Exhibit A

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF COLORADO
* * * * *

RE: IN THE MATTER OF THE APPLICATION OF PUBLIC SERVICE COMPANY OF COLORADO FOR AN ORDER GRANTING A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR DISTRIBUTION GRID ENHANCEMENTS, INCLUDING ADVANCED METERING AND INTEGRATED VOLT-VAR OPTIMIZATION INFRASTRUCTURE	)	**PROCEEDING NO. 16A-0588E**

UNOPPOSED COMPREHENSIVE SETTLEMENT AGREEMENT

Introduction and Identification of Parties

This Settlement Agreement is a full and complete resolution of all issues raised in Proceeding No. 16A-0588E, Public Service Company of Colorado's ("Public Service" or the "Company") Verified Application ("Application") for approval of a Certificate of Public Convenience and Necessity ("CPCN") for distribution grid enhancements, including Advanced Metering Infrastructure ("AMI") and Integrated Volt-VAr Optimization Infrastructure ("IVVO"). The Settlement Agreement is joined by the following parties to this proceeding: Public Service, Commission Trial Staff ("Staff"), the Colorado Office of Consumer Counsel ("OCC"), the Colorado Energy Office ("CEO"), Colorado Energy Consumers ("CEC"), the Colorado Solar Energy Industries Association ("COSEIA"), Energy Freedom Coalition of America ("EFCA"), Energy Outreach Colorado ("EOC"), the Mission:data Coalition, Inc. ("Mission:data"), Southwest Energy Efficiency Project ("SWEEP"), and Western Resource Advocates ("WRA") (the "Settling Parties"). The remaining party, the City of Boulder ("Boulder"), has authorized the Settling Parties to

state that it neither supports nor opposes this settlement. Thus, this Settlement Agreement is unopposed.

Background

On August 2, 2016, Public Service filed an Application requesting the Commission grant to it a CPCN to implement AMI, IVVO, and the associated components of an advanced communications network (known as the Field Area Network or "FAN") to support the AMI and IVVO (collectively "CPCN Projects"). While these projects are part of the Company's broader Advanced Grid Intelligence and Security ("AGIS") initiative,[1] the Company sought a CPCN for AMI, IVVO, and the associated components of the FAN due to the magnitude of the investments, and because these technologies are newer in Colorado and will further extend the capabilities of the Public Service distribution system.

AMI consists of meters that will measure and transmit voltage, current, and power quality data via the FAN and can act as sensors providing near real-time monitoring to the Company and customers, which cannot be done by the Company's existing automated meter reading ("AMR") meters.[2] IVVO will use the voltage information transmitted by AMI meters to automate and optimize the operation of distribution voltage, ultimately allowing the Company to lower voltage across the system.[3] The portions of the FAN associated with AMI and IVVO that were requested as part of the CPCN Projects are the communications network that will facilitate the flow

[1] Application, pp. 1–2. In its Application, the Company also explained that the broader AGIS initiative includes components that the Company intends to implement in the ordinary course of business, which are: the Advanced Distribution Management System ("ADMS"), Fault Location Isolation and Service Restoration ("FLISR"), Fault Location Prediction ("FLP"), Geospatial Information System ("GIS"), and the FAN not associated with the CPCN Projects. Application, p. 8, ¶ 3. The Company did not seek a CPCN for these projects on the grounds that they are foundational components of the grid and/or logical extensions of work that utilities have traditionally performed and signify the continued use of advancing technologies in a normal evolution of the business.
[2] *Id.* at p. 10, ¶ 7.
[3] *Id.* at p. 10, ¶ 8.

of information between the existing communications infrastructure at the Company's substations and the other components of the AGIS initiative, such as AMI meters and the intelligent field devices.[4] In its Application, the Company estimated that the CPCN Projects would cost approximately $562 million and would be deployed between 2016 and 2021.[5]

Public Service supported its Application with the Direct Testimony and attachments of eight (8) witnesses.

The Commission deemed the Application complete in Decision No. C16-0845-I mailed on September 12, 2016, and set the hearing *en banc*. In the same Decision the Commission acknowledged the intervention by right of Staff, OCC, and CEO, and granted the permissive interventions of Boulder, CEC, COSEIA, EFCA, EOC, Mission:data, SWEEP, and WRA (collectively, the "Parties").

On January 25, 2017, eight (8) of the parties filed Answer Testimony: Staff, OCC, CEO, COSEIA, EOC, Mission:data, SWEEP, and WRA. CEC, Boulder, and EFCA did not file Answer Testimony in the proceeding.

On March 2, 2017, Public Service filed Rebuttal Testimony of five (5) witnesses, and Staff, OCC, WRA, CEO, SWEEP, and Mission:data filed Cross-Answer Testimony.

After the filing of Rebuttal and Cross-Answer Testimony, the Settling Parties engaged in settlement discussions, which culminated in this Settlement Agreement.

While the Settlement Agreement contains the common provision stating that this Settlement Agreement and the compromises herein are supported by the pre-filed testimony that has been submitted by the parties, the Settling Parties believe it is

[4] *Id.* at p. 11, ¶ 9.
[5] *Id.* at p. 4, and pp. 11-12 ¶11.

appropriate to emphasize in this Background section three aspects of the Company's AMI proposal. First, the Company is undertaking the roll-out of advanced meters as an upgrade to its distribution system. The AMI meters provide functionality beyond traditional consumption measurement for billing purposes. A few examples are but not limited to the following: (1) AMI meters measure and transmit distribution system information (e.g., voltage and current) to more efficiently manage the distribution grid (e.g., more accurate tracking and responding to outages); (2) the first 13,000 AMI meters will enable IVVO and will act as sensors for that purpose; and, (3) providing detailed energy use data to customers and other authorized persons.

Second, while new AMI meters have increased capabilities as compared to existing AMR meters, the cost of a new AMI meter also exceeds the cost of a new AMR meter.

Third, the Company intends to replace all of its customers' meters in areas that will have FAN connectivity with AMI meters on a system-wide basis, including replacing those AMR meters that are not yet at the end of their useful life, regardless of the present operational capability of the existing meters. There may be some isolated areas where it is cost prohibitive to have FAN connectivity; the Company will implement another meter alternative in these rare instances.

Settlement Terms

I. Common Settlement Principles Applicable to Both AMI and IVVO.

A. The Settling Parties support issuance of a CPCN for the implementation of IVVO, AMI and the associated FAN. The conditions presented throughout the remainder of this Settlement Agreement concern how these CPCN Projects will be

implemented. To the extent there are provisions in the Company's Direct or Rebuttal Testimonies that are contradicted by or modified by the provisions in this Settlement Agreement, the provisions in the Settlement Agreement shall control, e.g. timelines to install AMI meters or projected capital and O&M costs incurred.

