



RACINE WASTEWATER UTILITY

Energy Roadmap Study

Proposal Package

▶ SEPTEMBER 19, 2025



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Connecting

PEOPLE — PLACES — IDEAS



Client Focused

We strive to always give our clients the best solutions.



Integrity

We do the right thing in an ethical, fair, and sustainable way.



Collaboration

We bring a diverse and inclusive team, working together toward technical excellence.



Innovation

We strive to create new and better ways to solve our clients' toughest challenges.



Nate Tillis
Wastewater Director
Racine Wastewater Utility
800 Center St - Room 227
Racine, WI 53403

Subject: Racine Wastewater Utility Energy Roadmap Study

Dear Nate,

Thank you for the invitation to submit our proposal in response to the City of Racine Wastewater Utility request for proposals for Energy Roadmap Study. We are pleased to provide City of Racine with a qualified team of professionals that are dedicated to meeting your goals and vision for this exciting project.

Our team is excited for the opportunity to collaborate with you in your journey of energy management and build upon the work the City of Racine and Racine Wastewater Utility Team has executed, including what we have done together, to date. To accomplish your goals, we have assembled a team of technical experts that will listen and work with you to:



Collaborate with City staff to systematically build consensus and make key decisions through planned workshops where the entire team's evaluation criteria are confirmed and recommendations based on the needs that have been identified.



Evaluate and take into consideration all previous work and projects that tie to the energy goals and plan.



Identify additional energy conservation opportunities beyond those already recognized. Innovation will be a key element in identifying new energy savings opportunities, energy and resource recovery opportunities, and renewable energy implementations not currently used by the City.



Analyze current energy consumption and implement additional monitoring as needed at the Wastewater Facilities, the Conveyance System and the Administrative Facilities to determine if the existing baseline metrics need adjustment.



Deliver a comprehensive Energy Plan that summarizes findings, opportunities, and recommendations to the City focused on a long-term capital implementation plan for the proposed upgrades.



Communicate with the identified Stakeholders and help to develop material to support City Staff.

The Team will be led by powerhouse leaders in our industry who have a proven track record of delivering similar projects for utilities nationwide. **Joe Teusch, PE, Project Director** and **Katie Richardson, PE, ENV SP, Project Manager** will work closely with City of Racine and are committed to the successful completion of this project for you and the communities you serve. We look forward to serving you on this exciting project.

Sincerely,

Katie Richardson, PE, ENV SP
Project Manager
262.290.2254

A. Firm Identification

Firm Introduction

TYLin delivers award-winning engineering, architecture, and consulting expertise solely dedicated to providing sustainable engineering solutions for a broad range of water, wastewater, and solid waste challenges. We bring a holistic view to achieving energy neutrality and recovering resources for beneficial reuse of energy. Our team will help to identify opportunities for renewable energy and energy consumption that are critical to evaluate potential energy efficiency solutions to achieve energy management goals.

DEMONSTRATED EXPERIENCE



City of South Bend Digester Gas Utilization: **30% reduction in annual energy costs**, this project saves the City money each year and provides environmental benefits by reducing the carbon footprint of the plant.



Pima County Energy and Sustainability Plan and Design: *Utility of the Future Today Honoree* for their approximately **30% reduction in energy use** and reusable energy installations at multiple treatment facilities.

Our Core Services

TYLin's Water sector team is developing innovative engineering and management solutions for complex water, wastewater, water reuse, and solid waste challenges. A key component of this leadership is our expertise in a wide array of energy and sustainable study and design services. These services can help our clients attain profitable, green design solutions that most economically respond to energy and sustainability goals.

We apply these services starting at this project's inception so energy and operating savings are designed in, and not added on later. Our staff have extensive experience evaluating the feasibility and energy impacts of design solutions that are sustainable, resilient, energy efficient, and provide a return on the utility's investment.

Areas of expertise include:

- Energy Planning, Project Management and Administration—
- Biosolids and Resource Handling, Beneficial Management and Optimization
- Biogas Generation from Fats, Oils and Grease (FOG)
- Biogas Cleaning and Handling for Effective Reuse
- Power System Studies and Power Metering
- Energy and Carbon Neutrality

- Analysis and Implementation
- Conceptual Design, Facility Planning and BODR Development—
- Utility Coordination and Collaboration
- Stakeholder Collaboration, Coordination and Management—
- Regulatory Coordination and Management
- Maintenance of Plant Operations
- Program Management
- Technology Evaluation

REQUIRED STATEMENTS

Firm Name: T.Y. Lin International Great Lakes, Inc. (TYLin)

Remit HQ: 345 California Street, Suite 2300, San Francisco, CA 94104

Lead Office: 200 S. Wacker, Suite 1400, Chicago, IL 60606

Years in Business: 43 Years

Organization Size: International, 3,500+ employees

TYLin is licensed to operate in Wisconsin

TYLin's water sector brings over 100 years of wastewater experience to clients across the United States.

Sampling of Energy Management Experience	Location
2020 Energy Plan for MMSD Facilities	Milwaukee, WI
Ventilation and Odor Study for the Inline Storage System Planning	Milwaukee, WI
JIWRF Administrative and Maintenance Facilities Space Planning Analysis	Milwaukee, WI
Pima Energy and Sustainability Plan	Tuscon, AZ
Boiler Replacement, Digester Gas Utilization and Solar Energy Study	Lafayette, IN
City of Evanston Climate Action and Resilience Plan and Master Plan	Evanston, IL
City of Evanston Water Plant 4160V Electrical System Reliability	Evanston, IL
Energy Management Plan and Demonstration Project	Alexandria, VA
Greenville Water Strategic Plan	Greenville, SC
Methane Gas Alternatives Study	Oakland County, MI
Nutrient Harvesting, Food Waste to Energy, and Biosolids Dewatering Conceptual Evaluations Strategic Planning	Peoria, IL
Dillman Road Wastewater Treatment Plant Upgrade and Efficiency Improvements	Bloomington, IN
Digester Gas Utilization Study and Design	South Bend, IN
Power Distribution Improvements at the 275 MGD Wards Island WRRF	New York, NY
Power Distribution Improvements at 150 MGD Bowery Bay WRR	New York, NY
Fox River Water Reclamation District Energy Efficiency Aeration Blower Projects	Elgin, IL

TYLin has successfully completed energy audits and unit process evaluations at many municipal water resource recovery facilities. We identify the largest energy consuming processes and develop capital improvement plans to reduce overall energy usage while minimizing asset life-cycle costs. Below are recent projects that successfully reduced energy usage in pumping, aeration, filtration, digestion and sludge dewatering.

▶ **Lafayette Climate Action and Renewable Energy Plan | 33 MGD WRRF**

A pilot study consisting of belt filter press, centrifuge and volute press demonstrated that the volute press performed best with a 24-28% dewatered cake. The technology was also less expensive, easier to maintain, and used less energy compared to BFP and centrifuge. The motor for the volute press was approximately one tenth the size for the same capacity centrifuge. TYLin implemented three (3) solar array projects to support the City's Climate Action Plan. The solar arrays were designed to optimize efficiency and return on investment while working within the regulatory framework restricting the size of solar facilities. The arrays were directly interconnected to large regional lift stations or the motor control center at the WRRF. These represented large consistent power users, such that arrays could be sized to significantly reduce energy usage but not oversized to maximize return on investment.



▶ **Indianapolis Belmont and Southport | 150 MGD AWTs**

TYLin assessed the effluent filtration process at both plants. It was determined that the existing process was over-designed and annual energy cost was reduced by \$630,000. Backwash pumps were reduced from 33,000 gpm to 10,000 gpm and backwash time was cut from 15 minutes to 8 minutes. Motor horsepower was reduced by a factor of 10 from 500 HP to 50 HP.

▶ **Bloomington Dillman Road | 20 MGD WRRF**

Energy audit and assessment of the unit processes confirmed that 80% of energy usage was in pumping, aeration and digestion. Recommended improvements included automating the aeration process and providing new high-efficiency blowers. Positive displacement blowers were used in the aerobic digestion process to take advantage of energy savings from varying liquid levels. RAS and WAS pumps were replaced with horizontal arrangements to improve access for maintenance and equipped with VFDs. Annual energy savings from these improvements were approximately \$90,000.



▶ **Evansville East and West WWTPs | 18 and 21 MGD WRRF**

Energy audit and assessment of the anaerobic digestion process uncovered some opportunities through improved digester mixing. Alternatives evaluation of high-rate mixing options showed jet mixing to be most economical from a life-cycle perspective. It provided a significant increase in methane production and was used to fuel a microturbine as well as provided future flexibility to achieve Class A biosolids. Additionally, it provided opportunities for co-digestion and a new source of revenue for the utility.

B. Team Qualifications and Experience

Project Team

TYLin has assembled a highly qualified team of engineers and technical experts to collaborate with RWWU to evaluate and develop innovative solutions. Our team is made up of local and national experts paired with a Project Manager that has extensive experience leading energy and resource recovery projects and completing those projects on time and within budget.

The organizational chart on the following page outlines the project team organization and assignment based on the project's needs and services. As Primary Point of Contact and Project Manager, Katie Richardson will manage the project team's task assignments and deliverables, schedule management, and overall project management coordination. Katie Richardson will work alongside Joe Teusch, as Project Director, to organize and manage the projects completion.

Key personnel who bring facility engineering and planning experience include: **Matt Pontikis, PE**, Energy Planning Lead; **Mike Monte, PE, ENVP SP**, Renewable Electrical Projects Lead; **Chen Li, PE**, Process Optimization Lead; **Norbert Viranyi, PE, CEM, LEED AP**, Subject Matter Expert; **Nancy Neuman, Ph.D**, GHG and Air Permitting Lead; and **Maithilee Das Lappin, PE, ENVP SP, LEED Green Associate**, Utility and Permitting Lead. **Val Frenkel, Ph.D, PE, DWRE**, **Ted Bluver, PE**, and **Joe Dinkel, PE** will serve as Process Optimization and Water Reuse and Quality Control personnel. They bring a wealth of knowledge and experience advising on technical strategies and wastewater facility master planning.

Primary Point of Contact

Katie Richardson, PE, ENVP SP

Catharine (Katie) Richardson brings unique experience to the team having degrees in both Communications and Engineering. She brings 20 years of experience; the last 12 years have been working with utilities. She has compiled and collaborated on rate studies, reviewed engineering reports, reviewed plant drawings, completed hydraulic calculations, prepared detailed design drawings for pumping stations, disinfection facilities and odor control systems, and served as field technician to evaluate the construction progress for water and wastewater systems.

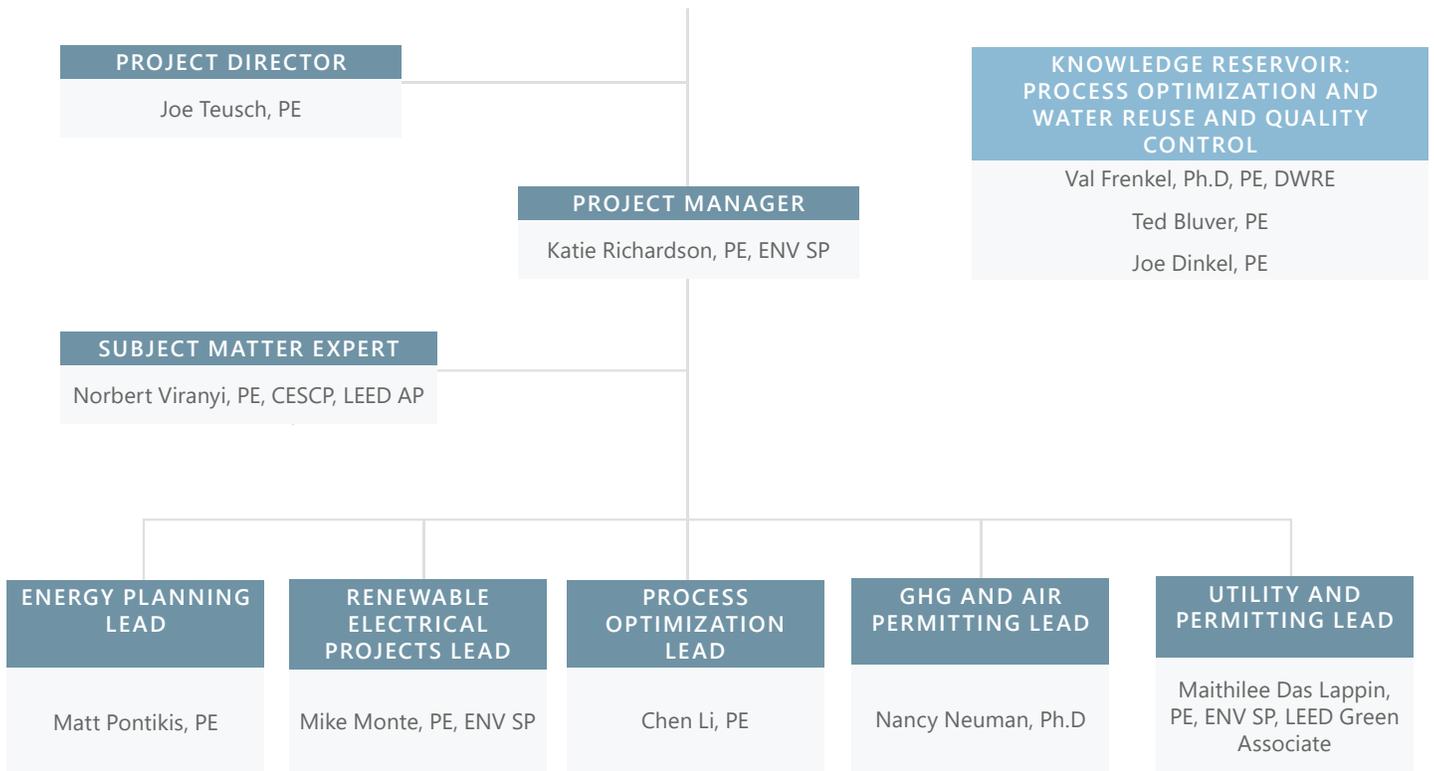
Katie is the Program Manager of the historic Great Water Alliance for the Waukesha Water Utility. As the Program Manager, she is leading the program team in implementation of the delivery of a new water supply system with a return flow system to the Great Lakes Basin. She brings unique experience to the leadership of programs, having degrees in both Communications and Engineering. She brings significant program management experience on major programs that have included effective public outreach strategies as well as having compiled and collaborated on rate studies, reviewed engineering reports, reviewed plant drawings, completed hydraulic calculations, prepared detailed design drawings for water and wastewater treatment process facilities and conveyance systems, and served as field technician to evaluate the construction progress for water and wastewater systems. With her passion to help drive the betterment of communities and the industry, Katie is also the Chair of AWWA's Water Equation committee which focuses on raising funds to support workforce development initiatives in the water industry.



Project Management Expertise

- Developing effective program tracking and control system to effectively plan, schedule, and control each work activity.
- Data and information collection for program development and team member awareness.
- Identify and screen potential risk and opportunity events; Risk Management Plan and review of a project's plan at formal meetings to track implementation of mitigating actions and strategies.
- Oversee and execute financial management services on a project basis.
- Provide strategic communication plan and messaging document development.

Organization Chart



ADDITIONAL RESOURCES

Energy Planning
Kate Sargent

Architect
Brent Sevcik, AIA, ENV SP, LEED AP BD+C

BIM/CAD
Robert Mason

I&C
Amol Galande

Process Engineer
Karissa Brunette



YEARS OF EXPERIENCE

20 Years

YEARS WITH TYLIN

12 Years

EDUCATION

BS, Civil Engineering, University of Wisconsin, 2012

BA, Communication Studies, University of Minnesota, 2004

LICENSE

Professional Engineer, Illinois, Wisconsin

Envision™ Sustainability Professional (ENV SP)

Catharine (Katie) Richardson, PE, ENV SP

Project Manager

Catharine (Katie) Richardson brings unique experience to the team having degrees in both Communications and Engineering. She brings 20 years of experience; the last 12 years have been working with utilities. She has compiled and collaborated on rate studies, reviewed engineering reports, reviewed plant drawings, completed hydraulic calculations, prepared detailed design drawings for pumping stations, disinfection facilities and odor control systems, and served as field technician to evaluate the construction progress for water and wastewater systems.

