



thoroughbred solar

Exhibit 10

Analysis of Economic Effect

EXHIBIT 10 – ANALYSIS OF ECONOMIC IMPACT

An analysis of the proposed facility's economic impact on the affected region and the state. KRS 278.706(2)(j).

Respondent: Rob Kalbouss

Pursuant to KRS 278.706(2)(j), the attached Economic Impact Analysis of Thoroughbred Solar was prepared by Gilbert Michaud, PhD, principal researcher of the Michaud Energy Policy Research Group, under the direction and supervision of Rob Kalbouss, on behalf of Thoroughbred.

The local and state tax analysis included in the report does not reflect tax abatement at any level. The Project does not yet have tax abatement agreements in place but is evaluating the appropriate tax framework for Thoroughbred Solar's financial contributions to the community, which could take the form of an abatement under Kentucky's industrial revenue bond ("IRB") program.

Thoroughbred will update the Siting Board if an agreement is reached with local and/or state authorities regarding tax abatement, including any updated tax payment projections.

Attachment A (16 pages): Economic Impact Analysis of Thoroughbred Solar



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Attachment A

Economic Impact Analysis of Thoroughbred Solar

Exhibit 9 – Analysis of Economic Effect



ECONOMIC IMPACT ANALYSIS OF THOROUGHbred SOLAR

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June 2022

Prepared for



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Executive Summary

This study represents a detailed economic impact analysis for the proposed **Thoroughbred Solar project** in the Commonwealth of Kentucky (USA).¹ In 2022, it was shared that Thoroughbred Solar, LLC had an interest in developing the Thoroughbred Solar project in Hart County, Kentucky – a small county of about 19,000 people² in the south-central portion of the state – at a total installed capacity of **50 megawatts (MWac)**.³ The project would be the first utility-scale solar facility built in Hart County. This study was conducted to help support the project’s application to the Kentucky State Electric Generation and Transmission Siting Board⁴ by assessing the economic implications of the project.

Key findings from this study indicate that, at 50 MW, Thoroughbred Solar would bring notable economic impacts to south-central Kentucky, including **294 total construction phase jobs** (over the course of roughly 12 months), and an **annual 7 total operations and maintenance (O&M) phase jobs** (over the course of roughly 30–40 years). For every 1 job directly supported in the construction of Thoroughbred Solar, an additional 1.09 jobs are supported in Kentucky, with that same figure being 0.75 additional jobs in the O&M phase.⁵

Further, the modeling indicated that Thoroughbred Solar would bring **\$36.3 million of total economic impacts in the construction phase** to Kentucky. Thoroughbred Solar is also projected to generate over **\$1.5 million of annual total economic impacts in the O&M phase**, which could amount to nearly **\$62 million over the life of the system**.⁶ Finally, Hart County, Kentucky is slated to receive new annual tax revenues from Thoroughbred Solar, which would help the communities in which the project is sited.

Suggested citation: Michaud, G. (2022). *Economic Impact Analysis of the Thoroughbred Solar Project*. Prepared for Thoroughbred Solar, LLC.

For additional information about this study, please contact the principal researcher at gmichaud@luc.edu.

¹ See the project website here: <https://thoroughbredsolar.com/>. According to the Revised Notice of Intent: “The approximate street address of the Thoroughbred Solar Project is 637-301 L & N Turnpike Road, Munfordville, Kentucky 42765, on the east side of Interstate 65 and west of the town of Rowletts, Kentucky. Its coordinates are 37.24 degrees latitude and -85.91 degrees longitude.” (p. 2) (see: https://psc.ky.gov/psccef/2022-00115/torahood%40bricker.com/04292022021438/Thoroughbred_Solar_2nd_Updated_NOI.pdf).

² U.S. Census Bureau. (2021). *QuickFacts: Hart County, Kentucky*. Retrieved from <https://www.census.gov/quickfacts/hartcountykentucky>.

³ “ac” stands for “alternating current,” which is the type of electricity transported on the grid and used in homes and businesses.

⁴ This “Siting Board” was created via a Kentucky General Assembly act in 2002, and it works to review applications and grant building certificates for electricity generation facilities and transmission lines. For more information on the Siting Board, please see: https://psc.ky.gov/agencies/psc/siting_board/guide.pdf.

