NERC

NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

2010 Special Reliability Scenario Assessment:

Potential Reliability Impacts of Swift Demand Growth After a Long-Term Recession

to ensure the reliability of the bulk power system

August 2010

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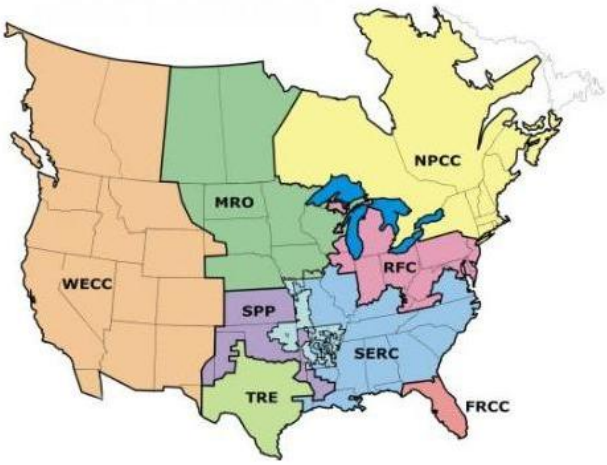
NERC's Mission

The North American Electric Reliability Corporation (NERC) is an international regulatory authority established to evaluate reliability of the bulk power system in North America. NERC develops and enforces Reliability Standards; assesses adequacy annually via a 10-year forecast and winter and summer forecasts; monitors the bulk power system; and educates, trains, and certifies industry personnel. NERC is the electric reliability organization for North America, subject to oversight by the U.S. Federal Energy Regulatory Commission (FERC) and governmental authorities in Canada.[1]

NERC assesses and reports on the reliability and adequacy of the North American bulk power system, which is divided into eight Regional areas as shown on the map below and listed in Table A. The users, owners, and operators of the bulk power system within these areas account for virtually all the electricity supplied in the U.S., Canada, and a portion of Baja California Norte, México.



Note: *The highlighted area between SPP and SERC denotes overlapping regional area boundaries. For example, some load serving entities participate in one region and their associated transmission owner/operators in another.*

Table A: NERC Regional Entities

FRCC Florida Reliability Coordinating Council	**SERC** SERC Reliability Corporation
MRO Midwest Reliability Organization	**SPP** Southwest Power Pool, Incorporated
NPCC Northeast Power Coordinating Council	**TRE** Texas Reliability Entity
RFC Reliability*First* Corporation	**WECC** Western Electricity Coordinating Council

[1] As of June 18, 2007, the U.S. Federal Energy Regulatory Commission (FERC) granted NERC the legal authority to enforce Reliability Standards with all U.S. users, owners, and operators of the BPS, and made compliance with those standards mandatory and enforceable. In Canada, NERC presently has memorandums of understanding in place with provincial authorities in Ontario, New Brunswick, Nova Scotia, Québec, and Saskatchewan, and with the Canadian National Energy Board. NERC standards are mandatory and enforceable in Ontario and New Brunswick as a matter of provincial law. NERC has an agreement with Manitoba Hydro making reliability standards mandatory for that entity, and Manitoba has recently adopted legislation setting out a framework for standards to become mandatory for users, owners, and operators in the province. In addition, NERC has been designated as the "electric reliability organization" under Alberta's Transportation Regulation, and certain reliability standards have been approved in that jurisdiction; others are pending. NERC and NPCC have been recognized as standards-setting bodies by the *Régie de l'énergie* of Québec, and Québec has the framework in place for reliability standards to become mandatory. Nova Scotia and British Columbia also have frameworks in place for reliability standards to become mandatory and enforceable. NERC is working with the other governmental authorities in Canada to achieve equivalent recognition.

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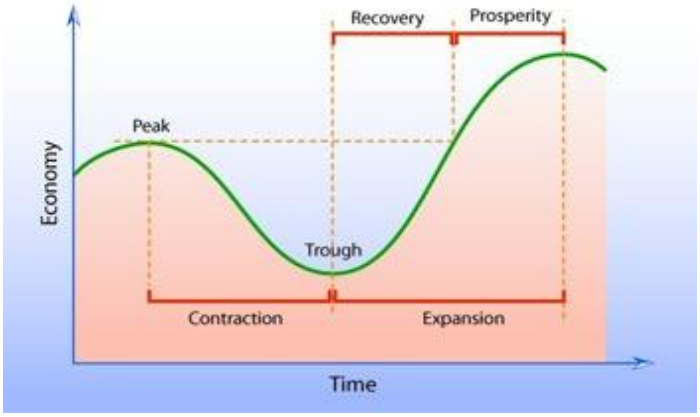
Executive Summary

With the economic recession affecting electricity demand throughout North America, forecasts of future electricity demand are less certain for both short- and long-term planning horizons (See Figure A). This report assesses the potential reliability impacts of a high demand growth scenario, with a rapid peak demand increase to the 2008 demand forecasts occurring after four years (2014) of lower demand growth reflected in the 2009 projections, which represents a steep economic recovery.[2] The design of this Special Reliability Assessment includes the following:

1. The 2009 Long-Term Reliability Assessment[3] summer and winter peak demand and capacity projections for the 2010–2013 timeframe forms the basis of the Reference Case.
2. The *2008 Long-Term Reliability Assessment*[4] summer and winter peak demand projections for the 2014–2017 timeframe forms the basis for the *Scenario Case*.

Figure A: Recession Effects and Lifecycle



The key findings from this reliability assessment are as follows:

Significant Increases in Peak Demand Observed in Regions that are the Most Affected by the Current Economic Recession

WECC and FRCC are among the most potentially affected Regions in this scenario. In particular, within WECC, the Rocky Mountain Power Area (RMPA) and Arizona-New México-Southern Nevada (AZ-NM-SNV) subregions each experience more than an 11 percent increase. For the portion of WECC in the United States, the demand increased 8,300 MW, almost six percent, in the 2014 Scenario Case. For FRCC, a 10-percent increase was experienced in the Scenario Case.

While summer peak demand increases are identified in the WECC-México subregion (almost 30 percent), this equates to only 700 MW. Other affected subregions with significant increases are the NPCC-Maritimes, SERC-Central, and RFC-PJM subregions, all with approximately an eight-percent increase in peak demand.

[2] The design of this study calls for comparisons between a *Reference Case* and a *Scenario Case.* See *Introduction* section for background on each case.
[3] http://www.nerc.com/files/2009_LTRA.pdf
[4] http://www.nerc.com/files/LTRA2008v1_2.pdf

In Canada, Projected Scenario Peak Demands are Nearly Identical

The projected peak demand (mostly winter peaking) in Canadian provinces were not forecast to decrease significantly in the Reference Case compared to the Scenario Case, reflecting smaller effects on peak demand from the economic recession. The overall potential impacts on the winter planning reserve margins in Canada are small, resulting in a 1,000 MW increase in peak demand for the Scenario Case in 2014. Furthermore, in some of the Canadian Regions, peak demand actually decreased in the Scenario Case. Increases were observed in the Maritimes and Ontario subregions of NPCC, and the WECC-Canada subregion.

Unexpected Demand Increases Result in Reduced Planning Reserve Margins

Planning Reserve Margins could rapidly decrease during the latter portions of the planning horizon (4–8 years) as the 2009 projected addition of resources (e.g., generation and demand-side management) do not match the rapid increase in seasonal peak demand in the Scenario Case. Because Planning Reserve Margins are sensitive to changes in peak demand, increases may mean more resources are needed to reliably balance supply and demand. For example, when calculating Planning Reserve Margins with Adjusted Potential Resources, the WECC-CA-MX-México subregion and the RFC-MISO subregion were below NERC's Reference Margin Level[5] *in 2014.*

Further, FRCC and the SERC-Central subregion are below NERC's Reference Margin Level in 2015. Reductions in Planning Reserve Margins are as much as 16 percentage points (WECC-RMPA) and average approximately six percentage points across all Regions and subregions.

In addition, Regions and subregions already highlighted in the 2009 Long-Term Reliability Assessment *(Reference Case) to be below NERC's Reference Margin Level decreased further. For example, WECC-Canada and MRO-US Planning Reserve Margins were below NERC's Reference Margin Level in the Reference Case, and these margins were further reduced in the Scenario Case.*

This Scenario Reliability Assessment is designed to stress system planning reserve margins based on industry preparations documented in NERC's *2009 Long-Term Reliability Assessment*. The conceptual reliability assessment is based on an assumed rapid increase in peak demand occurring in a one-year timeframe, providing no time for industry to obtain additional resources.

[5] NERC's Reference Margin Level represents either the Target Reserve Margin provided by the Region/subregion or NERC assigned based on capacity mix (i.e., thermal/hydro). Each Region/subregion may have its own specific margin level based on load, generation, and transmission characteristics as well as regulatory requirements. If provided in the data submittals, the Regional/subregional Target Reserve Margin level is adopted as the NERC Reference Reserve Margin Level. If not, NERC assigned a 15 percent Reserve Margin for predominately thermal systems, and 10 percent for predominately hydro systems.

Introduction

Background

Beginning in December 2007 (and with much greater intensity in the United States since September 2008[6]), much of the industrialized world was affected by a recession—a pronounced decline of economic activity. This global recession now affects almost every economic decision made by residential, commercial, and industrial consumers—including electricity usage.

With the economic recession affecting electricity demand throughout North America, forecasts of future demands for electricity have resulted in greater uncertainty for both short- and long-term planning horizons. Accordingly, NERC's *2009 Long-Term Reliability Assessment Demand* forecasts showed that recession affects electric demand at varying degrees, depending on the Region. While not all changes between 2008 and 2009 seasonal peak forecasts result from the economic recession, about 80 percent of the reduction in peak demand forecasts could be attributed to it.[7]

Reacting to the recent decline in demand growth projections, industry may retire or "mothball" generation earlier than expected.[8] As a result, resource capacity projections could be subsequently reduced to meet the forecast operational levels. However, this demand growth and generation retirement may result in a supply and demand imbalance if demand growth increases unexpectedly due to a swift economic recovery. Therefore, Planning Reserve Margins could rapidly deteriorate during the latter portions of the planning horizon (4–8 years) if the addition of resources (e.g., generation and demand-side management) cannot keep up with the rapid increase in demand.

To measure the sensitivity of the resource plans provided in the *2009 Long-term Reliability Assessment* to this potential condition, NERC's Planning Committee requested that the Reliability Assessment Subcommittee assess the reliability of the bulk power system if there was to be a swift, unexpected rise in demand. This rise in projected demand was modeled by using the *2008 Long-Term Reliability Assessment* demand projections and the *2009 Long-Term Reliability Assessment* resource plans, with the swift recovery beginning in 2014.

Reliability Assessment Study Design[9]

This reliability assessment includes studying slowed peak demand growth for four years from 2010, followed by swift increase in peak demand, providing little time to respond within the horizon. This severe increase is meant to measure the robustness of the 2009 resource plans for unexpected increases in peak demand and identify areas where additional resources may be required in the case of rapid demand growth due to economic recovery effects. This scenario represents a "worst case" situation designed to stress industry preparations.

[6] According to the National Bureau of Economic Research at http://www.nber.org/.
[7] http://www.nerc.com/files/2009_LTRA.pdf; the other 20 percent was attributed to increases in Demand-Side Management.
[8] This report does not study other factors that may contribute to early retirement of generation, such as pending environmental regulations.
[9] For more detailed information, please refer to the *Terms Used in This Report*, *Further Reading*, and *Endnotes* sections of this report. These sections include important concepts that are essential to clearly understand the findings in this report.

The design of this Special Reliability Assessment includes the following:

1. The 2009 projected summer peak demand and capacity for the 2010–2017 timeframe forms the basis of the *Reference Case*.
2. The *Scenario Case* demand growth patterns are based upon summer- and winter peak-demand forecast assumptions provided by the Regions in the *2008 Long-Term Reliability Assessment.*[10]

Refer to the *"Terms Used in This Report"* section for detailed descriptions and definitions of the terms used for this scenario report.

All resource comparisons to these peak demands follow the *Reference Case* projections. Further, all demand and resource projections are based on the assumptions made when the data was provided in 2008 and 2009. The summer- or winter peak-demand[11] and resource supply pattern will reflect the *Reference Case* projections through 2013, followed by the growth in summer peak demand in the *Scenario Case* for the second four years, with resource and margin calculations unchanged from the *Reference Case*. Using these projections, a range of potential outcomes can be measured by applying the different supply categories currently used by NERC, which represent different layers of certainty of projected resources (i.e., Existing, Future, and Conceptual). A graphical representation of the concept is shown in Figure B, with the inflection year indicated by the blue arrow.

Therefore, a combination of the 2008 and 2009 peak demand forecasts is used: the 2009 forecast will be used until the inflection year (2014) and the 2008 peak forecast will be used for the 2014 through 2017 *Scenario Case*. By simulating a discrete change in the seasonal peak demand changing from the 2009 forecast to the 2008 forecast, effects from a one-year rapid increase in demand can be assessed.

This *Scenario* study will assess and identify:

- the magnitude of peak demand impacts (MW and percentage),
- the effects to Planning Reserve Margin, and
- when more resources may be needed in the *Scenario Case* based on the NERC Reference Margin Level.[12]

Planning Reserve Margin[13] is designed to measure the amount of generation capacity available to meet expected demand within the planning horizon,[14] and can be used to gauge the ability to

[10] http://www.nerc.com/files/LTRA2008v1_2.pdf

[11] For summer-peaking Regions/subregions, summer peaks are included in this report. For winter-peaking Regions/subregions, winter peaks are included.

[12] NERC's Reference Margin Level represents either the Target Reserve Margin provided by the Region/subregion, or NERC assigned based on capacity mix (i.e., thermal/hydro). Each Region/subregion may have its own specific margin level based on load, generation, and transmission characteristics as well as regulatory requirements. If provided in the data submittals, the Regional/subregional Target Reserve Margin level is adopted as the NERC Reference Reserve Margin Level. If not, NERC assigned a 15 percent Reserve Margin for predominately thermal systems, and 10 percent for predominately hydro-electric systems.

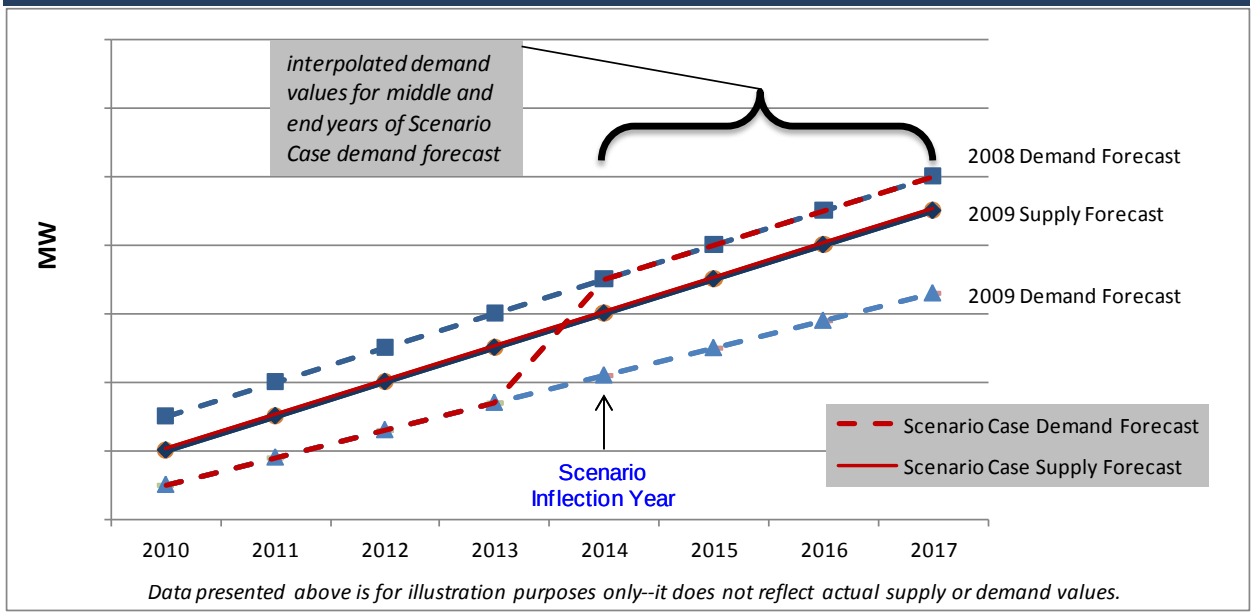
[13] Planning Reserve Margin equals the difference in supply resources (changes depending on resource/supply category, and Net Internal Demand, divided by Net Internal Demand).

[14] The Planning Reserve Margin indicated here is not the same as an operating reserve margin that system operators use for near-term operations decisions.

balance capacity and seasonal peak demand. Coupled with probabilistic analysis, Planning Reserve Margin is an industry standard as a relative indication of resource adequacy.

Generally, the projected seasonal peak demand is based on a 50/50 forecast.[15] Planning Reserve Margin is the difference between available capacity and peak demand, normalized by peak demand and shown as a percentage. Based on experience, Planning Reserve Margin indicates the amount of capacity needed to maintain reliable operation while meeting unforeseen increases in demand (e.g., extreme weather or economic effects) and unexpected outages of existing capacity. Therefore, from a planning perspective, Planning Reserve Margin trends identify whether or not capacity additions are projected to keep pace with demand growth during the timeframe of the assessment.

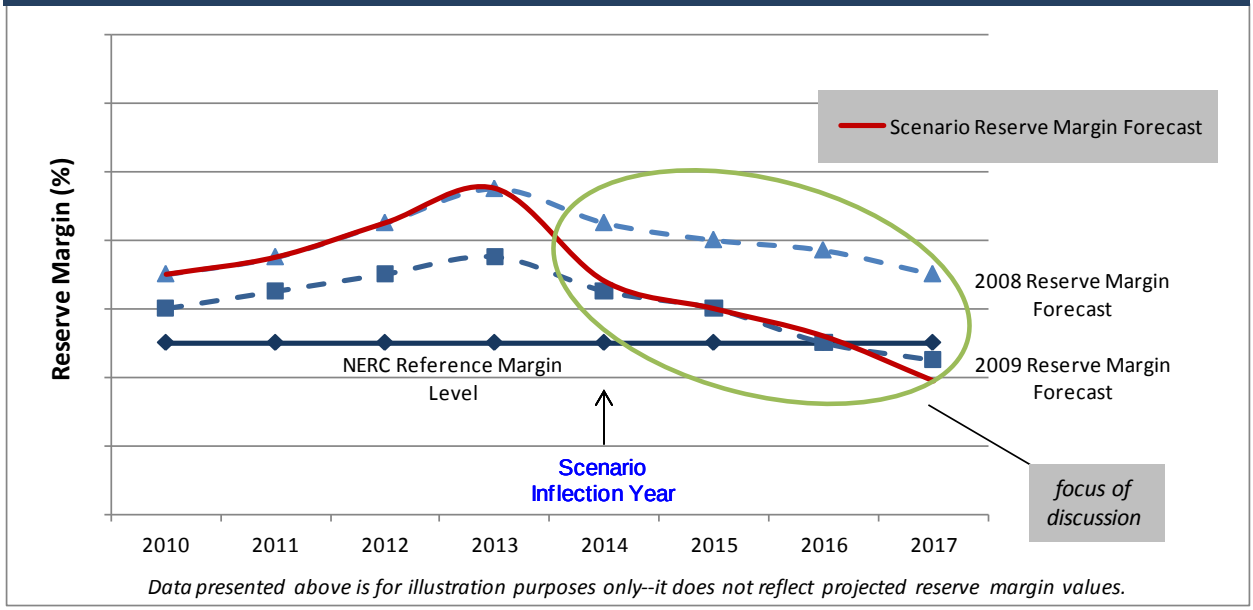
Figure B: Example of Study Analysis Method — 2008 and 2009 Supply and Demand Forecasts



For this assessment, Regional/subregional data will be analyzed to identify whether rapid economic recovery might cause Planning Reserve Margins to fall below NERC's Reference Reserve Margin Level after the year of inflection in 2014 — see Figure C.

[15] These demand forecasts are based on the "50/50" forecast assumption. This is defined as a forecast that has been adjusted to reflect normal weather, and is expected on a 50% probability basis (i.e., a peak demand forecast level that has a 50% probably of being under- or over-achieved by the actual peak). This forecast can then be used to test against more extreme conditions.

Figure C: Example of Study Analysis Method — Reserve Margin Analysis



The assumptions used for this scenario study interpolate peak demand forecasts from the *2008* and *2009 Long-Term Reliability Assessments*, including the supply/demand side assumptions identified in these reports. Further, this report identifies many areas in high-industrial centers that may have potential reliability concerns, though in many cases, a portion of this demand has been closed permanently. Therefore, assuming that this demand will return can be misleading. That said, the demand might return in a different form as the economy recovers and new economic opportunities arise that use large amounts of electricity. This scenario is designed to be a sensitivity analysis to identify when Planning Reserve Margins go below NERC's Reference Level indicating that additional resources may be needed.

Potential Reliability Considerations

The economic recession that began in 2007 has become a major global recession and has had an indelible impact on the electric power industry. While there is currently substantial uncertainty on the time, rate, and breadth of an economic recovery in the coming years, it is certain that its potential arrival may present risks and challenges to the bulk power system on several levels. Here, the following two issues are explored in detail:

Seasonal Peak Demand Forecast

- The recession has caused significant impacts in seasonal peak demand forecasts.

Rapid Demand Growth after a Flat Period

- When and how fast an economic recovery occurs is uncertain, but if the economy recovers quickly, the bulk power system must be ready to balance supply and demand to maintain the reliability.

Seasonal Peak Demand Forecasts

The recession that has taken place throughout North America affects seasonal peak and electric energy demands to varying degrees, depending on the Region and end-user base. Long-term effects (structural) of the current recession may remain so that a decline in short- and long-term load forecasts is likely. The contribution of the economic component is a primary factor in load forecasting. Typically, the electricity use in North America closely tracks the performance of the Gross Domestic Product (GDP) along with regional employment and income. The severity of the current recession, coupled with the uncertainty of the recovery magnitude, renders near-term seasonal peak demand estimates particularly suspect. However, data suggest that in the first two- to three-year period, economic uncertainty will prevail. Whether changes are cyclical, structural, or both, seasonal peak demand forecasts are entering an uncertain phase and close monitoring of the recession's influence on electric demand is recommended.

For the U.S., the 2009 forecasts include an average downward revision for the 2009–2017 timeframe of about 3.4 percent in terms of Net Energy for Load, and 4.1 percent in terms of summer peak demand when compared to the 2008 forecast. In Canada, this downward revision is about 1.8 percent (from 2.9 percent in 2009 to 0.9 percent in 2017) in energy and 0.5 percent in winter peak demand for 2017.[16]

A recovery pattern, not much different from that which followed previous slowdowns, is anticipated by the majority of the Regions. However, in the first two- or three-year period, major economic uncertainty will prevail. Additional uncertainty about deferral or cancellation of major industrial projects will not be easily quantifiable and will make both short- and long-term demand forecasting more challenging than within a steady economic growth cycle.

The economic recession has already impacted the seasonal peak demand forecast, which has in turn driven short-term Planning Reserve Margins up. In the longer run, generation projects and transmission infrastructure investment may also be affected. Regions should continue to monitor the impact of the recession, the economic recovery, and their impacts on the bulk power system reliability.

Rapid Demand Growth after Slowed Growth

Maintaining adequate reserves is vital to sustaining reliable electric service and ensures operators have the flexibility to withstand a variety of contingencies that may occur in real time. No forecast can say, with certainty, how peak-demand and electricity use will change over the coming years. A demand growth sensitivity case (or *Scenario*) involves seasonal peak demand growth as forecast in the *Reference Case* until 2014, followed by an abrupt change to normal- or high demand growth. The result of this seasonal peak demand growth pattern and 2009 supply projections may result in supply and demand imbalances. While the industry is certainly prepared to handle increased demand growth over a long-term period, potential rapid growth in a short-term period can position the industry in a situation where resources cannot be fully deployed to meet resource adequacy requirements.

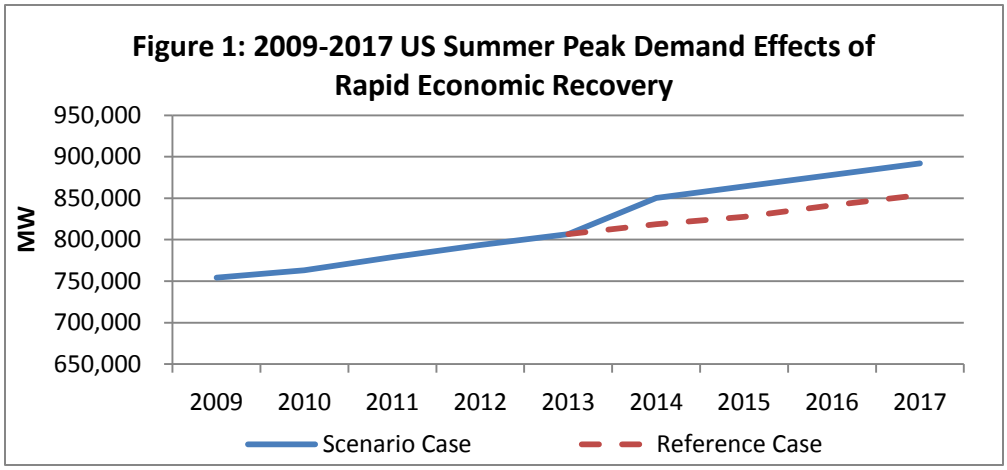
[16] http://www.nerc.com/files/2009_LTRA.pdf

Analysis of Scenario Results

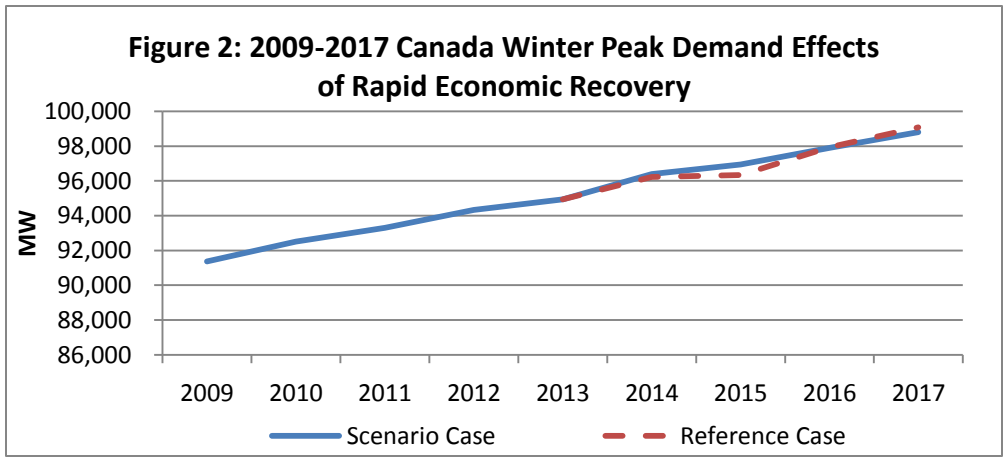
Peak Demand Impacts

Due in large part to the economic recession, peak demand forecasts in 2009 were significantly reduced from the previous year forecasts, according to the NERC *2009 Long-Term Reliability Assessment*.[17] While some Regions, including Texas, continue to see record peak demand, overall peak demand forecasts for 2009 have decreased by four percent from forecasts projected in 2008. The most significant change in projected peak demand occurs in Florida, where demand previously projected to be realized in 2010 is now not expected until 2015.

A theoretical increase in electricity use in 2014 (simulating an economy in rapid recovery), as referenced in this *Scenario Case*, may result in a 4.3 percent increase in summer peak demand, or just over 35,400 MW, in the United States (Figure 1). By 2017, the difference in the *Reference Case* and *Scenario Case* peak demand forecasts would increase to 41,800 MW (4.9 percent) due to a slightly higher annual growth rate for the *Scenario Case*.



Overall, impacts in Canada (winter peaking) are smaller in the *Scenario Case* with an overall increase of about one percent, or almost 1,000 MW. However, by 2017 the impact (the demand increase) in the *Scenario Case* is reduced to about 550 MW (Figure 2).



[17] http://www.nerc.com/files/2009_LTRA.pdf

At a more granular level of analysis, Regions and subregions sensitive to demand increases are identified in Table 1, which shows the impacts during an assumed year of rapid demand increase.

Table 1 - 2014 Annual Peak Net Internal Demand Impacts of Scenario

				Scenario Case	
		Annual Peak Net Internal Demand Reference Case - 2009 Forecast (MW)	Annual Peak Net Internal Demand Scenario Case - 2008 Forecast (MW)	Change in Annual Peak Net Internal Demand (ΔMW)	Percent Change (Δ%)
United States					
FRCC	-	45,581	50,202	4,621	10.14%
MRO	-	45,062	46,455	1,393	3.09%
NPCC	-	63,840	66,016	2,176	3.41%
NPCC	New England	29,750	30,510	760	2.55%
NPCC	New York	34,090	35,506	1,416	4.15%
RFC	-	185,900	194,300	8,400	4.52%
RFC	MISO	63,515	66,700	3,185	5.01%
RFC	PJM	122,264	131,600	9,336	7.64%
SERC	-	215,585	223,378	7,793	3.61%
SERC	Central	43,180	46,607	3,427	7.94%
SERC	Delta	30,019	31,807	1,788	5.96%
SERC	Gateway	20,127	20,396	269	1.34%
SERC	Southeastern	54,189	56,238	2,049	3.78%
SERC	VACAR	68,070	68,330	260	0.38%
SPP	-	46,699	47,655	955	2.05%
TRE	-	69,722	71,453	1,731	2.48%
WECC	-	146,240	154,572	8,332	5.70%
WECC	AZ-NM-SNV	32,926	36,627	3,701	11.24%
WECC	CA-MX	60,788	62,305	1,517	2.50%
WECC	NWPP	44,713	45,127	414	0.93%
WECC	RMPA	11,860	13,681	1,821	15.35%
United States Total		**818,629**	**854,030**	**35,401**	**4.32%**
Canada					
MRO	-	8,282	8,032	-250	-3.02%
NPCC	-	63,991	63,971	-20	-0.03%
NPCC	Maritimes	5,158	5,611	453	8.78%
NPCC	Ontario	22,932	24,312	1,380	6.02%
NPCC	Quebec	37,391	37,023	-368	-0.98%
WECC	-	23,948	25,173	1,225	5.12%
Canada Total		**96,221**	**97,176**	**955**	**0.99%**
Mexico					
WECC	CA-MX	2,402	3,086	684	28.48%
NERC Total		**917,252**	**954,292**	**37,040**	**4.04%**

Note: Blue bars indicate the reduction magnitude relative to other Regions/subregions; Yellow bars indicate an increase.

Due to higher assumed annual growth rates in the *Scenario Case*, demand increases are exacerbated by the end of the assessment period, 2017 — see Table 2.

