jobs, that aren't coming back, with solar careers that gives workers a sustaining income for life and improves our planet's and humanity's continued survival.

Q: What are your duties, responsibilities, and goals with Morton Solar?

A: I develop the larger commercial solar projects by providing innovative and cost-effective solutions, and overseeing the design, engineering, and execution of the projects to lower the cost of renewable energy to society. I develop the vision for the company.

Since we live and operate from one of the highest carbon emitting regions of the United States, we desire to establish a 501c3 organization that can accept funding from all over the world to educate the public about climate change and fight for better policies in our legal systems so that renewable energy can benefit everybody. Our goal would be to make solar & wind energy non-political topic, and to demonstrate the benefits and dispel the myths.

Q: Have you ever testified before the Indiana Utility Regulatory Commission (IURC)?

A: Yes, I testified in Cause No. 44344.

Summary

Q: What is the purpose of your testimony in this Cause No. 45378?

A: My testimony will explain the adverse impacts Vectren's proposals would have on my business Morton Solar, on our prospective customers, on ratepayers served by Vectren and on Indiana's economy. I describe that Vectren's estimated value of EDG solar is much too low, unreasonably lengthening the Vectren customer "pay back" period for the cost of a new solar energy system. This will deter customers from installing solar energy systems on their homes and businesses.

Negative Impacts of Vectren's Proposal

Q: Please describe the Hoosiers that express interest in solar installation and those who own solar generation.

A. Those who own and those who are interested in owning solar generation units represent a cross section of Indiana. They include small residential customers, farms, municipal governments, schools, commercial business customers and industrial customers. Many customers express that they have a focused desire to make a positive environmental impact. But most of our customers purchase a solar energy system to provide a long term cost effective fuel-less energy supply that over a reasonable time generates savings that offset the systems cost, i.e. recovery of investment. Without a reasonable investment recovery, there would be very little demand for solar energy systems.

Q: What are the common critical considerations for prospective solar installation customers?

A: The most critical consideration generally is system cost and the period over which the solar equipment and installation will be recovered. There of course is also great interest in improving the environment, and reducing reliance on others for energy needs. But financial viability is the most common and critical concern. The installed cost of customer solar has declined. But even with the lower installed cost, Vectren EDG proposal grossly lengthens the customer investment pay back period. Large business prospective solar customers are typically looking for a 5-6 year payback period. Most residential customers want 7-10 year payback period.

Q: Please describe the financial analysis you provide for your prospective residential customers.

A: It is a simple spreadsheet that contains the following variables:

1) Future yearly inflation rate of electricity (%)
2) Current cost of electricity ($/KWH)
3) Tax Credit calculation
4) Generated KWH per year
5) Future yearly generated KWH production
6) Percentage of Self Consumption

Q: How would the full EDG proposal impact Vectren customer solar investment payback?

A: Currently, residential customer solar investment pay back is typically estimated to be 7-10 years. This is using a projected 3% future inflation rate. Based on Vectren's proposed EDG rate and their new "instantaneous netting methodology" that customer payback period would be lengthened to approximately 25 years. That is an unreasonably high EDG regime payback period, and that excessive payback period is despite the fact that Vectren's residential electric rates are the highest of all Indiana investor-owned electric utilities. The higher the utility rate the shorter the typical solar investment payback.

Q: What is the current status of the Federal tax credit for solar installations?

A: The Tax credit is declining and soon absent a legislative revamp will expire. Specifically the credit is currently 26%. It drops to 22% in 2021, 10% in 2022 and thereafter ends.

Q: What is the impact of Vectren's netting proposal on a typical customer's investment pay back period?

A: I'm not sure even Vectren really knows the customer impact at this time. But my understanding is it will reduce the customers' monthly bill credit by about 25%-50%. It alone will essentially add several years to the payback, or customer break even point. This will adversely affect the home or business owner's decision to invest in a solar energy system, and will allow Vectren to monopolize the solar market.

Q: Can you roughly demonstrate for us the adverse residential customer impact from Vectren's EDG rate of about 3.1 cents per kWh, Vectren's netting proposal and the declining Federal tax credit?

