

Ulteig We listen. We solve.®



STATEMENT OF QUALIFICATIONS

| RENEWABLES



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*This is an interactive document.
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WHO WE ARE

Ulteig is a leader in the engineering industry. We are a team of forward-thinking, innovative experts who make critical connections, putting together the complex, multi-disciplinary strategies needed in today's changing world.

In over 75 years, the Ulteig team has expanded to more than 1200 professionals, offering a full range of engineering solutions across 14 offices and various satellite locations throughout North America. We are well-positioned to respond to our clients' evolving needs in a flexible, agile and collaborative manner.

Today, Ulteig manages an average of 2,000 technical and field service projects per year. We are continually expanding our portfolio of projects that serve our core Lifeline Sectors®.

THE VALUES AT OUR CORE

CLIENT SUCCESS

We create exceptional value through our expertise and collaborative approach.

INTEGRITY

We are authentic and always do what's right.

ENTHUSIASM

We are passionate about the work we do and have fun doing it.

INCLUSION

We seek diverse backgrounds, empower all voices, and value all perspectives.

AGILITY

We act with speed, flexibility and balance.

INNOVATION

We leverage ingenuity and foster creative outcomes.

AWARDS AND RECOGNITION



IN 2022, ULTEIG
**Moved Up
15 SPOTS**
IN THE RANKINGS TO
#124
ON THE ENGINEERING
NEWS-RECORD (ENR) ANNUAL
TOP 500 DESIGN FIRMS LIST.

TOP WORKPLACE RECOGNITION

ZWEIG GROUP HOT FIRM
GLASSDOOR BEST PLACES TO WORK
THE DENVER POST
MINNEAPOLIS/ST. PAUL BUSINESS JOURNAL
STAR TRIBUNE
PRAIRIE BUSINESS MAGAZINE

HOW WE WORK

More than ever before, communities rely on the connections that bring infrastructure, services and information to their citizens. Ulteig is committed to designing, planning, building, sustaining and maintaining the interconnected infrastructure vital to everyday life.

OUR PEOPLE & THE PROMISE WE MAKE:

Ulteig is wholly built on the belief that growth starts with individual achievements. Innovation requires talented, curious people. Our employee-owners work in multi-disciplinary teams across core Lifeline Sectors® to learn from each other, create new approaches and devise expert solutions.





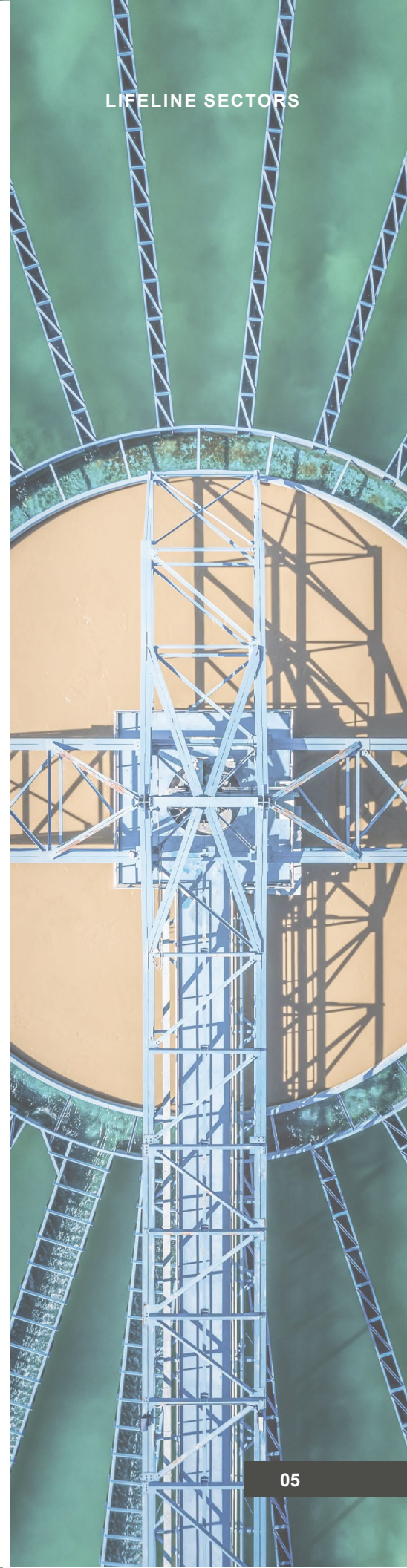
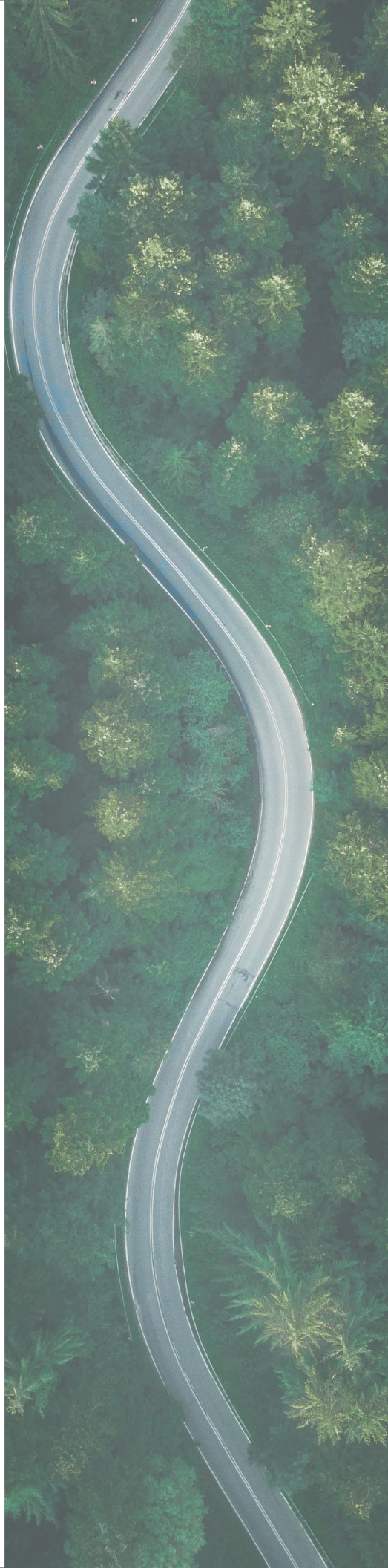
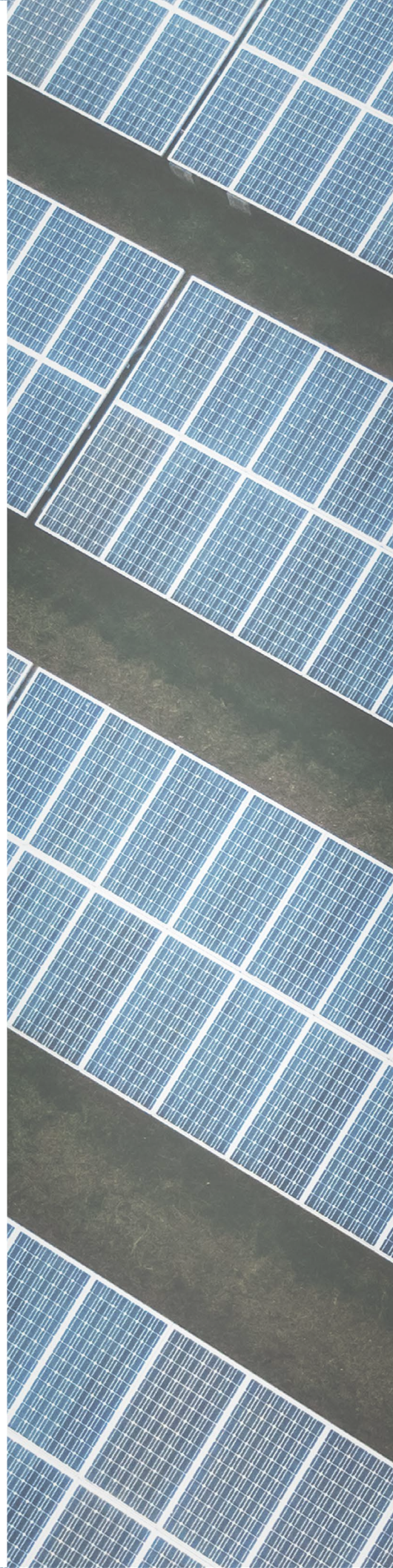
LIFELINE SECTORS.®

At Ulteig we work across the country's entire infrastructure, the silent foundation that sustains everyday life. We specialize in **Power, Renewables, Transportation and Water**, and call these **LIFELINE SECTORS**.

We registered the term Lifeline Sectors because we feel so strongly about what we do. We are creating and maintaining lifelines. We are helping people live cleaner, safer and healthier lives.

 [Learn more about Ulteig's Lifeline Sectors](#)







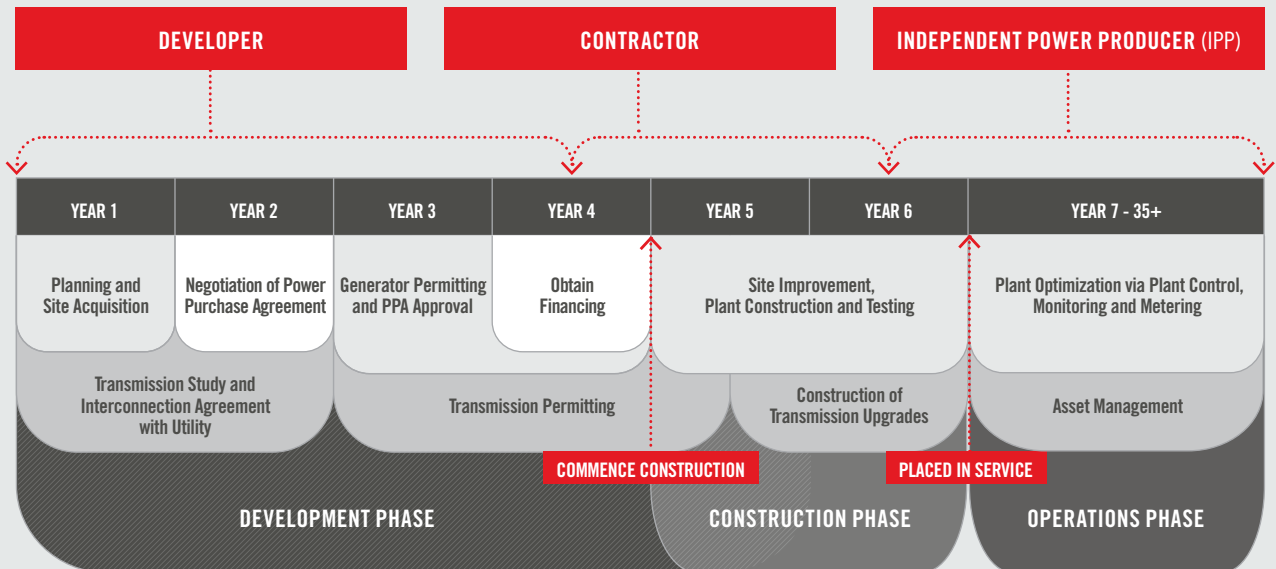
RENEWABLES MARKET OVERVIEW

Ulteig is made up of experts with different combinations of experience — across our Renewable Lifeline Sector® and throughout our solutions. Together our Renewables team brings precisely the right skills, education and training to collaborate relentlessly and create innovative solutions, however complex your challenge or need.

Ulteig assists our clients from project start through completion, providing successful on-time and on-budget performance, regardless of the project size, scope and structure. The continued demand for cost-effective and reliable renewable energy sources is driving the need for a higher level of engineering expertise necessary to support this trend. Ulteig has a strong and proven track record of providing developers, owner/operators, contractors and utilities with innovative professional services and full project support and execution. Ulteig is committed to delivering reliable solutions to be the renewable partner of choice in the industry.

OUR RENEWABLES TEAM WORKS IN THREE KEY MARKET AREAS: **SOLAR, WIND AND ENERGY STORAGE.**

RENEWABLES CLIENT MIX





NORTHWEST OHIO WIND, SOLAR & BATTERY STORAGE | HAVILAND, OH

Paulding County, in northwest Ohio, is considered the flattest land in the state. Its soil is dark, rich and among the best in Ohio for farming. And it's here, near the small town of Haviland, that in 2009 a group of farmers saw the potential of wind power.

More than 10 years later, the Northwest Ohio Wind project — a 105 MW wind energy farm located on 10,000 acres, comprised of 42 wind turbines, each generating 2.5 MW of wind energy. Building on its success, CMS Enterprises commissioned Ulteig to design and engineer the addition of a solar park and battery energy storage system (BESS).

DESIGNING FOR RELIABILITY

The intent of adding solar power and battery energy storage system to Northwest Ohio Wind is to increase reliability and diversity. Core components of the project included:

- **SOLAR PARK** - Built on roughly 30 acres, the solar park is comprised of up to a total of 3.5 MW(DC power) solar PV modules connected to an AC-power “central” inverter. The inverter(s) output to an adjacent/ integrated step-up transformer to bring the system to 34.5 kV and will be terminated to the substation via a single underground AC circuit.
- **BATTERY STORAGE** - The new BESS is a 1 MW by 3.4 MW/hour facility feeding the central inverter via DC coupling. The BESS facility consists of SunGrow short-duration (up to 8 hours) lithium-ion batteries housed inside prefabricated enclosures/containers, power conversion systems, auxiliary power electrical equipment racking system; and will utilize concrete pier foundations.
- **TRANSFORMER** - The solar and storage generation will tie into the existing Northwest Ohio (NWO) Wind substation at 34.5 kV through a step-up transformer and new feeder addition at the substation.
- **ENERGY MANAGEMENT SYSTEM** - Ulteig partnered with Ontario-based NLS Engineering* to design the energy management system (EMS). This partnership provided a control system design for the solar and storage addition to the existing NWO Wind site. The solar park and battery storage system's EMS system can source some information from the wind farm to make decisions.
- **CIVIL ENGINEERING** - The civil engineering design on the 30-acre site included new access roads, perimeter fencing, erosion control, and site grading to improve the drainage on-site and meet the specifications needed for racking and pile installation.

