

PNM 2017-2036 Integrated Resource Plan

AUGUST 11, 2016 BASELOAD RESOURCES



Talk to us.



DISCLOSURE REGARDING FORWARD LOOKING STATEMENTS

The information provided in this presentation contains scenario planning assumptions to assist in the Integrated Resource Plan public process and should not be considered statements of the company's actual plans. Any assumptions and projections contained in the presentation are subject to a variety of risks, uncertainties and other factors, most of which are beyond the company's control, and many of which could have a significant impact on the company's ultimate conclusions and plans. For further discussion of these and other important factors, please refer to reports filed with the Securities and Exchange Commission. The reports are available online at www.pnmresources.com.

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AGENDA

BASELOAD GENERATION IN THE 2017 IRP

- Meeting preliminaries
- Baseload generation overview
- Description of existing facilities
 - San Juan Generating Station
 - Palo Verde Nuclear Generating Station
 - Four Corners Power Plant
- Replacement Options for Baseload Plants
- Coordination with 2017 IRP

SAFETY AND LOGISTICS

MEETING PRELIMINARIES

- Fire escape routes via stairways at east and west ends of hallway; please let us know if you require special handicap egress or special assistance
- We must obey any fire or emergency alarm; even drills/test alarms
- Restrooms – Women's room at west end; Men's room at east end
- PNM's WiFi
- Please be aware that there are outlets/network connections on the floor

SAFETY AND LOGISTICS CONTINUED

MEETING PRELIMINARIES

- Must sign-in with security desk each time you enter the building
- Must be escorted in and out of the building by a PNM employee
- Recycling is easy and encouraged

MEETING GROUND RULES

MEETING PRELIMINARIES

- IRP Public Advisory purpose is to solicit and receive public input
- Questions and comments are welcome
- Comments should be respectful of all participants
- Use name tents to indicate you have a comment or question
- Please silence your cell phone
- Reminder; today's presentation is not PNM's plan or a financial forecast, it is a discussion of PNM's planning process

SCHEDULE

THREE PUBLIC ADVISORY PHASES, ONE DEADLINE

- July – October: Build assumptions and discuss scenarios and sensitivities
- November – February: Discuss analysis plan and discussion of findings
- March – June: Discuss draft report
- July 1, 2017 – File report documenting the Plan and process with New Mexico Public Regulation Commission

NEAR TERM SCHEDULE

MEETING SCHEDULE THROUGH NOVEMBER

- July 30: Kickoff, overview and timeline
- July 27: Reliability standards & grid modernization concepts
- Today: Baseload resources
- September 1: Transmission, renewable energy & energy efficiency
- September 22: Natural gas price forecasts & environmental regulations
- October 13: Load forecast, rates and tariffs
- November 10: Modeling roadmap resulting from discussion at previous meetings