A: Yes, while results will vary from one customer system to the next I have performed some examples of typical customer impacts. My *Attachment 1* shows that today under current Vectren net metering and with the current tax credit a 10 KW residential size solar installation would have a payback period of about 9 years.

My *Attachment 2* shows that the impact of only Vectren's proposed 3.1 cent EDG rate would increase that current payback period to about 14 years.

My *Attachment 3* shows the impact that Vectren's proposed 3.1 cent EDG combined with their instantaneous netting proposal would increase the current payback period to at least 21 years.

My *Attachment 4* shows the cumulative impact of Vectren's EDG and instantaneous netting proposals along with elimination of the Federal tax credit. The resulting payback period would be approximately more than 25 years.

Harm to Indiana's Economy

Q: What would be the end impact of Vectren's proposals on customers' interest in investing in solar generation?

A: The resulting lengthening of customer investment payback period would make customers extremely reluctant or unwilling to make the investment in solar. This will be devastating to Indiana's fledgling solar industry and result in job losses and probable market contraction to an industry and was just beginning to blossom. This will push Indiana solar job opportunities backwards instead of moving forward.

Q: What would be the impact on your Company Morton Solar from approval of Vectren's proposed EDG?

A: It will likely be very detrimental to Morton Solar's business. We currently employ 17 people and we engage many subcontract workers. It could require us to lay off workers and possibly no longer install solar energy systems in Vectren's service area. Instead of continuing to focus on investing our time and resources in Indiana it would only be

logical that we shift focus to neighboring jurisdictions that treat solar installations reasonably rather that punishing them. Morton Solar's ongoing Indiana solar business operations could be in jeopardy.

Q: What economic contribution does Morton solar make to the wellbeing of Vectren's service area and in Indiana as a whole?

A: Last year Morton Solar did $2.5M of projects in Vectren's service area and $3.1M million of projects in Indiana as a whole. We paid out $1.1M in employee wages and benefits, mostly to union electricians. When possible, we purchase materials and supplies locally. Logically the money Morton Solar injects into Indiana's economy gets re-spent and invested by the Hoosier recipients several times before those dollars leave Indiana. I believe Morton Solar makes a substantial contribution to the economic well being of Indiana and Hoosiers in Vectren's service area.

Q: Does Indiana and local government benefit from Morton Solar's business activity?

A: Yes. Morton Solar, employees and contract workers pay local and state income taxes and sales taxes. The economic stimulus we create spurs more tax revenues from ripple affect beneficiaries.

Q: Is Vectren's service area the only area of Indiana in which Morton Solar does business?

A: No, it is not. But if Vectren's EDG rate coupled with its proposed netting were to be requested and approved for other Indiana IOU electric utilities it could force our company to focus on nearby states that do not discourage customer investment in solar energy generation, rather than continue business focus in Indiana.

Q: But wouldn't solar customer installation of battery storage eliminate the adverse cost effect of Vectren's proposed EDG by allowing the customers to rely on stored solar energy at night?

A: No, it wound not. Battery storage is very expensive. Currently the primary reason for battery stored energy is during periods of grid power outages and extended darkness. But the downside of installing an energy storage system or batteries with a solar system are: 1) materially increased upfront cost 2) lower operating efficiency of the solar panels 3) increased complexity of system and maintenance costs 4) decreased return-of-investment / increased payback period.

Adding the cost of batteries lengthens the financial payback time for a solar energy investment, further removing access to renewable energy from middle- and lower-income classes.

<u>Vectren Benefits of Customer Owned Solar Generation.</u>

Q: Please describe the benefits that distributed customer owned solar generation bring to Vectren and all Vectren customers.

A: Distributed solar generation has many benefits that are described in detail by other consumer witnesses in this Cause. First is improvement to the environment by displacing the need to burn carbon emitting polluting coal, diesel, or natural gas to generate electricity. Second is reduced load on the transmission system. Third is reduced transmission line loss by having the solar energy output used in the proximity of the customer demand. The reduced transmission load and line loss can be particularly

beneficial financially and in reliability during periods of peak customer demand, often encountered on very hot sunny humid summer days. Fourth is zero fuel cost. These and other solar benefits are detailed and quantified by other solar consumer party witnesses.

Q: What direct economic benefit's have customer owned solar brought to all Hoosiers and to state and local Indiana governments?

