



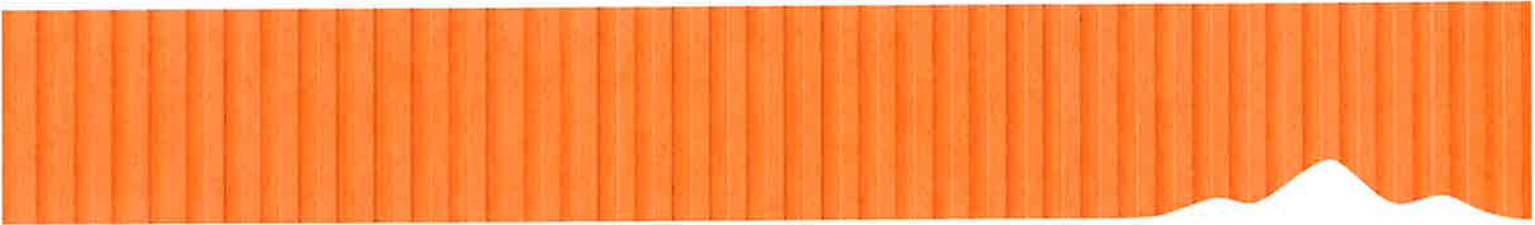
2019-2021 Energy Efficiency Demand Side Management Plan

Feasibility Study
Black Hills Colorado Electric, LLC

Proceeding No. 18A-0279E

October 30, 2019





Contents

Executive Summary 2

Proceeding Background 2

Feasibility Study Overview 3

Pilot Program Recommendations 9



Executive Summary

Black Hills Colorado Electric, LLC (“Black Hills” or “Company”) is filing this Demand Side Management (“DSM”) Pilot Program Feasibility Study report as required by Paragraphs 44 – 46 of the Amended Settlement Agreement. The Company held six total stakeholder meetings with three of the meetings being held locally in Pueblo, CO and the other three meetings held via conference call. The stakeholder meetings were robust, collaborative and resulted in many stakeholders presenting possible pilot programs that could potentially deliver continued success to the Company’s DSM Program. The Company is pleased to report that through this 2019 stakeholder process, two programs are being added to the Company’s portfolio as 2020 pilot programs. These two programs being introduced as 2020 pilot programs are the Cannabis Industry Audit Program and Small Business Direct Install Expansion Program. Between the two pilot programs, the Company will expend \$552,805 for the Cannabis Industry Audit Program and \$100,000 for the Small Business Direct Install Expansion Program, resulting in mTRC cost effectiveness ratings of 2.47 and 2.61, respectively. Pursuant to the Amended Settlement Agreement and Tariff Sheet Nos. 70A-70B, the Company is afforded the ability to incur expenses up to 115% of its authorized DSM budget without Commission approval. As a result of the implementation of these two pilot programs, the Company will incur additional expenses of \$652,805, or 110% of its authorized 2020 budget.

Proceeding Background

On May 4, 2018, the Company filed an Application in Proceeding No. 18A-0279E seeking Commission approval of several items related to its pursuit of energy efficiency and demand response resources under §40-3.2-104, C.R.S., and Commission Rule 3002(b), 4 *Code of Colorado Regulations* (CCR) 723-3 of the Rules Regulating Electric Utilities. The Application filed in Proceeding No. 18A-0279E sought approval of its Electric Demand Side Management (“DSM”) Plan for program years 2019, 2020, and 2021 (“2019-2021 DSM Plan” or “Plan”) and associated components.

On October 17, 2018, the parties filed an Unopposed Joint Motion to Approve Settlement Agreement and Unanimous Comprehensive Settlement Agreement.

On November 6, 2018, the parties filed a Unanimous Comprehensive Amended Settlement Agreement (“Amended Settlement Agreement”).

On November 19, 2018, the Application filed by Black Hills on May 4, 2018, seeking approval of its 2019-2021 DSM Plan was granted and approved by the Administration Law Judge, as modified by the Amended Settlement Agreement.