EXPERIENCE

MILWAUKEE METROPOLITAN SEWERAGE DISTRICT, 2020 ENERGY PLAN | MILWAUKEE, WI, USA Project Manager

This comprehensive plan helped Milwaukee Metropolitan Sewerage District (MMSD) become less reliant on fossil fuels. The plan included evaluation and analysis at the Jones Island and South Shore Water Reclamation Facilities, the conveyance system, and the administration facilities to determine opportunities for energy conservation and renewable energy sources to achieve the MMSD's 2035 Vision: 100% of energy needs with renewable sources, 80% of energy needs with internal renewable sources, and 90% carbon footprint reduction from MMSD's 2005 baseline. Internal resources included maximization, optimization, and utilization of landfill gas and digester gas for the existing CHP systems and possible opportunities for other applications to approach zero flaring.

GREATER PEORIA SANITARY DISTRICT, BIOSOLIDS DEWATERING PORTION OF THE NUTRIENT HARVESTING, FOOD WASTE TO ENERGY, AND BIOSOLIDS DEWATERING CONCEPTUAL EVALUATIONS STRATEGIC PLANNING | PEORIA, IL, USA

Project Director

GPSD owns and operates a 26 MGD WWTP with an activated sludge system. TYLin helped to secure energy grant funding for GPSD by replacing aging aeration blowers with energy efficient turbo blowers. A feasibility study of co-digestion with high strength food waste. The goal was to evaluate the potential economic and operational benefits by generating more biogas. The study included two phases. The first phase was to evaluate the capacity of the existing anaerobic digestion system, including rate of biogas production and existing biogas usage. Upon reviewing existing data and current digester performance which include volatile solids reduction rate and biogas production, it was concluded that the existing digesters system had the excess capacity to handle high strength waste. The second phase was to identify alternatives for increasing biogas production, optimizing the quality of the biogas, and for utilizing biogas as a sustainable energy source. The potential beneficial uses of the additional biogas that can be generated via the co-digestion process were evaluated. Biogas utilization alternatives included fueling the existing boilers throughout the facility; implementing a combined heat and power (CHP) system for electricity generation; fuel cells application; and converting into compressed natural gas (CNG) for vehicle fuel or trading as renewable fuel credit via a renewable identification number (RIN) program. These uses require varying amounts of treatment and gas cleaning equipment.

MILWAUKEE METROPOLITAN SEWERAGE DISTRICT, HVAC SYSTEM UPGRADES IN THE DEWATERING AND DRYING FACILITY AT JONES ISLAND WATER RECLAMATION FACILITY | MILWAUKEE, WI, USA

Project Director

The purpose of this project is to ensure the District maintains operations of biosolids processing at the Dewatering & Drying (D&D) facility as this process is critical in supporting permit compliance, providing Milorganite® revenue, and maintaining efficient operations. The project is upgrading and replacing over 200 HVAC system assets to improve safety and incorporate HVAC improvements to improve energy efficiency at this 400,000 SF facility. This project includes an NFPA 820 evaluation, boiler system evaluation, heat recovery evaluation, and an energy audit. Systems evaluated include large hot water and natural gas air handling units, chillers, pumps, exhaust fans, and fan coil units.



YEARS OF EXPERIENCE

28 Years

YEARS WITH TYLIN

28 Years

EDUCATION

BS, Civil Engineering, Purdue University, 1997

LICENSE

Professional Engineer, Indiana, Ohio, and Oklahoma

CERTIFICATIONS

American Water Works Association (AWWA)

Water Environment Federation (WEF)

Indiana Water Environment Association (IWEA) -Collection Systems Committee

Joe Teusch, PE

Project Director

Mr. Joseph Teusch brings more than 28 years of experience in the field of wastewater engineering. His experience includes condition assessment, energy audits, planning, design, and construction services for wastewater pumping and treatment projects. He has served as project director, project manager and design engineer on numerous multi-million-dollar projects. His project experience has included the assessment of unit processes at many water resource recovery facilities including energy audits and energy master plans in addition to expansion and rehabilitation designs. Mr. Teusch has served as Project Director for several recent energy assessments and improvement projects.

EXPERIENCE

CITIZENS ENERGY GROUP, BELMONT AND SOUTHPORT ADVANCED WASTEWATER TREATMENT PLANTS FILTER REHABILITATION AND OPTIMIZATION PROJECT | INDIANAPOLIS, IN, USA

Project Director

This project included a comprehensive assessment and evaluation of existing mono media filters for two 150 MGD Advanced Wastewater Treatment Facilities. Both facilities have 12 existing media filters. The study analyzed existing problems, and prepared alternatives for rehabilitation or replacement. Study considered life cycle costs of all options based on capital improvement costs, operation/maintenance costs, and replacement costs. Field testing revealed process optimization opportunities such as reduced backwash pump sizes and backwash run times. The project included replacement of existing filter coarse mono-media; new combination air scour underdrains; new filter backwash system; modifications to the process air blower system; revisions to filter backwash programming; and replacement of control valves and associated automation. Total estimated annual savings from the process optimization was \$630,000.

CITY OF BLOOMINGTON, DILLMAN ROAD WASTEWATER TREATMENT PLANT UPGRADE AND EFFICIENCY IMPROVEMENTS PROJECT | BLOOMINGTON, IN, USA

Project Director

The project included a plant-wide condition assessment and energy assessment including process, electrical and SCADA systems to most efficiently treat flows for a 20-year planning period. The project included diffuser improvements for aeration and digestions to improve efficiency; new secondary treatment flow metering to improve operational efficiency; new energy efficient process air blowers and dissolved oxygen control for aeration and digestion processes; new disc filter for expanded effluent filtration; new RAS/WAS/Scum pumps and associated VFDs for reduced O&M and energy efficiency; upgrading the electrical system; and standby power for critical secondary treatment processes to reduce risk and improvement resiliency during power interruptions. Total estimated annual savings from the process optimization was \$90,000.

EVANSVILLE WATER AND SEWER UTILITY, EAST AND WEST PLANT DIGESTER REHABILITATION PROJECT | EVANSVILLE, IN, USA

Project Director

The project included an assessment, energy audit and improvements to the anaerobic digestion process at both the East and West WWTPs. Improvements included rehabilitation of digester covers and heat exchangers, replacement of pumps, valves, gas handling equipment, piping simplification, addition of jet mixing and miscellaneous structural, HVAC and electrical improvements. The design of the \$14M project was fast tracked as it was completed in four months to meet State Revolving Fund financing timeline. Replacing the gas mixing system with jet mixing considerably improved methane production which was used for both sludge heating and use in a micro-turbine. Additionally, the high-rate mixing also provided for co-digestion of FOG, food waste and formalin which provided a new source of revenue.



YEARS OF EXPERIENCE

46 Years

YEARS WITH TYLIN

9 Years

EDUCATION

Ph.D, Water and Ecology Science, Lviv Polytechnic University, 1983

MSc, Civil Engineering, Water and Wastewater, Lviv Polytechnic University, 1978

LICENSE

Professional Engineer, New York, Michigan, Texas, California

CERTIFICATIONS

Diplomate, Water Resource Engineering (D.WRE)

Fellow WEF

Fellow IWA

Fellow ASCE/EWRI

IDA Outstanding Professional in Water Reuse 2018

Val Frenkel, Ph.D, D.WRE

Process Optimization, Water Reuse & Quality Control

Dr. Val Frenkel is a well-recognized expert with 46 years of experience in water, wastewater, and water reuse. He has a successful record of applying technological approaches to provide project cost savings and energy optimization, often via development of new technologies and applications used worldwide for treating water and wastewater. Val was a contributing author to WEF MOP No. 38 Sustainability and Energy Management for Water Resource Recovery Facilities.

EXPERIENCE

EVANSVILLE WATER AND SEWER UTILITY, EAST AND WEST PLANT DIGESTER REHABILITATION PROJECT | EVANSVILLE, IN, USA

Technical Advisor

The project included an assessment, energy audit and improvements to the anaerobic digestion process at both the East and West WWTPs. Improvements included rehabilitation of digester covers and heat exchangers, replacement of pumps, valves, gas handling equipment, piping simplification, addition of jet mixing and miscellaneous structural, HVAC and electrical improvements. The design of the \$14M project was fast tracked as it was completed in four months to meet State Revolving Fund financing timeline. Replacing the gas mixing system with jet mixing considerably improved methane production which was used for both sludge heating and use in a micro-turbine. Additionally, the high-rate mixing also provided for co-digestion of FOG, food waste and formalin which provided a new source of revenue.

CITY OF RICHMOND WASTEWATER TREATMENT, PLANT MASTER PLAN UPDATE DEVELOPMENT | RICHMOND, VA, USA

Senior Process Designer

The Master Plan included a 10-year spending plan that laid out the budget and schedule for 18 maintenance projects and 29 capital projects at the WWTP. TYLin is working with the City to update the Master Plan to identify improvement needs and ultimately develop and establish a Capital Improvements Plan (CIP). The CIP will identify a roadmap for the City that can be implemented over the next 20 years to continue to provide reliable treatment and meet regulatory requirements as well as identify opportunities for energy optimization. The updated Master Plan will also provide a focused effort towards biosolids management, energy management, and process optimization for more efficient use of resources.

PAJARO AND SUNNY MESA COMMUNITY SERVICES DISTRICT, DESALINATION PROGRAM DEVELOPMENT | CALIFORNIA, USA

Program Leader and Desalination Process Engineer

Val was Program Leader and Desalination Process Engineer for a Desalination Program based on open intake seawater desalination program. The program objectives were to develop a cost-effective Sea Water Desalination project for the District and Monterey Peninsula, with the pilot study establishing design criteria and verifying costs for a proposed 20 MGD open intake SWRO. The study produced desalinated water quality, SWRO technological parameters, brine discharge criteria, and supported the public outreach program.

MILWAUKEE METROPOLITAN SEWERAGE DISTRICT, 2020 ENERGY PLAN | MILWAUKEE, WI, USA

Technical Advisor

This comprehensive plan helped Milwaukee Metropolitan Sewerage District (MMSD) become less reliant on fossil fuels. The plan included evaluation and analysis at the Jones Island and South Shore Water Reclamation Facilities, the conveyance system, and the administration facilities to determine opportunities for energy conservation and renewable energy sources to achieve the MMSD's 2035 Vision: 100% of energy needs with renewable sources, 80% of energy needs with internal renewable sources, and 90% carbon footprint reduction from MMSD's 2005 baseline.



YEARS OF EXPERIENCE

13 Years

YEARS WITH TYLIN

10 Years

EDUCATION

MS, Civil and Environmental Engineering, University of Illinois at Urbana-Champaign, 2013

BS, Civil and Environmental Engineering, University of Illinois at Urbana-Champaign, 2012

LICENSE

Professional Engineer: Illinois, Wisconsin, New York and Missouri

CERTIFICATIONS

OSHA 10-Hour Construction and General Industry Outreach Training

Ted Bluver, PE

Process Optimization, Water Reuse & Quality Control

Ted Bluver is an Associate Civil Engineer and Project Manager at TYLin with 13 years of experience in the planning, design, and construction of water, wastewater, and stormwater infrastructure. Mr. Bluver's experience includes wet weather infrastructure ranging from large diameter deep tunnels and drop structures to typical sewers and culverts, municipal and industrial wastewater treatment processes and plant upgrades, pumping facilities, transmission and force mains, distribution and collection system improvements, and storage facilities. Mr. Bluver has also led or contributed to services for master plans, rate studies, preparation of cost opinions, alternatives analyses, life-cycle cost assessments, and office engineering services during construction. He brings recent experience working with clients to develop strategic solutions to satisfy client goals and objectives.

EXPERIENCE

MILWAUKEE WATER WORKS, OKLAHOMA PUMPING STATION AND PIPELINE | MILWAUKEE, WI, USA

Project Engineer

TYLin was retained by Milwaukee Water Works (MWW) to provide design for a pumping station and associated pipelines. This project will provide infrastructure necessary to provide the City of Waukesha with potable water and also serve a portion of the City of Milwaukee. The new Oklahoma Pumping Station will allow the City of Milwaukee to abandon the existing Oklahoma Pumping Station that is located underground and poses safety concerns. Special consideration was given to the connections to the MWW distribution system, suction piping, construction phasing to maintain level of service to the existing MWW customer base, flexibility in operations, and redundancy at the WSPS.

MILWAUKEE WATER WORKS, WATER MAIN REPLACEMENT PROJECTS | MILWAUKEE, WI, USA

Project Engineer

Milwaukee Water Works (MWW) operates a large water system with an average daily pumpage of 90 MGD that serves its retail and wholesale customers through 2,000 miles of water main, 20,000 hydrants, and 50,000 valves. MWW continuously updates and improves in water mains. TYLin is designing several water main replacement projects. Mr. Bluver's responsibilities included quality control reviews and technical guidance for the design of water mains and appurtenances and development of plan sheets.

WAUKESHA WATER UTILITY, GREAT WATER ALLIANCE PROGRAM | WAUKESHA, WI, USA

Transmission and Force Main Design Manager

The purpose of this program is to transition the City's water supply from groundwater to Lake Michigan water at a net zero water balance with the Lake Michigan watershed. TYLin performed Program Management and Design services to provide planning, design, and construction of an anticipated 36-miles of transmission and force mains, a Water Supply Pumping Station (preliminary design), a Water Booster Pumping Station, a Return Flow Pumping Station (preliminary design), outfall facilities, water supply connections, a water reservoir, associated chemical feed facilities, and distribution system improvements. Ted is responsible for project management of the route study and pipeline design, water demand analysis, steady state and transient hydraulic modeling of new infrastructure, distribution system modeling, preparation of contract documents, preparation of opinions of probable construction cost, permitting coordination related to pipelines, coordination between disciplines and subconsultants, and office services during construction.

VILLAGE OF ORLAND PARK, MAIN PUMPING STATION EVALUATION | ORLAND PARK, IL, USA

Lead Project Engineer

This study evaluated pumping capacity and performance, rebuild vs. replacement life-cycle costs, and the potential for Variable Frequency Drives (VFDs), along with recommendations for improvements to the pumping systems, SCADA, and electrical systems to optimize performance and reduce energy costs.



YEARS OF EXPERIENCE
25 Years

YEARS WITH TYLIN
10 Years

EDUCATION
BS, Mechanical Engineering,
Michigan Technological
University, 2000

LICENSE
Professional Engineer: Illinois,
Indiana, Michigan, Missouri,
New York, Ohio, Kentucky,
Texas, Oklahoma, Maryland,
Pennsylvania, New Jersey,
Wisconsin, Nevada, Arizona, and
Virginia

PROFESSIONAL AFFILIATIONS
American Society of
Heating, Refrigerating and
Air Conditioning Engineers
(ASHRAE)

American Society of Plumbing
Engineers (ASPE)

Joe Dinkel, PE

Process Optimization, Water Reuse & Quality Control

Joseph Dinkel has 25 years of experience in management, engineering, construction, and project execution, with broad skills in both leadership and technical subject matter. He excels in design and specification of complex mechanical, HVAC and plumbing systems. He has designed turnkey projects from concept through completion as well as engineering changes and upgrades. Mr. Dinkel possess extensive communication and coordination skills for managing teams assigned with challenging tasks.

EXPERIENCE

MILWAUKEE METROPOLITAN SEWERAGE DISTRICT, 2020 ENERGY PLAN | MILWAUKEE, WI, USA Mechanical Engineer

This comprehensive Energy Plan Update evaluation and analysis at the Jones Island and South Shore Water Reclamation Facilities, the conveyance system, and the administration facilities to determine opportunities for energy conservation and renewable energy sources to achieve the MMSD's 2035 Vision: 100% of energy needs with renewable sources, 80% of energy needs with internal renewable sources, and 90% carbon footprint reduction from MMSD's 2005 baseline. Internal resources include maximization, optimization, and utilization of landfill gas and digester gas for the existing CHP systems and possible opportunities for other applications to approach zero flaring. Mr. Dinkel was responsible for the technical and quality reviews for the project.

WAUKESHA WATER UTILITY WAUKESHA, GREAT WATER ALLIANCE PROGRAM | WAUKESHA, WI, USA Mechanical Engineer

This multi-year, multi-million-dollar Program Management and Design program includes planning, design, and construction of an anticipated 35-miles of transmission and force mains, a Water Supply Pumping Station (preliminary design), a Water Booster Pumping Station, a Return Flow Pumping Station (preliminary design), outfall facilities, water supply connections, a water reservoir, associated chemical feed facilities, and distribution system improvements. Work included performing a route study, permitting, steady state and transient hydraulic modeling of new infrastructure, water quality analyses and distribution system modeling in InfoWater to prepare the distribution system for the new water supply connection, cost estimations and construction preparation of Contract Documents, preparation of construction management recommendations.

