Entergy

Entergy Services, Inc.
639 Loyola Avenue 70113-3125
P.O. Box 61000
New Orleans, LA 70161-1000
Tel 504 576 6571
Fax 504 576 5579

Timothy S. Cragin
Assistant General Counsel
Legal Services - Regulatory

September 18, 2015

Via Hand Delivery
Ms. Lora W. Johnson, CMC
Clerk of Council
Room 1E09, City Hall
1300 Perdido Street
New Orleans, LA 70112

Re: *In Re*: Resolution Regarding Proposed Rulemaking to Establish Integrated Resource Planning Components and Reporting Requirements for Entergy New Orleans, Inc. (Docket No. UD-08-02)

Dear Ms. Johnson:

Enclosed please find an original and three copies of Entergy New Orleans, Inc.'s ("ENO") 2015 Integrated Resource Plan ("IRP") Updates for the Final IRP Report. This presentation provides updates regarding the following: (1) the effects of the reallocation of the Union Power Station resource from a power purchase agreement to the acquisition of Power Block 1; (2) the economic evaluation of demand-side management programs; and (3) the total supply cost of the evaluated portfolios, including updated load and capability data for the preferred CT portfolio. Please file an original and two copies into the record in the above-referenced matter, and return a date-stamped copy to our courier.

Thank you for your assistance with this matter.

Sincerely,

Timothy S. Cragin

TSC/tm
Enclosures
cc: Official Service List UD-08-02 *(via electronic mail)*

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BY: KB

CERTIFICATE OF SERVICE
Docket No. UD-08-02

I hereby certify that I have this 18th day of September 2015, served the required number of copies of the foregoing report upon all other known parties of this proceeding, by:
☒ electronic mail, ☐ facsimile, ☐ overnight mail, ☐ hand delivery, and/or
☐ United States Postal Service, postage prepaid.

Lora W. Johnson
Clerk of Council
Council of the City of New Orleans
City Hall, Room 1E09
1300 Perdido Street
New Orleans, LA 70112

W. Thomas Stratton, Jr.
Director, City Council Utilities
Regulatory Office
City of New Orleans
City Hall, Room 6E07
1300 Perdido Street
New Orleans, LA 70112

Evelyn F. Pugh, Esq.
Council Chief of Staff
New Orleans City Council
City Hall, Room 1E06
1300 Perdido Street
New Orleans, LA 70112

Sharonda Williams
City Attorney Office
City Hall, Room 5E03
1300 Perdido Street
New Orleans, LA 70112

Norman S. Foster
Department of Finance
City Hall, Room 3W06
1300 Perdido Street
New Orleans, LA 70112

Hon. Jeffery S. Gulin
3203 Bridle Ridge Lane
Lutherville, GA 21093

Clinton A. Vince, Esq.
Presley R. Reed, Jr., Esq.
Emma F. Hand, Esq.
Dentons US LLP
1301 K Street, NW
Suite 600, East Tower
Washington, DC 20005-3364

Basile J. Uddo, Esq.
J.A. "Jay" Beatmann, Jr.
c/o Dentons US LLP
The Poydras Center, Suite 2850
650 Poydras Street
New Orleans, LA 70130-6132

Walter J. Wilkerson, Esq.
Bobbie Mason, Esq.
Kelley Bazile
Wilkerson and Associates, PLC
The Poydras Center, Suite 1913
650 Poydras Street
New Orleans, LA 70130

Joseph A. Vumbaco, P.E.
Victor M. Prep
Joseph W. Rogers
Legend Consulting Group Limited
8055 East Tufts Avenue
Suite 1250
Denver, CO 80237-2835

Errol Smith, CPA
Bruno and Tervalon
4298 Elysian Fields Avenue
New Orleans, LA 70122

Gary Huntley
Entergy New Orleans, Inc.
Mail Unit L-MAG-505B
1600 Perdido Street
New Orleans, LA 70112

Charles Rice, Jr.
Entergy New Orleans, Inc.
Mail Unit L-MAG-505A
1600 Perdido Street
New Orleans, LA 70112

Seth Cureington
Polly S. Rosemond
Al D. Eiffert
Entergy New Orleans, Inc.
Mail Unit L-MAG-505B
1600 Perdido Street
New Orleans, LA 70112

Kathryn J. Lichtenberg, Esq.
Timothy S. Cragin, Esq.
Brian L. Guillot, Esq.
Lawrence J. Hand, Jr., Esq.
Edward Wicker, Jr., Esq.
Entergy Services, Inc.
Mail Unit L-ENT-26E
639 Loyola Avenue
New Orleans, LA 70113

Joseph J. Romano, III
Suzanne Fontan
Therese Perrault
Entergy Services, Inc.
Mail Unit L-ENT-4C
639 Loyola Avenue
New Orleans, LA 70113

Kimberly A. Fontan
Entergy Services, Inc.
4809 Jefferson Highway
Mail Unit L-JEF-357
Jefferson, LA 70121

Michael L. Winberry
Jacobs Technology Inc.
13800 Old Gentilly Rd., Bldg. 320
New Orleans, LA 70129

Randy Day
Director
The Folger Coffee Company
14601 Old Gentilly Road
New Orleans, LA 70129

Ernest L. Edwards, Jr.
Beirne, Maynard & Parsons, L.L.P.
601 Poydras Street
Suite 2200
New Orleans, LA 70130-6097

Fred M. Mazurski, CEM, CDSM
Energy USG Corporation
550 West Adams Street
Chicago, IL 60661-3676

Joshua Smith
Staff Attorney
Sierra Club Environmental Law Program
85 Second Street, 2nd Floor
San Francisco, CA 94105

Casey DeMoss
CEO
Logan Atkinson Burke
Alliance for Affordable Energy
4035 Washington Avenue
New Orleans, LA 70125

Jeff Cantin
Heather Pohnan
Gulf States Renewable Energy Industries Association
643 Magazine Street, Suite 102
New Orleans, LA 70130

Abby Fox
Policy Manager
Southeast Energy Efficiency Alliance
50 Hurt Plaza SE, Suite 1250
Atlanta, GA 30303

Robert L. Suggs, Jr., CEO
C. Tucker Crawford
Co-Founder/Partner
South Coast Solar, LLC
2605 Ridgelake Drive
Metairie, LA 70002

Ernest L. Edwards, Jr.
Beirne, Maynard & Parsons, L.L.P.
601 Poydras Street
Suite 2200
New Orleans, LA 70130-6097

Thomas W. Milliner
Brian Burke
Anzelmo, Milliner & Burke LLC
3636 S. I-10 Service Road W.
Suite 206
Metairie, LA 70001

Jacquelyn Dadakis, Managing Director
Regina La Macchia, Development Manager
GCE Services
2725 So. Broad Street
New Orleans, LA 70125

Karla Loeb
Margot Want
Posigen Solar Solutions
2424 Edenborn Ave., Suite 550
Metairie, LA 70001

Rick Boyd
The Folger Coffee Company
14601 Old Gentilly Road
New Orleans, La 70129

Mark Zimmerman
Air Products and Chemicals, Inc.
7201 Hamilton Boulevard
Allentown, PA 18195-1501

New Orleans, Louisiana, this 18th day of September, 2015.