Table 2 - 2017 Annual Peak Net Internal Demand Impacts of Scenario

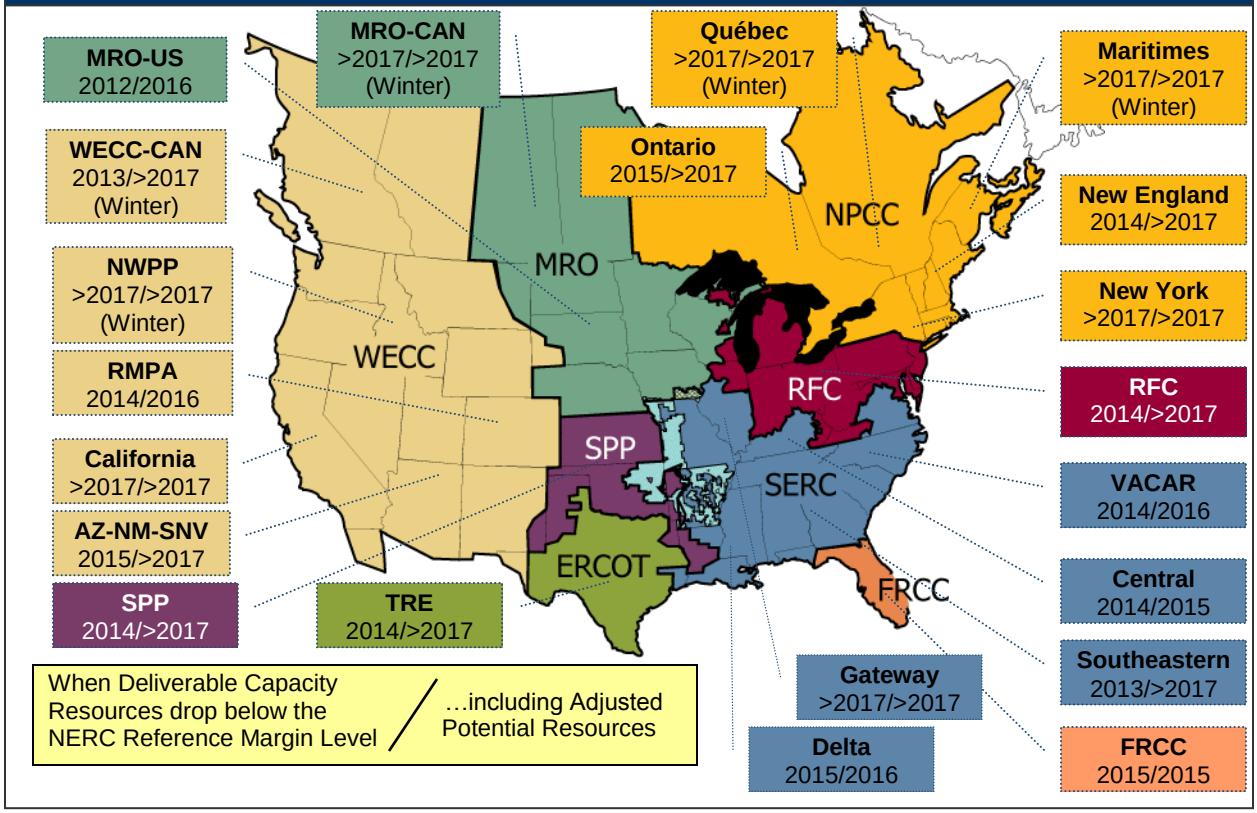
				Scenario Case	
		Annual Peak Net Internal Demand Reference Case - 2009 Forecast (MW)	Annual Peak Net Internal Demand Scenario Case - 2008 Forecast (MW)	Change in Annual Peak Net Internal Demand (ΔMW)	Percent Change (Δ%)
United States					
FRCC	-	48,655	53,733	5,078	10.44%
MRO	-	46,901	48,625	1,724	3.68%
NPCC	-	65,579	67,711	2,132	3.25%
NPCC	New England	30,695	31,250	555	1.81%
NPCC	New York	34,884	36,461	1,577	4.52%
RFC	-	191,400	201,700	10,300	5.38%
RFC	MISO	64,614	68,900	4,286	6.63%
RFC	PJM	126,666	137,000	10,334	8.16%
SERC	-	225,423	236,070	10,647	4.72%
SERC	Central	44,613	49,673	5,060	11.34%
SERC	Delta	31,062	33,144	2,082	6.70%
SERC	Gateway	20,643	20,997	354	1.71%
SERC	Southeastern	57,555	60,156	2,601	4.52%
SERC	VACAR	71,550	72,100	550	0.77%
SPP	-	47,846	49,853	2,007	4.19%
TRE	-	73,756	75,201	1,445	1.96%
WECC	-	154,288	162,763	8,475	5.49%
WECC	AZ-NM-SNV	35,547	39,442	3,895	10.96%
WECC	CA-MX	63,104	64,598	1,494	2.37%
WECC	NWPP	46,582	46,858	276	0.59%
WECC	RMPA	12,574	14,747	2,173	17.28%
United States Total		**853,848**	**895,656**	**41,808**	**4.90%**
Canada					
MRO	-	8,410	8,179	-231	-2.75%
NPCC	-	65,526	64,663	-863	-1.32%
NPCC	Maritimes	5,291	5,749	458	8.66%
NPCC	Ontario	22,538	23,960	1,422	6.31%
NPCC	Quebec	39,000	37,814	-1,186	-3.04%
WECC	-	25,148	26,796	1,648	6.55%
Canada Total		**99,084**	**99,638**	**553**	**0.56%**
Mexico					
WECC	CA-MX	2,586	3,598	1,012	39.13%
NERC Total		**955,518**	**998,892**	**43,374**	**4.54%**

Note: Blue bars indicate the reduction magnitude relative to other Regions/subregions; Yellow bars indicate an increase.

Planning Reserve Margin Assessment

Three subregions are expected to fall below the NERC Reference Margin Level during the four-year period before the *Scenario Case* assumes a rapid increase in demand: MRO-US (2012), WECC-Canada (2013), and SERC-Southeastern (2013). While new resources are expected in the coming years to ensure that planning reserve margins remain adequate throughout the ten-year period, NERC will be closely monitoring the situation in these three areas (Figure 3). Because these subregions already have potential resource adequacy issues, even slight increases in peak demand can cause margins to further slip below the NERC Reference Margin Level.

Figure 3: Deliverable and Adjusted Potential Resources Reserve Margins (*Scenario Case*) Compared to NERC's Reference Margin Level



Overall, this *Scenario* would advance the need for even more resources (e.g., generation or demand-side management) two years earlier than identified in the *Reference Case*. However, an advancement of as much as four years was identified in RFC, SERC-Central, and the AZ-NM-SNV subregion of WECC. These Regions and subregions would require additional resources at a much faster rate than other Region, and may be susceptible to unexpected resource adequacy issues.

Other notable areas of concern include SERC-Delta and WECC-RMPA, where the need for more resources advances about three years and falls within the five-year forecast period.

While the change in Planning Reserve Margins from the *Scenario Case* compared to the *Reference Case* may not directly indicate a resource adequacy concern, understanding the potential magnitude, as well as sensitivities to demand, are critical to determine how prepared the industry should be to deal with extreme or rapid changes in electricity usage. Additionally, neighboring Regions and/or subregions must be aware of the implications these extreme conditions may cause to their systems.

Regions and/or subregions most affected by this *Scenario* are the CA-MX-México and RMPA subregions of WECC, as well as FRCC and the Maritimes subregion of NPCC (Table 3). A majority of the Regions and subregions can expect Planning Reserve Margins to decrease from one to nine percentage points. Unexpectedly, Reserve Margins for some subregions actually increased in the *Scenario Case* assumptions, indicating these areas have not realized any significant reductions in seasonal peak demand through the recent economic recession.

Table 3: Change to Reserve Margins in Scenario Case for 2014

	Deliverable Reserve Margin - Reference Case	Deliverable Reserve Margin - Scenario Case		Net Change (percentage points)
CA-MX MEX	15.7%	**-9.9%**	🔴	-25.6
RMPA	19.1%	**3.2%**	🔴	-15.9
RFC-MISO	12.0%	**6.7%**	🟡	-5.3
Southeastern	12.3%	**8.2%**	🟡	-4.1
WECC CA	5.8%	**8.6%**	🟢	2.8
MRO US	12.0%	**8.6%**	🟡	-3.4
TRE	14.1%	**11.3%**	🟡	-2.8
RFC-PJM	20.5%	**12.0%**	🟡	-8.5
SPP	14.3%	**12.0%**	🟡	-2.3
VACAR	13.3%	**12.9%**	🟡	-0.4
RFC	18.2%	**13.1%**	🟡	-5.1
SERC	17.3%	**13.3%**	🟡	-4.0
Central	22.3%	**13.3%**	🟡	-9.0
Québec	12.7%	**13.8%**	🟢	1.1
New England	17.1%	**14.1%**	🟡	-3.0
FRCC	27.1%	**15.4%**	🔴	-11.7
Delta	24.1%	**17.2%**	🟡	-6.9
AZ-NM-SNV	19.9%	**18.2%**	🟡	-1.7
New York	27.0%	**20.9%**	🟡	-6.1
Gateway	23.8%	**22.2%**	🟡	-1.6
MRO CA	21.4%	**25.2%**	🟢	3.8
NWPP	28.5%	**27.3%**	🟡	-1.2
Maritimes	39.1%	**27.9%**	🔴	-11.2
WECC US	41.9%	**34.0%**	🟡	-7.9
Ontario	45.3%	**37.1%**	🟡	-8.2
CA-MX US	51.3%	**41.8%**	🟡	-9.5
🔴 Reserve Margin decrease greater than 10 percentage points				
🟡 Reserve Margin decrease less than 10 percentage points				
🟢 Reserve Margin increase				

Regions in the Northeast show an increase in Reserve Margins in the *Scenario Case*. The NPCC-Québec subregion shows an increase of about one percentage point. Additionally, an increase of almost four percentage points is observed in MRO-Canada.

While WECC-CA shows an increase in Reserve Margins for the *Scenario Case*, the subregion appears to be below sufficient reserve levels in both the *Reference Case* and the *Scenario Case*.

Industry Actions

Fast Solutions for Unexpected Capacity Shortfalls

A variety of enhancements and solutions can help mitigate the capacity concerns created by this *Scenario*. While not all areas would be able to realize many of these enhancements, the Reliability Assessment Subcommittee is confident that Regional Entities and NERC stakeholders would continue to operate reliably. The enhancements include the following:

Increase in transfers from areas of available capacity where transfer capability is sufficient and deliverability is confirmed

- Regions\subregions that have access to a larger pool of generation may be able to increase the amount of import capacity.
- Additional transmission or upgrades may enable additional transactions to provide additional resources across operating boundaries.
- Accelerated siting and permitting may be possible.

Advancing in-service dates of Future or Conceptual resources

- Generation resources may be able to advance their in-service dates where sufficient lead time is given.
- Accelerated siting and permitting may be possible.

Addition of new resources not yet proposed

- Smaller, mobile generation units can be added to maintain local reliability where additional capacity is needed.
- Additional distributed generation may also mitigate local reliability issues.

Increased Demand-Side Management and conservation

- Increased Energy Efficiency may offset future demand growth.
- Increasing available Demand Response resources can provide planning and operating flexibility by reducing peak demand.

Special Operating Procedures or Special Protection Systems

- Implementing new operating procedures may alleviate potential capacity deficiencies by increasing transmission capabilities and reconfiguring flows to optimize system performance.

The enhancements listed are all options for consideration to offset potential reliability concerns identified in this Scenario Assessment. The industry should closely monitor load forecasts and, in particular, economic development and recovery actions occurring not only in their area, but in neighboring areas. Appropriate actions should be taken to mitigate any potentially unexpected capacity deficits and maintain the reliability of the bulk power system.

Regional Scenario Assessment

Results in this section are organized by Regional Entity — see Figure 4. Where applicable, a subregion assessment is included, as well as aggregations of Regional portions within individual countries — see Figure 5. The primary purpose of this Scenario report is to assess the resource adequacy of Regions and subregions after the point of inflection (2014). Regions or subregions already below the NERC Reference Margin Level in the *Reference Case* prior to 2014 will be identified. Adequacy concerns in the *Reference Case* have already been assessed in the *2009 Long-Term Reliability Assessment.*

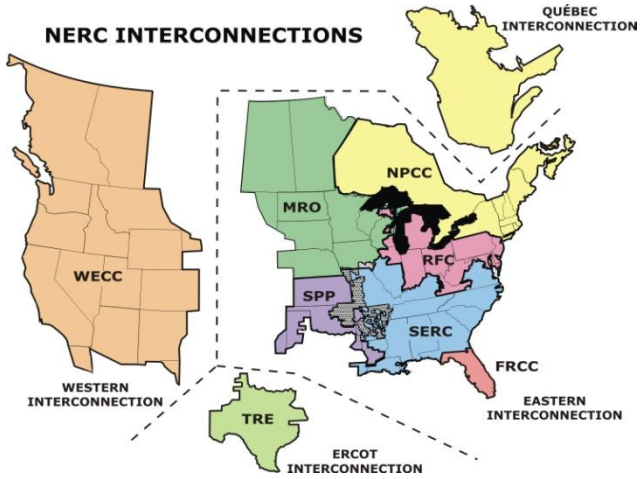


Figure 4: NERC Interconnections

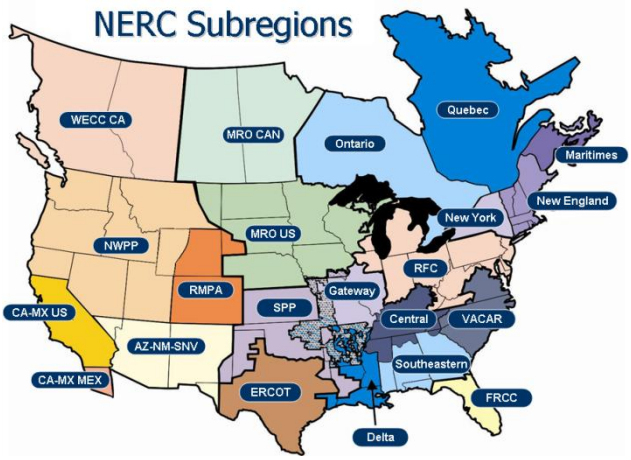


Figure 5: NERC Subregions

For summer-peaking Regions/subregions, summer peaks are assessed in this report. For winter-peaking Regions/subregions, winter peaks are assessed.

Table [*Region/subregion*]-3 Notes (pgs. 15–89):

A Planning Reserve Margin is a measure of available capacity over and above the capacity needed to meet normal peak demand levels. Planning for reserve capacity is needed to provide an operator with flexibility in case resources are unexpectedly unavailable during the time of peak demand or when demand exceeds the forecast.

- Reserve Margins are rounded to the nearest tenth of a percentage (0.1%).
- Color-coding for each cell is as follows:

Less than 2 percentage points above the NERC Reference Margin Level
Below NERC Reference Margin Level
Above NERC Reference Margin Level

- The NERC Reference Margin Level is Region/subregion-specific. This value can be found in the top-left corner of each table.
- Falling below the NERC Reference Margin Level provides an indication to NERC that there may be less operator flexibility in a certain Region/subregion and that more resources may be needed to maintain reliability. Action may need to be taken if the Planning Reserve Margin is forecast to below the NERC Reference Margin Level.

FRCC

Resource projections (Table FRCC-1) for the FRCC Region for 2010 through 2017 show Deliverable Resources increasing from 53,198 MW to 61,680 MW during the *Scenario* timeframe. FRCC does not include Adjusted Potential Resources in their forecast, therefore, there is no impact on Adjusted Potential Resources.

The *Scenario Case* assumes a rapid increase in demand for the 2014 summer peak — see Figure FRCC-1.

For 2014, peak demand projections in the *Scenario Case* represent approximately a 4,600 MW increase, or 10.1 percent, over the *Reference Case* — see Table FRCC-2. For 2017, the increase in the *Scenario Case* is slightly more at 5,100 MW, or 10.4 percent.

Table FRCC-1: Supply Resource Projections

Year	Existing-Certain Resources and Net Firm Transactions (MW)	Deliverable Resources (MW)	Prospective Resources (MW)	Adjusted Potential Resources (MW)
2010	48,875	53,198	53,198	53,198
2011	48,737	54,830	54,830	54,830
2012	49,350	55,611	55,611	55,611
2013	49,330	57,464	57,464	57,464
2014	48,379	57,956	57,956	57,956
2015	48,380	58,235	58,235	58,235
2016	47,101	59,558	59,558	59,558
2017	48,004	61,680	61,680	61,680

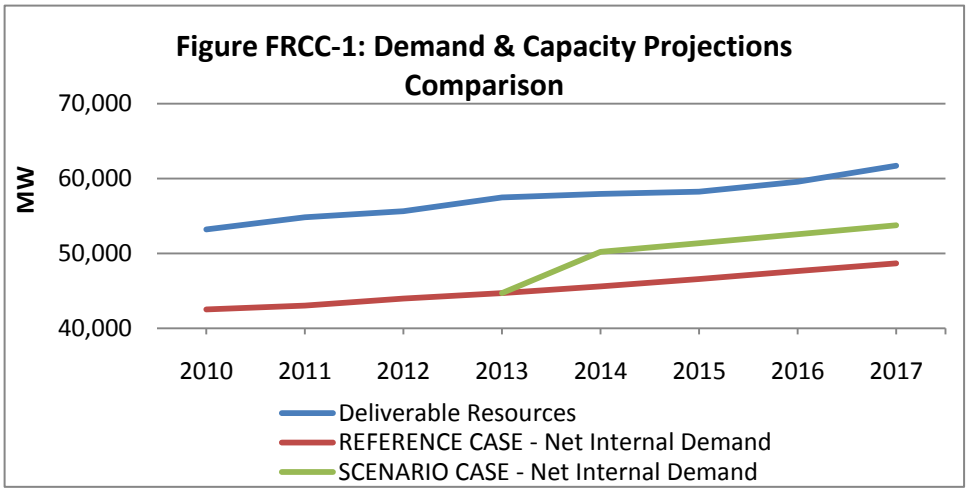


Table FRCC-2: Demand Comparison Between *Reference* and *Scenario* Cases with a 2014 Inflection Point

Year	Annual Peak Net Internal Demand *Reference Case* (2009 Forecast)	Annual Peak Net Internal Demand *Scenario Case* (2008 Forecast)	Change in Annual Peak Net Internal Demand	Percent Change in *Scenario Case*
2014	45,581	50,202	4,621	10.14%
2017	48,655	53,733	5,078	10.44%

For the 2010 to 2017 assessment period in the *Reference Case*, FRCC Reserve Margins are not projected to be under the NERC Reference Margin Level — see Figure FRCC-2 and Table

FRCC-3. In the *Scenario Case*, when considering the Deliverable, Prospective and Adjusted Potential Reserve Margin, FRCC will fall slightly below the NERC Reference Margin Level in 2015. Because FRCC does not include Adjusted Potential Resources in their forecast, FRCC will remain slightly below the NERC Reference Margin Level through the assessment timeframe of 2017 in the *Scenario Case*.

Figure FRCC-2: Reserve Margin Projections Comparison - 2014 Inflection Point

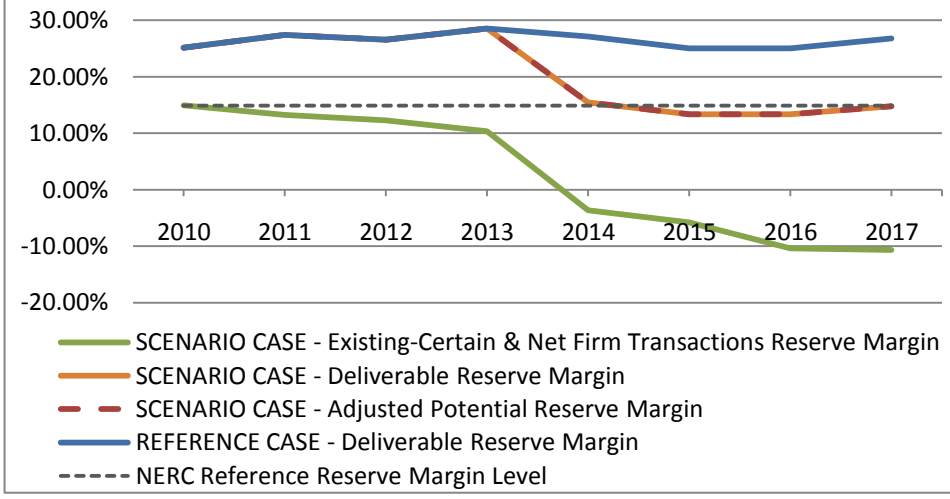


Table FRCC-3: Projected Planning Reserve Margins for *Reference* and *Scenario* Cases

	Reference Case				*Scenario Case*			
NERC Reference Margin Level 15%	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin
2010	15.0%	25.1%	25.1%	25.1%	15.0%	25.1%	25.1%	25.1%
2011	13.3%	27.4%	27.4%	27.4%	13.3%	27.4%	27.4%	27.4%
2012	12.3%	26.5%	26.5%	26.5%	12.3%	26.5%	26.5%	26.5%
2013	10.4%	28.6%	28.6%	28.6%	10.4%	28.6%	28.6%	28.6%
2014	6.1%	27.1%	27.1%	27.1%	-3.6%	15.4%	15.4%	15.4%
2015	3.9%	25.0%	25.0%	25.0%	-5.8%	13.4%	13.4%	13.4%
2016	-1.1%	25.1%	25.1%	25.1%	-10.4%	13.4%	13.4%	13.4%
2017	-1.3%	26.8%	26.8%	26.8%	-10.7%	14.8%	14.8%	14.8%

Additional resources may be needed to meet the peak demands in the *Scenario Case* forecast, when considering Deliverable, Prospective, and Adjusted Potential Resources, in 2015 — see Table FRCC-4). In order to meet the NERC Reference Margin Level in 2015, an additional 831 MW may be needed. By 2017, the need for more resources is less, with only 113 MW needed to meet the NERC Reference Margin Level.

Table FRCC-4: Planning Reserve Impacts	
When Considering Deliverable Resources	
Drops Below NERC Reference Reserve Margin Level in	2015
Additional Capacity Needed to Meet NERC *Reference* Reserve Margin Level in 2015 — MW	831
Additional Capacity Needed to Meet NERC *Reference* Reserve Margin Level at End of Analysis (2017) — MW	113
When Considering Prospective Resources	
Drops Below NERC Reference Reserve Margin Level in	2015
Additional Capacity Needed to Meet NERC *Reference* Reserve Margin Level in 2015 — MW	831
Additional Capacity Needed to Meet NERC *Reference* Reserve Margin Level at End of Analysis (2017) — MW	113
When Considering Adjusted Potential Resources	
Drops Below NERC *Reference* Reserve Margin Level in	2015
Additional Capacity Needed to Meet NERC *Reference* Reserve Margin Level in 2015 — MW	831
Additional Capacity Needed to Meet NERC *Reference* Reserve Margin Level at End of Analysis (2017) — MW	113

MRO

For MRO, the U.S. and Canada portions are assessed separately, due to the different peaking natures of these subregions; MRO-US is a summer-peaking subregion, while MRO-Canada is a winter-peaking subregion.

MRO US (United States)

Resource projections (Table MRO US-1) for the MRO-US subregion for 2010 through 2017 show Deliverable Resources decreasing from 49,836 MW to 49,612 MW during the *Scenario* timeframe. Additionally, approximately 5,000 MW of Adjusted Potential Resources may be available by 2017, increasing total supply projections.

The *Scenario Case* assumes a rapid increase in demand for the 2014 summer peak — see Figure MRO US-1.

For 2014, peak demand projections in the *Scenario Case* represent approximately a 1,400 MW increase, or 3.1 percent, over the *Reference Case* — see Table MRO US-2. For 2017, the increase in the *Scenario Case* is slightly more at 1,700 MW, or 3.7 percent.

Table MRO US-1: Supply Resource Projections

Year	Existing-Certain Resources and Net Firm Transactions (MW)	Deliverable Resources (MW)	Prospective Resources (MW)	Adjusted Potential Resources (MW)
2010	49,390	49,836	49,891	51,794
2011	49,669	50,266	50,357	53,354
2012	49,388	50,286	50,377	54,151
2013	49,159	50,218	50,309	54,299
2014	49,191	50,464	50,555	54,773
2015	47,977	49,952	50,080	54,312
2016	47,727	49,707	49,835	54,344
2017	47,627	49,612	49,740	54,250

Figure MRO US-1: Demand & Capacity Projections Comparison

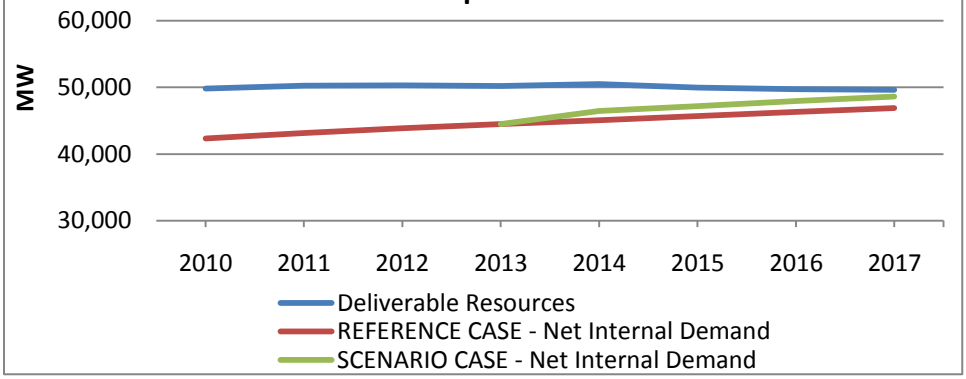


Table MRO US-2: Demand Comparison Between *Reference* and *Scenario* Cases with a 2014 Inflection Point

Year	Annual Peak Net Internal Demand *Reference Case* (2009 Forecast)	Annual Peak Net Internal Demand *Scenario Case* (2008 Forecast)	Change in Annual Peak Net Internal Demand	Percent Change in *Scenario Case*
2014	45,062	46,455	1,393	3.09%
2017	46,901	48,625	1,724	3.68%

For the 2010 to 2017 assessment period in the *Reference Case*, MRO-US Reserve Margins are projected to be under the NERC Reference Margin Level by 2012 if only Future-Planned and Prospective Resources are added — see Figure MRO US-2 and Table MRO US-3. Because MRO-US falls below the Reference Margin Level prior to the assumed point of rapid demand in the *Scenario Case*, this intensifies the situation in 2014. Even with the addition of the Adjusted Potential Resources, MRO-US will fall below the NERC Reference Margin Level in 2016 in the *Scenario Case*.

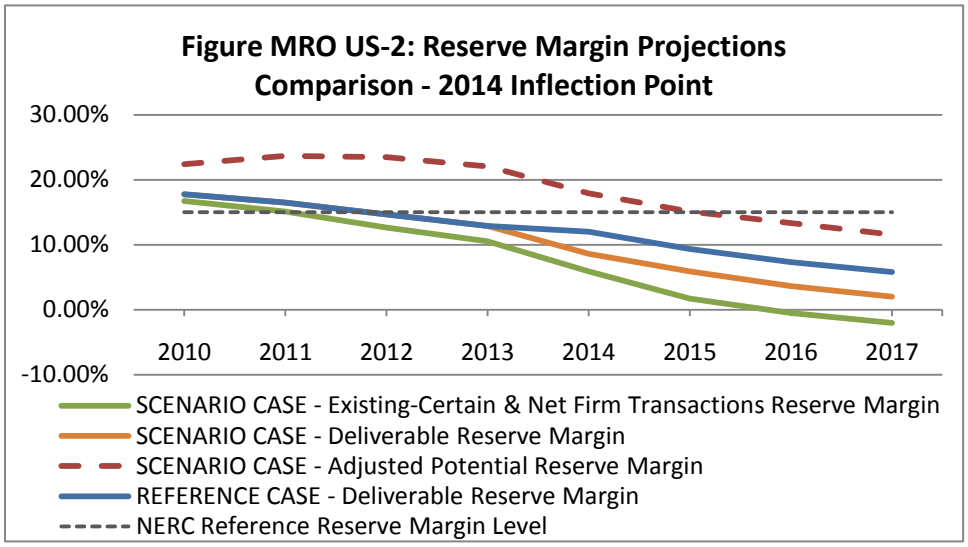


Table MRO US-3: Projected Planning Reserve Margins for *Reference* and *Scenario* Cases

	Reference Case				*Scenario Case*			
NERC Reference Margin Level 15%	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin
2010	16.7%	17.8%	17.9%	22.4%	16.7%	17.8%	17.9%	22.4%
2011	15.1%	16.5%	16.7%	23.7%	15.1%	16.5%	16.7%	23.7%
2012	12.6%	14.7%	14.9%	23.5%	12.6%	14.7%	14.9%	23.5%
2013	10.5%	12.9%	13.1%	22.1%	10.5%	12.9%	13.1%	22.1%
2014	9.2%	12.0%	12.2%	21.6%	5.9%	8.6%	8.8%	17.9%
2015	5.0%	9.4%	9.6%	18.9%	1.7%	5.9%	6.2%	15.1%
2016	3.0%	7.3%	7.6%	17.3%	-0.5%	3.6%	3.9%	13.3%
2017	1.5%	5.8%	6.1%	15.7%	-2.1%	2.0%	2.3%	11.6%

Additional resources may be needed to meet the peak demands in the *Scenario Case* forecast, when considering Deliverable and Prospective Resources, in 2014-Adjusted Potential Resources in 2016 — see Table MRO US-4. In order to meet the NERC Reference Margin Level in 2014, an additional 2,958 MW may be needed. By 2017, the need for more resources intensifies, with 6,307 MW needed to meet the NERC Reference Margin Level. Additionally, with the addition of Adjusted Potential Resources, the NERC Reference Margin Level would still not be met through 2017. An additional 1,669 MW would be needed by 2016 to meet the NERC Reference Margin Level.

Table MRO US-4: Planning Reserve Impacts	
When Considering Deliverable Resources	
Drops Below NERC Reference Reserve Margin Level in	2014
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	2,958
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	6,307
When Considering Prospective Resources	
Drops Below NERC Reference Reserve Margin Level in	2014
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	2,867
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	6,179
When Considering Adjusted Potential Resources	
Drops Below NERC Reference Reserve Margin Level in	2016
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level in 2016 — MW	807
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	1,669

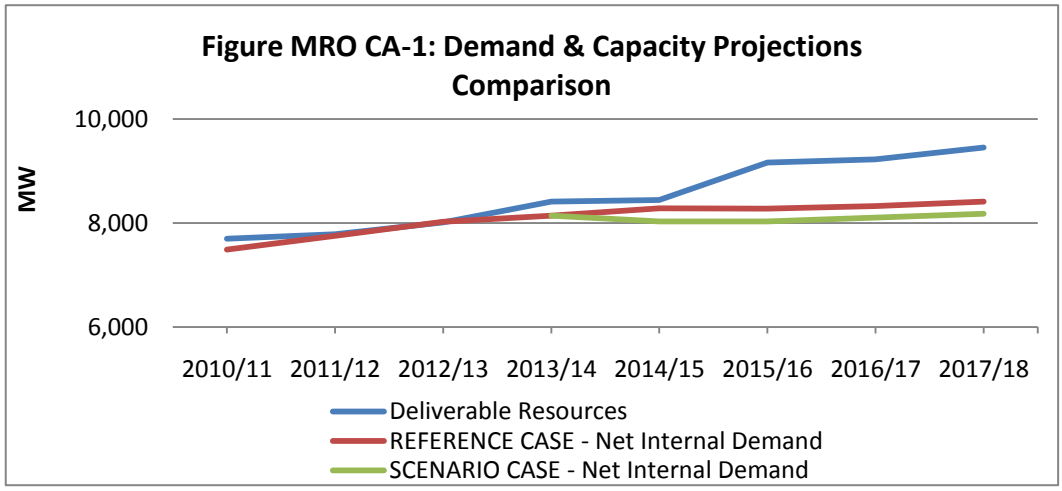
MRO CA (Canada)

Resource projections (Table MRO CA-1) for the MRO-Canada subregion for 2010/2011 through 2017/2018 show Deliverable Resources increasing from 7,695 MW to 9,451 MW during the *Scenario* timeframe. Additionally, approximately 300 MW of Adjusted Potential Resources may be available by 2017/2018.

The *Scenario Case* assumes a slight decrease in demand for the 2014/2015 winter peak — see Figure MRO CA-1.

Table MRO CA-1: Supply Resource Projections

Year	Existing-Certain Resources and Net Firm Transactions (MW)	Deliverable Resources (MW)	Prospective Resources (MW)	Adjusted Potential Resources (MW)
2010/2011	8,841	7,695	7,695	7,782
2011/2012	8,725	7,784	7,784	7,932
2012/2013	8,725	8,012	8,012	8,333
2013/2014	8,798	8,414	8,414	8,735
2014/2015	8,761	8,442	8,442	8,763
2015/2016	9,411	9,161	9,161	9,482
2016/2017	9,211	9,221	9,221	9,542
2017/2018	9,211	9,451	9,451	9,772



For 2014/2015, peak demand projections in the *Scenario Case* represent approximately a 250 MW decrease, or minus 3 percent, below the *Reference Case* — see Table MRO CA-2. For 2017/2018, the decrease in the *Scenario Case* is slightly less at negative 230 MW, or minus 2.8 percent.

