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June 20, 2023

Docket No. 19-057-33

Utah Public Service Commission
Heber M. Wells Building
P. O. Box 45585
Salt Lake City, UT 84145-0585

Re: *Dominion Energy Utah's Annual Report on 2022 Sustainable Transportation & Energy Plan*

Commissioners:

In compliance with the Utah Public Service Commission's (Commission) Order in Docket No.19-057-33, Dominion Energy Utah (DEU or the Company) files this annual report related to the Sustainable Transportation and Energy Plan (STEP) for the program year beginning March 1, 2022 and ending February 28, 2023. This report summarizes University of Utah's Intermountain Industrial Assessment Center (IIAC) STEP expenditures, potential energy efficiency and clean air benefits, estimated efficiency project paybacks, and participating businesses who took advantage of these enhanced assessments during the first program year. The Company consulted with the Division of Public Utilities (DPU) and Office of Consumer Services to create quarterly STEP reports. This annual report is based on the quarterly report format.

As background, the Company, DPU, and OCS submitted a Settlement Stipulation (Stipulation) in Docket No. 19-057-33 to the Commission on July 16, 2020. The Commission approved the Stipulation on August 31, 2020, and ordered a program start date of October 1, 2020. The terms of the Stipulation included funding for the IIAC at a level of $500,000 annually for a pilot-period of two years. In return for the funding, the IIAC is required to perform 20 energy efficiency assessments (in addition to the 20 Department of Energy funded energy efficiency assessments) and 40 clean air assessments in each of the pilot-period program years.

Since March 1, 2022, the IIAC has performed 20 STEP-related energy efficiency assessments and 40 clean air assessments at qualifying business facilities located throughout Utah. The included report provides details on the completed assessments including specifics on the 263 potential energy efficiency projects that the IIAC identified which, if undertaken by the assessed businesses, would result in estimated natural gas usage reductions of nearly 969,000 dekatherms annually and reduced electricity consumption of nearly 80 million kilowatt hours per year. It is estimated that these energy efficiency projects would cost approximately $60.8 million to complete but would save the assessed businesses nearly $7.7 million annually, resulting in a simple payback period of 7.9 years.

In addition to the financial benefits, the IIAC estimated that full implementation of the 263 potential energy efficiency projects would result in an annual reduction in CO_2 emissions of over 72,800 tons and criteria pollutant[1] emissions reductions of 149.2 tons.

Respectfully Submitted,

Michael A. Orton

Michael A. Orton

cc: Division of Public Utilities
Office of Consumer Services

[1] The U.S. Environmental Protection Agency has established national ambient air quality standards (NAAQS) for six of the most common air pollutants— carbon monoxide, lead, ground-level ozone, particulate matter, nitrogen dioxide, and sulfur dioxide—known as "criteria" air pollutants (or simply "criteria pollutants").

ANNUAL REPORT FY2022

Intermountain Industrial Assessment Center Pilot Program

Intermountain Industrial Assessment Center
THE UNIVERSITY OF UTAH

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FUNDING FROM THE SUSTAINABLE TRANSPORTATION AND ENERGY PLAN

Introduction

In 2019, the Sustainable Transportation and Energy Plan Act ("STEP Act") was amended by the State of Utah to authorize a large-scale natural gas utility (i.e. Dominion Energy Utah - DEU) "to establish natural gas clean air programs that promote sustainability through increasing the use of natural gas or renewable natural gas that the commission determines are in the public interest…" [Utah Code 54-4-13.1 (3)]. On August 31, 2020, the Utah Public Service Commission (PSC) approved DEU to establish the Intermountain Industrial Assessment Center (IIAC) pilot program using a balancing account to fund the program through a STEP surcharge tariff of DEU customers. DEU has partnered with the University of Utah's IIAC to conduct energy efficiency assessments and identify opportunities, technologies, and practices to improve Utah's air quality and assist DEU customers in adopting future-facing energy strategies. Any DEU customer who utilizes at least 2,500 dekatherms each year and is willing to be a part of the program is eligible to participate, regardless of rate schedule. For marketing purposes, the pilot program is titled StepWise to allow the IIAC and DEU to differentiate between their existing Department of Energy (DOE) manufacturing assessment and ThermWise energy efficiency programs, respectively. This report is a summary of the assessments and analysis results, impact of COVID-19 on the program, and detailed budget expenditures from March 1, 2022 through February 28, 2023.

Accomplishments

In the second year of the program, the IIAC team has successfully completed 40 energy and clean air assessments at facilities all around Utah – from Gunnison to Vernal. The team looked at renewable natural gas (RNG) opportunities with wastewater treatment plants, steam plant improvements at manufacturers, and innovative natural gas opportunities with education, hospital and commercial customers. For each assessment, the team evaluated air quality improvements associated with individual recommendations to effectively quantify benefits to Utah's ratepayers and Utahns as a whole.

The IIAC team, listed below, is excited to share their efforts with the Public Service Commission and other regulatory parties of the State of Utah.

Kody Powell, Ph.D., IIAC Director, StepWise Principal Investigator (PI)

Julie Sieving, P.E., C.E.M., StepWise Director

Kerry Kelly, Ph.D., StepWise Co-PI

Blake Billings, Ph.D., StepWise Manager

ENERGY AND CLEAN AIR ASSESSMENTS

Assessment Process

IIAC can be considered to house two branches, following the PSC approval of the IIAC Pilot Program. The DOE branch is a previously established part of a national program that uses federal funding to perform energy assessments for small to medium manufacturers. DOE customers are required to meet several criteria to be eligible for an assessment: greater than $100,000 and less than $3,500,000 in energy expenditures, annual sales under $100 million, fewer than 500 employees, and no in-house energy professionals. The assessments analyze all inputs and outputs of utilities equally with the focus spread across a customer's natural gas, electricity, water, and/or waste management practices.

