

PROPOSAL

RFP 23-8 – Docket No. U-36625, Entergy Louisiana, LLC, ex parte. In re: “*Application for Entergy Future Ready Resilience Plan (Phase I).*”

March 9, 2023





Kathryn H. Bowman
Executive Counsel
Louisiana Public Service Commission
602 North Fifth Street (Galvez Bldg)
P.O. Box 91154
Baton Rouge, Louisiana 70821-9154

March 9, 2023

Dear Ms. Bowman,

We are pleased to submit this Proposal to the Louisiana Public Service Commission for Independent Engineering consulting services related to *RFP 23-08, Docket No. U-36625, Entergy Louisiana, LLC, ex parte. In re: Application for approval of the Entergy Future Ready Resilience Plan (Phase I)*. This Request for Proposal is issued for an independent engineering consultant with specialized electric engineers on staff to assist the Commission Staff in the review of Entergy Louisiana, LLC's ("ELL" or "Company") request for approval, and issuance of a public interest finding, of the Entergy Future Ready Resilience Plan ("Plan"). The scope of this Proposal is solely for the assistance of an engineering review as further described in this Proposal.

Critical Technologies Consulting, LLC, with our main office located in Mesa, Arizona, and satellite offices in Massachusetts, New Jersey, and Kentucky is registered as a small woman-owned business that specializes in consulting and independent engineering, procurement, estimating, and construction management (EPC) consulting power projects. To better serve the Louisiana Public Service Commission, its Staff, and the consumers, we are working closely to supply the required services in this Docket with E9 INSIGHT, LLC, a very experienced consulting firm which provides services to many government entities including Public Service Commissions.

Both CTC and E9 are presently working for the Commission's Staff in a few Dockets. As a team, the combined CTC/E9 Team personnel bring extensive resources and expertise on numerous projects over the past 35 years as you will see in our proposal.

Jointly, our E9/CTC Team (from now on, the Team) has the knowledge, experience and understanding of the issues, challenges involving restoration, upgrading, and hardening of equipment and systems to increase resilience, appropriate associated costs and schedules, installation methods, and operational issues and to minimize short term impact to the consumers. With E9, our team brings expertise on current regulatory practices and a database of information on Resilience activities in Public Service jurisdictions nationwide, expertise with advance technologies, such as microgrids, metering systems, and communications with the communities affected and resiliency policies to be followed. From here on, any reference to CTC Team includes E9.

Our joint expertise working with a variety of clients and jurisdictions and our extensive technical and managerial expertise in resilience and hardening and upgrades of electric grid infrastructures from generation to the consumer's meter assures that we will deliver the best value for this assignment.

Sincerely,

Ben Hill, President
Critical Technologies Consulting, LLC.



Together - Shaping the Future

**Engineering Consulting, Procurement, Construction
Management, Independent Evaluations, and Risk
Management**



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PROPOSAL

EXECUTIVE SUMMARY

CTC is pleased to present our response to the recent RFP 23-8 Docket No. U-36625, Entergy Louisiana, ex parte. In re: “*Application for the Entergy Future Ready Resilience Plan (Phase I)*.”

To enhance the resources CTC can provide to the Commission under this Docket, CTC is teaming with a firm that is working with the Commission under another LPSC Docket. This firm is E9 Insight, LLC which won the RFP No. 21-22 issued by the Commission in 2021 to support the Commission’s Staff under SWEPCO's "Application for Approval of Automated Metering System and Request for Cost Recovery and Related Relief".

E9 Insight is a regulatory research and policy advisory firm with substantial experience helping clients respond to the dynamic regulatory and technology landscape that surrounds the US electricity industry. E9 Insight offers a unique combination of an informed 50-state perspective while acknowledging and maintaining an understanding of the unique context within each state. E9 Insight also collaborates with expert consultants, combining research and project management with their deep domain expertise to address the unique needs of each engagement.

Through this experience, E9 brings a strong ability to quickly and effectively draws from its own databases of regulatory activity and policy frameworks from Public Service Commissions in other states that will be very valuable in conducting the reviews of the ELL Filings involving its Resilience Plan. E9 also brings strengths in reviewing communications protocols among communities and electric utilities and expertise in microgrids and resiliency consulting which complement CTC’s expertise in utilities resiliency and reliability in hardening and upgrading the utility’s electric grid infrastructure which are the main issues of the ELL Resiliency Plan.

Our Team’s personnel have the requisite knowledge of the topics involved in this Docket No. U-36625 in addition to those provided in Commission's Contract Order. Our Team is highly experienced in reviewing and providing analysis on the engineering, design, construction, and operation of electric utility infrastructure, including but not necessarily limited to the distribution and transmission system.

Our Team is well qualified to provide the Commission and its Staff with the independent engineering expertise, resilience and reliability expertise, renewable and gas generation expertise, hardening and upgrades of the electric grid infrastructure, communications protocols expertise to bring the affected communities participation, innovation, codes and standards knowledge, utility knowledge, emergency planning and restorative management knowledge needed to assist Staff in assessing the ELL Resilience Plan as it is proposed to be implemented to upgrade the current ELL electric utility infrastructure in Louisiana.

As noted above this experience and expertise include prior experience associated with electric utility reliability and resilience plans including those upgrades, rehabilitations, and hardening



of utility's electric infrastructure as part of the work CTC conducted under Docket R-36226. Under this Docket, we investigated the information and data available from the power industry covering the operations and maintenance requirements for electric grid infrastructures at various States from generation to transmission and distribution right up to the consumers meters. Based on this information and data received from Louisiana utilities under this Docket, we drafted requirements and proposed regulations to harden and upgrade the operations and maintenance of the Louisiana electric grid infrastructure to better withstand extreme weather events. The results of this effort provide the Team with specific input to the review of ELL's Resilience Plan addressing upgrades and hardening of ELL's electric grid infrastructure in Louisiana under Docket U-36625. We also conducted the work under Docket R-35394 which included the development of rules, requirements, and regulations to cover transmission towers and poles and attachers.

Jointly, CTC and E9 have included in this proposal a Scope of Representation, a proposed Approach and Action Plan to support the Commission Staff in this matter. We also include the experience and qualifications of our team, a preliminary list of deliverables, our proposed rate schedule and an estimate of the costs on a not to exceed basis that reflects the scope of work and potential schedule for the assignment.

Our Team brings to the Commission resources and expertise that uniquely address the objectives and the scope of representation described in the RFP No. 23-08 document.

Some of these unique resources and characteristics are:

- The ability to review the ELL Resilience Plan including the ELL analyses accomplished and their results; validate ELL choice of systems, equipment and components ELL proposes to upgrade, rehabilitate and harden; validate the cost estimates and associated schedules and see how the funds will be spent at a parish level.
- Through this experience, E9 brings a strong ability to quickly and effectively draws from its own databases of regulatory activity and policy frameworks from Public Service Commissions in other states that will be very valuable in conducting the reviews of the ELL Filings involving its Resilience Plan. The expertise to evaluate the communication protocols to maintain close communications with the communities which will be affected and obtain their buy-in and participation in the jobs which will be created during the 5-year period of Phase 1.
- The experience our Team has with the use of microgrids in resiliency applications, clean energy and renewable energy more broadly. In particular, our Team brings strong experience on the policy frameworks developed to ensure that microgrids can be deployed in a "self-contained" isolated configuration, providing resiliency for those areas of the grid infrastructure that are deemed to be most vulnerable during periods of grid disruption and until the grid is fully recovered.
- Our knowledge of drones and their present use in upgrading and hardening and vegetation management of electric grid infrastructures throughout the country.
- Our experience in providing testimony and rebuttal testimony as needed including issuing topical reports and presentations.



- Our knowledge of the various Commission Dockets including 36227, 36226, 35394.
- The ability to be flexible in addressing the Commission’s concerns and provide a review of ELL’s Resilience Plan with results including comments, suggestions and recommendations.

In conclusion, the Team is well qualified to provide the Commission and its Staff with the independent engineering and consulting expertise to adequately review the ELL Resilience Plan.

We also possess the innovation, codes and standards knowledge, utility knowledge, knowledge of other resilience plans at other States, emergency planning and restorative management knowledge, and other knowledge and expertise as demonstrated in this Proposal that are needed to assist Staff in assessing the *Entergy Future Ready Resilience Plan (Phase I)* proposed by ELL to upgrade, rehabilitate and hardened the ELL electric grid infrastructure in Louisiana and provide the framework for its approval and the issuance of a public interest finding as requested by ELL.

CTC key team members are experienced in participating in cases involving public utility regulation, including the presentation of direct testimony, reports and recommendations, assistance in developing cross examination of witnesses, and the analysis of comments and exceptions to proposed recommendations.

Collectively, the CTC professionals possess a full understanding and ability to assist Commission Staff in reviewing the issues in this Docket. Indeed, the combination of our Team members' educational backgrounds, achievements, specific expertise, and prior experience best positions us to provide the Commission and Staff with the most innovative, extensive, and comprehensive independent engineering consultant services with specialized electric engineers on staff to assist Staff in achieving the goals and objectives of the Commission for this Docket No. U-36625.

INTRODUCTION

This proposal addresses the Request for Proposals ("RFP") RFP 23-08 issued by the Louisiana Public Service Commission on February 17, 2023, for independent engineering consultant services related to Docket No. U-36625, Entergy Louisiana, LLC, ex parte. In re: Application for approval of the Entergy Future Ready Resilience Plan (Phase I).

This Request for Proposal is issued for an independent engineering consultant with specialized electric engineers on staff to assist the Commission Staff in the review of Entergy Louisiana, LLC’s (“ELL” or “Company”) request for approval, and issuance of a public interest finding, of the Entergy Future Ready Resilience Plan ("Plan"). The scope of this Proposal is solely to conduct an engineering review as further described in this Proposal.

The Louisiana Public Service Commission ("Commission" or "LPSC") issued this RFP in accordance with the requirements of the LPSC General Order dated November 10, 2014 regarding the selection of contract employees (the "Contract Order"). It is understood that this



RFP 23-08 and the Applicant's proposal shall constitute the contract between the parties, including all terms and conditions. The Commission will not accept new terms, conditions, or proposals once an Applicant has been retained.

Overview

On December 19, 2022, ELL filed its request, which was docketed as Docket No. U-36625, and published in the Commission's Bulletin dated December 22, 2022, with eight parties intervening and two parties requesting Interested Party status.

ELL's request seeks approval, and issuance of a public interest finding, of the Company's Resilience Plan, as well as approval of a new Rider. Per the Company's application, this Plan is to "improve the resilience of its electric system through accelerated infrastructure hardening and vegetation management," which is "necessary and essential to foster a more resilient and reliable system that can better withstand extreme events, avoid or mitigate customer outages from such events, and facilitate faster restoration of service after such events."¹

ELL is proposing to implement the Resilience Plan over a 10-year period, with Phase I consisting of \$5 billion in projects over the first five years (2024 to 2028) and four interconnected components. The interconnected components generally consist of: 1) approximately 9,600 identified distribution and transmission hardening projects; 2) construction of 44 dead-end structures for the Company's 500 kV transmission lines; 3) several projects aimed specifically at increasing the resilience of the Company's telecommunications systems; and 4) resilience-based enhancements to its current vegetation management programs. The Company filed the testimony of seven witnesses in support of its application. The Team has reviewed the entire filing for more information on ELL's request in order to better prepare a proposal.

The team combining highly specialized and experienced members of CTC's and E9's staffs ("the Team") will be assisting Commission in-house Staff and an outside consultant, for the rider recovery component, in reviewing ELL's request and providing a recommendation to the Commission.

SCOPE OF REPRESENTATION

The Team is pleased to submit its proposal to the Louisiana Public Service Commission as an outside consultant, with specialized electric engineers and consultants on staff experienced to participate in many aspects of the electric grid infrastructure, to assist its Staff and:

- Review the application (including the direct testimony of several witnesses, any supporting documentation).
- Per the application, ELL is proposing to implement the Resilience Plan over a 10-year period, with Phase I consisting of \$5 billion in projects over the first five years (2024 to

¹ See ELL's Application, page 1.



2028) and four interconnected components. The interconnected components generally consist of:

- 1) approximately 9,600 identified distribution and transmission hardening projects;
- 2) construction of 44 dead-end structures for the Company's 500 kV transmission lines;
- 3) several projects aimed specifically at increasing the resilience of the Company's telecommunications systems; and
- 4) resilience-based enhancements to its current vegetation management programs.

The Company filed the testimony of seven witnesses in support of its application. The independent consulting Team has reviewed the entire public filing available from the Commission's Docket for more information on ELL's request in order to better address the RFP requirements and prepare this proposal. In addition, our Team will be assisting Commission in-house Staff and an outside consultant, for the rider recovery component, in reviewing ELL's request and providing a recommendation to the Commission. Our Team will be in a supporting role as needed by the Commission Staff.

- In assisting Staff, our Team will review the application (including the direct testimony of seven witnesses, any supporting documentation, and associated cost models); draft data requests and review responses thereto; assist in drafting a recommendation(s), including testimony, to the Commission regarding ELL's request on implementing Phase I of the Resiliency Plan; review and respond to any rebuttal testimony; assist in preparing any necessary direct and cross-answering testimony; assist in trial preparation, including cross-examination of witnesses and drafting pleadings and motions related thereto; and review and analyze potential stipulation terms. This scope of representation contemplates a contested hearing on ELL's Resiliency Plan.
- Further, our Team shall review ELL's Resiliency Plan alongside the Commission's Resiliency Rulemakings found in Docket No. R-36227 to ensure that the Commission's priorities are represented in Entergy's Plan and identify any gaps between the two plans. This will include evaluating the Company's Plan based on the framework being developed in the Commission's rulemaking. Staff's proposed rule in Docket No. R-36227 is anticipated to be filed by April 14, 2023 with a final rule for Commission consideration filed by August 30, 2023.
- At the February B&E, Chairman Campbell also requested a breakdown of the projects identified by ELL, including the estimated cost and location (parish) of each project. If retained, our Team will prepare a summary of the projects, including the information requested by Chairman Campbell.
- Additionally, our Team shall be available to participate in meetings, conference calls, status conferences, hearings, and other conferences with Staff and ELL, Staff and Intervenors, or Staff, ELL, and Intervenors, as well as Commissioners. Our Team will attend any B&E that Staff deems necessary, including B&Es discussing Docket No. R-



36227. The scope of work provided herein shall continue through the conclusion of Docket No. U-36625, including Commission consideration of the request at a B&E, or B&Es.

- ELL's request also proposed a monitoring program for Phase I, which would consist of quarterly reporting of the Plan approved by the Commission. Given the uncertainty, and magnitude, surrounding what the Commission would approve, the proposed scope of work herein does not include any proposed monitoring of Entergy's Resiliency Plan. Should the Commission approve a resiliency plan for Entergy, Staff anticipates soliciting the independent consultant retained pursuant to this RFP No. 23-08 at that time for a tailored scope of work for monitoring applicable to the resiliency plan approved.
- This Proposal includes under the **Proposed Approach and Plan of Action** section an outline of a plan of action for conducting the review of the application, including the activities described above. The Commission and its Staff shall have the right to determine how the tasks will be carried out. In addition, this Proposal proposals includes our Team's professional firms' resumes indicating the qualifications and experience necessary to meet the requirement of this RFP, including experience with reviewing riders as a cost recovery mechanism.

PERIOD OF REPRESENTATION

The time-period estimated to complete the Scope of Representation is approximately 10 to 12 months. This is merely an estimate at this time. The Commission makes no representations as to the accuracy of the Period of Representation.

The Team will issue monthly progress reports to the Staff as to the progress of the assignment and other important evaluation issues. The collaboration of Staff, our Team, Staff outside counsel, if any, and ELL are essential to the completion of the objectives of this Docket in the time approximately estimated.

PROPOSED APPROACH AND PLAN OF ACTION

The Proposed Plan of Action to assist Staff is broken into various **Tasks** shown below using the Scope of Representation and scope of work presented in the Request for Proposals RFP No. 23-08 Docket No. U-36625.

The E9 and CTC experts will work as a single Team under the direction of the Project Director, Albert Ferrer (Al).



The Team's Project Director will report to the Commission Staff's Project Director. The Team will work seamlessly with Staff in the execution of this assignment since both organizations are working presently with Staff in other existing Dockets.

The Team Proposed Approach and Plan of Action consists of the following steps or Tasks:

1. During the Kick-off Session with Staff, the Team will identify for the review and approval of Staff and Staff's legal counsel, the approach to the prudency review of the Application and filings, through the use of a "document request" system and questions/answers to be provided by ELL. A preliminary schedule will be discussed including a summary discussion on ELL's past, current and planned restoration efforts. Notes of meeting will be issued covering both sessions.

This session will be followed with a Kick-off Session with ELL which will include a discussion on the Application and filings and the schedule which has been targeted. The success of this review process will depend on the close collaboration among the parties.

2. Review prior information/documentation and "lessons learned" available from Staff and/or the Team, publicly obtained information available from other utilities and Public Service Commissions from States facing similar challenges in the development and implementation of resilience plans and programs to improve the resilience of its electric system through accelerated infrastructure upgrades and hardening and vegetation management covering the whole electric grid infrastructure, which is necessary and essential to foster a more resilient and reliable system that can better withstand extreme events, avoid or mitigate customer outages from such events, and facilitate faster restoration of service after such events. Information and lessons learned from the work accomplished in Docket 36226 will also be included.
3. Independent review of all the Filing documents including testimonies covering the whole electric grid infrastructure, from generating the electricity to interconnections to the grids, to the transmission and distribution systems right up to the meter of the consumer to validate the actions and activities described in the ELL Resilience Plan.
4. Assist Staff in the conduct of the review of the ELL Application and filings including testimony covering the Resilience Plan. Draft data and documentation requests and review responses thereto via a document request (DR) system which will be established with suggested response dates to be able to meet the estimated period of representation of approximately 10 to 12 months.
5. Identification of the major issues for discussion between Staff, the Team, and Staff's legal counsel.



6. Specific review of the Resilience Plan communications protocols with the communities affected. Our Team members have a lot of very useful expertise and experience in this area and will assure that the proper process and procedures are in place before, during and after the Phase I activities are implemented to properly communicate and obtain consensus from the community for the actions which ELL will be taking. A particular area of interest will be the participation of the community members in the jobs which will become available as the work is planned and implemented in construction.
7. Our Team's experience in renewables, gas fired and nuclear generation will be used jointly with our experience in microgrid systems and AMI (Advanced Metering Infrastructure) to evaluate the extent these items are being considered in the ELL Resilience Plan
8. Our Team's expertise and experience in large numbers of monitoring programs will also be utilized to evaluate the progress reporting and cost estimating processes ELL is proposing in their ELL Resilience Plan monitoring program for Phase I. ELL is proposing quarterly reporting of the Plan approved by the Commission. Given the uncertainty, and magnitude, surrounding what the Commission would approve, the proposed scope of work herein does not include any proposed monitoring of Entergy's Resiliency Plan.
9. Based on the documents and responses supplied by ELL and the research conducted by the Team, the Team will draft a single report (ELL Resilience Plan Review Report or ERPRR) on the results, conclusions, and recommendations of the independent review of ELL's Resilience Plan, decisions, actions, activities and associated costs including where these costs are broken down by Parish.
10. This Report will include the discussion of the basis of the Team's opinion for the potential issuance of a public interest finding and the discussion of the recommendations and bases for the potential approval of the Company's Resilience Plan by the Commission. It will also include Chairman Campbell's request of a breakdown of the projects identified by ELL, including the estimated cost and location (parish) of each project and a summary of the projects, including the information requested by Chairman Campbell.
11. The Team will be available at the request of Staff to participate in meetings, conference calls, status conferences, hearings, prepare presentations and other conferences with Staff and ELL, Staff and Intervenors, or Staff, ELL, and Intervenors, as well as Commissioners. The Team is required to attend any B&E that Staff deems necessary, including B&Es discussing Docket No. R-36227. The scope of work provided herein shall continue through the conclusion of Docket No. U-36625, including Commission consideration of the request at a B&E, or B&Es.
12. As requested by Staff, the Team would be defending, participating, and testifying (direct and cross-answering testimony) regarding the results, conclusions and recommendations resulting from this independent review.



13. As requested by Staff, will participate in informal meetings with Staff and ELL, Staff and Intervenors, or Staff, ELL, and Intervenors.

14. Issuance of monthly progress reports.

DELIVERABLE PRODUCTS

The Team will develop reports and documentation as requested by Staff.

There are reports CTC has presently identified as part of its proposed Action Plan for use to communicate with Staff and jointly develop strategies and plans to support the Commission on this Docket. These reports will be issued in power point format and are as follows:

Task # 1 Kick-off Session:

Notes of Meeting summary will be issued to document the discussions held and agreements reached. This Notes of Meeting will be reviewed with the Staff and comments discussed and resolved.