⁵ For additional information on multiplier effects, please see both Table 1 and footnote #17.

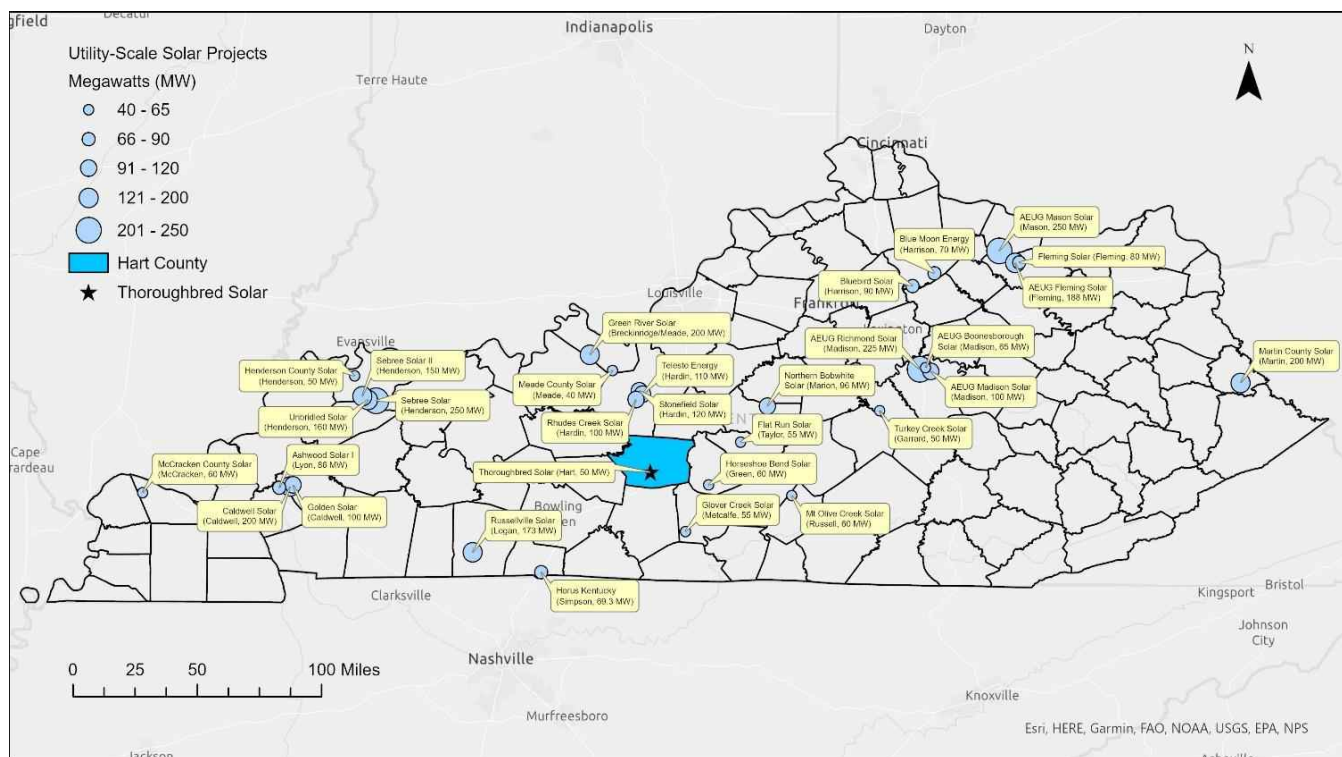
⁶ At 40 years. At 35 years, this figure is roughly \$54 million total, and at 30 years this figure is roughly \$46 million total.

1. Study Background

Declining costs, technological advancements, corporate and governmental demand for renewables, and several other drivers have worked together to spur the development of utility-scale solar energy projects in the Commonwealth of Kentucky over the past few years. At the time of this writing, since January of 2020 alone, the Kentucky State Electric Generation and Transmission Siting Board has received approximately 30 utility-scale solar project applications (see Figure 1).⁷ These potential new utility-scale solar projects – if built – would represent a sizeable increase in Kentucky’s total solar energy capacity, which has recently (i.e., over the past five years or so) been mostly smaller-scale distributed solar (i.e., rooftop or ground-mounted arrays on homes and businesses).⁸ Among other benefits (e.g., health), new utility-scale projects would help create local job opportunities, enhance tax revenues, and generate other positive economic impacts in Kentucky.

