



CASE STUDY:

Knoxville Utilities Board Leads Southeast in Renewable Energy Investment through Green Invest Program

Overview

The Knoxville Utilities Board (KUB) provides electric, natural gas, water, wastewater and broadband services to more than 468,000 customers in Knoxville and parts of 7 counties. Its mission is to serve its customers by providing safe, reliable, and affordable utility services, while being good stewards of the environment by safeguarding the communities' resources for future generations.

KUB has a long legacy of commitment to the economic development and sustainability of the Knoxville area. For the past two decades, KUB has worked to improve sustainability of their operations and has partnered with TVA to offer programs for residential and business customers with renewable energy needs. As renewable energy solutions are becoming increasingly important to businesses, local governments and community members, supporting the development of clean energy resources has become a key part of KUB's strategy to help create a greener future for the communities they serve.

The Tennessee Valley Authority (TVA) is a corporate agency of the United States that provides electricity for business customers and local power companies, like KUB, serving nearly 10 million people in parts of seven southeastern states. Carbon reduction is at the center of TVA's sustainability strategy. Almost 60% of the electricity TVA supplies is carbon-free.¹ TVA plans to reduce its carbon emissions rate by 70 percent by 2030 as compared to a 2005 baseline, is on a path toward 80 percent by 2035 and aspires to achieve net-zero generation emissions by 2050.²

¹ As of December 31, 2020.

² [Sustainability Report \(tva.com\)](https://www.tva.com/sustainability-report)

Partnering with TVA to find a sustainable solution

KUB selected TVA's pioneering Green Invest program for the development of clean energy sources that also benefit the entire region through the public power model. KUB's investment in solar energy was enabled by TVA's long-term Valley Partner agreement that positioned them to make the long-term purchase commitment required to get the most economical pricing. Additionally, by using the TVA credit for Valley Partners, KUB is able to fund the \$1.6 million-per-year Green Invest purchase without any rate increases for customers.

In the past two years, KUB has demonstrated their leadership in the renewable energy space with the largest municipal solar energy investment announced³ in the southeast United States through multiple [Green Invest](#) agreements totaling 502 MW of utility-scale solar capacity. These solar commitments have helped enable the development of four new-to-the-world solar projects to be constructed in the Tennessee Valley and come online by 2024.



Green Invest is an award-winning renewable energy solution that offers business and industry an effective, timely and cost-competitive solution to meet their sustainability goals in a way that benefits the broader community. The program matches customer demand for renewable energy to new utility-scale solar projects in the Tennessee Valley. The industry-leading components of this program include *leveraging the demand for utility-scale solar from business and industry for economic development* and a unique public/private partnership structure and competitive bid process that *enable the growth of affordable solar without shifting costs to non-participants*.

Overcoming solar development challenges

According to Mike Bolin, KUB Vice President of Utility Advancement, Green Invest eliminates many of the issues utilities face when considering developing their own solar projects. One of the biggest challenges is finding and procuring land appropriate for mid- to utility-scale solar development, which generally requires several acres per MW and might involve multiple landowners. Since solar developers submit proposals based on land they own or have leased in the Tennessee Valley that has been pre-screened for solar development, the problem of land availability is no longer an obstacle for the Green Invest customer.

³ As of April 27, 2021

Due to TVA's low-cost public power model, making renewable energy projects economically feasible for businesses can be challenging in the Tennessee Valley. Green Invest resolves this issue by leveraging TVA's economies of scale, negotiating power, and a competitive procurement process to get the most economic renewable energy pricing.

Since 2017, TVA has issued four (4) Requests for Proposals for utility-scale renewable projects to meet the needs of Green Invest customers. Based on a long-term commitment to purchase all power from the proposed facility, solar developers submit proposals for utility-scale solar projects and solar with battery storage that can be delivered within a specified time frame. Projects are then selected based on meeting the specific needs of one or more Green Invest customers.

Notably, Green Invest has been used by many companies with smaller capacity needs through the program's aggregation of customers with similar needs to one utility-scale solar project.

"Allowing participants to determine how to allocate their capacity across available solar projects was vital for KUB," said Bolin. "This helped us make the best decision for our goals and budget."

The Green Invest program utilizes TVA's core competencies in managing the competitive bid process, solar contracts and project implementation through the Green Invest program, which allows participants like KUB to focus on serving their community interests.