Timothy S. Cragin

SPO Planning Analysis

2015 ENO IRP

Updates for the Final IRP

SEPTEMBER 18, 2015

Entergy®

OBJECTIVES

The following topics will be discussed:

- Effects of Union Reallocation on ENO Supply Plan
  - Supply Role Capacity Analysis
  - Energy Mix Analysis
  - ENO Carbon Intensity
- DSM Economic Evaluation
  - Cost/Benefit and Breakeven Calculation
  - Demand Response Timing Optimization
  - Incremental Load Reduction from Demand Response
  - Diminishing Return Effect
- Total Supply Cost and Preferred Portfolio
  - Updated Total Supply Costs
  - Renewable Sensitivity Breakeven Analysis
  - Updated Load and Capability of Preferred Portfolio

Effects of Union Reallocation on ENO Supply Plan

OVERVIEW

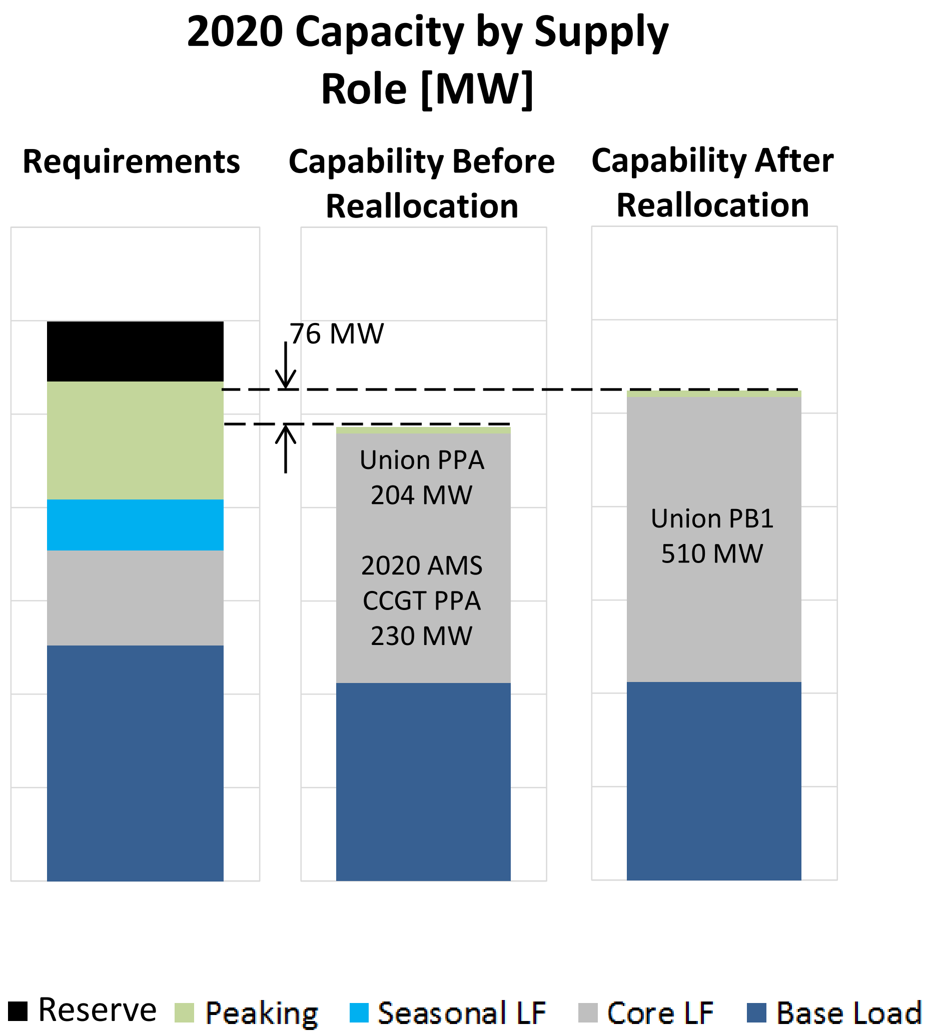
This section addresses the updates to the ENO IRP that relate to the reallocation of Union Power Block 1 (PB1). Two analyses were performed in order to understand the effects of the reallocation. Overall, the reallocation did not change the objective of the IRP, which is to identify the most economic way to meet the remaining peaking/reserve resource need.

- Capacity by Supply Role

- ENO Energy Mix
  - ENO Carbon Intensity

ENO PORTFOLIO AND SUPPLY ROLE NEEDS

Prior to and following the reallocation of Union PB1 and the 2020 Amite South CCGT, ENO's 2020 generation portfolio is projected to have adequate capacity for its Base Load and Core Load Following needs. However, additional peaking capacity is needed both before and after the reallocation. Union PB1 is economically suited to meet both load-following and peaking needs.

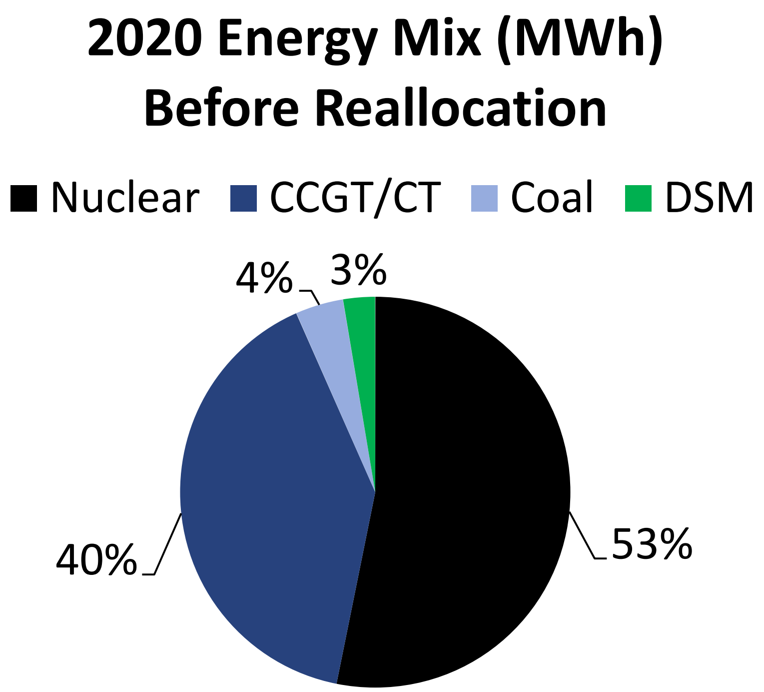


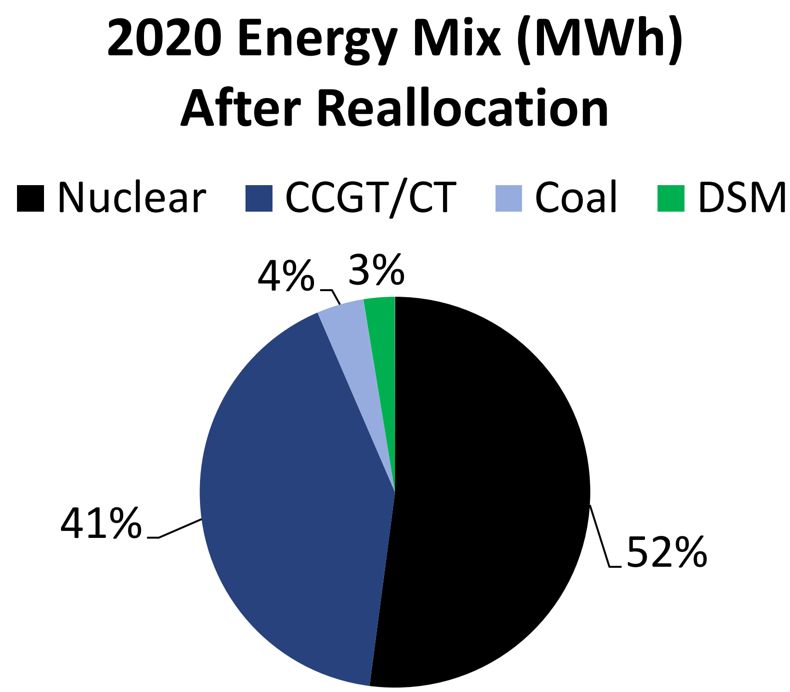
Capability After Reallocation

Unit	Fuel	Capability (MW)
Ninemile 6	Gas	112
Union	Gas	510
ANO 1	Nuclear	23
ANO 2	Nuclear	27
Grand Gulf	Nuclear	247
Independence 1	Coal	7
White Bluff 1	Coal	12
White Bluff 2	Coal	13