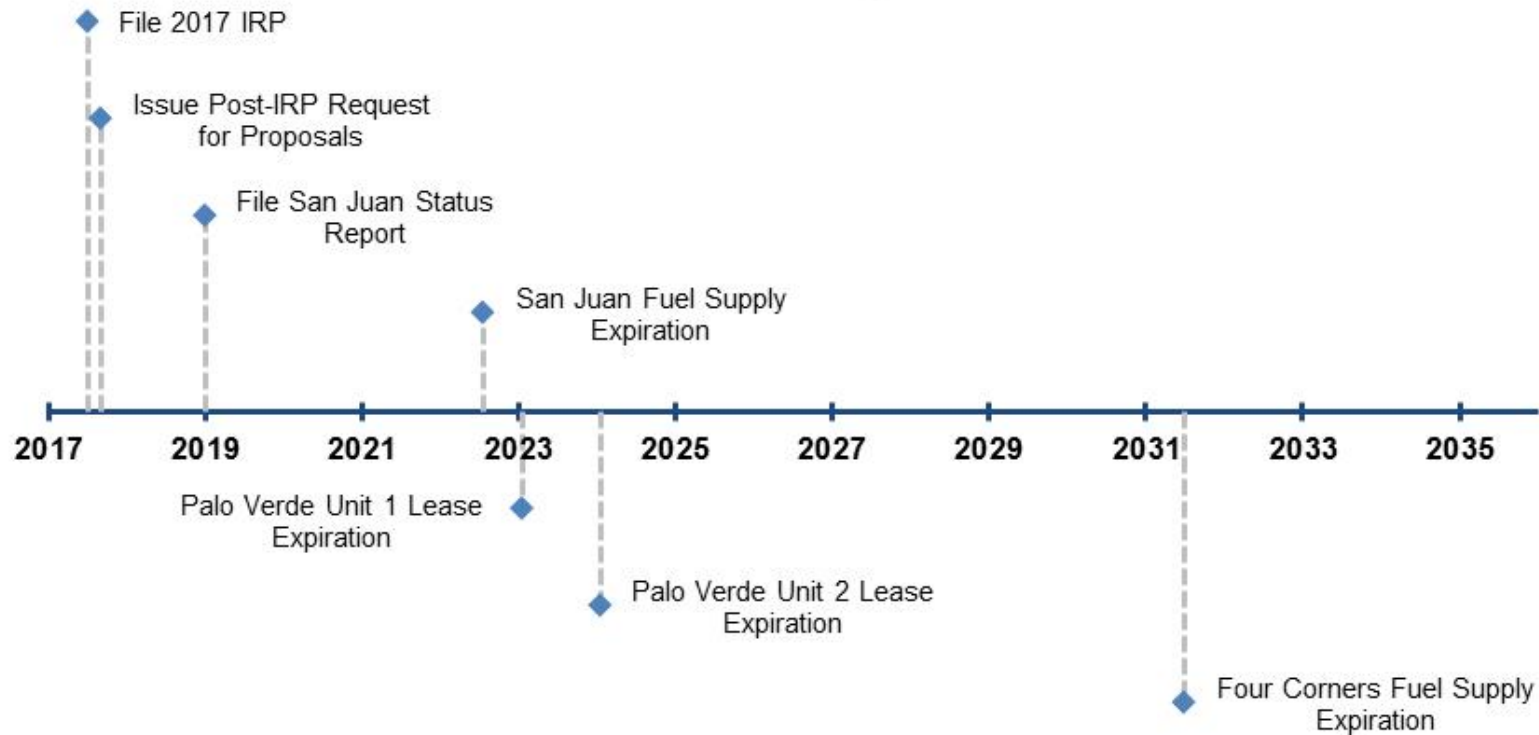
BASELOAD GENERATION

USES AND SOURCES

- On PNM's system baseload generators supply most of the energy used, provide capacity on peak and provide many of the essential reliability services
- Current baseload resources
 - San Juan Generating Station
 - Palo Verde Nuclear Generating Station
 - Four Corners Power Plant
 - Dale Burgett Geothermal Plant

TIMELINE OF BASELOAD EVENTS

Baseload Events in 2017 IRP Planning Period



SAN JUAN GENERATING STATION

DESCRIPTION

- San Juan Generating Station is a four unit coal-fired generator located west of Farmington, New Mexico
- Units 2 and 3 will be retired by the end of 2017
- After 2017, PNM, Tucson Electric, the City of Farmington, Los Alamos County and the Utah Association of Municipal Power Systems, and PNM Merchant will co-own Units 1 and 4
- There are operating and fuel supply agreements that run into 2022

Owner	Unit 1	Unit 4
PNM	170 MW	327 MW
Tucson	170 MW	-
PNM Merchant	-	65 MW
Farmington	-	43 MW
Los Alamos	-	37 MW
UAMPS	-	36 MW
	340 MW	507 MW