CITY OF LAFAYETTE, BOILER REPLACEMENT, DIGESTER GAS UTILIZATION AND SOLAR ENERGY STUDY | LAFAYETTE, IN, USA Mechanical Engineer

Work involved digester gas utilization evaluation with planned plant upgrades and potential boiler system upgrades. This evaluation was prepared to Triple-Bottom Line for capital, energy, and community benefits. A comprehensive energy plan was developed to generate power and heat with a co-generation system, schedule equipment replacement for efficiency improvements, and clean the digester gas to the quality for vehicle fueling or to be used as a high-BTU content fuel. The overall plan included a 600-kW photovoltaic installation to maximize renewable energy production and maximize the owner's land use for space identified as not suitable for building construction.

CITY OF SOUTH BEND, DIGESTER GAS UTILIZATION STUDY AND DESIGN | SOUTH BEND, IN, USA Mechanical Engineer

TYLin performed a comprehensive energy audit and equipment needs assessment that allowed the plant to maximize use of a renewable energy source (digester gas). The project included mixing to increase gas production as well as the installation of a has cleaning skid using pressure swing absorption to clean the gas to pipeline quality. The CNG station is used to fuel City fleet vehicles.



YEARS OF EXPERIENCE

34 Years

YEARS WITH TYLIN

21 Years

EDUCATION

BS, Electrical Engineering,
Purdue University, 1991

LICENSE

Professional Engineer: Indiana,
Arizona, California, Illinois,
Maryland, Michigan, Nevada,
New York, Ohio, Virginia,
Wisconsin, and District of
Columbia

NFPA Certified Electrical
Safety Compliance Professional
(CESCP)

LEED Accredited Professional

CERTIFICATIONS

Institute of Electrical and
Electronics Engineers (IEEE)
- Past Chair, Central Indiana
Section

American Water Works
Association (AWWA)

National Fire Protection
Association (NFPA)

Norbert Viranyi, PE, CESC, LEED AP

Subject Matter Expert

As Subject Matter Expert, Norbert has delivered energy assessments and associated optimization and capital improvements for clients throughout the midwest. He has led a multi-disciplinary team and coordinated all aspects of scope preparation, management approval, design, cost estimation, permitting, construction, startup, and operator training. Norbert has ensured compliance with applicable federal, state and local regulations, monitored contractor compliance with safety and environmental policies, and acted as technical support expert after project completion.

EXPERIENCE

LEXINGTON PUMPING STATION GENERATOR FACILITIES AND PHOTOVOLTAIC SYSTEM FOR THE DUPAGE WATER COMMISSION AND CHICAGO DEPARTMENT OF WATER MANAGEMENT, IL, USA

Electrical Project Engineer

Project scope included the design and construction of a 12.5-MW stand-by power generation system and the design and construction of a 1-MW photovoltaic system on top of an active finished water reservoir. The new generator building received USGBC LEED Gold certification.

MILWAUKEE METROPOLITAN SEWERAGE DISTRICT, 2020 ENERGY PLAN | MILWAUKEE, WI, USA

Technical Advisor and Quality Control Reviewer

Project scope included a comprehensive plan to help MMSD become less reliant on fossil fuels. The plan includes evaluation and analysis at the Jones Island and South Shore Water Reclamation Facilities, the conveyance system, and the administration facilities to determine opportunities for energy conservation and renewable energy sources to achieve the MMSD's 2035 Vision: 100% of energy needs with renewable sources, 80% of energy needs with internal renewable sources, and 90% carbon footprint reduction from MMSD's 2005 baseline. Internal resources include maximization, optimization, and utilization of landfill gas and digester gas for the existing CHP systems and possible opportunities for other applications to approach zero flaring.

RECONSTRUCTION OF POWER DISTRIBUTION AT WARDS ISLAND WATER RESOURCE RECOVERY FACILITY (CONTRACT WI-292) FOR THE NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION, NY, USA

Project Manager

Project scope includes the replacement of approximately 80% of the facility's medium-voltage and low-voltage power distribution system, including 5 – 13.8kV utility services, 4 – 4160V switchgear, 7 – 4160V/480V unit substations, and more than 30 – 480V motor control centers. The project also included the addition of a photovoltaic system on the roof of an expanded electrical building. The project has achieved an ISI Envision verification.

CITY OF LAFAYETTE, PEARL RIVER COMBINED SEWER OVERFLOW CONTROL FACILITY PLANNING PHASE II-C | LAFAYETTE, IN, USA

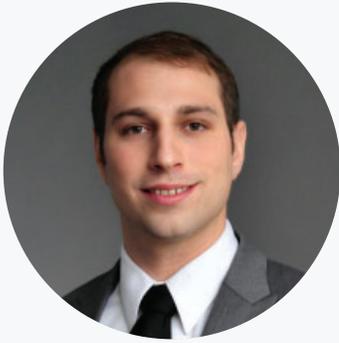
Technical Advisor

Project scope included the design and construction of a 5.2-MG CSO Storage Structure at the Pearl River Lift Station, with a 390-kW photovoltaic system on top of the underground storage structure.

EASTERN MUNICIPAL WATER DISTRICT, MORENO VALLEY NEW GAS TURBINE BLOWER EQUIPMENT | MORENO VALLEY, CA, USA

Project Electrical Engineer

Project scope includes the addition of a 5,400-SCFM digester gas turbine driven aeration blower to optimize renewable energy usage. Heat rejected from the gas turbine is also recovered in the plant heat loop used to heat the digesters.



YEARS OF EXPERIENCE

15 Years

YEARS WITH TYLIN

14 Years

EDUCATION

BS, Electrical Engineering,
University of Illinois at Urbana-
Champaign, 2010

LICENSE

Professional Engineer: Illinois,
Wisconsin, Washington,
Maryland, New York

CERTIFICATIONS

Envision™ Sustainability
Professional (ENV SP)

OSHA 10-Hour Construction
Safety and Health

Mike Monte, PE, ENV SP

Renewable Electrical Projects Lead

Michael Monte has 15 years of experience includes study, design, and project management services for electrical system and infrastructure improvement projects. His specific project experience includes performing load studies, energy audits and optimization, developing electrical construction cost opinions, low and medium voltage power distribution system design, emergency power system design, short circuit and arc flash analysis, control schematic design, utility coordination, developing and drafting one-line diagrams, creating electrical equipment layouts, designing room layouts, existing condition assessments, duct bank design and layout, lighting design, and grounding and lightning protection design. Mr. Monte has used lessons learned from the multitude of design and power systems analysis projects to guide the design of electrical upgrades to focus on safety, reliability, operational efficiency, and sustainability.

EXPERIENCE

CITY OF LAFAYETTE, BOILER REPLACEMENT, DIGESTER GAS UTILIZATION AND SOLAR ENERGY STUDY | LAFAYETTE, IN, USA

Electrical Engineer

Work involved digester gas utilization evaluation with planned plant upgrades and potential boiler system upgrades. This evaluation was prepared to Triple-Bottom Line for capital, energy, and community benefits. A comprehensive energy plan was developed to generate power and heat with a co-generation system, schedule equipment replacement for efficiency improvements, and clean the digester gas to the quality for vehicle fueling or to be used as a high-BTU content fuel. The overall plan included a 600-kW photovoltaic installation to maximize renewable energy production and maximize the owner's land use for space identified as not suitable for building construction.

MILWAUKEE METROPOLITAN SEWERAGE DISTRICT, 2020 ENERGY PLAN | MILWAUKEE, WI, USA

Electrical Engineer

This project's purpose is to provide a comprehensive plan to help MMSD become less reliant on fossil fuels. The plan includes evaluation and analysis at the Jones Island and South Shore Water Reclamation Facilities, the conveyance system, and the administration facilities to determine opportunities for energy conservation and renewable energy sources to achieve the MMSD's 2035 Vision: 100% of energy needs with renewable sources, 80% of energy needs with internal renewable sources, and 90% carbon footprint reduction from MMSD's 2005 baseline. Mike performed the energy data analysis and review, generation profiles, and determine the non-renewable energy gap that needs to be offset with renewable energy.

WHEATON SANITARY DISTRICT, ANAEROBIC DIGESTION FACILITIES ENHANCEMENTS AND OPPORTUNITIES STUDY | WHEATON, IL, USA

Electrical Engineer

The study examined the potential of utilizing the biogas produced from the anaerobic digesters to generate electricity and provide a conceptual design focused on offsetting the WWTP's energy usage. Various types and configurations of an Energy Recovery Facility were evaluated for an approximately 200 kilowatt electrical system capacity. Mike performed an economic evaluation of the proposed configurations, including capital costs and energy savings calculations. The study included a comprehensive analysis of the major components required for a Combined Heat and Power (CHP) facility.

NORTH SHORE WATER RECLAMATION DISTRICT, ENERGY CONSERVATION AND STORMWATER MANAGEMENT STUDY | NORTH SHORE, IL, USA

Electrical Engineer

The study included an analysis of a proposed photovoltaic system on top of a five-acre retention basin cover. The study included calculating the capacity of the photovoltaic system and examining the energy generation potential and financial analysis to demonstrate the feasibility of an approximately two mega watt photovoltaic installation.



YEARS OF EXPERIENCE

13 Years

YEARS WITH TYLIN

<1 Year

EDUCATION

MBA, University of Illinois at Urbana-Champaign, 2022

MS, Civil & Environmental Engineering, Carnegie Mellon University, 2011

BS, Environmental Sciences, Renmin University, 2010

LICENSE

Professional Engineer, Wisconsin

*Previous employer experience

Chen Li, PE

Process Optimization Lead

Chen is a licensed Environmental Engineer with 13 years of experience in Water and Wastewater Treatment Specialist, currently focused on supporting municipal utilities in solids handling, high-strength waste planning, and infrastructure rehabilitation. Expertise in process mechanical design, mass/energy balance analysis, hydraulic analysis and PFAS remediation. Strong foundation in advanced treatment technologies from a decade in the private sector, with consulting experience supporting the Milwaukee Metropolitan Sewerage District (MMSD) and other major municipal wastewater projects.

EXPERIENCE

MILWAUKEE METROPOLITAN SEWAGE DISTRICT, PLANNING SERVICE HSW SYSTEM IMPROVEMENTS | MILWAUKEE, WI, USA

Deputy Project Manager and Project Engineer

Chen currently serves as Deputy Project Manager on MMSD's High Strength Waste System Improvements project. Her work includes providing technical input on receiving station upgrades, leading development of mass and energy flow calculations and evaluating pretreatment options for FOG and dairy waste. She also supports capital analysis under MMSD's Energy Plan targets.

BALTIMORE CITY DEPARTMENT OF PUBLIC WORKS, ENGINEERING DESIGN SERVICES HIGH-RATE CONTROL BUILDING & GRAVITY SLUDGE THICKENER NO. 1 THROUGH 8 REHABILITATION AT BRWWTP | BALTIMORE, MD, USA

Lead Project Engineer

Chen is currently leading the rehabilitation design of the Gravity Sludge Thickeners (GSTs) as part of the Back River Wastewater Treatment Plant's solids handling upgrades. The project focuses on restoring the function and reliability of the facility's eight gravity sludge thickeners to improve solids handling and biosolids processing. Her work includes evaluating structural, mechanical, and hydraulic conditions of the thickeners; analyzing historical operating scenarios, producing design calculations and developing performance-based upgrade recommendations.

*A.O. SMITH, PFAS REMOVAL PRODUCT DEVELOPMENT | MILWAUKEE, WI, USA

Engineering Manager

Chen led the design and development of a high-capacity PFAS remediation system, aligning with EPA's latest water quality standards. Engineered adsorptive media solutions capable of reducing 1000 ppt PFOS and 500 ppt PFOA to <4 ppt. Work included the design for treatment systems for pharmaceuticals, disinfection byproducts, and organic contaminants, achieving NSF 53 & 401 certification. She managed Isotherm, RSSCT, pilot-scale system testing, regulatory approval processes, and full-scale deployment strategies.

*A.O. SMITH, AQUASANA WHOLE HOME FILTRATION LINE UPGRADE | MILWAUKEE, WI, USA

Senior Project Engineer and Product Development

Chen managed the development of whole-home water treatment systems, generating \$20M+ in annual sales. Part of her work included designing treatment train and verified contaminant removal performance for pesticides, disinfection byproducts, PFAS, iron, lead and arsenic. She led cost-reduction and optimization projects for high-efficiency filtration systems. She also worked cross-functionally with R&D, operations, regulatory compliance, and field-testing teams.

*A.O. SMITH, EMERGING TREATMENT TECHNOLOGIES INVESTIGATIONS | MILWAUKEE, WI, USA

Senior Project Engineer and R&D

Chen developed an NF membrane coating process, enhancing hardness reduction (>95%). She also developed several low-cost UV-LED solutions for Indian water treatment market.



YEARS OF EXPERIENCE

10 Years

YEARS WITH TYLIN

10 Years

EDUCATION

BS, Mechanical Engineering,
University of Illinois at Urbana-
Champaign, 2015

LICENSE

Professional Engineer, Illinois,
Wisconsin, California

Matt Pontikis, PE

Energy Planning Lead

Matthew Pontikis brings 10 years of experience in HVAC, Plumbing, and Fire Protection design. His experience includes energy audits and optimization, heating and cooling system design, plumbing design, energy analysis and modeling, data analysis, 1D CFD modeling, and drafting including Revit and AutoCAD. He has worked on projects for Milwaukee Metropolitan Sewerage District and Milwaukee Metropolitan Sewerage District delivering HVAC, electrical, and plumbing design.

EXPERIENCE

MILWAUKEE METROPOLITAN SEWERAGE DISTRICT, 2020 ENERGY PLAN | MILWAUKEE, WI, USA Mechanical Engineer

TYLin provided a comprehensive plan to help Milwaukee Metropolitan Sewerage District (MMSD) become less reliant on fossil fuels. The plan included evaluation and analysis at the Jones Island and South Shore Water Reclamation Facilities, the conveyance system, and the administration facilities to determine opportunities for energy conservation and renewable energy sources to achieve the MMSD's 2035 Vision: 100% of energy needs with renewable sources, 80% of energy needs with internal renewable sources, and 90% carbon footprint reduction from MMSD's 2005 baseline. Internal resources include maximization, optimization, and utilization of landfill gas and digester gas for the existing CHP systems and possible opportunities for other applications to approach zero flaring. Matt performed energy data analysis and review to identify energy consumption and generation profiles and determined the non-renewable energy gap. He also led production of the comprehensive energy plan and roadmap including energy savings projects and renewable energy recommendations. The roadmap provided project timelines and costs that would achieve MMSD's goals.

LAFAYETTE RENEW, DIGESTER GAS UTILIZATION, COMBINED HEAT AND POWER, AND SOLAR SYSTEM ENERGY ANALYSES | LAFAYETTE, IN, USA

Mechanical Engineer

TYLin evaluated opportunities for digester gas utilization and renewable electricity generation. Matt was responsible for analyzing the plant's digester gas production, heat and power demand, and utility bills to determine the feasibility of installing gas cleaning, solar, and/or CHP systems at the plant. He worked closely with the utilities to determine rate structures and requirements for net metering the power generated. Matt also developed cost estimates of the projects to determine simple paybacks using the utility rate structures, plant energy consumption, and project energy production.

CITY OF EVANSTON, CLIMATE ACTION AND RESILIENCE PLAN (CARP) ASSESSMENT FOR THE CITY OF EVANSTON'S SERVICE CENTER FACILITY EVALUATION AND MASTER PLAN | EVANSTON, IL, USA

Design Lead

TYLin provided a master plan for systems and city operational needs at the service center that incorporates the city's sustainability initiatives outline in the plan. Matt led the CARP assessment and report documenting the feasibility of achieving the city's goals at the service center and making recommendations and a plan to achieve them. He was also responsible for leading data analysis and energy calculations as part of the evaluation.

COGENERATION FACILITY FEASIBILITY STUDY | MIDDLESEX COUNTY UTILITY AUTHORITY, NJ, USA

Mechanical Engineer

Matt completed analysis of historical landfill gas conveyance, energy generation, and energy consumption using facility spreadsheet data from flow transmitters and meters, as well as utility electricity and natural gas bills. He was also responsible for evaluating alternatives for power generation equipment type and capacity using the analyzed data and determining simple paybacks and LCC's for the different alternatives.



