QUANTA TECHNOLOGY

PROPOSAL

Demand Response Consulting Support

PREPARED FOR

City of Lake Worth Beach

DATE

August 31, 2022

INTERNAL REFERENCE NUMBER

22G008

PREPARED BY

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VERSION HISTORY:

Version	Date	Description
1.0	8/31/2022	Initial submission

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1 COVER LETTER

Ed Liberty
Director, Electric Utilities
City of Lake Worth Beach

Dear Ed,

Quanta Technology welcomes the opportunity to work with the City of Lake Worth Beach Electric Utility to define and characterize a Demand Response program that will provide involvement opportunities to residents and yield operational benefits to the City of Lake Worth Utility with the goal of achieving a 5 MW or similar target demand reduction as was discussed at our recent meeting.

We are an **independent** and diverse consulting company with approximately 300 experienced consultants and industry experts headquartered in Raleigh, NC, with supporting offices in Illinois, California, and Canada. Our experts can help you with your Demand Response Program feasibility assessment, definition, and implementation. We also offer numerous related services that you can also take advantage of including Grid Modernization, AMI, T&D, Protection, Renewables, Energy storage, Electric Vehicles, and many more.

We have structured our proposal to line up with our discussions to essentially divide the scope of work into three phases:

- Phase 1 (Conduct DR Study): Provide a technology and cost assessment defining the most practical way to achieve the targeted DR reduction with a goal of 5 MW
- Phase 2 (RFP Development/Vendor Selection): Develop the RFP and support vendor bid responses, evaluation, and recommended selection
- Phase 3 (PM Oversight): Provide Project Management Oversight throughout Phase 2 and subsequent implementation and commissioning of the program ensuring that desired results are achieved.

We are providing pricing on Phase 1 and budgetary estimates for Phase 2 to help in your planning process. We also include our recommended Project Management approach. We will be happy to work with you to refine these estimates as the project is better defined.

We offer a full spectrum of services in the following:

- Grid Modernization & Business Strategy
- Regulatory Compliance
- Advanced Metering Infrastructure (AMI)
- Smart Water Solutions
- Non-revenue water
- Leak Detection, pressure monitoring
- Transmission & Distribution
- Automation & Testing
- Asset Operations
- Protection & Control
- Asset Management
- Enterprise Integration
- Smart Grid Strategies
- Applied R&D
- Renewables Integration
- Energy Storage
- Microgrids

We believe we are the best fit for this project based on our experience, proven methodology, and our past work and relationship with the City of Lake Worth Beach. Feel free to reach out to our team with any clarifying questions. We are also very open to adapting our proposal further if needed to meet your needs.

2 SCOPE OF WORK / ADVISORY SERVICES

2.1 Phase 1: Demand Response Study

Phase 1 involves conducting a Demand Response Study primarily aimed at:

- Collecting and analyzing current relevant data from the City of Lake Worth Beach (LWB) System
- Defining system demand response program potential benefits which drive success factors
- Conducting a technology assessment evaluating technology choices
- Detailing anticipated impacts and costs

This phase should result in defining the most practical way of achieving the target demand reduction (e.g. 5 MW or target) while primarily focusing on the residential sector allowing the LWB residents to engage in transformative Energy Programs.

Table 1 below provides an overview of anticipated services performed during this project phase.

Table 1: Phase 1 Proposed Services

Service Breakdown	Description	Notes
Data Collection / Analysis	Obtain and analyze current available data from the City including: • Distribution of Customer Types and end use services (e.g. AC, Pool Pump, Water Heater, etc.) • Demand and Load Profiles • System operations and power purchase costs Obtain other available relevant data such as: • Experiences with other utilities/customers in FL	Helps answer: How much is available for reducing, shifting, or increasing load?
System Benefits	Work with the City to define the desired system benefits derived from the Demand Response program. Potential benefits include: Planning: • Deferring upgrades Operations:	Helps answer: How can the load be used to create benefits?