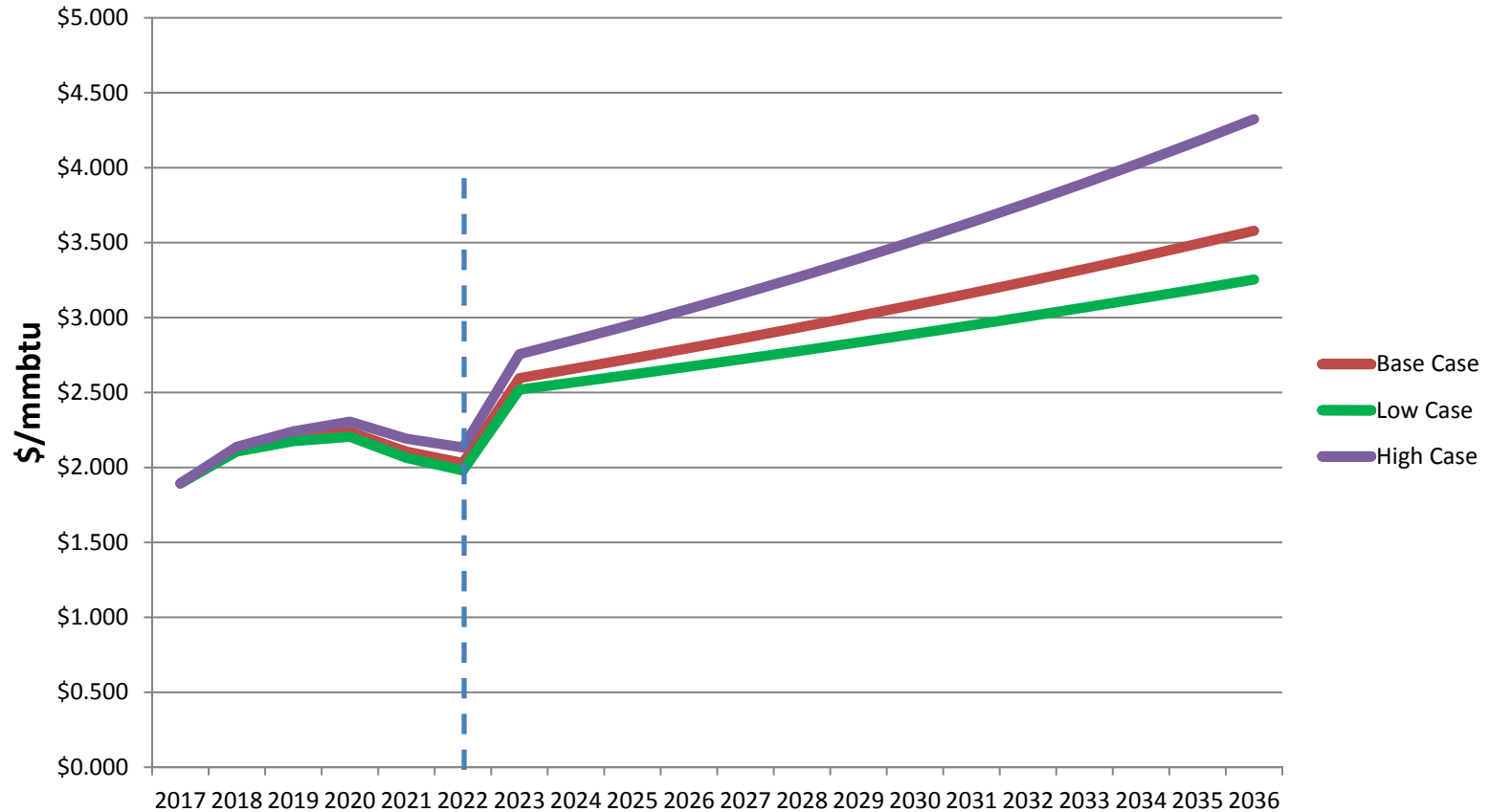
CURRENT MODELING ASSUMPTIONS

SAN JUAN GENERATING STATION

Item	SJGS Unit 1	SJGS Unit 4
O&M, \$/KW-yr	\$83	\$83
Avg. Annual Capital*, M\$/yr	\$6.3	\$3.8
Forced Outage Rate	14.5%	14.5%
Heat Rate, Btu/kWh	10,010	10,010
Nitrogen Oxide	3.2 lbs/MWh	3.2 lbs/MWh
Carbon Monoxide	2.5 lbs/MWh	2.5 lbs/MWh
Sulfur Dioxide	0.78 lbs/MWh	0.78 lbs/MWh
Particulates	0.04 lbs/MWh	0.04 lbs/MWh
Carbon Dioxide	2,445 lbs/MWh	2,445 lbs/MWh
Mercury	1.5 lbs/Million MWh	1.5 lbs/Million MWh
Freshwater Use (gal./MWh)	647	647
Est. Combined 2022 Book Value	\$350 M - \$400 M	

FUEL PRICE ASSUMPTION

SAN JUAN GENERATING STATION – PROJECTED FUEL COST



PALO VERDE NUCLEAR GENERATING STATION

DESCRIPTION

- Palo Verde Nuclear Generating Station is a three unit nuclear powered generator located west of Phoenix, Arizona
- After 2017, PNM will utilize 10.2% of the output – 402 MW of capacity - for jurisdictional service
- PNM currently leases 114 MW of capacity in Units 1 and 2
- The leases have been extended until 2023 for Unit 1 and 2024 for Unit 2

	Owned	Leased
Unit 1	30 MW	104 MW
Unit 2	124 MW	10 MW
Unit 3	134 MW	-
Total	288 MW	114 MW

