



# Reforming the Energy Vision

## Reforming the Energy Vision Demonstration Project Assessment Report

### Iberdrola, USA: Flexible Interconnect Capacity Solution

December 15, 2015

## INTRODUCTION

In an Order issued February 26, 2015, the Commission directed the six large investor owned electric utilities to develop, and file initial demonstration projects, consistent with the guidelines adopted by the Order, on or before July 1, 2015.<sup>1</sup> These projects are intended to demonstrate the potential of various aspects of the Reforming the Energy Vision (REV), the regulatory initiative launched by the Commission as part of Governor Cuomo's comprehensive energy strategy for New York.

As the Commission noted, the projects are intended to demonstrate new business models, i.e., new revenue stream opportunities for third parties and the electric utilities. In that regard, the projects will inform decisions related to developing Distributed System Platform functionalities, measure customer response to programs and prices associated with REV markets, and determine the most effective implementation of Distributed Energy Resources (DER). Further, as demonstration projects, they are intended to test new technology and approaches to assess value, explore variables and innovate before committing to full scale implementation. Therefore, demonstration projects should also be designed to deliver observable results and actionable information within a reasonable timeframe. During the demonstrations, the projects will be assessed regularly. Lessons learned should be incorporated into the projects or as appropriate into the utilities' operations as expeditiously as is reasonable.

---

<sup>1</sup> Case 14-M-0101, Reforming the Energy Vision, Order Adopting Regulatory Policy Framework and Implementation Plan (Issued February 26, 2015) (Track One Order).

DISCUSSION

New York utilities and third parties are required to comply with Public Service Law and the Commission's Standardized Interconnection Requirements to connect generation sources to a utility's electric distribution system. For large projects that do not qualify for net-metering, the interconnection costs, as determined by the utility, are paid for by the DER developer. These costs cover dedicated transformer(s) and other equipment needed to accommodate DER generation. Upgrades to the existing electrical system may also be required to ensure safety and reliability of the local feeder line, such that the aggregate or total amount of generation does not exceed the feeder's rated capacity. The costs for larger scale interconnection projects in areas where the electric distribution system capacity is insufficient to support the additional DER can be substantial and impact the economics of the project. As a result, some DER projects many not go forward due to the high initial interconnection cost.

Iberdrola's Proposal

In compliance with the Commission Track One Order, New York State Electric & Gas (NYSEG) and Rochester Gas & Electric (RG&E) (collectively referred to as Iberdrola as they are both Iberdrola, USA subsidiaries) proposed the Flexible Interconnect Capacity Solution (FICS) demonstration project on July 1, 2015. The main hypothesis being tested under the FICS project is whether providing DER developers the option of avoiding significant upfront interconnection costs by paying a lower fee and being subject to criteria based curtailments during constrained periods (thermal and/or voltage constraints) of the distribution system will increase the deployment rate and density of DERs. It will also test if the utility can utilize

these grid management tools to avoid potential adverse impacts from high DER penetration by managing the output from the facilities. Smarter Grid Solutions (SGS), Iberdrola's project partner, will deploy Active Network Management technologies to actively manage DER and distribution system assets in a flexible, scalable, and transparent manner.

During the demonstration period, Iberdrola will initially target proposed projects of 150 kW or larger photovoltaic (PV) interconnection projects with proposals to tie into the distribution system at various locations within NYSEG's and RG&E's service territories. During constrained periods, the utility will be able to reduce the PV generation output or have the PV generation taken completely off-line, thus reducing system upgrades needed and incremental grid cost to the customer.

According to Iberdrola, FICS should increase and accelerate large scale PV generation that can be connected to the grid by allowing a circuit to be used more at or near its capacity. While the DER developers will still pay for the right to connect to the grid through this solution, the overall interconnection costs would be lower than if a system upgrade was needed. This fact, combined with the expectation that any curtailment would be minimal, results in many projects that would otherwise not be viable may be completed due to improved project economics. Deployment of an active DER management system also creates a potential new source of utility revenue in the form of a payment for management of the flexible interconnection, which will be reflected in a contract between the developer and Iberdrola that includes the commercial arrangements and the percent of time annually that a customer can expect to be curtailed.

As proposed, this project and the expected benefits are made possible by automation control technologies. The Company states that the automation control technologies provide a unified smart grid system architecture that is secure, safe and reliable as an alternative to traditional grid reinforcement. This approach provides a consistent, scalable, and integrated solution for smart grid upgrades, where the number, cumulative capacity, timing, and location of future connections are uncertain.

Department of Public Service Staff (Staff) Review

Staff reviewed Iberdrola's FICS demonstration project filing for consistency with the Track One Order as well as the Commission's REV policy objectives and demonstration project principles. The REV policy objectives are: enhanced customer knowledge and tools to support effective management of their total energy costs; market animation and leverage of customer contributions; system wide efficiency; fuel and resource diversity; system reliability and resiliency; and, reduction of carbon emissions. REV demonstration project core elements, as defined in the Commission's December 12, 2014 Resolution on Demonstration Projects are: third party participation; new business models; customer/community engagement; identification of economic value; pricing and rate design; transactive grid; scalability; market rules and standards; system benefits; cost effectiveness; and, implementation with constructive feedback within reasonable timeframe.<sup>2</sup> Staff also evaluated the extent to which the demonstration project maintains a reasonable

---

<sup>2</sup> Case 14-M-0101, Reforming the Energy Vision, Memorandum and Resolution on Demonstration Projects (Issued December 12, 2014).

relationship between estimated costs and estimated benefits, including demonstration value.

