AMERESCO

Request for Information

Cuyahoga County Utility & Microgrids

Prepared for

Cuyahoga County Department of Sustainability

July 15th, 2022

Dear Mr. Foley,

We understand that Cuyahoga County is interested in identifying an experienced and reliable partner to develop and deliver a microgrid project. In addition, we understand that the County has created a new energy utility (County Utility). The County Utility's vision is to help transform Northeast Ohio's energy grid to be cleaner, more resilient, more secure and more cost effective for its residents, industries, and commercial businesses.

Over the past four years we have been involved in this unique endeavor; we responded to the initial microgrid RFQ and were shortlisted. Since that time, we have had numerous conversations with Mike Foley, Cuyahoga County Project Leader and Andrew Thomas from Cleveland State University. In addition, we facilitated a collaboration for the county to work with the project manager of the Ameresco's Philadelphia Naval Yard microgrid project.

Ameresco can help the County develop microgrid district systems that are smart, reliable, clean, secure and, importantly, cost effective.

Ameresco is confident in our ability as a clean energy integrator to provide a comprehensive design and implement a turnkey microgrid project. We intend to leverage previously completed efficiency and infrastructure projects and build off the previous projects to complete the design and implement a financially positive project that meets the goals of the County. We are also proud to share details of our experience helping our customers design, build and construct microgrid projects across the nation. We feel that Ameresco's clean energy mission is aligned with Cuyahoga County values, and we ask for consideration to be your microgrid energy solution provider.

Sincerely,

Michelle Jorgenson
Sr. Account Executive

RFI Responses

- **Entity / Business Name, summary of services, and relevant experience.**

Ameresco, Inc. has been engaged in providing energy services for over 22 years and has acquired companies, some of which have been in existence for over 40 years. Ameresco, Inc. was founded by George P. Sakellaris in 2000 in the State of Delaware. *His vision for Ameresco was to create a flexible and nimble independent company that provides a broad range of client-focused services with the stability to deliver on its promises*. This vision has been instrumental in Ameresco's position at the forefront of influencing and reshaping the industry and delivering client satisfaction.

Ameresco is both **vendor neutral and technology agnostic**, and independent of any parent company or other competing lines of business. Our clients appreciate that all decisions are made locally, and the financial benefits of our projects stay in the communities we serve. This ensures attention to detail and commitment from our executive leadership and all employees, which ultimately results in successful and timely completion of projects for our clients.

Ameresco Microgrid Experience

Ameresco is the premier microgrid implementor and developer in the U.S. and has extensive experience in delivering numerous microgrids for a variety of customers, including many municipalities. Ameresco frequently pairs batteries with solar PV and interconnection controls for microgrid applications to meet resiliency, efficiency, and carbon reduction objectives. The technical experts we have on staff are great at what they do, which is why Ameresco continues to be selected to study, design and build microgrids for mission critical United States military installations.

Ameresco Funding Experience

" Ameresco has discovered that key to microgrids success is getting grant funding "

The Ameresco Team has researched, applied for and obtained millions of dollars in grants, rebates and incentives for customers across the country. We were also able to secure 100% grants for some of our customers. Generally speaking, best chance to secure the highest grant opportunities is to include multiple technologies. For instance, the Maryland Department of Energy Grant provided two-thirds of the cost of a similar microgrid installation at Frederick, MD while the 1.3 MW-DC solar system and 850 kW 2-hour BESS constructed under an EPC agreement for Ballenger-McKinney WWTP was a similar statistic.

Relevant Grant / Incentive Experience

Ballenger-McKinney WWTP, MD
$2.4 M Grant: Maryland Department of Energy
$3.2 M Project Cost

City of Hutchinson, MN, & WWTP
$958 K Xcel Energy Grant
$1.8 M Project Cost

South Yarmouth High School, MA
$1.47 M Grant Massachusetts DOER

Trinitas Medical Hospital, NJ
$6.6 M Grant

Sample Microgrid Projects

Below is just a small sample of some of our many microgrid projects to date. We have provided more detailed case studies in ***Appendix C*** of this response.

