



January 8, 2016

VIA EMAIL

Honorable Kathleen Burgess
Secretary, New York State Public Service Commission
Three Empire State Plaza
Albany, New York 12223

Re: Case 14-M-0101 – Reforming the Energy Vision – Demonstration Project
Implementation Plan

Dear Secretary Burgess:

On behalf of AVANGRID, Inc. enclosed for filing is an Implementation Plan for the Flexible Interconnect Capacity Solution demonstration project.

If you have any questions, please contact me.

Respectfully submitted,

A handwritten signature in black ink, appearing to be "Laney Brown", written over a light blue horizontal line.

Laney Brown
Director, Smart Grid Planning & Programs

Reforming the Energy Vision (REV) Demonstration Project Implementation Plan

Flexible Interconnect Capacity Solution

REDACTED



Table of Contents

Executive Summary	3
<hr/>	
Section 1: Demonstration Design	5
A) Test Statements	5
<hr/>	
B) Test Population	6
<hr/>	
C) Test Scenarios	6
<hr/>	
D) Check Points	9
<hr/>	
Section 2: Project Structure & Governance	12
A) Project Team	12
<hr/>	
B) Roles & Responsibilities	13
<hr/>	
C) Governance	15
<hr/>	
Section 3: Work Plan & Budget	17
A) Project Plan	17
<hr/>	
B) Project Budget	23
<hr/>	
Section 4: Reporting Structure	26
A) Reporting Expectations	26

Executive Summary

The following Project Implementation Plan details the design, work plan, budget, governance and reporting structure for AVANGRID' Flexible Interconnect Capacity Solution (FICS) Reforming the Energy Vision (REV) Demonstration Project.

On July 1, 2015, AVANGRID's subsidiaries New York State Electric & Gas Corporation (NYSEG) and Rochester Gas and Electric Corporation (RG&E) (and together, the Companies) filed proposals for three demonstration projects in compliance with Ordering Clause 4 of the New York State Public Service Commission's Order Adopting Regulatory Policy Framework and Implementation Plan, issued and effective February 26, 2015. The following Implementation Plan for FICS incorporates the New York State Department of Public Service Staff's (Staff) comments and recommendations for FICS following the July 1 proposal filing. This is a living document and it may be updated during project execution due to new discoveries requiring updates to the project scope, schedule, and costs.

FICS tests a new model for interconnecting large-scale controllable Distributed Energy Resources (DERs) to the grid, where "controllable" encompasses the ability of the utility to potentially curtail the delivery of electricity generated by a DER to the distribution network. The traditional interconnection process assumes that a utility must invest in network facilities (network reinforcements) necessary to accommodate the maximum rated capacity of proposed DERs or otherwise limit the capacity that can be interconnected. The DER developer is required to finance the incremental costs of network reinforcement attributable to their interconnection, and as a result the DER opportunity may not be economical.

The traditional reinforcement model has met system requirements to date, but may no longer be efficient under a REV environment that contemplates a significant expansion of DER capacity. Under REV, the planning and operation of the grid will need to change, and the interconnection process is one element of this transition. FICS aims to establish a flexible interconnection solution for DER developers and the utility to come to an agreement that maintains the viability and benefits of large-scale DER development. Under a flexible interconnection, during constrained periods due to thermal or voltage issues caused by DER generation the developer will agree to have the utility curtail generation export below maximum capacity in return for reducing or avoiding incremental network reinforcement costs. The flexible interconnection concept has been proven in the United Kingdom (U.K.) by ScottishPower Energy Networks, an affiliate of Iberdrola S.A. (our ultimate parent company), and we are looking to build upon this valuable experience.

FICS utilizes Active Network Management (ANM) technology developed by Smarter Grid Solutions, AVANGRID's project partner. ANM leverages automation control to provide greater visibility into the operation and performance of the grid as more DER capacity is interconnected. ANM can work in isolation or as part of an integrated approach, providing unified smart grid system architecture that is a secure, safe, and reliable alternative to traditional network reinforcement. This approach provides a scalable and integrated solution to support increased DER penetration where the number, cumulative capacity, timing, and location of future DER interconnections are uncertain.

FICS aims to achieve the following benefits:

- Align the interests of utilities, DER developers, and customers to work together to identify the best interconnection solution given the specific facts and circumstances.
- Accelerate and expand the benefits of DER development to NYSEG and RG&E customers.
- Allow NYSEG and RG&E to leverage the distribution network to support a "platform-as-a-service" business model that generates new revenue streams for the Companies.
- Maximize the utilization of existing network infrastructure, while in parallel increasing visibility of the network.
- Support the achievement of certain core REV policy goals, including an increase in DER interconnections.

The FICS Implementation Plan is divided into four sections. Section 1 includes the demonstration design with project test statements, test population, test scenarios, and check points. Section 2 presents project structure and governance with the project team, roles and responsibilities, and governance. Section 3 details the project work plan and budget. Lastly, Section 4 lays out the project's reporting structure.

Section 1: Demonstration Design

FICS was designed to advance the development of new utility and third party business models and to gain experience with integration of DERs, two core objectives of the REV demonstration projects. AVANGRID is partnering with Smarter Grid Solutions to implement an ANM scheme that delivers flexible interconnections at several test sites in the NYSEG and/or RG&E service territory; to support operations of the ANM system during the demonstration project's initial term; and to support AVANGRID's FICS market development for platform-as-a-service through internal stakeholder education, developer engagement, and advising on business model development.

The FICS scope was designed with Smarter Grid Solutions to include the deployment of two ANM 100 systems to be able to provide flexible interconnections for at least two customers, one each within the NYSEG and/or RG&E service territory. Due to the high volume of current interconnection applications for large-scale distributed solar photovoltaic (PV) projects in the NYSEG and RG&E service territory¹, AVANGRID is initially evaluating how FICS may support PV interconnection. That being said, ANM has also been deployed and proven to work for wind, hydro, and other DERs, and FICS may include these technologies as well.