B. While specific terms for IVVO implementation and AMI deployment are detailed in Sections II and III below, the following common principles apply to the implementation of both.

1. Cost Recovery Management - The public interest is served by containing the overall costs of the CPCN Projects and limiting resulting rate impacts on customers. Thus, the Settling Parties recognize that the decision regarding the continuation of the deferred accounting mechanisms described below in Sections II and III, in whole or in part, should be determined in a base rate case rather than in this Proceeding. Additionally, the timelines for implementation have been modified to accommodate a longer deployment plan than originally proposed by the Company. It is also reasonable to implement financial measures to mitigate future rate impacts. Therefore, the Settling Parties agree to continued deferred accounting for operations and maintenance ("O&M") expenses as well as capital investments beyond the first rate case in which those costs could be included in base rates. The following principles will govern the deferral of costs associated with AMI, IVVO, and the associated FAN:

a. In accordance with the deferral language included in each section below, two deferred accounting mechanisms will be established for each project: one for deferred capital investment and one for O&M expenditures.

b. In the event the sum of the two capital investment deferrals totals $50 million or greater, the Company will begin to assess an interest rate equal to the Company's after-tax weighted average cost of capital ("WACC") on the balance of the deferred account until such amounts are included in base rates and an amortization of the deferred balance is initiated.

c. Amortization of the O&M deferral shall be at least in a proportionally equal manner as the amortization associated with the capital investment deferral.

2. Reporting Requirements

a. The Company shall provide the semi-annual reporting regarding investment and deployment as proposed in its Direct and Rebuttal Testimonies, including but not limited to: (1) the total costs per year of the AMI meter installation, (2) the final cost per AMI meter, excluding installation and taxes, (3) the final cost per AMI meter including installation and taxes, and (4) the total number of AMI meters installed each year. The Company's reporting shall also include planning and implementation of customer education.

b. Stakeholders may request additional metrics for reporting purposes via normally available means, such as informal information requests, litigated proceedings before the Commission, or existing stakeholder groups.

II. IVVO

This section of the Settlement Agreement describes the implementation of IVVO, including associated cost and cost recovery issues.

A. IVVO Implementation Timeline - The Company will implement IVVO on its system consistent with the timeline and scope put forward in its Rebuttal Testimony with implementation commencing in 2017 and continuing through 2022 (Rebuttal Testimony of John D. Lee, Table JDL-R-1, page 5) with the exception of the provision contained in Table JDL-R-1 that 95% of the AMI meters will be installed by the end of 2021. The deployment of AMI meters is stated in Section III. A. below and Attachment B.

B. IVVO Implementation Methodology

1. IVVO will be implemented by installing approximately 13,000 advanced meters to function initially as voltage sensing devices ("IVVO Voltage Sensing Meters"). These will be the same types of meters, with the same capabilities, as those the Company will acquire for the AMI implementation across its service territory in Colorado.
2. A specific geographic portion of the FAN and software components will be necessary to achieve full functionality of IVVO for communication, operations, and integration into the billing system. These components will also be installed in this initial stage in order to achieve full IVVO functionality pursuant to the Company's Rebuttal position, with the exception of the provision in Table JDL-R-5 that 95% of the AMI meters will be installed by the end of 2021 and that the projected capital costs and O&M costs will be incurred through 2024 for AMI

meters rather than through 2022 as depicted in Tables JDL-R-6 and JDL-R-7. (Rebuttal Testimony of John D. Lee, pages 49-52).

3. In the event it is necessary for an existing AMR meter located within the IVVO implementation footprint to be replaced, the Company will replace that meter with the same meter as those utilized for IVVO implementation provided the communications network is available and capable of reading the meter at that location. A "necessary" replacement is one that results from existing AMR meter operational malfunction or failure. The objective of this provision is to minimize incremental AMR expenses that would be incurred prior to a full advanced meter roll-out. The cost difference between the AMR and IVVO capable meter shall be afforded deferred accounting treatment as described below in the IVVO and Associated Infrastructure Costs (II.D.3) section.

C. IVVO Implementation Costs - To achieve the agreed-upon IVVO implementation, a cost of $32.9 million above the cost of IVVO implementation presented in the Company's Rebuttal Testimony is estimated to be incurred during the IVVO deployment timeframe versus during the AMI deployment. This is a cost shift in project accounting from the AMI to the IVVO portions of the CPCN Projects, but is not an additional cost to the CPCN Projects overall. This cost shift will result in the following estimated total cost for the implementation of IVVO:

Table 1

Cost Descriptor (capital & O&M)	Base Amount	Contingency	Total
Rebuttal Cost of IVVO Implementation (2016-2022)	$131.4 M	$25.8 M	$157.2 M
Cost Shift from AMI	17.1 M	15.8 M	32.9 M
Incremental Cost Impact	3.6 M	0	3.6 M
Total IVVO Implementation Cost Estimate	**$152.1 M**	**$41.6 M**	**$193.7 M**

The change in the IVVO implementation schedule, described above in Section II.B, will result in an incremental cost of approximately $3.6 million above the Company's Rebuttal Testimony cost estimate.

D. IVVO Cost Recovery

1. The Settling Parties agree to conditional recovery for the impact of measurable decreased energy consumption attributable to IVVO implementation as follows:

   a. In the event that (1) no decoupling mechanism is approved in Proceeding No. 16A-0546E, (2) a decoupling mechanism for less than the entire Residential and Small Commercial Class is approved; or (3) a decoupling mechanism is approved with a cap that does not afford the Company the ability to offset the measurable financial impacts attributable to decreased energy consumption resulting from IVVO deployment, the Settling Parties agree to provide the Company an opportunity to account for and reasonably recover incremental amounts associated with such measurable decreased energy consumption.[6] The Settling Parties agree to allow a mechanism to offset such measurable decreased energy consumption in this narrow circumstance, particularly when the Company

[6] As described in Attachment A.

is investing its own capital in an IVVO project. The amounts to be collected will be based on the measurable reduced energy use attributable to IVVO multiplied by the applicable fixed cost component of base usage charges for residential and small commercial customers. The measurable reduced energy use will be derived and recovered through the following:

i. The measurable energy reduction due to IVVO will be calculated as described in Attachment A.

ii. The Company will calculate the reduced kilowatt-hours ("kWh") for residential and small commercial customers on an annual basis and record the measurable financial impact as a deferred accounting asset. For each annual deferral amount, the recovery of the deferred amount shall be completed within twenty-four (24) months of the end of that calendar year.

iii. The Company will report annually the calculated kWh reductions and associated measurable financial impact based on such kWh reductions resulting from the application of the procedure included in Attachment A as part of the annual Electric Commodity Adjustment ("ECA") review filing (currently filed on or before August 1 of each year).[7] Interested parties may review and comment on the application of the Attachment A formula and process by filing a