Table MRO CA-2: Demand Comparison Between *Reference* and *Scenario* Cases with a 2014/2015 Inflection Point

Year	Annual Peak Net Internal Demand *Reference Case* (2009 Forecast)	Annual Peak Net Internal Demand *Scenario Case* (2008 Forecast)	Change in Annual Peak Net Internal Demand	Percent Change in *Scenario Case*
2014/2015	8,282	8,032	(250)	-3.02%
2017/2018	8,410	8,179	(231)	-2.75%

For the 2010/2011 to 2017/2018 assessment period in the *Reference Case*, MRO CA Reserve Margins are projected to remain above the NERC Reference Margin Level — see Figure MRO CA-2 and Table MRO CA-3. In the *Scenario Case*, when considering Deliverable, Prospective,

and Adjusted Potential Reserve Margins, MRO CA remains above the NERC Reference Margin Level through the assessment period.

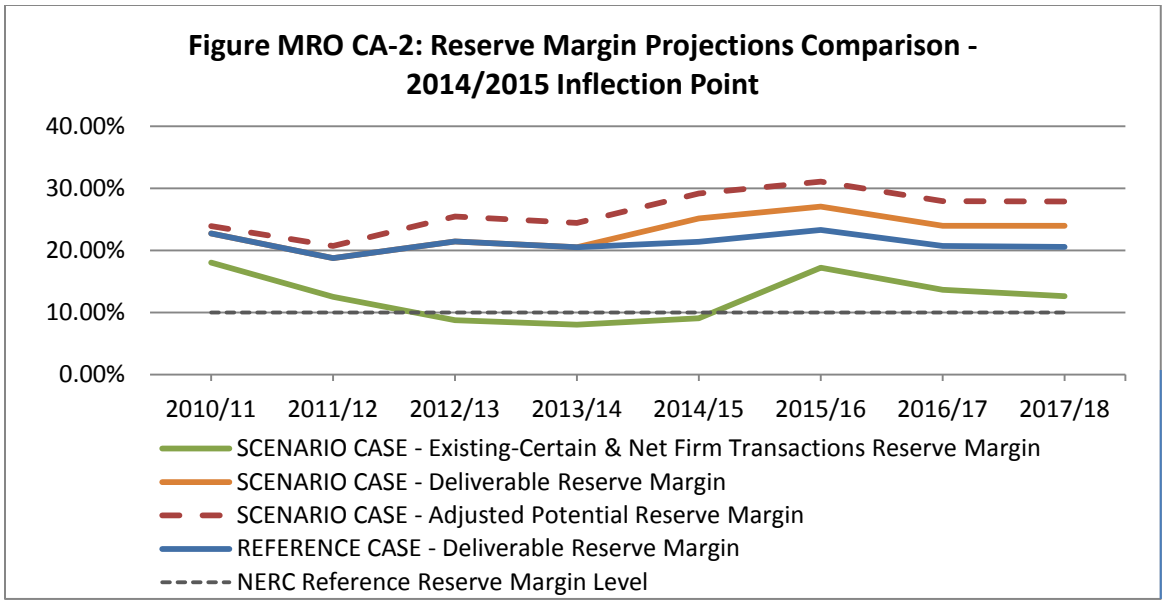


Table MRO CA-3: Projected Planning Reserve Margins for *Reference* and *Scenario Cases*

	Reference Case				*Scenario Case*			
NERC Reference Margin Level 10%	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin
2010/2011	18.1%	22.8%	22.8%	23.9%	18.1%	22.8%	22.8%	23.9%
2011/2012	12.5%	18.8%	18.8%	20.7%	12.5%	18.8%	18.8%	20.7%
2012/2013	8.8%	21.4%	21.4%	25.4%	8.8%	21.4%	21.4%	25.4%
2013/2014	8.0%	20.5%	20.5%	24.5%	8.0%	20.5%	20.5%	24.5%
2014/2015	5.8%	21.4%	21.4%	25.3%	9.1%	25.2%	25.2%	29.2%
2015/2016	13.7%	23.3%	23.3%	27.1%	17.2%	27.1%	27.1%	31.1%
2016/2017	10.7%	20.7%	20.7%	24.6%	13.7%	24.0%	24.0%	27.9%
2017/2018	9.5%	20.6%	20.6%	24.4%	12.6%	24.0%	24.0%	27.9%

Additional resources may not be needed to meet the peak demands in the *Scenario Case* forecast.

NPCC

For NPCC, the subregion are assessed separately due to the peaking nature of each; New England, New York, and Ontario are summer-peaking subregion, while the Maritimes and Quebec are winter-peaking subregions.

New England

Resource projections (Table New England-1) for the New England subregion for 2010 through 2017 show Deliverable Resources increasing from 32,873 MW to 34,499 MW during the *Scenario* timeframe. Additionally, approximately 2,700 MW of Adjusted Potential Resources may be available by 2017.

Table New England-1: Supply Resource Projections

Year	Existing-Certain Resources and Net Firm Transactions (MW)	Deliverable Resources (MW)	Prospective Resources (MW)	Adjusted Potential Resources (MW)
2010	32,648	32,873	33,091	33,561
2011	35,849	37,198	37,416	38,466
2012	35,442	36,791	37,009	38,779
2013	33,478	34,827	35,045	37,122
2014	33,478	34,827	35,045	37,358
2015	33,428	34,777	34,995	37,487
2016	33,256	34,605	34,823	37,315
2017	33,150	34,499	34,717	37,209

The *Scenario Case* assumes a slight increase in demand for the 2014 summer peak — see Figure New England-1.

For 2014, peak demand projections in the *Scenario Case* represent a 760 MW increase, or 2.5 percent, over the *Reference Case* — see Table New England-2. For 2017, the increase in the *Scenario Case* is slightly lower at 555 MW, or 1.8percent.

Figure New England-1: Demand & Capacity Projections Comparison

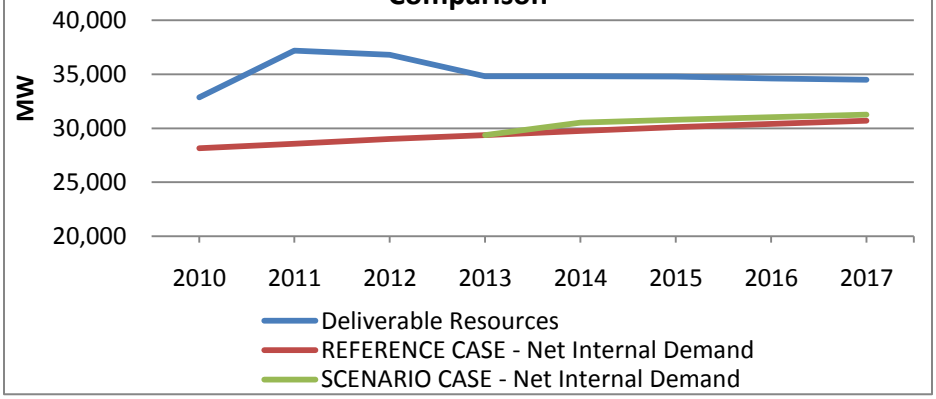


Table New England-2: Demand Comparison Between *Reference* and *Scenario* Cases with a 2014 Inflection Point

Year	Annual Peak Net Internal Demand *Reference Case* (2009 Forecast)	Annual Peak Net Internal Demand *Scenario Case* (2008 Forecast)	Change in Annual Peak Net Internal Demand	Percent Change in *Scenario Case*
2014	29,750	30,510	760	2.55%
2017	30,695	31,250	555	1.81%

For the 2010 to 2017 assessment period in the *Reference Case*, New England Reserve Margins are projected to be under the NERC Reference Margin Level by 2016 if only Deliverable Resources are added — see Figure New England-2 and Table New England-3. In the *Scenario*

Case, the Deliverable Reserve Margin for this projection would advance the year of the need for more resources to 2014. However, when considering Adjusted Potential Reserve Margins, New England remains above the NERC Reference Margin Level through the assessment period.

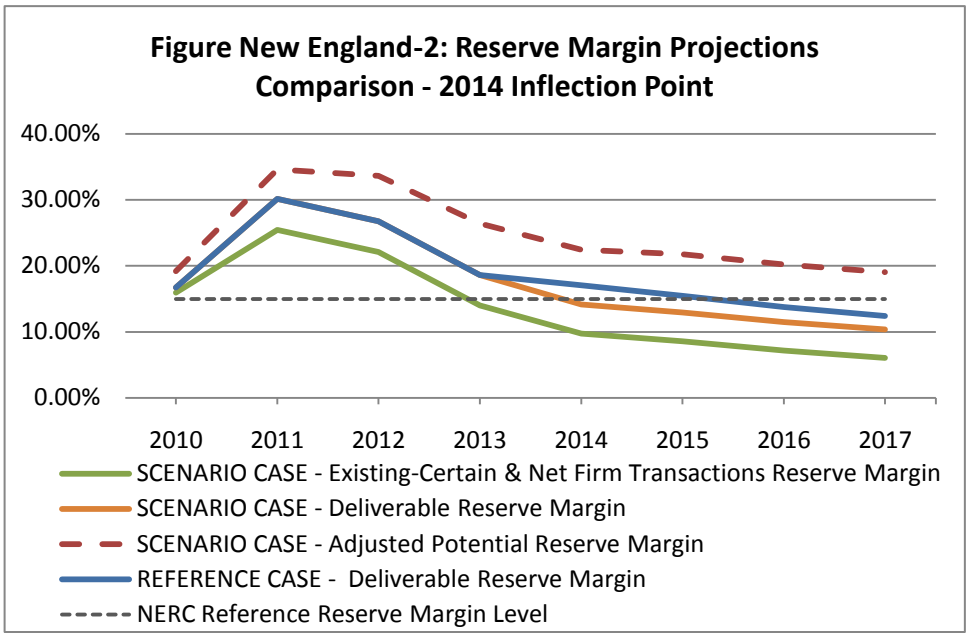


Table New England-3: Projected Planning Reserve Margins for *Reference* and *Scenario* Cases

NERC Reference Margin Level 15%	*Reference Case*				*Scenario Case*			
	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin
2010	15.9%	16.7%	17.5%	19.2%	15.9%	16.7%	17.5%	19.2%
2011	25.5%	30.2%	30.9%	34.6%	25.5%	30.2%	30.9%	34.6%
2012	22.1%	26.8%	27.5%	33.6%	22.1%	26.8%	27.5%	33.6%
2013	14.0%	18.6%	19.3%	26.4%	14.0%	18.6%	19.3%	26.4%
2014	12.5%	17.1%	17.8%	25.6%	9.7%	14.1%	14.9%	22.4%
2015	11.0%	15.5%	16.2%	24.5%	8.6%	12.9%	13.7%	21.8%
2016	9.3%	13.8%	14.5%	22.7%	7.2%	11.5%	12.2%	20.2%
2017	8.0%	12.4%	13.1%	21.2%	6.1%	10.4%	11.1%	19.1%

Additional resources may be needed to meet the peak demands in the *Scenario Case* forecast, when considering Deliverable and Prospective Resources, in 2014— see Table New England-4. In order to meet the NERC Reference Margin Level in 2014, an additional 260 MW may be needed. By 2017, the need for more resources intensifies, with 1,439 MW needed to meet the NERC Reference Margin Level. However, with the addition of Adjusted Potential Resources, New England would remain above the NERC Reference Margin Level through 2017.

Table New England-4: Planning Reserve Impacts	
When Considering Deliverable Resources	
Drops Below NERC Reference Reserve Margin Level in	2014
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	260
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	1,439
When **Considering Prospective Resources**	
Drops Below NERC Reference Reserve Margin Level in	2014
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	41
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	1,221
When Considering Adjusted Potential Resources	
Drops Below NERC Reference Reserve Margin Level in	2017+
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	N/A
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	N/A

New York

Resource projections (Table New York-1) for the New York subregion for 2010 through 2017 show Deliverable Resources increasing from 42,578 MW to 43,281 MW during the *Scenario* timeframe. Additionally, approximately 700 MW of Adjusted Potential Resources may be available by 2017.

The *Scenario Case* assumes a rapid increase in demand for the 2014 summer peak — see Figure New York-1.

Table New York-1: Supply Resource Projections

Year	Existing-Certain Resources and Net Firm Transactions (MW)	Deliverable Resources (MW)	Prospective Resources (MW)	Adjusted Potential Resources (MW)
2010	39,112	42,578	42,578	43,542
2011	39,030	42,664	42,664	43,814
2012	39,746	43,381	43,381	43,957
2013	39,746	43,381	43,381	43,957
2014	39,696	43,281	43,281	43,977
2015	39,696	43,281	43,281	43,977
2016	39,696	43,281	43,281	43,977
2017	39,696	43,281	43,281	43,977

For 2014, peak demand projections in the *Scenario Case* represent approximately a 1400 MW increase, or 4.2 percent, over the *Reference Case* — see Table New York-2. For 2017, the increase in the *Scenario Case* is slightly higher at 1,600 MW, or 4.5 percent.

Figure New York-1: Demand & Capacity Projections Comparison

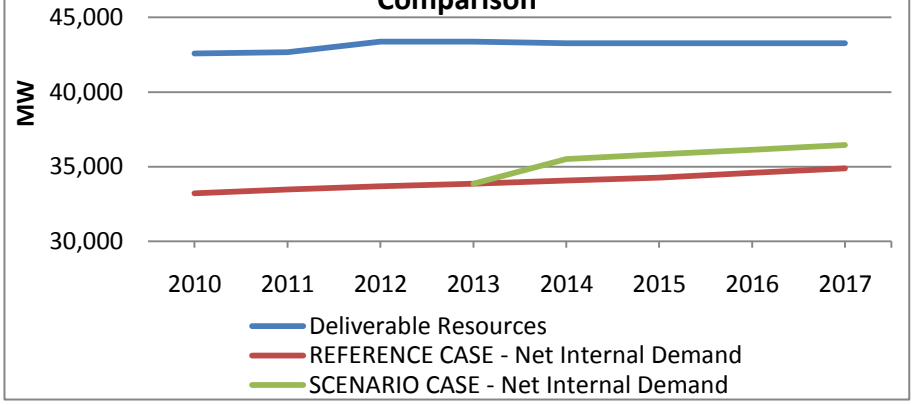


Table New York-2: Demand Comparison Between *Reference* and *Scenario* Cases with a 2014 Inflection Point

Year	Annual Peak Net Internal Demand *Reference Case* (2009 Forecast)	Annual Peak Net Internal Demand *Scenario Case* (2008 Forecast)	Change in Annual Peak Net Internal Demand	Percent Change in *Scenario Case*
2014	34,090	35,506	1,416	4.15%
2017	34,884	36,461	1,577	4.52%

For the 2010 to 2017 assessment period in the *Reference Case*, New York Reserve Margins are projected to be above the NERC Reference Margin Level — see Figure New York-2 and Table New York-3. In the *Scenario Case*, when considering Deliverable, Prospective, and Adjusted Potential Reserve Margins, New York remains above the NERC Reference Margin Level through the assessment period.

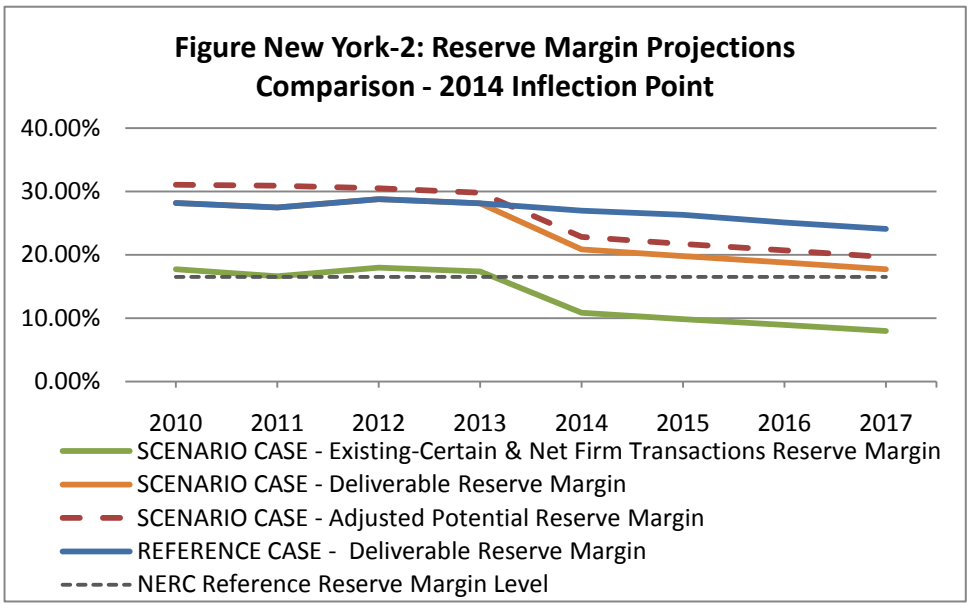


Table New York-3: Projected Planning Reserve Margins for *Reference* and *Scenario* Cases

	Reference Case				*Scenario Case*			
NERC Reference Margin Level 16.5%	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin
2010	17.7%	28.2%	28.2%	31.1%	17.7%	28.2%	28.2%	31.1%
2011	16.6%	27.5%	27.5%	30.9%	16.6%	27.5%	27.5%	30.9%
2012	18.0%	28.8%	28.8%	30.5%	18.0%	28.8%	28.8%	30.5%
2013	17.4%	28.1%	28.1%	29.8%	17.4%	28.1%	28.1%	29.8%
2014	16.4%	27.0%	27.0%	29.0%	10.9%	20.9%	20.9%	22.8%
2015	15.9%	26.3%	26.3%	28.3%	9.9%	19.8%	19.8%	21.7%
2016	14.8%	25.1%	25.1%	27.1%	8.9%	18.8%	18.8%	20.7%
2017	13.8%	24.1%	24.1%	26.1%	8.0%	17.7%	17.7%	19.6%

Additional resources may not be needed to meet the peak demands in the *Scenario Case* forecast. However, Reserve Margins approach the NERC Reference Margin Level in the latter part of the assessment period.

Maritimes

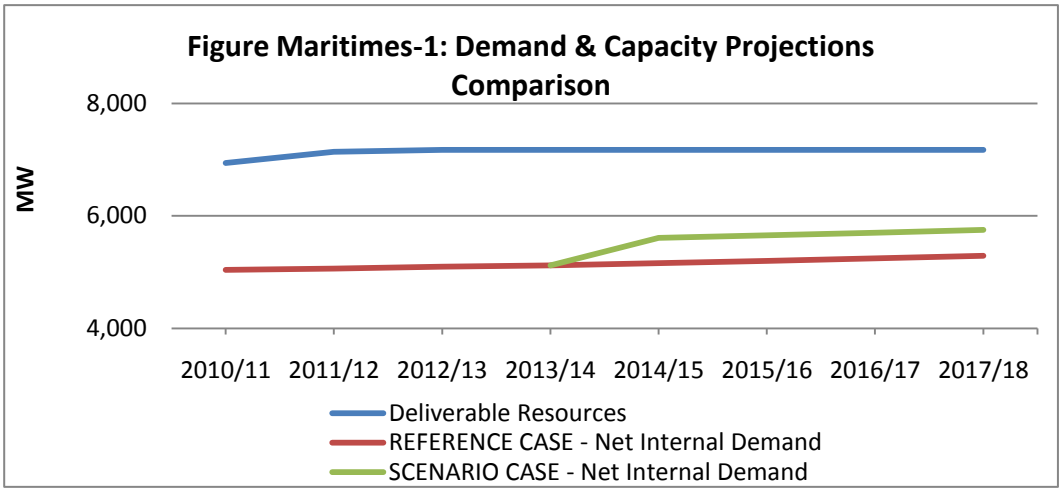
Resource projections (Table Maritimes-1) for the Maritimes subregion for 2010/2011 through 2017/2018 show Deliverable Resources increasing from 6,944 MW to 7,176 MW during the *Scenario* timeframe. The Maritimes does not include Adjusted Potential Resources in their forecast; therefore, there is no impact on Adjusted Potential Resources.

The *Scenario Case* assumes a rapid increase in demand for the 2014/2015 winter peak — see Figure Maritimes-1.

Table Maritimes-1: Supply Resource Projections

Year	Existing-Certain Resources and Net Firm Transactions (MW)	Deliverable Resources (MW)	Prospective Resources (MW)	Adjusted Potential Resources (MW)
2010/2011	6,066	6,944	6,944	6,944
2011/2012	6,266	7,144	7,144	7,144
2012/2013	6,266	7,176	7,176	7,176
2013/2014	6,266	7,176	7,176	7,176
2014/2015	6,266	7,176	7,176	7,176
2015/2016	6,266	7,176	7,176	7,176
2016/2017	6,266	7,176	7,176	7,176
2017/2018	6,266	7,176	7,176	7,176

Figure Maritimes-1: Demand & Capacity Projections Comparison



For 2014/2015, peak demand projections in the *Scenario Case* represent approximately a 500 MW increase, or 8.8 percent, over the *Reference Case* — see Table Maritimes-2. For 2017/2018, the increase in the *Scenario Case* remains flat at 500 MW, or 8.7 percent.

Table Maritimes-2: Demand Comparison Between *Reference* and *Scenario* Cases with a 2014/2015 Inflection Point

Year	Annual Peak Net Internal Demand *Reference Case* (2009 Forecast)	Annual Peak Net Internal Demand *Scenario Case* (2008 Forecast)	Change in Annual Peak Net Internal Demand	Percent Change in *Scenario Case*
2014/2015	5,158	5,611	453	8.78%
2017/2018	5,291	5,749	458	8.66%

For the 2010/2011 to 2017/2018 assessment period in the *Reference Case*, Maritimes Reserve Margins are projected to be above the NERC Reference Margin Level — see Figure Maritimes-2 and Table Maritimes-3. When considering Deliverable, Prospective, and Adjusted Potential

Reserve Margins, Maritimes will remain above the NERC Reference Margin Level through the assessment timeframe of 2017/2018, in the *Scenario Case*.

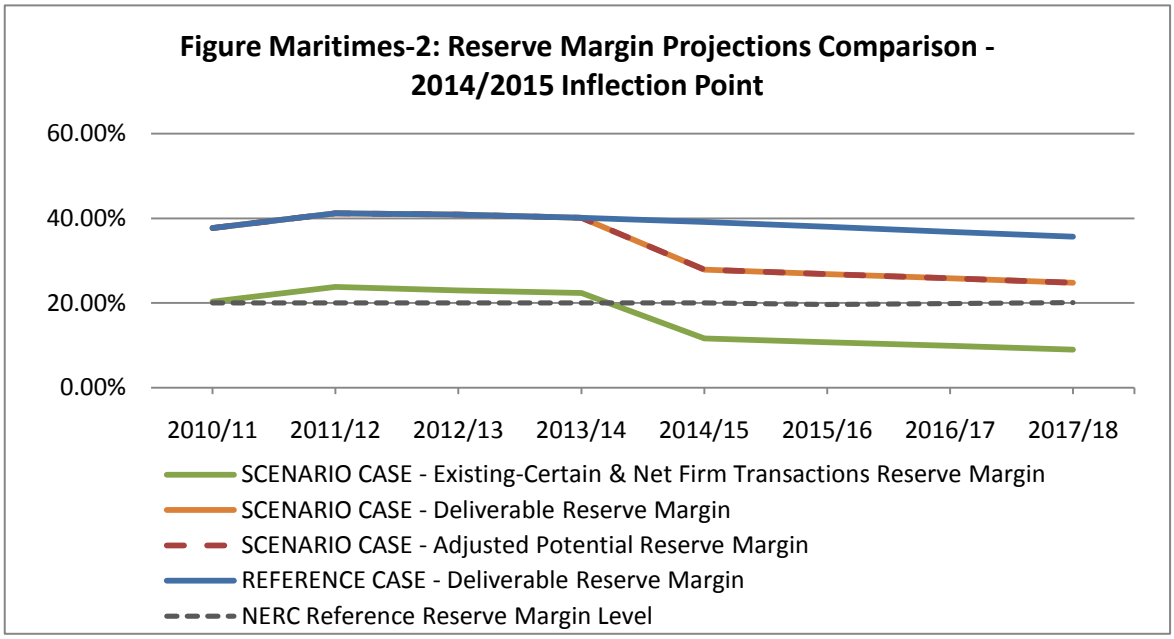


Table Maritimes-3: Projected Planning Reserve Margins for *Reference* and *Scenario* Cases

	Reference Case				*Scenario Case*			
NERC Reference Margin Level 20%	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin
2010/2011	20.3%	37.7%	37.7%	37.7%	20.3%	37.7%	37.7%	37.7%
2011/2012	23.8%	41.2%	41.2%	41.2%	23.8%	41.2%	41.2%	41.2%
2012/2013	23.0%	40.8%	40.8%	40.8%	23.0%	40.8%	40.8%	40.8%
2013/2014	22.4%	40.1%	40.1%	40.1%	22.4%	40.1%	40.1%	40.1%
2014/2015	21.5%	39.1%	39.1%	39.1%	11.7%	27.9%	27.9%	27.9%
2015/2016	20.5%	38.0%	38.0%	38.0%	10.8%	26.8%	26.8%	26.8%
2016/2017	19.4%	36.8%	36.8%	36.8%	9.9%	25.8%	25.8%	25.8%
2017/2018	18.4%	35.6%	35.6%	35.6%	9.0%	24.8%	24.8%	24.8%

Additional resources may not be needed to meet the peak demands in the *Scenario Case* forecast.

Ontario

Resource projections (Table Ontario-1) for the Ontario subregion for 2010 through 2017 show Deliverable Resources decreasing from 29,015 MW to 24,681 MW during the *Scenario* timeframe. However, approximately 4,400 MW of Adjusted Potential Resources may be available by 2017, bringing the total capacity in 2017 to the same levels of 2010.

The *Scenario Case* assumes a rapid increase in demand for the 2014 summer peak — see Figure Ontario-1.

Table Ontario-1: Supply Resource Projections

Year	Existing-Certain Resources and Net Firm Transactions (MW)	Deliverable Resources (MW)	Prospective Resources (MW)	Adjusted Potential Resources (MW)
2010	25,990	29,015	29,123	29,123
2011	25,856	31,230	31,038	31,061
2012	26,710	32,978	32,805	33,309
2013	26,467	33,410	33,205	33,988
2014	26,282	33,326	33,098	34,435
2015	19,920	27,606	27,331	29,606
2016	19,243	26,718	26,373	29,998
2017	17,350	24,681	24,239	29,069

For 2014, peak demand projections in the *Scenario Case* represent approximately a 1,400 MW increase, or 6 percent, over the *Reference Case* — see Table Ontario-2. For 2017, the increase in the *Scenario Case* remains relatively flat at 6.3 percent.

Figure Ontario-1: Demand and Capacity Projections Comparison

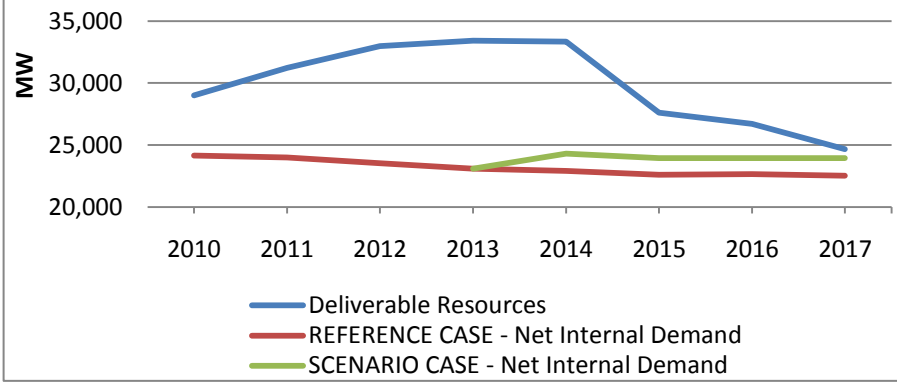


Table Ontario-2: Demand Comparison Between *Reference* and *Scenario* Cases with a 2014 Inflection Point

Year	Annual Peak Net Internal Demand *Reference Case* (2009 Forecast)	Annual Peak Net Internal Demand *Scenario Case* (2008 Forecast)	Change in Annual Peak Net Internal Demand	Percent Change in *Scenario Case*
2014	22,932	24,312	1,380	6.02%
2017	22,538	23,960	1,422	6.31%

For the 2010 to 2017 assessment period in the *Reference Case*, Ontario Reserve Margins are projected to be under the NERC Reference Margin Level by 2016 if only Deliverable Resources and Prospective Resources are added — see Figure Ontario-2 and Table Ontario-3. In the *Scenario Case*, the Deliverable and Prospective Reserve Margin projections would advance one year to 2015. However, with the addition of the Adjusted Potential Resources, Ontario will remain above the NERC Reference Margin Level through the assessment timeframe of 2017, though appearing tighter in the latter years.

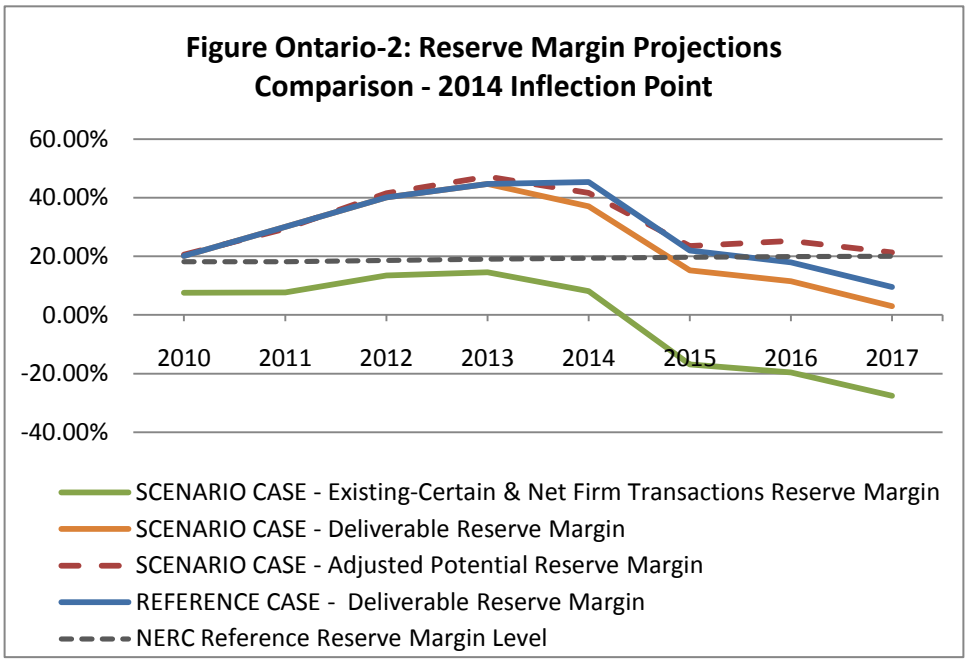


Table Ontario-3: Projected Planning Reserve Margins for *Reference* and *Scenario* Cases

NERC Reference Margin Level 18.2%	*Reference Case*				*Scenario Case*			
	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin
2010	7.6%	20.1%	20.5%	20.5%	7.6%	20.1%	20.5%	20.5%
2011	7.7%	30.1%	29.3%	29.4%	7.7%	30.1%	29.3%	29.4%
2012	13.5%	40.1%	39.4%	41.5%	13.5%	40.1%	39.4%	41.5%
2013	14.6%	44.7%	43.8%	47.2%	14.6%	44.7%	43.8%	47.2%
2014	14.6%	45.3%	44.3%	50.2%	8.1%	37.1%	36.1%	41.6%
2015	-11.9%	22.0%	20.8%	30.9%	-16.9%	15.2%	14.1%	23.6%
2016	-15.1%	17.9%	16.4%	32.4%	-19.6%	11.6%	10.1%	25.3%
2017	-23.0%	9.5%	7.5%	29.0%	-27.6%	3.0%	1.2%	21.3%

Additional resources may be needed to meet the peak demands in the *Scenario Case* forecast, when considering Deliverable Resources, in 2015 — see Table Ontario-4. In order to meet the NERC Reference Margin Level in 2015, an additional 1,161 MW may be needed. By 2017, the need for more resources intensifies, with 4,086 MW needed to meet the NERC Reference Margin Level. However, with the addition of Adjusted Potential Resources, the NERC Reference Margin Level would be met through 2017.

