

**SAN DIEGO GAS & ELECTRIC COMPANY  
SOUTHERN CALIFORNIA GAS COMPANY**

**APPLICATION REGARDING FEASIBILITY OF INCORPORATING  
ADVANCED METER DATA INTO THE CORE BALANCING PROCESS  
(A.17-10-002)**

**(DATA REQUEST ORA-SCG-01)**

**DATA REQUEST RECEIVED: 10-17-17**

**DATA RESPONDED: 11-8-17**

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**QUESTION 1:**

At page 5 of above subject Application, SoCalGas/SDG&E state “As provided in settlement term 14, the settling parties agreed that SoCalGas and SDG&E would initiate a regulatory proceeding to “address the feasibility of incorporating AMI data into the core balancing process.”

- (a) Please describe the key findings and conclusions of the feasibility study conducted to “address the feasibility of incorporating AMI data into the core balancing process.”
- (b) Please provide the breakdown of all the estimated potential costs by categories (i.e., capital/expense) associated with incorporating AMI data into the core balancing process for each of SoCalGas and SDG&E.
- (c) Please confirm whether the items of potential costs shown in (b) above are high level estimates and describe how these estimates were arrived at, including whether any quotes were obtained from a market canvass of suppliers.
- (d) Please confirm whether there are any cost contingencies included in the items of cost shown in (b) above.
- (e) Please describe the expected incremental potential benefits of incorporating AMI data into the core balancing process, in particular, incremental benefits to the core’s daily forecast with the use of hourly lag data, and/or any other incremental benefits not described in this question.
- (f) Please state whether SoCalGas/SDG&E prepared an estimate of the dollar value of the expected incremental benefits described in item (e) above.
- (g) Based on your response to item (f) above, please provide the estimated incremental benefits of incorporating AMI data into the core balancing process, including all assumptions for the estimated benefits assumed.

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- (h) Please state whether the feasibility study's findings show that the estimated incremental potential benefits shown in item (g) above outweigh the estimated potential costs shown in item (b) above.
- (i) Please state whether SoCalGas/SDG&E have considered any other alternative/s to incorporating AMI data into the core balancing process that could provide similar expected incremental benefits described in item (e).

**RESPONSE 1:**

- (a) SoCalGas and SDG&E did not conduct a "feasibility study." Mr. David Mercer and Mr. Jerry Stewart did estimate several of the potential costs in determining the feasibility of enabling Hour Lag Data (defined in Mr. Mercer's direct testimony as data taken at the top of each hour that would be available to balancing agents at the top of the following hour) through SoCalGas' and SDG&E's AMI systems. Certain costs were not included in these estimates and there were no studies performed to determine whether the items / action items described in these excluded costs were obtainable / feasible.

The intent of this Application was to comply with Ordering Paragraph 12 of D.16-12-015. As such, SoCalGas' and SDG&E's requested relief is for the Commission to: (1) approve their proposal of incorporating AMI data into SoCalGas' core forecast once AMI installation is complete and sufficient historical data is available; and (2) grant other such relief as necessary and prudent.

- (b) Please see Responses 3 and 4.
- (c) Please see Responses 3 and 4.
- (d) Please see Responses 3 and 4.
- (e) Mr. Sharim Chaudhury's direct testimony describes the incremental benefits of incorporating AMI data into SoCalGas' core forecast. In particular, Mr. Chaudhury describes how the accuracy of the SDG&E forecast has improved by incorporating AMI data since December 1, 2016. As illustrated on page 6 of Mr. Chaudhury's direct testimony in the chart and table titled "SDG&E Daily Core Demand Forecasts: Percentage

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Error,” SDG&E lowered its core forecast’s mean absolute percentage error (MAPE), a commonly used metric to compare the accuracy of alternative forecasts, when it began incorporating AMI data into its core forecast. SoCalGas expects that incorporating AMI data into its core forecast when AMI installation is complete and sufficient data is available will also result in an improvement of its core forecast’s accuracy.

SoCalGas’ core forecast does not require Hour Lag Data in order to benefit from using AMI data. Additionally, SoCalGas does not require any additional revenues to incorporate AMI data into its core forecast once AMI installation is complete and sufficient historical data is available.

- (f) No.
- (g) N/A.
- (h) N/A.
- (i) SoCalGas and SDG&E have not considered any other alternatives to incorporating AMI data into the core balancing process other than incorporating AMI data into SoCalGas’ core forecast as described in Mr. Chaudhury’s testimony, and potentially achieving Hour Lag Data as described in Mr. Mercer and Mr. Stewart’s testimonies. SoCalGas and SDG&E are not recommending Hour Lag Data as an appropriate incorporation of AMI data into the core balancing process.

SoCalGas does not believe that Hour Lag Data may be achieved on its AMI system for a total cost that is less than the sum of the potential costs presented in Mr. Mercer’s direct testimony.

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**QUESTION 2:**

At page 5 of above subject, SoCalGas and SDG&E further state that they “propose to incorporate SoCalGas’ Advanced Meter data into the core forecasting process when SoCalGas’ AMI installation is complete and sufficient historical AMI data is available for SoCalGas’ retail core customers with which to develop a statistical model.”