[7] Utilization of the ECA for the purposes of this recovery provides for some level of symmetry with the fuel benefits that all customers will experience due to the reduced kWh consumed. Additionally, this utilization will be temporary and keeps customer bills simpler. If the conditions described in Section II.D.1.a. are not satisfied, the Company shall annually report estimated energy savings and M&V results in accordance with the methods described in Attachment A. Such reporting will begin in August 2020 for the prior year and will be filed in this proceeding, unless and until the Company files an application for an IVVO performance incentive.

pleading with the Commission according to the existing processes for review of the ECA.

iv. The Company shall be allowed to recover the approved amounts in the ECA in the appropriate residential and commercial rate classes (R and C) beginning on January 1 following the filing of the calculation. The recovery will be amortized in the ECA over a twelve (12) month recovery period.

v. The Settling Parties expect IVVO will provide at least 1.8% energy savings across the feeders with IVVO measured at the end of the first twelve months following completion of the IVVO and associated infrastructure installation.

b. In the event the Company completes a base rate case that includes any portion of the IVVO usage reductions in the forecasted or actual billing determinants, the Company shall present those anticipated reductions in a transparent manner, and propose an adjustment to the annual IVVO recovery calculation to account for changes to billing determinants in order to prevent and avoid double recovery. After all IVVO usage reductions associated with the initial deployment are captured in a base rate case, the Company will discontinue the IVVO recovery treatment provided for in this Settlement Agreement.

c. In the event that the approved decoupling mechanism resulting from a

Final Order of the Commission[8] only partially accounts for the measurable energy reductions attributable to IVVO, thus both the approved decoupling mechanism and the calculation contemplated in Attachment A continue simultaneously, the Settling Parties agree that the following provisions should also apply:

i. In order to avoid double recovery within each rate class, the calculation methodology in Attachment A, and therefore the resulting deferred accounting asset, shall be reduced by the measurable revenues to be recovered through the approved decoupling mechanism for the measurable energy reductions. The Company shall provide its methodology and calculation through the process outlined above in Section D.1.a for any amounts that it is requesting above what is received through an approved decoupling adjustment. Settling Parties reserve their right to challenge the Company's presented methodology and calculation. [9]

ii. This provision (c) recognizes the circumstances in D.1.a may restrict the Company's ability to avoid potential adverse financial impacts of its IVVO program. Therefore, the Settling Parties agree the Company should have a reasonable opportunity to recover through the Attachment A mechanism any remaining portion of the financial impacts of the measurable energy reduction not recovered through

[8] On May 2, 2017 the Administrative Law Judge issued Decision No. R17-0337 in the Decoupling proceeding (16A-0546E). As written, this Recommended Decision triggers treatment under D.1.a.
[9] Prior to the Company's first presentation of its methodology and calculation in a recovery request, the Company will work with interested Settling Parties to devise a mutually agreeable a methodology and calculation, to the extent possible.

decoupling.

2. After the IVVO implementation contemplated in this Settlement Agreement is complete and the associated implementation costs are fully included in base rates, the Company may file an application for approval of a performance incentive; provided, however, the Settling Parties agree that such an application is not appropriate in a demand side management ("DSM") plan proceeding or a "Strategic Issues" proceeding. The Company may make such a filing within 48 months of the end of the measurement time period. The performance incentive will only be available in the event that the results from IVVO surpass the projected savings of 1.8% energy consumption across the feeders with IVVO measured at the end of the first twelve months following completion of the IVVO and associated infrastructure installation. Nothing in this provision prevents other parties from proposing a performance incentive. Likewise, nothing in this provision waives any party's right to take any position in a performance incentive application or proposal. Further, nothing in this provision prohibits the Company from filing a separate application for any future incentive request based on metrics other than those described in this provision.

3. IVVO and Associated Infrastructure Costs

   a. The Company may apply deferred accounting treatment for expenses and any capital in service for the IVVO costs contemplated in this Settlement Agreement until these costs are included in base rates. The Company will provide a listing of the O&M expenses that will be deferred to assure that there is no double recovery of those expenses.

b. The Settling Parties acknowledge that continued deferral of these costs beyond the first available rate case is possible, as discussed above in the Common Settlement Principles Applicable to AMI and IVVO Implementation, Section I.B.

4. Transferring IVVO Costs to Rate Base - When the Company proposes to include IVVO and associated infrastructure costs in base rates, the Company will be obligated to present robust direct testimony with appropriate accompanying exhibits to justify any expenditures that are in excess of the base amount. Notwithstanding the Company's presentation of robust direct testimony, Parties are free to challenge the prudence of the expenditures to overcome such rebuttable presumption. Confidentiality may be requested as necessary.

E. Energy reductions associated with IVVO will not be included in the energy reductions accounted for in energy efficiency and DSM calculations for the purposes of incentive awards or the disincentive offset. Further, the Company's DSM goals will not be adjusted to include the IVVO energy or capacity reductions. As discussed above, energy (kWh) savings due to IVVO will be reported on an annual basis in the ECA proceedings.

F. Future IVVO Deployment Potential - In calendar year 2021, the Company shall provide a report to the Commission (in this proceeding) presenting an analysis of its system regarding potential future IVVO deployment. In this report the Company shall present where it expects subsequent IVVO deployment would result in optimal benefits to the system and to customers in those areas at an appropriate

cost. Pursuit of these deployments would be at the Company's discretion without the need for a CPCN, or as ordered by the Commission. Nothing in this provision limits or waives any party's right to take any position with respect to future IVVO deployments.

III. AMI

This section of the Settlement Agreement discusses the implementation of AMI, including associated costs and cost recovery issues, the HAN and Green Button CMD, and remote disconnections/reconnections. Regarding the implementation of AMI, this portion of the Settlement Agreement addresses the relationship between AMI deployment and the provisions of the Non-Unanimous Comprehensive Settlement Agreement approved by the Commission in Consolidated Proceeding No. 16AL-0048E.

A. Full advanced metering deployment should not begin until calendar year 2020 and that the deployment will proceed as shown below in Table 2.

Table 2

Year	Anticipated Number of AMI Meters Deployed (Cumulative)	Meter Functionality
2019	13,000	IVVO
2020	175,000	AMI
2021	570,000	AMI
2022	1,050,000	AMI
2023	1,500,000	AMI
2024	Remainder	AMI

Table 2 depicts the anticipated and approximate roll-out of AMI meters inclusive of those deployed during the IVVO timeframe. Additional detail regarding AMI deployment is set forth in Attachment B to this Settlement Agreement. The

Company's initial AMI deployment will concentrate in the areas where IVVO has been implemented. The meters initially deployed to provide IVVO functionality will eventually provide full AMI functionality, as AMI software and related systems are completed.

