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June 1, 2016

Ms. Mary Jo Kunkle
Executive Secretary
Michigan Public Service Commission
7109 W. Saginaw Highway
P.O. Box 30221
Lansing, Michigan 48909

RE: Case No. U-17992 – In the matter of the investigation, on the Commission's own motion, into the electric supply reliability plans of Michigan's electric utilities for the years 2016 through 2020.

Dear Ms. Kunkle:

Pursuant to the Commission's December 22, 2015 order in Case No. U-17992 ("December 22 Order"), Energy Michigan submits information on the supply/demand situation that may be of help to the Commission in assessing reliability supply plans for the years 2016 through 2020.

Relevance: The December 22 Order refers to the MISO-OMS resource adequacy survey. Some of the reporting parties also mention this survey, and the comments of the Midcontinent Independent System Operator ("MISO") submitted in this docket discusses the results of the most recent completed survey (published by MISO in June and July of 2015).

There is additional relevant information in the 2015 survey that MISO did not include in its comments. Attached is a copy of the complete MISO presentation of the 2015 survey, dated July 2015.

Results: Page 11 of the July 2015 presentation shows that there are about 29 GW of generation under development in MISO with completion dates 2020 or before. MISO included only about 3 GW of this in its supply/demand assessment – excluding about 26 GW. Only about 7% of the planned generation is needed to offset MISO's total projected reserve deficit of 1.8 GW that it displays on page 7 of its comments to the Commission.

Page 47 of the July 2015 presentation shows that about 2 GW of planned generation in Zone 7 Lower Michigan was not included in the Zone 7 2020 surplus/deficit analysis. This planned generation would completely offset the 2020 nominal reserve deficit in Zone 7 of 2.0 GW that is shown on page 11.

Conclusion: The additional information from MISO, in the attached MISO July 2015 presentation of the 2015 MISO-OMS resource adequacy survey may provide the Commission with a broader perspective of the supply situation in MISO and in Michigan, that has not been communicated in other MISO documents.

By MISO's own survey, there is significantly more generation in the planning stages than MISO's projected deficits of capacity. By MISO's own survey, neither MISO in total nor any zone in MISO faces a capacity deficit in year 2020.

Sincerely,

Alexander Zakem
Consultant for Energy Michigan Inc.

Attachment: "2015 OMS MISO Survey Results, July 2015"

Link:
https://www.misoenergy.org/Library/Repository/Meeting%20Material/Stakeholder/SAWG/2015/20150709/20150709%20SAWG%20Item%2002%202015%20OMS-MISO%20Survey%20Results.pdf

# 2015 OMS MISO Survey Results

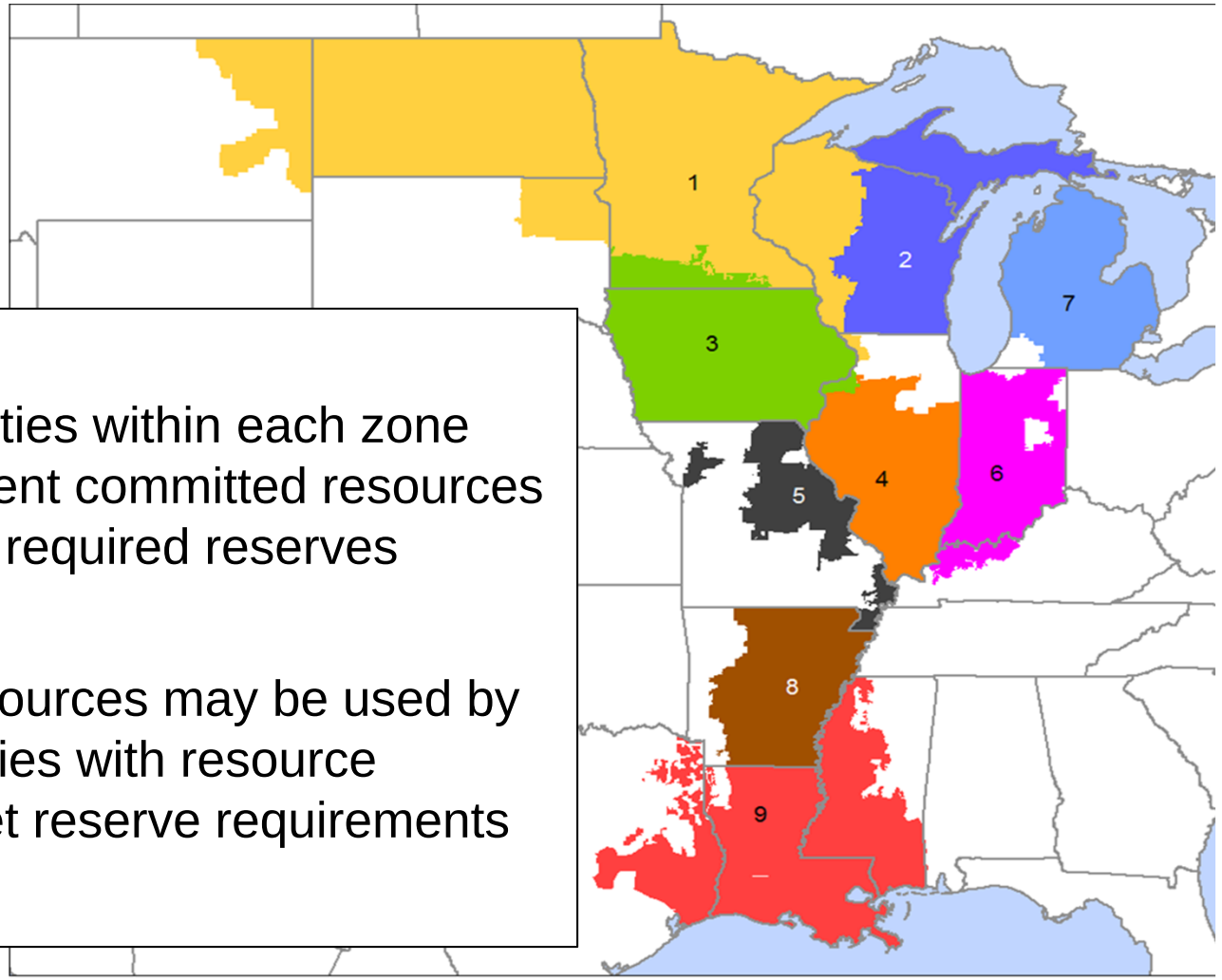
**July 2015**

# 2015 OMS MISO Survey Results

- Furthering our joint commitment to regional resource assessment and transparency in the MISO region, OMS and MISO are pleased to announce the results of the 2015 OMS MISO Survey
  - The MISO region has sufficient resources to meet its regional resources requirement
  - A regional surplus of 1.7 to 2.3 GW is projected in 2016, with the first potential regional shortfall appearing in 2020
  - Regional surpluses could address any zonal deficits through 2019
  - Additional actions needed to ensure sufficient resources beyond 2019

- Load forecasts results in an overall growth rate of 0.8%, consistent with the prior survey. However, 2015 load forecasts were below previous projections, creating a lower base level on which this growth was applied

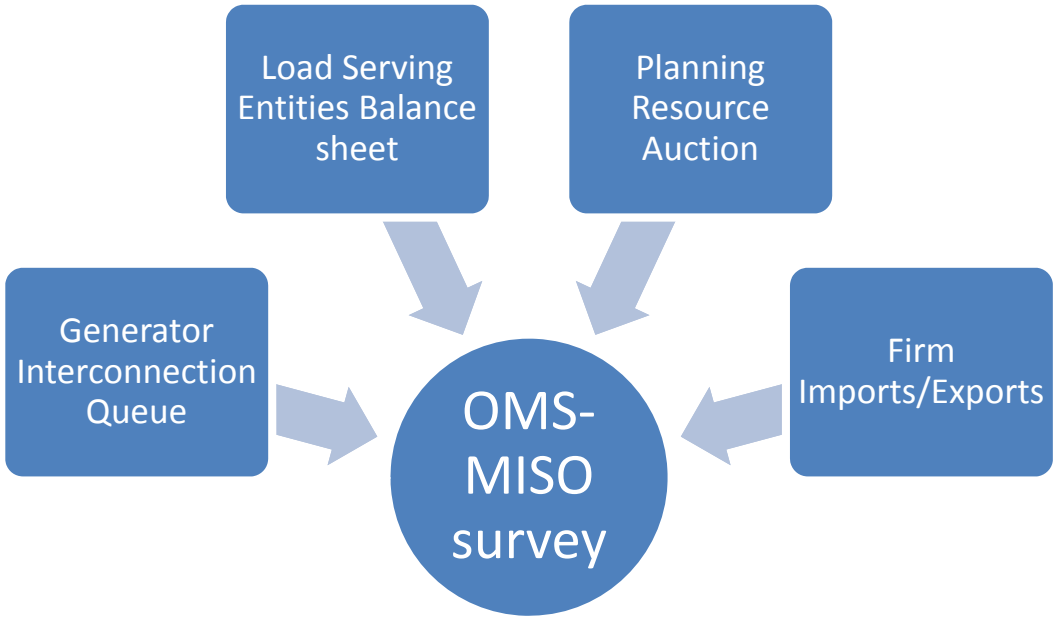
# Resource Adequacy Requirements




- Load serving entities within each zone must have sufficient committed resources to meet load and required reserves
- Uncommitted resources may be used by load serving entities with resource shortages to meet reserve requirements

## What's in the survey?

- OMS-MISO survey responses
  - Insight into confidence around availability of resources
- Updated load data
- All generation within MISO, including merchant resources, considered
- Imports and exports accounted for



# Illustrative OMS MISO Data Request

## Existing Resources

| | | | | | | | | 2016* | 2016** | . . . | 2024 | 2024 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LSE | LRZ | Location | Resource Name | Source | Type | Corrected ICAP (UCAP Renewables) | Corrected UCAP Summer Rated MW | YES/ NO | Factor | . . . | YES/ NO | Factor |
| TEST | Zone X | TBD | Unit 1 | Coal | Gen | 165.0 | 159.2 | Yes | H | . . . | Yes | H |
| TEST | Zone X | TBD | Unit 2 | Natural Gas | Gen | 153.0 | 145.9 | Yes | L | . . . | No | L |
| TEST | Zone X | TBD | Unit 3 | Diesel | BTMG | 26.5 | 26.5 | No | H | . . . | No | H |

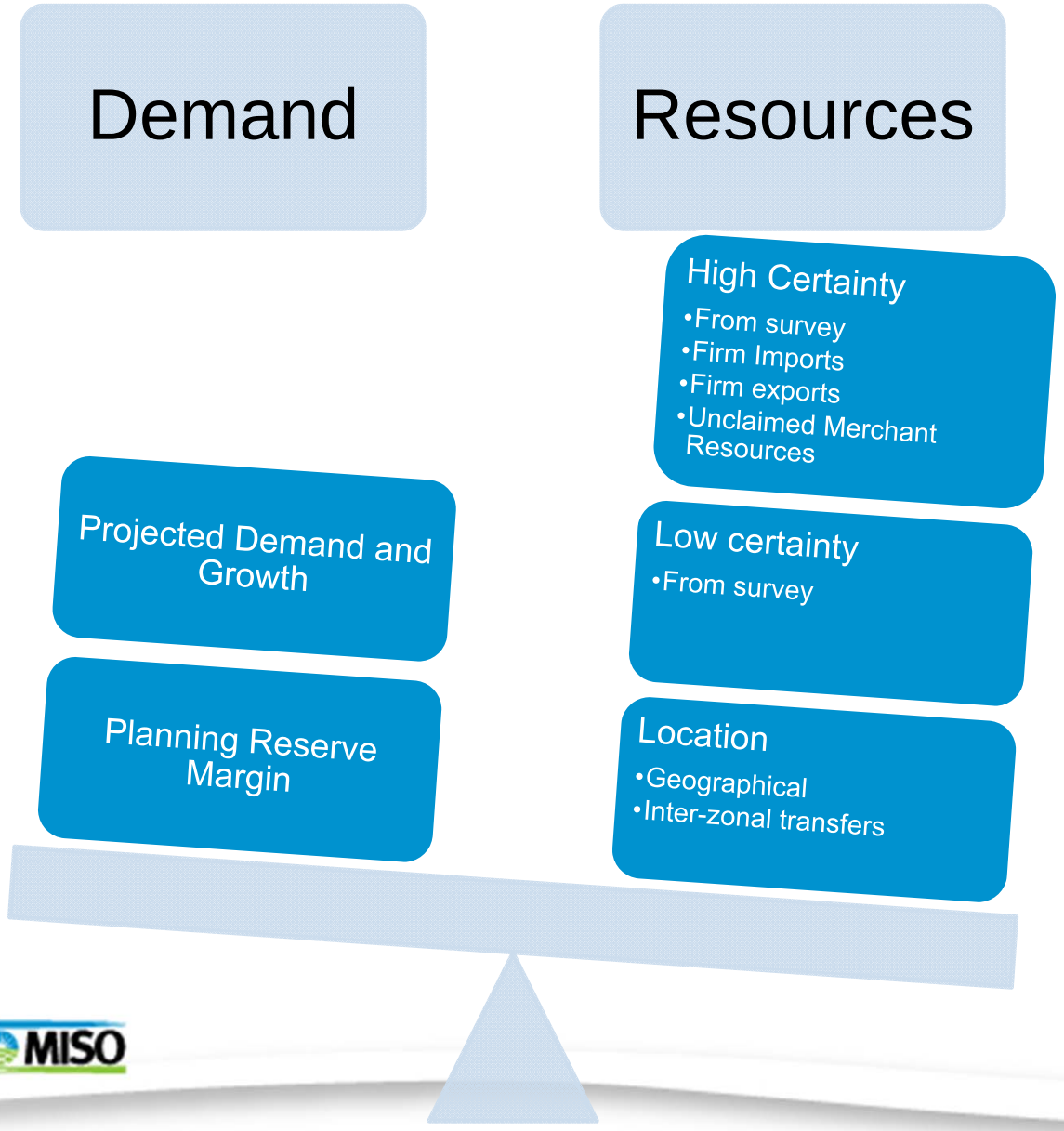
## New Resources

| LSE | Zone | Region | Project Name | in LTRA Sheet? | Resource Type | ICAP (Intermittent UCAP) | Winter Rated MW (owned/ contracted) | Year In-Service | GIQ | If not in GIQ, when ? |
|---|---|---|---|---|---|---|---|---|---|---|
| TEST | Zone X | #N/A | Test | | CC | 175 | 200 | 2020 | Yes | |

* Resource Availability

** Confidence Factor

# Survey Results



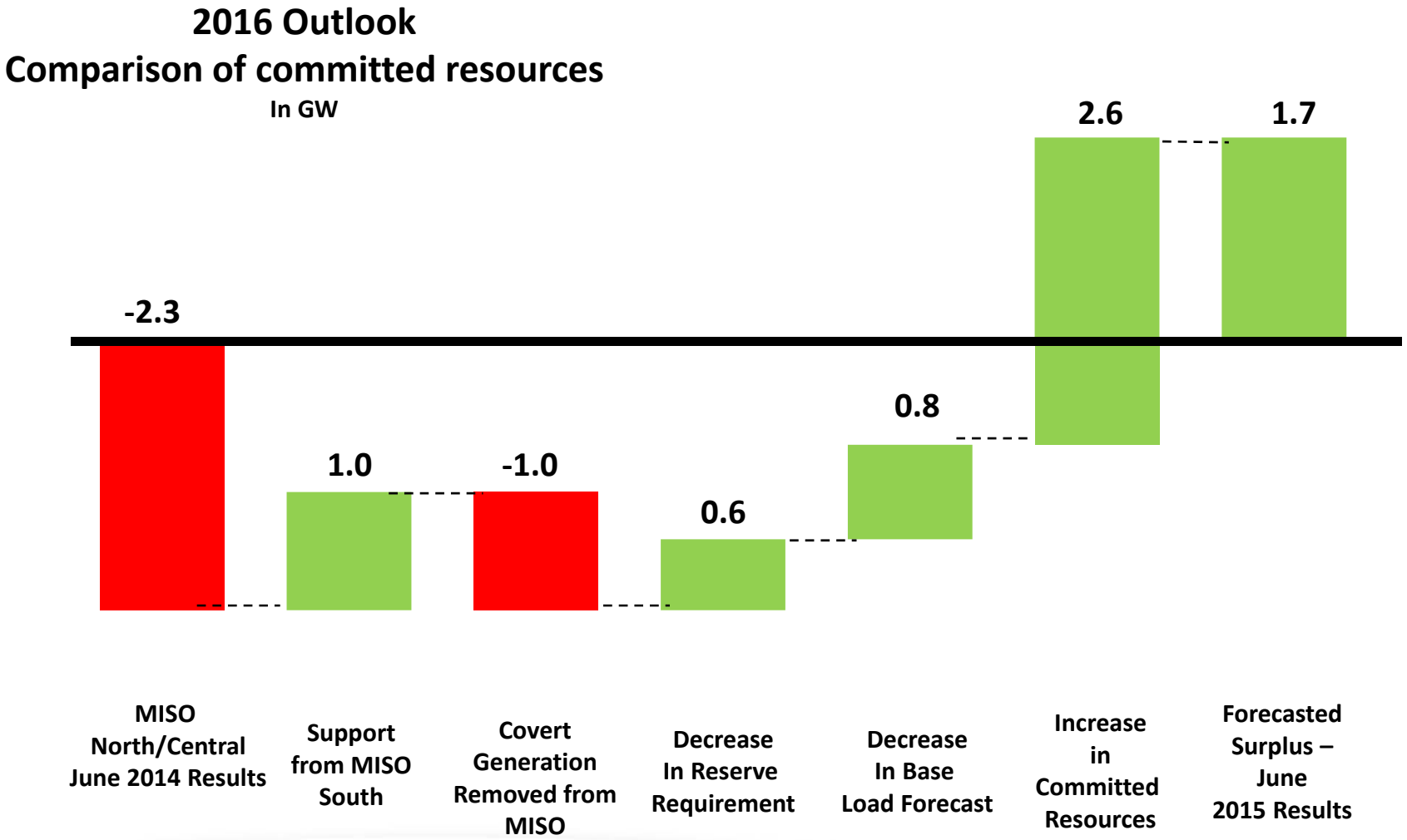

- **All values in an installed capacity (ICAP) value**
  - Planning Reserve Margin target was 14.3% ICAP
  - Translation from ICAP to UCAP was based on the weighted average of each LSE's EFORd

# Previous OMS MISO survey shows similar results as the 2015 PRA

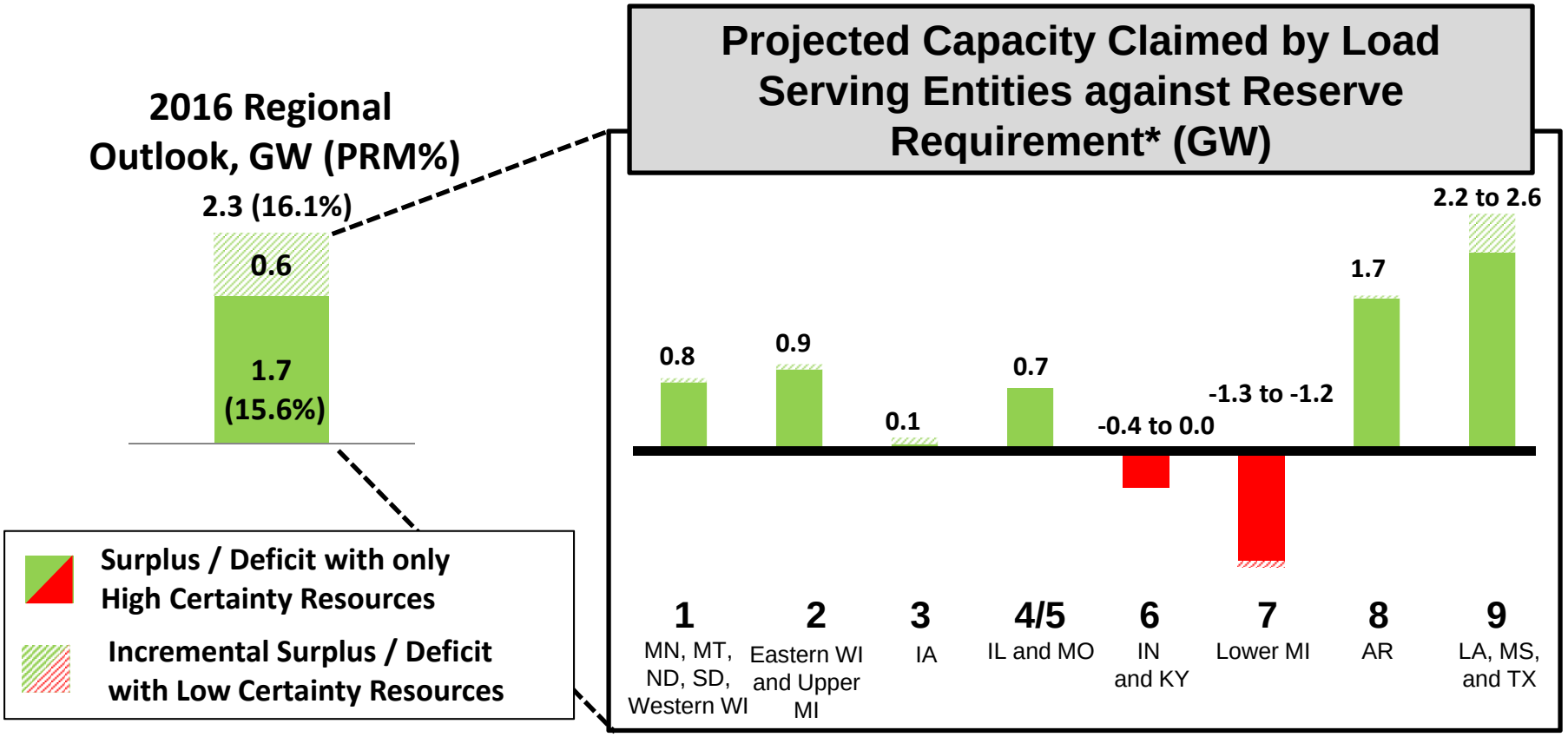
| | Demand (GW) | Planning Reserve Requirement (GW) | Supply (GW) |
|---|---|---|---|
| **2015 projection from 2014 OMS MISO survey** | **128.6** | **147.8** | **150.6** |
| **2015 PRA*** | **127.3** | **145.5** | **159.2** |

* Planning Resource Auction data converted to ICAP for comparison purposes

# The 2015 survey results show the actions of MISO members to ensure regional resource adequacy for 2016

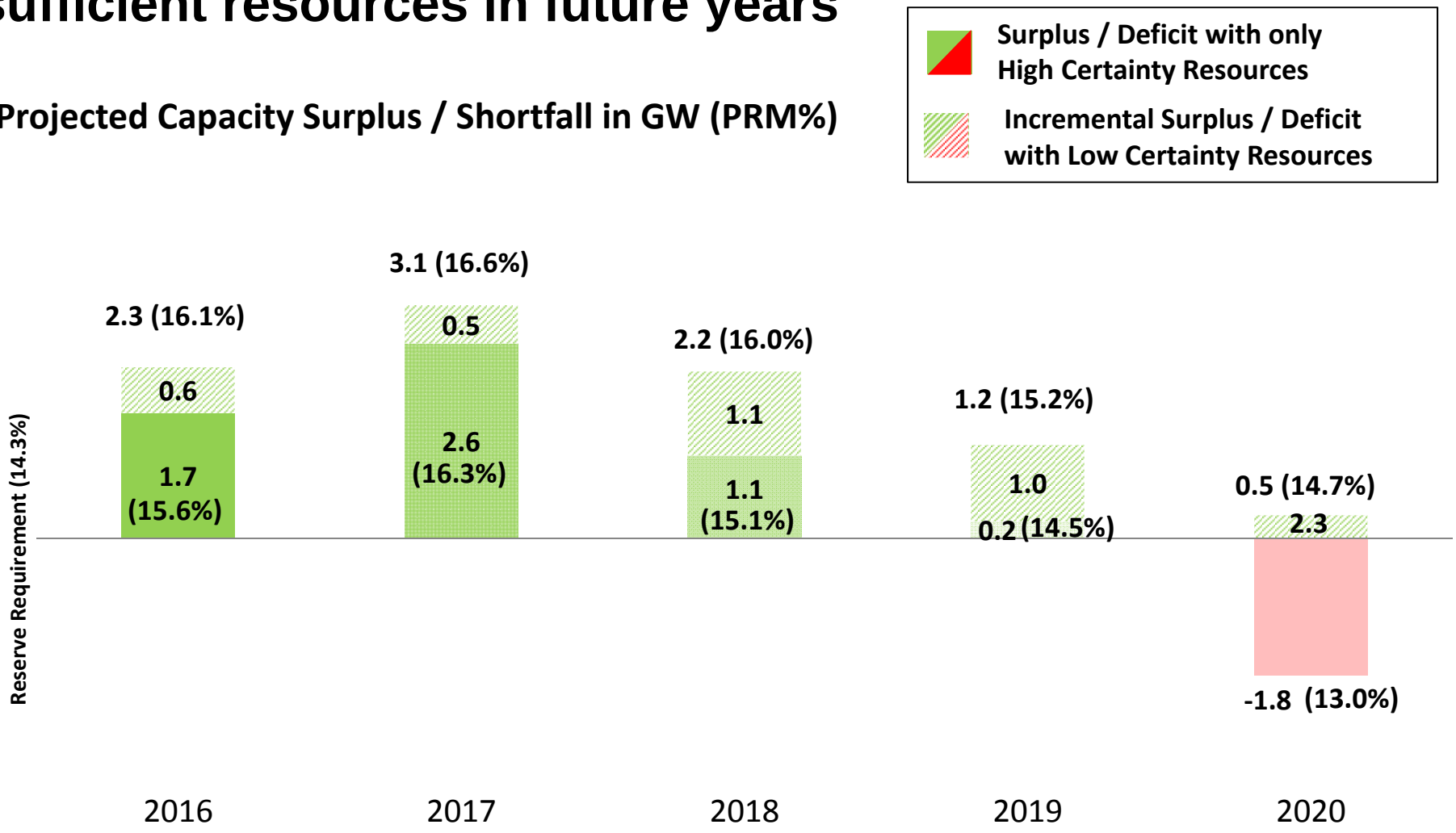


# In the near term, regional surpluses could address deficits for the footprint



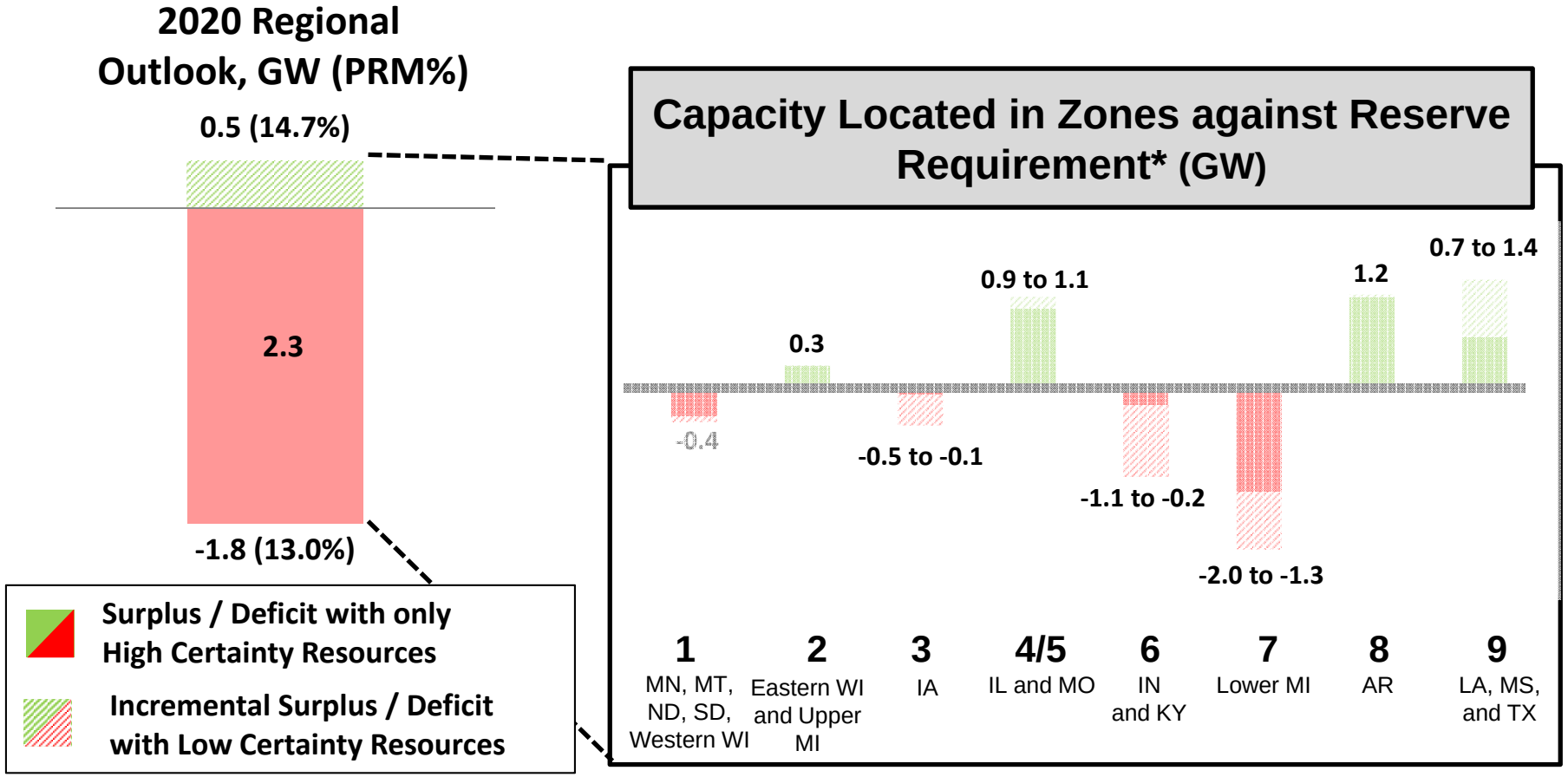

* Zonal values reflect capacity claimed in survey results, regardless of capacity location
Regional outlook includes a 1,000 MW limit on transfers between the South and Central/North zones

# Additional actions are required in the near term to ensure sufficient resources in future years




* This slide shows **a forecast**. **These figures will change as future capacity plans are solidified** by load serving entities and state commissions.
High and low certainty resources as reported by the load serving entities in survey responses. High certainty resources also include uncommitted merchant generation.