Per Paragraphs 44 – 46 of the Amended Settlement Agreement, Black Hills committed to work collaboratively with all interested stakeholders to establish the parameters and scope of feasibility studies to assess the feasibility of undertaking pilot program recommendations, including a demand response program advocated by Pueblo County and new DSM initiatives advocated by Colorado Energy Office. Specifically, Black Hills agreed to host a kick-off meeting to discuss and establish the scope and parameters of each of the feasibility studies, taking input from participants.



Following this initial meeting, Black Hills agreed to hold monthly calls during the study process to provide updates on the study and take input from interested parties. At the conclusion of the studies, Black Hills agreed to present the results of its analyses during a stakeholder meeting before the end of 2019, permitting stakeholders to assist in driving a final decision of whether to implement any such pilot. Thirty days after the final stakeholder meeting on the results of the feasibility studies, Black Hills agreed to file a report with the Commission in Proceeding No. 18A-0279E to explain recommendations on undertaking the studied pilots. The report will explain whether any proposed pilots can be undertaken within the 2019-2021 DSM Plan budgets or whether a budget modification is necessary. Parties will then have thirty days to file reply comments on the report and seek a Commission determination approving, modifying, or rejecting any pilots. In the event that a budget modification is necessary, Black Hills is required to comply with the DSM Plan Budget Flexibility process as described in currently-effective Sheet Nos. 70A and 70B of its Tariff.

Feasibility Study Overview

1st Stakeholder Meeting:

Black Hills began the feasibility study process on February 26, 2019 when the Company hosted stakeholders at the Olde Towne Carriage House in Pueblo, CO. This kick-off meeting provided an open forum and allowed all stakeholders the time to share thoughts and ideas as it related to new and innovative energy efficiency measures and programs for possible inclusion in future years. Black Hills hosted stakeholders from the following parties: Franklin Energy, Cultivate Energy, Trane Corporation, Energy Outreach Colorado (“EOC”), Pueblo County, Colorado Energy Office (“CEO”), Energy Smart Colorado, Nexant, Inc., MPTS, Energy Efficiency Business Coalition, and CleaResult. At the meeting, procedural background was discussed among the stakeholders regarding the feasibility study. Specifically, it was discussed that Black Hills is required to manage a set number of stakeholder meetings with the intent of allowing for new and innovative pilot programs that further energy savings. This process provided a means for intervenors and interested parties to bring to the table ideas and proposals for consideration in the DSM Plan.

To assist the feasibility study process, Black Hills explained that proposals for consideration in the study process must address the following criteria:

- Cost Effectiveness – What is the Modified Total Resource Cost of the program? Is the cost effectiveness of the program above 1.0?
- Program Implementation – How will the proposed pilot program be implemented? Will the program be implemented by a third party and what are the details behind that implementation or will the program be implemented by the Company and managed by the company?
- Target Audience – Will the proposed pilot program be marketed towards residential, commercial and industrial, low-income, or any other customers?
- Proposed Budget – What is the total amount of dollars to operate the pilot program between administrative, marketing, delivery, and incentive costs?



- Evaluation, Measurement, & Verification (“EM&V”) – Will the pilot program be subject to an EM&V analysis and how will results of the program be verified?

Black Hills asked all interested stakeholders to present their ideas at the next scheduled stakeholder meeting on June 20, 2019.

2nd Stakeholder Meeting:

Black Hills hosted a 2nd stakeholder meeting on June 20, 2019 in Pueblo, CO. At this meeting, various stakeholders presented ideas for possible pilot programs for inclusion of the 2019-2021 DSM Plan. Specifically, the following groups/stakeholders presented DSM Program proposals:

- Pueblo County
- MPTS Technology
- Cultivate Energy Optimization
- Colorado Energy Office
- Applied Energy Group (“AEG”)

Described below are the programs that were presented for evaluation.