B. The Company agrees to present estimated bill impacts for customers following the full AMI meter deployment. This will occur in the earlier of either the Company's (1) next Phase II portion of a rate case, or (2) the Schedule Residential Energy Time Of Use ("RE-TOU") rate design Advice Letter to be filed on or before December 2, 2019. The Settling Parties recognize and acknowledge this will be an imperfect analysis because the underlying assumption will necessarily be that the base from which to compare is the most recently approved base rate determination and any other offsetting cost variables will not be taken into account.

C. In its 2019 DSM Plan, the Company will develop and submit a plan for enhancing its DSM programs with the functionality enabled by AMI installation. The 2019 DSM Plan will describe how the Company will utilize AMI data to engage with its customers for increased energy savings and peak demand reduction through ongoing or new DSM products, measures, or pilots. This Settlement Agreement does not limit Settling Parties in any manner regarding their positions in the 2019 DSM Plan docket.

D. The extended rollout of AMI is anticipated to increase the total cost of deployment by approximately $36.0 million, in 2016 dollars. Attachment C graphically reflects a comparison between the spend cycle associated with the Company's Rebuttal Testimony versus that agreed to through this Settlement Agreement, less any time

value of money impacts. Table 3 reflects the anticipated costs separated between distribution and business systems as well as contingency amounts based upon the Company's Rebuttal Testimony and the incremental amount stated previously for the impact of extending the roll-out of AMI deployment.

Table 3

Category of AMI Cost	Base Amount	Contingency	Total
Distribution	$223.8 M	$19.5 M	$243.3 M
FAN	22.8 M	9.2 M	32.0 M
Business Systems	76.3 M	67.6 M	143.9 M
Incremental for Delay	40.9 M	(12.3 M)	28.6 M
Increased Customer Count	6.8 M	0.6 M	7.4 M
Work Shifted to IVVO	(17.1 M)	(15.8M)	(32.9) M
Incremental IVVO Cost Shift	(3.6 M)	0	(3.6 M)
Total	**$349.9 M**	**$68.8 M**	**$418.7 M**

E. AMI and Associated Infrastructure Cost Recovery

1. Costs incurred for deployment of AMI and associated infrastructure for capital investments and O&M expenses shall be included in a deferral mechanism to the extent such costs are not included in the existing Service and Facilities ("S&F") Charge until the costs are included in base rates. The Company will provide a listing of the O&M expenses that will be deferred to assure that there is no double recovery of those expenses.
2. The Settling Parties acknowledge that continued deferral of these costs beyond the first available rate case is possible, and the treatment of such deferral is addressed in the Common Settlement Principles Applicable to AMI and IVVO Implementation Section above.
3. Transferring AMI Costs into Rate Base - In a rate case, when the Company proposes to include the AMI and associated infrastructure costs in base rates,

the Company will be obligated to present robust direct testimony with appropriate accompanying exhibits to justify any expenditures that are in excess of the base amount. Notwithstanding the Company's presentation of robust direct testimony, Parties are free to challenge the prudence of the expenditures to overcome such rebuttable presumption. The Company may request confidential treatment of this information as necessary.

4. AMI meters are utilized for more than measurement of a customer's consumption for billing purposes as discussed in the Background section above. Therefore, it is reasonable that some portion of the meter cost not be classified as a specific customer cost. In its next Phase I and Phase II rate proceedings, the Company shall present a proposal for assigning the portions of the AMI meter costs to the functions that cause those costs. The Settling Parties expressly reserve the right to raise any arguments concerning all elements of the proper allocation of costs in future rate cases.

F. RE-TOU Rate for Customers Prior to 2019 RE-TOU Advice Letter Decision

1. Pursuant to the Non-Unanimous Comprehensive Settlement Agreement approved by the Commission in Consolidated Proceeding No. 16AL-0048E, customers who receive AMI meters prior to a decision in the final Schedule RE-TOU Advice Letter will automatically be placed on the RE-TOU rate schedule, and will remain on that tariff pending a decision in the RE-TOU Advice Letter proceeding, with the option to opt-out during the first six (6) billing cycles and prior to the end of the seventh (7th) billing cycle. The Company shall use its best efforts to educate all such customers concerning the shift in rate design,

the bill impacts of the RE-TOU rate specific to that customer, the option to opt-out of the rate design, and the availability of tools to manage energy use. Customers who receive one of the approximately 13,000 advanced meters in 2019 as sensors for IVVO will not be placed on the RE-TOU rate until such meters are fully functional AMI meters with the necessary FAN connectivity.

2. In order to minimize any negative impacts of this rate design on low-income customers, the Company shall automatically extend the hold harmless provision that applies to low-income RE-TOU trial participants, as set forth in the Non-Unanimous Comprehensive Settlement Agreement approved by the Commission in Consolidated Proceeding No. 16AL-0048E to all low-income customers enrolled in Low-Income Energy Assistance Program ("LEAP") or that received EOC bill assistance payments within the preceding twelve months that are subsequently placed on the RE-TOU rate prior to the RE-TOU Advice Letter Decision.

G. Home Area Network ("HAN") [10]

1. Hardware Procurement and Installation

   a. Consistent with the Company's rebuttal position,[11] the Company will select and install meters that incorporate the HAN hardware, which is a software defined radio in the AMI meter, as part of this CPCN.

   b. In selecting and installing HAN hardware, the Company will utilize the best commercially available technology that provides a platform that may be updated remotely without hardware replacement.

[10] Nothing in this Section or throughout this Settlement Agreement is intended to circumvent the Commission's Data Privacy Rules, pursuant to Rules 3025-3035 of the Commission Rules Regulating Electric Utilities, 4 *Code of Colorado* Regulations, 723-3.
[11] Lee Rebuttal Testimony, at 82:20-21.

c. In the event that the costs to implement the HAN are higher than the embedded meter costs contained in either the Company's Direct or Rebuttal Proposals, these costs will be afforded the same presumption of prudence as the CPCN Project costs.