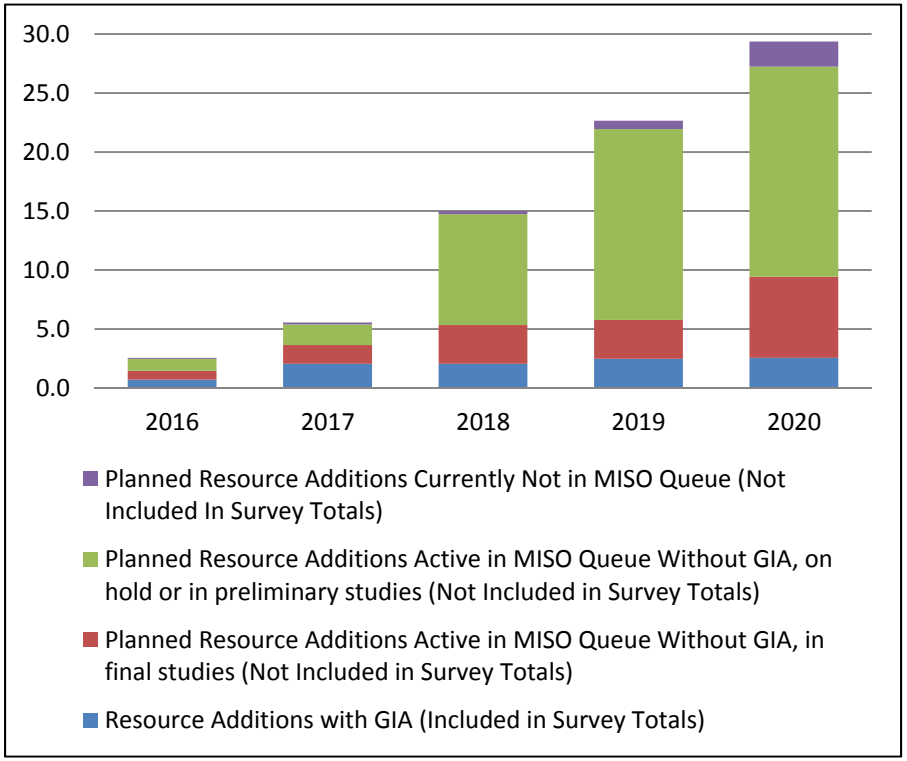
# 2020 Capacity Projections

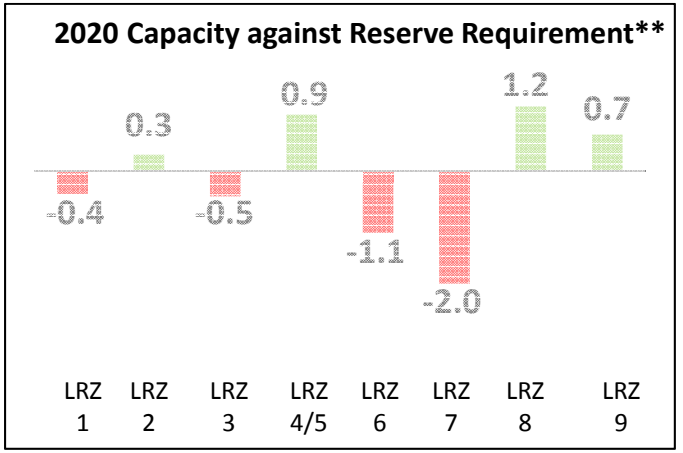


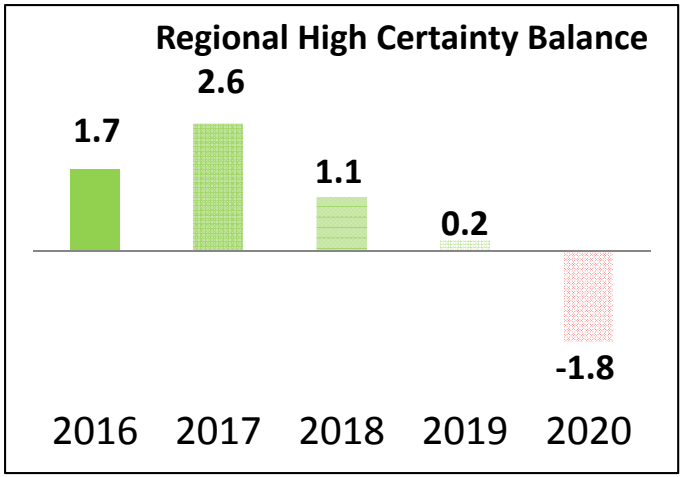

* Zonal values based on capacity location against reserve requirement and do not reflect inter-MISO transfers and future resource commitments
Regional outlook includes a 1,000 MW limit on transfers between the South and Central/North zones

# Continued progress is needed to ensure sufficient resources in future years

## Planned Generation Additions, in GW*



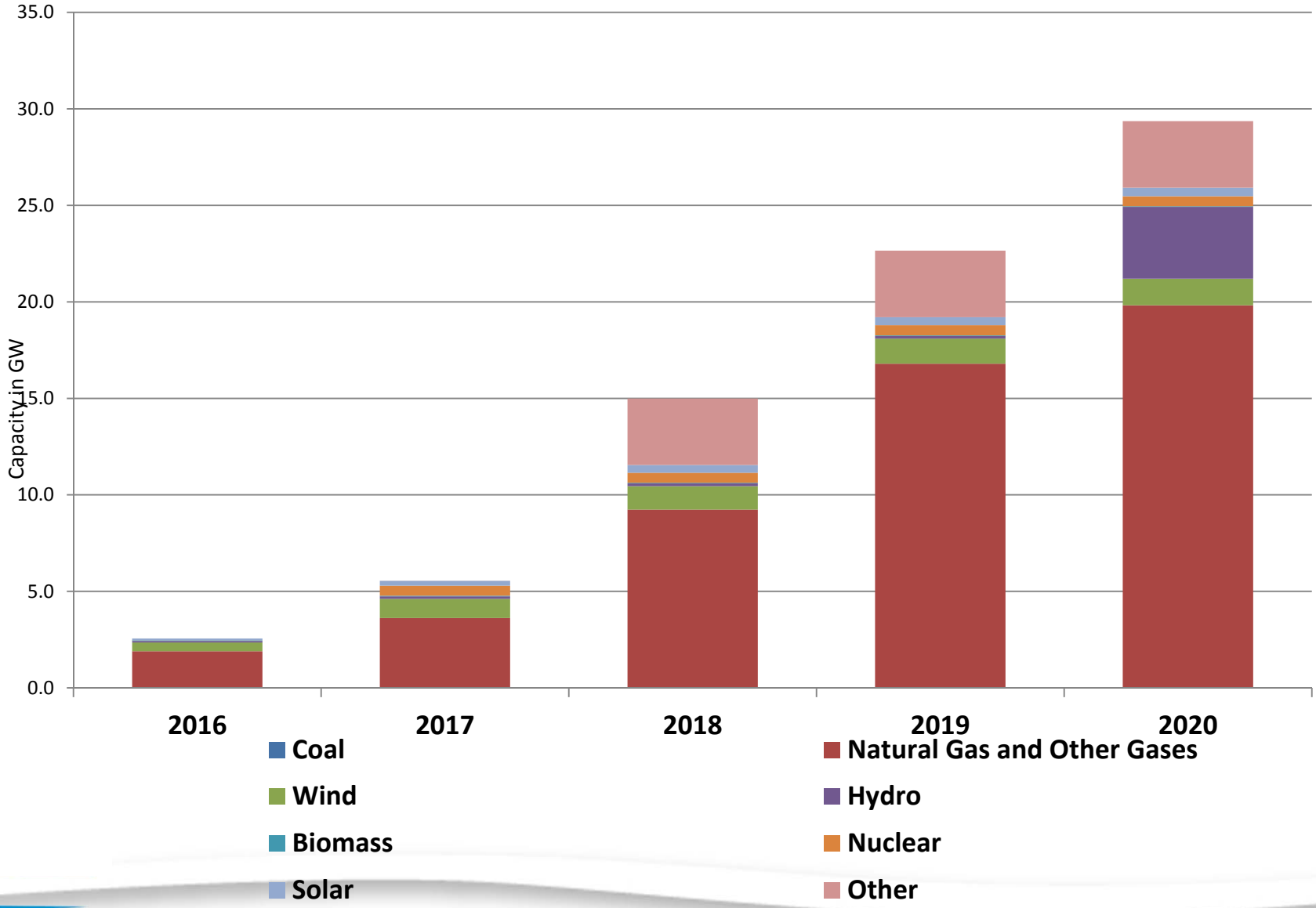



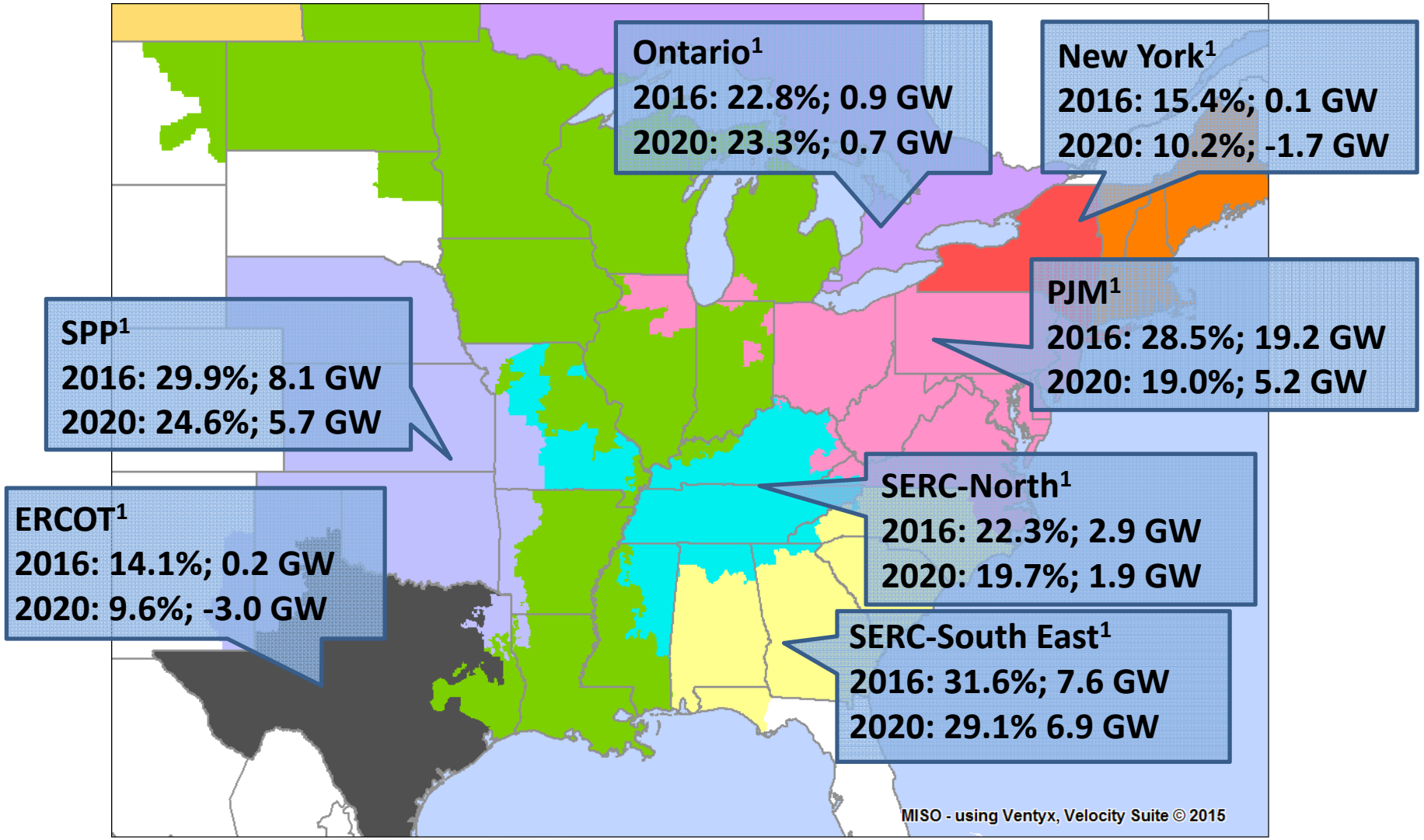

* Values based on survey results and do not include all generation in queue

** Zonal viewpoint based on capacity location against reserve requirement and does not reflect future inter-MISO commitments

# Reported New Resources by Fuel Type



# Reserve Margins in Adjacent Regions




[1]Sourced from 2014 NERC Long-Term Reliability Assessment (Published Nov. 2014)

# Additional Information

- **Zonal Views**
  - 2016 Breakdown
  - 2014 versus 2015 results comparison
  - Zonal Generator Interconnection Queue
  - 2020 Breakdown
- **Emergency Operating Procedures**
- **Ten-Year View**

# 2015 OMS MISO Survey Results

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  - 1.7 to 2.3 GW regional surplus projected in 2016, with the first potential regional shortfall appearing in 2020
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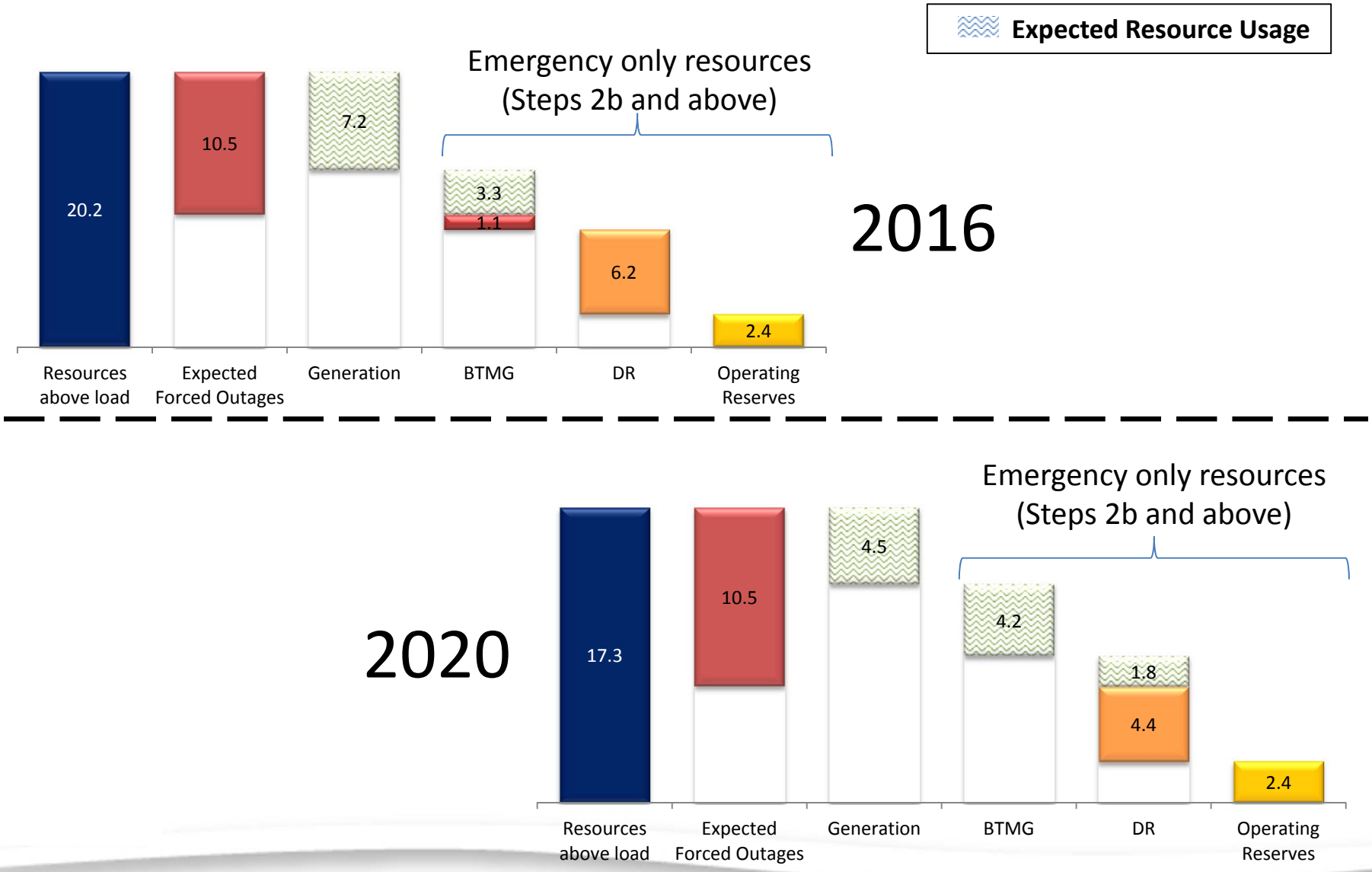
- Load forecasts include an overall growth rate of 0.8%, consistent with the prior survey
  - 2015 load forecasts were below previous projections, creating a lower base level on which this growth was applied

# Appendix A: Emergency Operating Procedures

# A decreased reserve margin will increase reliance on emergency operating procedures

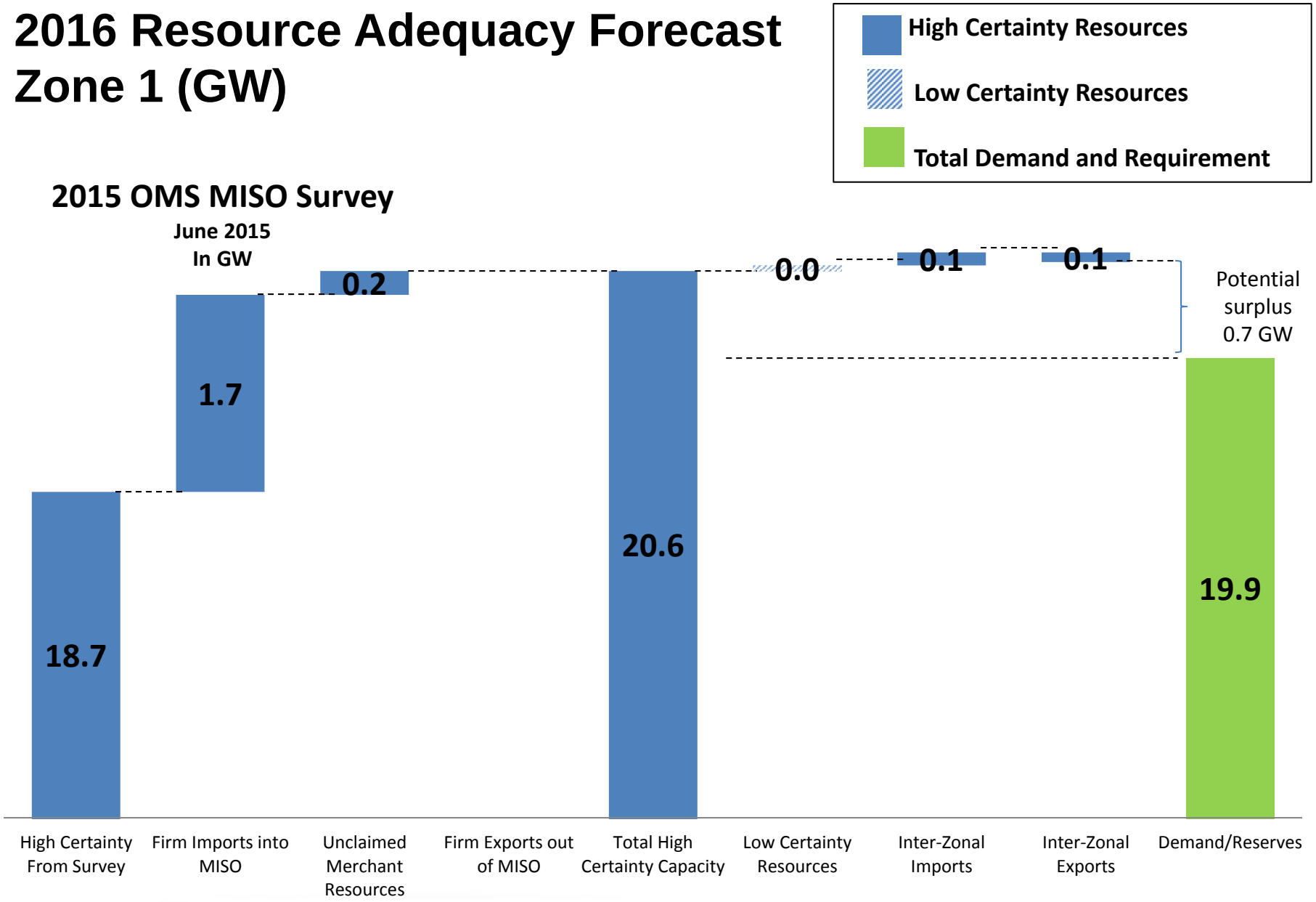


# Appendix B: Zonal Results

# Definitions

- High Certainty Resources
  - High Certainty From Survey
    - Resources within the MISO footprint committed to serving demand, based on survey responses
    - Includes resources with signed Interconnection Agreements
  - Firm Imports into MISO
    - Resources located outside of MISO committed to serving demand in MISO and included in zonal capacity totals
  - Unclaimed Merchant Resources
    - Any resource that is commercially registered with MISO but does not currently have a contract to serve load
  - Firm Exports out of MISO
    - Resources located inside of MISO committed to serving demand outside MISO and excluded from zonal capacity totals
- Total High Certainty Capacity
  - Total capacity available to serve demand in the given Planning Year. This will not include “Low” certainty resources
- Low Certainty Resources
  - Resources have some indication of not being available to serve demand and classified as ‘low certainty’ by survey responses
  - An example of a “low” certainty resource could be a resource that has submitted an attachment Y2
- Inter-zonal Imports / Exports
  - Resources from one zone within MISO which were designated as serving load in a different MISO zone by survey responses
- Demand/Reserves
  - Projected demand plus the MISO Planning Reserve Margin Requirement of 14.3%
  - A portion of this requirement may be served by capacity located outside of the zone

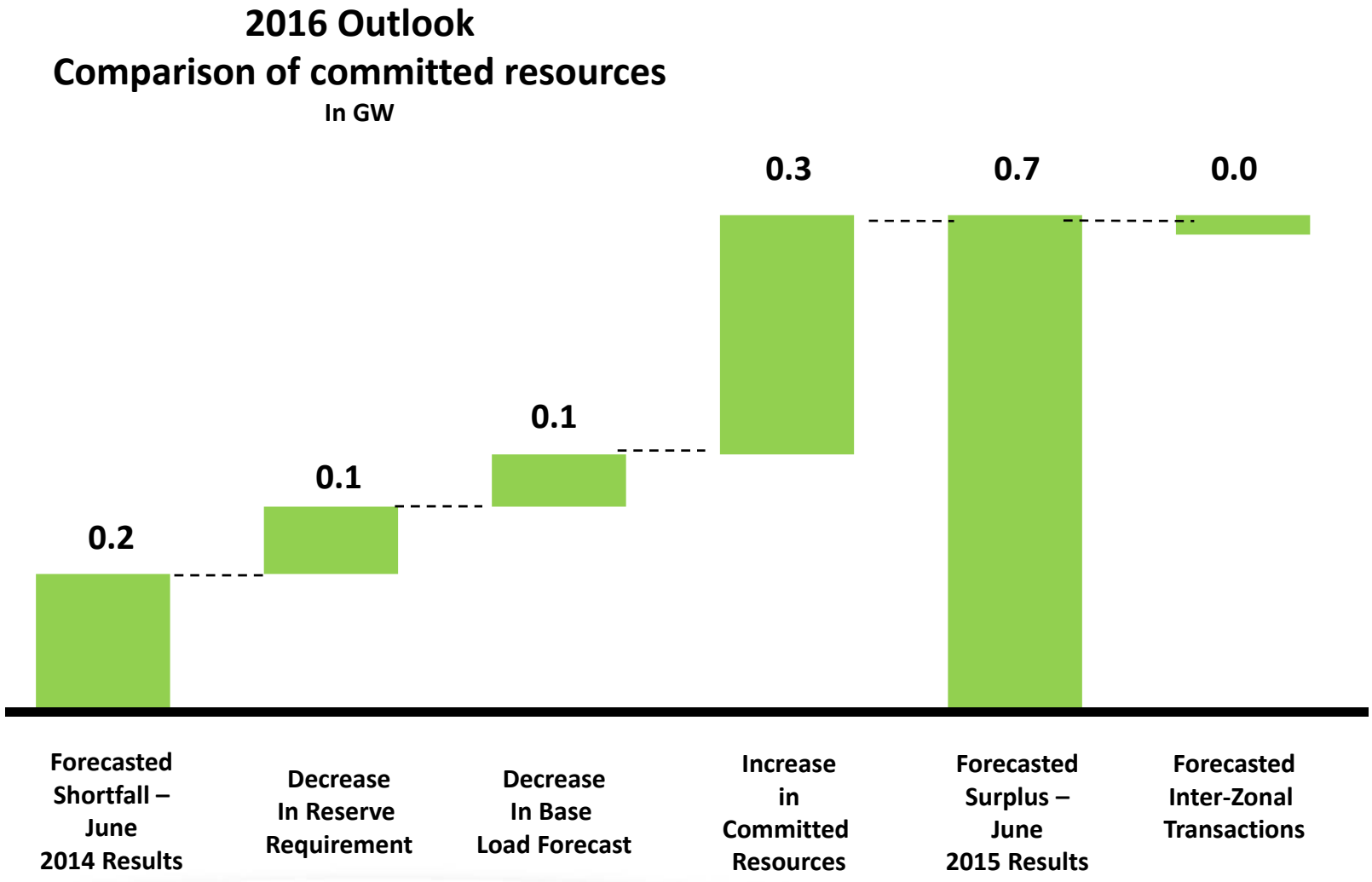
# 2016 Resource Adequacy Forecast Zone 1 (GW)