With the approval of the IIAC Pilot Program, IIAC has expanded its customer base to include commercial, state, and municipal customers with the initiation of the StepWise branch. The program also extends services to DEU customers on a transportation (TSS, TSM, and TSL) or Firm Service (FS) rate schedule who were not previously eligible for DEU's energy efficiency efforts with the ThermWise program. StepWise customers are required to meet the following criteria for eligibility: be a DEU customer, use at least 2,500 dth/year of natural gas, and be willing to be acknowledged as a participant.

Due to the different eligibility requirements between the two branches, results targeting natural gas efficiency, renewable natural gas, and hydrogen opportunities have been more easily identified in the StepWise assessments. The clean air analyses performed for both branches of assessments demonstrate the potential for a positive impact on Utah's air quality.

Over the fiscal year of March 2022 through February 2023, the IIAC completed energy assessments, including clean air analyses, and provided related reporting to 40 customers – 20 for StepWise customers and 20 for DOE customers. StepWise customers included a wide variety of industrial, commercial, municipal, universities, and government participants. The customers who participated in a StepWise assessment during fiscal year 2022 are listed as follows:

- Gunnison Valley Hospital
- Industrial Heat Treat
- Jordan Basin Water Reclamation Facility
- Payson Wastewater Treatment Plant
- Autoliv Promontory
- Ogden School District
- Merit Medical
- Nature's Sunshine
- Vernal City
- Alsco Uniforms
- Central Valley Water Reclamation Facility
- North Davis Sewer District
- High West Distillery
- Tooele School District
- Division of Facilities Management and Construction - State Capitol Central Plant
- University of Utah Real Estate Administration – 417 Wakara Way
- Northrop Grumman - Promontory
- Larry H. Miller – Jordan Commons Tower
- Jordan School District – Auxiliary Buildings
- Division of Facilities Management and Construction – Utah State Developmental Center

Assessment Results

A summary of results from the 40 total energy and clean air assessments are detailed in Tables 1 and 2 below. These are the assessments completed in year 2 of the program. In the tables, StepWise reports have a “SW” report number, while DOE reports have a “UU” number.

Table 1 details a summary of the total potential annual emissions reductions for equivalent carbon dioxide (Eq CO2), nitrogen oxides (NOx), sulfur dioxide (SO2), particulate matter 2.5 (PM2.5), volatile organic compounds (VOCs), and ammonia (NH3) in pounds per year for each assessment. The percentage of emissions which comes from natural gas savings is noted as %NG in the column to the right of each pollutant. Note that the % NG value is calculated by taking the natural gas emissions savings divided by the net emissions savings. When either electricity or natural gas emissions increase, it is represented by a negative number and can cause % NG values to be negative or over 100%. See the three example calculations below:

Example 1:

$$103\ \%\ \mathrm{NG} = \frac{21{,}000{,}000\ \text{eq CO2 natural gas lb/yr}}{-700{,}000\ \text{eq CO2 electricity}\frac{\text{lb}}{\text{yr}} + 21{,}000{,}000\ \text{eq CO2 natural gas}\frac{\text{lb}}{\text{yr}}}$$

Example 2:

$$-200\ \%\ \mathrm{NG} = \frac{2{,}000\ \text{NOx natural gas lb/yr}}{-3{,}000\ \text{NOx electricity}\frac{\text{lb}}{\text{yr}} + 2{,}000\ \text{NOx natural gas}\frac{\text{lb}}{\text{yr}}}$$

Example 3:

$$-25\ \%\ \mathrm{NG} = \frac{-1{,}000\ \text{eq CO2 natural gas lb/yr}}{5{,}000\ \text{eq CO2 electricity}\frac{\text{lb}}{\text{yr}} - 1{,}000\ \text{eq CO2 natural gas}\frac{\text{lb}}{\text{yr}}}$$

See the Appendix for a detailed explanation of air quality analysis. This appendix is included in all reports delivered to customers.

Table 2 details a summary of the total number of recommendations identified, potential energy and cost savings, implementation costs, and total simple payback period of each assessment.

Table 3 details a summary of the natural gas usage of each facility who participated in a StepWise assessment to demonstrate qualification under the 2,500 dth/year natural gas requirement. For confidentiality purposes, natural gas usage totals at DOE assessment facilities are not shared. Assessment dates are noted to demonstrate completion of all assessments within fiscal year 2022.

