

PNM 2017-2036 Integrated Resource Plan

SEPTEMBER 22, 2016 ENVIRONMENTAL DATA & REGULATION



Talk to us.



Maureen Gannon
Executive Director, Environment & Safety

ENVIRONMENTAL TOPICS

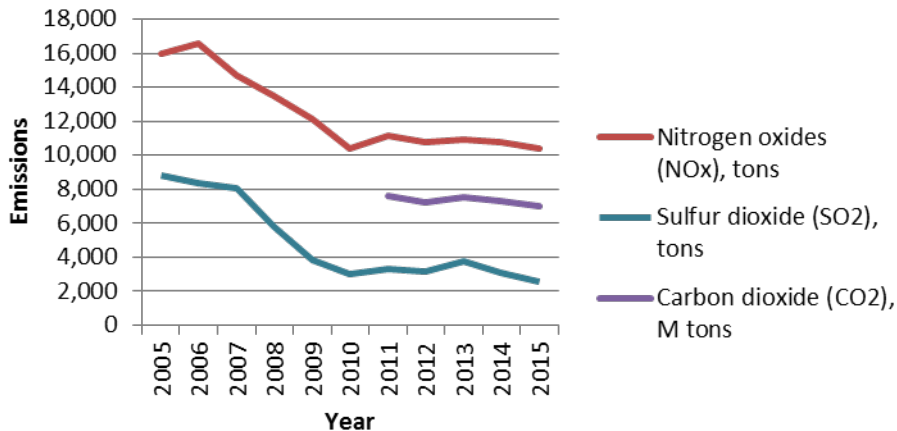
OVERVIEW

- Current State- Annual Emissions & Emission Controls
- San Juan Generating Station (SJGS) Post–2017 Profile
- Air
 - Carbon Emission Regulations
 - National Ambient Air Quality Standards: Ozone
 - Natural Gas & Methane
- Palo Verde Nuclear Generating Station
- Water
- Coal Ash

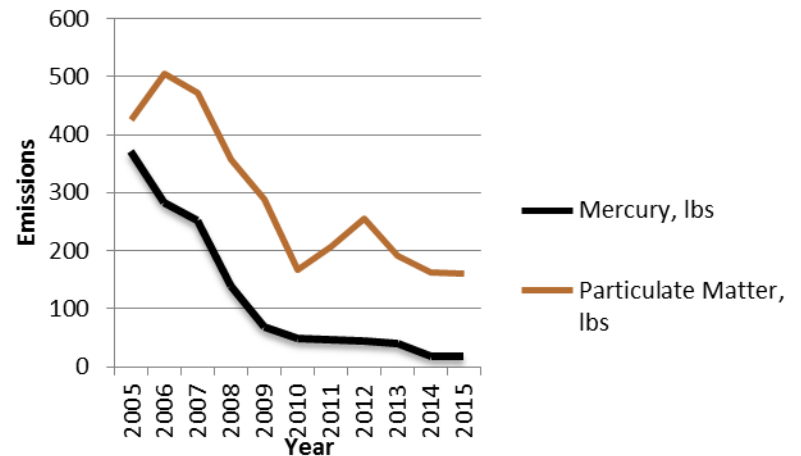
CURRENT STATE – ANNUAL EMISSIONS

PNM OWNED FACILITIES: EMISSIONS 2005 - 2015

NOx, SO2 and CO2 Annual Emissions



Mercury & Particulate Matter Annual Emissions



CURRENT STATE – EMISSION CONTROLS

ENVIRONMENTAL CONTROL EQUIPMENT AT COAL UNITS

Coal Unit	Low NOx Burners/ Overfired Air	Activated Carbon Injection	SNCR*	SCR**	Baghouse	Scrubbers
SJGS Unit 1	✓	✓	✓		✓	✓
SJGS Unit 2 (shutdown 12/17)	✓	✓			✓	✓
SJGS Unit 3 (shutdown 12/17)	✓	✓			✓	✓
SJGS Unit 4	✓	✓	✓		✓	✓
Four Corners Unit 4	Low NOx Burners			By July 31, 2018	✓	✓
Four Corners Unit 5	Low NOx Burners			By July 31, 2018	✓	✓

*SNCR refers to selective non-catalytic reduction systems.