Task # 5 Identification of Major Issues:

A summary power point will be issued for discussion with the Staff to identify the key issues which need to have RFIs/Data Requests which need to be addressed in the Resilience Plan Review Report

Tasks # 9 & 10 ELL Resilience Plan Review Report:

This involves the preparation, review, and issuance to Staff of the Resilience Plan Review Report as discussed in Tasks 9 and 10.

Task # 12 Testimony and Rebuttal Testimony:

As requested by Staff, the Team would be defending, participating, and testifying (direct and cross-answering testimony) regarding the results, conclusions and recommendations resulting from this independent review.

CONFLICTS OF INTEREST

The CTC/E9 Team and its personnel and their respective organizations do not have any conflicts of interest concerning this Docket scope of representation and none of the CTC/E9 personnel have any work with any of the potential utilities and entities subject to the Louisiana Public Service Commission (LPSC) regulatory responsibilities.

CTC/E9 personnel have worked in the past for various utilities, public service commission staffs, ISOs, IPPs, regulatory bodies and other entities in the power and oil and gas fields as



part of their employment history with other companies in the past. Their resumes indicate that kind of experience.

CTC currently represents the Louisiana Public Service Commission, Arkansas Public Service Commission, and the Public Utility Commission of New Orleans in the evaluation of the prudence of the decisions by Entergy during the operations and outages at the Grand Gulf Nuclear facility. A detailed report of technical deficiencies at Grand Gulf as well as a detailed Prudence review and written as well as oral testimony are being performed.

Additionally, CTC represents the Louisiana Public Service Commission in Docket No. R-35394 related to a “Proceeding to Examine Options Pertaining to Pole Viability, Pole Attachments, and all Areas that may Affect the Reliability and Sustainability of Louisiana’s Electric Utility Distribution Grid” and Docket No. R-36226 related to Louisiana Public Service Commission, ex parte. In re: *“Evaluation of Louisiana's electric grid regarding status, maintenance, and whether there is more that could have been done and can be done to benefit Louisiana customers.”* In both of these Dockets, CTC personnel assisted Staff in conducting due diligences and conducted independent evaluations to prepare draft regulations for the consideration of Staff covering the operations and maintenance of the transmission and distribution systems including the upgrades, rehabilitations and hardening of these systems within the electric grids in Louisiana which covered generation to transmission, distribution systems and right to the consumers’ meters.

E9 Insight currently represents the Louisiana Public Service Commission in Docket No. R-36169 to review SWEPCO’s AMS system to ensure compliance with applicable Commission rules and that it is in the public interest.

These assignments are not considered as conflicts of interest.

CTC/E9 RESUME AND QUALIFICATIONS

The Team has the requisite knowledge of the topics involving this Docket and discussed in the RFP 23-08, in addition to those provided in the Commission’s General Order dated November 10, 2014. CTC has been pre-qualified by the Commission to receive this RFP under Docket No. U-36625.

CTC has assembled a very experienced and qualified team of personnel with the requisite knowledge, of the topics covered in the RFP’s Scope of Representation and the proposed Action Plan to achieve the Commission’s strategic objectives under this Docket.

To enhance the resources CTC can provide to the Commission under this Docket, it is teaming with a firm which is working with the Commission under another LPSC Docket. This firm is E9 Insights, LLC which won the RFP No. 21-22 issued by the Commission in 2021 to support



the Commission's Staff under SWEPCO's "Application for Approval of Automated Metering System and Request for Cost Recovery and Related Relief".

E9 Insight is a regulatory research and policy advisory firm with substantial experience helping clients respond to the dynamic regulatory and technology landscape that surrounds the US electricity industry. E9 Insight offers a unique combination of an informed 50-state perspective while acknowledging and maintaining an understanding of the unique context within each state. E9 Insight also collaborates with expert consultants, combining research and project management with their deep domain expertise to address the unique needs of each engagement.

The strengths of E9 in having the ability to quickly and effectively research its own data bases of information from other Public Service Commissions in other states will be very valuable in conducting the reviews of the ELL Filings involving its Resilience Plan. E9 also brings strengths in reviewing communications protocols among communities and electric utilities and expertise in microgrids and resiliency consulting which complement CTC's expertise in utilities resiliency and reliability in hardening and upgrading the utility's electric grid infrastructure which are the main issues of the ELL Resiliency Plan.

Our Team's personnel have the requisite knowledge of the topics involved in this Docket No. U-36625 in addition to those provided in Commission's Contract Order. Our Team is highly experienced in reviewing and providing analysis on the construction, design and operation of electric utility infrastructure, including but not necessarily limited to the distribution and transmission system. This expertise includes prior experience associated with electric utility reliability plans including those upgrades and hardening of the utility electric infrastructure as part of the work CTC conducted under Docket R-36226 covering the operations and maintenance requirements/regulations for the Louisiana electric grid infrastructure from generation to transmission and distribution right up to the consumers meters.

Our Team is qualified and prepared to draft and render expert testimony and be cross-examined with respect to all of the issues addressed in RFP No. 23-08 and which are likely to arise in the proceedings, and be qualified and prepared to render testimony at a hearing and/or a B&E regarding the same and have knowledge of:

- (1) Major functional areas of a regulated investor-owned electric utility;
- (2) Construction, design, and operation of electric utility infrastructure, including but not necessarily limited to distribution and transmission systems;
- (3) Commission General Order dated April 20, 2012 (Corrected) (Docket No. R-30021) regarding electric utilities filing Integrated Resource Plans;
- (4) The Commission's pending Docket No. R-36227;
- (5) Midcontinent Independent System Operator ("MISO") tariffs rules and planning processes, generally, as well as MISO's MTEP process.



Our Team will be able to provide technical advice regarding industry standards such as IEEE, NREL, NETL, EPRI, etc. Our Team also brings its knowledge and expertise of the actions and policies which major utilities have accomplished such as FP&L, Duke and Dominion and widely accepted industry practices regarding electric utility infrastructures, and their design, operations and maintenance thereof, as outlined above.

Our team has engineering personnel who are licensed electrical engineers and in good standing with applicable engineering licensing and certification boards.

More specifically, the Team assembled for this assignment, are experienced professionals in multidisciplinary areas specifically applicable to the needs specified in this Docket.

Among the resources and expertise which our Team can provide to the Commission:

- Engineering and design, procurement, construction, and operations/maintenance of all aspects of electric generation, transmission and distribution including:
 - Switchyards, substations, grids and microgrids, energy storage and utilizing lines at various voltages including 500 kV down to 4 kV.
 - Transmission towers and structural support systems made of wood, composites, reinforced concrete, and steel.
 - Renewable generation including solar, wind and bio-gas systems.
 - Gas generation in simple cycle and combined cycle modes.
 - Nuclear power plants located in Louisiana in addition to Grand Gulf located in Mississippi.
 - Emergency planning and restoration planning for various disruptive events.
 - Drone inspection systems.
 - Resilience evaluations
 - Hardening and upgrading of the electric grid infrastructure
- Project Technical/Financial Transactions.
- Independent Consulting Evaluations for PSCs, ISOs, utilities of various types, investors and lenders
- Asset Acquisitions.
- Program Designs.
- Program Management and Operations Management.
- Engineering, Procurement and Construction Management from generation plants to transmission and distribution systems at various locations throughout the country.
- Independent technology evaluations including distributed systems, advancing resilience in transmission and distribution systems, climate change minimization, advanced thermal and renewable technologies and other technologies involving decarbonization such as the use of hydrogen with natural gas, etc.
- Independent evaluations of transmission and distribution systems for acquisition by confidential clients (in Louisiana).



- Commercial and regulatory evaluation of new technology developments.
- Emergency plans and restoration programs development involving disruptive events at renewable, fossil, and nuclear power stations.
- Development of resiliency plans and programs.

Our Team of professional experience consists of a combined expertise of:

- Our team has an average of 35 years of experience of working in the engineering field involving engineering, procurement, and construction services to electric utilities from generation to transmission, distribution to interconnection to residential, commercial and industrial customers and the management of such services.
- Bringing the potential of over 60 personnel with a variety of specialized expertise in the areas important to the issues on this Docket No.U-36625.
- Since the mid-1980s, our personnel have worked in over 300 projects involving independent engineering services and consulting to a variety of clients, from utilities, lenders, investors, operators, DOE, PSC staffs, local regulatory agencies, and many other clients in various states such as Arkansas, Louisiana, Georgia, Texas, Florida, Mississippi, Alabama, Missouri, Massachusetts, NY, Connecticut, Maine, New Hampshire, Virginia, California, Arizona, New Mexico, North and South Carolina, Utah, and other states and international locations.

Additional expertise provided specifically by E9 INSIGHT:

E9 Insight includes a team of expert consultants with a successful history of working together and individually on a wide range of the leading issues surrounding grid modernization, advanced technologies and resilience.

Principal project leads will include:

Cameron Brooks (E9 Insight) E9 Insight is a boutique research and advisory firm focused on the regulatory and policy environment of the U.S. electric industry. Since 2013, clients range from Fortune 500 to start-up companies and government agencies to advocacy groups. E9 Insight has particular expertise in organizing up-to-date dashboards and strategy recommendations across the 50 states. We have developed a suite of custom database tools that allows us to develop comprehensive reports that combine information from regulatory proceedings, insights from a trusted professional network, and market statistics. These methodologies are tailored to identify and track regulatory developments that support an understanding of industry trends and inform the development of regulatory best practices. Cameron Brooks is the President of E9 Insight. As an advisor, Cameron serves as an advisor to a wide range of technology companies, advocacy coalitions and government agencies, including the Department of Energy and Lawrence Berkeley National Labs. Cameron has served in executive roles with clean energy companies and non-profits, including Opus One Solutions, Tendril, Renewable Choice Energy and the Clean Energy States Alliance. He studied



Ecologic Design at Yale University and holds an MBA from Cornell. E9 and Cameron are based in Boulder, Colorado.

Sam Kozel, Managing Director (E9 Insight) Sam Kozel is the Managing Director of E9 Insight. Working with E9 Insight since 2016, Sam leads the operations and fulfillment of E9's services, managing the team of policy associates. He began his clean energy career in reforming municipal energy policy to expand clean energy development opportunities on the Western Slope of Colorado. With over eight years of experience in the sector, Sam develops state-level policy strategies for E9's clients; including strategic market segmentation and policy analysis. Sam works with utility vendors and technology companies, government agencies, national labs and other market actors to support awareness and engagement in state level policy making. Sam has experience in the development of multiple database tools and products to track and report on nationwide regulatory updates for clean energy technologies. Sam leads E9's electric vehicle (EV) policy research and has worked with clients in the EV charging space to implement policy changes in support of transportation electrification. He holds a Master of Environmental Management (MEM) from Western Colorado University and a Bachelor of Business Administration (BS) from the University of Vermont.

Chris Villarreal (Plugged In Strategies) Plugged In Strategies was started in 2017 by Chris Villarreal. Chris has worked on issues related to AMS/AMI applications since 2009, including overseeing the development of the California Public Utilities Commission data access and privacy rule and participating in the development of the DataGuard initiative by the U.S. Department of Energy and Volume 2 of the NISTIR 7628 on Data Security and Data Privacy developed by NIST. Chris has advised state commissions, both formally and informally, in Hawaii, Arkansas, Minnesota, Ohio, Kentucky, New Jersey, Connecticut, New Hampshire, and New York on topics related to AMS, including data access. Chris is also the author or co-author of several reports that relate to AMS, including writing a report, along with Cameron Brooks, sponsored by the U.S. Department of Energy that looked at state regulatory experiences with AMI since 2018 He has also worked on a number of technical components associated with AMS, including interoperability, the role of AMS in distribution planning, and interoperability. He is also an advisor to the National Association of Regulatory Utility Commissioners and works with its Center for Partnership and Innovation on a number of topics including utility financial toolbox initiative, National Council on Electricity Policy, and interoperability.

The full team includes:

1. Cameron Brooks, E9 Insight
2. Sam Kozel, E9 Insight
3. Cole Triedman, E9 Insight
4. Daisy Dunlap, E9 Insight
5. Madeleine Moyano, E9 Insight
6. Chris Villarreal, Plugged In Strategies
7. Ted Ko, Ted Ko Consulting



Resumes for each team member are included.

Together, this team brings unique capabilities and direct experience working on projects related to resilience, microgrids, advanced meters, data governance and the broad suite of issues surrounding grid modernization. These projects include direct experience working within the public utility commissions and state agencies in multiple states, including Louisiana. We have advised and provided technical support to over 20 state commissions, as well as numerous projects for the Department of Energy and several national labs. We have worked with companies providing leading technology solutions and utility services, such as advanced meters, distribution system software and planning tools. We have supported stakeholder advocacy efforts focused on establishing updated data governance to support customer access and improved market opportunities for technologies that can provide important grid services. We understand the importance of ensuring that grid modernization technology deployments are implemented in ways that bring immediate benefits to customers and can be leveraged to support multiple utility purposes.

Chris and Cameron, with funding from the U.S. Department of Energy, provided education and expertise to state regulatory commissions regarding data access and data privacy frameworks. Chris and Cameron also collaborated in the production of a report released for the U.S. Department of Energy on AMI business cases. We have trusted relationships with the leading thinkers and industry leaders, including with state regulatory commissions around the country, NARUC, NIST, and DOE, and companies working on E9 Insight microgrids, resilience, hosting capacity models and data privacy and access frameworks.

Lastly, we have extensive experience with facilitating meetings and productive collaboration that seeks reasonable solutions (and not gridlock). As consultants and former regulatory staff, we have run many workshops and working groups over the course of our careers. Similarly, Cameron has led multi-state, multi-agency collaborations and regularly organizes industry events, roundtables and dialogues. Our team, both individually and working in collaboration, has extensive experience across the broad range of issues surrounding resilience, grid modernization, advanced metering and beneficial distribution grid data, including understanding the customer benefits from AMS. While these topics are highly interrelated, we have identified specific projects that we believe are directly relevant to the topics identified. This team has worked closely with state commissions, either as staff or advising commissions, in the development of several policies and reports.

Our Team is well qualified to provide the Commission and its Staff with the independent engineering expertise, resilience and reliability expertise, renewable and gas generation expertise, hardening and upgrades of the electric grid infrastructure, communications protocols expertise to bring the communities participation, innovation, codes and standards knowledge, utility knowledge, emergency planning and restorative management knowledge needed to assist Staff in assessing the ELL Resilience Plan as it is proposed to be implemented to upgrade the current ELL electric utility infrastructure in Louisiana.

Our Team members are experienced in participating in cases involving public utility regulation, including the presentation of direct testimony, reports and recommendations, assistance in



developing cross examination of witnesses, and the analysis of comments and exceptions to proposed recommendations.

Indeed, the combination of our team members' educational backgrounds, achievements, specific expertise, and prior experience best positions us to provide the Commission and Staff with the most innovative, extensive, and comprehensive consulting services to assist Staff in the review of the details of the ELL Resilience Plan under this Docket No. U-36625

RECENT ASSIGNMENTS - CTC

Client	Description	Location
Louisiana Public Service Commission Staff	Proceeding to Examine Options Pertaining to Pole Viability, Pole Attachments, and all Areas that may Affect the Reliability and Sustainability of Louisiana’s Electric Utility Distribution Grid under Docket R-35394	State of Louisiana
Louisiana Public Service Commission Staff	Proceedings to Examine “Evaluation of Louisiana’s electric grid regarding status, maintenance, and whether there is more that could have been done and can be done to benefit Louisiana customers.” Docket R-36226	State of Louisiana
West Virginia Public Service Commission Staff	Technical reviews/reports/testimony related to three (3) Coal Fired Power Plants imprudence cases before the PSC.	State of West Virginia
Stone Pigman (Representing LPSC) Denton (representing CNO) Stinson, LLP (representing APSC)	Technical reviews/reports/testimony related to the Grand Gulf Nuclear Power Plant imprudence case before FERC.	Grand Gulf Nuclear Power Plant Louisiana Arkansas City of New Orleans
Mississippi Public Service Commission Staff (MPUS)	Conducted Independent Engineering due diligence on the new 600 MW Integrated Gasification Combined Cycle (IGCC) – including the technical and commercial viability, cost, schedule, engineering, and construction monitoring, including 7 switchyard modifications and 150 miles of new Transmission poles and cabling.	Kemper Project Meridian, MS
Banking Lenders Group (Mizuho)	Independent engineering of a 1000 Liters/second desalination plant including 100 miles of 36” in-ground piping and 75 miles of Transmission poles and cables.	Antofagasta Chile



Client	Description	Location
Enbridge Project	500kV GIS/GIL Transmission Project. The project scope included conducting an independent technical evaluation and fatal flaws analysis, technology review and a risk assessment for this 500kV transmission project which consists of the engineering-procurement-construction of three 500kV GIS switching stations, 30-miles of 500kV overhead transmission line and 3-miles of double-circuit underground Gas Insulated 500kV transmission line installed in a tunnel.	California
Florida Public Service Commission and FP&L	Conducted a detailed technical and commercial independent engineering due diligence and provided written reports and testimony on the prudence of FP&L in the implementation of various upgrades of the FP&L nuclear power plants and transmission systems to accommodate these upgrades	St Lucie and Turkey Point and switchyards and substations
Mississippi Public Service Commission Staff (MPUS)	Independent Engineering services and monitoring of the installation of a flue gas desulfurization system for (2) 500 MW Coal Fired Units – Cost, Schedule, Risk Management, and Construction Monitoring.	Plant Daniel Mississippi
Independent System Operator (ISO) New England	Conducted independent evaluations of the technical quality, costs, and schedules of projects in the ISO que to determine if they can meet the schedules agreed with the ISO	New England States
US Department of Energy Loan Guarantee Program	Participated in independent engineering assignments in over 15 transmission and renewable energy projects under the US DOE Loan Guarantee projects. Provided detailed IE reports on each project with an evaluation of the new technologies involved including commercial viability, assessment of the scoping, construction contracts and cost and schedules and risk management of each project. Conducted construction monitoring over these projects after financial close.	Various States in the US including Nevada, Arizona, Texas, California, etc.
Office of Arkansas Attorney General	Review for Prudence of actions and expenditures during forced outages for potential adjustment of customer rates for the Public Service Commission/AG Office.	Grand Gulf Nuclear Power Plant Arkansas Mississippi
AEI Energy El Arrayan	115 MW Wind Farm (50 Units) Acting as Independent Engineer representing the Lenders in reviews of the ongoing project and in approval of financial disbursements by the Lenders monthly. This also included 20 miles of new roadways and 45 miles of new transmission and distribution poles and cabling with 3 new switchyards.	La Serena, Chile
Georgia Public Service Commission Staff	Representing the Public Service Commissioners and the Ratepayers of the State of Georgia, CTC is responsible for the overall monitoring of the construction, financial, cost and schedule adherence, project progress, and providing twice yearly written and oral testimony in GPSC Hearings.	Vogtle Nuclear Power Plant Units 3&4 (New Construction)
PacifiCorp/ Rocky Mountain Power	Red-Butte 345kV Transmission Line Scope included design for this ~200-mile Greenfield transmission line with towers through the mountains of UT and the (2) remote substation expansions including the addition of a series capacitor.	Red-Butte, Utah



Client	Description	Location
X24, 69kV Transmission and Distribution Reconducting & Refurbishment Project	Preparation of Scope Documents and Construction Documents. Engineered structure modifications and replacement structures in accordance with client, regional, and NESC standards. Analysis for various aspects of the transmission line using PLS-CADD. Calculated insulator swing and integrated it into the structure work list to determine where insulator swing issues existed and how much weight needed to be added to meet swing tolerance. Provided field support during construction.	Mass to Vermont
Y25, 69kV Line Reconducting Project	Preparation of scope document. Preparation of Construction Document. Conducted field inspections. Engineered structure modifications and replacement structures in accordance with client, regional and NESC standards. Analysis using PLS-CADD. Created spreadsheet to calculate insulator swing and the amount of weight to add to each conductor to eliminate uplift and to ensure an insulator swing of less than 30 degrees under user defined conditions.	Mass to Vermont
Ticonderoga-Republic, Republic-Whitehall, 115kV Refurbishment Project, NY	Line refurbishment of (112) mile long transmission line primarily made up of wood pole structures. Environmental issues and excessively long spans were some of the challenges associated with this project as this line runs through the Adirondack Mountains of upstate NY. Preparation of Construction Document. Conducted field inspections. Engineered structure modifications and replacement structures in accordance with client, regional and NESC standards. Analysis for various aspects of the transmission line using PLS-CADD.	Ticonderoga, NY
Private Investor	Conducted an independent technical evaluation and condition assessment of the transmission and distribution assets of a utility in Louisiana for potential lease or acquisition	Louisiana
AEI Energy and Lenders Jaguar Energy Guatemala	300 MW CFB Coal Project, Acting as Independent Engineer representing the Lenders in reviews of the ongoing project and in approval of financial disbursements by the Lenders monthly, including 70 miles of transmission and distribution poles and cabling.	Antigua, Guatemala
AEI Energy Fenix Project	520 MW Combined Cycle Project Acting as Independent Engineer representing the Lenders in reviews of the ongoing project and in approval of financial disbursements by the Lenders on a monthly basis including 66 miles of Transmission and Distribution poles and cabling and 1000 feet of outfall piping.	Lima, Peru
U.S. Department of Energy (DOE) Loan Guarantee Program	716 MW Integrated Gasification Combined Cycle (IGCC) – Cost, Schedule, Engineering and Construction Evaluation.	Taylorville, IL
US Department of Energy (DOE) Loan Guarantee Program	South Texas Nuclear Power Project Units 3 and 4 – Preparation of an Independent Project Review and Analysis including Preparation of the Cost and Construction of the project.	Bay City, TX



Client	Description	Location
LS Power	Two 600 MW Long Leaf Energy Project – Basic Design Development.	Georgia
City Public Service	4 LM6000 Combined Cycle units. Owner Engineer.	Texas
Rochester Gas & Electric	300 MW Coal Fired Power Plant – CFB Boiler Based Expansion.	New York
Reunion Power	35 MW and 45 MW Biomass Power Project FEED Study.	Ludlow, VT
Unistar	Independent technical and commercial review of the 1600 MW Gen 3+ Nuclear Power Project.	Calvert Cliffs, MD
Department of Energy	Oversight of the removal of the 440 Building, Nuclear Weapons Plant at Rocky Flats Environmental Technology Site	Rocky Flats, CO
Department of Energy	Complete Cost Estimate – Title I, Engineering Phase for the Accelerator Production of Tritium (APT) Project.	Los Alamos, NM Aiken, SC
Department of Energy	MFFF – Independent Evaluation of Project Construction Costs for Savannah River.	Aiken, SC

RECENT ASSIGNMENTS – E9 INSIGHT

PROJECT: *Lawrence Berkeley Laboratory Utility Demand Flexibility Programs (ongoing)*

Policy and regulatory research services to support Labs’ understanding of recent regulatory actions that focus on demand flexibility. Project supports LBNL’s engagement with the Department of Energy’s Grid-Interactive Efficient Building (GEB) initiative.

