Description of Methodology
Used to Determine Marginal Costs
on a System-Wide and Locational Basis
Distributed System Implementation Plan
July 2018

Introduction

New York State Electric & Gas Corporation (“NYSEG”) and Rochester Gas and Electric
Corporation (“RG&E”), collectively the "Companies", retained NERA Economic Consulting
(NERA) to assist in the development of updated location-based marginal costs within the context
of the New York Public Service Commission’s Reforming the Energy Vision initiative and more
specifically, Case 15-E-0751 –In the Matter of the Value of Distributed Energy Resources.
NERA\(^1\) prepared the following exhibits for inclusion with the Companies’ July 2018 updates to
the Distributed System Implementation Plan (DSIP):

- NERA Exhibit 1: NYSEG Systemwide Marginal Cost of Service
- NERA Exhibit 2: NYSEG Locational Marginal Cost of Service for LSRV and DRV areas
- NERA Exhibit 3: RG&E Systemwide Marginal Cost of Service
- NERA Exhibit 4: RG&E Locational Marginal Cost of Service for LSRV and DRV areas

The methodology employed by NERA to determine the marginal costs presented in these
exhibits is an extension of NERA’s traditional approach, used for decades by NERA economists
and furthering the work of the late Dr. Alfred Kahn. In theory, marginal cost is the change in
total cost with respect to a small change in output. In practice, NERA determines the marginal
cost of electricity by examining the utility’s planning processes to determine what drives new
investment and operating decisions and how changes in consumption affect utility system
operations.

**Step 1: Identify Pertinent Capital Investment Projects**

The first step in the marginal cost of service (“MCOS”) study involved an examination of the
Companies’ five-year capital investment plans. NERA examined each project listed in those
plans and screened out projects that were not undertaken to respond to growth on the distribution
system. We also screened out projects that were customer-funded. The remaining projects—all
of which were initiated to respond to load growth on the Companies’ distribution networks—
formed the basis for our MCOS analysis.

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\(^1\) Mr. Kurt G. Strunk, Director in NERA’s New York City office, together with Walter Hopkins, Senior Analyst, led this
assignment on behalf of NERA. Affiliated Consultant Dr. Hethie Parmesano provided peer review.
Marginal cost estimates were developed for the distribution network component costs that each Company anticipates could be deferred or avoided by the installation of Distributed Energy Resources (“DER”) on their respective systems. For the application of the MCOS study to DER, NERA has focused on costs for (a) stations upstream of the distribution substations (labeled “Upstream” in the NERA exhibits) and (b) distribution substations & trunkline feeders (labeled “Distribution” in the NERA exhibits). The MCOS study does not capture local distribution facilities costs (local primary and secondary lines and transformers) and does not capture customer-related facilities. The Companies have determined that it is not possible, at the current time, to defer or avoid any local facilities or customer-related costs in response to DER.

**Step 2: Identify Initial Set of Projects on LSRV Circuits**

In order to apply a locational designation to each project, the Companies identified those projects located in areas eligible for Locational System Relief Value (“LSRV”) pricing. The Companies identified specific circuits within their distribution systems in which customers investing in DER could be eligible for LSRV pricing, subject to applicable megawatt caps.

**Step 3: Compute Marginal Costs**

NERA used the Companies’ forecast investment budget to determine the investment cost per kW of capacity added by each project and then aggregated over the appropriate area. To convert investment per kW of capacity to investment per kW of load (or load relief), a factor reflecting typical reserve margins on distribution equipment was applied. NERA then annualized the investment cost using an economic carrying charge and added in appropriate levels of operating and maintenance expenses and loaders for administrative and general expenses and general plant investment. Finally, NERA included provisions for working capital requirements and losses from the new equipment to customers’ meters to arrive at a total marginal cost in each LSRV area, expressed in $/kW of peak demand met by the investment.

NERA estimated the base Demand Reduction Value (DRV) marginal costs by aggregating the costs and load growth associated with those projects not located in LSRV areas and applied the marginal costing techniques described above. To account for the fact that, outside of the identified LSRV circuits, many distribution areas are not experiencing load growth, NERA adjusted the DRV marginal cost to reflect the portion of the system that has been observed to be growing, consistent with the treatment in prior NERA MCOS studies conducted on behalf of the Companies.

NERA computed marginal costs for Upstream investments and for Distribution investments. In its exhibits, NERA presents the marginal cost of each type of facility separately.

**Step 4: Iterate to Finalize Projects on LSRV Circuits**

When the estimated marginal cost for an LSRV area fell below the overall DRV marginal cost, NERA reclassified that circuit as part of the DRV area and iterated its calculation of the DRV marginal costs to include the costs of those investment projects that had previously been
classified as LSRV. This approach is consistent with the Commission’s March 9, 2017 Order, which anticipates higher compensation in LSRV areas.

**Step 5: Calculate Systemwide Marginal Costs**

In addition to the DRV and LSRV calculations, NERA also expressed the marginal cost estimates on a systemwide basis for each Company. These estimates are included in Exhibits 1 and 3. For these calculations, NERA aggregated all growth-related investment projects and calculated the annual marginal cost without regard to location, adjusted the system-wide marginal cost to reflect the portion of the system that has been observed to be growing, and incorporated appropriate levels of operating costs and loaders.