



February 3, 2017

Oregon Public Utility Commission  
Attn: Filing Center  
P.O. Box 1088  
Salem, OR 97308-1088

**Re: LC 59, Cascade Natural Gas Corporation's Annual Update to its 2014 Integrated Resource Plan**

Cascade Natural Gas Corporation (Cascade or the Company) files herewith the attached Annual Update to its 2014 Integrated Resource (IRP Update) in Docket No. LC 59. This IRP Update conforms to the requirements established by the Commission in Order No. 16-054.

If you have any questions regarding this filing, please contact Mark Sellers-Vaughn at (206) 617-2708.

Sincerely,  
CASCADE NATURAL GAS CORPORATION

A handwritten signature in black ink that reads "Mark Sellers-Vaughn". The signature is written in a cursive, flowing style.

Mark Sellers-Vaughn  
Manager, Supply Resource Planning



*In the Community to Serve®*

**2014 INTEGRATED RESOURCE PLAN ANNUAL UPDATE  
As of February 3, 2017**

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## Introduction

Cascade Natural Gas Corporation (Cascade or the Company) is a public utility serving more than 273,000 customers, with approximately 68,000 in Oregon and 205,000 in Washington. The Company's customers are located in 96 communities, 28 of which are in Oregon and 68 in Washington. Cascade's service territory is concentrated in central and eastern Oregon, and in western and central Washington. Cascade is subject to the jurisdictions of the Public Utility Commission of Oregon (OPUC) and the Washington Utilities and Transportation Commission (WUTC) regarding rates, terms, and conditions of service.

Consistent with the requirements in Oregon and Washington, Cascade prepares and files an Integrated Resource Plan (IRP or Plan) which is a long term plan for acquiring the necessary resources to deliver a sufficient supply of natural gas to its firm service customers over a twenty year timeframe. The IRP presents a forecast of customer growth and customer usage, as well as an analysis of the supply and demand side resources that could most reliably and cost effectively be used to meet future core customers' gas requirement.

Cascade filed its most current IRP on July 17, 2015, in Docket No. LC-59. By Commission Order No. 16-054, the Plan was not acknowledged and the Commission requested a number of requirements for Cascade's 2016 annual IRP Update and future IRPs.

This filing is responsive to the Commission's requirements as established in Order No. 16-054 for a 2016 annual IRP Update.

## Overview of Requirements

The requirements for an IRP are established in OAR 860-027-0400, and Order Nos. 07-002, 07-047, and 08-339. Acknowledgement of an IRP is the Commission's action to represent these requirements have been met with a focus on the utility's two to four year Action Plan.

A year after an IRP is acknowledged, a utility is required to file an update to its IRP that describes the actions it has taken to implement its acknowledged Action Plan, provides an assessment of significant changes since the plan was filed, and discusses any deviations from the Action Plan.<sup>1</sup> Because Cascade's 2014 IRP was not acknowledged, rather than filing an update on unacknowledged items, the Company responds to the Commission requested specific content, as follows.

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<sup>1</sup> Per OAR 860-027-0400(8), Cascade filed an IPR Update to its last acknowledged IRP on August 13, 2013, in docket LC 54. The Company's 2011 IRP was acknowledged in Order No. 12-342 on August 14, 2012.

### **Item One: Action Plan**

Present an Action Plan with Action Items meeting IRP Guideline 4n, and revise Action Items 1 and 9 to be specific and measurable.<sup>2 3</sup>

### **Item Two: Oregon Shortfall**

Include the missing central Oregon shortfall resolution action item in the Action Plan.<sup>4</sup>

### **Item Three: Resource Deficiency**

Resolve the apparent conflict, noted in Staff's final comments, between the Oregon resource deficiency depicted in Figures 7-B-2 and 7-C-2 and described in the LC 54 Second Supplemental Update, and the Appendix Section F load-resource balance figures.<sup>5</sup>

### **Item Four: Reduced Peak Load**

Present an analysis to show how much the peak day load could be reduced or delayed by accelerated DSM and recallable service agreement programs.<sup>6</sup>

### **Item Five: Cascade's IRP Staffing**

Evaluate its staffing approach and make changes where needed, to ensure that its required regulatory IRP activities are performed on schedule and in compliance with Commission requirements.<sup>7</sup>

## **Item One - Action Plan**

*Present an Action Plan with Action Items meeting IRP Guideline 4n, and revise Action Items 1 and 9 to be specific and measurable.*

Below are items 1 and 9 from the Action Plan as they were included in Cascade's 2014 IRP. Both action items are followed by revised action items and a brief discussion that provides additional background information as well as an explanation of how the revised Action Item is specific and measurable. All action items are provided in Appendix 4 for reference.

### ***Action Item 1***

As filed:

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<sup>2</sup> Appendix A to Order No. 15-054 references Guideline 3(n) which more accurately should be stated as 4(n).

<sup>3</sup> See Order No. 16-054 Appendix A at page 3.

<sup>4</sup> IBID, page 3.

<sup>5</sup> IBID, page 8.

<sup>6</sup> IBID.

<sup>7</sup> IBID, page 13. This item is included even though it was not required for this Update.

“In continuing efforts to create a more accurate load forecast, Cascade will research the viability of expanding the detail of the data by determining therm usage per customer per degree day by customer class (residential, commercial, etc.) along with the non-heat sensitive baseload usage. This is largely dependent upon the capabilities of the Company’s new Customer Information System which came on-line in July 2010. We are continuing to work toward generating reports and data extracts from the new system to improve the forecast process.”

Revised:

The Company revises the above action item into the following two action items:

Action Item 1.A

Cascade will improve its demand forecast by developing a report to track the issuance of corrected bills and reclassifying therms from corrected bills to the month those therms were used.

Action Item 1.B

In its next IRP, Cascade will use its new Statistical Analysis Software (SAS) to test non-linear weather effects on natural gas, to perform analysis on potential serial correlation problems, and to create a time series autoregressive integrated moving average (ARIMA) model for customer forecasting.

***Discussion on Action Item 1A:***

Cascade’s ability to determine therm usage per customer, per degree day, by customer class (residential, commercial, etc.) along with the non-heat sensitive baseload usage is largely dependent upon the data extracted from the Company’s Customer Care & Billing (CC&B) system. Cascade is working on generating reports and data extracts from the CIS to better inform the Company’s forecast.

Cascade is currently working on generating a report to track reissued bills. Bill corrections are currently reported as throughput for the month when the rebilling occurs which generally is months later than when the gas actually flowed. This results in large “lumpy” corrections that misinform the forecast. By tracking corrected bills, Cascade can correctly attribute the rebilled therms to the months when those therms were used. The Company will report on the completion status of this report development at the first Technical Advisory Group meeting for the 2018 Integrated Resource Plan.

Revised action item 1A is specific as it is the creation of defined report which will be used expressly to improve the forecast, as explained above. Revised action item 1A is measureable in that the report is the deliverable that, when created, completes this action item.

***Discussion on Action Item 1B***

In future IRPs, Cascade will use its new SAS to advance its statistical analysis beyond standard linear regressions. Cascade plans to test non-linear weather effects on natural gas as well as perform analysis on potential serial correlation problems. Cascade also plans to use SAS for a time series ARIMA model for customer forecasting. Cascade will report the status of this modified forecast development at the first Technical Advisory Group meeting for the 2018 IRP.

Revised action item 1B is specific as it provides greater detail regarding Cascade's revised approach to forecasting. Revised action item 1B is measurable in that the employment of the defined approach in the 2018 IRP will accomplish this action item.

### ***Action Item 9***

#### **As filed:**

"The Company will continue to monitor the futures market for price trends and will evaluate the effectiveness of its risk management policy. Implementation of Dodd-Frank in the coming year raises potential administrative challenges from a reporting standpoint; additionally it is unknown how the costs associated with the use of clearinghouses might impact prices of natural gas in the future."

#### **Revised Action Item 9**

As part of the Cascade's risk management policy and implementation, the Company will report on the status of the UM 1720 as well as related risk management policy enhancements to Cascade's risk management policy, at the first Purchased Gas Adjustment (PGA) quarterly meeting with OPUC Staff in early 2017. This docket is the Commission's Investigation into Long Term Hedging Policy.

### ***Discussion on Action Item 9***

Cascade is an active participant in OPUC's hedging investigation docketed as UM 1720. The OPUC initiated UM 1720 in response to the long-term hedging guidelines NW Natural proposed in its 2014 IRP. Cascade is also a current participant in the WUTC's hedging investigation, Docket No. UG-132019, which is focusing on hedging no more than four or five years out. Cascade has provided comments and explanations of its risk management efforts in both proceedings and the Company will continue to participate actively in both.

It appears that both dockets will provide guidance on enhancing the analysis that justifies entering into a hedge and will require local distribution companies (LDCs) to report their hedging activities. At this time, no general consensus has materialized amongst the participants of either docket. Cascade is hopeful that, while the two dockets are not coordinated efforts, the guidelines from each will be consistent, or at least complementary, for LDCs operating in both states. The Company will report on the status of the UM 1720 and any enhancements to Cascade's risk management policy at the first PGA quarterly meeting with OPUC Staff in early 2017.

This action item is specific in that it obligates the Company to provide information at a specific meeting. This action item is also measurable in that the delivery of the promised information at the first PGA quarterly meeting in 2017 will satisfy is action item.

## **Item Two – Oregon Shortfall Action Item**

*Include the missing central Oregon shortfall resolution action item in the Action Plan.*

The following details provide specific and measurable deliverables aimed at addressing future resource deficiencies. Each of these items will be complete by and presented as informational updates to the OPUC Staff by August 1, 2017, as well as at a yet to-be-scheduled IRP TAG meetings in 2017:

- Cascade will work with Northwest Pipeline (NWP) to define what transportation capacity delivery rights can be contractually realigned to meet potential shortfalls. The Company will begin the assessment in 2016 and complete it by July 1, 2017.
- Cascade will develop a citygate study, inclusive of both core and non-core customers. The Company will begin the study in 2016 and complete it by July 1, 2017.
- Cascade will use the results of the citygate study to confirm level of incremental capacity on GTN needed. Upon determination of incremental capacity needed, Cascade will begin negotiations with TransCanada for the needed incremental GTN capacity.
- Cascade will use the results of the citygate study to assess which alternative resources, including satellite LNG and incremental capacity on GTN, are least cost resources for meeting the Company's shortfall. The Company will determine if satellite LNG is a proper solution by July 1, 2017.
- Cascade will Work with NWP and potentially other regional LDCs to determine if a combination of I-5 corridor, Wenatchee, etc. upstream pipeline expansion or segmentation can address shortfalls and regional infrastructure concerns. The Company will complete this assessment by July 1, 2017.

Cascade discusses the Oregon Shortfall in more detail under Item Three.

### **Item Three - Oregon Shortfall**

*Resolve the apparent conflict, noted in Staff's final comments, between the Oregon resource deficiency depicted in Figures 7-B-2 and 7-C-2 and described in the LC 54 Second Supplemental Update, and the Appendix Section F load-resource balance figures.*

In the Company's 2014 IRP, Cascade indicated a number of potential transportation shortfalls for peak day. The Company believes the 2014 IRP and the second supplemental update included errors that have since been corrected during the Company's ongoing planning process. In Cascade's 2016 IRP filed in Washington in Docket No. UG-160453, the Company improved its long-term demand forecast. During this more current IRP process, the Company also considered a host of resource alternatives that could be added to its resource portfolio, including additional conservation programs, incremental off-system storage alternatives at AECO Hub, Mist, Ryckman Creek, Wild Goose, and Gill Ranch. Additionally, incremental transportation capacity on NWP, Ruby, NGTL, Foothills and GTN pipeline systems was considered along with on-system satellite LNG facilities, biogas, and imported LNG. Through this more recent IRP process, the Company has identified the following potential capacity shortfalls in Oregon:

Year	Projected MDDO Contract Demand for Oregon (Therms)																			
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
ATHENA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BAKER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BEND LOOP	0	0	0	0	2418	3644	3712	3779	3844	3910	3974	10421	26713	43155	59774	76505	93400	110401	127547	144850
CHEMULT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GILCHRIST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HERMISTON	0	0	0	0	0	0	0	0	0	10856	10965	11070	18008	15486	18201	18287	18373	18449	18520	18588
HUNTINGTON	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA PINE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MADRAS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MILTON-FREEWATER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MISSION TAP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NYSSA-ONTARIO	0	0	0	0	0	0	0	2315	9108	9143	9170	9196	9213	9231	10654	10654	10651	10644	10635	10620
PENDLETON	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PRONGHORN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PRINEVILLE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
REDMOND	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STANFIELD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STEARNS (SUNRIVER)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UMATILLA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2418</b>	<b>3644</b>	<b>3712</b>	<b>6094</b>	<b>12952</b>	<b>23909</b>	<b>24109</b>	<b>30687</b>	<b>53935</b>	<b>67873</b>	<b>88629</b>	<b>105445</b>	<b>122424</b>	<b>139494</b>	<b>156702</b>	<b>174057</b>

The Company could minimize the need to secure incremental transportation through the acquisition of citygate peaking resources which include both the supplies and the associated pipeline delivery for a certain number of days or through the purchase of other’s excess capacity through short or medium term capacity releases. Additionally the Company will be working with both GTN and NWP to realign its delivery rights, also known as Maximum Daily Delivery Obligations (MDDOs) prior to July 2017. Finally, the Company will work with the two pipelines and regional LDCs to identify potential system expansions to address the shortfalls that are anticipated in the region, such as Cascade’s Hermiston and Nyssa-Ontario citygates.

In support of the above, a more detailed presentation of Cascade’s capacity transport flexibility by citygate and load area is provided in Appendix 2.

## Item Four – Reduced Peak Day Load

*Present an analysis to show how much the peak day load could be reduced or delayed by accelerated DSM and recallable service agreement programs.*

Staff requested this Update include an analysis of the impact accelerated demand side management (DSM) and recallable service agreements might have on peak day load.<sup>8</sup> Below, Cascade responds to the impact of each separately.

<sup>8</sup> Order No. 16-054, Appendix A, Page 8, Recommendation 6

### Accelerated DSM

In an IRP process, DSM is analyzed on an equal basis with other supply side resources. If a utility can purchase conservation by providing a customer rebate for the installation of an appliance that is more efficient than what is required by code, and the cost of that rebate is less than the cost to serve the next therm of gas, then the expenditure is a prudent, least cost resource. Like any other resource, the cost and availability of therm savings varies from year to year. The planning process establishes annual targets for the acquisition of future DSM.