2. HAN Activation and Customer Experience

a. In a separate HAN Application, the Company will present a plan to activate the HAN in a manner that meets cybersecurity concerns consistent with industry standards and best practices at the time, while striving to provide easy data access to the extent prudent. This Application shall be filed no later than March 2018, with a goal of implementing the HAN concurrent with the full AMI roll-out beginning in 2020. The HAN Application shall also include:

i. Cybersecurity plan for HAN activation;

ii. The communications protocols to be utilized, how they do or do not promote easy data access by customers and energy service providers and why they were chosen;

iii. Plan for recovery in the event of a breach;

iv. All reasonable alternatives to the Company's cybersecurity plan and communication protocols that were considered and the reasons any such alternatives were determined to be insufficient;

v. Customer activation process;

vi. Outreach plan to inform and educate customers on how to activate their HAN, what information is available, as well as how they may

utilize the HAN information;

vii. Incremental costs (if any) to implement the HAN Application proposals; and,

viii. Within the customer portion of the Application, the Company shall consider and present information regarding the Company's position and recommendation on a customer's ability to: (1) provision their own device to interact with the HAN on the Company's web portal in as few steps as possible, and (2) "bring your own device" ("BYOD"), in which any customer with an AMI meter after AMI implementation with FAN connectivity may connect any device of their choice so long as it is standards compliant.

b. Portions of the HAN Application may be filed as Confidential or Highly Confidential pursuant to Commission rules to protect the sensitivity of the materials being provided.

H. Green Button Connect My Data

1. The Company's customer web portal shall include the ability for all customers to access their energy usage data and provide that data to third parties following required privacy waiver policies according to Rule 3027. The currently accepted standard to achieve this is known as Green Button CMD, which has been ratified by the ANSI-accredited North American Energy Standards Board.
2. The Company will implement Green Button CMD unless another standard is nationally adopted and the Company believes the new standard is superior to Green Button CMD.

3. The Company will provide reasonable notice to the Settling Parties in advance of its selection of another nationally adopted standard through a compliance filing in this proceeding, to which the other Settling Parties may respond. In the event the Company adopts another standard, the Company has the burden in its rate recovery filing to justify why the new standard is superior and should be afforded cost recovery.
4. In order to ensure compliance with the technical specifications of the Green Button CMD standard, the Company will annually test its Green Button CMD system. In the Company's annual DSM Report beginning the first calendar year after implementation of Green Button CMD, the Company shall present system availability metrics, the results of the annual test(s), information describing the test(s) conducted, as well as how any deficiencies will be remedied. Interested persons and Settling Parties may file responses to the report.
5. In implementing the Green Button CMD standard, the Company shall work to create a streamlined customer experience and minimize the number of screens and clicks required of the customer.
6. The Company will work to minimize the time lag between customer authorization and the start of the Company's Green Button CMD beginning transmission of data to an authorized third party.
7. The cost to implement Green Button CMD was not explicitly included in the cost of the Company's proposed CPCN. Implementing Green Button CMD may increase the overall cost of the CPCN implementation by up to $2.0 million. There is a presumption that this cost increase is considered a prudent

expenditure. Individual customers and customer-authorized third parties will not be charged to use Green Button CMD implemented as presently contemplated in this Settlement Agreement.

I. Remote Disconnection/Reconnection

1. Upon approval of this Settlement Agreement, the Company will engage with interested stakeholders to assemble a consensus proposal and request to the Commission for a Rulemaking to consider how the implementation of AMI meters and their capabilities associated with Remote Disconnection/Reconnection should be utilized.
2. Until at least the aforementioned rulemaking is concluded, the Company will continue its practice for disconnect for non-payment[12], which is compliant with Commission Rules, regardless of the availability of remote disconnection. Disconnection following any in-person visit may be executed remotely.

J. Customer AMI Opt-Out

1. Customers should have the option to opt-out of having an AMI meter installed. These customers should be allocated the cost of continuing to read, maintain, and stock the alternative meters.
2. The Company's proposal regarding the meter type to be installed for these customers, as discussed in the Company's Direct Testimony, is approved.[13]
3. For purposes of this Settlement Agreement, the rates proposed by the

[12] Currently, the Company sends a disconnection letter allowing the customer 15 days to pay a past due bill and if that amount is not paid within 15 days the account is placed in collections. Then the Company makes a first attempt to contact the customer via telephone and if the Company is successful in that contact the account is put on a one day hold. When that one day hold expires without payment the account goes into a routing system to be assigned to the field for disconnection. If the first contact via telephone is unsuccessful the account is put into the collections router for a notice to be left on the customer's door advising them they have 24 hours to pay or they will be disconnected. If the customer has not paid the noticed amount within the 24 hour period the Company will send a field collector out to the customer's property to attempt collection prior to the disconnecting service.
[13] Direct Testimony and Attachments of Russell E. Borchardt, 59: 3-10.

Company for customers who opt out of having an AMI meter will not be adopted as filed in its Application in this proceeding. On or before the fourth quarter of 2018, the Company shall file an advice letter with the Commission to establish the tariff for these customers that are opting out. In this filing the Company shall consider methods to mitigate the cost impact of reading the meter, such as how the customer may participate in billing programs (e.g., average billing) so their meter does not need to be read every month.

General Provisions

1. Each Settling Party understands and agrees that this Settlement Agreement represents a negotiated resolution of all issues the Settling Party either raised or could have raised in this proceeding. Each Settling Party understands that the Commission's approval of this Settlement Agreement shall constitute a determination that the Settlement Agreement represents a just, equitable, and reasonable resolution of these issues. Accordingly, the Settling Parties state that reaching resolution of these issues in this proceeding through this negotiated Settlement Agreement is in the public interest and that the results of the compromises and agreements reflected in the Settlement Agreement are just, reasonable, and in the public interest.
2. Each Settling Party has the discretion to sponsor a witness at any proceeding the Commission holds to address the Settlement Agreement. In the event that a Settling Party sponsors a witness, its witness will only testify in support of the Settlement Agreement and all of the terms and conditions of the Settlement Agreement.

3. The Settling Parties agree that all pre-filed testimony and exhibits in the proceeding submitted prior to the filing of this Settlement Agreement by any Party shall be admitted into evidence.

4. Except as expressly stated herein, nothing in this Settlement Agreement shall resolve any principle or establish any precedent or settled practice. Moreover, nothing in this Settlement Agreement shall constitute an admission by any Settling Party of the correctness or general applicability of any principle, or any claim, defense, rule, or interpretation of law, allegation of fact, regulatory policy, or other principle underlying or thought to underlie this Settlement Agreement or any of its provisions in this or any other proceeding. As a consequence, no Settling Party in any future negotiations or proceedings whatsoever (other than any proceeding involving the honoring, enforcing, or construing of this Settlement Agreement in those proceedings specified in this Settlement Agreement, and only to the extent, so specified) shall be bound or prejudiced by any provision of this Settlement Agreement.

5. The discussions among the Settling Parties that produced this Settlement Agreement have been conducted with the understanding, pursuant to Colorado law, that all offers of settlement, and discussions relating thereto, are and shall be privileged and shall be without prejudice to the position of any of the Settling Parties and are not to be used in any manner in connection with this or any other proceeding.