A) Test Statements

Table 1: FICS Test Statements

Test Statement	Hypothesis
<i>Technology Test:</i> We believe ANM is a technology solution that will provide the monitoring and real-time control capabilities needed to address constraints preventing scaling interconnection of large-scale DERs in the NYSEG and RG&E service territory.	If ANM is deployed and tested on large-scale DER interconnections, ANM will increase hosting capacity on targeted distribution circuits and provide the necessary thermal and/or voltage constraint management so that installed generation does not adversely impact network facilities and other customers' service.
<i>Revenue Test:</i> We believe the proposed platform-as-a-service business model enabled by ANM will produce new revenue streams in the form of annual fees from participating DER developers.	If flexible interconnections are offered as an alternative interconnection option to DER developers, then developers will agree to a compensation structure that will support the upfront and ongoing costs of ANM when the platform-as-a-service business model is implemented at scale.
<i>Customer Acceptance Test:</i> We believe flexible interconnections align with DER developers' interest in efficiently and cost effectively interconnecting large-scale DER projects in the NYSEG and RG&E service territory.	If flexible interconnections are offered as an alternative interconnection option to DER developers, then developers will be willing to accept curtailment actions on generation when needed.
<i>Stakeholder Engagement Test:</i> We believe engaging external, non-developer stakeholders involved in the development and interconnection of large-scale DER projects in New York will leverage lessons learned from the demonstration project and identify opportunities to scale FICS.	If NYSEG and RG&E engage the New York State Energy Research and Development Authority (NYSERDA), the Joint Utilities, Staff, and other stakeholders, lessons learned from FICS can support the ongoing evaluation on how to improve interconnection outcomes for large-scale DER projects in New York by using ANM as well as identifying other potential solutions.

¹ "Large scale" includes DERs with active generation capacity over 250 kW interconnected under the New York Standardized Interconnection Requirements (SIR).

	The stakeholder process and improved interconnection processes will result in increased DER penetration in New York.
--	---

B) Test Population

Due to the high volume of current applications to interconnect large-scale distributed PV generators in the NYSEG and RG&E service territory, AVANGRID is working with Smarter Grid Solutions to identify candidate DER projects for participation in FICS starting with open PV interconnection applications:

Table 2: FICS Test Population

Test Population Description	Selection Method
DER interconnections in the NYSEG and RG&E service territory 250 kW or larger proposed at a network voltage level of 34.5 kV or below.	<p>AVANGRID will initially evaluate the Initial Technical Reviews or Coordinated Electric System Interconnection Reviews (CESIRs) of proposed DER projects in the NYSEG and RG&E service territory that have yet to move to construction.</p> <p>AVANGRID will evaluate the following project and circuit characteristics to identify candidate sites for FICS:</p> <ul style="list-style-type: none"> • Proposed generation capacity and associated network reinforcement required • Existing network layout and protection infrastructure on the distribution circuit where the DER interconnection is proposed, with 12.5 kV or 34.5 kV circuits preferred • Existing automated network infrastructure, communications capabilities, and availability of interval loading data on the distribution circuit where the DER interconnection is proposed

C) Test Scenarios

As detailed in Section 3: Work Plan and Budget, project execution is divided into two primary activities. Each activity is broken down into project tasks, which contain the FICS test scenarios. Activity 1 focuses on FICS site selection, with project tasks of Kick-Off, Stakeholder Engagement, Modeling, Data Gathering and Analysis, and Initial Design. Activity 2 focuses on ANM system deployment and integration, with project tasks of Final Design, Build and Configuration, Installation and Testing, Support, and Evaluation. Table 3 details the test scenarios by activity:

Table 3: FICS Test Scenarios

Scenario	Description
Technology Test	<p><u>Activity 1</u></p> <ul style="list-style-type: none"> • In the Modeling task, AVANGRID and Smarter Grid Solutions (the Project Team) will evaluate how ANM modeling impacts network hosting capacity compared to current interconnection screening. • In the Data Gathering & Analysis task, the Project Team will evaluate how availability of interval loading data on distribution circuits impacts the projected level of generation curtailment.

	<p><u>Activity 2</u></p> <ul style="list-style-type: none"> • In the Evaluation task, the Project Team will evaluate actual versus forecasted curtailment levels for participating DERs. • In the Evaluation task, the Project Team will evaluate ANM's performance managing thermal and voltage conditions on targeted distribution circuits.
<p>Revenue Test</p>	<p><u>Activity 1</u></p> <ul style="list-style-type: none"> • In the Stakeholder Engagement and Data Gathering & Analysis tasks, the Project Team will engage developers to evaluate the impact of generation curtailment versus network reinforcement on DER project economics. • In the Evaluation task, the Project Team will evaluate the range of flexible interconnection fee options, including analysis of cost-based pricing, value-based pricing, and shared-risk curtailment models.
<p>Customer Acceptance Test</p>	<p><u>Activity 1</u></p> <ul style="list-style-type: none"> • In the Stakeholder Engagement task, the Project Team will engage developers to evaluate their baseline perception of challenges with current interconnection solutions. • In the Stakeholder Engagement and Data Gathering & Analysis tasks, the Project Team will evaluate developers' tolerance for accepting generation curtailment, and their requirements for shared risk in a fee-based platform-as-a-service model. • In the Stakeholder Engagement and Data Gathering & Analysis tasks, the Project Team will engage DER developers to evaluate the appropriate operational terms for ANM, known as Principles of Access, to implement in the NYSEG and RG&E service territory. Principles of Access are further described below. <p><u>Activity 2</u></p> <ul style="list-style-type: none"> • Following the Installation and Testing task, the Project Team will evaluate the most effective communication and presentation means for all parties to understand and accept curtailment actions on DER generation during ongoing ANM operations.
<p>Stakeholder Engagement Test</p>	<p><u>Activity 1</u></p> <ul style="list-style-type: none"> • The Project Team will engage NYSERDA with the aim to gauge the statewide baseline interconnection record for funded DER projects, to understand DER developers' business model and the impact of generation curtailment on project financing, and identify opportunities for ANM to increase successful interconnections in New York. • The Project Team will engage the Joint Utilities to review current interconnection challenges and alternative interconnection solutions being developed in New York.

As noted under the Customer Acceptance Test detailed in Table 3, the Project Team will engage DER developers to evaluate the appropriate operational terms for ANM, known as Principles of Access, to implement in the NYSEG and RG&E service territory. Principles of Access are the commercial rules that govern the operation of an ANM scheme, both for participating DER generation today and additional capacity to be interconnected in the future.