PROJECT: *U.S. National Labs (Lawrence Berkeley; Pacific Northwest National Lab; National Renewable Energy Lab) (ongoing)*

Review public utility commission proceedings of all US states and territories to identify orders on energy resilience and related activities (e.g., integrated resource planning, distribution system planning, transmission planning, and equity initiatives), including resilience metrics and methodologies that are identified.

PROJECT: *Department of Energy Office of Policy – State, Local, Tribal Policy – State Engagement Workplan: Advancing National Climate Goals (ongoing)*

Support the Berkely Lab and DOE in working to engage with states that do not have explicit climate goals but could make progress on decarbonization while meeting their own energy-related goals.



PROJECT: *Lawrence Berkeley Laboratory Electrification Impacts on Electric and Natural Gas Distribution Systems (ongoing)*

Policy and regulatory research services to support understanding of recent and ongoing state actions - including state legislation, public utility commission proceedings, and governors' executive orders - related to the impacts of electrification of buildings and transportation on the electric and natural gas distribution systems, as

PROJECT: *Think Microgrid (2021-present)*

E9 Insight, in partnership with Microgrid Knowledge, led formation of this coalition organization, which seeks to educate policymakers and regulators about the capabilities of microgrids to provide public resiliency, climate and equity benefits. Primary activities include published reports, regulatory briefs, direct outreach meetings and unique hosted events. The Inaugural Policy Summit resulted in a consensus set of recommendations for action by state-level government agencies.

Website: www.thinkmicrogrid.org

PROJECT: *“AMI in Review: Informing the Conversation” (2019-2020)*

Under contract to the U.S. Department of Energy, conducted a detailed review of advanced meter applications over a 10-year period, with particular focus on cost-benefit evaluations presented to regulatory commissions. Organized regional workshops and direct interviews with commissioners, utilities and stakeholders to validate analysis and conclusions. “AMI in Review: Informing the Conversation” report and compendium with reference materials of 600 filings from over 230 proceedings published in July 2020.

Report: <https://e9radar.link/ami-report>

Compendium: <https://e9radar.link/ami-compendium>

PROJECT: *Illinois Commerce Commission Data Access Framework*

As a participant in proceedings before the Illinois Commerce Commission on behalf of the Environmental Defense Fund developed comprehensive data access framework.

PROJECT: *Dataguard Technical Support (2018-present)*

Manage outreach technical assistance outreach to state commissions in support of U.S. DOE's Dataguard, which provides best practices guidance for customer energy usage data security and stewardship. In collaboration with a subcontractor, preparation of briefing materials for commission workshops.

PROJECT: *New York Department of Public Service*

Assisted the New York Department of Public Service in developing a new data access framework for New York State. This report details a new model for data access in New York, including access to customer energy usage data, access to aggregated customer data, and access to grid information.

PROJECT: *California Public Utilities Commission Report on Cybersecurity (2012)*



Co-authored report for California PUC on the topics and role of state regulatory commissions in reviewing and considering utility practices, policies, and investments on cyber-security.

PROJECT: *NIST Interagency Report 7628*

Participated in the development of the NISTIR 7628 Volume 2, Privacy and the Smart Grid. NISTIR 7628 was developed by NIST in 2010 to provide guidance to stakeholders on protecting the security and privacy of participants in the Smart Grid.

PROJECT: *Arkansas Public Service Commission (2018-2020)*

Facilitated the Arkansas PSC’s proceeding on distributed energy resources, which included organizing agendas, identifying speakers, facilitating discussions and working groups, and meeting with PSC Commissioners and advisors on an ongoing basis to discuss topics of interest for the proceeding.

ESTIMATE OF COSTS

CTC/E9 presents below the schedule of hourly rates to be used for the services to be provided. CTC standard hourly rates per hour normally vary per consultant from \$150.00/hour to \$395.00/hour, however, we have discounted our fees for the commission such that they range from \$120.00/hour to \$265.00/hour as shown below:

CTC Rate Schedule for 2023:

Position	Standard Rate	Discounted Rate
Senior Executive Consultant	\$395	\$265
Executive Consultant	\$370	\$230
Senior Consultant	\$285	\$190
Consultant	\$200	\$165
Senior Specialist	\$250	\$190
Specialist	\$225	\$165
Research and Management	\$150	\$135
Analyst	\$135	\$120
Expenses	Actual Cost	Actual Cost

E9 INSIGHT presents below the schedule of hourly rates to be used for the services to be provided.

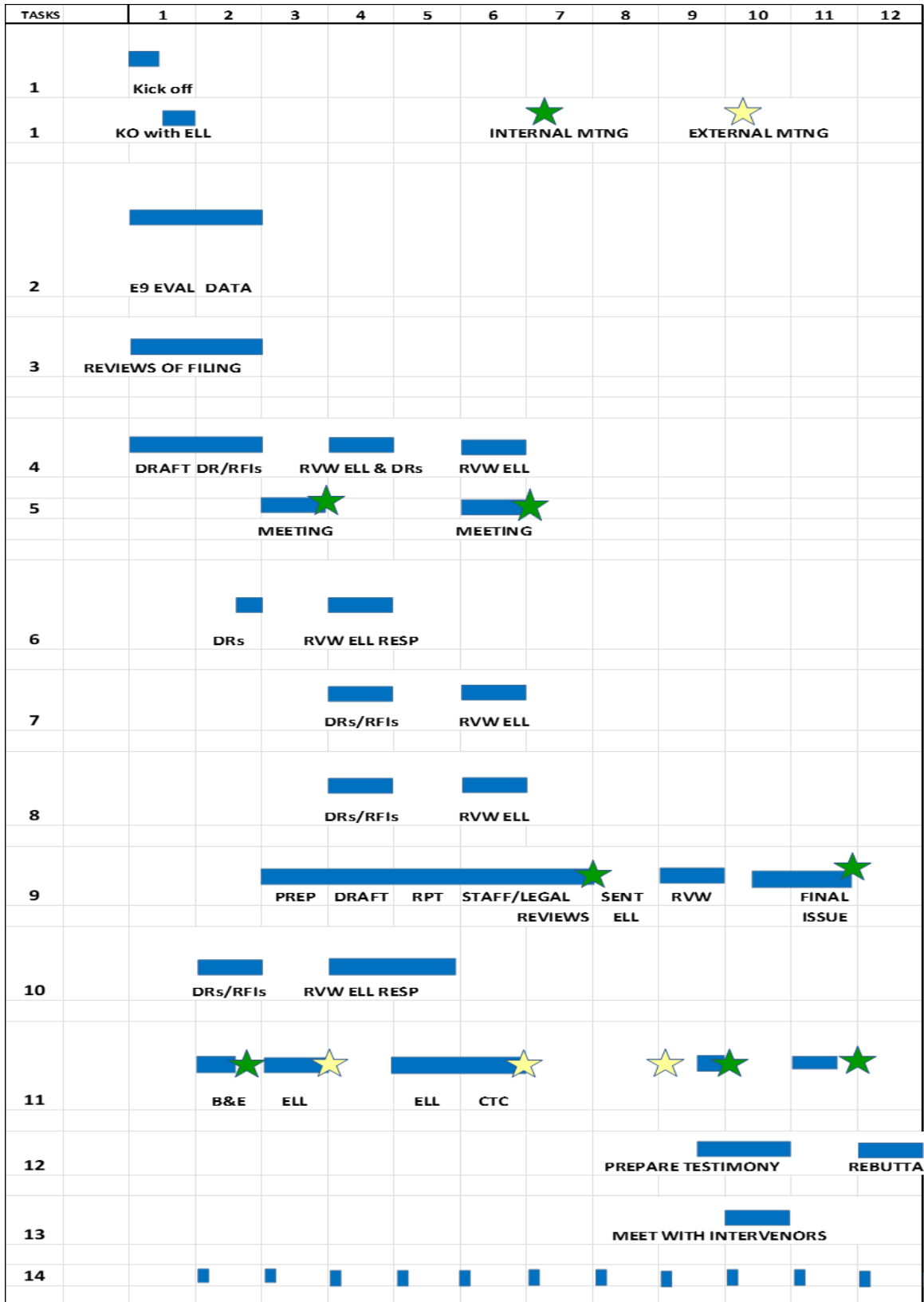


E9 Rate Schedule - 2023

<i>Position</i>	<i>name</i>	<i>standard</i>	<i>discounted</i>
Principal Executive	Cameron Brooks	\$325	\$250
Managing Director	Sam <u>Kozel</u>	\$250	\$175
Research Director	Cole <u>Triedman</u>	\$150	\$125
Research Associate	Daisy Dunlap	\$125	\$95
Research Associate	Madeleine <u>Moyano</u>	\$125	\$95
Senior Consultant	Chris Villarreal	\$225	\$175
Senior Consultant	Ted Ko	\$300	\$250

For this assignment CTC/E9 has developed a cost estimate of \$369,125 for the services and we have included six (6) trips to the Commission offices or other sites for a cost of \$2000 per trip or \$12,000 in expenses. Total assignment cost \$381,125.

PROPOSED SCHEDULE – BY TASK





APPENDIX A

Key Personnel Detailed Resumes



Ben Hill
President/Senior Executive Consultant
Education

Bachelor of Science, Business Management – Stony Brook University

Certificate in Construction Project Management: University of Florida

Career Highlights

As an Executive Consultant for Construction and Project Management in the Power market, provided all construction and project related activities as well as Owner Engineering, Independent Engineering, and Construction Management Services.

Provided Construction and Project Consulting Services in the power arena including IGCC, coal, nuclear, gas, and renewables. Typical activities included overall project management, pre-construction studies such as labor analysis, cost studies and analysis, economic impacts, construction development of plans and procedures, nuclear plant outage coordination, project layout and reviews of conceptual designs, constructability reviews and preparation of bid documents. Performed post-construction claims mitigation and analysis to determine prudence of performance. Also performed acquisition due-diligence studies.

Prior Project Experience
(Partial Listing)

- ❖ **Louisiana PSC; Arkansas PSC, City of New Orleans Commission – Grand Gulf Prudence Review**
Represent the Louisiana Public Service Commission, Arkansas Public Service Commission and the Public Utility Commission of New Orleans in evaluation of the prudence decisions by Entergy during the operations and outages at the Grand Gulf Nuclear facility. A detailed report of technical deficiencies at Grand Gulf as well as a detailed Prudence review and written as well as oral testimony is being performed.

- ❖ **West Virginia Public Service Commission – Case No. 21-0339-E-ENEC and Case No. 22-0393-E-ENEC**
Provided Expert Consulting Services to work with Staff to undertake a review of the prudence of Appalachian Power Company (APCO) and Wheeling Power Company (WPCO) (jointly the Companies) Expanded Net



Energy Cost (ENEC) including fuel purchasing practices, power plant utilization, bidding strategy to sell generation into the PJM energy market, extent to which generation from the Companies' plants failed to clear the PJM energy market during hours of PJM energy prices in excess of the incremental variable costs of self-generation, and reliance on PJM energy relative to self-supply options.

- ❖ **Louisiana Public Service Commission – Docket R-35394**
Provided independent technical expertise in this Rule making docket to Examine Options Pertaining to Pole Viability, Pole Attachments, and all Areas that may Affect the Reliability and Sustainability of Louisiana’s Electric Utility Distribution Grid under Docket R-35394.
- ❖ **Louisiana Public Service Commission – Docket R-36226**
Provided independent technical expertise in this Rule making docket to Examine “Evaluation of Louisiana's electric grid regarding status, maintenance, and whether there is more that could have been done and can be done to benefit Louisiana customers.”
- ❖ **Georgia Public Service Commission – Vogtle Nuclear Construction Project**
CTC, through its subsidiary Vogtle Monitoring Group (VMG) is providing expert witness testimony, on-site construction monitoring, and evaluating services as well as reviewing and evaluating the reasonableness of the costs in an ongoing basis at the Vogtle Nuclear Power Plant Unit 3 and 4 Project for the Georgia Public Service Commission Staff.
- ❖ **Mississippi Public Utility Staff (MPUS), 582 MW Integrated Gasification Combined Cycle (IGCC) Facility, Meridian, MS**
Represent the MPU Staff and Citizens of the State of Mississippi, monitoring the engineering, procurement, and construction activities by the project participants to assure compliance with their execution plan, budget, and timeframe approved by the MPU Staff. Recently performed detailed cost and schedule reviews/analysis for prudence relative to a Motion submittal by the Owner to the MPUS to increase the approved recoverable budget for the project. Also monitor ongoing construction, engineering, and procurement activities to assure they were within industry standards and methods.
- ❖ **Braunig Peaking Turbines Project**, Owner Engineer for a 200 MW peaking facility for City Public Service in San Antonio, Texas. Performed all Pre-Project development activities, ie Development and Review of Design Criteria, preparation of Bid Document for Major Equipment as well as the EPC Contractor, Evaluation of Potential Bidders, which included visiting Reference Plants to determine Contractor capabilities and detailed review of the execution schedule



and monitoring of progress. Performed sequence of construction analysis, approval of execution plans, monitoring construction progress as owner engineer, Claims Mitigation analysis, and final close out of the project.

- ❖ **AEI Energy – Jaguar Project** – 300 MW CFB Coal Plant Antigua, Guatemala- Performed all Independent Engineers reviews, reports and studies necessary to represent the Lenders in the design, construction, and operation of the facility.
- ❖ **AEI Energy – El Arrayan Project** – 115 MW Wind Farm (50 Units) La Serena, Chile- Performed all Independent Engineers reviews, reports and studies necessary to represent the Lenders in the design, construction, and operation of the facility.
- ❖ **AEI Energy – Fenix Project** – 520 MW Combined Cycle Plant, Lima, Peru - Performed all Independent Engineers reviews, reports and studies necessary to represent the Lenders in the design, construction, and operation of the facility.
- ❖ **Wolverine Clean Energy Venture**, 600 MW greenfield coal project Owner Engineer Construction Representative. Performed contractor analysis, traffic study, economic impact study for the community, major equipment layout and sequence of construction, and execution plans, schedule monitoring for successful completion.
- ❖ **Starwood Solar One Project**, 290MW Concentrated Solar Facility Performed a detailed Labor and Productivity Study and detailed sequence of construction due to extremely restricted site. Proposed methods of construction contracting, prepared construction execution plans, and performed a detailed sequencing of component deliveries and assembly at the offsite facility, as well as the on-site installation process. Due to restricted site conditions, the detailed site assembly process, component and material deliveries, site assembly and final installation were all critical to schedule achievement.
- ❖ **Imperial Valley Project**, 300 MW CSP Electric Generation Facility Performed a detailed Due Diligence for International Power America (IPA) to determine viability and credibility of the project. Performed analysis of the sequence of construction, including detailed review of the proposed automated on-site fabrication facility and sequencing of product delivery and assembly.
- ❖ **Kennecott Utah Copper Project**, 250 MW Phased Upgrade Power Project - Performed a detailed Labor and Productivity Study for the Greater Northern Utah Area. Evaluated various locations for specific equipment selections, sequenced the construction process, as this was



an extremely restricted site, and performed preliminary schedule and detailed cost study.

- ❖ **Taylorville Energy Center**, 716MW Integrated Gasification Combined Cycle (IGCC) facility Performed Independent Engineering and Construction analysis services for the Department of Energy Loan Guarantee Program to determine the viability and achievability of the execution of this project. Project execution, cost analysis, potential site analysis of conditions, and procurement of components were all reviewed for achievability and applicability. (The project was later canceled prior to the start of construction.)

- ❖ **South Texas Nuclear Project, Units 3 and 4** Performed Independent Engineering and analysis services for the Department of Energy Loan Guarantee Program to determine the viability and achievability of the execution of this project. Performed Construction Management oversight services for the project. Project Execution, detailed cost analysis, and procurement of components, as well as site conditions, were reviewed for achievability. (The project was later canceled prior to the start of construction.)

- ❖ **Florida Power and Light** - Performed a detailed review of “decisions” relative to the EPU uprates at the Turkey Point Nuclear Plant and Saint Lucie Nuclear Power Plant to determine prudence of major decisions prior to presentation to the Public Service Commission for rate increase approval. Also performed detailed reviews of the EPU Uprate plans for both outages at each site.

- ❖ **Calvert Cliffs Nuclear Project, Unit 3 & 4** - Performed Independent Engineering and analysis services for the Department of Energy Loan Guarantee Program to determine the viability and achievability of the execution of this project. Performed Construction Management oversight services for the project. Project execution, cost analysis, and procurement of components as well as site conditions, were reviewed for achievability.

- ❖ **Rocky Flats Engineers and Constructors, LLC (Stone & Webster)**. As Vice President, responsibilities included the overall management of the Design/Build, Firm Fixed Price, and Unit Rate contracts. This included the over site of design and construction efforts of major modifications to existing facilities as well as demolition, removal of nuclear waste materials, and characterization of many major buildings and components. This was for the Department of Energy at the Rocky Flats Environmental Technology site. This contract included over 400 task orders ranging in value from a few thousand dollars to over 50 million dollars. The majority of these task orders, were performed on a Firm Fixed price basis and were competitively bid. The total value of this contract was approximately \$350 million. Held a “Q” Clearance.



- ❖ **Browns Ferry Nuclear Plant.** As Superintendent of Construction, I served as the Shift Site Manager, responsibilities included the overall site management to support the successful restart of Browns Ferry Unit 3. Management included all field supervision, work plan writers, field engineering, cost and scheduling, interface with design engineering group and Senior Site Representative. Later, responsibilities included oversight of the Maintenance and Modification activities. Also, responsible for Outage Coordination for refueling outages and detailed planning and implementation for all major upgrades to the facility.
- ❖ **Quad Cities Nuclear Station.** As Chief Construction Supervisor – Mechanical, served as a work plan writer.
- ❖ **Clinton Nuclear Power Station.** As Chief Construction Supervisor Mechanical, responsibilities included management of all Mechanical Department activities including corrective maintenance to plant components and modifications to various plant systems as well as the detailed planning and execution of Clinton’s Maintenance Outages. On special assignment to Illinois Power Company, responsibilities included coordination of all pre-outage, outage, and post-outage activities. Position required an extensive amount of interface with all Illinois Power departments. Major pre-outage efforts included the development of execution schedules, manpower requirements, and mobilization. Major outage efforts involved coordination of all activities including status and tracking of all work as well as continued interface with owner personnel. Post-outage requirements involved the formulation of the Outage Critique.
- ❖ **River Bend Nuclear Station.** As Senior Construction Supervisor – Mechanical, responsibilities included installation of all ductwork, equipment, and seismic supports for the HVAC systems in all Category I, safety-related areas of the plant. Included the direct supervision of the fabrication, installation, testing, and successful completion of the systems.
- ❖ **Shoreham Nuclear Power Station.** As Construction Engineer, responsibilities included coordinating activities of structural steel contractor for the installation of the CO2 Fire Protection System. Duties were to identify and solve technical problems associated with the above-named contractors; check and validate contractors’ claims for back-charges and progress payments; monitor schedule and progress of same contractors; initiate work directives to contractors or work to be performed outside scope to assure that all specifications are met; and all other duties assigned by the Structural Supervisor.



