HEAPY

REQUEST FOR INFORMATION (RFI)

CUYAHOGA COUNTY

UTILITY & MICROGRIDS

REAL **COLLABORATION**
REAL **PERFORMANCE**
REAL **INSPIRATION**

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HEAPY

ABOUT

HEAPY

HEAPY is a nationally recognized leader in sustainable and resilient engineering design. Founded in 1945, the corporation plans, designs and commissions more than $1 billion annually in total construction costs. Through HEAPY Solutions, we also offer comprehensive engineer-led design/build construction services.

We keep your project on time and on budget, helping reduce risk and ensure success. We make buildings functional and smart, while honoring the interior design and aesthetics of the spaces where people live and work. We put innovation and creativity at the forefront of every project to bring your vision to life.

MARKETS

- Government
- Healthcare
- Education
- Corporate / Commercial
- Industrial / Manufacturing
- Science & Technology
- Cultural / Arts
- Mission Critical

SERVICES

- Sustainability & Resiliency
- Master Planning / Facility Condition Assessment
- Mechanical, Electrical & Plumbing Design
- Fire & Life Safety Design
- Lighting Design
- Information & Communication Technology Design
- Building Optimization / Commissioning
- Engineer Led Design-Build Construction

TOTAL STAFF

The firm has enjoyed healthy and steady growth over the past 75 years, boasting more than 200 colleagues.

We maintain five offices throughout the United States in Indianapolis, Indiana, Raleigh, North Carolina, Dayton, Columbus and Cleveland, Ohio.

HEAPY is an ISO Certified Company (FS-98575)

UTILITY AND MICROGRID
ROLE

In support of Cuyahoga County's authority to create its own energy utility - "County Utility", HEAPY proposes to assist in the role of **DESIGN AND CONSTRUCTION TEAM**.

DESIGN

Physical design engineering. Collaboration with the Cuyahoga County Utility will determine the extent and interconnection of the various distributed energy resources (DERs), HEAPY utilizes advanced engineering software, analytical and engineering teams to develop physical concepts and designs of the county wide microgrid system. Final designs are based on industry CAD standards and regulatory requirements such as the NEC, NEMA and NESC.

Detailed installation drawings. HEAPY has expertise in the preparation of protection schematics and logic diagrams, wiring diagrams, conduit and raceway diagrams, cable and conduit schedules, bus arrangement and layout drawings, grounding drawings, site plans, AC and DC panel schedules and installation, and construction details. We can also provide drawings for custom installations and retrofit projects on distribution systems.

PROCUREMENT / CONSTRUCTION MANAGEMENT

Suppliers. HEAPY has the resources and capabilities to procure the equipment and materials needed to get the job done.

Contractors. HEAPY can put together a team of subcontractors who have the expertise and manpower to perform this project.

Logistics. HEAPY can manage all the logistical aspects of the project, including shipping coordination of the system equipment.

CONSTRUCTION / COMMISSIONING

Safety. HEAPY places safety as a top priority. All team members maintain an excellent safety record by ensuring that all personnel and contractors are trained to adhere to safety practices while on the job.

On-site Testing and Commissioning. This service covers all equipment and system components to ensure proper start-up and on-time completion of the project. Our commissioning process includes comprehensive checklists, inspections, testing, and safety procedures.

ONGOING SUPPORT

Proactive Support & Monitoring. HEAPY would partner with subcontractors on the project to act as a single point of contact for reliable post-installation support for your microgrid assets, providing 24/7 condition-based monitoring of the equipment and controls.

Maintenance. HEAPY has a regional office in Cuyahoga County with field service technicians, as well as a network of partnering local third-party technicians to repair and maximize the operating life of your microgrid equipment, including inspection, testing, and repair. Services can be provided as part of an ongoing asset management program or on a task-by-task basis. Our team could provide a full preventative maintenance schedule for individual equipment provided under this project.

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UTILITY AND MICROGRID
TEAM

PRINCIPAL IN CHARGE

Michael Berning, Chief Innovation Officer, PE, CEM, LEED Fellow, Senior Principal, is responsible for providing corporate leadership for HEAPY Solutions (a wholly owned Construction Management subsidiary) and leads the development of markets and services centered on Smart Technologies Integration, Distributed Energy Resources, and Resiliency Planning. Michael's project experience in both the public and private sectors shows, when properly planned and executed throughout the entire design and construction process, every project can be environmentally responsible, energy efficient, and cost effective.