**In May 2021, Ulteig acquired NLS Engineering, turning our long-standing partner into part of the Ulteig team.*

SOLAR

In an industry where change is constant you need a steadfast solar development partner. With over 20 gigawatts of experience, we have a deep understanding of the entire development process, from concept to energization. Like the industry itself, our technology and equipment expertise is continuously evolving at the speed of innovation to meet the rapidly evolving needs of today’s modern solar developers, contractors, and owners. We have the experience to know where solar has been and, more importantly, the strategic foresight to know where it’s going next.

EXPERT SPOTLIGHT



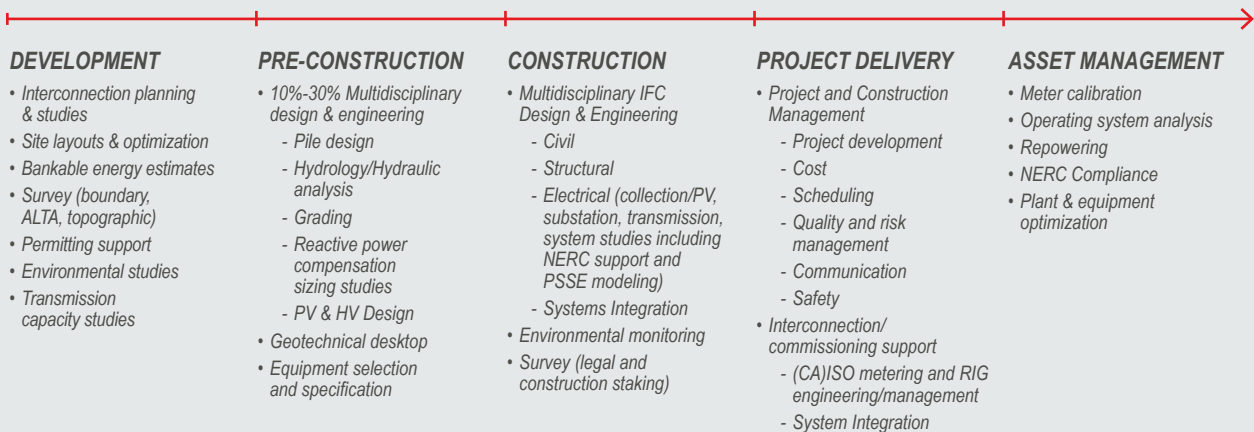
ANDREW MELVIN, PE | TECHNICAL MANAGER - SOLAR

Andrew has over 13 years of expertise in solar design and performance modeling. He is proficient in solar plant design including siting & wiring to NEC requirements, shading and performance, energy modeling including PVSyst, Helioscope, SAM, value engineering, monitoring & commissioning and design automation. Andrew has over 5 years of utility scale solar development specific experience and has been involved in nearly every aspect of engineering during a project’s life from initial site identification through maintenance after completion.

65+ UTILITY-SCALE PROJECTS DELIVERED IN 2021 ALONE

20+ GW SOLAR DELIVERED IN THE PAST DECADE

CAPABILITIES - FROM CONCEPT TO ENERGIZATION





NEW SOLAR POWER CENTER | ELORA, TN

Tennessee is known for many things—its bourbon, BBQ, Goo Goo Clusters, Moon Pies, Graceland and the Grand Ole Opry—but one thing it's not, is solar power. Until now.

Near a small farming town in southern Tennessee, Ulteig designed and engineered one of the largest solar power center in the state. Located on more than 1,700 acres near the Tennessee-Alabama border, this new 150 MW AC solar farm will interconnect with the Tennessee Valley Authority's (TVA) existing electrical grid. The TVA, under a 20-year power purchase agreement (PPA), will sell most of the output to Facebook, which built a \$750 million data center located in nearby Huntsville, Alabama.

Built with 508, 147 solar panels, the solar farm will help create more economic diversity in the region by attempting to attract high-tech companies to this largely agricultural region of the state.

OPTIMIZE TO REDUCE COSTS; INCREASE PRODUCTIVITY

Ulteig was brought on board in April 2020 as the solar design engineer with the responsibility of optimizing the preliminary project design and equipment to be selected for the project. "In designing the solar energy farm near Elora, our engineers were challenged with optimizing project plans to reduce costs while maintaining or increasing the solar farm's productivity," said Andrew Melvin, P.E., a technical manager with Ulteig's transmission and distribution team.

WIND

Ulteig supports the design, development, interconnection and re-powering of utility-scale wind projects. With over 20 years of experience in the renewable industry, we have worked with 75+ clients on over 500 wind projects across North America.

While entirely capable of handling a specific scope of a wind development project, our clients derive the greatest value from their renewable investments when utilizing our full spectrum of integrated wind services. Proactively engaging as your strategic partner, we are able to drive efficiencies by applying discipline at every stage of a project's lifecycle. We also serve as a liaison and project facilitator, balancing the priorities of all involved stakeholders to ensure a timely, successful outcome. Our integrated wind services address all stages of a project's lifecycle, from conception through completion.

75+ CLIENTS

500+ WIND PROJECTS ACROSS NORTH AMERICA

#9 2022 ENR WIND RANKING

EXPERT SPOTLIGHT

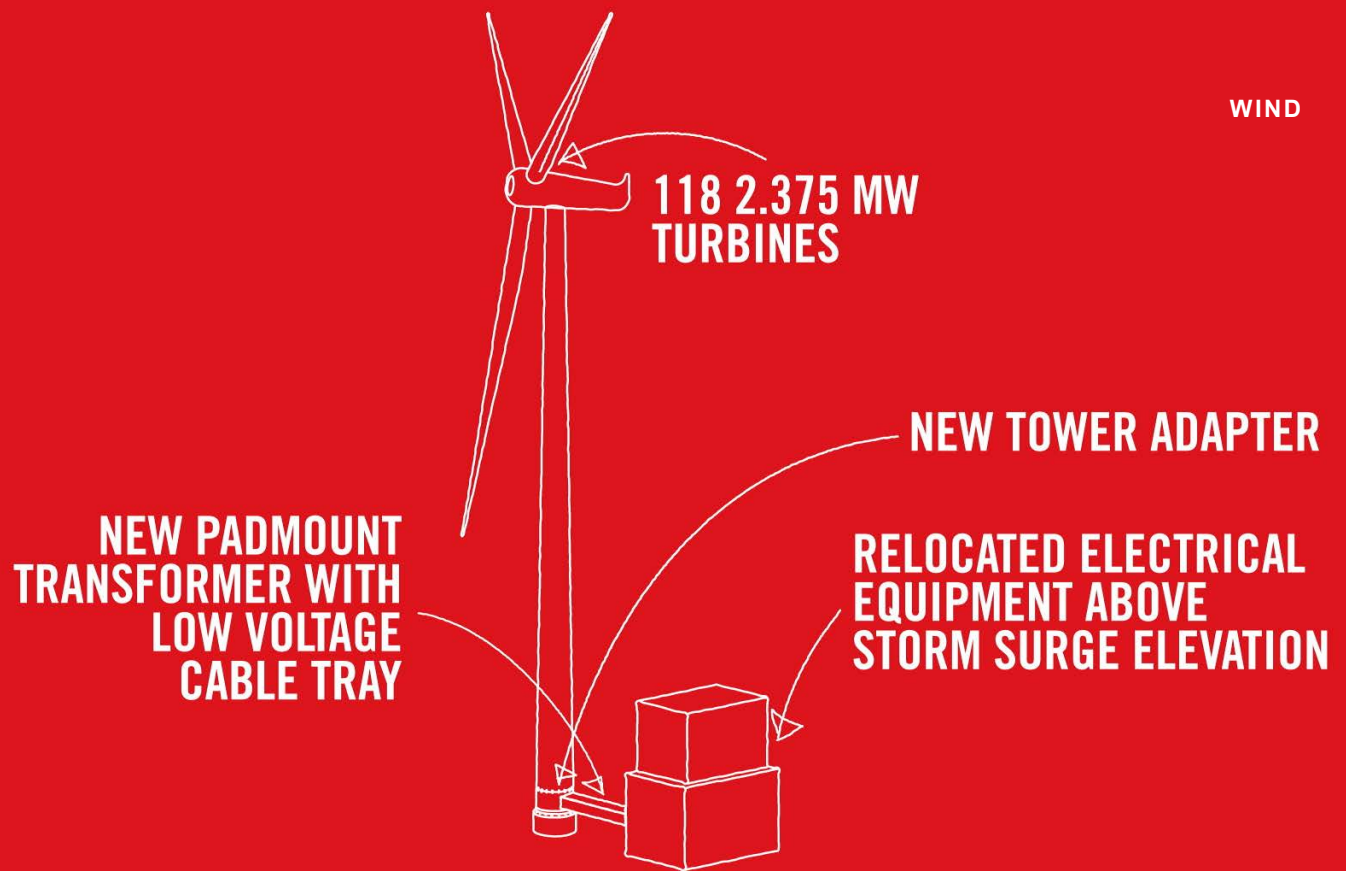


PAUL PEBLER, PE | TECHNICAL MANAGER - CIVIL

Paul manages a civil design team to produce engineering designs and plan sets for renewable energy projects, and is highly involved on a project level managing project coordination and client communications. Paul started his career in renewables by spending nearly 2 years in-field as a Project Engineer for a large EPC on wind projects. He's spent the past 5+ years at Ulteig working on all aspects of civil designs, moving his way from a design engineer to lead engineer, and now a manager role with a team of designers and engineers reporting to him. Paul's experience includes preliminary design and permitting support, logistics reviews, detailed design of civil scope items, micro-siting and field reconnaissance, and preparation of SWPPP and SPCC documentation.

AREAS OF EXPERTISE

- Site Evaluation and Conceptual Design
- Hydrologic and Hydraulic Studies
- Existing Road Studies and Delivery Flow Analysis
- Optimized Access Road Vertical Design
- Earthwork Analysis
- Civil Engineering Design
- Crane Pad Design
- AC Electrical Engineering Design (MV & HV)
- Project Energy Loss Analysis
- Federal, State and Local Permitting
- Stormwater Pollution Prevention Plans (SWPPP)
- Spill Prevention, Control, and Countermeasure Plans (SPCC)
- Construction Survey
- Construction Specifications, Management, Observation and Support
- Owner's Engineering
- SCADA & System Integration
- ALTA, Boundary, Topo survey
- Interconnection Studies & Planning
- Environmental Services
- Land and ROW Acquisition



TEXAS GULF WIND REPOWERING | TX

The Pattern Energy Group, based in San Francisco, is breathing new life into its Gulf Wind project located in Kenedy County, south of Corpus Christi, Texas. Gulf Wind was constructed in 2009 and sits on 9,600 acres leased from the Corpus Christi-based Kenedy Memorial Foundation.

Pattern Energy conducted a major repowering of its wind farm during the first half of 2020. As a long-term partner to Pattern, Ulteig was brought in as Engineer on Record to evaluate the existing electrical plant infrastructure and perform the engineering and design for the incorporation of the new equipment. The repowering consisted of replacing nacelles, towers, and blades for the 118 turbines at Gulf Wind with new Siemens Gamesa 2.3 MW turbines, each with 108-meter blades on 80-meter towers.

Ulteig performed a reactive power study to ensure compliance with ERCOT requirements, conducted various cable ampacity studies that evaluated the existing cable, and designed the addition of a padmount transformer for each wind turbine. In conjunction with the installation of the latest technology turbines by the project, Ulteig played a crucial role in ensuring that the repowered facility will have more efficient production, lower operating costs and longer life – all of which combined to increase the long-term value of Gulf Wind.

The new turbines are expected to generate 271 megawatts per year or roughly the same amount of energy to power 80,000 Texas homes. The new turbines will cause a 19% increase in energy produced when compared to previous turbines. The electricity produced annually by Gulf Wind offsets the carbon dioxide emissions of 180,000 cars and conserves enough water to supply more than 10,500 Texans each year.

ENERGY STORAGE

Ulteig is uniquely qualified to deliver comprehensive, revenue-generating energy storage technologies that can be leveraged across the entire energy supply chain. Our team lends expertise in every project stage while ensuring seamless integration across phases. Services range from helping clients understand the use cases for storage and providing engineering services to overseeing the project and testing functionality of systems.

EXPERT SPOTLIGHT



MCKENZIE SANTIN | ASSOCIATE DIRECTOR - AUTOMATION & INTEGRATION

McKenzie has over seven years of experience in Energy Storage, Solar and Wind SCADA integration and controls. He has led the development of over 10 GW in renewable projects through managing a team of 20+ people. His experience covers HMI design, plant controls, hardware design and procurement. He drives change through aligning engineering and business goals.

ENERGY STORAGE SOLUTIONS FOR EVERY PROJECT PHASE

SYSTEM STUDIES AND DEVELOPMENT

We provide certainty around energy storage development and investment decisions.

- Modeling and studies
- Business case development
- Owner's engineer support
- Interconnection and permitting
- Technical bid support
- Decision making road map (Siting, Application and Size)

CONSTRUCTION DESIGN

Our experienced multi-discipline teams deliver context-sensitive designs to meet your unique needs.

- Conceptual design
- Balance of plant/system engineering
- High-voltage engineering
- Owner's engineering
- EPC support
 - Permitting
 - Environmental
 - Survey & staking
 - Procurement & logistics

AUTOMATION & INTEGRATION

We've completed 10+GW of utility-scale SCADA design, programming, and commissioning across North America.

