FROST & SULLIVAN

Attn. Greg Walker

Continental Automated Buildings Association

1173 Cyrville Road, Suite 210

Ottawa, ON, K1J 7S6

"Energy Roadmap for the Connected Home"

CLOSING DATE

Dec 5, 2016

4:00 PM ET

"Technical Proposal"

From:

Frost & Sullivan

5 December 2016

Table of Contents

1 RFP Section 13 – Mandatory Requirements Reference

RFP Reference	Requirement (Bidder's proposal should repeat exactly as defined in the RFP)	Referenced Section/Page In Bidder's Proposal
13.2	Evidence of knowledge and experience of personnel of current theory and practice in the Connected Home discipline by providing short relevant biographies of all personnel who it is proposed will participate in the project. The vendor's project leader must have a minimum of 10 years relevant experience.	Pages 12-13; 29-35
13.3	Evidence of previous experience in the Connected Home discipline by providing examples of relevant projects prepared for three (3) separate clients within the preceding 48 months. References may be required from these three (3) clients, only if requested by CABA. References are normally not required.	Pages 6-8; 16-28
13.4	A summary of how the vendor proposes to perform the project and the relevant experience of the proposed staff.	Pages 9-11
13.5	Identify size of the sample of both the interviews and surveys	Page 10
13.6	Acceptance of deliverables as identified in the Terms of Reference/Prospectus and proposed schedule.	Certified on Page 4 and further outlined on page 11
13.7	**The vendor must be a member of CABA or agree to become a member of CABA (US$800)** (before the RFP is reviewed).	Already Member of CABA
13.8	**RFP Signature** - Bidders must complete, sign (end of Section 17) and return this RFP form prior to the closing date.	Signed and submitted to CABA
13.9	**Costs must be in $USD.** A fixed price including a full cost breakdown as per Section 16, "Financial Proposal" must be provided.	Provided in $USD
13.10	The Financial Proposal must be submitted as a separate package (PDF document) to the Technical Proposal **(NO FINANCIAL INFORMATION MAY APPEAR IN THE TECHNICAL PROPOSAL).**	Submitted Separately

2 Legal/Certification/Other

Frost & Sullivan hereby provides the following certifications:

CERTIFICATION

I As per the RFP reference point # 9, sub points 9.1 and 9.2 (on page 5 of the RFP), Frost & Sullivan hereby certifies the following:

9.1 We hereby certify that all the information provided in all the attached biographies/resumes, particularly as this information pertains to education achievements, experience and work history, has been verified by us to be true and accurate. Furthermore we hereby certify that, should we be awarded a contract and unless CABA is notified in writing to the contrary, the personnel offered in our proposal shall be available to perform the tasks described herein, as and when required by the project authority. CABA and the Steering Committee must approve all new personnel working on the research that were not listed in the RFP submission.

9.2 We hereby recognize and certify that CABA will be the owner of the final deliverables and that no revenue sharing arrangements on subsequent report sales will be made with the selected consultancy/research vendor.

II Frost & Sullivan confirms acceptance of the deliverables as identified in the Terms of Reference/Prospectus and proposed schedule, as stated in the mandatory requirements of the RFP outlined in Section 13 of the RFP (Please refer to page 9, Section 13 – Mandatory Requirements, Item # 13.6).

III As per the RPF reference point # 1.2 (on page 2 of the RPF), Frost & Sullivan certifies the following:

1.2 a) We hereby offer to sell and/or supply to the Continental Automated Buildings Association (CABA), for terms and conditions set out herein, the supplies and/or services listed herein and/or any attached sheets at the price(s) set out therefore.

1.2 b) We hereby certify that the price quoted is not in excess of the price charged anyone else, including our most favored customer, for like services.

Signature Konkana Khaund .....
(Authorized Representative of Frost & Sullivan)

Name – Konkana Khaund

Date – 5 December, 2016

This proposal is valid till February 24, 2017 (60 business days from the date of submission).