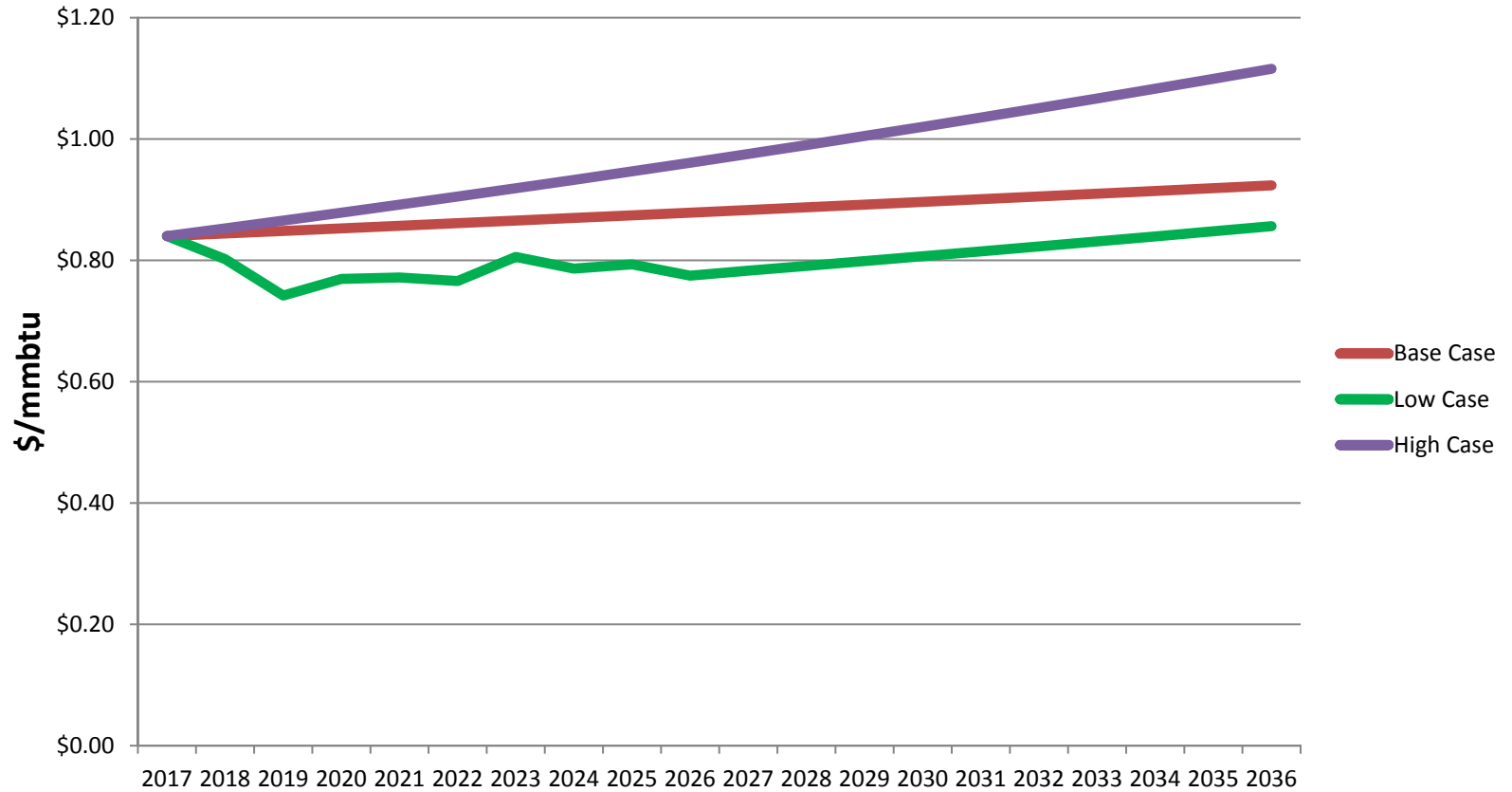
CURRENT MODELING ASSUMPTIONS

PALO VERDE GENERATING STATION

Item	PVNGS Unit 1	PVNGS Unit 2	PVNGS Unit 3
O&M, \$/KW-yr	\$173	\$146	\$171
Ave Capital Expenditure, M\$/yr	\$8.6	\$8.7	\$7.9
Forced Outage Rate	2.0%	2.0%	2.0%
Heat rate, Btu/kWh	10,300	10,300	10,300
Nitrogen Oxide	0 lbs/MWh	0 lbs/MWh	0 lbs/MWh
Carbon Monoxide	0 lbs/MWh	0 lbs/MWh	0 lbs/MWh
Sulfur Dioxide	0 lbs/MWh	0 lbs/MWh	0 lbs/MWh
Particulates	0 lbs/MWh	0 lbs/MWh	0 lbs/MWh
Carbon Dioxide	0 lbs/MWh	0 lbs/MWh	0 lbs/MWh
Mercury	0 lbs/MWh	0 lbs/MWh	0 lbs/MWh
Freshwater Use, gal/MWh	18	18	18
Estimated Leased Book Value	\$104.8 M	\$9.1 M	N/A

FUEL PRICE ASSUMPTION

PALO VERDE NUCLEAR GENERATING STATION



FOUR CORNERS POWER PLANT

DESCRIPTION

- Four Corners Power Plant is a two unit coal-fired generator located south west of Farmington, New Mexico
- Four Corners was a five unit plant, but units 1, 2 and 3 were retired in 2013
- PNM owns 13% of Units 4 and 5
- There are operating and fuel supply agreements that run into 2031

Owner	Unit 4	Unit 5
APS	539 MW	539 MW
PNM	100 MW	100 MW
SRP	77 MW	77 MW
Tucson	54 MW	54 MW
Total	770 MW	770 MW