Albert Ferrer

Sr. Executive Consultant/ Project Director

Education

Executive Development Program, Northeastern University

Global Institute for Leadership Development Program

MS Nuclear Engineering, New York University

BS Mechanical Engineering, Manhattan College

Career Highlights

Executive Vice President of Consulting Services with over 40 years of professional experience in the US and international power industry. Al Ferrer is responsible for business development and marketing of all the power consulting services Critical Technologies Consulting provides to its clients including Owner's Engineering, Independent Engineering, due diligence, acquisition services, power plant performance improvement, CO2 strategies, operational risk management, air emissions control retrofits, upgrades and life extension, covering nuclear, coal, gas and combined cycle, biomass, geothermal, IGCC, circulating fluid bed, renewables such as solar, wind and biomass, and other power plant generation technologies.

He worked for Stone & Webster most of his career with his last position serving as Senior Vice President and Managing Director. He worked for Burns and Roe as VP of the Consulting Division and brought the Consulting Division from 8 personnel to 85 personnel when he left. He has directed and executed work in the US, Canada, Chile, Brazil, Mexico, Malaysia, Indonesia, Thailand, Japan, and Korea. He holds a BS in Mechanical Engineering and an MS in Nuclear Engineering and has participated in Executive Management Educational Programs.

Prior Project Experience

(Partial Listing)

- ❖ **West Virginia Public Service Commission – Case No. 21-0339-E-ENEC and Case No. 22-0393-E-ENEC**
Provided Expert Consulting Services to work with Staff to undertake a review of the prudence of Appalachian Power Company (APCO) and Wheeling Power Company (WPCO) (jointly the Companies) Expanded Net Energy Cost (ENEC) including fuel purchasing practices, power plant utilization, bidding strategy to sell generation into the PJM energy market, extent to which generation from the Companies' plants failed to clear the PJM energy market during hours of PJM energy prices in excess of the incremental variable costs of self-generation, and reliance on PJM energy relative to self-supply options.



- ❖ **Louisiana Public Service Commission – Docket R-35394**
Provided independent technical expertise in this Rule making docket to Examine Options Pertaining to Pole Viability, Pole Attachments, and all Areas that may Affect the Reliability and Sustainability of Louisiana’s Electric Utility Distribution Grid under Docket R-35394.
- ❖ **Louisiana Public Service Commission – Docket R-36226**
Provided independent technical expertise in this Rule making docket to Examine “Evaluation of Louisiana's electric grid regarding status, maintenance, and whether there is more that could have been done and can be done to benefit Louisiana customers.”
- ❖ **New England ISO CONE** Directed the New England ISO CONE analysis and the technical, cost and schedule of the projects in the que and execution of the work for ISO New England and Concentric Energy Advisors.
- ❖ **Transmission and Distribution Facilities, B Capital Partners, Louisiana** Project Director in charge of a Due Diligence Review of the electrical transmission and distribution systems of a confidential municipal utility to assist B Capital in presenting a proposal to operate and manage these systems.
- ❖ **Conducted for the Mississippi PSC an Independent Engineering due diligence and construction monitoring** on the new 600 MW Integrated Gasification Combined Cycle (IGCC) – including the technical and commercial viability, cost, schedule, engineering, and construction monitoring, including 7 switchyard modifications and 150 miles of new Transmission poles and cabling.
- ❖ **Conducted for the Florida PSC and FP&L an independent detailed technical and commercial engineering due diligence** and provided written reports and testimony on the prudence of FP&L in the implementation of various upgrades of the FP&L nuclear power plants and associated transmission systems to accommodate these upgrades.
- ❖ **Participated and directed independent engineering assignments** for the US-DOE over 15 transmission and renewable energy projects under the US DOE Loan Guarantee projects. Provided detailed IE reports on each project with an evaluation of the new technologies involved including commercial viability, assessment of the scoping, construction contracts and cost and schedules, operations, and risk management of each project. Conducted construction monitoring over these projects after financial close.
- ❖ **El Campesino and Octopus Regas Terminal and 600MW Combined Cycle Projects, Santiago, Chile – Consortium of Banks: SG, CA,**



MUFG & DNB – Joint Project by EDF, Chenier & Biobio Genera
Program Director for Independent Due Diligence on a gas-to-wire project including an LNG FSRU and terminal, subsea and onshore pipeline, H Class Single Shaft CCGT and about 140 miles of transmission and distribution lines. Conducted a detailed technical due diligence of the project Financial Model analyzing project profitability and developing a wide spectrum of sensitivity scenarios. Included due diligence on the Chilean pipelines and compressor stations.

- ❖ **Mississippi Public Utility Staff (MPUS), 582 MW Integrated Gasification Combined Cycle (IGCC) Facility, Meridian, MS**
Represent the MPU Staff and Citizens of the State of Mississippi, monitoring the engineering, procurement, and construction activities by the project participants to assure compliance with their execution plan, budget, and timeframe approved by the MPU Staff. Recently performed detailed cost and schedule reviews/analysis for prudence relative to a Motion submittal by the Owner to the MPUS to increase the approved recoverable budget for the project. Also monitor ongoing construction, engineering, and procurement activities to assure they were within industry standards and methods.
- ❖ **Los Guindos Due Diligence, GE Capital, Chile:** Project Director for a technical due diligence for a refinancing transaction of an existing GE 9E 135 MW gas turbine and the non-recourse financing of an GE 9E 135 MW. Due diligence reviews of all project agreements, contractual risk assessments and the financial model. Assisted the Natixis, MUFG and SMBC banks in the EPC contract negotiation until the issuance of the execution copy of the contract.
- ❖ **Minera Spence Project, Mizuho, Chile (Ongoing)** Project Director for the construction monitoring phase. Currently in charge of the Due Diligence Review for MUFG (Mizuho). The project consists of designing a desalination plant to take the ocean water and desalinate it to a certain grade to then send it to Spence Mine. The mine will have a nominal treatment capacity of 95,000-100,000t/d. The desalination plant will supply approximately 800l/s desalinated water to be used in the industrial processes, as well as a 154km pipeline and electrical distribution lines and pumping system, and a 4,000m³ storage tank.
- ❖ **Pesqueria power plant re-financing, Techgen, Mexico:** Project Director for review of a re-financing of a 1GW combined cycle gas turbine project in Mexico for Credit Agricole Bank. The transaction is a syndicated loan refinancing that involves 10 commercial international banks.
- ❖ **Gas-to-Power Project Development, ExxonMobil LNG Executives, USA** Headed a three-day capacity building workshop for eight members of the global LNG ExxonMobil executives. The objective of the workshop



was to educate the teams on the gas-to-power model from a project financing and development point of view. The workshop included the basis of non-recourse financing and its application to global gas to power projects including all project agreement, financing agreement and project structuring.

- ❖ **CHP La Plata Acquisition Due Diligence, YPF S.A. Argentina** Project Director for a technical due diligence of an acquisition of a 100 MW combined heat and power plant in the La Plata refinery in Argentina. Besides the technical aspects, advised the CEO of YPF S.A. on the key risk aspects of the acquisition and how to quantitatively incorporate this risk in the acquisition final price.
- ❖ **YPF/GE Fast Power Project, Citi Bank, Credit Suisse and Export Development Canada, Argentina** Project Director for a technical due diligence of two power plants, a 266 MW 9FA.04 unit plant located in the province of Tucuman, and a 108 MW LMS100 unit plant in Neuquén. The due diligence was conducted during an advanced stage of engineering and construction. The extent to which facilities and services were shared with existing operating facilities resulted in contractual complexity. Review of all project agreements including the EPC, CSA, AMA, LLA, and the PPA for both plants. Define project risks especially as the plant is integrated in existing complexes and will share to a larger extent existing facilities. The project reached financial close and represents the first international project financing in Argentina in more than 15 years.
- ❖ **Project Aconcagua Acquisition Due Diligence, YPF S.A., Argentina** Project Director for a technical due diligence over a large fleet of power generation plants owned by YPF EE to incorporate a partner with up to 50% of the company, while maintaining co-control. The fleet included co-generation, small and large CCGT, open cycle and aero-derivatives, solar, wind and Biomass. Review of detailed plans for the projects under development producing a risk matrix and a paper of recommendations for YPF EE to consider.
- ❖ **1,500 MW Porto de Sergipe I Gas-to-Power Project, IFC and IIC, Brazil** Project Director for a technical due diligence of a 1,500 MW gas to power including a 7HA.02 CCGT, 170,000 m3 FSRU and a submerged soft yoke (SSY) mooring system. Onshore and offshore technical due diligence. Review of all project agreements including the EPC, O&M, CSA, EPCI, BBC, OSA and the PPA producing a consistency matrix and advising all lenders on the project overall risks. Contingency sizing for the project using probabilistic analysis and montecarlo simulation. Review of the financial model. Negotiation on behalf of the lenders with GE to introduce 25 amendments to the EPC contracts. Scope included the undersea and overland pipelines due diligence.



- ❖ **Abengoa El Norte III Acquisition Due Diligence, acquisition and execution, Macquarie Capital, Mexico.** Project Director for a technical due diligence for atypical and unusual acquisition of a partially constructed power plant that was owned by Abengoa before bankruptcy. Review of the PPA and the financial model. Consistency analysis with the remaining project agreements. Probabilistic availability and reliability model. Risk analysis conducted. Developed the final schedule to build the facility
- ❖ **Coal-to-Urea Market and Techno-Economic Feasibility Study, Navajo Transitional Energy Company (NTEC), Arizona** Directing the Consulting assignment with the Navajo Nation concerning coal to liquids and coal to power Phase 1 activities. Phase 2 activities include the market study for the coal to liquids project (ammonia-urea) they are considering. The outcomes and reporting to be provided to the US department of Energy for assessment to provide sovereign loan guarantees.
- ❖ **Pio Pico Energy Center, San Diego, CA, GE Capital** Program Director for this merger and acquisition technical advisor project conducting a full Due Diligence on a three-unit simple cycle peaking facility.
- ❖ **Gas-to-Power Plant (GTPP) and LNG Import Terminal, Panama, MKM/Gorgeous Partners** Provided advisory work on project structuring, lenders key requirements, techno-financial aspects required for project success. Analysis included technology evaluation, LNG procurement, offshore terminal optioneering and key pre-requisites to be considered for profitability enhancements.
- ❖ **South African Gas to Power** Provided consulting services to the South African Gas-to-Power Project with Interger.
- ❖ **Wisconsin Light and Power** Expert Witness for the Wisconsin Light and Power case involving Project Estimates for a Confidential Project which was settled out of court as a result of my testimony.
- ❖ **Confidential Client** Executed due diligence for an 1800MW Combined Cycle plant near Manchester, UK for a US client (hedge fund) this included the critical flaw analysis prior to the Capacity Auction.



Constantinos (Dinos) Nicolaou **Exec VP/Executive Consultant**

Education

Master of Business Administration – University of Puget Sound, Tacoma, Washington

Bachelor of Science, Economics and Accounting – Staten Island College (CUNY)

Career Highlights

Mr. Nicolaou has over 38 years' experience in project controls and construction planning and scheduling for engineering, construction, start up and outage projects, within both home and field offices, for major energy projects. His background encompasses IGCC, nuclear and fossil generating stations, with extensive hands-on experience in the use of PRIMAVERA and several other scheduling tools.

Prior Project Experience

(Partial Listing)

- ❖ **Louisiana PSC; Arkansas PSC, City of New Orleans Commission – Grand Gulf Prudence Review**
Represent the Louisiana Public Service Commission, Arkansas Public Service Commission and the Public Utility Commission of New Orleans in evaluation of the prudence decisions by Entergy during the operations and outages at the Grand Gulf Nuclear facility. A detailed report of technical deficiencies at Grand Gulf as well as a detailed Prudence review and written as oral testimony is being performed.
- ❖ **Georgia Public Service Commission – Vogtle Nuclear Construction Project**
CTC, through its subsidiary Vogtle Monitoring Group (VMG) is providing expert witness testimony, on-site construction monitoring, and evaluating services as well as reviewing and evaluating the reasonableness of the costs in an ongoing basis at the Vogtle Nuclear Power Plant Unit 3 and 4 Project for the Georgia Public Service Commission Staff.
- ❖ **Mississippi Public Utility Staff (MPSC) 600 MW Integrated Gasification Combined Cycle (IGCC) Facility, Meridian, MS -** Represent the MPU Staff and Citizens of the State of Mississippi, performing an Independent Review and providing comments regarding the Project Schedule prepared by Southern Company and KBR. Attend regular meetings with MPUS and Southern Company Staffs in order to reconcile variances in the Project Schedule.



Participate in site construction inspections in order to validate work progress and labor productivity to measure against the Project Schedule. Advise MPUS staff of any issues.

- ❖ **Taylorville Energy Center**, 716MW Integrated Gasification Combined Cycle (IGCC) Facility - Performed Independent Review and provided comments regarding the Project Schedule prepared by the KBMD team. Prepared the Project Schedule section of the detailed report issued to the U.S. Department of Energy (DOE) for the DOE's evaluation of the project for the Loan Guarantee Program. (The project was later canceled prior to the start of construction.)
- ❖ **South Texas Nuclear Project, Units 3 and 4** – Prepared an Independent Project Schedule Review and Analysis for the U.S. Department of Energy Loan Guarantee Program. Attended meetings on a regular basis with the Project Team to discuss findings. Prepared the Project Schedule section of the detailed report issued to the DOE. (The project was later canceled prior to the start of construction.)
- ❖ **MNPC (Malaysia) and EGAT (Thailand) Feasibility Study** - Project Controls Manager responsible for developing baseline cost and schedule, establishing performance measurement system and monthly reporting on an Integrated Resource loaded schedule.
- ❖ **Pennsylvania Power and Light (PPL) U.S. EPR Bell Bend Project** - Lead Scheduler
- ❖ **MNES US-APWR Project** - Lead Scheduler for the EPC level II schedule. Validated both cost and schedule including declared critical paths.
- ❖ **Calvert Cliffs EPR Project** - Lead Scheduler in an Independent Engineer DOE-sponsored review of the Calvert Cliffs project's EPC Level II schedule, including interviews and meetings with Bechtel and Unistar.
- ❖ **Westinghouse AP1000** - Lead Scheduler in the External Independent Review of the Westinghouse AP1000 Nuclear Power Plant. This level III EPC Integrated Project Schedule had over 65,000 activities, was Engineering resource loaded, and included a series of interviews with Westinghouse.
- ❖ **Indian Point NPP, Units 2 and 3, New York** – Served as Engineer for several refueling outages, starting in 1998. Responsible for project schedule and cost control, including development of detailed level II and III Primavera schedules, collection and control of all labor, and material costs, weekly monitoring of project outage work.



- ❖ **Served as Lead Scheduler on the Burns and Roe Independent Review Team of the U.S. Department of Energy (DOE)**-sponsored programs which included Independent Cost Estimates (ICE) and External Independent Reviews (EIR) for the following:
 - The Columbus Closure EIR Project – Columbus, Ohio
 - Yucca Mountain EIR - Las Vegas, Nevada (Baseline, CD-1 and ICE)
 - The Mound (MEMP) Closure – Dayton, Ohio (PRS 66 and total Project EIR)
 - The Neutrinos Project (NuMI) at Fermi Lab in Illinois
 - The Hanford Project Clean-up EIR in Washington
 - The Oak Ridge Cleanup EIR in Tennessee
 - Review of National Ignition Facility (NIF), at DOE’s Lawrence Livermore National Lab in California
 - The EIR of Sandia’s MESA Project - Albuquerque New Mexico

- ❖ **Vogtle Nuclear Power Station** - Responsible for project controls assignments including all phases of schedule development, maintenance and reporting for the plant. Prepared schedules involving engineering, construction, pre-operations, startup and testing, pre- fueling, and refueling outages. Also used Project/2 scheduling system and maintained overall database.

- ❖ **Brookhaven Graphite Research Reactor Project** - Responsible for the development of integrated project schedules, WBS, cost plans, and performance reports required for decommissioning.

- ❖ **Yucca Mountain Project** - Responsible for the review of integrated schedules, cost plans and cost performance reports. Also prepared External Independent Reviews on this project.

- ❖ **La Salle Nuclear Power Station** - Responsible for providing overall supervision establishment of scheduling and cost control required

- ❖ **WPPS Nuclear Project Units 3 and 5** - Responsible for engineering, construction interface, and project controls coordination.



Michael Tomadakis, PE
Senior Executive Consultant
Education

MS, Electrical Engineering, Worcester Polytechnic Institute (WPI)

Power Engineering Management (WPI)

BS, Electrical Engineering, Wentworth Institute of Technology (WIT)

Emerging Leaders 24-month program + 2-weeks immersive training in London

Registrations:

Professional Engineer: MA #49228, 2011 TX #119633, 2015

Awards:

Mott MacDonald Technology and Innovation Award, First Place for Development of Integrated 3D Technologies

Career Highlights

Considerable experience in leadership, operations, management, project management, engineering, design, team building, and business development. Guiding, mentoring, and aspiring leaders in a holistic manner, considering all facets of business. Implements training and process development, mentors aspiring leaders, and sets the team standard for professionalism and excellence.

He has managed transmission (OH and UG), substation and distribution projects from 12kV to 500kV AC and up to +/- 600kV DC. He has considerable experience with wind and solar collector systems and works closely with developers, utilities, and ISO's (NYISO, ISONE, PJM, CAISO). He has solid technical skills, strong business acumen and excellent written/verbal communication skills. He has an aptitude for engineering, project management, and problem solving for even the seemingly most impossible of situations.

Prior Project Experience
(Partial Listing)

- ❖ **CleanLine Energy's 700-mile +/- 600kV DC Plains and Eastern Project, OK, AR, TN:** As Project Manager, facilitated Engineer and EPC



Planning services for design, permitting, ROW acquisition and the Department of Energy's NEPA process. Presented at several open house forums to educate the public about the project.

- ❖ **PacifiCorp/Rocky Mountain Power, Sigurd to Red-Butte 345kV Transmission Line, UT:** Project Manager. Project Scope included the conceptual design for this ~200mile Greenfield transmission line through the mountains of UT and the (2) remote substation expansions including the addition of a series capacitor. Responsibilities included geotech data acquisition, ROW acquisition support including preparation of legal exhibits, Access Road design, BLM and National Forrest technical support including giving presentations, RFQ preparation and Evaluation of the OEM and EPC contractors, and more. This project was culturally, environmentally and geographically challenging.
- ❖ **Enbridge 500kV GIS/GIL Transmission Project, CA** Technical lead, primary author and director of this due-diligence project. The project scope included conducting fatal flaws analysis, technology review and a risk assessment for this 500kV transmission project which consists of the engineering-procurement-construction of three 500kV GIS switching stations, 30-miles of 500kV overhead transmission line and 3-miles of double-circuit underground Gas Insulated 500kV transmission line installed in a tunnel.
- ❖ **TNMP TNP1/Twin-Oaks 345kV Substation, TX** Project Manager for the Engineering, Construction, and Testing/Commissioning associated with the replacement of (11) 345kV breakers in two different stations. The intent was to replace the existing single-pole, live tank breakers and free-standing CT's with new dead-tank units. This project is particularly challenging due to the extremely aggressive construction/testing schedule and close coordination with the Power Plants to ensure no interruption of production.
- ❖ **WETT OE Contract, TX** Project Manager for this Owner's Engineer contract with Wind Energy Transmission of Texas (WETT), a Texas electrical transmission utility and CREZ player. Responsibilities include managing of engineering/design resources, scoping tasks, estimating and developing task orders, developing, maintaining schedule and budget, and ensuring a high degree of quality in deliverables.
- ❖ **Spicewood 138/15kV Substation, TX** Construction Project Manager responsible for the materials/equipment procurement and construction associated with this refurbishment project. The scope of this project entails the complete removal and rebuilding of two substation bays including all structural steel, breakers, switches, AC/DC cable, control and communications cable, foundations, two power transformers, and



all other miscellaneous apparatus associated with this refurbishment project.