Table 1 - Annual potential emissions improvements

Report Number	Equivalent CO2 (lb/yr)	% NG	NOx (lb/yr)	% NG	SO2 (lb/yr)	% NG	PM2.5 (lb/yr)	% NG	VOCs (lb/yr)	% NG	NH3 - Electricity Only (lb/yr)
SW2022-05	14,626,695	99%	75,168	100%	964	100%	170	72%	470	99%	1.4
SW2022-06	531,175	76%	1,424	92%	32	80%	76	3%	24	76%	2.1
SW2022-07	593,620	97%	792	97%	38	95%	19	15%	28	94%	0.3
SW2022-08	839,680	68%	712	66%	50	72%	159	2%	38	68%	4.4
SW2022-09	216,160	90%	120	84%	13	92%	14	7%	10	90%	0.4
SW2022-10	11,097,300	16%	8,504	9%	684	16%	5,241	0%	498	16%	61.7
SW2022-11	993,470	11%	1,281	43%	61	11%	494	0%	44	11%	5.8
SW2022-12	575,000	56%	477	55%	36	56%	144	1%	26	56%	1.7
SW2022-13	-2,231,140	282%	776	-337%	-148	268%	2,235	-1%	-106	272%	26.9
SW2022-14	95,520	-749%	85	-698%	5	-968%	450	-1%	4	-885%	5.4
SW2022-15	4,659,780	100%	3,858	100%	294	100%	29	81%	212	100%	0.1
SW2022-16	1,570,990	98%	2,625	99%	99	98%	26	29%	72	98%	0.3
SW2022-17	149,800	-23%	124	-23%	9	-25%	103	0%	7	-24%	1.2
SW2022-18	357,500	114%	296	114%	23	113%	-25	-8%	16	113%	-0.3
SW2022-19	346,788	79%	395	85%	22	80%	41	3%	16	80%	0.5
SW2022-20	404,270	89%	190	80%	25	89%	27	7%	18	89%	0.3
SW2023-01	1,589,900	80%	1,319	79%	100	80%	188	3%	72	80%	2.2
SW2023-02	192,810	70%	84	43%	12	71%	33	2%	9	71%	0.4
SW2023-03	395,070	99%	342	100%	26	99%	6	53%	19	99%	0.0
SW2023-04	1,178,060	74%	2,186	88%	71	78%	180	2%	54	74%	4.9
UU0199	389,950	10%	344	9%	20	12%	204	0%	18	10%	232.6
UU0200	1,125,000	788%	16,882	141%	137	392%	-4,272	-6%	-154	-130%	-128.6
UU0201	57,040	0%	51	0%	3	0%	33	0%	3	0%	0.9
UU0202	1,840,000	73%	28,400	7%	2,014	4%	17,607	0%	1,471	4%	209.0
UU0203	288,980	3%	242	3%	18	3%	157	0%	13	3%	1.9
UU0204	1,194,600	0%	997	0%	73	0%	669	0%	53	0%	7.9
UU0205	341,960	54%	284	53%	21	54%	90	1%	15	54%	1.1
UU0206	1,615,530	0%	1,356	0%	99	0%	907	0%	72	0%	10.7
UU0207	45,370	72%	38	71%	3	72%	7	2%	2	72%	0.1
UU0208	47,440	0%	40	0%	3	0%	27	0%	2	0%	0.3
UU0209	225,600	0%	188	0%	14	0%	126	0%	10	0%	1.5
UU0210	361,890	46%	301	46%	22	48%	110	1%	16	47%	1.3
UU0211	448,930	99%	372	99%	28	99%	5	46%	20	99%	0.0
UU0212	296,890	55%	247	55%	18	56%	75	1%	13	56%	0.9
UU0213	75,910	0%	63	0%	5	0%	42	0%	3	0%	0.5
UU0214	454,190	0%	379	0%	28	0%	254	0%	20	0%	3.0
UU0215	282,620	21%	235	21%	17	21%	126	0%	13	21%	1.5
UU0216	1,441,900	0%	1,203	0%	88	0%	808	0%	65	0%	9.6
UU0217	287,850	2%	249	2%	17	2%	151	0%	12	2%	2.9
UU0218	165,620	12%	138	12%	10	12%	82	0%	7	12%	1.0
Total	**49,169,718**	**52%**	**152,766**	**20%**	**5,053**	**35%**	**26,816**	**8%**	**3,208**	**23%**	**477.5**

Table 2 - Annual potential cost and energy savings

Report Number	Recommendations Identified	Gas Savings (MMBtu/yr)	Electric Savings (kWh/yr)	Total Cost Savings	Incremental Recommendation Costs	Simple Payback Period
SW2022-05	10	27,660	114,550	$1,692,390	$30,161,060	17.8
SW2022-06	11	3,430	175,700	$34,140	$153,160	4.5
SW2022-07	7	4,860	22,250	$23,570	$135,470	5.7
SW2022-08	9	4,820	373,360	$47,610	$233,360	4.9
SW2022-09	6	1,654	30,990	$14,730	$40,705	2.8
SW2022-10	6	15,190	15,409,390	$759,850	$3,864,220	5.1
SW2022-11	9	890	1,460,190	$94,690	$198,290	2.1
SW2022-12	5	2700	421,370	$53,200	$288,480	5.4
SW2022-13	5	-53250	6,715,270	$312,910	$3,119,410	10.0
SW2022-14	8	-6100	1,339,320	$38,480	$417,705	10.9
SW2022-15	5	39270	16,170	$257,100	$3,198,340	12.4
SW2022-16	9	12990	52,540	$161,000	$458,930	2.9
SW2022-17	3	-300	304,960	$48,250	$84,400	1.7
SW2022-18	3	3430	-80,680	$15,485	$79,920	5.2
SW2022-19	8	2320	118,330	$21,940	$19,880	0.9
SW2022-20	7	3060	74,540	$29,640	$45,880	1.5
SW2023-01	8	10680	539,340	$121,290	$691,390	5.7
SW2023-02	3	1155	94,600	$15,420	$78,610	5.1
SW2023-03	6	3492	8,180	$33,030	$144,890	4.4
SW2023-04	5	7960	424,670	$240,030	$504,040	2.1
UU0199	5	330	487,310	$20,550	$45,735	2.2
UU0200	3	79,880	-10,780,330	$47,610	$68,030	1.4
UU0201	6	0	79,235	$38,140	$12,505	0.3
UU0202	7	793578	52,218,000	$1,939,601	$7,200,046	3.7
UU0203	3	70	464,545	$55,928	$173,270	3.1
UU0204	10	0	1,978,868	$92,452	$75,227	0.8
UU0205	7	1550	263,180	$35,630	$68,060	1.9
UU0206	9	0	2,682,945	$271,895	$126,480	0.5
UU0207	8	275	21,390	$37,575	$89,705	2.4
UU0208	6	0	77,669	$43,708	$160,112	3.7
UU0209	7	0	374,940	$21,670	$38,010	1.8
UU0210	7	1405.1	322,141	$32,043	$27,272	0.9
UU0211	6	3754	7,670	$58,183	$91,255	1.6
UU0212	7	1388.6	219,613	$44,482	$125,677	2.8
UU0213	5	0	125,668	$16,099	$32,973	2.0
UU0214	8	0	751,455	$71,267	$315,213	4.4
UU0215	8	494	371,346	$37,699	$121,077	3.2
UU0216	6	0	2,388,118	$135,350	$547,024	4.0
UU0217	5	52	440,824	$666,124	$7,466,810	11.2
UU0218	7	166	241,781	$29,893	$146,504	4.9
Grand Total	**263**	**968,854**	**80,351,408**	**$7,710,654**	**$60,849,125**	**7.9**