Figure 1.

Proposed Utility-Scale Solar Projects in Kentucky (2020–2022)



Note. Figure developed using data from the Kentucky Public Service Commission (2022) (see footnote #7). Project coordinates were gathered from site/development plans and related documents included in the “case files” of each project as of June 2022 (except for Stonefield Solar, in which the exact coordinates were not provided, and, thus, the county center was used as an approximation). The labels of each location indicate the solar project name, with the county and installed capacity (in megawatts) in the parentheses. For a full list with additional information on these projects, please see Appendix B.

⁷ Kentucky Public Service Commission. (2022). *Electric Generation and Transmission Siting Board: Merchant power plant electronic case files*. Retrieved from <https://psc.ky.gov/Home/EGTSB>.

⁸ Solar Energy Industries Association. (2022). *Kentucky solar*. Retrieved from <https://www.seia.org/state-solar-policy/kentucky-solar>. Since 2018, the largest percentage of installations (and capacity) each year has been at the residential level.

Thoroughbred Solar, LLC is interested in constructing a 50 megawatt (MWac) solar energy facility on roughly 450 acres in Hart County, Kentucky,⁹ and would like to better discern the economic impacts generated as part of its application to the Kentucky State Electric Generation and Transmission Siting Board. These data will also help with project marketing/outreach, education, and related efforts.

The following sections of this report detail the methods and results of the economic impact analysis conducted. In particular, the results focus on the *direct*, *indirect*, and *induced* economic impacts during both the construction and operation and maintenance (O&M) phases of Thoroughbred Solar. The report concludes with synthesizing implications of Thoroughbred Solar for the region and state.

2. Economic Impact Analysis

2.1. Overview

Economic impact analyses are a frequently used research approach to better comprehend the effect of a new project – such as the spike in economic benefits from the construction of a new utility-scale solar energy facility – to local, regional, or state economies. Such analyses traditionally use input-output (IO) methods to re-create inter-industry linkages and model the impact on an economy. Economic impact analyses can also measure the contribution of an existing industry or a policy change.

Modeling the economic impacts of a utility-scale solar project requires the analysis of three major types of effects (i.e., direct, indirect, and induced) across two major project phases (i.e., construction and O&M). First, the *direct effect* of a solar project refers to the economic impacts of the “direct” employees working to construct or operate a facility, such as installers, project managers, electricians, engineers, and others. Beyond this initial/direct economic impact, there will also be a new demand for the intermediate goods/services needed for a solar project, such as modules, inverters, wiring, legal, and many others, which is referred to as the *indirect effect*. Finally, the additional income of workers within these aforementioned sectors is going to lead to added spending in a regional economy (e.g., for goods and services, such as groceries), which is referred to as the *induced effect*. Thus, the total economic impact of a solar project (in this case, Thoroughbred Solar) is the *sum* of the direct, indirect, and induced effects, as shown below in Figure 2. In essence, the new economic activity in a region as a result of a new solar project will create a ripple or multiplier effect in the economy of that area.

Figure 2.

Total Economic Impacts of a Utility-Scale Solar Project



Note. Figure developed by author.

Beyond the direct, indirect, and induced effects, Table 1 offers a list of additional variables and definitions that are traditionally used in economic impact analyses.

⁹ See: <https://hartcounty.ky.gov/Pages/default.aspx>.

Table 1.

Variables in Economic Impact Analyses

Variable	Definition
Employment	Employment refers to a mix of full-time, part-time, and seasonal jobs. It is expressed in terms of full-time equivalents (or FTEs). One FTE = 2,080 hours worked in a year.
Labor Income	Labor income refers to all forms of employment income, including employee compensation (i.e., wages, salaries, and benefits) and proprietor income.
Value Added	Value added is the difference between total output and the cost of intermediate inputs; it is a measure of the new contribution to regional gross domestic product (GDP).
Total Output	Total output is the total value of production. It can also be described as annual revenues plus net inventory change. It is often referred to as “total economic impact.”
Multiplier Effect	The multiplier effect is the measurement of how influential a specific industry is to other industries in a region. For instance, employment multipliers describe the total jobs generated as a result of 1 job in the direct industry under investigation.