6. This Settlement Agreement shall not become effective until the issuance of a final Commission Decision approving the Settlement Agreement, which Decision does

not contain any modification of the terms and conditions of this Settlement Agreement that is unacceptable to any of the Settling Parties. In the event the Commission modifies this Settlement Agreement in a manner unacceptable to any Settling Party, that Settling Party shall have the right to withdraw from this Agreement and proceed to hearing on any issue(s) that may be appropriately raised by that Settling Party. The withdrawing Settling Party shall notify the Commission counsel, Commission advisors, and the Settling Parties to this Settlement Agreement by email within three (3) business days of the Commission modification that the party is withdrawing from the Settlement Agreement and that the party desires to proceed to hearing; the email notice shall designate the precise issue or issues on which the party desires a rehearing (the "Hearing Notice").

7. The withdrawal of a Settling Party shall not automatically terminate this Agreement as to any other party. However, within three (3) business days of the date of the Hearing Notice from the first withdrawing party, all Settling Parties shall confer to arrive at a comprehensive list of issues that shall proceed to hearing and a list of issues that remain settled as a result of the first party's withdrawal from this Settlement Agreement. Within five (5) business days of the date of the Hearing Notice, the Settling Parties shall file with the Commission a formal notice containing the list of issues that shall proceed to hearing and those issues that remain settled together with a proposed procedural schedule. The Settling Parties who proceed to hearing shall have and be entitled to exercise all rights with

respect to the issues that are heard that they would have had in the absence of this Settlement Agreement.

8. All Parties have had the opportunity to participate in the drafting of this Settlement Agreement. There shall be no legal presumption that any specific Settling Party was the drafter of this Settlement Agreement.

9. This Settlement Agreement may be executed in counterparts, all of which when taken together shall constitute the entire Settlement Agreement with respect to the issues addressed by this Agreement.

Dated this 8th day of May 2017.

Respectfully submitted,

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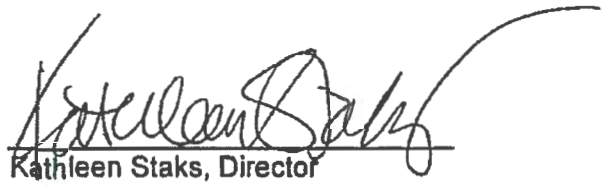
By: 

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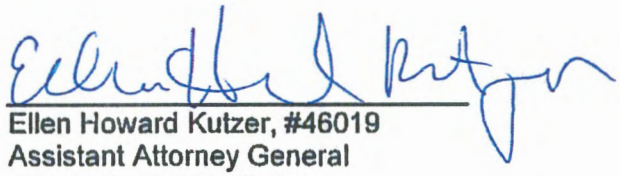
By: 

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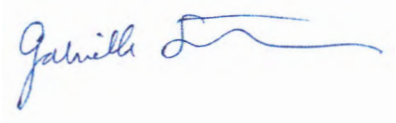

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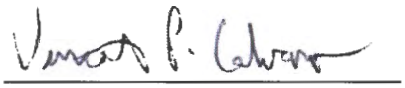
By : 

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ATTORNEYS FOR THE COLORADO ENERGY CONSUMERS

Purpose

The purpose of this document is to outline the formula and methodology for determining the measurable energy reductions and associated decreased contributions to fixed costs due to IVVO.

Calculation of Measurable Energy Reductions Due to IVVO

The following formulas will be used to calculate energy reductions for each distribution feeder due to IVVO.

$$\%\ Energy\ Reduction = \%_E = \frac{(V_{Historic\ Average} - V_{Hourly})}{V_{Nominal}} * (CVRf)$$

As readings at field devices will be net readings (inclusive of any IVVO savings), an adjustment will need to be incorporated in order to ensure that energy readings represent what they would have been absent IVVO. The formula for energy reduction, including that adjustment, is below.

$$Energy\ Reduction\ (kWh) = \ \Delta E = \frac{\%_E}{1 - \%_E} * (Energy_{Hourly\ Net})$$

Average Voltage *($V_{historic\ average}$)*

The Public Service SCADA system records voltage measurements on an hourly basis at each substation transformer bus (grouping of 1-5 feeders). When determining average voltage, PSCo will retrieve these measurements for a time period of 2 years (prior to IVVO enablement) and will use that data to derive an average voltage level for each feeder.

For each transformer, some additional work will be required to correct for outlier measurements (loss of communications or inaccurate readings).

Hourly Voltage *(V_{hourly})*

After IVVO is enabled, hourly substation transformer voltage measurements will be retrieved on a yearly basis.

Nominal Voltage *($V_{nominal}$)*

ANSI C84.1 defines an acceptable voltage range for operation. ANSI defines the Nominal Voltage as being near the voltage level at which the system normally operates which is a nominal voltage of 120V basis.

$V_{historic\ average}$ and V_{hourly} will establish the voltage difference for customers when operating IVVO and will be divided by $V_{nominal}$ as the typical customer voltage and as a means to convert voltage measurements to a percentage. For example, a 2V difference would then be divided by the 120V to show a voltage percentage of 1.67%.

Hourly Energy ($Energy_{Hourly\ Net}$)

Public Service records hourly feeder demand on a per feeder basis. As energy is simply demand over time, that hourly reading can be used in conjunction with hourly bus voltage to derive an hourly savings.

As with voltage, some additional work will be required to correct for outlier measurements (loss of communications or inaccurate readings).

CVR Factor *(CVRf)*

Over the past 5 years, the Company has undertaken a small IVVO pilot project in PSCo, and observed a conservation voltage reduction ("CVR") factor from that project. The Company has also worked closely with EPRI (Green Circuits study) to understand what a typical CVR factor range is for the industry. The pilot projects yielded a CVR factor of around 1.0, and EPRI's Green Circuits study indicated that a CVR factor should be expected in the range of 0.6 – 0.8. Based on data from the two studies above, the company proposes to use a 0.8 CVR factor until additional CVR Measurement and Verification can be conducted across the PSCo system. A CVR factor of 0.8 aligns with the previous DVO filing made in Docket No. 13A-0686EG.

Company Proposed CVR Factor

Based on data from the two studies above, the company proposes a 0.8 CVR factor for 2019. In addition, the company includes a 2% reduction to CVR factor per year, to reflect customer behaviors shifting towards more power electronics based load types with lower CVR factors. This results in a 2025 CVR factor of around 0.71 (after the end of the IVVO deployment).

Proposed CVR Factors by Year *(CVRf)*

2019	.80
2020	.78
2021	.77
2022	.75
2023	.74
2024	.72
2025	.71

Hourly Energy ($Energy_{Hourly\ Net}$)

Public Service records hourly feeder demand on a per feeder basis. As energy is simply demand over time, that hourly reading can be used in conjunction with hourly bus voltage to derive an hourly savings.