- Use-case consulting
- AC/DC coupled & stand-alone
- Plant-level PV & storage integration
- SCADA and System Integration
- Power plant control
- Performance & financial reporting
- Commissioning
- Networking & NERC/CIP security
- Hardware & software supply

PROJECT DELIVERY AND ANCILLARY SERVICES

We align with our clients' requirements and objectives to ensure safe and timely project delivery.

- Project and construction management
- Equipment FAT support
- Testing and commissioning (third-party)
- Asset management
- O&M Analytics
- Construction surveying
- Environmental monitoring
- Owner's Engineering



SOLAR POWER AND BESS INTEGRATION IN OIL COUNTRY | TX

Ulteig's System Integration and SCADA Services Team Integrates Solar Power Plant and Battery Energy Storage System in West Texas.

In West Texas, considered the heart of the U.S. oil industry, one of the largest solar projects in the U.S. was recently commissioned for operation. The solar project consists of a 460 MW (AC) solar power plant featuring 420 MW of solar PV and 40 MW of battery storage located on a 3,600-acre site alongside an existing oil and gas installation. Supplying a growing demand in West Texas for electricity, the project's 1.3 million solar panels will generate enough clean energy to power more than 80,000 homes.

To help the owner of the new solar energy center integrate the solar PV and BESS with the Texas electrical grid known as ERCOT, the solar plant's owner called on Ulteig's System Integration and SCADA Team. Ulteig served as the Engineer of Record (EOR) for the substation, providing AC and DC collection, site PV, and civil engineering services.

One of the major challenges of this project involved the BESS participation in a new Fast Frequency Response (FFR) ancillary service market. This self-dispatched service requires full output from the BESS within 15 cycles (250 milliseconds), which it must maintain between 95%-105% throughout the dispatch period. FFR is emerging as an in-demand technology to address the lack of inertia from inverter-based resources. FFR increases system stability by providing high speed frequency support normally handled by traditional generation. Ulteig's System Integration team was successfully able to design, and commission a site controller that met these requirements.

With the goal of commissioning the project in Spring 2021, the Ulteig team found itself launching the system for the solar PV and the BESS in mid-February just as a major winter storm hit and paralyzed the Lone Star state. Seeing the storm come and its potential impact, it was imperative for the team to commission the project, which it was able to do, even helping discharge stored energy when it was needed most.

"It was an incredible opportunity for us. Coupling battery storage with solar PV was new for our client, and new for Texas," said McKenzie Santin, Associate Director within Ulteig's Automation, Integration and System Protection (AISP) group. "We are seeing a growing interest in adding battery storage to solar projects and we anticipate more of these types of projects in the future."

TECHNOLOGY INNOVATION

The search for innovative ways to solve client challenges better, faster and more efficiently never ends. The pandemic may have constrained certain aspects of the way Ulteig team members work, but it didn't constrain their ability to think outside the box to find novel solutions to the year's myriad of challenges. In fact, it was quite the opposite. The constraints the pandemic imposed fed into team members' passion for problem solving and inspired new ways of thinking. Here are a few examples:

In Texas, at the height of COVID-19 travel restrictions, Ulteig engineers devised an innovative solution that enabled them to successfully perform SCADA integration remotely, from 1,000 miles away. In addition, when Ulteig couldn't send a team to the field, it brought the field to the team. Ulteig developed 360 VMI, a seamless integration of 360-degree video and GIS web mapping. This application reduced the number of in-person site visits and kept the project on track.

Innovation isn't always a new product or technology. Sometimes it's a new process, methodology or approach to solving client challenges. For example, when a devastating derecho hit the Midwest in August, the Ulteig team, with limited time and resources, pivoted quickly and decisively, working days and nights to deliver an outside-the-box solution built around a streamlined design methodology that restored power and put the Cedar Rapids, Iowa, community on the path to recovery. Work that normally would have taken weeks was compressed into days.

Because creating innovative tools and unique applications of technology is an important part of Ulteig's culture, there's no shortage of stories like these. In 2020, Ulteig didn't merely react to change, it put its spirit of innovation to work and initiated the change. Ulteig harnessed the power of technology, the creativity of its team members' imaginations and the boundless possibilities of innovation to help its clients and the communities it serves.



ERIC STERN | DIRECTOR, TECHNOLOGY INNOVATION

“ WE’RE NOT A STATIC COMPANY. WE DON’T JUST CONTINUE TO DO THE SAME THING OVER AND OVER AGAIN. WE ARE PROBLEM SOLVERS. WE’RE ALWAYS LOOKING TO DO BETTER. TECHNOLOGY PLAYS A BIG ROLE IN THAT.”



MADE BY ULTEIG

At Ulteig, innovation is in the company's DNA. At every level, in every department, and in every position in the company there are opportunities to do things differently, faster, more efficiently, and better. "Made by Ulteig" (MBU) is proof of the company's deep commitment to fostering a spirit of innovation within its walls. Developed, curated, and built throughout 2020, the internal MBU platform is a showcase of Ulteig's culture of innovation at work. The platform houses hundreds of custom employee-created innovations, such as tools and calculators, that have been developed over the years to improve processes and client outcomes. And now they're available in one easy-to-navigate database, where they can be scaled, redeployed, commented on and iterated.

WHAT'S NEXT?

Success in 2020 was defined by, and dependent on, technology. The years ahead are sure to be shaped by the company's ability to continue to leverage technology and innovation to the advantage of its team members and clients. Here are a few things Ulteig's Technology Innovation team is actively exploring:

- 1** NEW MIXED & AUGMENTED REALITY TECHNOLOGIES
- 2** CLOUD COMPUTING & AI
- 3** AUTOMATED CONSTRUCTION EQUIPMENT
- 4** 3D MODELING
- 5** ADVANCES IN ENERGY STORAGE
- 6** BIG DATA / ANALYTICS



LAND SERVICES

- Land Surveying
- Geographic Information Systems (GIS)
- Right-of-Way (ROW) Acquisition
- 360 Video Mapping Integration (VMI)

ENVIRONMENTAL

- Desktop and Field Analysis
- NEPA
- Permitting
- Reporting

PLANNING AND STUDIES

- Renewables Design
- NERC/ISO Compliance
- Generation Interconnection
- Substation
- Transmission
- Transmission Planning
- Vendor/Equipment Analysis Optimization
- Grid Modernization

INTEGRATED SOLUTIONS

Clients depend on us to deliver comprehensive engineering and technical services that strengthen infrastructure vital to everyday life. We provide services in six primary areas of expertise. Ulteig Solutions can be leveraged according to your project needs across all of our **LIFELINE SECTORS**.

 *Click each title to navigate straight to that section.*

ASSET MANAGEMENT

- *Technology Evaluation*
- *Data Sharing & Integration*
- *Analysis, Reporting & Planning*
- *Asset Optimization Services*
- *Information Management & Insight Development*
- *Application Development, Hosting & Maintenance*
- *Discovery & Assessment*

PROJECT DELIVERY SERVICES

- *Program Management*
- *Project Management*
- *Construction Management*
- *Alternate Delivery and Owner's Engineer*

DESIGN AND ENGINEERING

Balance of Plant/System

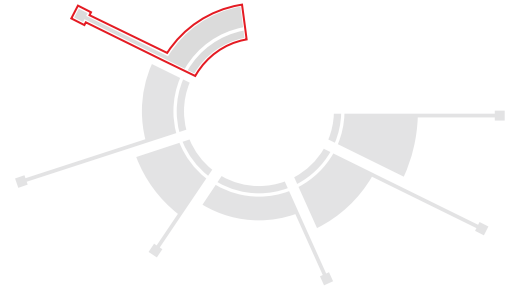
- *Civil, Structural and Geotechnical Engineering*
- *Collection Systems (AC/DC)*

High Voltage

- *Substation Design*
- *Transmission Line Design*

Automation & Integration

- *System Integration & SCADA*
- *CAISO Services*



LAND SERVICES

LAND SURVEYING

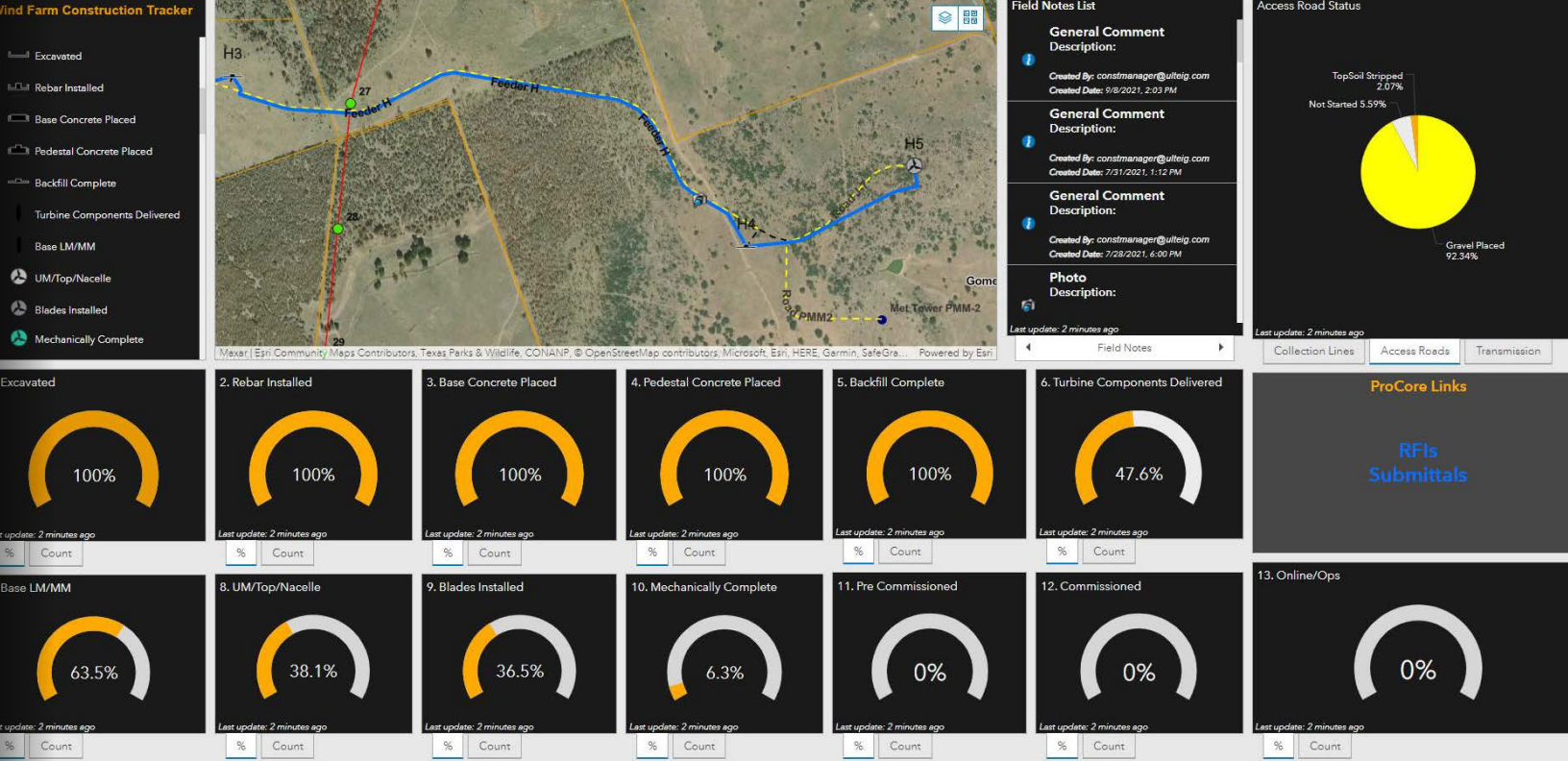
Ulteig has the distinct combination of capacity and experience to deliver a wide range of surveying services to meet your specific project needs. We provide a one-stop shop for our clients, which can fast track a project and reduce coordination efforts and risk. Our in-house surveying capabilities are comprehensive to support your project needs and include boundary surveys, construction staking surveys, topographic surveys and more. To complement our in-house survey solution capabilities, Ulteig may also leverage our network of trusted subcontractors to perform specialty survey scopes of work, such as LiDAR surveying, depending on the project location.

LAND SURVEYING EXPERTISE		
• Cadastral surveys	• Due diligence and constraint analysis support	• Mapping
• Boundary surveys	• Control surveys	• Topographic design surveys
• ALTA/NSPS land title surveys	• Land divisions and subdivision platting	• Construction staking surveys
• Micrositing	• Easement surveys and land descriptions	• Pre & post construction haul route road scan
• Utility locating - Quality level B		

RIGHT-OF-WAY ACQUISITION

As the layout of the project takes shape, right-of-way acquisition is an essential step in the process of developing a concept into a successful project site. Ulteig’s experienced real estate professionals deliver site acquisition and right-of-way services for a wide range of projects. Ulteig’s experts negotiate land purchases, leases, options and easements to best meet the client’s project objectives and criteria. The team also handles document preparation, permitting, land title searches and public presentations.

RIGHT-OF-WAY EXPERTISE		
• Title research	• Roadway, large-scale electric transmission	• Real-time easement tracking dashboards
• Land acquisition	• Temporary construction and permanent easements	• Crossing permits
• Lease/option acquisition		• Crop damage assessments



Ulteig's GIS Team supports renewable projects with solutions such as site selection constraint analysis and real-time, online applications that optimize planning, design, ROW, permitting, geotech, and construction. Leveraging GIS technology, Ulteig's customizable, real-time construction progress tracker enhances the collaboration process, connecting development, engineering and construction data with one, easy-to-view dashboard that can be accessed from anywhere.