Finally, as noted, the traditional development process for a utility-scale solar energy project concerns two major project phases: construction (~12 months), and O&M (~30–40 years). Economic studies focused on new solar energy facilities typically model the impacts across these two different phases, yet do not cover the planning/development and decommissioning phases of a project (which only amounts to about 3% of the total labor hours).¹⁰

2.2. Methodology

This report calculates the economic impacts of the proposed build-out of Thoroughbred Solar in Hart County, Kentucky. These impacts were calculated using traditional economic impact analysis methods, with some data provided by the project sponsor, such as potential project size (in MW) and geographic location. In particular, the National Renewable Energy Laboratory’s (NREL) Jobs and Economic Development Impact (JEDI) tool was used, which is well known and regarded for estimating the economic impacts of different types of electricity generation facilities.¹¹ JEDI was used to estimate the projected effects of an new increase in demand that would result from the solar-related economic activity in the Hart County region (i.e., from Thoroughbred Solar), in terms of employment, labor income, value added (i.e., increase in the study area’s GDP), and total output (i.e., the total economic impact to the region/state) (See Table 1, above) across the two fundamental project phases (i.e., construction and O&M).

NREL has developed JEDI models specific to various electricity generation assets, including, but not limited to, biofuels, coal, hydro, natural gas, and wind energy. For this study, the researcher used the solar photovoltaic (PV) JEDI model as the central tool to calculate the economic impacts of the Thoroughbred Solar project. However, the solar PV JEDI model is no longer regularly updated by NREL (as of 2016), so the researcher updated this model to include 2020 multipliers from Impact Analysis for PLANNing

¹⁰ Meaning that the results contained in this report represent a realistic, yet conservative, estimation. For additional information, please see: International Renewable Energy Agency (IRENA). (2017). *Renewable energy benefits: Leveraging local capacity for solar PV*. Retrieved from https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2017/Jun/IRENA_Leveraging_for_Solar_PV_2017.pdf.

¹¹ For additional information on the JEDI models, please refer to the NREL website: <https://www.nrel.gov/analysis/jedi/about.html>

(IMPLAN) (version 3.1), as well as 2021 NREL benchmark costs, representing the most recent data available for each. The model default values for project costs in JEDI were specifically updated using cost inputs from the NREL report titled, “U.S. Solar Photovoltaic System and Energy Storage Cost Benchmarks: Q1 2021.”¹² It was also assumed that Thoroughbred Solar will employ one-axis (east-west) tracker technology, which is the predominant form of utility-scale solar projects in the United States (U.S.) today.

The aforementioned NREL report includes cost benchmarks by category (e.g., modules, inverters, etc.) for 5 MW, 10 MW, 50 MW, and 100 MW project sizes. This study used the 50 MW cost inputs (which are running under \$1 per watt) for the calculations, as shown below in Table 2.¹³

Table 2.

Cost Inputs for JEDI Model

Installation Costs (Per Watt)	50 MW
Materials & Equipment	
<i>Modules</i>	\$0.33
<i>Inverters</i>	\$0.04
<i>Mounting</i>	\$0.14
<i>Electrical</i>	\$0.09
Labor	
<i>Installation</i>	\$0.12
Other Costs	
<i>Other Costs</i>	\$0.16
<i>Business Overhead</i>	\$0.10
Total	\$0.98

Once the cost defaults in the JEDI model were updated, the researcher proceeded to update the payroll parameter estimates, specifically with data from IMPLAN, which has wages per sector via data from the U.S. Bureau of Labor Statistics’ Quarterly Census of Employment and Wages, the U.S. Bureau of Economic Analysis’ Regional Economic Accounts, and the U.S. Census Bureau’s County Business Patterns.¹⁴

Additionally, JEDI requires assumptions regarding what products are locally manufactured and purchased, as well as what percentage of local labor is used. In this study, it was assumed that a “market-based” percentage of materials and labor would be utilized, as derived from an internal analysis of the types of industries (and specific companies) specializing in the goods associated with the solar project’s needs (e.g., electrical equipment, wiring, etc.) that exist in Kentucky, as well as an internal analysis of the labor supply in Kentucky for the demanded occupations.¹⁵ It was also assumed that the “other costs” (i.e., interconnection/permitting fees, contingency, etc.) are spent locally at the rate of 80%.¹⁶

¹² Ramasamy, V., Feldman, D., Desai, J., Margolis, R. (2021). *U.S. solar photovoltaic system and energy storage cost benchmarks: Q1 2021*. National Renewable Energy Laboratory. Retrieved from <https://www.nrel.gov/docs/fy22osti/80694.pdf>.