- ❖ **HTLS Transmission Conductor Assessment and Design Specification, Ireland** Project Manager and Lead Engineer responsible for the schedule, budget, resource management associated with the technical assessment of various HTLS (High Temperature Low Sag) conductors on the market today ultimately delivering our client an assessment report with our recommendations on which HTLS conductor is best suited for their needs of up-rating existing transmission lines while reusing existing facilities. Developed a standard specification for our client outlining the criteria, deliverables, and installation methods associated with reconductoring with the recommended HTLS conductor.
- ❖ **110kV Cauteen Bay Conductor Rating, Ireland** Project Manager and Lead Engineer tasked with analyzing a proposed conductor design to verify that it would meet the required 2500A steady state current carrying capacity. A complete report was submitted outlining the findings of the analysis and recommendations based on said findings. Created steel specification to be sent out to bid to various manufacturers based on the strain-bus design tensions and calculated structure loads per appropriate weather cases. Calculated short circuit forces acting on the strain bus and gantry support structures per IEC 865-1.
- ❖ **Boggeragh 110kV Transmission Line, EirGrid, Ireland** Project manager and Lead Engineer responsible for the schedule, budget, and resource management associated with the owner's engineering support services that required reviewing the 110kV transmission line PLS-CADD design and construction drawings/documents including Plan and Profile drawings and Sag Charts. Design had to conform to the National Normative Aspects (NNA) for Ireland as well as EirGrid's specifications
- ❖ **Garvagh 110kV Transmission Line, EirGrid, Ireland** Project manager and Lead Engineer responsible for the schedule, budget, and resource management associated with the owner's engineering support services that required reviewing the 110kV transmission line PLS-CADD design and construction drawings/documents including Plan and Profile drawings and Sag Charts. Design had to conform to the National Normative Aspects (NNA) for Ireland as well as EirGrid's specifications.
- ❖ **Sabiya 138kV GIS to AIS switchyard, Kuwait** Responsible for completing the physical design within the allotted scope, schedule and budget for the GIS to AIS riser and yard. Primarily responsible for the GIS-AIS riser design/drawings & physical design/drawings for the AIS yard including the Bill of Materials. Worked closely with the client and project team to deliver on within the allotted budget and schedule.



- ❖ **Barking C 132kV Substation, National Grid, UK** Responsible for creating a detailed scale model of an existing 132kV AIS indoor substation in 3D. Upon completion of the detailed existing model, design modifications from Mott MacDonald's Brighton (UK) office were implemented into the 3D model to determine feasibility of the proposed modifications and to develop detailed drawings to facilitate the future replacement of some of the AIS equipment with GIS equipment in several bays.
- ❖ **Ivanpah 115kV Transmission Lines, CA** Project Manager and Lead Engineer responsible for the detailed design of several new overhead and underground 115kV transmission lines that will support a new solar power facility in California. Work directly with the EPC contractor to optimize the design and overall project cost. Work with the cable manufacturer to maximize efficiency of the underground transmission line cables and overall design. Set and monitor project budget, maintain project schedule and responsible for project invoicing.
- ❖ **Duley Rd. 230kV Substation, NY** Responsible for the detailed design and on-site support through construction/commissioning of a greenfield 230/34.5kV substation for a windfarm. Scope consisted of a 3-breaker 230kV ring bus and 34.5kV collection feeders.
- ❖ **Ryan Rd. 230kV Substation, NY** Responsible for the detailed design and on-site support through construction/commissioning of a greenfield 230/34.5kV substation for a windfarm. Scope consisted of a 230kV breaker and a half bay addition and 34.5kV collection feeders.
- ❖ **Wethersfield 230kV Switchyard, NY** Responsible for the timely completion and management of resources to aid in the production of the following: power one-line, general arrangement design/drawings, physical design/drawings, grounding grid design & study per IEEE-80, lightning protection design & study per IEEE-998, Bill of Materials, control building layout/design, conduit schedule, cable schedule and lighting design. All designs had to meet NEC and NESC standards. All designs and drawings had to conform to client standards. Worked closely with client and contractors throughout the design-build process. This was a new construction site that had to adhere to bulk power requirements for primary and secondary protection schemes, guidelines and criteria.
- ❖ **Altona Wind-Park Collector System, NY** Lead engineer supporting the engineering, design and construction of 34.5kV collector systems. Supplied on-site construction management/support for these projects. Worked closely with client throughout the process. Successfully designed low resistivity turbine grounding system in highly resistive soil location. Conducted load flow and short circuit analysis of collector



branches using SKM. Conducted cable sizing calculations. Designed support structures for overhead cable per NESC loading and overload criteria.

- ❖ **Chateaugay Wind-Park Collector System, NY** Lead engineer supporting the engineering, design and construction of 34.5kV collector systems. Supplied on-site construction management/support for these projects. Worked closely with client throughout the process. Successfully designed low resistivity turbine grounding system in highly resistive soil location. Conducted load flow and short circuit analysis of collector branches using SKM. Conducted cable sizing calculations. Designed support structures for overhead cable per NESC loading and overload criteria.
- ❖ **NYISO Consulting Service Agreement**, Various Tasks: Working with ISO, developers and regional utilities to facilitate obtaining IA, LGIA and PPA for entities that wish to interconnect into the power grid. Tasks include conceptual design, feasibility analysis, scheduling, cost estimating, design review and other miscellaneous tasks.
- ❖ **Calpine Sutter 230kV UG Transmission Line, USA:** Project Manager / Lead Engineer responsible for preliminary design, cost estimates, feasibility and study report for several options to connect the Sutter 600MW power plant in California to a new 230/500kV substation on the PG&E 500kV network. Worked with the client to optimize the various scenarios to their needs and took various technologies and approaches into consideration such as HPFF and solid dielectric technologies and means/methods of installation as the location of installation is in a flood-zone and rice farms that are submerged in water.
- ❖ **CPV Valley 345kV Interconnection, NY** Project Manager and Lead Engineer responsible for the schedule, budget and technical design/advisory associated with preliminary design and owners engineering services to accommodate an interconnection of a combined-cycle power plant into an existing bulk power 345kV transmission line. The ultimate design yielded a six breaker AIS ring at the power plant, a one mile UG transmission line, and a four breaker GIS switchyard inside a metal building which is intended to create a looped connection with the exiting 345kV line. Michael supported the client through the SIS phase to obtain an LGIA working with the NYISO and the interconnecting utilities.
- ❖ **Longview 500kV Transmission Line Design, USA** Owners Engineer responsible for reviewing the designs/drawings associated with the 500kV transmission line and switchyard design. Responsible for checking transmission associated designs, drawings and bill of materials for the EPC contractor.



- ❖ **Q169, 115kV Reconductoring/Refurbishment Project using ACSS, MA** Project Manager & Lead Engineer. Line Reconductoring Project, install 795 ACSS Condor to uprate the existing line without replacing supporting structures. Preparation of scope document. Preparation of Construction Document. Conducted field inspections. Engineered structure modifications and replacement structures in accordance with client, regional and NESC standards. Analysis for various aspects of the transmission line using PLS-CADD. Determined location of two new load break switches. Prepared steel specs for both switches including the calculations for loading trees. Designed 110 ft single pole three way load break switch in a landfill near a marsh anchored to a concrete capped pile foundation. Designed caisson foundations for 22 structures in a marsh.
- ❖ **Lockport-Mortimer 113 & 114, 115kV Refurbishment Project, NY** Project Manager & Lead Engineer. Line refurbishment of two parallel (56) mile long transmission lines primarily made up of steel lattice structures. Preparation of Construction Document. Conducted field inspections. Engineered structure modifications and replacement structures in accordance with client, regional and NESC standards. Analysis for various aspects of the transmission line using PLS-CADD.
- ❖ **Ticonderoga-Republic, Republic-Whitehall, 115kV Refurbishment Project, NY** Project Manager & Lead Engineer. Line refurbishment of (112) mile long transmission line primarily made up of wood pole structures. Environmental issues and excessively long spans were some of the challenges associated with this project as this line runs through the Adirondack Mountains of upstate NY. Preparation of Construction Document. Conducted field inspections. Engineered structure modifications and replacement structures in accordance with client, regional and NESC standards. Analysis for various aspects of the transmission line using PLS-CADD.
- ❖ **Y25, 69kV Line Reconductoring, MA/VT** Project Manager & Lead Engineer. Reconductoring Project, MA & VT. Preparation of scope document. Preparation of Construction Document. Conducted field inspections. Engineered structure modifications and replacement structures in accordance with client, regional and NESC standards. Analysis using PLS-CADD. Created spreadsheet to calculate insulator swing and the amount of weight to add to each conductor to eliminate uplift and to ensure an insulator swing of less than 30 degrees under user defined conditions.
- ❖ **X24, 69kV Reconductoring/Refurbishment Project** Project Manager & Lead Engineer. Preparation of Scope Documents and Construction Documents. Engineered structure modifications and replacement



structures in accordance with client, regional, and NESC standards. Analysis for various aspects of the transmission line using PLS-CADD. Created a spreadsheet that calculated insulator swing and integrated it into the structure work list to determine where insulator swing issues existed and how much weight needed to be added to meet swing tolerance. Provided field support during construction.

- ❖ **National Grid 301 and 326 Lines, 345kV Line Refurbishment**
Detailed engineering and Design associated with a major refurbishment effort of a twenty-five mile and fifteen mile 345kV transmission line. Scope included development of construction drawings and construction package. Line and engineered structure modifications and replacement structures in accordance with client, regional, and NESC standards. Analysis using PLS-CADD.
- ❖ **Cape Cod Canal 345kV Line Relocation, MA** Preliminary Engineering and Design to evaluate the feasibility of this line relocation option. Preparation of preliminary design drawings for proposed structure types and plan & profile drawings. Preparation of construction cost estimates for the proposed line relocation. Design had to meet client, regional, and NESC standards. Analysis using PLS-CADD.
- ❖ **National Grid, 345kV River Crossing** Project Manager & Lead Engineer Improved clearance of two parallel 345kV transmission lines over the Oneida River in New York. Located and designed new structures and foundations for 130-foot steel pole structures to cross the 1100-foot space across the Oneida River. Improved Lightning Protection for the crossing was considered as part of the design. Line and engineered structure modifications and replacement structures in accordance with client, regional, NESC and ACOE standards. Analysis using PLS-CADD.
- ❖ **Porter-Rotterdam 30, 230kV Refurbishment Project, NY** Preparation of Scope Documents and Construction Documents associated with the refurbishment of (75) mile long transmission line. Engineered structure modifications and replacement structures in accordance with client, regional, and NESC standards. Analysis using PLS-CADD.
- ❖ **Porter-Rotterdam 31, 230kV Refurbishment Project, NY** Preparation of Scope Documents and Construction Documents associated with the refurbishment of (75) mile long transmission line. Engineered structure modifications and replacement structures in accordance with client, regional, and NESC standards. Analysis using PLS-CADD.
- ❖ **S171N and S171S, 115kV Line Refurbishment and Shieldwire Addition Project, RI** Lead Engineer. Preparation of scope document. Preparation of Construction Document. Conducted field inspections,



engineering of structure modifications and replacement structures in accordance with client, regional and NESC standards. Analysis for various aspects of the transmission line using PLS-CADD.

- ❖ **Tacoma Light and Power, Tacoma River Crossing** Created a program using MATLAB to conduct Aeolian vibration analysis on the 5800-foot span crossing the Tacoma River.
- ❖ **Tri-Lakes Reliability Project, NY** Compared the benefits and setbacks of overhead construction vs. underground construction of a new line-segment in the Adirondack region of NY. Conducted research into the benefits and setbacks of using EPR or XLPE dielectric cables for use in the underground application. Aided in the study to determine most reliable structure construction for overhead lines in this region.



REGINALD S. GAGLIARDO
Vice President/Executive Consultant

Education

Bachelor of Science in Electrical Engineering, New Jersey Institute of Technology

MIT Sloan Executive Education - Managing Technical Professionals and Organizations.

Numerous Burns and Roe, POWER Engineers and industry professional development courses.

Professional Registrations

Registered Professional Engineer (Retired) in New York, New Jersey and a number of other states.

Professional Affiliations and Industry Participation

American Nuclear Society; Institute of Electrical and Electronics Engineers (Senior and Life Member)

Fiatech - Member of the Board of Advisors and Conference Planning Committee for this industry consortium that provided leadership in the development, demonstration, and deployment of fully integrated and automated technologies for capital construction projects.

Construction Industry Institute - Member, and later Chair, of the Fully Integrated and Automated Project Process (FIAPP) Steering Team.

Construction Industry Institute - Member of the Academic Advisory Council to provide liaison between the construction industry and academia and to develop recommendations for CII research.

New Jersey Institute of Technology – Member of the Advisory Board for the development of the College of Computing Sciences.

Career Highlights

Extensive technical and project management experience in providing engineering services for nuclear and non-nuclear power generating stations and federal projects.

- Senior-level positions for the leadership, direction and development of engineering, procurement, construction, project controls, quality assurance and information technology divisions.
- Business unit direction and leadership for management, marketing, sales and technical execution of projects for commercial nuclear and special purpose facilities.
- Strategy planning, development and implementation.



- Special assignments and initiatives for CEO and Executive Management.
- Contributions to industry initiatives to improve productivity, competitiveness and technology.

Prior Project Experience (Partial Listing)

- ❖ **POWER ENGINEERS** (acquired Burns and Roe in June 2014)
Vice President, Nuclear Services and Advanced Technology

Responsible for the leadership, direction and operation of the Nuclear Services and Advanced Technology business unit from strategy selection through business development and project delivery. Provided direction and leadership for marketing, project management, engineering, project controls, procurement, consulting, and construction support services. Developed operational, financial and organizational initiatives to achieve performance targets. Projects ranged from: nuclear feasibility studies for international Clients; to consulting for advanced nuclear designs; to modifications and retrofits for operating power plants and government facilities.

- ❖ **BURNS AND ROE ENTERPRISES**
Senior Vice President, Nuclear Services and Advanced Technology

Responsibilities were the same as POWER Engineers position above.

Senior Vice President, Corporate Resources & Technology

Responsible for the leadership, direction and management of multiple technical divisions, including Engineering & Design, Construction Services, Supply Management, Project Controls, Quality Assurance and Information Technology Services. Primary duties included: effective support to and oversight of the technical aspects of projects; assurance of the quality of work; performance of work to budgets and schedules; training and development of personnel; improvement of work processes, standards and procedures; support to business development initiatives; and implementation of information technology and computer-aided applications.

As part of this assignment, led the effort to upgrade the company's Quality Assurance Plan and the associated project and technical procedures. Led the successful corporate initiative to obtain the company's **N-Stamp (ASME Boiler and Pressure Vessel Code Section III)**.

Served as the Burns and Roe representative on the **Board of Governors of the Uranium Disposition Services, LLC** for the design, construction and start-up of the Depleted Uranium Hexafluoride Projects in Ohio and Kentucky for the U. S. Department of Energy.



Served on the “Proof of Concept” Review Team to provide recommendations regarding the types of facilities that should be advanced for the **Yucca Mountain Project** for the U. S. Department of Energy.

Vice President/Director, Engineering

Responsible for the leadership, technical direction, supervision and administration of engineering and design work for fossil fueled, nuclear and waste-to-energy power generating plants and other industrial and special purpose facilities. Primary areas included management and development of engineering personnel, preparation of project technical documents as well as the overall assignment and coordination of engineering and design for all projects. In addition, duties included the development of in-house training programs, technical specifications and standards, engineering practices and procedures, and computer-aided engineering applications. Provided oversight of branch office engineering functions and consolidated two separate multi-discipline engineering divisions into one combined division to serve multiple market sectors and business units resulting in greater flexibility and better utilization. For the first part of this period, also held co-position of Chief Electrical Engineer.

Chief Electrical Engineer

Responsible for the technical direction, supervision and administration of electrical engineering and electrical design work for power generating plants, both fossil and nuclear, and other industrial facilities. Duties included engineering quality and productivity, development of project design criteria, one line diagrams, building and equipment layouts, equipment sizing, specification and selection, design and installation documents, calculations and the overall coordination of electrical engineering and design efforts for all projects. In addition, responsibilities included the development of in-house training programs, technical specifications and standards, recommended engineering practices and computer-aided engineering applications.

During this period, undertook special assignment at the request of TVA management to review, improve and strengthen the TVA **Project Management Program** for the modification and upgrade program at the **Browns Ferry Nuclear Plant**.

Manager, Nuclear Plant Services

Responsible for the overall leadership, direction, technical supervision and management of assigned projects, project managers and engineering staff. Duties included the direction and coordination of engineering and design services, procurement support, construction support, and budgets and schedules. Also, responsible for Client satisfaction, liaison and responsiveness, development of new business, and fulfillment of contractual requirements. Projects involved modification and upgrade of operating nuclear power plants, including the Recovery Program for Three



Mile Island Unit 2. Plants involved Pressurized Water and Boiling Water Reactors and included Three Mile Island Lessons Learned, 10CFR50 Appendix R Fire Protection Program, NRC-mandated and other plant betterment modifications. Progressed through the positions of Project Engineer and Project Manager.

Competitively bid, obtained and executed over multiple years a **Preferred Engineering Services Contract** for GPU Nuclear's **Oyster Creek Nuclear Generating Station** and developed numerous engineering packages to implement regulatory requirements, including Appendix R, and other improvement modifications.

Group Supervisor, Electrical Engineering

Responsible for the technical direction and supervision of electrical engineering and design work for new and operating nuclear power plants. Duties included: development of project criteria, technical specifications and calculations; planning and scheduling; coordination with other engineering disciplines; and liaison with the Client, vendor, and field support personnel.

Following the accident on March 28, 1979, was deeply involved in the **Three Mile Island Unit 2 Recovery Program** both at the site and the home office. Served as the electrical supervisor for the electrical post-accident modifications and in various project management capacities as well as being the cognizant engineer for a number of the modifications. Duties included management and direction of the site and home office electrical groups, system design, equipment specification and selection, Client and NRC liaison, and construction support.

Senior Electrical Engineer

Responsible for the electrical interface with the nuclear steam supply system vendor; DC and AC distribution systems; heat tracing and freeze protection systems; local control boards; solid state component controls (first nuclear use); multiplexing; specifications; calculations; electrical separation criteria; instrumentation shielding and grounding criteria; and development of electrical documents.

Electrical Design Squad Leader

Responsible for the supervision and performance of electrical control wiring design for nuclear power plants; development of schedules and budgets; and interface with Client, vendor, and site personnel.



DONALD GRACE, PE
Senior Consultant

Education and Certifications

Master of Business Administration, Project Management
Harvard Graduate School of Business (Awarded Fellowship to Attend)

Bachelor of Science in Marine Engineering and Mathematics
United States Naval Academy (Graduated Cum Laude)

**US Naval Polaris Missile Officer School, US Naval Submarine School,
US Naval Nuclear Power School, and US Naval Scuba Diver School**

Professional Engineer (Pennsylvania), Power Generation

Career Highlights

- Over 45 years of hands on technical, management and executive experience with all phases of the Plant Life Cycle (design, licensing, construction, start-up and testing, commissioning, operations and decommissioning). Also, highly experienced in performing economic analyses of projects, facilities, and processes.
- Development of New Facilities – Seventeen years of experience with a major U.S. Architectural Engineering firm, Burns and Roe Enterprises (BREI), in the positions of Project Engineering Manager, Project Manager, Executive Consultant, and President of a company formed by BREI, AREVA and Duratek. Nearly all of these experiences entailed First of a Kind (FOAK) projects which involved new Nuclear Power Plant Projects and FOAK Chemical Process Projects.
- Directing Major Project, Independent Reviews - As an employee of BREI, contracted by the Department of Energy (DOE) to assemble project review teams which I then directed to provide independent project management reviews of multi-billion-dollar DOE projects. Nearly all of the projects were FOAK, and the reviews were total scope reviews (i.e., reviewed ability to achieve technical objectives, within the forecast costs and schedules). Subsequently, and as an



independent consultant, was contracted by DOE to work as the technical lead working as part of DOE teams that reviewed and certified DOE contractors Earned Value Management Systems. Reviews per the 32 criteria of ANSI Standard 748.

- Upgrades to Operational Facilities – Seventeen years of experience with General Public Utilities (GPU) in designing, constructing new or modified systems, testing, training plant operators and turning systems over to plant operations. Also, worked with the Nuclear Regulatory Commission (NRC) and state environmental agencies in support of the nuclear and fossil plant licensing and permitting activities.
- Economic and Costing Studies: Performed many such studies, examples of which include developing a return of investment model for the DOE Waste Management Office, computing asset value for an existing operating power plant, computing component costs of power plants generating electricity, computing component costs of fabricating nuclear fuel (did this for Westinghouse).
- Skilled Communicator: Highly experienced in analyzing and presenting complex technical and economic issues to executive levels of various government agencies (e.g., US Nuclear Regulatory Commission, US Department of Energy, Thai Government, and International Atomic Energy Agency), and responding to questions in articulate and professional manner.

