

From Cotton Gin to Power Plant: The Collaboration Between Ovanova and EG4

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1. INTRODUCTION: POWERING ENERGY INDEPENDENCE

The future of energy is rooted in innovation, collaboration, and a commitment to sustainability. As modern energy needs evolve, the demand for more versatile, reliable, and scalable solutions continues to grow. Ovanova and EG4 Electronics share a belief in the potential of Virtual Power Plants (VPPs)—distributed energy systems that harness renewable sources like solar and battery storage to provide sustainable, reliable power.

Together, we are pushing the boundaries of what's possible in the world of renewable energy, demonstrating that energy abundance is within reach. This white paper explores the impact of that collaboration, beginning with a flagship project that exemplifies our shared mission: the Liberty Hill Farms VPP in Tennessee. A project of this scale and complexity shows that modern energy solutions can revitalize even the most historic sites while meeting the energy demands of today and tomorrow.

2. LIBERTY HILL FARMS CASE STUDY: A BLUEPRINT FOR RURAL ENERGY INDEPENDENCE

At Liberty Hill Farms in Tennessee, EG4 and Ovanova embarked on one of our most ambitious projects to date—a transformative venture that would breathe new life into a 100-year-old cotton gin while also helping to support the local grid. Known affectionately by those involved as "DowdyLand," after the Dowdy family who has owned the farm for generations, the site became a proving ground for what modern energy solutions could achieve in rural America.

"We affectionately call the site 'DowdyLand,' like Disneyland, after the Dowdys, the generational farmers who own the land. It's a place where families have grown up for generations, solving problems like turning a century-old cotton gin into a vehicle workshop," said Chris, the master electrician and Head of Installation for Ovanova who spearheaded the project. But this was no ordinary renovation. The goal was to completely transform the site into a hybrid solar and battery power system that could act as a sort of microgrid.

The setup at Liberty Hill Farms is divided across two separate locations. At the first site, the solar panel array produces 96.9 kW of energy, supported by 100.1 kWh of battery storage, while the second location features 172.9 kW of solar power and 429 kWh of battery capacity. This complex configuration involves multiple EG4 18kPV hybrid inverters and EG4's WallMount All Weather Batteries, which were designed specifically to pair with one another for maximum efficiency and reliability through closed loop communication.

To date, Liberty Hill Farms has generated over 11,207,700 W of solar power and discharged 4,333,700 W from its battery systems. These figures reflect the balance between powering daily operations and storing excess energy for future use. The system's performance showcases its ability to meet the rigorous demands of agricultural operations, while remaining sustainable and efficient. Additionally, the solar yield is split approximately 50/50 between powering loads and charging batteries.

This project wasn't just about upgrading the farm's energy infrastructure; it was also about contributing to the local community and utility grid. "Our goal was to turn that shop into a power plant that contributes to the local grid, just like a farmer contributes to the community. We wanted to maximize roof space to help support the local utility," Chris explained. With this mindset, every aspect of the farm's needs was considered, leading to the use of large roofs for the solar arrays while leaving the fertile land untouched for continued agricultural use.

This balance between tradition and innovation was key to the project's success. The farm remains fully operational, producing soybeans, hay, and using heavy machinery to process raw produce into pellets. Yet now, it also serves as a model for sustainable energy generation in rural settings. "We can use large roofs with the latest battery tech to build power plants in rural America. The Dowdys were one of the first to go through this process," Chris added. Another key element of the system is its hybrid inverter setup, which allows for maximum flexibility and cost savings during high-demand periods. "Hybrid inverters are a big value-add here, where demand charges can fluctuate. The system can shed up to 108kW during peak times and rely on battery power during off-peak hours, thanks to the hybrid inverter setup," Chris said. This not only reduces the farm's energy costs but also helps stabilize the local grid, further demonstrating the far-reaching potential of hybrid VPP systems in rural America.

3. EG4 & OVAROVA'S VISION: A FUTURE OF ENERGY ABUNDANCE

The partnership between EG4 and Ovanova is built on a shared belief in decentralized power, where sustainable systems, big or small, contribute to local communities and the grid alike. Rather than relying on centralized energy production, we see a future where renewable energy is generated and stored across rural and urban America, creating resilience and energy security.

Ovanova's founders envision a world where energy is abundant and accessible to everyone. Lester, Ovanova's co-founder, highlighted the importance of projects like Liberty Hill Farms: "When we started Ovanova, we wanted to bring as much value as possible to as many lives as possible. These projects aren't just one-offs—they're steppingstones to something larger."

EG4's adaptable technology, from hybrid inverters to advanced battery storage systems, plays a key role in this vision. Whether for small homes or large commercial setups like Liberty Hill Farms, these innovations are helping to create energy independence. Each new project brings us closer to realizing democratized energy—allowing farms, businesses, and homes to generate, store, and manage their own power sustainably.

4. THE ROAD AHEAD

The success of the Liberty Hill Farms project highlights the scalability and flexibility of this type of approach to energy generation. Our shared vision for the future centers around creating more projects like this, where solar and battery systems can be integrated into diverse environments. One example is a project currently underway for a grocery store in Florida's panhandle. This installation presents unique challenges due to the store's refrigeration demands and need for continuous power. The solution EG4 provides involves inverters that support 208V three-phase systems paired with battery storage, ensuring the store's operational needs are fully met with reliable energy come rain or shine.

Looking beyond individual installations, Ovanova is also developing modular energy solutions housed in shipping containers. These containers would come pre-equipped with solar panels, batteries, and inverters, ready to be deployed at commercial sites or during emergency scenarios. Such setups are ideal for locations facing space constraints or critical energy needs during natural disasters. The goal is to provide rapid, adaptable power solutions that can be scaled for both small and large-scale applications.

By continuing to partner on innovative projects like these, EG4 and Ovanova aim to lead the charge in transforming how energy is generated, stored, and distributed. These collaborative

efforts are helping to pave the way for a more sustainable and resilient energy grid, ensuring that future generations benefit from the groundwork being laid today.

Whether you're a farmer looking to reduce energy costs, a business owner interested in sustainability, or a community leader seeking energy independence, EG4 and Ovanova can provide the tools and expertise to make that vision a reality. We invite you to join us—help us build a world where personalized energy generation is available for everyone.

5. REFERENCES

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