FICS is an innovative solution that will allow Iberdrola to test the use of curtailable DER to increase DER penetration levels and its value to customers, utilities, and DER developers. The FICS provides large scale DER developers an alternative to high traditional interconnection cost, which range from \$1 million to \$12 million for current projects with Iberdrola, and long lead times. FICS is intended to support the utility as a Distributed System Platform provider to address electric distribution problems in an integrated, efficient, safe, and reliable fashion. Staff concurs with Iberdrola that the FICS project supports certain core REV policy goals, including an increase in third-party owned DER connections, system benefits in the form of increased efficiency and reliability, and improved environmental benefits from increased solar based interconnection projects, while also providing a new revenue source to the utility. Therefore, as documented in the August 3, 2015 letter from Staff, Iberdrola's FICS demonstration project complies with the requirements of the Commission's Track One Order and the utility will file the implementation plan with the Secretary within thirty days from the date of this letter.

REV OBJECTIVES ADDRESSED

Market Animation and Leverage Customer Contributions

If the FICS demonstration project is successful, Iberdrola anticipates that more DER developers and large corporations will be attracted to the New York market. Currently, developers expend significant time and resources before knowing the cost to connect to the grid. According to Iberdrola, approximately 50% of DER developers in NYSEG's and

RG&E's service territory did not go forward with their large scale DER developments in the last 12 months, in part due to significant interconnection infrastructure cost estimates that adversely impact the project economics. Moreover, certain parts of the system may not readily accommodate large scale DER projects due to capacity and other constraints. This adds to the risks of DER development and implementation, and discourages a competitive DER developer market. The FICS project will address these concerns by having the developer agree to curtail generation, when necessary, in order to avoid costs to expand the distribution system's capacity. In addition, to help further animate the market, Iberdrola has committed to not using any of its unregulated affiliates during this demonstration project to participate as a DER provider and will work with parties to develop rules governing how Iberdrola would interact with unregulated affiliates providing DER if FICS is scaled beyond the demonstration period. Therefore, Staff concludes that FICS has the potential to produce greater DER penetration in New York State and better leverage customer and developer contributions.

#### System Wide Efficiency

The FICS project will examine a business model designed to support the cost-efficient growth of DER. During the demonstration, DER developers will work with the utility to identify the most efficient distribution solutions for proposed facilities and the utilities will be proactively identifying areas where new curtailable DER can provide the most value to the network. The desired outcome is a faster, more efficient interconnection process that drives DER toward existing and projected needs thereby maximizing its value, while at the same time potentially deferring or reducing overall capacity-related

network investment costs. Staff agrees that this outcome has the potential to benefit all customers by resulting in a more efficient development and operation of the distribution network.

System Efficiency, Reliability, and Resiliency

As stated in the Track One Order, "the confluence of cost, reliability and environmental concerns cannot be satisfactorily resolved under a business as usual approach. In order to fulfill its statutory duty, the Commission must consider new approaches." Staff believes the FICS project is a new approach that can potentially provide this benefit. The Active Network Management application will be used under the FICS project to identify the state of the network in real time and take appropriate action to issue curtailment instructions or trip signals to the DER units. The application functions are configured to meet the requirements to manage pre-fault and post-fault operating constraints. Both voltage and thermal constraints can be managed via the real power curtailment actions implemented by Active Network Management. The demonstration will determine if FICS can be implemented in a way that is cost-effective to the DER developer and as a result improve the efficiency, reliability, and resiliency of the system.

Reduction of Carbon Emissions

The 2015 New York State Energy Plan establishes State goals of reducing greenhouse gas emissions from the energy sector 40% from 1990 levels by 2030 and of decreasing total carbon emissions from all sectors 80% by 2050. As discussed in the State Energy Plan, renewable resources can reduce electric price volatility and limit carbon emissions. However, interconnection protocols and costs have been recognized as one barrier to broader adoption of renewables. This demonstration



project will test the effectiveness of one approach for mitigating that barrier. For the demonstration period, Iberdrola will take advantage of the current high volume of interconnection requests for large scale distributed PV projects to test if FICS can improve DER deployments. Staff concludes that the success of this project can help increase the number of large scale renewable power generation source in New York State and advance the vision of the 2015 New York State Energy Plan. If successful, this demonstration project can help foster the growth of large scale PV and other DER installations that could lead to a reduction in the use of power generation sources that have high levels of greenhouse gas emissions.