Prior and Current Project Experiences (A Partial Listing)

- **Louisiana PSC; Arkansas PSC, City of New Orleans Commission – Grand Gulf Prudence Review**
Represent the Louisiana Public Service Commission, Arkansas Public Service Commission and the Public Utility Commission of New Orleans in evaluation of the prudence decisions by Entergy during the operations and outages at the Grand Gulf Nuclear facility. A detailed report of technical deficiencies at Grand Gulf as well as a detailed Prudence review and written as oral testimony is being performed.
- **Georgia Public Service Commission – Vogtle Nuclear Construction Project**
CTC, through its subsidiary Vogtle Monitoring Group (VMG) is providing expert witness testimony, on-site construction monitoring, and evaluating services as well as reviewing and evaluating the reasonableness of the costs in an ongoing basis at the Vogtle Nuclear Power Plant Unit 3 and 4 Project for the Georgia Public Service Commission Staff.
- **BREI, GPU, and Independent Executive Consultant project experiences have included:**



- President of a company created from merging personnel from BREI, Duratek (a nuclear waste management company), and AREVA (a fabricator of nuclear fuel), and contracted to the DOE to design, construct, and operate facilities for disposing of depleted uranium hexafluoride (a by-product of the uranium enrichment process). Project entailed utilizing a patented, FOAK chemical process for taking uranium hexafluoride (UF₆) gas and converting it to Uranium Oxide (UO_x) with usable Hydrofluoric Acid (HF) as a by-product. Two full scale facilities were designed, have been constructed, and are functioning at the Paducah, KY and Portsmouth, OH uranium enrichment facilities.
- Director of a Nuclear Power Feasibility Study conducted for the nationalized electric utility of Thailand (EGAT) and the Thai government. Study entailed evaluation of commercially available Nuclear Power Plant alternatives, estimates of their capital costs, operating costs, and forecasts of their bus bar costs (in terms of Levelized Cost of Electricity); plant licensing/construction/start-up schedules all leading to licensed plant operations; evaluation of nuclear safety issues and risks; and approach to educating and training of personnel. Study entailed evaluation of various commercially available nuclear plant types (i.e., a Boiling Water Reactor, as proposed by Japan/ Hitachi; and four separate types of Pressurized Water Reactors, as proposed by (1) Toshiba/ Westinghouse, (2) Japan/ Mitsubishi, (3) France/ AREVA, and (4) Korea/ KEPCO. Also involved economic studies of alternative electrical energy sources.
- Executive Consultant / Director of DOE Project Independent Reviews: The DOE, in pursuit of improved management practices, established an office independent of those managing major DOE projects (i.e., established the Office of Engineering and Construction Management). They then contracted with BREI and others to perform full scope (i.e., technical, cost and schedule) reviews of its projects. All major projects (i.e., larger dollar values) were assigned to BREI, and I assembled the required personnel expertise and directed all of these reviews. Example projects (most of which are FOAK) that were reviewed include the following:
 - Yucca Mountain Project: This is the highly political project of the first facility to permanently store High Level Wastes (from both DOE facilities, and mostly Spent Nuclear Fuel from operating nuclear plants). Included in this effort was the first project Life Cycle Cost Estimate.
 - The National Ignition Facility at Lawrence Livermore Laboratory: This project consists of 192 high energy pulse laser beams, all fired at the same time at a target the size of a bee. Its purpose is to do research regarding fusion reactions in support of predicting the performance of fusion weapons as they age. The facility is now operational, but actual costs greatly exceeded the budget and schedule, and it is still not functioning at the desired level.



- The Mixed Oxide Fuel Facility (MOX Facility) at the Savannah River Site. This project is based on a French technology and its purpose is to take plutonium from excess nuclear weapons and combine plutonium oxide with uranium oxide to make fuel for commercial nuclear reactors.
- The Neutrino Project at Argonne National Laboratory: This project consists of an accelerator located at Argonne (in the Chicago area) shooting neutrinos through the earth's crust to a target located in a mine shaft in Minnesota, to study the properties of neutrinos.
- Numerous Site Cleanup Projects: During the cold war many of the materials for nuclear weapons were developed via reactors and other facilities, and with the primary criteria being schedule, environmental controls (although somewhat effective) were not nearly as strict as they are today. As a result, there are numerous "legacy wastes" in need of treatment and / or disposal. Cleanup projects reviewed include: (a) Fernald, (b) Rocky Flats, (c) Mound, (d) Oak Ridge, (e) Brookhaven National Laboratory, (f) the Nevada Test Site, (g) Pantex, (h) the Savannah River site, (i) the Hanford Site, and (j) Idaho National Laboratory.
- Director for the Oyster Creek Nuclear Power Plant Safety and Reliability Upgrade Program: Valued at over one billion dollars (in current year dollars). Work over a roughly 10 year period included nearly 100 separate projects which were largely the result of Three Mile Island Lessons Learned, NRC Appendix R (fire protection related requirements), required upgrades to the Torus (i.e., part of the containment), and plant reliability projects. Efforts resulted in keeping oldest publicly financed U.S. Nuclear Power Plant operational (has been operating since December 1969).
- Project Engineering Manager for the Modular High Temperature Gas Cooled Reactor First-of-a-Kind Project. Contracted to the DOE, the objectives of this FOAK project were to produce tritium in support of U.S. Department of Defense missions, and to demonstrate a new commercial reactor technology.
- Project Operations Manager for the Accelerator Production of Tritium Project: This was another DOE contracted FOAK project whose mission was also to produce tritium in support of DOD missions. Project was valued at three billion dollars.
- Served as the first utility elected Chairman of the Boiling Water Reactor Owners' Group (BWROG), and in working with GE, other nuclear industry groups, and the BWR owners developed generic design upgrades to address NRC identified safety issues.
- Served as on-site manager during completion of construction and demonstration testing of a FOAK proof of concept chemical process for disposing of chemical weapons.



- Worked as a team with Cost Plus Consulting, a certified Appraiser, and legal-council, to develop Fitzpatrick Nuclear Station asset values. Working through legal-council, the ultimate client consists of local municipality taxing authorities, with their objective being to receive favorable and fair taxing of the facilities within their jurisdiction. Early in my career, I worked in the GPU Plant Licensing Group, and worked with legal-council, state and federal environmental groups, the Nuclear Regulatory Commission and nuclear and fossil plant personnel to develop, implement and maintain acceptable liquid discharge permits (i.e., National Pollution Discharge Elimination System; NPDES permits) and air emissions permits.
- Also, early in my career I worked within the Comptroller's Office and performed economic analysis of the various elements of a power plants costs (i.e, Fixed, Variable, Fuel, and Recovery of Capital Costs). This was done for fossil and nuclear plants. Also, worked with coal fired plant personnel to develop and implement Corrective Maintenance and Preventative Maintenance Programs.
- US Navy, Nuclear Plant Operations Experience: Five years as a submarine naval officer in the U.S. Nuclear Navy as a nuclear trained and qualified Engineering Officer of the Watch (equivalent to a commercially licensed Nuclear Plant Senior Reactor Operator). Also served as Weapons Officer responsible for operational readiness of Polaris-missile and torpedo weapons systems.

Positions Held

- US Navy: Served as a naval officer aboard submarines for 5 years following graduation from the US Naval Academy. Positions included engineering department head, weapons officer, and stood watches as Officer of Watch and Engineering Officer of the Watch. Retired from service as a Lieutenant, Sr. Grade (O-3).
- General Public Utilities: In 17 years held positions of increasing responsibility, several of which are summarized below (and for which the roles and responsibilities are also described):
- Lead Licensing Engineer: Responsible for licensing and permitting activities for a pressurized water reactor nuclear plant and several coal fired plants.
- Senior Analyst, working for the Comptroller: Analyzed the component costs of the company's generating plants. Also, did efficiency studies of how plant outages were conducted, and working with fossil plant personnel developed and implemented corrective maintenance and preventative maintenance program.
- Project Engineering Manager: Responsible primarily for Electrical and Instrumentation & Controls Upgrades to a Boiling Water Reactor (BWR) Nuclear Plant.



- Director, Engineering Projects: Responsible for all major projects (both capital, and O&M) for a BWR Nuclear Plant. Also, responsible for developing, prioritizing, and managing the over-all capital budget.
- Burns & Roe Enterprises, Inc (BREI): In 17 years with BREI positions of increasing responsibility, several of which are summarized below.
 - BREI Site Manager (working at Aberdeen Proving Grounds, for proof of concept testing of a new method of treating/ disposing of Chemical Weapons).
 - Project Engineering Manager (for the Modular High Temperature Gas Cooled Reactor (MHTGR) Project).
 - BREI Site Manager (working with Booz Allen Hamilton, in support of the DOE Office of Waste Management, in Germantown, Md.)
 - Project Operations Manager (for the Accelerator Production of Tritium Project).
 - Project Manager and Executive Consultant (for the Independent Project Management Reviews of Major DOE Projects)
 - Director, Thailand Nuclear Feasibility Study
 - President & Project Manager, Uranium Disposition Services, Inc.
- Management Consulting Services: For 11 of the past 13 years have had my own consulting company, and have served in various capacities either on my own (Grace Management Consulting Services, LLC) or as part of Cost Plus Consulting, LLC or Critical Technologies Consulting, LLC on many assignments, some of which are summarized below:
 - Executive Consultant
 - Worked in support of a General Electric (GE) proposal to the DOE: The effort resulted in the award of a contract to the GE team to pursue fuel reprocessing studies in support of the Global Nuclear Energy Partnership initiative of the U.S. Government.
 - Worked under contract to NuScale in support of their development of a “Small Modular Reactor” proposal to the DOE: The effort has resulted in NuScale having been awarded a contract to further pursue the effort.
 - Worked under contract to the DOE, functioned as part of a team of personnel reviewing and certifying major DOE contractors Earned Value Management Systems against the criteria of ANSI Std 748



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- More recently completed working with Cost Plus in support of providing a bottoms-up estimate of what it would cost today to build the Fitzpatrick Nuclear Plant. Also, developed a report of that same cost, based on the forecast cost and schedules of other US Nuclear Plants under construction.
 - Currently working with Critical Technologies Consulting as follows:
 - Independently monitoring for the Vogtle Nuclear Plant construction effort, offering Testimony for Prudence every 6 months throughout the construction phase of the project.
 - Prudency of Operations Review of Grand Gulf Nuclear Station (contracted to the Louisiana PSC, Arkansas PSC, and the City of New Orleans Commission.)
 - Independent Monitor for the Kemper Integrated Gasification and Combined Cycle Project (contracted to the Mississippi Public Utility Staff).
 - Prudency of Operations Review of Grand Gulf Nuclear Station (contracted to the Arkansas Attorney General).



**Donald E. Cecich
Senior Consultant**

Education and Certifications

MBA, Santa Clara University, 1978

BS, Mechanical Engineering, University of Nevada, 1973

Professional memberships:

Northeast Energy and Commerce Association

American Society of Mechanical Engineers

**Treasurer/CFO of The Writers' Room of Boston, Inc. (a 501(c)(3)
Non-Profit Organization) since 1993**

Career Highlights

With over 40 years' experience, Don Cecich possesses proven skills in domestic and international industrial and power project development, management, marketing/business development, due diligence and sales experience with large multinational corporations, mid-sized private firms, and small entrepreneurial businesses. His experience includes combined-cycle, simple-cycle, cogeneration, coal, geothermal, steam turbine generator, transmission and distribution, industrial, and energy conservation projects. Don worked for the General Electric Company for more than 12 years, holding positions in GE's gas turbine, medium steam turbine, and large steam turbine divisions. He joined Parsons Brinckerhoff (PB) after serving as vice president of a New England firm specializing in energy efficiency/demand-side management, inside-the-fence cogeneration and water conservation projects. He joined Mott MacDonald after working for Parsons Brinckerhoff for more than 20 years as Vice President, US Industrial and Energy Services. He has been with Critical Technologies Consulting for the past 4 years performing due Diligence and Independent Engineering assignments. This wide-range of experience has allowed him to adapt to the now-changing, power generation and power delivery/transmission and distribution market conditions.

**Prior and Current Project Experiences
(A Partial Listing)**

- **Special Projects – Net-Zero, Carbon Capture and Hydrogen-Fuelled Combustion Turbine Generator Studies and Project Development:**



Working with GE, Mitsubishi and Siemens to understand their ability to burn a blend of methane and hydrogen in existing and newly manufactured combustion turbine generators (CTGs) with the goal of burning 100% hydrogen down the road in new units as hydrogen production gears up to support demand. Discussing their product line capabilities, combustion technology development and testing, and production plans for their H and J Class Frame CTGs and aero-derivative CTGs. Developing an understanding of blending methane and hydrogen gas and transportation issues in methane gas pipelines, CTG firing temperatures issues, the additional NO_x generation and impact on SCR emissions control system catalysts and on BOP equipment. Also discussing carbon capture options offered by each manufacturer.

- **ExxonMobil – Principal in charge on the following ExxonMobil projects:**

GPX Golden Pass LNG Export Black Start Study, Sabine, TX: Feasibility study to evaluate utilizing the existing seven (7) 3.9 MW emergency diesel generators to Black Start one combustion turbine and the steam turbine generator followed by a complete re-start of the LNG facility in the event of a major power outage in the area. The GPX facility includes three liquefaction trains each consisting of 2 x GE 7EA mechanical drive turbines, 2 x compressors, 2 x 25 MW helper motors, 2 x supplementary fired HRSGs, 1 x 100 MW steam turbine generator, 1 x ACC, and BOP and auxiliary equipment. The total facility power generation capability is 300 MW, which is all used in the LNG process. The facility is connected to the grid and is normally a net importer or power.

Also provided estimates equipment site plans to add small combustion turbines to separately provide Black start capability with tie ins to the plants 34 kV electrical distribution system. Finally prepared an estimate to add a new 8.6-mile 230 kV transmission line to the LNG liquefaction facility as an additional option for Black Start. The cost estimate included the tap at the LDC, right-of-way acquisition, poles, conductors, installation and tie in at the Plants substation.

- **Permian Basin Gas-to-Power Project, XTO Energy, NM:** Concept evaluation to develop options and costs that addresses the company's power needs to support the planned development of oil and gas production. Included evaluation of existing transmission and distribution system to supply power to several hundred individual jack-pumps, each requiring 250 to 300 kW for operation. The focus was on determining ways to supply power to drilling rigs via truck mounted gas turbines (GE TM 2500s) or reciprocating engines in remote areas. The concept addresses flexibility, reliability, portability of generating equipment, delivery, and operation and maintenance and tie into the distribution system to determine where truck mounted gas turbines should be strategically located for easy installation and later relocation.
- **Permian Basin Gas-to-Power Project, XTO Energy, NM:** Scoping/feasibility studies, Pre-FEED and FEED for a 500 MW Mitsubishi H-100 4x1 Cogeneration project providing power and thermal energy for a Central Delivery Point (CDP) processing facility. Feasibility studies, Pre-FEED and FEED for two different



sites. Stressed modularization of equipment. Supported the high-voltage electrical interconnection with Xcel and MISO. Initial studies included evaluation of performance, emissions, and CAPEX for GE's LM6000 and Mitsubishi's H-25 combustion turbine generators.

- **GPX Golden Pass LNG Export, Sabine, TX:** The LNG Export facility includes three liquefaction trains each consisting of two GE 7EA mechanical drive turbines, two compressors, two 25 MW helper motors, two supplementary fired HRSGs, one 100 MW steam turbine generator, one ACC, and BOP and auxiliary equipment. Provided MISO interconnect support and NERC compliance program services. Advised on Qualified Facility status of the plant. Also, OE review of Chiyoda's LNG liquification train equipment specifications.
- **Guyana Gas-to-Power Project:** 200 MW Gas-fired reciprocating engine plant. Scoping study to determine the optimum combination of 8.6 MW and/or 17.6 MW gas-fired reciprocating engines to install. The project interfaces with the NGL facility and the onshore landing of the gas pipeline to the NGL process facility. Developed site plan options, CAPEX, prepared a transportation study, and evaluated Guyana's local transmission and distribution system's capability to accept power from the plant.
- **Vietnam Blue Whale Gas-to-Power, CA Vaoi Xanh Project, Hanoi, Vietnam:** Owner's Engineer overseeing the 4 x 1000 MW CCGT projects being built by third party EPC contractors. The CCGT projects will burn all the gas produced from offshore wells and must be commercially available simultaneously with the start of natural gas production.
- **LNG to Power Project Development Workshops, Houston, TX:** Conducted two (2) LNG to Power workshops on how to develop 1,000 MW+ CCGT plants to act as the anchor to pull through ExxonMobil's world-wide LNG sales.
- **Golden Pass LNG Import Project, Chiyoda Corporation, TX:** Principal in Charge – The Joint Venture consisting of Chiyoda International Corporation, CB&I LLC and Zachry Industrial, Inc. ("CCZJV-GPX"), has been awarded the contract by Golden Pass Products, LLC ("Client") for the engineering, procurement, construction (EPC) and commissioning of the Golden Pass LNG Export Project at Sabine Pass, Texas, USA ("GPX Project"). Provided engineering support services to complete 10 electrical system studies for the liquefaction generation equipment 230 kV interconnection to Entergy and the MISO Grid.
- **Port Authority of New York and New Jersey, JFK Airport 100 MW Cogeneration Plant Relocation and Refurbishment Study:** Project Manager to develop a site-wide energy strategy for the JFK International Airport, considering future KIAC/CHRP operations, renewable energy, evaluation of the existing electric distribution system within the airport and supporting the airport, and interaction with external utility providers in the context of the long-term JFK Redevelopment Master Plan. The Master Plan serves to guide JFK Airport's



redevelopment and provide related program planning and project support services, which included expert professional planning, architectural, engineering, constructability and estimating services, program support, and business case analyses.

- **Minera Spence Sea Water RO Desalination Project for a Copper Mine, Chile:** Project Manager at kick-off for the project representing the owner for a 1,000-liters per second reverse osmosis desalination plant, including a seawater intake tower, concentrate outfall pipeline, a 154-km 36-inch diameter carbon steel water pipeline to transport the water to the Minera Spence mine at an elevation of 1,652 meters. The conveyance system consists of three pumping stations and 75 miles of electric transmission lines that supply power to the desalination plant and power the pumps along the pipeline. Evaluated power supply substation from the local utility and the distribution system to three pumping stations.
- **Bayonne Energy Center, Macquarie Infrastructure Corporation (MIC) Power:** Principal in Charge responsible for development, permitting and EPC Contractor selection of the 120 MW 2x Siemens Trent 60s with SCR/CO emissions controls addition to the existing 2 x Trent 60 peaking plant. Included a three-winding 13.8 kV/345 kV GSU and the tie-in to an existing 345 kV transmission line for power export.
- **MIC Power (Macquarie Infrastructure Corporation), Project Orion, Bayonne, NJ:** Principal in Charge for the development of a 1,000 MW 2x1 gas/oil-fired GE 7HA.02 combined cycle facility at the International-Matex Tank Terminal (IMTT) in Bayonne, NJ. IMTT is owned by MIC.
- **MIC Power, Gilmerton Energy Center, VA:** Principal in Charge for project development and permitting of two (2) 1x1, single-shaft, gas/oil-fired GE 7HA.02 1,250 MW combined cycle facility at the IMTT in Chesapeake, VA.
- **Hess Corporation, Woodbridge, NJ:** Project Manager on a 2x1 multi-shaft 685 MW combined cycle plant at Hess' Newark, NJ Terminal. Provided project development support, preliminary design during permitting and was responsible for obtaining all project permits. Prepared power island specifications and supported negotiations with GE for the 7FA.05 combustion turbine generators, HRSGs, and steam turbine generator. Prepared the Engineer, Procure, Construct (EPC) RFP to provide detailed design/engineering of the plant, and procure the balance of plant (BOP) and auxiliary equipment, erect, install, construct, paint, check-out, commission, start-up, test, train, and transfer to Hess a completed operational plant.

Project included grey water cooling tower makeup system, tie-in to the Transco natural gas pipeline, gas metering station, 18 kV/345 kV substation and a 4.6-mile underground 345 kV transmission line from the plant to PSE&G's Essex Substation tie-in.



- **Large International Oil Company Confidential Client:** Project Manager for Scoping Studies and preliminary FEED for several 1,000 MW+ projects located in the US, Canada, UK, Middle East and Pacific Rim. Responsible for preliminary design, site plans, power block drawings, CAPEX and OPEX for various simple cycle, combined cycle and cogeneration projects including desalination. Projects included switchyards, substations, long distance high-voltage transmission lines, and AC to DC to AC conversion.