¹³ Expressed in 2020 U.S. dollars.

¹⁴ IMPLAN Group, LLC. (n.d.). *IMPLAN data: Overview and sources*. Retrieved from <https://implan.com/wp-content/uploads/IMPLAN-Data-Overview-and-Sources.pdf>.

¹⁵ Generally, a higher percentage of local labor (e.g., ~75% or higher) and a lower percentage of local materials (~25% or lower) could be feasibly utilized for this project. This is a common assumption employed in prior studies, both through analyses of available materials/labor at the state level, as well as from internal developer estimates. For an example, please see: Michaud, G., Khalaf, C. Zimmer, M., & Jenkins, D. (2020). *Measuring the economic impacts of utility-scale solar in Ohio*. Ohio University. Retrieved from <https://www.ohio.edu/voinovich-school/news-resources/reports-publications/utility-scale-solar>.

¹⁶ Ibid.

2.3. Results

Table 3 presents the one-time, construction-related economic impacts of Thoroughbred Solar. As shown, Thoroughbred Solar would support 141 direct construction-related jobs in Kentucky over the course of roughly 12 months, as well as generate a total one-time economic impact of over \$36 million. Each direct job constructing the solar facility would support about 1 additional job in the state,¹⁷ amounting to nearly 300 total jobs supported as a result of Thoroughbred Solar.

Table 3.

Construction-Related Economic Impacts of Thoroughbred Solar

	Employment	Labor Income	Value Added	Total Economic Impact
Direct Effect	141	\$10,342,700	\$11,109,600	\$12,542,600
Indirect Effect	99	\$6,196,000	\$9,380,300	\$15,142,900
Induced Effect	54	\$2,887,200	\$4,790,900	\$8,628,300
Total Effect	294	\$19,425,900	\$25,280,800	\$36,313,800
Multiplier Effect	2.09	1.88	2.28	2.90

Note. Values may not perfectly sum due to rounding.

Next, Table 4 presents the *annual* O&M-related economic impacts of Thoroughbred Solar. Each year of its operational life, the project will support 4 direct jobs in Kentucky, as well as generate a total annual economic impact of \$1.54 million. Each direct job performing O&M on Thoroughbred Solar would support 0.75 additional jobs in the state, amounting to 7 total jobs supported each year in Kentucky as a result of this project. Since these are annual values, they can be multiplied by the assumed life of the solar energy system (often 30–40 years) to determine the comprehensive impacts during Thoroughbred Solar’s operational life.¹⁸

Table 4.

O&M-Related Economic Impacts of Thoroughbred Solar

	Employment	Labor Income	Value Added	Total Economic Impact
Direct Effect	4	\$415,900	\$615,700	\$1,008,900
Indirect Effect	2	\$125,900	\$206,800	\$388,500
Induced Effect	1	\$54,400	\$90,300	\$145,800
Total Effect	7	\$596,200	\$912,800	\$1,543,200
Multiplier Effect	1.75	1.43	1.48	1.53

Note. Values may not perfectly sum due to rounding.

¹⁷ To get to this estimate, one must consider the full multiplier effect value, and then subtract 1 from it to accommodate for the direct job. In other words, in this example, the full multiplier effect is 2.09. Subtracting 1 from this value leaves 1.09, which is the number of additional jobs supported as a result of the direct solar jobs. Same rule applies for Table 4.

¹⁸ Put another way, at an assumed 40-year lifespan, the comprehensive O&M-related economic impacts of Thoroughbred Solar would sum to nearly \$62 million. See footnote #6 for additional figures for additional lifespans.