PROJECT MANAGER

Tim Krzywicki, PE, Principal, has over 17 years experience in multi-discipline engineering, sustainable design, commissioning and project management. As a mechanical engineer he has been involved in hundreds of projects providing professional design services for HVAC and plumbing engineering, as well as sustainable duties such as LEED program management, energy modeling, life cycle cost analysis and green building grant assistance.

SENIOR RENEWABLE / MICROGRID TECHNICAL COORDINATOR

John Black, PE, CTS, LEED AP BD+C, Senior Principal, is responsible for establishing and maintaining electrical standards for design, drawings and specifications. He assists the electrical designers on the various teams in system concepting, special problems, code interpretations and in-office training. John has performed and coordinated several renewable energy studies and microgrid system concepts, along with interacting with applicable manufacturers on equipment costs and delivery.

SOLAR / RENEWABLE TECHNICAL SUPPORT

Bryan Kinch, LEED AP BD+C, is responsible for Renewable Energy, Sustainable Design, Energy Analysis, Energy Modeling and LEED Project Administration as part of his Energy Engineer role with HEAPY. Bryan works to increase the energy production of renewable energy sources like wind and solar power. He is experienced in monitoring and developing alternative energy outputs. In working with his clients, he has demonstrated if a project is properly planned and executed throughout the design and construction process, every project can be environmentally responsible, energy efficient AND cost effective.

HEAPY

CHALLENGE / SOLUTION
EVIDENCE

CHALLENGE	SOLUTION
Designing and building a new microgrid and utility service can incur significant initial capital costs, making it challenging to set an affordable rate for new customers.	• HEAPY will conduct a comprehensive and practical analysis of first cost versus lifecycle cost with multiple design alternatives to ensure that the most cost effective, practical, and actionable design is selected. • HEAPY will collaborate with top potential customers and test sites early in the process to encourage early adoption. • Early in the process, HEAPY will assess methods to minimize geographic infrastructure interconnections.

EVIDENCE	
	**Miami University** Multiple initial studies to assess capital costs of various solar, battery and interconnection locations / configurations. Use of microgrid analysis software.
	**Confidential Healthcare provider in Ohio** Initial assessment of solar configurations and capital costs at a remote site.
	**City of Upper Arlington Microgrid** AEP funded and awarded Designed by HEAPY, Construction Management by HEAPY Solutions (construction cancelled due to COVID)

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CHALLENGE / SOLUTION
EVIDENCE

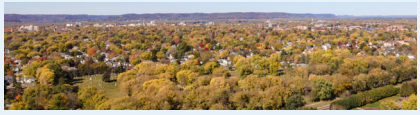
CHALLENGE	SOLUTION
Diversity and inclusivity are high priorities for Cuyahoga County, but the current project lacks precise targets and goals to help achieve these ideals.	• Set realistic and measurable diversity business enterprise utilization targets from the outset, to create clear expectations for the team. • Engage with local community of contractors and consultants early and often to ensure that available local resources know about the project and how to get involved. Have a dedicated point of contact and schedule meet and greets between top prime contractors and local DBEs.

EVIDENCE

Dayton Public Schools
Reviewed approved diversity list to determine potential areas of expertise to integrate on design team for school projects.

CHALLENGE	SOLUTION
Equipment Procurement Delays / Supply Chain Issues	• Determine early in process major equipment needs and communicate with suppliers to assess available delivery times and / or cost premiums. • Develop alternative designs to utilize lower cost equipment or different system configurations.

EVIDENCE



City of Upper Arlington
Developed for Ohio municipality pre-purchase microgrid components to expedite proposed construction schedules.

Cincinnati Financial Corporation
Determined and issued major equipment specifications prior to detail design for major Ohio Corporation to assure timely project schedule completion due to supply chain delays.