For Cascade's Oregon IRP, the Energy Trust of Oregon (Energy Trust) takes housing stock information as well as customer growth forecasts and demolition assumptions to estimate how many replacement appliances, such as furnaces or water heaters, and new homes will be built in Cascade's Oregon service territory over the next twenty years. Energy Trust also uses housing stock and demolition information to estimate the opportunity for "retrofit measure" installations in existing homes (e.g., insulation). The 20-year potential from acquiring all energy efficient installations within the Company's service territory is called the "technical potential". The "achievable potential" is the technical potential decremented by 15% to account for market barriers (e.g., not all customers responding to rebate offers). The achievable potential is then subjected to a Total Resource Cost cost-effectiveness screen using the Company's Avoided Costs. The total cost-effective achievable potential is then allocated into annual acquisition targets based on known market factors such as the maturity of conservation programs, customer knowledge of programs, market vitality, and the relative uptake of program offerings.

Accelerated DSM is the acquisition of therm savings sooner than anticipated in the planning forecast. Ultimately customers make the decision whether or not the Company will acquire DSM, since customers make the final determination of whether or not an investment is economically beneficial for them.

For the purpose of this analysis, measures are separated into two different categories since not all forecasted therm savings are able to be moved forward, or accelerated, in the forecast. For instance, some savings are dependent upon annual customer growth, new home construction, or the natural replacement cycle of equipment, which happens over time independent of a DSM program's influence. The two categories of measures described here are 1) lost opportunity measures and 2) discretionary measures (also referred to as "retrofit measures" above). Lost opportunity measures are those that require a customer to invest in an energy efficiency action in a fixed and limited timeframe or the opportunity is effectively lost for years to come. Failed appliances and new construction projects are examples of situations that create potential lost opportunity measures since customers do not typically replace working appliances or mechanical systems in newly constructed homes if they are still working. Lost opportunity measures are those where customers generally wait until the existing equipment is at or near the end of its useful life to replace it. For example, most customers replace a furnace when their current model stops functioning due to the high cost of purchasing a furnace. When an appliance is at end-of-life, replacing the appliance immediately is necessary if the heat or other function of the appliance is essential. This gives Energy Trust a limited opportunity to influence a customer to purchase an *incrementally* more efficient furnace, *compared to what they would have purchased otherwise*. Discretionary measures are those where customers can be influenced to invest in an energy efficiency measure at any point in time, not just when the existing equipment is at or approaching the end of its useful life. Ceiling insulation in existing homes is an example of a discretionary measure. Investment in discretionary measures could result in an accelerated acquisition of therm savings for Cascade. To

encourage customers to invest in discretionary measures sooner, Energy Trust could enhance outreach and marketing or offer larger incentives. These actions would inevitably increase delivery and/or incentive costs, and such action may create market instability by accelerating uptake and leaving reduced opportunities in the future for market providers in the future.

Cascade’s current analysis is based on the 2014 DSM forecast as provided by Energy Trust to determine what portion of savings might be discretionary and able to be moved forward. Cascade’s goal in this exercise is to make an initial determination of whether or not accelerated DSM has the potential to reduce peak day load such that the supply stack might become less expensive over the 20-year planning period in some manner, such as delaying the acquisition of additional capacity. This exercise is a measure of magnitude, not the development of an implementable plan.

If accelerated DSM proves to be a viable alternative supply side option, a more exacting and time-intensive study would be required to address how accelerated programs would be implemented, what that implementation would cost and, whether with additional costs, the therm savings potential is cost-effective. Parties to the IRP process would need to discuss this in more detail, and the Energy Trust would need to perform the related economic analysis as well as undergoing associated program redesign.

For the purpose of this update, the Company has taken the 20-year DSM potential forecast as provided to the Company by Energy Trust and has developed three accelerated DSM scenarios. Cascade assigned allocation factors for discretionary savings that could be accelerated by customer class. As stated previously, some DSM such as new construction is not discretionary. Thus, for example, the residential allocation factor is smaller than that for the industrial class, which is assumed to be predominantly discretionary. Market transformation by definition already presumes DSM is accelerated; therefore, no additional therm savings are accelerated for market transformation. The assumptions for acceleration by customer class are as stated in the table below:

Scenarios	Percentage of Discretionary DSM
<b>Low</b>	
Residential	10%
Market Transformation	0%
Commercial	15%
Industrial	40%
<b>Medium</b>	
Residential	25%
Market Transformation	0%
Commercial	50%
Industrial	70%
<b>High</b>	
Residential	40%
Market Transformation	0%
Commercial	70%
Industrial	90%

Appendix 3 provides tables of the 20-year DSM forecast as used in the 2014 IRP and the three accelerated DSM scenarios. Below is a description of each scenario:

- Low: The Low scenario contemplates accelerating therm savings into earlier years with the most conservative allocation factors.
- Medium: The Company considers the Medium scenario the most likely estimate of discretionary DSM. Under this scenario, the majority of Industrial DSM is discretionary. Residential DSM is more constrained by timing and is less likely to be moved forward. Market Transformation is zero since this activity is already accounted for as part of accelerated acquisition of DSM. The assumptions applied to Commercial DSM mirror those applied to Industrial DSM, but the Commercial DSM scenario is a little lower due to new construction components which are not discretionary.
- High: The High scenario presumes greater acquisition of therm savings could be possible in the earlier years through different energy efficiency program designs.

For each scenario, the DSM from years 2022 through 2026 is moved forward to 2017 through 2021. Cascade believes accelerating the curve into a timeframe shorter than five years would be unrealistic. Time is needed to accelerate the uptake of the program and to adjust to the market's response. Therefore, one-half of the discretionary savings are moved forward by five years.

Since the costs of accelerating DSM were not evaluated as part of this exercise, the relative cost-effectiveness of the accelerated scenarios has not been quantified. It is expected that accelerating the acquisition of DSM would cost more than current estimates.

If increased costs result in failed cost-effectiveness tests, discussions about accelerated DSM would require reexamination of the Commission's current cost effectiveness methodologies and directives in Commission Order No. 87-402, issued in Docket No. UM 551. In UM 1622, Energy Trust requested exceptions to the UM 551 cost-effectiveness standards because the low cost of natural gas was resulting in long-standing natural gas measures no longer being cost-effective. At that time, the Commission chose to retain the parameters for cost-effectiveness as established in UM 551 but allowed specific exceptions, some with specific cost caps. This is only to note that significant analysis and process would likely result from changing conservation acquisition schedules from what is otherwise determined in the IRP process.

Cascade analyzed its base case against the accelerated DSM scenarios. The table below compares the incremental Gas Transmission Northwest (GTN) transportation that would be needed to remedy a capacity shortfall with the DSM in the base case as well as the three accelerated DSM scenarios. For this analysis, the accelerated DSM savings are applied to the peak day event, which Cascade models in the month of December. In the non-accelerated DSM case included in the 2014 IRP, approximately 191 dekatherms (dth) are saved on peak day 2017 through conservation efforts. With the addition of

accelerated DSM through low, medium, and high cases, Cascade projects dekatherm (dth) savings on peak day 2017 to be approximately 202, 219, and 229, respectively.

in dths	2017	2018	2019	2020	2021
Incremental GTN	2,113	3,550	5,004	6,470	7,956
DSM in Non-Accelerated Case	191	183	166	162	139
Accelerated DSM in Low Case	202	194	177	172	150
Additional DSM in Low Case	11	11	12	10	11
Accelerated DSM in Medium Case	219	210	196	187	166
Additional DSM in Medium Case	28	27	30	25	27
Accelerated DSM in High Case	229	219	206	195	175
Additional DSM in High Case	38	36	40	33	36

The Accelerated DSM scenarios would save approximately 11, 28, and 38 additional dekatherms (dths) on peak day from the low, medium, and high scenarios, respectively. Whether Cascade is looking at 7,956 dths or 7920 dths, under the high accelerated DSM case, the Company would purchase 8,000 dths in either case because purchasing long-term incremental transport is typically only available in 5-10 year lumps. Since Cascade would purchase 8,000 dths in either case, the magnitude of savings from accelerated DSM is not great enough to delay any shortfalls and thereby change or delay Cascade’s preferred portfolio.

During the 2018 IRP cycle which will begin in early 2017, Cascade contemplates three potential improvements to its DSM modeling to better understand what is cost-effective and how cost-effective DSM might reduce peak day requirements:

- 1) Cascade’s avoided costs will be revised to include costs for distribution projects, as DSM has the potential to delay reinforcement projects.
- 2) Currently DSM is modeled in SENDOUT® as a “must take” resource that is decremented from load. In the future, DSM will be modeled as a citygate resource that SENDOUT® can either accept or reject. This new approach will give Cascade a more accurate understanding of DSM’s impact as a cost effective resource and its ability to delay a reinforcement project or capacity investments.

- 3) Energy Trust will provide an updated 20-year energy efficiency resource forecast to identify cost-effective potential.

The Company looks forward to working with parties, including the Energy Trust, to determine how these changes impact its DSM targets over the 2018 IRP's planning period.

#### Recallable Service Agreements

The Company has a number of tariffed services where a class of customers agrees to maintain standby fuel burning facilities and adequate supply of standby fuel to replace the entire supply of natural gas they would receive under non-critical day would essential switch to their alternate fuel, allowing the Company to redirect those natural gas supplies to meet the needs of firm customers on a peak day. Over the next twenty-year planning horizon the Company forecasts having only 23 of these Oregon core interruptible customers by 2036. For purposes of this Update the Company uses the high growth scenario rather than the medium forecast to illustrate that the volumes available are small, regardless of growth projections. The table below identifies the expected level of natural gas supplies that would essentially be "recalled" from these customers on a peak day:

High growth forecasted recallable peak day volumes from Oregon core interruptible customers (volumes in therms):

Location	Number of Core Interruptible Transportation Customers	2017	2021	2025	2029	2033	2036
Bend Loop	3	942	1,028	1,112	1,200	1,296	1,378
Hermiston	3	842	899	961	1,026	1,092	1,148
Madras	1	104	104	104	104	104	105
Nyssa-Ontario	2	2,543	2,635	2,697	2,732	2,741	2,736
Pendleton	3	1,864	2,019	2,160	2,289	2,407	2,490
Prineville	2	366	367	365	362	359	357
Redmond	1	669	699	717	728	734	738
Umatilla	2	1,617	1,723	1,810	1,880	1,935	1,967

## Item Five - Cascade IRP Staffing

*Order No. 16-054 requested that Cascade evaluate “its staffing approach and make changes where needed, to ensure that its required regulatory IRP activities are performed on schedule and in compliance with Commission requirements.”*

A restructuring of the Resource Planning department was implemented in spring 2016. Two new IRP analyst positions were approved by Cascade senior management. These incremental positions join the Manager of Resource Planning, and the Sr. Resource Planning Analyst to form the principle IRP team for Cascade.

In addition to expanding the Resource Planning team, the Company created an IRP Steering Committee to provide senior management oversight of the internal IRP process. The membership of the IRP Steering Committee is identified below:

- Garret Senger (Executive V.P. Regulatory Affairs, Customer Service & Gas Supply), Committee Chair
- Mark Chiles (V.P. Regulatory Affairs and Customer Service)
- Eric Martuscelli (V.P. Operations)
- Bob Morman (Director, Gas Supply)
- Mike Parvinen (Director, Regulatory Affairs for CNGC)

The primary IRP team consists of Mark Sellers-Vaughn (Manager, Resource Planning), Brian Robertson (Sr. Resource Planning Analyst), and Devin McGreal (Resource Planning Analyst I). One additional analyst position is vacant as of the drafting of this Update. The Company is actively recruiting to fill this position.

Significant contributions are also made by internal staff in support of the IRP. These departments include Conservation, Engineering, Finance & Accounting, Gas Supply/Gas Control, Regulatory, Industrial Services, Information Technology and the Executive team.

## **2018 IRP**

Cascade intends to file its next IRP by January 25, 2018—two years from the issuance of Commission Order No. 16-054, the order concluding the review of Cascade’s 2014 IRP. The Company will prepare the IRP through a public process that will include multiple technical advisory group (TAG) meetings. Cascade’s next IRP will meet the requirements established in Commission Order OAR 860-027-0400, and Order Nos. 07-002, 07-047, and 08-339, as well as the requested items included in Order No. 16-054. Those additional requirements included in Order No. 16-054 are below:

- Provide a clear explanation of the timing and resource needs and how capacity deficits will be met.
- Include detailed load forecast information by class and by state
- Clearly explain the analysis for determining and achieving the conservation potential.
- Describe the stakeholder engagement process
- Explain the Company’s risk management rationale and hedging strategy.

## **Conclusion**

This report is intended to meet the requirements established in Commission Order No. 16-054. Cascade appreciates the opportunity to provide the requested data and enhanced action items. The Company looks forward to collaborating with Staff and other parties on a 2018 IRP that satisfies the Commission's requirements and results in an acknowledged plan that informs the Company's future resource decisions.

## **APPENDICES**

## APPENDIX 1 - Compliance Matrix

The table below lists the requirements of this IRP Update and cites how the Company has met each obligation.

OAR 860-027-0400(8)	Each energy utility must submit an annual update on its most recently acknowledged IRP. The update is due on or before the acknowledgement order anniversary date.	Cascade filed an IPR Update to its last acknowledged IRP on August 13, 2013, in docket LC 54. The Company's 2011 IRP was acknowledged in Order No. 12-342 on August 14, 2012. The Company's 2014 IRP was not acknowledged but the company files this IRP Update in compliance with the requirements established in Order No. 16-054.
OAR 860-027-0400(8)	The energy utility must summarize the annual update at a Commission public meeting	While Cascade does not need to meet the requirements of this rule for this Update since its last IRP was not acknowledged, the Company has offered to present its Update at a Commission Public Meeting. As of this time, no date has been scheduled.
OAR 860-027-0400(8)	The energy utility may request acknowledgement of changes, identified in its update, to the IRP Action Plan.	Cascade is not seeking acknowledgement of this Action Plan.
OAR 860-027-0400(8)	The annual update is an informational filing that:	Cascade's IRP update is an information filing in that it provides the information requested per Order No. 16-054.
OAR 860-027-0400(8)(a)	Describes what actions the energy utility has taken to implement the Action Plan to select the best portfolio of resources contained in its acknowledged IRP;	Cascade's IRP Update discusses revised Action Items as requested in Order no. 16-054. The Action Plan in the Company's 2014 IRP was not acknowledged. The Company met this requirement with its last acknowledged IRP with the Update filed in LC 54.