Pueblo County:

- Low-Income Rooftop Solar – This proposal recommended using \$70k from the Low-Income budget of the 2019 – 2021 DSM Plan to provide rooftop solar to low-income customers within the Company’s service region. Additionally, Pueblo County would expend \$30k from their Weatherization Assistance Program in the joint effort. At the time of the presentation, there was no information or details on the EM&V of the proposal.
- Autonomous Demand Control Systems – Pueblo County made an initial presentation regarding Autonomous Demand Control Systems. No information was available regarding budget, effectiveness or implementation.
- Cannabis Specific Energy Auditing – Pueblo County recommended an audit program focusing on cannabis cultivation that would use approximately \$100k of the Company’s budget flexibility dollars to perform audits in the cannabis industry in the Company’s service territory.
- Small Business Direct Install Expansion Program– Pueblo County recommended an audit program that would focus on providing energy audits to customers whose businesses have less than 50,000 square feet of space. Pueblo County recommended providing 80 audits by 2021 where each audit would cost approximately \$600. No details were provided on cost effectiveness, implementation, or budget recommendations.

MPTS Technology:

- MPTS Technology – MPTS Technology presented to the stakeholder group regarding installation of MPTS technology in commercial buildings within the Company’s service territory. Approximately \$150k would be used to target small and large business



customers to install MPTS technology to generation 50 – 400 kW of savings annually. The MPTS technology would be installed by 3rd party contractors and would be implemented and monitored by MPTS Technology. No other details were provided regarding the EM&V of the program outside of initial benchmarks of the installation.

Cultivate Energy Optimization:

- Cannabis Industry Audit Program – Cultivate Energy Optimization presented to the stakeholders a potential 12-month pilot program to provide audits to customers in the Company’s service territory within the cannabis industry. Specifically, the program would be operated in partnership with Black Hills, Pueblo County, and Cultivate Energy Optimization to provide on-site technical assessments for customers. Approximately \$270k of the Company’s budget would be used to conduct the audits over a 12-month time period to generate potential savings. A formal EM&V process would be initiated at the conclusion of the pilot to validate achieved savings in partnership with Applied Energy Group, Black Hills’ 3rd party consultant.

Colorado Energy Office:

- Colorado Agricultural Energy Efficiency Program Proposal – Colorado Energy Office presented to the stakeholder group a proposal to provide audits to the agricultural industry that would be implemented by a third party or by the Company. No proposed budget for the audit program was provided but an EM&V would be provided at the conclusion of the program. Colorado Energy Office has had prior audit partnerships through Public Service Company of Colorado.

Applied Energy Group:

- Smart Thermostat Direct Load Control Assessment – AEG presented to the stakeholder group information regarding how the Smart Thermostat Direct Load Control Assessment could be provided to residential customers. A cost/benefit analysis would be completed in order to further decide how the program would be useful to customers.
- Non-Intrusive Load Monitoring Assessment – Provided on an informational basis, AEG presented that the assessment could be provided through current rebate programs targeting residential customers. Load Monitoring Reports would validate savings and dependent upon expenditures of the program, savings would be recognized.

3rd and 4th Stakeholder Meetings:

Black Hills hosted its next two stakeholder meetings via teleconference on July 24, 2019 and August 21, 2019 to discuss the energy efficiency proposals that were presented from the June 20th stakeholder meeting. These two teleconference meetings provided further insight into each of the proposals and allowed Black Hills and other stakeholders to ask questions and gather additional information regarding the proposals.



5th Stakeholder Meeting:

Black Hills hosted the 5th stakeholder meeting in Pueblo, CO on September 11, 2019. At this stakeholder meeting, Black Hills reviewed with the stakeholder group two proposals that the Company progressed to the evaluation stage. The Company decided to progress the Cannabis Industry Audit Program and Small Business Direct Install Expansion program to the evaluation stage given the developed proposals and possible savings with each program. AEG presented an assessment of DSM Pilot Proposals, including the Cannabis Industry Audit Program and the Small Business Direct Install Expansion proposals.

AEG conducted an extensive analysis regarding the proposals including: reviewing proposals and evaluating required data inputs, developing key program assumptions with implementer feedback, conducted benefit-cost analysis consistent with 2019 – 2021 DSM Plan, and interpreted the cost-effectiveness results and evaluated savings and budget impacts. Refer below for AEG's analysis regarding the Cannabis Industry Audit Program and the Small Business Direct Install Expansion Program.