For FICS, Smarter Grid Solutions will advise AVANGRID on the Principles of Access utilized in the U.K. to help determine which are most appropriate for implementing in the NYSEG and RG&E service territory. The Principles of Access will define the relationship and connection priority of DERs connected to the same distribution circuit or network area that may contribute to one or more network constraints. The selected Principles of Access will specify the order in which to curtail DERs and define the operational rules applied by the ANM scheme to keep the network within safe operating limits. Potential Principles of Access options include the following examples:

Table 4: ANM Principles of Access Examples

Principle of Access	Description
Last In First Out	The last DER added to the ANM scheme is curtailed first. Adding a new DER interconnection to the Last In First Out priority list (in the position of least priority) does not alter the priority position.
Pro Rata	The required curtailment is divided equally among all DERs contributing to a constraint. The total amount of curtailment would be shared by each of the DERs based on the ratio of rated or actual DER output to total required curtailment.
DER Size	The largest DER that is contributing to a constraint is curtailed first. The total amount of curtailment required to alleviate a constraint is allocated in order of size, which may refer to the installed rated capacity of the DER or the power output at any given time when constraints arise.
Greatest Carbon Benefit	The largest carbon emitting DER is curtailed first, using a carbon metric such as CO ₂ /MWh per DER.

Based on the ANM experience in the U.K., the Last In First Out approach has been most commonly implemented to date. According to Smarter Grid Solutions and U.K. Distribution Network Operators, the simplicity of the Last In First Out philosophy ensures it is transparent to all network stakeholders and achieves consistency for both existing DERs and new DERs by not impacting their interconnection agreements. This de-risks the interruptible contract for project financiers as the long-term impact of curtailment can be modelled based on a fixed position in a priority stack for access to capacity.

Similarly, Smarter Grid Solutions and U.K. Distribution Network Operators have indicated the Pro Rata, Shared Percentage approach has been viewed favorably by developers due to its fairness. Dividing curtailment evenly among all constraint-contributing DERs ensures fair access to available network capacity for multiple DERs. The main issue with the implementation of this Principle of Access has been the difficulty for project financiers to assess the long-term impact of the interruptible contract on their proposed project economics. Under a Pro Rata agreement, the DER that is the first unit to interconnect would experience increasing curtailment as additional DERs, both small and large scale, interconnect over the life cycle of the project.

As noted under the Customer Acceptance Test detailed in Table 3, the Project Team will also evaluate the most effective communication and presentation means for all parties to understand curtailment actions on DER generation during ongoing ANM operations. Leveraging the extensive stakeholder engagement findings disseminated by the U.K. Distribution Network Operators who have trialed ANM, AVANGRID plans to engage participating DER developers throughout the demonstration term and subsequent

operations to ensure an understanding of their needs, concerns, and viewpoints of FICS. Based on the U.K. experience, DER developers have had minimal concerns about being offered interconnections with some form of curtailment, as long as the implementation was transparent and the estimate of curtailment had low uncertainty.

D) Check Points

AVANGRID identified the following measures in its July 1 FICS proposal filing as potential metrics to evaluate demonstration results:

Table 5: FICS Proposal Filing Metrics

Metric	Description
Selection of the FICS Option	Measurement of the number and percentage of FICS-qualified projects that elect the FICS option expressed as both the number of projects and MWs.
Interconnection Timeframe	Periodic reporting of the period required to process and install the FICS-based DER interconnections as compared to current and historical values for projects that follow the existing interconnection process.
Share of Generation Curtailed	The proposals to developers will include a forecasted curtailment percentage. The metric will measure the share of generation curtailed expressed as a comparison between actual and forecast.
Total FICS Utility Revenue	Utility revenues from platform-as-a-service fees in the aggregate and on a per-MW basis.
Customer Satisfaction	Based on a post-interconnection survey of all projects, including those that decided not to go forward. The survey would capture feedback to improve the process over time.

Building on these project metrics, the check points presented in Table 6 describe FICS results to be assessed at regular intervals and compared to initial expectations. As information on each measure becomes available, quarterly reports provided to Staff will review the following check points:

Table 6: FICS Check Points

Check Point	Description
Selection of the FICS Option	<p><u>Measure:</u> The number and percentage of FICS-qualified projects that elect the FICS option expressed as both the number of projects and MWs.</p> <p><u>When:</u> Execution of interconnection contracts with participating developers is targeted for Q2 2016, therefore progress updates will be provided in the Q4 2015 and Q1 2016 reports.</p> <p><u>How:</u> FICS qualification is based on preliminary screening of DER interconnection applications, where ANM can enable incremental DER generation capacity that would otherwise require network reinforcement to accommodate the full proposed capacity.</p> <p><u>Expected Target:</u> At least two DER developers in the NYSEG and/or RG&E territory will elect the FICS option during the demonstration term.</p> <p><u>Strategy if Results are Below Expectation:</u> If less than two developers provide a show of interest in the FICS option during initial outreach to be conducted in Q4 2015, AVANGRID will review options for next steps in site selection with Staff.</p>

<p>Interconnection Cost</p>	<p><u>Measure</u>: The total utility infrastructure cost per MW interconnected and the avoided cost of network reinforcement that would otherwise be required. The original project metric proposed included Interconnection Timeframe, but comparing the interconnection period during the demonstration term to that of a firm interconnection may be misleading since the timeline to deliver the ANM system does not accurately represent the timing of deploying ANM at additional DERs following the demonstration term.</p> <p><u>When</u>: ANM system go live is targeted for Q4 2016, therefore a review of the final interconnection cost for participating sites will be included in the Q4 2016 report.</p> <p><u>How</u>: The total cost per MW interconnected will be available following completion of the interconnection. The avoided cost of network reinforcement will be determined in the CESIR process based on an estimate developed by AVANGRID.</p> <p><u>Expected Target</u>: ANM projects in the U.K. have reduced interconnection costs by up to 90 percent. Interconnection costs for current and historical DER projects governed by the New York Standardized Interconnection Requirements vary by location depending on a number of factors, including size of the project, existing network topology, and required network reinforcement. Therefore, it is challenging to project expected cost avoided through FICS at this time. AVANGRID will propose reasonable comparative assumptions for Staff review.</p> <p><u>Strategy if Results are Below Expectation</u>: Developers will likely not participate in FICS unless there is a cost savings in completing their interconnection. IUSA Networks will identify scenarios/opportunities where FICS could provide a more economical solution.</p>
<p>Additional MW Exported and Share of Generation Curtailed</p>	<p><u>Measure</u>: The additional generation exported by participating DER installations (versus projected generation of the baseline firm interconnection capacity offered) and the share of generation curtailed expressed as a comparison between actual curtailment and forecasted curtailment.</p> <p><u>Timeline</u>: ANM system go live is targeted for Q4 2016, therefore generation and operational curtailment levels will be included in the Q4 2016 report.</p> <p><u>How</u>: Additional DER generation exported will be measured starting during operations in Q4 2016 and compared to participating developers' generation projections. The share of generation curtailed due to constraint management will be measured during operations in Q4 2016 and compared to Smarter Grid Solutions' forecasted curtailment (as an annualized percentage). Curtailment due to communications failures and network outages will be highlighted and differentiated from curtailment due to constraint management.</p> <p><u>Expected Target</u>: Additional DER generation exported will vary by project and site. The average DER project curtailment has been approximately five percent annually in the U.K.</p> <p><u>Strategy if Results are Below Expectation</u>: If actual curtailment in Q4 2016 exceeds the forecasted level on an annualized basis, AVANGRID and Smarter Grid Solutions will reexamine modeling results to refine the curtailment forecast.</p>
<p>Total FICS Utility Revenue</p>	<p><u>Measure</u>: Utility revenues from platform-as-a service fees in the aggregate and on a per-MW basis for participating projects.</p> <p><u>When</u>: Execution of FICS-based interconnection contracts with participating developers is targeted for Q2 2016, therefore progress updates will be provided in the Q4 2015 and Q1 2016 reports.</p>