APPENDIX 1 – Compliance Matrix		
OAR 860-027-0400(8)(b)	Provides an assessment of what has changed since the acknowledgement order anniversary date that affects the Action Plan to select best portfolio of resources, including changes in such factors as load expiration of resource contracts, supply-side and demand-side resource acquisitions, resource costs, and transmission availability; and	Again, the Company’s 2014 IRP was not acknowledged. The Company met this requirement with its last acknowledged IRP with the Update filed in LC 54. However, this IRP Update does include a discussion on capacity shortfalls, when they may occur and how they can be remedied.
OAR 860-027-0400(8)(c)	Justifies any deviations from the Action Plan contained in its acknowledged IRP.	Again, the Company’s 2014 IRP was not acknowledged. The Company met this requirement with its last acknowledged IRP with the Update filed in LC 54.
Order No. 16-054, Appendix A, page 3	Staff recommends that, in Cascade’s IRP Update, due one year from the acknowledgement order for this IRP, Cascade present an Action Plan with Action Items meeting IRP guideline 4n, and revise Action Items 1 and 9 to be specific and measureable.	Revised Action items 1 and 9 that are measurable and specific are provided beginning on page 3.
Order No. 16-054, Appendix A, page 3	In addition, Staff recommends that, in Cascade’s IRP Update, Cascade include the missing central Oregon shortfall resolution action item in the Action Plan.	Cascade addresses the central Oregon shortfall beginning on page 5.

**APPENDIX 1 – Compliance Matrix**

<p>Order No. 16-054, Appendix A, page 8 (No. 4)</p>	<p>In Cascade’s IRP Update, Cascade resolve the apparent conflict, noted in Staff’s initial comments, between the Oregon resource deficiency depicted in Figures 7-B-2 and 7-C-2 and described in the LC 54 Second Supplemental Update, and Appendix Section F load resource balance figures.</p>	<p>Beginning on page 6, Cascade addresses the apparent conflict regarding the Oregon resource deficiency discussed in the Company’s 2014 IRP.</p>
<p>Order No. 16-054, Appendix A, page 8 (No. 6)</p>	<p>In Cascade’s IRP Update, Cascade presents an analysis to show how much the peak day load could be reduced or delayed by accelerated DSM and recallable service agreement programs.</p>	<p>Beginning on page 7, the Company addresses how accelerated DSM might impact peak day load, and beginning on page 11, the Company discusses how recallable contracts might impact peak day load.</p>
<p>Order No. 16-054, Appendix A, page 12</p>	<p>Staff recommends that Cascade evaluate its staffing approach and make changes where needed, to ensure that its required regulatory IRP activities are performed on schedule and in compliance with Commission requirements.</p>	<p>Cascade discusses changes to its staffing for IRP activities beginning on page 11.</p>

## APPENDIX 2: Item Three – Oregon Shortfall

The purpose of this document is to illustrate the flexibility of Cascade’s system, and to identify where Cascade needs to pick up incremental transportation rights.

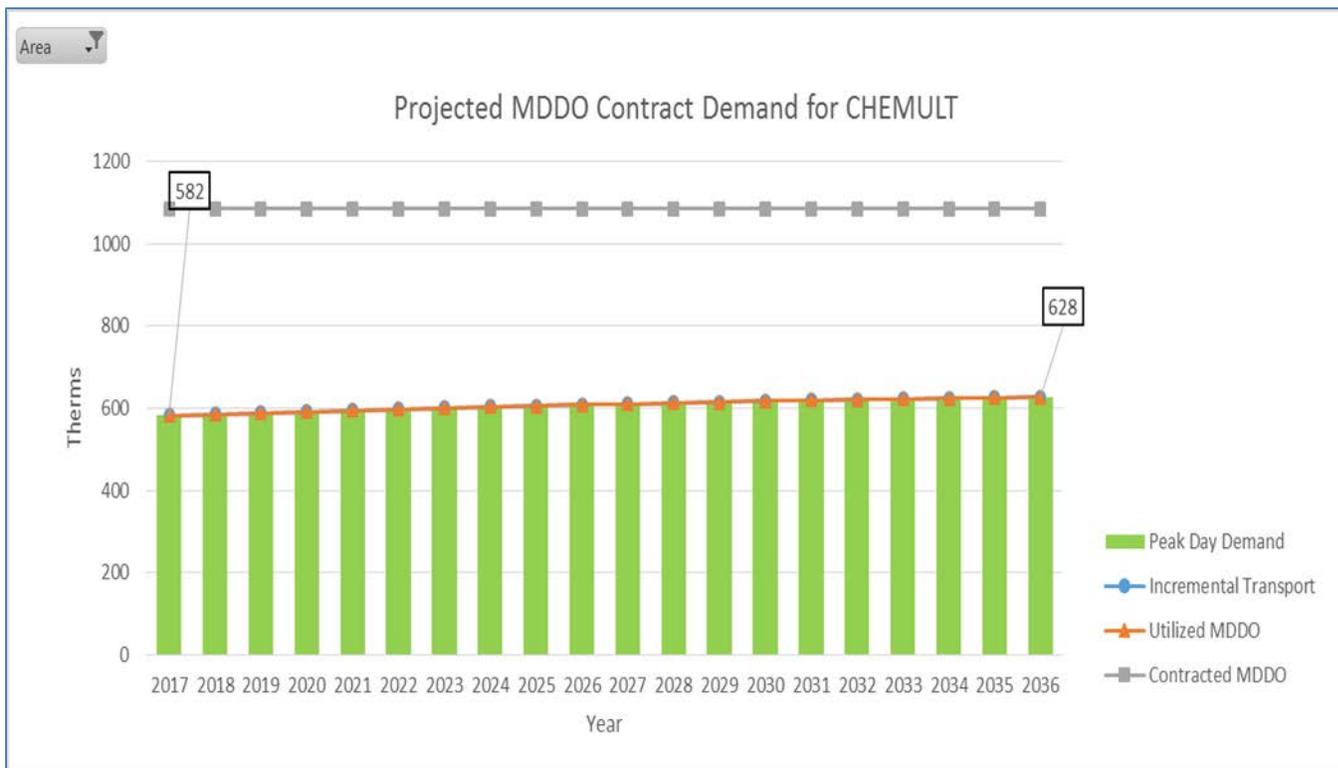
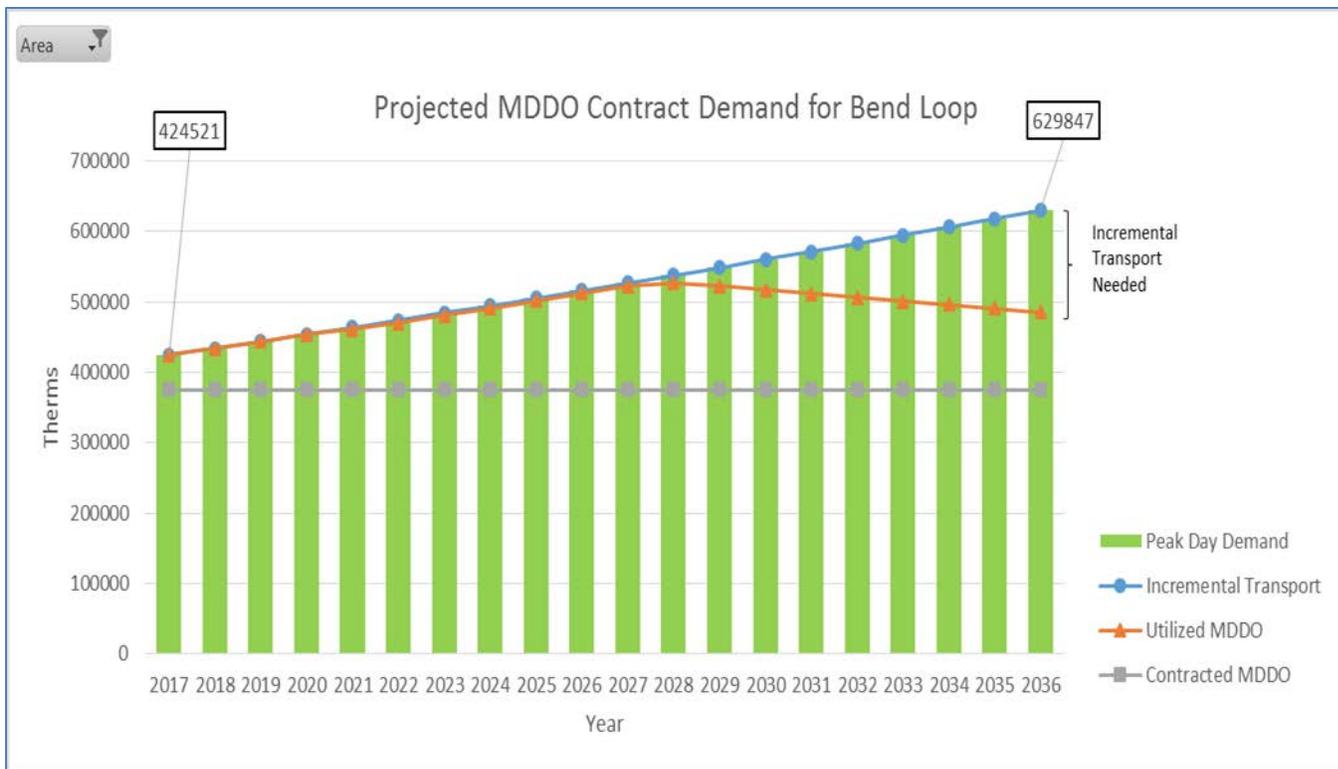
Cascade can realign some of the transportation Maximum Daily Delivery Obligation(s) (MDDOs) in the Company’s contracts to citygates in the same zone so long as the contract doesn’t specify a Cascade-specific citygate where the gas needs to flow and the path is still within Cascade’s primary corridor.

The charts below analyze each of Cascade’s citygates in Oregon. The green bars represent forecast demand in a peak day environment for a 20-year time horizon. The gray line shows how many therms can contractually be delivered to that area with location-specific MDDOs. The orange line shows the total amount of therms that are utilized by realigning certain contracts that do not specify a Cascade-specific location where the therms need to go, and adding those MDDOs to the Cascade path specific contracts. These flexible contracts are assigned using the Company’s optimization software, SENDOUT®. Finally, the blue line illustrates how much demand Cascade can serve by adding incremental transportation agreements to its existing transportation portfolio. The space between the blue line and orange line, if any, shows how much additional transport the Company believes it will need to acquire and when it needs to be picked up.

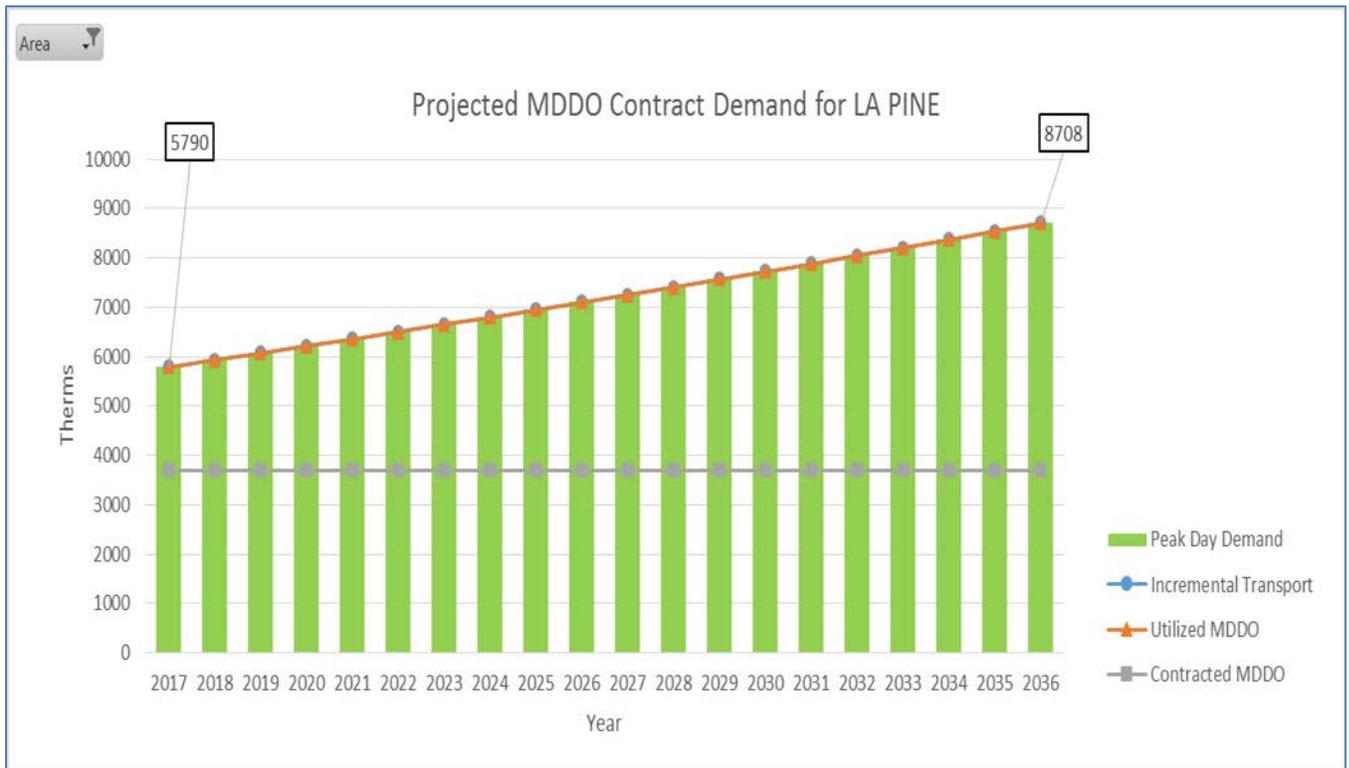
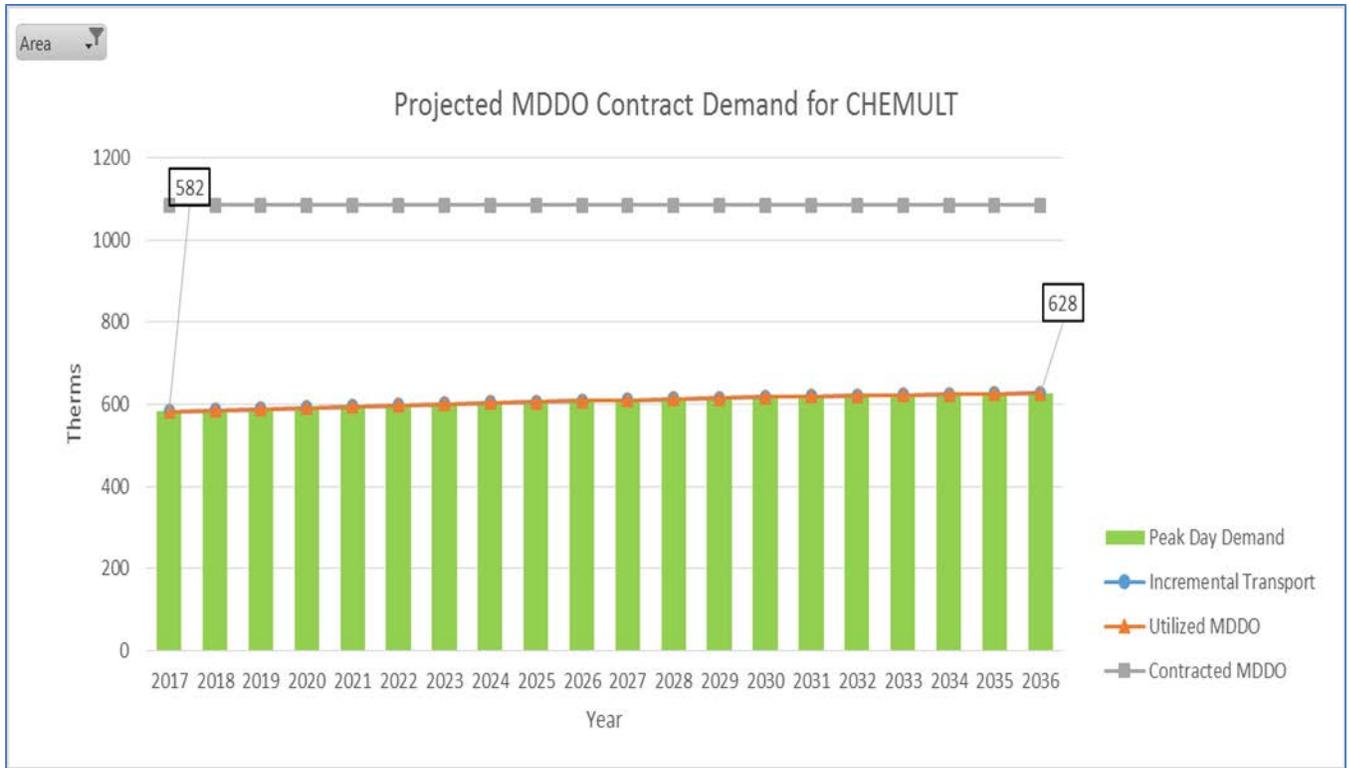
As mentioned above, Cascade has the ability to realign certain MDDOs on the zonal level to help serve demand in areas where there is not a direct contract to that citygate. To that end, certain citygates within Northwest Pipeline (NWP) will utilize MDDOs above or below their contracted level. Some examples of this are shown below:

- Citygates where Utilized MDDOs are below contracted MDDOs: This occurs when the Company has the capacity to transport more gas to a citygate than the forecast demand over the 20-year planning horizon. Ideally, this transportation capacity is moved to another citygate within that zone, but in certain situations these MDDOs are unable to be utilized if they are not needed elsewhere. Examples: Baker, Umatilla, Huntington.
- Citygates where Utilized MDDOs are above Contracted MDDOs: This occurs when the Company projects that not enough capacity exists in current transportation contracts to serve projected demand over the 20-year planning horizon, but a citygate within the same zone has excess capacity. It is important to distinguish that this is not an acquisition of additional capacity, but a realignment of excess capacity within the same zone. Examples: Lapine, Pronghorn, Redmond.
- Citygates where Utilized MDDOs are both above and below Contracted MDDOs: In certain situations, excess capacity may exist at a citygate at the start of the planning horizon, but demand may grow to a point where Cascade expects a capacity shortfall with current contracts. In these circumstances the Company illustrates the citygate first sharing the excess MDDOs with other locations that need it, but later pulling capacity from other area with excess transportation contracts. Example: Stearns.

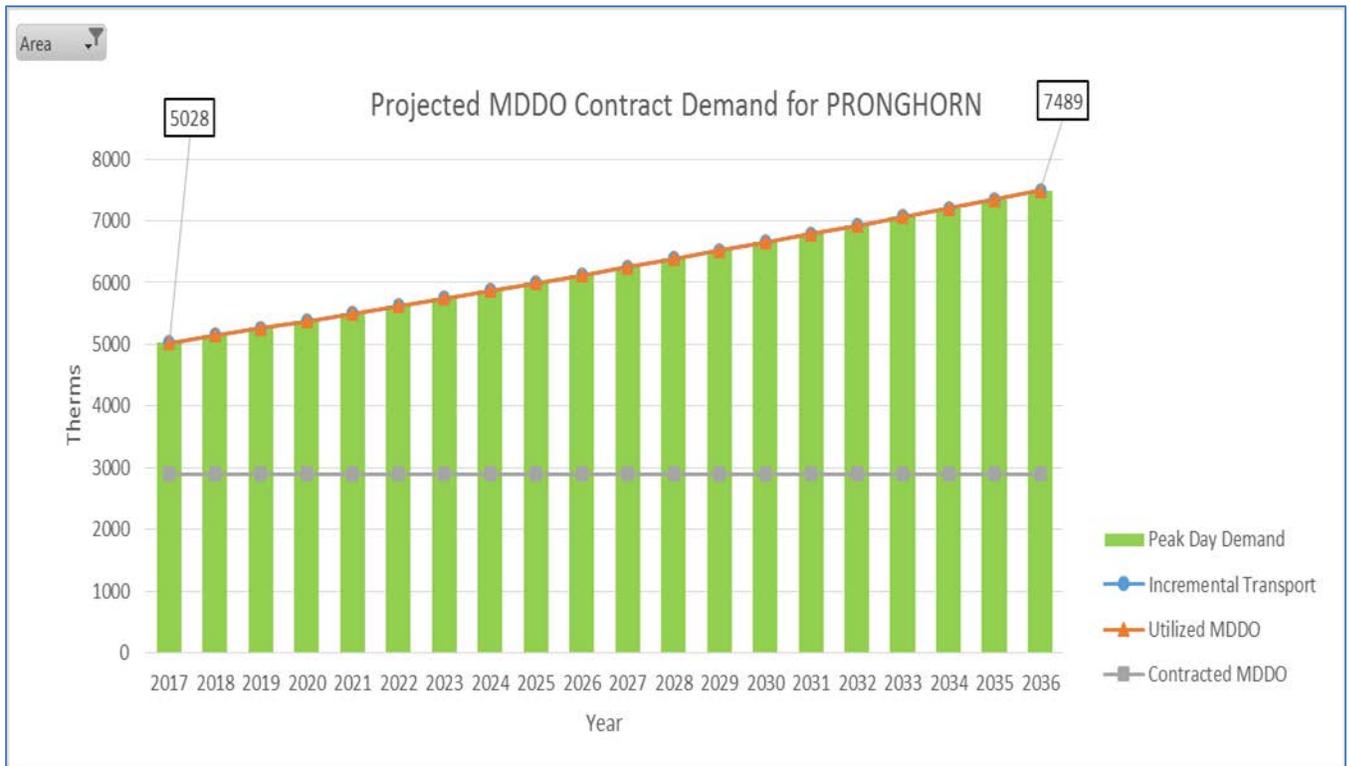
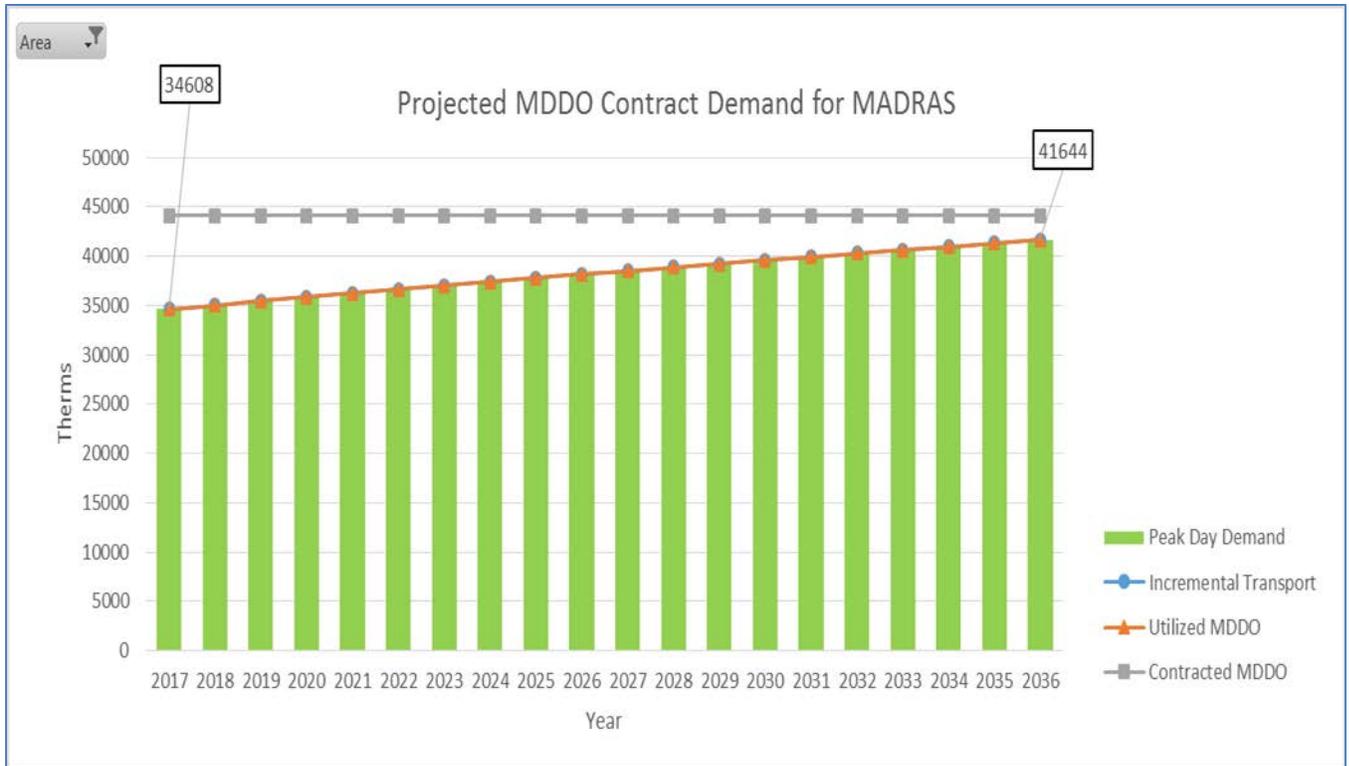
APPENDIX 2: Item Three – Oregon Shortfall



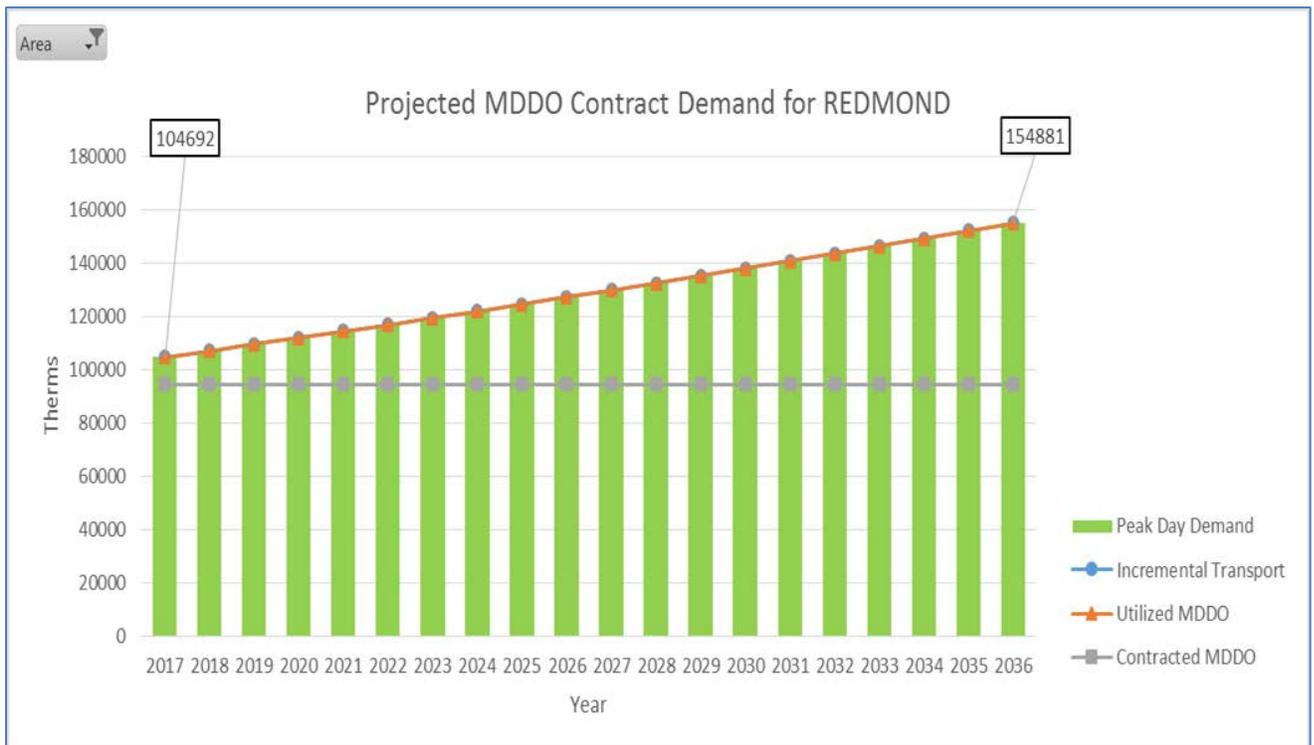
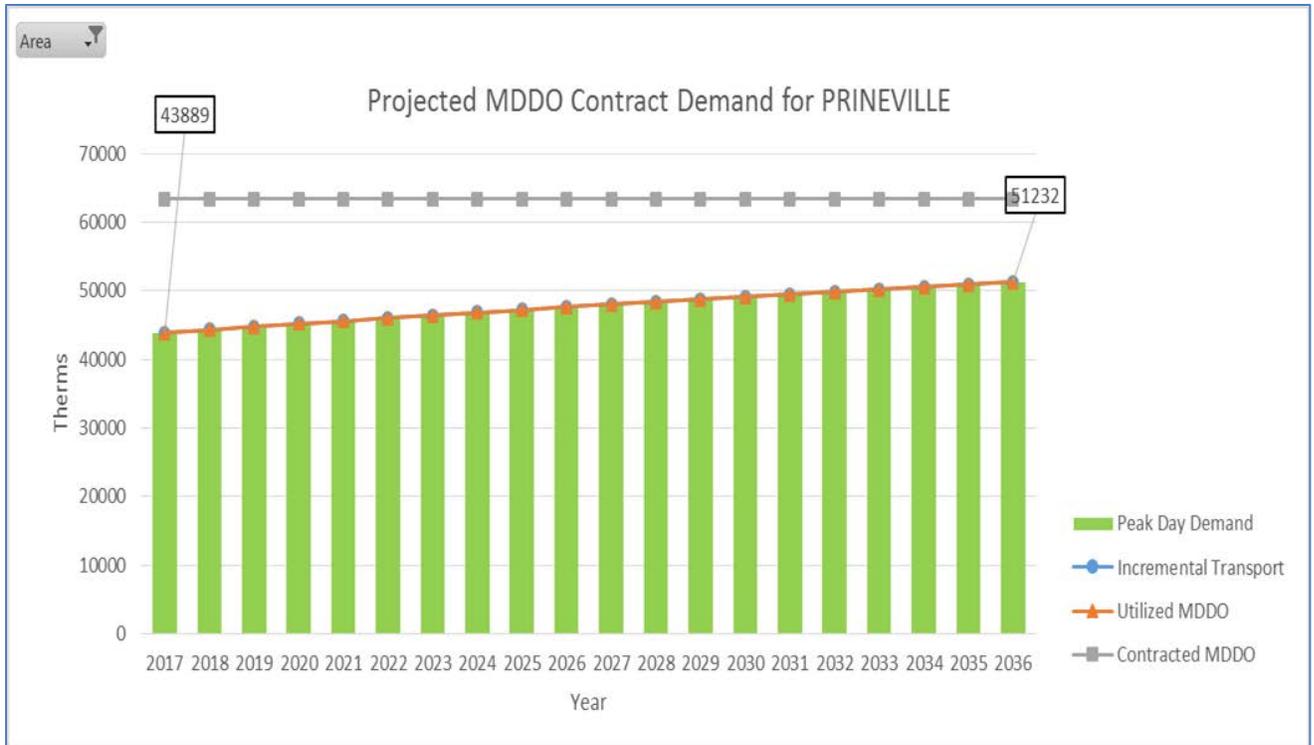
## APPENDIX 2: Item Three – Oregon Shortfall