A: The Indiana solar industry has grown substantially over the past ten years. The number of solar jobs has increased to approximately 3500 in 2019. The solar industry also engages in substantial contract work, often with union electrical workers. It buys local goods and materials. All of those economic benefits are multiplied by the ripple affect of solar employees, contractors and merchants spending their solar industry payment earnings locally in Indiana. State County and Municipal governments all thereby benefit from the various tax revenues that the solar economic stimulus creates. My *Attachment 5* from The Solar Foundation depicts the increase in solar jobs from 2015-2019.

<u>Other Reasons Why Vectren's EDG Proposals Are Unjust, Unreasonable and Inequitable.</u>

Q: You have described EDG's harm to Vectren customers, to Vectren solar installers and to the Indiana and Vectren area economies. Are there other aspects of Vectren's EDG proposals that in your opinion are unjust and should be discussed?

A: Yes, there are. Morton Solar was the first to commercially install solar units in the Vectren Service area. Back then, we endured the cost and struggle of starting a new business. We did so at a time when solar panels were far less efficient and cost much more than today. We tamed the challenges and made a successful solar installation

business. At the same time IOU electrics were promoting high cost rate increasing rate base additions for coal fired pollution control, and huge gas fired generation. Now their focus is on getting customers to buy utilities out of remaining net investments in coal fired generation and shifting to large scale solar and wind farms. But as they make the transition to renewable energy, Vectren asks to deploy an EDG regime that clearly serves to financially constrict or end new customer solar DG and the businesses that install customer solar. It is one thing to have a monopoly service area for retail sales of electricity. But it's completely inequitable and unfair to then seek regulatory treatments that serve to prevent customers from using the sun to illuminate, cool and heat their homes with their own solar generation. Energy from our Sun does not need regulatory monopoly protection. God gave us our Sun to sustain all our lives, not to become the monopoly tool of Vectren. So severely restricting the value of customers monthly solar generation offsets leads Vectren into monopolizing solar energy generation in its service area. Vectren's EDG proposals and results are unjust and unreasonable.

As others will detail EDG also offers no value for DG's environmental benefits, operational benefits like reduced line losses and peak shaving.

Recommendations

Q: What are your recommendations to the Commission?

A: The Commission should voice its recognition of the serious threat that Vectren's proposal creates for non-utility owned new solar installation and the economic benefits from customer owned solar. Rate making is an art, not a science. There will be much evidence in this Cause that will allow the Commission to use its regulatory expertise and discretion in crafting a far better outcome than that proposed by Vectren, an outcome that avoids or at least greatly minimizes the serious harm to solar DG, Vectren customers and Indiana.

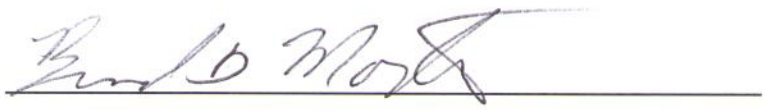
The Commission should deny Vectren's EDG proposal, including both its proposed rate and the instantaneous netting methodology. Absent flat out denial the Commission should deny and order Vectren to collaborate with stakeholders, better formulate its proposal and refile at a later date.

Q: Does this conclude your testimony?

A: Yes, it does at this time.

VERIFICATION

I Brad Morton affirm under the penalties of perjury that the foregoing Direct Testimony is to the best of my knowledge and belief true and accurate.



Brad Morton

Dated: August 20, 2020

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing was served upon the following by electronic delivery this 20th day of August 2020, to:

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ATTACHMENT 1

Made for: Vectren residential system
Case: Net Metering Rate
Design: Annual net-zero
Made by: Brad Morton
Date: 8/19/2020

	Initial Cost:	$27,500
	26% Federal tax credit	$7,150
	Net cost:	$20,350
	Current Electric Rate:	$0.155
	Annual Energy Inflation Rate:	3%
	System Size (DC KW):	10.000