- **Due Diligence for Acquisition of Coal and Gas-fired Generation Plants:** Confidential Client, USA: Project manager to perform an independent assessment of coal and gas-fired generation assets at several US electric generation stations. The stations included one 1600 MW station with three (3) coal and one (1) oil fired unit; a 745 MW station with three (3) coal and one (1) oil fired unit; a 495 MW station with three gas-fired combined cycle units; and thirteen hydro-electric stations. Based on review and analysis of data and site visits, provided condition assessments of assets, evaluations of CAPEX, OPEX, overhaul maintenance costs, decommissioning costs and evaluated environmental compliance record.

- **ExxonMobil – Principal in charge on the following ExxonMobil projects:**
 - Golden Pass, Sabine, TX: Screening study to convert this existing LNG import facility to a LNG liquefaction export facility.
 - Ft. McMurray, Alberta, Canada: Study and preparation of a CAPEX to add a GE 7EA combustion turbine generator with a HRSG to the facility.
 - South Hook, Wales, UK: Feasibility study and Pre-FEED to add a 400 MW combined cycle with modifications to the existing submerged combustion vaporizers (SCVs) to accept steam turbine condensate for regasification of the LNG. The power island includes a 1x1 multi-shaft GE 9FA combined cycle with a hybrid dry/wet cooling tower. Both the LNG facility and the power plant were dispatchable on a merchant plant basis independent of each other. Included evaluation and cost estimated of a new transmission line to export power.
 - Braintree Electric Light Department (BELD), Thomas A. Watson Generating Station, Braintree, MA: Project manager during proposal through contract negotiations and NTP on a dual fuel gas/ULSD-fired 2 x 60 MW Rolls Royce Trent 60 simple-cycle combustion turbines with SCR/CO emissions control systems. Joint venture with an EPC contractor to provide project engineering and engineering support during construction through start-up and commissioning. Managed the EPC team selection and during proposal to provide the preliminary engineering needed to win the project.
 - Lake Road Generating Station, British Gas North America (BGNA), Killingly, CT: Project Manager on a 1x1 multi-shaft 411 MW “G” Class combined cycle plant. Provided project development support and preliminary design during permitting and prepared power island functional specifications and supporting negotiations with Mitsubishi for the M501G gas turbine, heat recovery steam generator (HRSG) and steam turbine generator, substation modifications to connection to the grid.



- Prepared an engineer-procure-construct (EPC) request for proposal (RFP) for an EPC contractor to design/engineer the plant, and procure the balance of plant (BOP) and auxiliary equipment, to erect, install, construct, paint, check-out, commission, start-up, test, train, and transfer to BGNA a completed operational plant.
- **Massachusetts Municipal Wholesale Electric Company (MMWEC), Ludlow, MA:** Project Manager on a 1x1 multi-shaft 280 MW “F” Class combined cycle plant. Supported project development and preliminary design during permitting and prepared power island specifications including gas turbine, HRSG, axial exhaust steam turbine generator and air-cooled condenser. Also prepared RFP for an EPC contractor to design/engineer the plant and procure the balance of plant (BOP) and auxiliary equipment, to erect, install, construct, paint, check-out, commission, start-up, test, train, and transfer to MMWEC a completed operational plant.
 - **Fortistar Peabody LLC—99 MW Peaking Power Plant, Peabody, Massachusetts:** Project manager on this project including site development, environmental remediation of the site, and permitting. The project consisted of one Alstom GT11N2 combustion turbine generator and a SCR exhaust system fired on natural gas and No. 2 fuel oil, fuel oil storage and the interconnection to National Grid’s 115 kV transmission line. The Project required preparation of a site remediation plan with TRC due to it being the home of a leather tannery at the turn of the century. Commercial operation has been postponed with the project on hold.
 - **Due Diligence for Acquisition Confidential Client, Japan:** Project Manager to perform independent assessments of InterGen’s international electrical generation assets. Teams from the U.S., U.K. and Australia visited 12 combined cycle and coal-fired plant sites in Mexico, Europe and Australia. Managed the due diligence efforts covering the two (2) combined cycle plants located in Mexico. The first was a 320 MW gas fired CCGT power plant in Mexicali, Mexico using SWPC 501 FD technology. The second was a 600 MW gas fired CCGT power plant in Guanajuato, Mexico using General Electric 7FA technology. Based on review and analysis of data and site visits, provided condition assessments of assets, evaluations of capital, operating and overhaul maintenance costs, and evaluated environmental compliance record.
 - **South Norwalk Electric Works (SNEW)--22.8 MW GE TM2500 Temporary Peaking Power Plant, South Norwalk, Connecticut:** Project manager during project development and permitting. The project consisted of one (1) GE TM2500 (trailer mounted) aero-derivative combustion turbine generator fired on natural gas and No. 2 fuel oil, fuel oil storage, extension of SNEW’s existing 27.6 kV switchyard, a 13.8/27.6 kV step-up transformer (used), and interconnection to the switchyard. With equipment immediately available for rental from GE, it took 11 weeks from full release for engineering to the plant achieving commercial operation.



- **PPL Wallingford Energy Plant, LCC (PPL Global) 250 MW Peaking Plant, Wallingford, Connecticut:** Project manager during project development and preliminary design, and then owner's engineer during procurement and construction of a \$160 million 250-MW simple-cycle peaking plant. Over 7,500 cubic yard of coal ash had to be removed from the site to an out of state landfill and the site remediated. Successfully managed the project through the Wallingford Town Council, Boards and Commissions; the Connecticut Siting Council; and the Connecticut Department of Environmental Protection permitting processes to obtain construction and operating air, water use, and wastewater discharge permits. This project was initially planned to be a \$220 million, 540 MW combined cycle merchant plant and presented several unique challenges regarding noise and cooling tower fog and plume. The site was very small—12.5 acres (5 hectares)—and was the home of an existing 21.5 MW coal converted to oil-fired power plant. A large residential neighborhood lies directly across the street from the plant. State guidelines set a 59-dBA nighttime noise limit at the site boundary.

The unique design proposed met the noise requirements, aesthetically improved the existing site, and eliminated 100 percent of cooling tower fog and 98 percent of cooling tower plume, during the months that a plume might occur. For economic reasons, the client scaled back the project to 5 x LM6000 GE aero-derivative Sprint gas turbines. An 80-foot (24-meter) sound wall was utilized. The plant can be remotely dispatched from the client's headquarters located in Allentown, Pennsylvania. The air permit requirements (2.5 ppm NO_x and 6 ppm ammonia slip), which is requiring extensive modifications to the SCR. All five GE gas turbines have met their emission and performance guarantees. The client has also elected to add anti-icing systems to all five units so that they can be dispatched on a year-round basis. The project also included modifications to Wallingford Electric's existing substation to add a 5-breaker ring bus and a new 1-mile, double-circuit, 115 kV transmission line and tap. Conducted negotiations for the right-of-way for the new transmission line.



Christopher Hill

Senior Specialist

Education

Warren University

Bachelor's Degree: Management of Information Systems

Microsoft Corp

Microsoft Certified Systems Administrator – Windows 2000, XP, Windows 7, Windows 10

Comptia

A+ Certified

Net+ Certified

Server+ Certified

Career Highlights

Business and Information Technology Executive with 26 years of experience in multiple industries. Excellent record of creating tangible benefits in large organizations. Areas of specialty are system configuration, resource utilization, process design, waste identification and elimination, and security and identity management. Highly effective in roles requiring project planning, scope analysis, communications, and deployment. CIO for independent construction monitoring service and consulting firm.

- 24 years of experience in Information Technology Management in various industries: Industrial Construction, Aviation, Mill/Manufacturing, and big-box retail.
- 6 complete Life-cycle SAP implementations involving SAP R/3, APO, CRM, SCEM 5.0, BW and NetWeaver.
- 20 years of experience in Fortune 500 Companies.
- Bilingual: English and Spanish
- Six Sigma Yellow Belt, Change Acceleration Process (CAP) Certification, Facilitation certified

SELECTED CAREER ACHIEVEMENTS

- **As Chief Information / Information Security Officer: Critical Technologies Consulting LLC.** - Planned, sourced, developed, and implemented total information and business suite solution. Leveraged SaaS and PaaS opportunities to reduce IT and infrastructure costs by 20% from 2016 to 2021.

- **As Business Analyst Lead / Subject Matter Expert (Warehouse: IM/MM): International Paper** - directed activities in the analysis, design, testing, training, and implementation of warehouse management (MM/SD/IM) solution



in SAP ECC. Responsible for identifying business requirements & enhancements, cost/benefit analysis, project planning & deployment, and developing a 5-year strategic road map for IM and warehouse management team.

- **As Project Manager (IM/MM/SD): Honeywell** - designed, planned, and launched a Material Resource Planning (MRP) initiative to support the Global Supply Chain cost reduction objective for Honeywell Aircraft Landing Systems (SAP ECC6.0). **International Paper** – Led business process design, testing, training, and deployment readiness for Enterprise Identity Management system replacement (replaced Oracle Identity Management with SailPoint). **Critical Technologies Consulting** – Total responsibility for design, build, testing, deployment of cloud-based project document repository system for major construction projects. Designed, analyzed, and implemented corporate technical infrastructure (Microsoft Azure AD, Exchange, Office 365)

- **As SAP Configuration and Security Manager: International Paper** - directed multiple implementations of SAP R/3 including total system upgrade from SAP R/3 4.7c to SAP ECC 6.0. Responsibilities included configuration design and implementation across multiple SAP systems (R/3, APO, SCEM, and Sap Netweaver) for multiple business process areas including Transportation and Logistics, S&D, Inventory Management, and Warehouse Management.

- **As Site Support and Administration Supervisor: Stone & Webster** - responsible for all support staff (procurement and subcontracting, cost & accounting, Information Technology, Document Control, and Safety) on a 250-million-dollar Heat Recovery Steam Generator project. Designed and implemented electronic document control system for engineering, quality, and safety records (estimated savings \$150,000.00). Directed 15+ resources in materials management and procurement/subcontracting activities supporting construction and engineering.

Prior Project Experience (Partial Listing)

Critical Technologies Consulting LLC in Mesa, Az

Chief Information / Information Security Officer – June 2015 to Present
Responsible for complete technical set up including infrastructure, communications, and storage. Responsibilities included:

- Manage domain acquisition, SaaS/PaaS utilization, communications, and hardware & software procurement for all projects.
- Established data integrity and business continuity standards (including disaster recovery practices) for corporate and project sites.
- Coordinated and remotely controlled operating system upgrades from Windows 7 to Windows 10 with zero lost time.
- Provide 24/7 remote support assistance for all contracted clients

International Paper, Corporate Headquarters in Memphis, Tennessee

COE Sr. Process Steward - Security – May 2014 to Present
Responsible for managing security / access management, enterprise security controls processes, job role design, Sarbanes-Oxley compliance, and



identifying Oracle Identity Management enhancements. Responsibilities included:

- Manage and approve all activity and job role changes including Sarbanes-Oxley compliance, segregation of duties, Role repository management, Change Management, testing, training, and documentation.
- Responsible for user management processes of all IP Global Supply Chain/Business users including manufacturing mills, all distribution network facilities, centrally based business users, and Executive Leadership.
- Responsible for security management process assessments and improvements across the Global supply chain operating model facilities and corporate headquarters
- Responsible for design of security solution for EMEA and Global Cellulose Fiber deployments (2017 and 2018)
- Responsible for design of security standards for new Omega Replace project (2018-2019)
- Responsible for business process and role design for Enterprise Identity and Access Management system deployment (SailPoint)

International Paper, Corporate Headquarters in Memphis, Tennessee

SAP Global Supply Chain (Warehouse and Transportation) Configuration and Security Lead – October 2005 to May 2014

Responsible for managing design, configuration and change management in a multiple version/release implementation of SAP R/3 Responsibilities included:

- Managed and performed all configuration and security changes for Warehouse/Logistics team across R/3, ECC6, APO, and SCEM, to support sustain activities. Coordinated all development work in relation to Warehouse/Logistics team in ECC6.
- Managed all change control processes in six (6) Life-cycle implementations in SAP R/3 4.7c and ECC 6.0 for Deliver Warehouse/Logistics team, including total system upgrade from SAP 4.7c to SAP ECC 6.0
- Designed and led implementation of warehouse support organization and COE training program.
- Designed, tested, and implemented external portal access model for 3PL and non-internal employee users.
- Responsible for security upgrade design and implementation from SAP R/3 4.7c to ECC 6.0.
- Led Disaster Recovery and Business Continuity plan security and access designs.
- Received three “Key Driver Award” for outstanding leadership contributions to overall SAP implementation – (2014, 2015,2017).

Honeywell-ALS Corporation, Aircraft R&O Facility in Memphis, Tennessee

Logistics Manager (Procurement/Materials/Shipping) & Subject Matter Expert (MRP & MM) - October 2002 to October 2005

Responsible for design, configuration, and deployment of the SAP Solution (Project investment \$12 million). Responsibilities included:



- Responsible for Material Resource planning execution for 5000-part manufacturing facility utilizing the Glovia ERP system.
- Led design, testing, and implementation of Inventory Management solution including Global MRP strategy.
- Designed, created, tested, and implemented complete security architecture for all Global Supply Chain and finance activities.
- Directed efforts for “big-bang” S&D module SAP implementation: Project planning, technical build, GAP resolution, system test definition and execution, cutover planning, and go-live activities.
- Key contributor for build, test, and implementation of global MRP and centralized procurement solution for new SAP system.

Shaw - Stone & Webster, MintFarm HRSG Project at Longview, Washington

Site Support and Administration Supervisor – July 2001 to August 2002

Responsible for directing 20+ resources in support of a \$250 Million Power Generation Project. Responsibilities included:

- Managed field support operations staff including Procurement & Subcontracts, Cost and Accounting, Materials, Safety, Information Technology and Administration teams.
- Managed 55,000 sq. ft. Warehouse, “lay down” yard and pipe fabrication shop on-site.
- Designed and implemented a global records management system for engineering and quality documentation (Est. \$150,000.00 savings for life of project – 1 year 2 months).
- Expanded current financial reporting system to include interfaces with sub-contractors and vendors systems to improve financial reporting and accuracy.

Shaw - Stone & Webster, Centralia WFGD Project at Centralia, Washington

Site Administration Supervisor - November 1999 to July 2001

Responsible for processes and personnel in Warehouse, Procurement, and Construction/Engineering/Quality Documentation.

- Managed 30,000 sq.ft. warehouse, lay down yard and pipe fabrication shop on-site.
- Managed MRO procurement team to support construction activities.
- Managed Records Management and Controls team on site



CAMERON BROOKS

3020 Jefferson Street • Boulder, Colorado 80304 • (303) 957-7667 • cameron@tolerableplanet.com

PROFESSIONAL EXPERIENCE

- 2013 - present **E9 INSIGHT** Boulder, Colorado
President...Custom Policy Research and Regulatory Analysis
- Subscription database and custom research of regulatory activities for leading electric utility industry companies, agencies and organizations, such as DOE, LBNL, Nest, Enemroc, EDF and over 50 other clients.
 - Led sales, operations and company expansion of more than 10 staff.
- 2002 - present **TOLERABLE PLANET ENTERPRISES** Boulder, Colorado
President...Clean Energy Strategy and Policy Advisory
- Consulting to technology companies and new energy advocates, including Google, Energy Foundation, Varentec, EnergyHub, Mission:data, Nest, Sunverge and others.
- 2008 - 2012 **TENDRIL** Boulder, Colorado
Vice President, Policy (2011-2012)
Senior Director, Market Development & Policy Strategy (2008-2011)
- Led regulatory engagement and market segmentation for over \$50m utility sales pipeline with interdisciplinary staff and advisory team
 - Instrumental role in coalition efforts establishing Green Button, securing data access commitments for over 30m electric consumers
- 2006 - 2008 **RENEWABLE CHOICE ENERGY** Boulder, Colorado
Vice President, Resource Development
- Managed renewable energy credit (REC) and carbon offset portfolio
- 2002 - 2006 **CLEAN ENERGY GROUP** Montpelier, Vermont
Consultant 2002; Project Director 2003 - 2006
- Program and financial advisor to Clean Energy States Alliance, coalition of state public benefit funds responsible for over \$4 billion

PREVIOUS PROFESSIONAL EXPERIENCE

Telluride, Colorado

- 1991 - 2001 **TELLURIDE NEGAWATT** (*President, energy-efficiency & renewable energy consulting*)
MOUNTAINFILM IN TELLURIDE (*Assistant Director, adventure & environmental film festival*)
SHEEP MOUNTAIN ALLIANCE (*Executive Director, community environmental advocacy*)
SAN JUAN HUT SYSTEMS (*Business Development Manager and Backcountry Ski Guide*)

EDUCATION

- CORNELL UNIVERSITY** Ithaca, New York
 Johnson Graduate School of Management
 Master of Business Administration, May 2003, with honors
- YALE UNIVERSITY** New Haven, Connecticut
 Bachelor of Arts, Cultural Ecology and Ecologic Design
 May 1991, magna cum laude



SAM KOZEL

762 33rd Ave. • San Francisco, CA • skozel@e9insight.com • (847) 894 1144

PROFESSIONAL EXPERIENCE

- 2016 - present **E9 INSIGHT** San Francisco, California
Director & Policy Analyst
- Responsibilities include oversight of the analyst team, convening on business strategy and development, and maintaining daily operations, including curating research and analysis.
 - This role requires a high degree of adaptability to prioritize a wide range of work flows, often independently. I strive to advance clients understanding of their regulatory environments by bringing visibility to actionable and relevant information out of the regulatory space
- 2016 **NUNATAK ALTERNATIVE ENERGY SOLUTIONS** Crested Butte, Colorado
Customer Relations Management/Project Management
- Set up monitoring system software, building financial modeling and general project support. Led site assessments to determine resource potential and identify new project opportunities for sales.
 - As Project Manager, my work ensures projects are appropriately scheduled, equipment is ordered, on-hand, and that associated utility compliances were filed to ensure interconnection.

COMMUNITY LEADERSHIP

- 2013 - 2016 **THE CLIMATE REALITY PROJECT** (*Climate Reality Leader*)
CONSERVATION COLORADO (*Western Slope Field Coordinator*)
WESTERN STATE ZERO WASTE PROJECT (*Project Manager*)
SUSTAINABLE ACTION COMMITTEE, WESTERN STATE (*Student Chair*)

RELEVANT ACADEMIC EXPERIENCE

- 2014 - 2016 **MASTERS THESIS PROJECT**
Project Management of Energy Systems; Barriers to rural distributed generation at Western
- Lead a stakeholder group, including university faculty, city council, electric utility, power providers, and solar developers to amend our power contract to allow for a NEM exception of 500 kW.
 - Developed financial models on project feasibility and convened with university administration to issue an RFP for a 500 kW solar array.
- 2014 - 2015 **GUNNISON COUNTY ELECTRIC ASSOCIATION**
Graduate Fellow
- Managed a team to build an outreach and communication plan for the utility weatherization programs. This required targeted messaging, social media outreach, organizing community events and capacity building amongst stakeholder channels.

EDUCATION

- WESTERN STATE COLORADO UNIVERSITY** Gunnison, Colorado
Masters Environmental Management (MEM), GPA 3.92
Concentration: Sustainable and Resilient Communities, December 2016
- UNIVERSITY OF VERMONT** Burlington, Vermont
Bachelors of Science in Business Administration
Concentration: Marketing, May 2008



COLE TRIEDMAN

Crested Butte, CO • ctriedman@e9insight.com • 401.575.7755

PROFESSIONAL EXPERIENCE

2021 - **E9 ENERGY INSIGHT** Boulder, Colorado

present *Research Consultant and Energy Policy Analyst*

- Provide national review and analysis of regulatory activities and legislation across electric grid transformation areas including: renewable and distributed energy, resiliency and microgrids, grid modernization, demand-side management, ratemaking, resource planning, and EVs. Closely monitor a personal portfolio of 20 states.
- Act as policy lead and strategic support for E9 affiliate Think Microgrid
- Support E9 strategic client engagements across topics including distributed energy storage, advanced metering, demand response, emissions automation, and utility accountability.
- Lead author of E9's monthly distributed energy report.

2021 **GLOBAL ENERGY MONITOR** San Francisco, California

Climate & Energy Researcher

- Contributed to global wind and solar infrastructure trackers.
- Researched thousands of wind and solar projects in countries spanning Spain, Germany, Philippines, Iran, and more.

2018 - **BROWN UNIVERSITY CLIMATE AND DEVELOPMENT LAB** Providence, Rhode Island

2021 *Undergraduate Co-Coordinator*

- Led three reports on climate and energy governance issues, including utility political advocacy and PUCs' role in the energy transition. Reports have received coverage in *The Atlantic*, *The New York Times*, *InsideClimate News*, *E&E News*, and more.
- Served as Fall 2019 teaching assistant to "Engaged Climate Policy in the United States," provided leadership and administrative support.
- Presented to the US Senate Climate Change Task Force, Woods Hole Research Center.