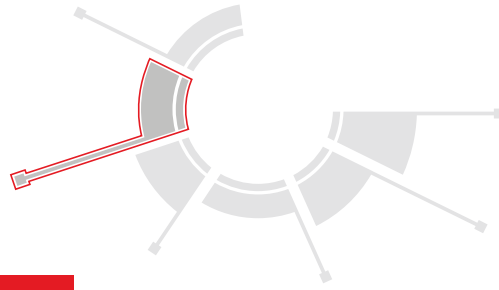
GEOGRAPHIC INFORMATION SYSTEMS

Geographic Information Systems (GIS) technology is one of many innovative surveying services that Ulteig tailors to meet the unique needs of our clients. Our GIS team uses the most up-to-date GIS software to provide customized geospatial solutions built around your business requirements. Ulteig's wide-ranging solutions include data collection and custom mapping, GIS server solutions and technical support for utilities, commercial organizations and various levels of government.

We're using 360-degree cameras to collect videos of project areas by attaching the camera to a vehicle or walking down a corridor. This video is then integrated into our web mapping system to allow the user to click on a map and start the video at the time stamp of that exact point. This application reduces the number of return trips to the field and gives us yet another innovative tool to communicate more difficult design situations with our internal staff and clients. Because innovation has no finish line.

GEOGRAPHIC INFORMATION SYSTEMS EXPERTISE

- Site diligence
- Field inspection forms (daily logs, SWPPP, etc.)
- Data download hubs
- Construction tracking dashboards
- Project web maps
- Mobile mapping solutions
- Field data collection
- Integration with clients' GIS Department data
- Construction support
- Database design



ENVIRONMENTAL

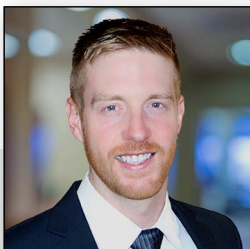
At Ulteig, we built an environmental team that understands the big picture of what your project intends to accomplish. Our team is composed of engineers and environmental scientists who see your projects through both lenses. We possess the technical and project management expertise necessary to keep your projects moving forward. We work together to find solutions that meet your needs while minimizing impacts to the environment and remaining in compliance with federal, state and local regulations. We are experts at what we do and are honored to play a key role in your project's success.

Our team handles and prepares all the environmental documentation, permitting and fieldwork, ensuring federal, state and local agency stakeholders are satisfied and that your project proceeds from concept to reality as quickly, efficiently and responsibly as possible.

No matter the size of the project, Ulteig's environmental services team:

- Builds trusted relationships with agencies and clients
- Collaborates with design teams and other partners
- Leans on expertise as both engineers and environmental professionals
- Handles and prepares environmental documentation, permitting and fieldwork to meet regulations
- Finds expedient solutions to unanticipated problems

EXPERT SPOTLIGHT



MIKE HUFFINGTON | MARKET LEADER

Mike is an environmental professional with experience managing projects throughout the United States. He has overseen the environmental approval process for more than \$1 billion worth of infrastructure development projects including roadways, pipelines, renewable energy, oil and gas development, power transmission and municipal water. Mike specializes in NEPA and state level regulatory compliance, permitting, wetlands, threatened and endangered species, and public and agency coordination.

EXPERTISE

DESKTOP AND FIELD ANALYSIS

- Wetlands – Delineations, Mitigation, Banking, Monitoring
- Environmental Monitoring – Construction, Wetlands, Vegetation, Wildlife
- Restoration – Vegetation, Soils, Wetlands
- Federally Listed Threatened and Endangered Species - Presence/Absence Surveys, Habitat Surveys, USFWS Consultation (Sections 7 and 10), Habitat Conservation Plans
- State Listed Species- Presence/Absence Surveys, Habitat Surveys, Agency Coordination
- Environmental Site Assessment – Desktop, Phase I, Phase II
- Avian and Bat Protection Plans & Avian Risk Assessments
- Asbestos-Containing Materials (ACM) and Lead-Containing Paint (LCP) Sampling
- Health and Safety Plans (Pre-Construction, Soil, Groundwater)

- Environmental Management Plans (Invasive/ Endangered Species, Wetlands, Habitat)
- Environmental Remote Sensing
- Noise Analysis Abatement and Reporting
- Floodplain Analysis
- Environmental Siting and Route Studies
- Viewshed Analysis

NEPA

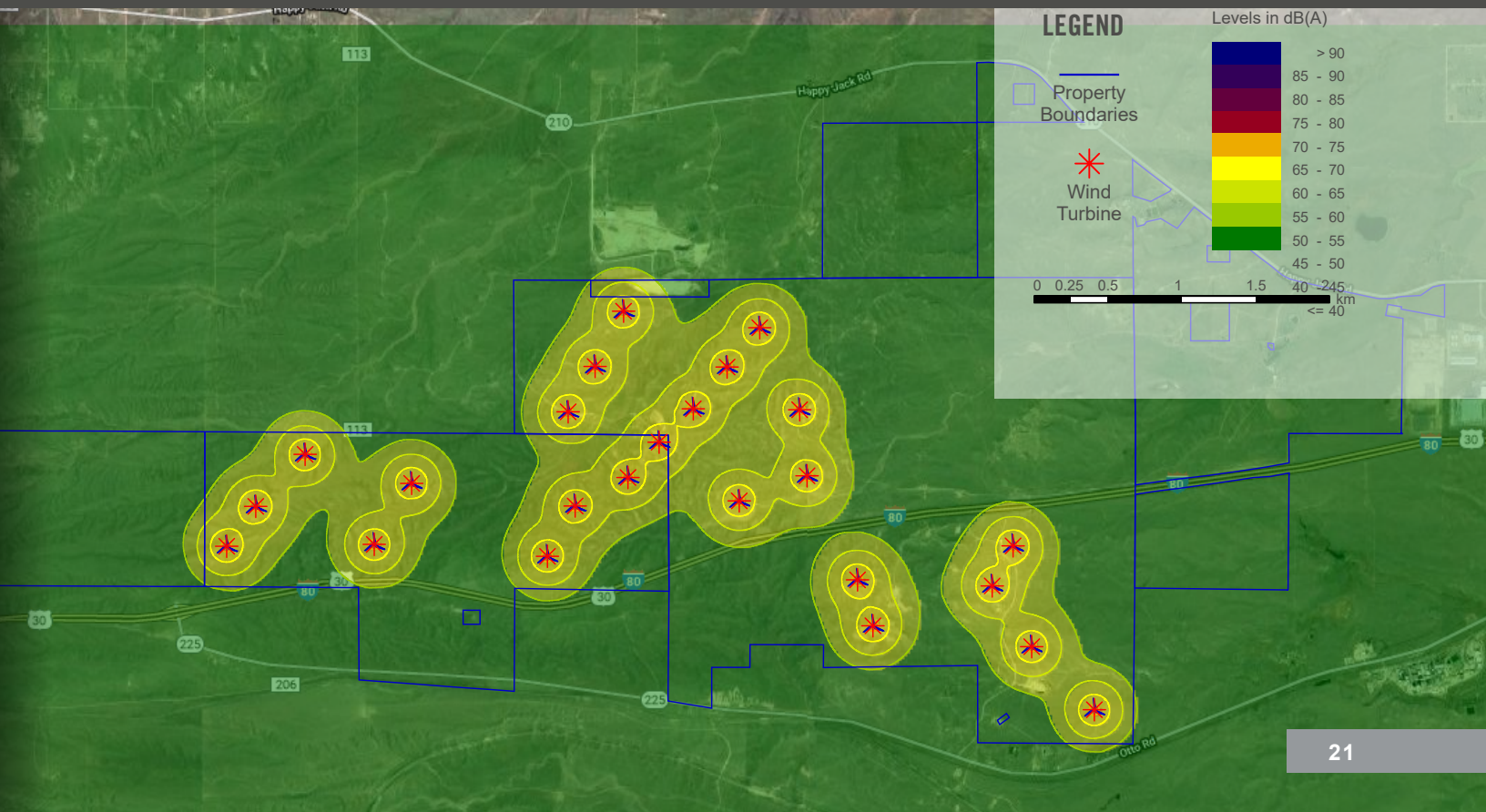
- Environmental Impact Statement
- Environmental Assessment
- Categorical Exclusion
- Public and Stakeholder Involvement

PERMITTING

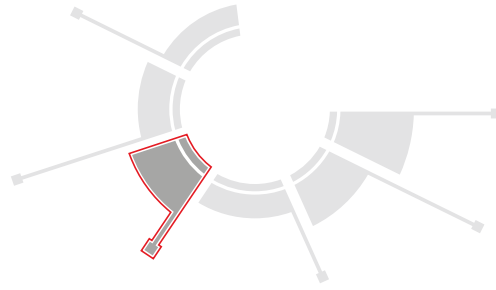
- Wetland Permitting - Federal, State & Local Permits, Routing/Siting Permits
- Spill Prevention Control & Countermeasure (SPCC)
- Stormwater Pollution Prevention Plan (SWPPP)

WIND PROJECT NOISE MODEL

Noise Map Day | Wind Speed: 8 m/s



PLANNING AND STUDIES



Our goal is to ensure that consensus is reached and innovative, expert solutions are carried out, creating efficiencies and facilitating communication along the way.

POWER SYSTEM STUDIES

Ulteig’s depth of experience and knowledge in the renewables market makes us well positioned to conduct a wide range of studies in renewable design, transmission planning and design, substation, generation interconnection, NERC/ISO compliance, and vendor/equipment analysis and optimization. Our team of highly-qualified studies engineers provide insightful data and analysis to help guide our clients in decision-making, and advise of potential pitfalls and future project considerations for added long-term value. We manage all aspects of the studies in-house, resulting in better efficiency and communication, and giving you direct and reliable access to our team. We maintain several industry-leading software licenses to ensure we meet every client’s system requirements.

EXPERTISE

RENEWABLE DESIGN

- Capacitor bank switching studies
- Fuse/breaker coordination studies
- Transient Recovery Voltage (TRV) studies
- Insulation coordination studies
- Fault current studies
- Conductor rating and selection
- Corona/audible noise/EMF
- Energy loss evaluation
- Post-construction harmonic metering and analysis

GENERATION INTERCONNECTION

- Transient and dynamic stability studies
- Power flow and contingency analysis
- Interconnection studies, prospecting and strategy
- Mitigation solutions
- Injection studies
- Renewable project economic sizing
- Utility/ISO interconnection study review
- Utility-scale wind, solar and storage project interconnection support

VENDOR/EQUIPMENT ANALYSIS AND OPTIMIZATION

- Economic conductor analysis
- Reactive compensation equipment comparison

SUBSTATION

- Fault current
- Arc flash
- Current-limiting reactor sizing
- Transformer energization
- Grounded system

TRANSMISSION

- Parallel circuit analysis
- AC interference
- FEA analysis
- 5mA
- OPGW selection and thermal analysis

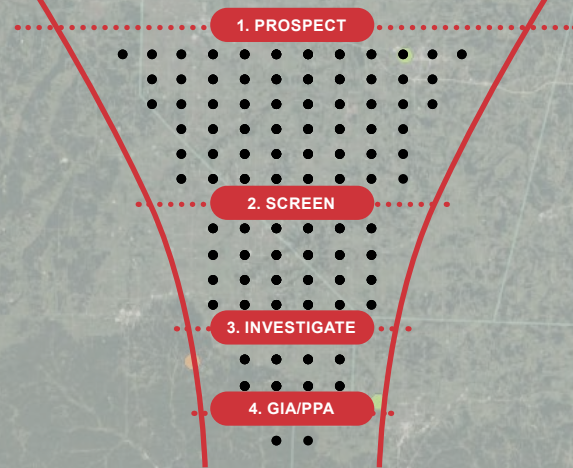
TRANSMISSION PLANNING

- Transient and dynamic stability studies
- Power flow and contingency analysis
- Interconnection studies
- Transmission line path studies
- Mitigation solutions
- Sub-synchronous resonance

NERC/ISO COMPLIANCE

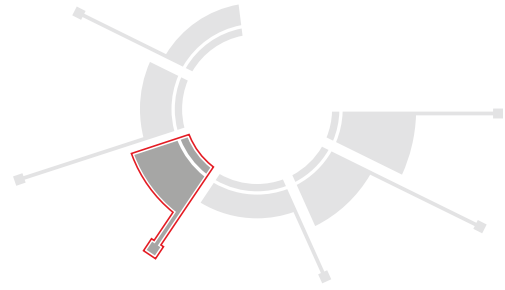
- Transient and dynamic stability studies
- Power flow and contingency analysis
- NERC compliance support and analysis

FOUR PHASES.
ONE SEAMLESS PROCESS.



PROSPECTING SWEEP SERVICES

Ulteig helps renewable energy developers unlock possibilities and manage risk for their next wind, solar, or BESS energy project. By providing technical and commercial solutions, Ulteig helps clients increase certainty that developers desire in understanding the viability of a specific development location. Leveraging more than 20 years in renewable energy projects, Ulteig's Prospecting Sweep pinpoints the most ideal locations for developers to interconnect their projects to the power grid, with the intent of lowering interconnection costs for renewable energy projects. As the momentum behind renewable energy continues to accelerate, the race is on for remaining viable locations throughout North America. The Ulteig team helps developers identify the best Points of Interconnection in every state and province in North America, and evaluate existing development assets to determine their commercial viability with respect to interconnection.



PLANNING AND STUDIES

GRID MODERNIZATION

As energy generation and usage demands evolve, it's imperative that utilities modernize their grids to meet present and future realities including the increased penetration of Distributed Energy Resources (DERs). Our team of grid modernization experts will work with you to develop unique solutions to achieve your strategic goals. We will partner with you to create and implement a well-designed grid modernization plan with long-lasting benefits. We maintain several industry-leading software licenses to ensure we meet every client's system requirements.