Maithilee Das Lappin, PE, ENVP SP, LEED Green Associate

Utility and Permitting Lead

With a decade of experience in the industry, Maithilee has gained expertise in planning, design and construction services for wastewater infrastructure systems, including serving as Project Manager for combined sewer overflow facilities (CSO) storage and conveyance facilities and wastewater treatment plant (WWTP) upgrade and expansions, development of asset management programs, strategic planning, sewer extensions and rehabilitation, digester gas utilization and energy optimization. With her distinctive passion for sustainability and resiliency, she led the development of Indiana's first regional Climate Action Plan in Greater Lafayette. She is currently assisting communities on both US coasts with their climate action and resiliency journeys.

EXPERIENCE

LAFAYETTE RENEW AND CITY OF LAFAYETTE, UTILITY REBRANDING | LAFAYETTE, IN, USA Project Engineer

With a goal to promote sustainable solution through private and public sustainable public partnerships, community education, and application of progressive technologies, and procedures, the City of Lafayette rebranded the utility from the Lafayette Water Pollution Control Department to Lafayette Renew. Maithilee drafted and applied for the Water Environment Federation (WEF) Utility of the Future (UTOF) Award on behalf of the utility. Lafayette Renew became the first utility in Indiana to receive this recognition in 2018.

CITY OF LAFAYETTE, CITY OF WEST LAFAYETTE AND TIPPECANOE COUNTY, GREATER LAFAYETTE CLIMATE ACTION PLAN | MULTIPLE LOCATIONS, IN, USA Project Manager

Led the development of a historic, collaborative, regional, synergistic and holistic climate action plan for the Greater Lafayette community. A strong emphasis was on clean and renewable energy alternatives, including solar pilot projects that were implemented for the wastewater utility.

CITY OF LAFAYETTE, BOILER REPLACEMENT, DIGESTER GAS UTILIZATION AND SOLAR ENERGY STUDY | LAFAYETTE, IN, USA Mechanical Engineer

Work involved digester gas utilization evaluation with planned plant upgrades and potential boiler system upgrades. This evaluation was prepared to Triple-Bottom Line for capital, energy, and community benefits. A comprehensive energy plan was developed to generate power and heat with a co-generation system, schedule equipment replacement for efficiency improvements, and clean the digester gas to the quality for vehicle fueling or to be used as a high-BTU content fuel. The overall plan included a 600-kW photovoltaic installation to maximize renewable energy production and maximize the owner's land use for space identified as not suitable for building construction.

CITY OF SOUTH BEND, DIGESTER GAS UTILIZATION STUDY AND DESIGN | SOUTH BEND, IN, USA Project Engineer

TYLin performed a comprehensive energy audit and equipment needs assessment that allowed the plant to maximize use of a renewable energy source (digester gas). The project included mixing to increase gas production as well as the installation of a gas cleaning skid using pressure swing absorption to clean the gas to pipeline quality. The CNG station is used to fuel City fleet vehicles.

UNIVERSITY OF CALIFORNIA - SANTA BARBARA, CLEAN ENERGY MASTER PLAN | SANTA BARBARA, CA, USA Advisor

The focus of this decarbonization study and master plan was to: (1) produce a strategy for a 90% or greater environmental reduction in Scope 1 emissions from fossil gas use in campus energy systems from a 2019 baseline study; (2) Identify environmental justice and equity considerations related to the transition to fossil fuel free infrastructure; (3) Document knowledge gaps, and subsequent studies and analyses needed to achieve a Net-Zero campus; (4) Identify climate resiliency planning considerations.

YEARS OF EXPERIENCE

10 Years

YEARS WITH TYLIN

10 Years

EDUCATION

MS, Environmental and Ecological Engineering, Purdue University, 2019

BS, Environmental and Ecological Engineering, Purdue University, 2015

LICENSE

Professional Engineer, Indiana

Envision™ Sustainability Professional (ENV SP)

LEED Green Associate

CERTIFICATIONS

OSHA 40-Hour HAZWOPER Certification



YEARS OF EXPERIENCE

45 Years

YEARS WITH TYLIN

8 Years

EDUCATION

Ph.D. Geography, Rutgers University, 1986

MCRP City & Regional Planning, Rutgers University, 1986

BS, Urban Affairs, Boston University, 1973

PROFESSIONAL AFFILIATIONS

Air & Waste Management Association (AWMA)

Institute of Noise Control Engineering (INCE)

Nancy Neuman, Ph.D

GHG and Air Permitting Lead

Ms. Neuman has over 45 years of experience in environmental studies in numerous states and has served as an expert witness for both air quality and noise. Her experience includes modeling air quality concentrations and noise levels from a wide variety of mobile and stationary sources, as well as monitoring noise levels at sites throughout New York. Air quality and noise analyses have included housing developments, waste material transfer stations, highway constructions, power plants, manufacturing sites, airports, marine terminals, elevated rail and rail terminals, and wastewater treatment plants. She has also prepared over a hundred Phase I ESA's for hazardous materials. She has also been a guest lecturer on community noise assessment at New York University for the Summer Institute in Environmental Impact Assessment and the Science and Environmental Reporting Program.

EXPERIENCE

MIDDLESEX COUNTY UTILITIES AUTHORITY, ODOR SOURCE AND MITIGATION MODELING | SAYREVILLE, NJ, USA

Air Quality Task Leader

Nancy was the air quality task leader for the TYLin Team contracted to develop odor control strategies for a wastewater treatment plant operated by the Middlesex County Utilities Authority. Tasks included a review of previous odor modeling studies and approaches to odor modeling, selection of a dispersion model (AERMOD), selection of pollutants to model (hydrogen sulfide), conversion of monitored values to emission factors for use with AERMOD, calibration of the AERMOD model for use with the MCUA sources, and direction of AERMOD modeling for baseline and odor mitigation scenarios. She developed emission factors using pollutant data from AcruLogs taken every three minutes over a one-month period at multiple locations. Emission factors were based on the flow rate of wastewater through influent/effluent channels and sedimentation tanks.

NYC DEPARTMENT OF ENVIRONMENTAL PROTECTION, TRAFFIC ANALYSES WITH CEQR EAS/EIS REVIEW PROJECT | NEW YORK, NY, USA

Senior Technical Reviewer, Air Quality and Noise

Nancy is the lead participant in TYLin's on-call contract with the NYC Department of Environmental Protection (NYCDEP). Tasks include reviewing EAS/EIS documents and background materials submitted by applicants for proposed projects. She identifies deficiencies in the air/noise analyses and prepares memos for DEP's signature that outline changes to be made for the resubmittal of the documents. Representative projects reviewed include a tunnel beneath the East River to handle combined sewer overflows, a permit modification for a waste transfer station, and construction of a new CHP plant to complement an existing energy building cogeneration system.

SOUTH SHORE RECYCLING LLC, CLIMATE LEADERSHIP AND COMMUNITY PROTECTION ANALYSIS, STATEN ISLAND | NEW YORK, NY, USA

Senior Technical Advisor, Air Quality and Noise

South Shore Recycling operates a Solid Waste Transfer Station in Staten Island, NY and is pursuing a permit to enclose C&D operations within a new building. Dr. Neuman directed air quality and noise analyses and the Climate Leadership and Community Protection Act (CLCPA) analysis. This included calculation of greenhouse gas (GHG) emissions, conversion of GHG emissions to CO₂e, and comparison of CO₂e between Existing Conditions and With Action Conditions to determine whether the evaluation criteria were exceeded. This was carried out pursuant to NYSDEC's policy to incorporate climate change considerations into aspects of its activities and comply with the specific requirements of the CLCPA and the Community Risk and Resiliency Act (CRRRA) of 2014.

C. References

Greater Lafayette Climate Action Plan and Renewable Energy Plan | Lafayette Renew, IN

YEAR COMPLETED

Variou, 2022-2025

REFERENCE

Brad Talley
Superintendent
1700 Wabash Avenue
Lafayette, IN 47909
(765) 807-1800
btalley@lafayette.in.gov



Lafayette Renew, a Utility of the Future, has embarked on a mission to reduce energy consumption at their WWTP. The plant understands that while a portion of digester gas is currently used for digester and building heating, there are opportunities to further optimize digester and natural gas utilization by improving solids and waste handling processes. In 2017 and 2018, our team assisted in the pilot of a number of dewatering systems including a belt filter press, centrifuge and volute dewatering press. Through our preliminary engineering study, the PWTech volute dewatering press was selected as the preferred system due to its small footprint, low horsepower, ease of maintenance and high performance. This system has resulted in significant energy and cost savings over time. Additionally, Lafayette had long envisioned the installation of a solar field to accomplish their long-term goal of energy and carbon neutrality at the WWTP. Our team has assisted the utility every step of the way, including assistance with the solar vendor procurement. Today, Lafayette proudly owns three photovoltaic arrays in different locations of the city, including a 810 kW DC solar field at their WWTP. All three arrays are in service and helping offset peak and base electrical demand, thus reducing electrical energy costs for each facility and resulting in significant annual savings, as well as supporting the City's overall carbon emission reduction goals as put forth by the Greater Lafayette Climate Action Plan (2023). Our team has also assisted the utility with their Asset Management Plan. Through this work, the installation of a high efficiency turbo blower has resulted in energy and cost savings for the plant. This work was later combined with the replacement of the 20-year old bubble diffusers with current technology, allowing for better efficiency and more energy savings.

Renewable Energy Program | Middlesex County Utilities Authority, NJ

YEAR COMPLETED

Ongoing

REFERENCE

Wilfredo Guzmán
Senior Program Manager
2571 Main Street
Sayreville, NJ 08872
(732) 721-3800 x 542
wguzman@mcua.com

TYLin has been tasked with providing professional engineering services to develop a feasibility study for the replacement of the Middlesex County Utility Authority's (MCUA), New Jersey Cogeneration Facility located at their Central Treatment Plant. The existing Cogeneration Facility utilizes approximately 4,500 scfm of Landfill Gas (LFG) to fuel a combined cycle consisting of two gas turbines, with heat recovery steam generators (HRSG) that use turbines exhaust to produce steam for a steam turbine. The total installed generation output is 20.2 MW. The electricity generated from the gas and steam cogeneration cycle has been used beneficially on site at the Central Treatment Plant. With the existing Cogeneration Facility approaching the end of its useful service life, and in accordance with the county's "Destination 2040" sustainability plan, MCUA required a holistic feasibility study to further develop a clean energy source while limiting waste. The energy analysis included the evaluation of all current and future energy sources.

2020 Energy Plan | Milwaukee Metropolitan Sewerage District, WI

YEAR COMPLETED

2024

REFERENCE

Micki Klappa-Sullivan
Engineering Design Manager
260 W. Seeboth Street
Milwaukee, WI 53204
(414) 225-2205
mklappasullivan@mmsd.com

This project provided a comprehensive energy management plan to help MMSD become less reliant on fossil fuels. The plan included evaluation and analysis at the Jones Island (330 MGD) and South Shore (300 MGD) Water Reclamation Facilities, the conveyance system, and the administration facilities to determine opportunities for energy conservation and renewable energy sources to achieve the MMSD's 2035 Vision: 100% of energy needs with renewable sources, 80% of energy needs with internal renewable sources, and 90% carbon footprint reduction from MMSD's 2005 baseline plant capacity. The project delivered a capital planning report including a roadmap that presented project timelines and costs to achieve MMSD's vision.

Dillman Road Wastewater Treatment Plant Upgrade and Efficiency | City of Bloomington Utilities, IN

YEAR COMPLETED
2022

REFERENCE

Dan Hudson
Capital Improvements
Manager
600 East Miller Drive
Bloomington, IN 47401
(812) 349-3653
daniel.hudson@
bloomington.in.gov



A 20-year Facilities Plan was prepared to assist in the evaluation, scheduling, and coordination of the various wastewater improvements. The design for this project included the first phase of recommended improvements to increase capacity from 15 mgd to 20 mgd and peak flow capacity from 30 mgd to 40 mgd to meet 20-year flow projections. The design of the first phase of improvements included upgrades necessary to achieve a capacity increase as well as improvements aimed at improving energy efficiency and operations at the plant. Efficiency and operational improvement projects included providing correctly sized process air blowers to meet current and future aeration needs, providing automated process air control valves to meet pre-set dissolved oxygen requirements to better control the process and reduce energy consumption.

Clean Energy Master Plan | University of Santa Barbara, CA

YEAR COMPLETED
2024

REFERENCE

Jordan Sager
Associate Director, Energy &
Engineering
5221 Cheadle Hall
Santa Barbara, CA 93106
(805) 893-5365
jsager@ucsb.edu



This plan included full analysis of campus buildings, infrastructure, and decarbonization strategies – including full initial and life cycle cost analysis – to help the campus to establish a pathway and implementation plan to meet the University of California Office of the President (UCOP) goals for decarbonization. The Clean Energy Master Plan will define a strategy for 90% reduction in Scope 1 greenhouse gas emissions; those resulting from onsite fossil used in campus energy systems and that make up the vast majority of UCSB’s GHG emissions. The Plan will provide high-level estimates encompassing both total capital and operational costs and savings and provide financial information crucial in weighing potential decarbonization strategies. In addition to the formulation of a 90% emissions reduction strategy, the Plan will document any current knowledge gaps that point to areas for improvement and potential methods to incorporate new practices, as well as outline subsequent analyses required to conduct a comprehensive Net-Zero Campus assessment. Planning incorporates the identification of living laboratory opportunities for research demonstrations, courses, and student projects, as well as service activities, along with scalable and replicable knowledge sharing. Coordination with campus utilities, ongoing projects, and related site civil and master planning activities was essential to providing an actionable plan.

D. Project Approach

Project Methodology + Management

Our team is committed to delivering a comprehensive energy plan that aligns with your organization's goals while integrating the unique insights and experience of your team. By building on our proven track record with projects like MMSD and Greater Lafayette Climate Action and Renewable Energy Plan, we will collaborate closely with you to create a plan that is both visionary and actionable, addressing immediate energy needs and setting the stage for future sustainability. We first start by developing your Energy Roadmap to start with the end in mind, and work backwards to where we need to begin.

The objectives for this Energy Roadmap are to:



Identify the optimal energy plan for Racine.



Consider the greenhouse gas footprint and future energy demands.



Develop new strategies regarding Net Zero.



Evaluate partnerships with utilities and other entities.

We are excited to collaborate with you in developing a comprehensive energy roadmap that not only meets your current needs but also sets a visionary path forward. Our approach is centered on collaboration and leveraging the deep knowledge and experience that you, as experts in your system, bring to the table.



Collaborative Approach: We recognize that no one knows your system better than you do. Our goal is to work with you, not just for you, ensuring that your insights and experience are fully integrated into the planning process. Together, we will build a plan that reflects the unique characteristics of your system and aligns with your organization's goals.



Proven Expertise: We have successfully executed similar projects at an industry-leading level, and we believe no one else can match the depth and effectiveness of our approach. Our work with the Milwaukee Metropolitan Sewerage District (MMSD) stands as a testament to this. We have a proven track record of delivering high-impact energy planning that sets new standards in the industry.



Holistic Planning: Our team understands the importance of integrating existing experience, previous studies, and ongoing projects into a cohesive plan. We specialize in pulling these elements together to create a comprehensive energy plan that your Board of Directors can use to set a clear and actionable vision for your energy goals. Our success with MMSD and Waukesha demonstrates our ability to deliver such holistic planning.



Actionable Plans: We don't just deliver plans; we provide concrete, actionable strategies that lead to real, measurable improvements in energy usage. Our work with MMSD is a clear example of our ability to turn plans into real-world results that drive meaningful change.



Understanding Infrastructure: A successful energy plan requires a deep understanding of the connection between electrical infrastructure and renewable energy projects. Our experience with MMSD has shown that we have the expertise to design plans that address both aspects, ensuring that your energy goals are not only ambitious but also achievable.

Task 0: Project Management

Strong project management is required to successfully deliver this project which includes contract administration, budget management, executing the project delivery, leading meetings and workshops, responsibility for coordinating communications, and building a team environment for all stakeholders. A Project Performance Plan (PPP) will be developed at the start of the project to define project milestones, stakeholders, deliverables, schedule and cash flow projections. The PPP will be monitored closely to mitigate potential schedule delays and budget overruns and communicated to Racine Wastewater Utility (RWWU) Project Manager through monthly progress status reports. Frequent check-ins will occur to keep RWWU informed of the progress as well as potential challenges that could arise so that they are addressed swiftly.

Our proposed approach reorganizes tasks slightly in a way we believe will help the project team and utility make informed decisions regarding establishing evaluation metrics and energy goals.

The start of the project will include a kickoff meeting to review the project scope and outcomes from this project.