Ballenger-McKinney Wastewater Treatment Plant Ameresco designed and built a 1.35 MW-DC ground mount solar PV array with an 800 kW / 1,350 kWh Li-ion battery energy storage system to this wastewater treatment plant. In addition to the benefits of generating renewable energy on-site and monthly savings on their utility bill, Ballenger-McKinney specifically requested a battery system to be implemented to provide black-start capabilities for the Influent Pump Station at the facility. In a scenario when the utility loses power, the integrated controls will activate the BESS to power the station and return it to full critical load operation for almost 4 hours. Important measures include:

- 1,350 kW-DC Ground Mount Solar PV Array
- 800 kW / 1,350 kWh Li-ion BESS

Portsmouth Naval Shipyard Advanced Microgrid Ameresco successfully completed commissioning of a microgrid demonstration project at this naval yard in Kittery, Maine. More details of this project can be located in *Appendix C*. Key Project Metrics included:

- Two Solar Taurus T-60s
- 3MW Standby Diesel
- 500kW Battery
- Integrated Microgrid & Battery Energy Storage System with on-site generation
- Provide Ancillary Services to an ISO

Philadelphia Navy Yard Microgrid Ameresco partnered with PIDC, Philadelphia's public private economic development corporation for a new 8-megawatt natural gas-fired peaking plant that anchors one of the largest private microgrids in the United States. More details of this project can be located in *Appendix C*. Services provided:

- Eight megawatt (8 MW) natural gas-fired peaking plant
- Ameresco responsible for design, build and commissioning
- Ameresco providing long-term operations and maintenance

- **What role(s) from Section 3 would the respondent fulfill?**

Ameresco has significant experience in the development and design of microgrid projects and can comfortably serve Cuyahoga County in the second and third roles as described in the RFI:

- ***Developer of Utility Customers, Distributed Generation Projects, and/or Microgrids*** (hereafter referred to as Developer)
- ***Design and Construction Team (Engineering, Procurement, Construction) of Distribution Infrastructure, Distributed Generation, and/or Microgrids*** (hereafter referred to as Design EPC).

However, one critical aspect of the first role described in the RFI, ***Utility Management***, will be the operation of the utility DER and microgrid systems, including the interface with the greater utility "macrogrid". This effort will require sophisticated utility management software, including Distributed Energy Resource Management Systems (DERMS) and people that know how to use it. In addition to developing, designing, and building microgrids Ameresco has experience in their operation and maintenance. As a result, we are familiar with DERMS and microgrid management systems. One of our potential partners, OATI has extensive experience in developing, deploying, and maintaining these systems. We have included a detailed presentation of their systems and software platform capabilities in *Appendix B* of this response. You will note that they can provide a comprehensive utility management system and Ameresco is very interested in further discussions with Cuyahoga County to illuminate how we may be able to use OATI's tools to manage the daily operations of this newly formed utility enterprise.

- **Please provide a brief description of relevant experience for each role.**

Ameresco's Microgrid Projects

	Project	Location	Year Completed	Use Case(s)	Rated Power Capacity (kW)	Rated Energy Capacity (kWh)
OPERATING	**Ontario IESO**	Newmarket, Ontario	2019	Energy Arbitrage, Ancillary Services Capacity	5,000	20,000
	Marine Corps Recruit Depot (MCRD) ESPC*	Parris Island, SC	2019	Increased PV Consumption, Demand Charge Management (DCM), Microgrid Islanding Support	4,000	8,000
	JBSA Lackland Air Force Base	San Antonio, TX	2021	DCM, Microgrid Islanding Support	4,000	8,000
	JPII Secondary School Microgrid*	London, Ontario	2021	Facilitate Carbon Free retrofit, Increased PV Consumption, Market participation, DCM	1,100	2,200