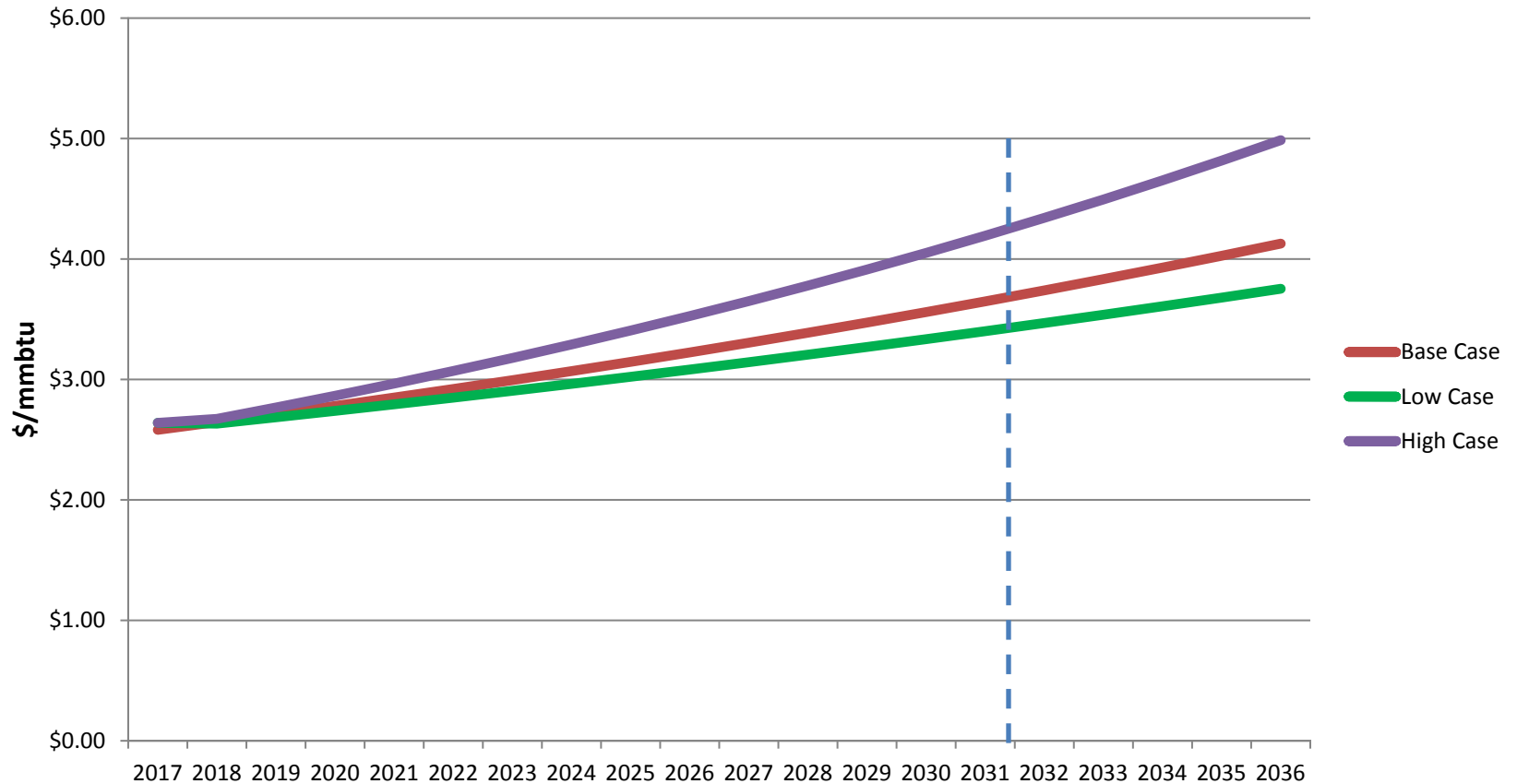
CURRENT MODELING ASSUMPTIONS

FOUR CORNERS POWER PLANT

Item	FCPP Unit 4	FCPP Unit 5
O&M, \$/KW-yr	97	97
Ave Annual Capital, M\$/yr	\$5.6	\$4.7
Forced Outage Rate	12.0%	12.0%
Heat rate, Btu/kWh	9,850	9,850
Nitrogen Oxide	5.15 lbs/MWh	5.15 lbs/MWh
Carbon Monoxide	Pending	Pending
Sulfur Dioxide	1.457 lbs/MWh	1.457 lbs/MWh
Particulates	0.051 lbs/MWh	0.051 lbs/MWh
Carbon Dioxide	2,025 lbs/MWh	2,025 lbs/MWh
Mercury	17.2 lbs/Million MWh	17.2 lbs/Million MWh
Freshwater Use, gal/MWh	496	496
Estimated 2031 Book Value	\$0	\$0

FUEL PRICE ASSUMPTION

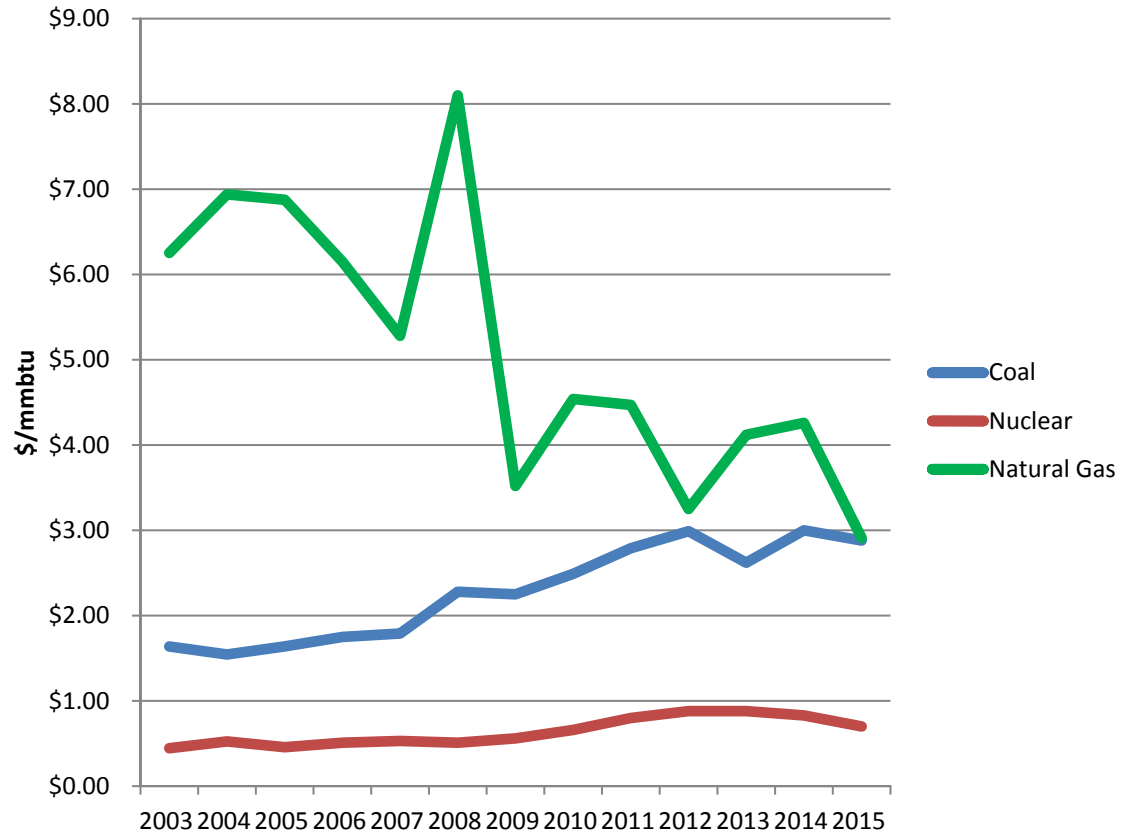
FOUR CORNERS POWER PLANT FUEL COST PROJECTION