Compared to other electricity generation assets, solar energy facilities (and renewable energy in general) have relatively lower O&M labor requirements and economic impacts.¹⁹ Regular maintenance such as inverter servicing, grounds keeping, module cleaning, or site security is relatively straightforward, and can be performed by the project owner or local contractors. Again, the decommissioning of Thoroughbred Solar is *not* included in the above calculations, but it is certainly additive and will increase the economic impacts of the project by a marginal amount. It should also be noted that Thoroughbred Solar is slated to begin operating in late 2024 or early 2025.²⁰

3. Tax-Related Impacts

Thoroughbred Solar will make a multi-million dollar investment in Hart County, Kentucky, and the project will generate ongoing revenue for Hart County and other local governments in the surrounding area. Currently, the project team is evaluating the appropriate tax framework for these financial contributions to the community. This could take the form of an abatement under Kentucky's industrial revenue bond (IRB) program. This approach would provide Hart County with a significant say as to how the payments are used. The selected arrangement will be entered into prior to the commencement of project construction.

4. Conclusions

The aim of this study was to better discern the economic impacts of the proposed 50 MWac Thoroughbred Solar project in Hart County, Kentucky, the first project of its size in this county. This research found a number of positive, lasting economic benefits that the project would bring. Specifically, the economic impact modeling showed that Thoroughbred Solar would support 294 total construction-related jobs in the state, as well as 7 total O&M-related jobs. Further, Thoroughbred Solar would generate over \$36 million of one-time construction phase economic impacts to the state, and an annual ~\$1.5 million O&M phase impact. Over the operational lifespan of the project, this latter figure could reach nearly \$62 million. It is worth noting that these figures represent conservative estimates given the inputs and assumptions used, meaning that south-central Kentucky could see even larger job and economic impacts if higher levels of in-state materials and labor was utilized for the project. Either way, Thoroughbred Solar can be a low impact and low cost to government project to boost local jobs and bring in new tax revenues to the county.²¹

From a wages perspective, the jobs supported or created by Thoroughbred Solar are well paying, with many ranging from \$50,000–\$80,000 per year, which far outpaces the county's current median household income of \$39,834.²² These jobs would help create new economic opportunities for civilians to enter the

¹⁹ Kotarbinski, M., Keyser, D., Stefek, J. (2020). *Workforce and economic development considerations from the operations and maintenance of wind power plants*. National Renewable Energy Laboratory. Retrieved from <https://www.nrel.gov/docs/fy21osti/76957.pdf> & Thomson, J., Denny, B., Jones, B., Hardin, K., & Amon, C. (2021). *The decarbonized power workforce: Digital and diverse*. Deloitte Insights. Retrieved from https://www2.deloitte.com/content/dam/insights/articles/7155_ER-I-Digital-workforce-PU-R/DI_ER-I-Digital-workforce-PU-R.pdf.

²⁰ According to the project website: <https://thoroughbredsolar.com/>.

²¹ As of 2020, Kentucky ranks 47th in the U.S. in terms of total solar capacity installed (at ~71 MW), and 31st in the U.S. in terms of solar-related jobs (at 1,249). For more information, see: <https://www.seia.org/sites/default/files/2022-03/Kentucky%20Solar-Factsheet-2021-YearinReview.pdf>. Thoroughbred Solar would considerably increase both figures/ranks.

²² U.S. Census Bureau. (2021). *QuickFacts: Hart County, Kentucky*. Retrieved from <https://www.census.gov/quickfacts/hartcountykentucky>. Expressed in 2020 U.S. dollars. Per capita income in the past 12 months in Hart County (also expressed in 2020 U.S. dollars) is \$21,542, and the percentage of the population below the poverty line is 22.1%.

labor force, as well as raise earnings for locals.²³ Further, Thoroughbred Solar may serve as an attraction or destination to some, especially if marketed as such, which could increase the amount of visitors in the county who may also spend time at Mammoth Cave National Park, the American Cave Museum, and other local attractions such as Kentucky Stonehenge, Dutch Country Safari Park, and the Kentucky Down Under Adventure Zoo.²⁴

More broadly, the build-out of new utility-scale solar in Kentucky will help promote economic growth and diversification, and may even help attract additional businesses to the state, especially those with sustainability missions and/or renewable energy procurement targets.²⁵ Solar energy may also be a strategy to replace historical electricity generation from coal, which not only produces air emissions, but, as infrastructure ages, is reaching the end of its useful life. Overall, Thoroughbred Solar will enhance local energy security and resilience, as well as provide an injection of millions of dollars of new capital within the Commonwealth.

