

SYNC, INC., (“SYNC ENERGY AI”)
**City of Chicago Franchise for Electricity
Delivery RFI**

1. Executive Summary

When it comes to energy resiliency, society needs to be proactive, not reactive. By simulating all risks and vulnerabilities in advance using proprietary Energy AI, Sync Energy AI shows how this resiliency can be achieved. In this RFI, we outline how the City of Chicago can achieve the goals and priorities below.

- Power city-owned buildings by renewable energy by 2025
- Supply renewable energy for all buildings by 2035
- Convert to an all-electric public bus fleet by 2040

2. Company or Organization Information and Past Experience

Sync Energy AI is a GridTech company based in Birmingham, Alabama, USA. We are committed to helping electric utilities adopt Artificial Intelligence faster to improve their business processes and engineering operations.

With our solution, utilities can save millions of capital dollars required for AI/ML DevOps. Instead of setting up their cloud servers and re-training AI models for repeating tasks and projects, utilities can save time and money by directly using our high-accuracy, utility-data trained AI model for various use cases. Sync's solution ranges from vegetation management to load forecasting, electric vehicle planning, and rate case design.

We are leading providers of AI-as-a-Service, specifically for engineers in electric utilities. Data governance? We take care of it. Hundreds of engineer-hours spent on tedious model building and hyper-parameter optimization? We do it too. Engineers love Sync Energy AI because it is not just another AI. It is an analytics assistant. It helps them focus on best-in-class customer satisfaction through resilient power delivery.

Some highlights from our past work:

- Sync has helped Alabama Power predict power outages up to 96 percent accuracy, up to 4 weeks in advance.
- Sync was among the 10 teams in TechStars' EnergyTech cohort, selected among more than 950 applicants.

3. Name of Company/Organization

Sync Energy, Inc. (“Sync”) vision is to maintain and improve the resilience of electric power grids in the face of climate change, cyber threats, and increasing reliance on renewable power generation which tends to be less predictable. The best way for us to support that vision is by creating the leading analytics platform for the electric power grid and make it accessible to all utilities through a cloud-based, Software-as-a-Service (SaaS) model. Our company is rapidly becoming the most innovative energy analytics platform, leveraging its proprietary artificial intelligence (AI) algorithms to help electric utilities predict vulnerabilities in the power grid to natural and manmade hazards.

Despite being a new player, Sync has already secured interest from utilities covering the entire range from publicly traded corporations to rural cooperatives, as well as partners from related industries. Referring to the Resources Plan in section 2, Sync has raised or received commitments of \$650,000 out of a \$800,000 capital raising goal by July 2021. In a successful pilot project with Alabama Power, which was only completed in January 2021, Sync received invaluable thousands of dollars of in-kind contributions through the man-hours provided by the partner.

Sync’s founders - Robert “Rob” Kabera and Sayonsom “Sayon” Chanda - met while attending post-graduate programs in Electrical Engineering from 2012-2014, both with a focus on Power Systems at Washington State University in Pullman, home of Schweitzer Engineering Labs, and a world-leading institution in electric grid-related engineering. Both remained committed to the electric grid technologies in their subsequent career, until they reconnected in 2017 and started to collaborate developing their ideas, which culminated in the formation of Sync in 2020. The founders’ complementary pathways since 2014 - Robert’s entrepreneurial experience and Sayon’s more traditional academic career at Idaho National Laboratory and industrial experience at National Grid - proved to be an effective combination: Sync was almost immediately accepted into the coveted TechStars accelerator program just kickstarted at the new EnergyTech accelerator in Birmingham, AL, where Sync is headquartered. Sync has since joined the Plug and Play Accelerator energy cohort.

Key Principals and their Prior Experience:

Dr. Sayonsom “Sayon” Chanda, Principal Investigator and CEO of Sync. Dr. Chanda has more than ten years of experience in electric grid analytics prior to co-founding Sync. His most recent role was as a Senior Quantitative Analyst at National Grid of New York, in a mission-critical analytics function at one of the world’s largest electric transmission companies. Prior to that, he worked on the integration of renewable energy, electromobility, and microgrids as a Research Engineer at Idaho National Laboratory while completing his PhD on electric grid resilience[i] at Washington State University. Throughout his career, he managed to combine academic work with application-oriented assignments with institutions or companies such as Schweitzer Engineering Labs. Sayon has authored 15 publications related to Sync’s mission, among them many papers in first-tier peer-reviewed journals, and has found time to serve in leadership roles at the IEEE Young Professional Society.