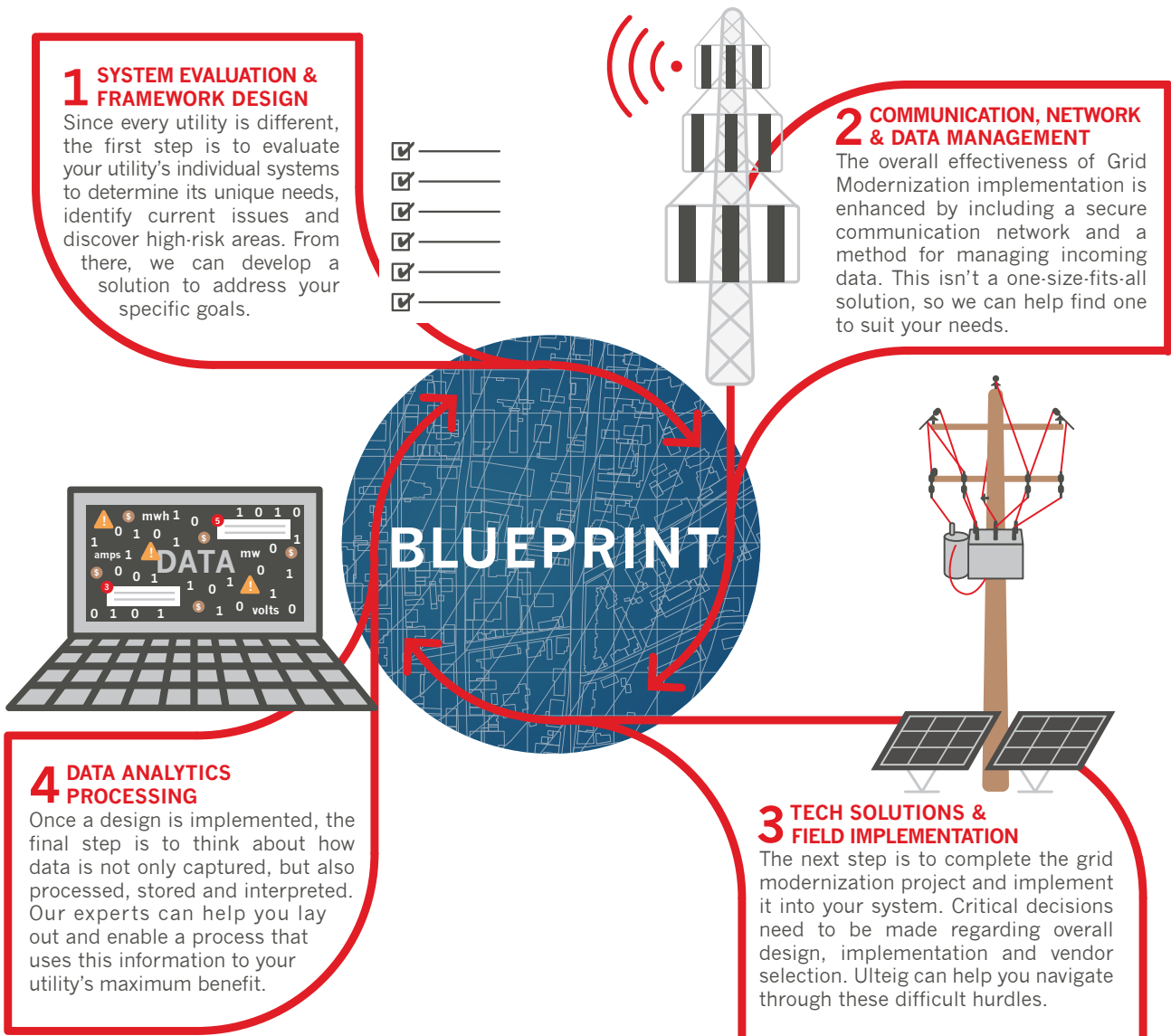
EXPERTISE

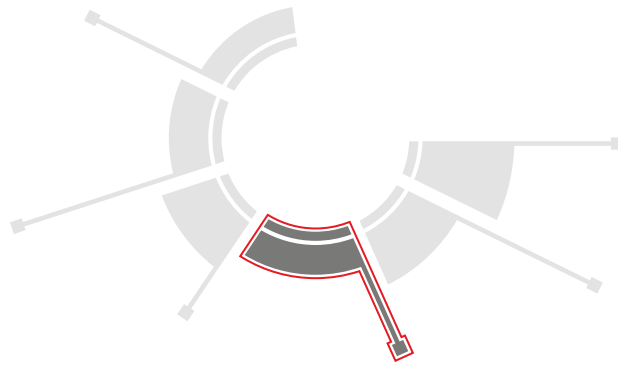
- GIS Mapping of the Electric System
- Distribution Planning and Studies
- Fault Current, Power Flow, Voltage Drop, Coordination, Load Balancing
- Electric System Model Development
- Power Quality
- Peak Demand Management
- Volt/VAR Optimization
- System Reliability
- Grid Resiliency
- Automated Fault Location, Isolation & Service Restoration
- Conservation Voltage Reduction
- Distributed Energy Resources (DERs) Impact Analysis
- Grid Modernization and Technology Road Map Development
- Policy Changes
- EV Impact Analysis

WHY GRID MODERNIZATION? As the electric grid continues to age, it is imperative to develop a holistic approach to a grid modernization strategy. This helps develop proactive solutions that maximize efficiencies and provide resilient and reliable power while adapting to ever-changing technologies affecting our nation's network. Grid modernization provides electric utilities of any size with an opportunity to address challenges associated with the evolving grid.

GRID MODERNIZATION CYCLE – We partner with electric utilities to develop future-ready modernization strategies designed to anticipate and meet the energy supply and demand challenges of the years ahead. We use a set of unique criteria, along with an electric system model, to customize a solution to meet your needs. Solutions typically include one or more of the following principles: **RELIABILITY, RESILIENCY, HARDENING, VISIBILITY, ADAPTABILITY AND SYSTEM INTEGRATION.**

Not sure where to start? Generally, we recommend the following four stages to build the blueprint for your long-term grid modernization strategy. Enter the process at whatever step makes the most sense for your utility.



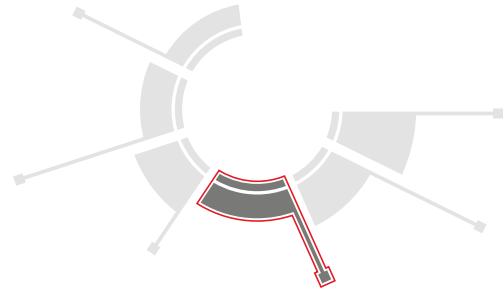


DESIGN AND ENGINEERING

We put our vast knowledge and experience to work for you, assisting from conceptual design through detailed design and construction support. Ulteig's designs are context-sensitive and cost-effective. They strive to balance the competing needs and desires of the clients and end users. We offer detailed design work, development and review of design calculations, selection and design implementation. Our goal is to provide solid commitment through unmatched client services and create a positive experience for our clients.







DESIGN AND ENGINEERING

RENEWABLES BALANCE OF PLANT/SYSTEM (BOP/S)

CIVIL, STRUCTURAL AND GEOTECHNICAL ENGINEERING

Ulteig’s civil, structural, and geotechnical integrated design teams work closely with our clients and suppliers to stay ahead of industry trends that impact design decisions made throughout the life cycle of renewable energy projects. Our team has extensive experience working on wind, solar, and battery energy storage projects from Hawaii to Pennsylvania, and are familiar with numerous federal and local agency requirements required to successfully permit and design your renewable energy project.

We are confident in the innovative design services we provide and are proud of the quality we deliver. We offer a broad range of design services, including preliminary site evaluation and design, existing site topography evaluation, site grading plans, foundation design, earthwork mass haul and site balancing, SPCC, SWPPP, all while collaborating with our medium and high-voltage renewable design teams. We know that consolidating these designs under one roof will deliver instant value-add benefits to our clients and we are excited to begin working with your team.

EXPERTISE

- *Site evaluation and conceptual layouts*
- *Fatal flaw and due diligence review*
- *Public road condition assessment*
- *Transportation delivery flow analysis*
- *Roadway alignment and section design*
- *Site grading*
- *Earthwork analysis*
- *Erosion and sediment control design*
- *Stormwater management design*
- *Hydrology and hydraulics*
- *Floodplain and scour analysis*
- *Stormwater Pollution Prevention Plans (SWPPP)*
- *Spill Prevention Control and Countermeasure Plans (SPCC)*
- *PV tracker/inverter pile design and optimization*
- *WTG foundation design*
- *Crane pad and crane crossing design*
- *Bill of Materials*
- *Value engineering*
- *Project permitting*
- *Geotechnical due diligence and desktop studies*
- *Owner’s Engineering Review*

EXPERT SPOTLIGHT



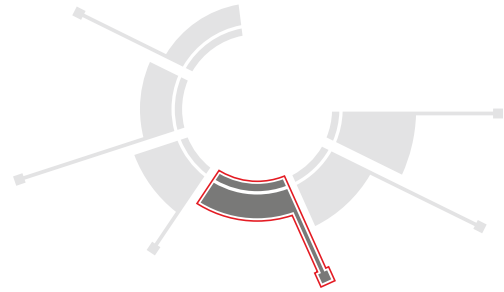
CHRIS SMAALADEN, PE | ASSOCIATE DIRECTOR, ENERGY SOLUTIONS

Chris is a Technical Manager for the Civil Renewable design team with 10 years of experience in site development, water resources, and transportation engineering. As a technical leader, he is responsible for providing guidance and oversight to direct reports and fellow engineers on wind and solar design projects across the United States and has worked in ND, IA, NE, KS, TX, OK, and NM. Chris has performed and oversaw numerous wind and solar site design projects, providing a full range of civil engineering including site layouts, grading, stormwater management, SWPPP & SPCC, and construction & permitting support.



FOX SQUIRREL SOLAR PROJECT | MADISON COUNTY, OH

About 30 miles west of Columbus, Ohio, Ulteig’s Renewable Energy team, contracted with Geenex Solar to provide design planning for the Fox Squirrel Solar Project in Madison County, Ohio. Ulteig’s design expertise was utilized to obtain regulatory approval for the project from the Ohio Power Siting Board. The proposed solar power plant is a ground-mount solar photovoltaic facility that will deliver 577 MW of clean renewable energy to the utility grid by the end of 2024 with a capacity to provide electricity to 129,900 households annually. The Ulteig Solar PV and Civil Engineering teams collaborated with the client to conduct research and design entirely through virtual means during the COVID-19 pandemic. The team encountered several challenges, which included providing the developer a recommendation for the maximum amount of MWdc power that could be generated on the available land; funneling feeder lines through a small narrow piece of land to a substation; and dealing with residential setbacks and unbuildable wetlands. Planning also included developing a vegetation screening plan to reduce the visual impact of the project on nearby residents.



DESIGN AND ENGINEERING

RENEWABLES BALANCE OF PLANT/SYSTEM (BOP/S)

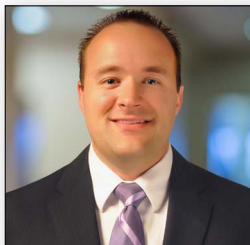
COLLECTION SYSTEM (AC/DC)

Ulteig designs collection systems and innovates emerging renewable and sustainable energy solutions. Our team focuses on creating sound design by taking into account the project site conditions, project size and owner/interconnecting utility requirements. Our experienced professionals deliver the full range of land services for your renewable energy project. Because renewable energy projects typically involve many different groups – from the developer to landowners to contractors to vendors – communication is key. Interaction between the groups creates collaboration and understanding. However complex your challenges, we provide you with the information you need to help you make informed, cost-effective decisions.

EXPERTISE

- *Optimized layout & cable design*
- *Collection Design Studies*
- *System Design Studies*
- *Equipment installation design*
- *Material specifications*
- *Permit support*
- *Construction support*
- *Energy production study*
- *Dynamic modeling*
- *Transient analysis*
- *Harmonic study*
- *Arc flash studies*
- *NERC compliance*

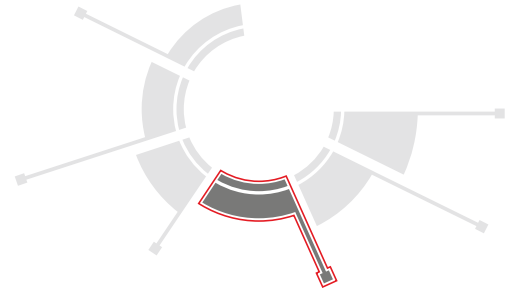
EXPERT SPOTLIGHT



JAKE HERMANSON | ASSOCIATE DIRECTOR, ENERGY SOLUTIONS

Jake has over 19 years of experience. Over the past 16 years Jake has been a part of the designing of over 35+ GW of underground collection for renewable projects across the United States. Jake's responsibilities include project management, design, specifications and QA/QC.





DESIGN AND ENGINEERING

HIGH-VOLTAGE

SUBSTATION DESIGN

Ulteig’s substation team has engineered and designed more than 1,000 high-voltage substations, switching stations and interconnect stations—from 12.5 kV to 500 kV—for developers, contractors, IPPs, investor-owned utilities, cooperatives and municipalities.

Our project experience includes system studies, EHV and HV air-insulated and gas-insulated switchyards, static and dynamic VAR compensation, renewables interconnections, 3-D modeling, NERC and FERC requirements, relay settings, site development, testing and commissioning, client-specific standards and a full EPC/design build service. Our top priorities are safety, quality, constructability, efficiency, budget and schedule.

EXPERT SPOTLIGHT



MATT BATES, PE | ASSOCIATE DIRECTOR - SUBSTATION

Matt is an Associate Director in Ulteig’s Substation department. In addition to managing high performing teams of diverse engineers, technicians and specialty staff, he serves in advancing Ulteig’s business with strategic initiatives and positioning the business well for future growth and client pursuits. With an electrical engineering degree, Matt has supported detailed designs and project leadership in various departments both in the Power and

Renewables Lifeline Sectors (up to 345kV). Matt is responsible for technical portfolio execution of several multi-year renewable projects. Additionally, Matt supports client development for Power and Renewable clients. Matt provides leadership surrounding topics of safety, quality, all aspects of execution, client and geographic expansion, partnership, mentorship, and strategic initiatives.