- (a) For SoCalGas, please provide an estimated timeline for implementation to incorporate AMI data into the core balancing process including when SoCalGas’ AMI installation is expected to be complete and when sufficient historical AMI data is expected to be available for SoCalGas’ retail core customers to develop a statistical model.
- (b) For SDG&E and SoCalGas, please provide an estimate of the time needed to redeploy the AMI infrastructure that would enable SDG&E and SoCalGas to obtain hourly meter readings.
- (c) Given the SoCalGas timeline in item (a) above, please provide an estimated timeframe (i.e., month(s)/year(s)) for when SoCalGas and SDG&E would be able to begin utilizing and incorporating the hourly AMI data/information into each of their core forecasts.

**RESPONSE 2:**

- (a) Per Advice Letter 5134, SoCalGas anticipates completion of its advanced meter system by December 31, 2018. As stated in Mr. Chaudhury’s direct testimony, page 9: “After SoCalGas’ AMI system is completely installed, a minimum of one year of historical data is required to estimate the DLFM model parameters.” Based on this, SoCalGas expects the minimum amount of historical AMI data required to develop a statistical model to be available by December 31, 2019, one year after the anticipated completion of the advanced meter system.

Even after this minimum required amount of SoCalGas historical AMI data becomes available, further work will be necessary to develop a forecasting model based on the data. Because the development of forecasting models is often not a completely straight-forward and predictable process, SoCalGas is not certain of when the SoCalGas AMI data will be fully

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---

incorporated into core forecasting process. However, SoCalGas estimates that this may be possible by the end of the summer of 2020.

- (b) SoCalGas does not need to redeploy its AMI infrastructure to obtain hourly meter reads because its AMI system currently captures hourly meter reads. As stated in response to 2(a) above, SoCalGas expects that its advanced meter system will be complete by December 31, 2018.

SDG&E's AMI data has already been incorporated into its core forecasting process. However, hourly meter reads are not available using SDG&E's current AMI systems. Any effort for SDG&E to obtain either hourly meter reads or Hour Lag Data, as described in Mr. Stewart's testimony, would require redeployment of its advanced meter system, which is estimated to take approximately 2.5 years from the initiation of such a project.

- (c) As stated in the response to 2(a) above, SoCalGas estimates that it may be able to begin fully incorporating its hourly AMI data into its core forecasting process by the end of the summer of 2020.

SDG&E's daily AMI data has already been incorporated into its core forecasting process. However, without a complete redeployment of its AMI-enabled gas modules, hourly SDG&E AMI data/information cannot be obtained for incorporation into the core forecasting process. As stated in response to 2(b) above, such a redeployment effort would require approximately 2.5 years to complete, after which a minimum one year of historical AMI data will be required to develop a statistical model. Once this minimum required amount of historical AMI data becomes available, further work will be necessary to develop a forecasting model based on the data.

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**QUESTION 3:**

At page 7 of the above subject, SoCalGas/SDG&E state:

“Because SDG&E’s AMI gas modules do not currently obtain hourly reads, and the method in which the reads are transferred and collected would not make it possible to enable Hour Lag Data with the current AMI technology, obtaining Hour Lag Data would require a complete redeployment of SDG&E’s AMI-enabled gas modules.”

Page 3 of Mr. Jerry Stewart’s prepared testimony for SoCalGas/SDG&E states:

“Reinstallation of new AMI enabled gas modules and additional network relays to support additional network bandwidth would cost at least \$200 million. Additionally, SDG&E back office systems would also have to be evaluated in relation to their ability to deliver Hour Lag Data. If the Commission finds that such a solution should be prepared, SDG&E would need to file a separate business plan application for approval.”

- (a) Please provide a breakdown of the estimated \$200 million of potential costs by category (i.e., capital/expense) identified in Mr. Stewart’s testimony for SDG&E’s AMI.
- (b) Please state whether the \$200 million of estimated potential costs are based on high level estimates and describe how these estimates were arrived at, including whether any quotes were obtained from a market canvass of suppliers.

**RESPONSE 3:**

- a. Please see the following table for a breakdown of the estimated \$200 million of potential costs to deliver Hour Lag Data.