	Project	Location	Year Completed	Use Case(s)	Rated Power Capacity (kW)	Rated Energy Capacity (kWh)
	GSA - Schwartz Courthouse	San Diego, CA	2018	Demand Charge Management	750	1,450
	Ballenger-McKinney Wastewater Treatment Plant*	Frederick, MD	2021	DCM, TOU Energy Management, Blackstart	800	1,350
CONSTRUCTION	**Southern California Edison**	San Joaquin Valley, CA	2022 (est.)	Energy Arbitrage, Ancillary Services, TOU Energy Management, Energy Shifting, Grid Reliability, Peak- Shaving	225,000	900,000
	Southern California Edison	Long Beach, CA	2022 (est.)	Energy Arbitrage, Ancillary Services, TOU Energy Management, Energy Shifting, Grid Reliability, Peak- Shaving	200,000	800,000
	Southern California Edison	Rancho Cucamonga, CA	2022 (est.)	Energy Arbitrage, Ancillary Services, TOU Energy Management, Energy Shifting, Grid Reliability, Peak- Shaving	112,500	450,000
	United States Coast Guard Training Center	Petaluma, CA	2023 (est.)	DCM, TOU Energy Savings and Resiliency	2,900	11,600
	Trent University	Peterborough, ON, Canada	2022 (est.)	Energy Arbitrage, Ancillary Services, Peak- Shaving, DCM	2,500	5,000
	Town of Lexington*	Lexington, MA	2022 (est.)	Demand Charge Management	1,120	2,240
	Baltimore Gas & Electric	Chesapeake, MD	2022 (est.)	Grid Reliability, Ancillary Services	1,000	2,000
	Correctional Services Canada	Joyceville, ON, Canada	2023 (est.)	Global Adjustment & Demand Reduction	1,000	2,000
	Correctional Services Canada	Bath, ON, Canada	2023 (est.)	Global Adjustment & Demand Reduction	1,000	2,000
	Portsmouth Naval Shipyard	Kittery, ME	Phase 1: 2015 Phase 2: (2022 est.)	Phase 1: Demonstration Phase 2: Microgrid Support; Ancillary Services	Phase 1: 500 Phase 2: 1,000	Phase 1: 580 Phase 2: 2,000
	Plymouth High School*	Plymouth, MA	2022 (est.)	Demand Charge Management	250	500

	Project	Location	Year Completed	Use Case(s)	Rated Power Capacity (kW)	Rated Energy Capacity (kWh)
DEVELOPMENT	**McKinleyville Community Services District (MCSD)***	McKinleyville, CA	2022 (est.)	DCM, TOU Energy Management, Microgrid Islanding	250	500
DEVELOPMENT	**Norfolk Naval Shipyard**	Portsmouth, VA	2022 (est.)	Microgrid Islanding Support	3,000	5,000
DEVELOPMENT	**Hampden Landfill***	Hampden, MA	2023 (est.)	Clipping Capture, Energy Shifting, Ancillary Services	3,000	6,750
DEVELOPMENT	**City of Methuen**	Methuen, MA	2022 (est.)	Demand Charge Management	500	1,000
DEVELOPMENT	**Town of Natick***	Natick, MA	2022 (est.)	Demand Charge Management	223	445
AWARDED	**Chapmans Ice Cream**	Markdale, ON, Canada	2023 (est.)	Global Adjustment & Demand Reduction, Operating Reserve, Capacity, Arbitrage	5,500	11,000
AWARDED	**Town of Yarmouth***	Yarmouth, MA	2023 (est.)	SMART Program participation	1,500	3,000
AWARDED	**Town of Cohasset**	Cohasset, MA	2022 (est.)	Peak-shaving and resiliency	250	500
*Includes Solar				**Total**	**579,243 kW**	**2,258,535 kWh**

- **Please provide any edits to the role's definition or responsibilities.**

It is early in the evolution of this unique approach to developing and constructing microgrids and distributed generation projects to retain, expand, and attract new economic and social justice opportunities, therefore detailed roles and responsibilities will surely adapt and change over time. However, the roles as defined in the current RFP sufficiently define the three major aspects of the endeavor. Additional tasks and responsibilities necessary within the ***Utility Management*** role include an interface/liaison with incumbent electric utility local distribution companies (LDC). There will also need to be significant legal and regulatory staff support.

- **Optional - Within this section, consider providing a hypothetical organizational chart, a Responsible, Accountable, Consulted, and Informed (RACI) matrix, or other visual to help define roles and relationships.**

Ameresco's typical Microgrid Project team comprises of:

- Account Executive
- Project Development Engineers
- Solar Experts
- Battery Experts
- Microgrid Specialists
- Financial Expert

- **Are there other roles not identified in Section 3 that the County should be aware of?**

As mentioned before, it is early in the evolution of this unique approach to developing and constructing microgrids and distributed generation projects to retain, expand, and attract new economic and social justice opportunities, therefore detailed roles and responsibilities will surely adapt and change over time. However, some additional roles that can be considered in future might include:

- Establishing Energy Efficiency Rebates Department
- Establishing a Lighting (Streetlighting) Department
- Exploring Additional Revenue Streams
- Explore using Renewable Natural Gas

- **What duties would these new roles perform?**

Energy Efficiency Rebates Department – Provide rebates to customers for energy efficiency improvements. Not only does this help with customer retention but it also helps lowering the energy load on plant, delaying a need for capital intensive expansion.

