

**FINAL Environmental Impact Report  
Grayson Repowering Project**



Prepared for:  
City of Glendale Water and Power  
141 N Glendale Avenue  
Glendale, California 91206

Prepared by:  
Stantec Consulting Services Inc.  
290 Conejo Ridge Avenue  
Thousand Oaks, California 91361

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**FINAL ENVIRONMENTAL IMPACT REPORT  
GRAYSON REPOWERING PROJECT**

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**DOCUMENT ERRATA**

The following minor revisions or errata have been made to correct spelling and/or typing errors and additions within the Final EIR. Additions and corrections are in Red text and deletions can be found as strikethrough black text (i.e. ~~text~~).

<b>Section</b>	<b>Page</b>	<b>Errata</b>
Glossary	xxiv - xxxi	Addition of new terms
2.3 Purpose and Need	2.9	Update of name for Western Electricity Coordinating
2.3 Purpose and Need	2.11	Update of Table 2-3
4.3.4 Air Quality	4.3.27	Update of Table 4-19
	4.3.30	Update of Tables 4-21 and 4-22
	4.3.31	Update of Tables 4-23 and 4-24
	4.3.33	Update of Table 4-26
	4.3.35	Update of Table 4-27
	4.3.36	Update of Table 4-28
4.5 Greenhouse Gases	4.5.6	Update of Table 4-35
4.5.1 LORS	4.5.5	Update of section reference
4.10 Tribal Cultural Resources	4.10.1 - 4.10.10	Update of Environmental Setting and LORS
6.1.3 Precedent Setting Action	6.2	Update of text
6.2 Economic Growth	6.3	Update of text
6.2.1 Irreversible Commitment of Resources	6.4	Update of text
7.1.5 City of La Canada Flintridge	7.2	Update of City Information
7.1.6 Unincorporated County of Los Angeles	7.2	Update of County Information
Appendix A of Initial Study	multi	Update of Architectural Resource Evaluation

## **Executive Summary**

### **Project Location and Description**

Pursuant to the requirements of the California Environmental Quality Act (CEQA), the City of Glendale (City) has prepared this Draft Environmental Impact Report (EIR) to evaluate the potential environmental impacts of the proposed repowering of the Grayson Power Plant ("Repowering Project" or "Project"). The Project site is located at 800 Air Way, Glendale, California 91201, northeast of the Interstate 5 freeway and Hwy 134 interchange.

A majority of the equipment and facilities at the existing Grayson Power Plant were completed between 1941 and 1977, and are proposed to be replaced with more reliable, efficient, flexible, and cleaner units. With the exception of the 2003 simple cycle peaking plant (Unit 9), the City is proposing to replace the existing generation equipment and related facilities with a combination of new combined cycle and simple cycle gas turbine generation units. The generating capacity would increase from 267 megawatts (MW) net to 310 MW net (an increase of 43 MW net) which is necessary for the City to serve its customer load and meet a regulatory requirement for reliability. Because the Project involves less than a 50 MW increase in generation capacity, it is not subject to the California Energy Commission's Power Plant Licensing jurisdiction. The City is the CEQA Lead Agency for the Project.

The Project is designed to provide reliable generating capacity, avoid electrical capacity shortages, facilitate the use of more renewable energy by freeing up transmission line capacity to bring more renewable-based electricity to the City, and to provide flexibility to operate efficiently over the wide range of electrical loads placed on the City's electric system. The Project will allow the City to maintain reliable service, keep rates affordable, and facilitate compliance with state regulations regarding renewable energy supplies mandated through the Renewable Portfolio Standards without the need for new transmission lines. The Project will also allow the City to meet its existing and future electrical demands even if the City is separated from existing interconnections with the electric grid, it will minimize the City's reliance on importing power from remote generation locations across a congested transmission grid, and it will support water conservation efforts by eliminating the use of potable water for generation purposes.