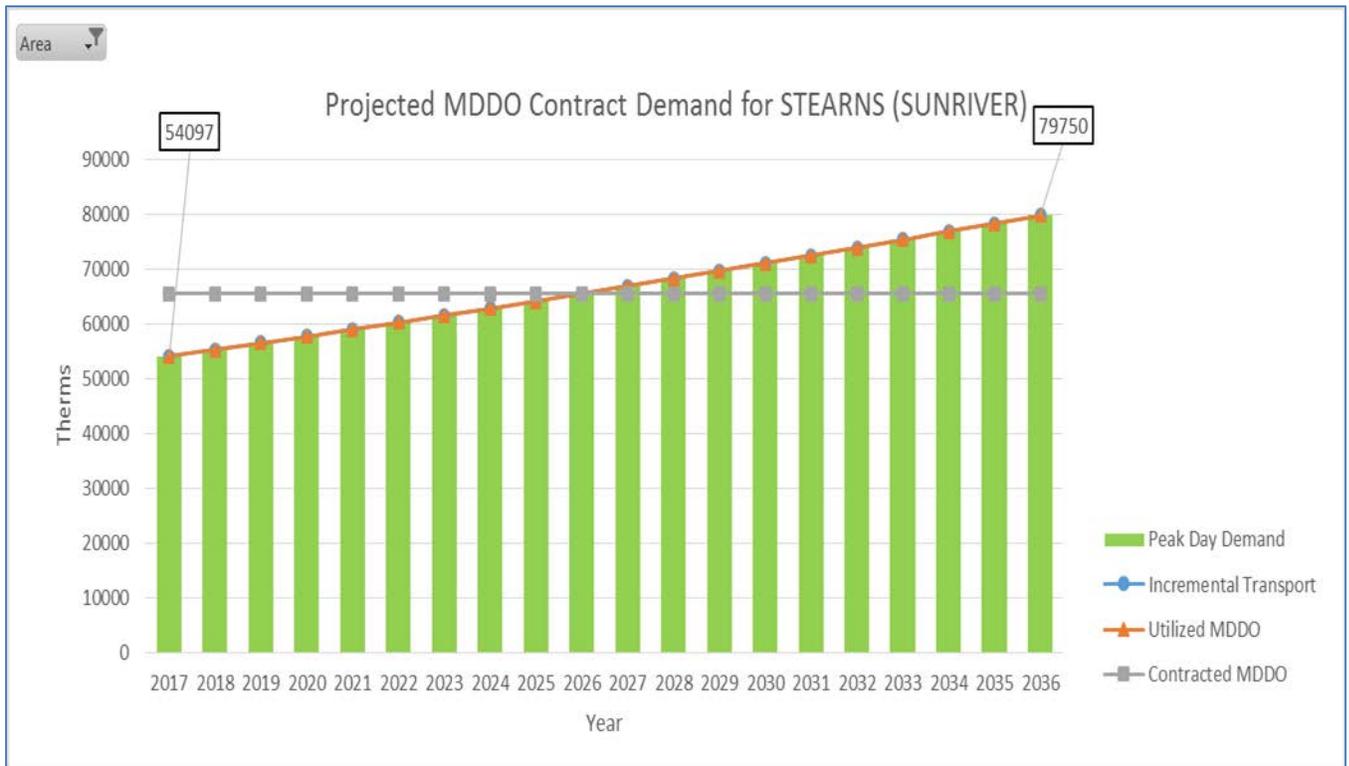
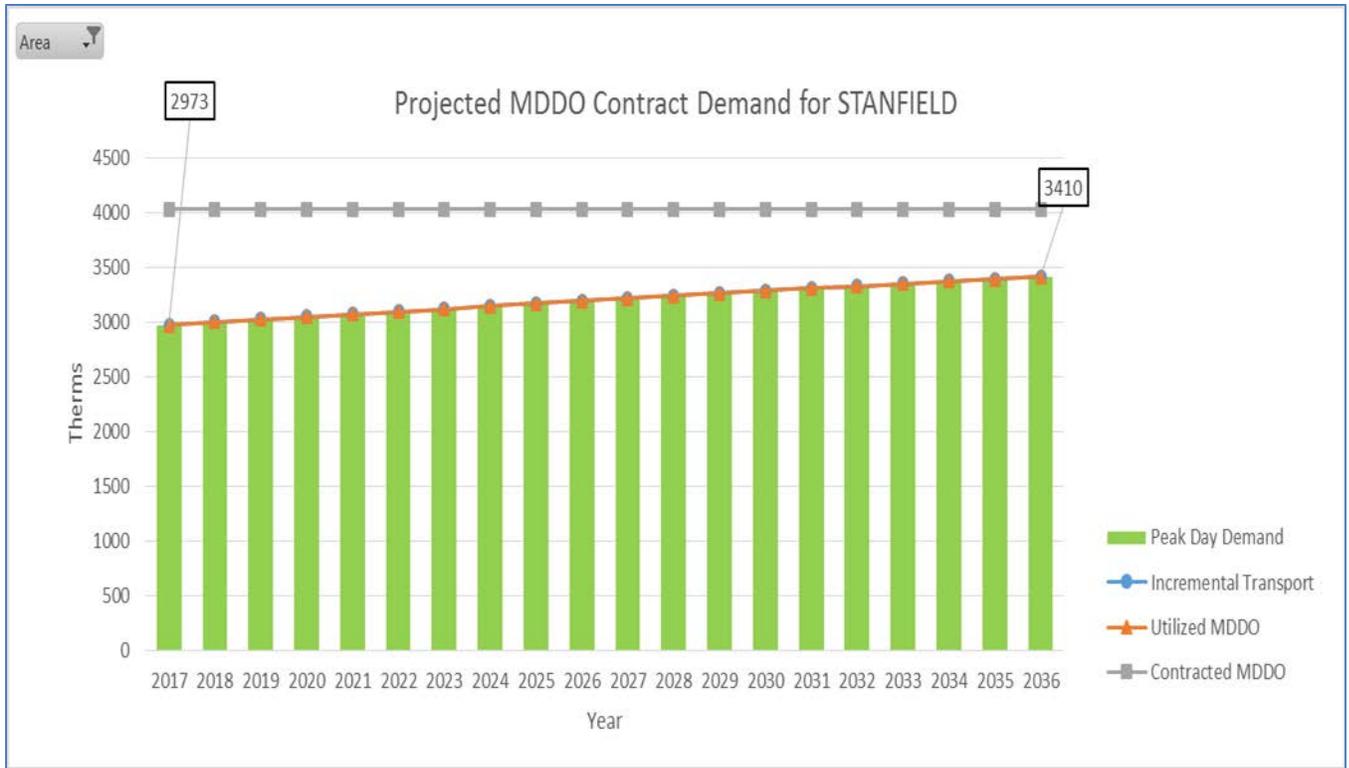
## APPENDIX 2: Item Three – Oregon Shortfall



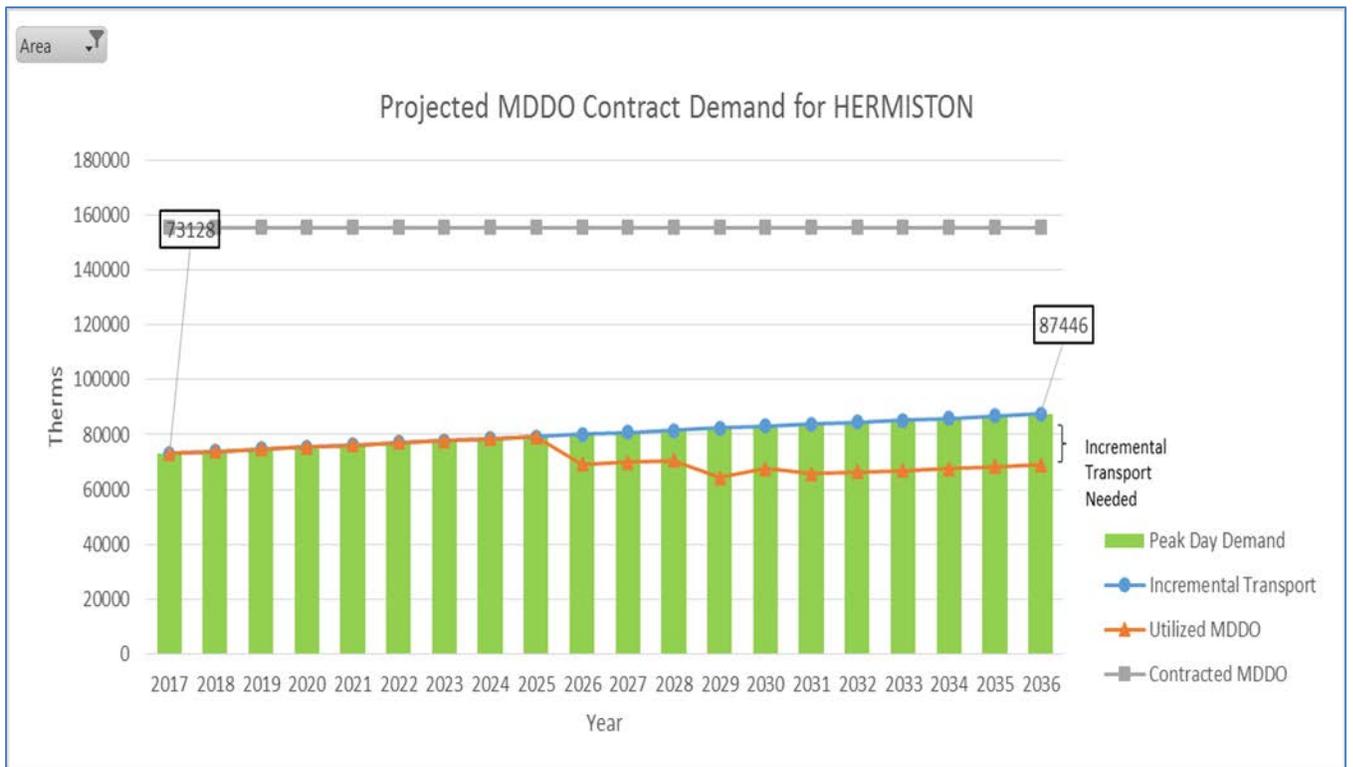
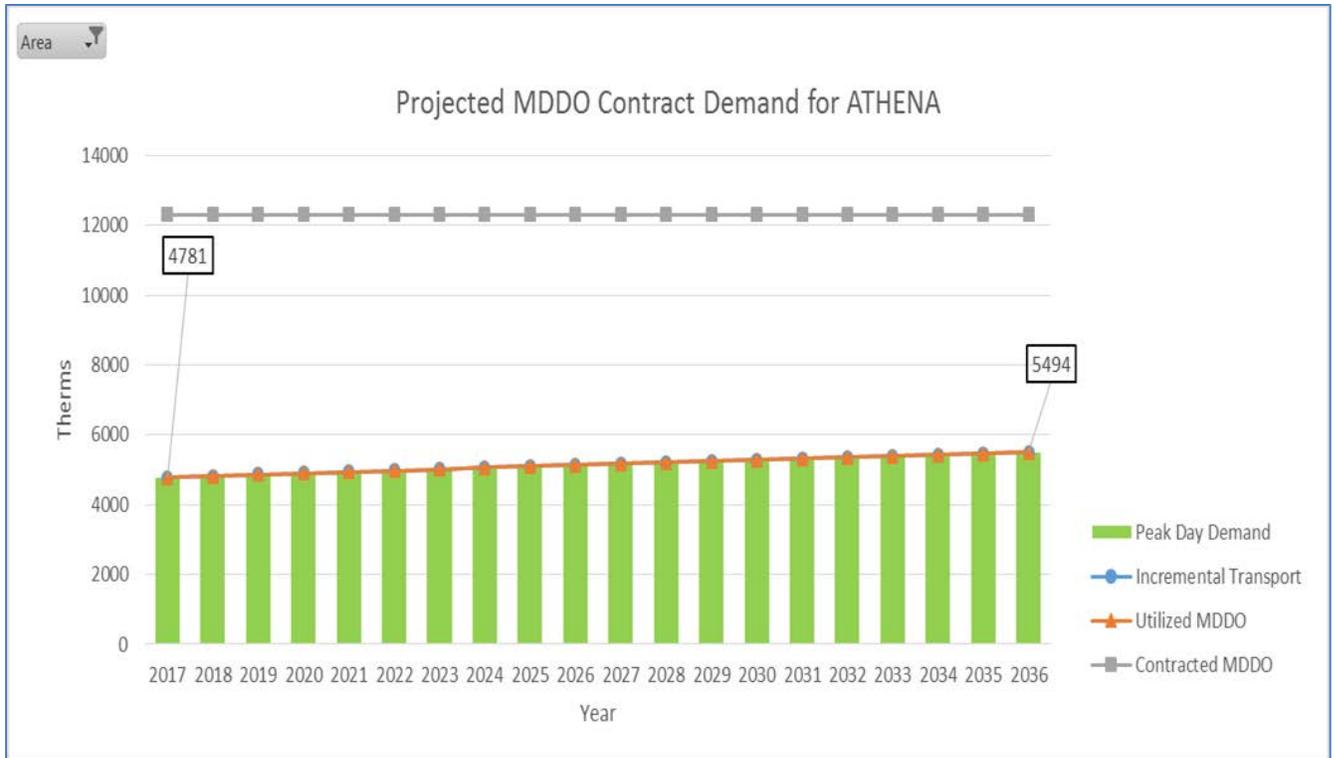
## APPENDIX 2: Item Three – Oregon Shortfall