	• Controlling power purchase costs, e.g., demand charges (peak shaving)	
Conceptual DR Programs (Technology Assessment)	Design potential DR programs options, for example Residential Program options: • Smart thermostats or other HVAC controls • Remote controlled services (water heating, pool pumps, other) • Smart EV charging C&I Program Concepts (Palm Beach State College) • Chilled water loop Other Factors to Consider: • Communications and control platform • Interactions with AMI • Experiences with other utilities	Helps Answer: What technology choices are available for implementation?
Assessment of Impact and Costs	Estimate program benefits and cost. Expected elements include: • Participation rates and anticipated evolution • Load shape impacts, dispatchable loads (daily, seasonal, and/or quarterly) and anticipated C/B • Equipment, installation, communication infrastructure, integration, marketing, and SAAS/maintenance costs • Customer and Utility Costs (including Incentives) • Measurement and evaluation approach • Leveraging costs of EE & financing programs	Helps Answer: Cost / Benefit considerations

2.1.1 Anticipated Schedule

It is anticipated that Phase 1 could take 8 – 12 weeks of duration.

2.2 Phase 2: RFP Development / Vendor Selection

Phase 2 of the project provides the following services associated with RFP development and vendor selection:

Table 2: Phase 2 Proposed Services

Service Breakdown	Description
RFP Development	Development of an RFP Functional Specification detailing system requirements.
RFP Issuance	The City would combine its Terms and Conditions with the RFP Specification and issue the RFP using its preferred method. Quanta Technology would provide oversight and support.
Support for Vendor Questions	Provide answers to vendor questions during the prescribed Q/A period. Responses to be distributed to all bidders.
Compliance review of Bidder Responses	Quanta Technology will develop a compliance matrix with essential elements required for all proposals. An initial compliance review will be conducted to ensure that only compliant bidder responses are forwarded to the Evaluation Team for consideration.
Bidder Proposal Evaluations / Ranking	Quanta Technology will provide rating/ranking matrix allowing for vendor scoring and weighting to be utilized to determine vendor scores.
Shortlist Vendor Interviews	Short-list vendor interviews (up to 2 hours each) are scheduled to allow vendors to present any key items as well as Best and Final Offer considerations.
Final Recommendation	Quanta Technology will consolidate scoring and data gathered during the evaluation process and present a final recommendation to the City. The City will make the final selection.

2.2.1 Anticipated Schedule

This project phase can take between 12 – 14 weeks of elapsed time primarily driven by the following high-level estimates:

- RFP Development: 4 weeks
- Vendor Q/A Period: 1 week (in parallel to Vendor Response period)
- Vendor Response Period: 4 weeks
- Vendor Compliance Review: 1 week
- Vendor Evaluation: 2 weeks – 3 weeks
- Final Recommendation / Wrap up: 1 week

2.3 Phase 3: Project Management Support

Phase 3 involves Project Management (PM) Oversight and Technical Advisement during the system implementation and field rollout phase. The PM will ensure that the program is implemented and will help drive and quantify system benefits, essentially evaluating and achieving the desired results.

Quanta Technology can provide an experienced Senior AMI PMP Certified Project Manager located in Raleigh, NC, to serve as the City's Deployment Program/Project Manager for the project on a T&M basis. The project manager would be responsible for project planning, communication, risk management, action tracking, problem resolution, and financial support. A detailed budgetary estimate can be provided upon a further understanding the selected Demand Response option and chosen technology.

3 PROJECT TEAM

Our assigned project team comprises experts who have previously worked together on similar projects. This section details their qualifications, how they will be organized, and who will work on what aspects of the City's project. Detailed resumes can be found in Appendix I. The proposed personnel for this project and their roles and responsibilities are shown below

Table 1: Project Team Roles & Contributions

Name	Title	Relevant Experience	Role	Involvement Level	Project Contribution
Jesus Gonzalez, PMP	Principal Advisor	11+ yrs. Utility 24+ yrs. PM	Project Manager	Heavy Participation	Project Management; Team Lead; Customer Prime
Veronika Rabl, PhD	Executive Advisor	40+ yrs. Energy	Subject Matter Expert	Medium Participation	Technical Prime; Advisement
Robert Dumas, PhD	Principal Advisor	40+ yrs. Utility	Subject Matter Expert	Medium Participation	Technical Prime; Advisement
David Uy	Principal Engineer	27+ yrs. Utility Electric	Engineering & Project Support	Heavy Participation	Data Analysis; Project Support
Chad Abbey, PhD	Executive Advisor	19+ yrs. Utility	Subject Matter Expert	Support Role	Technical Prime; Advisement

3.1 Project Organization

Figure 2-2 (below) shows the proposed working structure for this project. Jesus Gonzalez, PMP, will serve as the project manager, overseeing all the activities, the project schedule, work assignments, on-time delivery, quality assurance, and coordination with the customer.