Additional background including the site's history as a power plant, purpose and need, objectives, and benefits of the Project are included in Section 2.0. A detailed Project description is included in Section 3.0

## **Environmental Impacts and Mitigation Measures**

Topics evaluated in this Draft EIR have been identified based on preparation of an Initial Study (Appendix A), the responses to the Notice of Preparation (NOP), and the review of the Project by City staff. The City determined through this initial review process that impacts related to aesthetics, air quality, geology and soils, greenhouse gases, hazards and hazardous materials, hydrology and water quality, noise, traffic and transportation, and tribal cultural resources could be potentially significant and require an assessment in this Draft EIR.

Based on the analysis in the Draft EIR, the City determined that the Project would result in less than significant impacts to air quality, geology and soils, greenhouse gas emissions, hydrology and water quality, and tribal cultural resources. However, it was also determined that aesthetics, hazards and hazardous materials, noise, and transportation and traffic would, with associated mitigation measures, also be reduced to a less than significant level. The Project has no potentially significant impacts that could not be mitigated.

The required mitigation measures for the Project are summarized below. A more detailed summary of all the Project's environmental impacts is included in Table 2-4 and detailed environmental impact analyses are in Sections 4.0.

### **Aesthetics**

During the construction period, construction activities may contrast with the existing visual character/quality of views in the Project area. Mitigation Measure AES-1 requires screening construction activities and laydown areas to reduce their visibility.

### **Hazards and Hazardous Materials**

There would be a potentially significant temporary hazards and hazardous materials impact. The demolition and construction phases of the Project may create temporary hazards and hazardous materials impacts due to the use of fuels, handling of petroleum-impacted soils, and handling of materials containing asbestos/lead based paint. Mitigation Measures HAZ-1, 2, 3, 4, and 5 require adherence to a Soil Management Plan, Hazardous Materials Management Plan, Asbestos and Lead Paint Management Plan, and safe fuel handling practices/spill response.

In addition, to mitigate the off-site consequence of the worst-case accidental release of ammonia during Project operation. Mitigation Measure HAZ-6 requires the surface area of the proposed and existing ammonia tank containment systems to be effectively reduced by 90 percent or greater which would restrict the concentrations of concern within the site boundary.

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## **Transportation and Traffic**

During the demolition and construction phases, traffic would increase in on adjacent public roadways and the acceptable circulation standard at the San Fernando Rd./Doran St. intersection could be exceeded during construction. Mitigation Measures TRA-1, 2, 3, 4, 5, 6, 7, 8, and 9 require adherence to a Traffic Control Plan and number of public safety precautions as well as limiting the number of vehicle trips at the San Fernando Rd./Doran St. intersection during construction.

## **Noise**

The noise from the Project operation has been reduced through engineering design and controls as described in Mitigation Measures NOI-1, 2, 3, 4, 5, 6, 7, 8, 9, and 10 which require limits on source noise levels and controls to ensure acceptable noise levels during facility operation are not exceeded.

## **Mitigation Measures**

Implementation of the above mitigation measures would reduce the Project's potentially significant impacts to aesthetics, hazards and hazardous materials, noise, and transportation and traffic to a less than significant level. When the EIR is certified, a mitigation monitoring program would be adopted to ensure that the mitigation measures are fully implemented. With the implementation of these mitigation measures, the Project would not result in any significant and unavoidable environmental impacts.

## **Alternatives to the Project**

A reasonable range of alternatives that could feasibly attain some of the basic objectives of the Project and their potential environmental impacts are evaluated in the Draft EIR. These alternatives include use of a battery energy storage system, off-site utility-scale renewable energy generation combined with the addition of new high voltage transmission capacity and interconnections, a combination of reduced on-site generating capacity combined with the addition of new high voltage transmission capacity and interconnections, and a combination of reduced on-site generating capacity and a battery energy storage system. A summary of each alternative evaluated in this Draft EIR is set forth below. A more detailed evaluation of alternatives is set forth in Section 5.0.

### **No Project Alternative**

The No Project Alternative would involve running the existing power plant to failure and not proceeding with repowering of the Grayson Power Plant. The No Project Alternative would result in reduced environmental impacts over time as the units are shut down and would have less potential environmental impacts than those of the Project.

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However, the No Project Alternative is not a viable alternative in that it would not serve the needs of the City as the City could no longer meet its obligations as a load serving entity for its residents and customers, placing them at significant risk for decreased electrical system reliability and availability. Moreover, the No Project Alternative would not meet the Project objectives and would fail to comply with Federal and State reliability standards.