	<p><u>How:</u> Platform-as-a-service fee included in interconnection contracts executed with participating developers, which may be based on a shared risk structure.</p> <p><u>Expected Target:</u> The area of commercials development for the platform-as-a-service business model is a primary focus for testing. AVANGRID is aiming to obtain robust lessons learned on effective development of revenue opportunities from FICS. In the July 1 FICS proposal filing, AVANGRID examined various fee options that would cover the revenue requirements of adopting FICS capabilities, with analysis indicating that a [REDACTED] annual fee charged to each DER would cover the revenue requirements of ANM at scale with [REDACTED] DERs contracted.</p> <p><u>Strategy if Results are Below Expectation:</u> Capture robust lessons learned on developing revenue opportunities from FICS should be the primary indicator of successful testing for the project. IUSA Networks will identify barriers preventing revenue generation and assess potential alternative revenue models.</p>
Customer Satisfaction	<p><u>Measure:</u> Key drivers and obstacles of FICS adoption among targeted DER developers.</p> <p><u>Timeline:</u> Execution of FICS-based interconnection contracts with participating developers is targeted for Q2 2016, therefore surveying results of targeted developers that decided not to go forward with FICS will be presented in the Q2 2016 report and surveying results of participating projects will be presented in the Q4 2016 report.</p> <p><u>How:</u> Post-interconnection survey of all targeted developers, including those that decided not to go forward.</p> <p><u>Expected Target:</u> AVANGRID is aiming to obtain robust lessons learned from non-participating developers to inform future FICS site selection and outreach efforts and to gather lessons learned from participating developers to inform how ongoing ANM operations can meet developers' needs.</p> <p><u>Strategy if Results are Below Expectation:</u> AVANGRID will evaluate how to improve engagement efforts to increase future participation in FICS and meet participating developers' needs.</p>
External Engagement	<p><u>Measure:</u> Lessons learned and opportunities for scaling FICS based on feedback from external, non-developer stakeholders with a role in DER development and interconnection in New York.</p> <p><u>Timeline:</u> AVANGRID will provide updates in each quarterly report on engagement outcomes with the Joint Utilities, NYSERDA, etc.</p> <p><u>How:</u> Description of stakeholder engagement lessons learned.</p> <p><u>Expected Target:</u> AVANGRID will engage NYSERDA with the aim to gauge the statewide baseline interconnection record for funded DERs, to effectively develop the platform-as-a-service business model, and identify opportunities for other ANM applications to increase DER interconnections in New York. AVANGRID will engage the Joint Utilities to review current interconnection challenges and alternative interconnection solutions being developed in New York.</p> <p><u>Strategy if Results are Below Expectation:</u> AVANGRID will utilize NYSEG and RG&E interconnection records as its base data set for reviewing and comparing interconnection outcomes and challenges.</p>

Section 2: Project Structure & Governance

AVANGRID will have ultimate responsibility for managing project spending, meeting project milestones, and ensuring compliance with regulatory reporting requirements. In the spirit of the REV demonstration projects, AVANGRID will share implementation responsibilities with our project partner Smarter Grid Solutions. The Project Team is detailed below.

A) Project Team

Tables 7-10: AVANGRID and Smarter Grid Solutions Skillsets and Core Team Members

AVANGRID Skillsets
Project Management and Reporting
Interconnection Technical Review and Planning Guidelines
Systems Protection Review
Business Model Development Support and Customer Outreach
System Integration and Testing
Interconnection Contract Development

Smarter Grid Solutions Skillsets
Project Management
ANM Technical Design Authority
ANM Technical Advisor
ANM System Modeling
ANM System Delivery
Developer Engagement Strategy

AVANGRID Team	Relevant Skillsets
[REDACTED]	Project Management and Reporting
[REDACTED]	Interconnection Technical Review and Planning Guidelines
[REDACTED]	Systems Protection Review
[REDACTED]	Business Model Development Support and Customer Outreach
[REDACTED]	System Integration and Testing
[REDACTED]	Interconnection Contract Development

Smarter Grid Solutions Team	Relevant Skillsets
[REDACTED]	Project Management
[REDACTED]	ANM Technical Design Authority
[REDACTED]	ANM Technical Advisor
[REDACTED]	ANM System Modeling
[REDACTED]	ANM System Delivery
[REDACTED]	Developer Engagement Strategy

Tables 11-12: FICS Decision Making and Project Team Logistics

Decision Making Body	
Utility Participants	Partner Participants
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]

Decision Making Logistics	
Meeting format	Conference calls
Meeting frequency	Weekly