As noted above, the entire team will not be dedicated full-time to your project. The project's scope will determine the level of involvement in any given phase. This involvement can increase or decrease as needed by the City, but the resource allocation will always be appropriate for the level of effort required on the project. Quanta Technology has sufficient resources to meet the need.

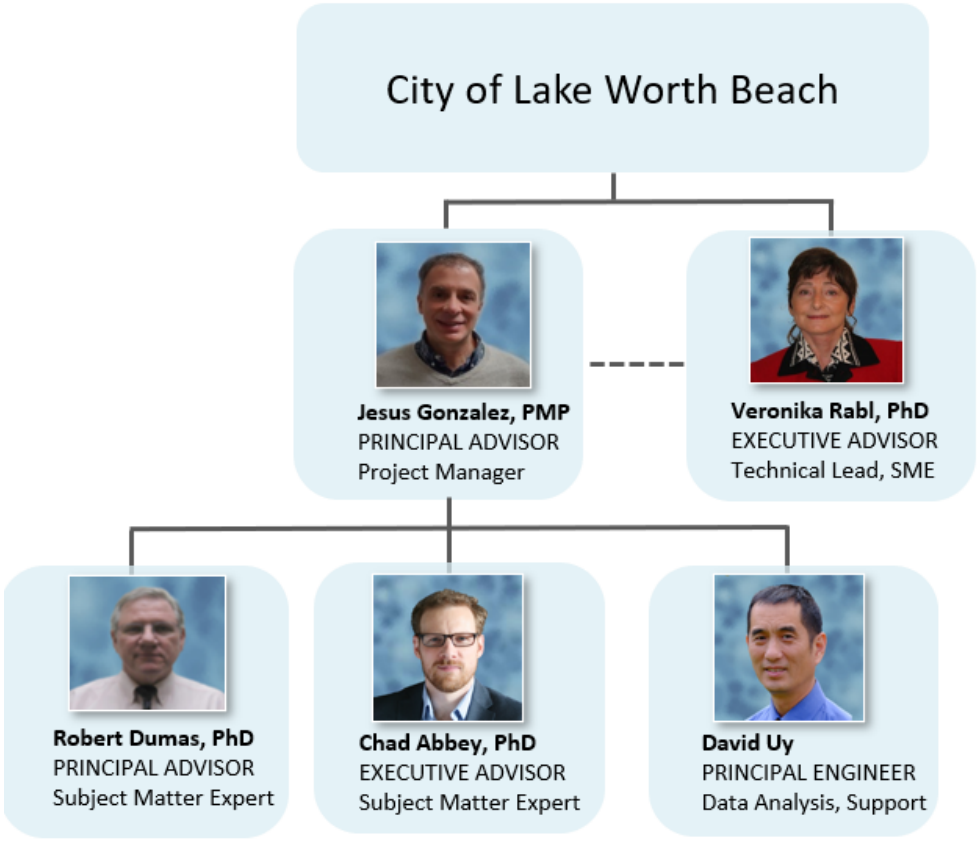

Figure 2-2. Project Organization Chart

4 COST

4.1 Phase 1: Demand Response Study (T&M)

Phase 1 will be billed on a T&M basis. It is anticipated that most of the work will be conducted remote with onsite meetings only conducted as requested by the City. Expenses for requested travel will be billed on an "At Cost" basis with no markup.

Advisory Services	Estimated Cost
Phase 1: • Data Collection • System Benefits • Conceptual DR Programs (Technology Assessment) • Assessment of Impacts and Costs	$49,948

4.2 Phase 2: RFP Development / Vendor Selection (budgetary estimate)

A budgetary estimate is provided for Phase 2 activities to help with the City's planning activities. A formal estimate will be provided upon request once Phase 1 is more clearly understood.

Advisory Services	Budgetary Estimate
Phase 2: • RFP development • RFP issuance • Support for Vendor Q/A • Bid Response Compliance Review • Vendor Bid Evaluation /Ranking • Shortlist Vendor Interviews • Final Recommendation	$45,970

4.3 Travel

Travel, lodging, and materials will be billed at cost. Typical travel trips required to support the project implementation are shown below. All other travel tied to T&M-provided services will be rendered as required by the project and billable at cost.