Robert “Rob” Kabera, COO of Sync. Rob Kabera is a Forbes 30-under-30 entrepreneur with a history of successful startups and exits in the energy domain after filling business development roles for major multinational corporations including Chevron and Siemens Energy. Even apart from his business track record, he is an accomplished engineer with software development expertise which he now applies at Sync, drawing on a BS in Energy Resources Engineering from Stanford, participation in the Postgraduate Program in Power Systems Engineering at Washington State University, and a past position as a Process Engineer at Chevron’s Richmond Technology Center. Under the Obama Administration’s Power Africa Program, Robert was the Chief Consultant for the United States Africa Development Foundation (USADF) energy investment portfolio, working with over 50 energy companies in 9 countries. Robert was trained in General Management at the Stanford University Graduate School of Business.

3. Narrative

Sync is a leader in developing a first-of-kind no-code electric grid analytics platform targeted at electric utilities whose engineers need predictive analytics for planning and emergency response. This platform will be the first to combine weather and power system domains, to simulate present and future power grid scenarios.

- **Power city-owned buildings by renewable energy by 2025**
Our hi-resolution satellite imagery can be used to identify building roof-tops that have high potential for reaping the benefits of on-site renewable energy to reduce peak demands.
- **Supply renewable energy for all buildings by 2035**
Our hi-resolution satellite imagery can be used to identify vacant parcels close to high-energy growth areas so that developers can be incentivized to leverage those empty parcels first to ensure clean energy projects (which usually takes 10 years for full commissioning) can be used to supply renewable for all buildings by 2035.
- **Convert to an all-electric public bus fleet by 2040**
Sync has developed an algorithm to identify traffic demand patterns by studying customer AMI data. This can help city planners design EV-bus routes to target more climate-friendly customers. Also, our simulation platform can help understand the impact of large fleet charging on the electric grid.

4. Public Benefits

The past year and a half was full of extreme challenges to the United States' electric grid, combining natural disasters, terror and sabotage attempts, coupled with a pandemic that suddenly shifted electricity needs geographically. These stresses resulted in 340 major power outages in 2020 alone, with that year's hurricane season - the most active in the last 20 years, including hurricanes Zeta and Sally - causing \$52 billion of damage in the US. The trend continued in 2021, culminating in the catastrophic power outage of February 2021, which was centered on Texas, where it caused more than 100 fatalities. More than four million customers lost power, with BIPOC suffering a four-fold elevated risk of being affected. While the causes are still being analyzed, it is clear that most of the event's effects could have been avoided by smart predictive analytics. It is equally clear that such extreme events will become more common as climate change progresses. The crisis came on the heels of the

discovery of the Solar Winds hacks in December 2020, which also affected electric utilities, and showcased vulnerabilities to the electric grid by potential bad actors. Due to the brave sacrifices by utility workers, even worse outcomes were averted. The past year was no doubt a wakeup call for the utility industry to leverage the power of Artificial Intelligence (AI) to avoid even worse disasters in the future.

It is thus clear that utilities need new tools for a smart digital transformation, which is oriented towards preparation and prediction instead of reacting and responding. Recent technological and scientific advancements have provided the fundamental building blocks for predictive analytics transformation. Sync's Event Intelligence platform presents a productized culmination of these developments. Sync is an innovative, US-based software enterprise which leads the way in predictive grid analytics in the future. Its products are able to directly bring AI to field maintenance technicians working in utilities, upgrading their skill level and therefore economic prospects, while addressing labor shortages both at the high-skill (data scientists) and low-skill (tree trimmers) end of the vegetation management sector for electric utilities. Sync Energy AI will transform how utilities respond to extreme weather events, saving millions of customers from being in the dark, and help utilities protect their own network and business interests. The platform is scalable - as the algorithms developed for one utility can be replicated across all 3,736 utilities in the US. The resilience it creates will ultimately translate into more resilience following integration of two major revolutions in the electric grid: electric vehicles and the increasing reliance on microgrids associated with renewable generation.