Table Ontario-4: Planning Reserve Impacts	
When Considering Deliverable Resources	
Drops Below NERC Reference Reserve Margin Level in	2015
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level in 2015 — MW	1,161
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	4,086
When Considering Prospective Resources	
Drops Below NERC Reference Reserve Margin Level in	2015
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level in 2015 — MW	1,436
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	4,529
When Considering Adjusted Potential Resources	
Drops Below NERC Reference Reserve Margin Level in	2017+
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	N/A
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	N/A

Québec

Resource projections (Table Québec-1) for the Québec subregion for 2010/2011 through 2017/2018 show Deliverable Resources increasing from 40,190 MW to 42,709 MW during the *Scenario* timeframe. Québec does not include Adjusted Potential Resources in its forecast, and therefore, there is no impact on Adjusted Potential Resources.

Table Québec-1: Supply Resource Projections

Year	Existing-Certain Resources and Net Firm Transactions (MW)	Deliverable Resources (MW)	Prospective Resources (MW)	Adjusted Potential Resources (MW)
2010/2011	40,120	40,190	40,169	40,169
2011/2012	39,285	40,013	39,992	39,992
2012/2013	40,239	41,402	41,381	41,381
2013/2014	40,239	41,452	41,431	41,431
2014/2015	40,239	42,124	42,103	42,103
2015/2016	40,223	42,108	42,087	42,087
2016/2017	40,186	42,331	42,310	42,310
2017/2018	40,186	42,709	42,688	42,688

The *Scenario Case* assumes a rapid increase in demand for the 2014/2015 winter peak — see Figure Québec-1.

For 2014/2015, peak demand projections in the *Scenario Case* represent approximately a 350 MW decrease, or minus 1 percent, below the *Reference Case* — see Table Québec-2. For 2017/2018, the decrease in the *Scenario Case* is greater at negative 1,200 MW, or minus 3 percent.

Figure Québec-1: Demand & Capacity Projections Comparison

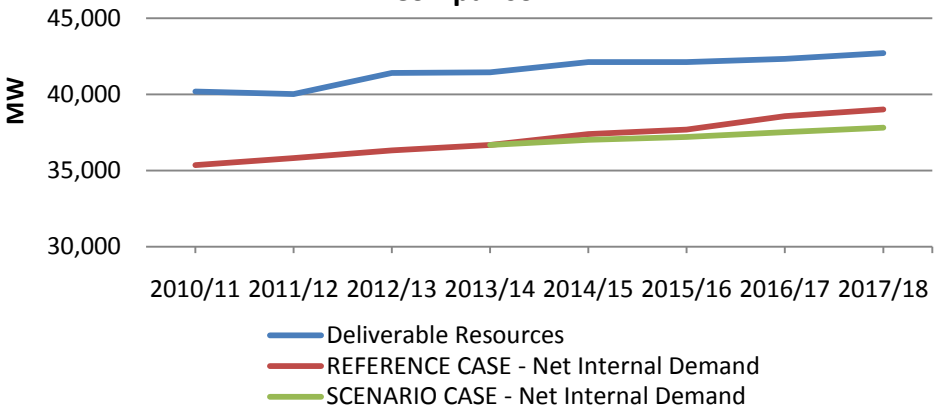


Table Québec-2: Demand Comparison Between *Reference* and *Scenario* Cases with a 2014/2015 Inflection Point

Year	Annual Peak Net Internal Demand *Reference Case* (2009 Forecast)	Annual Peak Net Internal Demand *Scenario Case* (2008 Forecast)	Change in Annual Peak Net Internal Demand	Percent Change in *Scenario Case*
2014/2015	37,391	37,023	(368)	-0.98%
2017/2018	39,000	37,814	(1,186)	-3.04%

For the 2010/2011 to 2017/2018 assessment period in the *Reference Case*, Québec Reserve Margins are projected to be under the NERC Reference Margin Level by 2016/2017 with a slight dip in 2011 — see Figure Québec-2 and Table Québec-3. In the *Scenario Case*, the Deliverable Reserve Margin this projection would defer the need for more resources beyond the assessment timeframe, though appearing tighter in the latter years.

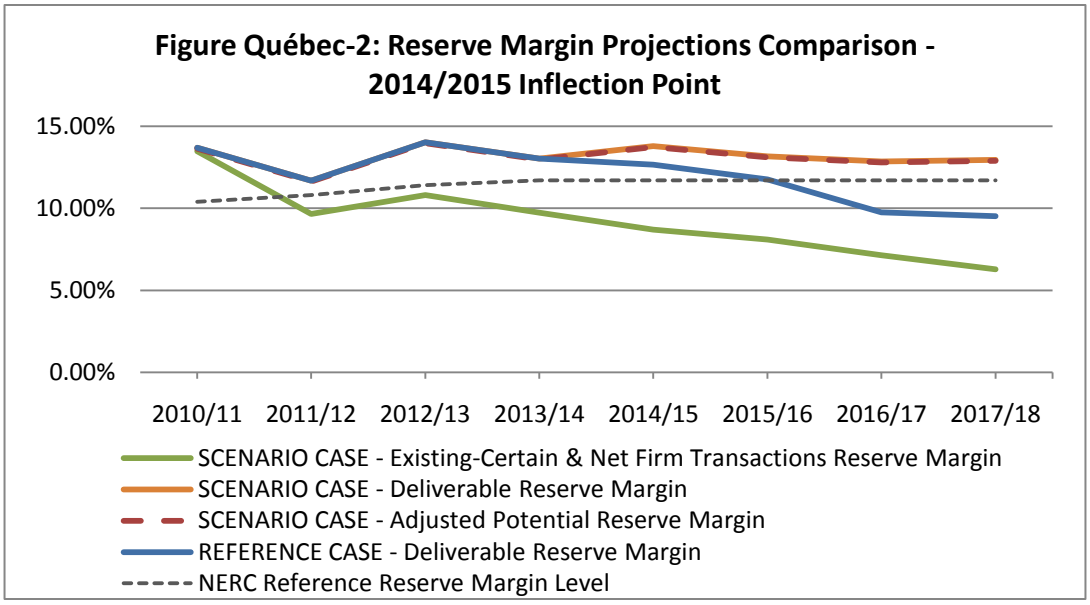


Table Québec-3: Projected Planning Reserve Margins for *Reference* and *Scenario* Cases

	Reference Case				*Scenario Case*			
NERC Reference Margin Level 10.4%–11.7%[18]	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin
2010/2011	13.5%	13.7%	13.6%	13.6%	13.5%	13.7%	13.6%	13.6%
2011/2012	9.7%	11.7%	11.6%	11.6%	9.7%	11.7%	11.6%	11.6%
2012/2013	10.8%	14.0%	14.0%	14.0%	10.8%	14.0%	14.0%	14.0%
2013/2014	9.7%	13.0%	13.0%	13.0%	9.7%	13.0%	13.0%	13.0%
2014/2015	7.6%	12.7%	12.6%	12.6%	8.7%	13.8%	13.7%	13.7%
2015/2016	6.8%	11.8%	11.7%	11.7%	8.1%	13.2%	13.1%	13.1%
2016/2017	4.2%	9.8%	9.7%	9.7%	7.1%	12.8%	12.8%	12.8%
2017/2018	3.0%	9.5%	9.5%	9.5%	6.3%	12.9%	12.9%	12.9%

Additional resources may not be needed to meet the peak demands in the *Scenario Case* forecast. However, Reserve Margins remain tight through the assessment period.

[18] The NERC Reference Margin Level for Québec increases during the assessment timeframe. For 2010, the NERC Reference Margin Level is 10.4 percent; for 2011, it is 10.8 percent; for 2012 it is 11.4 percent; and from 2013–2017 it is 11.7 percent.

RFC

The RFC Region is primarily comprised of portions of the Midwest ISO and the PJM RTO. Because these areas have access to resources outside the RFC area, the Planning Reserve Margin assessment does not completely indicate the resource adequacy of RFC, the Midwest ISO, or the PJM RTO. The analysis of RFC is constrained to the RFC footprint and does not include those parts of MISO and PJM external to RFC.

Resource projections (Table RFC-1) for the RFC Region for 2010 through 2017 show Deliverable Resources increasing from 217,300 MW to 219,800 MW during the *Scenario* timeframe. Additionally, approximately 10,250 MW of Adjusted Potential Resources may be available by 2017.

The *Scenario Case* assumes a rapid increase in demand for the 2014 summer peak — see Figure RFC-1.

Table RFC-1: Supply Resource Projections

Year	Existing-Certain Resources and Net Firm Transactions (MW)	Deliverable Resources (MW)	Prospective Resources (MW)	Adjusted Potential Resources (MW)
2010	214,900	217,300	219,100	220,180
2011	214,800	220,100	221,800	225,450
2012	214,000	219,600	221,300	227,137
2013	214,000	219,600	221,300	228,502
2014	214,000	219,800	221,500	229,063
2015	214,000	219,800	221,500	229,546
2016	214,000	219,800	221,500	229,753
2017	214,000	219,800	221,500	230,054

For 2014, peak demand projections in the *Scenario Case* represent approximately an 8,400 MW increase, or 4.5 percent, over the *Reference Case* — see Table RFC-2. For 2017, the increase in the *Scenario Case* is greater at 10,300 MW, or 5.4 percent.

Figure RFC-1: Demand & Capacity Projections Comparison

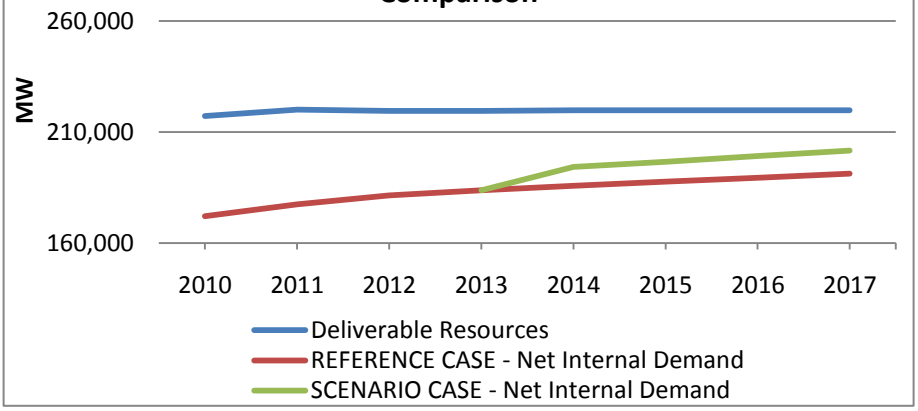


Table RFC-2: Demand Comparison Between *Reference* and *Scenario* Cases with a 2014 Inflection Point

Year	Annual Peak Net Internal Demand *Reference Case* (2009 Forecast)	Annual Peak Net Internal Demand *Scenario Case* (2008 Forecast)	Change in Annual Peak Net Internal Demand	Percent Change in *Scenario Case*
2014	185,900	194,300	8,400	4.52%
2017	191,400	201,700	10,300	5.38%

For the 2010 to 2017 assessment period in the *Reference Case*, RFC Reserve Margins are projected to be under the NERC Reference Margin Level by 2017 if only Deliverable Resources are added — see Figure RFC-2 and Table RFC-3. In the *Scenario Case*, considering the Deliverable Reserve Margin, the need for more resources would advance three years to 2014. Even with the addition of the Adjusted Potential Resources, RFC will fall slightly below the NERC Reference Margin Level in 2017.

Figure RFC-2: Reserve Margin Projections Comparison - 2014 Inflection Point

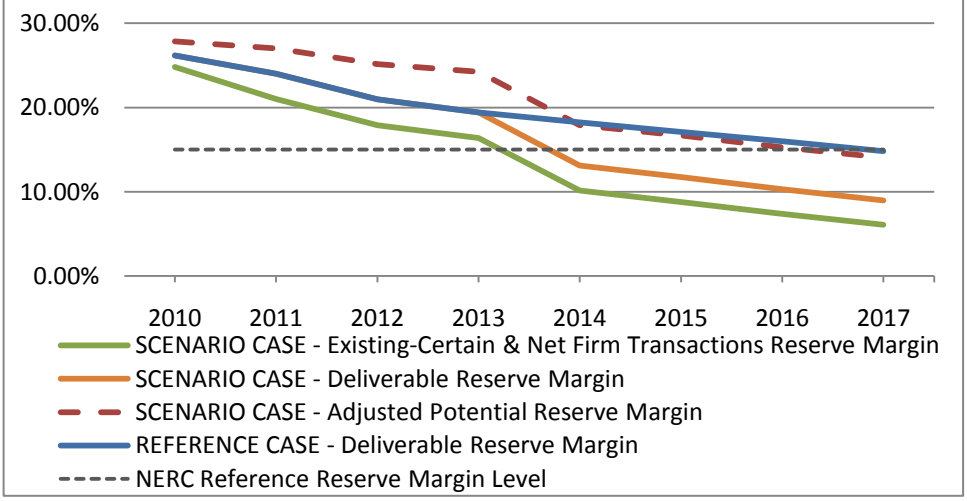


Table RFC-3: Projected Planning Reserve Margins for *Reference* and *Scenario* Cases

NERC Reference Margin Level 15%	*Reference Case*				*Scenario Case*			
	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin
2010	24.8%	26.2%	27.2%	27.9%	24.8%	26.2%	27.2%	27.9%
2011	21.0%	24.0%	25.0%	27.0%	21.0%	24.0%	25.0%	27.0%
2012	17.9%	21.0%	21.9%	25.1%	17.9%	21.0%	21.9%	25.1%
2013	16.4%	19.4%	20.3%	24.3%	16.4%	19.4%	20.3%	24.3%
2014	15.1%	18.2%	19.2%	23.2%	10.1%	13.1%	14.0%	17.9%
2015	14.0%	17.1%	18.0%	22.3%	8.8%	11.7%	12.6%	16.7%
2016	12.9%	16.0%	16.9%	21.2%	7.4%	10.3%	11.1%	15.3%
2017	11.8%	14.8%	15.7%	20.2%	6.1%	9.0%	9.8%	14.1%

Additional resources may be needed to meet the peak demands in the *Scenario Case* forecast, when considering Deliverable Resources, in 2014 — see Table RFC-4. In order to meet the NERC Reference Margin Level in 2014, an additional 3,645 MW may be needed. By 2017, the need for more resources intensifies, with 12,155 MW needed to meet the NERC Reference Margin Level. However, with the addition of Adjusted Potential Resources, the NERC Reference Margin Level would be met until 2016. For 2017, an additional 1,901 MW of resources would be needed in the *Scenario Case*.

Table RFC-4: Planning Reserve Impacts	
When Considering Deliverable Resources	
Drops Below NERC Reference Reserve Margin Level in	2014
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	3,645
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	12,155
When Considering Prospective Resources	
Drops Below NERC Reference Reserve Margin Level in	2014
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	1,945
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	10,455
When Considering Adjusted Potential Resources	
Drops Below NERC Reference Reserve Margin Level in	2017
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	1,901
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	1,901

RFC-MISO

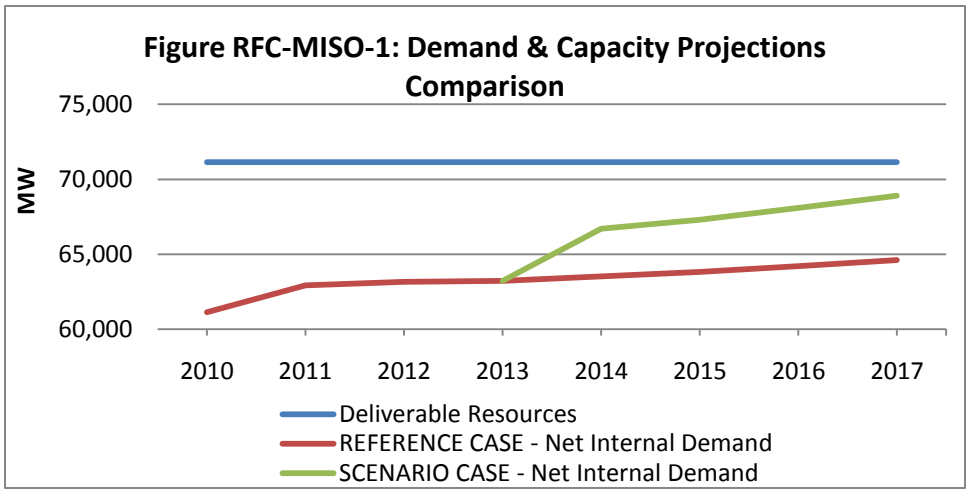
The RFC-MISO subregion represents a portion of the Midwest ISO contained within the RFC Region. Because this area has access to resources outside the RFC area, the Planning Reserve Margin assessment does not completely indicate the resource adequacy of the Midwest ISO.

Resource projections (Table RFC-MISO-1) for the RFC-MISO subregion for 2010 through 2017 show Deliverable Resources remain flat at 71,138 MW during the *Scenario* timeframe. Approximately 2,900 MW of Adjusted Potential Resources may be available by 2017.

Table RFC-MISO-1: Supply Resource Projections

Year	Existing-Certain Resources and Net Firm Transactions (MW)	Deliverable Resources (MW)	Prospective Resources (MW)	Adjusted Potential Resources (MW)
2010	70,714	71,138	72,732	72,815
2011	70,714	71,138	72,732	73,200
2012	70,714	71,138	72,732	73,510
2013	70,714	71,138	72,732	73,544
2014	70,714	71,138	72,732	73,552
2015	70,714	71,138	72,732	73,710
2016	70,714	71,138	72,732	73,710
2017	70,714	71,138	72,732	74,011

The *Scenario Case* assumes a rapid increase in demand for the 2014 summer peak — see Figure RFC-MISO-1.



For 2014, peak demand projections in the *Scenario Case* represent approximately a 3,200 MW increase, or 5 percent, over the *Reference Case* — see Table RFC-MISO-2. For 2017, the increase in the *Scenario Case* is greater at 4,300 MW, or 6.6 percent.

Table RFC-MISO-2: Demand Comparison Between *Reference* and *Scenario* Cases with a 2014 Inflection Point

Year	Annual Peak Net Internal Demand *Reference Case* (2009 Forecast)	Annual Peak Net Internal Demand *Scenario Case* (2008 Forecast)	Change in Annual Peak Net Internal Demand	Percent Change in *Scenario Case*
2014	63,515	66,700	3,185	5.01%
2017	64,614	68,900	4,286	6.63%

For the 2010 to 2017 assessment period in the *Reference Case*, RFC-MISO Reserve Margins are projected to be under the NERC Reference Margin Level by 2011 — see Figure RFC-MISO-2 and Table RFC-MISO-3. In the *Scenario Case*, Reserve Margins, already below the NERC Reference Margin Level, are further reduced, exacerbating potential reliability issues in 2014. Even with the addition of the Adjusted Potential Resources, RFC-MISO will fall below the NERC Reference Margin Level in 2014, decreasing to 7.4 percent in 2017.

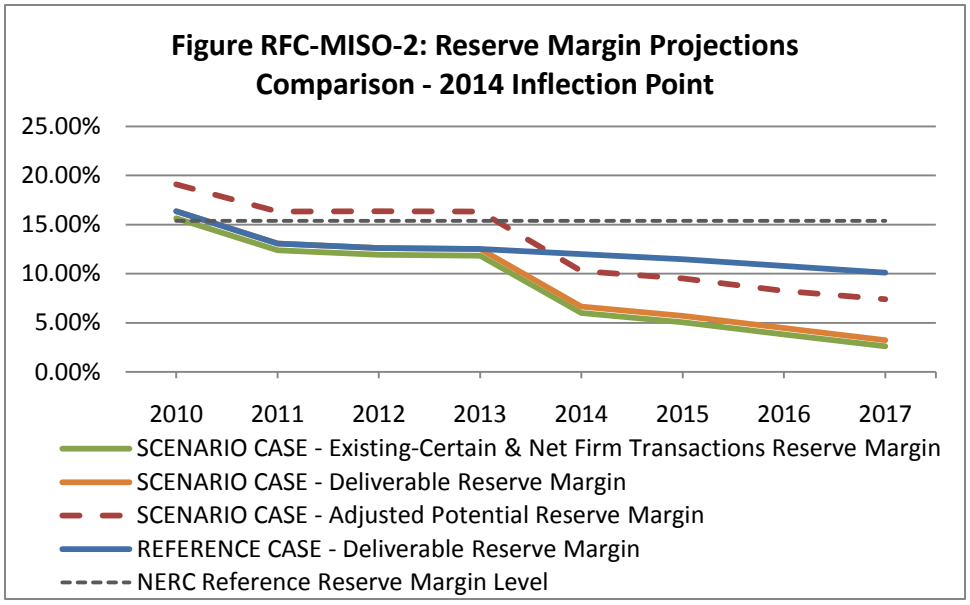


Table RFC-MISO-3: Projected Planning Reserve Margins for *Reference* and *Scenario* Cases

	Reference Case				*Scenario Case*			
NERC Reference Margin Level 15.4%	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin
2010	15.7%	16.4%	19.0%	19.1%	15.7%	16.4%	19.0%	19.1%
2011	12.4%	13.1%	15.6%	16.3%	12.4%	13.1%	15.6%	16.3%
2012	11.9%	12.6%	15.1%	16.4%	11.9%	12.6%	15.1%	16.4%
2013	11.8%	12.5%	15.0%	16.3%	11.8%	12.5%	15.0%	16.3%
2014	11.3%	12.0%	14.5%	15.8%	6.0%	6.7%	9.0%	10.3%
2015	10.8%	11.5%	14.0%	15.5%	5.1%	5.7%	8.1%	9.5%
2016	10.1%	10.8%	13.3%	14.8%	3.8%	4.5%	6.8%	8.2%
2017	9.4%	10.1%	12.6%	14.5%	2.6%	3.2%	5.6%	7.4%

Additional resources may be needed to meet the peak demands in the *Scenario Case* forecast, when considering Deliverable Resources, in 2011 — see Table RFC-MISO-4. In order to meet the NERC Reference Margin Level in 2014, an additional 5,834 MW may be needed. By 2017, the need for more resources intensifies, with 8,373 MW needed to meet the NERC Reference Margin Level. Even with the addition of Adjusted Potential Resources, the NERC Reference Margin Level would still not be met by 2017. An additional 5,499 MW of resources would be needed in 2017 for the *Scenario Case*.

Table RFC-MISO-4: Planning Reserve Impacts	
When Considering Deliverable Resources	
Drops Below NERC Reference Reserve Margin Level in	2014
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) - MW	5,834
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	8,373
When Considering Prospective Resources	
Drops Below NERC Reference Reserve Margin Level in	2014
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	4,240
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	6,779
When Considering Adjusted Potential Resources	
Drops Below NERC Reference Reserve Margin Level in	2014
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	3,420
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	5,499

The RFC-MISO area is only a portion of the entire Midwest ISO, so it must be noted that this area does not indicate the resource adequacy of the Midwest ISO. Using Midwest ISO data consistent with the other data in this *Scenario*, the Midwest ISO Reserve Margin based on Adjusted Potential Resources would exceed the Midwest ISO target through 2016. In 2017 an additional 900 MW of resources beyond the Adjusted Potential Resources would be needed to satisfy the Midwest ISO Reserve Margin target (also the NERC Reference Margin Level).

RFC-PJM

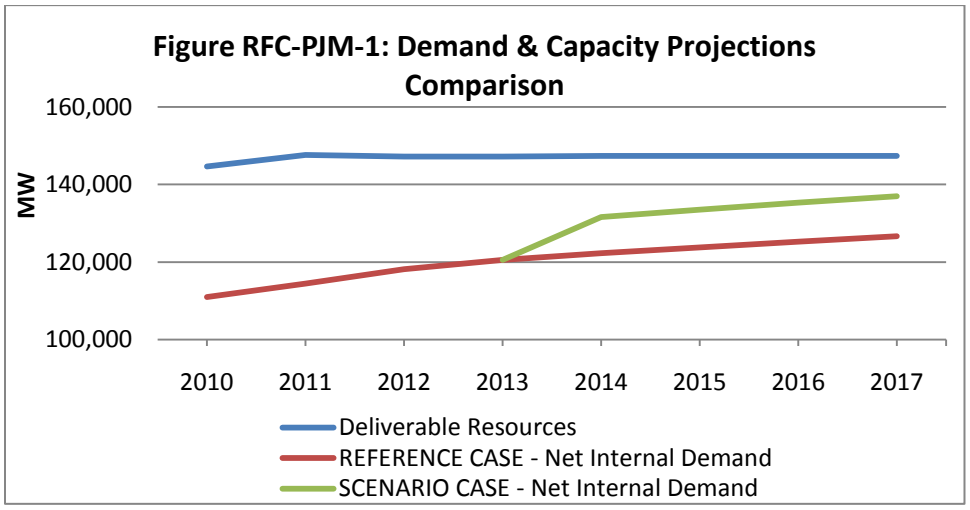
The RFC-PJM subregion represents a portion of the PJM RTO contained within the RFC Region. Because this area has access to resources outside the RFC area, the Planning Reserve Margin assessment does not completely indicate the resource adequacy of the PJM RTO.

Resource projections (Table RFC-PJM-1) for the RFC-PJM subregion for 2010 through 2017 show Deliverable Resources increasing from 144,627 MW to 147,368 MW during the *Scenario* timeframe. Additionally, approximately 7,400 MW of Adjusted Potential Resources may be available by 2017.

Table RFC-PJM-1: Supply Resource Projections

Year	Existing-Certain Resources and Net Firm Transactions (MW)	Deliverable Resources (MW)	Prospective Resources (MW)	Adjusted Potential Resources (MW)
2010	142,687	144,627	144,797	145,788
2011	142,812	147,645	147,736	150,944
2012	142,022	147,228	147,319	152,413
2013	142,022	147,228	147,319	153,732
2014	142,022	147,368	147,459	154,231
2015	142,022	147,368	147,459	154,575
2016	142,022	147,368	147,459	154,772
2017	142,022	147,368	147,459	154,772

The *Scenario Case* assumes a rapid increase in demand for the 2014 summer peak — see Figure RFC-PJM-1.



For 2014, peak demand projections in the *Scenario Case* represent approximately a 9,300 MW increase, or 7.6 percent, over the *Reference Case* — see Table RFC-PJM-2. For 2017, the increase in the *Scenario Case* is greater at 10,300 MW, or 8.1 percent.

Table RFC-PJM-2: Demand Comparison Between *Reference* and *Scenario* Cases with a 2014 Inflection Point

Year	Annual Peak Net Internal Demand *Reference Case* (2009 Forecast)	Annual Peak Net Internal Demand *Scenario Case* (2008 Forecast)	Change in Annual Peak Net Internal Demand	Percent Change in *Scenario Case*
2014	122,264	131,600	9,336	7.64%
2017	126,666	137,000	10,334	8.16%

For the 2010 to 2017 assessment period in the *Reference Case*, RFC-PJM Reserve Margins are projected to remain above the NERC Reference Margin Level — see Figure RFC-PJM-2 and Table RFC-PJM-3. In the *Scenario Case*, considering the Deliverable Reserve Margin, this projection would advance at least four years to 2014. Even with the addition of the Adjusted Potential Resources, RFC-PJM will drop below the NERC Reference Margin Level in 2015, decreasing to 13 percent in 2017.

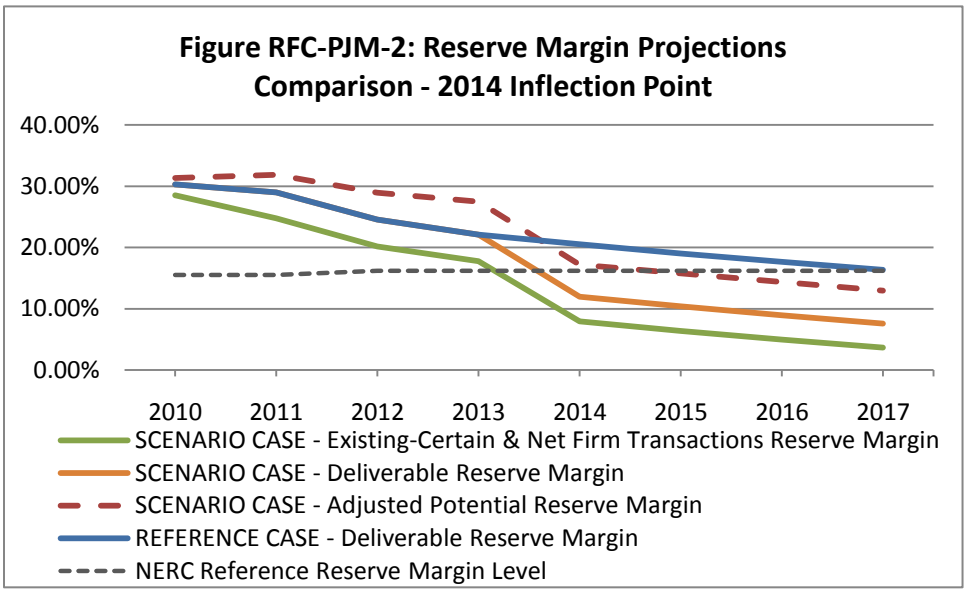


Table RFC-PJM-3: Projected Planning Reserve Margins for *Reference* and *Scenario* Cases

NERC Reference Margin Level 15.5%–16.2%[19]	*Reference Case*				*Scenario Case*			
	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin
2010	28.6%	30.3%	30.5%	31.3%	28.6%	30.3%	30.5%	31.3%
2011	24.8%	29.0%	29.1%	31.9%	24.8%	29.0%	29.1%	31.9%
2012	20.1%	24.6%	24.6%	28.9%	20.1%	24.6%	24.6%	28.9%
2013	17.8%	22.1%	22.2%	27.5%	17.8%	22.1%	22.2%	27.5%
2014	16.2%	20.5%	20.6%	26.1%	7.9%	12.0%	12.1%	17.2%
2015	14.7%	19.0%	19.1%	24.8%	6.4%	10.4%	10.5%	15.8%
2016	13.4%	17.7%	17.8%	23.6%	5.0%	8.9%	9.0%	14.4%
2017	12.1%	16.3%	16.4%	22.2%	3.7%	7.6%	7.6%	13.0%

Additional resources may be needed to meet the peak demands in the *Scenario Case* forecast, when considering Deliverable Resources, in 2014 — see Table RFC-PJM-4. In order to meet the NERC Reference Margin Level in 2014, an additional 5,551 MW may be needed. By 2017, the need for more resources intensifies, with 11,826 MW needed to meet the NERC Reference Margin Level. Even with the addition of Adjusted Potential Resources, the NERC Reference Margin Level would not through 2017. An additional 4,422 MW would be needed in 2017 for the *Scenario Case*.

[19] The NERC Reference Margin Level for PJM-RFC increases during the assessment timeframe. For 2010–2011, the NERC Reference Margin Level is 15.5 percent; for 2012–2017 it increases to 16.2 percent.

Table RFC-PJM-4: Planning Reserve Impacts	
When Considering Deliverable Resources	
Drops Below NERC Reference Reserve Margin Level in	2014
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	5,551
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	11,826
When Considering Prospective Resources	
Drops Below NERC Reference Reserve Margin Level in	2014
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	5,460
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	11,735
When Considering Adjusted Potential Resources	
Drops Below NERC Reference Reserve Margin Level in	2015
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level in 2015 — MW	552
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	4,422

Although the RFC-PJM area is a large portion of the entire PJM RTO, it must be noted that this area does not necessarily indicate the resource adequacy of the PJM RTO. Using PJM RTO data consistent with the other data in this scenario, the PJM RTO Reserve Margin based on Adjusted Potential Resources would exceed the PJM RTO target through 2016. In 2017 an additional 1,400 MW of resources beyond the Adjusted Potential Resources would be needed to satisfy the PJM RTO Reserve Margin target (also the NERC Reference Margin Level).

SERC

Resource projections (Table SERC-1) for the SERC Region for 2010 through 2017 show Deliverable Resources increasing from 246,543 MW to 259,732 MW during the *Scenario* timeframe. Additionally, approximately 14,000 MW of Adjusted Potential Resources may be available by 2017.

The *Scenario Case* assumes a rapid increase in demand for the 2014 summer peak — see Figure SERC-1.

For 2014, peak demand projections in the *Scenario Case* represent approximately a 7,800 MW increase, or 3.6 percent, over the *Reference Case* — see Table SERC-2. For 2017, the increase in the *Scenario Case* is greater at 10,600 MW, or 4.7 percent.