Lighting(Streetlighting) Department – It is estimated that more than 50% of streetlighting in US are utility owned. Utilities can offer both exterior lighting and streetlighting services. This can be done in conjunction with energy efficiency improvements to meet energy goals.

Exploring Revenue Streams – This can be achieved in a variety of ways. Equipment rentals, tree trimming services, EV charging stations, providing energy audits are a few examples. Lighting services mentioned above also adds to revenue.

Explore using Renewable Natural Gas (RNG) – RNG is a carbon-neutral alternative to conventional natural gas that can be used as a source of electricity, heat, or vehicle fuel. RNG is raw biogas that has been treated to be natural gas pipeline quality. As a critical component to a clean energy future, RNG is one of the most effective ways to decarbonize existing natural gas pipelines and deliver carbon-neutral energy alternatives to municipalities, major corporations, colleges, and the transportation sector. Ameresco is one of the most experienced RNG developers in North America and we can help the County identify opportunities to collect, treat, and utilize RNG in its microgrid projects.

- **What else should the County know about each newly defined role?**

Ameresco has done several projects and has in-house expertise for the majority of the roles identified above.

- **What challenges or barriers could you see for your role(s) as envisioned by the County and what might be ways for the County to address those challenges?**

The most significant challenge will be fighting the status quo.

This concept calls for the creation and development of a new electric utility within the territory of existing electric utilities. How these incumbent local distribution companies (LDC) react to this development will be very critical to the success of this effort. Will they perceive it as a threat to their business with the loss of existing and potential customers and/or revenue? Will they see it as an opportunity to use their existing infrastructure and operations to counter or circumvent the Cuyahoga County Electric Utility efforts? On the other hand, will they see this effort as potential benefit for their operation and customer base, adding reliability and enhanced services to their existing distribution network, opening alternative revenue opportunities, and perhaps even differing otherwise necessary network upgrades? To ensure the later as opposed to the former, it will be critical to develop a team of internal and partner experts to work with the LDC's from the beginning of this effort. Fortunately, Ameresco's extensive microgrid experience has fostered these experts within the company. As a partner to the County, we will bring these experts to bear throughout the microgrid development and design process.

Related to the above challenge is the issue of Utility Interconnections

Assuming the future microgrids will be connected to the larger "macrogrid", interconnections with the LDC or perhaps ta the PJM level will be necessary. The technical and regulatory requirements of these interconnections will be pivotal in the success of this effort. Utility interconnection approval is often the most time-consuming process in microgrid or DER development and design. In fact, it is often the variable that derails actual implementation of a project. The time required can be months or even years. In fact, PJM is currently experiencing a backlog of nearly 2,500 applications. Keeping this in mind, it may be advantageous to keep the initial microgrid interconnection efforts contained at the LDC electric utility level and thus avoid significant PJM involvement. This may reduce some of the savings and grid services opportunities but can help keep project development moving in a timely fashion.

Another challenge will be choosing appropriate Business Model(s)

The vision proposed by Cuyahoga County will require business models and associated contractual agreements between multiple parties, The models will need to account for costs and revenue of multiple participants including the electric customer/consumer, microgrid or DER developer/builder, the County Utility itself, and the incumbent LDC. The success of this effort will require the use of one or more of the many business models and financial vehicles available to account for all of these parties. As discussed in more detail in Appendix A, Ameresco is experienced with numerous business models and contract vehicles to implement projects and is prepared to assist the County in this effort.

Clearly Defining the Utility Customer Requirements/Expectations

- Growing number of government, commercial and industrial customers place high value on resiliency and sustainability. Microgrids offer resiliency and sustainability making it a good fit for this group.