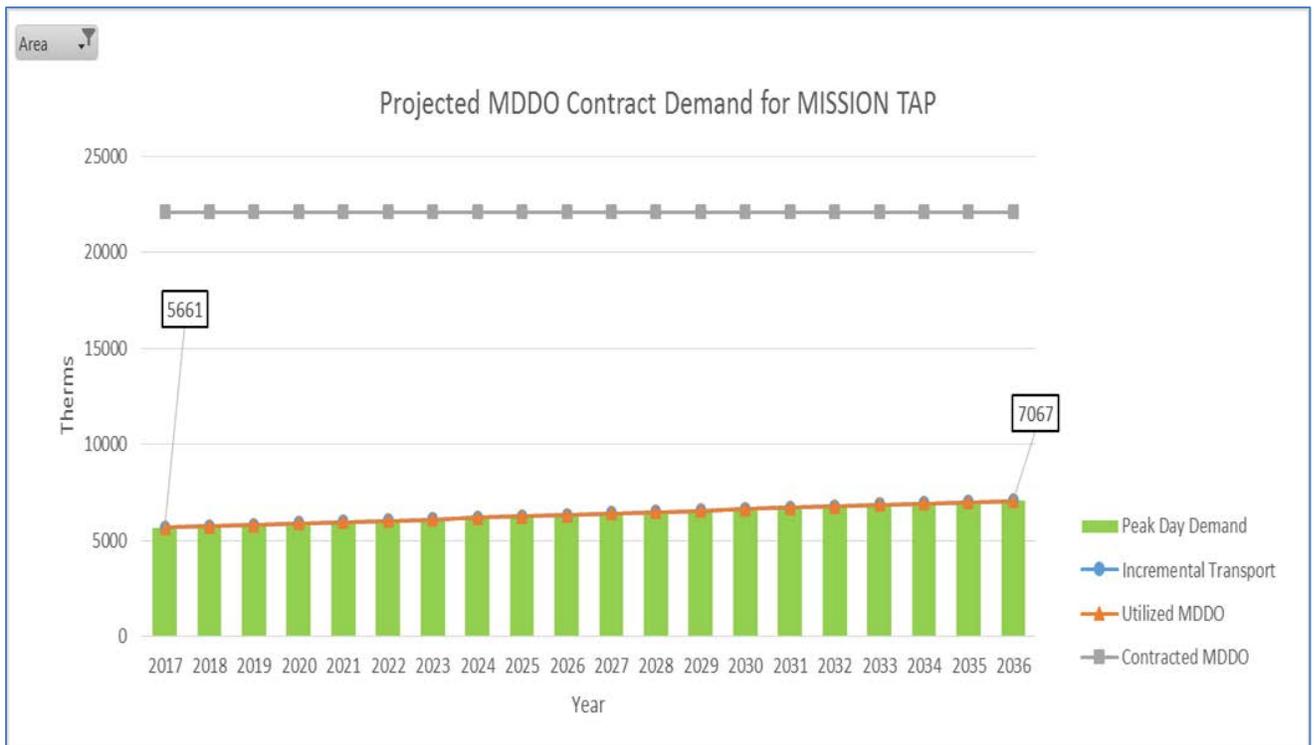
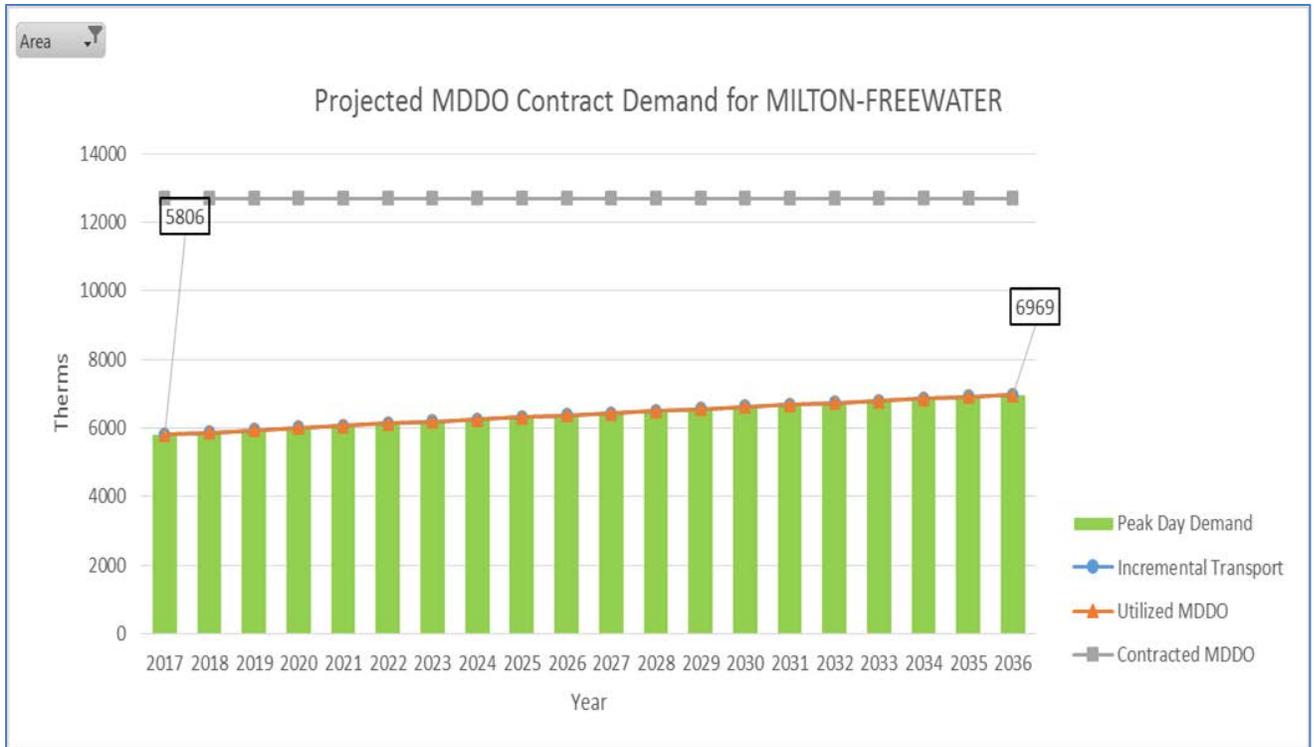
## APPENDIX 2: Item Three – Oregon Shortfall



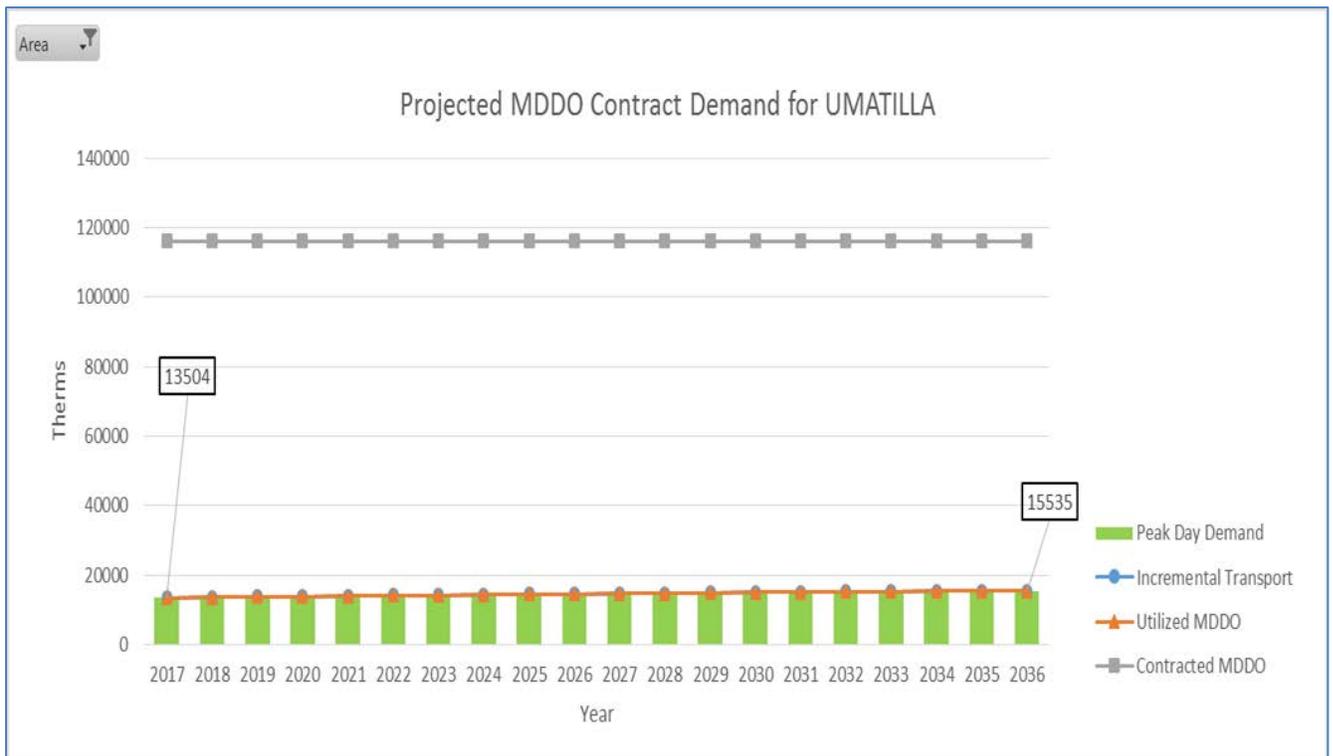
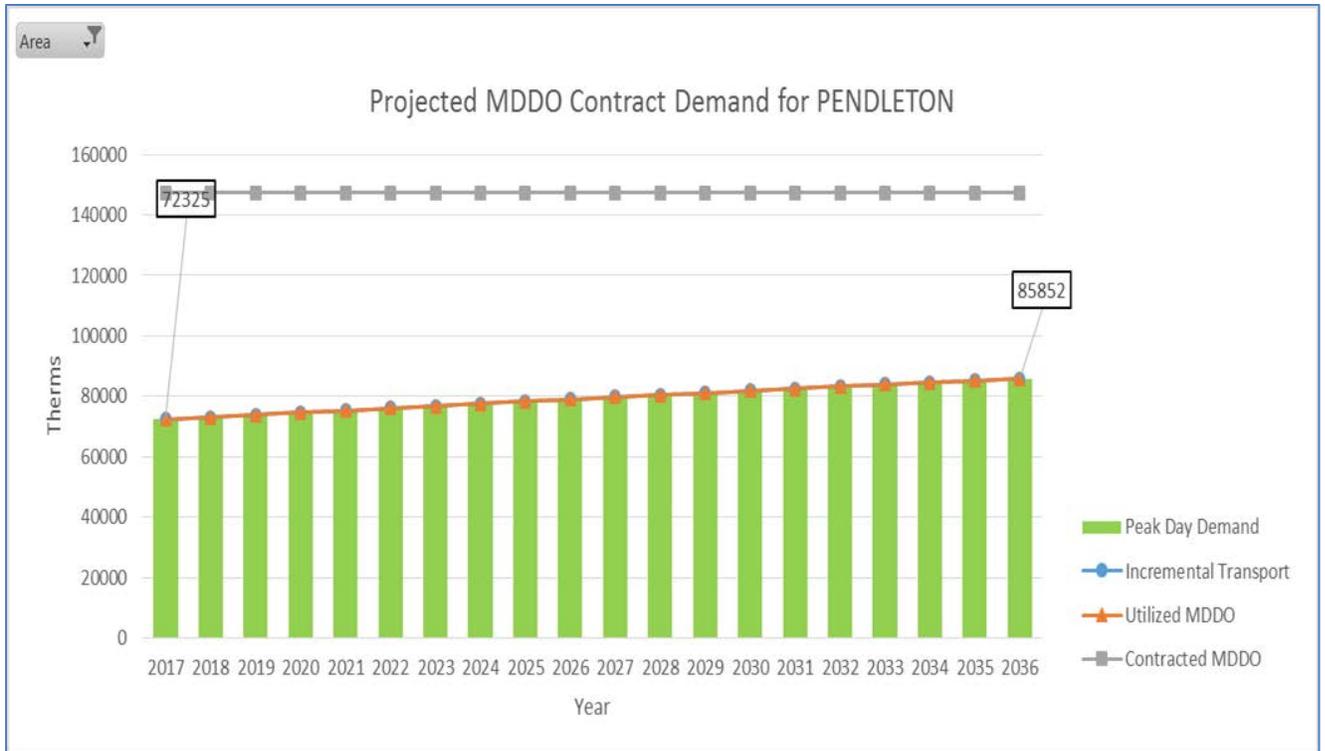
## APPENDIX 2: Item Three – Oregon Shortfall