Table 3 - Assessment facility annual natural gas usage and assessment date

Report Number	NG Usage (MMBtu/yr)	Date of Assessment
SW2022-05	800,091	3/8/2022
SW2022-06	18,204	3/24/2022
SW2022-07	23,619	3/29/2022
SW2022-08	9,392	4/19/2022
SW2022-09	3,763	5/11/2022
SW2022-10	65,077	5/25/2022
SW2022-11	12,057	6/21/2022
SW2022-12	7,971	8/10/2022
SW2022-13	116,662	8/18/2022
SW2022-14	11,773	9/1/2022
SW2022-15	56,214	9/16/2022
SW2022-16	21,290	9/20/2022
SW2022-17	11,414	10/5/2022
SW2022-18	12,291	10/11/2022
SW2022-19	17,738	10/26/2022
SW2022-20	8,020	11/16/2022
SW2023-01	15,803	1/18/2023
SW2023-02	50,313	2/7/2023
SW2023-03	11,320	2/16/2023
SW2023-04	33,170	2/23/2023
UU0199	N/A - DOE	2/17/2022
UU0200	N/A - DOE	3/3/2022
UU0201	N/A - DOE	4/7/2022
UU0202	N/A - DOE	5/17/2022
UU0203	N/A - DOE	5/11/2022
UU0204	N/A - DOE	6/9/2022
UU0205	N/A - DOE	6/21/2022
UU0206	N/A - DOE	7/7/2022
UU0207	N/A - DOE	7/21/2022
UU0208	N/A - DOE	8/30/2022
UU0209	N/A - DOE	8/23/2022
UU0210	N/A - DOE	9/12/2022
UU0211	N/A - DOE	10/11/2022
UU0212	N/A - DOE	10/21/2022
UU0213	N/A - DOE	10/21/2022
UU0214	N/A - DOE	11/4/2022
UU0215	N/A - DOE	1/5/2022
UU0216	N/A - DOE	1/13/2023
UU0217	N/A - DOE	1/19/2023
UU0218	N/A - DOE	2/27/2023

ASSESSMENT ANALYSIS

Over the 40 assessments completed in FY2022, the IIAC tracked trends in the customers served, recommendations identified, and recommendations implemented.

Customers

In evaluating customers served, it is noted that StepWise assessments were almost evenly split between commercial and industrial assessments. 11 assessments were for industrial customers, and 9 were for commercial customers. The number of recommendations identified were an approximate split between commercial and industrial, but industrial recommendation savings for natural gas and electricity accounted for a larger portion of the total StepWise savings identified.

As noted above, the StepWise program expands services not only to commercial customers but also to various DEU rate schedule customers. DEU customers are typically on either a General Service (GS), Firm Service (FS), or Transportation service (TSS, TSM, and TSL) rate schedule. Only GS customers are eligible to participate in DEU's ThermWise incentive program. The breakdown for StepWise customers is shown in Table 4.

Table 4 – StepWise Customers by Rate Schedule

Rate Schedule	Percent of Assessments
TS	55%
GS	15%
FS	10%
Mixed (FS/GS, TS/GS, FS/TS)	20%

Recommendations

In analyzing the 263 total potential recommendations in year 2 (133 through StepWise and 130 through DOE) the IIAC has identified through assessments, observations of eight types of recommendations were noted and summarized in Tables 5 and 6. The categories encapsulate topics and equipment where most recommendations may be related. For example, boiler recommendations may include boiler controls upgrades, retrofits, replacements, or other changes to a facility's boiler system. Recommendations consider innovative solutions, energy efficiency improvements, as well as recommendations to bring older systems up to current best practices.

Table 5 – Recommendation type definitions

Recommendation Type	Recommendation Description
Boiler	Directly impacts a boiler or boiler system's operation
Cogeneration	Directly impacts an existing or proposed cogeneration system
Compressed Air	Directly impacts a compressed air system
Electricity/Other	Impacts electricity driven equipment outside of the other listed categories or other recommendations which fall outside the scope of this list
HVAC	Directly impacts a facility's system for heating, ventilation, or air conditioning their buildings; not process-related
Other gas	Recommendations which reduce natural gas and do not impact the other systems on this list

RNG	Directly related to the production or use of renewable natural gas in a facility
Water	Directly related to water systems or water reductions

Table 6 - Results broken down by recommendation type

Recommendation Type	Percent of Total Recommendations	Percent of Total Natural Gas Savings	Average Simple Payback Period	Potential Criteria Pollutant Reductions (ton/yr)	Potential Equivalent CO2 Reductions (ton/yr)
Boiler	21%	69%	6.1	62.9	30,998
Cogeneration	2%	10%	7.7	18.3	9,278
Compressed Air	16%	0%	0.8	2.3	1,514
Electricity/other	31%	0%	4.4	40.4	6,029
HVAC	16%	11%	1.6	12.6	14,311
Other gas	7%	6%	21.8	4.4	4,168
RNG	2%	3%	1.3	3.0	2,874
Water	1%	0%	3.2	0.3	188

It is noted that HVAC and other natural gas[1] recommendations provide the most natural gas savings with the shortest payback periods. These are often recommendations that involve an easily implemented controls change with no capital investment. While boiler retrofit and replacement recommendations made up the majority of the natural gas savings identified, these recommendations had higher costs and longer payback periods on average. Boiler and cogeneration recommendations may not be achievable for customers without outside funding due to the longer payback periods.