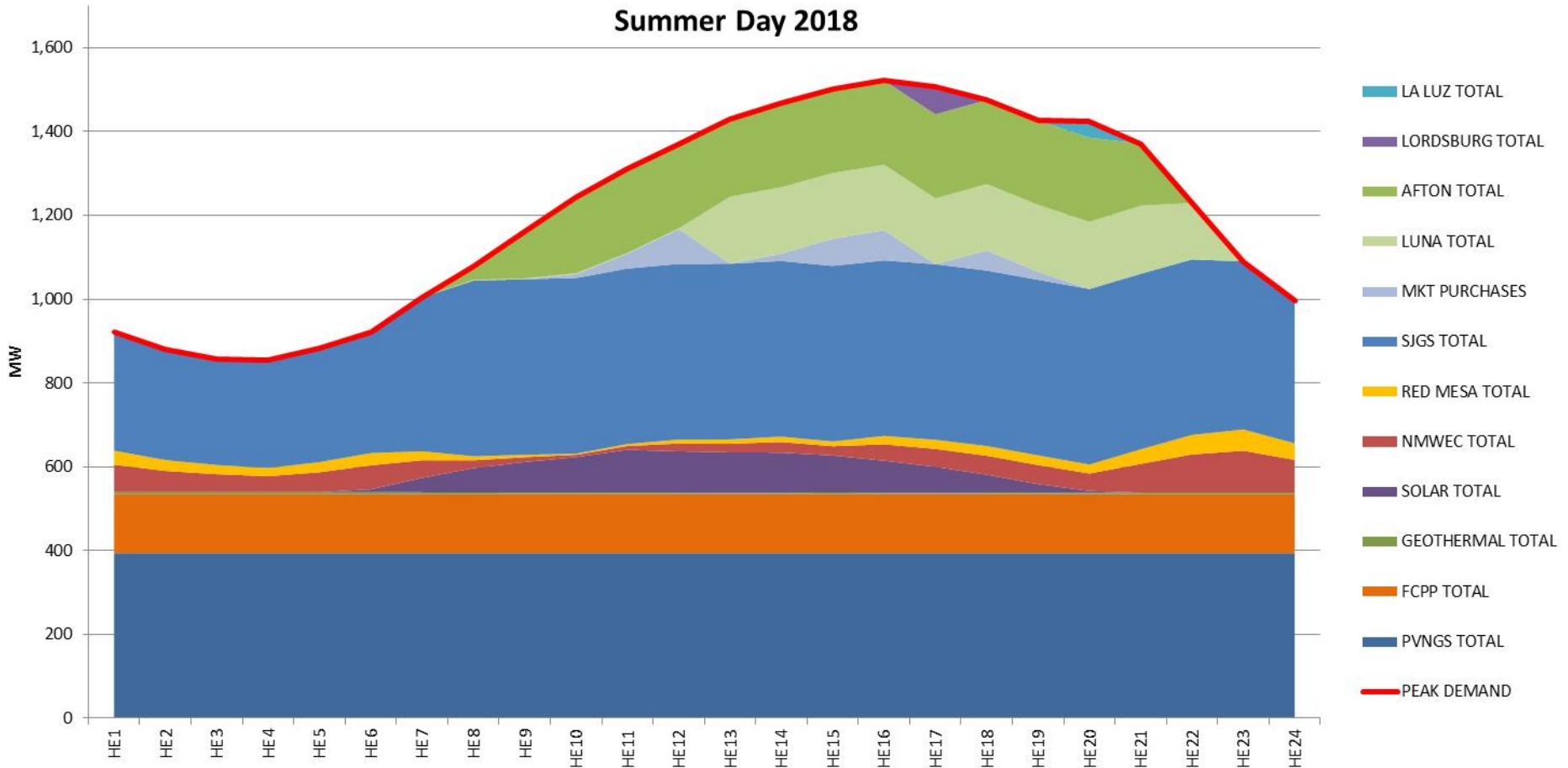
FUEL PRICE HISTORY

AVERAGE FUEL COST

PNM Average Cost of Fuel			
	Coal	Nuclear	Natural Gas
	\$/mmbtu	\$/mmbtu	\$/mmbtu
2003	\$1.64	\$0.45	\$6.25
2004	\$1.54	\$0.53	\$6.94
2005	\$1.64	\$0.46	\$6.88
2006	\$1.75	\$0.51	\$6.15
2007	\$1.79	\$0.53	\$5.28
2008	\$2.28	\$0.51	\$8.10
2009	\$2.25	\$0.56	\$3.52
2010	\$2.49	\$0.66	\$4.54
2011	\$2.79	\$0.80	\$4.47
2012	\$2.99	\$0.88	\$3.25
2013	\$2.62	\$0.88	\$4.12
2014	\$3.00	\$0.83	\$4.26
2015	\$2.88	\$0.70	\$2.91



BASELOAD REPLACEMENT CONSIDERATIONS



REPLACEMENTS FOR BASELOAD

ANALYSIS CONSIDERATIONS

PNM will analyze the entire resource portfolio, and a reasonable outcome is that a combination of resources best replace existing baseload capacity.