- Sometimes smaller microgrids are not cost effective which could make them harder to justify. Identifying a customer or customers with enough load will be important to achieve the scale necessary to be cost-effective.
- Depending upon many circumstances, it can be difficult to provide all the potential benefits of microgrids AND provide utility cost savings as compared to the business-as-usual approach. Thus, it will be critical for the County Utility and microgrid developer to avoid situations in which the incumbent LDC utility adds a layer of costs with minimal customer benefit and then uses that to derail or delay a project.

Site Selection
Urban settings also create challenges for community microgrids with solar and battery storage due to space limitations. Potential sites should be studied earlier in the development phase and if possible, a site should be chosen that would allow for easy future expansion.

- **What's the typical timeline/cycle for the respondents proposed role(s)?**

Development
In Ameresco's experience, the time required for the proposed roles varies significantly form one project to the next. Every microgrid project is unique in terms of customer expectations, and requirements, equipment and systems utilized, potential geographic locations/limitations, utility interconnection characteristics, and more. The list of variables is quite extensive and have a large impact on the project development timeline. It is not unusual to see development timelines of 6 to 12 months once a customer has been identified.

Design EPC
Once the microgrid project has been developed (customer(s) confirmed, location(s) determined, deliverables defined, business models approved, conceptual design approved, and contracts executed) the EPC period has historically been 12 to 24 months. However, recent supply chain issues have pushed equipment lead times beyond 50 weeks. Therefore, it is critical to work with an EPC partner that is experienced and comfortable with procuring equipment as early as possible in the design process, well before final engineering is completed to reduce the impact of these very long lead times.

- **Would the respondent meet with the County and / or its representatives to present ideas and to answer follow up questions?**

As mentioned previously, the proposed County Electric Utility operation is a unique and intriguing endeavor that will require the effort and energy of experienced partners. Ameresco is very excited about the opportunity to discuss the concept further and answer follow-up questions.

- **All respondents will be placed on a list for other respondents to consider for teaming and/or subcontracting. If your entity requires exclusion from this list, please state so.**

Ameresco welcomes the opportunity to discuss partnerships, teaming arrangements, and subcontracting opportunities with other respondents and therefore does not require an exclusion.

Appendix A

1. Vision

a. What is your vision as to how the County Utility could fit into the emerging energy ecosystem?

Simply put, a modern electric utility should have following characteristics

1. Generate energy safely, reliably, and resiliently
2. Have significant clean energy in the mix
3. Have transparent and reasonable well-designed tariffs
4. Be considerate of its environmental impacts

b. How might the County Utility improve services compared to traditional systems?

Some common challenges that utilities face in modern days are listed below. While not everything is avoidable, planning can minimalize impacts and enable County Utility to provide better service than other utilities. Subscription based service models are thriving in modern economy. Utilities should also consider offering some services to increase their revenue stream.

Resiliency – Minimal disruptions during extreme weather events that are rising.

Balancing supply and demand – Solar and Wind are weather controlled energies. They add variables and create complexities to supply and demand forecasting unlike coal and natural gas.

Customer choice – Growing number of companies have ESG goals and reducing their carbon footprint is a part of it. Utilities should invest in clean energy to address these customers.

Additional Services – Generate additional revenue streams by installing and operating certain systems. Some examples are solar panels, EV charging stations and street lighting

c. How would you propose building a system in a manner that constrains costs based upon available loads, yet is flexible enough to adapt to new end users who are attracted to the system?

Most microgrids are flexible due to the modularity of their components. The components can be expanded and added-to with rising customer demand. Some examples include adding more batteries to the BESS, expanding a solar PV array, or adding additional microgrids to expand total capacity.

d. How might your approach be different for new developments, such as industrial or commercial parks, versus existing customers? Would you envision merging district energy or transportation or hydrogen into the development?

Ameresco has experience designing and installing microgrids for several federal facilities. Case studies for some of these projects are attached in *Attachment C.* Although not identical, similar design principles would apply to large commercial parks or industrial users. Merging with district energy should be studied on case-by-case basis.