Recommendation types with a higher percentage of the overall natural gas savings result in higher potential emissions reductions. The exception to this being the electricity/other[2] recommendations, which have the second largest amount of criteria pollutant reductions. This is likely due to the sulfur dioxide emissions that are reduced from preventing electricity generation with coal sources.

Several recommendations identified by the IIAC provide good examples of high impact natural gas efficiency recommendations which may need further funding assistance for the customer to move forward. These may be a consideration for future projects outside the StepWise program.

Implementation

The IIAC has a practice of contacting customers approximately 300 days after DOE report delivery to check in on implementation and provide any further assistance the customer may require. Based on these outreach efforts, the IIAC has a historical implementation rate of 57% of assessment recommendations. The completed implementation surveys are shown below:

Table 7 - Implementation results for DOE and StepWise assessments

	StepWise	DOE
Customers Contacted since 2021	21	28
Surveys Completed	18	26
Number of Recommendations in Progress or Implemented	133	
Percent of Recommendations that are In Progress or Implemented	45%	

[1] "Other gas" may include any recommendation not directly related to building space heating or boiler natural gas use, such as oven or furnace improvements.
[2] "Electricity/other" recommendations refer to any recommendation that did not save natural gas which may include electricity efficiency recommendations or adjusting utility rate schedules,

Estimated CO2 Tons per Year Saved	8,567
Estimated Percent from Natural Gas Savings	75%
Estimated Criteria Pollutants Tons per Year Saved	20.17
Estimated Percent from Natural Gas Savings	85%

The average implementation based on these assessments is 45%. While slightly lower than the IIAC's average historical rate, this implementation rate exceeds many equivalent national utility-type programs. Additionally, the majority of the emissions reductions from the implemented recommendations are from natural gas, which means most of the reductions are having a direct impact on Utah air quality.

StepWise has executed and updated the plan developed last year around implementation surveys. At approximately 300 days after the report is delivered, the customer is contacted to set up a time to complete an implementation survey. During the survey, the StepWise team asks questions to evaluate whether recommendations have been implemented, are in progress, or have been rejected. When recommendations are in progress, the team determines how far along in the implementation process the customer is and uses the progress to determine how much of the savings to include in saved emissions values. The StepWise team has determined that one follow-up interaction to complete the surveys is best practice due to the limited services the team can offer customers who are working on implementing recommendations. The quarterly reports will continue to include implementation rates for StepWise recommendations, and a summary of surveys will be included in the FY2023 report. .

PROGRAM ANALYSIS

Throughout the year, DEU and University of Utah met with regulators and took input and feedback on quarterly reporting. Reports were delivered as follows:

- Q1.22 Report – Delivered on 5/13/2022, 2/20 assessments completed
- Q2.22 Report – Delivered on 8/1/2022, 7/20 assessments completed
- Q3.22 Report – Delivered on 11/4/2022, 10/20 assessments completed
- Q4.22 Report – Delivered on 2/2/2023, 16/20 assessments completed
- Q1.23 Report – To be delivered on 5/16/2023, 20/20 assessments completed

Topics of feedback included implementation surveys, impacts of energy efficiency on air quality in Utah, and completing settlement discussions to renew the program into its third and final year.

In an effort to be responsive to feedback discussions in FY2021, the IIAC has implemented a more conservative approach to secondary electricity-associated air emissions (noting that electric efficiency recommendations are secondary to natural gas recommendations and simply a good faith effort to benefit the customer's economic viability). Emission factors were updated for FY2022 and continue to be updated for FY2023. One ongoing effort that is not yet reflected in this annual report is to update new VOC and NH3 emissions factors from the National Emission Inventory (NEI) 2020 with new power plant data from the Environmental Protection Agency's (EPA) eGRID 2021. Other emission factors are being updated with the eGRID 2021 and AVERT 2021 data. Updates will be finalized in time for assessments completed in March and reported in the first quarterly report of 2023.

Program Outreach and Marketing

IIAC has been actively promoting awareness of StepWise program opportunity to the community. From April 12th – 15th of 2022, the StepWise program attended and presented at the Water Environment Association of Utah's annual conference in St. George to promote the program with wastewater treatment plants and districts from around the state. Three wastewater treatment plant assessments have been subsequently completed. On May 10th, several Intermountain IAC team members attended the One Utah Summit to network with Utah businesses and promote the two programs. On May 19th, the Intermountain IAC presented to the Utah Clean Air Partnership to continue connecting with Utahns focused on improving local air quality. Intermountain IAC members attended the Utah Sustainable Business Coalition flagship networking event on September 29th, 2022 where a StepWise participant presented on their company's sustainability efforts and the assistance provided through the StepWise program. The StepWise team presented to the Clean Air Caucus on October 18th, 2022 and participated in the Northern Utah Manufacturing Excellence Conference on October 29th, 2022. StepWise team members plan to attend the Intermountain Sustainability Summit on March 23, 2023 to further connect with other energy efficiency professionals. The Intermountain IAC notes that current interest in program participation remains strong through the new fiscal year and plans for additional outreach throughout FY2023.

COVID-19 Impacts

Dominion Energy is actively monitoring the development of COVID-19. Related, the start date of the IIAC pilot program was shifted to March 1, 2021. No further program impacts have been experienced to date.

CONCLUSIONS

Based on the experience of the pilot program's second year, the IIAC has a number of conclusions and observations related to customers, sectors, recommendations and marketing/program outreach.

Customers/Sectors

The following sectors had the greatest savings opportunities identified for both emissions and energy reductions:

- Private manufacturers
- Wastewater treatment plants
- School districts

Targeted outreach by the IIAC team included rural hospitals, school districts, wastewater treatment plants. Private manufacturers continue to be the central interested parties in IIAC assessments, and it is anticipated that this trend will continue in the next fiscal year. To expand the sectors which with the team works, future outreach may include Utah city buildings, especially those without the resources for energy management staff.