Implementation

In the spring and fall of 2020, KUB announced Green Invest commitments that helped enable four new-to-the-world solar projects in Mississippi and Tennessee. These projects are scheduled to go online in 2023 and 2024, pending environmental review.

Solar Project	Project Size (MW)	KUB's Commitment	Solar Developer	Project Location-County	Project Location-State
Ridgely	177	177	Leeward Energy	Lake County	TN
Golden Triangle	200	70	Origis Energy	Lowndes County	MS
Optimist	200	200	Origis Energy	Clay County	MS
Moore County	200	55	Silicon Ranch	Moore County	TN

KUB's investment also helped enable the addition of 50 MW of new battery storage technology at the Optimist Solar project that will benefit the entire Valley by increasing the resilience of TVA's power grid.

Environmental impact of KUB-supported solar development

As public power providers, both KUB and TVA have a mutual interest in opportunities to make life better for the people who live and work in the Tennessee Valley. Renewable energy is uniquely positioned as a tool that both KUB and TVA can leverage to continue their core missions. Green Invest has enabled KUB to meet its own sustainability goals in a way that benefits all its customers and the broader Tennessee Valley through environmental stewardship and economic development.

When all four projects come online in 2024, KUB's solar investment will offset 20% of the utility's current energy load or the equivalent of powering approximately 83,000 average homes annually. KUB's investment in clean solar energy will reduce carbon in the Valley atmosphere by roughly 400,000 tons annually or the equivalent of the carbon sequestered by 444,585 acres of U.S. forests in one year.

According to Gabriel Bolas, KUB President and CEO, "This investment in solar is one more way we are working to protect our environment. We exist to serve our customers and supporting a cleaner energy grid at an affordable cost is an important way for us to do that."

Importantly, KUB's Green Invest commitment makes significant progress toward achieving the City of Knoxville's goal to reduce carbon emissions by 80% from a 2005 baseline by 2050.⁴

"This commitment is a major step that advances the objectives of our Climate Council to reduce community greenhouse gas emissions," Knoxville Mayor Indya Kincannon said. "KUB is a leader in the Valley for their sustainability efforts and this investment in solar energy helps all of us reduce emissions and take action against climate change."

The environmental impacts of these solar investments are beneficial for the entire Valley, including other KUB customers like the University of Tennessee.

"The University of Tennessee, Knoxville is pleased to see that the Knoxville Utilities Board continues to be forward looking and is increasing renewable energy offerings by participating in the Green Invest Program offered by the Tennessee Valley Authority," said Terry Ledford, Director of Energy Management at the University of Tennessee. "This investment assists TVA in achieving the goal of a carbon neutral generation mix by 2050. This in turn contributes greatly to the goal of the University to be carbon neutral by 2061. That KUB is able to accomplish this without an increase in rates is especially beneficial to the university and the entire KUB community. The university is very appreciative of the support we receive from KUB and TVA and we value our partnership to make Knoxville and the Valley a better place for all."

⁴ <https://cleanenergy.org/blog/city-of-knoxville-takes-step-to-realizing-carbon-reduction-goals/>

Economic impact of KUB-supported renewable energy projects

In addition to supporting its sustainability goals, KUB's Green Invest commitment has positioned the utility and Knoxville area to attract and retain businesses and organizations who are increasingly driven by sustainability goals imposed by corporate and regulatory requirements. Renewable energy investments are a key tool for local utilities to support corporate and environmental goals of existing business customers while attracting new businesses with sustainability metrics.

Green Invest can be leveraged to grow jobs and investment in communities in three ways: attracting new business and industry to the Valley, meeting the renewable energy needs to maintain and facilitate growth of existing business and industry, and the construction and maintenance of new solar facilities in the Valley.

The development of the four solar projects enabled by KUB's commitment will initially generate significant construction phase jobs and investments in the communities where they are located. Afterward, there are ongoing direct and indirect investment dollars stemming from operations, maintenance and increased tax revenues. New renewable capacity also has other indirect economic benefits such as the increased local spending resulting from job creation.

Construction of these solar projects will support approximately 1,300 jobs. The construction phase includes an estimated \$327 million in construction expenditures.

Operations will support approximately 12 jobs. The operations phase includes an estimated \$7.3 million in annual operating expenditures for total operating expenditures of nearly \$146 million over the 20-year PPAs.

Significantly, all four of the solar projects are located in rural areas and three of the projects are located in economically-distressed counties. Except for Moore County, all projects have a poverty rate above the national average and median household incomes below the national levels. Clay County, MS and Lake County, TN also have median household incomes below their state levels.⁵ These types of economic challenges magnify the positive community impacts from these solar projects.