Ameresco is one of the top companies in integrating clean technology. To keep up with the latest developments, Ameresco participated in the innovative Guidehouse Clean Economy consortium with aims to support clean Hydrogen projects. By participating in the consortium, the company is aiming to advance green hydrogen as a low-carbon, scalable fuel source for the heavy transportation sectors in Los Angeles and the Phoenix along the I-10 corridor. The project will also utilize hydrogen produced from existing and future renewable natural gas facilities.

e. How might you go about marketing your vision to end users?

Ameresco has developed microgrid project for a wide range of customers. The key is to understand the customer's goals and cater solutions based on their needs. In the case of Microgrids, better energy resiliency could be valuable to some customers whereas other customers might be drawn to using clean energy.

Ameresco has a team of marketing experts that understand this territory and can seek and engage with potential customers.

2. Business Economic Models

a. How do you envision revenue flowing through the various entities?

Utilities face an uphill battle trying to generate necessary revenue from just selling energy to its customers. However, there are other things that can be done to improve revenue. This can include capturing federal and local incentives, providing ancillary services, leasing equipment, service contracts, asset sale, subscription services are a few examples.

b. The County envisions a scenario where the developer/concessionaire is compensated through a pass-through model from power purchase agreements with individual customer/off-takers. Do you see any problems with this model or have suggestions on possible alternative compensation models?

Ameresco has experience with Energy as a Service, Power Purchase Agreement and Design-Build projects. The primary difference between them is the funding mechanism. Design-build projects would require county to initially come up with significant capital and which may cause delays through the budget and approval process. Whereas a PPA or EaaS model require the developer to fund the infrastructure, making the process easier for county. Microgrids can be funded be financed with either of these options. In case of

PPA, there may be risks associated with construction delays, performance risk, price risk and credit risk to name a few examples. Ameresco's energy specialists apply a best practice physical and financial price hedging approach that integrates fixed-price, basis and swing exposure mitigation. This can include an optimized power purchase agreement with utility companies in deregulated markets to ensure price stability and to mitigate price risk. Ameresco is open to all financing modes and is willing to partake in risk analysis and evaluate what route would benefit most to the County.

c. What process would you take with the County to design customer billing (i.e., tariffs) in a fair and transparent way?

Designing rate tariffs poses several challenges from customer/end-user acceptance to revenue sufficiency. Rates can be different for industrial customers operating 24x7 plants to commercial parks with fixed hours load profile. Factors such as fuel cost, weather events, grid volatility, etc. also have an impact on tariffs. Drawing from our expertise in tariffs, rate structures and energy systems, Ameresco is willing to help County with any critical pieces of information needed to develop rates.

d. What types of tariffs are needed to support the County initiative?

Simply put, the rate/s should be affordable for the microgrid customer(s) while generating sufficient revenue for the County and its microgrid developer(s). Whereas a typical utility has a mix of residential, commercial and industrial customers across which it can spread its cost of operations through specifically designed tariffs, the County Electric Utility will have a much more specific set of customers utilizing its microgrids. Since each of these customers will have their own unique load profile and operation, it will be beneficial to have a selection of flexible rates/tariffs. Ameresco is willing to share its expertise on tariffs during project scope development phase.

e. Would you be willing to provide the capital for the scope/role the County envisions?

Yes, Ameresco has funded projects in past and is willing to discuss providing capital in this effort as well.

f. How would you ensure prices for specific projects (e.g. new distribution line or a microgrid) are competitive?

Ameresco recommends competitively bidding the various components of projects and discuss the results of those bids with the County. Ameresco has significant experience in bidding jobs and vetting contractors/suppliers. Our team is experienced in apples-to-apples comparison when looking at multiple bids and understand that the cheapest solution may not always be the right solution. Through the projects that Ameresco has performed over the years, we have built up a database of pricing that we can use to analyze the cost-reasonableness of an equipment or construction proposal.

3. Organization Models

a. Would you be willing to contract directly with the County to be responsible for the full scope of this initiative?

As discussed at the beginning of this response, Ameresco is extremely adept at the Development and Design EPC roles as described in the RFI and therefore open to contracting directly with the County for those roles immediately. The Utility Management role is unique and still requires considerable definition and refinement. Ameresco is interested in participating in this process, and based on the outcome, would consider direct contract for this role as well.

b. What are the tradeoffs for one firm serving all roles versus separate firms serving separate roles?