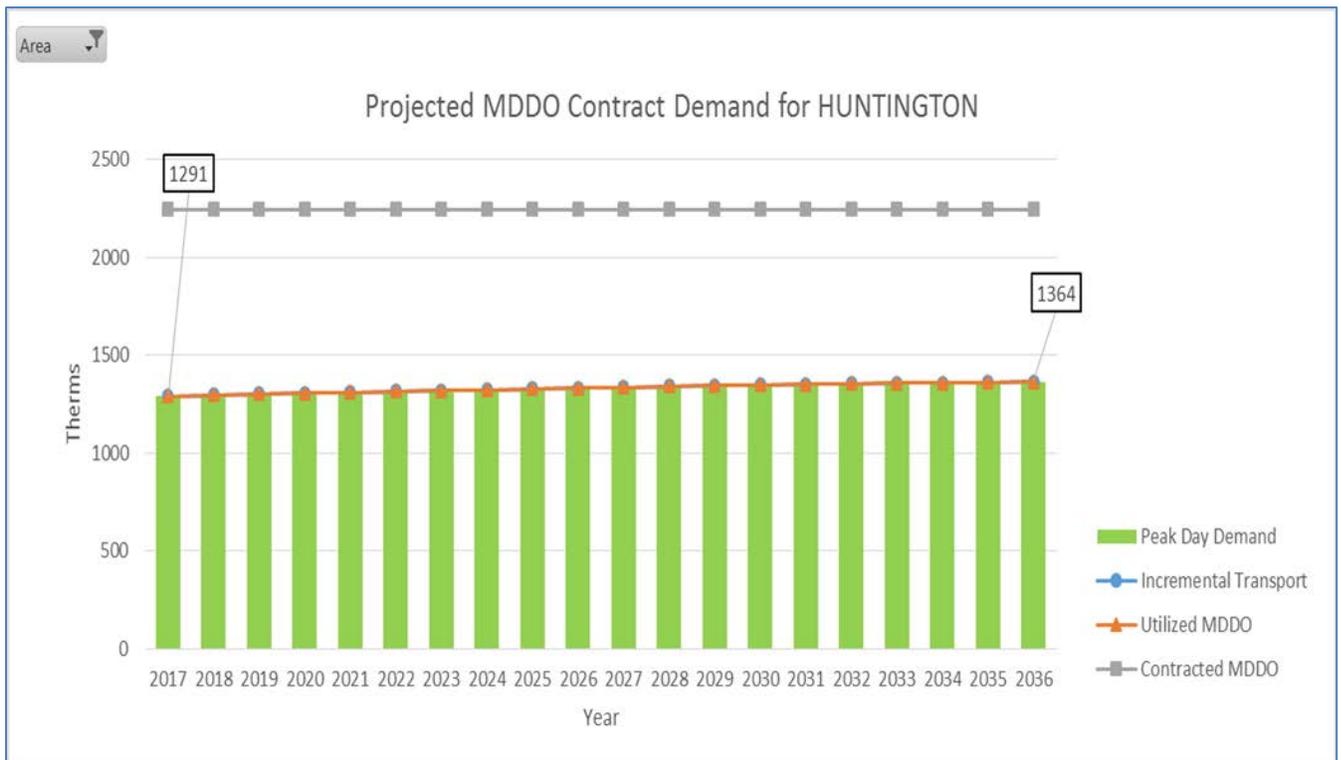
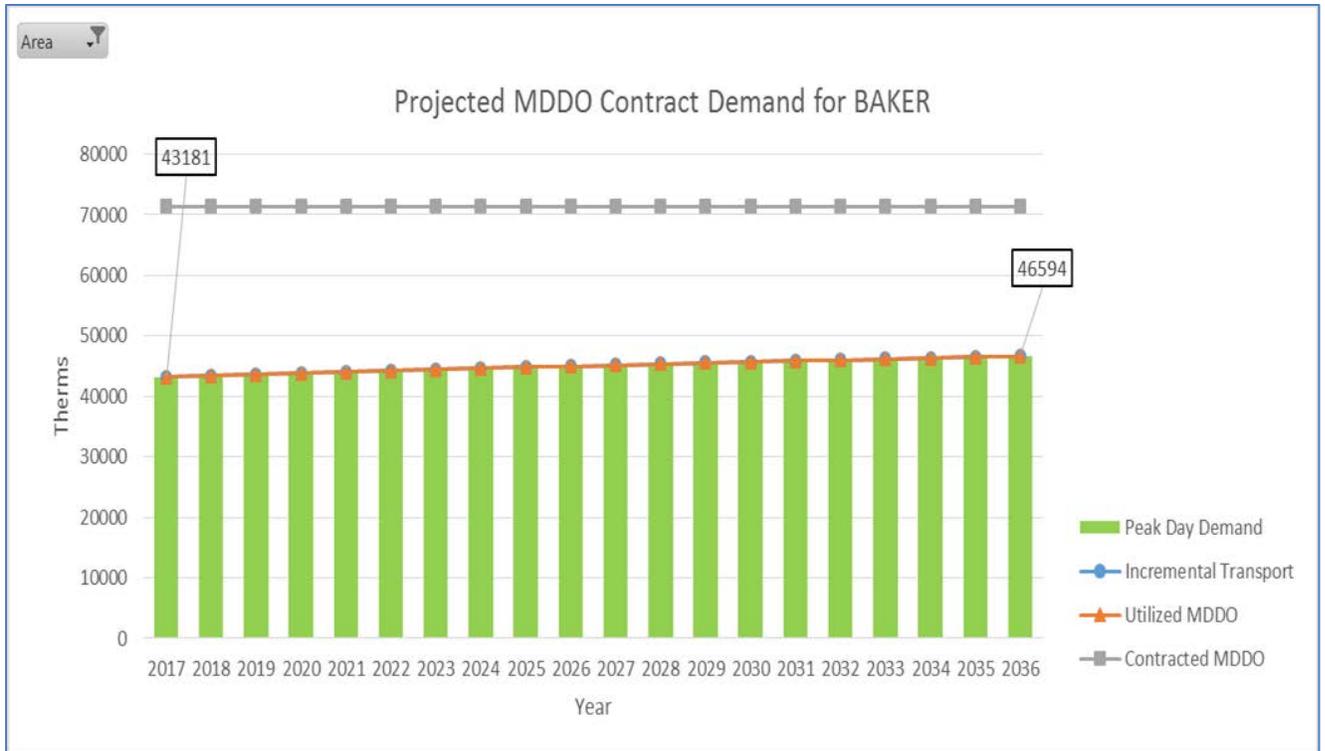
## APPENDIX 2: Item Three – Oregon Shortfall



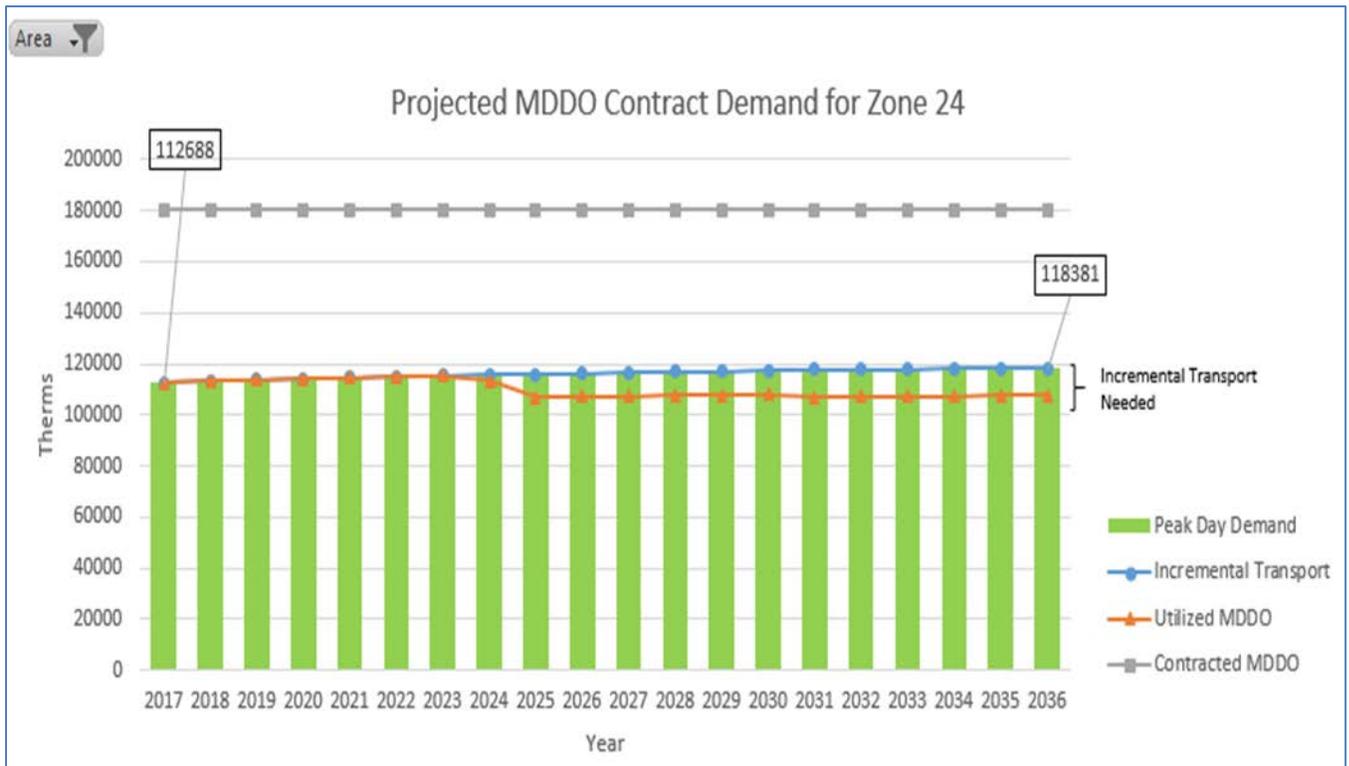
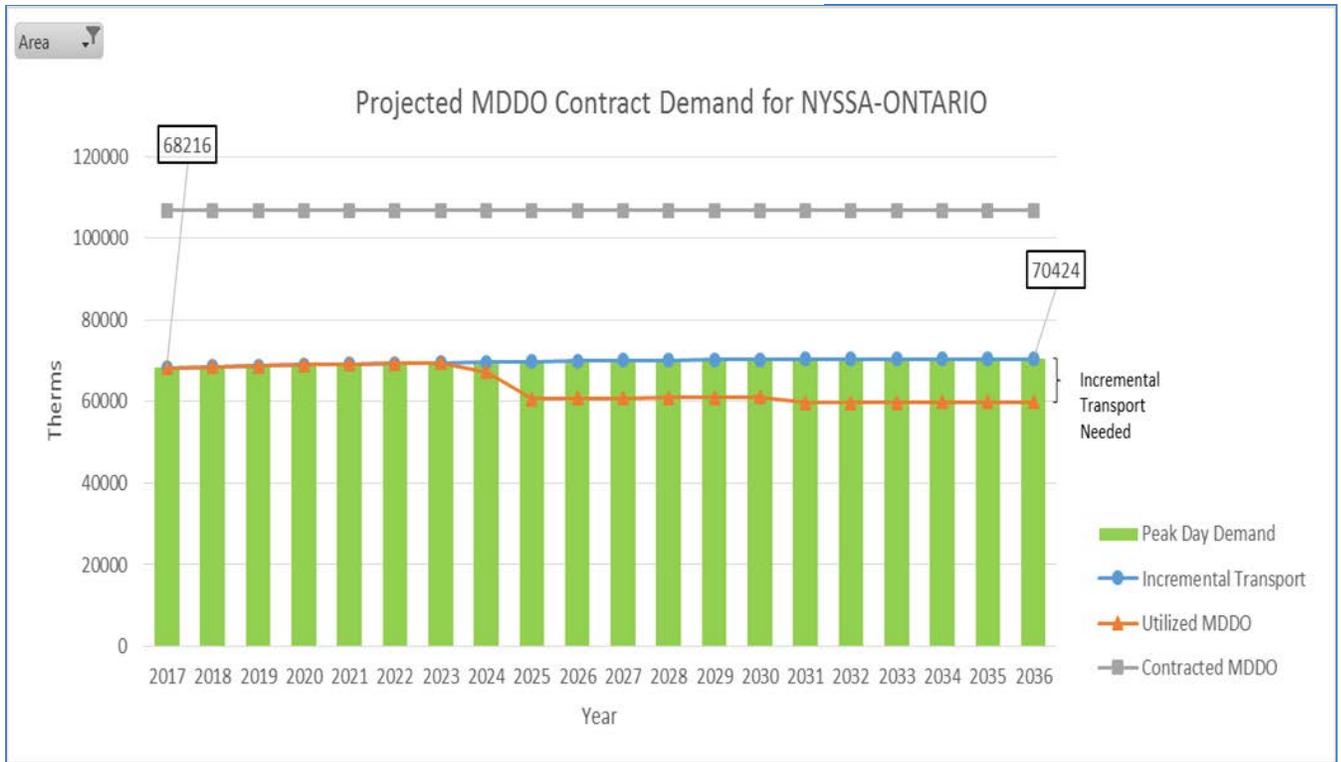
## APPENDIX 2: Item Three – Oregon Shortfall