EXPERTISE

DEVELOPMENT

- Site selection
- Preliminary design
- Project scoping
- Design basis/guide
- Siting and permitting support, including photo renderings - CRP
- Construction cost estimate
- Preliminary general arrangement
- Stormwater pollution prevention plans (SWPPP)
- Spill prevention, control and countermeasure (SPCC) plans

HV SUBSTATION EOR DESIGN

- Equipment specification
- Material bid support
- 3D design
- Illumination study
- Grounding design
- Protection and control design
- Physical design
- Station battery system sizing
- Fault coordination studies
- Structural steel design
- Protective relay settings and coordination study
- Lightning protection

- Grading design
- Control equipment enclosure design and specification
- RTU programming
- Network design and integration
- Arc flash mitigation
- Supervisory Control and Data Acquisition (SCADA) design and integration
- Auxiliary power system design

O&M SERVICES

- Event analysis and evaluation
- NERC-PRC-005 program development

PROJECT PROFILE



NEWPORT SUBSTATION INTERCONNECT | WAPELLO, IA

Among the cornfields in southeastern Iowa, near the small town of Wapello, where the Iowa and Mississippi Rivers converge, lies the Newport Substation.

In 2019, the Central Iowa Power Cooperative (CIPCO) embarked on a project to reconfigure its Newport Substation and add a line in response to a request for a solar interconnection. The substation, located slightly to the south of Wapello, Iowa, serves as an access point for generation onto CIPCO’s eastern Iowa power grid.

“Based on our experience with substations and interconnects,” said Patrick Deibel, P.E., a technical manager with Ulteig’s substation team, “Ulteig was awarded the design to reconfigure the Newport Substation and connect it with a new solar project being built on 800 acres adjacent to the substation.”

Working on the Newport Substation was familiar ground for Ulteig’s engineers. Just two years earlier, Ulteig assisted CIPCO in the redesign of a 161 kV ring bus to expand the Newport Substation to provide more reliability to the overall system. During the start of design and construction in 2017 and 2018, a future line position was not needed, but the new design was added to provide for future positions to be integrated into the expansion.

CHANGE TO MEET FUTURE DEMANDS

In 2019, CIPCO agreed to purchase 100 percent of the energy and capacity output for 25 years from the 127.5 MW Wapello Solar LLC facility. Wapello is the largest solar project located in Iowa. As the engineer of record, Ulteig provided:

- *Electrical physical layout and design for the major equipment, including physical section views, conduit layout, grounding design and lightning protection.*
- *Electrical design, which included schematics, wiring diagrams and control panel layouts for the protective relaying & SCADA equipment.*
- *The structural engineering, which included steel fabrication and foundation designs.*
- *Project management services for the design engineering portion of the project.*

TERRY FETT, PE | DIRECTOR OF ENGINEERING AND OPERATIONS, CIPCO

“ WE’VE PARTNERED WITH ULTEIG FOR MANY YEARS. THEIR KNOWLEDGE OF OUR STANDARDS AND THEIR SUPPORT THROUGH THE ENTIRE PROJECT HELPED US MAINTAIN OUR SCHEDULE, WHICH IS ALWAYS CRITICAL DURING OUTAGE SCHEDULING AND WHEN CONNECTING TO GENERATION FACILITIES. ”



OVERCOMING CHALLENGES

Working on an existing site can be a challenge, as drawings may not always be accurate. During construction, the contractor discovered that the new substation dead-end and associated metering equipment could not be located where designed. Ulteig engineers collaborated with CIPCO engineers and the contractor to overcome this challenging new development and came up with a creative solution, which included relocating the equipment and maintaining proper electrical clearances.

Scheduling became a concern when the Generator Interconnect Agreement (GIA) and funding were not in place until Dec. 2019. The in-service date of Nov. 1, 2020, made for a roughly 10-month project schedule to execute engineering, material delivery, construction and commissioning. To meet the Nov. 1 deadline, Ulteig reduced the engineering design process from the typical eight or nine months to just six and a half.

SUCCESS: DRIVING DOWN COSTS

When the site was set up to add an additional line, the only major change required was to relocate an existing line to an open position in the substation, thus terminating the Wapello Solar line in the least expensive and most constructible position. Cost savings were implemented in the line location swap by reusing equipment and relocating it as necessary.

“By relying on an experienced team,” said Deibel, “as well as the team’s knowledge of the project based on its previous work at the substation in 2017, we executed a quality design in the required timeframe for the solar farm to connect to the grid.”

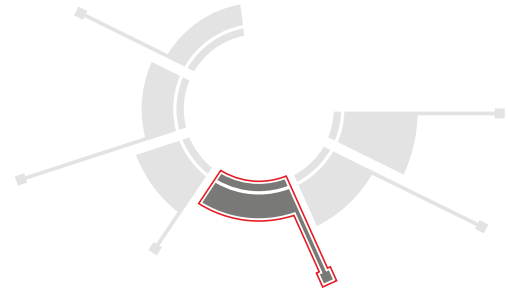


AWARD-WINNING PROJECT

The American Council of Engineering Companies (ACEC) of Iowa presented Ulteig with a **Grand Prize Award for the Newport Substation Interconnect**. This work was recognized as the top project in the energy production category of the 2021 ACEC Engineering Excellence Awards competition.

DESIGN AND ENGINEERING

HIGH-VOLTAGE



TRANSMISSION LINE DESIGN

At Ulteig, no transmission line project is too big for our team of engineers who are 100% dedicated to transmission line design and engineering. Based on over 75 years of experience in serving the power industry, Ulteig has surveyed and engineered more than 18,000 miles of AC and DC transmission lines for investor owned utilities (IOUs), municipals and cooperatives, developers and contractors across the United States. We've completed projects ranging in size from 12.5 kV distribution to 500 kV EHV transmission. With 13 regional offices, we have local, on-the-ground understanding of the particular challenges facing power customers in different parts of the country.

From concept to energization and operations, Ulteig's Transmission Team prides itself on solving complex problems, helping customers anticipate future needs, and seamlessly collaborating with a customer's internal teams. From routing, economic analysis, design performance specifications and permitting to surveying, ROW support, detailed design and construction management, our team is prepared to handle every aspect of your project. At every point along the process, Ulteig transmission engineers drive innovative solutions that deliver higher quality results and more value.

EXPERTISE

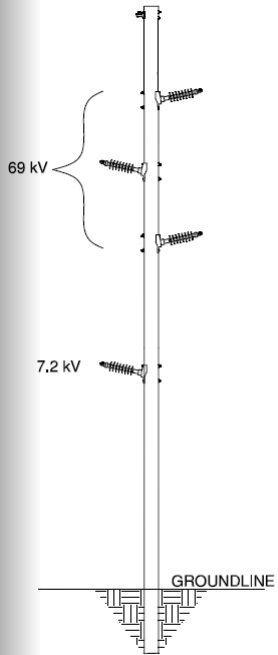
- Permitting assistance, including photo renderings
- Scoping
- Transmission routing
- Estimates
- Transmission line design
- Design criteria preparation
- Facility studies
- Shielding studies
- Electromagnetic field (EMF) studies
- Underground design
- Audible Noise (AN) studies
- Steel design
- Lattice tower analysis
- Foundation design
- Optical Ground Wire (OPGW) replacements
- Line uprating studies
- Structure analysis
- Stormwater pollution prevention plans (SWPPP)
- Material specifications
- Material procurement support
- Construction specification, management, observation and support
- Transmission line reconductors
- Expert Testimony

EXPERT SPOTLIGHT



GREG PARENT, PE, SE | PRINCIPAL ENGINEER - TRANSMISSION & DISTRIBUTION

Greg is a Senior Engineer in the Transmission and Substation department. He has 14 years of structural design experience with numerous structures including buildings and bridges, and more than eight years of design experience in power infrastructure. He has published several white papers on structural design, has led seminars on transmission line design and is an active member of DFI Transmission Line Foundation Committee and ASCE Transmission Line and Substation Foundation Committee.



Typical Structure
Average Height 70' to 75'
Above Grade



CUSTER PPD TRANSMISSION | CENTRAL NEBRASKA

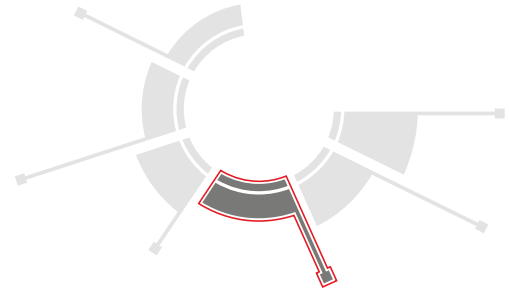
Theedford, Nebraska -- From mid-February to mid-April, one of the greatest events in our natural world occurs throughout the Sandhills region of central Nebraska – the migration of more than 500,000 sandhill cranes from their winter-feeding grounds in Texas to their summer breeding grounds in northern Canada and Alaska.

It's out of respect for these beautiful birds and what they mean to Nebraskans that Custer Public Power District (Custer PPD), the largest geographical rural public power district in Nebraska, challenged Ulteig transmission engineers to develop an avian-safe design for the replacement of 38 miles of aging transmission line between Seneca and Dunning, Nebraska. The line, which runs parallel along Highway 2, is situated in Nebraska's famous Sandhills region, a semi-arid area encompassing 19,300 square miles that features rolling, grass-covered sand dunes.

“This project includes converting the operating voltage of the line from 34.5 kV to 69 kV, said Kelly Bjerke, Technical Manager with Ulteig’s transmission team. “In addition, with the new, higher voltage line, we needed to not only replace the original wooden poles, most of which were installed in the mid-1950s, but also increase their height. We specified new steel poles up to 120 feet in length; however, most of the poles will be in the 75- to 85-foot range.”

Replacing this transmission line is part of Custer PPD’s long-term plan to modernize its electrical grid system. The project will give Custer PPD more reliable and efficient electricity transmission and a new transmission line that will be good for at least 50 years.

Construction on the project was launched in late November 2020 and should be complete by April 2022.



DESIGN AND ENGINEERING

AUTOMATION & INTEGRATION

SYSTEM INTEGRATION

As an owner or operator within the renewable or power utility markets, it is important to have a reliable plant controller, SCADA system and communication network in place. The system should be versatile, providing customized data, monitoring and control measures that can dynamically adapt to anomalies and outages, and even predict failures.

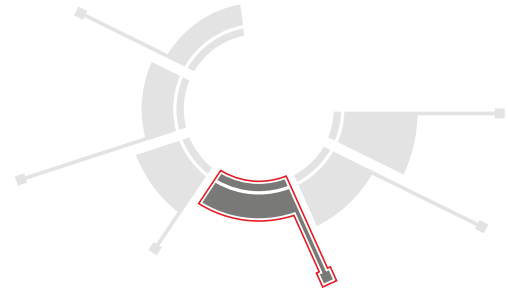
Ulteig defines System Integration as the ability to incorporate data and control sub-system equipment from multiple vendors and bring them together into a single unified system that meets the owner's operational and regulatory needs.

Ulteig's team of System Integration professionals offers an extensive set of Supervisory Control and Data Acquisition (SCADA) and networking design services. These services can be part of an upfront collaborative effort on a greenfield site or added to an existing site. Our experts will work with you to deliver a customized solution that meets your specific needs.

OUR ENGINEERS TEST COMMUNICATIONS,
I/O AND PROGRAMS/CONFIGURATIONS IN OUR
ADVANCED ENERGY LAB (AELAB),
A CONTROLLED ENVIRONMENT DESIGNED TO MIMIC MULTIPLE
SUBSTATION CONFIGURATIONS.

EXPERTISE

- *SCADA Design & Integration*
 - *RTU programming*
 - *Custom HMI display development*
 - *Owner's Engineer commissioning*
 - *Systems audit*
 - *Proactive/preventative maintenance*
 - *Plant optimization*
 - *NERC CIP compliance*
- *Network design & integration*
- *Historical data collection & custom reporting*
- *System event alerts*
- *Alarm scheme design & integration*
- *Data management & integration*
- *Custom coding*
- *Trending display configurations*
- *Synchrophasors*
- *Plant control for PV & BESS*



DESIGN AND ENGINEERING

AUTOMATION & INTEGRATION

CAISO RIG AND METER ENGINEERING

Ulteig is a RIG Third Party Engineering Firm and an Approved Meter Inspection Company that offers in-house CAISO Authorized Inspectors. We can design, execute and support any new and existing RIG and metering installation. Whether you're performing a QF conversion or looking to participate in the market as a Hybrid Resource, Ulteig has the skillset and qualifications to make it happen.

CAISO NRI PROCESS MANAGEMENT

Ulteig is experienced in the CAISO New Resource Implementation (NRI) bucket process and requirements; our consulting services will make the process as seamless and transparent as possible. We will leverage our experience to stay ahead of issues and pitfalls, monitor the progress of your project's schedule versus the deliverables and provide on-site and remote support as your project approaches its Commercial Operation Date (COD). From your first Project Details Form to Commercial Operation we can lead the process, manage document and information retrieval and submit documents to the ISO on your behalf.

CAISO ANCILLARY SERVICES

Ulteig can assist with, or fulfill additional requirements necessary at some CAISO facilities.