ENO'S ENERGY MIX

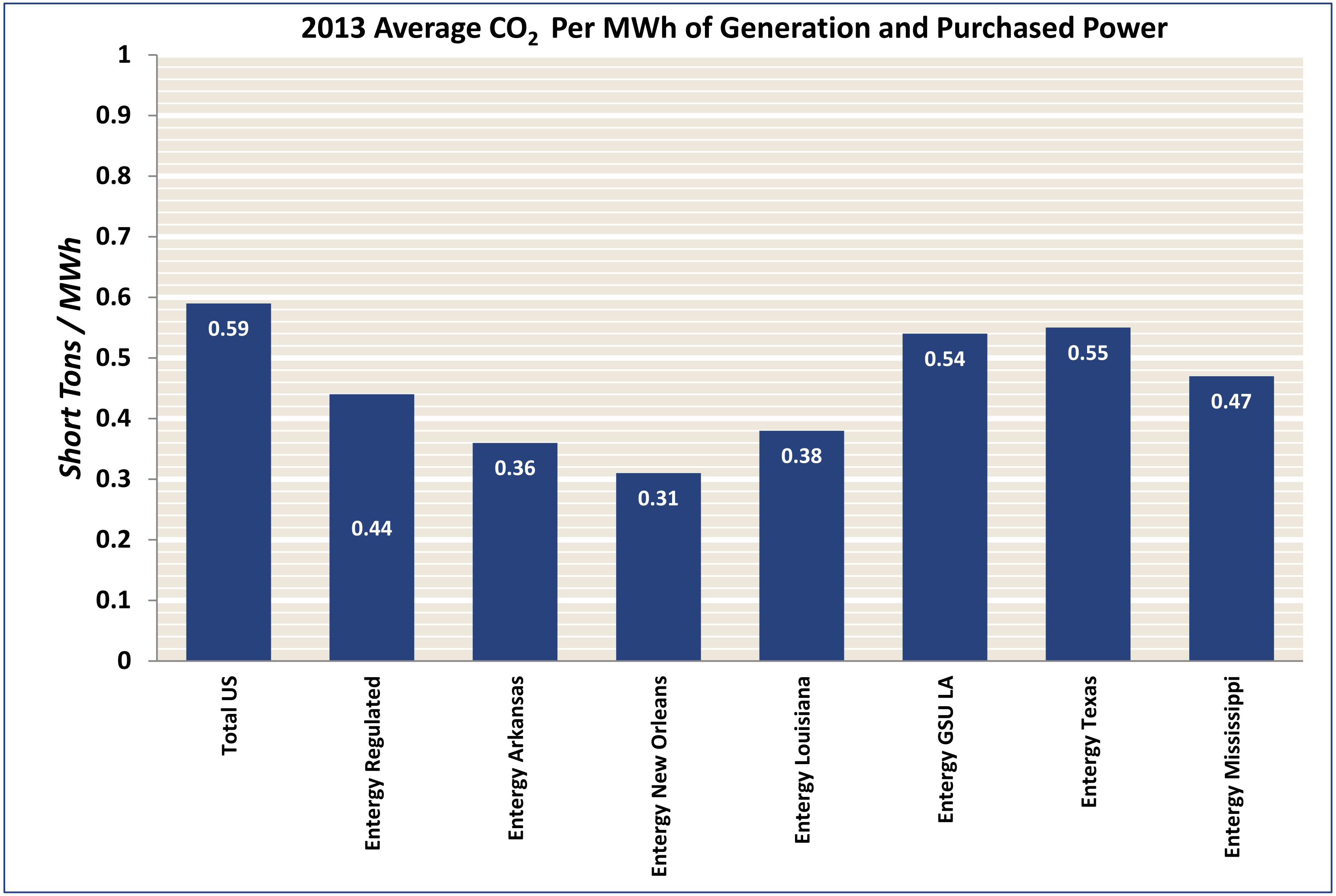
The projected energy mix for ENO by the year 2020 is consistent prior to and after the reallocation of Union PB1. ENO retains the same energy diversity with Union PB1 as it did with Union PB3&4 and 2020 Amite South PPAs. Over half of ENOs projected energy needs will be met with zero carbon emission stabled-priced baseload nuclear energy.





ENO'S CARBON INTENSITY

ENO's generation portfolio produced approximately 50% fewer CO2 emissions than the average US utility in 2013.



DSM Economic Evaluation

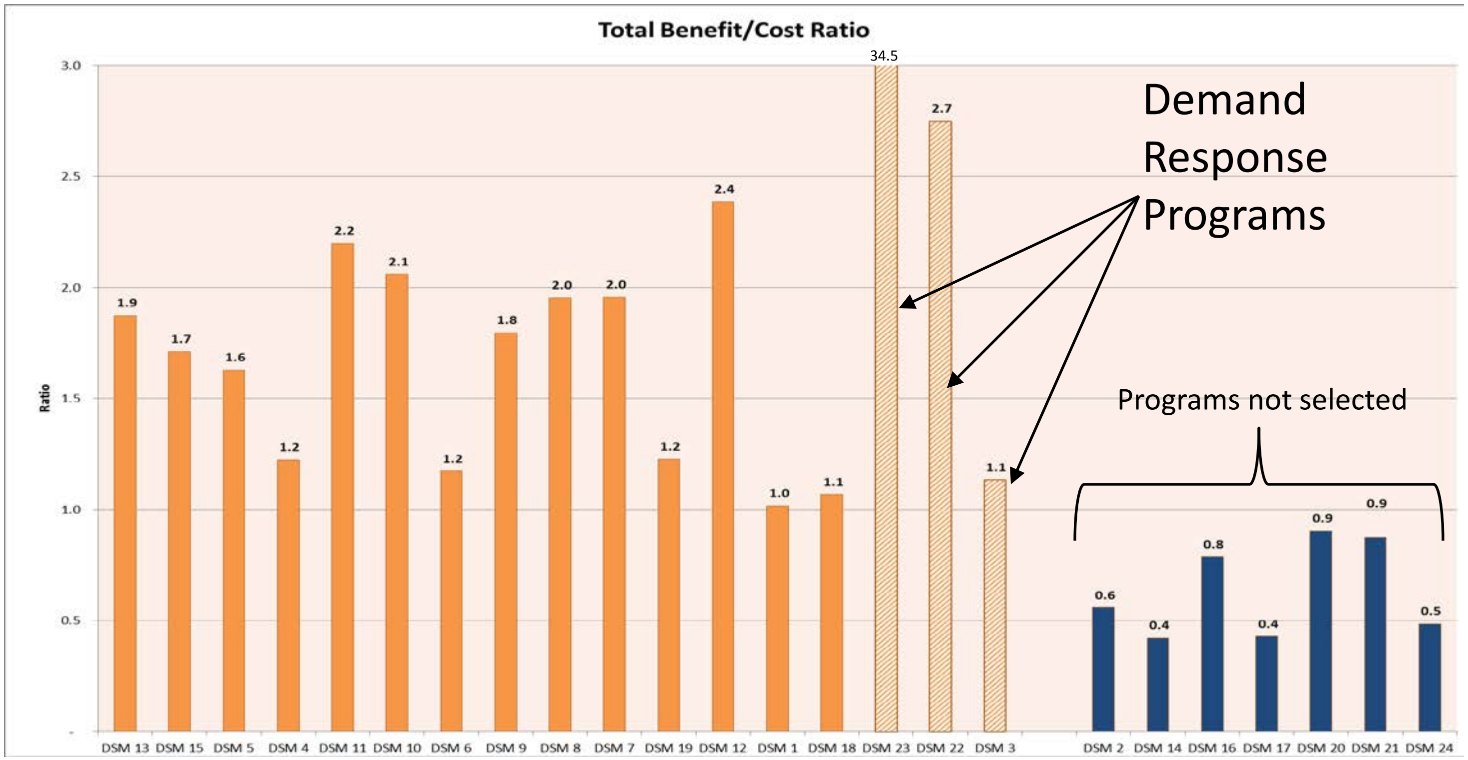
OVERVIEW

This section addresses the updated economic evaluation of the DSM programs. Major changes include updated costs for ENO incentives, updated load shapes, and updated cost/benefit analysis. All programs previously selected in the draft IRP were again selected in the updated analysis. In addition, three demand response programs were selected, contributing to an additional 35 MW in load reduction by 2034.