²³ For a current listing of employment by occupation and wages, please see the U.S. Bureau of Labor Statistics' "Occupational Employment and Wage Statistics" for the south-central Kentucky non-metropolitan area, in which Hart County resides: https://www.bls.gov/oes/current/oes_2100002.htm.

²⁴ Again, see: <https://hartcounty.ky.gov/Pages/default.aspx>, as well as <https://www.kentuckytourism.com/munfordville/history-heritage/memorials-monuments/kentucky-stonehenge>, <https://dutchcountrysafaripark.com/>, and <https://www.kentuckydownunder.com/>.

²⁵ Purchasers of solar energy output will also receive a hedge against future electricity price increases.

Bibliography

- IMPLAN Group, LLC. (n.d.). *IMPLAN data: Overview and sources*. Retrieved from <https://implan.com/wp-content/uploads/IMPLAN-Data-Overview-and-Sources.pdf>.
- International Renewable Energy Agency (IRENA). (2017). *Renewable energy benefits: Leveraging local capacity for solar PV*. Retrieved from https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2017/Jun/IRENA_Leveraging_for_Solar_PV_2017.pdf.
- Kentucky Public Service Commission. (2022). *Electric Generation and Transmission Siting Board: Merchant power plant electronic case files*. Retrieved from <https://psc.ky.gov/Home/EGTSB>.
- Kotarbinski, M., Keyser, D., Stefek, J. (2020). *Workforce and economic development considerations from the operations and maintenance of wind power plants*. National Renewable Energy Laboratory. Retrieved from <https://www.nrel.gov/docs/fy21osti/76957.pdf>.
- Michaud, G., Khalaf, C. Zimmer, M., & Jenkins, D. (2020). *Measuring the economic impacts of utility-scale solar in Ohio*. Ohio University. Retrieved from <https://www.ohio.edu/voinovich-school/news-resources/reports-publications/utility-scale-solar>.
- Ramasamy, V., Feldman, D., Desai, J., Margolis, R. (2021). *U.S. solar photovoltaic system and energy storage cost benchmarks: Q1 2021*. National Renewable Energy Laboratory. Retrieved from <https://www.nrel.gov/docs/fy22osti/80694.pdf>.
- Solar Energy Industries Association. (2022). *Kentucky solar*. Retrieved from <https://www.scia.org/state-solar-policy/kentucky-solar>.
- Thomson, J., Denny, B., Jones, B., Hardin, K., & Amon, C. (2021). *The decarbonized power workforce: Digital and diverse*. Deloitte Insights. Retrieved from https://www2.deloitte.com/content/dam/insights/articles/7155_ER-I-Digital-workforce-PU-R/DI_ER-I-Digital-workforce-PU-R.pdf.
- U.S. Census Bureau. (2021). *QuickFacts: Hart County, Kentucky*. Retrieved from <https://www.census.gov/quickfacts/hartcountykentucky>.

Appendix A: Researcher Biography & Acknowledgements

Gilbert Michaud, PhD (Principal Researcher)

Gilbert Michaud, PhD, is the principal researcher of the Michaud Energy Policy Research Group.²⁶ He is an Assistant Professor of Environmental Policy at the School of Environmental Sustainability at Loyola University Chicago. Michaud also serves as a Faculty Affiliate at the Gerald R. Ford School of Public Policy at the University of Michigan, and as a Senior Research Fellow at Global Law Initiatives for Sustainable Development (gLAWcal). Michaud has published academic papers in journals such as the *Journal of Environmental Planning and Management*, *The Electricity Journal*, and *Economic Development Quarterly*, among other scholarly venues. He is author or co-author of over 80 technical reports and commentary pieces, and has been quoted in several national news media outlets, including NPR, The Associated Press, Forbes, and Bloomberg Law. He currently serves as the national policy chair for the American Solar Energy Society (ASES), and has also served as a guest editor for a special issue of *Solar Energy* journal focused on solar policy and economics for climate action. Previously, Michaud was a faculty member at the George V. Voinovich School of Leadership and Public Service at Ohio University. He holds a PhD in Public Policy and Administration from the L. Douglas Wilder School of Government and Public Affairs at Virginia Commonwealth University (VCU), as well as a certificate in Data Analytics from Cornell University.