3 Introduction and Background

The Continental Automated Buildings Association (CABA) is an industry association dedicated to the advancement of intelligent home and building technologies. The Connected Home Council (CHC) of CABA has expressed interest to pursue a landmark research project in 2017 titled "Energy Roadmap for the Connected Home" to provide the council members, and to the smart home industry in general, a comprehensive examination of all the major aspects of energy in the smart home.

Strategic Imperative and Objectives

The strategic intent and key objectives is to help CHC address the following:

- Evaluate the key components, their implications and impact milestones along the energy roadmap for connected homes
- Obtain valuable learning pertaining to the state of the market, key industry participants of the connected energy ecosystem for the home, technical barriers and opportunities, and future market direction
- Assess the impact of conventional and emerging trends, including energy sector market volatility, impact of connectivity and the Internet of Things (IoT) and energy efficient technology adoption
- Uncover specific opportunities and solutions in relation to this roadmap and gain perspectives from successful use cases

Intended Outcome

Frost & Sullivan envisages the following as the key outcomes from this landmark research:

- Innovations, trends and opportunities pertaining to home energy solutions, their market readiness and ability to deliver to consumers' needs and priorities
- Market evolution and transitions in home energy management and energy efficiency solutions impacted by IoT, connectivity and convergence, and delivery business models
- Consumer adoption issues and challenges for various home energy technologies and market demand indicators
- Role of government mandates, utility rebates, and case for regulated and deregulated energy market scenarios
- Market acceptance and proliferation smart grid initiatives including demand response, smart metering, renewables microrenewables, distributed energy resources and energy storage solutions
- Market perspectives on energy management systems, connected platforms and services, including energy data collection, diagnostics and consumer privacy elements
- Interaction between connected and sustainable energy options including zero net energy concepts
- Interdependencies among the connected home energy solution provider ecosystems and implications of the roadmap on various stakeholder groups
- Strategic recommendations for various ecosystem players to address roadmap implementation priorities

Energy is an integral part of the connected home ecosystem, and one that is increasingly functioning in a less standalone manner. Frost & Sullivan predicts the global connected living market to reach over $750 billion by 2020, of which a huge $8.5 billion will be attributed to connected home energy. Our extensive experience in connected homes, energy and environment sectors will prove invaluable to CABA in executing this research. Our perspectives on the evolving world of home energy management, connected living and IoT, renewables, smart grid and distributed energy and sustainability will help drive strategic thinking and plausible recommendations in delivering this energy roadmap to the CHC.

We are pleased to put forward this proposal to assist the CHC in formulating an actionable energy roadmap for the connected home that will address its market complexities, identify prospective opportunities and deliver expert recommendations for implementing its critical milestones. This proposal provides a detailed understanding of scope and our suggested methodology to execute the same in order to meet the end goals that CABA and CHC has set out to achieve by undertaking the project.

4 About Frost & Sullivan

Frost & Sullivan, a global research and consulting organization, is uniquely positioned to not only identify growth opportunities but to also empower and inspire our clients to create visionary growth strategies for their future, enabled by our extraordinary depth and breadth of thought leadership, research, tools, events and experience that assist our clients by making their goals into a reality. Our understanding of the interplay between industry convergence, mega trends, technologies and market trends provides our clients with new business models and expansion opportunities. We are organized, positioned and trained to assist our clients in the development of their transformational growth strategies. We work with clients to not only help them survive the present, but adapt and thrive for the future. Our unparalleled breadth of services combines collaborative growth partnership research and consulting, technology and IP solutions, strategy, brand and demand solutions.