- Cost/Benefit and Breakeven Calculation
- Demand Response Timing Optimization
- Incremental Load Reduction from Demand Response
- Diminishing Return Effect

TOTAL BENEFIT TO COST RATIO

Selected DSM Program Summary, PV 2015$ M$, 2015 - 2034			
Total Benefit	Cost	Net Benefit	# of Programs
$164.3M	$110.8 M	$53.5M	17



DSM Program Net Benefit, PV 2015$ (M$)																								
M$	DSM 13	DSM 15	DSM 5	DSM 4	DSM 11	DSM 10	DSM 6	DSM 9	DSM 8	DSM 7	DSM 19	DSM 12	DSM 1	DSM 18	DSM 23**	DSM 22	DSM 3	DSM 2	DSM 14	DSM 16	DSM 17	DSM 20	DSM 21	DSM 24
PV 2015$	13.1	8.8	2.4	1.8	1.9	1.8	0.9	0.6	0.5	0.5	0.2	0.2	0.8	0.0	12.6	7.1	0.4	(6.7)	(21.2)	(0.3)	(3.3)	(0.2)	(0.3)	(0.0)

*For all programs highlighted in red, total costs exceed total benefit.
**DSM Program has a benefit:cost ratio of 34.5.
***ENO's discount rate as of YE 12/31/14 is 6.93%.

NET BENEFIT/BREAKEVEN FOR DSM PROGRAMS, PV 2015$

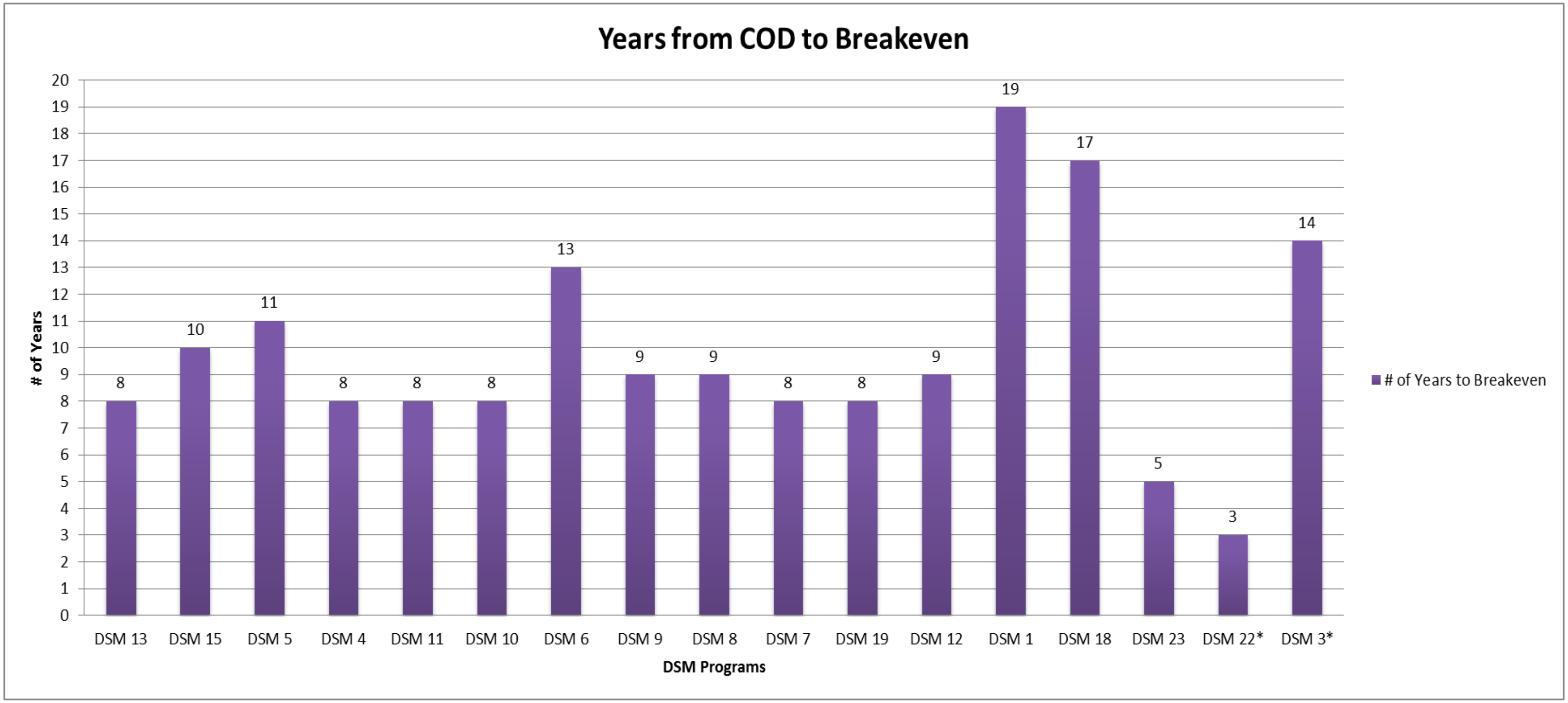
DSM breakeven net benefit illustrates that cost-effective programs break even within the evaluation period 2015 – 2034.

Benefit:		**DSM 13**	**DSM 15**	**DSM 5**	**DSM 4**	**DSM 11**	**DSM 10**	**DSM 6**	**DSM 9**	**DSM 8**	**DSM 7**	**DSM 19**	**DSM 12**	**DSM 1**	**DSM 18**	**DSM 23**	**DSM 22**	**DSM 3**
Energy Revenue	*M$*	$22.5	$11.3	$5.4	$8.5	$2.8	$2.9	$5.1	$1.0	$0.9	$0.8	$1.1	$0.2	$45.0	$0.2	$0.0	$0.0	$0.0
Load Reduction Capacity Value	*M$*	$5.6	$9.9	$0.8	$1.6	$0.6	$0.7	$1.1	$0.2	$0.2	$0.2	$0.1	$0.1	$8.0	$0.1	$12.9	$11.1	$3.4
Total Benefit	*M$*	$28.1	$21.1	$6.2	$10.1	$3.4	$3.6	$6.2	$1.3	$1.1	$1.0	$1.2	$0.3	$53.0	$0.3	$12.9	$11.1	$3.4
Cost:																		
Total Program Cost	*M$*	$15.0	$12.4	$3.8	$8.3	$1.6	$1.7	$5.3	$0.7	$0.6	$0.5	$1.0	$0.1	$52.2	$0.3	$0.4	$4.0	$3.0
Net Benefit	*M$*	**$13.1**	**$8.8**	**$2.4**	**$1.8**	**$1.9**	**$1.8**	**$0.9**	**$0.6**	**$0.5**	**$0.5**	**$0.2**	**$0.2**	**$0.8**	**$0.0**	**$12.6**	**$7.1**	**$0.4**
Breakeven Year		2023	2025	2026	2023	2023	2023	2028	2024	2024	2023	2023	2024	2034	2032	2020	2022	2035

*The Net Benefit Breakeven is calculated using the rolling net benefit, defined as revenue minus cost. The rolling cumulative net benefit is then calculated on a PV basis over the evaluation period until revenues exceed costs.
**The effect of the peak and energy reduction is cumulative in the sense that each successive program added is in addition to the previous programs that were selected.
***DSM programs were added in the order shown above from left to right.