B) Roles & Responsibilities

Table 13: FICS Project Team Role Descriptions

Project Task	AVANGRID Role Description	Smarter Grid Solutions Role Description
Role #1: Kickoff	<ul style="list-style-type: none"> Identify and bring together stakeholders; Prepare for and attend workshops as an active participant. 	<ul style="list-style-type: none"> Facilitate stakeholder workshops.
Role #2: Modeling	<ul style="list-style-type: none"> Provide available historical network data; Identify potential DERs; Approve ANM methodology. 	<ul style="list-style-type: none"> Simulate network data and capacity analysis.
Role #3: Data Gathering & Analysis	<ul style="list-style-type: none"> Provide monitoring connectivity; Install network data gathering system (as needed). 	<ul style="list-style-type: none"> Simulate network data and capacity analysis; Network data gathering specification; Production of Requirements Specification; Projected capacity analysis.
Role #4: Initial Design	<ul style="list-style-type: none"> Approval of Requirements Specification 	<ul style="list-style-type: none"> Production of Draft Design Specification; Proposal for commercial rules and operational limitations.
Role #5: Final Design	<ul style="list-style-type: none"> Providing details of interfaces to existing systems, measurement points and communications infrastructure; Approval of Design Specification, commercial rules and operational limitations. 	<ul style="list-style-type: none"> All build and configuration activities.
Role #6: Build and Configuration	<ul style="list-style-type: none"> Purchase and deliver equipment to Smarter Grid Solutions. 	<ul style="list-style-type: none"> Production of Acceptance Test Specification; Conduct of Factory Acceptance Test; Assist with installation of production ANM system; Conduct Site Acceptance Test; Witness installation of sgs connect at DER sites; Conduct commissioning test.
Role #7: Installation and Testing	<ul style="list-style-type: none"> Approval of Acceptance Test Specification; Witness of Factory Acceptance Test (optional); Modify Supervisory Control and Data Acquisition (SCADA) system to provide interface to ANM system; 	

	<ul style="list-style-type: none"> • Modify existing RTUs/measurement devices (or install new devices) to provide measurement data to ANM system; • Modify DER control systems to interface to ANM system; • Provide communications mechanism between sgs comms hub and sgs connects; • Install production ANM system, including central rack and 2 off sgs connects (see Adding Devices and Support below); • Agree the commercial arrangements with owners of third party controllable devices (e.g. DERs) for participation; • Install sgs connect at the relevant site; • Witness commissioning test; • Witness Site Acceptance Test. 	
Role #8: Training and Support	<ul style="list-style-type: none"> • Receive Training; • Provide secure mechanism for remote support; • Report issues. 	<ul style="list-style-type: none"> • Provide Training; • Provide support and resolve issues.
Role #9: Evaluation	<ul style="list-style-type: none"> • Lessons learned gathering/documentation • Development of final report. 	<ul style="list-style-type: none"> • Support lessons learned gathering and development of final report.

Table 14: FICS Stakeholder Role

FICS Stakeholder	Role Description
NYSERDA	<p>AVANGRID will engage NYSERDA to propose collaboration in the following areas:</p> <ul style="list-style-type: none"> • Application tracking to identify reasons funded projects do not move forward • Review of funding mechanisms to support ANM applications and FICS scaling opportunities • Advising on the FICS platform-as-a-service business model for effective marketing to developers <p>The Project Team will utilize NYSEG and RG&E interconnection records from 2015 as its base data set for reviewing current interconnection outcomes. If NYSERDA provides baseline interconnection records for funded PV projects, the records will be reviewed in addition to NYSEG and RG&E interconnection records.</p>

C) Governance

AVANGRID's Project Team includes individuals from AVANGRID, NYSEG, and RG&E. To clarify the relationship among the entities, AVANGRID is a holding company with executive responsibilities dealing with the ordinary direction and effective management of the business of its group of companies. The business affairs of AVANGRID are managed under the direction of its Board of Directors and of its governing bodies. In carrying out these responsibilities and exercising its decision-making authority, AVANGRID abides by the principles set forth in its by-laws, corporate policies, internal corporate governance rules and other internal codes and procedures that make up its corporate governance, and the standards rules for development or supplement it.

Operating companies of AVANGRID's subsidiary Iberdrola USA Networks serving electricity customers include:

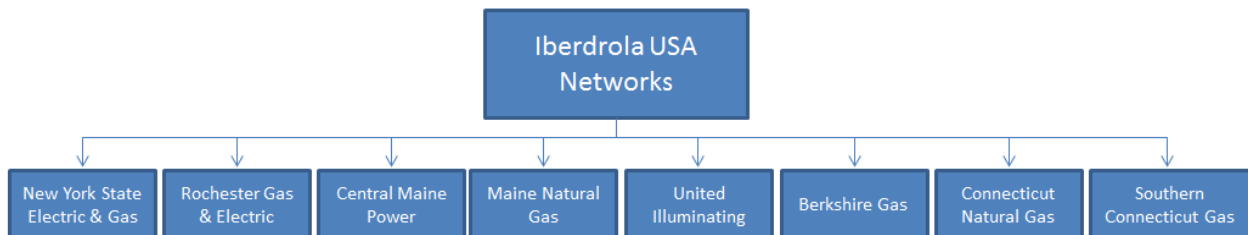
Rochester Gas and Electric Corporation (RG&E): Serves 371,000 electricity customers and 307,000 natural gas customers in a nine-county region centered around Rochester, NY.

New York State Electric & Gas Corporation (NYSEG): Serves 881,000 electricity customers and 263,000 natural gas customers across more than 40 percent of upstate New York.

Central Maine Power Company (CMP): Serves 612,000 electricity customers in central and southern Maine.

United Illuminating (UI): Serves 325,000 electricity customers in Connecticut's Greater New Haven and Bridgeport areas.