2020 - **SHER EDLING LLP** San Francisco, California

Legal Intern

- Performed archival, historical, and current events research to support climate litigation.
- Drafted sections of complaints, discovery requests, climate impact memos.

2019 - **CLIMATE INVESTIGATIONS CENTER**

Intern

- Performed archival, online, and database research on U.S. and international climate governance issues.
- Helped draft FOIA requests, document annotations, blog posts for *DeSmog*.

EDUCATION

BROWN UNIVERSITY Providence, Rhode Island

B.A. Environmental Studies, Sustainability in Development track. GPA 3.93.

Capstone: *Chamber of Obstruction: The U.S. Chamber of Commerce's Shifting Discourses on Climate Change, 1989-2009.*



Daisy Dunlap

Brooklyn, NY • ddunlap@e9insight.com • 630.258.9026

PROFESSIONAL EXPERIENCE

2022 - **E9 ENERGY INSIGHT** Boulder, Colorado

present Research Consultant and Energy Policy Analyst

- Provide national review and analysis of regulatory activities and legislation across electric grid transformation areas including: renewable and distributed energy, resiliency and microgrids, grid modernization, demand-side management, ratemaking, resource planning, and EVs. Closely monitor a personal portfolio of 20 states.
- Support E9 strategic client engagements across topics including distributed energy storage, advanced metering, demand response, emissions automation, and utility accountability.
- Lead author of E9's monthly grid modernization report

2022 ZwillGen LLC Washington, DC

Research Analyst

- Researched statewide policy
- Designed logo and branding interfaces
- Investigated RFP opportunities for firm interests

2020 - 2022 RegiStart San Francisco, California

Curriculum Development Associate

- Developed and led fellowship program
- Designed youth voter registration curriculum
- Researched software implementation and worked with product development

2019 - 2023 Lung Screening, Tobacco, and Health Study

Washington, DC

Research Assistant

- Created research questions to address emotional and chemical nicotine dependence
- Open-coded qualitative data and transcribed patient interviews
- Analyze patient fidelity in counseling sessions in English and Spanish

2020 - 2021 Democratic Party of Georgia Marietta, Georgia

Coordinated Campaign Fellow

- Recruited volunteers for socially distant canvassing
- Contacted people for voter registration and conducted followups

2020 Maine Democratic Party Bath, Maine

Coordinated Campaign Volunteer Organizer

- Contacted voters and constructed volunteer network
- Hosted 1:1 conversations with interested voters to recruit shift-leaders

EDUCATION

GEORGETOWN UNIVERSITY Washington, District of Columbia

B.S. Science, Technology, & International Affairs; Business, Growth, & Development track.

GPA 3.78.



MADELEINE MOYANO

Vancouver, WA • mmoyano@e9insight.com

PROFESSIONAL EXPERIENCE

2023 - **E9 ENERGY INSIGHT** Vancouver, Washington

present *Policy Associate*

- Provide national review and analysis of regulatory activities and legislation across electric grid transformation areas including renewable and distributed energy, resilience, microgrids, grid modernization, demand-side management, ratemaking, and electric vehicles
- Support E9 strategic client engagements across topics including grid resilience activities and electric vehicle programs

2021 - **URBINT** Portland, Oregon

2022 *Policy Analyst*

- Research, analysis, and reporting on investor-owned utility and state commission activities related to infrastructure resilience, wildfire mitigation, and capital construction
- Provided research expertise to internal departments
- Conducted research on market developments related to emerging technology
- Wrote and submitted public comments to regulatory proceedings
- Attended regulatory and trade conferences as company representative
- Kept company up to date on industry news via weekly newsletters

2020 - **OREGON STATE UNIVERSITY SUSTAINABILITY OFFICE** Corvallis, Oregon

2021 *Student Policy Coordinator*

- Developed and implemented a comprehensive carbon offsets program for university travel
- Tracked state legislation and regulatory activities related to GHG emission limits and clean energy incentives
- Collaborated with campus stakeholders to develop an internal proxy carbon price and environmental justice framework
- Developed the first phase of outreach for a potential solar PPA

2019 - **OREGON STATE UNIVERSITY LEGISLATIVE SCHOLARS** Corvallis, Oregon

2021 *Peer Leader and Mentor*

- Led teams in legislative advocacy at the Oregon Capitol
- Gained familiarity with political processes and public participation

2019 - **EPA PACIFIC ECOLOGICAL SYSTEMS DIVISION LABORATORY** Corvallis, Oregon

2019 *Intern*

- Created communication materials for the Southern Willamette Groundwater Management Area (GWMA) project
- Used ArcGIS to create an interactive story map for public education

EDUCATION

OREGON STATE UNIVERSITY Corvallis, Oregon

B.S. Environmental Science and Public Policy, double major



CHRISTOPHER R. VILLARREAL

9492 Olympia Drive, Eden Prairie, MN 55347

(415) 680-4224

email: chris@pluggedinstrategies.com

EMPLOYMENT

NON-RESIDENT (ENERGY AND ENVIRONMENTAL POLICY) ASSOCIATE FELLOW SEPTEMBER 2019-CURRENT
R Street Institute *Washington, D. C.*

- Provide regulatory and policy support on topics including performance-based ratemaking, development of rules for integrated resource planning, distributed energy resources, and market-oriented solutions for customer choice and development of clean energy resources.
- Develop written materials summarizing regulatory actions on topics related to performance-based ratemaking, customer choice, distribution system planning, distributed energy resources, and other topics as needed.
- Participate in state and federal regulatory proceedings and working groups on development of performance-based ratemaking mechanisms, distributed energy resources, net energy metering, and integrated resource planning, including the review of utility proposals, participating in working groups to review and recommend metrics for performance-based ratemaking frameworks, and providing comments to state regulatory commissions on performance-based ratemaking metrics and frameworks.

PRESIDENT APRIL 2017-CURRENT
Plugged In Strategies *Eden Prairie, MN*

- Provide regulatory and policy analysis and consulting services related to evolution of electricity grid, distribution system planning, emerging customer and grid-connected technologies, and regulatory strategies
- Provide facilitation and moderation services for groups, workshops, and working groups
- Provide research and analysis services regarding utility and regulatory matters and structures
- Provide additional expert analysis on matters affecting electricity and regulatory structures, including topics such as data privacy, data access, rate design, interoperability, advanced technologies, performance-based ratemaking, and convergence of technology, industries, and markets.
- Provide expert testimony and presentations before state utility commissions on topics including distribution system planning, distributed energy resources, electric vehicles, rate design, data privacy and data access, performance-based ratemaking, and grid modernization.
- Prepare training materials on distributed energy resources, interoperability, and grid modernization for international regulatory and policy decision-makers.

DIRECTOR OF POLICY MAY 2015- APRIL 2017
Minnesota Public Utilities Commission *Saint Paul, MN*

- Maintained high profile inside and outside the state representing the Commission on electricity matters.
- Assisted Commissioners with policy analysis to support decision-making options.
- Provided policy analysis to support development of record in proceedings.
- Provided subject matter expertise on specific topics, including rate design, energy storage, grid modernization, data privacy, data access, interconnection, and security.
- Organized workshops, including preparing agendas, inviting speakers, and moderating public panels.
- Engaged and interact with several national organizations, including National Association of Regulatory Utility Commissioners, Department of Energy, Federal Energy Regulatory Commission, National Institute of Standards and Technologies, North American Energy Standards Board, and Smart Grid Consumer Collaborative.
- Regularly spoke and participated in panels, conference, webinars, and other international, national, and state conferences on behalf of the Minnesota Public Utilities Commission.



- Engaged and worked with several state-level projects, including e21 Initiative and 2025 Energy Action Plan
- Participated in actions related to Midcontinent Independent System Operator product development, including demand response and energy storage.
- Chaired NARUC Staff Subcommittee on Rate Design, and managed development of Distributed Energy Resources Rate Design and Compensation manual, which included meeting specific deadlines, organize and manage a group of seven staff from around the country to develop, draft, and finalize manual on time.
- Maintained an awareness and understanding of electricity policy developments across the country, including at national and state level; provide an analysis of these developments for Commissioners.

SENIOR REGULATORY ANALYST
California Public Utilities Commission

MARCH 2006- APRIL 2015
San Francisco, CA

Major Accomplishments:

- Staff lead on Commission Smart Grid rulemaking: responsible for coordinating Staff work on rulemaking, working with ALJ and Assigned Commissioner's Office, organizing and facilitating workshops on a number of Smart Grid-related topics, including cybersecurity, privacy, customer data access and other customer issues, and ensuring proceeding met legislatively mandated time-frame.
- Prepared initial Orders Instituting Rulemaking on energy storage, rate design reform, and Smart Grid, and assisted in completion of final Commission decisions on Smart Grid, rate design, customer access to data, and privacy.
- Named as a Top 50 Smart Grid Pioneers for 2013 by Smart Grid Today.
- Managed and facilitated Commission workshops on emerging topics, such as privacy, cybersecurity, energy storage, and customer data access.
- Provided lead and support analysis on many electricity issues affecting customers, market participants, and utilities, including dynamic pricing, demand response, energy efficiency, rate design, electric energy storage, direct access and retail/wholesale integration.
- Responsible for monitoring activities, preparing analyses of policies, and preparing and submitting comments related to specific subject areas before FERC, U.S. Congress, California State Legislature, CEC, DOE, NIST, and Office of Science and Technology Policy.
- Participated in standard making process, and prepared and submitted comments to FERC, NIST, and NAESB.
- Chair of NAESB Energy Services Provider Interface Task Force, and a member of NAESB Executive Committee.
- Lead author and contributor on White Papers related to several emerging topics, such as Pre-Pay, cybersecurity, and microgrids.
- Presented at conferences on updates and summaries of Commission position on Smart Grid issues, such as customer education, privacy, cybersecurity, customer access to usage, rate design and tariffs, and general regulatory policy.

PARALEGAL
Patton Boggs

NOVEMBER 2005-FEBRUARY 2006
Washington, D.C.

- Performed research at FERC, other Federal agencies, Congressional legislative history, and various state agencies.
- Cite-check, proofread, and shepardize pleadings filed at FERC and various U.S. Courts of Appeals.
- Organized and maintained discovery files.



PARALEGAL

JULY 2004- OCTOBER 2005

McCarthy, Sweeney & Harkaway

Washington, D.C.

- Performed research for FERC, other Federal agencies, U.S. Congress, state legislatures and state regulatory agencies.
- Obtained and summarized pleadings filed at FERC and courts for clients and attorneys.
- Performed energy-related research (e.g., monitor Energy news, obtain FERC and U.S. Court cases and opinions) and maintained extensive knowledge of many energy issues (e.g., RTOs, deregulation/competition, and California/Pacific Northwest refund proceedings at FERC and U.S. Courts).
- Prepared testimony and discovery-related materials for hearing before FERC Administrative Law Judge, and provided proofreading, cite-checking, and shepardizing assistance for documents filed at FERC, U.S. Supreme Court, U.S. Court of Appeals and U.S. District Courts.
- Prepared briefs and appendices, and maintained and organized case files for proceedings before FERC and U.S. Court of Appeals.
- Monitored energy-related legislation and hearings before U.S. Congress and state legislatures, as well as energy-related activities at state PUC levels (e.g., electric competition/deregulation activities).

PARALEGAL

MARCH 2003- JUNE 2004

Duane Morris, LLP

Washington, D.C.

- Performed research at FERC and other Federal agencies. Monitored FERC meetings and prepared summaries of meeting for attorneys and clients.
- Obtained and summarized pleadings filed at FERC and courts for clients and attorneys.
- Performed energy-related research (e.g., monitor Energy news, obtain FERC and U.S. Court cases and opinions) and maintained knowledge base on many energy issues (e.g., RTOs, deregulation/competition, and California/Pacific Northwest refund proceedings at FERC and U.S. Courts).
- Prepared testimony and discovery-related materials for hearing before FERC Administrative Law Judge, and provided proofreading, cite-checking, and shepardizing assistance for documents filed at FERC, U.S. Supreme Court, U.S. Court of Appeals, and U.S. District Courts.
- Monitored energy-related legislation and hearings before U.S. Congress and state legislatures, as well as energy-related activities at state PUC levels (e.g., electric competition/deregulation activities).

LEGAL ASSISTANT

APRIL 2001-MARCH 2003

McGwireWoods LLP

Washington, D.C.

- Performed research at FERC and other Federal agencies. Monitored FERC meetings and prepared summaries of meeting for attorneys and clients.
- Performed energy-related research (e.g., monitor energy news, obtain FERC and U.S. Court cases and opinions) and responsible for monitoring energy issues for attorneys (e.g., RTOs, deregulation/competition, generation interconnection, and California/Pacific Northwest refund proceedings at FERC and U.S. Courts).
- Prepared testimony and discovery-related materials for hearing before FERC Administrative Law Judge, and provided proofreading, cite-checking, and shepardizing assistance for documents filed at FERC, U.S. Supreme Court, U.S. Court of Appeals for D.C. Circuit and 9th Circuit, and U.S. District Court for D.C.
- Monitored energy-related legislation and hearings before U.S. Congress and state legislatures, as well as energy-related activities at state PUC levels (e.g., electric competition/deregulation activities).

ENERGY SPECIALIST

MARCH 1998- APRIL 2001

Verner, Litfert, Bernhard, McPherson, & Hand

Washington, D.C.

- Performed research at FERC, SEC, Library of Congress, U.S. Congress, NRC, Department of Interior, National Archives, EPA, U.S. Supreme Court, U.S. Court of Appeals for D.C. Circuit, U.S. District Court for



- D.C., and other state agencies.
- Performed and monitored energy and environmental-related research.
- Made filings at FERC, U.S. Court of Appeals for D.C. Circuit, U.S. District Court for D.C., and SEC.
- Provided proofreading assistance, including cite-checking and shepardizing of documents.
- Attended U.S. Congress hearings on Energy issues and summarized for attorneys.
- Organized and maintained Energy Group library and trade press.
- Supervised Energy Group Summer intern.

EDUCATION

BACHELOR OF ARTS IN HISTORY
Baylor University

1993-1997
Waco, Texas

ASSOCIATIONS

- Board of Directors, Minnesota Conservative Energy Forum
- Board of Directors, Minnesota Solar Energy Industries Association
- Associate Member, GridWise Architecture Committee
- Planning Commission, City of Eden Prairie, MN (2017-2020)
- Board of Directors, Emeritus, North American Energy Standard Board
- Executive Committee, Emeritus, Retail Markets Quadrant, North American Energy Standards Board
- Board of Directors, Emeritus, Smart Grid Consumer Collaborative
- Chair, Staff Subcommittee on Rate Design, National Association of Regulatory Utility Commissioners (November 2015-April 2017)
- Co-Chair, Business and Policy Domain Expert Working Group, Smart Grid Interoperability Panel (2014-2016)

PUBLICATIONS

- *Electric Vehicle Interoperability: Considerations for Public Utility Regulators*, National Association of Regulatory Utility Commissioners (2022)
<https://pubs.naruc.org/pub/D548E3DA-1866-DAAC-99FB-70957246AEBE>
- *A System in Transition: The Influence of Next Generation Technologies*, U.S. Department of Energy, Advanced Grid Research, Voices of Experience Initiative (May 2022)
https://www.energy.gov/sites/default/files/2022-05/A%20system%20in%20transition_5.13.22_web.pdf
- *Investigating Interoperability for Electric Vehicles: A Case Study from Connecticut*, National Association of Regulatory Utility Commissioners, on behalf of the Connecticut Public Utilities Regulatory Authority (October 2021)
[http://www.dpuc.state.ct.us/2nddockcurr.nsf/4b3c728dd1c0d642852586db0069aa70/4bbe04558990992285258764005afb5e/\\$FILE/NARUC%20CT%20Case%20Study%20on%20EV%20Interoperability-submission.pdf](http://www.dpuc.state.ct.us/2nddockcurr.nsf/4b3c728dd1c0d642852586db0069aa70/4bbe04558990992285258764005afb5e/$FILE/NARUC%20CT%20Case%20Study%20on%20EV%20Interoperability-submission.pdf)



Ted Ko

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PROFILE

World-class energy policy leader applying uniquely varied expertise towards a sustainable economy. Multi-functional background creates a highly valued strategic bridge between technology, business and policy. Proven reputation for deep policy knowledge, clear communication, and partnering with integrity produces successful relationships with policy makers, media, and industry stakeholders.

Currently one of the top North American experts on public policy for energy storage

HIGHLIGHTS

- Featured speaker in the energy space, including Congress, FERC, Edison Electric Institute, NARUC, and industry conferences
- Heavily influenced major portions of FERC Order 2222, landmark ruling setting the future of distributed energy resources (DER) in wholesale markets
- Drove core thinking in the first New York Energy Storage Roadmap, resulting in a \$350M incentive program for energy storage
- Drove legislative and regulatory change in the California SGIP program, resulting in doubling of the incentive budget and over \$50MM in incentives awarded to employer
- Initiated and helped complete first-of-its-kind legislation to streamline energy storage permitting, signed by the California Governor in 2017
- Initiated and led early policy conversations resulting in California's innovative first-in-the-nation mandate for utility Distribution Resource Plans

EXPERIENCE

Principal, Ted Ko Consulting, Denver, CO – 2021-Present

Current Clients: Generac, GridWealth

- Providing policy and strategy consulting to energy companies and non-profit organizations focused on distributed energy resources, energy storage, virtual power plants and energy resilience.
- Special expertise in integrating policy intelligence and insights into both near-term business decisions and longer-term strategic planning.

VP Policy & Regulatory Affairs, Stem, Inc., Millbrae, CA – 2020-2021

Director of Policy 2015-2020

- Global lead on all regulatory and legislative policy matters for the company
- Develop policy for the full range of topics related to energy storage, including mandates, incentive programs, grid modernization, resource planning, rate design, demand response and hybrid resources
- Lead nationwide advocacy on storage participation in wholesale markets
- Represent Stem for Federal policy advocacy including Congress, FERC and US Dept of Energy
- Craft and represent Stem's policy positions in regional and national trade associations

Principal, Complete Society Consulting, SF, CA – 2007-2015

- Product roadmap, venture finance and policy strategy consulting for cleantech startups, social ventures, and non-profit organizations
- Primary Contract: Energy storage and electric vehicle policy strategy and programs for CalCharge



Co-founder, Assoc. Executive Director, Clean Coalition, SF, CA – 2009-2013

- Policy development and legislative relations for clean energy policies across the country
- Provided key analysis and policy design to policymakers and advocates for more than 20 pieces of state and federal legislation
- Managed and delivered several dozen impactful interventions in state regulatory proceedings
- Cultivated productive partnerships with major clean energy stakeholders such as environmental groups, solar industry alliances, cleantech companies, and labor organizations

Director of Products, GreenDimes Inc, Palo Alto, CA – 2006-2007

- As first employee, ran product management, backend operations and early market analysis
- Grew site, service and operations from company inception to over 30,000 paying subscribers in first 9 months
- Product success was a key factor in \$20MM Series A financing
- Planned and executed three major strategic product shifts with full site/service rebuilds

Product Manager, Yahoo! Inc., Sunnyvale, CA – 2003-2006

- Front line product manager for the Yahoo! Mail and Yahoo! Widgets products, including market research, planning, specification, and launch of major product initiatives.
- Designed, launched and managed products combining Yahoo! Mail and high-speed Internet service. Success was critical component of a \$100MM+ business for Yahoo.
- Achieved migration of over 3 million new subscribers to the Yahoo! Mail premium service and was recognized with the highest Yahoo! employee honor, the SuperStar award

Founder, Social Entrepreneurship Initiative, Palo Alto, CA – 2002-2003

Created and ran volunteer group dedicated to helping build socially beneficial technology ventures

Principal, PacSpan Technologies, Palo Alto, CA – 2001-2003

Market research and strategic consulting for a variety of high tech companies

Senior Technologist, NBC Internet Inc., SF, CA – 2000-2001

Technical and business analysis on major corporate acquisition targets and technical design for company-wide strategic initiatives

Founder, Director of Engineering, Flyswat, Inc., SF, CA – 1998-2000

Technical lead and engineering manager for service's core content management system

Achieved angel funding, \$3MM Series A, and successful acquisition by NBC Internet.

EDUCATION

Presidio Graduate School — MBA in Sustainable Management

- Founded first venture finance club to connect investors to social entrepreneurs and provide new startups with expert advice

Massachusetts Institute of Technology — BS/MS Computer Science

- Tau Beta Pi and Eta Kappa Nu honor societies