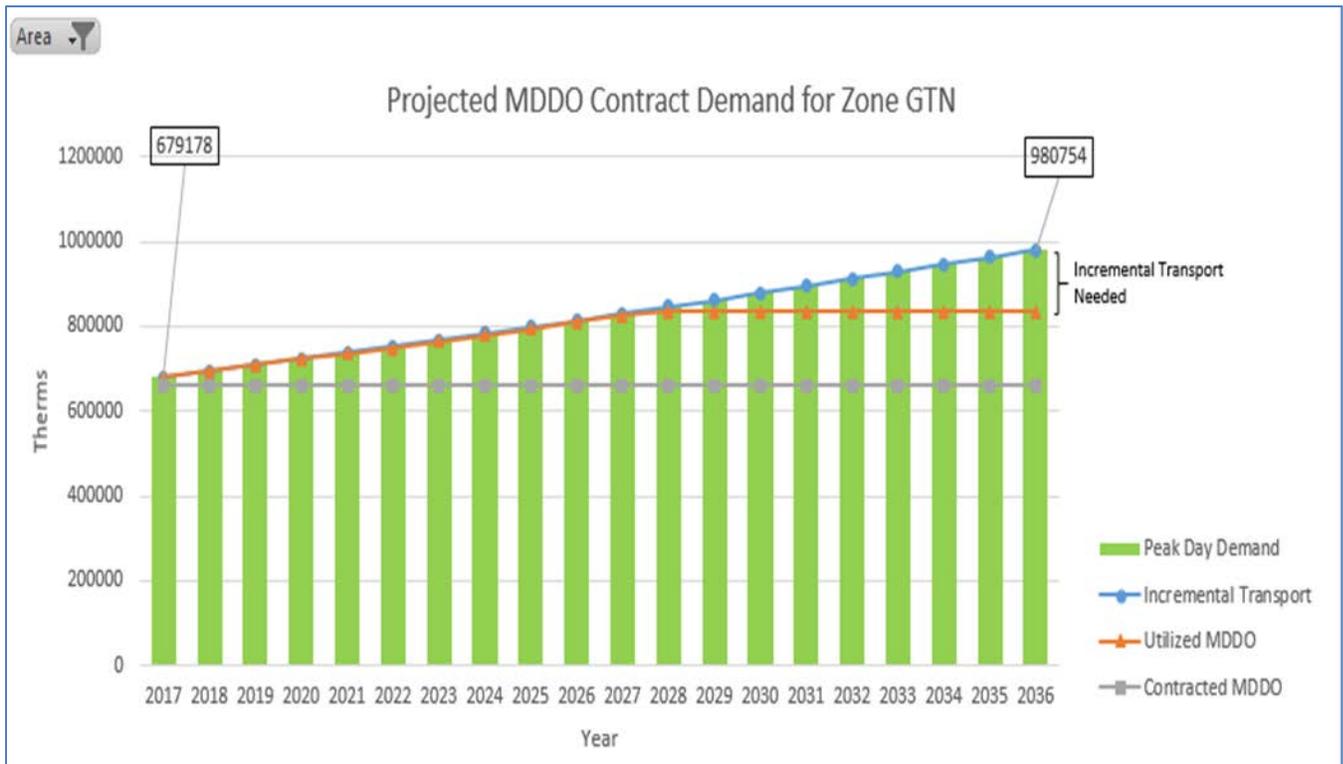
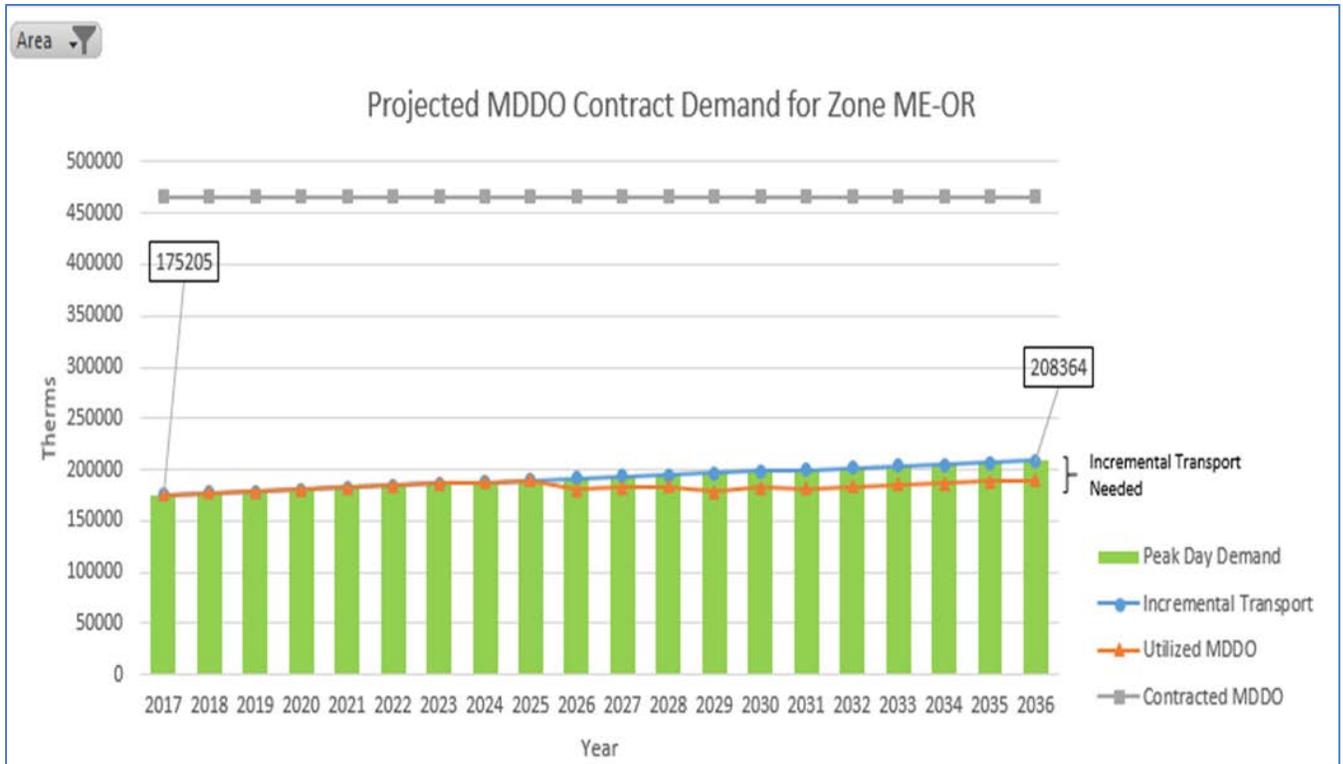
## APPENDIX 2: Item Three – Oregon Shortfall



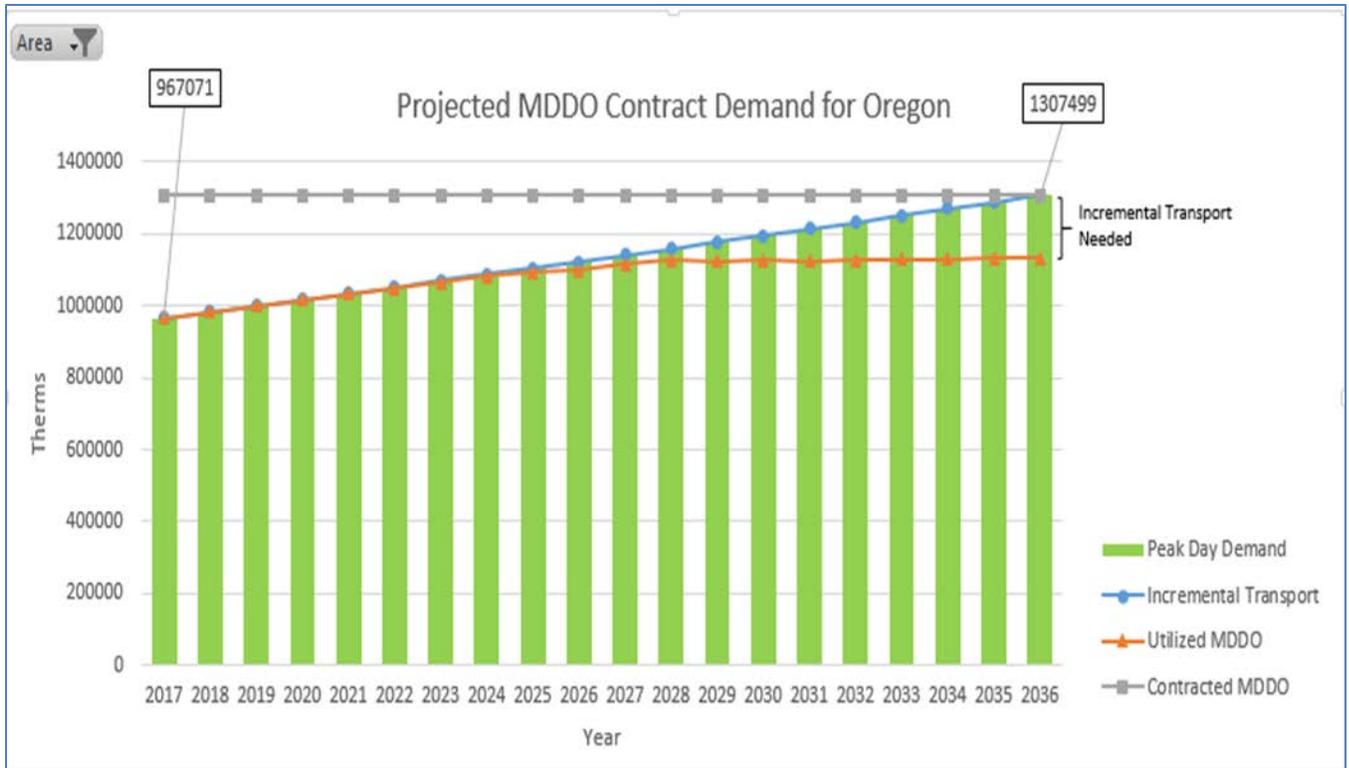
## APPENDIX 2: Item Three – Oregon Shortfall



APPENDIX 2: Item Three – Oregon Shortfall



## APPENDIX 2: Item Three – Oregon Shortfall



### APPENDIX 3: Item Four – Accelerated DSM

**Table 1 - 2014 IRP Base Case DSM**

**Net Annual Therms**

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Commercial	260,822	259,779	189,968	176,117	164,419	159,409	115,120	111,325	101,665	117,167	80,575	94,749	93,276	109,686	71,890	88,722	87,534	105,329	59,643	77,824
Industrial	35,015	35,015	32,481	32,644	32,237	32,462	34,36	35,207	34,880	39,276	37,716	38,080	37,824	38,233	36,699	37,135	36,937	37,416	35,900	36,404
Residential	91,447	93,697	75,688	75,134	77,618	75,559	74,378	74,241	71,487	74,274	73,171	72,240	77,264	76,699	74,884	73,839	72,947	72,051	66,923	70,491
Market Transformation	45,736	58,580	58,580	58,580	35,148	35,148	35,148	21,089	21,089	21,089	21,089	21,089	21,089	21,089	21,089	21,089	21,089	21,089	21,089	21,089
<b>Total</b>	<b>433,020</b>	<b>447,071</b>	<b>356,717</b>	<b>342,476</b>	<b>309,422</b>	<b>302,578</b>	<b>259,583</b>	<b>241,861</b>	<b>229,121</b>	<b>251,806</b>	<b>212,551</b>	<b>226,158</b>	<b>229,454</b>	<b>245,707</b>	<b>204,561</b>	<b>220,785</b>	<b>218,508</b>	<b>235,884</b>	<b>183,554</b>	<b>205,808</b>

**Table 2 - Low Accelerated DSM**

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Commercial	260,822	259,779	<b>198,317</b>	<b>183,742</b>	<b>173,206</b>	<b>165,452</b>	<b>122,226</b>	<b>102,975</b>	<b>94,040</b>	<b>108,379</b>	<b>74,532</b>	<b>87,643</b>	93,276	109,686	71,890	88,722	87,534	105,329	59,643	77,824
Industrial	35,015	35,015	<b>41,282</b>	<b>41,365</b>	<b>42,056</b>	<b>41,891</b>	<b>44,456</b>	<b>26,405</b>	<b>26,160</b>	<b>29,457</b>	<b>28,287</b>	<b>28,560</b>	37,824	38,233	36,699	37,135	36,937	37,416	35,900	36,404
Residential	91,447	93,697	<b>79,400</b>	<b>78,708</b>	<b>81,332</b>	<b>79,217</b>	<b>77,990</b>	<b>70,529</b>	<b>67,913</b>	<b>70,560</b>	<b>69,513</b>	<b>68,628</b>	77,264	76,699	74,884	73,839	72,947	72,051	66,923	70,491
Market Transformation	<b>45,736</b>	<b>58,580</b>	<b>58,580</b>	<b>58,580</b>	<b>35,148</b>	<b>35,148</b>	<b>35,148</b>	<b>21,089</b>												
<b>Total</b>	<b>433,020</b>	<b>447,071</b>	<b>377,580</b>	<b>362,395</b>	<b>331,742</b>	<b>321,708</b>	<b>279,821</b>	<b>220,998</b>	<b>209,202</b>	<b>229,486</b>	<b>193,421</b>	<b>205,920</b>	<b>229,454</b>	<b>245,707</b>	<b>204,561</b>	<b>220,785</b>	<b>218,508</b>	<b>235,884</b>	<b>183,554</b>	<b>205,808</b>

**Table 3 - Medium Accelerated DSM**

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Commercial	260,822	259,779	<b>217,799</b>	<b>201,533</b>	<b>193,710</b>	<b>179,553</b>	<b>138,808</b>	<b>83,493</b>	<b>76,249</b>	<b>87,875</b>	<b>60,431</b>	<b>71,062</b>	93,276	109,686	71,890	88,722	87,534	105,329	59,643	77,824
Industrial	35,015	35,015	<b>48,324</b>	<b>48,341</b>	<b>49,912</b>	<b>49,434</b>	<b>52,072</b>	<b>19,364</b>	<b>19,184</b>	<b>21,602</b>	<b>20,744</b>	<b>20,944</b>	37,824	38,233	36,699	37,135	36,937	37,416	35,900	36,404
Residential	91,447	93,697	<b>84,968</b>	<b>84,070</b>	<b>86,902</b>	<b>84,705</b>	<b>83,408</b>	<b>64,961</b>	<b>62,551</b>	<b>64,990</b>	<b>64,025</b>	<b>63,210</b>	77,264	76,699	74,884	73,839	72,947	72,051	66,923	70,491
Market Transformation	45,736	58,580	<b>58,580</b>	<b>58,580</b>	<b>35,148</b>	<b>35,148</b>	<b>35,148</b>	<b>21,089</b>	<b>21,089</b>	<b>21,089</b>	<b>21,089</b>	<b>21,089</b>	21,089	21,089	21,089	21,089	21,089	21,089	21,089	21,089
<b>Total</b>	<b>433,020</b>	<b>447,071</b>	<b>409,671</b>	<b>392,524</b>	<b>365,672</b>	<b>348,840</b>	<b>309,436</b>	<b>188,907</b>	<b>179,073</b>	<b>195,556</b>	<b>166,289</b>	<b>176,305</b>	<b>229,454</b>	<b>245,707</b>	<b>204,561</b>	<b>220,785</b>	<b>218,508</b>	<b>235,884</b>	<b>183,554</b>	<b>205,808</b>

**Table 4 - High Accelerated DSM**

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Commercial	260,822	259,779	<b>228,931</b>	<b>211,700</b>	<b>205,427</b>	<b>187,610</b>	<b>148,283</b>	<b>72,361</b>	<b>66,082</b>	<b>76,159</b>	<b>52,374</b>	<b>61,587</b>	93,276	109,686	71,890	88,722	87,534	105,329	59,643	77,824
Industrial	35,015	35,015	<b>50,084</b>	<b>50,085</b>	<b>51,875</b>	<b>51,320</b>	<b>53,976</b>	<b>17,603</b>	<b>17,440</b>	<b>19,638</b>	<b>18,858</b>	<b>19,040</b>	37,824	38,233	36,699	37,135	36,937	37,416	35,900	36,404
Residential	91,447	93,697	<b>90,536</b>	<b>89,432</b>	<b>92,473</b>	<b>90,193</b>	<b>88,826</b>	<b>59,393</b>	<b>57,190</b>	<b>59,419</b>	<b>58,537</b>	<b>57,792</b>	77,264	76,699	74,884	73,839	72,947	72,051	66,923	70,491
Market Transformation	45,736	58,580	<b>58,580</b>	<b>58,580</b>	<b>35,148</b>	<b>35,148</b>	<b>35,148</b>	<b>21,089</b>	<b>21,089</b>	<b>21,089</b>	<b>21,089</b>	<b>21,089</b>	21,089	21,089	21,089	21,089	21,089	21,089	21,089	21,089
<b>Total</b>	<b>433,020</b>	<b>447,071</b>	<b>428,132</b>	<b>409,796</b>	<b>384,923</b>	<b>364,271</b>	<b>326,233</b>	<b>170,446</b>	<b>161,801</b>	<b>176,305</b>	<b>150,858</b>	<b>159,508</b>	<b>229,454</b>	<b>245,707</b>	<b>204,561</b>	<b>220,785</b>	<b>218,508</b>	<b>235,884</b>	<b>183,554</b>	<b>205,808</b>