Deliverables

- Workshop 0: Project Kick-Off Meeting

Task 1: Review Energy Consumption and Demand and Evaluate Optimization Opportunities

We propose reordering the tasks listed in the RFP to review energy consumption and evaluate optimization opportunities prior to establishing the metrics and goals. This will allow us to propose and establish an energy and GHG baseline to present to RWWU leadership and stakeholders to make informed decisions regarding future metrics and goals.

During this task, we will build off the work that we have already started with RWWU and thoroughly analyze the existing energy data associated with each process. We will thoroughly review the existing energy data associated with each process. Our approach includes:

Data Review: We will examine how the current energy data was obtained, whether through utility meters, equipment monitoring, estimates, or other methods.

Consensus Building: It is crucial to define the project boundary clearly. We will facilitate discussions to gain consensus on what is included in this scope.

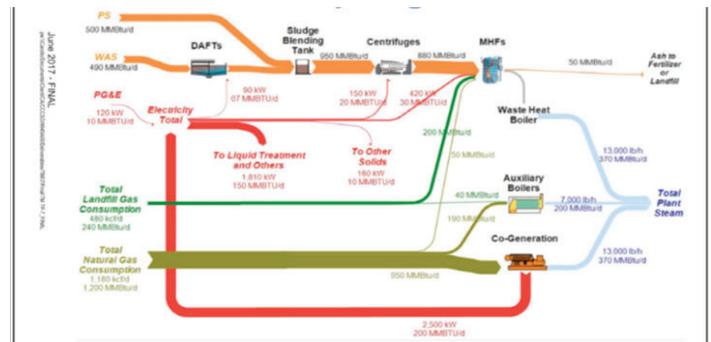
After setting a clear boundary, we will analyze energy consumption across the entire treatment process. Racine's facility includes flow equalization, pumping, mechanically cleaned bar screens, grit removal, primary clarification, activated sludge aeration with blowers, anaerobic digestion, UV disinfection, and belt filter press dewatering. Each process contributes to energy consumption. After determining the energy consumption, we'll create a process-level energy profile showing demand by each operation using visualization tools such as Sankey diagrams to display energy flows and losses from the generation source to the consuming process.

Our analysis will quantify biogas production and its contribution to onsite energy offset, and review utility rate structures to identify opportunities for cost savings.

After thoroughly analyzing existing conditions, we will provide recommendations for equipment specification updates for future capital projects, operational optimization, and replacement criteria considering lifecycle cost energy performance. **Examples of systems evaluated for optimization include pumping systems, aeration systems, digestion and high strength waste, and facility boilers. This analysis will result in a new energy baseline and identify opportunities for energy demand reduction.**

Deliverables

- Workshop 1: Energy Baseline and Optimization Opportunities



A Sankey Diagram example showing energy sources on the left and end consumers on the right, visually depicting where and how much energy is consumed.



NYCDEP 26th WARD - Pump Station and Settling Tanks Upgrade: TYLin performed energy modeling with results showing an anticipated reduction goal of 18 to 20% from the blower system alone. This could be achieved by the proposed project based on the increased efficiency of the new blowers. During implementation, this energy reduction goal was exceeded and received the **Envision Silver Award**.



TYLin completed digester rehabilitation for Evansville Water and Sewer Utility. As part of the project, more efficient pumps were installed, the existing boilers were rehabilitated to improve efficiency, and a jet mixing system was added. The improvements significantly increased methane gas production which facilitated a future project to utilize the digester gas to produce energy.

Task 2: Evaluate and Establish Metrics and Goals

After presenting the baseline energy consumption and greenhouse gas (GHG) emissions, we will work with RWWU leadership to gain alignment on an agreed set of metrics. We'll define what success looks like to achieve 80%, 90% and 100% renewable energy attainment from current level. Key subtasks include:

- Host a meeting with Utility staff and stakeholders.
- Present and establish baseline energy consumption and GHG emissions.
- Review and align with City's climate and sustainability goals.
- Identify Key Performance Indicators (KPI's), such as renewable percentage, GHG emissions, kWh per MG treated, and cost impact.

We will ensure KPI's reflect RWWU's priorities, setting the stage for clear benchmarking. An example of establishing metrics and goals and energy and GHG baselines include the MMSD Energy Plan.

Deliverables

- Workshop 2: Key Metrics and Goals

Task 3: Cost Estimate to Provide Design Services for a 1,000 kW-DC Power Modular Solar Array

TYLin will develop a conceptual-level cost estimate for a 1,000 kW-DC modular solar array to be located on the plant property. The estimation work will include site suitability screening, coordination with We Energies or the local utility and preparing preliminary engineering assumptions for panel specifications, electrical tie-in, and operations and maintenance requirements. A Class 5 cost estimate will then be developed.

Deliverables

- Workshop 3: 1000 kW Solar Array Estimate and Planning
- 1,000 kW-DC Modular Solar Array Class 5 Cost Estimate

Task 4: Evaluate Partnerships with Other Utilities

We will lead a strategic exploration of partnership opportunities with external stakeholders to advance RWWU's energy goals in a fiscally responsible and technically feasible manner.

We will begin with a structured stakeholder mapping exercise - an approach TYLin has adopted through projects like Monroe County's Climate Adaptation and Resiliency Plan. The stakeholder mapping exercise will ensure that Utility leadership has a clear picture of where engagement will matter most. We will:

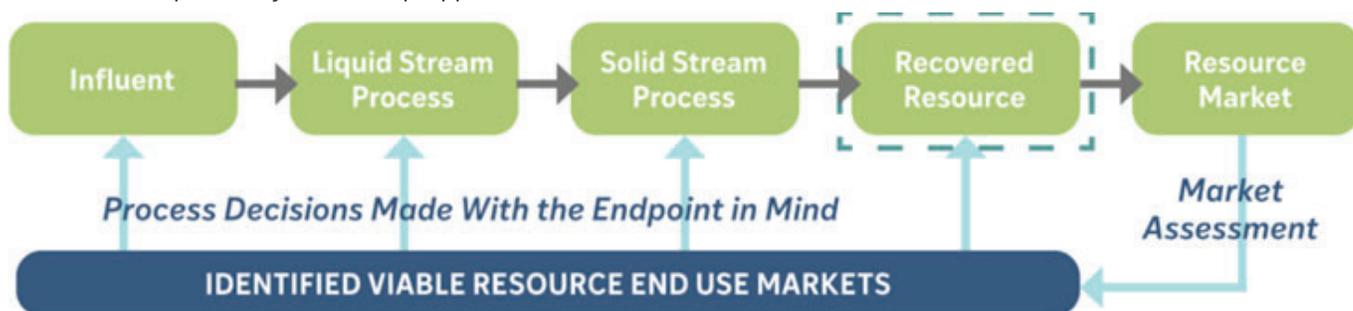
- **Conduct interviews with key stakeholders**, including neighboring utilities, waste generating utilities, energy utilities and potential P3 participants.
- **Identify shared objectives and mutual benefits**, for example, RNG off-take, lowering electricity rates, etc.

We will collaborate with RWWU leadership to ensure these discussions are constructive. Using data from the Racine 2024 Annual Report and leveraging our experiences with other waste utilities, we will identify:

- Feasibility of co-developing infrastructure such as anaerobic digestion, gas cleaning, and biosolids processing.
- Energy generation from shared facilities.

Deliverables

- Workshop 4: Utility Partnership Opportunities



► Stakeholder Mapping

Our team establishes a stakeholder mapping exercise as a structured process to categorize stakeholders by their roles, interests and opportunities for collaboration.



TYLin worked closely with Milwaukee Metropolitan Sewerage District (MMSD) to organize and present historical energy data in a format that allows for better tracking of their energy goals. Energy consumption and GHG data were tracked and presented by locations, fuel source, and equipment consumer.

Task 5: Prepare 5-Year and 20-Year Capital Improvement Plans (CIP)

Building on Tasks 1 through 4, we will develop 5-year and 20-Year Capital Improvement Plans (CIPs) that align with both RWWU's energy goals and existing 2020 Facility Plan priorities:



Carbon Neutrality

- Solar photovoltaics
- Increasing equipment and building efficiencies



Emit Cleaner Air

- Minimize biogas flaring
- Cleaner combustion exhaust



Discharge Cleaner Effluent Water

- Incorporate dissolved oxygen and ammonia controls
- More efficient and upgraded UV disinfection



Construct Green Infrastructure

- Green Roofs

We'll provide a detailed CIP Technical Memorandum outlining timelines, investments and responsibilities for the recommendations. We will clearly document all findings and decisions, ensuring effective communication with stakeholders and providing opportunities for feedback.

This approach will outline a clear path forward as well as emphasize City of Racine's team's ability to deliver results that are both innovative and practical. By integrating these tasks and approach points, TYLin will be able to achieve City of Racine's energy goals in a manner that is sustainable and forward-thinking.

This approach of providing a detailed timeline, project summary, and costs while seeking out and incorporating stakeholder feedback proved successful when we delivered the Milwaukee Metropolitan Sewerage District's (MMSD) 2020 Energy Plan which was adopted by MMSD commissioners in March of 2024.

Deliverables

- Workshop 5: Capital Improvement Plans
- 5 Year Capital Improvement Plan
- 10 Year Capital Improvement Plan

Proven CIP Program Innovation to Meet District Goals

2020 Energy Plan for MMSD Facilities

TYLin provided a comprehensive plan as an update to the 2015 existing plan to help MMSD become less reliant on fossil fuels by completing evaluation and analysis at various MMSD facilities. The team evaluated current renewable energy practices, completed energy analysis and monitoring, and provided MMSD with a plan focused on using established energy baselines and metrics to approach energy neutrality. **The planning report provided MMSD with a comprehensive list to measure the effort required to achieve certification based on the energy conservation opportunities available for the District.** As part of the Planning Report, the TYLin Team developed a Capital Improvement Plan (CIP) which included the life-cost analyses of all alternatives identified for each asset in Subtask B. The data gathered for each energy conservation opportunity was integrated into a Greenhouse Gas (GHG) calculation tool to determine the emissions reduction that will encompass the 80% carbon footprint reduction established by the District in its 2035 Vision.



E. Timeline

Our team stands prepared and capable of accelerating select portions of the project scope, including baseline analysis, metric setting, and solar design. We recognize the advantage of expediting these key elements to ensure early momentum and deliver value as swiftly as possible. While advancing these specific areas can be beneficial, we believe that allocating ample time for stakeholder engagement remains paramount. Meaningful collaboration and dialogue with stakeholders are critical to the success of this initiative, providing opportunities to gather valuable input, address concerns, and ultimately build a strong, unified consensus around project decisions. Our proposed schedule is crafted to balance the need for efficiency in technical deliverables with the necessity of thorough and inclusive stakeholder participation. By accelerating appropriate tasks while safeguarding the time required for effective engagement, we aim to foster both progress and partnership, positioning the project for long-term success.

Task	MONTH																	
	Dec-25	Jan-26	Feb-26	Mar-26	Apr-26	May-26	Jun-26	Jul-26	Aug-26	Sep-26	Oct-26	Nov-26	Dec-26	Jan-27	Feb-27	Mar-27	Apr-27	May-27
Notice to Proceed (December 1st, 2025)	★																	
Task 0 - PROJECT MANAGEMENT																		
Project Management																		
★ Project Kick-Off Meeting (December 2nd, 2025)	★																	
Provide Design Schedule and Cash Flow																		
Provide Monthly Design Progress Reports																		
★ Prepare and Attend 5 Workshops										★		★		★			★	
Provide Design Coordination and Management																		
Quality Assurance and Quality Control																		
Task 1 - Review Energy Consumption and Demand and Evaluate Optimization Opportunities																		
1A: Preliminary Background Data Request and Review																		
1B: Requests for Record Drawings and Other Background Information																		
1C: Design Reference Information Review																		
1D: Energy Analysis and Calculations																		
1E: Operational Optimization Recommendations																		
1F: Energy and Greenhouse Gas Baseline Recommendations																		
★ Workshop No. 1 - Energy Baseline and Optimization Opportunities																		
Task 2 - Evaluate and Establish Metrics and Goals																		
2A: Establish Sustainability Metrics																		
2B: RWWU PM Coordination																		
★ Workshop No. 2 - Key Metrics and Goals																		
Task 3 -1,000 KW-DC Modular Solar Array Cost Estimate																		
3A: Site Suitability Screening																		
3B: Utility Coordination																		
3C: Preliminary Engineering																		
3D: 1,000 kW-DC Modular Solar Array Cost Estimate																		
★ Workshop No. 3 - 1,000 kW-DC Solar Array Estimate and Planning																		
Task 4 -Evaluate Partnerships with Other Utilities																		
4A: Exploration of Partnership Opportunities																		
4B: Stakeholder Interviews and Synergy Identification																		
4C: Biogas and Energy Generation and Distribution																		
★ Workshop No. 4 - Utility Partnership Opportunities																		
Task 5 -Prepare 5-Year and 20-Year Capital Improvement Plans																		
5A: Develop Community Investment Plan																		
★ Capital Improvement Plan Memorandum																		
★ Workshop No. 5 - Capital Improvement Plan																		
Project Closeout (May, 2027)																		

Notes:

★= Project Milestone

F. Utility Engagement

Our team has demonstrated that comprehensive utility engagement is essential to successfully implement the major elements of your Energy Roadmap. Developing an engagement plan is key to understanding how to navigate the utilities' processes that range from managing system wide impacts to legal and regulatory affairs. Early, timely, and frequent communications with utilities will foster trust and develop the collaboration needed when working with utilities and other authorities having jurisdiction. Working closely with utilities and their stakeholders from the very start of the project is critical to managing risks, schedule, and expectations.

First, our team will work with Racine Wastewater Utility (RWWU) to notify the utilities of your desire to explore, develop, and implement energy projects. It is expected that the utilities will identify representatives as the point of contact to start this process. The team will work with the utilities to identify initial lines of communications and future stakeholders for the plan development. Next our team will begin the process of developing the engagement plan and identifying the expected stages of engagement with the utilities. The engagement plan is expected to include the following:

- ▶ Client account manager
- ▶ Data requests like billing and consumption history, and rate schedules
- ▶ Establish program and interconnect limits
- ▶ Incentivized funding
- ▶ Legal, pricing, and contracting
- ▶ Legal and regulatory approvals
- ▶ Utility approvals

Our proven success with engaging utilities through a defined plan will reduce many utility-related risks for new rate contracts, utility connections, approvals, and implementation. The reduction of these risks will lead to addressing issues before they become problems and provide the confidence to all stakeholders to move forward with the successful implementation of your Energy Roadmap.



RFQ Form A

Racine Wastewater Utility Energy Roadmap Study

Due Date: 09/19/2025 12:00 PM

RFQ FORM A

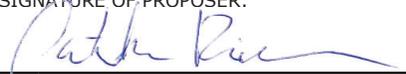
SIGNATURE AFFIDAVIT

Note: This form must be returned with your proposal response.

In signing this proposal, we certify that we have not, either directly or indirectly, entered into any agreement or participated in any collusion or otherwise taken any action in restraint of free competition; that no attempt has been made to induce any other person or firm to submit or not to submit a proposal; that this proposal has been independently arrived at without collusion with any other proposer competitor or potential competitor; that this proposal has not been knowingly disclosed prior to the opening of proposals to any other proposer or competitor; that the above statement is accurate under penalty of perjury.

The undersigned, submitting this proposal, hereby agrees with all the terms, conditions, and specifications required by the Utility in this Request for Proposal, and declares that the attached proposal and pricing are in conformity therewith, and attests to the truthfulness of all submissions in response to this solicitation..

Proposer shall provide the complete information requested below. Include the legal name of the Proposer and signature of the person(s) legally authorized to bind the Proposer to a contract.