Year	Energy production (kWh)	Yearly Revenue	Cumulative Revenue	Return
1	12125.00	$1,879.38	$9,029.38	-$18,470.63
2	12052.25	$1,924.14	$10,953.52	-$16,546.48
3	11979.94	$1,969.97	$12,923.49	-$14,576.51
4	11908.06	$2,016.90	$14,940.39	-$12,559.61
5	11836.61	$2,064.94	$17,005.33	-$10,494.67
6	11765.59	$2,114.13	$19,119.46	-$8,380.54
7	11695.00	$2,164.49	$21,283.95	-$6,216.05
8	11624.83	$2,216.05	$23,500.00	-$4,000.00
9	11555.08	$2,268.83	$25,768.83	-$1,731.17
10	11485.75	$2,322.88	$28,091.70	$591.70
11	11416.83	$2,378.21	$30,469.91	$2,969.91
12	11348.33	$2,434.86	$32,904.76	$5,404.76
13	11280.24	$2,492.85	$35,397.62	$7,897.62
14	11212.56	$2,552.23	$37,949.85	$10,449.85
15	11145.28	$2,613.03	$40,562.88	$13,062.88
16	11078.41	$2,675.27	$43,238.15	$15,738.15
17	11011.94	$2,738.99	$45,977.14	$18,477.14
18	10945.87	$2,804.24	$48,781.38	$21,281.38
19	10880.19	$2,871.03	$51,652.42	$24,152.42
20	10814.91	$2,939.42	$54,591.84	$27,091.84
21	10750.02	$3,009.44	$57,601.28	$30,101.28
22	10685.52	$3,081.12	$60,682.40	$33,182.40
23	10621.41	$3,154.52	$63,836.92	$36,336.92
24	10557.68	$3,229.66	$67,066.58	$39,566.58
25	10494.34	$3,306.59	$70,373.16	$42,873.16
		$63,223.16		

ATTACHMENT 2

Made for: Vectren residential system
Case: Only EDG Rate
Design: Annual net-zero
Made by: Brad Morton
Date: 8/19/2020

	Initial Cost:	$27,500
	26% Federal tax credit	$7,150
	Net cost:	$20,350
	Current Electric Rate:	$0.155
	Annual Energy Inflation Rate:	3%
	System Size (DC KW):	10.000

Year	Energy production (kWh)	Yearly Revenue	Cumulative Revenue	Return
1	12125.00	$1,277.98	$8,427.98	-$19,072.03
2	12052.25	$1,308.42	$9,736.39	-$17,763.61
3	11979.94	$1,339.58	$11,075.97	-$16,424.03
4	11908.06	$1,371.49	$12,447.47	-$15,052.53
5	11836.61	$1,404.16	$13,851.63	-$13,648.37
6	11765.59	$1,437.61	$15,289.23	-$12,210.77
7	11695.00	$1,471.85	$16,761.09	-$10,738.91
8	11624.83	$1,506.91	$18,268.00	-$9,232.00
9	11555.08	$1,542.81	$19,810.80	-$7,689.20
10	11485.75	$1,579.56	$21,390.36	-$6,109.64
11	11416.83	$1,617.18	$23,007.54	-$4,492.46
12	11348.33	$1,655.70	$24,663.24	-$2,836.76
13	11280.24	$1,695.14	$26,358.38	-$1,141.62
14	11212.56	$1,735.52	$28,093.90	$593.90
15	11145.28	$1,776.86	$29,870.76	$2,370.76
16	11078.41	$1,819.18	$31,689.94	$4,189.94
17	11011.94	$1,862.52	$33,552.46	$6,052.46
18	10945.87	$1,906.88	$35,459.34	$7,959.34
19	10880.19	$1,952.30	$37,411.64	$9,911.64
20	10814.91	$1,998.81	$39,410.45	$11,910.45
21	10750.02	$2,046.42	$41,456.87	$13,956.87
22	10685.52	$2,095.16	$43,552.03	$16,052.03
23	10621.41	$2,145.07	$45,697.10	$18,197.10
24	10557.68	$2,196.17	$47,893.27	$20,393.27
25	10494.34	$2,248.48	$50,141.75	$22,641.75
		$42,991.75		

ATTACHMENT 3

Made for: Vectren residential system
Case: EDG Rate & Instantaneous Netting
Design: Annual net-zero
Made by: Brad Morton
Date: 8/19/2020