### **Energy Storage Project Alternative**

The Energy Storage Project Alternative would involve replacing Units 1 – 8 at the existing Grayson Power Plant with a battery energy storage facility. Use of the City's existing Unit 9 electrical generation, the City's allotment from the Magnolia Power Plant, and transmission capacity to serve the City's electrical load and charge batteries when excess capacity is available. Energy stored in the batteries would then be discharged to serve the electrical load when demand exceeds available transmission and generation resources.

The Energy Storage Project Alternative's potential for local air quality, greenhouse gas emissions, hydrology and water quality, noise, and traffic and transportation impacts are less than those of the Project. More distant impacts due to the additional night-time generation needed to charge the batteries, when renewable solar energy will not be available, are potentially increased. Additionally, during the summer season, it is not possible to import enough electricity to charge the batteries to serve the daytime load. For these reasons, this Alternative was not selected because it does not feasibly meet the Project objectives to the same extent as the Project.

### **Alternative Energy Project Alternative**

The Alternative Energy Project would involve some combination of photovoltaic or wind power production with energy storage and transmission lines. While the Alternative Energy Project Alternative reduces local potential air quality, greenhouse gas emissions, hydrology and water quality, and noise impacts local to the Grayson Power Plant site, it increases off-site impacts due to the need for increased transmission as well as the large area needed for a wind farm or solar field.

Because of the very limited ability to site solar or wind resources within the City, combined with the energy storage considerations discussed in the preceding Energy Storage Project Alternative, as well as the complications associated with building a new transmission line to import alternative energy, the Alternative Energy Project Alternative was not considered an adequate replacement for the power that would be generated by the Project. Additionally, the Alternative Energy Project Alternative does not feasibly meet the Project objectives to the same extent as the Project.



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## **150 MW Project Alternative**

The 150 MW Project Alternative would involve a reduced size power project located on the existing project site with a new transmission interconnection. While the 150 MW Project Alternative would have incrementally less potential air quality, greenhouse gas emissions and noise impacts than those of the Project, the potential impacts at the Grayson Power Plant site are generally similar.

However, the 150 MW Project Alternative also includes construction of a new transmission line that has the potential to result in greater potential impacts to aesthetics, agriculture and forestry resources, cultural/tribal cultural resources, geology and soils, land use and planning, and population and housing. In addition to the potential environmental impacts, the 150 MW Project Alternative does not feasibly meet many of the Project objectives or meet them as well as the Project.

## **200 MW Project Alternative**

The 200 MW Alternative would have reduced air and greenhouse gas emissions and noise from one less generation unit compared to the Project, with the reduction of one unit offset by the addition of a battery energy storage system (one that is smaller than the earlier alternative). The battery energy storage system adds the impact of the cost of periodic battery replacement as well as the need to dispose/recycle the batteries when they reach end of life. If sufficient transmission capacity were not available for charging the BESS, then the air emissions may not be reduced due to the need to operate additional unit(s) to charge the BESS.

## **Environmentally Superior Alternative**

The Draft EIR found that none of the alternatives would totally avoid or significantly lessen significant impacts of the Project. As a result of this analysis, the proposed Project would meet all project objectives while resulting in the fewest impacts when compared to the feasible alternatives evaluated and is therefore considered the environmentally superior alternative.

## **Alternatives Considered but Not Evaluated in this EIR**

A number of alternatives were considered but eliminated from further consideration in this Draft EIR. The alternatives that were not evaluated further include alternative power plant sites, and a variety of alternative technologies (generation technology, fuel technology, and alternative power plant cooling). These alternatives are more fully discussed in Section 5.3.

## **Environmentally Superior Alternative**

The Draft EIR found that none of the alternatives would totally avoid or significantly lessen significant impacts of the Project. As a result of this analysis, the proposed Project would meet all Project objectives while resulting in the fewest impacts when compared to the feasible alternatives evaluated and is therefore considered the environmentally superior alternative.