Proposal Invalid Without Signature	
SIGNATURE OF PROPOSER: 	DATE: 9.10.2025
NAME AND TITLE OF PROPOSER: Katie Richardson, PE Associate Vice President	COMPANY NAME: T.Y. Lin International Great Lakes, Inc
TELEPHONE: 262-290-2254	ADDRESS: 200 South Wacker Drive, Suite 1400 Chicago, Illinois 60606
FAX NO.:	
Person to Be Contacted If There Are Questions about Your Proposal (if different from above)	
NAME:	TITLE:
TELEPHONE:	FAX NO.:

| Appendix: Exhibits

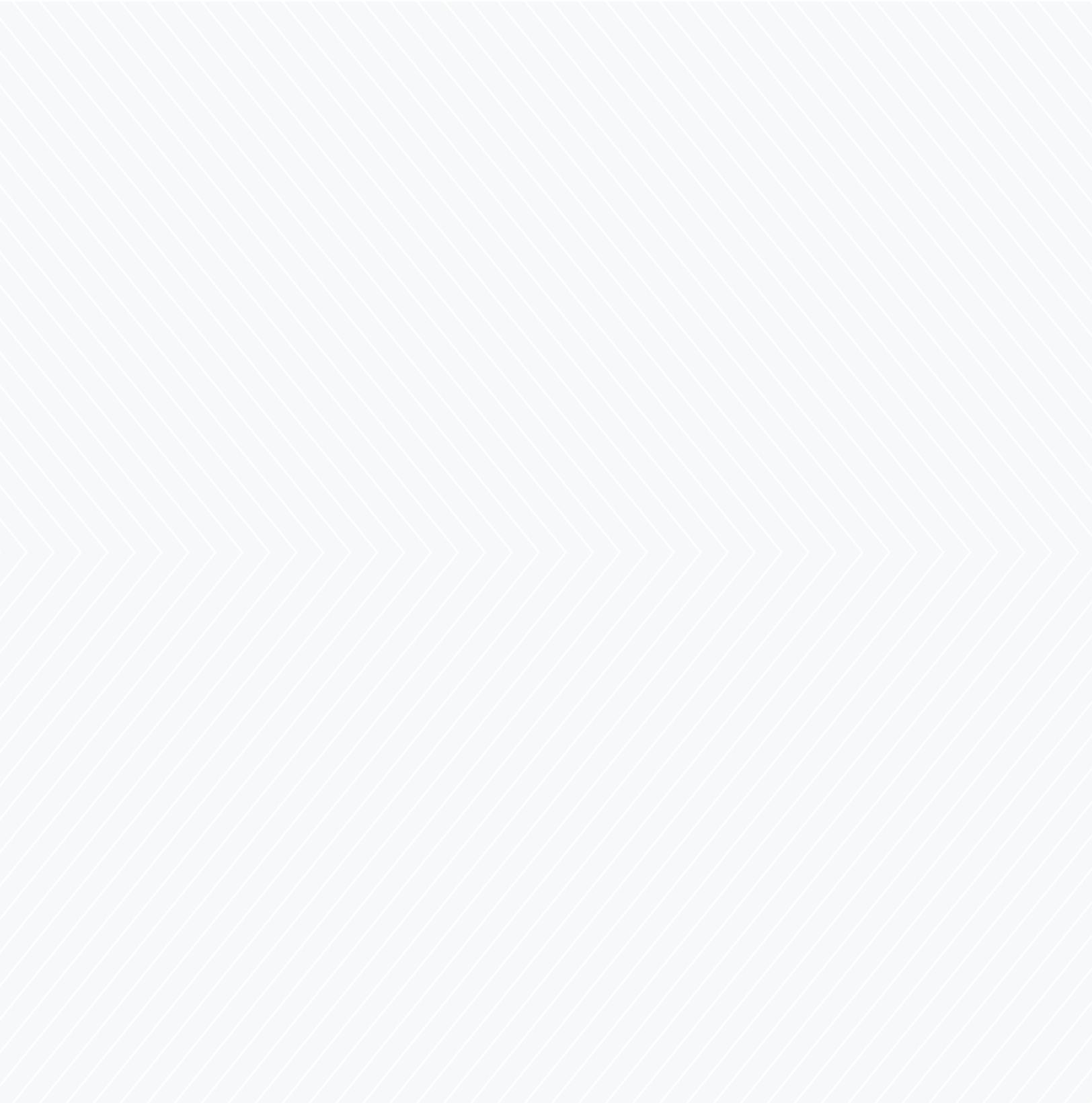
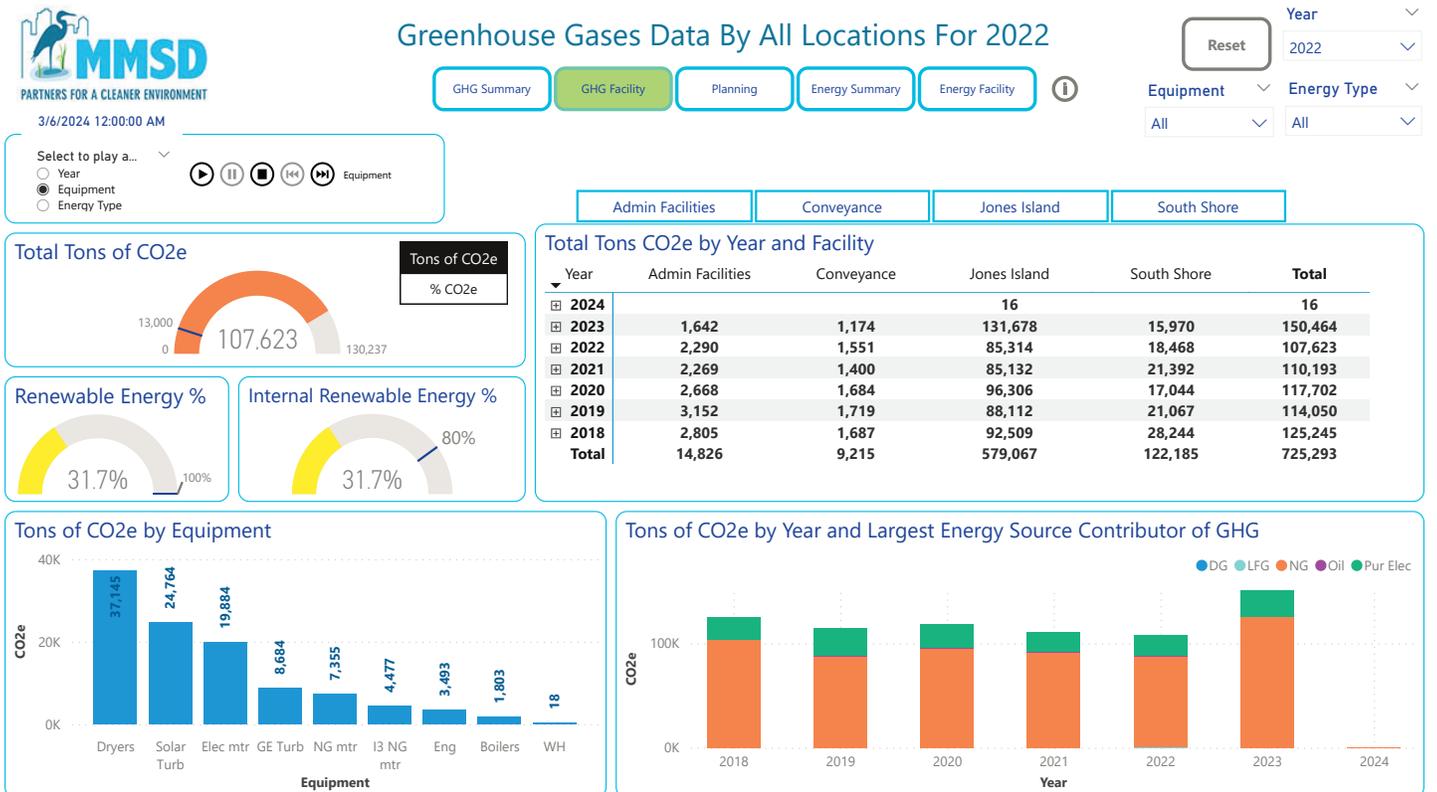
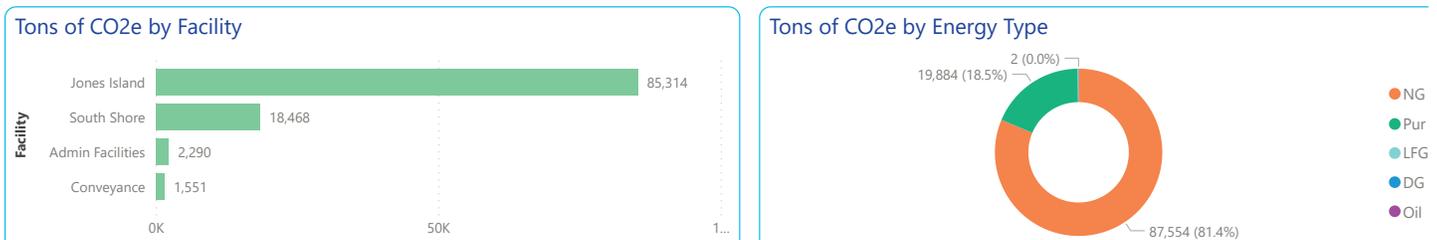
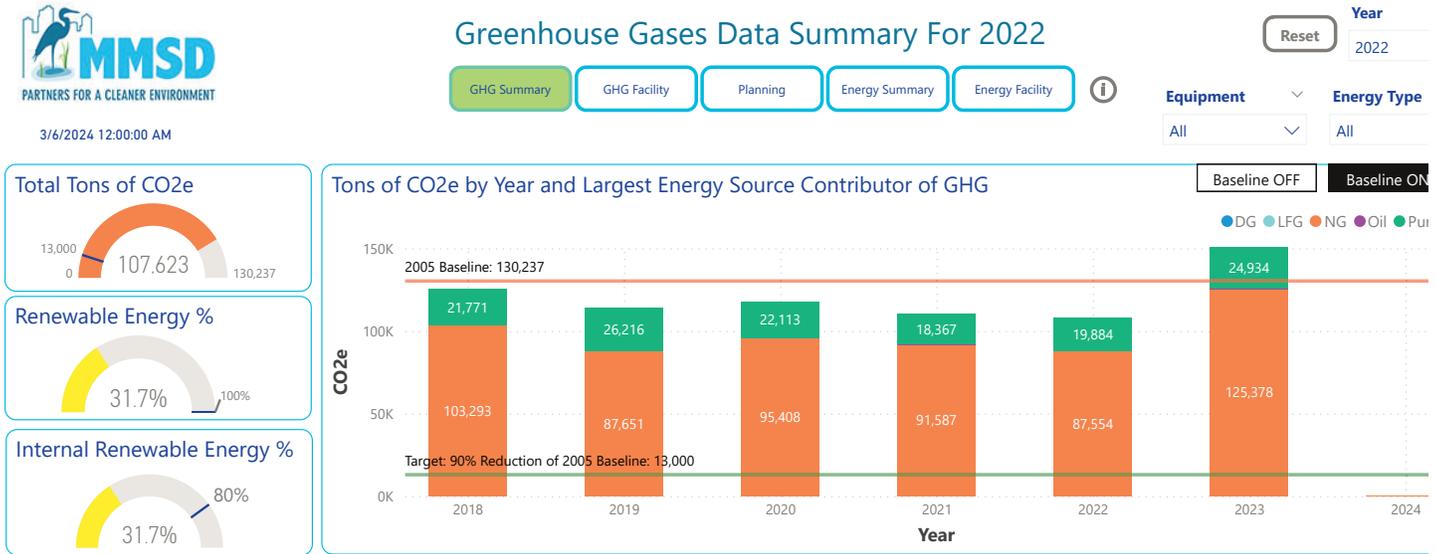


Exhibit A: MMSD's Greenhouse Gas and Energy Consumption Dashboard

Dashboard detailing MMSD's Greenhouse Gas and Energy Consumption and progress towards their goals of 90% CO2e reduction from their 2005 baseline, 100% renewable energy, and 80% internally renewable energy.





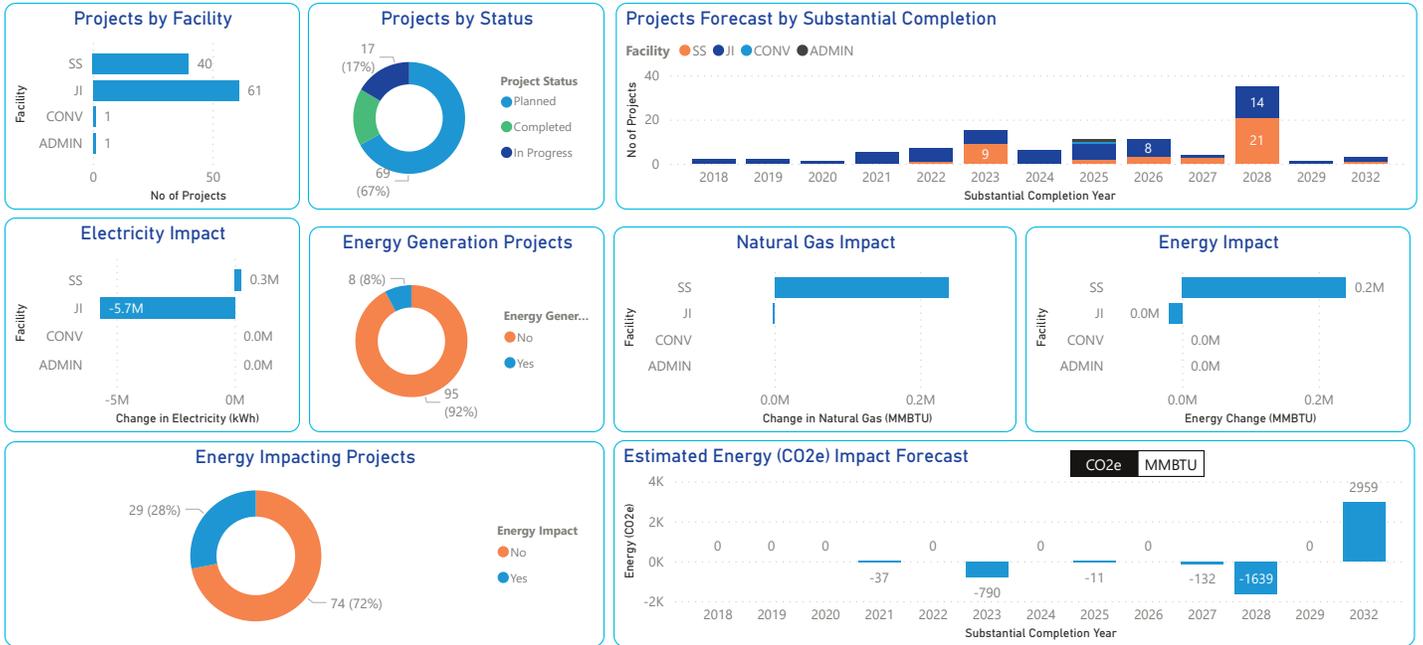
Planned Projects Energy Impact

3/6/2024 12:00:00 AM

Substantial Completion

GHG Summary GHG Facility Planning Energy Summary Energy Facility

Facility
Energy Generation
Energy Impact



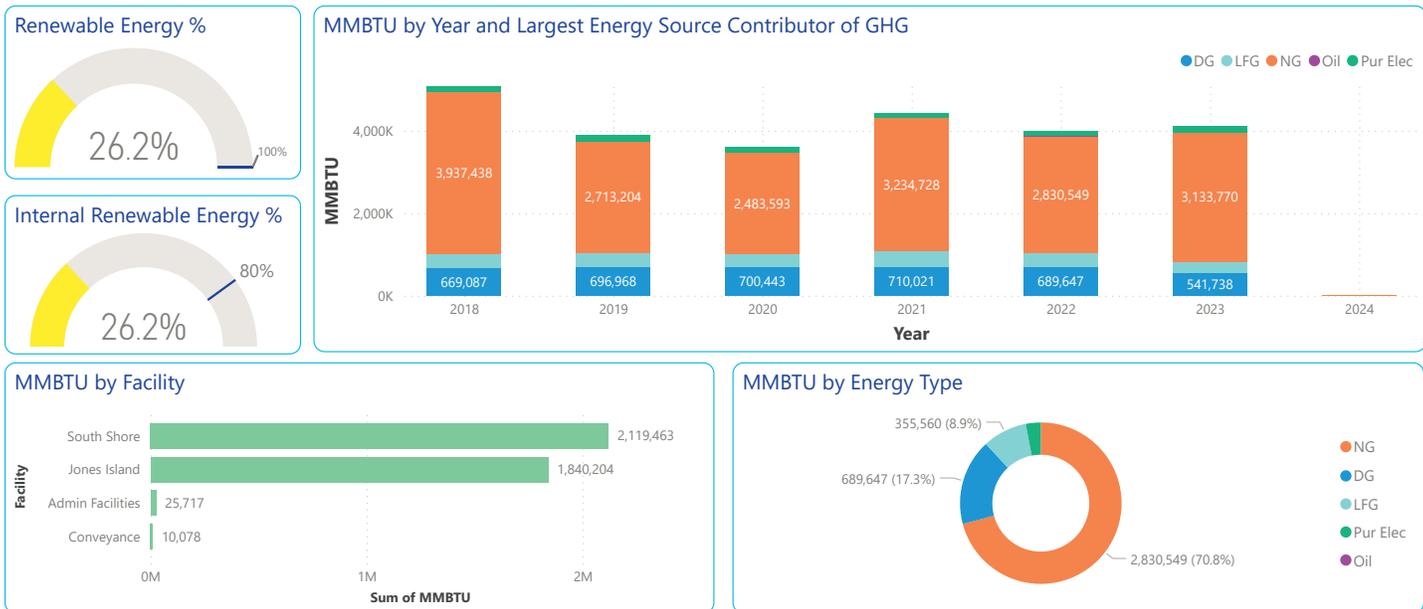
Energy Data Summary For 2022

3/6/2024 12:00:00 AM

Year

GHG Summary GHG Facility Planning Energy Summary Energy Facility

Equipment
Energy Type





3/6/2024 12:00:00 AM

Energy Data By All Locations For 2022

- GHG Summary
- GHG Facility
- Planning
- Energy Summary
- Energy Facility

Year: 2022

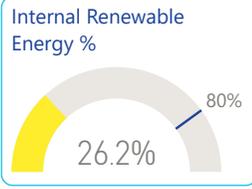
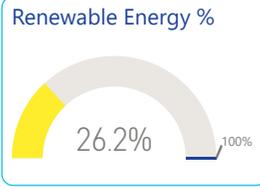
Equipment: All