In addition to the generators listed below, we will be examining a wide range of load forecasts and testing the sensitivity to energy efficiency savings and other demand side impacts. The initial modeling plan will be discussed on November 10.

Generators that will be included in portfolio analysis & 2017 IRP discussion dates:

- Other baseload resources (today)
- Natural gas combined cycle generation (today)
- Renewable resources including geothermal (September 1)
- Gas peaking resources (September 22)

NUCLEAR POWER

REPLACEMENTS FOR BASELOAD

New nuclear generating capacity additions are assumed to be in the form of small modular nuclear reactors. Summary of presentation from July 27:

- In development stage, no SMRs have been licensed
- First expected capacity will be in 2023 in Idaho
- Earliest date available to PNM assumed to be 8 years after completion of this IRP, or summer of 2026

The Palo Verde leases (114 MW), which expire in 2023-24, will require a decision whether to purchase or to relinquish that capacity. That choice will be examined in the San Juan and Four Corners baseload retirement studies.

NATURAL GAS COMBINED CYCLE

REPLACEMENTS FOR BASELOAD

Additional energy but not capacity is available from Afton and Luna, PNM's existing natural gas combined cycle generators

PNM will assume the ability to buy existing natural gas combined cycle capacity and will examine a range of purchase prices and sizes

PNM will include new natural gas combined cycle capacity as a generation resource option

SUMMARY

AFTON AND LUNA

- Afton and Luna are both located in southern New Mexico and receive fuel from the El Paso Natural Gas southern mainline
- Afton is southwest of Las Cruces, NM
- Luna is near Deming, New Mexico
- We will discuss electric transmission from southern New Mexico to PNM's load center on September 1

	Afton	Luna
PNM Capacity	230 MW	185 MW
Total Capacity	230 MW	560 MW
Configuration	1 x 1	2 x 1
In Service Date	2002	2006

CURRENT MODELING ASSUMPTIONS

AFTON AND LUNA

Item	Afton	Luna
O&M, \$/KW-yr	\$25.58	\$29.68
Ave Annual Capital, M\$/yr	\$3.9	\$3.0
Forced Outage Rate	3.3%	3.3%
Average Heat rate, Btu/kWh	7,750	7,450
Nitrogen Oxide	0.15 lbs/MWh	0.1 lbs/MWh
Carbon Monoxide	0.16 lbs/MWh	0.12 lbs/MWh
Sulfur Dioxide	0.005 lbs/MWh	0.005 lbs/MWh
Particulates	0.00 lbs/MWh	0.00 lbs/MWh
Carbon Dioxide	955 lbs/MWh	923 lbs/MWh
Freshwater Use, gal/MWh	85	202

SUMMARY

NATURAL GAS COMBINED CYCLE ADDITIONS

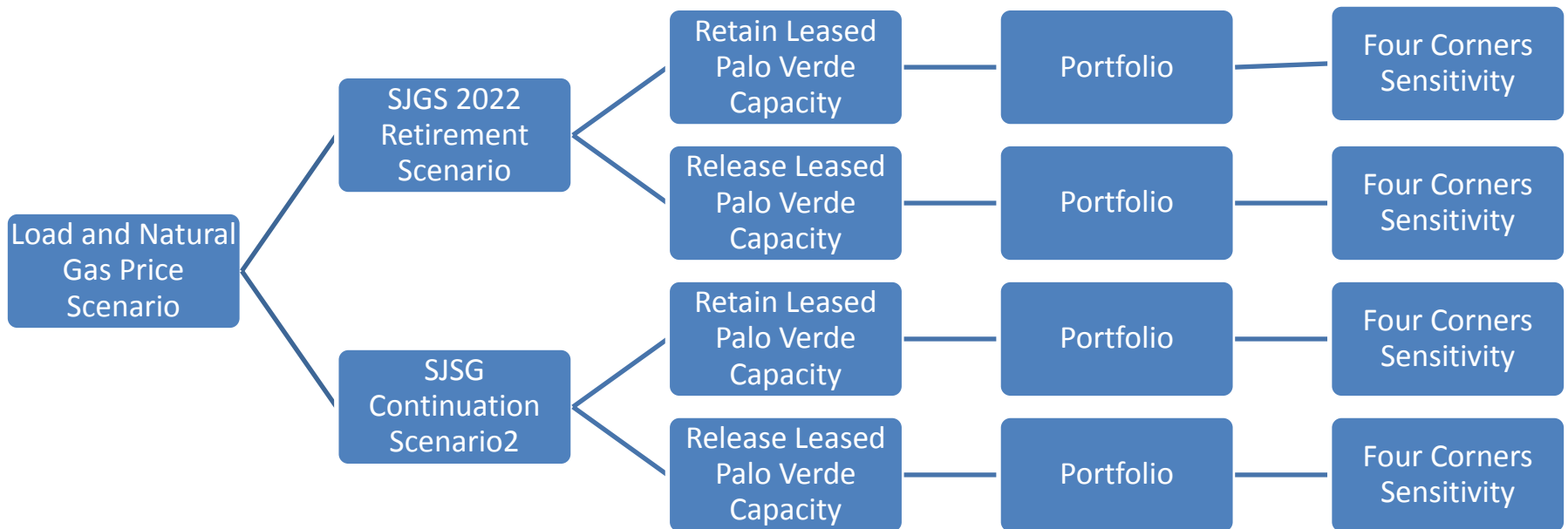
- Assume that PNM can add natural gas combined cycle capacity by either buying existing capacity or building new units
- Existing capacity tends to be offered in sizes larger than appears to be optimal for PNM's portfolio (e.g. 550 MW power blocks in Arizona)
- New capacity is typically much more expensive than existing
- After the conclusion of this IRP, PNM will issue a request for proposals for generating capacity that will include combined cycle resources