Figure 1: Iberdrola USA Networks Operating Companies



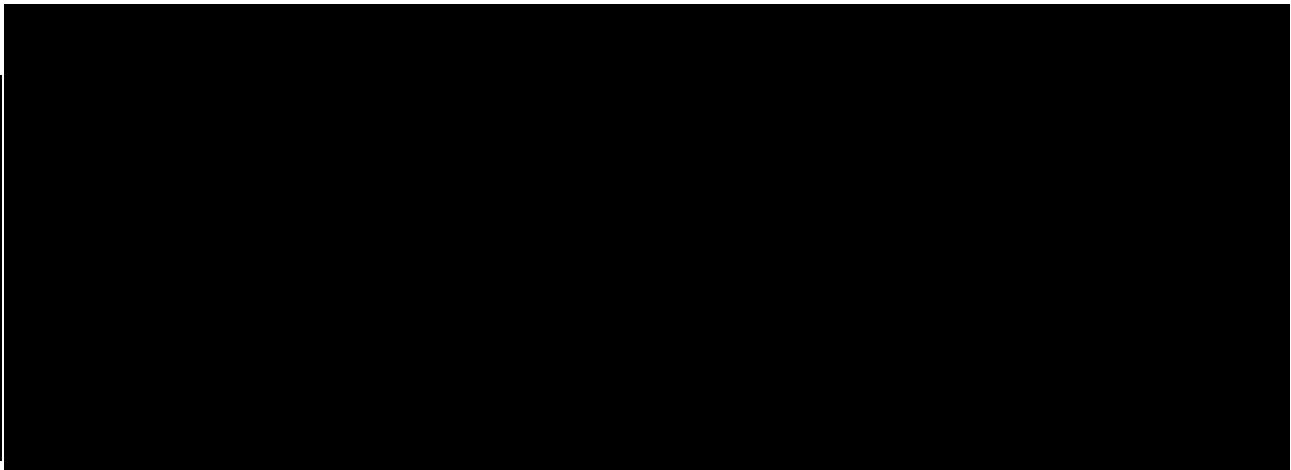
For FICS, in support of NYSEG and RG&E AVANGRID maintains overall responsibility of project execution. As stated above, AVANGRID will have ultimate responsibility for managing project spending, meeting project milestones, and ensuring that regulatory reporting requirements are met. In the spirit of the REV demonstration projects, AVANGRID will share implementation leadership responsibilities with our project partner Smarter Grid Solutions.

FICS will be governed through an Advisory Board. AVANGRID and Smarter Grid Solutions' project teams will be responsible for the day-to-day project implementation decisions. On a bi-weekly basis the AVANGRID Project Manager will meet with an AVANGRID Advisory Board to report on project status and solicit feedback on strategic guidance. On a monthly basis, the chair of the FICS Advisory Board will review project status with the AVANGRID Executive Steering Committee in order to ensure continued alignment with AVANGRID's strategic direction, alignment other REV initiatives, and to ensure any internal roadblocks to project success are mitigated.

Table 15 presents the members of the FICS Advisory Board, with Figure 2 presenting the FICS governance process:

Table 15: FICS Advisory Board

Advisory Board Member	Title	Responsibility
[REDACTED]	[REDACTED]	Chair
[REDACTED]	[REDACTED]	Distribution Planning & Technical Interconnection Screening
[REDACTED]	[REDACTED]	Systems Protection
[REDACTED]	[REDACTED]	Regulatory & Tariff Considerations
[REDACTED]	[REDACTED]	New York Standardized Interconnection Requirements and Interconnection Procedures
[REDACTED]	[REDACTED]	ANM System Integration



Section 3: Work Plan & Budget

A) Project Plan

FICS execution is divided into two primary activities, with follow on evaluation and final reporting. A project schedule is included in Appendix A, and assumes an October 1, 2015 start date and December 31, 2016 completion date. Project tasks and deliverables in Activity 1 and Activity 2 are detailed below:

Activity 1 – Kick-Off, Stakeholder Engagement, Modeling, Data Gathering and Analysis, and Initial Design

During this activity, the Project Team will work to identify candidate DER projects, conduct outreach to targeted DER developers, and develop the detailed design for the ANM system. The proposed activities and deliverables for Activity 1 are as follows:

Kick-Off: Project kickoff and project management overview.

- Deliverable: Project Initiation Document & Project Plan. The Project Initiation Document will include project procedures, change control procedure, deliverable acceptance procedure, and escalation procedure.

Stakeholder Engagement: Smarter Grid Solutions will hold workshops in six theme areas with key AVANGRID stakeholders. Workshop material will include ANM design, deployment, integration, and operations topics, and will enable AVANGRID to confirm ANM requirements and specifications, to understand integration with existing communication and operations technologies, and to develop its FICS business model to validate the platform-as-a-service market channels and revenue opportunities.

- Deliverables: Workshop meeting notes report(s) and ANM requirements specification

Modeling: Smarter Grid Solutions will simulate network data (e.g., via Monte Carlo time-series simulation) to engage with NYSEG and RG&E network planners and DER developers on ANM solutions for flexible interconnection. Network data simulations for targeted DER applications will utilize available historical data (e.g., single data point for circuit peak load; monthly meter data for all the customers on the target circuit) provided by NYSEG and RG&E and model FICS capacity and control based on agreed-upon load profiles and DER generation profiles. Modeling will include the following steps and deliverables:

- o The Project Team will agree on Measurement and Verification (M&V) principles for simulated data analysis.
- o Smarter Grid Solutions will create a set of simulated network data to develop FICS capacity and control analysis.
- o The Project Team will present the FICS capacity and control analysis to targeted DER developers and seek feedback on viability for proposed DER sites.
 - Deliverable: Preliminary and Final Simulated Flexible Interconnection Reports for AVANGRID and targeted DER developers.

Data Gathering and Analysis: The Project Team may collect an initial three months of actual network data on selected circuits (as needed) and analyze initial FICS capacity and control modeling using the collected data. Data gathering and analysis will include the following steps and deliverables:

- o Smarter Grid Solutions will engage AVANGRID stakeholders on ANM requirements and specifications to achieve agreement on communications and measurement point monitoring solutions.
 - Deliverable: ANM Communications and Monitoring Specification report.
- o Smarter Grid Solutions will work with AVANGRID to deploy a network monitoring scheme supporting real-time voltage and/or capacity monitoring and modeling.
 - Deliverable: Installation of server to collect real-time network data on NYSEG and RG&E's system.
- o When sufficient data has been gathered, Smarter Grid Solutions will compare the actual network data with the modeled data and calculate projected FICS capacity and control.

- Deliverable: Smarter Grid Solutions will provide FICS reports on firm versus flexible capacity for selected DER sites. AVANGRID and DER developers will review the reports and decide on execution of a commercial agreement to proceed with ANM deployment.

Initial Design: After commercial agreements with two DER developers are executed, Smarter Grid Solutions will develop a Design Specification based on the constraints identified earlier in Activity 1 and the outcome of the ANM Requirements Specification.

- Deliverable: Draft ANM Design Specification.

Activity 2 –Final Design, Build and Configuration, Installation and Testing, Support, and Evaluation

Final Design: Smarter Grid Solutions will assess configuration options and complete an ANM scheme, including initial power systems analysis and management of constraints. Each DER will be managed in accordance with the headroom available at constraint locations and the Principles of Access established by AVANGRID. Creation of a suitable test specification to ensure functional requirements are met.

- Deliverables: Final ANM Design Specification and Acceptance Test Specification report.