EXPERTISE

- Revenue Meter design & integration
- Complex metering schemes
- Remote Intelligence Gateway (RIG) design & integration
- RIG Certification renewals
- New Resource Implementation (NRI) process management
- Energy Imbalance Market (EIM) process management
- Energy Communication Network (ECN) facilitation
- Qualifying Facility (QF) conversions
- Equipment specifications
- Site surveys
- Remote and in-field support
- Design compliance review
- Milestone and deliverable tracking
- Meteorological (MET) Station implementation
- Third-party monitoring system integration
- Annual meter re-certifications
- Load profile data retrieval
- Troubleshooting and repair



PROJECT PROFILE



WESTERN SPIRIT WIND PROJECT | CORONA, NM

Over the course of the next few years, this rural region of New Mexico will become famous for being the center of the largest wind energy project in the United States.

In 2017, Ulteig was hired by wind energy developer and Independent Power Producer Pattern Energy to design a system to collect energy from the 377-turbine Western Spirit Wind Projects through four collection substations. Electricity would then be transmitted through 67 miles of 345 kV AC transmission lines (the GenTie Transmission) to the Western Spirit Transmission line, a massive new 155-mile transmission line running through New Mexico. Ulteig also designed a power metering system that meets the California ISO (CAISO) metering requirements, which allows power produced from the Western Spirit wind farm to be sold on the California grid.

1,050 MW of power will be transmitted from the Western Spirit Wind Project, which consists of four wind farms across approximately 292,000 acres of land, held by 40 landowners across three counties.

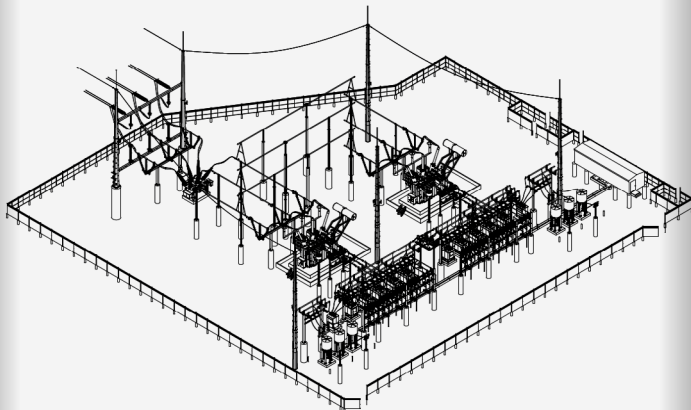
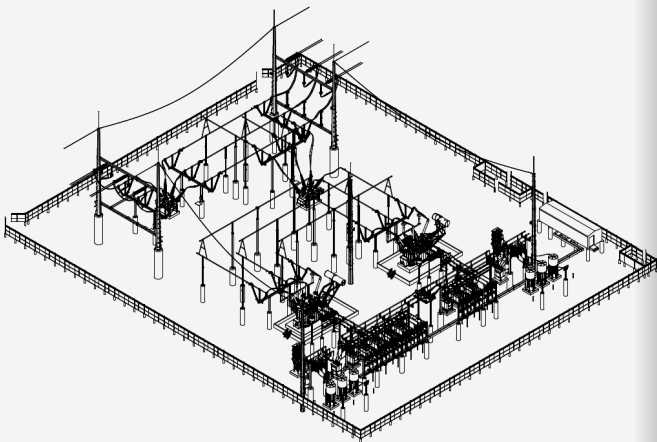
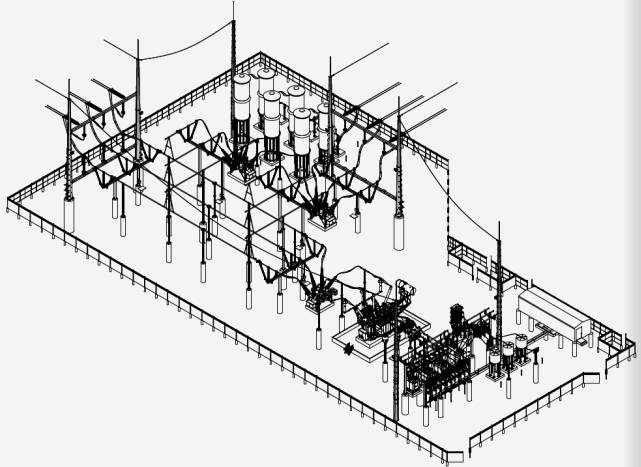
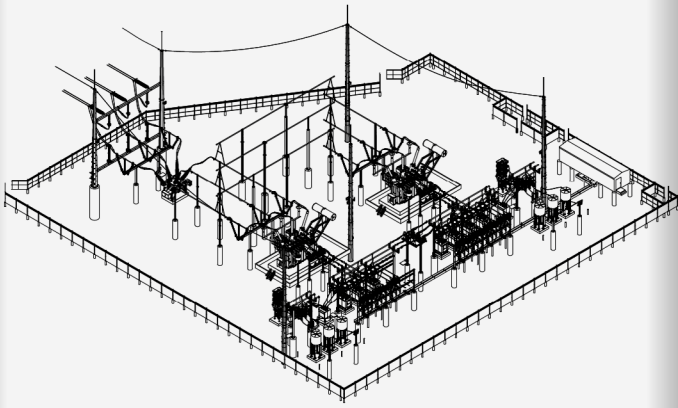
An incredibly complex project, the Western Spirit Wind Project involved numerous design services across multiple Lifeline Sectors. Ulteig engineers sought to drive down costs and stay on budget within the construction schedule, all while navigating the remote terrain of central New Mexico.

“There are very few consultants that can provide everything that was needed for this project – especially the combination of a collection system, substation, gen-tie transmission and CAISO metering – all in one place,” said Greg Parent, P.E., S.E., Principal engineer with Ulteig’s Transmission and Distribution team. “The fact that a client can come to us and get all these engineering disciplines from the same consultant is what sets Ulteig apart.”

Tapping into wind-rich central New Mexico, the Western Spirit GenTie transmission lines will connect four collection substations at Tecolote, Clines Corners, Duran Mesa and Red Cloud, New Mexico. These substations support the four wind farms that make up the 377-turbine Western Spirit Wind Project.

With a project so large and complex, the Ulteig Transmission and Distribution, Substation, Renewables and CAISO teams faced a number of challenges while designing and engineering this project.





COLLECTION SYSTEM – With 377 Western Spirit wind turbines spread out over a three-county area, the Ulteig Transmission and Distribution team sought to find the most advantageous routes to lay underground collection cables. The team was able to limit trenching to 285 miles.

CAISO METERING – Based on power purchase agreements, which would involve distributing some power from the project outside of New Mexico to California, Ulteig involved its CAISO metering team, which determined that the project would require 46 meters (double the number of a typical project) based on the complexity and scale of the project.

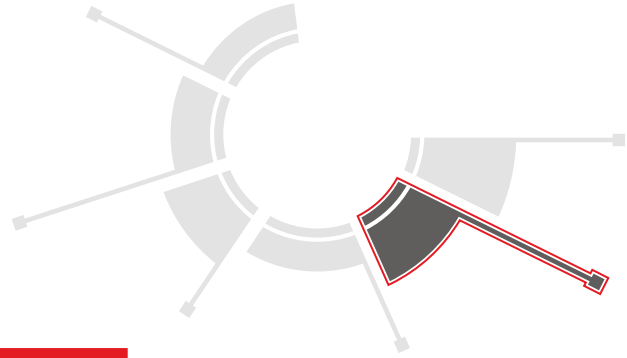
TRANSMISSION LINES – With the 67-mile gen-tie transmission line system structure, the Ulteig Transmission and Distribution team faced two big challenges: designing without an identified route and contending with varying soil substrata.

“Our team also was very nimble in leveraging various geographic surveys and other sources to optimize pole placement,” said Parent. “To consolidate the schedule, we worked closely with the power line pole manufacturer to select the 490 poles needed for this project from their internal library.”

In this part of New Mexico, the team also contended with rocky terrain, as well as still-changing easements, which meant that some pole locations should shift as much as 150 feet either way from a proposed location.

SUBSTATIONS – In designing four 34.5/345 kV collection substations, the Ulteig Substation team utilized a daisy-chain design to reduce transmission line, construction costs and long-term maintenance costs. The team wired together the three southern substations to reduce the gen-tie transmission line length and underground cabling between turbines..

The key to Ulteig’s success on this project lies in the close collaboration between its different teams and with its clients.



PROJECT DELIVERY SERVICES

PROJECT MANAGEMENT – Our project managers have experience throughout a project’s life cycle, from development through construction and operation. We coordinate and streamline all aspects of the project, working with subcontractors and arranging all necessary services to ensure objectives are being met. Your project’s success is our highest priority, and we consistently deliver creative solutions, on time and within budget.

PROGRAM MANAGERS – Our program managers can focus on the big picture, providing consistent and integrated services. These professionals coordinate all your projects to integrate multiple design disciplines and ensure all projects in your portfolio are consistently delivered the way you need them. Our priority is to help you meet your overall strategic goals. When you need help in executing a large volume of projects, our professionals can supplement the expertise of your internal team for as long as you require it.

EXPERTISE

<p>PROJECT DEVELOPMENT</p> <ul style="list-style-type: none"> • Bid Package Preparation • Architect/Engineer/ Contractor Selection 	<p>SCHEDULING</p> <ul style="list-style-type: none"> • Critical Path Schedule Modeling • Schedule Scenario Forecasting • Earned Value Analysis 	<p>QUALITY & RISK MANAGEMENT</p> <ul style="list-style-type: none"> • Perpetual Risk Management • Qualitative & Quantitative Risk Analysis • Issues Tracking and Resolution
<p>COST</p> <ul style="list-style-type: none"> • Project Budget Development • Project Cost and Cash Flow Forecasting • Project Cost Estimating • Pay Application Processing • Change Order Reviews 	<p>SCOPE</p> <ul style="list-style-type: none"> • Contract Management • RFI Management • Procurement and Logistics Coordination • Financing Due Diligence 	<p>COMMUNICATION</p> <ul style="list-style-type: none"> • Coordination with Stakeholders • Progress Reports and Meetings • Document Control
		<p>SAFETY</p> <ul style="list-style-type: none"> • Site Safety Audits

PDS WHAT IS PROJECT DELIVERY SERVICES?

PDS IS A GROUP THAT OFFERS A RANGE OF SERVICES IN PROJECT MANAGEMENT.

PROJECT MANAGEMENT | CONSTRUCTION MANAGEMENT | PORTFOLIO MANAGEMENT

PDS IS HERE TO FIT WHEREVER YOU NEED.



Owner/Developer needs to fit a position to manage a project or portfolio on their behalf.



Ulteig's PDS team is available to help Owner/Developer at any stage in the project.



Ulteig's PDS team will integrate into the Owner/Developer's organization to put project into action.



Ulteig's PDS team will interface with the Owner/Developer's team and manage their contract on behalf of the company.



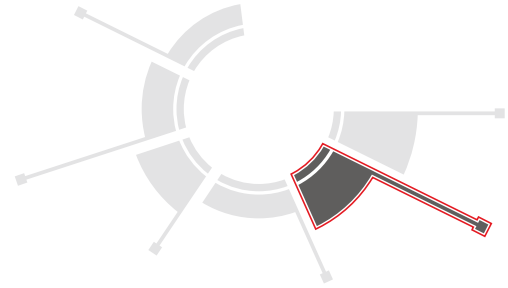
Ulteig's PDS team manages the contractors, engineers and suppliers on behalf of a project or portfolio.



Ulteig's PDS team will take the project to COD, then hand it off to O & M to maintain the project.

PROJECT DELIVERY SERVICES

PROJECT MANAGEMENT



Successful project management begins by assessing and aligning with our clients' requirements and objectives, and culminates with safely delivering projects on time and on budget, despite all issues and obstacles that challenge that objective. Exceptional project management is distinguished by attentive and responsive communication with clients and stakeholders, perpetual proactive risk management and creative resolution of conflicts and issues. Ulteig project managers consistently deliver this value to our clients by employing sophisticated schedule modeling and project controls techniques coupled with expert judgment attained through years of experience delivering successful energy and infrastructure projects. Acting as the project owner's representative and advocate, Ulteig project managers leverage this expertise on behalf of our clients to consistently deliver unparalleled service and value that yields tangible results for the projects we manage.

EXPERTISE

- Coordination with stakeholders
- Qualitative and quantitative risk analysis
- Perpetual risk management
- Critical path schedule modeling
- Schedule scenario forecasting
- Project cost estimating
- Project budget development
- Project cost & cash flow forecasting
- Earned value analysis
- Contract administration
- Bid package preparation
- Architect/engineer/contractor selection
- Pay application processing
- Change order reviews
- RFI management
- Issues tracking and resolution
- Procurement and logistics coordination
- Permit compliance
- Progress reports and meetings

EXPERT SPOTLIGHT



RANDI SUE SURRANT | ASSOCIATE DIRECTOR, RENEWABLE PROJECTS

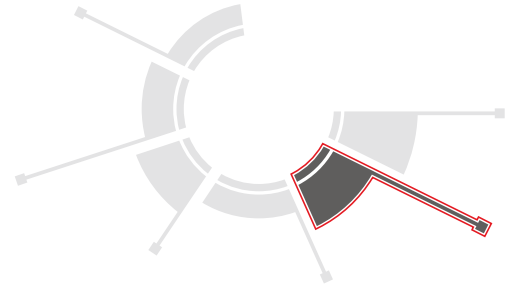
Randi Sue joined the Ulteig team in April 2021 and is Ulteig's Associate Director of Renewable Projects. She holds a bachelor's degree in business management, PPM Certificate and has over 13 years experience in the renewable sector with focus in Engineering, Subcontractor Services, Project Construction, Land Owner Development and O&M industries. Randi Sue's attention to detail, experience from each stakeholder's perspective and contract management along with her leadership, problem solving and can-do attitude help to fortify the projects, as well as directly managing a team of qualified Project Managers.