One firm serving all roles would give the County assurance, consistency, and accountability. It would require fewer business/contractual arrangements and less County staffing and operations to provide oversite of the provider. There would be a single-point of responsibility to the County.

Multiple firms serving separate rolls would give the County greater flexibility for the ultimate operation and expansion of the utility. The contract for Utility Management services could be issued independently for a defined period. The subsequent microgrid Development and Design EPC roles could then be issued to multiple providers based upon a pre-qualified list or competitive solicitation. This approach would likely require a larger County staff with diverse experience to provide oversite of both the Utility operations and microgrid project implementors.

c. How would you structure the relationship between yourself, the County, and other entities (if applicable)?

There are many options, Ameresco is willing to discuss in more detail with the County.

d. What level of responsibility, if any, would you be willing to have for microgrid project identification and development, customer identification and selection, customer contract negotiations, etc.?

Ameresco is experienced with all of these efforts and willing to assume full responsibility for them.

e. What level of pre-design and other information or assurances would you need to respond to an RFP/Q and engage in negotiations with the County?

Ameresco is typically involved in the pre-design process on our projects so minimal pre-design is required.

f. What level of commitment would you need to have from potential County utility customers to respond to an RFP/Q and engage in negotiations with the County?

Ameresco is accustomed to partnering with potential customers early in the development process and working through increasing levels of commitment on both parties. We are used to starting with the customer when they have no level of commitment other than interest in a microgrid and an understanding of the potential benefits they provide. The understanding is that a potential project must be taken from this conceptual phase to an order-of-magnitude scope/budget/benefits definition quickly, with minimal investment. This is but one of several milestones at which a project may proceed or halt. Our approach allows for these milestones and only requires the commitment and/or investment to get to the next.

4. Concession Agreement & Other Contracts

a. What contracts will need to be in place and between what entities?

There are many options, but Ameresco is experienced with PPA and EaaS arrangements which appear to be a good fit for the County's envisioned utility arrangement.

b. What critical terms and conditions need to be addressed?

This will vary greatly based upon a number of factors.

c. What term lengths would respondent be comfortable with for a distributed energy or microgrid PPA?

Ameresco has experience with PPA terms of 20 to 30 years but we are aware of longer concession agreement terms in the market and are comfortable discussing.

d. What additional information would you need to sign a contract with the County for a scope of work?

Ameresco can provide terms and conditions for the Developer and Design EPC roles to assist the County in creating an agreement for those services.

5. Initiative Timelines

a. What is a typical turn-around time for you to sign a contract for your role(s)?

Ameresco can provide terms and conditions for the Developer and Design EPC roles to assist the County in creating an agreement for those services. We anticipate 6 to 12 months for the County to finalize definition for all of the roles and to begin contract negotiations. Our experience with contract negotiations is typically 90 to 120 days.

b. What is a typical development time for a microgrid, from customer recruitment through operation? What are the major milestones?

Typical development timelines from concept to operation are 12 to 24 months but may be as long as 36 months. Important milestones include project scope definition, contracting (Ameresco), initial design, major equipment procurement, final design, AHJ and utility approvals, construction & implementation, commissioning & testing, and finally operations & maintenance.

c. What impact on this initiative do you foresee, if any, from the current supply chain disruptions? Equipment lead times, interconnection ques and delays (PJM)

As mentioned previously, major equipment lead times are now beyond 12 months in some cases. However, with diligent project development and design, the impact of these delays can be reduced. Another critical component is the current interconnection backlog at PJM. It is uncertain what impact this might have on microgrid projects in the future.

6. Technology

a. What technologies should the County consider to address power issues for commercial and industrial customers? (power quality issues vs. short power outages vs. long power outages)

Microgrids can take advantage of several DER and power quality technologies. These can include Solar PV, Battery Energy Storage Systems (BESS), baseload generation such as fuel cells, generators, and microturbines. They can include systems cogeneration systems to provide electric and thermal energy and can include thermal energy storage.

b. Can you provide high-level cost estimates for distribution infrastructure, distributed generation, and/or microgrid technologies across different sizes? (e.g., 14.4 kV feeder, 1 MW/1 MWh battery, 5 MW solar PV)

Since every microgrid project is unique it is difficult to estimate typical unit costs. Add to this today's current cost inflation and supply-chain issues and it gets even more difficult. However, it is safe to assume that most DER and microgrid projects will be in the order of magnitude of millions to tens of millions of dollars.

c. Are there ranges of economic feasibility that the County should be aware of when considering on-site generation, storage, etc. For example, do projects only over X MW prove to be economically feasible in your experience?