Table 4-1. Proposed Travel Expense Cost Estimate

Item	Trips	Days	Staff	Cost Estimate
PH1: Onsite review meeting	1	2	2	$1.740
			Total	$1,740

4.4 Hourly Rate Schedule

Quanta Technology Standard Hourly Rates are shown below.

Table 4-2. Quanta Technology Standard Hourly Rates for 2022

Title	Standard Rates (Shown in USD)
Executive Advisor	$342
Principal Advisor	$288
Senior Advisor	$244
Senior AMI Project Manager / Technical Advisor	$244
Senior Engineer	$147

These rates are exclusive of taxes, which are the customer's sole responsibility.

4.5 Assumptions

No.	Assumption
General	
1	There is a fixed start date within 14 days of contract signing. Possible start of September 15th.
2	If the project scope or duration changes, we will work with the City team to assess impacts and work through a documented change order process accordingly.
3	Out-of-scope activities would be handled via a documented change order.
Phase 1: Demand Response Study	
4	City will upload all related data and deliver electronically
5	Quanta Technology will not be conducting Market Research. Focus groups can be added as an optional service.
6	Customer data is available and segmented by building type, equipment, saturation/penetration or City will help define estimates.
Phase 2: RFP Development / Vendor Selection	
7	Assumes RFP will be sent out to vendors and up to 6 vendors are evaluated post compliance review
8	Quanta Technology will use existing tools for the bidder RFP evaluation with minimal modification. Customization will be scoped separately.
9	Based on the City's evaluation, Quanta Technology will make the final vendor recommendation under standard services. The City will make the final vendor selection.

No.	Assumption
10	The budgetary estimate provided does not include support for contract negotiations with vendors. These services can be provided as requested.
11	The City will follow Quanta Technology's recommended review process, including its SharePoint approach to bid management.

APPENDIX I: STAFF RESUMES

JESUS GONZALEZ, PMP

JESUS GONZALEZ, PMP, *PRINCIPAL ADVISOR, Protection, Control & Automation,* has over 30 years of professional experience spanning the utility and telecommunications sectors and 24 years of project management experience. His utility experience includes over ten years of advanced metering infrastructure (AMI) deployments with Honeywell (formerly Elster Solutions & ABB). He led numerous deployment projects across a broad customer base consisting of municipal cooperatives and IOUs in North America and Mexico. He holds a master's degree in Information and Computer Science from the Georgia Institute of Technology in Atlanta and has been a certified Project Management Professional for 15 years.

Areas of Expertise

- Advanced Metering Infrastructure (AMI) electric, water, and gas system deployments
- Project management planning and governance, risk analysis/management, cost control
- Project management office portfolio management, Clarity PPM

Experience and Background

- Years of experience in the utility industry 2011–Present
- Principal Advisor, Protection, Control & Automation, Quanta Technology 2022–Present
- Manager Customer Delivery, Honeywell/Elster Solutions 2015–2021
- Senior Project Manager, Customer Delivery, Elster Solutions 2011–2015
- Years of experience in the telecommunications industry 2011–1987

Relevant Field Deployment Projects:

- City of Newberry AMI Deployment, Water: 2.1K, Elec: 1.9, AMI meter deployment (Quanta Technology)
- Entergy, Electric 3.0M, Gas 200K, AMI meter deployment (Honeywell)
- City of Tallahassee, Water: 87K, Electric 113K, Gas 24K, AMI meter deployment (Honeywell)
- City of Fort Collins, Water: 31K, Elec: 68K, AMI meter deployment (Honeywell)
- Lafayette Utilities Sys. (LUS), Water 56K, Electric: 65K, AMI meter deployment (Honeywell)

Accomplishments and Industry Recognition

- Project Management Professional, PMP since 2007
- Six Sigma Green Belt, Villanova University

Education

- MS, Information and Computer Science, Georgia Institute of Technology, 1988
- BS, Electrical and Computer Engineering, University of Miami, 1987