	Initial Cost:	$27,500
	26% Federal tax credit	$7,150
	Net cost:	$20,350
	Current Electric Rate:	$0.155
	Annual Energy Inflation Rate:	3%
	System Size (DC KW):	10.000

Year	Energy production (kWh)	Yearly Revenue	Cumulative Revenue	Return
1	12125.00	$751.75	$7,901.75	-$19,598.25
2	12052.25	$769.66	$8,671.41	-$18,828.59
3	11979.94	$787.99	$9,459.40	-$18,040.60
4	11908.06	$806.76	$10,266.16	-$17,233.84
5	11836.61	$825.98	$11,092.13	-$16,407.87
6	11765.59	$845.65	$11,937.78	-$15,562.22
7	11695.00	$865.80	$12,803.58	-$14,696.42
8	11624.83	$886.42	$13,690.00	-$13,810.00
9	11555.08	$907.53	$14,597.53	-$12,902.47
10	11485.75	$929.15	$15,526.68	-$11,973.32
11	11416.83	$951.28	$16,477.96	-$11,022.04
12	11348.33	$973.94	$17,451.91	-$10,048.09
13	11280.24	$997.14	$18,449.05	-$9,050.95
14	11212.56	$1,020.89	$19,469.94	-$8,030.06
15	11145.28	$1,045.21	$20,515.15	-$6,984.85
16	11078.41	$1,070.11	$21,585.26	-$5,914.74
17	11011.94	$1,095.60	$22,680.86	-$4,819.14
18	10945.87	$1,121.70	$23,802.55	-$3,697.45
19	10880.19	$1,148.41	$24,950.97	-$2,549.03
20	10814.91	$1,175.77	$26,126.74	-$1,373.26
21	10750.02	$1,203.78	$27,330.51	-$169.49
22	10685.52	$1,232.45	$28,562.96	$1,062.96
23	10621.41	$1,261.81	$29,824.77	$2,324.77
24	10557.68	$1,291.86	$31,116.63	$3,616.63
25	10494.34	$1,322.64	$32,439.27	$4,939.27
		$25,289.27		