**SCR refers to selective catalytic reduction systems.

SAN JUAN GENERATING STATION EMISSIONS

POST 2017 EMISSIONS

SJGS	NOx	SO ₂	Particulate Matter	Mercury*	CO ₂ *
Emission Reductions after 2009 Environmental Pollution Control Upgrades	44% ↓	71% ↓	72% ↓	99% ↓	N/A
2012 Emissions ** (tons per year)	21,000	10,500	2,380	0.005	11,906,236
Emission Reductions from 2012 to 2018 Revised State Implementation Plan (2 unit shutdown/2 unit SNCR)	62% ↓	67% ↓	50% ↓	50% ↓	47% ↓
Permitted Emissions in 2018 (tons per year)	8,011	3,483	1,184	0.002	6,359,750

* Mercury and CO₂ numbers are based upon actual emissions since there are currently no required permit limits for these constituents.

** 2012 chosen as base year to match the base year of EPA's Clean Power Plan for reduction of CO₂ emissions for fossil generation.

CURRENT STATE – EMISSION CONTROLS

ENVIRONMENTAL CONTROLS AT GAS-FIRED GENERATING PLANTS

- Natural gas has much lower emissions of nitrogen oxides (NO_x) and sulfur dioxide (SO₂) as compared to coal.
- Carbon dioxide (CO₂) emissions are ≈ 50 percent lower than coal when burned to generate electricity. CO₂ emissions from gas-fired plants are reduced relative to coal-fired plants given the same power output because of the
 - higher heat content of gas,
 - lower carbon intensity of gas and
 - higher overall efficiency of the gas units.
- NO_x emissions are controlled by low-NO_x burners and/or selective catalytic reduction. Catalyst is also used to control carbon monoxide emissions.
- PNM's gas-fired electric generating units operate in compliance with Clean Air Act Title V Operating Permits issued by the New Mexico Environment Department.

AIR

CARBON: CLEAN POWER PLAN FOR EXISTING SOURCES

Year	New Mexico Current State	
	CO2 Emission Rate	CO2 Emissions
2012	1,798 lb/MWh	17,339,683 tons
EPA Standard for New Mexico		
	CO2 Emission Rate	CO2 Emissions
2022	1,325 lb/MWh	13,815,561 tons
2030	1,146 lb/MWh	12,412,602 tons

Overview

- Requires a 32% reduction in CO₂ emissions from fossil electric generating units by 2030.
- Compliance begins in 2022 with final compliance by 2030.
- NM is required to reduce emissions by 32% (lbs CO₂/MWh) on a rate basis or 28% on a mass basis (tons CO₂) from 10 affected facilities (including four from PNM). Shutdown of SJGS Units 2 & 3 reduces annual CO₂ emissions ≈50% and is a significant step towards NM's compliance with the Clean Power Plan.

AIR

CARBON: CLEAN POWER PLAN FOR EXISTING SOURCES CONTINUED

- Stay of Clean Power Plan
 - 2/9/16 – U.S. Supreme Court stayed rule.
 - 9/27/16 – Oral arguments will be heard before en banc panel of the D.C. Circuit Court.
 - Early 2017 – Possible final ruling by D.C. Circuit.
 - Late 2017 – Supreme Court ruling expected on D.C. Circuit decision.
- Stay remains in effect pending Supreme Court review if such review is sought.
- Current CPP deadlines likely will shift based upon length of stay.

AIR

CARBON: 111(b) NEW SOURCES

- Final EPA rule to regulate CO₂ from new sources issued on August 3, 2015.
- Regulates CO₂ emissions from new, modified or reconstructed electric generating units (EGUs).
- Affects natural gas-fired combustion turbines and coal-fired steam EGUs.
- PNM has one new facility that is affected by this regulation– La Luz Energy Center. La Luz is compliant with the new regulation based upon capacity factor and operating hours.