## **Abbreviations**

µg/m <sup>3</sup>	micrograms per meters squared
AADT	Average Annual Daily Traffic
AAQS	Ambient Air Quality Standards
AB	Assembly Bill
ACM	Asbestos-Containing Materials
ACWM	Asbestos-Containing Waste Materials
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model Improvement Dispersion Model
AES	Aesthetics
AICUZ	Air Installation Compatible Use Zone
ANSI	American National Standards Institute
AVO	Average Vehicle Occupancy
BA	Balancing Area
BAT	Best Available Technology Economically Achievable
BCT	Best Conventional Pollutant Control Technology
BLM	Bureau of Land Management
BMPs	Best Management Practices
Btu	British thermal units
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
Cal ARP	California Accidental Release Prevention Program
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
Cal-OSHA	California Occupational Safety and Health Administration
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CBC	California Building Code
CCCT	Combined Cycle Combustion Turbine
CCR	California Code of Regulations
CEC	California Energy Commission
CEMS	Continuous Emission Monitoring Systems
CEQA	California Environmental Quality Act

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CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERS	California Environmental Reporting System
CFR	Code of Federal Regulations
CGS	California Geological Survey
CH <sub>4</sub>	Methane
CHLs	California Historical Landmarks
CHSRA	California High Speed Rail Authority
City	City of Glendale
CMP	Congestion Management Program
CNEL	Community Noise Equivalent Level
CO	Carbon Monoxide
CO <sub>2</sub>	Carbon Dioxide
CO <sub>2</sub> e	Carbon Dioxide equivalent
CRHR	California Register of Historical Resources
CRS	California Road System
CTG	Combustion Turbine Generator
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibel
dB(C)	C-weighted decibel scale
DC	Direct Current
DTSC	California Department of Toxic Substances and Control
EIR	Environmental Impact Report
EPC	Engineering, Procurement, and Construction
ERAs	Exceedance Response Actions
ERC	Emission Control Credit
ESA	Environmental Site Assessment
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
G	Ground absorption
GHG	Greenhouse Gas
GIS	Gas Insulated Switchgear
GIS	Geographic Information System
gr	grains
GWP	Glendale Water and Power
H <sub>2</sub> S	Hydrogen Sulfide

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HAZ	Hazards
HCM	Highway Capacity Manual
HFCs	Hydrofluorocarbons
HI	Hazard Indices
HOV	High Occupancy Vehicle
hp	horsepower
hr	hour
HRSG	Heat Recovery Steam Generator
HSWA	Hazardous and Solid Waste Act
Hwy	Highway
Hz	Hertz
I-5	Interstate 5
IBC	International Building Code
ICU	Intersection Capacity Utilization
in	inches
ISO	International Organization for Standardization
KOP	Key Observation Points
kV	kilovolt
kWe	kilowatt electrical
kWH	kilowatt hour
L <sub>a</sub>	Vibration Acceleration Level
LADWP	Los Angeles Department of Water and Power
lbm	pounds-mass
Ldn	day-night average sound level
Leq	equivalent continuous sound level
LFN	Low Frequency Noise
LORS	Laws, Ordinances, Regulations, and Standards
LOS	Level of Service
LST	Liquid Storage Tank
L <sub>v</sub>	Vibration Velocity Level
m	meters
MERPs	Modeled Emission Rates for Precursors
MICR	Maximum Individual Cancer Risk
MM	Mitigation Measure
mmcf	Million Cubic Feet
MND	Mitigated Negative Declaration
MOE	Measure of Effectiveness
mph	miles per hour