Energy Type: All

- Admin Facilities
- Conveyance
- Jones Island
- South Shore

Select to play axis

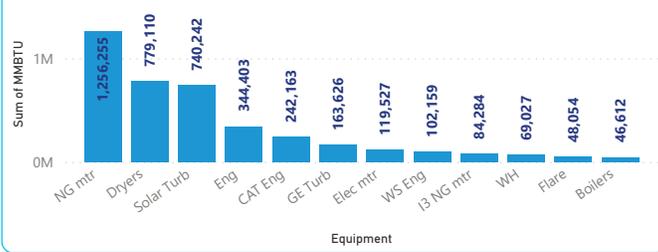
- Year
- Equipment
- Energy Type



MMBTU by Year and Facility

Year	Admin Facilities	Conveyance	Jones Island	South Shore	Total
2024			301		301
2023	18,132	7,481	2,570,085	1,512,858	4,108,556
2022	25,717	10,078	1,840,204	2,119,463	3,995,462
2021	24,707	9,063	1,868,078	2,527,935	4,429,783
2020	31,605	11,137	2,002,760	1,570,121	3,615,623
2019	40,139	12,073	1,845,201	2,006,240	3,903,653
2018	36,173	12,060	1,964,937	3,070,028	5,083,198
Total	176,473	61,892	12,091,566	12,806,645	25,136,576

MMBTU by Equipment



MMBTU by Year and Largest Energy Source Contributor of GHG

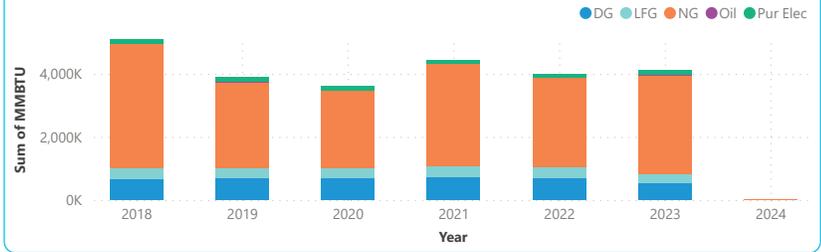


Exhibit B: MMSD Energy Consumption Comparison Summary and Recommendations

MMSD Energy Consumption Comparison (MMBTU)

	Conveyance		Administration		JIWRF		SSWRF		Total	
	2018-2020 Average	After Recommended Energy Profile								
Purchased Non-Renewable Natural Gas (MMBTU)	2,100	0	26,200	0	1,625,000	0	114,800	0	1,768,100	0
Purchased Renewable Natural Gas (MMBTU)	0	2,100	0	23,600	0	0	0	0	0	25,700
Landfill Gas (MMBTU)	0	0	0	0	326,600	1,111,650	0	0	326,600	1,111,650
Digester Gas (MMBTU)	0	0	0	0	0	0	381,700	493,450	381,700	493,450
Purchased Electricity (MMBTU)	9,400	0	8,500	0	69,000	0	69,100	0	156,000	0
Purchased Renewable Electricity (MMBTU)	0	8,303	0	5,350	0	0	0	0	0	13,653
Purchased Oil (MMBTU)	0	0	0	0	400	0	0	0	400	0
Total	11,500	10,403	34,700	28,950	2,021,000	1,111,650	565,600	493,450	2,632,800	1,644,453
Energy Consumption Difference									MMBTU	-988,347
									%	-37.5%

JIWRF Summary Table

CONSUMER	Baseline			Change (+/-)		PI			RI			Baseline + PI + RI			
	MMBTU/yr	dth/yr	kWh/yr	dth/yr	kWh/yr	dth/yr	kWh/yr	MMBTU/yr	MMBTU/yr	MMBTU/yr	dth/yr	kWh/yr	dth/yr	kWh/yr	MMBTU/yr
Dryers	861,000	861,000	0			861,000	0	861,000	0	0	0	0	861,000	0	861,000
Aeration and Blowers	107,500	0	31,510,000			0	31,510,000	107,500	0	31,700	0	9,290,000	0	22,220,000	75,800
Process Pumps	80,800	0	23,680,000			0	23,680,000	80,800	0	2,400	0	700,000	0	22,980,000	78,400
Lighting	29,000	0	8,500,000			0	8,500,000	29,000	0	15,500	0	4,540,000	0	3,960,000	13,500
Boiler	61,000	0	17,880,000			0	17,880,000	61,000	0	12,200	0	3,580,000	0	14,300,000	48,800
ISS Pumps	52,000	0	15,240,000			0	15,240,000	52,000	0	0	0	0	0	15,240,000	52,000
D&D Dust System and HVAC	37,700	0	11,050,000			0	9,940,000	33,900	3,800	1,100	0	320,000	0	9,620,000	32,800
D&D HVAC Upgrade	--	--	--	0	-880,000	--	--	--	--	--	--	--	--	--	--
Milorganite Dust Suppressant System Upgrades	--	--	--	0	-230,000	--	--	--	--	--	--	--	--	--	--
Other Electric Loads	53,000	0	15,530,000			0	15,469,320	52,800	200	0	0	0	0	15,470,000	52,800
Compressed Air System Upgrade	--	--	--	0	-680	--	--	--	--	--	--	--	--	--	--
HVAC System Improvements - Bldgs 234, 235, 243, & 256	--	--	--	0	-60,000	--	--	--	--	--	--	--	--	--	--
Other Natural Gas Loads	153,000	153,000	0			152,920	0	152,900	100	0	0	0	152,920	0	152,900
HVAC System Improvements - Bldgs 234, 235, 243, & 256	--	--	--	-80	0	--	--	--	--	--	--	--	--	--	--
Total	1,435,000	1,014,000	123,390,000	-80	-1,170,680	1,013,920	122,219,320	1,430,900	4,100	62,900	0	18,430,000	1,013,920	103,790,000	1,368,000

SSWRF Summary Table

CONSUMER	Baseline			Change (+/-)		PI			RI			Baseline + PI + RI			
	MMBTU/yr	dth/yr	kWh/yr	dth/yr	kWh/yr	dth/yr	kWh/yr	MMBTU/yr	MMBTU/yr	MMBTU/yr	dth/yr	kWh/yr	dth/yr	kWh/yr	MMBTU/yr
Aeration	83,700	0	24,600,000			0	17,420,000	59,400	-24,500	-10,950	0	-3,210,000	0	14,210,000	48,500
Primary Clarifier Improvements	--	--	--	0	-1,030,000	--	--	--	--	--	--	--	--	--	--
Aeration System Upgrade	--	--	--	0	-4,920,000	--	--	--	--	--	--	--	--	--	--
Process Air Header Improvements	--	--	--	0	-1,230,000	--	--	--	--	--	--	--	--	--	--
UV Disinfection Improvements	0	0	0	0	1,130,000	0	1,130,000	3,900	3,860	0	0	0	0	1,130,000	3,900
Other (HVAC, Misc Process)	22,300	0	6,510,000			0	6,256,500	21,300	-860	-3,764	0	-1,100,000	0	5,156,500	17,600
Replace W3 Flushing Water Pumps	--	--	--	0	-250,000	--	--	--	--	--	--	--	--	--	--
Bldg. 378 HVAC Improvements	--	--	--	0	-2,300	--	--	--	--	--	--	--	--	--	--
Bldg. 383 HVAC Improvements	--	--	--	0	-1,200	--	--	--	--	--	--	--	--	--	--
RAS	16,700	0	4,890,000			0	4,890,000	16,700	0	-500	0	-150,000	0	4,740,000	16,200
Lighting	12,400	0	3,630,000			0	3,630,000	12,400	0	-8,275	0	-2,430,000	0	1,200,000	4,100
Effluent Pumps	8,900	0	2,610,000			0	2,531,700	8,600	-270	-260	0	-80,000	0	2,451,700	8,400
Effluent Pump MCC and VFD Upgrade	--	--	--	0	-78,300	--	--	--	--	--	--	--	--	--	--
IPS	4,400	0	1,300,000			0	1,160,000	4,000	-480	-120	0	-40,000	0	1,120,000	3,800
Primary Clarifier Improvements	--	--	--	0	-140,000	--	--	--	--	--	--	--	--	--	--
RAS/WAS Transfer Pumps	4,400	0	1,300,000			0	1,300,000	4,400	0	-130	0	-40,000	0	1,260,000	4,300
WAS	1,300	0	390,000			0	390,000	1,300	0	-40	0	-10,000	0	380,000	1,300
Primary Sludge Pumps	900	0	260,000			0	260,000	900	0	-30	0	-10,000	0	250,000	900
Boiler	129,500	129,500	0			129,500	0	129,500	0	0	0	0	129,500	0	129,500
Other Natural Gas	24,000	24,000	0			23,910	0	23,910	-90	0	0	0	23,910	0	23,910
Bldg. 378 HVAC Improvements	--	--	--	-60	0	--	--	--	--	--	--	--	--	--	--
Bldg. 383 HVAC Improvements	--	--	--	-30	0	--	--	--	--	--	--	--	--	--	--
Total	308,500	153,500	45,490,000	-90	-6,521,800	153,410	38,968,200	286,310	-22,340	-24,069	0	-7,070,000	153,410	31,898,200	262,410

Exhibit C: UCSB Clean Energy Master Plan Executive Summary

Executive Summary

UCSB Clean Energy Master Plan

The University of California acknowledges the urgency of the climate crisis and has committed to reducing greenhouse gas emissions across all campuses. As part of the UC Sustainable Practices Policy, each campus will achieve a minimum 90% reduction in total greenhouse gas emissions by 2045, relative to 2019 levels.

While UCSB already procures 100% clean power from the UC Clean Power Program, heating and hot water provided by distributed combustion-based equipment throughout campus buildings account for approximately 94% of UCSB's natural gas consumption.

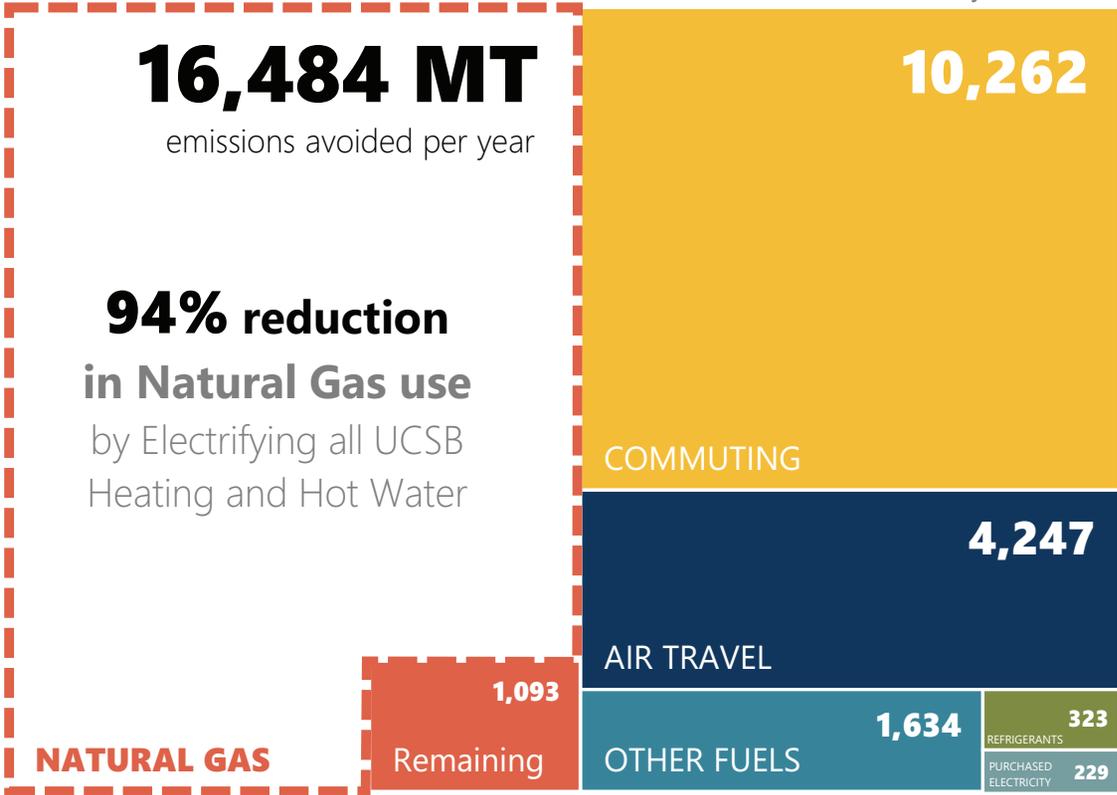
By electrifying all heating and hot water sources, UCSB will eliminate 16,484 metric tons of carbon dioxide equivalent (MTCO_{2e}) emissions annually, equal to 50% of the University's total greenhouse gas emissions (2023).

To guide this transition, UCSB has developed the Clean Energy Master Plan, a comprehensive strategy focused on decarbonizing and electrifying campus heating infrastructure.

The Plan evaluates alternatives for replacing existing fossil fuel-based thermal energy systems, including a new central utility plant (CUP) and expanded hot and chilled water distribution network serving 154 buildings on campus (82% of UCSB's current total building area). Off campus buildings not connected to the new CUP are proposed to have stand-alone all-electric thermal systems.

This Plan and its recommendations are largely the result of a year long State-funded decarbonization study overseen by the UC Santa Barbara Decarbonization Study Project Committee.

2023 GHG Emissions Annually in MTCO_{2e}



19 UCSB -Sized Forests
Area of average U.S. forests for equivalent carbon sequestration annually



3,923 Cars
Number of U.S. gasoline-powered passenger vehicles' annual driving



12,256 Homes
Number of California homes' average annual electricity use

Key Highlights of the Clean Energy Master Plan

The UCSB Clean Energy Master Plan will eliminate 94% of current Natural Gas emissions and significantly reduce UCSB's operational costs and complexity compared to a non-decarbonized future.

Saves

432,500 MTCO₂e
in GHG Emissions

\$120M
in Operational Cost

through 2070



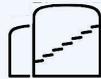
Electrify all Heating and Hot Water

Eliminate 94% of UCSB Scope 1 Emissions



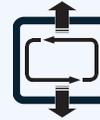
Centralized Campus Thermal Plant

Provides Cooling, Heating, and Hot Water



Thermal Energy Storage Tanks

~50% of all Thermal Work made Simultaneously



High-Temp Heat Pump Chillers

Allows for just Pumps and Valves at each Building



Air-Source CO₂ Type Heat Pumps

Save ~20% Electricity Leveraging Mild Climate



Optimized Size and Operation

Minimize Energy Cost, Balanced with Investment



Battery Backup Power

Use Tanks as Batteries, and Backup Pumps



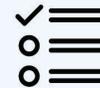
Reclaimed Water and Treatment

Reduce Potable Water Use for Cooling Towers



Prioritize Building Plant and Distribution

Central Backbone and Main Piping



Phase by Emissions, Proximity, Maintenance

Accelerate Impact and Avoid Repairing Abandoned Assets

Executive Summary

By implementing cutting-edge technologies and sustainable practices, UCSB will serve as a model for other institutions grappling with similar challenges.