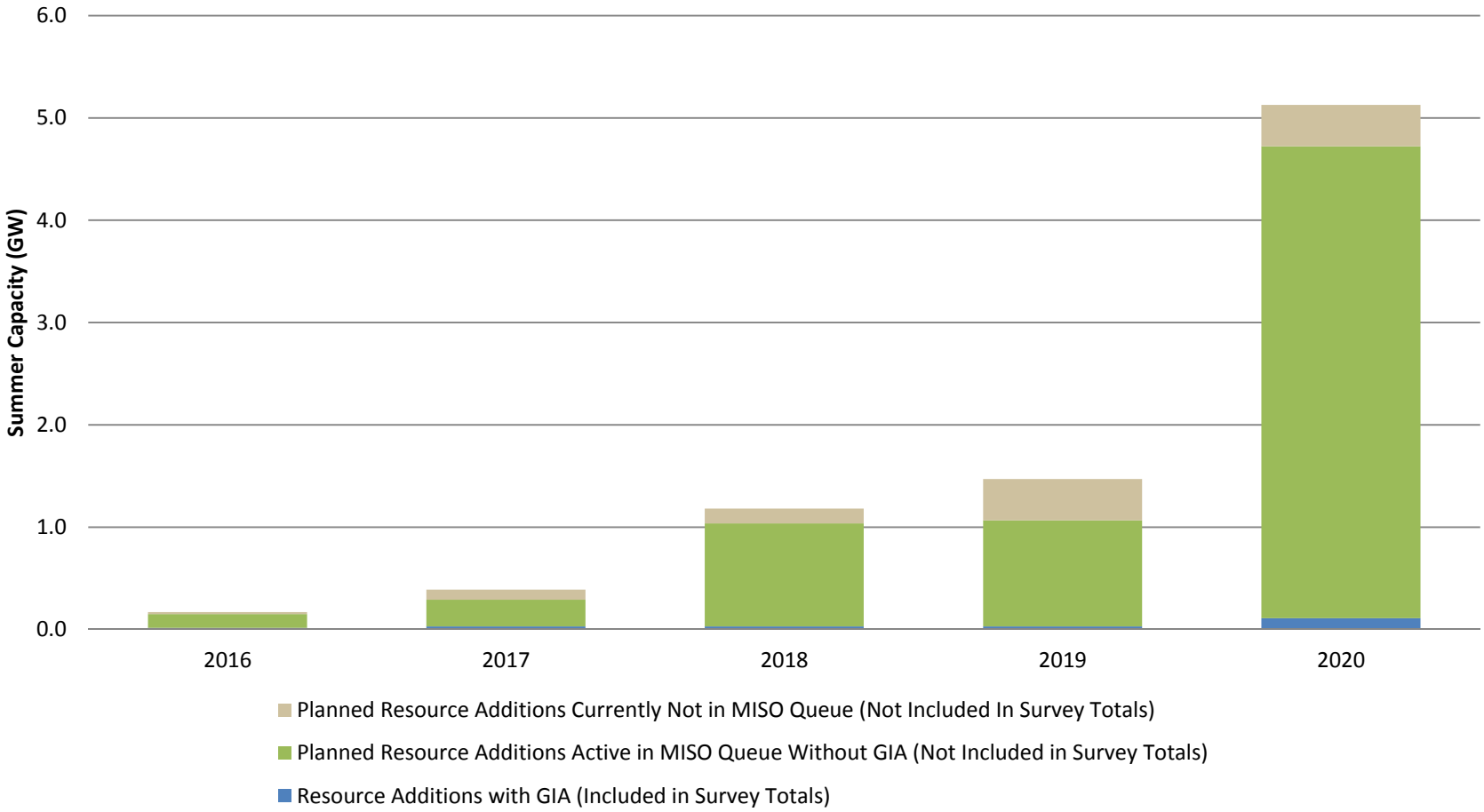

Values in Installed Capacity (ICAP)

Capacity Import Limit: 3.7 *GW (From 2015 Planning Resource Auction)*

# 2014 vs 2015 OMS MISO Survey Results Zone 1

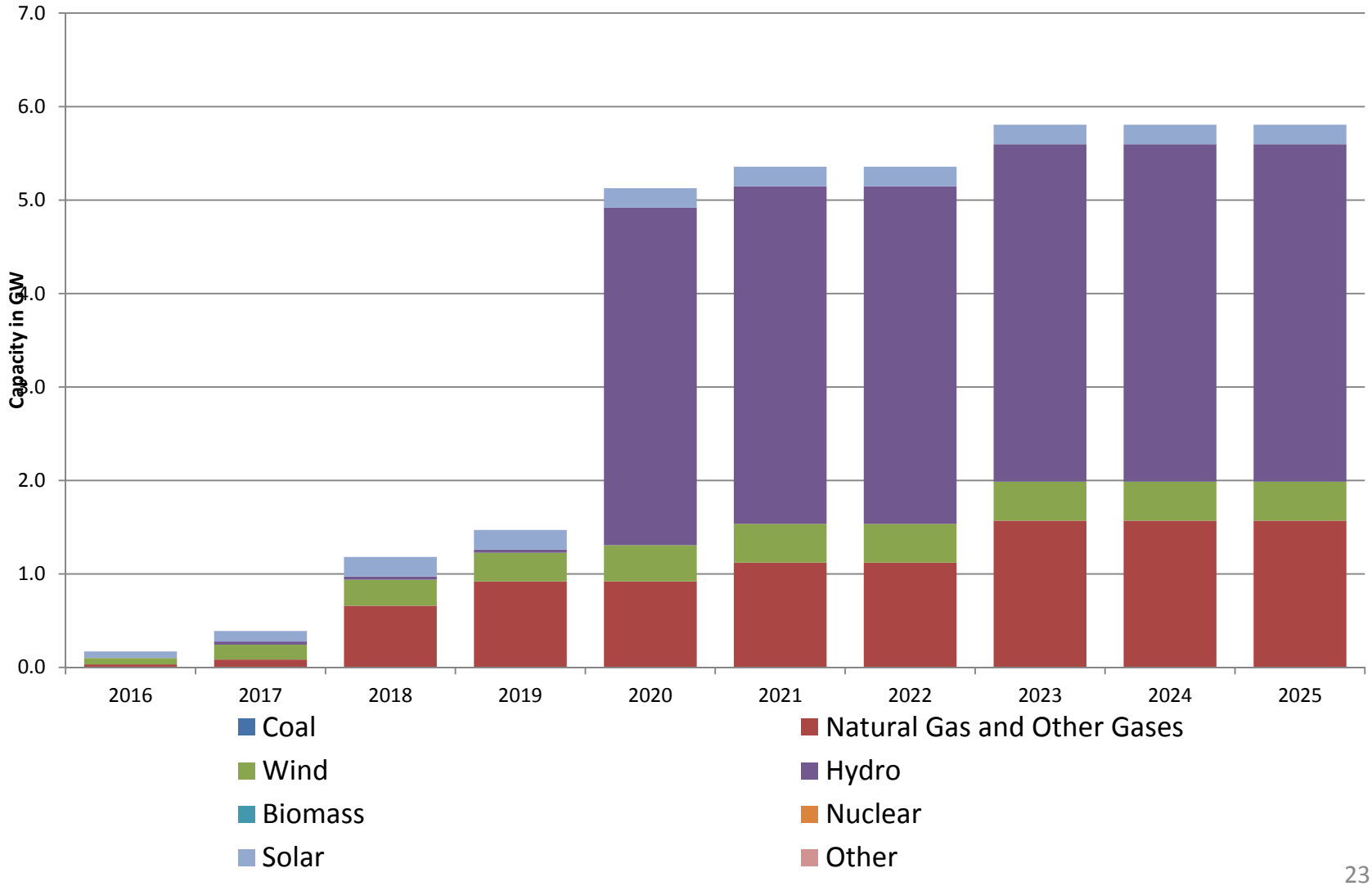


# New Generation Reported in Survey Zone 1 (GW)

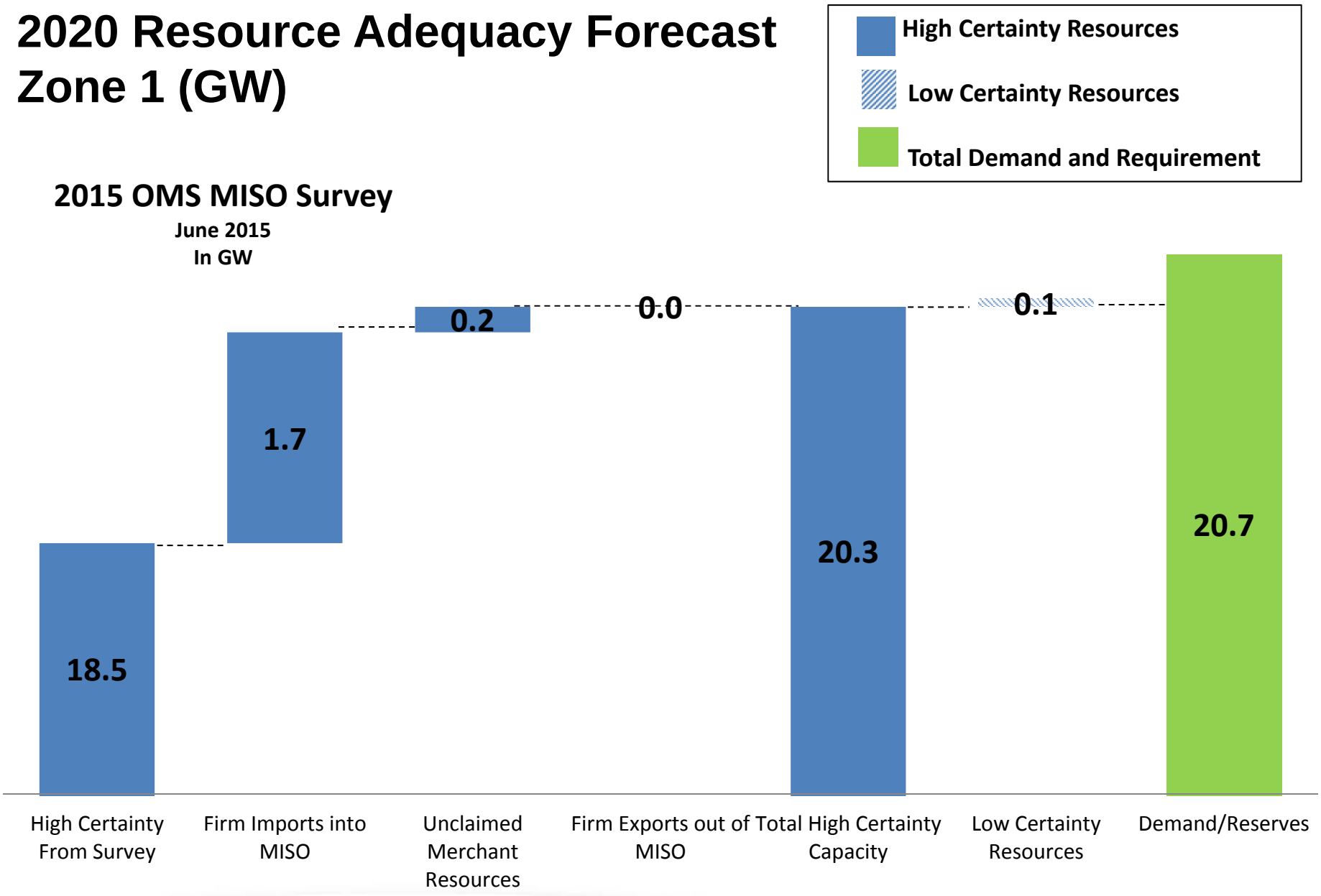



*Values based on survey results and do not include all generation in queue
Wind at capacity credit of 14.1%

# Zone 1 Reported New Resources by Fuel Type

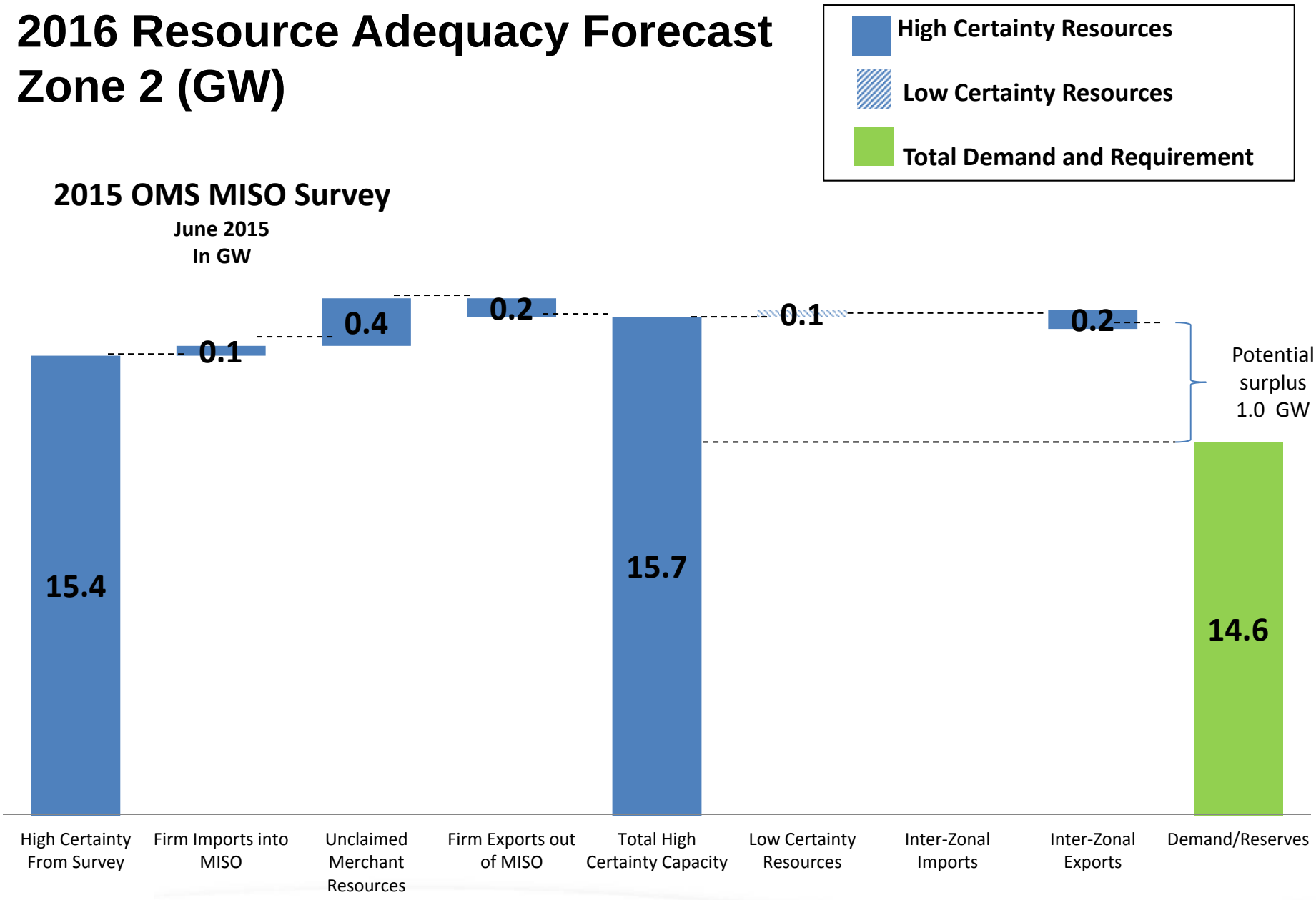


# 2020 Resource Adequacy Forecast Zone 1 (GW)




Values in Installed Capacity (ICAP)

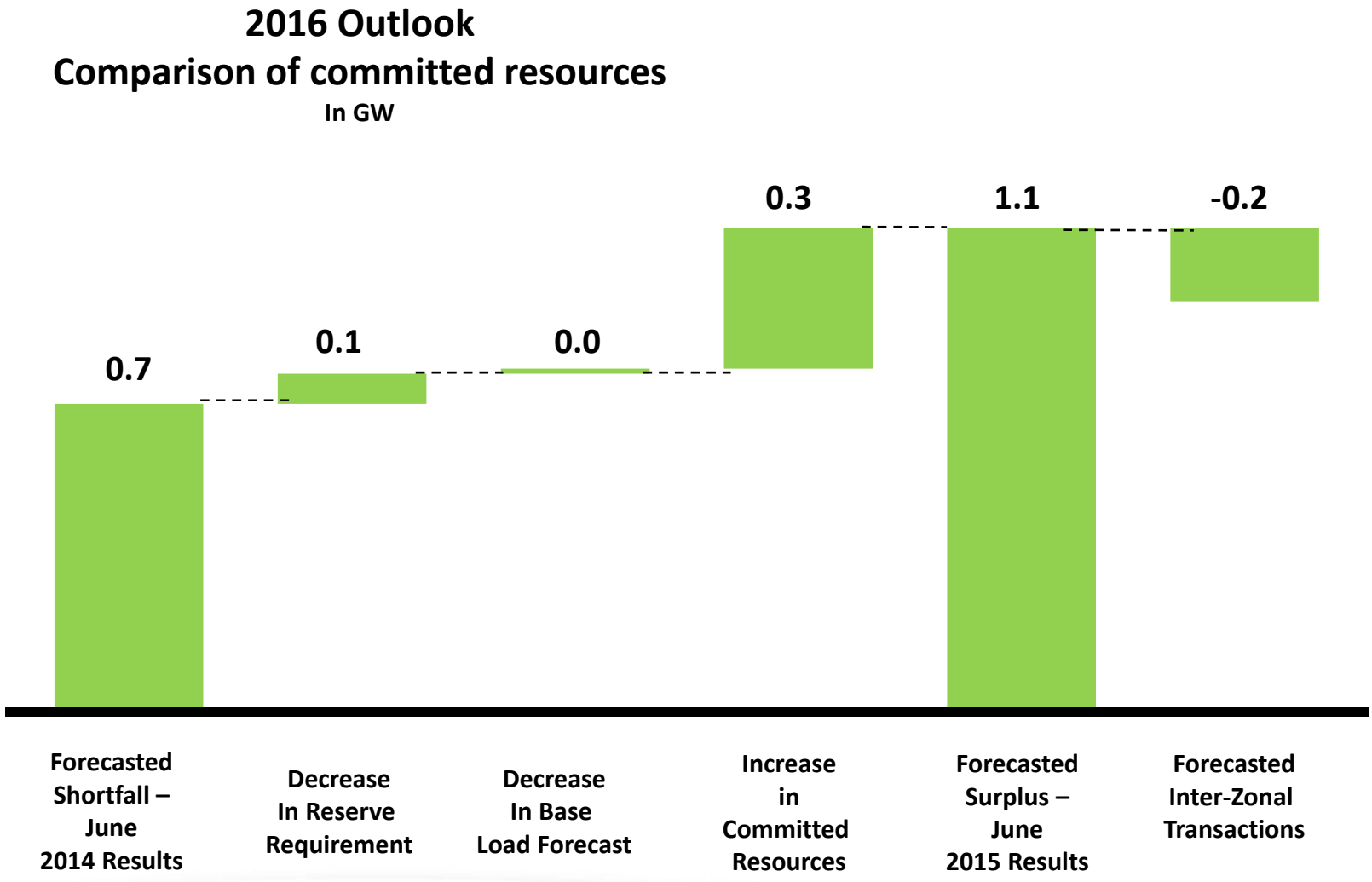
# 2016 Resource Adequacy Forecast Zone 2 (GW)



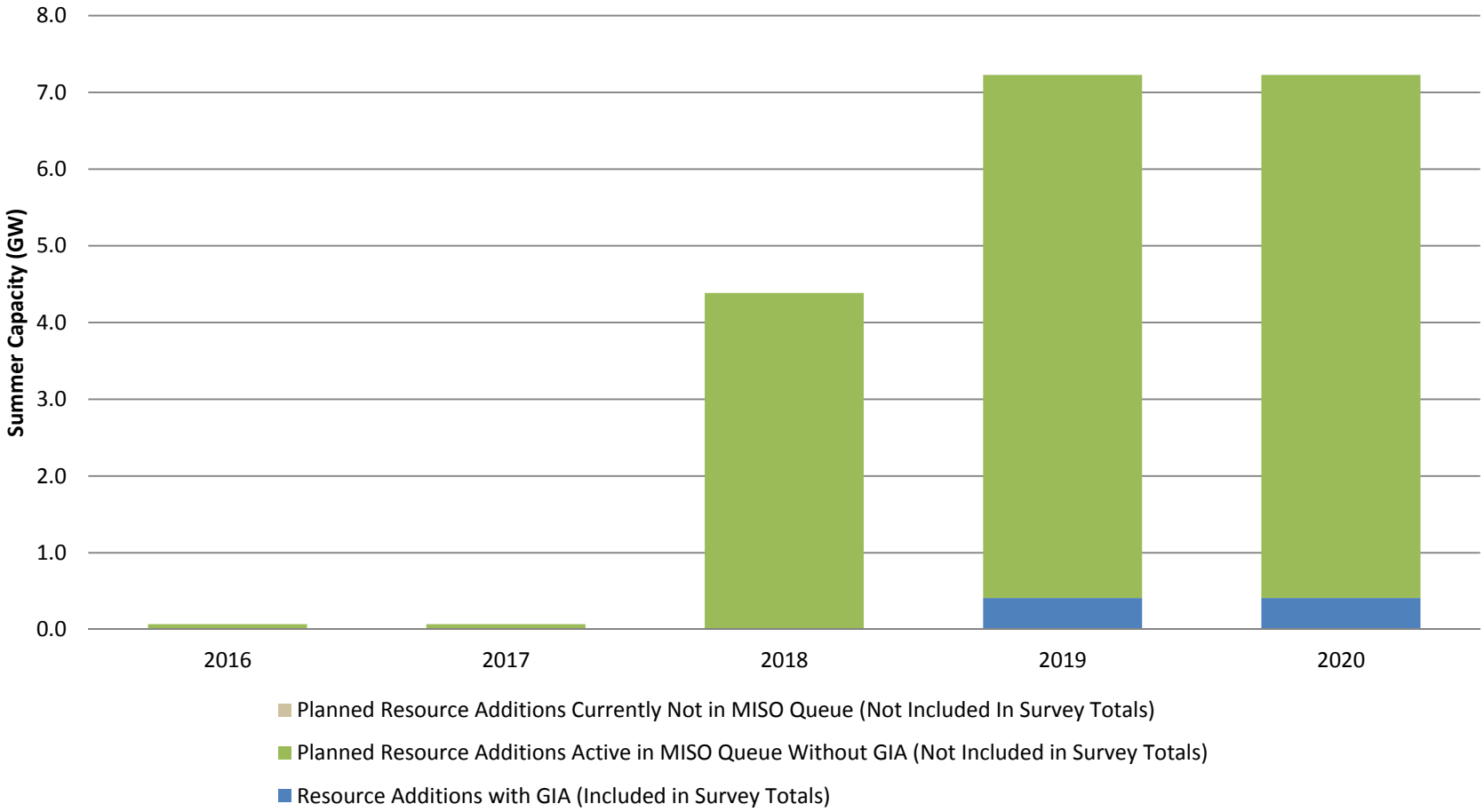

Values in Installed Capacity (ICAP)

Capacity Import Limit: 2.9 GW *(From 2015 Planning Resource Auction)*

# 2014 vs 2015 OMS MISO Survey Results Zone 2

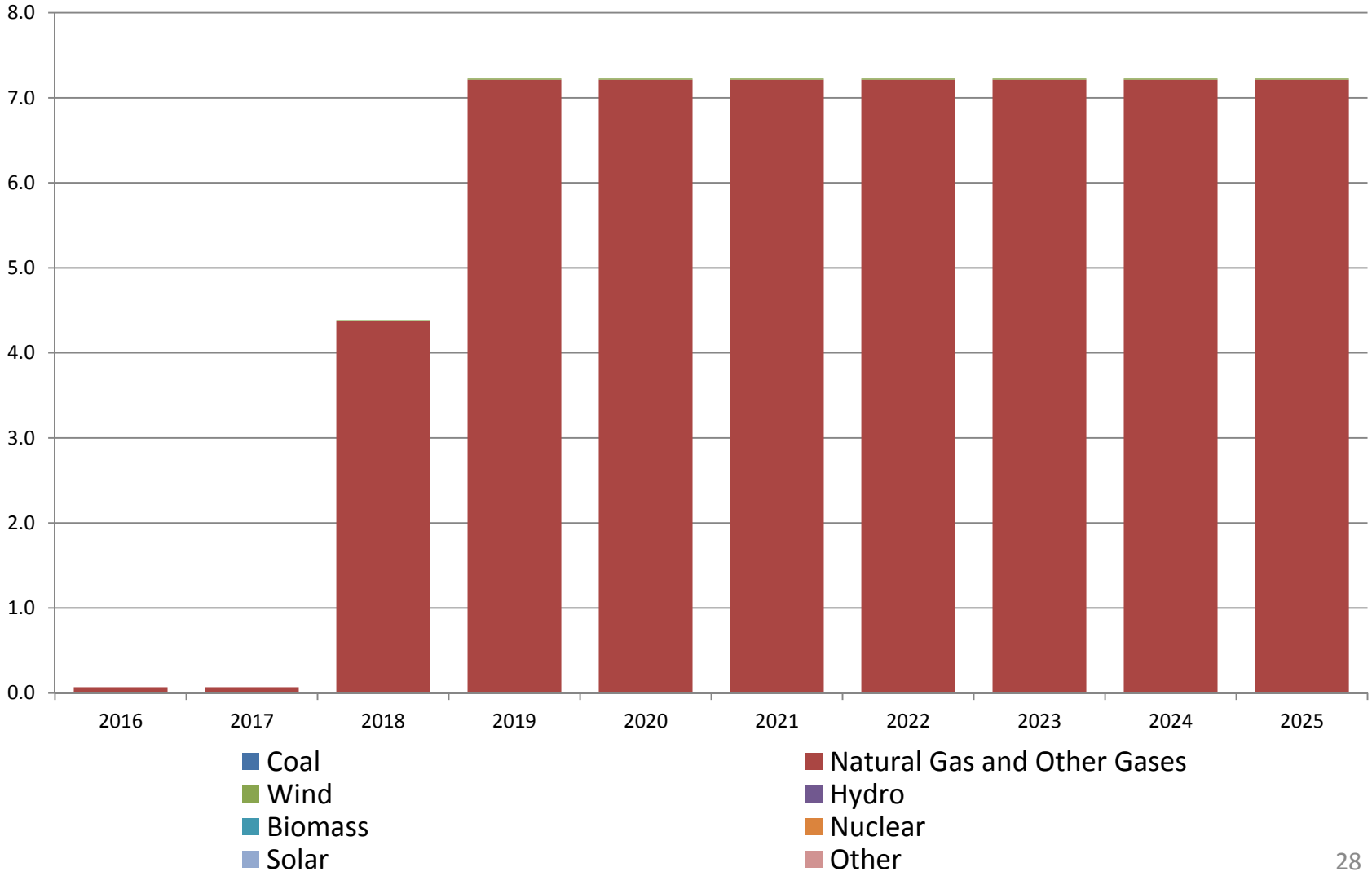


# New Generation Reported in Survey Zone 2 (GW)

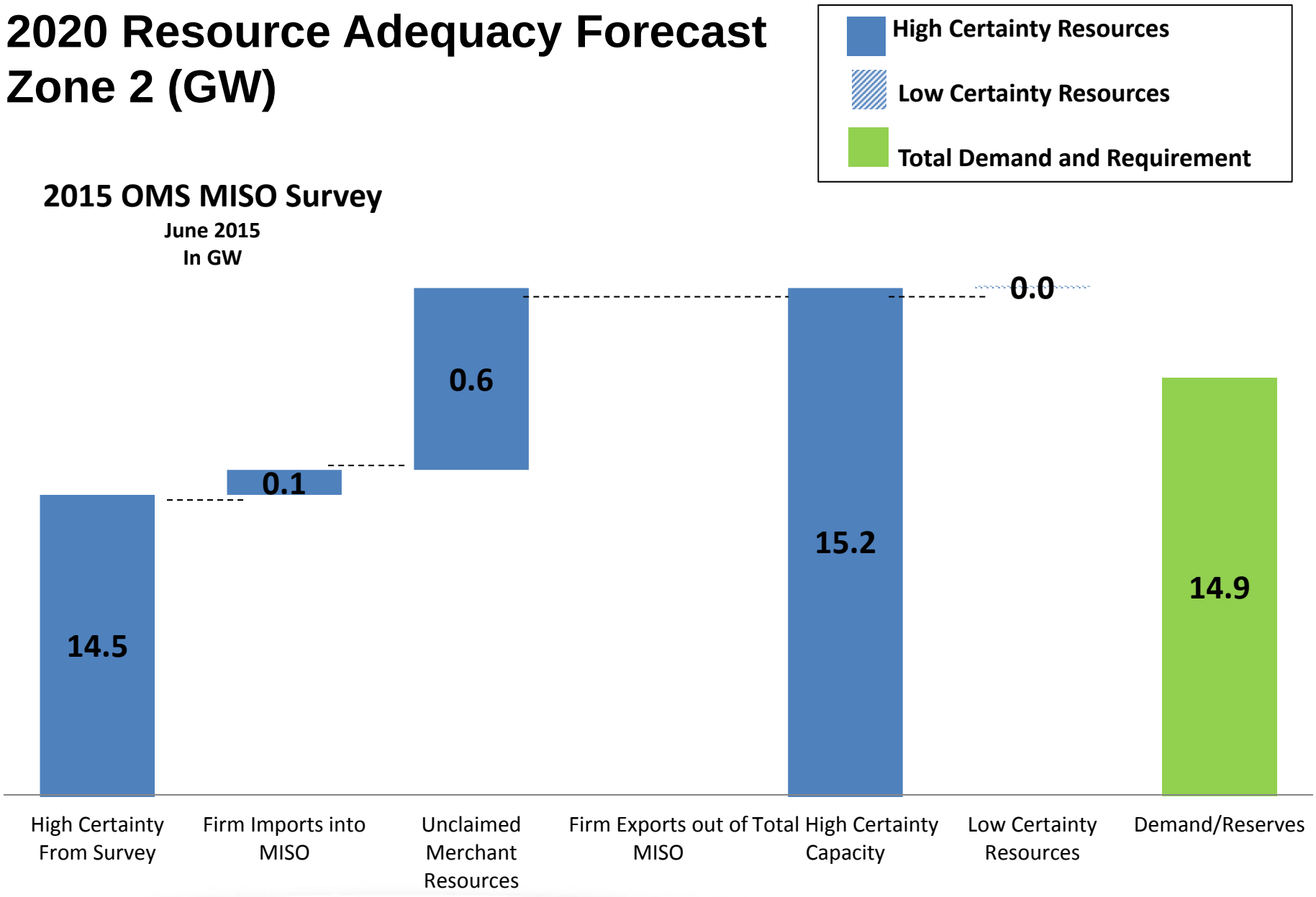



*Values based on survey results and do not include all generation in queue
Wind at capacity credit of 14.1%