DSM PROGRAM BREAKEVEN YEAR

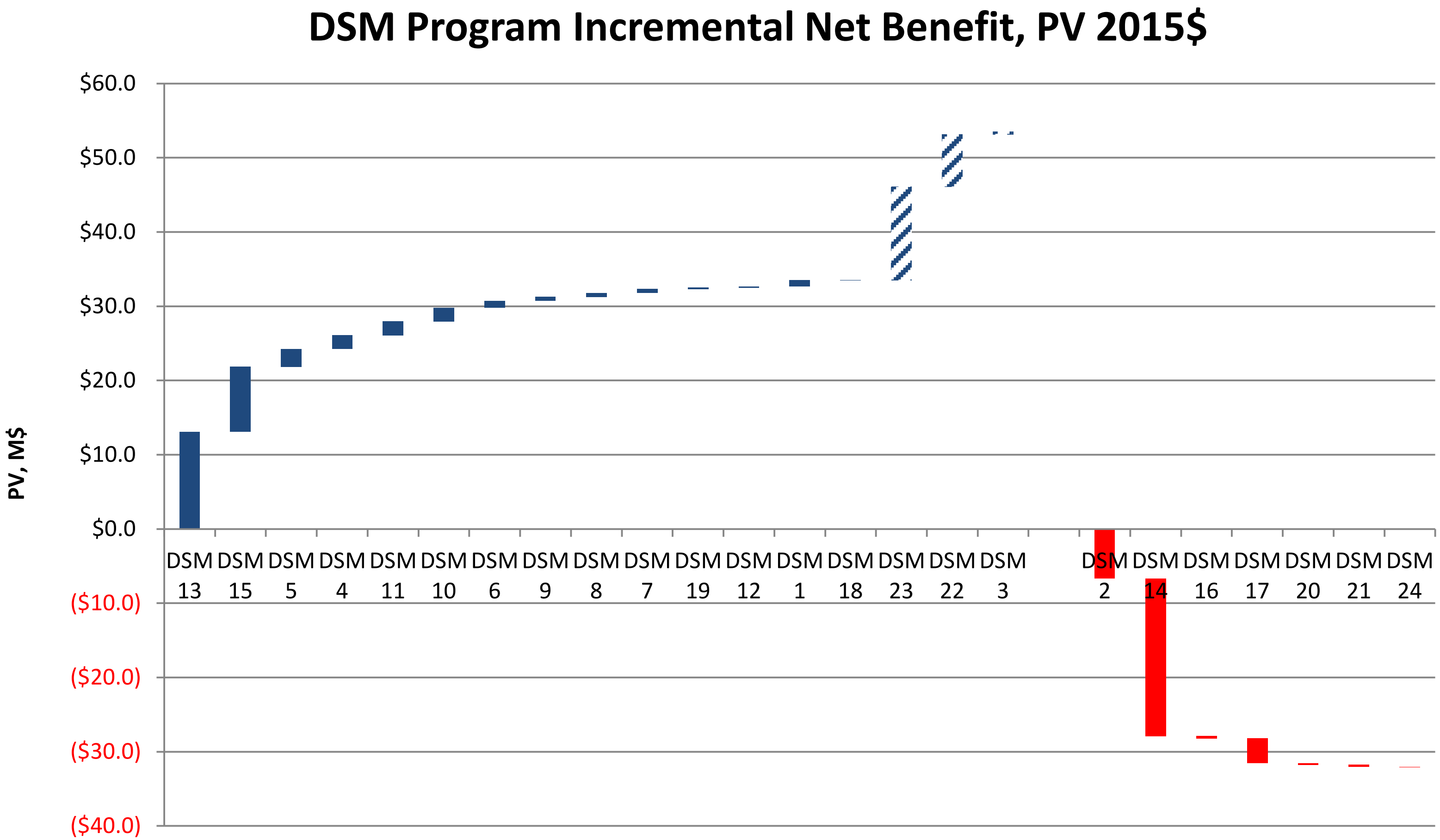
Of the 17 cost-effective DSM programs, 13 programs breakeven (76%) by 2026.



*DSM 3 starts in 2021 and DSM 22 starts in 2019. All other programs start in 2015.
**The Net Benefit Breakeven is calculated using the rolling net benefit, defined as revenue minus cost. The rolling cumulative net benefit is then calculated on a PV basis over the evaluation period until revenues exceed costs.
***The effect of the peak and energy reduction is cumulative in the sense that each successive program added is in addition to the previous programs that were selected.

INCREMENTAL NET BENEFIT

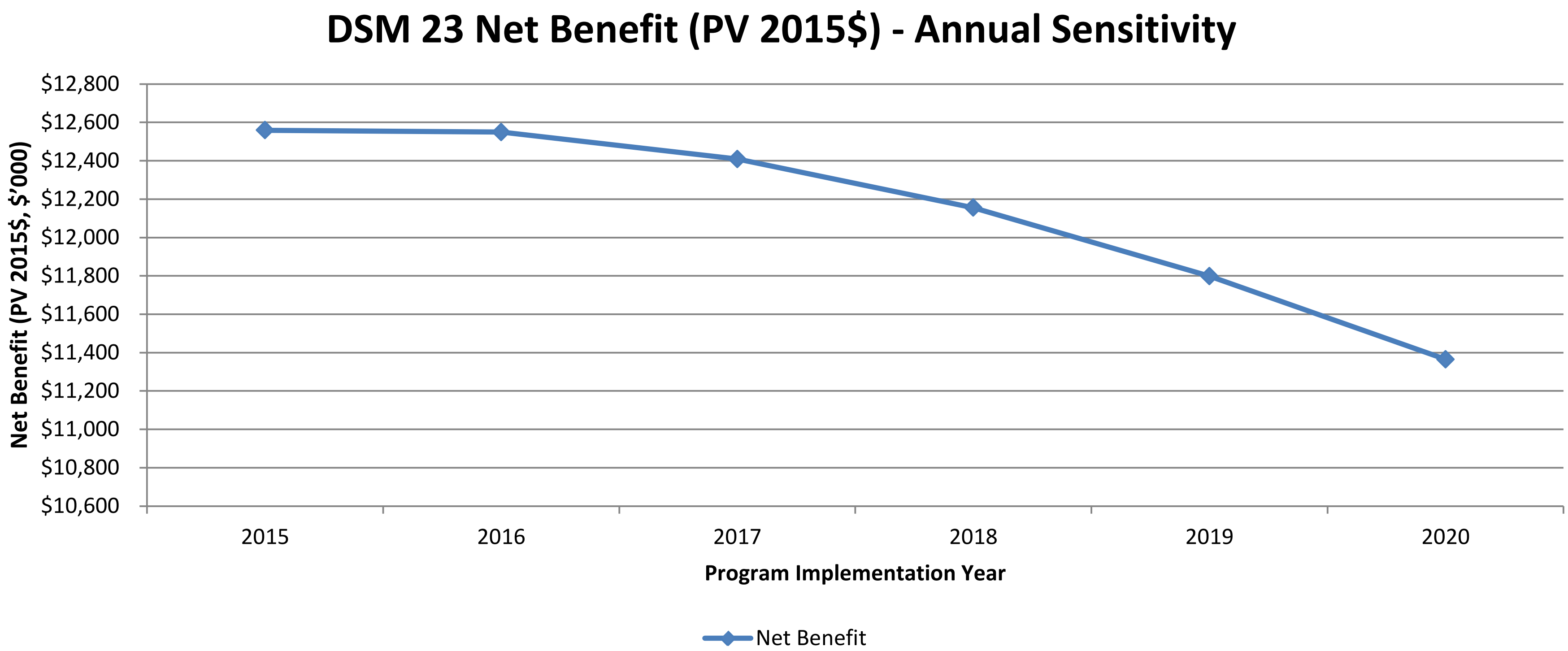
Below represents the net benefit of each individual DSM program; together, the total cumulative net benefit of the <u>Cost-Effective</u> DSM programs is $53.5M.



*ENO's discount rate as of YE 12/31/14 is 6.93%.
*Striped bars represent Demand Response programs

DEMAND RESPONSE – DSM PROGRAM 23

DSM Program 23 is Dynamic Pricing. The most net benefit received for DSM Program 23 occurs with implementation in 2015.