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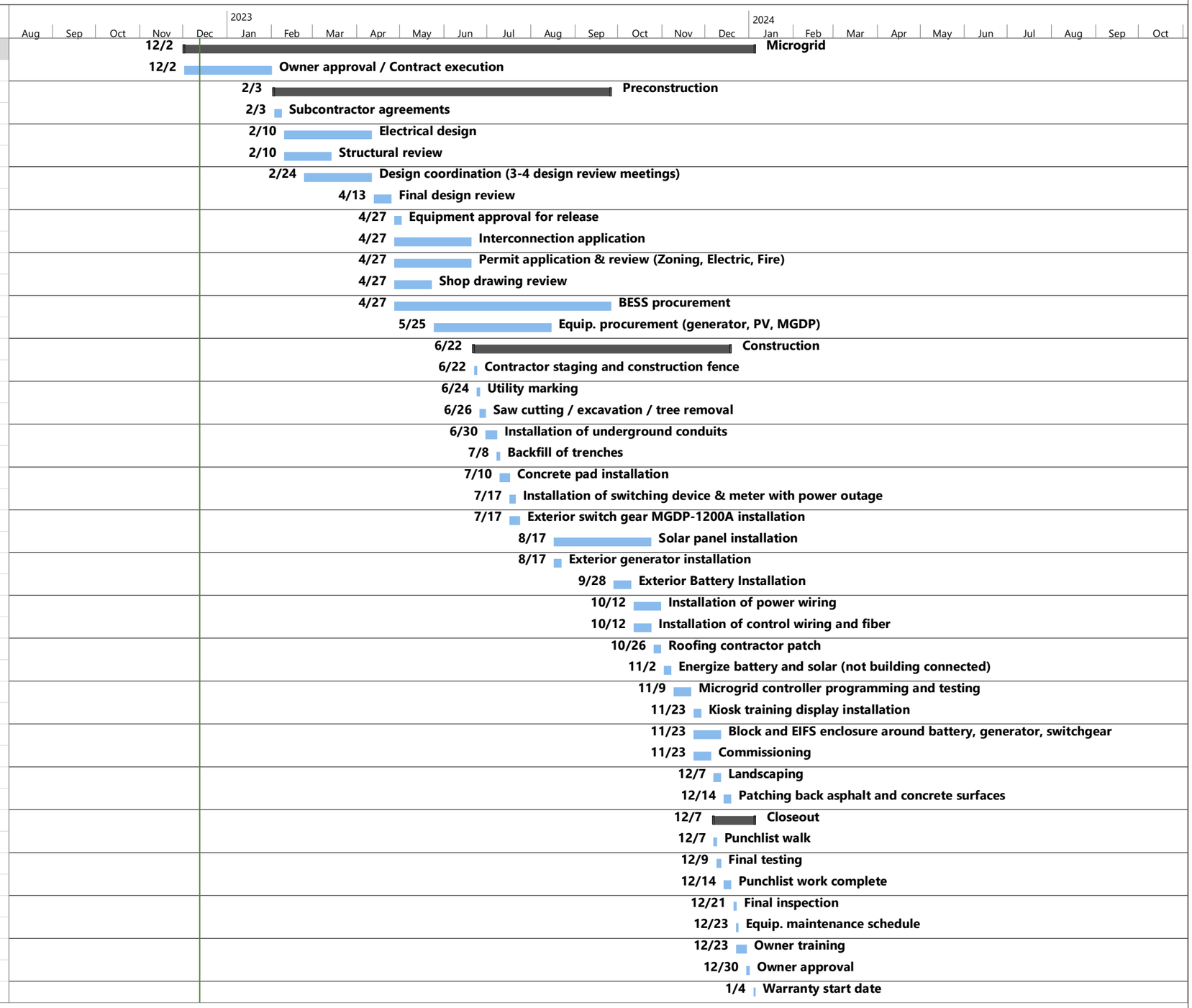
TYPICAL DESIGN AND CONSTRUCTION TIMELINE