As with voltage, some additional work will be required to correct for outlier measurements (loss of communications or inaccurate readings).

CVR Factor Measurement and Verification

The Company currently records the demand and voltage measurements from substation transformers and feeders at the top of each hour. After IVVO is deployed, the following data will be gathered to verify expected energy savings:

- Average historic substation transformer voltage over a 2 year period prior to IVVO deployment

- Hourly actual voltage per substation transformer

That data will be used to determine an expected change in voltage using IVVO. This, in combination with the CVR factor will be used to calculate an expected energy savings. The Company is proposing to run this analysis by feeder and report on it annually.

In order to verify expected CVR factor, Company proposes using a subset of substations to provide a representative sample of the overall IVVO deployment area loads. At a high level, this subset would include a substation for each of the below categories:

- Mostly residential loads and overhead feeders
- Mostly commercial loads and overhead feeders
- Mostly residential loads and underground feeders
- Mostly commercial loads and underground feeders
- Mostly residential with higher DER penetrations
- Mostly commercial with higher DER penetrations

The Company proposes choosing one substation transformer for each category above and bi-annually performing on/off IVVO testing for two weeks at a time (one week on and one week off each test, one test during the summer load season and one during the winter load season). Actual timeframes will be chosen each year so that it can reasonably be assumed that the transformer load shape will be similar between the on and off weeks, so as to limit the impacts of weather and other factors on the testing.

Testing results will be averaged between the two testing periods and the six substation transformers. The Company proposes a tolerance of ten percent (above or below) so that if the testing results show a CVR factor within ten percent of the expected CVR factor, ongoing CVR factor and energy savings calculations are not adjusted.

Energy Reduction Example Calculation

Date	Hour	CVRf	Vhistoric average (V)	Vnominal (V)	Vhourly (V)	Feeder A Demand (kW)	Voltage %	Energy %	Energy Savings (kW)
7/1/2017	12:00pm	0.8	125	120	121	8,000	3.33%	2.67%	219
7/1/2017	1:00pm	0.8	125	120	122	8,500	2.50%	2.00%	173
Default									
Measured									
Calculated									

Using the equations above, the total energy reduction for Feeder A during the two hour period would be 392 kWh based on the example above.

For each hour, the energy savings calculation mentioned above will be used to determine hourly energy savings. A summation of those hourly savings values will be done over the course of a year to determine yearly energy savings by feeder.

Calculation of Measurable Decreased Contributions to Fixed Costs Due to IVVO

The following formula will be used to calculate the measurable decreased contributions to fixed costs resulting from the energy reductions due to IVVO.

$$Decreased\ Fixed\ Cost\ Contribution\ = (Energy\ Reduction) * (Fixed\ Cost\ Rate)$$

Fixed Cost Rate
This is the dollar-per-kilowatt hour rate based on the approved fixed cost recovery established by the Commission in the Company's last rate case that will be used in the calculation of the measurable decreased contributions to fixed costs due to IVVO. It is defined as:

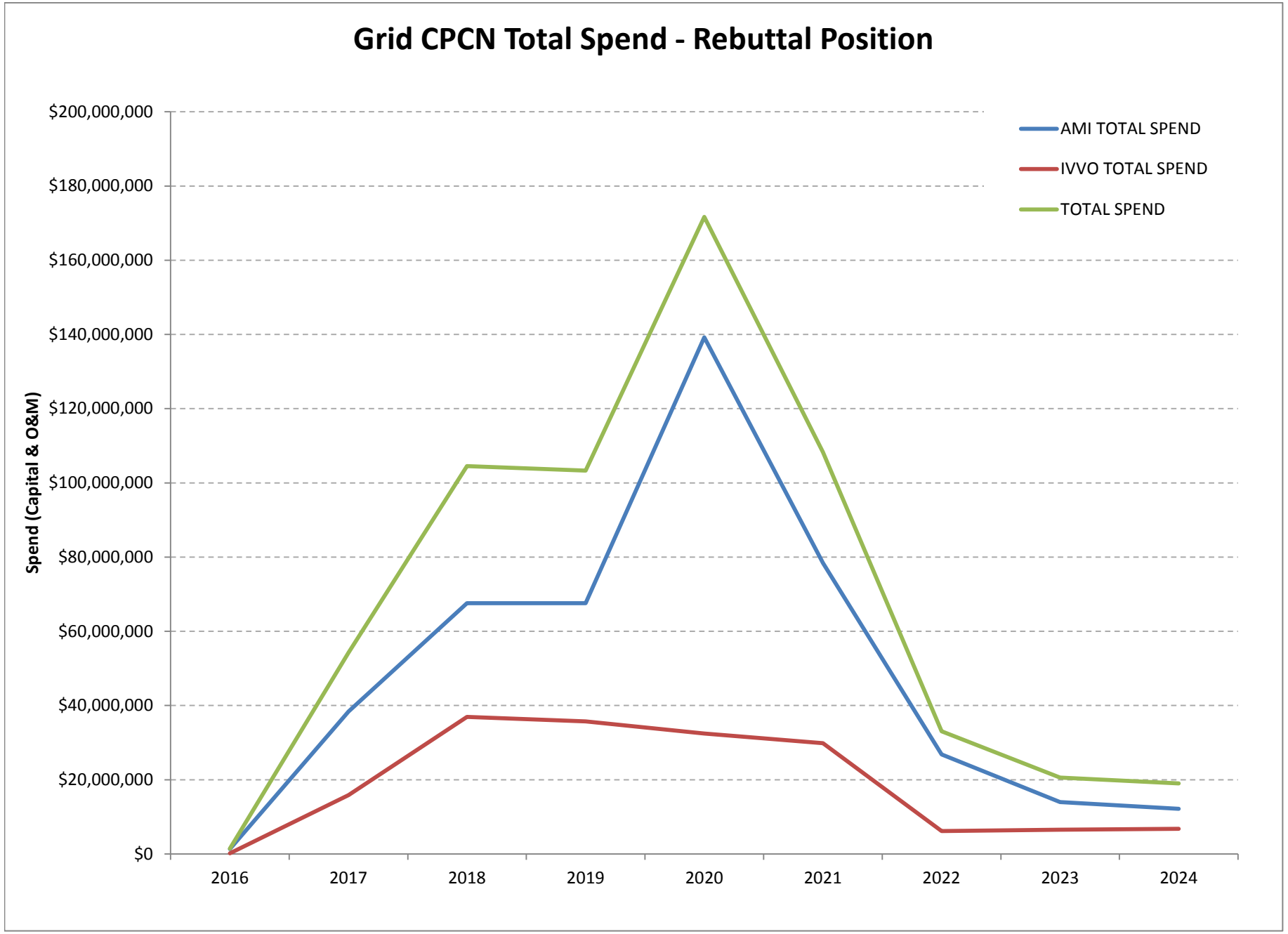
> The base kilowatt-hour charge inclusive of any General Rate Schedule Adjustments for rate Schedule R and Schedule C, minus the component of the charge designated as recovery of variable Operations and Maintenance expenses. The fixed cost rate will be derived for the winter and the weighted average of summer tiers I and II base charges for Schedule R and for winter and summer base charges for Schedule C.