Frost & Sullivan's Global Presence, Coverage and Perspectives

More than 1,800 Consultants and Analysts in 40+ Offices Provide Perspective, Coverage & Service

Our Industry and Market Coverage

- Comprehensive understanding of all industry and market opportunities
- Analysis of potential competition from outside Client's industry
- Identification of growth opportunities in areas other than Client's current industry

10,000 active clients globally in more than 300 industry sectors and markets

Our Clientele

- Emerging and Global 1000 companies
- Leading industry associations
- Universities, business and tech schools
- The investment community

Frost & Sullivan's Expertise in Connected Homes and Energy Sectors

The connected home energy segment is undergoing rapid transformation from a static and conventional environment to a dynamic one with the impact of IoT. Connected concepts and platforms are making a steady headway into the home, although connectivity challenges and interoperability issues continue to hinder adoption. At the same time renewables and sustainable energy concepts for the home are showing a rapid growth in the last decade spurring advanced solutions in grid technologies and energy storage. Services to the industry are rapidly evolving to leverage the influx of information from the influence of IoT, creating new solutions and business models. And all of this is driven by the push and pull of increasing demand for cleaner alternatives and zero net energy concepts alongside the need for more smart and autonomous energy solutions. In keeping with the changing trends Frost & Sullivan's research has always taken a holistic view of the connected home and energy industry encompassing all key aspects. From exploring market commercialization prospects, new business models, industry convergence, and initiatives to disseminating though leadership–our experience profile and recognized brand equity gives us a distinct edge.

Our Energy, Homes and Buildings Industry Expertise

Power Generation
Power equipment, services, fuel mix, renewable/alternative energy

Oil & Gas
Oil & Gas equipment and services

Environment & Water
Water technologies and services (Municipal and Industrial), waste to energy, recycling

Critical Power
Power systems for critical infrastructure (UPS, cooling, data centers)

Homes & Buildings
Building technologies and services, smart buildings, connected homes

Energy Storage
Products, technologies and business models for energy storage and batteries

Smart Grid
Grid technologies and services, T&D, smart grids, microgrids, VPPs

Distributed Energy
DG business models and prosumers (generation, microgrids, storage)

Sample of Past Experience

Provided below is a representative list of our expertise in the connected homes and energy sectors that would directly benefit CABA in working with Frost & Sullivan on this project.

Project	Project Highlights and Outcome
Cybersecurity in the Connected Home CABA-CHC, 2015-16	• The project involved uncovering both consumer and industry perceptions around cyber risks, security concerns and the adequacy of various counter measures in dealing with cyber threats within the connected home. • It evaluated the roles and responsibilities of various stakeholders of the connected home industry value chain in dealing with cyber threats and the best practices that are being adopted by various entities in that direction. • Finally the project looked at recommendations for industry participants to follow in countering cyber threats going forward. The findings were tabled before the project steering committee in early 2016.
Impact of Smart Grid on the Connected Home CABA-CHC, 2012	• The project assessed critical needs such as the consumer's need for easy-to-use interfaces and simplified options to control, monitor, and remotely manage the connected home. • It confirmed that competitive advantages will depend upon the vendors' ability to offer solutions that have multi-faceted features and can meet scalable needs for the customer. • Findings proved that the ability of a connected home to integrate with the smart grid is a beneficial proposition both for home owners and utilities. • Recommendations made to the steering committee included hands-on approaches such as creating work stream-oriented sub-committees to pursue technology developments and standards, among others.
Home Energy Management Roadmap and Ideal Persona Evaluation Client: Tier 1 Global energy management player, 2016	• The project involved understanding the niches and market levers that can be targeted to predict the value of a fully intuitive and autonomous home and the role of home energy management and connected devices to deliver to it. • It included determination of motivators and adoption challenges, and market evolution paths for ecosystem partnerships along the implementation roadmap. • It also established the future course of activity including determination of persona types, and identification of technology disruptors that will help client achieve their project goals.
Market Prospects and Future Roadmap for Smart Home Energy System Client: Internet Technology Leader and Smart Home Operating System Provider, 2012	• The project included uncovering the market potential for innovative smart thermostats and home energy management devices as intuitive products for enabling connected home energy monitoring and management. • Frost & Sullivan undertook a detailed market research exercise in North America to understand the demand for such products in the context of the anticipated growth in connected home devices and home energy management. • The research identified specific niches that the product could capitalize on, and developed a growth roadmap based on the latent demand that could propel its potential growth within the connected homes market over the next five years.
Evaluation of the Growth Prospects for Residential, Natural Gas-Fueled, Onsite Power Technologies in Southern California Client: Leading California based Utility, 2013	• This study evaluated options for distributed energy for the residential market as a means to curtail emissions in Southern California. • Product scope consisted of onsite natural gas fueled micro combined heat and power technologies across the utility's gas service territory. Comparisons were made with existing deployed micro CHP units in Japan and South Korea. • The research evaluated market constraints, opportunities, and requirements to make significant head in mainstreaming residential micro CHP units in the future • The study also analyzed how micro CHP compares in pricing to solar photovoltaic (PV) installations as well as PV with integrated with energy storage.