Table SERC-1: Supply Resource Projections

Year	Existing-Certain Resources and Net Firm Transactions (MW)	Deliverable Resources (MW)	Prospective Resources (MW)	Adjusted Potential Resources (MW)
2010	242,982	246,543	258,396	258,396
2011	242,713	250,917	263,827	263,977
2012	242,632	254,132	267,491	267,766
2013	240,012	253,404	267,483	267,583
2014	239,337	252,979	266,954	267,179
2015	239,471	254,371	268,672	268,997
2016	241,583	259,050	273,351	273,351
2017	241,824	259,732	274,033	274,033

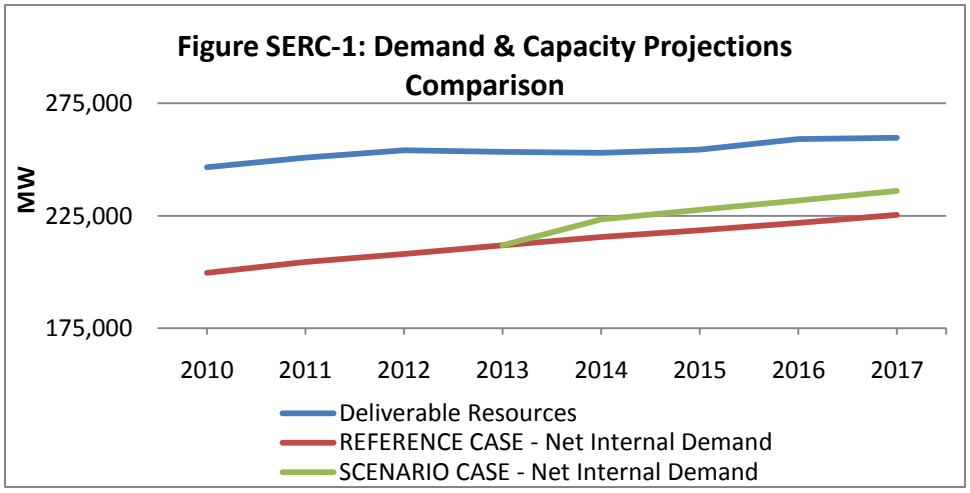


Table SERC-2: Demand Comparison Between *Reference* and *Scenario* Cases with a 2014 Inflection Point

Year	Annual Peak Net Internal Demand *Reference Case* (2009 Forecast)	Annual Peak Net Internal Demand *Scenario Case* (2008 Forecast)	Change in Annual Peak Net Internal Demand	Percent Change in *Scenario Case*
2014	215,585	223,378	7,793	3.61%
2017	225,423	236,070	10,647	4.72%

For the 2010 to 2017 assessment period in the *Reference Case*, SERC Reserve Margins are projected to remain above the NERC Reference Margin Level — see Figure SERC-2 and Table SERC-3. In the *Scenario Case*, considering the Deliverable Reserve Margin the need for more resources would advance at least four years to 2014. However, with the addition of the Prospective or Adjusted Potential Resources, SERC will remain above the NERC Reference Margin Level through the assessment timeframe of 2017, though appearing tighter in the latter years.

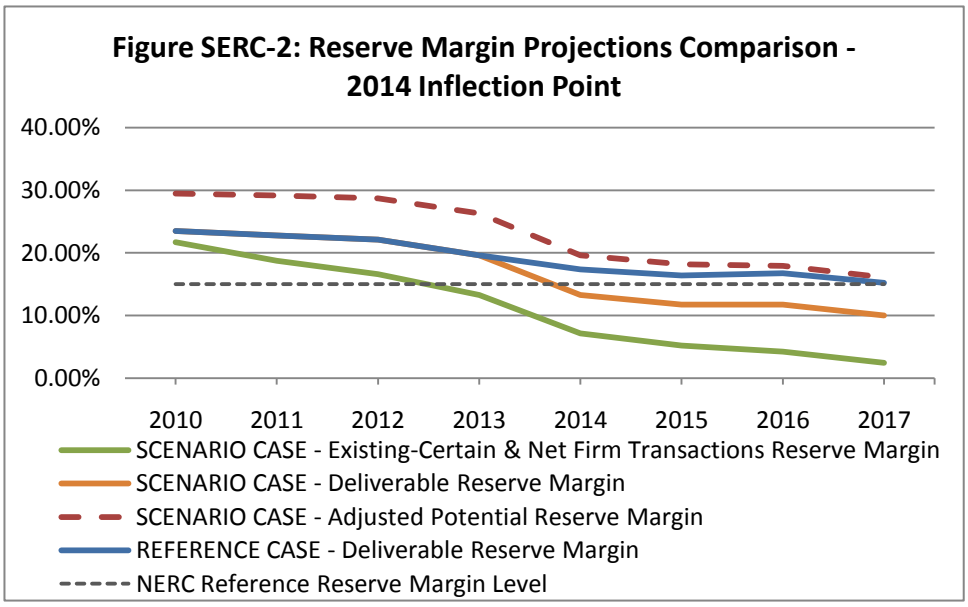


Table SERC-3: Projected Planning Reserve Margins for *Reference* and *Scenario* Cases

NERC Reference Margin Level 15%	*Reference Case*				*Scenario Case*			
	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin
2010	21.7%	23.5%	29.4%	29.4%	21.7%	23.5%	29.4%	29.4%
2011	18.7%	22.8%	29.1%	29.1%	18.7%	22.8%	29.1%	29.1%
2012	16.6%	22.1%	28.5%	28.7%	16.6%	22.1%	28.5%	28.7%
2013	13.3%	19.6%	26.2%	26.3%	13.3%	19.6%	26.2%	26.3%
2014	11.0%	17.3%	23.8%	23.9%	7.1%	13.3%	19.5%	19.6%
2015	9.6%	16.4%	22.9%	23.1%	5.2%	11.7%	18.0%	18.2%
2016	8.9%	16.7%	23.2%	23.2%	4.2%	11.8%	17.9%	17.9%
2017	7.3%	15.2%	21.6%	21.6%	2.4%	10.0%	16.1%	16.1%

Additional resources may be needed to meet the peak demands in the *Scenario Case* forecast, when considering Deliverable Resources, in 2014, — see Table SERC-4. In order to meet the NERC Reference Margin Level in 2014, an additional 3,906 MW may be needed. By 2017, the need for more resources intensifies, with 11,749 MW needed to meet the NERC Reference Margin Level. However, with the addition of Prospective or Adjusted Potential Resources, which are included as Adjusted Potential Resources, the NERC Reference Margin Level would be met through 2017.

Table SERC-4: Planning Reserve Impacts	
When Considering Deliverable Resources	
Drops Below NERC Reference Reserve Margin Level in	2014
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	3,906
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	11,749
When Considering Prospective Resources	
Drops Below NERC Reference Reserve Margin Level in	2017+
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	N/A
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	N/A
When Considering Adjusted Potential Resources	
Drops Below NERC Reference Reserve Margin Level in	2017+
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	N/A
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	N/A

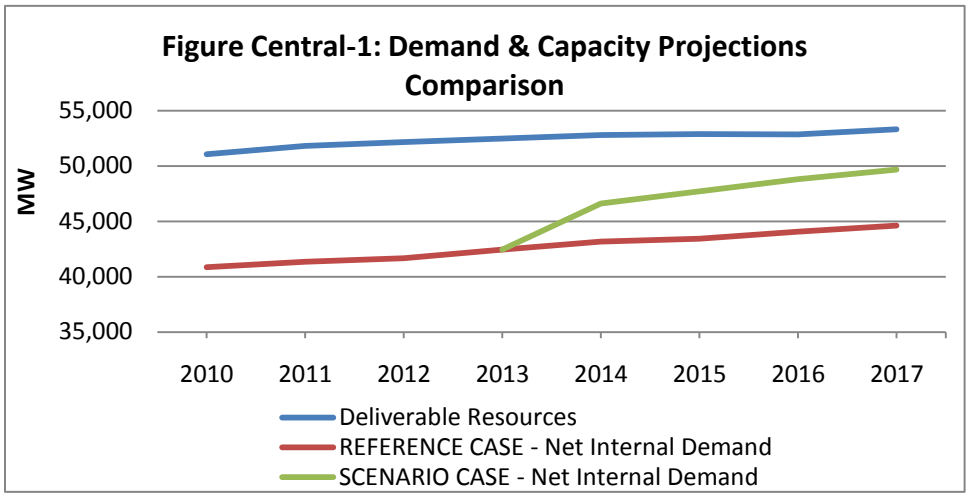
Central

Resource projections (Table Central-1) for the Central subregion for 2010 through 2017 show Deliverable Resources increasing from 51,054 MW to 53,302 MW during the *Scenario* timeframe. Additionally, approximately 1,500 MW of Adjusted Potential Resources may be available by 2017.

The *Scenario Case* assumes a rapid increase in demand for the 2014 summer peak — see Figure Central-1.

Table Central-1: Supply Resource Projections

Year	Existing-Certain Resources and Net Firm Transactions (MW)	Deliverable Resources (MW)	Prospective Resources (MW)	Adjusted Potential Resources (MW)
2010	50,152	51,054	51,422	51,422
2011	50,911	51,815	52,183	52,183
2012	50,982	52,156	52,953	52,953
2013	49,607	52,473	53,990	53,990
2014	49,075	52,806	54,222	54,222
2015	49,151	52,882	54,399	54,399
2016	49,133	52,864	54,381	54,381
2017	49,113	53,302	54,819	54,819



For 2014, peak demand projections in the *Scenario Case* represent approximately a 3,400 MW increase, or 7.9 percent, over the *Reference Case* — see Table Central-2. For 2017, the increase in the *Scenario Case* is greater at 5,000 MW, or 11.3 percent.

Table Central-2: Demand Comparison Between *Reference* and *Scenario* Cases with a 2014 Inflection Point

Year	Annual Peak Net Internal Demand *Reference Case* (2009 Forecast)	Annual Peak Net Internal Demand *Scenario Case* (2008 Forecast)	Change in Annual Peak Net Internal Demand	Percent Change in *Scenario Case*
2014	43,180	46,607	3,427	7.94%
2017	44,613	49,673	5,060	11.34%

For the 2010 to 2017 assessment period in the *Reference Case*, Central Reserve Margins are projected to remain above the NERC Reference Margin Level — see Figure Central-2 and Table Central-3. In the *Scenario Case*, considering the Deliverable Reserve Margin projections, the need for more resources would advance at least four years to 2014. Even with the addition of the Prospective or Adjusted Potential Resources, Central will fall below the NERC Reference Margin Level in 2015, to 10.4 percent in 2017.

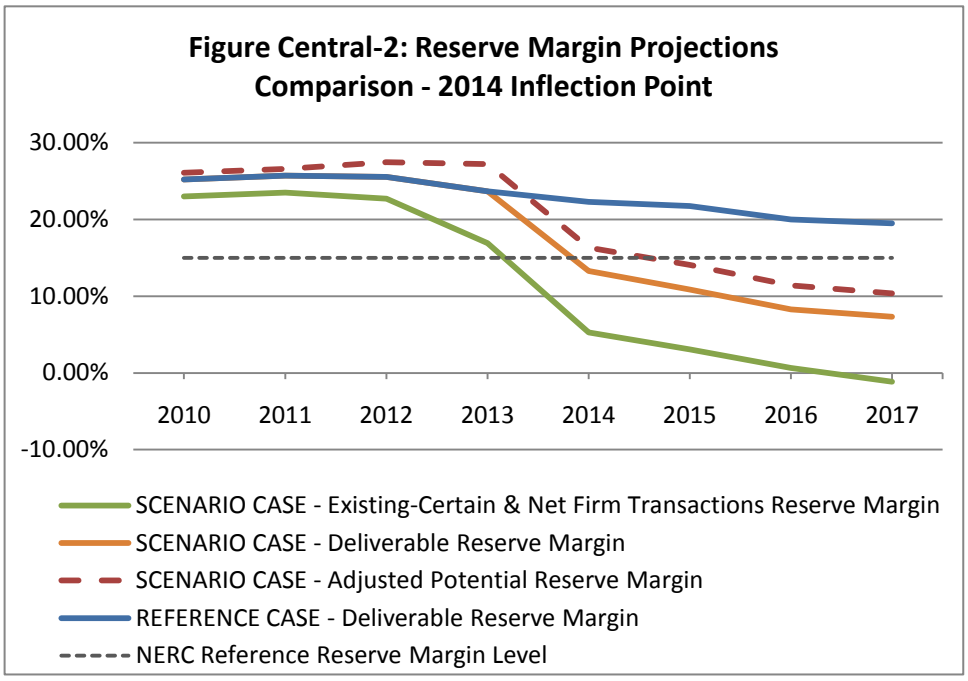


Table Central-3: Projected Planning Reserve Margins for Reference and *Scenario* Cases

NERC Reference Margin Level 15%	*Reference Case*				*Scenario Case*			
	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin
2010	23.0%	25.2%	26.1%	26.1%	23.0%	25.2%	26.1%	26.1%
2011	23.5%	25.7%	26.6%	26.6%	23.5%	25.7%	26.6%	26.6%
2012	22.7%	25.5%	27.5%	27.5%	22.7%	25.5%	27.5%	27.5%
2013	16.9%	23.6%	27.2%	27.2%	16.9%	23.6%	27.2%	27.2%
2014	13.7%	22.3%	25.6%	25.6%	5.3%	13.3%	16.3%	16.3%
2015	13.2%	21.8%	25.3%	25.3%	3.1%	10.9%	14.1%	14.1%
2016	11.5%	20.0%	23.4%	23.4%	0.7%	8.3%	11.4%	11.4%
2017	10.1%	19.5%	22.9%	22.9%	-1.1%	7.3%	10.4%	10.4%

Additional resources may be needed to meet the peak demands in the *Scenario Case* forecast, when considering Deliverable Resources, in 2014 — see Table Central-4. In order to meet the NERC Reference Margin Level in 2014, an additional 792 MW may be needed. By 2017, the need for more resources intensifies, with 3,822 MW needed to meet the NERC Reference Margin Level. Even with the addition of Adjusted Potential Resources the NERC Reference Margin Level would be not be met by 2017. An additional 2,305 MW of resources would be needed in 2017, for the *Scenario Case*.

Table Central-4: Planning Reserve Impacts	
When Considering Deliverable Resources	
Drops Below NERC Reference Reserve Margin Level in	2014
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	792
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	3,822
When Considering Prospective Resources	
Drops Below NERC Reference Reserve Margin Level in	2015
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level in 2015 — MW	449
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	2,305
When Considering Adjusted Potential Resources	
Drops Below NERC Reference Reserve Margin Level in	2015
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level in 2015 — MW	449
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	2,305

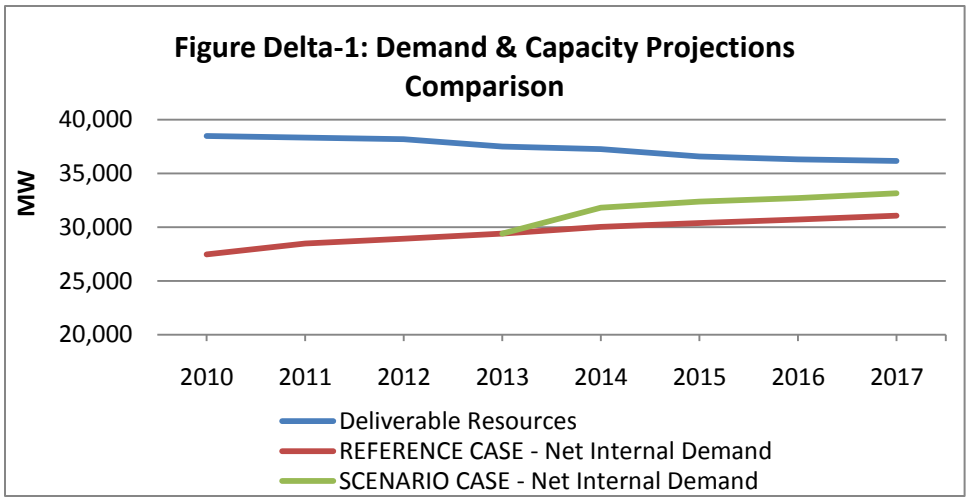
Delta

Resource projections (Table Delta-1) for the Delta subregion for 2010 through 2017 show Deliverable Resources decreasing from 38,476 MW to 36,161 MW during the *Scenario* timeframe. However, approximately 1,000 MW of Adjusted Potential Resources may be available by 2017, still less than the 2010 forecast.

The *Scenario Case* assumes a rapid increase in demand for the 2014 summer peak — see Figure Delta-1.

Table Delta-1: Supply Resource Projections

Year	Existing-Certain Resources and Net Firm Transactions (MW)	Deliverable Resources (MW)	Prospective Resources (MW)	Adjusted Potential Resources (MW)
2010	38,340	38,476	38,497	38,497
2011	37,638	38,314	39,320	39,320
2012	37,499	38,175	39,181	39,181
2013	36,823	37,499	38,505	38,505
2014	36,588	37,264	38,270	38,270
2015	35,906	36,582	37,588	37,588
2016	35,638	36,314	37,320	37,320
2017	35,485	36,161	37,167	37,167



For 2014, peak demand projections in the *Scenario Case* represent approximately a 1,800 MW increase, or six percent, over the *Reference Case* — see Table Delta-2. For 2017, the increase in the *Scenario Case* is slightly greater at 2,100 MW, or 6.7 percent.

Table Delta-2: Demand Comparison Between *Reference* and *Scenario* Cases with a 2014 Inflection Point

Year	Annual Peak Net Internal Demand *Reference Case* (2009 Forecast)	Annual Peak Net Internal Demand *Scenario Case* (2008 Forecast)	Change in Annual Peak Net Internal Demand	Percent Change in *Scenario Case*
2014	30,019	31,807	1,788	5.96%
2017	31,062	33,144	2,082	6.70%

For the 2010 to 2017 assessment period in the *Reference Case*, Delta Reserve Margins are projected to remain above the NERC Reference Margin Level — see Figure Delta-2 and Table Delta-3. In the *Scenario Case*, considering the Deliverable Reserve Margin, the need for more resources would advance at least three years to 2015. Even with the addition of the Prospective or Adjusted Potential Resources, Central will fall below the NERC Reference Margin Level 2016, to 12.1 percent in 2017.

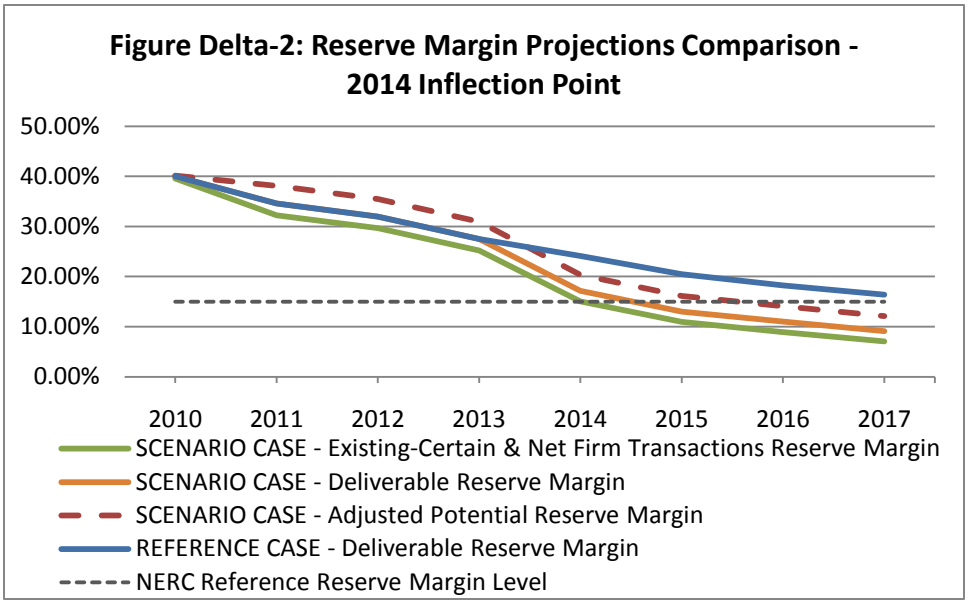


Table Delta-3: Projected Planning Reserve Margins for *Reference* and *Scenario* Cases

NERC Reference Margin Level 15%	*Reference Case*				*Scenario Case*			
	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin
2010	39.6%	40.0%	40.1%	40.1%	39.6%	40.0%	40.1%	40.1%
2011	32.2%	34.6%	38.1%	38.1%	32.2%	34.6%	38.1%	38.1%
2012	29.6%	32.0%	35.5%	35.5%	29.6%	32.0%	35.5%	35.5%
2013	25.2%	27.5%	30.9%	30.9%	25.2%	27.5%	30.9%	30.9%
2014	21.9%	24.1%	27.5%	27.5%	15.0%	17.2%	20.3%	20.3%
2015	18.2%	20.5%	23.8%	23.8%	10.9%	13.0%	16.1%	16.1%
2016	16.0%	18.2%	21.5%	21.5%	8.9%	11.0%	14.1%	14.1%
2017	14.2%	16.4%	19.7%	19.7%	7.1%	9.1%	12.1%	12.1%

Additional resources may be needed to meet the peak demands in the *Scenario Case* forecast, when considering Deliverable Resources, in 2014 — see Table Delta-4. In order to meet the NERC Reference Margin Level in 2015, an additional 642 MW may be needed. By 2017, the need for more resources intensifies, with 1,955 MW needed to meet the NERC Reference Margin Level. Even with the addition of Adjusted Potential Resources, the NERC Reference Margin Level would be not be met by 2017. An additional 949 MW of resources would be needed in 2017 for the *Scenario Case*.

Table Delta-4: Planning Reserve Impacts	
When Considering Deliverable Resources	
Drops Below NERC Reference Reserve Margin Level in	2015
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level in 2015 — MW	642
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	1,955
When Considering Prospective Resources	
Drops Below NERC Reference Reserve Margin Level in	2016
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level in 2016 — MW	305
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	949
When Considering Adjusted Potential Resources	
Drops Below NERC Reference Reserve Margin Level in	2016
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level in 2016 — MW	305
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	949

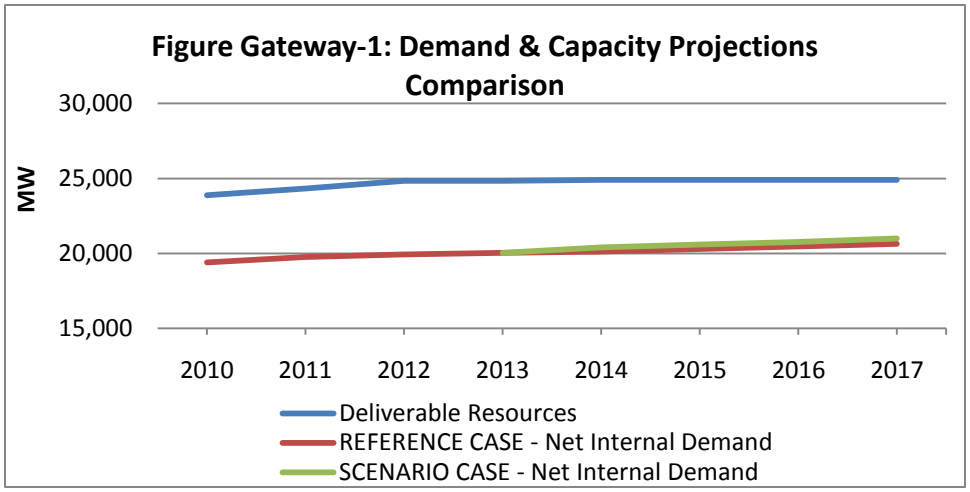
Gateway

Resource projections (Table Gateway-1) for the Gateway subregion for 2010 through 2017 show Deliverable Resources increasing from 23,882 MW to 24,916 MW during the *Scenario* timeframe. Additionally, approximately 800 MW of Adjusted Potential Resources may be available by 2017.

The *Scenario Case* assumes a slight increase in demand for the 2014 summer peak — see Figure Gateway-1.

Table Gateway-1: Supply Resource Projections

Year	Existing-Certain Resources and Net Firm Transactions (MW)	Deliverable Resources (MW)	Prospective Resources (MW)	Adjusted Potential Resources (MW)
2010	22,916	23,882	24,693	24,693
2011	23,322	24,328	25,139	25,139
2012	23,727	24,835	25,646	25,646
2013	23,707	24,834	25,645	25,645
2014	23,668	24,916	25,727	25,727
2015	23,668	24,916	25,727	25,727
2016	23,668	24,916	25,727	25,727
2017	23,668	24,916	25,727	25,727



For 2014, peak demand projections in the *Scenario Case* represent approximately a 250 MW increase, or 1.3 percent, over the *Reference Case* — see Table Gateway-2. For 2017, the increase in the *Scenario Case* is slightly greater at 350 MW, or 1.7 percent.

Table Gateway-2: Demand Comparison Between *Reference* and *Scenario* Cases with a 2014 Inflection Point

Year	Annual Peak Net Internal Demand *Reference Case* (2009 Forecast)	Annual Peak Net Internal Demand *Scenario Case* (2008 Forecast)	Change in Annual Peak Net Internal Demand	Percent Change in *Scenario Case*
2014	20,127	20,396	269	1.34%
2017	20,643	20,997	354	1.71%

For the 2010 to 2017 assessment period in the *Reference Case*, Gateway Reserve Margins are projected to be above the NERC Reference Margin Level — see Figure Gateway-2 and Table Gateway-3. When considering Deliverable, Prospective, and Adjusted Potential Reserve Margins, Gateway will remain above the NERC Reference Margin Level through the assessment timeframe of 2017 in the *Scenario Case*.

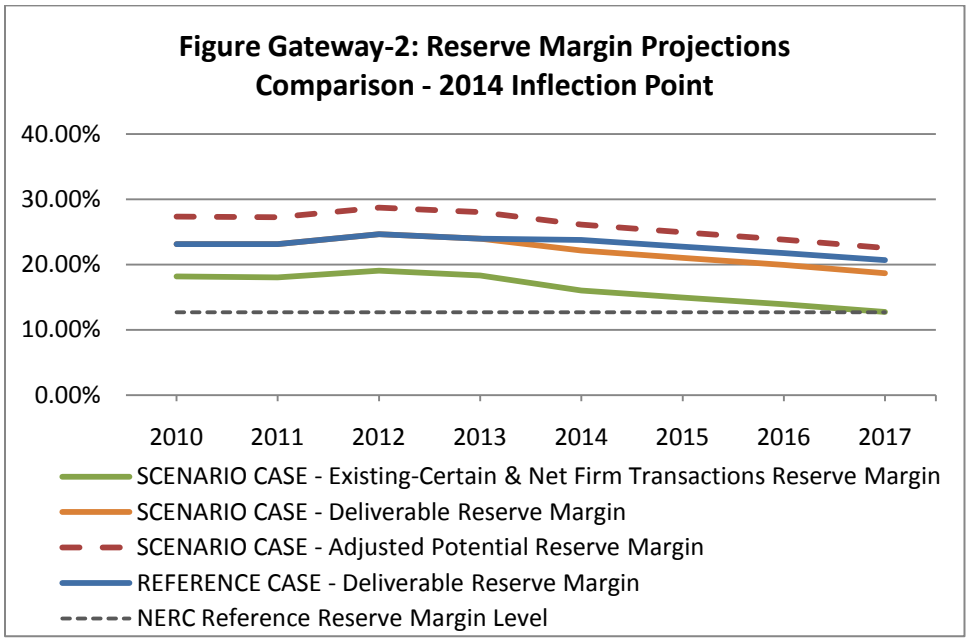


Table Gateway-3: Projected Planning Reserve Margins for *Reference* and *Scenario* Cases

NERC Reference Margin Level 12.7%	*Reference Case*				*Scenario Case*			
	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin
2010	18.2%	23.2%	27.3%	27.3%	18.2%	23.2%	27.3%	27.3%
2011	18.1%	23.1%	27.2%	27.2%	18.1%	23.1%	27.2%	27.2%
2012	19.1%	24.6%	28.7%	28.7%	19.1%	24.6%	28.7%	28.7%
2013	18.3%	24.0%	28.0%	28.0%	18.3%	24.0%	28.0%	28.0%
2014	17.6%	23.8%	27.8%	27.8%	16.0%	22.2%	26.1%	26.1%
2015	16.6%	22.7%	26.7%	26.7%	14.9%	21.0%	24.9%	24.9%
2016	15.7%	21.8%	25.7%	25.7%	13.9%	19.9%	23.8%	23.8%
2017	14.7%	20.7%	24.6%	24.6%	12.7%	18.7%	22.5%	22.5%

Additional resources may not be needed to meet the peak demands in the *Scenario Case* forecast.

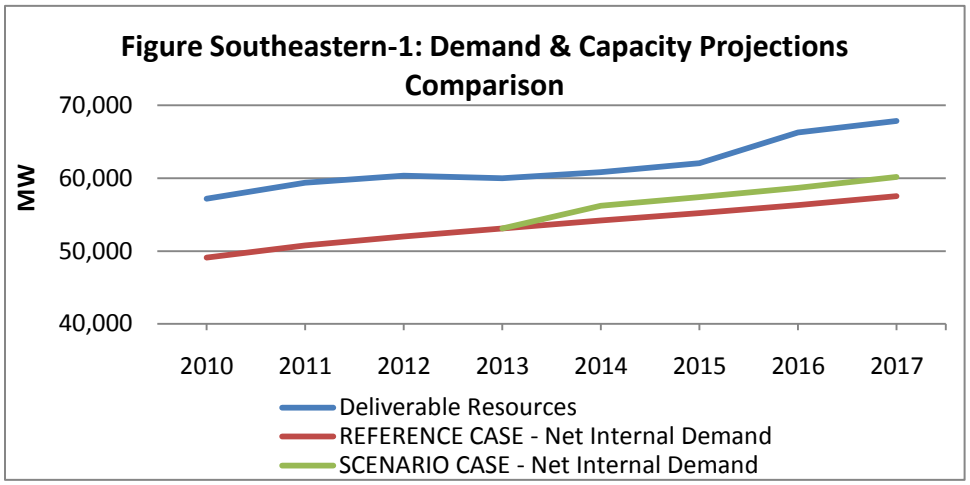
Southeastern

Resource projections (Table Southeastern-1) for the Southeastern subregion for 2010 through 2017 show Deliverable Resources increasing from 57,166 MW to 67,853 MW during the *Scenario* timeframe. Additionally, approximately 9,200 MW of Adjusted Potential Resources may be available by 2017.

The *Scenario Case* assumes a rapid increase in demand for the 2014 summer peak — see Figure Southeastern-1.

Table Southeastern-1: Supply Resource Projections

Year	Existing-Certain Resources and Net Firm Transactions (MW)	Deliverable Resources (MW)	Prospective Resources (MW)	Adjusted Potential Resources (MW)
2010	56,816	57,166	66,056	66,056
2011	56,811	59,383	68,345	68,345
2012	56,656	60,337	69,299	69,299
2013	56,306	59,987	68,949	68,949
2014	56,691	60,848	69,810	69,810
2015	57,893	62,050	71,237	71,237
2016	60,655	66,262	75,449	75,449
2017	61,146	67,853	77,040	77,040



For 2014, peak demand projections in the *Scenario Case* represent approximately a 2,000 MW increase, or 3.8 percent, over the *Reference Case* — see Table Southeastern-2. For 2017, the increase in the *Scenario Case* is greater 2,600 MW, or 4.5 percent.

Table Southeastern-2: Demand Comparison Between *Reference* and *Scenario* Cases with a 2014 Inflection Point

Year	Annual Peak Net Internal Demand *Reference Case* (2009 Forecast)	Annual Peak Net Internal Demand *Scenario Case* (2008 Forecast)	Change in Annual Peak Net Internal Demand	Percent Change in *Scenario Case*
2014	54,189	56,238	2,049	3.78%
2017	57,555	60,156	2,601	4.52%

For the 2010 to 2017 assessment period in the *Reference Case*, Southeastern Reserve Margins are projected to be under the NERC Reference Margin Level by 2013 if only Deliverable Resources are added — see Figure Southeastern-2 and Table Southeastern-3. In the *Scenario Case*, the Deliverable Reserve Margin, already below the NERC Reference Margin Level in the *Reference Case*, is further reduced, exacerbating potential reliability issues in 2014. However, with the addition of the Prospective and Adjusted Potential Resources, Southeastern will remain above the NERC Reference Margin Level through the assessment timeframe of 2017.