Build and Configuration: Smarter Grid Solutions will execute build and configuration of the FICS platforms and applications, and will conduct Factory Acceptance Testing against approved test specification.

- Deliverables: Factory Acceptance Test summary report and all remaining ANM hardware.

Installation and Testing: Smarter Grid Solutions will install the ANM scheme at the selected sites and conduct Systems Integration Testing.

- Deliverable: ANM system is deployed, including:
 - Two redundant production system to host the system's sgs core and sgs comms hub;
 - Four panel-mounted devices for production (two for each ANM 100 system) to host sgs connect;
 - A switch, rack-mounted monitor and rack for each production system;
 - Configured ANM system installed and Site Acceptance Testing;
 - ANM Engineering Manual;
 - All applicable ANM 100 software licenses for two ANM 100 deployments, four sgs connect devices, and applicable system and third party software licenses.

Support: Smarter Grid Solutions will complete two training sessions for NYSEG and RG&E stakeholders: one for engineering staff on the support of the system and one for users on the operation and use of the system. Ongoing office hours support of the operational scheme will be agreed with AVANGRID up to the end of the demonstration project term.

Evaluation: AVANGRID will review ANM operational data and compile lessons learned with Smarter Grid Solutions to present to Staff in its final report.

To complete Activity 1 and Activity 2, AVANGRID estimates the following time allocations for team members:

Table 16: Incremental Labor Requirements for AVANGRID Team Members

AVANGRID Team	Relevant Skillsets	2015 Effort (Hours)	2016 Effort (Hours)
[REDACTED]	Project Management and Reporting	[REDACTED]	[REDACTED]
[REDACTED]	Interconnection Technical Review and Planning Guidelines	[REDACTED]	[REDACTED]
[REDACTED]	Systems Protection Review	[REDACTED]	[REDACTED]
[REDACTED]	Business Model Development Support and Customer Outreach	[REDACTED]	[REDACTED]
[REDACTED]	System Integration and Testing	[REDACTED]	[REDACTED]
[REDACTED]	Interconnection Contract Development	[REDACTED]	[REDACTED]



Table 17: Smarter Grid Solutions Labor, FICS Project Spend, and FICS Project Revenue

Activity/Task	Smarter Grid Solutions Labor (Hours)	Project Spend	Project Revenue
Kickoff	[REDACTED]	[REDACTED]	[REDACTED]
Stakeholder Engagement	[REDACTED]	[REDACTED]	[REDACTED]
Modeling	[REDACTED]	[REDACTED]	[REDACTED]
Data Gathering and Analysis	[REDACTED]	[REDACTED]	[REDACTED]
Initial Design	[REDACTED]	[REDACTED]	[REDACTED]
Final Design	[REDACTED]	[REDACTED]	[REDACTED]
Build and Configure	[REDACTED]	[REDACTED]	[REDACTED]
Installation and Testing	[REDACTED]	[REDACTED]	[REDACTED]
Project Management	[REDACTED]	[REDACTED]	[REDACTED]
Support	[REDACTED]	[REDACTED]	[REDACTED]
Total	[REDACTED]	[REDACTED]	[REDACTED]



The proposed workshop theme areas are presented below with each described in terms of the targeted stakeholders, an initial list of issues to be addressed, and expected workshop outcomes. The workshops' requirements and stakeholder feedback will be included as part of the Final ANM Design Specification.

Theme 1: ANM and Flexible Interconnection Overview

Stakeholders: AVANGRID core FICS Project Team.

Issues:

- General understanding of ANM and constraint management for flexible interconnections
- ANM control options
- Principles of Access
- Feasibility assessment methodology, including constraint analysis
- Contracts for constrained connections
- ANM costs and interconnection cost apportionment

Outcomes:

- Feasibility assessment methodology, including details of constraint analysis processes and capacity assessment protocol.
- Feasibility assessment for FICS, including consideration of different prospective constrained DERs.
- Outline ANM scheme design and functional design requirements.

Theme 2: Power System Planning and Capacity Analysis

Stakeholders: AVANGRID system planners and those concerned with new DER interconnections, including primary engineering representatives.

Issues:

- Understanding of the network constraints (i.e., power flow, voltage) and capacity assessment protocol, and identification of measurement points
- ANM control options
- Principles of Access
- Power systems analysis requirements
- Feasibility assessment methodology, including constraint analysis

Outcomes:

- Feasibility assessment methodology, including details of constraint analysis processes and capacity assessment protocol.
- Feasibility assessment for FICS, including consideration of different prospective constrained DERs.
- Outline ANM scheme design and functional design requirements.

Theme 3: ANM Systems Integration and Communications

Stakeholders: Control room, IT, operations technologies, safety representatives, and protection/operational engineers involved in new DER interconnections.

Issues:

- Interfaces to DERs and measurement points
- Interfaces to SCADA, data historian and other central systems
- Operator interaction and Human Machine Interface (HMI)
- Communications options, including performance (e.g., availability, resilience)
- Security and failsafe functionality

- Remote access
- Cybersecurity
- Data requirements for monitoring and reporting (e.g., collecting data on constraints)

Outcomes:

- Interface and communications requirements (DERs, measurements, SCADA, data historian), generic with FICS-specific appendix.
- HMI requirements, generic with FICS-specific appendix.

Theme 4: Flexible Interconnection Commercial Arrangements

Stakeholders: Those concerned with the commercial offers for new DER interconnections and FICS revenue stakeholders (financial and economics teams).

Issues:

- Principles of Access
- Contracts for constrained connections
- Constraint analysis and preparation of curtailment estimates
- ANM costs and interconnection cost apportionment
- Procurement of ANM, including intellectual property
- Use of system fee for recovery of FICS costs

Outcomes:

- Curtailment scheme for constrained DERs.
- Contractual structure for participating generators
- Tariff impacts and considerations

Theme 5: Alternative Grid Reinforcement Policy and Standards

Stakeholders: Protection engineers, safety representatives, and technical policy/regulatory managers.

Issues:

- Security and failsafe functionality, including system autonomy
- Protection and the implications of the DPS/FERC/NERC/IEEE safety, quality and power reliability regulations
- Impact of autonomous operation on network planning and control
- AVANGRID grid design, equipment, and operation standards and associated documents
- Feasibility assessment methodology
- Principles of Access, including options for future approaches

Outcomes:

Need for protection as backup to ANM to ensure compliance with safety and reliability regulations.

Theme 6: Business as Usual Support

Stakeholders: Commercial contract managers, Generation customer support staff, Network Planners, ANM scheme owner.