Sample of Relevant Research Expertise

Transformational Trends in the Home Energy Management Solutions Industry (2016)

Opportunities for Internet of Things (IoT) in Connected Homes and Buildings, Mar 2015

Technology Convergence with IoT and impact on Urbanization, Construction and Mega Cities, 2016

North American Energy Management Services, 2015

Connected Homes: Winning Solutions and Applications, 2015

Connected Homes: Supplier Strategies and Business Models, 2016

DC power distribution markets for home and building energy management, 2015

Home of the Future – connected home consumer demand review on connectivity, security and energy integration, 2015

Connected Home Consumer Preferences: A Market Ready for Solutions, May 2014

Connected Living, Apr 2014

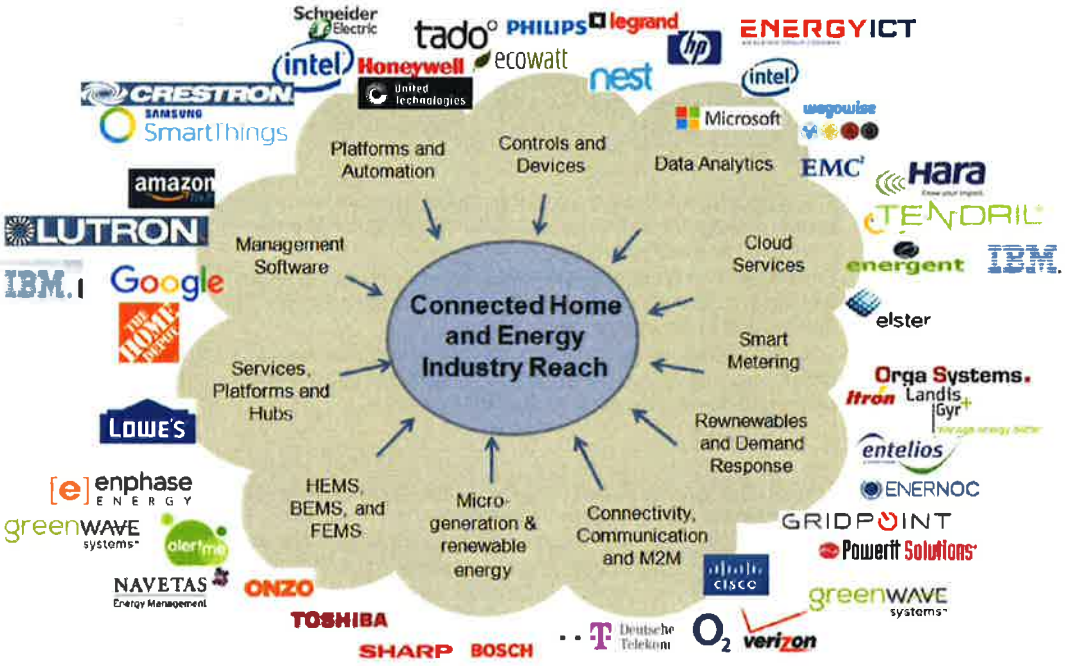
Next Steps for Smart and Connected Homes, Feb 2015

Cybersecurity in Smart Buildings, Sep 2015

The Future of Lighting – Role of IoT and LaaS in Home and Buildings, Feb 2016

Connected Lighting and LED Integration in Smart Buildings, Dec 2015

Representative Client List and Our Reach in the Connected Home and Energy Markets



5 Technical Proposal Methodology and Deliverables

Frost & Sullivan will extensively utilize our repository of industry research and databases pertaining to connected homes, energy, IoT and related domains for a good head start on this project. To uncover the underlying trends and issues associated with energy aspects as it related to the home environment Frost & Sullivan will start with certain key predictions and hypotheses about the concept. The research process will aim at proving these, as well as determining the potential changes to be expected over the span of the next decade in formulating the ideal energy roadmap for the connected home. The predictions and hypotheses relevant to this research and the action items that will address these are listed in the exhibits below.