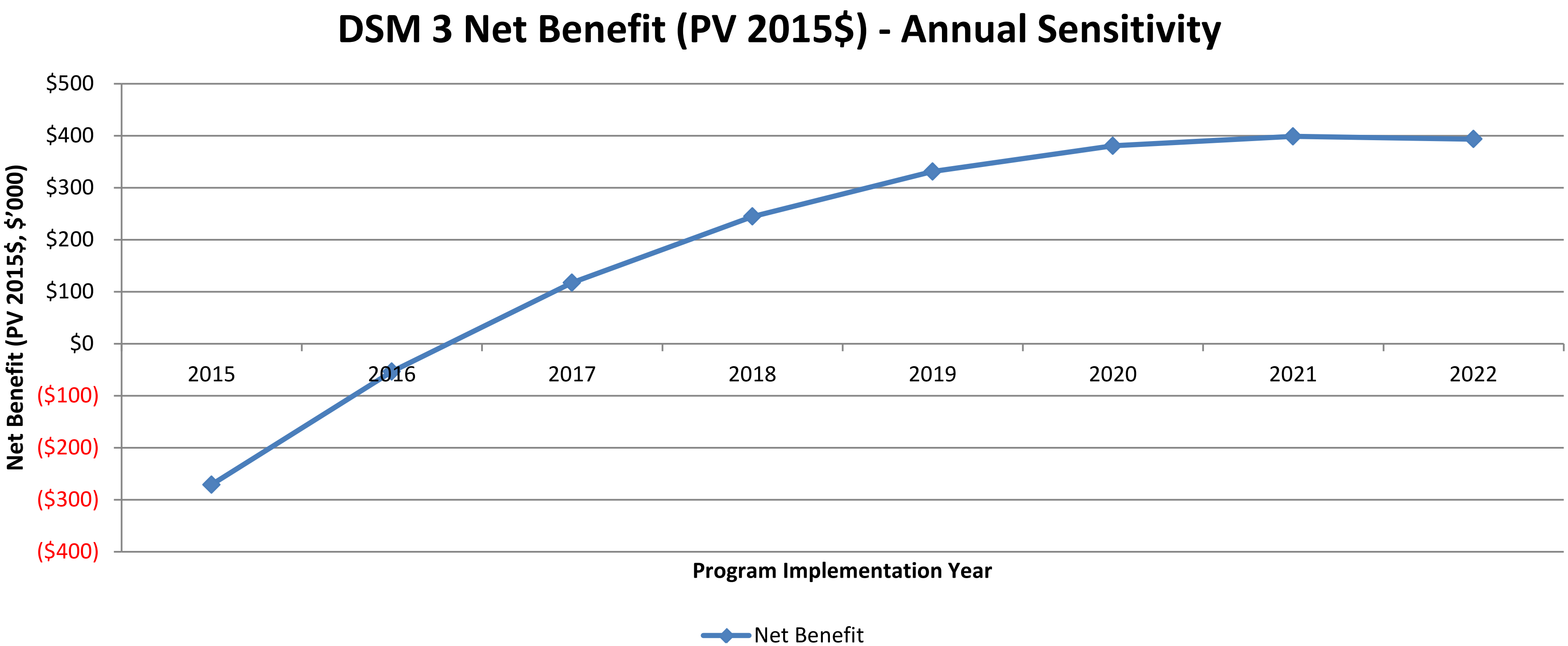
DSM 23	2015	2016	2017	2018	2019	2020
Total Benefit	$12,934	$12,907	$12,750	$12,481	$12,109	$11,661
Total Cost	$375	$358	$341	$326	$311	$296
Net Benefit	**$12,559**	**$12,549**	**$12,409**	**$12,155**	**$11,799**	**$11,365**

*The Net Benefit measures the Present Value (PV) of the benefits minus costs over a 20 year evaluation period. The data points assumes the program is implemented in the respective year and the program lasts 20 years after implementation.

**ENO WACC - 6.93%

DEMAND RESPONSE – DSM PROGRAM 3

DSM Program 3 is Non-Residential Dynamic Pricing. The most net benefit received for DSM Program 3 occurs with implementation in 2021.



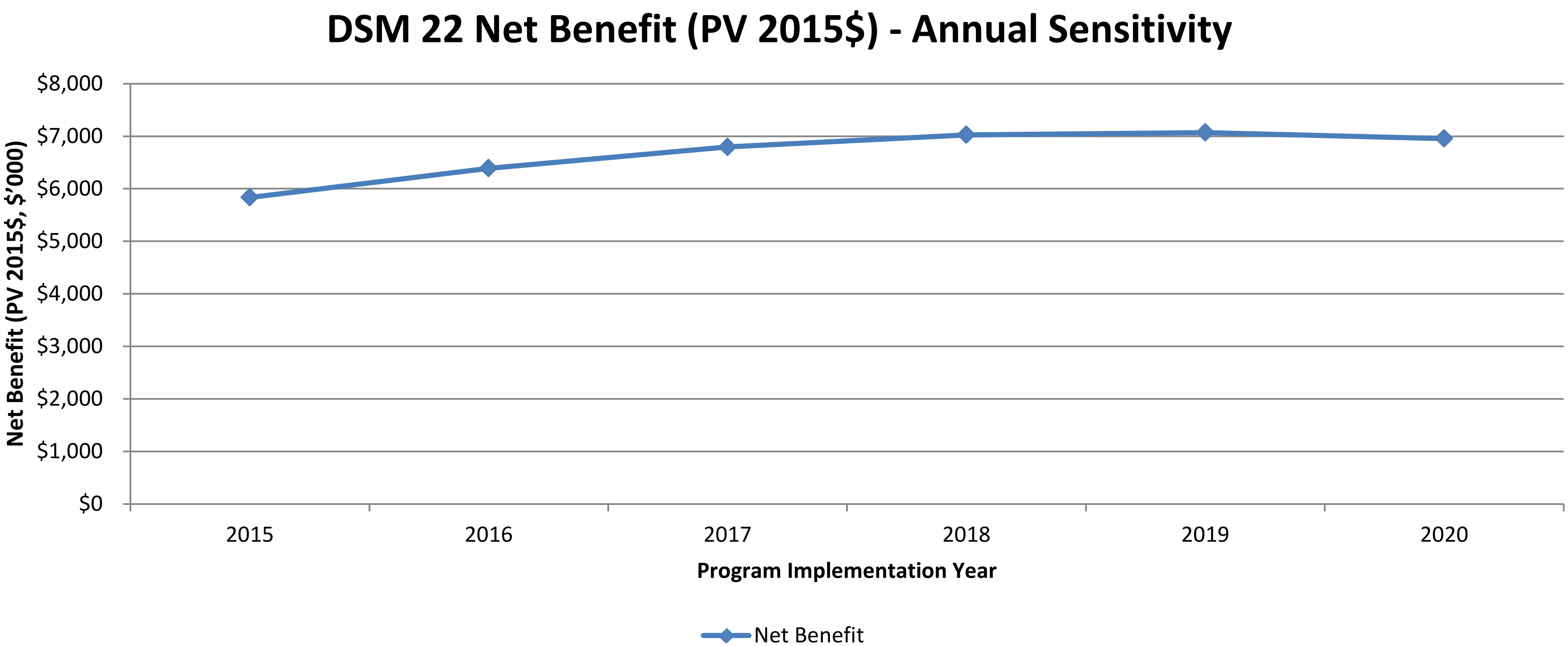
DSM 3	2015	2016	2017	2018	2019	2020	2021	2022
Total Benefit	$3,708	$3,742	$3,738	$3,698	$3,625	$3,522	3396	$3,252
Total Cost	$3,979	$3,795	$3,620	$3,453	$3,294	$3,142	2997	$2,859
Net Benefit	**($271)**	**($54)**	**$117**	**$245**	**$331**	**$380**	**$399**	**$393**

*The Net Benefit measures the Present Value (PV) of the benefits minus costs over a 20 year evaluation period. The data points assumes the program is implemented in the respective year and the program lasts 20 years after implementation.

**ENO WACC - 6.93%

Demand Response – DSM Program 22

DSM Program 22 is Direct Load Control. The most net benefit received for DSM Program 22 occurs with implementation in 2019.