Issues:

- System support requirements
- Maintenance support and ANM product updates
- System expansion

- Annual review and reporting
- Data collection and sharing (e.g., analysis of constraints)
- Training requirements

Outcomes: Required support services, including those required from Smarter Grid Solutions, and the roles and responsibilities of all parties in the provision of support.

Smarter Grid Solutions' estimated effort in 2015, which will include execution of tasks in Activity 1 only, includes the following time allocations by project task:

Table 18: Smarter Grid Solutions 2015 Estimated Effort

Activity/Task	Effort (Hours)	Total
<i>Activity 1</i>		
Kickoff		
Stakeholder Engagement		
Modeling		
Data Gathering and Analysis		
Initial Design		
Project Management		
<i>Total</i>		

Smarter Grid Solutions' estimated effort in 2016, which will include execution of tasks in Activity 1 and Activity 2, includes the following time allocations by project task:

Table 19: Smarter Grid Solutions 2016 Estimated Effort

Activity/Task	Effort (Hours)	Total
<i>Activity 1</i>		
Kickoff		
Stakeholder Engagement		
Modeling		
Data Gathering and Analysis		
Initial Design		
<i>Activity 2</i>		
Final Design		
Build and Configure		
Installation and Testing		
Project Management		
<i>Total</i>		

B) Project Budget

Figure 3 presents project expenditures and Table 20 details the assumptions included in the pro forma forecast:

Figure 3: FICS Pro Forma Forecast

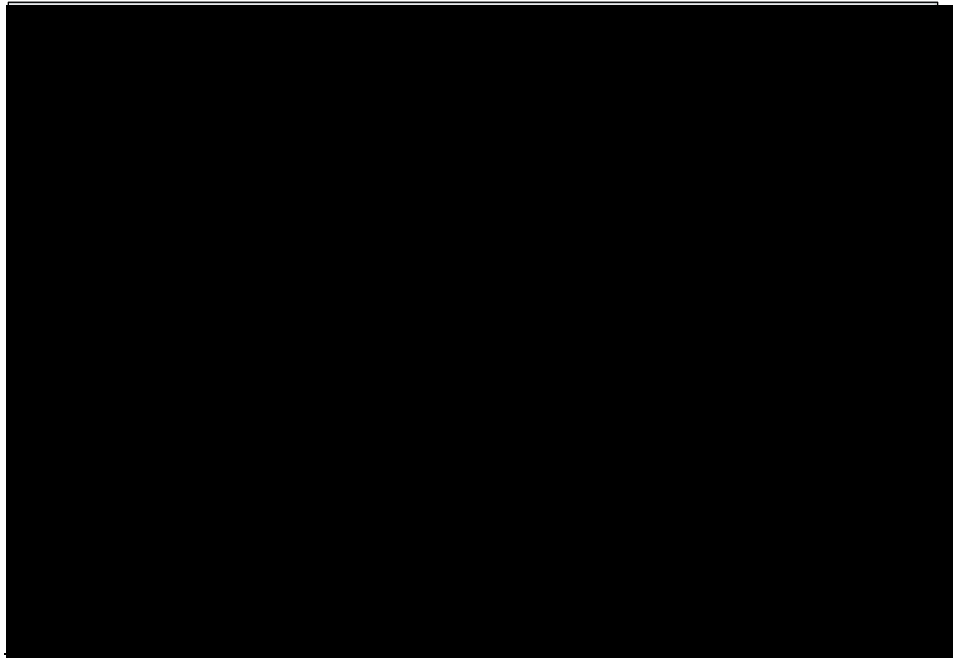


Table 20: FICS Pro Forma Forecast Line Item Descriptions

Cost Line Item	Description
[Redacted content]	

Using the pro forma forecast and the current project schedule, the following project expenditure estimates have been developed and assume an October 1, 2015 start date for the project and December 31, 2016 completion.



Table 22: FICS Budget Forecast by Quarter

	2015	2016			
Quarter	Q4	Q1	Q2	Q3	Q4
Expected Cash-Out					
Expected Cash-In					

Section 4: Reporting Structure

A) Reporting Expectations

Quarterly reports will be provided to Staff throughout the demonstration project's initial term. The reports will follow the outline presented below in Figure 4, will provide an update on implementation progress according to the project plan and budget, and will identify any deviations from the project plan and budget.

Project milestones align with the project tasks of Activity 1 and Activity 2, and are presented in the project schedule as "gates". Completion of a project milestone indicates the completion of a project task:

Table 23: Milestones by Project Task

Project Task	Milestone for Task Completion	Milestone Target
Kickoff	Smarter Grid Solutions delivers Project Initiation document to AVANGRID	Q4 2015
Stakeholder Engagement	AVANGRID signs off on ANM requirements specifications	Q1 2016
Modeling	Developer reviews simulated capacity analysis and signs off to proceed with data gathering	Q1 2016
Data Gathering and Analysis	Developer accepts projected capacity analysis produced by Smarter Grid Solutions	Q1 2016
Initial Design	AVANGRID and Developer accept draft ANM design specification, interconnection contract executed	Q2 2016
Final Design	Pre-production and production acceptance test specifications finalized	Q2 2016
Build and Configure	Pre-production and production factory acceptance test	Q3 2016
Installation and Testing	Site acceptance test, ANM system go live	Q4 2016

As the information becomes available, the quarterly reports will provide the results of key project metrics as detailed in the Check Points presented in Section 1. Figure 4 presents the quarterly report outline for FICS:

Figure 4: Quarterly Report Outline

1.0 Executive Summary
2.0 Demonstration Highlights
2.1 Since Previous Quarter
2.1.1 Tasks Completed
2.1.2 Task Activities Overview
2.1.3 Sub-Task Activities Overview
2.2 Next Quarter Forecast
2.2.1 Checkpoints/Milestone Progress
2.2.2 Planned Activities
2.2.3 Expected Changes
2.3 Issues
3.0 Work Plan & Budget Review
3.1 Task Review
3.1.1 Task 1.0
<ul style="list-style-type: none">• Progress Assessment• Issues
3.1.1.1 Sub-Task 1.0.1
3.1.1.2 Sub-Task 1.0.2
3.2 Work Plan
3.2.1 Updated Work Plan
3.2.2 Updated Budget
4.0 Conclusion
4.1 Lessons Learned
4.2 Recommendations

Appendix A: Project Schedule