Our Understanding of Scope: Key Domain Areas for Research

Examples of Study Hypotheses
Smart thermostats and connected energy management devices will usher in a new era of energy regime and ecosystem partnerships to deliver to the connected home.
IoT enablement and innovations in batteries and alternative energy storage technologies will give consumers the flexibility to shift their usage from peak times.
Utilities' grid modernization will converge with connected home technologies and services.
Government policies for sustainability will result in homeowners' opportunities for alternative options such as distributed generation, renewable power, and micro grid.
Advancements in IOT will roll out new programs for energy efficiency and increase in accountability for energy consumption in the connected home.

Scope of Work

The scope of work as understood from the RFP includes the following. Frost & Sullivan acknowledges that the steering committee will have the ability to collaborate on ratifying the scope at the kick-off stage of the study.

Scope Items	Description
Domain areas	This research will encompass the energy aspects of a connected home. It would address the many challenges and opportunities surrounding the need for more energy efficient homes. This research will utilize both qualitative (In-depth interviews) and quantitative (consumer and industry surveys) research to provide actionable data relevant to: business opportunities, technical barriers and opportunities, future market direction, issues, case studies and industry recommendations, etc.
Topics of coverage (sample list)	Sustainability and renewable; battery storage and bi-directional power systems; electric vehicles; role of IoT devices; zero net energy homes; micro and nano-grids; energy efficient technologies and solutions; the role of utilities and energy pricing; energy integration; government mandates, rebates, incentives and energy policies; energy management systems; energy management device and services market analysis; smart grid and alternative sources of energy; demand response; smart metering and sub-metering; retrofit vs new construction; energy use scheduling; platforms (Nest, HomeKit, etc.); return on investment (ROI) of energy solutions; the new role of solar energy generation; data ownership and privacy; real-time energy usage monitoring and control; barriers towards adoption; business analysis and value proposition for each stakeholder group

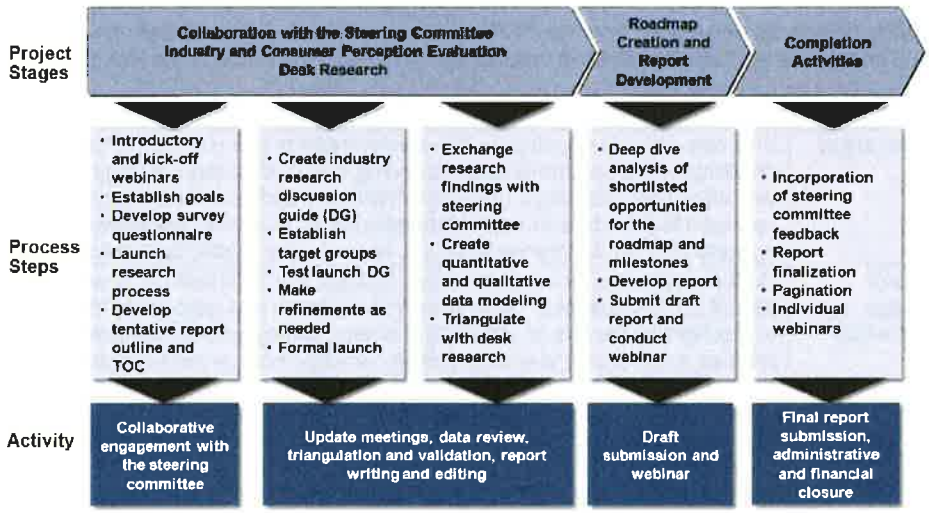
Sample Size, Target Groups and Research Methodology

The exhibit below provides a detailed description of the sample categorization, interview technique and research methodology to be deployed and the target groups to be included in this research.