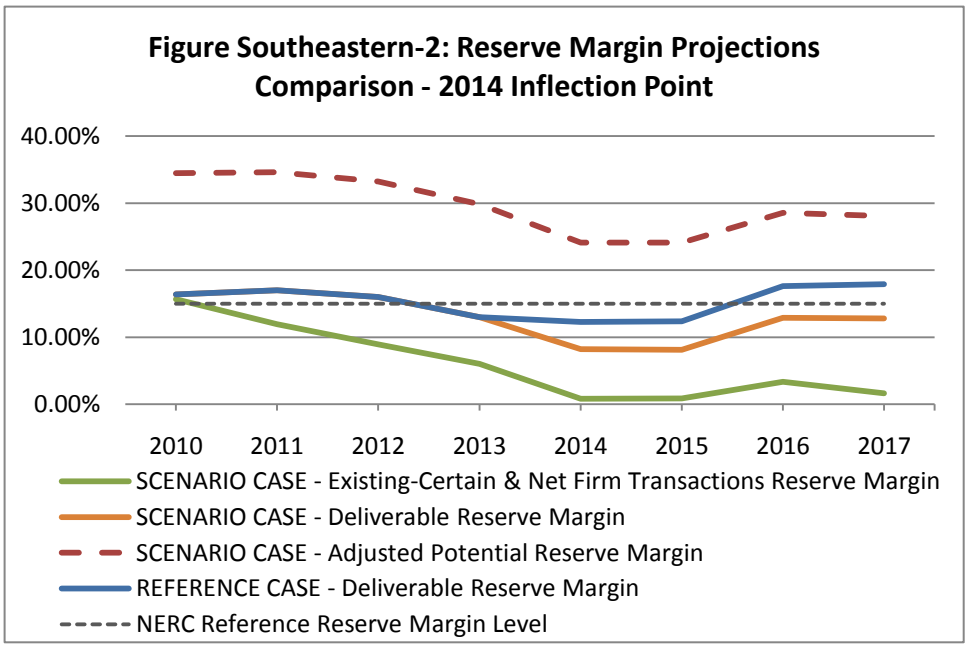


Table Southeastern-3: Projected Planning Reserve Margins for *Reference* and *Scenario* Case

NERC Reference Margin Level 15%	*Reference Case*				*Scenario Case*			
	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin
2010	15.7%	16.4%	34.5%	34.5%	15.7%	16.4%	34.5%	34.5%
2011	11.9%	17.0%	34.6%	34.6%	11.9%	17.0%	34.6%	34.6%
2012	8.9%	16.0%	33.2%	33.2%	8.9%	16.0%	33.2%	33.2%
2013	6.0%	13.0%	29.8%	29.8%	6.0%	13.0%	29.8%	29.8%
2014	4.6%	12.3%	28.8%	28.8%	0.8%	8.2%	24.1%	24.1%
2015	4.8%	12.4%	29.0%	29.0%	0.9%	8.1%	24.1%	24.1%
2016	7.7%	17.6%	34.0%	34.0%	3.4%	12.9%	28.6%	28.6%
2017	6.2%	17.9%	33.9%	33.9%	1.6%	12.8%	28.1%	28.1%

Additional resources may be needed to meet the peak demands in the *Scenario Case* forecast, when considering Deliverable Resources, in 2013 — see Table Southeastern-4. This need for more resources is identified not only in the *Scenario Case*, but in the *Reference Case* as well. In order to meet the NERC Reference Margin Level in 2014, an additional 3,826 MW may be needed. By 2017, the need for more resources improves, with only 1,326 MW needed to meet the NERC Reference Margin Level. However, with the addition of Adjusted Potential Resources, the NERC Reference Margin Level would be met through 2017.

Table Southeastern-4: Planning Reserve Impacts	
When Considering Deliverable Resources	
Drops Below NERC Reference Reserve Margin Level in	2014
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	3,826
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	1,326
When Considering Prospective Resources	
Drops Below NERC Reference Reserve Margin Level in	2017+
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	N/A
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	N/A
When Considering Prospective Resources	
Drops Below NERC Reference Reserve Margin Level in	2017+
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	N/A
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	N/A

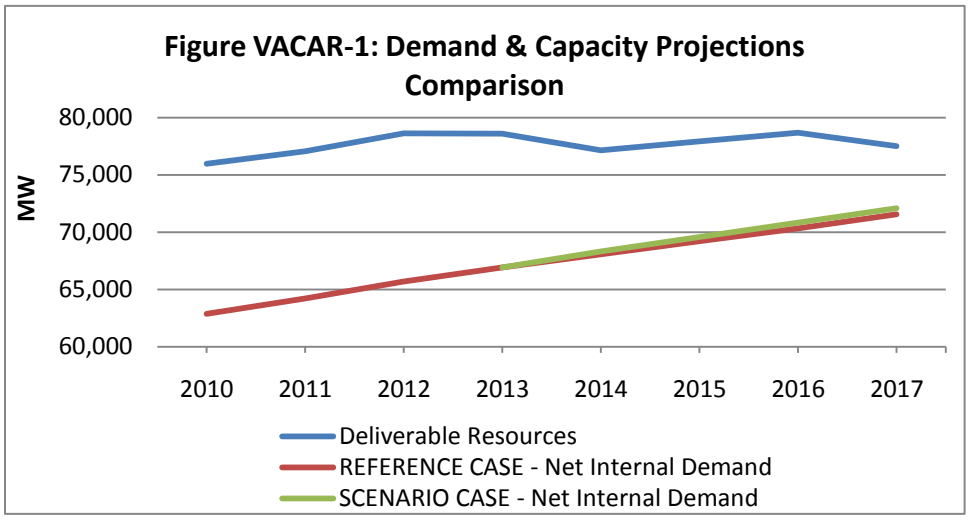
VACAR

Resource projections (Table VACAR-1) for the VACAR subregion for 2010 through 2017 show Deliverable Resources increasing from 75,965 MW to 77,500 MW during the *Scenario* timeframe. Additionally, approximately 1,800 MW of Adjusted Potential Resources may be available by 2017.

The *Scenario Case* assumes a slight increase in demand for the 2014 summer peak — see Figure VACAR-1.

Table VACAR-1: Supply Resource Projections

Year	Existing-Certain Resources and Net Firm Transactions (MW)	Deliverable Resources (MW)	Prospective Resources (MW)	Adjusted Potential Resources (MW)
2010	74,758	75,965	77,728	77,728
2011	74,031	77,077	78,840	78,990
2012	73,768	78,629	80,412	80,687
2013	73,569	78,611	80,394	80,494
2014	73,315	77,145	78,925	79,150
2015	72,853	77,941	79,721	80,046
2016	72,489	78,694	80,474	80,474
2017	72,412	77,500	79,280	79,280



For 2014, peak demand projections in the *Scenario Case* represent approximately a 250 MW increase, or 0.4 percent, over the *Reference Case* — see Table VACAR-2. For 2017, the increase in the *Scenario Case* is slightly greater at 550 MW, or 0.8 percent.

Table VACAR-2: Demand Comparison Between *Reference* and *Scenario* Cases with a 2014 Inflection Point

Year	Annual Peak Net Internal Demand *Reference Case* (2009 Forecast)	Annual Peak Net Internal Demand *Scenario Case* (2008 Forecast)	Change in Annual Peak Net Internal Demand	Percent Change in *Scenario Case*
2014	68,070	68,330	260	0.38%
2017	71,550	72,100	550	0.77%

For the 2010 to 2017 assessment period in the *Reference Case*, VACAR Reserve Margins are projected to be under the NERC Reference Margin Level by 2014 if only Deliverable Resources are added — see Figure VACAR-2 and Table VACAR-3. In the *Scenario Case*, this observation is consistent with the *Reference Case*, though slightly less. Even with the addition of the Adjusted Potential Resources, VACAR will fall below the NERC Reference Margin Level in 2016, to 10 percent in 2017.

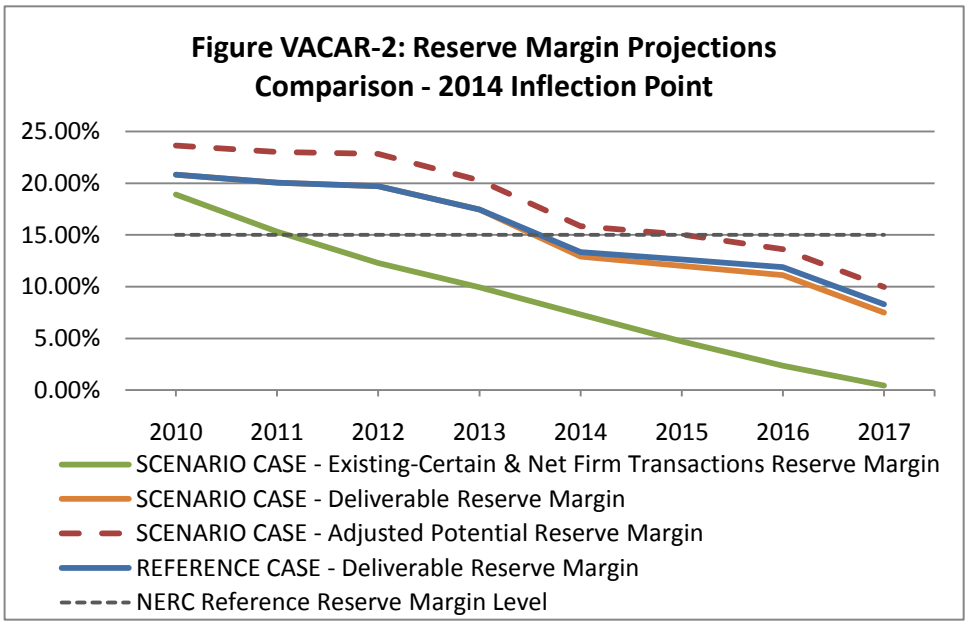


Table VACAR-3: Projected Planning Reserve Margins for *Reference* and *Scenario* Cases

NERC Reference Margin Level 15%	*Reference Case*				*Scenario Case*			
	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin
2010	18.9%	20.8%	23.6%	23.6%	18.9%	20.8%	23.6%	23.6%
2011	15.3%	20.1%	22.8%	23.0%	15.3%	20.1%	22.8%	23.0%
2012	12.3%	19.7%	22.4%	22.8%	12.3%	19.7%	22.4%	22.8%
2013	9.9%	17.5%	20.1%	20.3%	9.9%	17.5%	20.1%	20.3%
2014	7.7%	13.3%	15.9%	16.3%	7.3%	12.9%	15.5%	15.8%
2015	5.3%	12.6%	15.2%	15.7%	4.7%	12.0%	14.6%	15.0%
2016	3.1%	11.9%	14.4%	14.4%	2.4%	11.1%	13.6%	13.6%
2017	1.2%	8.3%	10.8%	10.8%	0.4%	7.5%	10.0%	10.0%

Additional resources may be needed to meet the peak demands in the *Scenario Case* forecast, when considering Deliverable Resources, in 2014 — see Table VACAR-4. In order to meet the NERC Reference Margin Level in 2014, an additional 1,435 MW may be needed. By 2017, the need for more resources intensifies, with 5,415 MW needed to meet the NERC Reference Margin Level. Even with the addition of Adjusted Potential Resources the NERC Reference Margin Level would be not be met by 2017. An additional 3,635 MW of resources would be needed in 2017 for the *Scenario Case*.

Table VACAR-4: Planning Reserve Impacts	
When Considering Deliverable Resources	
Drops Below NERC Reference Reserve Margin Level in	2014
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	1,435
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	5,415
When Considering Prospective Resources	
Drops Below NERC Reference Reserve Margin Level in	2015
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level in 2015 — MW	299
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	3,635
When Considering Adjusted Potential Resources	
Drops Below NERC Reference Reserve Margin Level in	2016
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level in 2016 — MW	971
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	3,635

SPP

Resource projections (Table SPP-1) for the SPP subregion for 2010 through 2017 show Deliverable Resources increasing from 51,682 MW to 53,318 MW during the *Scenario* timeframe. Additionally, approximately 6,800 MW of Adjusted Potential Resources may be available by 2017.

The *Scenario Case* assumes a rapid increase in demand for the 2014 summer peak — see Figure SPP-1.

For 2014, peak demand projections in the *Scenario Case* represent approximately a 950 MW increase, or two percent, over the *Reference Case* — see Table SPP-2. For 2017, the increase in the *Scenario Case* is greater at 2,000 MW, or four percent.

Table SPP-1: Supply Resource Projections

Year	Existing-Certain Resources and Net Firm Transactions (MW)	Deliverable Resources (MW)	Prospective Resources (MW)	Adjusted Potential Resources (MW)
2010	49,687	51,682	58,172	58,230
2011	49,597	52,415	58,904	58,992
2012	49,646	53,074	59,561	59,678
2013	49,602	53,477	60,001	60,149
2014	49,516	53,391	59,915	60,092
2015	49,255	53,480	60,004	60,210
2016	49,119	53,344	59,868	60,104
2017	49,093	53,318	59,842	60,108

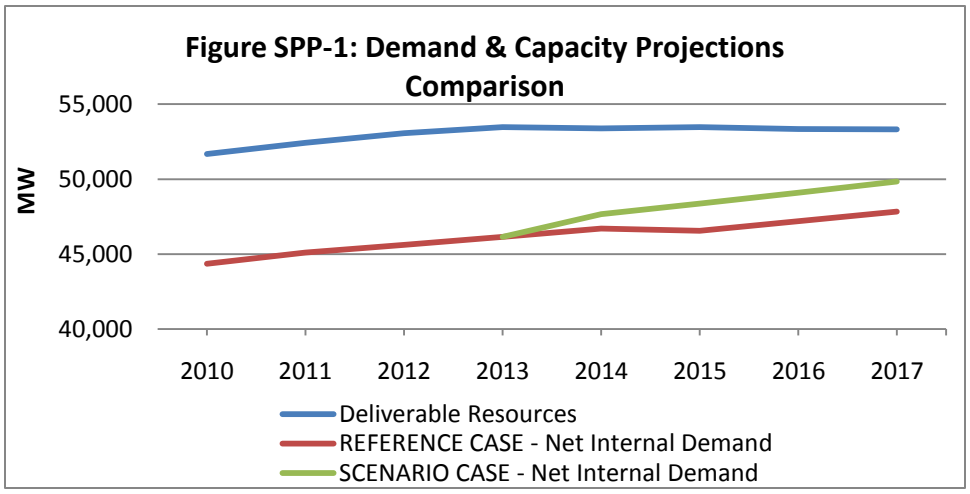


Table SPP-2: Demand Comparison Between *Reference* and *Scenario* Cases with a 2014 Inflection Point

Year	Annual Peak Net Internal Demand *Reference Case* (2009 Forecast)	Annual Peak Net Internal Demand *Scenario Case* (2008 Forecast)	Change in Annual Peak Net Internal Demand	Percent Change in *Scenario Case*
2014	46,699	47,655	955	2.05%
2017	47,846	49,853	2,007	4.19%

For the 2010 to 2017 assessment period in the *Reference Case*, SPP Reserve Margins are projected to be under the NERC Reference Margin Level by 2016 if only Deliverable Resources are added — see Figure SPP-2 and Table SPP-3. In the *Scenario Case*, considering the Deliverable Reserve Margin, the need for more resources would advance two years to 2014. However, with the addition of the Adjusted Potential Resources, SPP will remain above the NERC Reference Margin Level through the assessment timeframe.

Figure SPP-2: Reserve Margin Projections Comparison - 2014 Inflection Point

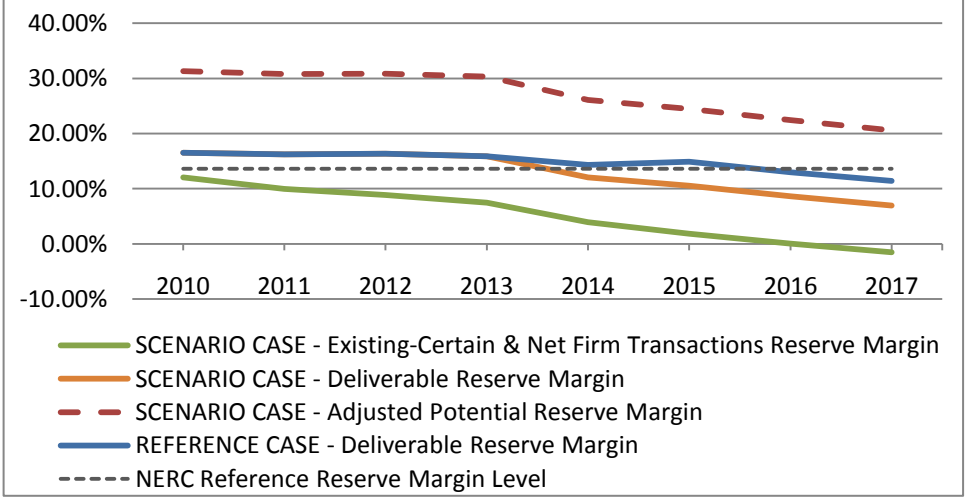


Table SPP-3: Projected Planning Reserve Margins for *Reference* and *Scenario* Cases

NERC Reference Margin Level 13.6%	*Reference Case*				*Scenario Case*			
	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin
2010	12.0%	16.5%	31.2%	31.3%	12.0%	16.5%	31.2%	31.3%
2011	10.0%	16.2%	30.6%	30.8%	10.0%	16.2%	30.6%	30.8%
2012	8.8%	16.4%	30.6%	30.8%	8.8%	16.4%	30.6%	30.8%
2013	7.5%	15.9%	30.0%	30.3%	7.5%	15.9%	30.0%	30.3%
2014	6.0%	14.3%	28.3%	28.7%	3.9%	12.0%	25.7%	26.1%
2015	5.8%	14.9%	28.9%	29.3%	1.8%	10.6%	24.0%	24.5%
2016	4.1%	13.0%	26.8%	27.3%	0.1%	8.7%	21.9%	22.4%
2017	2.6%	11.4%	25.1%	25.6%	-1.5%	6.9%	20.0%	20.6%

Additional resources may be needed to meet the peak demands in the *Scenario Case* forecast, when considering Deliverable Resources, in 2014 — see Table SPP-4. In order to meet the NERC Reference Margin Level in 2014, an additional 745 MW may be needed. By 2017, the need for more resources intensifies, with 3,315 MW needed to meet the NERC Reference Margin Level. However, with the addition of Adjusted Potential Resources, the NERC Reference Margin Level would be met through 2017.

Table SPP-4: Planning Reserve Impacts	
When Considering Deliverable Resources	
Drops Below NERC Reference Reserve Margin Level in	2014
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	745
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	3,315
When Considering Prospective Resources	
Drops Below NERC Reference Reserve Margin Level in	2017+
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	N/A
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	N/A
When Considering Adjusted Potential Resources	
Drops Below NERC Reference Reserve Margin Level in	2017+
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	N/A
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	N/A

TRE

Resource projections (Table TRE-1) for the TRE Region for 2010 through 2017 show Deliverable Resources increasing from 76,049 MW to 79,523 MW during the *Scenario* timeframe. Additionally, approximately 5,000 MW of Adjusted Potential Resources may be available by 2017.[20]

The *Scenario Case* assumes a rapid increase in demand for the 2014 summer peak — see Figure TRE-1.

For 2014, peak demand projections in the *Scenario Case* represent approximately a 1,700 MW increase, or 2.5 percent, over the *Reference Case* — see Table TRE-2. For 2017, the increase in the *Scenario Case* is slightly less at 1,400 MW, or two percent.

Table TRE-1: Supply Resource Projections

Year	Existing-Certain Resources and Net Firm Transactions (MW)	Deliverable Resources (MW)	Prospective Resources (MW)	Adjusted Potential Resources (MW)
2010	72,204	76,049	76,049	77,817
2011	72,204	76,714	76,714	79,985
2012	72,204	77,686	77,686	82,301
2013	72,204	79,521	79,521	84,617
2014	72,206	79,523	79,523	84,967
2015	72,206	79,523	79,523	84,967
2016	72,206	79,523	79,523	84,967
2017	72,206	79,523	79,523	84,967

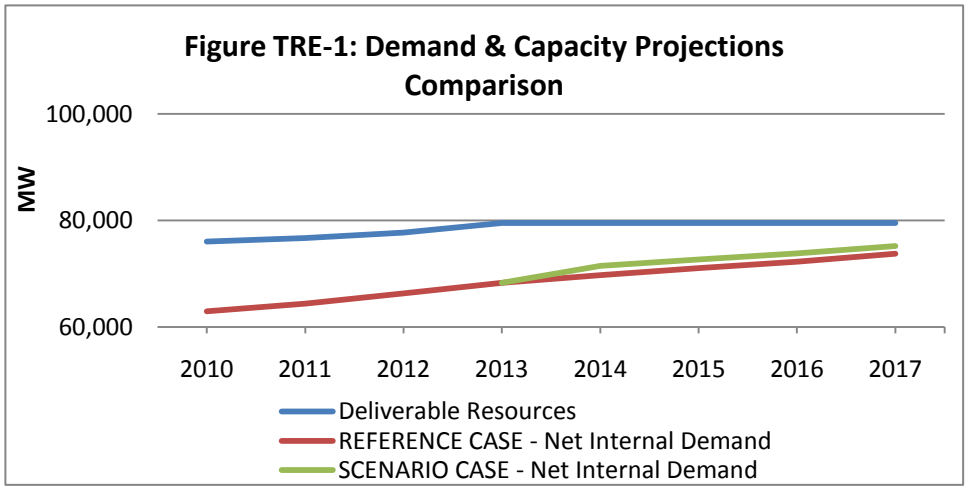


Table TRE-2: Demand Comparison Between *Reference* and *Scenario* Cases with a 2014 Inflection Point

Year	Annual Peak Net Internal Demand *Reference Case* (2009 Forecast)	Annual Peak Net Internal Demand *Scenario Case* (2008 Forecast)	Change in Annual Peak Net Internal Demand	Percent Change in *Scenario Case*
2014	69,722	71,453	1,731	2.48%
2017	73,756	75,201	1,445	1.96%

[20] This value is determined by the difference between Adjusted Potential Resources and Deliverable Resources (APR minus DR).

For the 2010 to 2017 assessment period in the *Reference Case*, TRE Reserve Margins are projected to be under the NERC Reference Margin Level by 2015 if only Deliverable Resources are added — see Figure TRE-2 and Table TRE-3. In the *Scenario Case*, when considering the Deliverable Reserve Margin, this projection would advance one year to 2014. However, with the addition of the Adjusted Potential Resources, TRE will remain above the NERC Reference Margin Level through the assessment timeframe of 2017, though appearing tighter in the latter years.

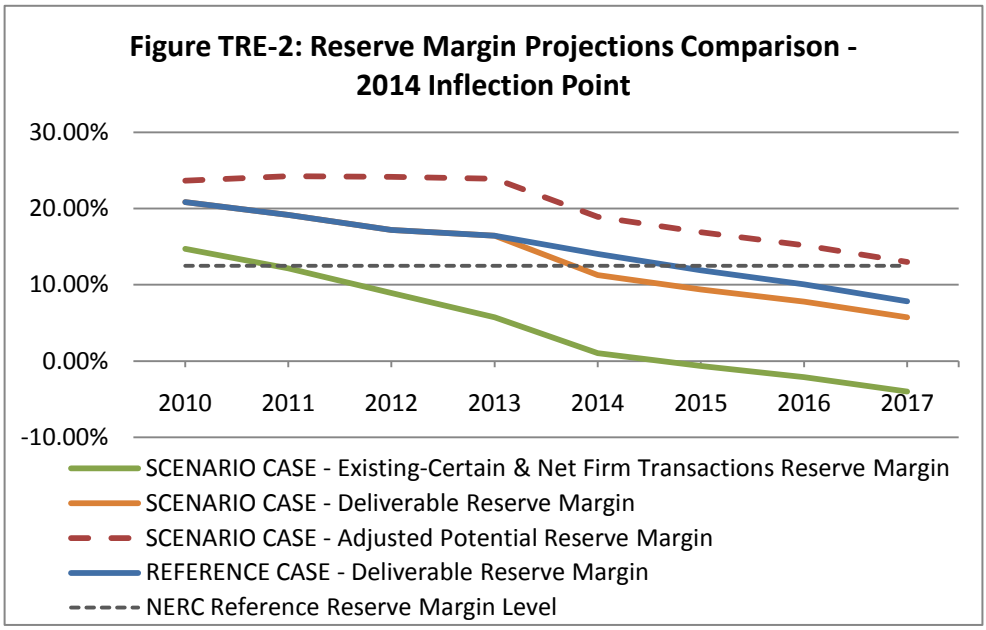


Table TRE-3: Projected Planning Reserve Margins for *Reference* and *Scenario* Cases

	Reference Case				*Scenario Case*			
NERC Reference Margin Level 12.5%	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin
2010	14.7%	20.8%	20.8%	23.6%	14.7%	20.8%	20.8%	23.6%
2011	12.2%	19.2%	19.2%	24.2%	12.2%	19.2%	19.2%	24.2%
2012	8.9%	17.2%	17.2%	24.2%	8.9%	17.2%	17.2%	24.2%
2013	5.7%	16.5%	16.5%	23.9%	5.7%	16.5%	16.5%	23.9%
2014	3.6%	14.1%	14.1%	21.9%	1.1%	11.3%	11.3%	18.9%
2015	1.6%	11.9%	11.9%	19.6%	-0.7%	9.4%	9.4%	16.9%
2016	-0.1%	10.1%	10.1%	17.6%	-2.1%	7.8%	7.8%	15.2%
2017	-2.1%	7.8%	7.8%	15.2%	-4.0%	5.7%	5.7%	13.0%

Additional resources may be needed to meet the peak demands in the *Scenario Case* forecast, when considering Deliverable and Prospective Resources, in 2014 — see Table TRE-4. In order to meet the NERC Reference Margin Level in 2014, an additional 862 MW may be needed. By 2017, the need for more resources intensifies, with 5,079 MW needed to meet the NERC Reference Margin Level. However, with the addition of Adjusted Potential Resources, the NERC Reference Margin Level would be met through 2017.

Table TRE-4: Planning Reserve Impacts	
When Considering Deliverable Resources	
Drops Below NERC Reference Reserve Margin Level in	2014
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	862
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	5,079
When Considering Prospective Resources	
Drops Below NERC Reference Reserve Margin Level in	2014
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	862
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	5,079
When Considering Adjusted Potential Resources	
Drops Below NERC Reference Reserve Margin Level in	2017+
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	N/A
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	N/A

WECC

For WECC, the U.S. and Canada portions are assessed separately, due to the peaking nature of each of these subregions. WECC-US is primarily a summer-peaking subregion (NWPP is winter-peaking), while WECC-Canada is a winter-peaking subregion.

For all WECC subregions, transfers in the *Scenario Case* were modeled using the *Scenario Case* peak demand data.[21] Therefore, the supply resources included in the reserve margin calculations for the *Scenario Case* are not identical to those in the 2009 Long-Term Reliability Assessment *Reference Case*.

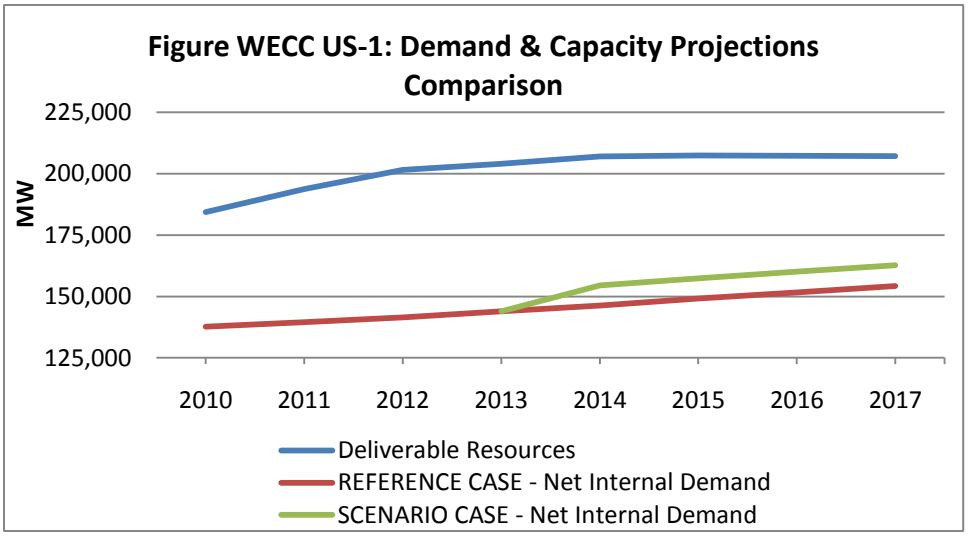
WECC US (United States)

Resource projections (Table WECC US-1) for the WECC-US subregion for 2010 through 2017 show Deliverable Resources increasing from 184,432 MW to 207,137 MW during the *Scenario* timeframe. Additionally, approximately 2,600 MW of Adjusted Potential Resources may be available by 2017.

The *Scenario Case* assumes a rapid increase in demand for the 2014 summer peak — see Figure WECC US-1.

Table WECC US-1: Supply Resource Projections

Year	Existing-Certain Resources and Net Firm Transactions (MW)	Deliverable Resources (MW)	Prospective Resources (MW)	Adjusted Potential Resources (MW)
2010	172,266	184,432	184,432	184,438
2011	173,051	193,787	193,787	193,941
2012	173,489	201,597	201,597	202,144
2013	172,192	204,058	204,058	205,307
2014	172,539	207,107	207,107	209,290
2015	171,882	207,477	207,477	210,040
2016	171,837	207,293	207,293	209,923
2017	171,801	207,137	207,137	209,727



[21] This assessment accounts for the inter-subregional market transactions that would be completed in anticipation of rapid demand growth. The use of the subregional transfers reported to NERC in the *2009 Long-Term Reliability Assessment* while disregarding the change in demand creates planning margin deficits in some subregions while creating extremely high margins in other subregions. For this reason, WECC has explicitly modeled the *Scenario Case* peak demands, thereby adjusting the transfers associated with the *2009 Long-Term Reliability Assessment* supply data.

For 2014, peak demand projections in the *Scenario Case* represent approximately an 8,300 MW increase, or 5.7 percent, over the *Reference Case* — see Table WECC US-2. For 2017, the increase in the *Scenario Case* is slightly greater at 8,500 MW, or 5.5 percent.

Table WECC US-2: Demand Comparison Between *Reference* and *Scenario* Cases with a 2014 Inflection Point

Year	Annual Peak Net Internal Demand *Reference Case* (2009 Forecast)	Annual Peak Net Internal Demand *Scenario Case* (2008 Forecast)	Change in Annual Peak Net Internal Demand	Percent Change in *Scenario Case*
2014	146,240	154,572	8,332	5.70%
2017	154,288	162,763	8,475	5.49%

For the 2010 to 2017 assessment period in the *Reference Case*, WECC US Reserve Margins are projected to remain above the NERC Reference Margin Level — see Figure WECC US-2 and Table WECC US-3. In the *Scenario Case*, when considering Deliverable, Prospective, and Adjusted Potential Reserve Margins, WECC US remains above the NERC Reference Margin Level through the assessment period.