**SDG&E Core Estimated Costs Summary for Hour Lag Data**

	Totals
<b>Internal Labor</b>	
Direct Costs	\$ 1,170,000.00
CFG Internal Labor	\$ 58,500.00

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CFNC Internal Labor	\$ 58,500.00
Subtotal (Direct+CFG+CFNC)	\$ 1,287,000.00
Labor Loader	\$ 1,253,924.10
Subtotal (Direct+CFG+CFNC+Labor Loader)	\$ 2,540,924.10
Admin &General	\$ 40,540.50
<b>Internal Labor Total</b>	<b>\$ 2,581,464.60</b>

**Hardware**

Direct Costs	\$ 85,104,600.00
CFG Non Labor	\$ 4,255,230.00
CFNC Non Labor	\$ 4,255,230.00
Subtotal (Direct+CFG+CFNC)	\$ 93,615,060.00
Property Tax Loader	\$ 468,075.30
Non Labor Loader	\$ 702,112.95
Subtotal (Direct+CFG+CFNC+Labor Loader)	\$ 94,785,248.25
Admin &General	\$ 2,948,874.39
<b>Hardware Total</b>	<b>\$ 97,734,122.64</b>

**Vendor Services**

Direct Costs	\$ 87,666,600.00
CFG Non Labor	\$ 4,383,330.00
CFNC Non Labor	\$ 4,383,330.00
Subtotal (Direct+CFG+CFNC)	\$ 96,433,260.00
Non Labor Loader	\$ 723,249.45
Subtotal (Direct+CFG+CFNC+Labor Loader)	\$ 97,156,509.45
Admin &General	\$ 3,037,647.69
<b>Vendor Services Total</b>	<b>\$ 100,194,157.14</b>

**Non Labor Totals**

Non Labor Totals (Direct+CFG+CFNC) excluding A&G	\$ 190,048,320.00
Non Labor Totals (Direct+CFG+CFNC+ Loaders) excluding A&G	\$ 191,941,757.70
<b>Non Labor Totals (Direct+CFG+CFNC+ Loaders + A&amp;G)</b>	<b>\$ 197,928,279.78</b>

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**Capital Grand Totals**

Labor + Non Labor A&G Total	\$ 6,027,062.58
Labor + Non Labor Totals (Direct+CFG+CFNC) excluding A&G	\$ 191,335,320.00
Labor + Non Labor Totals (Direct+CFG+CFNC+ Loaders) excluding A&G	\$ 194,482,681.80
<b>Labor + Non Labor Totals (Direct+CFG+CFNC+ Loaders + A&amp;G)</b>	<b>\$ 200,509,744.38</b>

- b. Given the scope of this proceeding, SDG&E has developed an illustrative cost to deliver Hour Lag Data. This was based on general information and related advanced meter implementation activities. No quotes were obtained from a market canvass of suppliers. These costs are for informational purposes only and are presented to provide a sense of the magnitude of the project.

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**QUESTION 4:**

At page 7 of the above subject, SoCalGas/SDG&E state that Mr. David Mercer's testimony "describes the minimum system enhancements and related estimated expenses that would be needed to make available "Hour Lag Data" (as that term is defined in his testimony) with the level of accuracy that could be allocated and aggregated to the respective core Balancing Agents."

At pages 7 through 9 of the prepared testimony of Mr. Mercer in the above subject application, several different costs were identified to be potential costs associated with incorporating AMI data into the core balancing process for SoCalGas, which in the aggregate, amount to a combined estimate of \$733 million.

- (a) Please confirm that ORA's understanding of the total aggregate amount of \$733 million of potential costs as described above for SoCalGas is correct.
- (b) Please provide illustrative rate impacts for both SDG&E and SoCalGas' customers given the respective \$200 million and \$ 733 million potential costs to reinstall new AMI enabled gas modules that would support additional network relays for transmitting hourly data.
- (c) Please state all assumptions, including the basis for them, in your response to item (b) above.

**RESPONSE 4:**

**Revised Response Dated December 14, 2017**

- a. The AMI application (A.08-09-023), which includes project implementation planning, took over a year to develop at significant expense. Given the scope of the current proceeding, SoCalGas has developed an illustrative cost to implement the outlined minimum system requirements. This was based on information (not formally quoted or contracted) provided by Aclara, SoCalGas' AMI vendor, and related advanced meter implementation activities as understood by the team members who participated on the

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AMI project. These costs are for informational purposes only and are presented to provide a sense of the magnitude of the project. SoCalGas did not include a summary table of the costs because SoCalGas did not want to imply that \$733 million would be the total project cost necessary to provide Hour Lag Data. In addition to the known unknown costs, examples of which are outlined within sections III-C and III-D of Mr. Mercer's testimony, SoCalGas' estimate does not include any contingency. Rather, \$733 million is best viewed as the beginning stage of the project estimation process. If directed to proceed, it is expected that a project team would work through the analysis required to provide a complete cost estimate (as was performed with the original AMI application). That team will likely uncover many cost components and project elements that were not anticipated, understood, or fully developed at this preliminary stage of the estimation process.

- b. SDG&E and SoCalGas did not prepare rate impacts as part of its filing. **However, in order to provide a sense of the potential magnitude, SDG&E and SoCalGas generated illustrative rate impacts for the purposes of responding to this question using "rules of thumb" for developing revenue requirements. These revenue requirements are \$133 million for SoCalGas and \$36 million for SDG&E. The attached Excel file shows the first-year rate impacts under three rate allocation methods: Equal Percent of Authorized Margin (EPAM), Equal Cents per Therm (ECPT), and ECPT Noncore Only (i.e., all costs allocated to only noncore customers).**



ORA SCG-D1

- c. **See Response 4.b.**