ID	Task Name	Duration	Start
1	**Microgrid**	**286 days**	**Mon 12/2/22**
2	Owner and AEP approval / Contract execution	45 days	Mon 12/2/22
3	**Preconstruction**	**170 days**	**Mon 2/3/23**
4	Subcontractor agreements	5 days	Mon 2/3/23
5	Electrical design	45 days	Mon 2/10/23
7	Structural review	25 days	Mon 2/10/23
6	AEP design coordination (3-4 design review meetings)	35 days	Mon 2/24/23
8	Final design review	10 days	Mon 4/13/23
9	AEP equipment approval for release	5 days	Mon 4/27/23
10	Interconnection application to AEP	40 days	Mon 4/27/23
11	Permit application & review (Zoning, Electric, Fire)	40 days	Mon 4/27/23
12	Shop drawing review	20 days	Mon 4/27/23
13	BESS procurement	110 days	Mon 4/27/23
14	Equip. procurement (generator, PV, MGDP)	60 days	Mon 5/25/23
15	**Construction**	**130 days**	**Mon 6/22/23**
16	Contractor staging and construction fence	2 days	Mon 6/22/23
17	Utility marking	2 days	Wed 6/24/23
18	Saw cutting / excavation / tree removal	2 days	Fri 6/26/23
19	Installation of underground conduits	6 days	Tue 6/30/23
20	Backfill of trenches	2 days	Wed 7/8/23
21	Concrete pad installation	5 days	Fri 7/10/23
22	Installation of switching device & meter with power outage	2 days	Fri 7/17/23
25	Exterior switch gear MGDP-1200A installation	5 days	Fri 7/17/23
23	Solar panel installation	50 days	Mon 8/17/23
26	Exterior generator installation	5 days	Mon 8/17/23
27	Exterior Battery Installation	10 days	Mon 9/28/23
28	Installation of power wiring	15 days	Mon 10/12/23
29	Installation of control wiring and fiber	10 days	Mon 10/12/23
24	Roofing contractor patch	5 days	Mon 10/26/23
30	Energize battery and solar (not building connected)	5 days	Mon 11/2/23
31	Microgrid controller programming and testing	10 days	Mon 11/9/23
32	Kiosk training display installation	5 days	Mon 11/23/23
33	Block and EIFS enclosure around battery, generator, switchge	15 days	Mon 11/23/23
35	Commissioning	10 days	Mon 11/23/23
36	Landscaping	5 days	Mon 12/7/23
34	Patching back asphalt and concrete surfaces	5 days	Mon 12/14/23
37	**Closeout**	**21 days**	**Mon 12/7/23**
38	Punchlist walk	2 days	Mon 12/7/23
39	Final testing	3 days	Wed 12/9/23
40	Punchlist work complete	5 days	Mon 12/14/23
41	Final inspection	2 days	Mon 12/21/23
42	Equip. maintenance schedule	1 day	Wed 12/23/23
43	Owner training	5 days	Wed 12/23/23
44	Owner approval	2 days	Wed 12/30/23
45	Warranty start date	1 day	Mon 1/4/24



AEP Tasks that duration and exact dates must be confirmed

TRUSTED PARTNER

Performance makes successful projects. **COLLABORATION** makes successful **TEAMS**.

HEAPY believes in creating a culture of collaboration, where the right conversations can occur. We will always maintain open dialogue by engaging all of the key stakeholders to provide the best outcome of the project.

As part of a working team, we recognize that our responsiveness can make or break a project. As we rely on others for information, most other team members rely on us for the same. Open, honest, and timely communication is emphasized in our project approach.

But no project is perfect, and issues can arise. This is where collaboration is critical. The first step in resolving any issue is identifying it and knowing what must be done as early as possible in the process. The first moment an issue is known is usually when its solution will be the least costly to implement. Only after the issue is identified can the appropriate team members respond.

We have assembled colleagues with the experience and expertise needed to help deliver a successful project. HEAPY is open to team building and can work together when trouble arises. We can provide input during the early phases and work with the team to provide the best project solution. We can provide the necessary leadership to organize a group of firms to collaborate on executing a successful project.

HEAPY

CITY OF UPPER ARLIGNTON

MICROGRID CONCEPT STUDY

HEAPY SERVICES
Study

In support of AEP Ohio's ongoing mission to develop a smarter, more resilient, low carbon grid in the state of Ohio, HEAPY assessed the implementation of a Microgrid concept for the City of Upper Arlington Municipal Services Center. This concept will provide substantial public benefits.

Specifically, the proposed Microgrid concept would provide the following Value:

- Increasing the resilience of critical elements of the City of Upper Arlington public safety services and infrastructure.
- Assisting with City sustainability goals through reduced carbon dioxide emissions.
- Providing strong economic returns through delivery of a low-cost diverse power mix, which can be responsive to evolving rate structures (time-of-use) and peak demand needs; this project is designed to provide net cost benefits to the City.
- Allow the Municipal Services Center to stay online in 'island mode' during regional grid events (ie: outages) and both natural and man-made disasters, to support critical operations and serve as a place of refuge for the City.

This concept includes the development of an energy efficiency building upgrade, installation of a building (and potential parking canopy) Solar PV, coupled with a Battery Energy Storage System (BESS), and microgrid controls at the Upper Arlington Municipal Services Center (MSC). This building is critical to City operations, serving as the Command Center for Police, Fire, City Administration and other city services. Providing islanding capacity for this facility would provide an added level of resiliency for the City and allow for the MSC to serve as a place of refuge during critical emergency outages.