Recommendations

The IIAC found that boiler and HVAC opportunities typically had the best energy and emissions savings for the cost of the recommendation. Most HVAC opportunities were identified at commercial buildings, as HVAC makes up most of their utility costs. Both boiler and HVAC recommendations will continue to be target opportunities in the next year.

Program Outreach and Marketing

The IIAC will continue to pursue marketing and outreach options that offer program access equity. In particular, the IIAC has found introducing the StepWise program at conferences and local association chapter meetings to be a successful method of outreach. It is likely that the IIAC will continue to stay involved in local and regional conferences to continue to advertise both the DOE and StepWise services that the IIAC provides. Upcoming federal grant funding from the Department of Energy for Industrial Assessment Center customers may be made available to certain StepWise participants as well and create further opportunity for engagement and implementation of recommendations.

Future Goals

The IIAC is excited to continue their assessment of Utah facilities for energy and air quality improvements in the next year as a new stipulation agreement was approved on February 6, 2023. Using the lessons learned and data collected in the second year of the pilot program, the IIAC will target assessments that will better maximize the forward-facing recommendations this program was originated to identify.

APPENDIX: ESTIMATING EMISSIONS

Utah Air Quality Challenges

Utah faces three key air quality challenges. First, Utah's Wasatch Front experiences periodic episodes of elevated fine particulate pollution matter (PM2.5) during the winter.[3] Because of these episodes, the United States Environmental Protection Agency (US EPA) classifies Utah's Wasatch Front Valley as non-attainment regions for failure to meet the 24-hour PM2.5 ambient air quality standard.[4] These pollution episodes are caused by a combination of local emissions, mountainous topography, and meteorology. During winter, cold air settles in our mountain valleys, and warm air traps this cold air as well as all the pollution. Locally, this is known as an "inversion". The only realistic strategy for addressing these pollution episodes is to reduce direct emissions of PM2.5 and PM2.5 precursors (NOx, SOx, VOCs, and NH4). Recent emission reductions have been leading to improvements in air quality in these nonattainment areas. In fact, these emission reductions, combined with favorable winter-time weather conditions, have led the EPA to announce its intention to redesignate this area as PM2.5 maintenance areas. This redesignation is anticipated to occur in 2022. However, population growth and the accompanying emission increases will likely continue to put pressure on these constrained airsheds.

Second, Utah's Uinta Basin's experiences elevated levels of ozone during the winter, and it is currently classified as a non-attainment area for ozone.[5,6] The topography, meteorology, and emissions from oil and gas development have led to elevated levels of ozone. Researchers, the state, and oil and gas developers have been working to understand and address the causes of winter-time ozone in this region.

Third, Utah's Wasatch Front was recently declared as nonattainment for ozone. This non-attainment designation divides the Wasatch front into two regions, the Northern Wasatch, and Southern Wasatch Front. Utah's Wasatch Front experiences elevated levels of ozone during the summer, and this is a result of sunlight, warm temperatures, and regional and local emissions of NOx, CO and VOCs. The state is currently in the process of developing plans to bring these areas into compliance with the National Ambient Air Quality standards for ozone.

Calculation of Emission Savings

StepWise personnel estimated the changes in emissions associated with the ARs. These changes included reduction in natural gas and electricity usage. Natural gas usage occurs on site, and the associated emission reductions are estimated using EPA's AP-42 emission factors. These emissions factors quantify emissions based on the type of equipment used to combust the natural gas. If the facility is located in the Wasatch Front ozone nonattainment modeling domain, the emissions savings during the months of May to September will benefit the Wasatch Front ozone non-attainment areas. If the emissions savings occur during the months of November through February, these savings will benefit the Wasatch Front PM2.5 nonattainment area.

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[3] https://deq.utah.gov/air-quality/pm-2-5-serious-sips-2017-2019
[4] https://www.epa.gov/green-book/green-book-8-hour-ozone-2015-area-information
[5] https://deq.utah.gov/air-quality/ozone-in-the-uinta-basin
[6] https://www.epa.gov/green-book/green-book-8-hour-ozone-2015-area-information

Recommendations that reduce electricity usage will result in grid-level emissions savings (i.e. at the location of electric power generation), which may have varying air-quality impacts depending on the resource mix used to produce the electricity. In agreement with the Office of Consumer Services and the Division of Public Utilities on November 18, 2021, the emissions factors were updated to use regional data rather than state specific data.

Consequently, StepWise presents a range of emission savings from two EPA tools: eGrid 2020 NWPP (WECC Northwest)[7] and from AVERT 2021 (Northwest)[8]. EPA's eGrid captures annual emissions, whereas AVERT captures the dynamics of electricity dispatch based on the historical patterns of actual generation. Since eGrid does not contain NH3 and VOC emissions, we used the 2017 National Emission Inventory (NEI) data (the most recent year available) and adjusted these to 2020 emissions based on electricity generation. Specifically, we assume that the emission rate in 2020 for each power plant is similar to 2017, then using the amount of electricity generation for each unit in 2020 we estimate the 2020 emission factor (lb/MWhr). Table A-1 summarizes electricity generation emission factors.

Table A-1: Electricity-Associated Emissions Factors

Source	Electricity Generated (MWh)	$CO_{2,e}$ (lb/MWhr)	NOx (lb/MWhr)	$PM_{2.5}$ (lb/MWhr)	SO_2 (lb/MWhr)	VOC (lb/MWhr)	NH3 (lb/MWhr)
eGrid (2020)	286,004,986	604	0.504	0.037	0.338	0.028	0.004
AVERT (2021)	123,946,280	1494	0.909	0.073	0.542	0.027	0.020

Emissions Equivalents

Emission equivalents are included in all reports to better provide context on assessment report numerical results to customers. The average CO_2 emissions for driving one mile in a typical passenger vehicle in the US is 0.891 lbs .[9] A light duty gasoline vehicle emits 0.000637 lbs NOx/mile.[10] Annual CO_2 emissions from a typical US home are 19,114 lbs.[11] Annual NOx emissions from a home in the United States are 9 lbs (due to energy consumption).[12] Average electricity use per home in the United States is 12146 kWh.[13] Table A-2 summarizes the emission equivalents.