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MRR	Mandatory Reporting Rule
MT	Metric Tons
MW	Megawatt
MWH	Megawatt-hour
N <sub>2</sub>	Diatomic Nitrogen
N <sub>2</sub> O	Nitrous Oxide
Na <sub>2</sub> PO <sub>4</sub>	Tri-sodium phosphate
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NAHC	Native American Heritage Commission
NALs	Numeric Action Levels
NCP	National Contingency Plan
NECs	No Exposure Certifications
NERC	North American Electric Reliability Corporation
NESHAP	National Emission Standards for Hazardous Air Pollutants
NH <sub>3</sub>	Ammonia
NHPA	National Historic Preservation Act
NO <sub>2</sub>	Nitrogen Dioxide
NOIs	Notices of Intent
NOP	Notice of Preparation
NOTs	Notices of Termination
NO <sub>x</sub>	Nitrous Oxides
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NSR	New Source Review
NSWDs	Non-storm water discharges
O <sub>2</sub>	Oxygen Gas
O <sub>3</sub>	Ozone
OEHHA	Office of Environmental Health Hazard Assessment
OPR	Governor's Office of Planning and Research
OSHA	Occupational Safety and Health Administration
PAHs	Polycyclic Aromatic Hydrocarbons
Pb	Lead
PCB	Polychlorinated Biphenyls
PCE	Passenger Car Equivalent
PCR	Public Resources Code
PFCs	Perfluorocarbons
PHI	California Points of Historical Interest

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PM	Particulate Matter
PPA	Peak Particle Acceleration
ppb	parts per billion
ppm	parts per million
ppmv	parts per million by volume
ppmvd	parts per million by volume, dry basis
PPV	Peak Particle Velocity
PRDs	Permit Registration Documents
PSD	Prevention of Significant Deterioration
psig	pounds per square inch gauge
P-waves	Primary waves
RCRA	Resource Conservation and Recovery Act
REL	Reference Exposure Levels
RMP	Risk Management Plan
RMS	Root-Mean-Square
ROWD	Report of Waste Discharge
RTP	Regional Transportation Plan
R-waves	Rayleigh waves
RWQCB	Los Angeles Regional Water Quality Control Board
s	second
SARA	Superfund Amendments and Reauthorization Act
SB	Senate Bill
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCC	Siemens Combined Cycle
SCCT	Simple Cycle Combustion Turbine
scf	square cubic feet
SCR	Selective Catalytic Reduction
SCRRA	Southern California Regional Rail Authority
SEA	Significant Ecological Area
SF <sub>6</sub>	Sulfur Hexafluoride
SMARTS	Storm Water Multiple Application and Report Tracking System
SO <sub>4</sub> <sup>2-</sup>	Sulfates
SoCalGas	Southern California Gas Company
SO <sub>x</sub>	Sulfur Oxides
SPCC	Spill Prevention, Control, and Countermeasure
SR	State Route

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SRTS	Safe Routes to School
SUSMP	Standard Urban Stormwater Mitigation Plan
S-waves	Secondary waves
SWPPP	Stormwater Pollution Prevention Plan
TEWAC	Totally Enclosed Water to Air Cooled
TMDL	Total Maximum Daily Loads
TPY	Tons Per Year
TQ	Threshold Quantity
TRA	Traffic
USC	United States Code
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
V/C	Volume-to-Capacity
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compound
vpd	vehicles per day
WECC	Western Electricity Coordinating Council



## Glossary

### ENGINEERING TERMS

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<b>Auxiliary Load</b>	The difference between the gross generation as measured at the electric generators output and the net generation delivered to the electric grid at the point of interconnection. The auxiliary load is the electric load necessary to operate a generating unit, e.g., pumps, fans, controls, etc.
<b>Balancing Area</b>	A geographic area defined by the interconnected transmission/distribution systems (which may be owned/operated by different entities) that are managed by the Balancing Authority. The boundaries of the Balancing Area are defined by the points of interconnection to other Balancing Areas. The generation within a Balancing Area must be constantly adjusted so that the sum of the power generated within the Balancing area, plus power imported into the Balancing Area, less the power exported from the Balancing Area, less the load within the Balancing Area is maintained at zero, e.g., in balance. For the Grayson project, the Balancing Area is composed of Los Angeles Water and Power, Glendale Water & Power, and Burbank Water & Power.
<b>Balancing Authority</b>	The responsible entity that integrates resource plans ahead of time, maintains load-interchange-generation balance within a Balancing Authority Area, and supports Interconnection frequency in real time. Los Angeles Department of Water and Power is the Balancing Authority for the Project area.
<b>Blow Down</b>	The removal of a continuous or intermittent stream of water from a Heat Recovery Steam Generator or cooling tower to remove the dissolved impurities and maintain the required water/steam quality requirements.
<b>Boiler Building</b>	A building containing mechanical and electrical equipment used to heat water and produce steam to be used in a steam turbine for power generation.
<b>Capacity Factor</b>	The capacity factor is the ratio of the energy generated over one year, divided by the potential energy generated over one year. For example, a five-megawatt generator could produce a maximum of $5\text{MW} \times 8760\text{hours/year} = 43,800$ megawatt-hours (there are 8,760 hours in a

year). If it produces 25,000 megawatt-hours over the course of a year, then its capacity factor is 57% ( $25,000 \div 43,800 = 0.57$ , i.e. 57%).