AIR

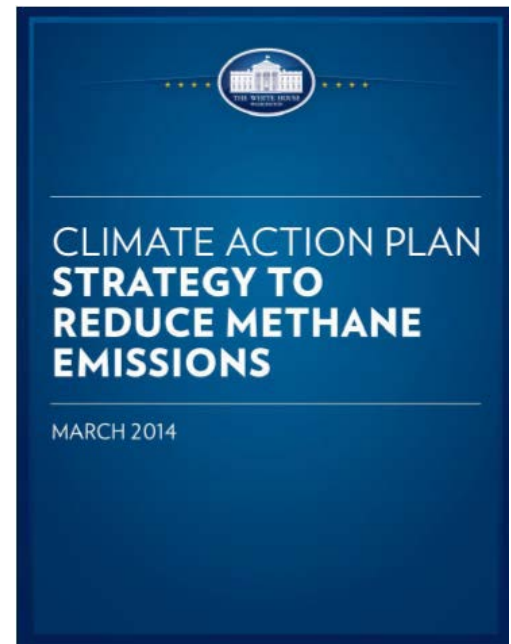
OZONE

- EPA has set the national ambient air quality standard for ozone at 70 ppb (from former 75 ppb).
- EPA expects states to use 2013 -2015 data to determine designations.
- According to NMED, Dona Ana County may have a small non-compliant section that is non-attainment for ozone which is likely the result of ozone transport from Mexico. All other counties in the state should be compliant.
- PNM facilities should not be affected by the new standard.
- NMED will submit their determination of non-compliance areas by October of 2016 and EPA will finalize the designations by October of 2017.

AIR

NATURAL GAS & METHANE

- In May of 2016, EPA issued a final rule to curb emissions of methane (a greenhouse gas) and other pollutants (volatile organic compounds and air toxics) from new, reconstructed and modified oil and gas sources.
- EPA's goal is to cut methane emissions from the oil and gas sector by 40 to 45 percent below 2012 levels by 2025.
- The rule's focus is on
 - Setting emission limits for methane from oil & gas production, processing, transmission & storage,
 - Ensuring coverage of additional processes, and
 - Requiring owners/operators to find and repair leaks.



OTHER

PALO VERDE GENERATING STATION

- Palo Verde is licensed and routinely inspected by the Nuclear Regulatory Commission (NRC).
- Currently, no pending new or revised environmental regulations are anticipated during the planning period.
- Palo Verde does not emit greenhouse gases and uses treated sewage effluent for cooling water.

Claudette Horn

Senior Manager, Environmental Services

WATER

CLEAN WATER ACT

316(b) Cooling Water Intake Structures

- A 2014 rule which addresses fish mortality and the Best Technology Available (BTA) to minimize entrainment and impingement mortality at National Pollutant Discharge Elimination System (NPDES)-permitted facilities.
- 316(b) rule applies as plant operates under EPA's NPDES Multi-Sector General Stormwater Permit.
- With the shutdown of SJGS units 2 and 3, flow through the intake structure will be reduced about 50% and significant changes to the intake structure are not expected.
- PNM is working with EPA Region 6 to address any requirements with the next permit renewal which could be issued as soon as 2020.
- Arizona Public Service (APS) is currently in discussions with EPA Region 9 to determine the scope of the impingement and entrainment requirements at Four Corners. APS has indicated that it does not expect costs to be material.

Waters of the U.S.

- A 2015 rule adopted jointly by the EPA and the Army Corps of Engineers which expanded the definition of Waters of the U.S. as applied to various regulatory programs.
- The rule has been stayed since October 2015.