Table A-2: Emissions Equivalents

Emissions	Miles Driven (lbs/mi)	Homes Heated
CO_2	0.891	19,114.08
NO_x	0.000637	9
kWh	N/A	12,146

Natural Gas Combustion

Any energy efficiency measure that reduces combustion of natural gas will result in air quality improvement by directly reducing emissions of combustion products. Emissions savings for direct gas reduction are determined using EPA's AP-42 emission factors[14]. This publication compiles air pollutant emission factors for many air-pollution sources, including natural-gas

[7] https://www.epa.gov/egrid
[8] https://www.epa.gov/avert
[9] https://www.epa.gov/greenvehicles/greenhouse-gas-emissions-typical-passenger-vehicle
[10] https://www.bts.gov/content/estimated-national-average-vehicle-emissions-rates-vehicle-vehicle-type-using-gasoline-and
[11] https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references
[12] https://www.epa.gov/sites/production/files/201812/documents/power_profiler_terms_calculations_and_data_sources_12-1-2018.pdf
[13] https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references
[14] https://www3.epa.gov/ttn/chief/ap42/ch01/final/c01s04.pdf

fired boilers and heaters. These emission factors differ depending on the maximum firing rate, the firing configuration, and pollution control technologies. For each AR, StepWise personnel estimated emission reductions by applying the appropriate AP-42 emission factor. A summary of example emission factors from the AP-42 document are shown in Table A-3.

Table A-3: EPA AP-42 Boiler emission factors for a small natural gas boiler with low-NOx/FGR

Emission Metric	Emission Factor
CO_2 equivalent[15]	120,000
NO_x	32
SO_2	0.6

The Utah Division of Air Quality and the EPA view AP-42 as the only verified source of emission data for stationary natural gas combustion. The most recent version of AP-42 for natural gas combustion was completed in 1998. AP-42 is accepted as the industry standard for estimating air emissions. The Utah Division of Air Quality does makes two exceptions to the use of AP-42. The first is for stationary natural gas combustion sources that have been upgraded or replaced as a result of undergoing best available control technology (BACT) evaluation (part of the state's SIP process). This reduced emission factor is 0.04 lb/mmBTU. To the best of the StepWise team's knowledge, none of the boilers that were included in the recommendations or subsequent emission estimations met either of these criteria. Consequently, AP-42 was used.

If facility monthly natural gas consumption is available and a facility is located in the Wasatch Front non-attainment zone, then StepWise calculates winter-time $PM_{2.5}$ emissions. If an AR affects a natural gas load that varies with temperature, monthly natural gas savings are scaled by average monthly temperature. The average monthly temperature is found for cities in Utah using weather.gov. Because the colder months correlate with higher natural gas usage, the difference between the hottest month and and each individual month is used to scale the natural gas savings. This causes the months with very low average temperatures to have proportionally more natural gas savings per month than the months with high average temperatures. If an AR affects a natural gas load that does not vary with temperature, the natural gas savings are divided evenly among the 12 months and are not scaled with average monthly temperature. This allows for more accurate calculations of actual natural gas savings.

If an AR is considering a change in fuel type for the facility's combustion system, the emission changes related to the current and proposed situations (emissions associated with the current fuel combustion and the emissions associated with the proposed fuel combustion) are calculated based on the emission rates for each fuel type, reported by the EPA[16,17,18,19], then the emission changes related to the fuel switch AR can be calculated. These emission rates are combustion emissions and do not include life-cycle emissions.

[15] Carbon dioxide equivalent means the number of metric tons of CO2 emissions with the same global warming potential as one metric ton of another greenhouse gas.
[16] https://cfpub.epa.gov/webfire/SearchEmissionFactor/searchpage.cfm
[17] https://www.epa.gov/sites/default/files/2015-07/documents/emission-factors_2014.pdf
[18] https://www.epa.gov/sites/default/files/2020-09/documents/1.11_waste_oil_combustion.pdf
[19] https://www.epa.gov/sites/default/files/2020-09/documents/1.3_fuel_oil_combustion.pdf

Maps indicating Utah Air Quality Non-attainment Areas and Modeling Domain

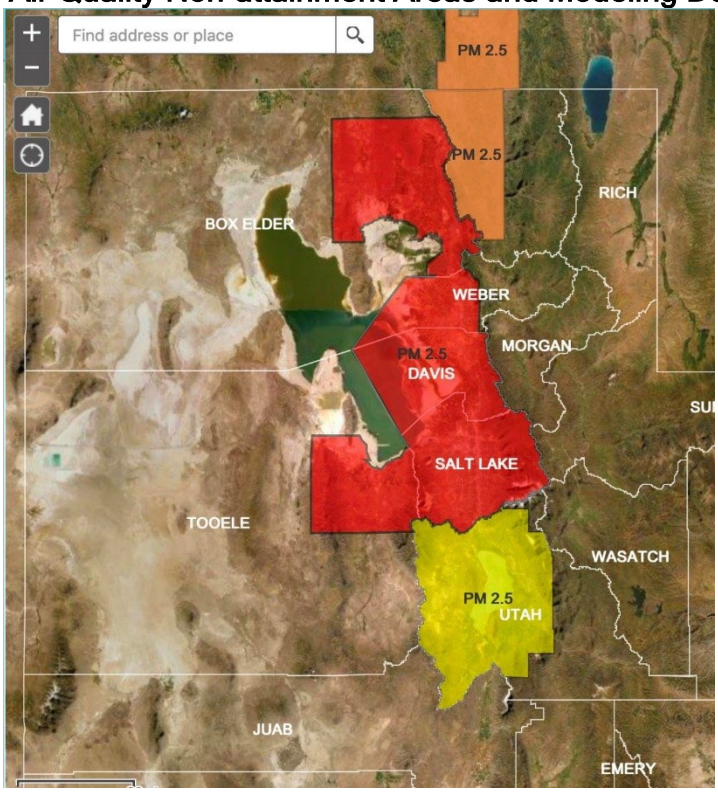

Figure A-1: Logan/Franklin (orange), Provo (yellow), and Salt Lake County (red) PM2.5 non-attainment areas. Note that Logan/Franklin and Provo have been reclassified as non-attainment maintenance areas.