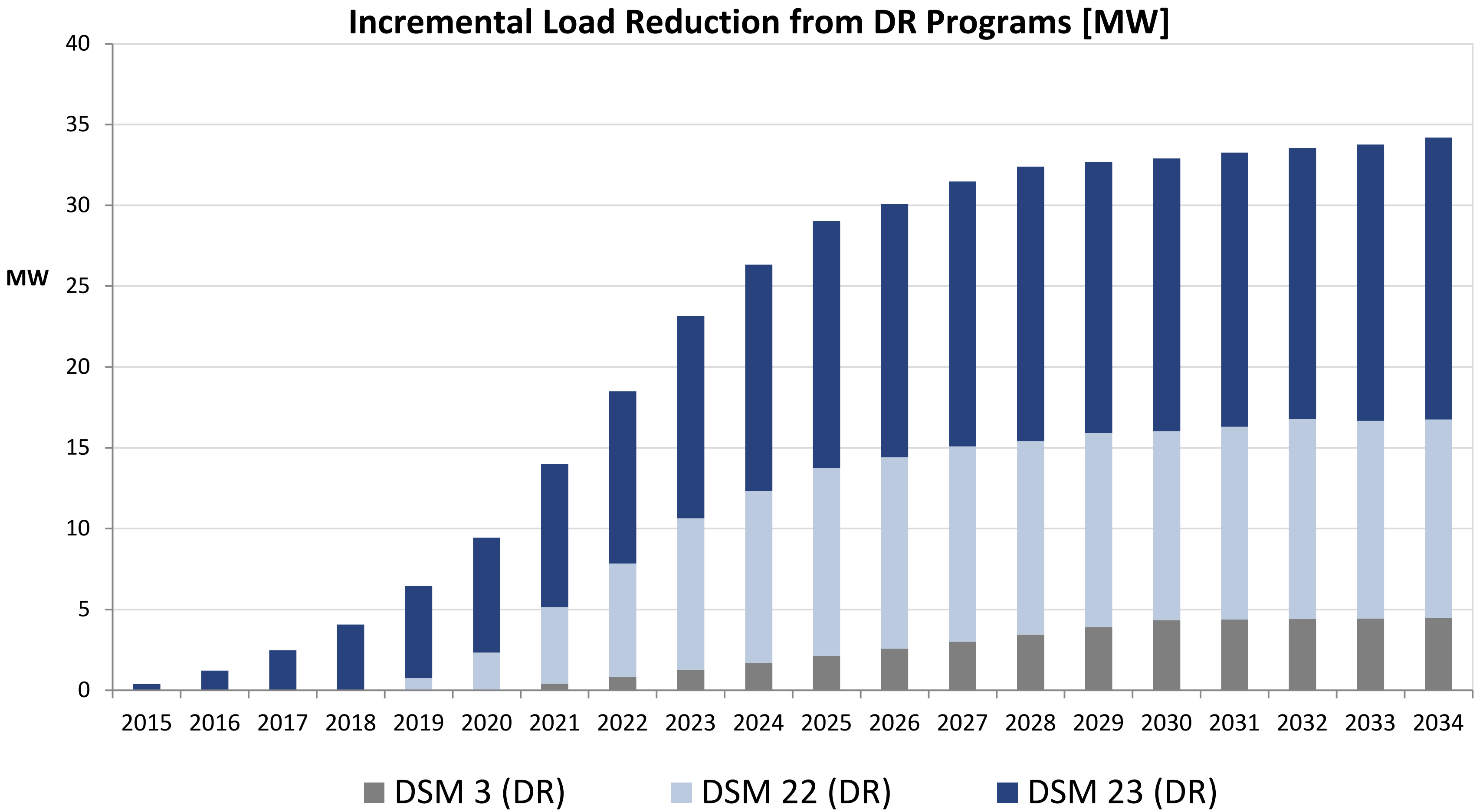
DSM 22	2015	2016	2017	2018	2019	2020
Total Benefit	$10,717	$11,048	$11,238	$11,264	$11,112	$10,812
Total Cost	$4,883	$4,658	$4,443	$4,238	$4,042	$3,856
Net Benefit	**$5,834**	**$6,391**	**$6,795**	**$7,026**	**$7,070**	**$6,956**

*The Net Benefit measures the Present Value (PV) of the benefits minus costs over a 20 year evaluation period. The data points assumes the program is implemented in the respective year and the program lasts 20 years after implementation.

**ENO WACC - 6.93%

INCREMENTAL LOAD REDUCTION FROM DR PROGRAMS

With the inclusion of the three DR programs, ENO peak load could be reduced by an additional 35 MW by 2034. Total reduction of load from all DSM programs by 2034 is projected to be 86 MW[1].



[1]The implementation of cost-effective DSM requires consistent, sustained regulatory support and approval. ENO's investment in DSM must be supported by a reasonable opportunity to timely recover all of the costs, including lost contribution to fixed cost, associated with those programs.

DEMONSTRATION OF DSM DIMINISHING MARGINAL RETURNS

The table below demonstrates that with each additional DSM program selected by AURORA, the benefit of the other previously selected programs is decreased.

MWh-Weighted Program Benefit by Iteration (PV, 2015$)				
Program	**Iteration 1**	**Iteration 2**	**Iteration 3**	**Iteration 4**
DSM13 - Residential Lighting & Appliances	615.03	614.71	614.68	614.29
DSM15 - ENERGY STAR Air Conditioning	N/A	697.51	697.34	696.82
DSM4 - RetroCommissioning	N/A	N/A	566.81	566.41

Notes:

1. Program benefit includes both avoided energy and capacity.

2. The values in this analysis do not reflect the actual avoided energy and capacity of each DSM program. Because of the small size of each program relative to the entire MISO system, the effect of each program on energy pricing is very small. Thus, it is difficult to demonstrate the effect of diminishing marginal returns within the precision of the AURORA model. To demonstrate proof of concept, hourly load reductions for each of the three programs were increased by a factor of 10.

3. Iteration refers to the iterative process employed in the AURORA capacity expansion algorithm

4. "N/A" values indicate a program was not in the system for that iteration. Each iteration, the program with the next highest net benefit is selected to be included in the system, in addition to all programs previously selected.