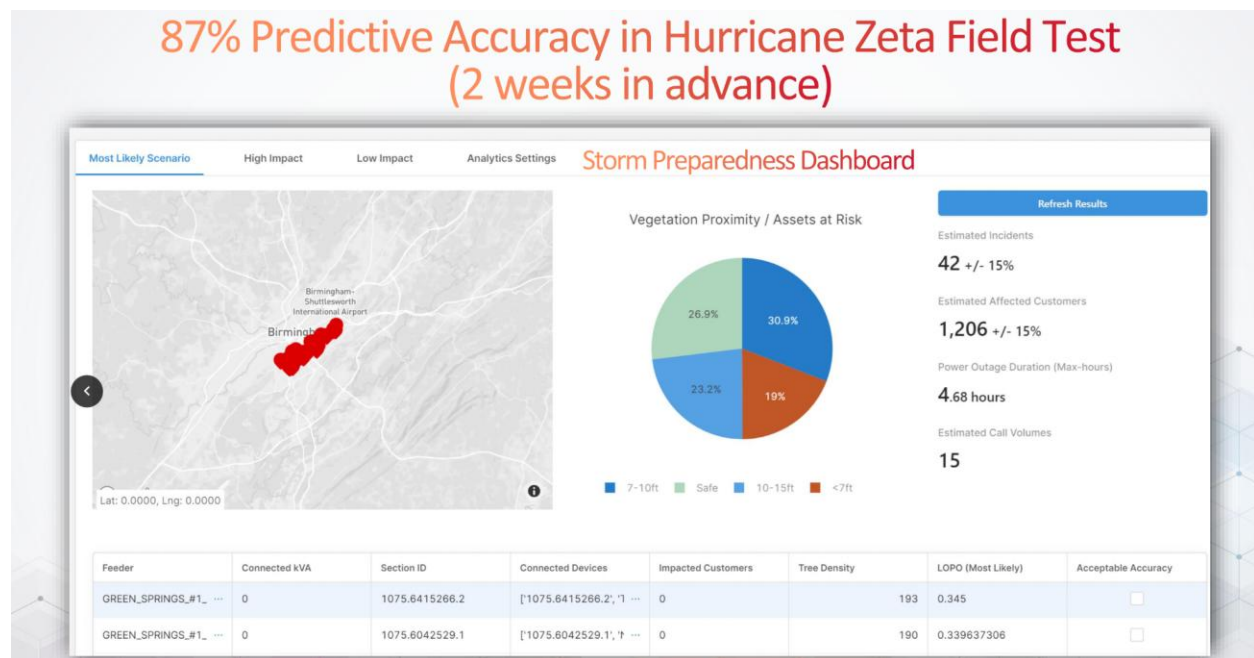
The ongoing global Covid pandemic peaked in the US with well over 100,000 hospitalizations for several weeks, putting unprecedented strain on hospital capacities. The pandemic combined with wide-spread power outages put hospitals' emergency power preparedness into the spotlight: according to the NFPA 110 standard, hospitals are required to maintain 72-96 hours of emergency fuel supply for diesel backup generators. Hence, an outage of more than four days would inevitably endanger lives and the integrity of cryogenic assets such as vaccines. One blow to such contingency plans was hurricane Zeta, which caused power outages of more than two weeks in some parts of the US Southeast, leaving up to two million people without power. Analyzing Zeta's outage patterns, Sync demonstrated that the specific power outages caused by the hurricane could have been predicted with a success rate of almost 90%.

During extreme weather events, we can be able to quickly identify parts of the network that can be designated to operate as microgrids. Sync's power flow solution can help the network identify strategic locations for the point-of-common-coupling for the utility

and the ad-hoc microgrid. Correct sizing and billing (following an equitable and just formula) of the power exchanged with microgrids can be automated, as can be the compliance validation of microgrids with respect to IEEE 1547-2018-, IEEE P2030.7, IEC 61727-, and Clean Air Act regulations. Then latter processes alone normally take at least several months just for planning purposes.

Today, it takes a team of 7-10 data scientists no less than two weeks, with an annual budget of \$5M USD to perform the analytics that Sync Energy AI delivers in hours for \$300k/year. For any operating condition, Sync can develop most likely, worst case, and best-case scenarios, and strategies to overcome them in real-time. It can help prioritize load recovery and restoration and reduce customer downtime by up to 90%.

5. Lessons Learned/Next Steps



Sync did successful proof-of-concept pilot (96% accuracy, 4 months in advance) and field test (87% accuracy, 2 weeks in advance) projects with Alabama Power Company for its service territories in Birmingham, which is the seat of Jefferson County, Alabama. The scope of the pilot project was to predict the damage the power grid infrastructure in the aforementioned jurisdiction would endure when subjected to an extreme weather event, such as a hurricane. The field test was implemented in a 3-month pilot project with Alabama Power Company in January 2021, demonstrating its capability to analyze the potential storm impact in the Birmingham, AL area. The pilot encompassed two substations serving 4,000 customers, and achieved 96%

accuracy in predicting a storm's impact on the grid, six months in advance. The prediction accuracy, measured as the predicted sections damaged divided by the actual sections damaged, surpassed the 80% target set by the customer, giving a high level of confidence to our methodology. In a field test of Hurricane Zeta , 87% accuracy was achieved in predicting the number of impacted customers and 72% in forecasting the number of incidents (see dashboard above).

Today, it takes a team of 7-10 data scientists no less than two weeks, with an annual budget of \$5M USD to perform the analytics that Sync Energy AI delivers in hours for \$300k/year. For any operating condition, Sync can develop most likely, worst case, and best-case scenarios, and strategies to overcome them in real-time. It can help prioritize load recovery and restoration and reduce customer downtime by up to 90%. With Sync Energy AI in hand, the City of Chicago can be more resilient in terms of disaster preparedness, long-term planning and simulation towards the four pillars of its Energy and Equity Agreement development: governance & transparency, energy & electrification as well as equity and neighborhood development.