OTHER

COAL ASH

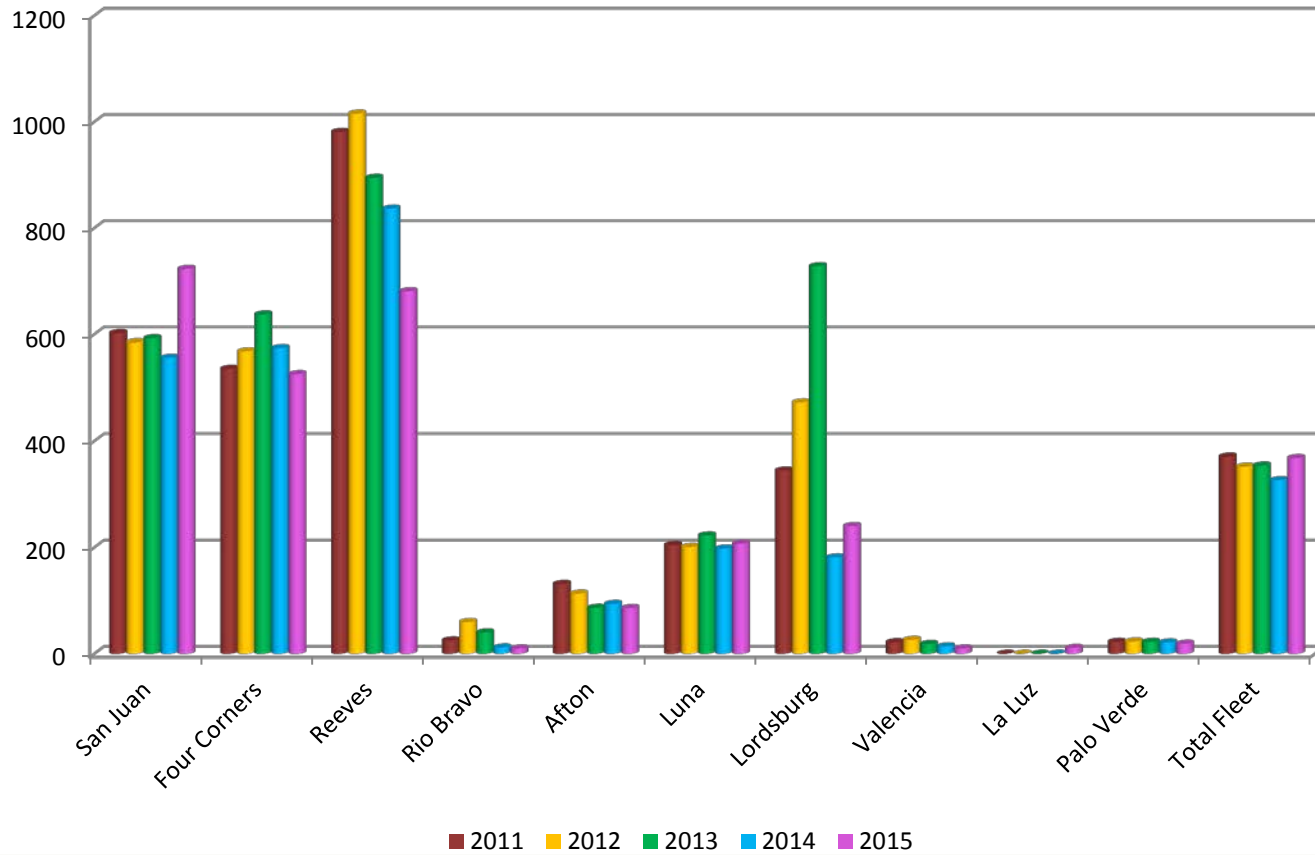
- Final EPA rule on coal combustion residuals (CCR) published 4/20/2015 designating coal ash as non-hazardous waste under Subtitle D of RCRA. This rule became effective October 19, 2015 and applies to ash impoundments and landfills.
- CCR generated at SJGS is returned to the adjacent surface mine for use in reclamation. SJGS does not have or utilize ash impoundments or landfills.
- The Office of Surface Mining (OSM) regulates mine placement of ash and is expected to issue a proposed rule in 2016.
- CCR at Four Corners are currently disposed of in impoundments and landfills. Groundwater monitoring, inspections, and analyses required by the CCR rule are occurring and further activities will be based on the results.

Pat O'Connell

Director, Planning and Resources

PNM WATER USE EFFICIENCY

FRESH WATER USE PER MEGAWATT HOUR



WRAP-UP DISCUSSION

ENVIRONMENTAL REGULATION IN THE IRP

Carbon Emissions

- Use carbon prices to test sensitivity as discussed this morning
- Will report modeled CO₂ emissions from portfolios (mass and emission rate) versus New Mexico Clean Power Plan requirements
- Will compare the expected dispatch of any new fossil units against 111b requirements

REMINDERS

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. 22, 2016, 10 am – 3 pm
 - Thursday, Oct. 13, 2016, 10 am – 3 pm
 - Thursday, October 13, 2016, 10 am – 3 pm

Thank you