ULTEIG'S PROJECT MANAGEMENT INTEGRATED
RESOURCE TEAM CONTRIBUTED TO MORE THAN

420 PROJECTS
IN THE LAST THREE YEARS.

PROJECT DELIVERY SERVICES

CONSTRUCTION MANAGEMENT



Our goal for every project is to meet the completion date, control the cost, achieve high quality and keep clients informed of construction progress. Ulteig’s Construction Managers monitor all construction activities, identify and manage risks, utilize industry best practices, collaborate with stakeholders and execute and monitor the uniform policies and procedures as established by our clients. In addition, we take responsibility for scheduling, cost reporting, the RFI process, conflict resolution, quality management and the general condition of major equipment deliveries. If required, we can also fulfill the role of onsite Resident Project Representative (RPR), acting as an extension of the project team and providing detailed daily inspection reports for project-specific tasks.

Our QA/QC service is implemented through a series of processes that assure each project activity is carried out in a method that meets our clients’ expectations. Ulteig is highly proficient in QA/QC implementation and engaging contractors in the process.

EXPERTISE

WHAT WE DO

Scope of work is determined based on the complexity of your project, and the makeup of your team is carefully coordinated to ensure full coverage across three core areas:

- Construction Management
- QA/QC Management
- Commissioning & Energization Management

Our team will identify and circumnavigate costly construction mistakes, minimize the potential for unexpected change orders, and keep you informed of potential risks, delays and challenges during construction. We'll also carefully monitor quality check points and develop a thorough commissioning and energization plan for a safe, timely and cost-effective in-service project.

VALUE-ADD SERVICES

Using Ulteig’s full breadth of resources, we can provide you with these unique value-add services:

- Real-Time Construction Status
- Cost Reporting
- Conflict Resolution
- Lessons Learned/ Debrief Meetings
- Request for Information (RFI) Management
- Environmental Monitoring, Mitigation and Restoration
- Disciplined Change Control
- Document Control
- Major Equipment Deliveries
- Third-Party Engineering Design Reviews Constructability Reviews

ALTERNATIVE DELIVERY SERVICES

- Construction Manager-at-Risk (CMAR)
- Lump Sum Design-Build
- Progressive Design-Build
- Construction Manager/General Contractor (CMGC)
- Engineer Procure Construct (EPC)
- Owners Rep Services



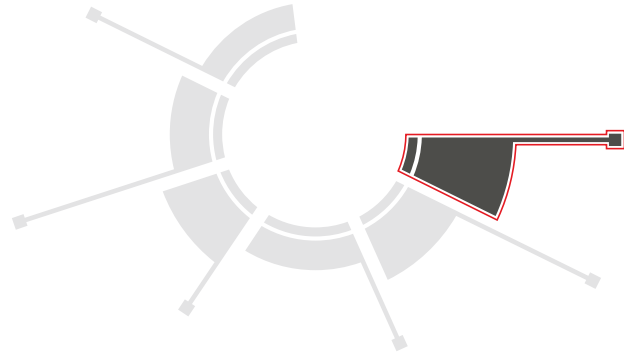
SOLOMON FORKS WIND PROJECT | COLBY, KANSAS

When Ulteig's Project Delivery Services (PDS) team kicked off the Solomon Forks Wind Project in July 2018, they already had multiple collaborations with Engie North America. And though every project comes with its share of challenges, this large 276 MW wind farm project was filled with challenges that put even the Ulteig PDS team to the test. In the end, the team delivered on time, to the satisfaction of its client.

Built with 105 Siemens Gamesa turbines, the Solomon Forks project was designed for Power Purchase Agreements (PPAs) made with major telecoms and retail customers. Based on its extensive experience, the Ulteig PDS team planned for success while preparing for any number of challenges that come with building a wind farm. However, facing strict deadlines, the Ulteig PDS team, which provided project and construction management services, achieved the following successes:

- **Keeping the project on-track despite a massive weather event** -- In mid-March 2019, a bomb cyclone hit the Central Plains, including Solomon Forks. This winter storm brought hurricane-strength winds exceeding 90 mph and snow, causing extensive damage to project roads, turbines and equipment.
- **Replacing damaged equipment in record time** -- In May 2019, the project site was directly hit by a tornado. In addition, torrential rains destroyed roads built for the project, damaged critical equipment and flooded the site. Twenty-four turbine blades were damaged by the tornado. The PDS team coordinated getting replacement blades in an expedited timeframe that met project schedule constraints, and they were an integral part in supporting insurance claims and settling change orders when issues arose.
- **Building relationships with the community** – The Ulteig PDS team put extensive effort in building and maintaining relationships with local landowners and the community despite the weather-event challenges. “The Solomon Forks and East Forks wind projects really changed the landscape of Thomas County,” said Kenny Van Ballegooyen, Manager of Construction Management - Renewables. “In the end, the landowners were very happy with how it all turned out.”

“The Solomon Forks project was an incredible example of how a strong project and construction management team can overcome seemingly endless obstacles. It’s a shining example of what our PDS team can do,” said Nick Knezevich, Ulteig Market Leader, Renewables.



ASSET MANAGEMENT

Managing and optimizing assets has never been more important. At Ulteig, Asset Management focuses on using data, information, insights, technology and engineering to manage your day-to-day business needs as well as identifying and prioritizing strategic asset management, investment decisions and long-term planning. Our team of experts works with you to capture and use data to develop insights critical to determining an informed, prioritized asset management and investment roadmap for your business.

Ulteig defines Asset Management as the data-driven, systematic tracking of key infrastructure elements to assess organizational risk, governing and automating capital spend. This solution benefits stakeholders' priorities by taking quality data collection and inspection and provides a roadmap to maintenance and replacement, informing new infrastructure investments.

AM WHAT IS ASSET MANAGEMENT?

AM IS A GROUP THAT OFFERS A SUITE OF TOOLS AND SERVICES TO TRACK, MANAGE AND PLAN FOR REPLACEMENT OF ASSETS TO MAXIMIZE FUTURE ASSET PERFORMANCE.

ASSET MANAGEMENT AREAS OF EXPERTISE



TECHNOLOGY EVALUATION

Ulteig works with you to understand what tools and technology you use and matches you with a customized solution based on your goals and priorities.



DATA SHARING & INTEGRATION

Ulteig partners with you to understand your existing asset management platform and technologies. We also can establish the asset management platform to use across your organization. This involves leveraging user friendly platforms that can be web or mobile applications to provide you with quick and easy access to information and as a decision support tool. Whether using your existing platforms or one we develop with you, Ulteig also integrates with other business systems such as a work order management system and deployed technologies to ensure current data is available across your business systems.



ANALYSIS, REPORTING & PLANNING

Ulteig understands that asset management drives long-term capital budgets and provides predictable planning and investments. Ulteig offers lifecycle modeling, risk assessment and management, capital improvement planning, master planning, forecasting and long-term asset management and optimization planning. Simply put, we give you the data to move your business forward at a pace that keeps up with our challenging industry dynamics.



ASSET OPTIMIZATION SERVICES

Ulteig looks at your overall operational performance of your assets and offers solutions to help you improve your infrastructure management and optimization. Our solutions range from deploying technology to understand equipment asset health, to mapping your assets to providing you with tools to quickly and easily view your assets a mid-range roadmap for asset inventory, management, and optimization. We provide you with valuable insights to help guide capital improvement investments and maximize your assets' life cycles and improve your key operation metrics.



INFORMATION MANAGEMENT AND INSIGHT DEVELOPMENT

Ulteig conducts GPS inventory collection and builds a GIS database of your assets. The asset database will capture and maintain the data and information important to assessing and managing your assets for day-to-day operations and for long-term planning. From the captured data and information, Ulteig identifies insights to inform your business planning. Through defect identification and cataloging of visual inspections, manual processes can be matured to machine learning reducing operations and maintenance costs.



APPLICATION DEVELOPMENT, HOSTING & MAINTENANCE

Ulteig will work with you to identify applications and data hosting solutions that will best fit your business needs.



DISCOVERY & ASSESSMENT

Ulteig works with you to evaluate existing data and systems and determine next steps that are aligned with your business and industry needs.



WHAT MAKES ULTEIG DIFFERENT?

We are committed to creating a positive experience for our clients throughout a project, offering the advantage of accessibility through exceptional project management, attentiveness and responsive communication. Ulteig anticipates needs and delivers results with trademark accuracy and timeliness. We proactively manage risks and project issues, constantly reassessing and strategically aligning with our clients' vision, objectives and requirements. We tailor designs and services to meet and exceed expectations.

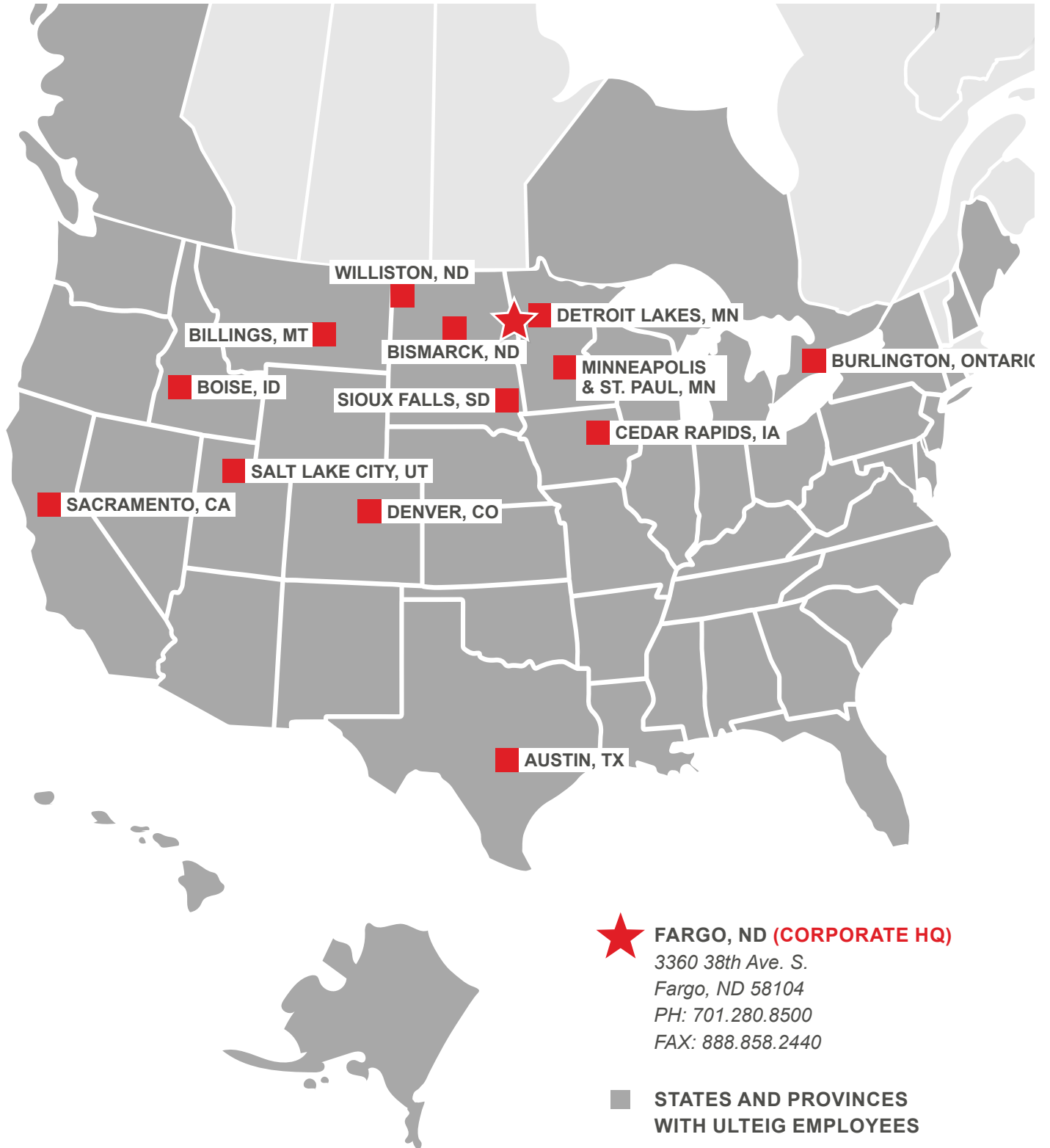
From concept to completion and long into the future, true partnership rooted in deep mutual respect is the working relationship we aspire to develop with every client. When respect goes both ways it opens communication channels, enables collaboration and removes the barriers to gaining trust. When we work this way, together, there's no infrastructure challenge we can't overcome. This is why, even after a project is completed, we stay connected with our clients and to the communities they serve. Because our commitment isn't bound by the timeline of a project. We are a partner for the long term, always ready to collaborate and consult in ongoing ways to maximize the innovative solutions we've created together. This way of working helps to explain why 78% of clients define us as a strategic partner.

IT'S ALL ABOUT CONNECTING with clients and their needs. Throughout the process, we are accessible and transparent, listening and solving through the daily connections that are essential to this work. Our clients and their customers depend on these connections that ultimately bring essential services to millions. While our experience spans the nation, we maintain a hometown feel.

A STRONG CONNECTION IS FOUNDATIONAL whether it involves wires, roads, pipes or people committed to working together for a common purpose. Ulteig generates the connections that strengthen infrastructure—planning, collaborating and creating reliable solutions for our clients and the communities they serve.

WE LISTEN. WE SOLVE.[®] Our tagline captures the essence of our unique position in the marketplace. "We listen" speaks to partnership, to becoming integrated in our clients' business and truly understanding their needs. We are constantly listening. "We solve" is the promise we make to clients and their communities – we offer comprehensive, long-lasting solutions.

LOCATIONS AND CONTACT





Ulteig delivers comprehensive engineering/design, program management, technical services and field services that strengthen infrastructure vital to everyday life. An employee-owned company, Ulteig connects people and resources to develop compelling, integrated solutions across the Lifeline Sectors® of power, renewables, transportation and water. Ulteig leverages its expertise throughout North America with a wide range of public and private clients.