Item	Component	Description	Target Group Profile	Sample Size	Research Technique
A	**Homeowners /Consumers**	Consumers of connected homes/smart devices/energy efficient home technologies	Occupant/Homeowner in US and Canada	1000-1200	End user survey through online panels and survey methods
B	**Connected Home Technology Vendors and Service Providers**	Vendors/suppliers of technology solutions such as home energy management systems and platforms, energy consuming devices and systems such as HVACR, Lighting, Security, Energy Display and Monitoring, Telecom and Connectivity, Cabling, Wireless solutions, IoT solutions, Managed services, Analytics, Dashboards, Remote monitoring, Could hosted technologies and platforms, End-to-end IoT providers, Ongoing services and support, third party product assimilators and integrators	Vice Presidents, Directors, Product/Sales Manager, CIOs, CTOs, Alliance Partners, Utilities Personnel, Third Party Service Personal, Building Super, Facility Manager	60-75	Analyst Interviews with Industry Stakeholders
C	**Utilities and Energy Solution Providers**	Utility solutions like smart meters, Sensors and Controls, Renewable Energy Technology providers and grid based solution experts	Utility CEOs/Grid Architects; Retail Consumer Heads; Home Energy Solution and Business Model Decision Makers	25-30	By Invitation Panel/Forum based Analyst Discussion Techniques
D	**Industry Influencers**	Codes and Standard Development Organizations for connected environments and IoT, Energy Policy Influencers, Regulators, Industry Associations, Academic Influencers, Municipal Authorities	Technical Committee Heads, Academic Professors, Association Governing Body Stakeholders, Government Leaders, Policy Analysts	20-25	Analyst Interviews with Industry Stakeholders
Overall Sample Size (A+B+C+D)				**1,110-1,330**	

The chart to the left explains Frost & Sullivan's complete methodology and process flow to be adopted for this project.

Methodology and Process Flow



Timeline: Activity Schedule

The proposed timeline for this project is depicted below. Actual milestones may vary based on progress and discussion with CABA and steering committee members. Total time frame is expected to be 18 working weeks.

Activity Schedule - Subject to modification based on actual project progress and discussion with CABA																		
Key Milestones - Conference Calls, Draft Submission, Final Deliverable Submission	Working Weeks																	
Project: Energy Roadmap for the Connected Home																		
Research Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Project initiation, kick-off, research launch																		
Desk research and primary research launch; consumer survey launch																		
Questionnaire development; definitions, hypotheses testing, preliminary analysis																		
Report writing and editing																		
Draft report submission																		
Steering committee webinar																		
Final report submission																		
Pagination and individual steering committee member webinars																		
Final CABA webinar after embargo period																		TBD

Deliverables

Frost & Sullivan will provide CABA with the following deliverables and webinars as requested in the RFP. The outline of report and content will be created once the steering committee is formed and the project is formally kicked off.

Reports, Presentations and Data	Webinars
Delivery of five (5) draft documents in a format that CABA will provide, including the following: (1) Full report (Microsoft Word format) (2) Executive summary (Microsoft Word format) (3) Full report presentation (Microsoft PowerPoint format) (4) Executive summary presentation (Microsoft PowerPoint format (5) Raw Data Delivery of five (5) final documents, including the following: (1) Full report (Microsoft Word and PDF format) (2) Executive summary (Microsoft Word and PDF format) (3) Full report presentation (Microsoft PowerPoint format) (4) Executive summary presentation (Microsoft PowerPoint format) (5) Raw Data	• One (1) introductory webinar (1 hour) for prospective funders • Kick-off webinar (1 hour) to the Steering Committee to outline the research purpose, scope, objectives, approach, and timelines. The webinar will be hosted and recorded, with contact information of attendees to be shared with CABA. • Regular Steering Committee webinar meetings (1 hour) to communicate; progress, preliminary findings, approvals of research methodologies, and next steps. The webinar will be hosted and recorded, with contact information of attendees to be shared with CABA. • Final group webinar (1.5 – 2 hours) will be presented to all the funders after the final documents have been delivered. This webinar will be hosted and recorded and all contact information provided to CABA. • Individual Steering Committee organization webinars (1 hour) for each organization on the Steering Committee, unlimited attendance per organization, to be delivered within one month of final report submission. • CABA Membership Webinar (1 hour on executive summary findings of the research to the CABA membership at the end of the four (4) month embargo period.