Cannabis Industry Audit Program

Through the evaluation of the Cannabis Industry Audit Program, the following key assumptions were evaluated and researched:

Administrative/Program Costs – Obtained from Cultivate Energy Optimization's proposal, which amount to \$552,805.

Participation – Cultivate Energy Optimization estimated to complete 29 facility audits in a 12-month trial with 11 of those facilities being projected to make energy efficiency upgrades.

Energy Savings – Cultivate Energy Optimization estimated an average of 120,000 kWh and 30 kW savings per project.

Incentives – An average incentive of \$0.22 per kWh was assumed, consistent with the historical average of the C&I Custom incentive.

Incremental Cost – An average project incremental cost of \$67,355 was assumed, equal to 200% of the average total project incentive.

Other Assumptions – Project lifetime, net-to-gross, and coincidence factor assumed to be consistent with the C&I Custom assumptions consistent with the 2019 – 2021 DSM Plan filed in Proceeding No. 18A-0279E.

Refer below for information regarding program description, participation, measures, savings, expenditures, and cost effectiveness tests of the Cannabis Industry Audit Program:

Program Description – The pilot program will provide specialized on-the-ground engagement and technical services to help cannabis business customers better understand the energy consumption of their operating processes, actively manage their participation into current rebate program offers, identify opportunities for equipment upgrades and procedure changes, connect eligible cannabis customers directly to qualified local horticulture-specific product/service contractors, and verify the installation of energy efficient measures.



Participation	2020
Total Audits	29
Energy Efficiency Projects	11

Eligible Measures
LED Lighting
HVAC Commissioning and Replacement
Commercial Insulation Upgrades
High Efficiency Fan Replacement
Dehumidification System Installations
Pump System Upgrades
Motor Replacements
Other Commercial Equipment Upgrades

Net Energy Savings	Net kWh per Customer	2020 Annual Net Energy Savings Goals (kWh)
Net Energy Savings @ Meter	120,000	1,287,979
Net Energy Savings @ Generator	129,478	1,389,706
Net Demand Savings	Net kW per Customer	2020 Annual Net Demand Savings Goals (kW)
Net Demand Savings @ Meter	20	215
Net Demand Savings @ Generator	22	232

Budget Categories	2020
Incentives	\$361,465
Administration	\$66,690
Marketing	\$66,690
Delivery*	\$57,960
Total	\$552,805

*\$0.045/kWh Performance Incentive

	2020 Total Budget	% of Total Budget	2020 Total Net kWh	% Total Net kWh
2019 – 2021 DSM Plan	\$6,528,050	100%	24,086,568	100%
C&I Cannabis Proposal	\$ 552,805	8.47 %	1,389,706	5.77 %

mTRC Test	RIM Test	Utility Cost Test	Participant Cost Test
2.47	0.54	4.67	4.14

Observations regarding C&I Cannabis Proposal –

- The proposed pilot program will yield savings of \$0.40/kWh as compared to the existing C&I Custom program within the 2019 – 2021 DSM Plan of \$0.30/kWh.
- The proposed pilot program will yield net savings of 1,389,706 kWh at the generator.
- The C&I Cannabis proposal will achieve an overall cost effectiveness of 2.47, while expending \$552,805.



Small Business Direct Install Expansion Program

Through the evaluation of the Small Business Direct Install Expansion Program, the following key assumptions were evaluated and researched:

Administrative Costs – Obtained from the Small Business Direct Install Expansion Program proposal, which amount to \$100,000.

Participation – Obtained from the Small Business Direct Install Expansion Program proposal.

Energy Savings – Proposed kWh savings estimated based on the C&I Prescriptive Program assumptions in the 2019 – 2021 DSM Plan.

Incentives – Obtained from the Small Business Direct Install Expansion Program proposal.

Incremental Cost – Assumptions made were consistent with those modeled in the 2019 – 2021 DSM Plan for the C&I Prescriptive Program.

Other Assumptions – Project lifetime, net-to-gross, and coincidence factor assumed to be consistent with the C&I Custom assumptions consistent with the 2019 – 2021 DSM Plan filed in Proceeding No. 18A-0279E.