#### DEMONSTRATION PROJECT ELEMENTS

##### Third Party Participation/Partnerships

Iberdrola has partnered with SGS who will contribute resources at its expense for demonstration project scope and concept development, preliminary customer feasibility analysis, and regulatory filings. SGS will provide, for a fee, the FICS technology and consulting services for network capacity data gathering, modeling, stakeholder engagement, and Active Network Management design specification. SGS will also provide Active Network Management procurement and configuration, as well as the final Active Network Management design, factory testing, and deployment. Finally, SGS will work as a partner with Iberdrola to fully advance FICS market opportunities.

##### New Utility Business Models and Economic Value

The FICS model incorporates collaboration with large-scale PV developers, the utility, and SGS; alternate solutions; and the testing of a fee-based platform service that will provide the utility with a new source of revenue from third

parties while providing a lower cost interconnection option for large scale DER developers. The platform service fees could be set at a level to cover the cost of the FICS studies, modeling, and design efforts. Iberdrola also proposes that the platform service fees be based on the DER system rated capacity, location conditions, timing, and asset condition circumstances. In addition, the fee structure and contract term will address the timing of grid upgrades and incorporate potential credits for upgrade cost contributions if there are future interconnections on the same circuit. Iberdrola is also evaluating certain fee options for circumstances if and when FICS expands to scale, including capacity controls, storage, and volume-based discounts for multiple installations for a DER developer. Finally, the site installations will likely require some capital investment with customer contribution, as well as recovery of operating and maintenance expenses.

#### Scalability

If successful, the FICS could be available to all large scale DER developers across NYSEG and RG&E's service territory, although further studies and collaboration would be required. The Active Network Management system has been validated and will initially support up to 100 DER installations. It could be rolled out on a regional basis as grid constraints emerge, and can be implemented such that one system can be part of another, thus allowing the system to support a large number of devices. Overall, the FICS project has the ability to scale across other utilities' service territories in New York. For these reasons, Staff believes that FICS satisfies the scalability criteria.

Transactive Grid

As proposed by Iberdrola, under FICS, controllable outcomes are handled by the Active Network Management technology that incorporates two-way communications and real-time monitoring of a distribution network's dynamic loads. In cases where curtailments are needed, this demonstration will help identify the methods and effectiveness of the automated processes and overall communications needed to successfully implement FICS.

Reasonable Timeframe

The FICS project has three phases lasting a total of twelve to eighteen months: project kick-off, implementation, and evaluation. The project kick-off phase includes project management, planning, data gathering and assessment, modeling, and creation of an initial design. The implementation phase includes creation of the final design, build and configuration, installation and test, and support. Finally, under the evaluation phase, Iberdrola will review the program, identify accomplishments, and recommend areas for improvement if fully deployed.

The kick-off phase relies on detailed historical network data profiles for the target feeders, as well as feeder load and DER performance profiles. The analysis will reveal the existence and characteristics of any network constraints or other performance concerns. The purpose of this analysis is to provide feedback to the demonstration project DER developers regarding potential curtailment options that have meaningful economic consequences for the DER developer and large customers. Iberdrola states there might be opportunities to reduce the timeline based on the use of existing data. This schedule supports the Commission's goals of producing measurable outcomes

within a timeframe that can help support REV implementation goals.

AREAS FOR FURTHER DEVELOPMENT

Milestones and Check Points

Iberdrola will evaluate the business model, potential revenue opportunities and DER developer's receptiveness to curtailment with the use of five potential measures. The measures include: the number and percentage of FICS-qualified projects that choose FICS; period required to process and install the FICS DER interconnects; amount of generation curtailed expressed as a comparison between actual and forecast; utility revenues from FICS service fees; and responses from participant surveys. Staff also concludes that Iberdrola should track the cost difference between interconnection through FICS versus traditional methods. For each measure, acceptance or performance criteria will need to be developed and included in the implementation plan. The project milestones will be used as communication and quality devices, to set expectations, share status information, and develop lessons learned. In addition, the milestones and checkpoints will be used to trigger actions to modify various aspects of the demonstration. This is an essential activity to develop effective project recommendations to inform REV. Therefore the implementation plan will include detailed milestones and checkpoints.

POTENTIAL LEGAL BARRIERS AND/OR  
AREAS OF COMMISSION ACTION

Standard Interconnection Requirements

The existing Standardized Interconnection Requirements are in the process of being revised.<sup>3</sup> As a result, changes to the FICS demonstration project may be needed to comply with any new standards adopted by the Commission, or Iberdrola may need to seek waivers of certain regulations to allow the demonstration project to proceed.

CONCLUSION

The proposed FICS demonstration project complies with the objectives set forth in Ordering Clause 4 of the Track One Order. Staff will continue working with Iberdrola to develop a detailed implementation plan. The implementation plan will include a detailed schedule, budget, projected milestones and checkpoints, and reporting requirements. Staff will also continue to discuss the areas of further development with Iberdrola and identify any issues that may require Commission action. The implementation plan will incorporate the results of these discussions.

The implementation plan is expected to evolve and incorporate lessons learned or new developments within the scope of the project. The project implementation plan will be updated quarterly. The implementation plan and updates will be filed with the Secretary within thirty days.

---

<sup>3</sup> Case 15-E-0557, Proposed Amendments to the New York State Standardized Interconnection Requirements.