# Zone 2 Reported New Resources by Fuel Type

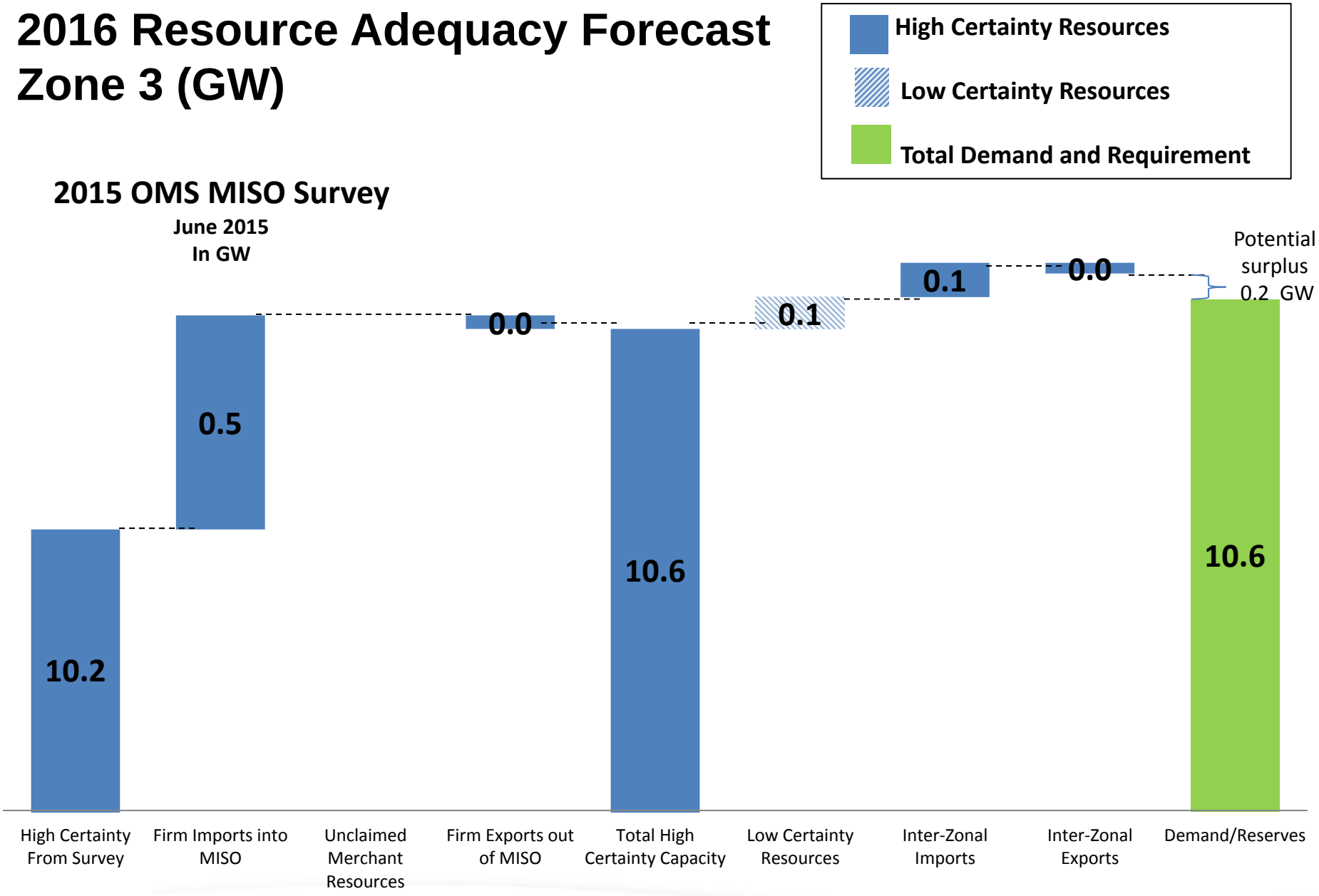


# 2020 Resource Adequacy Forecast Zone 2 (GW)




Values in Installed Capacity (ICAP)

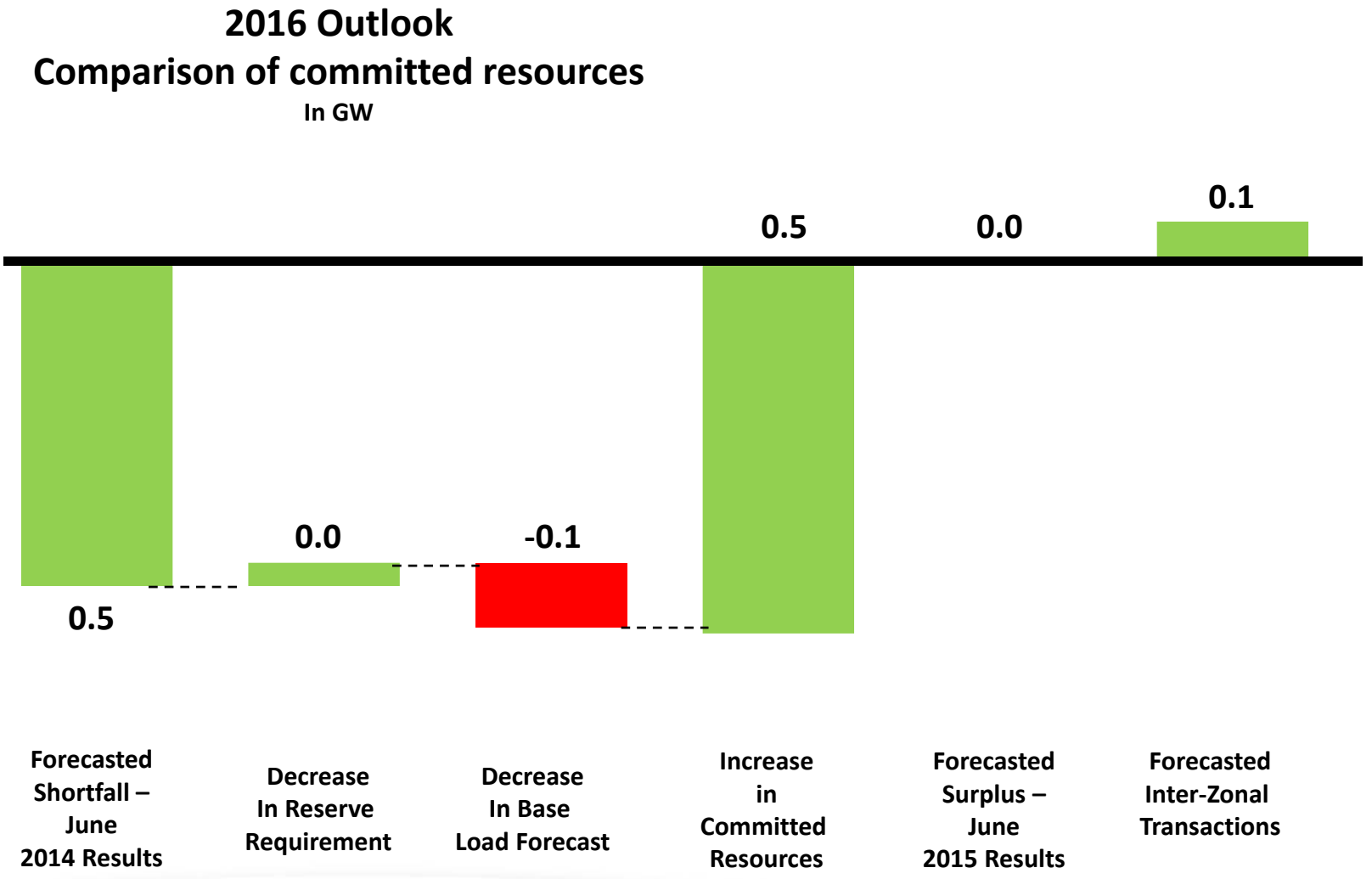
# 2016 Resource Adequacy Forecast Zone 3 (GW)



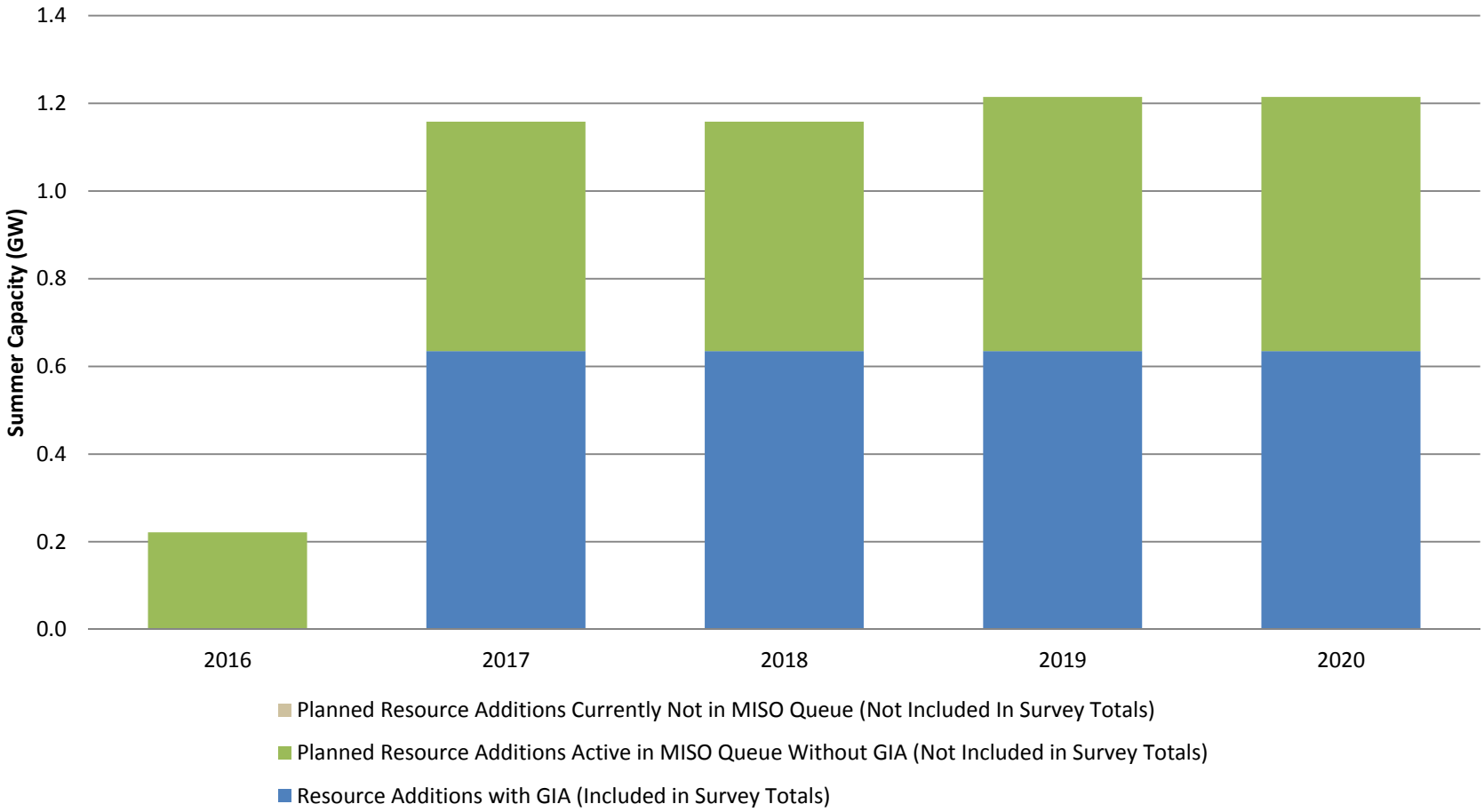

Values in Installed Capacity (ICAP)

Capacity Import Limit: 2.0 GW *(From 2015 Planning Resource Auction)*

# 2014 vs 2015 OMS MISO Survey Results Zone 3

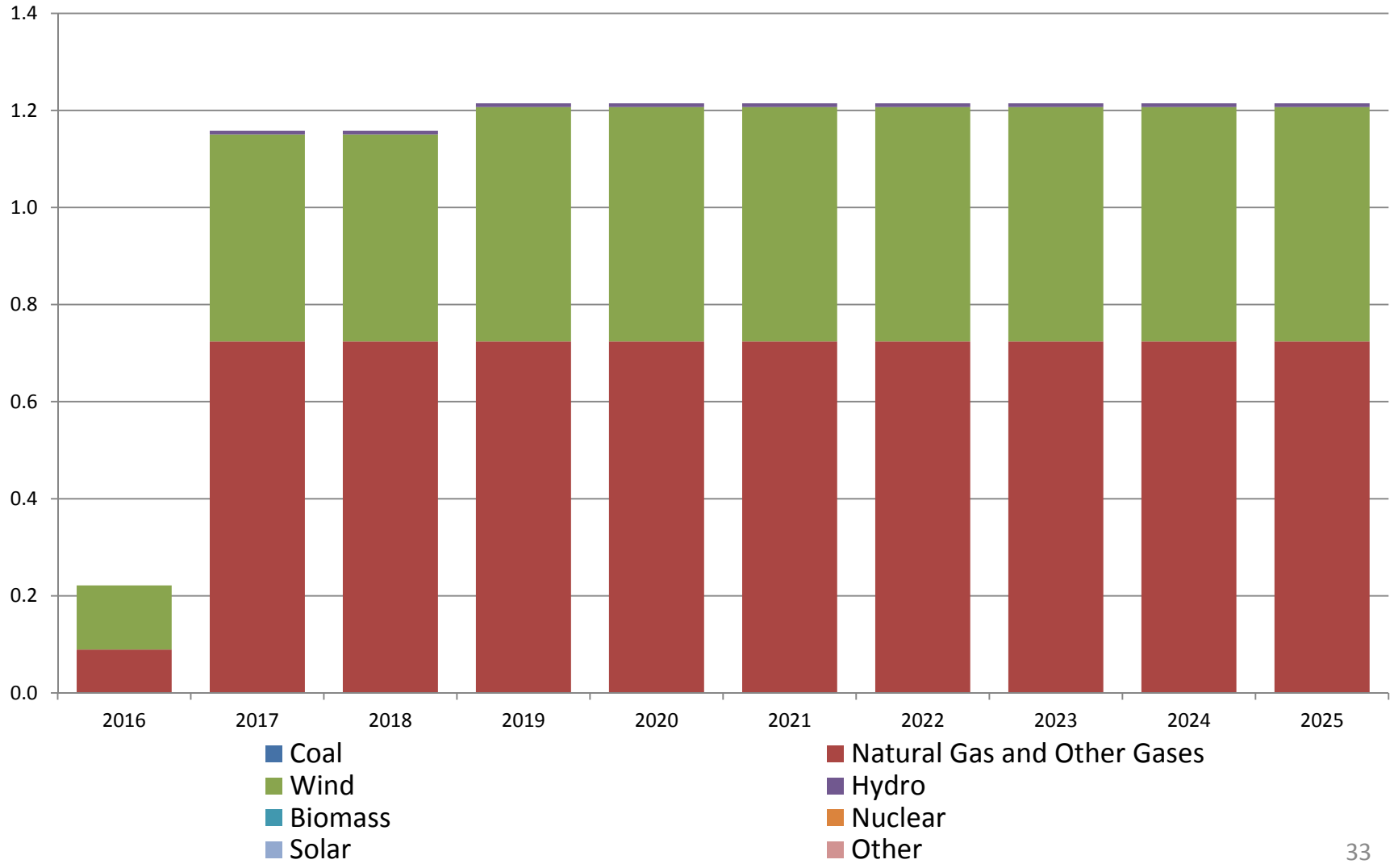


# New Generation Reported in Survey Zone 3 (GW)

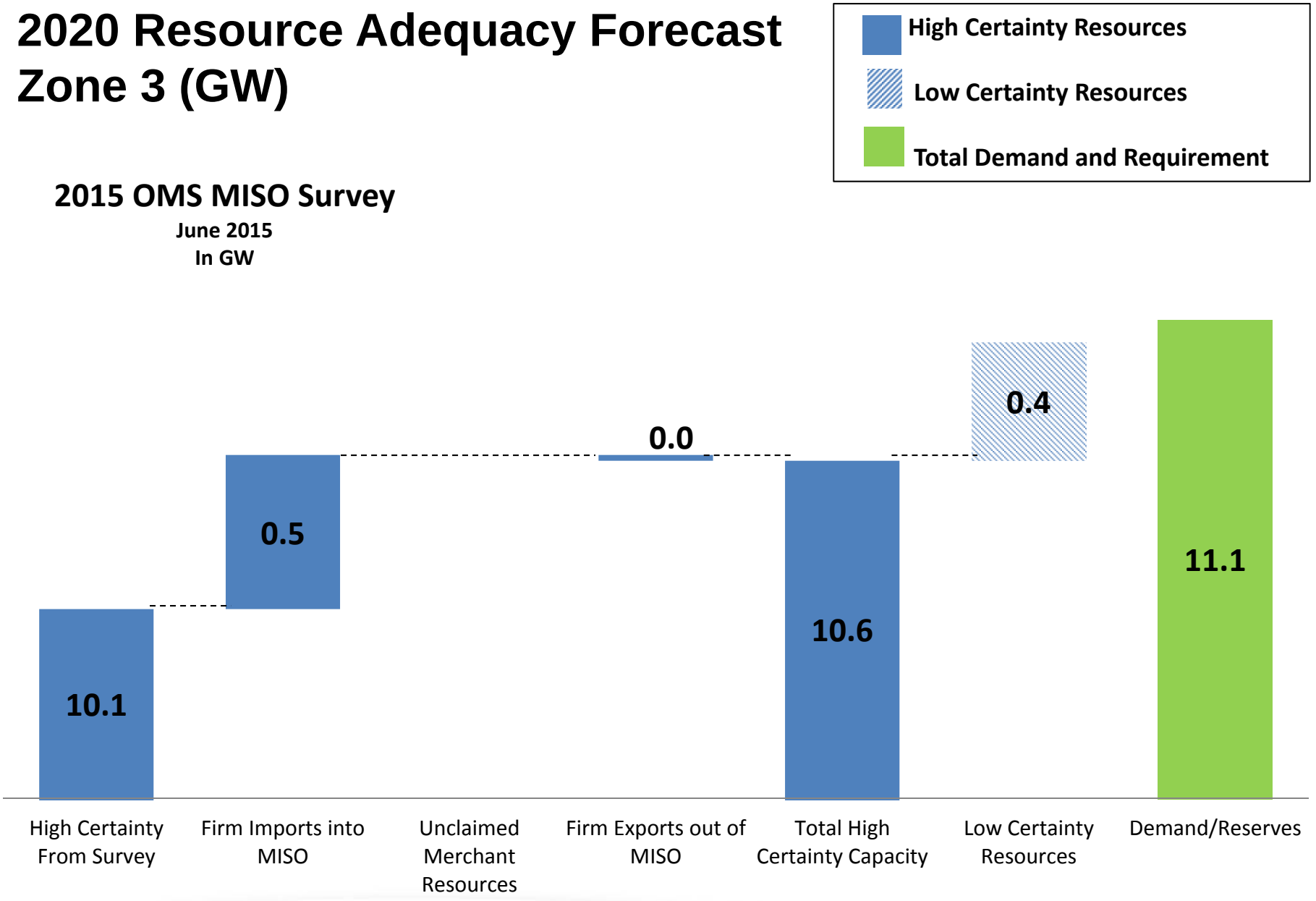



*Values based on survey results and do not include all generation in queue
Wind at capacity credit of 14.1%

# Zone 3 Reported New Resources by Fuel Type

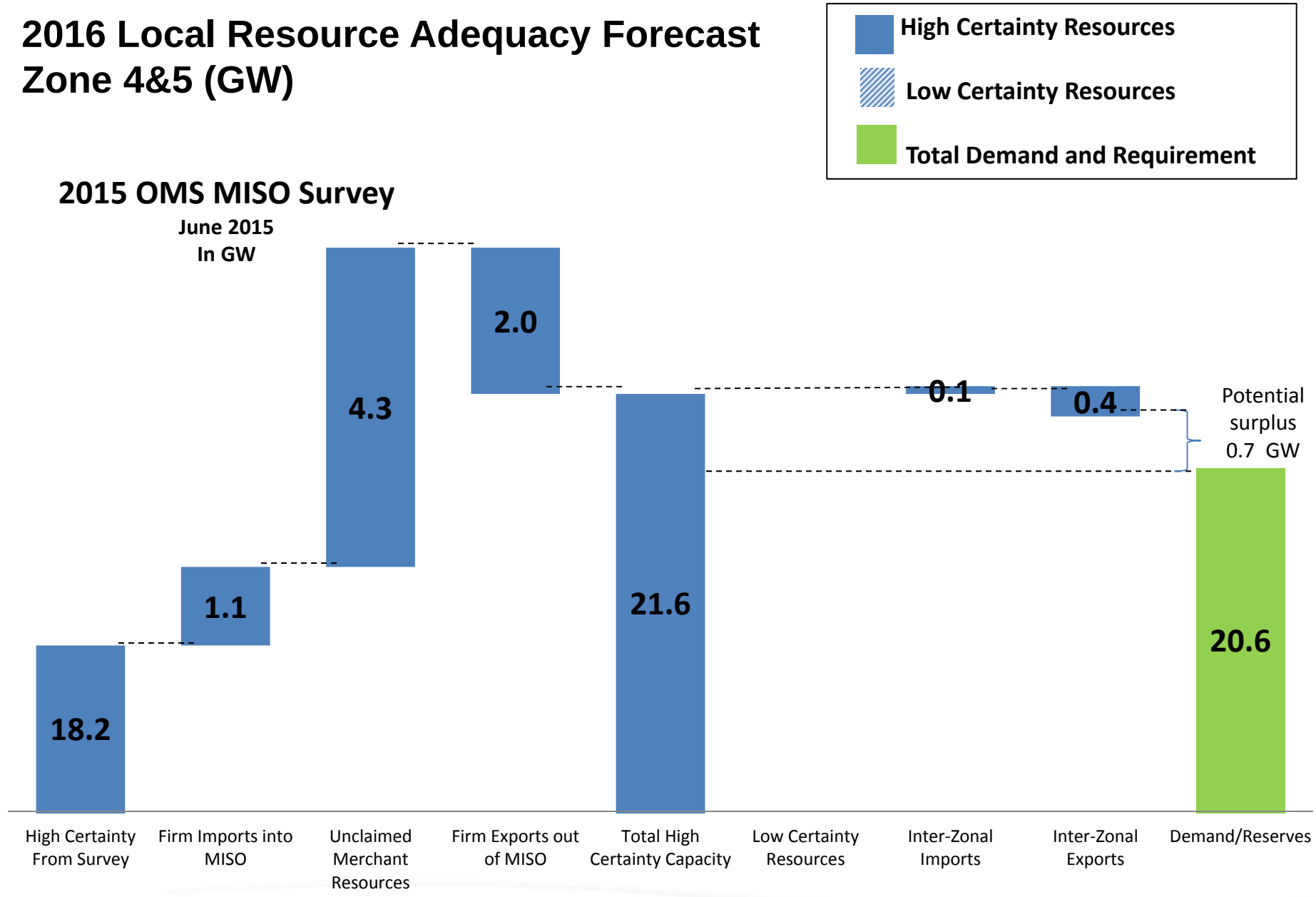


# 2020 Resource Adequacy Forecast Zone 3 (GW)




Values in Installed Capacity (ICAP)

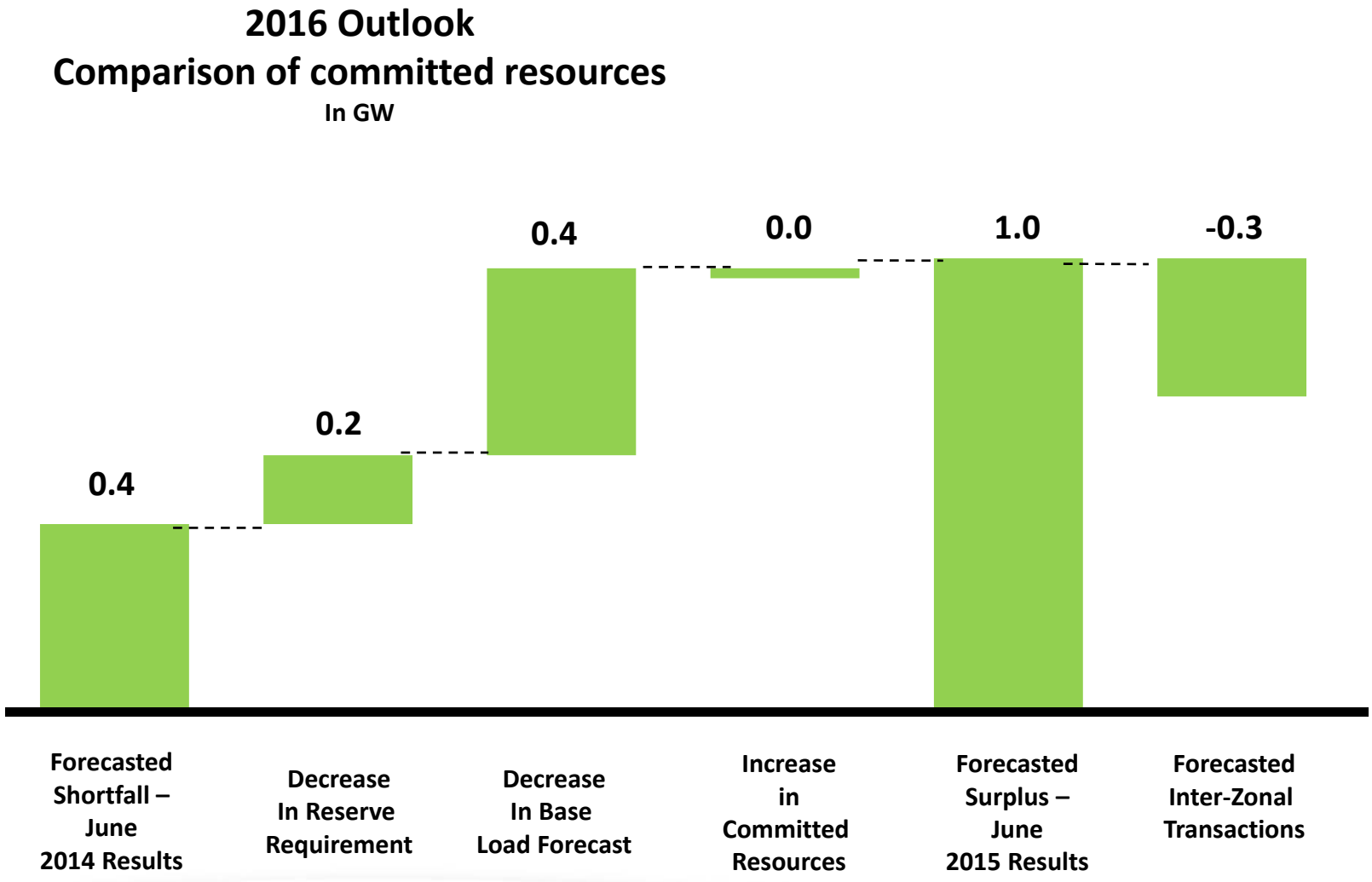
# 2016 Local Resource Adequacy Forecast Zone 4&5 (GW)