- Frost & Sullivan will provide a fully paginated final report to CABA as per CABA's guidelines

6 Personnel Biographies

Frost & Sullivan proposes the following project team structure and responsibilities for success of this project.

Project Team Organization		Responsibilities (both for CABA and Frost & Sullivan)
Client Project Steering Committee	Frost & Sullivan Roberta Gamble, Partner Konkana Khaund, Principal Consultant	• Provide supervision for the engagement • Approve initiatives • Eliminate roadblocks, facilitate client organization buy-in • Make decisions for engagement progress
Project Lead		
Client Project Steering Committee	Frost & Sullivan Konkana Khaund, Principal Consultant	• Manage day-to-day tasks • Lead creation of deliverables • Monitor progress against plan • Review weekly status
Project Team		
Client Project Steering Committee	Frost & Sullivan Core team Konkana Khaund, Principal Consultant Malavika Tohani, Principal Consultant Jonathan Robinson, Principal Consultant Seth Cutler, Senior Consultant Maria Benintende, Senior Consultant	• Provide deep industry expertise • Offer strategic insights into project planning and conduct research • Produce deliverables and recommendations

Brief Team Member Profiles

The exhibit below provides brief profile highlights of each team member. Detailed bios are provided in the appendix.

Team Member Credentials	Profile Highlights
Roberta Gamble, Partner & VP Role in this project: Project Supervisor and Quality Assurance Executive	• Over 16 years of consulting experience in energy, home and buildings and power sectors • Extensively involved in the home and building technology, power and energy sector, with focus on both traditional and alterative solution markets including Smart homes, connected living, smart buildings, IoT, environmental technologies, and converged industry solutions; renewables, in particular solar and wind industry; T&D markets with a focus on smart grid and metering
Konkana Khaund Role in this project: Project Manager and Team Lead	• Over 16 years of experience in research and consulting in home and building technologies, environmental technologies, and urban infrastructure sectors • Extensively involved in smart homes and building solutions, urban infrastructure development, energy management, Internet-of-Things (IoT) and cybersecurity, building automation and control, smart cities, sustainable solutions, energy efficient technologies and solutions, climate technologies, HVACR and lighting
Malavika Tohani, Principal Consultant Role in this project: Team Member	• Over 10 years of research and analysis expertise in the energy & power industry. • Lead consultant in numerous consulting assignments for the global homes, buildings and energy industry; frequently manages research agenda for power supplies, energy storage and transmission and distribution sectors and connected homes
Jonathan Robinson, Principal Consultant Role in this project: Team Member	• Over 10 years of research & consulting experience, involvement in more than 50 projects • Extensive track-record of leading energy focused research and consulting projects • In-depth knowledge of in the trends and issues affecting the power & energy sector (lead author of Frost & Sullivan's Energy & Environment Outlook)
Seth Cutler, Senior Consultant Role in this project: Team Member	• Over 9 years of industry expertise, which include research and consulting • Worked in several strategic project in smart homes and buildings, urbanization, econometrics, disruptive technologies and business models; energy efficiency technologies; water and wastewater process and reuse technologies; sustainable developments
Maria Benintende, Senior Consultant Role in this project: Team Member	• Consultant in the Energy and Environment team covering Home and Building Management Technologies, with over eight years of industry experience • Extensively worked in a wide range of sectors including home automation, smart grid and smart buildings, cloud technologies; physical security and surveillance; oil & gas and power; biofuels and renewable; environmental services