Total Supply Cost and Preferred Portfolio

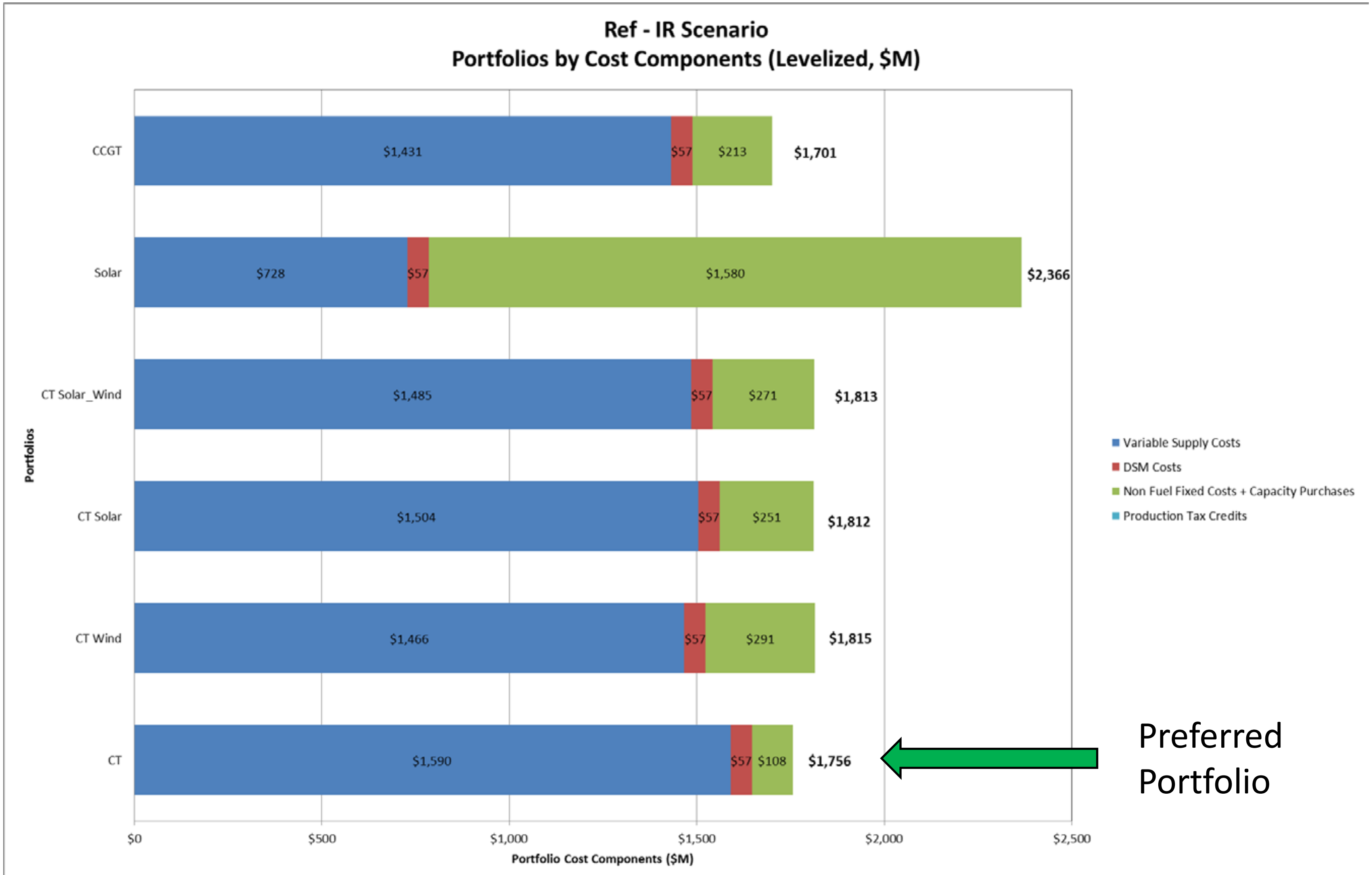
OVERVIEW

This sections addresses the necessary updates to the total supply cost of the evaluated portfolios. In addition, a sensitivity study was performed on the estimated install costs of solar and wind resources. This was done to determine at what point the CT Wind, CT Solar, and CT Solar_Wind portfolios would have an equal total supply cost to the preferred CT portfolio. Lastly, the updated load and capability chart is shown for the preferred portfolio.

- Total Supply Cost Comparison
- Renewable Install Cost Sensitivity Analysis
- Updated Load and Capability chart for ENO's preferred portfolio

TOTAL SUPPLY COSTS EXCLUDING NON-FUEL FIXED COSTS

After the reallocation of Union PB1 and the re-evaluation of the DSM programs, the CT portfolio is still the preferred portfolio for ENO.



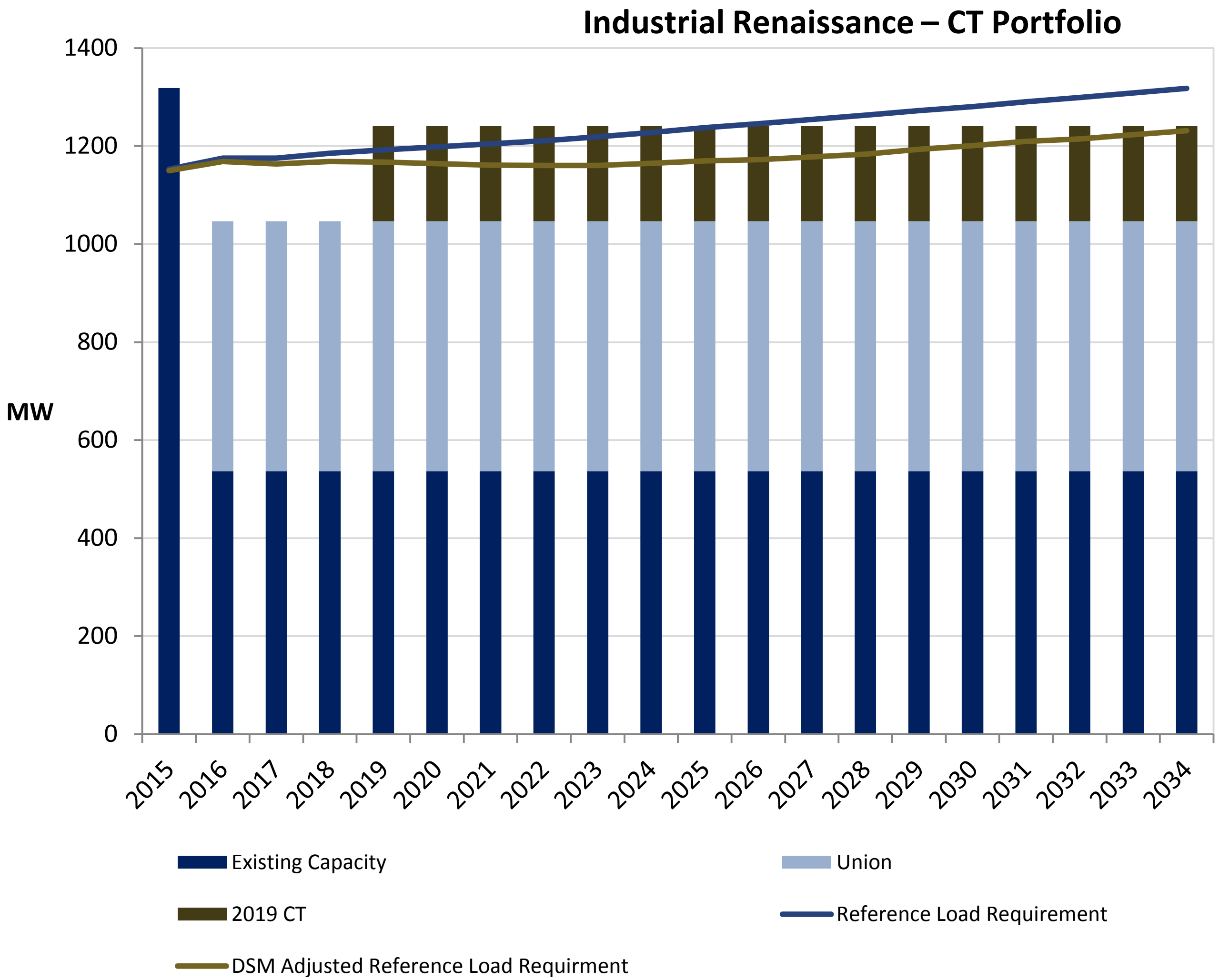
RENEWABLE RESOURCE COMPARISON TO PREFERRED PORTFOLIO

In order for the CT Wind, CT Solar, and CT Solar_Wind portfolios to be competitive with the CT Portfolio, the installed cost of wind and solar resources would have to be approximately 30-40% less than the current installed cost estimates. Thus, the CT Portfolio is still the preferred portfolio. Renewable installation costs will continue to be monitored for planning purposes going forward.

ENO IRP Breakeven Wind and Solar Installed Cost

Portfolio		**CT Wind**	**CT Solar**	**CT Solar_Wind**
Original Installed Cost (2020)	*$/kW*	$2,291 (Wind)	$2,076 (Solar)	$2,291 (Wind) $2,076 (Solar)
Breakeven (BE) Installed Cost	*$/kW*	$1,513 (Wind)	$1,250 (Solar)	$1,455 (Wind) $1,318 (Solar)
BE as % of Original Installed Cost	%	66%	60%	64%

ENO'S PREFERRED PORTFOLIO UPDATED



*Resources listed in blue are existing and planned resources. Resources additions listed in brown are the resources to be evaluated in the IRP.

Table 1: IRP Additions

Resource Addition	Capacity (MW)
2019 CT	194

Table 2: Additional Capacity Needs After IRP Additions (Reference Load)

Year	Capacity Need (Surplus) [MW]
2020	(42)
2021	(36)
2022	(30)
2023	(22)
2024	(13)
2025	(3)
2026	5
2027	14
2028	23
2029	32
2030	40
2031	50
2032	58
2033	68
2034	77