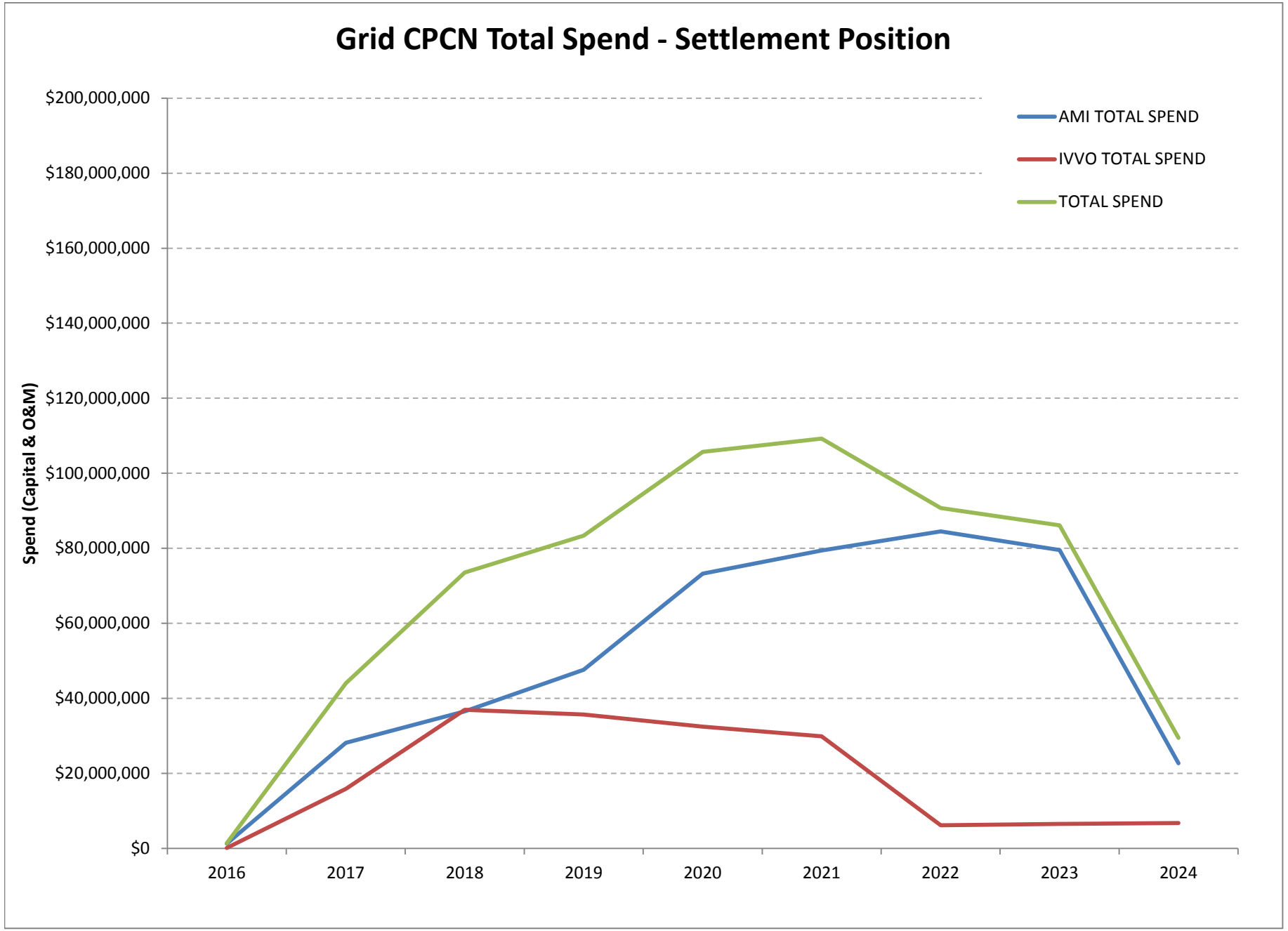
The Fixed Cost Rate is intended to represent the average amount of fixed costs that are embedded in the approved base rates for Schedule R and C.

Year	# of AMI Meters (Cumulative)	Business Capability	Integration Detail
2017	0	IVVO device and FAN deployment only	
2018	0	IVVO device and FAN deployment only and the Company will file an application that presents a plan to activate the HAN in March of 2018 pursuant to Section III. G.2 of the Settlement Agreement.	
2019	13,000	Head End	Communications Network
		Billing	Register usage data
			Load profile
			Energy/demand
			Interval data
		Event Processing	Billing quality events and alarms
			Temperature
		Support IVVO	Interface to ADMS
		Reporting	As Required
		Analytics	Deployment use case only
			Weekly system reconciliation
		OTA (Over the Air)	Support meter reconfiguration

2020	175,000	OTA (Over the Air)	Meter programming – rate changes, additional measured quantities, etc.
			Network equipment updates – AP's, Bridges, etc.
			Firmware updates
			Provide critical reporting to support business function Meter Reconfiguration for other use cases
		Customer Care	Real-time data access for customer agents for billing, issue resolution, quality of service, etc.
			Provide critical reporting to support business function
		My Account	Provide meter usage information to customers, per Section III. H. of the Settlement Agreement
			Customer billing information
			Provide critical reporting to support business function

2021	570,000	My Account	Up to last regular read
		Analytics	Theft use case
		Connect / Disconnect	Upgrade processes and systems to support remote connect / disconnect function
		Events Processing	Outage notification Connectivity model (GIS data)
			Meter events
			Network events
			Head-end events
			Reporting
			Support meter reconfiguration to enable customer changing rate plans
2022	1,050,000	Analytics	Non-theft use cases
		My Account	On demand reads for data since last read Integrate with mobile app
		Data Warehouse	Reporting
2023	1,500,000	Complete meter rollout	
2024	1,600,000	Complete meter rollout	




Grid CPCN Total Spend - Settlement Position
$200,000,000
$180,000,000
$160,000,000
$140,000,000
$120,000,000
$100,000,000
$80,000,000
$60,000,000
$40,000,000
$20,000,000
$0
Spend (Capital & O&M)
2016
2017
2018
2019
2020
2021
2022
2023
2024
AMI TOTAL SPEND
IVVO TOTAL SPEND
TOTAL SPEND