As discussed earlier, many variables come into play when determining economic feasibility, not the least of which is the customer's financial requirements. Therefore, it is difficult to specify a specific MW size at which projects are go or no-go. However, Ameresco's experience is that the cost-effectiveness of a microgrid application correlates with the size of the load(s) served by the microgrid. The base cost associated with development, design, and engineering as well as the necessary distribution equipment,

software and controls are substantial and require a substantial amount of electric load savings to offset the investment.

d. How should cybersecurity of the utility, individual microgrids, customers, or other pertinent entities be ensured?

This is one of the more significant challenges in today's microgrid market. Ameresco has significant experience at DOD installations where cybersecurity is an absolute top priority. A critical component of secure microgrids is the use of sophisticated, field-proven software. Please refer to *Appendix B* for more information on such a system from OATI.

e. What is your approach to managing: capacity and transmission peak load contributions? Energy market arbitrage? Frequency regulation?

Ameresco has experience with projects for both large utility consumers and directly for electric distribution utilities themselves and therefore have experience in all of these areas. As with cybersecurity, sophisticated controls and software platforms are critical to providing these services.

7. Diversity, Equity, and Inclusion

a. How will you ensure Diverse, Equitable and Inclusive (DEI) partnership(s) throughout this Initiative?

In order to retain and maximize project capital costs within the local communities surrounding our clients, project construction is typically subcontracted to local firms with an emphasis on the client's subcontracting requirements for local subcontracting, in addition to small business, small disadvantaged, women-owned, HUBZone, veteran-owned, and service-disabled veteran owned businesses enterprises. Ameresco takes great pride in working with local businesses and suppliers in maximizing project capital construction investments in the communities we serve. This commitment to Small Business subcontracting is documented on the U.S. Government Electronic Subcontracting Reporting System (eSRS).

Ameresco recognizes that providing competitive opportunities for small businesses supports our national economy and the enterprise system in which we operate. Additionally, broad-based competition contributes to our goal of providing the highest quality services at competitive prices. Ameresco affords small business concerns ample opportunity to compete for subcontracted work and to supply materials and equipment.

Ameresco will identify and qualify new small/disadvantaged businesses through the following outreach processes:

- Maintain a Small Business subcontractor / supplier resource listing
- Participate with small, small disadvantaged, and minority business associations to identify and recruit potential new small businesses
- Provide advice and assistance to small, small disadvantaged, and woman-owned small firms seeking to do business with Ameresco

- Encourage potential new subcontractors to submit a Statement of Qualifications (SOQ) which provides a concise format for review of a company's capabilities, certifications, and experiences. The SOQ includes questions on the candidate's small business certifications (the subcontractor must provide proof of any qualifying certifications claimed), organizational structure, a financial risk profile, experience, and capabilities in selected target markets, contract practices, recent project history, and references.
- Invite newly identified contractors to bid on upcoming work. Successful pre-qualified bidders will be selected based on completeness of scope, added value, innovation, and price.

Ameresco ensures that small business concerns meet Ameresco's commitments to safety, quality, schedule, labor standards, and cooperation with the client.

Our goal is not only to complete the work, but to enhance the capability of the SB, SDB, WOSB, HZSB, VOSB, and SDVOSB concerns so they can remain or become viable members of the contracting community. We will assist our small business subcontractors as necessary to ensure our mutual success.

8. Other

a. What potential risks, setbacks, or hurdles do you see for this Initiative?

A few of the potential risks, setbacks, and hurdles have been described in more detail on page 8 of this response. These are some common challenges that a typical microgrid project would face and an unexperienced company would get hung up on these. However, **Ameresco has performed multiple successful microgrid projects and is prepared to help the County navigate these issues.**

b. Please provide any other information that you feel would be pertinent to the County at this stage of the process.

Ameresco is prepared to bring our extensive resources and subject matter experts to partner with Cuyahoga County in the continued development and exploration of this exciting endeavor. We are prepared to begin immediately and look forward to continued discussions.

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