VERONIKA A. RABL, PHD

VERONIKA A. RABL, PhD, *EXECUTIVE ADVISOR, Distribution,* is an energy systems and markets expert. Her energy career started in solar, energy conservation, and environmental areas at Argonne National Laboratory. She led work in the modelling of community-size energy systems—from generation to service delivery. She managed technical/economic assessments of energy storage technologies while on assignment to U.S. DOE. Until 2001, Dr. Rabl served as General Manager and Director at the Electric Power Research Institute (EPRI). She established EPRI's demand response research program and technology portfolio, including energy storage, energy management, and distributed load control systems. Veronika's work includes policy papers on energy efficiency, electric transportation, clean power supply, and electric grid modernization, as well as energy and environmental life cycle assessments. She has recently been a team lead and coauthor of the IEEE PES (Power and Energy Society) Energy Storage Primer. She helped launch the Engineering Founder Societies' Technology for Carbon Management Grand Challenge Initiative; assessed EPA Clean Power Plan implementation options; reviewed ISO/RTO market rules and processes; served as co-chair of IEEE Joint Task Force on the U.S. DOE Quadrennial Energy Review; and co-chaired e-demand management alternatives for the Commonwealth of Virginia. Currently, she is a consultant specializing in energy and technology policy.

Areas of Expertise

- Skilled in and extensive experience with energy efficiency and demand-response technology, benefits, and applications on both sides of the meter
- Demonstrated expertise in policy analysis and strategy development, reflecting a synthesis of information on technologies, customers, and economic/regulatory environments
- Broad understanding of technology and energy issues in all sectors. Familiar with power system technology, planning, and operations

Experience and Background

- Executive Advisor, Quanta Technology 2020–Present
- Principal, Vision & Results 2005–Present
- Senior Subject Matter Expert, Energetics, Inc. 2012–2017
- Director, Energy Management Consulting, Aspen Systems 2002–2004
- General Manager, Retail Energy Products & Services, EPRI 1981–2001
- Office of Energy Systems Research, U.S. Department of Energy (DOE) 1980–1981
- Assistant Environmental Systems Engineer, Argonne National Laboratory 1974–1979

Accomplishments and Industry Recognition

- Chair, IEEE-USA Energy Policy Committee, 2012–2014,

- IEEE Lead Technical Member of the Engineering Founder Societies' Technology for Carbon Management Initiative, 2009–2014
- Member, DOE/NETL Carbon Capture Peer Review Panel, 2011, 2013
- Recipient of IEEE-USA Professional Achievement Award for Individuals, 2011

Education

- PhD, Ohio State University, 1974

ROBERT DUMAS, PHD

ROBERT DUMAS, PHD, *PRINCIPAL ADVISOR, Protection, Control & Automation,* has over 40 years of experience with increasing levels of organizational responsibility in electrical, nuclear, mechanical, and environmental engineering positions associated with electric utility generation, transmission operations, and advanced metering infrastructure (AMI) smart-grid solutions for some of the largest utilities in the US and internationally.

This experience includes 17+ years with Virginia Power Nuclear Design Engineering and 17 years in the AMI industry with Elster Solutions (formerly ABB) and Itron Inc. With Quanta Technology. He has been responsible for project execution of the multi-million-dollar Wide-Area Protection project for National Grid Saudi Arabia and ongoing AMI consulting projects. He continues with Quanta Technology as a senior AMI subject matter expert.

Areas of Expertise

- Project and program management
- Advanced metering infrastructure (AMI)
- Smart metering (electric, water, gas)
- Meter data management systems
- GIS system application
- Utility operations
- Resource planning
- Nuclear plant instrumentation and control
- Nuclear and EMS SCADA systems

Experience and Background

- Years of experience in the electric power industry 1977–Present
- Principal Advisor, Lead AMI, PCA, Quanta Technology 2016, 2018–Present
- Director, Solution Delivery, Itron Inc. 2017–2018
- Managing Partner, Smart Grid Consulting Associates, LLC 2015–2016
- Vice President, Program Implementation, Elster Solutions (formerly ABB) 1999–2014
- Senior Researcher and Doctoral Student, Environmental Engineering, NCSU 1995–1999
- Senior Staff Engineer, Nuclear Design and Power Supply, Virginia Power 1977–1994

Relevant Field Deployment Projects:

- City of Newberry AMI Deployment, Water: 2.1K, Elec: 1.9, AMI meter deployment (Quanta Technology)
- City of Tallahassee, Water: 87K, Electric 113K, Gas 24K, AMI meter deployment (Honeywell)
- City of Fort Collins, Water: 31K, Elec: 68K, AMI meter deployment (Honeywell)
- KCBPU, Water: 54K, Elec: 67K, AMI meter deployment (Honeywell)
- Peterborough, Water: 22K, Elec: 37K, AMI meter deployment (Honeywell)

Education

- PhD, Environmental Engineering, North Carolina State University (NCSU), 1999
- MS, Environmental Engineering, North Carolina State University (NCSU), 1996
- BS, Nuclear Engineering, North Carolina State University (NCSU), 1977

DAVID UY, PE

DAVID UY, PE, *SENIOR ENGINEER, Protection, Control & Automation,* is an accomplished engineer with expertise in designing and developing customer-focused solutions using customer requirements, system specifications, test and field data, and root cause analysis. He has expertise in developing, producing, and supporting power system protection, automation, energy measurement, and control products. David is also adept at managing projects and deploying efficient customer solutions.