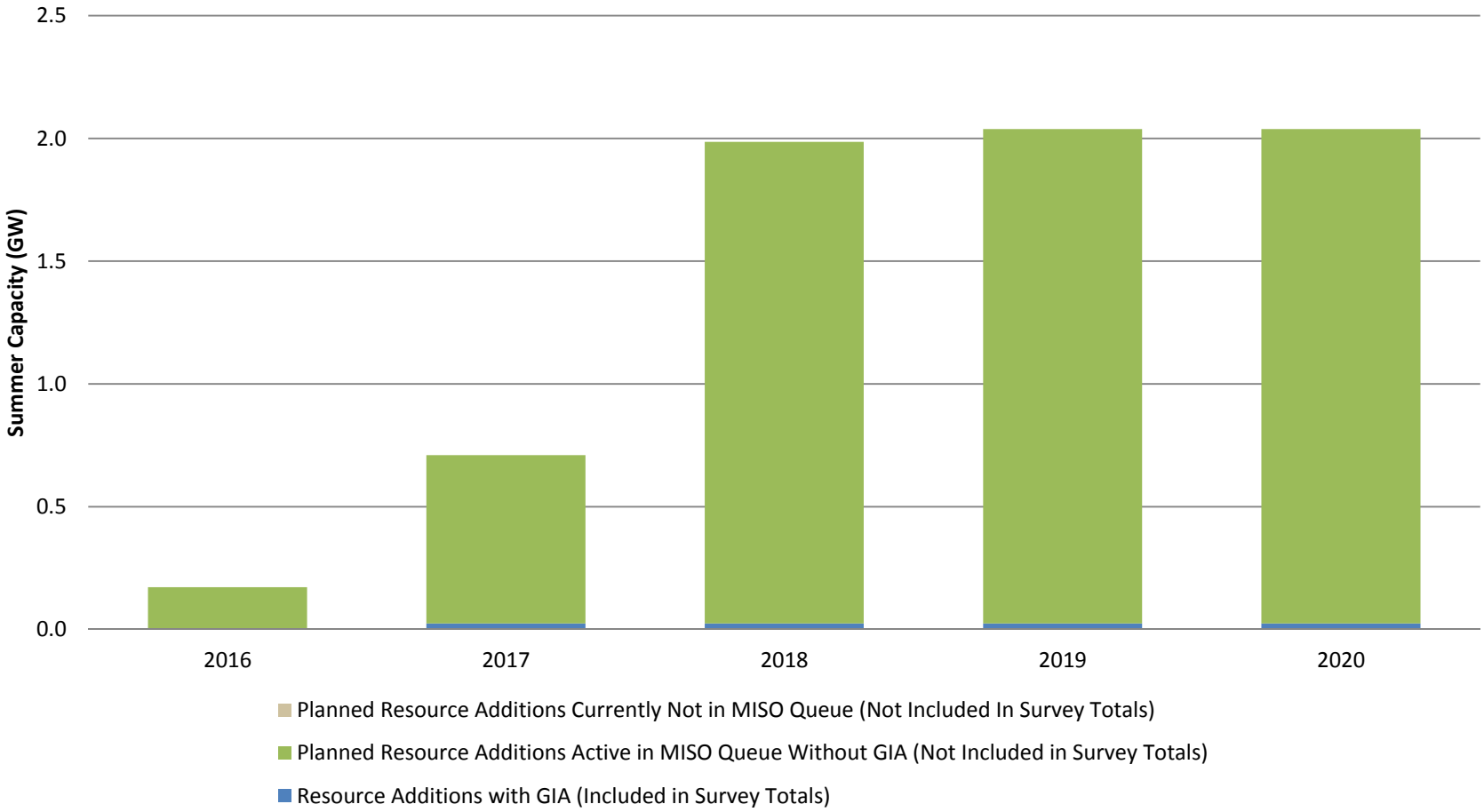

Values in Installed Capacity (ICAP)

Capacity Import Limit: 3.1 & 3.9 GW *(From 2015 Planning Resource Auction)*

# 2014 vs 2015 OMS MISO Survey Results Zone 4/5

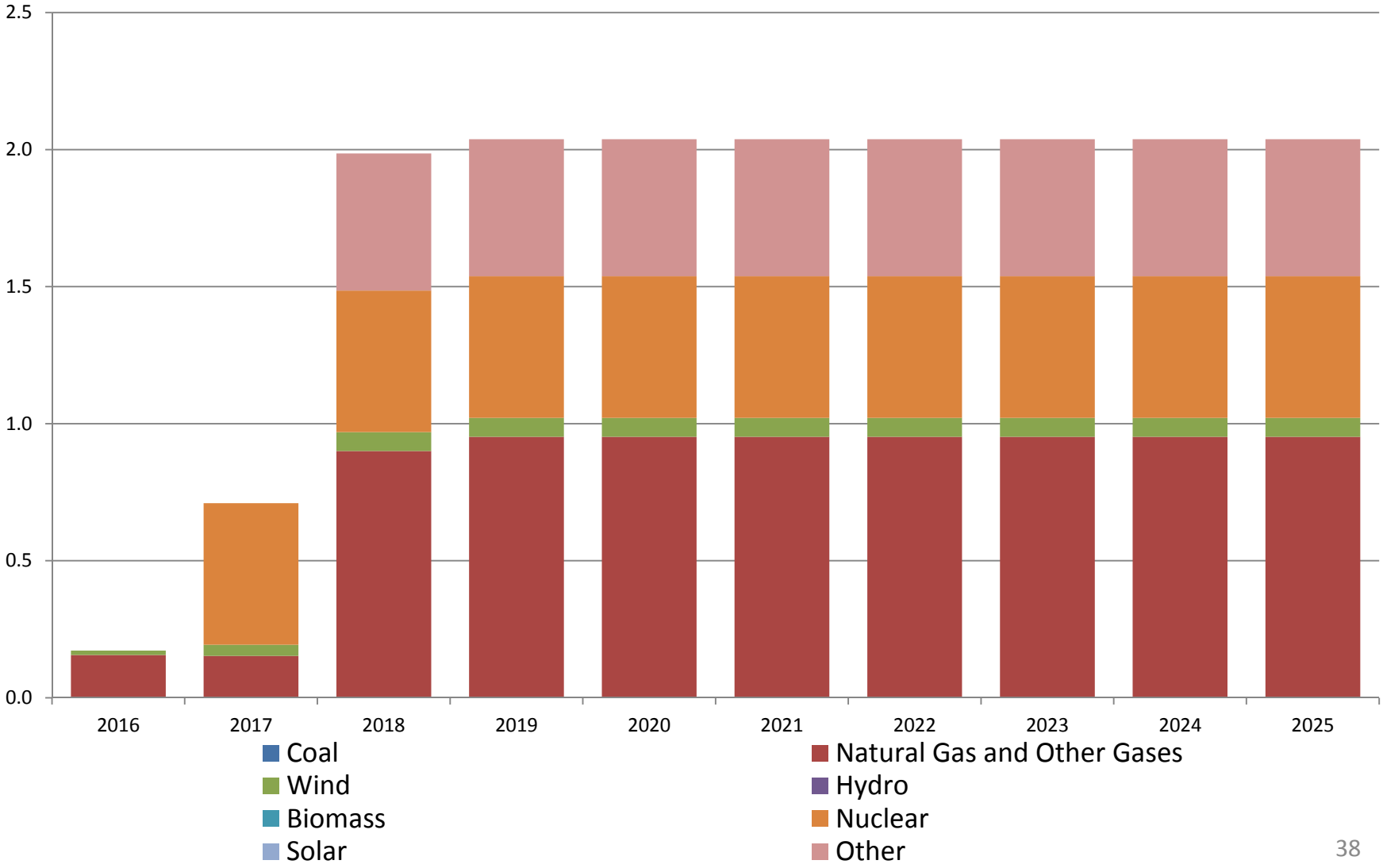


# New Generation Reported in Survey Zones 4&5 (GW)

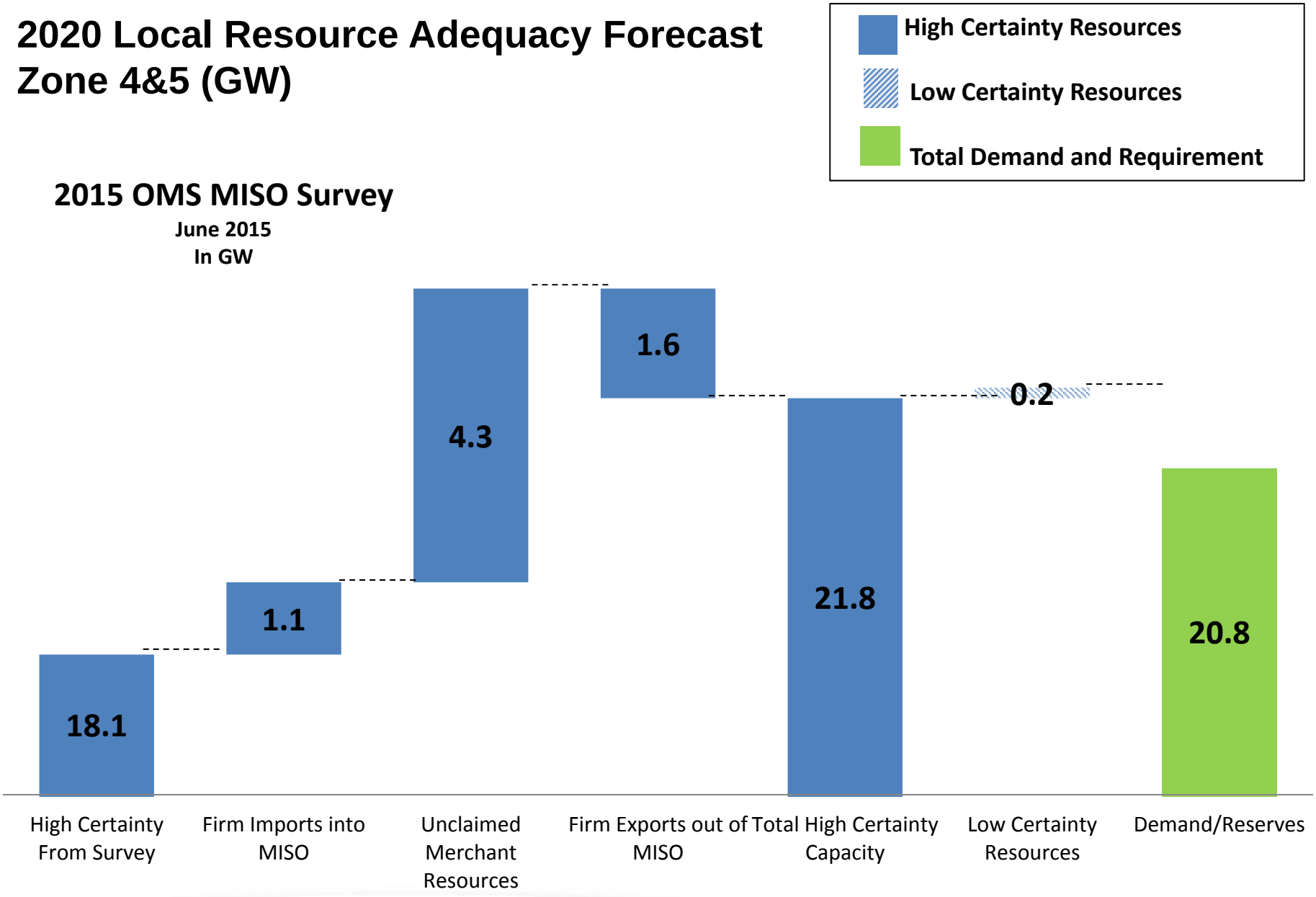



*Values based on survey results and do not include all generation in queue
Wind at capacity credit of 14.1%

# Zone 4/5 Reported New Resources by Fuel Type

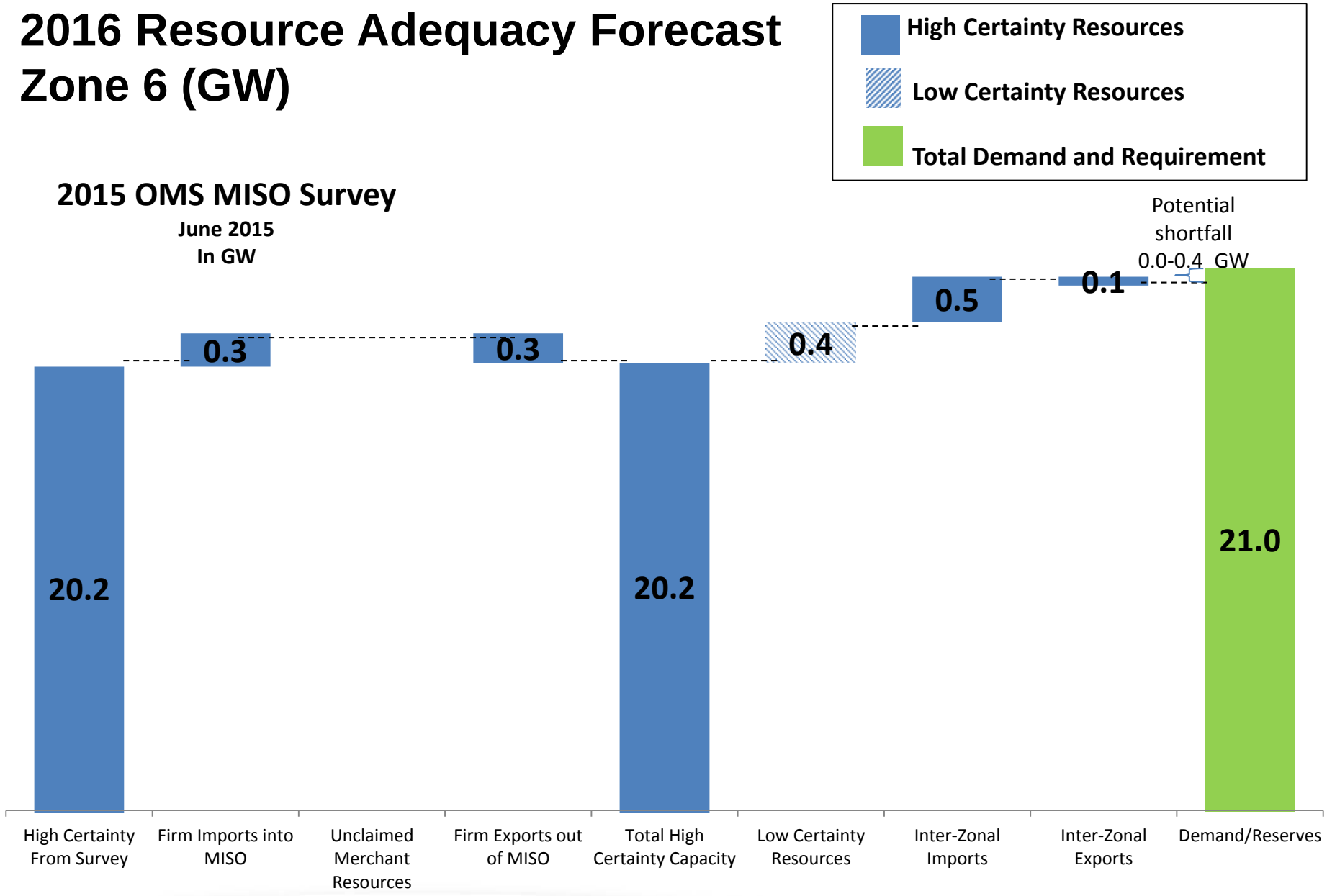


# 2020 Local Resource Adequacy Forecast Zone 4&5 (GW)




Values in Installed Capacity (ICAP)

# 2016 Resource Adequacy Forecast Zone 6 (GW)

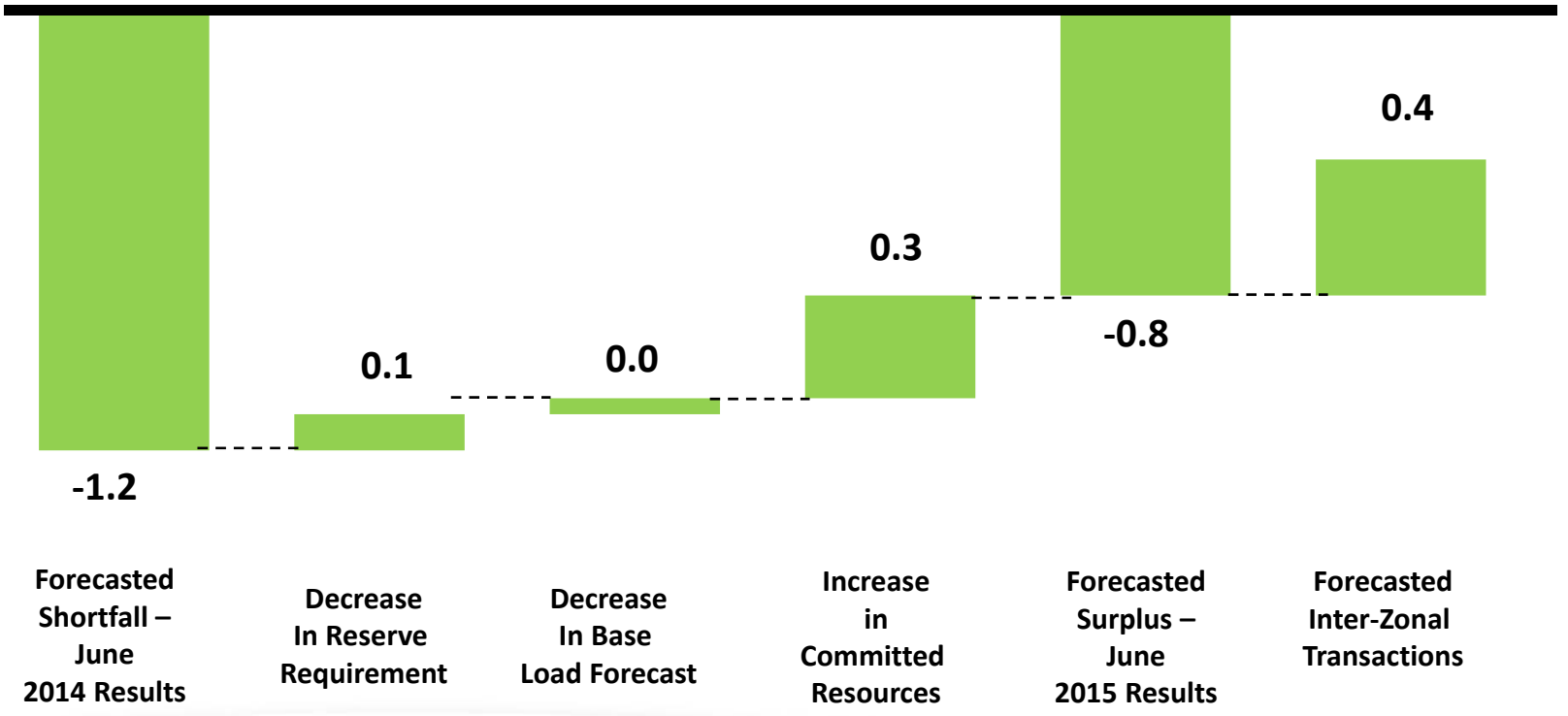



Values in Installed Capacity (ICAP)

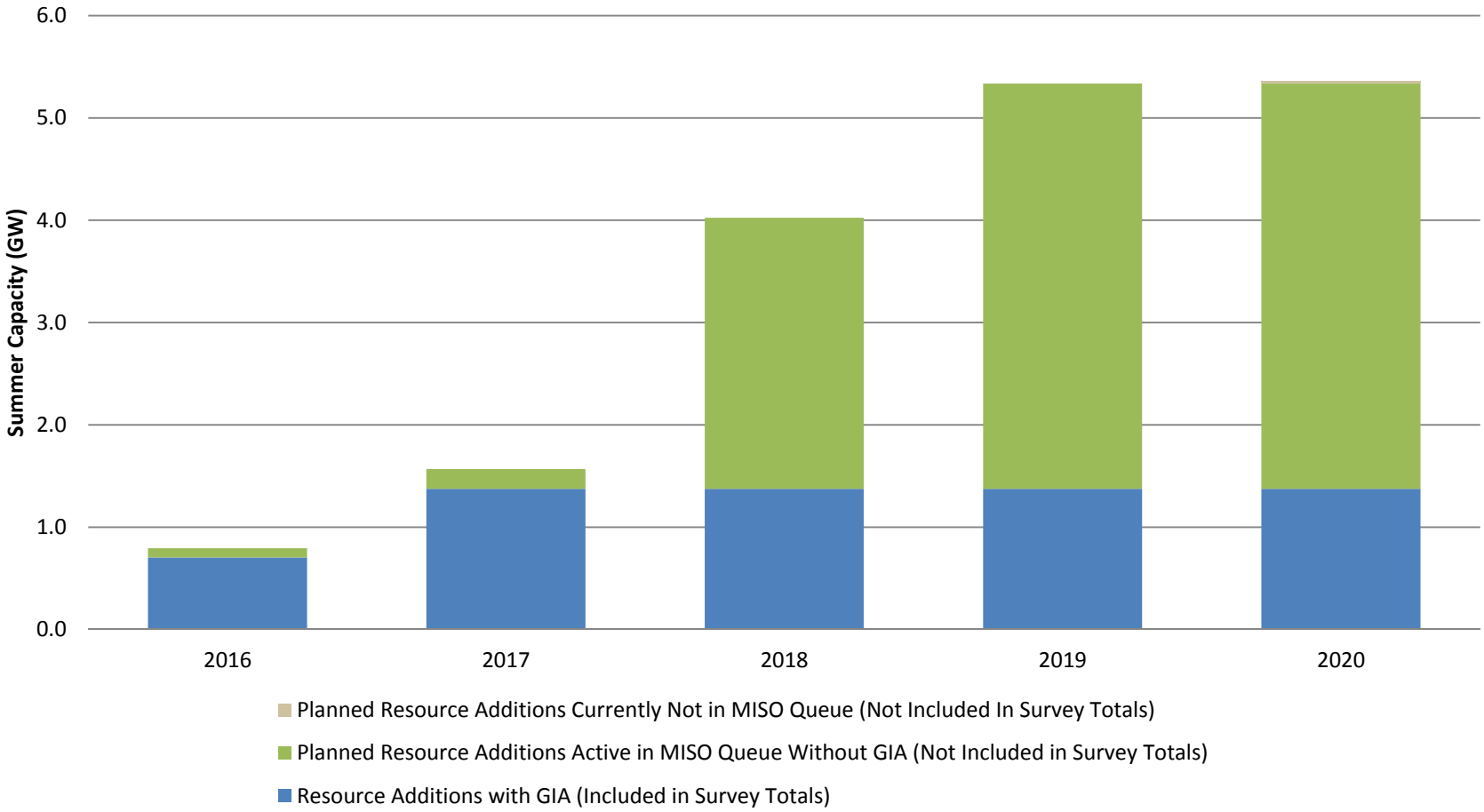
Capacity Import Limit: 5.6 GW *(From 2015 Planning Resource Auction)*

# 2014 vs 2015 OMS MISO Survey Results
# Zone 6

**2016 Outlook**
**Comparison of committed resources**
**In GW**

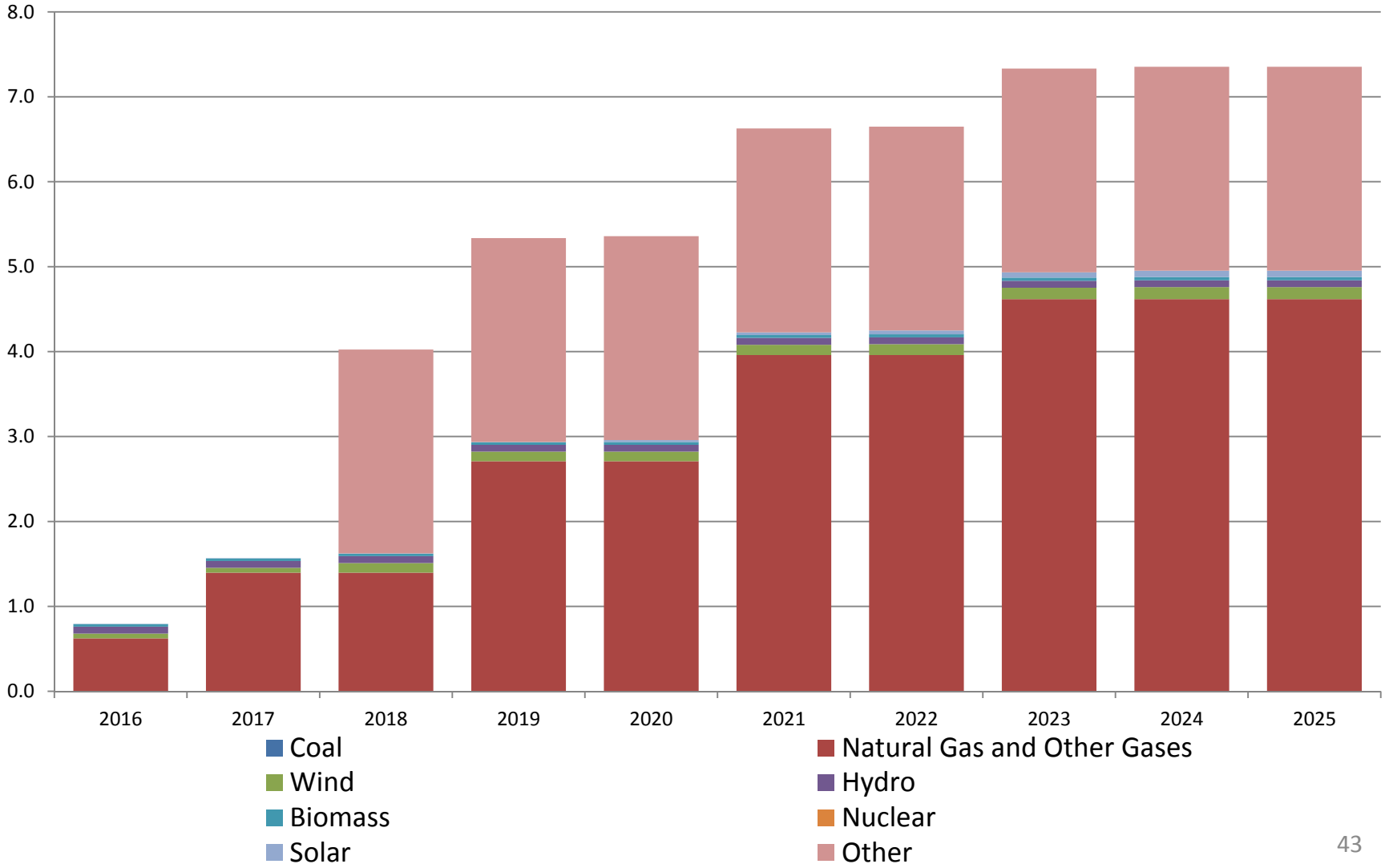


# New Generation Reported in Survey Zone 6 (GW)

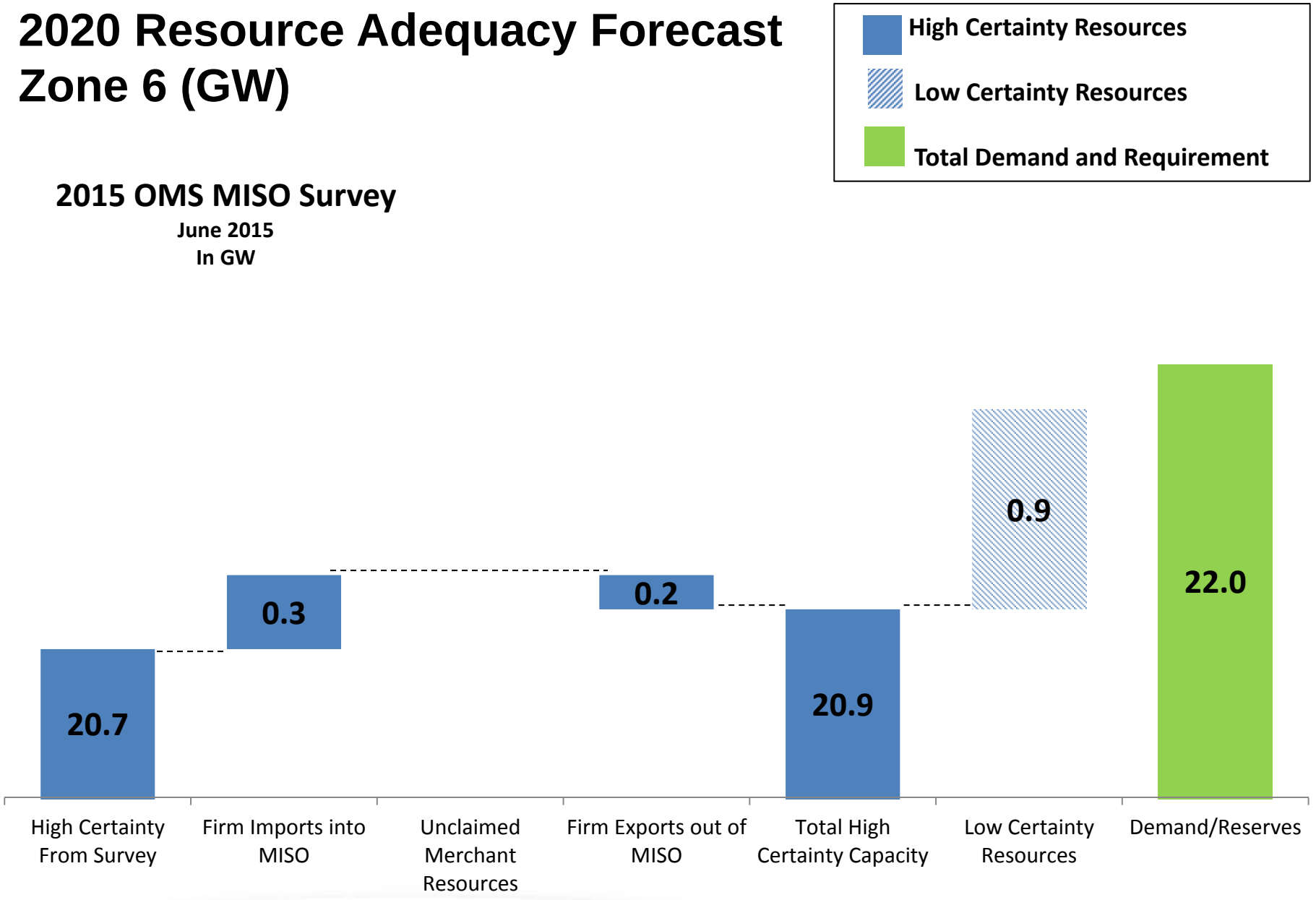



*Values based on survey results and do not include all generation in queue
Wind at capacity credit of 14.1%