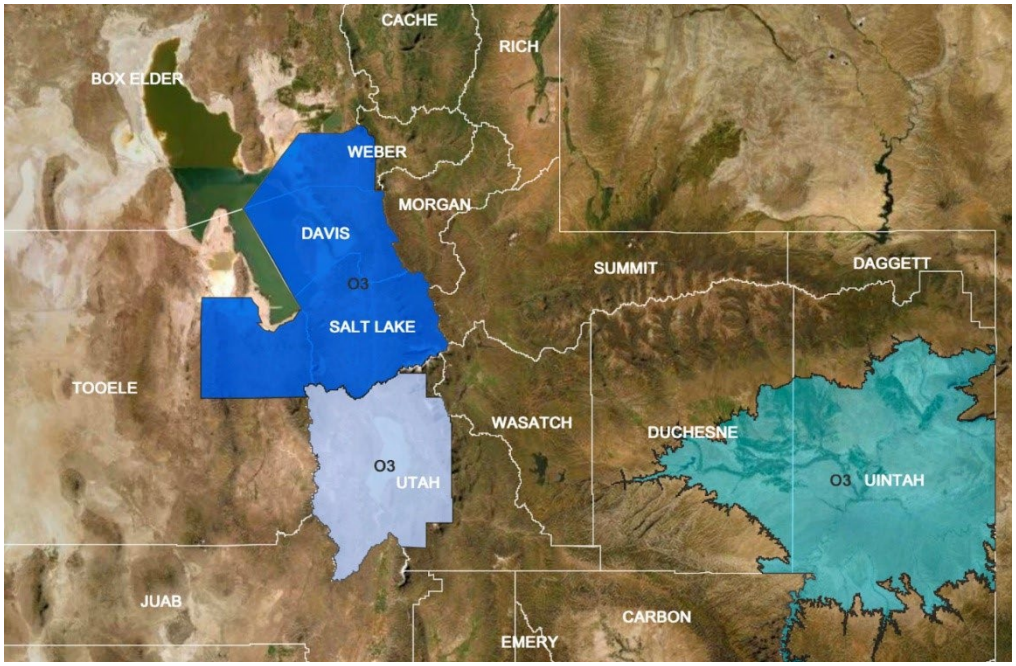

Figure A-2: Northern (dark blue) and Southern (light blue) Wasatch, Front and Uintah basin (turquoise) ozone non-attainment areas.

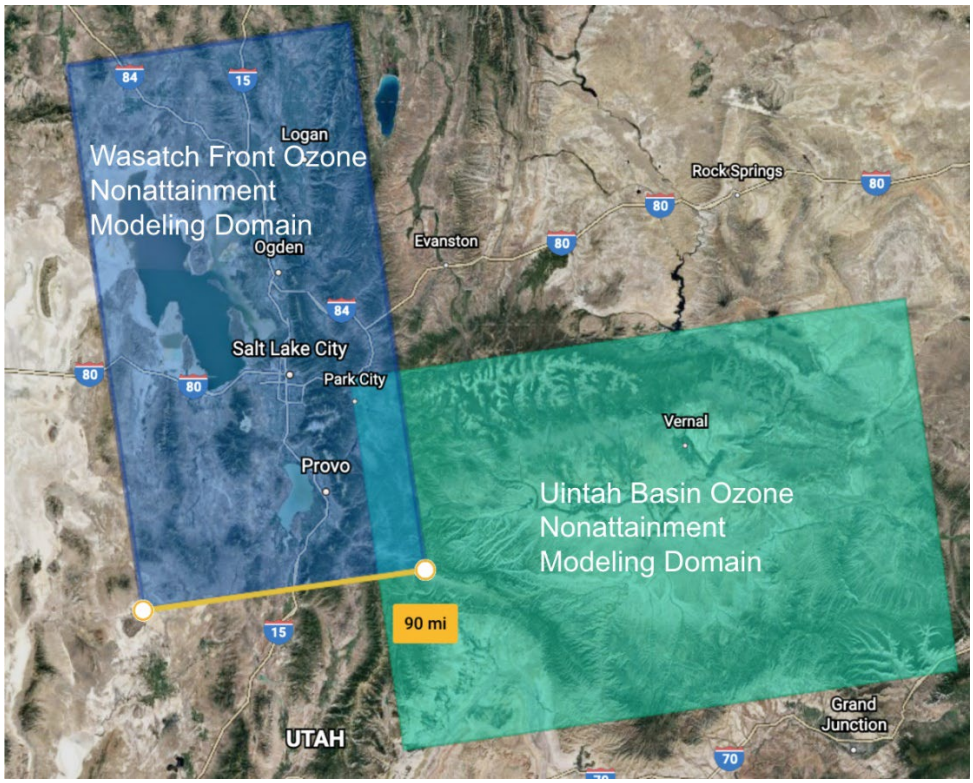

Figure A-3: Wasatch Front (blue) and Uintah basin (green) ozone non-attainment modeling domains. The boundaries of these domains exceed the non-attainment areas because emissions from the modeling domains influence ozone levels in the non-attainment areas. This domain was provided courtesy of the Utah Division of Environmental Quality, March 2021.