Areas of Expertise

- Advanced metering infrastructure (AMI)
- Advanced meter reading (AMR)
- ANSI C12.18/21/22, DNP 3.0, Modbus, TCP/IP
- Power system protection
- Process management
- Data analysis
- Root cause analysis
- Project management
- Testing

Experience and Background

- Years of experience in the electric power industry 1995–Present
- Senior Engineer (Associate), Quanta Technology 2020–Present
- Sr. Advanced Embedded Engineer, Honeywell International 2016–2019
- Principal Engineer, Elster Solutions 2001–2016
- Senior R&D Engineer, ABB Electric Systems Technology Institute 1997–2001
- R&D Engineer, ABB Transmission Technology Institute 1995–1997

Accomplishments and Industry Recognition

- Licensed Professional Engineer, North Carolina (No. 027004)
- IEEE member, 1983–Present
- Seven patents (four in AMI and three in distribution system protection and monitoring)

Education

- MS, Electrical Engineering (Power System Reliability), Missouri University of Science and Technology (University of Missouri-Rolla), 1991
- BS, Electrical Engineering, Michigan Technological University, 1988

CHAD ABBEY, PhD

CHAD ABBEY, PhD, *SENIOR DIRECTOR, Advisory Services,* is an international expert with over eighteen years of industry experience in grid modernization, utility operations, and renewable-energy and energy-storage integration. He has helped utilities and developers navigate the distributed generation (DG) interconnection process, deploy innovative solutions to accelerate and reduce the cost of DG interconnection, and integrate distributed energy resources (DER) into distribution system operations. These projects have included design, specification, and subsequent deployment of distributed energy resource management systems (DERMS) and advanced laboratory testing using real-time simulation of emerging distribution architectures and technologies, including high-penetration DER control, OpenFMB, microgrids, and hierarchical control architectures. Chad has extensive experience with power systems analysis tools such as CYMDIST, Synergi, OpenDSS, EMTP-RV, and OPAL-RT. He has worked on augmenting these commercial tools through integration with Python and historical data for advanced distribution planning, including data analytics and probabilistic planning methods.

Areas of Expertise

- Distributed generation interconnection, DER integration, and Non-Wire Alternatives
- Grid modernization architectures and technologies (DERMS, ADMS, DA)
- Operational data analytics (historian data, AMI, DA device, outage data)
- Software (Python, Matlab, OpenDSS, CYMDIST, OSIsoft PI, EMTP-RV, Power BI)

Experience and Background

- Years of experience in the electric power industry 2003–Present
- Senior Director, Advisory Services, Quanta Technology 2022–Present
- Executive Advisor, Advanced Technology Integration (ATI), Quanta Technology 2020–2022
- Principal Advisor, Advanced Technology Integration (ATI), Quanta Technology 2018–2020
- VP Power Systems, Smarter Grid Solutions 2014–2018
- Smart Grid Engineer, Hydro-Quebec Research Institute 2009–2014
- Engineer and Project Manager, CanmetENERGY, Natural Resources Canada 2004–2009
- Contractor, TransEnergie Technologie 2003–2004

Accomplishments and Industry Recognition

- Working Group Member of IEEE 1547.4, IEEE 1547.8, IEEE P2030.4, IEEE 2030.11, and contributing author to the IEEE Standards Association Power 2050 Vision
- CIGRE C6.11 Active Distribution Networks, WG Secretary
- EPRI Smart Grid Demonstration Innovation Award for Hydro-Quebec Smart Zone
- Published over ten papers in peer-reviewed journals (*IEEE Transactions*, *Elsevier*, *IEEE Power*, and *Energy Magazine*), and over fifty papers in conference proceedings

Education

- PhD, Electrical Engineering, McGill University, 2009
- MEng, Electrical Engineering, McGill University, 2004
- BSc, Electrical Engineering, University of Alberta, 2002