<b>Clean Energy</b>	Electricity produced from sources that do not create emissions such as renewable resources (solar, wind, geothermal, small hydro), large hydroelectricity, and nuclear power.
<b>Combined Cycle Unit</b>	Combined cycle units utilize both the electricity produced by a combustion turbine generator as well as the high temperature exhaust gases which are used to produce boil water and produce steam, which is then supplied to a steam turbine to generate additional electric power without requiring additional fuel. Combined Cycle Units are nearly twice as efficient as simple cycle plants, but take more time to get to full load.
<b>Combustion Turbine Generator (CTG)</b>	<p>A combustion turbine draws air into the engine, compresses it, which then flows into the combustors. Fuel (natural gas) is mixed with the compressed air and ignited. The hot exhaust gas then flows into a turbine that is mechanically connected to and drives the compressor. The same shaft also drives the electrical generator.</p> <p>This is the same technology as used for the engines on a jet airplane. Unlike an airplane, since combustion turbine generator is on the ground where weight, size, and shape are less of a concern, the combustion process and exhaust gases are treated to produce far cleaner engine exhaust.</p>
<b>Contingency</b>	Planning for the unexpected failure or outage of a system component, such as a generator, transmission line, circuit breaker, switch or other electrical element.
<b>Continuous Emission Monitoring Systems (CEMS)</b>	A system for measuring and reporting on a real-time continuous basis the combustion turbine exhaust emissions to the South Coast Air Quality Management District, the regulatory body that reviews the project and issues the air permit.
<b>Cooling Tower</b>	A device used to cool water that is used in the power plant to cool various pieces of equipment, the largest of which is the condenser which is used to condense the exhaust steam from the steam turbine back into water for re-use in the HRSG.
<b>Demand Management</b>	A set of actions taken to modify customer demand and reduce electric system loads by reducing, time shifting, or turning off loads. Examples include:

- Behavioral change with regards to the use of electricity through education.
- Financial incentives such as time-of-use rates that charge higher rates for electricity during times of the day when electric loads are high
- Financial incentives such as tiered rates that charge higher rates as the amount of electricity used increases
- Time-shifting of load by storing energy during times of low demand to be used during times of high demand

Reducing system load by either voluntary or involuntary means such as turning off air conditioning, reducing system voltage, or in extreme events, interrupting service to a customer.

**Derating (or de-rating)**

The temporary or long-term reduction in capacity of a device, unit, or system due to weather, equipment aging, or supply related issues. A typical example is operation below the maximum power rating.

**Dispatchable Generation**

Generating units that can start, change load, and shut down as needed on a 24/7 basis to serve electric load without being constrained by their fuel source.

**Electric Bus**

Refers to a high electric current duty portion of an electric distribution where a source of power feeds multiple loads. Typically, the loads will have their electric breaker to protect the bus and other electric loads from a fault on any load. Functionally equivalent to the distribution panel in a home.

**Firming**

Some renewable resources, solar and wind in particular, are subject to unplanned temporary reductions in output due to changes in the weather (wind drops off, clouds pass overhead, etc.). This is referred to as intermittency. To address the intermittency issue, other generating resources are used to supply power to make up the difference on a real-time basis and “firm” the renewable resource so that the combined output meets the planned or committed output.

**Frequency Deviation**

The degree to which the alternating current electrical system frequency deviates from 60 Hz due under-generation (<60 Hz) or over-generation (>60 Hz). An excessive frequency deviation, typically <1 Hz, will lead to load shedding and other remedial actions. At 57.9 Hz electric systems will separate from each other per WECC criteria.