# Zone 6 Reported New Resources by Fuel Type

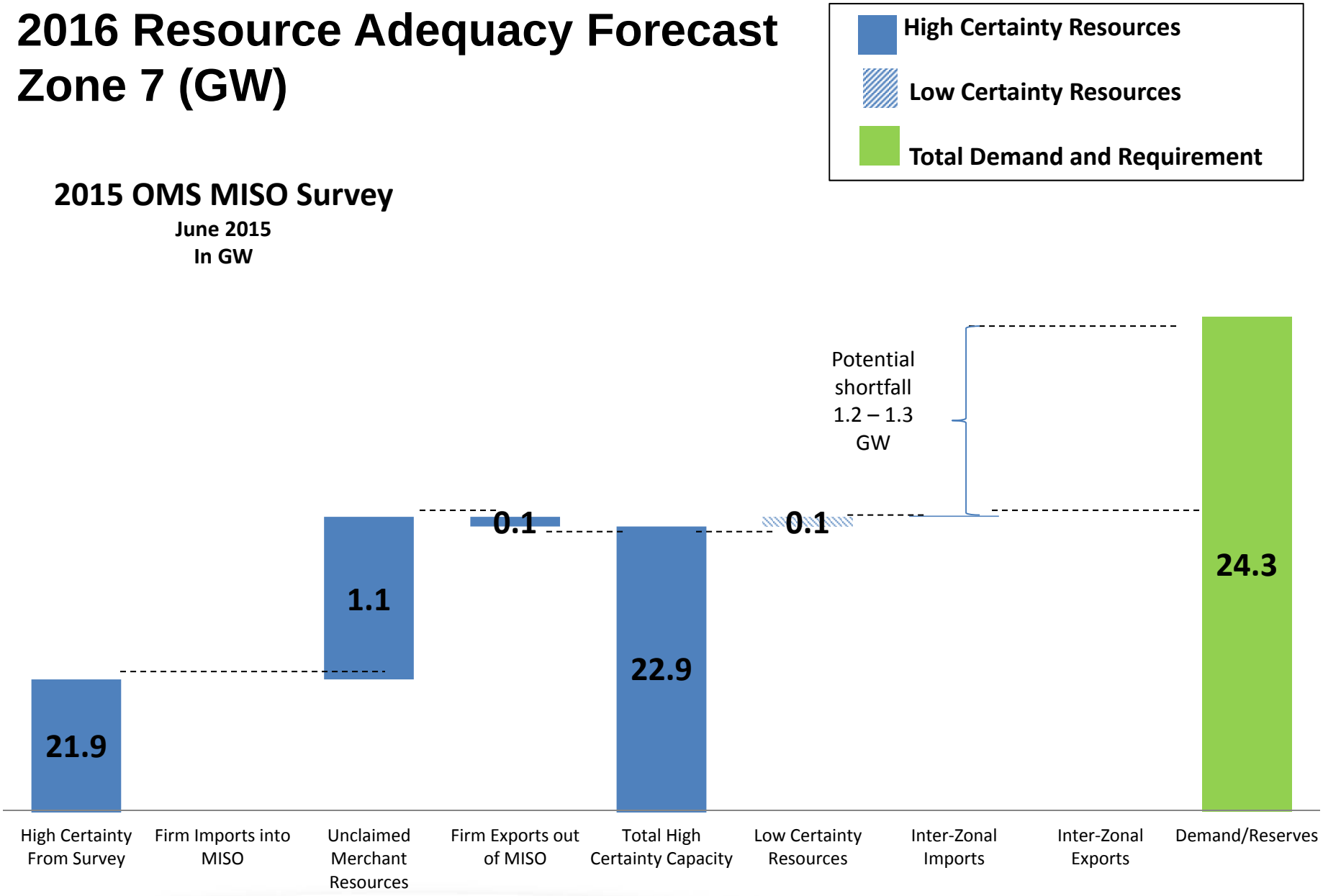


# 2020 Resource Adequacy Forecast Zone 6 (GW)




Values in Installed Capacity (ICAP)

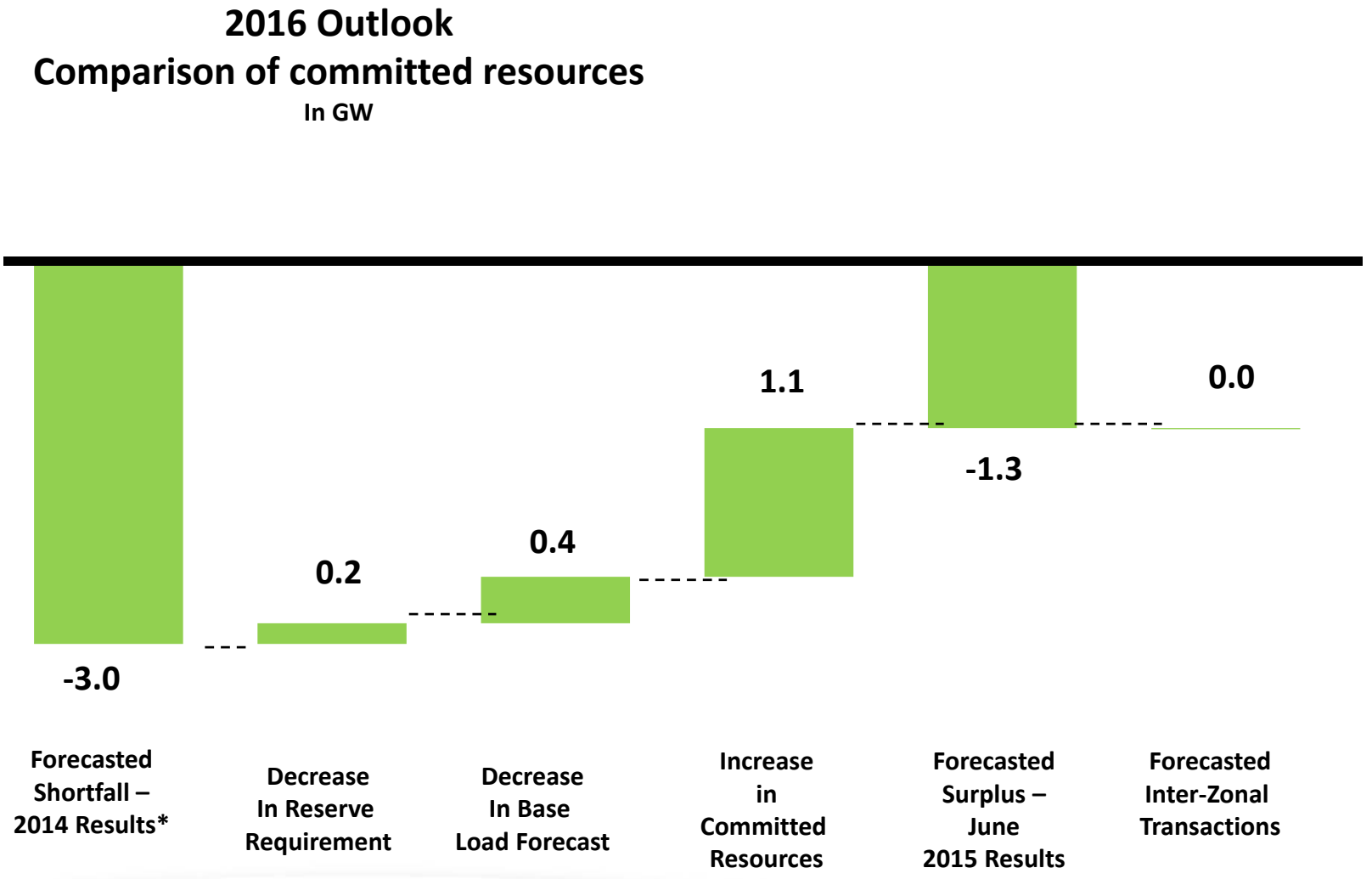
# 2016 Resource Adequacy Forecast Zone 7 (GW)




Values in Installed Capacity (ICAP)

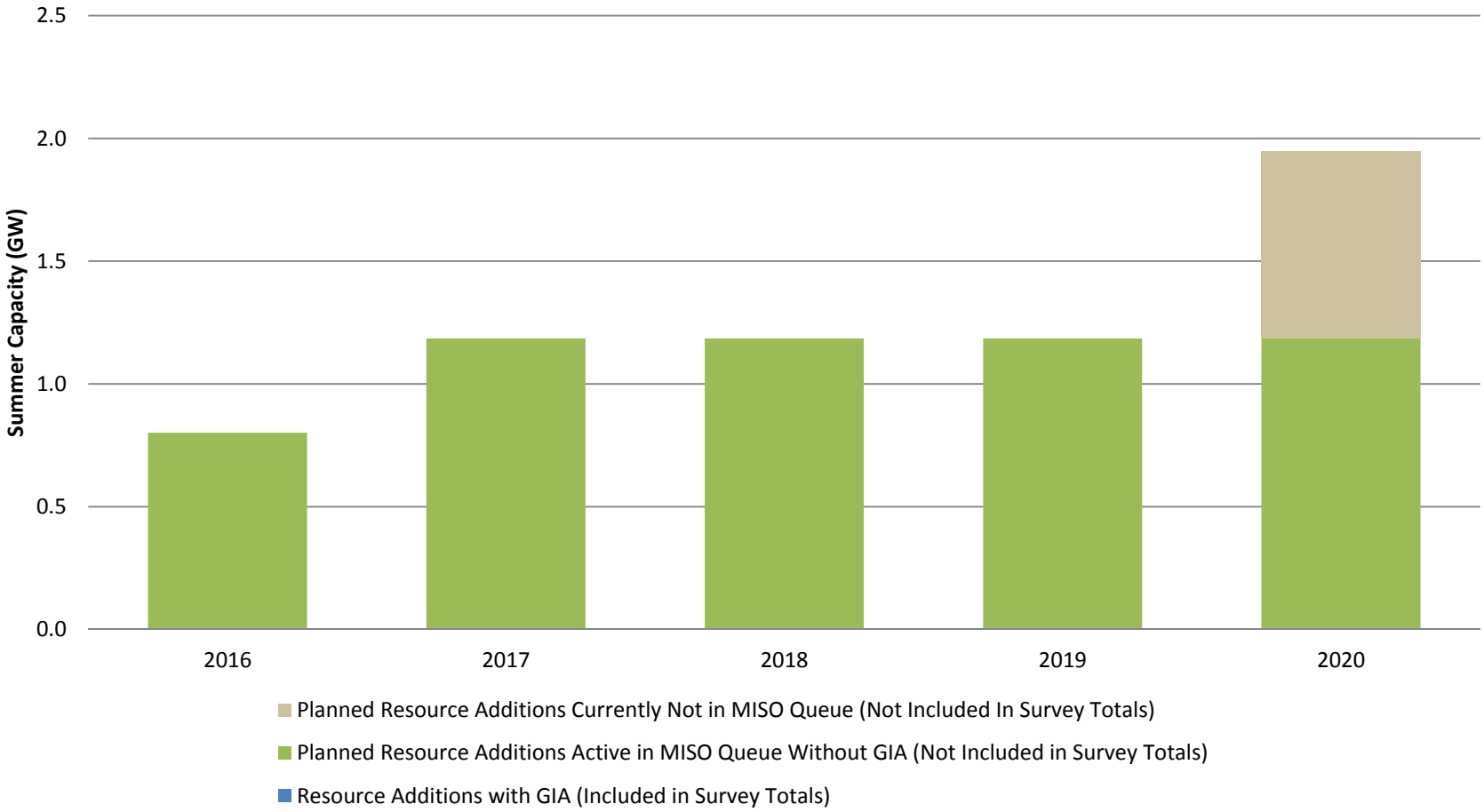
Capacity Import Limit: 3.8 GW *(From 2015 Planning Resource Auction)*

# 2014 vs 2015 OMS MISO Survey Results Zone 7



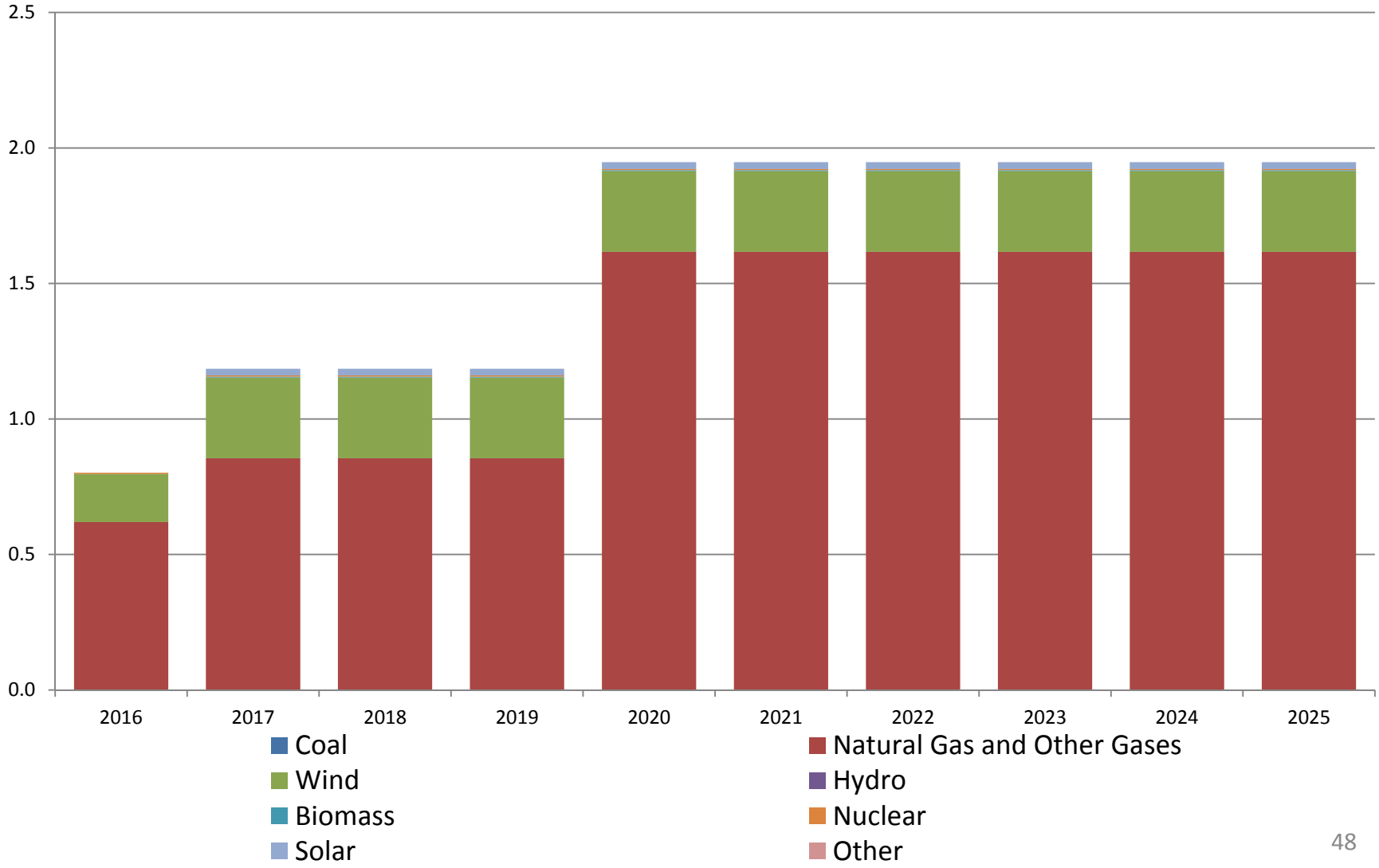

* Updated to remove Covert generation

# New Generation Reported in Survey Zone 7 (GW)

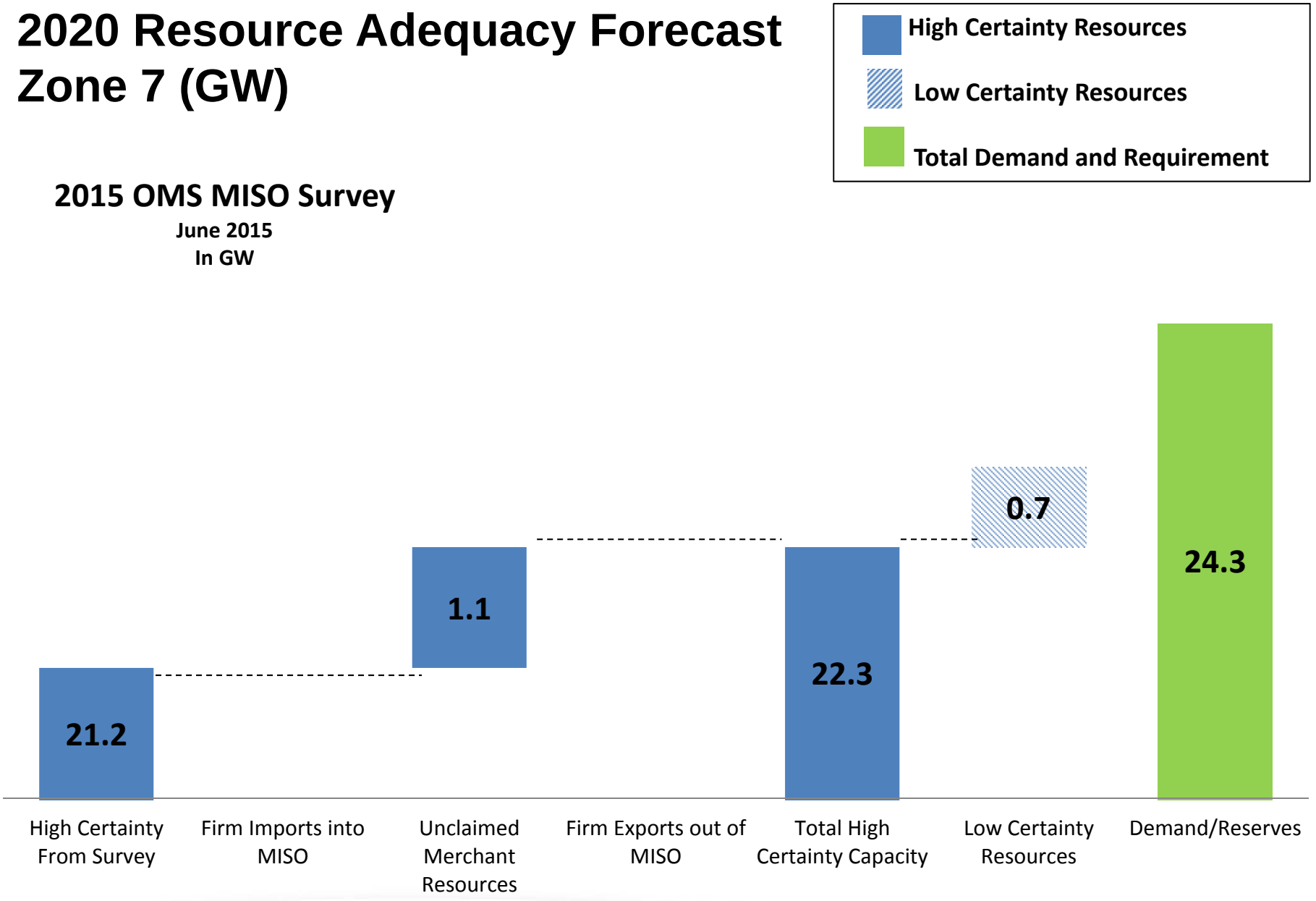



*Values based on survey results and do not include all generation in queue
Wind at capacity credit of 14.1%

# Zone 7 Reported New Resources by Fuel Type

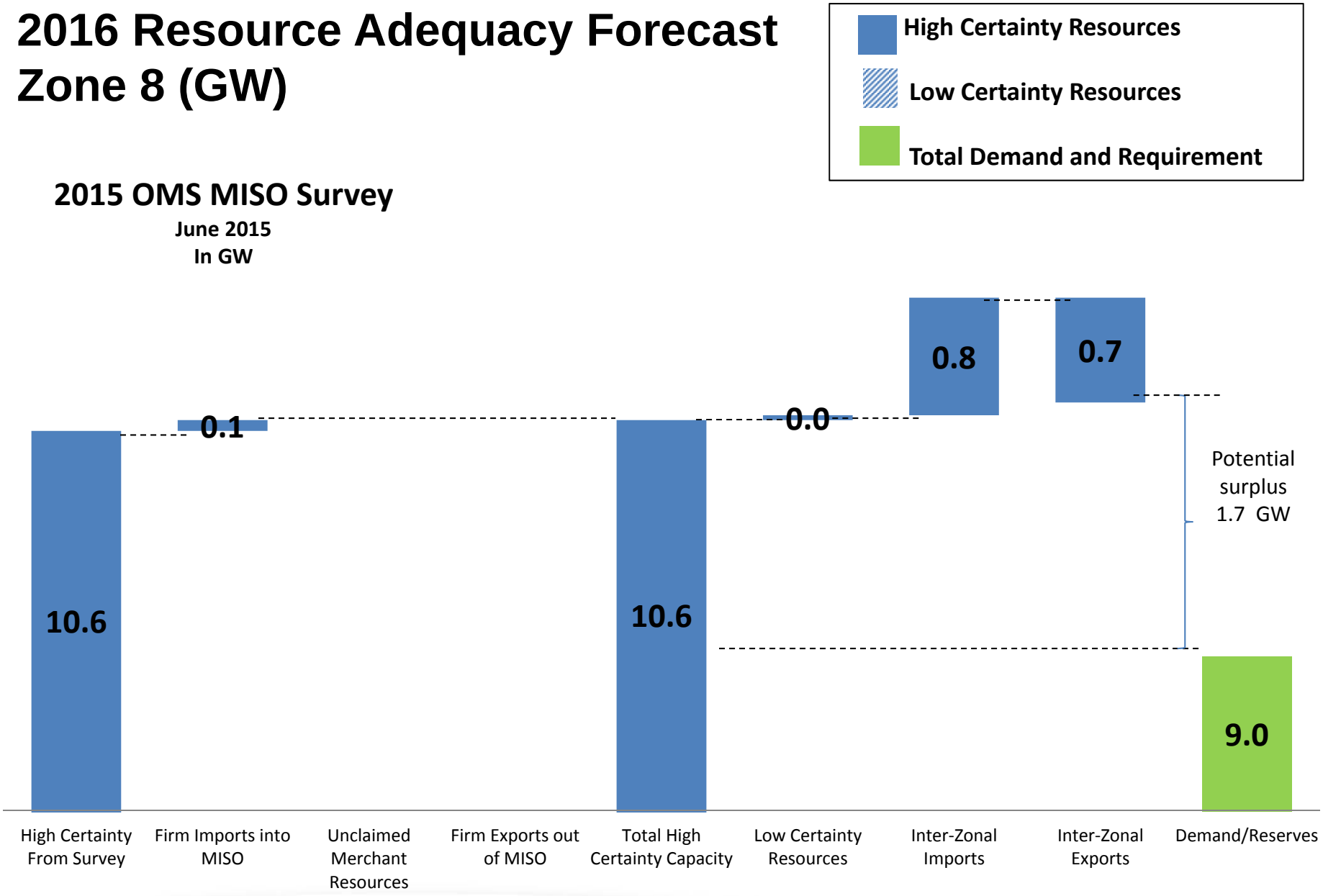


# 2020 Resource Adequacy Forecast Zone 7 (GW)




Values in Installed Capacity (ICAP)

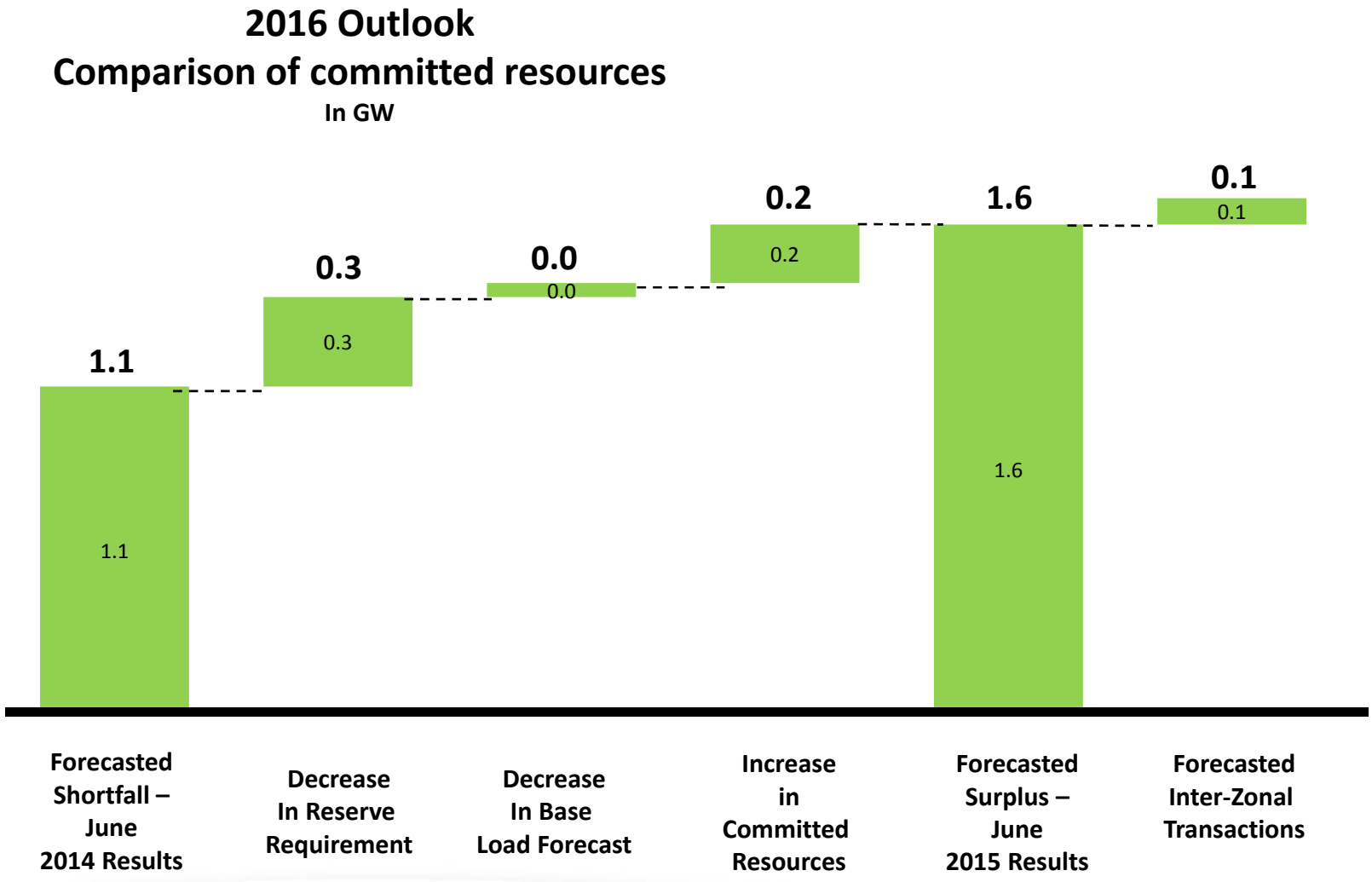
# 2016 Resource Adequacy Forecast Zone 8 (GW)