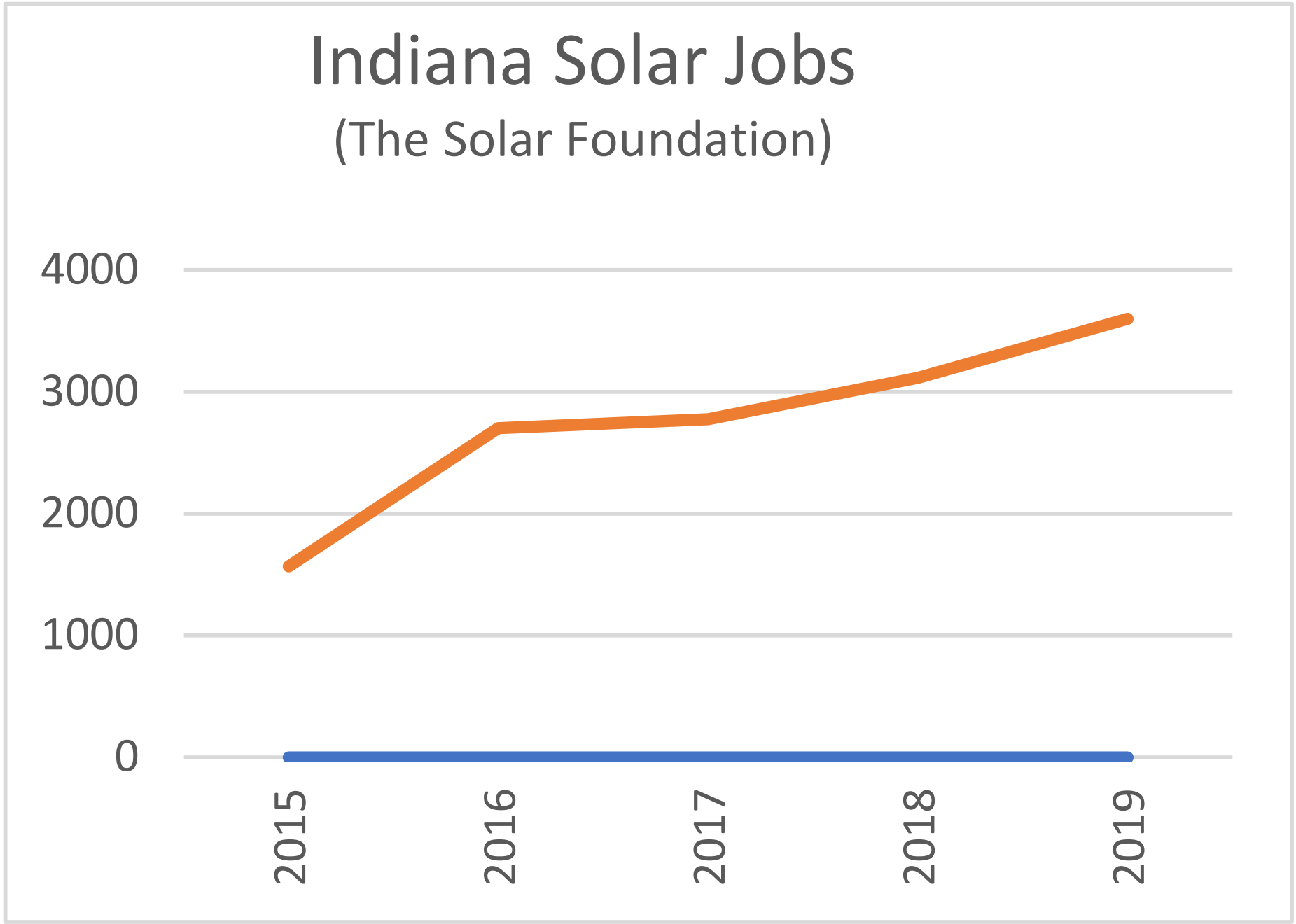
ATTACHMENT 4

Made for: Vectren residential system
Case: EDG, Instantaneous and No Tax Credit
Design: Annual net-zero
Made by: Brad Morton
Date: 8/19/2020

	Initial Cost:	$27,500
	26% Federal tax credit	$0
	Net cost:	$27,500
	Current Electric Rate:	$0.155
	Annual Energy Inflation Rate:	3%
	System Size (DC KW):	10.000

Year	Energy production (kWh)	Yearly Revenue	Cumulative Revenue	Return
1	12125.00	$751.75	$751.75	-$26,748.25
2	12052.25	$769.66	$1,521.41	-$25,978.59
3	11979.94	$787.99	$2,309.40	-$25,190.60
4	11908.06	$806.76	$3,116.16	-$24,383.84
5	11836.61	$825.98	$3,942.13	-$23,557.87
6	11765.59	$845.65	$4,787.78	-$22,712.22
7	11695.00	$865.80	$5,653.58	-$21,846.42
8	11624.83	$886.42	$6,540.00	-$20,960.00
9	11555.08	$907.53	$7,447.53	-$20,052.47
10	11485.75	$929.15	$8,376.68	-$19,123.32
11	11416.83	$951.28	$9,327.96	-$18,172.04
12	11348.33	$973.94	$10,301.91	-$17,198.09
13	11280.24	$997.14	$11,299.05	-$16,200.95
14	11212.56	$1,020.89	$12,319.94	-$15,180.06
15	11145.28	$1,045.21	$13,365.15	-$14,134.85
16	11078.41	$1,070.11	$14,435.26	-$13,064.74
17	11011.94	$1,095.60	$15,530.86	-$11,969.14
18	10945.87	$1,121.70	$16,652.55	-$10,847.45
19	10880.19	$1,148.41	$17,800.97	-$9,699.03
20	10814.91	$1,175.77	$18,976.74	-$8,523.26
21	10750.02	$1,203.78	$20,180.51	-$7,319.49
22	10685.52	$1,232.45	$21,412.96	-$6,087.04
23	10621.41	$1,261.81	$22,674.77	-$4,825.23
24	10557.68	$1,291.86	$23,966.63	-$3,533.37
25	10494.34	$1,322.64	$25,289.27	-$2,210.73
		$25,289.27		

ATTACHMENT 5


Indiana Solar Jobs
(The Solar Foundation)
4000
3000
2000
1000
0
2015
2016
2017
2018
2019