Funds used to conduct decarbonization studies at each UC location were used to produce the following five deliverables:

- Produce a strategy for a 90% or greater reduction in Scope 1 emissions from fossil gas use in campus energy systems from a 2019 baseline
- Provide high level estimates of total capital and operational costs and savings, to support funding requests as well as inclusion in the campus' capital financial plan
- Identify environmental justice and equity considerations related to the transition to fossil fuel free infrastructure
- Document knowledge gaps, and subsequent studies and analyses needed to conduct climate action planning
- Identify research, education and other opportunities for campus as a "living laboratory" for climate action and sustainability

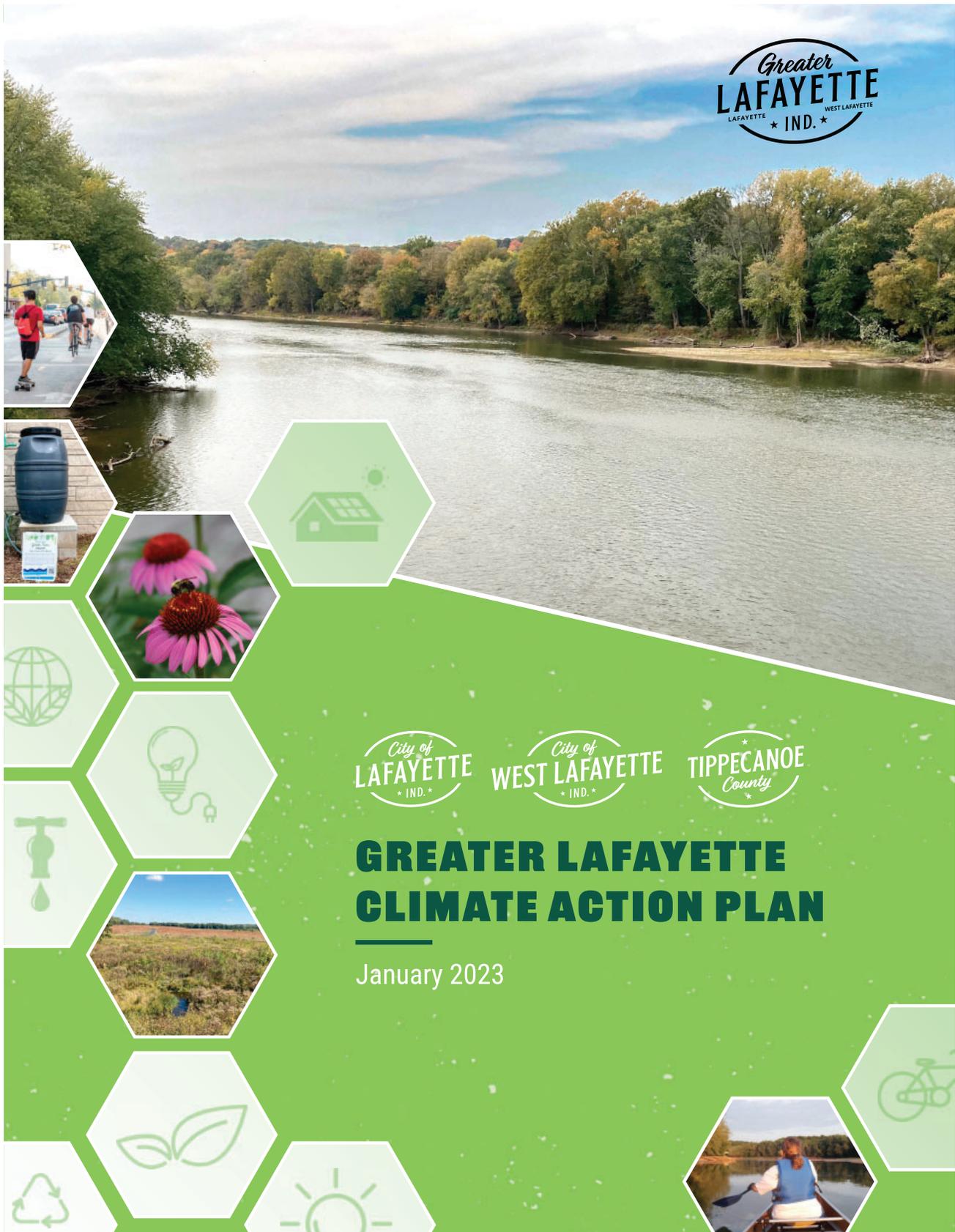
Additional context on the five Study deliverables is in the appendices.

The Clean Energy Master Plan considers factors such as utility use and cost, operational complexity, maintenance, replacement, and total cost of ownership to optimize operational efficiency, redundancy, and energy resilience as the campus transitions to fossil fuel free thermal systems.

Equity and Environmental Justice are central to the UCSB Clean Energy Master Plan, which aims to provide new skills and green job opportunities equitably among existing equipment operators and ensure accessibility to all community members during the phased implementation, which anticipates construction activities through 2045.

UCSB has already made strides in energy efficiency and carbon neutrality through investments in onsite renewables and clean power procurement. With this ongoing effort and the implementation of the Clean Energy Master Plan, UCSB is well-positioned to meet the UC Climate Action goals and to accelerate its transition toward becoming an all-electric campus. Aside from decarbonizing the campus, the Clean Energy Master Plan will also lay out Living Lab opportunities for innovation and education.

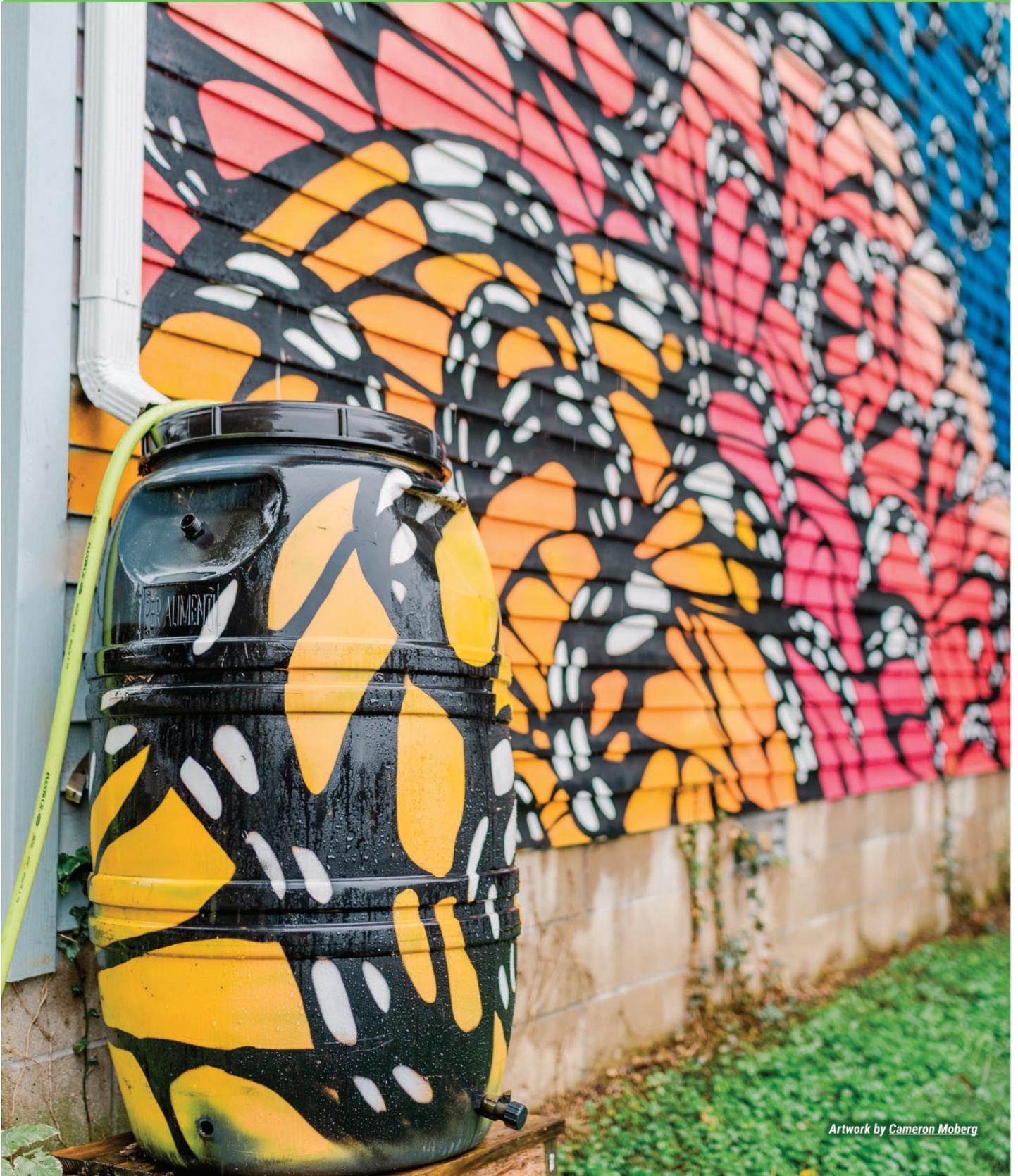
Exhibit D: Greater Lafayette Climate Action and Renewable Energy Plan Executive Summary



GREATER LAFAYETTE CLIMATE ACTION PLAN

January 2023

EXECUTIVE SUMMARY



Artwork by Cameron Moberg

A ROADMAP FOR AN EQUITABLE QUALITY OF LIFE

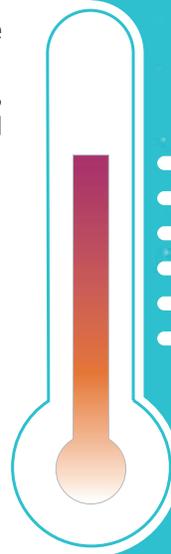
Greater Lafayette's economy, community health, quality of life, and environment are threatened by the effects of climate change. This climate action plan will help prepare for the future and build a stronger, more resilient community. It is a roadmap that will guide our government, businesses, and residents in reducing greenhouse gas emission and preparing for extreme weather events.

PLANNING PROCESS



How will Climate Change Impact Tippecanoe County in the next 25 years?

Average Hottest Day of the Year Will Increase



2050s

105°F

1970 - 2000s

95°F

+16%
2050s compared to PAST

Projected Change in SPRING rainfall

Source: Indiana Climate Change Impacts Assessment

SETTING A GOAL

To keep climate change impacts at a minimum, Greater Lafayette's goal is to reduce its greenhouse gas emissions by

58% BY 2030

Efforts must be made in government operations, private industry, and households to meet this goal. This plan should be revisited and reassessed over time to track our progress and adjust our strategies.

Several technical studies were conducted to inform decision making and determine the best course of action.

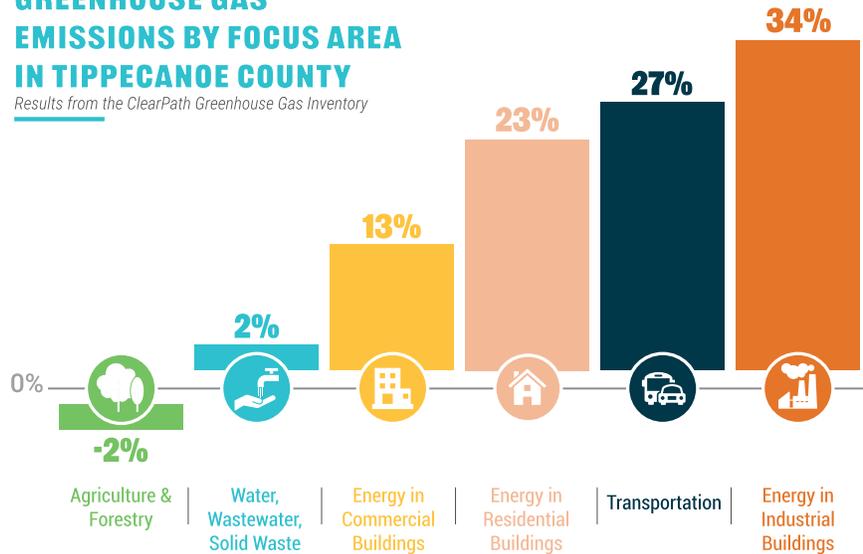
HOW PREPARED ARE WE FOR EXTREME WEATHER?

Results from the Hoosier Resilience Index



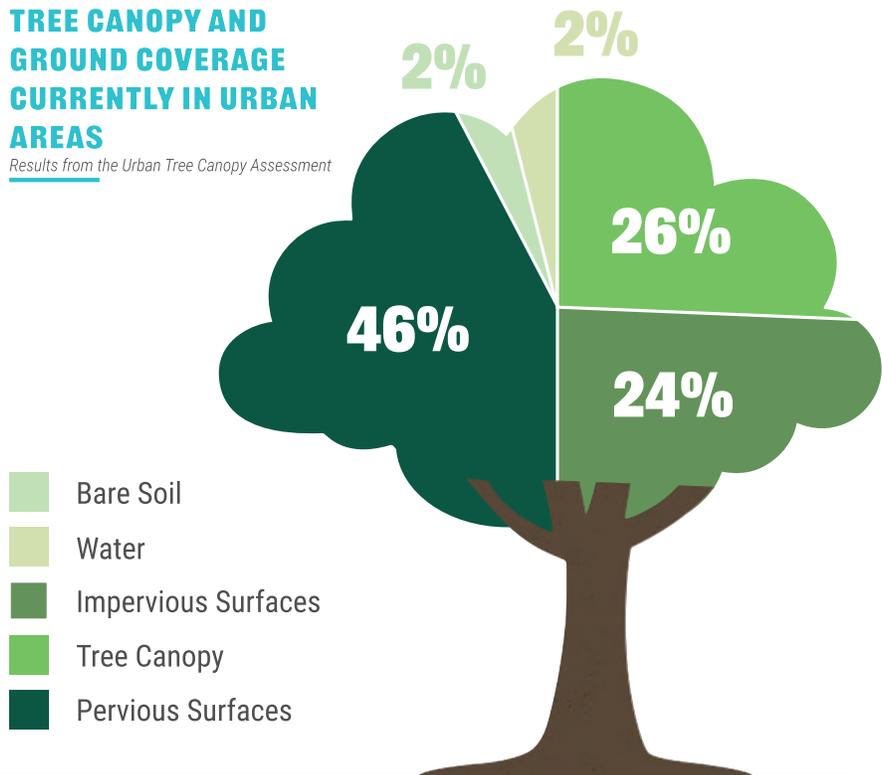
GREENHOUSE GAS EMISSIONS BY FOCUS AREA IN TIPPECANOE COUNTY

Results from the ClearPath Greenhouse Gas Inventory



TREE CANOPY AND GROUND COVERAGE CURRENTLY IN URBAN AREAS

Results from the Urban Tree Canopy Assessment



A COMMUNITY-FOCUSED PLAN

In addition to technical studies, we conducted multiple public surveys, hosted six public input meetings, convened an advisory committee, and consulted a variety of stakeholders, community leaders, and experts. Our technical studies identified the most effective reduction strategies, and integrating community voices helped prioritize these strategies.



TOP RESPONSES FROM OUR FIRST COMMUNITY SURVEY:

Biggest Concerns About Climate Change

- ❗ Increase in Extreme Weather Events
- ❗ Air Quality Impacts
- ❗ Availability of Clean Drinking Water
- ❗ Risks to Vulnerable Populations



FOCUS AREAS AND GOALS

	1 FOCUS AREA: ENERGY USE IN THE BUILT ENVIRONMENT	2 FOCUS AREA: TRANSPORTATION	3 FOCUS AREA: AGRICULTURE AND FORESTRY	4 FOCUS AREA: WATER, WASTEWATER, & SOLID WASTE
GOAL 1	Increase Energy Efficiency of Buildings and Infrastructure	Reduce Vehicle Miles Traveled	Support a Climate-ready Farming Community	Enhance Recycling, Waste Reduction, and Composting ❗
GOAL 2	Begin Transition From Fossil Fuels to Renewable Sources ❗	Incentivize Zero and Low Carbon Fuel Transit (and Equipment) ❗	Enhance, Protect, and Improve Access to Our Natural Resources ❗	Protect the Quality of Our Water
GOAL 3	Foster Innovation	Reduce Heat-island Impacts and Stormwater Run-off Associated With Transportation Infrastructure		Harvest Wastewater Energy and By-products
GOAL 4	Increase Social Resilience			



During public input, **Focus Area 1** was identified as the public's highest priority, with an emphasis on **Goal 2**. Additional goals the public identified as a priority within each focus area are identified with an ❗ symbol.



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