Figure WECC US-2: Reserve Margin Projections Comparison - 2014 Inflection Point

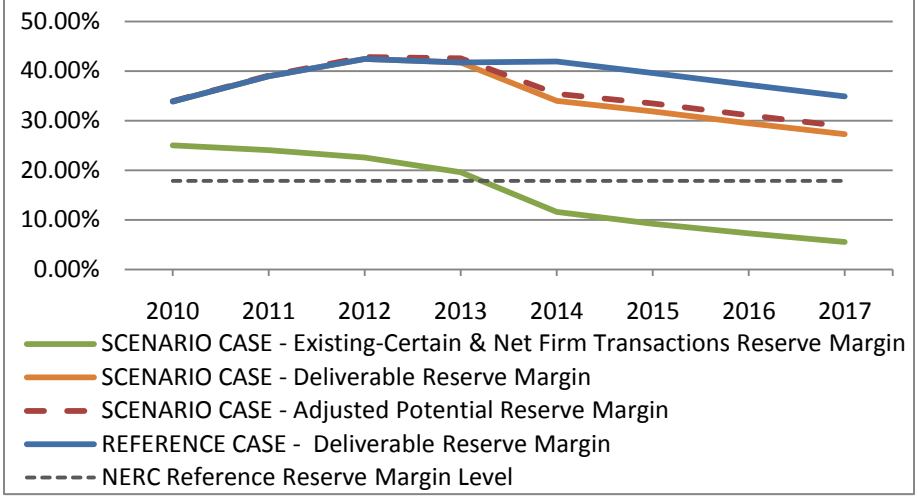


Table WECC US-3: Projected Planning Reserve Margins for *Reference* and *Scenario* Cases

NERC Reference Margin Level 17.9%	*Reference Case*				*Scenario Case*			
	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin
2010	25.1%	33.9%	33.9%	33.9%	25.1%	33.9%	33.9%	33.9%
2011	24.1%	39.0%	39.0%	39.1%	24.1%	39.0%	39.0%	39.1%
2012	22.6%	42.5%	42.5%	42.9%	22.6%	42.5%	42.5%	42.9%
2013	19.6%	41.7%	41.7%	42.6%	19.6%	41.7%	41.7%	42.6%
2014	18.1%	41.9%	41.9%	43.4%	11.6%	34.0%	34.0%	35.4%
2015	15.7%	39.6%	39.6%	41.3%	9.3%	31.9%	31.9%	33.5%
2016	13.8%	37.3%	37.3%	39.0%	7.3%	29.5%	29.5%	31.1%
2017	11.9%	34.9%	34.9%	36.6%	5.6%	27.3%	27.3%	28.9%

Additional resources may not be needed to meet the peak demands in the *Scenario Case* forecast.

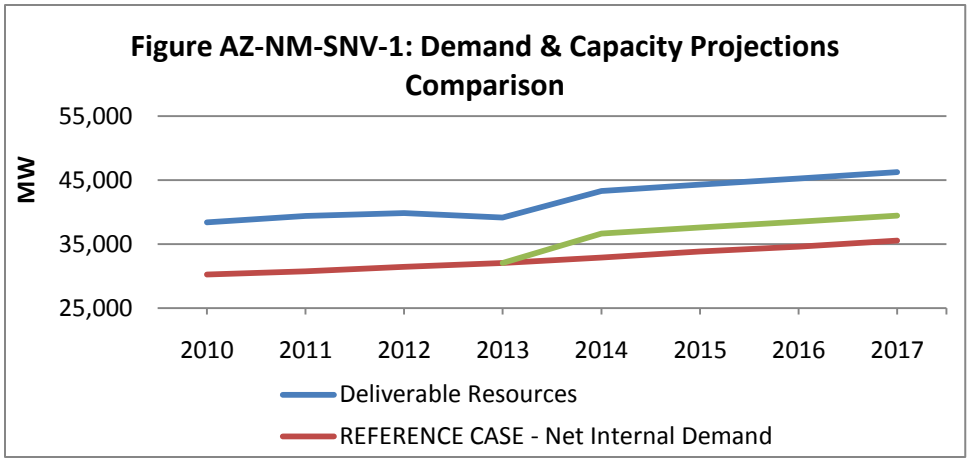
AZ-NM-SNV

Resource projections (Table AZ-NM-SNV-1) for the AZ-NM-SNV subregion for 2010 through 2017 show Deliverable Resources increasing from 38,395 MW to 46,225 MW during the *Scenario* timeframe. Additionally, approximately 1,100 MW of Adjusted Potential Resources may be available by 2017.

The *Scenario Case* assumes a rapid increase in demand for the 2014 summer peak — see Figure AZ-NM-SNV-1.

Table AZ-NM-SNV-1: Supply Resource Projections

Year	Existing-Certain Resources and Net Firm Transactions (MW)	Deliverable Resources (MW)	Prospective Resources (MW)	Adjusted Potential Resources (MW)
2010	35,707	38,395	38,395	38,395
2011	36,341	39,376	39,376	39,520
2012	36,496	39,822	39,822	40,057
2013	36,512	39,157	39,157	39,663
2014	37,014	43,294	43,294	44,051
2015	37,064	44,266	44,266	45,369
2016	37,117	45,216	45,216	46,336
2017	37,170	46,225	46,225	47,300



For 2014, peak demand projections in the *Scenario Case* represent approximately a 3,700 MW increase, or 11.2 percent, over the *Reference Case* — see Table AZ-NM-SNV-2. For 2017, the increase in the *Scenario Case* is slightly greater at 3,900 MW, or 11 percent.

Table AZ-NM-SNV-2: Demand Comparison Between *Reference* and *Scenario* Cases with a 2014 Inflection Point

Year	Annual Peak Net Internal Demand *Reference Case* (2009 Forecast)	Annual Peak Net Internal Demand *Scenario Case* (2008 Forecast)	Change in Annual Peak Net Internal Demand	Percent Change in *Scenario Case*
2014	32,926	36,627	3,701	11.24%
2017	35,547	39,442	3,895	10.96%

For the 2010 to 2017 assessment period in the *Reference Case*, AZ-NM-SNV Reserve Margins are projected to remain above the NERC Reference Margin Level — see Figure AZ-NM-SNV-2 and Table AZ-NM-SNV-3. In the *Scenario Case*, considering Deliverable Reserve Margin, the need for more resources would advance at least three years to 2015. However, with the addition of the Adjusted Potential Resources, AZ-NM-SNV will remain above the NERC Reference Margin Level through 2017, though tight in the latter years of the assessment timeframe.

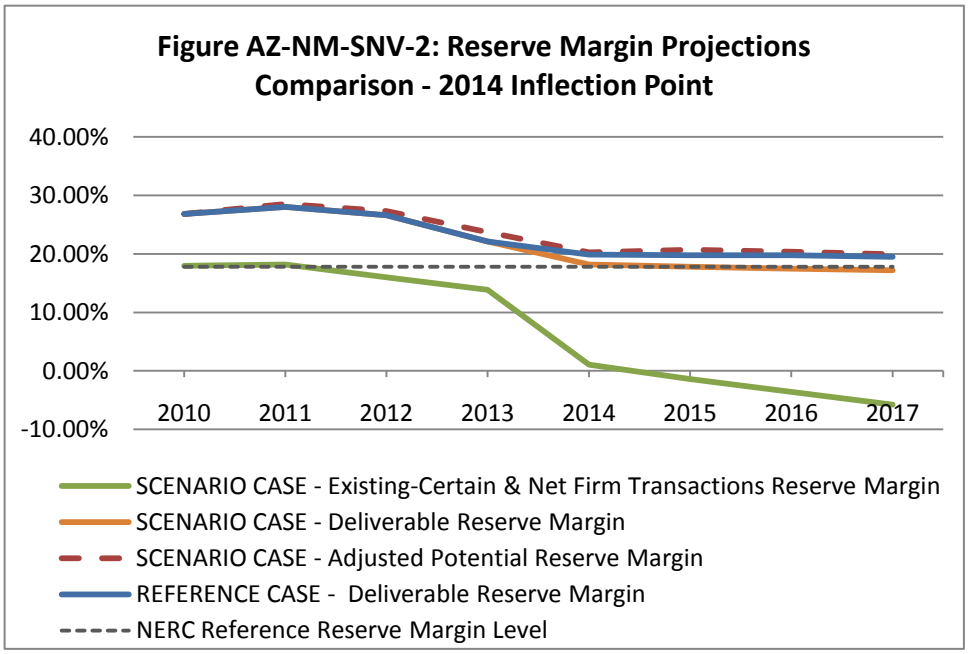


Table AZ-NM-SNV-3: Projected Planning Reserve Margins for *Reference* and *Scenario* Cases

	Reference Case				*Scenario Case*			
NERC Reference Margin Level 17.8%	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin
2010	18.0%	26.8%	26.8%	26.8%	18.0%	26.8%	26.8%	26.8%
2011	18.2%	28.0%	28.0%	28.5%	18.2%	28.0%	28.0%	28.5%
2012	16.0%	26.6%	26.6%	27.3%	16.0%	26.6%	26.6%	27.3%
2013	13.9%	22.1%	22.1%	23.7%	13.9%	22.1%	22.1%	23.7%
2014	10.7%	19.9%	19.9%	22.2%	1.1%	18.2%	18.2%	20.3%
2015	7.8%	19.8%	19.8%	23.0%	-1.4%	17.8%	17.8%	20.7%
2016	5.2%	19.8%	19.8%	23.0%	-3.6%	17.5%	17.5%	20.4%
2017	2.4%	19.5%	19.5%	22.5%	-5.8%	17.2%	17.2%	19.9%

Additional resources may be needed to meet the peak demands in the *Scenario Case* forecast, when considering Deliverable Resources, in 2014 — see Table AZ-NM-SNV-4. In order to meet the NERC Reference Margin Level in 2015, an additional 7 MW may be needed. By 2017, the need for more resources intensifies, with 238 MW needed to meet the NERC Reference Margin Level. However, with the addition of Adjusted Potential Resources, the NERC Reference Margin Level would be met through 2017.

Table AZ-NM-SNV-4: Planning Reserve Impacts	
When Considering Deliverable Resources	
Drops Below NERC Reference Reserve Margin Level in	2015
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level in 2015 — MW	7
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	238
When Considering Prospective Resources	
Drops Below NERC Reference Reserve Margin Level in	2015
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level in 2015 — MW	7
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	238
When Considering Adjusted Potential Resources	
Drops Below NERC Reference Reserve Margin Level in	2017+
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	N/A
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	N/A

CA-MX US

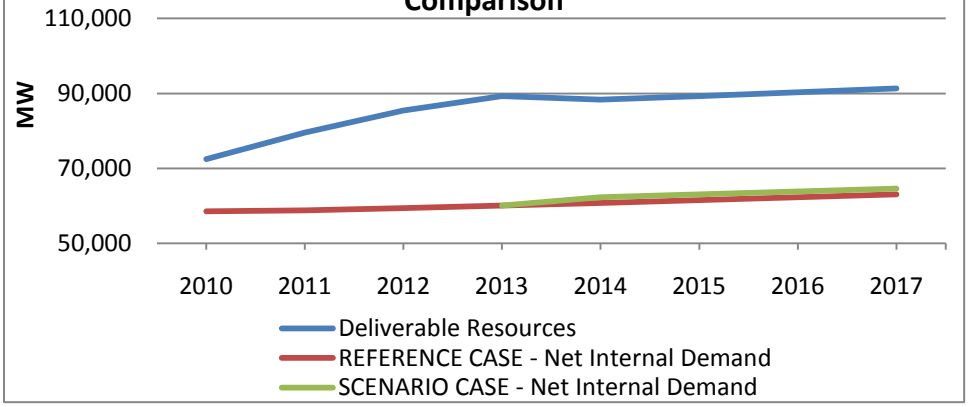
Resource projections (Table CA-MX US-1) for the CA-MX US subregion for 2010 through 2017 show Deliverable Resources increasing from 72,514 MW to 91,314 MW during the *Scenario* timeframe. CA-MX US does not include Adjusted Potential Resources in their forecast, and therefore, there is no impact on Adjusted Potential Resources.

The *Scenario Case* assumes a slight increase in demand for the 2014 summer peak — see Figure CA-MX US-1.

Table CA-MX US-1: Supply Resource Projections

Year	Existing-Certain Resources and Net Firm Transactions (MW)	Deliverable Resources (MW)	Prospective Resources (MW)	Adjusted Potential Resources (MW)
2010	72,374	72,514	72,514	72,514
2011	72,821	79,593	79,593	79,593
2012	71,622	85,476	85,476	85,476
2013	71,622	89,293	89,293	89,293
2014	72,899	88,325	88,325	88,325
2015	72,849	89,289	89,289	89,289
2016	72,771	90,322	90,322	90,322
2017	72,718	91,314	91,314	91,314

Figure CA-MX US-1: Demand & Capacity Projections Comparison



For 2014, peak demand projections in the *Scenario Case* represent approximately a 1,500 MW increase, or 2.5 percent, over the *Reference Case* — see Table CA-MX-2. For 2017, the increase in the *Scenario Case* remains flat at 1,500 MW, or 2.4 percent. [22]

Table CA-MX US-2: Demand Comparison Between *Reference* and *Scenario* Cases with a 2014 Inflection Point

Year	Annual Peak Net Internal Demand *Reference Case* (2009 Forecast)	Annual Peak Net Internal Demand *Scenario Case* (2008 Forecast)	Change in Annual Peak Net Internal Demand	Percent Change in *Scenario Case*
2014	60,788	62,305	1,517	2.50%
2017	63,104	64,598	1,494	2.37%

For the 2010 to 2017 assessment period in the *Reference Case*, CA-MX US Reserve Margins are projected to be above the NERC Reference Margin Level — see Figure CA-MX US-2 and Table CA-MX-3. When considering Deliverable, Prospective, and Adjusted Potential Reserve Margins, CA-MX US will remain above the NERC Reference Margin Level through the assessment timeframe of 2017 in the *Scenario Case*.

[22] The lesser percentage is due to the higher growth rate in the *Scenario Case*.

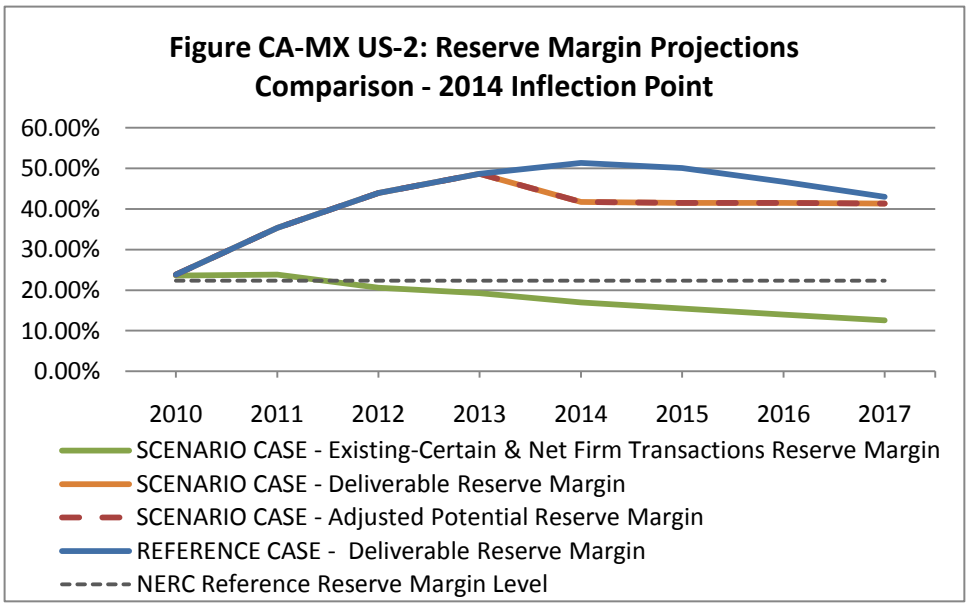


Table CA-MX US-3: Projected Planning Reserve Margins for *Reference* and *Scenario* Cases

	Reference Case				*Scenario Case*			
NERC Reference Margin Level 22.3%	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin
2010	23.6%	23.8%	23.8%	23.8%	23.6%	23.8%	23.8%	23.8%
2011	23.9%	35.4%	35.4%	35.4%	23.9%	35.4%	35.4%	35.4%
2012	20.6%	43.9%	43.9%	43.9%	20.6%	43.9%	43.9%	43.9%
2013	19.2%	48.6%	48.6%	48.6%	19.2%	48.6%	48.6%	48.6%
2014	17.8%	51.3%	51.3%	51.3%	17.0%	41.8%	41.8%	41.8%
2015	16.3%	50.1%	50.1%	50.1%	15.5%	41.5%	41.5%	41.5%
2016	14.9%	46.7%	46.7%	46.7%	14.0%	41.5%	41.5%	41.5%
2017	13.5%	43.0%	43.0%	43.0%	12.6%	41.4%	41.4%	41.4%

Additional resources may not be needed to meet the peak demands in the *Scenario Case* forecast.

NWPP

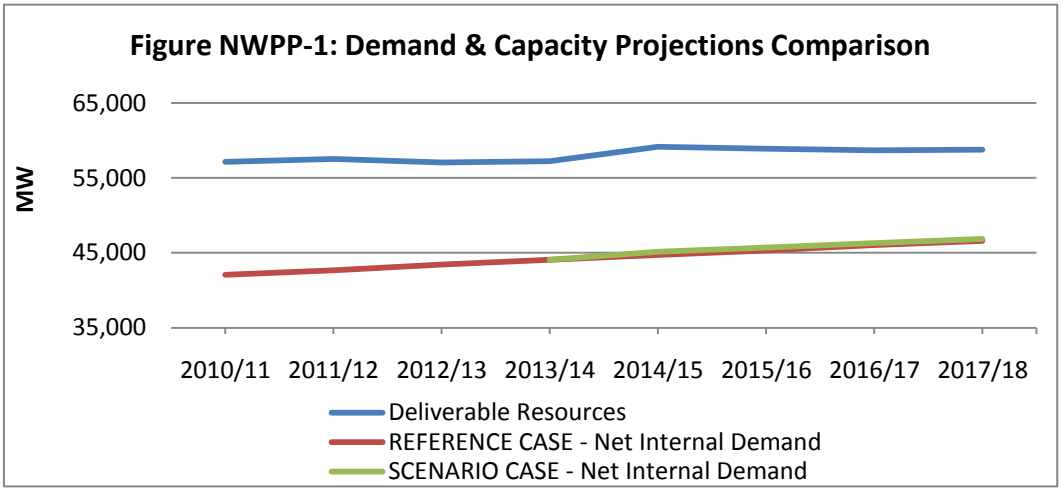
Resource projections (Table NWPP-1) for the NWPP subregion for 2010/2011 through 2017/2018 show Deliverable Resources increasing from 57,139 MW to 57,636 MW during the *Scenario* timeframe. Additionally, approximately 500 MW of Adjusted Potential Resources may be available by 2017/2018.

The *Scenario Case* assumes a slight increase in demand for the 2014/2015 winter — see Figure NWPP-1.

Table NWPP-1: Supply Resource Projections

Year	Existing-Certain Resources and Net Firm Transactions (MW)	Deliverable Resources (MW)	Prospective Resources (MW)	Adjusted Potential Resources (MW)
2010/2011	55,817	57,139	57,139	57,149
2011/2012	56,119	57,529	57,529	57,543
2012/2013	55,417	57,056	57,056	57,071
2013/2014	55,673	57,240	57,240	57,353
2014/2015	55,956	57,449	57,449	57,941
2015/2016	56,325	57,546	57,546	58,061
2016/2017	56,600	57,687	57,687	58,196
2017/2018	56,577	57,636	57,636	58,148

Figure NWPP-1: Demand & Capacity Projections Comparison



For 2014/2015, peak demand projections in the *Scenario Case* represent approximately a 400 MW increase, or one percent, over the *Reference Case* — see Table NWPP-2. For 2017/2018, the increase in the *Scenario Case* is slightly less, at 275 MW, or 0.6 percent.

Table NWPP-2: Demand Comparison Between *Reference* and *Scenario* Cases with a 2014/2015 Inflection Point

Year	Annual Peak Net Internal Demand *Reference Case* (2009 Forecast)	Annual Peak Net Internal Demand *Scenario Case* (2008 Forecast)	Change in Annual Peak Net Internal Demand	Percent Change in *Scenario Case*
2014/2015	44,713	45,127	414	0.93%
2017/2018	46,582	46,858	276	0.59%

For the 2010/2011 to 2017/2018 assessment period in the *Reference Case*, NWPP Reserve Margins are projected to be above the NERC Reference Margin Level — see Figure NWPP-2 and Table NWPP-3. When considering Deliverable, Prospective, and Adjusted Potential Reserve Margins, NWPP will remain above the NERC Reference Margin Level through the assessment timeframe of 2017/2018 in the *Scenario Case*.

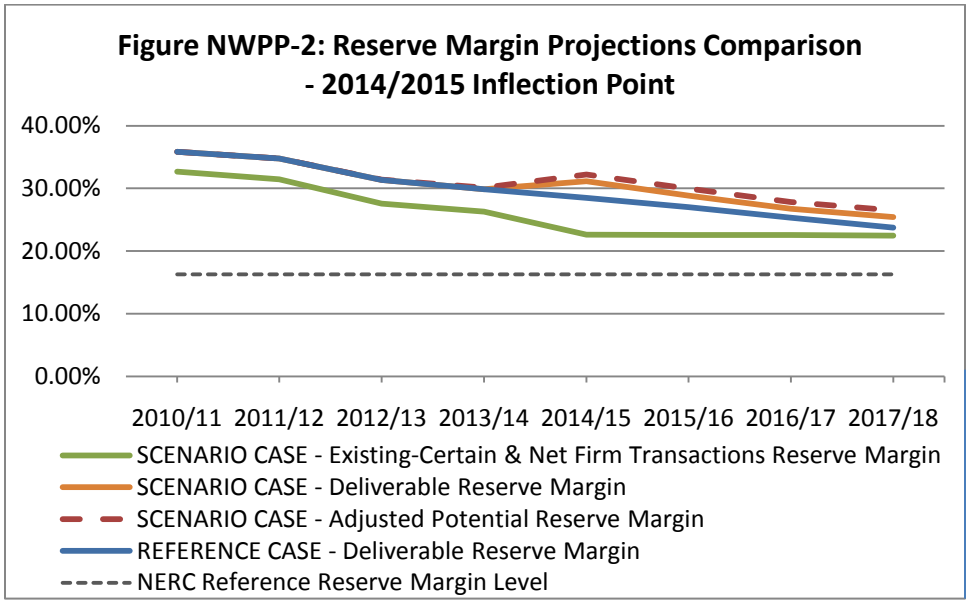


Table NWPP-3: Projected Planning Reserve Margins for *Reference* and *Scenario* Cases

	Reference Case				*Scenario Case*			
NERC Reference Margin Level 16.3%	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin
2010/2011	32.7%	35.8%	35.8%	35.9%	32.7%	35.8%	35.8%	35.9%
2011/2012	31.5%	34.8%	34.8%	34.8%	31.5%	34.8%	34.8%	34.8%
2012/2013	27.6%	31.4%	31.4%	31.4%	27.6%	31.4%	31.4%	31.4%
2013/2014	26.3%	29.9%	29.9%	30.1%	26.3%	29.9%	29.9%	30.1%
2014/2015	25.1%	28.5%	28.5%	29.6%	24.0%	27.3%	27.3%	28.4%
2015/2016	24.3%	27.0%	27.0%	28.2%	23.2%	25.9%	25.9%	27.0%
2016/2017	23.0%	25.3%	25.3%	26.4%	22.2%	24.5%	24.5%	25.6%
2017/2018	21.5%	23.7%	23.7%	24.8%	20.7%	23.0%	23.0%	24.1%

Additional resources may not be needed to meet the peak demands in the *Scenario Case* forecast.

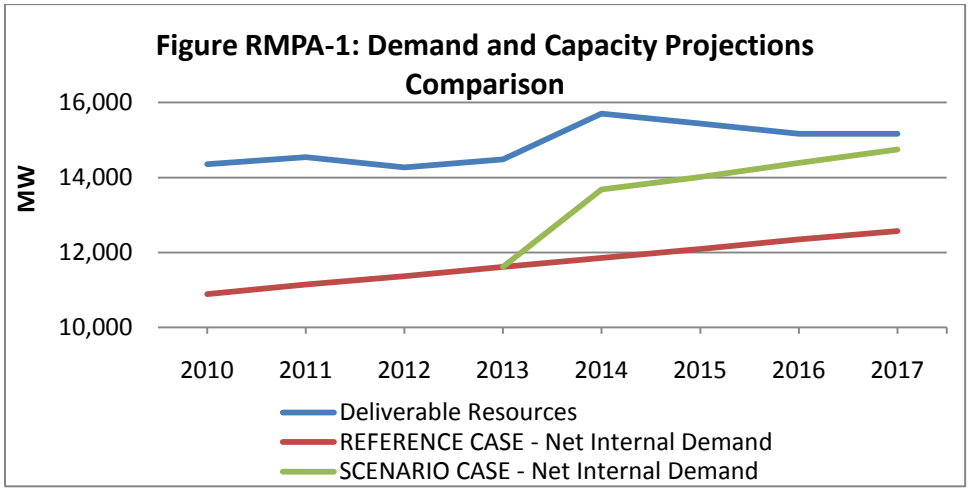
RMPA

Resource projections (Table RMPA-1) for the RMPA subregion for 2010 through 2017 show Deliverable Resources increasing from 14,355 MW to 15,171 MW during the *Scenario* timeframe. Additionally, approximately 1,100 MW of Adjusted Potential Resources may be available by 2017.

The *Scenario Case* assumes a rapid increase in demand for the 2014 summer peak — see Figure RMPA-1.

Table RMPA-1: Supply Resource Projections

Year	Existing-Certain Resources and Net Firm Transactions (MW)	Deliverable Resources (MW)	Prospective Resources (MW)	Adjusted Potential Resources (MW)
2010	12,871	14,355	14,355	14,355
2011	13,244	14,548	14,548	14,548
2012	13,563	14,268	14,268	14,566
2013	13,853	14,483	14,483	15,131
2014	13,372	15,708	15,708	16,707
2015	13,372	15,437	15,437	16,443
2016	13,372	15,171	15,171	16,209
2017	13,372	15,171	15,171	16,205



For 2014, peak demand projections in the *Scenario Case* represent approximately a 1,800 MW increase, or 15.4 percent, over the *Reference Case* — see Table RMPA-2. For 2017, the increase in the *Scenario Case* is slightly greater at 2,200 MW, or 17.3 percent.

Table RMPA-2: Demand Comparison Between *Reference* and *Scenario* Cases with a 2014 Inflection Point

Year	Annual Peak Net Internal Demand *Reference Case* (2009 Forecast)	Annual Peak Net Internal Demand *Scenario Case* (2008 Forecast)	Change in Annual Peak Net Internal Demand	Percent Change in *Scenario Case*
2014	11,860	13,681	1,821	15.35%
2017	12,574	14,747	2,173	17.28%

For the 2010 to 2017 assessment period in the *Reference Case*, RMPA Reserve Margins are projected to be under the NERC Reference Margin Level by 2015 if only Deliverable Resources are added — see Figure RMPA-2 and Table RMPA-3. In the *Scenario Case*, considering the Deliverable Reserve Margin, the need for more resources would advance at least one year to 2014. Even with the addition of the Adjusted Potential Resources, RMPA will fall below the NERC Reference Margin Level in 2016, to 9.9 percent in 2017.

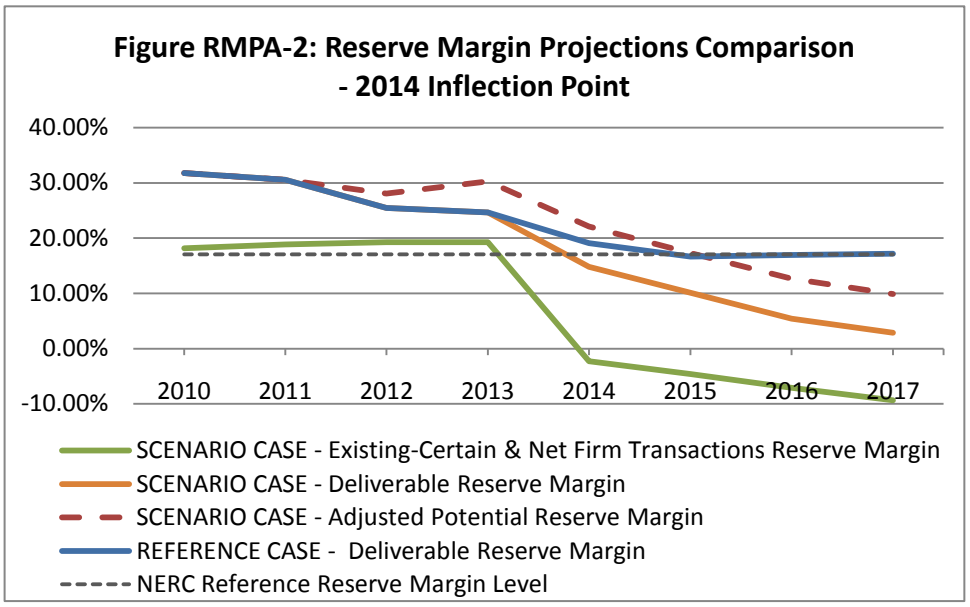


Table RMPA-3: Projected Planning Reserve Margins for *Reference* and *Scenario* Cases

	Reference Case				*Scenario Case*			
NERC Reference Margin Level 17.1%	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin
2010	18.1%	31.8%	31.8%	31.8%	18.1%	31.8%	31.8%	31.8%
2011	18.8%	30.5%	30.5%	30.5%	18.8%	30.5%	30.5%	30.5%
2012	19.3%	25.5%	25.5%	28.1%	19.3%	25.5%	25.5%	28.1%
2013	19.3%	24.7%	24.7%	30.3%	19.3%	24.7%	24.7%	30.3%
2014	16.8%	19.1%	19.1%	27.5%	-2.3%	14.8%	14.8%	22.1%
2015	14.5%	16.6%	16.6%	25.0%	-4.6%	10.1%	10.1%	17.3%
2016	12.1%	16.9%	16.9%	25.3%	-7.1%	5.4%	5.4%	12.6%
2017	10.2%	17.2%	17.2%	25.4%	-9.3%	2.9%	2.9%	9.9%

Additional resources may be needed to meet the peak demands in the *Scenario Case* forecast, when considering Deliverable Resources, in 2014 — see Table RMPA-4. In order to meet the NERC Reference Margin Level in 2014, an additional 312 MW may be needed. By 2017, the need for more resources intensifies, with 2,098 MW needed to meet the NERC Reference Margin Level. Even with the addition of Adjusted Potential Resources, the NERC Reference Margin Level would not be met through 2017. An additional 1,063 MW of resources would be needed in 2017 for the *Scenario Case*.

Table RMPA-4: Planning Reserve Impacts	
When Considering Deliverable Resources	
Drops Below NERC Reference Reserve Margin Level in	2014
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	312
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	2,098
When Considering Prospective Resources	
Drops Below NERC Reference Reserve Margin Level in	2014
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	312
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	2,098
When Considering Adjusted Potential Resources	
Drops Below NERC Reference Reserve Margin Level in	2016
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level in 2016 — MW	641
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	1,063

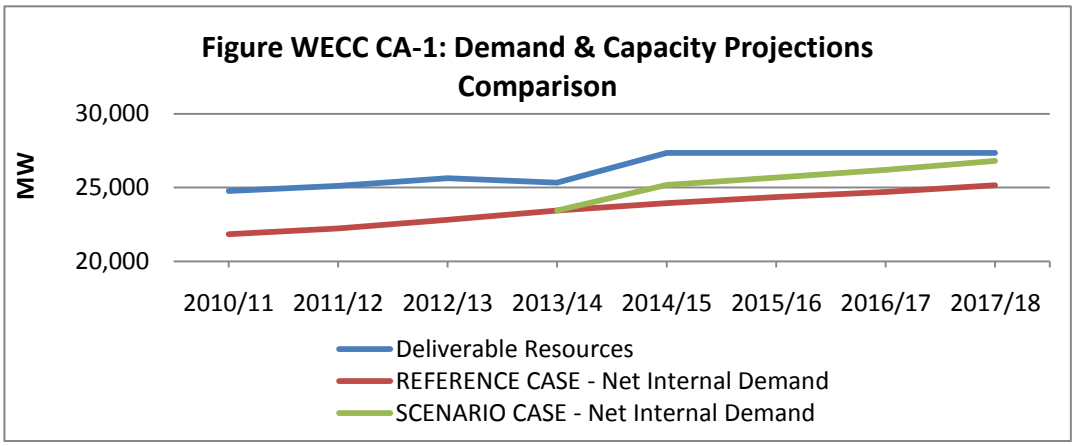
WECC CA (Canada)

Resource projections (Table WECC CA-1) for the WECC-Canada subregion for 2010/2011 through 2017/2018 show Deliverable Resources increasing from 24,769 MW to 27,335 MW during the *Scenario* timeframe. Additionally, approximately 3,500 MW of Adjusted Potential Resources may be available by 2017/2018.[23]

The *Scenario Case* assumes a rapid increase in demand for the 2014/2015 winter peak — see Figure WECC CA-1.