An applied and engaged scholar, Michaud's research portfolio broadly focuses on renewable energy policy, electricity markets, and sustainable economic development. Recent work has focused on the unfolding energy transition in the U.S., including studies on workforce and tax impacts, pollution mitigation scenarios, and innovative clean energy deployment programs. Currently, Michaud serves as a co-principal investigator on a U.S. Department of Energy Solar Energy Technologies Office (SETO) grant studying the adoption of utility-scale solar projects in the Great Lakes region. Other sponsored research activities have included economic impact studies for solar developers, emissions modeling, and several other projects funded by the Natural Resources Defense Council (NRDC), American Electric Power (AEP), Utility Scale Solar Energy Coalition (USSEC) of Ohio, and Solar United Neighbors (SUN).

Acknowledgements: The author would like to thank Bo Zhang for his assistance with this study.

²⁶ See: <https://www.michaudenergypolicyresearchgroup.com/>

Appendix B: Recent Utility-Scale Solar Projects in Kentucky

Case #	Project Name	County	MW	Latitude	Longitude	Board Status
2022 (4 projects)						
-00131	Sebree Solar II	Henderson	150	37.671800	-87.584700	Pending
-00115	Thoroughbred Solar	Hart	50	37.240000	-85.910000	Pending
-00096	Telesto Energy	Hardin	110	37.684230	-85.953536	Pending
-00011	Stonefield Solar	Hardin	120	37.702525	-85.972707	Pending
2021 (9 projects)						
-00414	Blue Moon Energy	Harrison	70	38.371642	-84.257759	Pending
-00235	Russellville Solar	Logan	173	36.782202	-86.943516	Pending
-00213	AEUG Boonesborough Solar	Madison	65	37.833375	-84.308631	Pending
-00212	AEUG Richmond Solar	Madison	225	37.825408	-84.341108	Pending
-00170	AEUG Mason Solar	Mason	250	38.498908	-83.880583	Pending
-00141	Bluebird Solar	Harrison	90	38.299894	-84.383489	Pending
-00127	Rhudes Creek Solar	Hardin	100	37.652056	-85.992778	Approved
-00072	Sebree Solar	Henderson	250	37.645129	-87.503046	Approved
-00029	Martin County Solar	Martin	200	37.747939	-82.476922	Approved
2020 (18 projects)						
-00417	Horus Kentucky	Simpson	69.3	36.668514	-86.543850	Approved
-00392	McCracken County Solar	McCracken	60	37.122497	-88.861236	Approved
-00391	Henderson County Solar	Henderson	50	37.787833	-87.629542	Approved
-00390	Meade County Solar	Meade	40	37.818083	-86.128667	Approved
-00387	Green River Solar	Breckinridge /Meade	200	37.908342	-86.260873	Approved
-00370	Fleming Solar	Fleming	80	38.434167	-83.765278	Approved
-00280	Ashwood Solar I	Lyon	86	37.150000	-88.066667	Approved
-00272	Flat Run Solar	Taylor	55	37.409722	-85.385000	Approved
-00244	Caldwell Solar	Caldwell	200	37.157445	-88.004156	Approved
-00243	Golden Solar	Caldwell	100	37.166086	-87.987126	Unknown
-00242	Unbridled Solar	Henderson	160	37.650688	-87.550852	Approved
-00226	Mt Olive Creek Solar	Russell	60	37.106003	-85.087872	Approved
-00219	AEUG Madison Solar	Madison	100	37.812986	-84.277314	Approved
-00208	Northern Bobwhite Solar	Marion	96	37.615778	-85.229325	Approved
-00206	AEUG Fleming Solar	Fleming	188	38.430997	-83.788242	Approved
-00190	Horseshoe Bend Solar	Green	60	37.166128	-85.570736	Approved
-00043	Glover Creek Solar	Metcalfe	55	36.900845	-85.705856	Approved
-00040	Turkey Creek Solar	Garrard	50	37.590142	-84.576225	Approved

Note. Table developed using data from the Kentucky Public Service Commission (2022) (as of June 2022).