HEAPY recommended the following:

- Energy Efficiency Upgrades
- Solar PV
- BESS for Emergency Island Capability (24-48 Hours)
- Install Dual-fuel Standby Generator

The potential benefits to the City of Upper Arlington can be scaled further in the context of broader resiliency master planning initiatives. This could include development of a 'city spine' microgrid link interconnecting the Kingsdale shopping center and the newly constructed high school. This link could provide dedicated service to critical infrastructure throughout the city and further increase the capacity to host in places of refuge/shelter and further improve emergency response capabilities.

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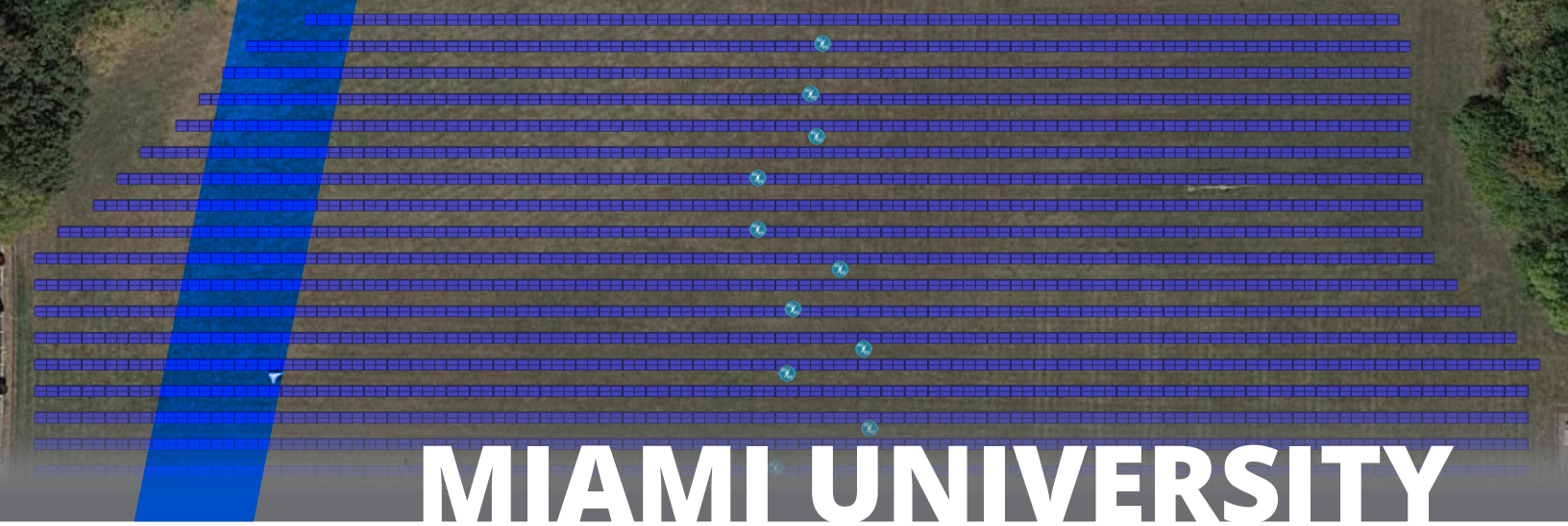

MIAMI UNIVERSITY

SOLAR ENERGY GENERATION STUDY

HEAPY SERVICES
Energy Modeling
Solar Installation Study
Solar Installation Design

SIZE
5 sites on two campuses

Miami University engaged HEAPY to perform a solar energy generation study. Miami University had recently become a signatory to Second Nature's Presidents' Climate Leadership Commitment and pledged to achieve carbon neutrality by September 2023, so the project was tied to the overall campus net zero target.

The study examined five potential solar installation sites (four at Oxford campus and one at Hamilton campus) to determine the feasibility, upfront cost, and potential return on investment for a large-scale solar installation.

- One site was located on a former landfill (Hamilton), so the team proposed a ground-mounted installation that did not require digging.
- Two sites in Oxford were located on parking lots, requiring canopy mounts.
- Two locations were in a flood plain, which had to be accounted for in design through increased elevation and resiliency.

Prior to design, HEAPY conducted a comprehensive review of the utility rate structure for both campuses and current KWH usage to determine if adding solar would reduce utility costs, provide some resiliency, and help with peak load demand reduction. The team then sought to determine how much solar could be installed at each site, reviewing electrical infrastructure, and evaluating the requirements to physically connect the new solar fields to the existing grids. It was determined that the installation of a medium-voltage substation would be required tie the solar installation into the existing utilities.