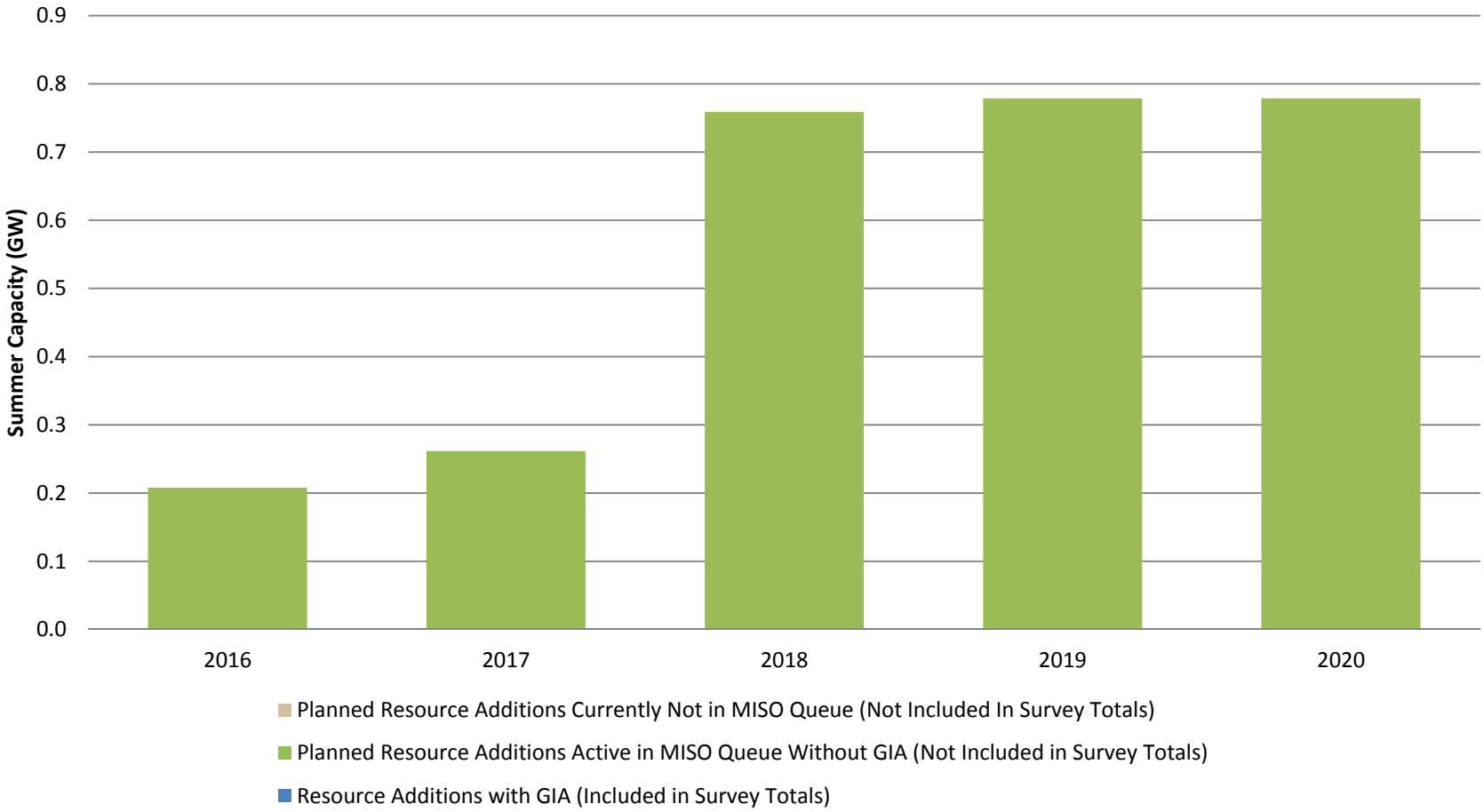

Values in Installed Capacity (ICAP)

Capacity Import Limit: 2.1 GW *(From 2015 Planning Resource Auction)*

# 2014 vs 2015 OMS MISO Survey Results Zone 8

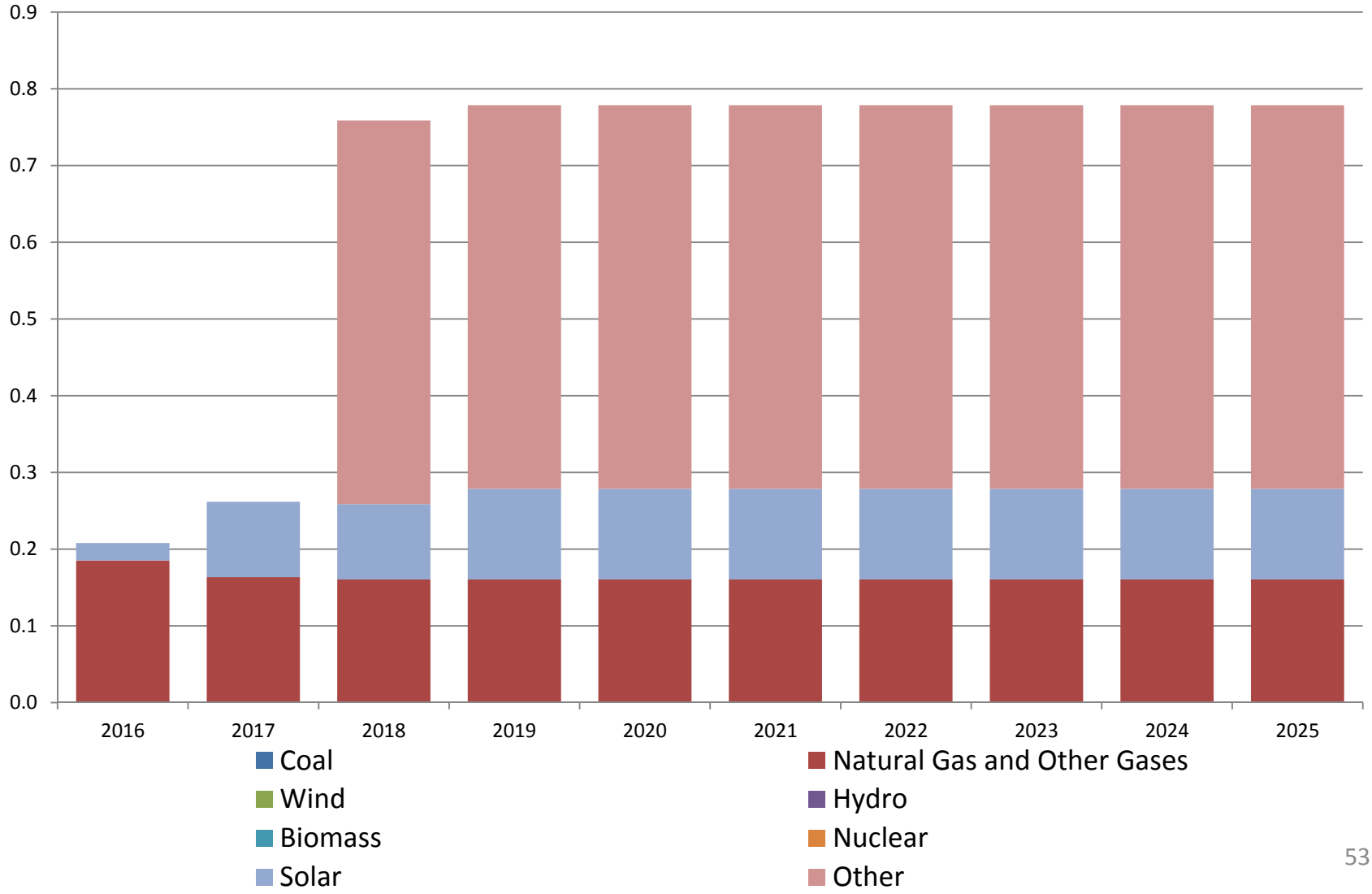


# New Generation Reported in Survey Zone 8 (GW)

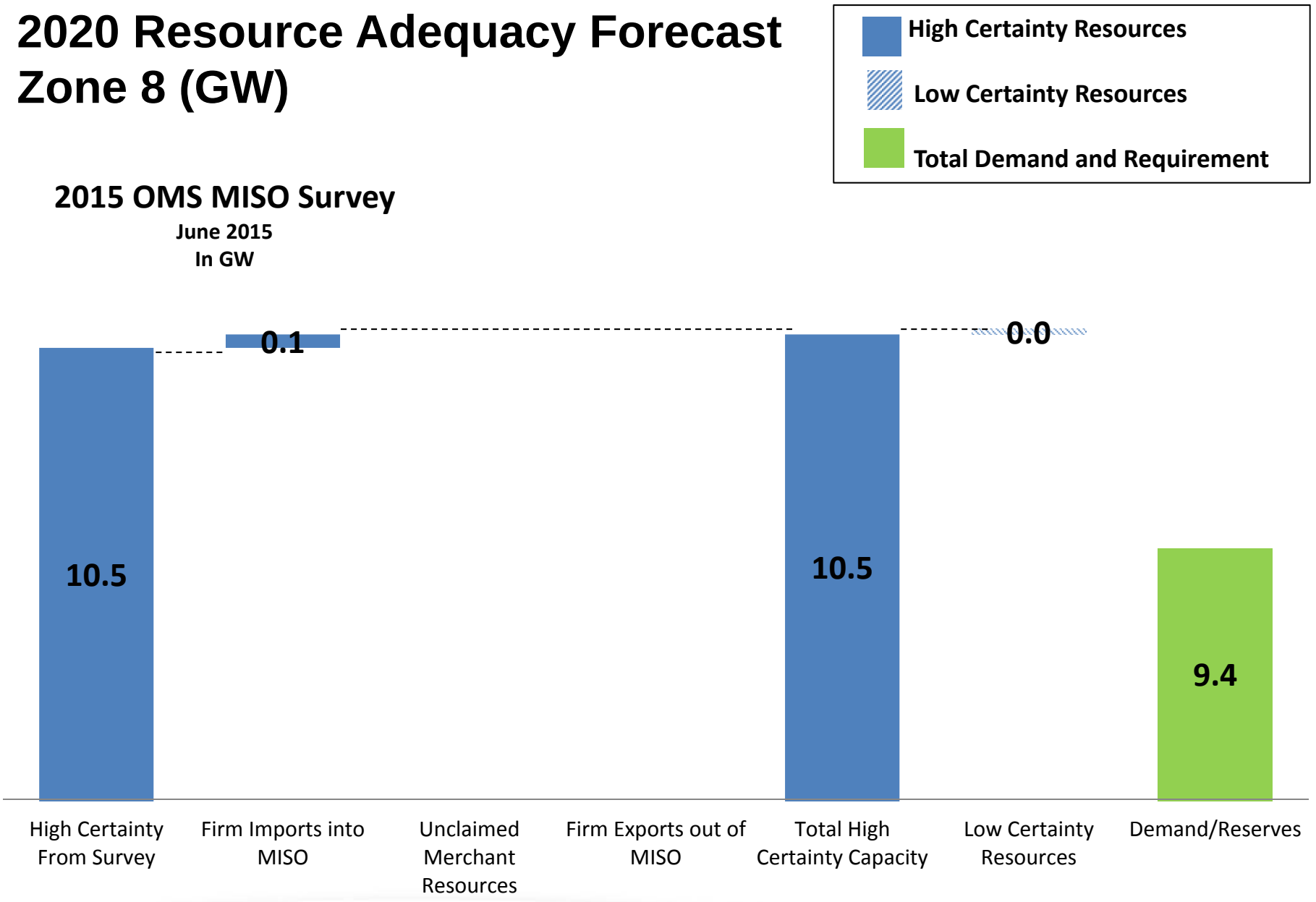



*Values based on survey results and do not include all generation in queue
Wind at capacity credit of 14.1%

# Zone 8 Reported New Resources by Fuel Type

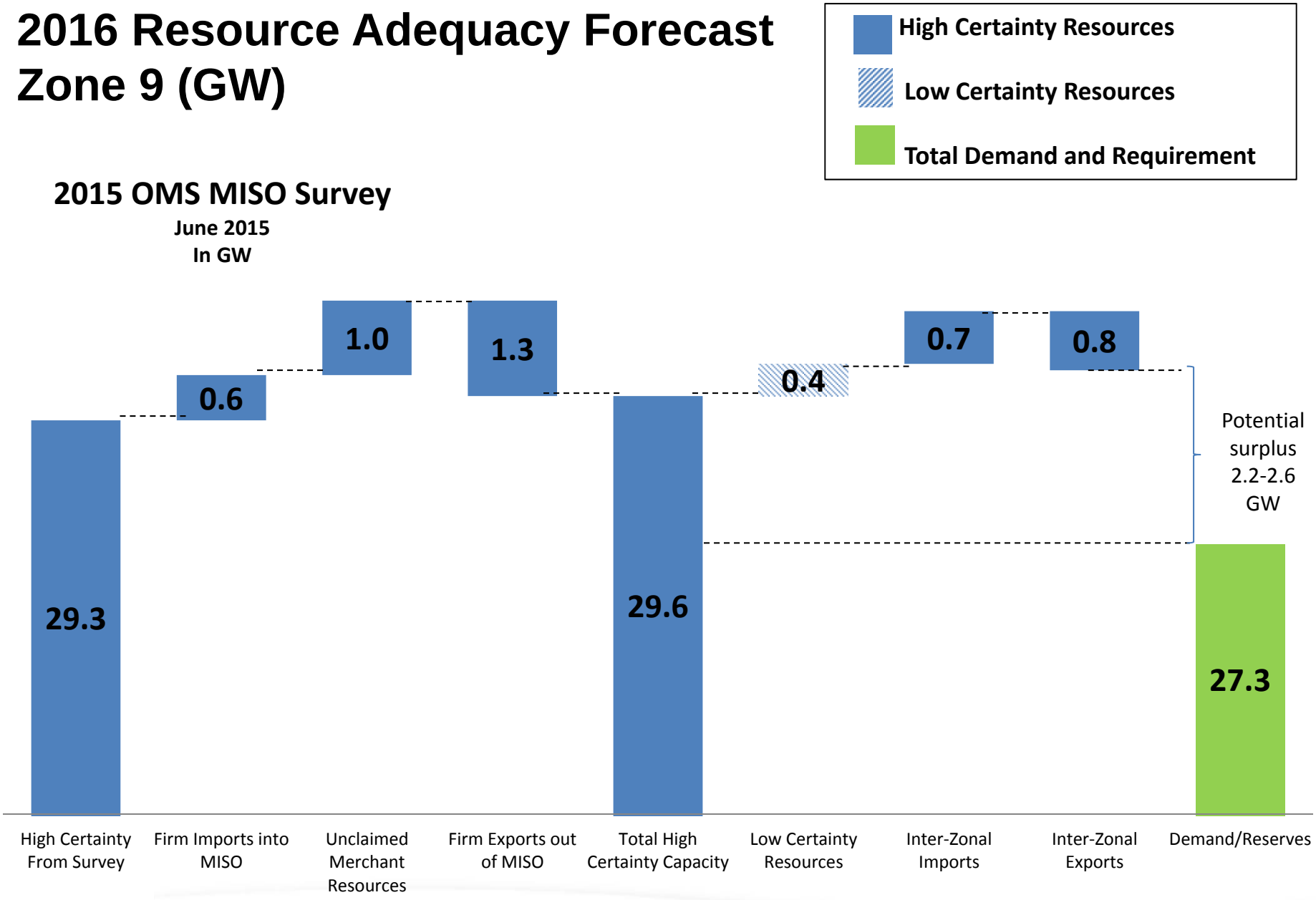


# 2020 Resource Adequacy Forecast Zone 8 (GW)




Values in Installed Capacity (ICAP)

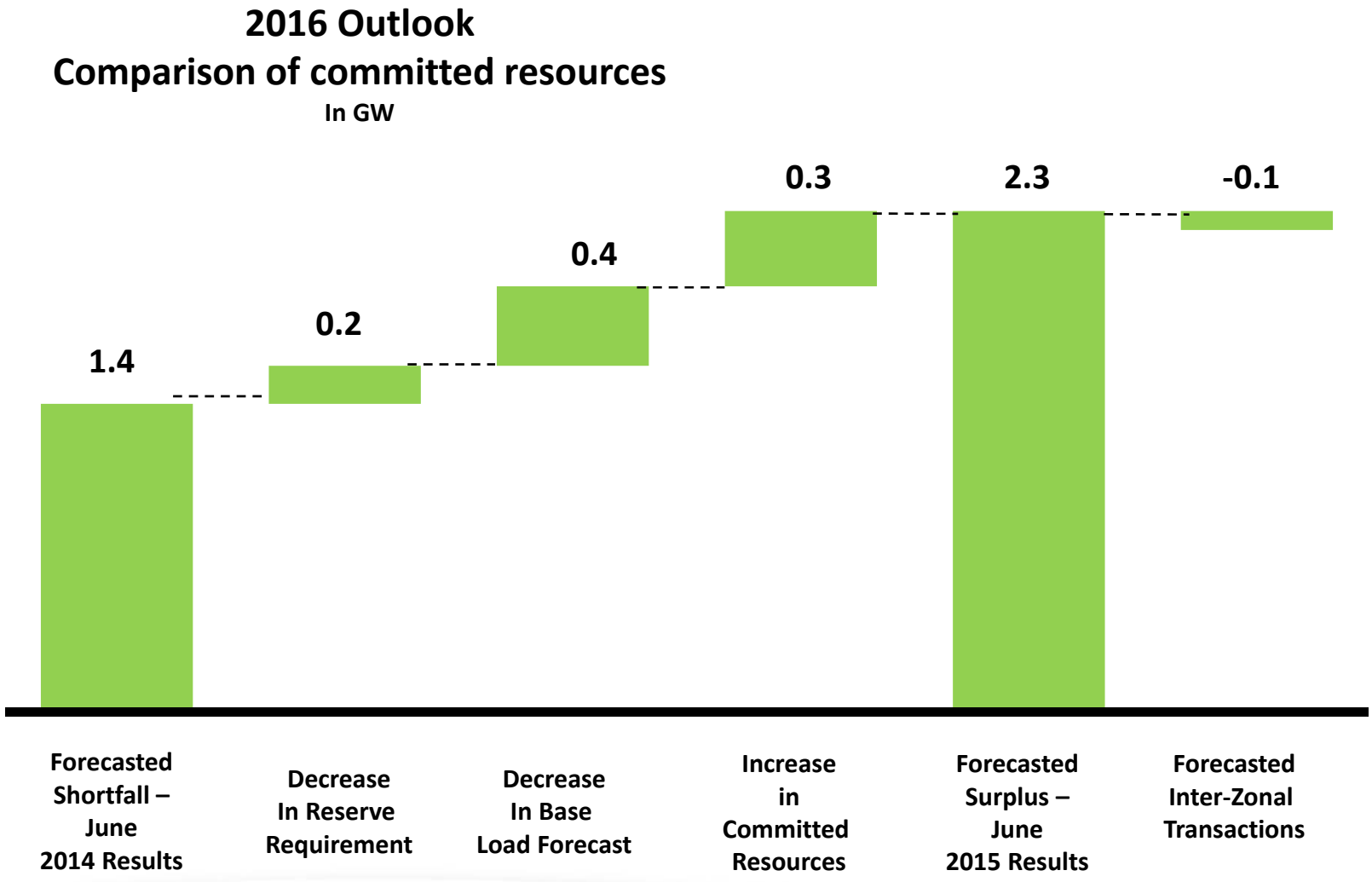
# 2016 Resource Adequacy Forecast Zone 9 (GW)



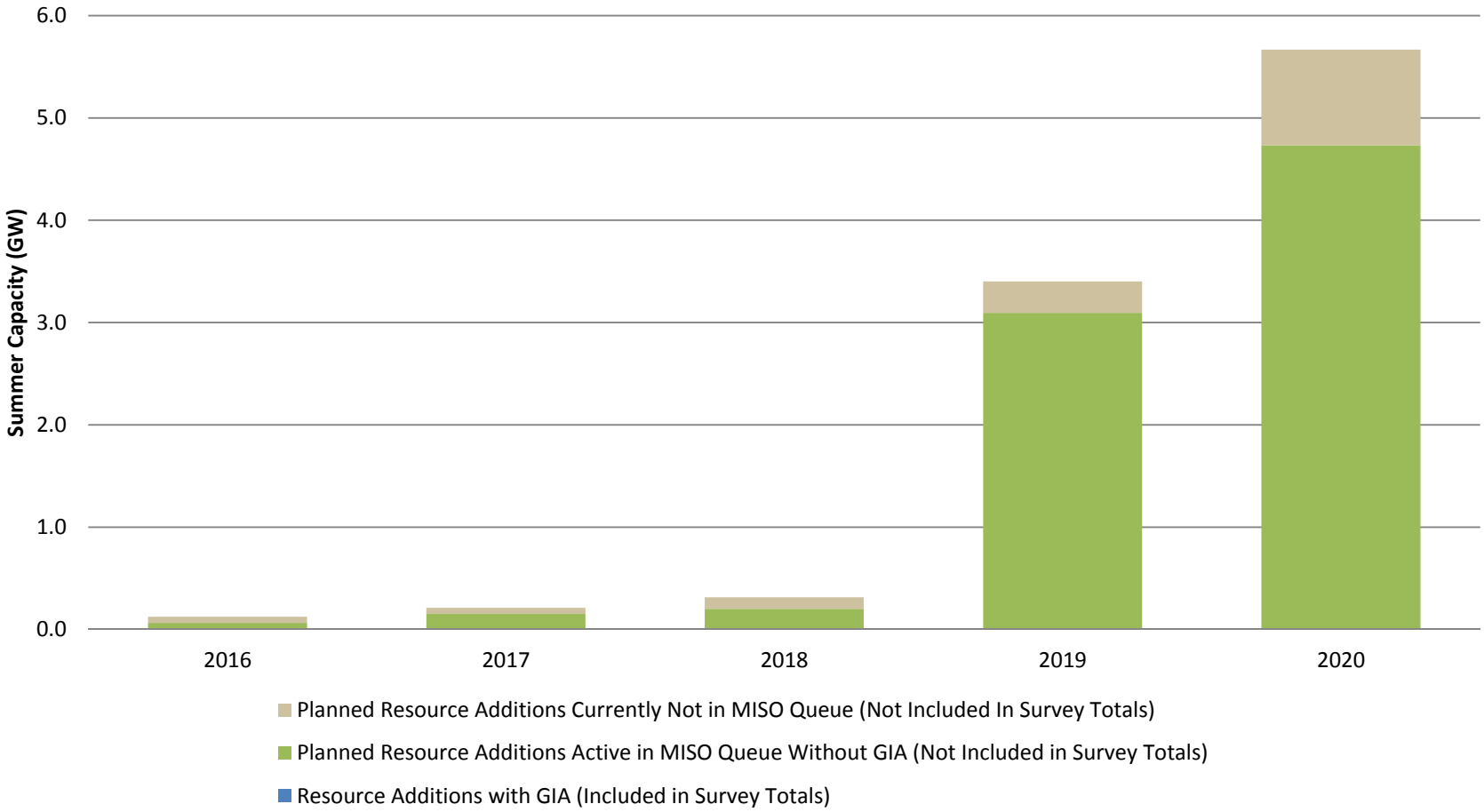

Values in Installed Capacity (ICAP)

Capacity Import Limit: 3.3 GW *(From 2015 Planning Resource Auction)*

# 2014 vs 2015 OMS MISO Survey Results Zone 9

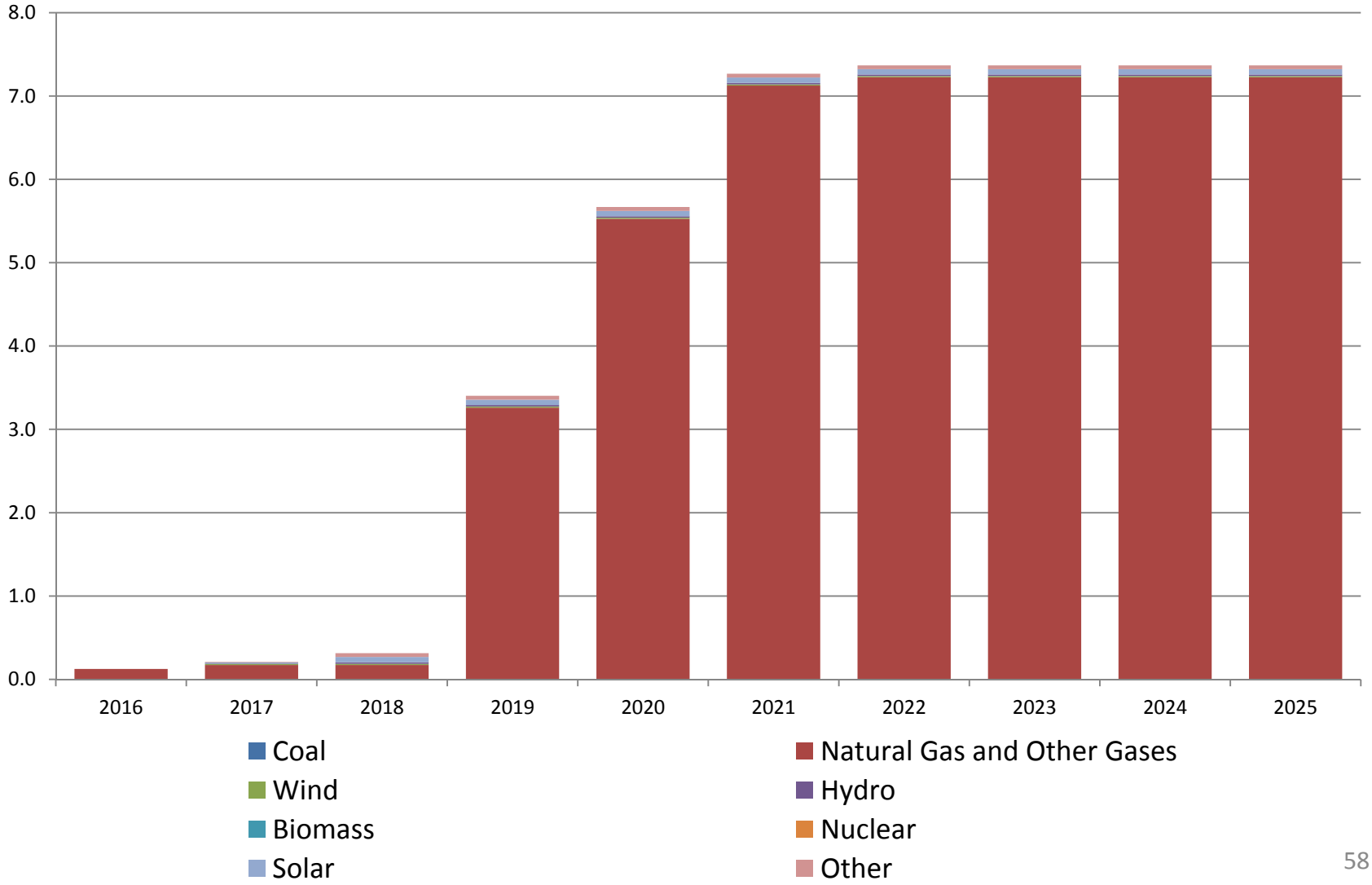


# New Generation Reported in Survey Zone 9 (GW)

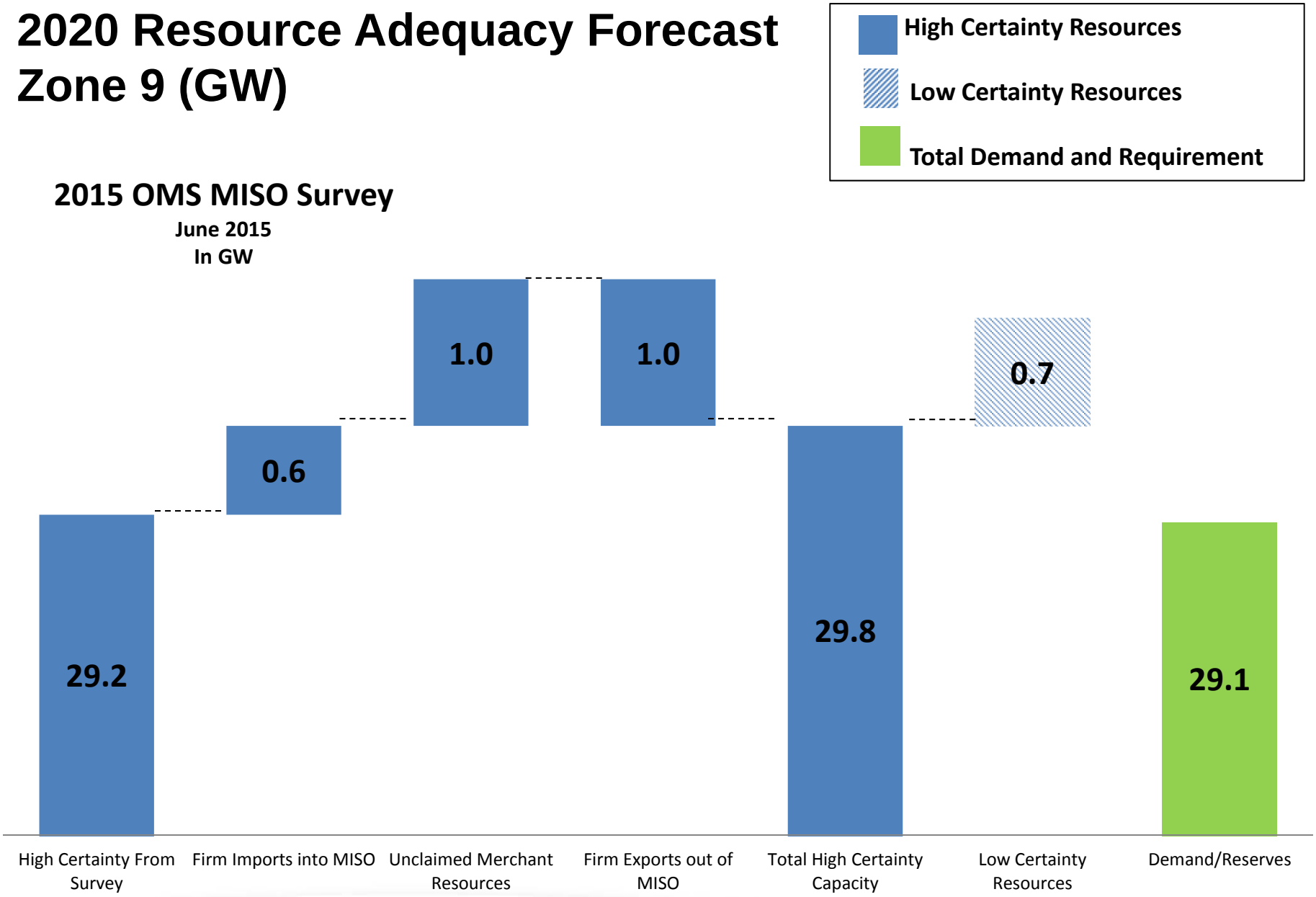



*Values based on survey results and do not include all generation in queue
Wind at capacity credit of 14.1%