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<b>Fuel Gas Compressors</b>	A device for increasing the pressure of the natural gas fuel so it can flow into the combustors of the combustion turbine. The fuel gas pressure must be higher than the pressure of the compressed air produced by the compressor section of the combustion turbine.
<b>Gross Output</b>	The electrical output of an electrical generator measured at the generator terminals.
<b>Heat Recovery Steam Generator (HRSG)</b>	Is an energy recovery heat exchanger that recovers heat from the hot gas stream of the combustion turbine to produce steam that can then be used to drive a steam turbine
<b>Linear Facilities</b>	Structures that follow an alignment between two ends such as a transmission line, pipeline, or roadway.
<b>Load-Following</b>	Adjusting power output as demand for electricity fluctuates throughout the day. Load following plants are typically in-between base load and peaking power plants in efficiency, speed of startup and shutdown, construction cost, cost of electricity and capacity factor.
<b>Load Serving Entity</b>	An entity that is responsible for securing energy and transmission service to serve the electrical demand and energy requirements of its end-use customers.
<b>Load-Shifting Battery</b>	A battery energy storage system used to store energy to be used at a later time (typically hours later). The battery is charged when there is excess energy available and discharged during periods when there is a high demand on the electric system or inadequate generation resources are available.
<b>Loading Order</b>	California, as state policy, has a preferred loading order to address the state's electrical needs. The loading order was adopted in the 2003 Energy Action Plan and included in the California Energy Commission's 2003 Integrated Energy Policy Report. The loading order consists of decreasing electricity demand by increasing energy efficiency and demand response, and meeting new generation needs first with renewable and distributed generation resources, and then with clean fossil-fueled generation.
<b>N-1 or Single Outage Contingency</b>	Single Outage Contingency (N-1) Criterion Applicability under System Operations. For multiple resources serving a system, the "N" number of resources, the loss of one of the resources, "-1." The N-1 criterion, particularly the loss of the largest resource, is a minimum system reliability

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consideration that the System Operator uses when modeling/planning/operating the electric transmission network to ensure sufficient redundancy of supply and avoid potential power interruptions and/or system failure.

**N-1-1 or  
Secondary  
Contingency**

N-1-1 Contingency: A sequence of events consisting of the initial loss of a single generator or transmission component (Primary Contingency), followed by system adjustments, followed by another loss of a single generator or transmission component (Secondary Contingency). For planning purposes to ensure system reliability, the Secondary Contingency is typically the second largest resource that is relied upon to serve load.

**Net Output**

The electrical output of a Unit delivered to the electrical system measured at the point of interconnection. The Net Output is equal to the Gross Output of the generator(s) less electrical power consumed within the Unit for pumps, fans, and other electrical loads as well as electrical losses in transformers and cabling.

**Non-Spinning  
Reserve**

The non-spinning reserve or supplemental reserve is the extra generating capacity that is not currently connected to the system but can be brought online within 10 minutes. In isolated power systems, this typically equates to the power available from fast-start generators. However, in interconnected power systems, this may include the power available on short notice by importing power from other systems or retracting power that is currently being exported to other systems.

**Power Block**

The primary collection of equipment within a power plant unit that converts fuel into thermal and mechanical energy and in turn into electricity.

**Power Plant  
Repowering**

The process of upgrading an older power plant, in part or in whole, with new equipment to improve efficiency and reliability, while reducing environmental impacts through reduced air emissions and water usage.

**Reactive Power  
Support**

The portion of electricity that establishes and sustains the electric and magnetic fields of alternating-current equipment. Reactive power must be supplied to most types of magnetic equipment, such as motors and transformers. It also must supply the reactive losses on transmission facilities. Reactive power is provided by generators, synchronous condensers, or electrostatic equipment such as capacitors and directly influences electric system voltage. It is usually expressed in kilovars or megavars.