Table WECC CA-1: Supply Resource Projections

Year	Existing-Certain Resources and Net Firm Transactions (MW)	Deliverable Resources (MW)	Prospective Resources (MW)	Adjusted Potential Resources (MW)
2010/2011	24,354	24,769	24,769	24,769
2011/2012	23,805	25,110	25,110	25,330
2012/2013	24,365	25,631	25,631	26,188
2013/2014	24,352	25,335	25,335	26,520
2014/2015	25,311	27,335	27,335	29,154
2015/2016	25,311	27,335	27,335	29,777
2016/2017	25,311	27,335	27,335	30,320
2017/2018	25,311	27,335	27,335	30,817



For 2014/2015, peak demand projections in the *Scenario Case* represent approximately a 1,200 MW increase, or 5.1 percent, over the *Reference Case* — see Table WECC CA-2. For 2017/2018, the increase in the *Scenario Case* is slightly greater at 1,600 MW, or 6.6 percent.

Table WECC CA-2: Demand Comparison Between *Reference* and *Scenario* Cases with a 2014/2015 Inflection Point

Year	Annual Peak Net Internal Demand *Reference Case* (2009 Forecast)	Annual Peak Net Internal Demand *Scenario Case* (2008 Forecast)	Change in Annual Peak Net Internal Demand	Percent Change in *Scenario Case*
2014/2015	23,948	25,173	1,225	5.12%
2017/2018	25,148	26,796	1,648	6.55%

[23] *Scenario Case* resource data was provided by WECC. These resources do not equal those in the *2009 Long-Term Reliability Assessment Reference Case*. Increased transfers were assumed to be provided to the WECC CA subregion under the *Scenario Case*. Therefore as demand increases in the *Scenario Case*, Reserve Margins increased as well, due to available resources being acquired through a transfer from a neighboring system.

For the 2010/2011 to 2017/2018 assessment period in the *Reference Case*, WECC CA Reserve Margins are projected to be under the NERC Reference Margin Level by 2013/2014 if only Deliverable Resources are added — see Figure WECC CA-2 and Table WECC CA-3. In the *Scenario Case*, the Deliverable Reserve Margins, already below the NERC Reference Margin Level, are further reduced, exacerbating potential reliability issues in 2014/2015. However, with the addition of Adjusted Potential Resources, the NERC Reference Margin Level would be met through 2017/2018.

Figure WECC CA-2: Reserve Margin Projections Comparison - 2014/2015 Inflection Point

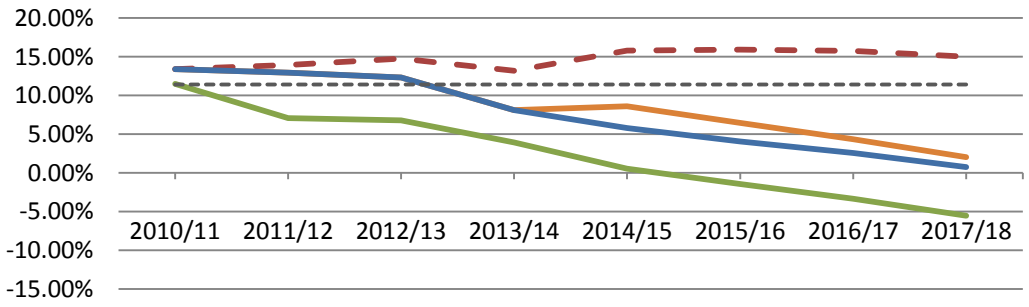


Table WECC CA-3: Projected Planning Reserve Margins for *Reference* and *Scenario* Cases

	Reference Case				*Scenario Case*			
NERC Reference Margin Level 11.5%	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin
2010/2011	11.5%	13.4%	13.4%	13.4%	11.5%	13.4%	13.4%	13.4%
2011/2012	7.1%	13.0%	13.0%	14.0%	7.1%	13.0%	13.0%	14.0%
2012/2013	6.8%	12.3%	12.3%	14.8%	6.8%	12.3%	12.3%	14.8%
2013/2014	3.9%	8.1%	8.1%	13.2%	3.9%	8.1%	8.1%	13.2%
2014/2015	1.4%	5.8%	5.8%	13.4%	0.5%	8.6%	8.6%	15.8%
2015/2016	-1.0%	4.0%	4.0%	14.1%	-1.4%	6.4%	6.4%	15.9%
2016/2017	-3.0%	2.6%	2.6%	14.6%	-3.4%	4.4%	4.4%	15.8%
2017/2018	-4.9%	0.7%	0.7%	14.6%	-5.5%	2.0%	2.0%	15.0%

Additional resources may be needed to meet the peak demands in the *Scenario Case* forecast, when considering Deliverable Resources, in 2013/2014 — see Table WECC CA-4. In order to meet the NERC Reference Margin Level in 2014/2015, an additional 708 MW may be needed. By 2017/2018, the need for more resources intensifies, with 2,516 MW needed to meet the NERC Reference Margin Level. However, with the addition of Adjusted Potential Resources, the NERC Reference Margin Level would be met through 2017/2018.

Table WECC CA-4: Planning Reserve Impacts	
When Considering Deliverable Resources	
Drops Below NERC Reference Reserve Margin Level in	2014
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	708
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	2,516
When Considering Prospective Resources	
Drops Below NERC Reference Reserve Margin Level in	2014
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	708
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	2,516
When Considering Adjusted Potential Resources	
Drops Below NERC Reference Reserve Margin Level in	2017+
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	N/A
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	N/A

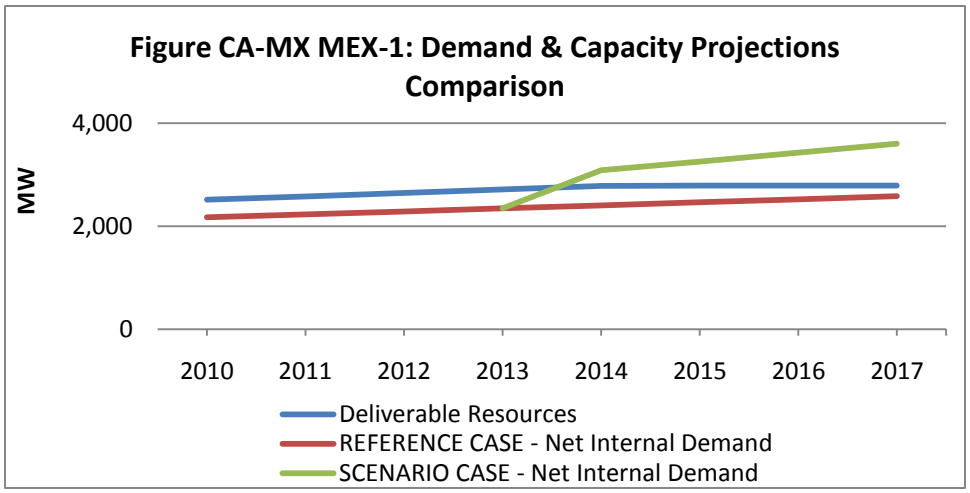
CA-MX MEX (México)

Resource projections (Table CA-MX MEX-1) for the CA-MX-México subregion for 2010 through 2017 show Deliverable Resources increasing from 2,512 MW to 2,788 MW during the *Scenario* timeframe. Additionally, approximately 600 MW of Adjusted Potential Resources may be available by 2017.

The *Scenario Case* assumes a rapid increase in demand for the 2014 summer peak — see Figure CA-MX MEX-1.

Table CA-MX MEX-1: Supply Resource Projections

Year	Existing-Certain Resources and Net Firm Transactions (MW)	Deliverable Resources (MW)	Prospective Resources (MW)	Adjusted Potential Resources (MW)
2010	2,512	2,512	2,512	2,512
2011	2,287	2,579	2,579	2,579
2012	2,287	2,646	2,646	2,959
2013	2,287	2,713	2,713	3,026
2014	2,287	2,779	2,788	3,101
2015	2,287	2,788	2,788	3,101
2016	2,287	2,788	2,788	3,381
2017	2,287	2,788	2,788	3,381



For 2014, peak demand projections in the *Scenario Case* represent approximately a 684 MW increase, or 28.5 percent, over the *Reference Case* — see Table CA-MX MEX-2. For 2017, the increase in the *Scenario Case* is greater, at 1,000 MW, or 39 percent.

Table CA-MX MEX-2: Demand Comparison Between *Reference* and *Scenario* Cases with a 2014 Inflection Point

Year	Annual Peak Net Internal Demand *Reference Case* (2009 Forecast)	Annual Peak Net Internal Demand *Scenario Case* (2008 Forecast)	Change in Annual Peak Net Internal Demand	Percent Change in *Scenario Case*
2014	2,402	3,086	684	28.48%
2017	2,586	3,598	1,012	39.13%

For the 2010 to 2017 assessment period in the *Reference Case*, WECC CA Reserve Margins are projected to be under the NERC Reference Margin Level by 2013 if only Deliverable Resources are added — see Figure CA-MX MEX-2 and Table CA-MX MEX-3. In the *Scenario Case*, the Deliverable Reserve Margins, already below the NERC Reference Margin Level, are further reduced, exacerbating potential reliability issues in 2014 to below zero values. Even with the

addition of the Adjusted Potential Resources, CA-MX MEX will fall significantly below the NERC Reference Margin Level in 2014, to minus six percent in 2017.

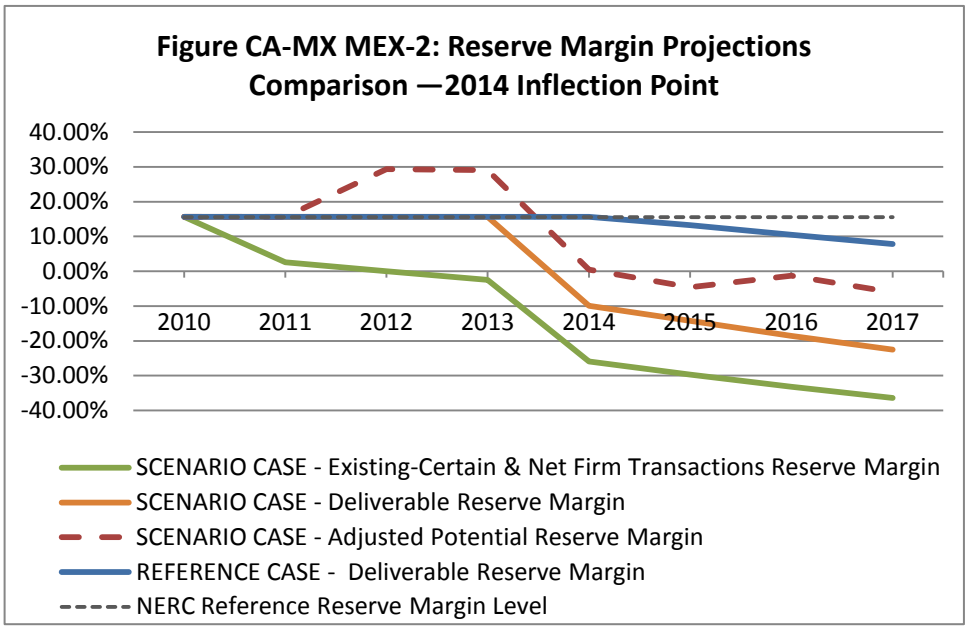


Table CA-MX MEX-3: Projected Planning Reserve Margins for *Reference* and *Scenario* Cases

	Reference Case				*Scenario Case*			
NERC Reference Margin Level 15.6%	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin	Existing-Certain Resources and Net Firm Transactions Reserve Margin	Deliverable Resources Reserve Margin	Prospective Resources Reserve Margin	Adjusted Potential Resources Reserve Margin
2010	15.7%	15.7%	15.7%	15.7%	15.7%	15.7%	15.7%	15.7%
2011	2.6%	15.7%	15.7%	15.7%	2.6%	15.7%	15.7%	15.7%
2012	0.0%	15.7%	15.7%	29.4%	0.0%	15.7%	15.7%	29.4%
2013	-2.5%	15.7%	15.7%	29.0%	-2.5%	15.7%	15.7%	29.0%
2014	-4.8%	15.7%	15.7%	28.7%	-25.9%	-9.9%	-9.7%	0.5%
2015	-7.1%	13.2%	13.2%	26.0%	-29.7%	-14.2%	-14.2%	-4.6%
2016	-9.4%	10.5%	10.5%	34.0%	-33.2%	-18.6%	-18.6%	-1.3%
2017	-11.6%	7.8%	7.8%	30.7%	-36.4%	-22.5%	-22.5%	-6.0%

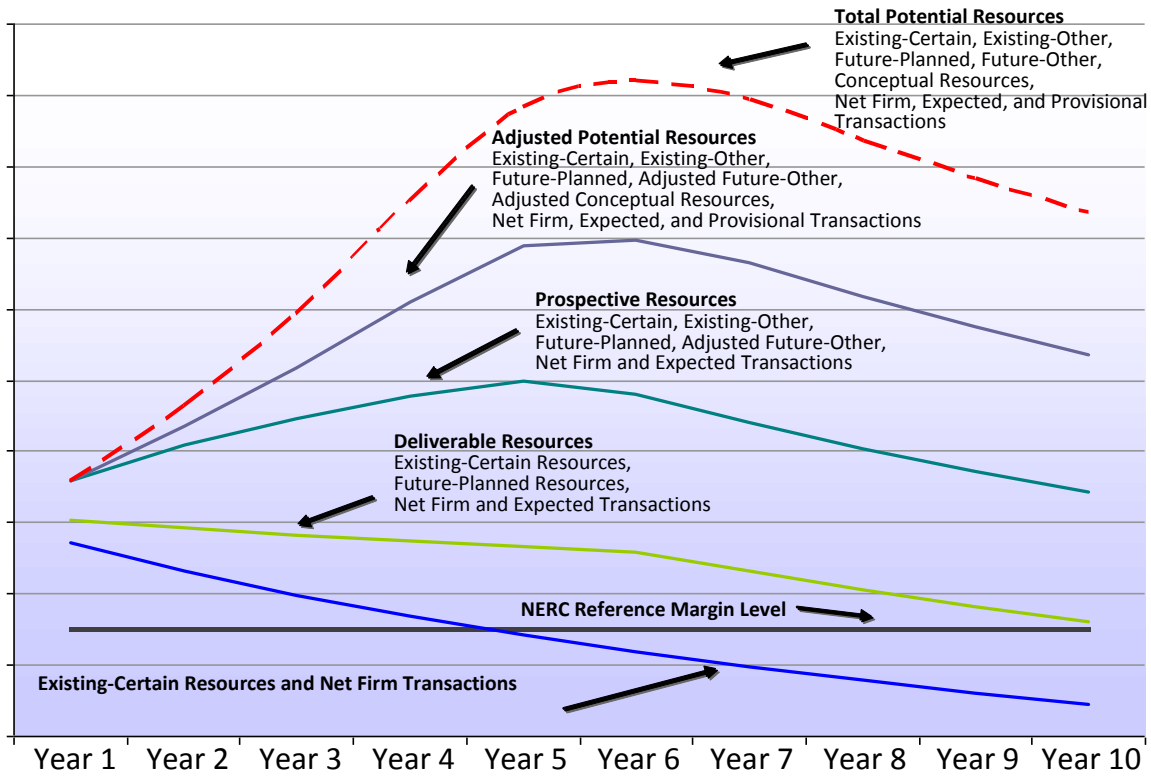
Additional resources may be needed to meet the peak demands in the *Scenario Case* forecast, when considering Deliverable Resources, in 2014 — see Table CA-MX MEX-4. In order to meet the NERC Reference Margin Level in 2014, an additional 788 MW may be needed. By 2017, the need for more resources intensifies, with 1,371 MW needed to meet the NERC Reference Margin Level. Even with the addition of Adjusted Potential Resources, the NERC Reference Margin Level would not be met through 2017. An additional 778 MW of resources would be needed in 2017 for the *Scenario Case*.

Table CA-MX MEX-4: Planning Reserve Impacts	
When Considering Deliverable Resources	
Drops Below NERC Reference Reserve Margin Level in	2014
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	788
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	1,371
When Considering Prospective Resources	
Drops Below NERC Reference Reserve Margin Level in	2014
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	779
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	1,371
When Considering Adjusted Potential Resources	
Drops Below NERC Reference Reserve Margin Level in	2014
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at Inflection Point (2014) — MW	466
Additional Capacity Needed to Meet NERC Reference Reserve Margin Level at End of Analysis (2017) — MW	778

Terms Used in This Report

Planning Reserve Margin Categories:

Figure Margins 1: Example — Margins Chart, including Definitions



Adjusted Potential Capacity Resources — The sum of Deliverable Capacity Resources, Existing Other Resources, Future Other Resources (reduced by a confidence factor), Adjusted Potential Resources (reduced by a confidence factor), and net provisional transactions minus all derates. (MW)

Adjusted Potential Reserve Margin (%) — The sum of Deliverable Capacity Resources, Existing Other Resources, Future Other Resources (reduced by a confidence factor), Adjusted Potential Resources (reduced by a confidence factor), and net provisional transactions, minus all derates and Net Internal Demand, shown as a percentage of Net Internal Demand.

Capacity Categories — *See **Existing Generation Resources, Future Generation Resources,** and **Conceptual Generation Resources**.*

Conceptual Generation Resources — This category includes generation resources that are not included in *Existing Generation Resources* or *Future Generation Resources*, but have been identified and/or announced on a resource planning basis through one or more of the following sources:

1. Corporate announcement
2. Entered into, or in the early stages of, an approval process
3. In a generator interconnection (or other) queue for study
4. "Place-holder" generation for use in modeling, such as generator modeling needed to support NERC Standard TPL analysis, as well as integrated resource planning resource studies.

Resources included in this category may be adjusted using a confidence factor (%) to reflect uncertainties associated with siting, project development, or queue position.

Deliverable Reserve Margin (%) — Deliverable Capacity Resources, minus Net Internal Demand, shown as a percentage of Net Internal Demand.

Demand — *See Net Internal Demand, Total Internal Demand*

Existing, Certain (Existing Generation Resources) — Existing generation resources available to operate and deliver power within or into the Region during the period of analysis in the assessment. Resources included in this category may be reported as a portion of the full capability of the resource, plant, or unit. This category includes, but is not limited to, the following:

1. Contracted (or firm) or other similar resource confirmed able to serve load during the period of analysis in the assessment
2. Where organized markets exist, designated market resource[24] that is eligible to bid into a market or has been designated as a firm network resource
3. Network Resource,[25] as that term is used for FERC *pro forma* or other regulatory approved tariffs
4. Energy-only resource[26] confirmed able to serve load during the period of analysis in the assessment and will not be curtailed[27]
5. Capacity resources that cannot be sold elsewhere
6. Other resources not included in the above categories that have been confirmed able to serve load and not to be curtailed[28] during the period of analysis in the assessment

Existing, Certain, and Net Firm Transactions — Existing, Certain capacity resources, plus Firm Imports, minus Firm Exports. (MW)

Existing, Certain, and Net Firm Transactions (%) (Margin Category) – Existing, Certain and Net Firm Transactions, minus Net Internal Demand, shown as a percentage of Net Internal Demand.

Existing, Inoperable (Existing Generation Resources) — This category contains the existing portion of generation resources that are out-of-service and cannot be brought back into service to serve load during the period of analysis in the assessment. However, this category can include inoperable resources that could return to service at some point in the future. This value may vary

[24] Curtailable demand or load that is designated as a network resource or bid into a market is not included in this category, but rather must be subtracted from the appropriate category in the demand section.

[25] Curtailable demand or load that is designated as a network resource or bid into a market is not included in this category, but rather must be subtracted from the appropriate category in the demand section.

[26] Energy Only Resources are generally generating resources that are designated as energy-only resources or have elected to be classified as energy-only resources and may include generating capacity that can be delivered within the area but may be recallable to another area (Source: 2008 EIA 411 document OMB No. 1905-0129). Note: Other than wind and solar energy, WECC does not have energy-only resources that are counted towards capacity.

[27] Energy only resources with transmission service constraints are to be considered in category Existing, Other.

[28] Energy only resources with transmission service constraints are to be considered in category Existing, Other.

for future seasons and can be reported as zero. This includes all existing generation not included in categories Existing, Certain or Existing, Other, but is not limited to, the following:

1. Mothballed generation (that cannot be returned to service for the period of the assessment)
2. Other existing but out-of-service generation (that cannot be returned to service for the period of the assessment)

Note: This category does not include behind-the-meter generation or non-connected emergency generators that normally do not run. This category also does not include partially dismantled units that are not forecasted to return to service.

Existing, Other (Existing Generation Resources) — Existing generation resources that may be available to operate and deliver power within or into the Region during the period of analysis in the assessment, but may be curtailed or interrupted at any time for various reasons. This category also includes portions of intermittent generation not included in Existing, Certain. This category includes, but is not limited to the following:

1. A resource with non-firm or other similar transmission arrangements
2. Energy-only resources that have been confirmed able to serve load for any reason during the period of analysis in the assessment, but may be curtailed for any reason
3. Mothballed generation (that may be returned to service for the period of the assessment)
4. Portions of variable generation not counted in the Existing, Certain category (e.g., wind, solar, etc. that may not be available or derated during the assessment period)
5. Hydro generation not counted as Existing, Certain or derated
6. Generation resources constrained for other reasons

Expected (Transaction Category) — A category of Purchases/Imports and Sales/Exports contract. The following considerations apply:

1. "Expected" implies that a contract has not been executed, but is in negotiation, projected or other. These Purchases or Sales are expected to be firm.
2. "Expected" Purchases and Sales should be considered in the reliability assessments.

Firm (Transaction Category) — A category of Purchases/Imports and Sales/Exports contract. The following considerations apply:

1. "Firm" implies a contract has been signed and may be recallable.
2. "Firm" Purchases and Sales should be reported in the reliability assessments. The purchasing entity should count such capacity in margin calculations. Care should be taken by both entities to appropriately report the generating capacity that is subject to such Firm contract.

Future Generation Resources (*See also Future, Planned and Future, Other)* — This category includes generation resources the reporting entity has a reasonable expectation of coming online during the period of the assessment. As such, to qualify in either of the Future categories, the resource must have achieved one or more of the following milestones:

1. Construction has started.
2. Regulatory permits being approved include any one of the following:
   a. Site permit
   b. Construction permit
   c. Environmental permit
3. Regulatory approval has been received to be in the rate base
4. Approved power purchase agreement

5. Approved and/or designated as a resource by a market operator

Future, Other (Future Generation Resources) — This category includes future generating resources that do not qualify in *Future, Planned* and are not included in the *Conceptual* category. This category includes, but is not limited to, generation resources during the period of analysis in the assessment that are, or may be, any of the following: (Note: Resources included in this category may be adjusted using a confidence factor to reflect uncertainties associated with siting, project development, or queue position.)

1. Curtailed or interrupted at any time for any reason
2. Energy-only resources that may not be able to serve load during the period of analysis in the assessment
3. Variable generation not counted in the *Future, Planned* category, may not be available, or is derated during the assessment period
4. Hydro generation not counted in category *Future, Planned* or derated

Future, Planned (Future Generation Resources) — Generation resources anticipated to be available to operate and deliver power within or into the Region during the period of analysis in the assessment. This category includes, but is not limited to, the following:

1. A contracted (or firm) or other similar resource
2. Where organized markets exist, a designated market resource[29] that is eligible to bid into a market or has been designated as a firm network resource
3. A Network Resource,[30] as that term is used for FERC pro forma or other regulatory approved tariffs
4. Energy-only resources confirmed able to serve load during the period of analysis in the assessment and will not be curtailed[31]
5. Where applicable, included in an integrated resource plan under a regulatory environment that mandates resource adequacy requirements and the obligation to serve

NERC Reference (Reserve) Margin Level (%) — Either the Target Reserve Margin provided by the Region/subregion or NERC assigned based on capacity mix (i.e., thermal/hydro). Each Region/subregion may have its own specific margin level based on load, generation, and transmission characteristics as well as regulatory requirements. If provided in the data submittals, the Regional/subregional Target Reserve Margin level is adopted as the NERC Reference Reserve Margin Level. If not, NERC assigned a 15 percent Reserve Margin for predominately thermal systems, and ten percent for predominately hydro systems.

Net Internal Demand: Equals the Total Internal Demand reduced by the total Dispatchable, Controllable, Capacity Demand Response equaling the sum of Direct Control Load Management, Contractually Interruptible (Curtailable), Critical Peak Pricing (CPP) with Control, and Load as a Capacity Resource.

On-Peak (Capacity) — The amount of capacity that is expected to be available on seasonal peak.

Planning Reserve Margin (%) — *See Deliverable Capacity Reserve Margin (%) and Prospective Capacity Reserve Margin (%).* Roughly, Capacity minus Demand, divided by

[29] Curtailable demand or load that is designated as a network resource or bid into a market is not included in this category, but rather must be subtracted from the appropriate category in the demand section.

[30] Curtailable demand or load that is designated as a network resource or bid into a market is not included in this category, but rather must be subtracted from the appropriate category in the demand section.

[31] Energy only resources with transmission service constraints are to be considered in the category Future, Other.

Demand or (Capacity-Demand)/Demand. Replaced *Capacity Margin(s) (%)* for NERC Assessments in 2009.

Potential Capacity Resources — The sum of Deliverable Capacity Resources, Existing Other Resources, Future Other Resources, Adjusted Potential Resources, and net provisional transactions, minus all derates. (MW)

Potential Reserve Margin (%) — The sum of Deliverable Capacity Resources, Existing Other Resources, Future, Other Resources, Adjusted Potential Resources, and net provisional transactions, minus all derates and Net Internal Demand shown, as a percentage of Net Internal Demand.

Prospective Capacity Reserve Margin (%) — Prospective Capacity Resources, minus Net Internal Demand, shown as a percentage of Net Internal Demand.

Prospective Capacity Resources — Deliverable Capacity Resources plus Existing, Other capacity resources, minus all Existing, Other deratings (Includes derates from variable resources, energy only resources, scheduled outages for maintenance, and transmission-limited resources), plus Future, Other capacity resources (adjusted by a confidence factor), minus all Future, Other deratings. (MW).

Provisional (Transaction Category) — A category of Purchases/Imports and Sales/Exports contract including transactions that are under study, but where negotiations have not begun. These Purchases and Sales are expected to be provisionally firm. Note: Provisional Purchases and Sales should be considered in the reliability assessments.

Purchases/Imports Contracts — *See Transaction Categories*

Reference Reserve Margin Level — *See NERC Reference Reserve Margin Level*

Regulation (Controllable Ancillary Demand Response) — Demand-side resources responsive to Automatic Generation Control (AGC) to provide normal regulating margin.

Total Internal Demand — The sum of the metered (net) outputs of all generators within the system and the metered line flows into the system, less the metered line flows out of the system. The demands for station service or auxiliary needs (such as fan motors, pump motors, and other equipment essential to the operation of the generating units) are not included. Internal Demand includes adjustments for indirect demand-side management programs such as conservation programs, improvements in efficiency of electric energy use, all non-dispatchable demand response programs (such as Time-of-Use, Critical Peak Pricing, Real Time Pricing and System Peak Response Transmission Tariffs) and some dispatchable demand response (such as Demand Bidding and Buy-Back). Adjustments for controllable demand response should not be incorporated in this value.

Transaction Categories (*See also Firm, Non-Firm, Expected, and Provisional)* — Contracts for Capacity are defined as an agreement between two or more parties for the Purchase and Sale of generating capacity. Purchase contracts refer to imported capacity that is transmitted from an outside Region or subregion to the reporting Region or subregion. Sales contracts refer to exported capacity that is transmitted from the reporting Region or subregion to an outside Region or subregion. For example, if a resource subject to a contract is located in one Region and sold to another Region, the Region in which the resource is located reports the capacity of the resource and reports the sale of such capacity that is being sold to the outside Region. The purchasing Region reports such capacity as a purchase, but does not report the capacity of such resource. Transmission must be available for all reported Purchases and Sales.

Further Reading

2008 Long-Term Reliability Assessment — Updated March 26, 2009
http://www.nerc.com/files/LTRA2008v1_2.pdf

2009 Long-Term Reliability Assessment – Updated December 15, 2009
http://www.nerc.com/files/2009_LTRA.pdf

Electricity Supply and Demand Database — Updated November 15, 2009
http://www.nerc.com/page.php?cid=4|38

Glossary of Terms Used in Reliability Standards — Updated April 20, 2009
www.nerc.com/files/Glossary_2009April20.pdf

Instructions for NERC Long-Term Reliability Assessment — *Data Reporting Form ERO-2009LTRA*, November 26, 2008

Reliability Assessments Guidebook, Version 1.2, March 18, 2008,
http://www.nerc.com/docs/pc/ragtf/Reliability_Assessment_%20Guidebook%20v1.2%20031909.pdf

Reliability Standards for the Bulk Electric Systems in North America — Updated May 20, 2009, http://www.nerc.com/files/Reliability_Standards_Complete_Set_2009May20.pdf

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Endnotes

Note 1: Existing, Certain resources and Net Firm Transactions are reported to be deliverable by the Regions.

Note 2: The WECC-US peak demands or resources do not necessarily equal the sums of the non-coincident WECC-US subregional peak demands or resources because of subregional monthly peak demand diversity. Similarly, the Western Interconnection peak demands or resources do not necessarily equal the sums of the non-coincident WECC-U.S., Canada, and México peak demands or resources. In addition, the subregional resource numbers include use of seasonal demand diversity between the winter-peaking northwest and the summer-peaking portions of the Western Interconnection.

Note 3: The Demand-Side Management resources are not necessarily sharable between the WECC subregions and are not necessarily sharable within subregions.

Note 4: WECC CA-MX represents only the northern portion of the Baja California Norte, México, electric system that is interconnected with the United States.

Note 5: MISO and PJM information do not sum to the RFC total, as approximately 100 MW of Ohio Valley Electric Corporation (OVEC)[32] peak demand is also included in RFC. OVEC is not affiliated with either PJM or MISO; however, OVEC's Reliability Coordinator services are performed by PJM. RFC information is only for the demand and capacity within its Region. Additionally, the RFC Region and the MISO and PJM subregion demand values are coincident.

Note 6: These demand and supply forecasts were reported on September 30, 2009.

Note 7: Each Region/subregion may have its own specific Reserve Margin level based on load, generation, and transmission characteristics as well as regulatory requirements. If provided in the data submittals, the Regional/subregional Target Reserve Margin level is adopted as the NERC Reference Reserve Margin Level. If not, NERC assigned a 15 percent Reserve Margin for predominately thermal systems and a 10 percent Reserve Margin for predominately hydro systems.

Note 8: Based on Midwest ISO tariff requirements, individual LSE reserve levels in the SERC Gateway subregion are 12.7 percent. Accordingly, the NERC Reference Margin Reserve Level for SERC Gateway subregion is 12.7 percent.[33]

Note 9: Where winter-peaking Regions or subregions are assessed, an identified year indicates the start of the winter season. For example, where the year 2012 is identified in the assessment, this represents the 2012/2013 winter season.

Note 10: For the NPCC-Canada subregion (Maritimes, Ontario, and Québec), NPCC-Canada values represent the winter seasonal peak demands. However, Ontario is a summer-peaking subregion. Therefore, values for the individual NPCC subregions cannot be summed to the Regional value.

The same is true for the WECC-US subregion. WECC-US values represent the summer seasonal peak demands. However, NWPP-US is a winter-peaking subregion. Therefore, values for the individual WECC subregions cannot be summed to the Regional value.

Note 11: RFC-MISO is not an official subregion of RFC, but a non-operational boundary used to assess the reliability within a Regional Entity footprint. The RFC-MISO area does not operate nor plan and use reserves based upon this boundary, but rather the entire Midwest ISO footprint. The RFC-MISO area is only a portion of the entire Midwest ISO, so it must be noted that this area does not indicate the resource adequacy of the Midwest ISO.

[32] OVEC is a generation and transmission utility located in Indiana, Kentucky, and Ohio.
[33] For more information, see the Midwest ISO 2009–2010 LOLE Study Report at http://www.midwestmarket.org/publish/Document/62c6cd_120e7409639_-7f2a0a48324a

to ensure
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