Refer below for information regarding program summary, participation, measures, savings, expenditures, and cost effectiveness tests of the Small Business Direct Install Expansion Program:

Program Description – The goal of the Small Business Direct Install Expansion Program is to provide small commercial customers with an expanded offering of energy saving installations and provide a more holistic approach of serving while increasing engagement of the small business community. The Small Direct Install Expansion Program will target businesses less than 50,000 square feet with proposed additions of water heater pipe insulation, refrigeration coil cleanings, refrigerated beverage and snack machines, and smart thermostats among other measures.

Participation (Measures)	2020
Energy Efficiency Projects	15

Eligible Measures
Water Heater Pipe Insulation
Refrigeration Coil Cleaning
Refrigerated Beverage and Snack Machines
Smart Thermostats
A/C Tune-ups
Motors & VSDs
Refrigeration Measures
HVAC Systems



Net Energy Savings	Net kWh per Customer	2020 Annual Net Energy Savings Goals (kWh)
Net Energy Savings @ Meter	16,280	147,331
Net Energy Savings @ Generator	17,566	158,968
Net Demand Savings	Net kW per Customer	2020 Annual Net Demand Savings Goals (kW)
Net Demand Savings @ Meter	5.04	43.2
Net Demand Savings @ Generator	5.44	46.6

Budget Categories	2020
Incentives	\$ 30,128
Administration	\$ 6,250
Marketing	\$ 6,250
Delivery	\$ 57,372
Total	\$100,000

	2020 Total Budget	% of Total Budget	2020 Total Net kWh	% Total Net kWh
2019 – 2021 DSM Plan	\$6,528,050	100%	24,086,568	100%
SBDI Expansion Program	\$ 100,000	1.53 %	158,968	0.66%

mTRC Test	RIM Test	Utility Cost Test	Participant Cost Test
2.61	0.62	3.73	4.37

Observations regarding Small Business Direct Install Expansion Program –

- The proposed pilot program will yield savings of \$0.63/kWh as compared to the existing SBDI program within the 2019 – 2021 DSM Plan of \$0.34/kWh.
- The proposed pilot program will yield net savings of 158,968 kWh at the generator.
- The Small Business Direct Install Expansion Program will achieve an overall cost effectiveness of 2.61, while expending \$100,000.

6th Stakeholder Meeting:

Black Hills hosted the 6th and final stakeholder meeting via teleconference on October 16, 2019. At this stakeholder meeting, the Company performed a final review of the Pilot Programs proposed.

Pilot Program Recommendations

Based on the stakeholder process and pilot program research, the Company is pursuing the two pilot programs described above, for the 2020 program year: Cannabis Industry Audit Program and the Small Business Direct Install Expansion Program. These two programs are highly cost effective, resulting in a mTRC score of 2.47 and 2.61, respectively. In addition, the two pilot programs are expected to achieve significant energy and demand savings. The Cannabis Industry Audit Program is expected to achieve 1,389,706 kWh in net energy savings and reduce demand by 22 kW. The Small Business Direct Install Expansion Program is expected to achieve 158,968



kWh in net energy savings and reduce demand by 5 kW. The overall cost of these two pilot programs is \$652,805. Pursuant to the Amended Settlement Agreement and Tariff Sheet Nos. 70A-70B, the Company is afforded flexibility in the annual budget. The Company can incur expenses up to 115% of its authorized budget without Commission approval. The approved 2020 Plan budget is \$6,528,050; thus, the Company can incur additional cost totaling \$979,207. However, for the two pilot programs in 2020, the Company will incur program costs of \$652,805, or 10% of its approved 15% budget flexibility. Following the completion of the pilot programs the Company will evaluate the energy savings, demand savings, and cost effectiveness of the two pilot programs. Additionally, third-party Evaluation, Measurement, & Verification studies and reports (“EM&V”) will be completed for the two pilot programs upon conclusion to evaluate and confirm results. Following completion of the pilot programs and EM&V analysis, the Company will determine if it is appropriate and cost effective to include the pilot programs as full-time programs in its 2022 – 2024 DSM Plan.