Through the Green Invest program, KUB was able to make this investment in renewable energy to benefit the Knoxville area and the Tennessee Valley without shifting the cost to the other ratepayers in their service area, thus maintaining their public power mission to maintain low electricity rates.

KUB Green Invest Commitments Helped Enable:

- 4 Utility-Scale Solar Projects in Mississippi and Tennessee
- 502 MW of new-to-the-world solar
- 50 MW of Battery Storage Technology
- 1300 Construction Phase Jobs
- \$327 million in estimated Construction Expenditures
- Increase in tax revenues for 4 Valley counties

⁵ Clay County, TN- [U.S. Census Bureau QuickFacts: Lake County, Tennessee; Tennessee; United States](#);
Lowndes County, MS- [U.S. Census Bureau QuickFacts: Lowndes County, Mississippi; United States; Mississippi](#);
Clay County, MS- [U.S. Census Bureau QuickFacts: Lake County, Tennessee; Tennessee; United States](#);
Moore County, TN- [U.S. Census Bureau QuickFacts: United States](#)

Becoming a leader in renewable energy

The commitment to solar energy through the Green Invest Program has positioned KUB as a leader in solar investment, both regionally and nationally.

KUB's purchase has been recognized as one of the most significant investments in solar energy by solar industry advocate, Tennessee Solar Energy Industries Association (TenneSEIA).

"It's an unprecedented commitment to solar energy by a local power company," said Gil Hough, executive director of TenneSEIA.

In October 2020, TenneSEIA also named KUB the 2020 Tennessee Valley Solar Champion, citing substantial contributions to expanding solar in the region through the Green Invest program.

"To lead the region, it takes great partners with a common vision using renewable energy to revitalize our urban and rural communities", said Bolas. "This program shows that Knoxville and the Tennessee Valley are open for business and the prime destination for any company who wants to achieve their environmental goals."

Renewable Energy is a key component of KUB's overall sustainability strategy

Green Invest has helped KUB meet its own sustainability goals while demonstrating its commitment to environmental stewardship through renewable energy investments that benefit all of its customers.

The company's renewable energy commitment is a key component of its broader sustainability efforts including:

- Plan to build Knoxville's first community solar project
- Solar installation at KUB's facilities
- Long-time participation in [TVA Green](#) programs.
- Current pilot with TVA for the [Green Switch Match](#) program that allows business and residential customers to match 100% of their energy usage with renewable energy sources including solar, wind, and biogas.

These efforts provide multiple options for business and residential customers to benefit from and invest in renewable energy in a way that meets their needs and budget. Learn more about KUB's sustainability efforts at www.kub.org/environment.



A changing energy landscape

KUB has made the second-largest Green Invest commitment to date.⁶ The success of the Green Invest program in attracting business and industry to the Tennessee Valley has been demonstrated through multiple projects to support the new in-Valley operations of Facebook and Google. Green Invest commitments have been made to meet the renewable energy needs of such diverse companies and organizations as General Motors, Vanderbilt University, Jack Daniel's, and Metro Government of Nashville.

Since 2018, Green Invest has brought over 2,000 MW of new contracted solar capacity plus 246 MW of battery storage and nearly \$3 billion in solar investment in the Tennessee Valley.

Appendix 1: Glossary

Megawatt (MW): A megawatt is a unit of electric capacity or electric load. Megawatt AC refers to alternating current. All references to MW in this case study are alternating current.

Renewable Energy: Renewable energy is energy from sources that are naturally replenished but limited in availability per unit of time.⁷

Tennessee Valley: The Tennessee Valley or Valley refers to the service area of TVA including all of Tennessee and parts of Alabama, Georgia, Kentucky, Mississippi, North Carolina and Virginia.

Appendix 2: Economic Impact Notes

The full economic impact of KUB's Green Invest commitment and the related solar projects is not depicted in this case study. Construction and operations expenditures and jobs data were projections supplied by the solar developers for the four solar projects: Leeward Energy, Origis Energy, and Silicon Ranch Corporation.

⁶ As of November 1, 2021.

⁷ Office of Energy Efficiency & Renewable Energy. Renewable Energy: Utility-Scale Policies and Programs. Accessed: <https://www.energy.gov/eere/slsr/renewable-energy-utility-scale-policies-and-programs>.