HEAPY designed several potential solar installations, as well as detailed construction cost estimates.

We conducted a comprehensive financial analysis to determine long-term payback and ROI, including the option to enter into power purchase agreements (PPA).

Finally, the team evaluated integration of a Battery Energy Storage System (BESS) to reduce peaks and allow for more resiliency.

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CITY OF WESTERVILLE

SOLAR INSTALLATION PROGRAM

HEAPY SERVICES
Solar Installation Study

HEAPY worked with the City of Westerville Electric Division to assist with concept development of a solar installation incentive program for the City and Commercial and Industrial (C&I) customers.

This study provided a feasibility analysis to identify the value proposition for the program.

This included the following:

- exploration of ownership model options
- incentive and payment structures
- quantification of respective value streams to Westerville and its customers

Our team provided a final report that included a comparative value analysis across three project types (pilots), program structure options, and recommendations that ultimately resulted in a formalized Commercial Solar Rebate Program.

Our work with the City continues with the ongoing piloting of a custom Retro-Commissioning incentive program through 2022.

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AT&T

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HEAPY SERVICES
Mechanical-Electrical & Plumbing Design

Commissioning

SIZE
950,000 SF

COST
$52,500,000

HEAPY designed the Mechanical-Electrical systems and provided Commissioning Services for the:

- Six story, 100,000 SF addition and complete renovation of 850,000 SF without incurring an outage or interruption in service over the project's six year timeline
- The existing standby power plant and the existing chiller plant were removed, then reconnected to a new chiller plant, a new standby power plant, and all connections from the existing building systems , including four shelled floors for future telephone switching equipment
- Installed an HVAC system capable of delivering 4,700 tons of cooling load to the new building addition and existing tower from an 8,000 SF chiller plant
- Six 2,000 KW generators were paralleled together to deliver 100% standby power
- A complete electrical distribution system, with the ability to deliver over 10,000 amps, was installed

The AT&T network was never jeopardized (no outages) during all of the critical cutover operations performed under HEAPY Engineering's direction. At the time of this project, this facility was the No. 1 Building for call traffic and revenue within the AT&T worldwide network.

HEAPY designed and Commissioned the entire Mechanical-Electrical infrastructure (including structural and architectural guidance) to ensure its reliability and redundancy matched the demands of the communication networks installed in the building. This design included a single point of failure analysis, N+1 system capacity and complete critical system redundancy.

During the Commissioning Process, it was discovered that when the three 1,400 ton & one 500 ton chillers all were started simultaneously during a simulated emergency power outage, the Emergency power system could not support load. If this had not been identified, it would have resulted in a system shutdown during emergency operation.

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APPENDIX
DIVERSITY
& INCLUSION

At HEAPY, we support diversity and inclusion through our actions. We acknowledge the importance of supporting small, local, and diverse businesses to build a strong community foundation. We build relationships with diverse firms because their work is vital to the continued growth of our community, and we know that the viability of our partners rely on the strength of major contractors, consultants and suppliers.

HEAPY is a part of the **Small Business Administration's Mentor-Protégé program**. Through this structured program, our Service Disable Veteran Owned Small Business Protégé FFE Engineering & Technical Services, HEAPY provides valuable technical and business development assistance in several areas, including:

- Guidance on internal business management systems, accounting, marketing and strategic planning
- Financial assistance in the form of equity investments, loans, and bonding
- Assistance navigating federal contract bidding, acquisition, and performance process
- Education about strategic planning and finding markets
- Business development, including strategy and identifying contracting and partnership opportunities
- General and administrative assistance, like human resource sharing or security clearance support

The overall intent of the program is help an economically disadvantaged business grow, even though they offer a similar array of services. Through this Mentor-Protégé relationship, we have formed a very strong SDVOSB CVE verified Joint Venture that can execute a wide array of projects ranging from heavy interior architectural renovations, PMET design, commissioning, energy studies and much more.

HEAPY is engaged in the **ACE Mentor Program of America (ACE)** which is designed to attract high school students into pursuing careers in the A|E|C industry. **69%** of ACE students are minority and one-third are female.

HEAPY supports a **Women in Engineering Society** (HEAPY Chapter). The society's focus is to promote diversity, mentoring and company culture. Our HEAPY female colleagues are always empowering each other as well as other women throughout the A|E|C industry.

HEAPY maintains a diverse workforce. Of our 208 colleagues, **29%** are of minority status including race, ethnicity and/or gender.

HEAPY