# Zone 9 Reported New Resources by Fuel Type

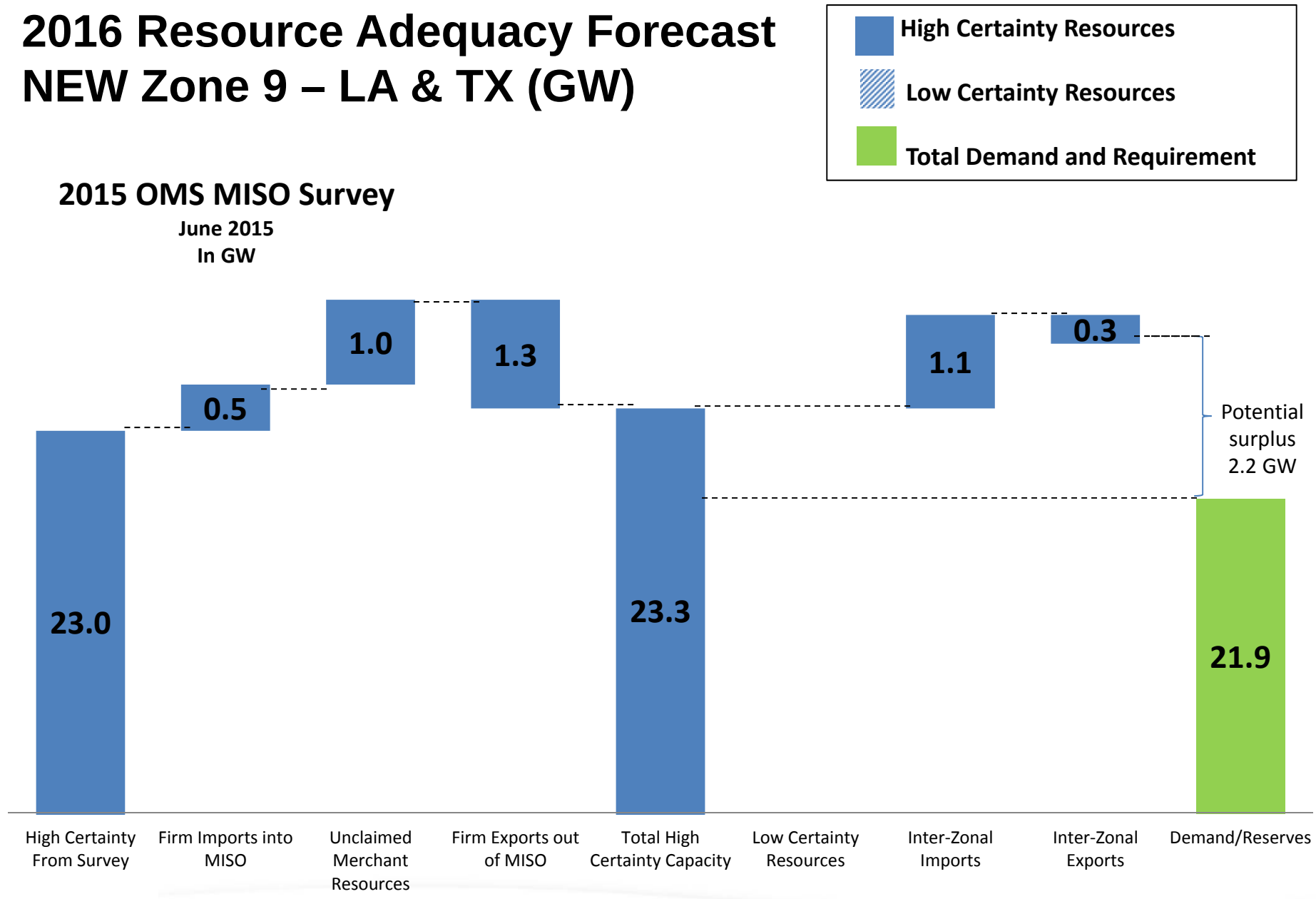


# 2020 Resource Adequacy Forecast Zone 9 (GW)




Values in Installed Capacity (ICAP)

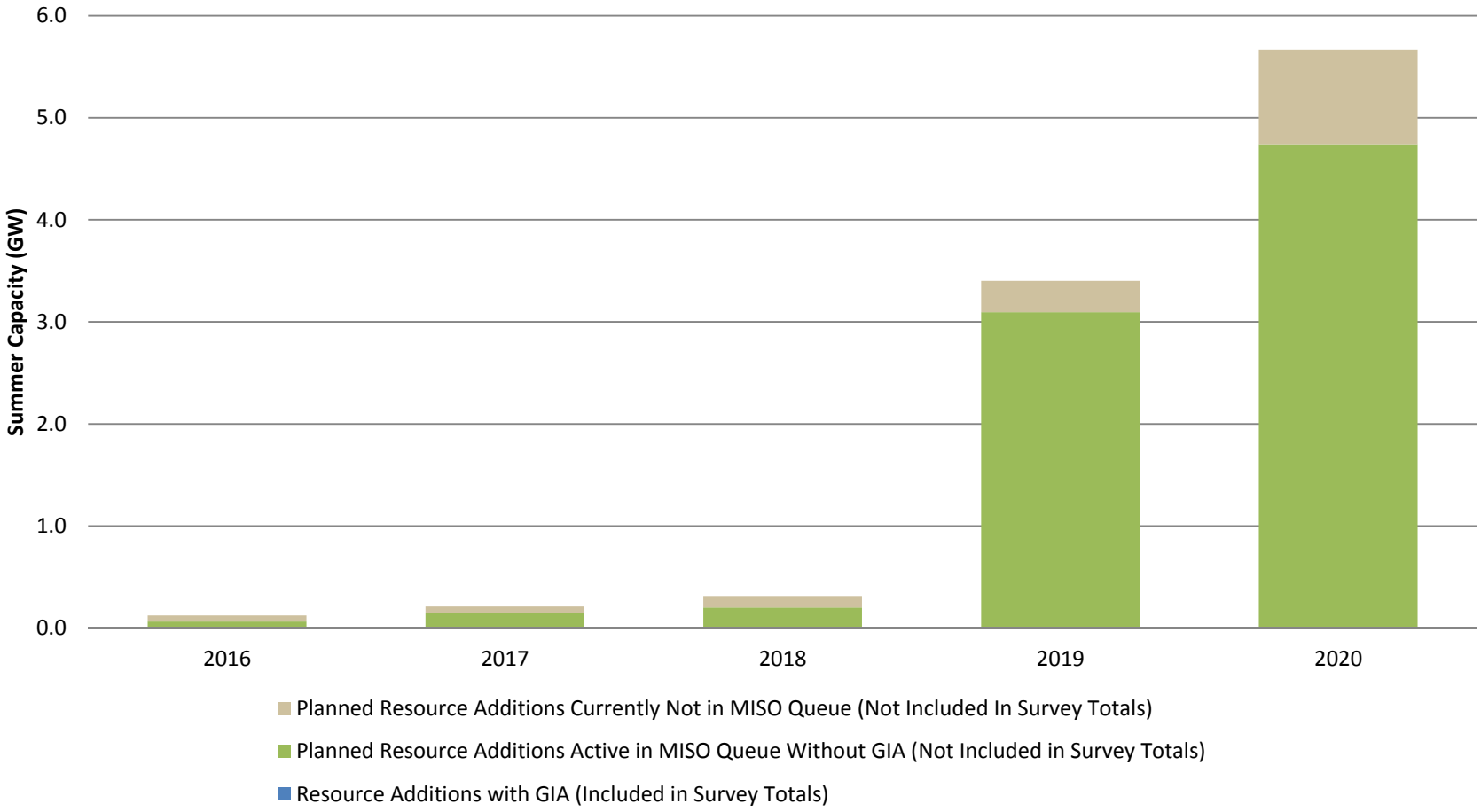
# 2016 Resource Adequacy Forecast
# NEW Zone 9 – LA & TX (GW)




Values in Installed Capacity (ICAP)

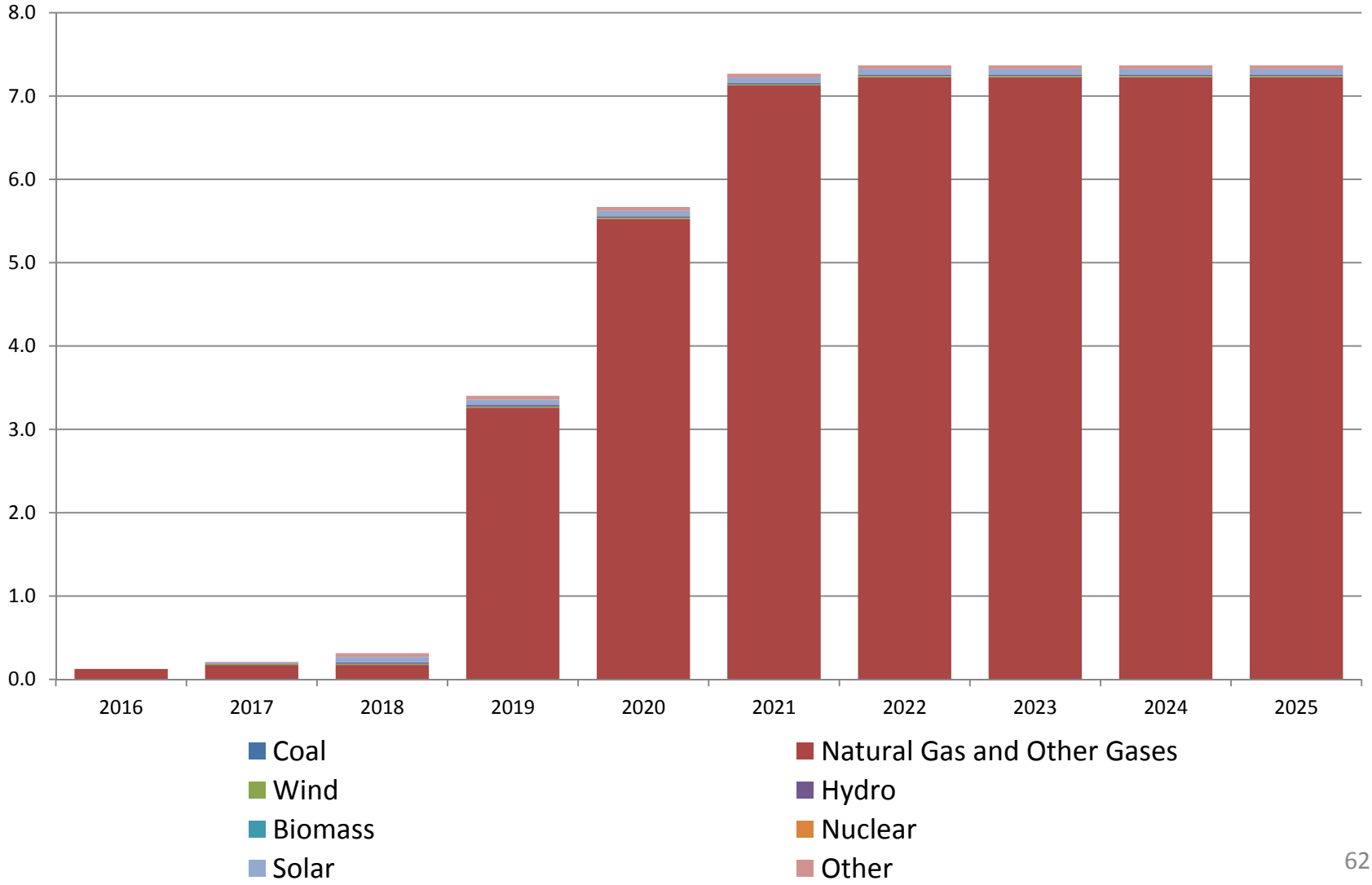
Capacity Import Limit: 4.0 GW (*From 2015 MS Zonal Separation Analysis)*

# New Generation Reported in Survey
# New Zone 9 (GW)

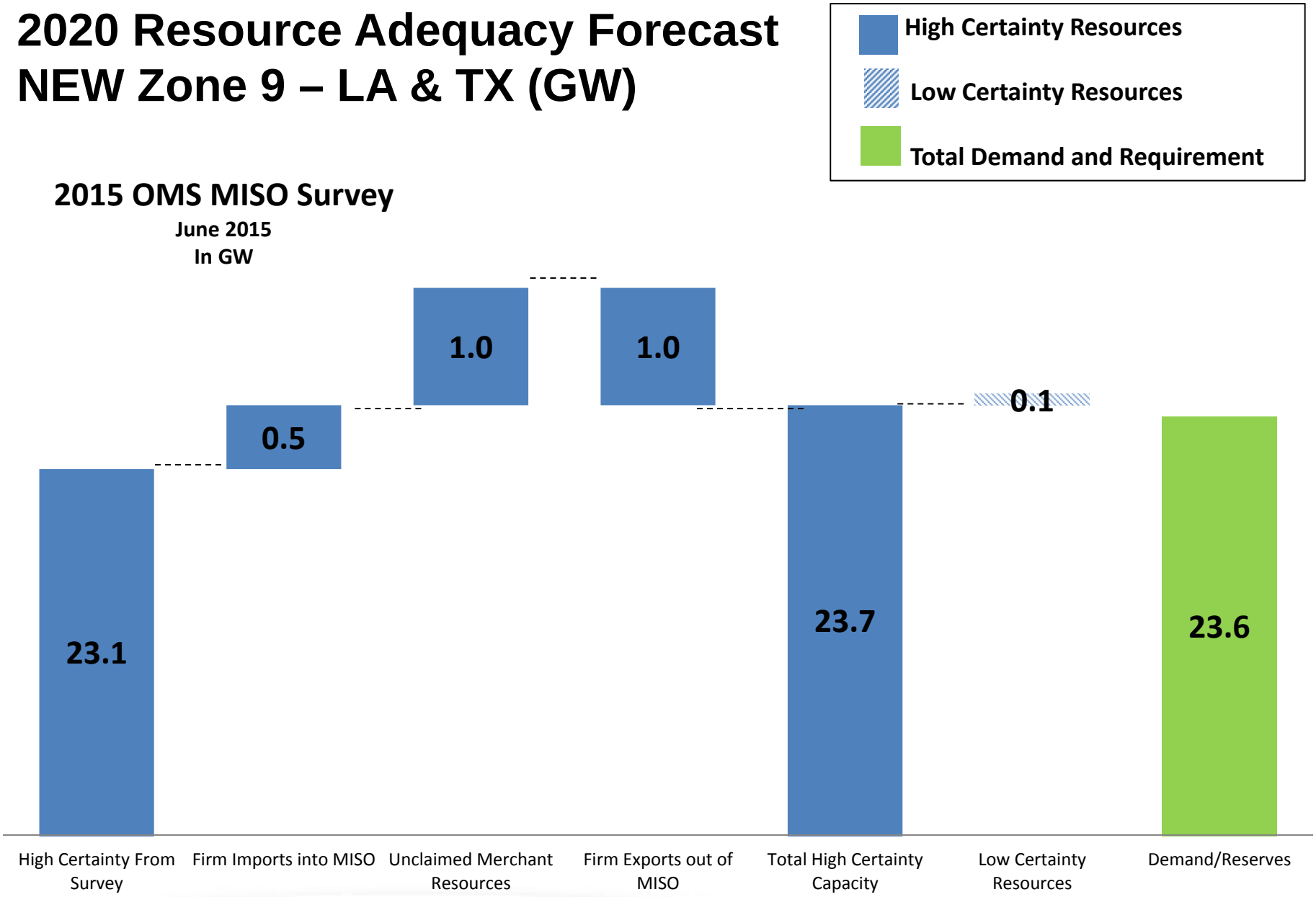



*Values based on survey results and do not include all generation in queue
Wind at capacity credit of 14.1%

# New Zone 9 Resources in the GI Queue Breakdown by Fuel Type

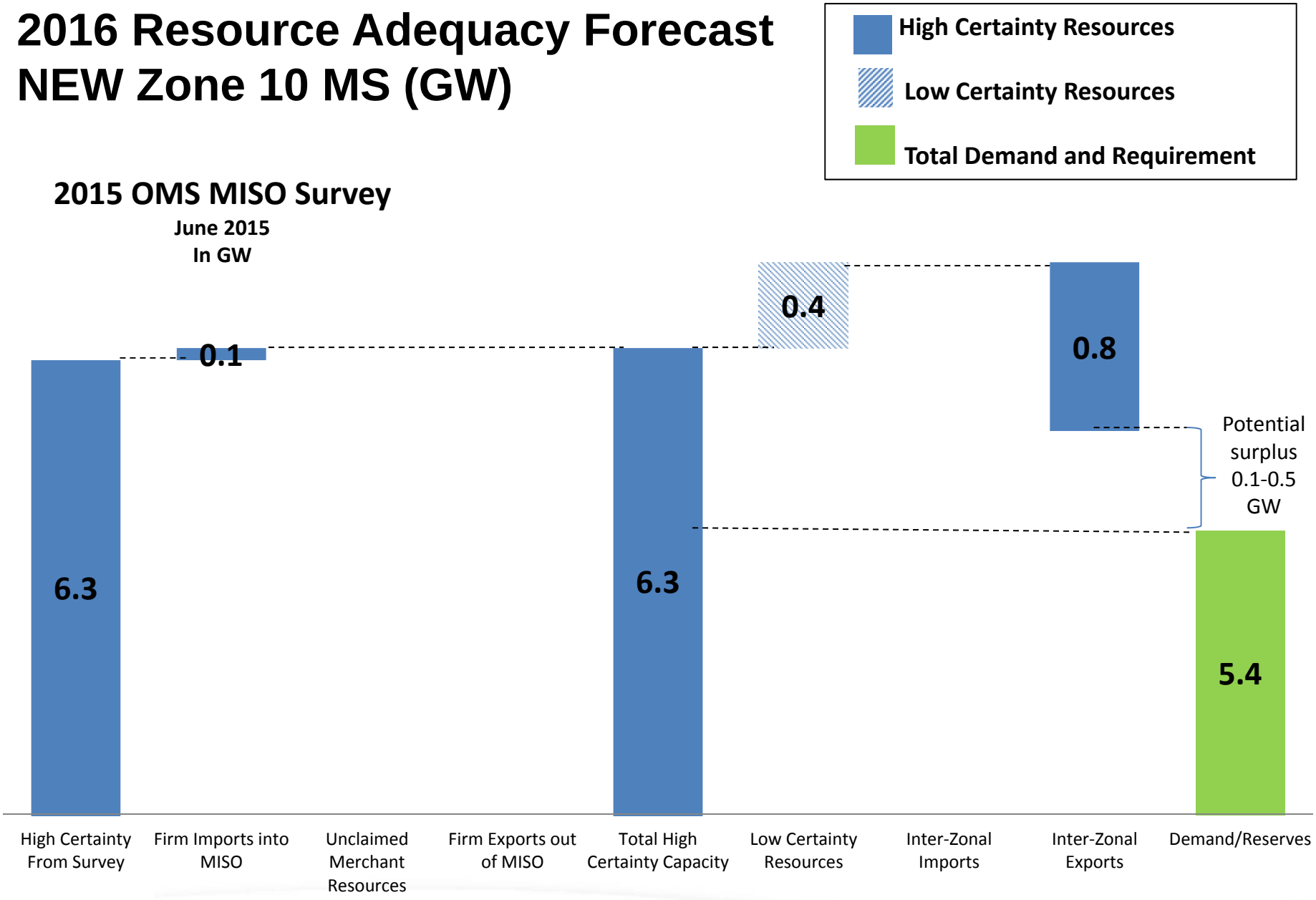


# 2020 Resource Adequacy Forecast
# NEW Zone 9 – LA & TX (GW)




Values in Installed Capacity (ICAP)

# 2016 Resource Adequacy Forecast
# NEW Zone 10 MS (GW)




Values in Installed Capacity (ICAP)

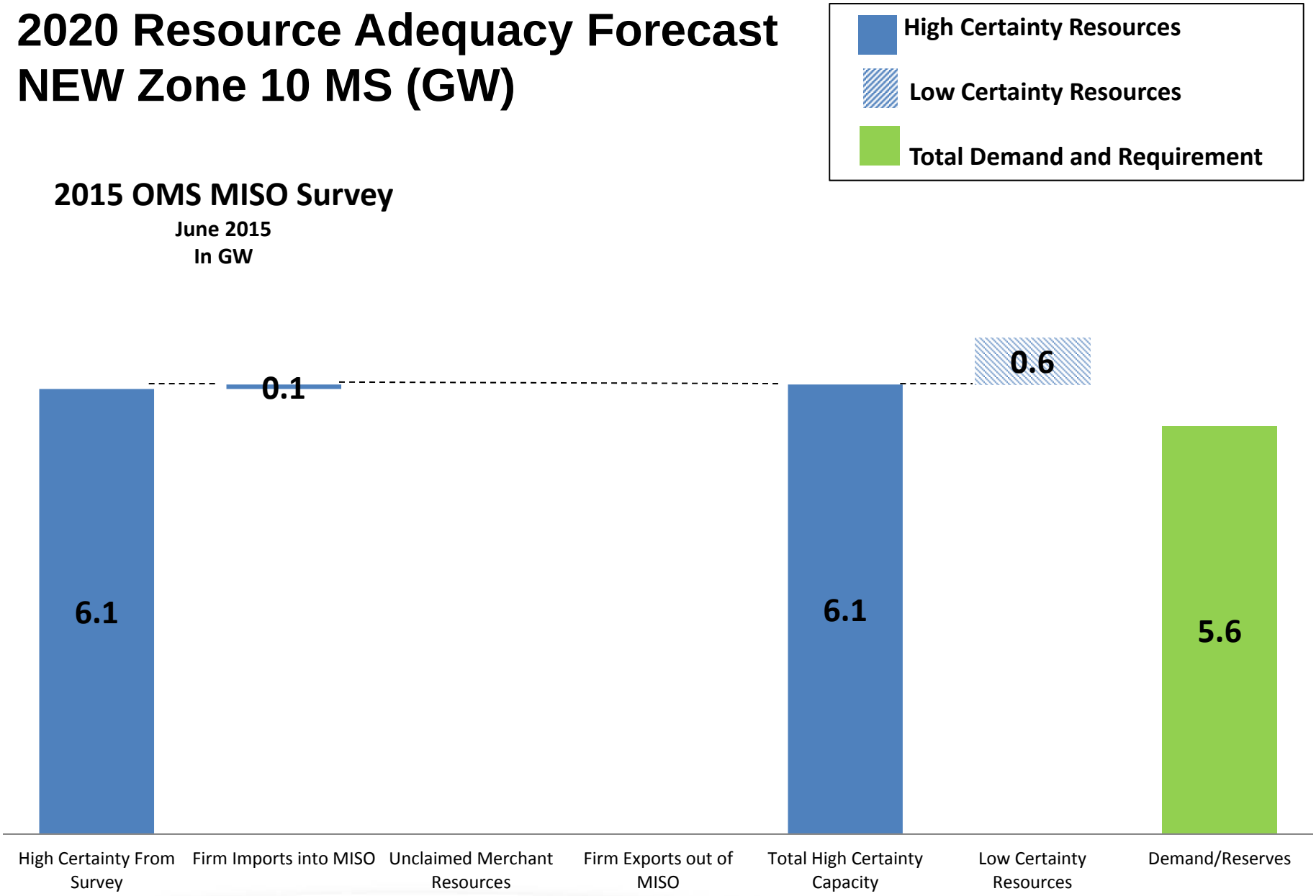
Capacity Import Limit: 2.6 GW (*From 2015 MS Zonal Separation Analysis)*

# New Generation Reported in Survey
# New Zone 10 (GW)

- No new generation was reported in the OMS MISO survey

*Values based on survey results and do not include all generation in queue
Wind at capacity credit of 14.1%

# 2020 Resource Adequacy Forecast
# NEW Zone 10 MS (GW)

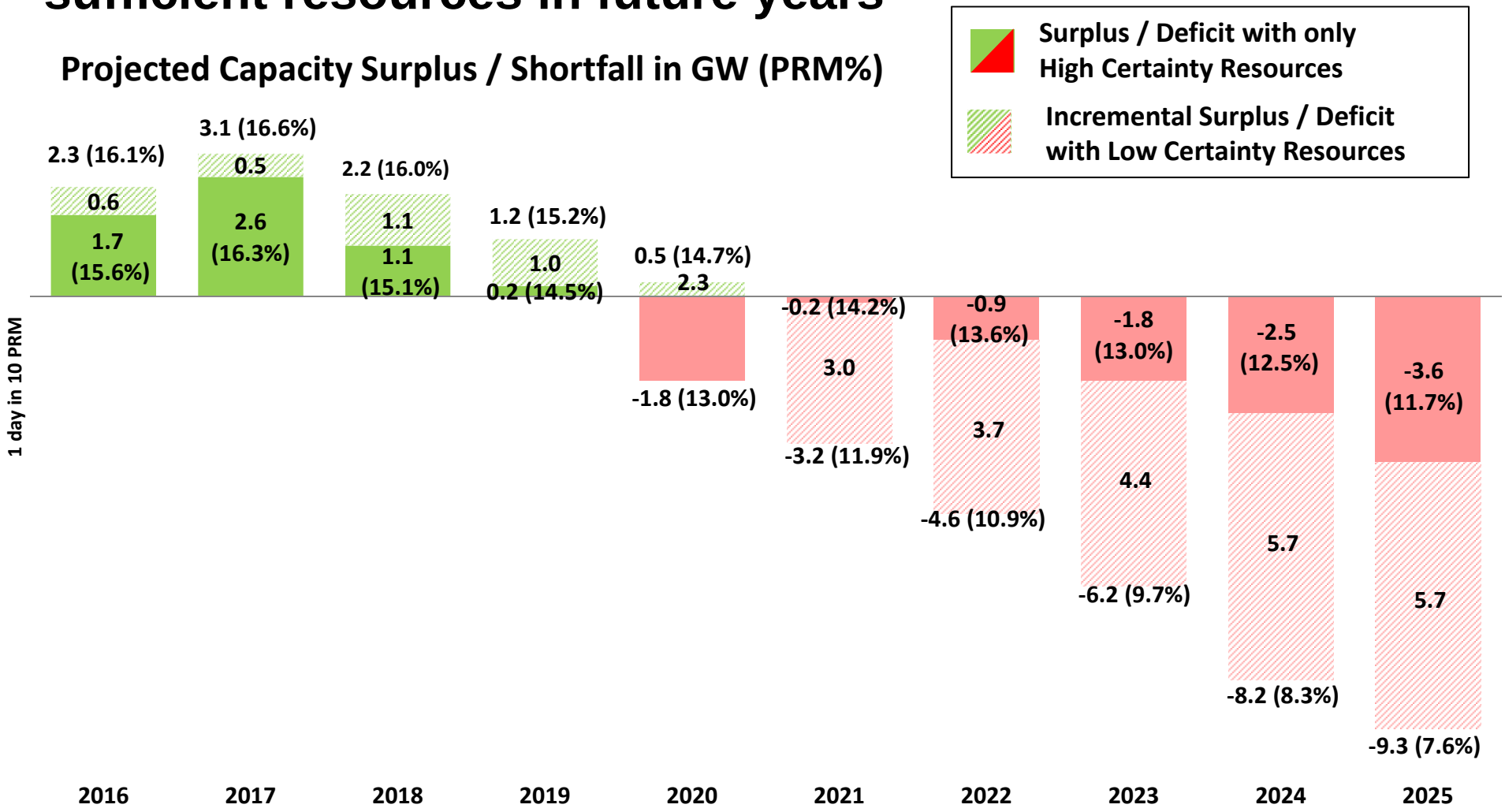



Values in Installed Capacity (ICAP)

# Appendix C: Ten Year Results

# Additional actions are required in the near term to ensure sufficient resources in future years

## Projected Capacity Surplus / Shortfall in GW (PRM%)




* This slide shows **a forecast**. **These figures will change as future capacity plans are solidified** by load serving entities and state commissions.
High and low certainty resources as reported by the load serving entities in survey responses. High certainty resources also include uncommitted merchant generation.