OPERATIONAL DATA

NATURAL GAS COMBINED CYCLE ADDITIONS

Item	Existing	New Option 1	New Option 2
IRP Size, MW	250	200	500
Year 1st Available	2022	2022	2022
Fixed O&M, \$/kW-yr	\$43.75	\$30.2	\$30.2
Variable O&M, \$/MWh	\$2.73	\$3.4	\$3.4
Forced Outage Rate	5 %	7.0 %	7.0 %
Heat rate, Btu/kWh	7,000	7,000	7,000
CO(lbs/MWh)	0.12	0.12	0.12
NOx (lbs/MWh)	0.08	0.08	0.08
Particulate (lbs/MWh)	1.00	1.00	1.00
SO2 (lbs/MWh)	0.00	0.00	0.00
CO2 (lbs/MWh)	925	810	810
Freshwater Usage (gal/MWh)	460	350	350

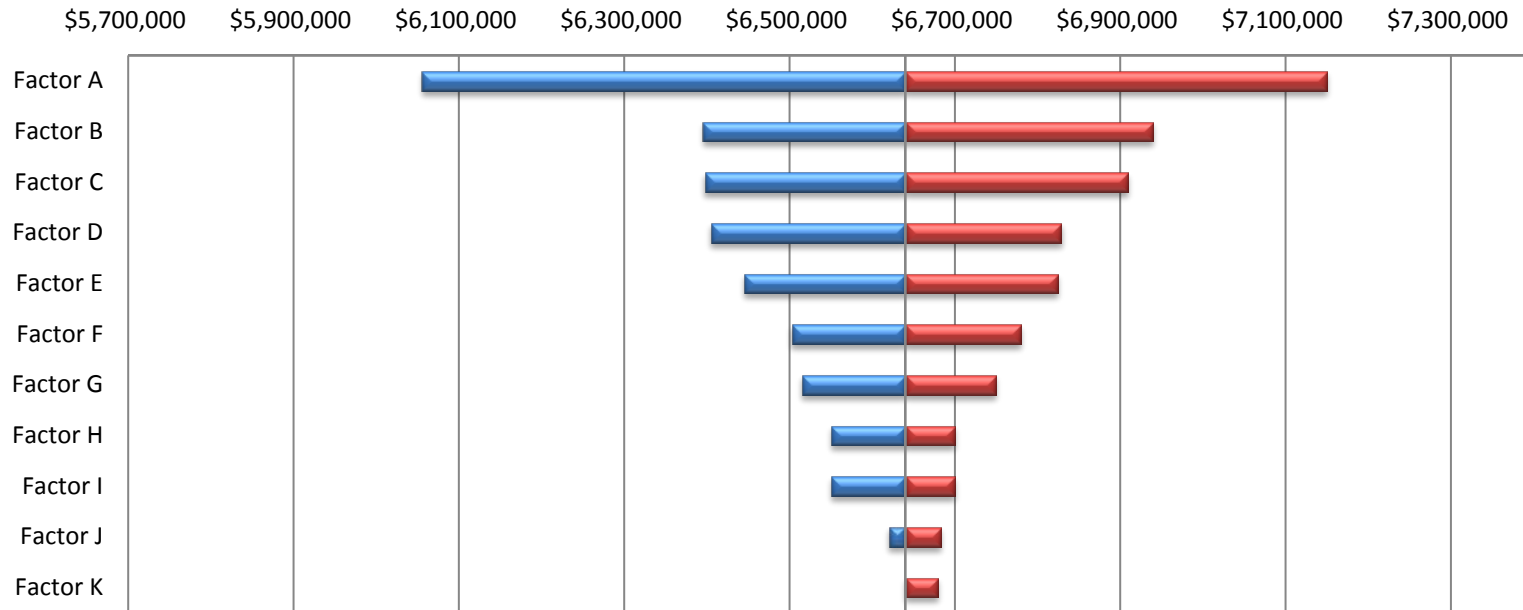
IRP SCENARIOS AND SENSITIVITIES



SENSITIVITY ANALYSIS

ILLUSTRATE COST IMPACT WITH TORNADO DIAGRAM

Variability and Impact; Potential Portfolio Cost Factors



MAKE SURE WE HAVE UP TO DATE CONTACT INFORMATION FOR YOU

www.pnm.com/irp for documents

irp@pnm.com for e-mails

Register your email on sign-in sheets for alerts of upcoming meetings and notices that we have posted new information to the website.

Meetings Schedule:

Thursday, Sept. 1, 2016, 10 am – 3 pm

Thursday, Sept. 22, 2016, 10 am – 3 pm

Thursday, Oct. 13, 2016, 10 am – 3 pm

Thank you