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<b>Regulation Battery</b>	A battery energy storage system used to balance short-term imbalances between the generation in service and the electric load. The battery can serve as a load (charging) if there is excess generation and serve as an additional source of generation if there is excess load. Longer-term imbalances are addressed by adjusting the amount of generation in service or shedding load as a last resort.
<b>Reliability Requirements</b>	The mandatory and enforceable standards for electricity reliability required by Section 215 of the Federal Power Act.
<b>Shaping</b>	Operation of a generating resource in conjunction with others, to deliver a combined output that matches the required shape of the load curve (load versus time) to meet demand.
<b>Selective Catalytic Reduction (SCR)</b>	An air emissions control technology system that injects a reductant agent (typically dilute aqueous ammonia) into the exhaust stream of a combustion unit and hence through a special catalyst to reduce nitrogen oxide pollutant concentrations.
<b>Shed-Load</b>	The action, either manually or as part of an automatic scheme, to disconnect load from the electric system to bring the load into balance with the available generation. Load shedding can result in customers being involuntarily disconnected on a temporary basis.
<b>Simple Cycle Unit</b>	A power plant that uses a combustion turbine to drive a generator to produce electrical power. Similar to the engines seen under the wing of an airplane, instead of producing thrust to push an airplane through the air, the power is used to drive an electrical generator. Like the engines on an airplane, the combustion turbine can start quickly and go to full power, several times a day if needed, quickly providing energy to the electric system.
<b>Single Largest Contingency</b>	The planned unexpected failure or outage of a system's largest electrical component.
<b>Spinning Reserve</b>	The spinning reserve is the reserve or additional generating capacity that is available by increasing the power output of generators that are already operating and connected to the power system. For most generators, this increase in power output is achieved by increasing the torque applied to the turbine's rotor.
<b>Steam Turbine Generator</b>	A Steam Turbine Generator is a device that uses the high temperature, high pressure steam from the Heat Recover Steam Generator and expands it through the turbine section that then rotates a shaft driving an

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electrical generator and producing electricity. The 'spent' steam is then condensed back into water that is then re-circulated back to the Heat Recovery Steam Generator to again produce steam.

**Transformers**

A device that increases or decreases the voltage in an electrical system. As electrical power is transmitted more efficiently at higher voltages, transformers are used to increase the voltage of the generated electricity so it can be distributed efficiently throughout the City. Transformers are also used to reduce the voltage of the generated electricity for use to power motors to drive pumps and fans in the power plant.

**Voltage  
Regulation**

The voltage regulation is the percentage of voltage difference between no load and full load voltages of a transformer with respect to its full load voltage.

**Water Treatment  
Facility**

A system consisting that will clean up the recycled water to a much higher quality for use in the HRSG and other power plant water applications where demineralized water is required.

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**ENVIRONMENTAL TERMS**

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<b>Best Available Control Technology</b>	Means an emission limitation based on the maximum degree of reduction of each pollutant subject to regulation under this Act emitted from or which results from any major emitting facility."
<b>City of Glendale local CEQA Guidelines</b>	The City of Glendale's adopted local CEQA Guidelines as set forth in the document entitled "City of Glendale and Glendale Housing Authority Guidelines for implementing the California Environmental Quality Act" as amended November 1, 2016.
<b>Emission Inventory</b>	Usually contains the total emissions for one or more specific greenhouse gases or air pollutants, originating from all source categories in a certain geographical area and within a specified time span, usually a specific year.
<b>Emission Reduction Credits</b>	A reduction in pollution that is equal to one emission unit. A company that reduces its pollution can sell its emission credits to companies that fail to reduce their pollution: If a company fails to meet its emission-reduction target, it will need to buy additional emission credits to cover its excess emissions.
<b>New Source Review</b>	The New Source Review is a permitting process created by the US Congress in 1977 as part of a series of amendments to the Clean Air Act.
<b>Prevention of Significant Deterioration</b>	The Prevention of Significant Deterioration, or PSD, permit program was developed by the United States Congress to prevent significant environmental impacts on "attainment areas" from large industrial sources of air pollution.
<b>Priority Reserve</b>	A Priority Reserve is established to provide credits for specific priority sources.
<b>Repowering</b>	Repowering is a common term among electric utilities that refers to rebuilding power plants by taking an old generating unit out of commission, dismantling it, and building a new, modern one at the same plant. The repowered units are more energy efficient, create less emissions, and increase reliability of the power grid.