

Proposed Rule 1110.4
Emissions from Emergency Generators (PR 1110.4)

Working Group Meeting #3 – September 10, 2026

Join Zoom Webinar Meeting:

<https://aqmd.zoomgov.com/j/1606894523>

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Working Group Meeting (WGM) Agenda



Summary of WGM #2

Response to Comment Letter

Best Available Retrofit Control Technology (BARCT) Assessment Status

Initial BARCT Emission Limits and Other Considerations

Cost-Effectiveness and Incremental Cost-Effectiveness Analyses

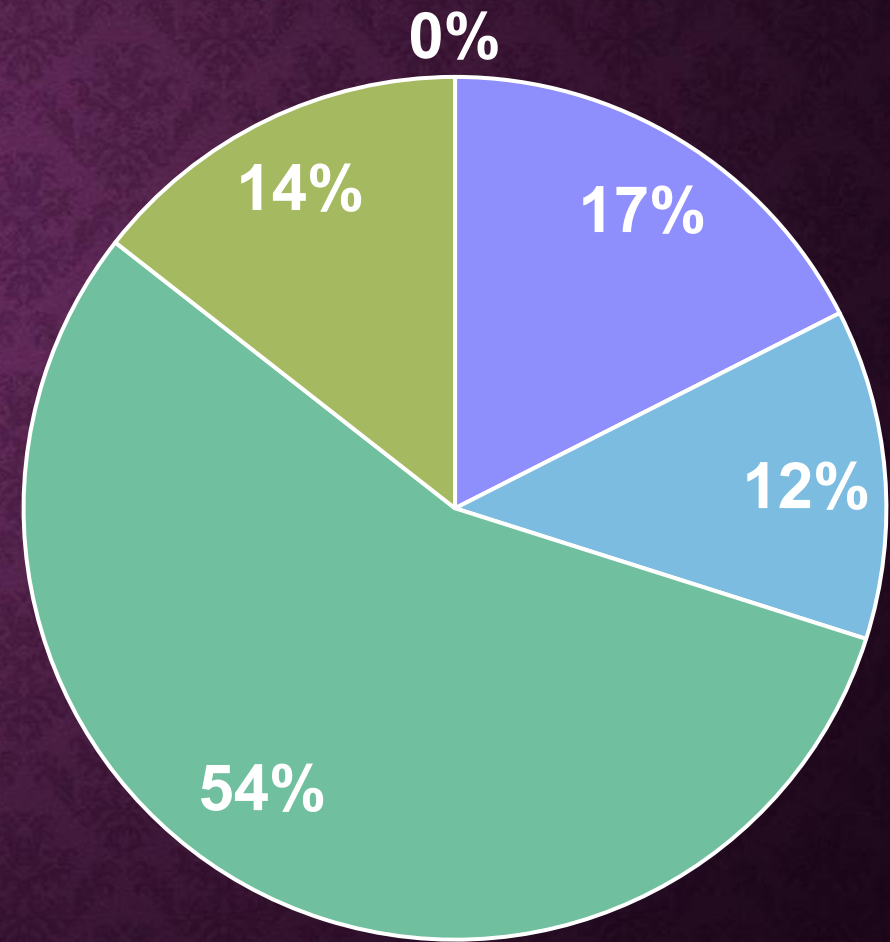
Proposed BARCT Emission Limits

Next Steps

Summary of WGM #2

- Staff presented the following topics during WGM #2:
 - Updated emergency generator inventory and refined emission estimates
 - Emergency power requirements, including NFPA 110
 - Completed technology assessment
- Stakeholders emphasized importance of emergency power reliability
- Stakeholder feedback informed the proposed BARCT emission limits, including:
 - Separate BARCT emission limits for Level 1 Emergency Power Supply Systems (EPSS)/critical operation units and Non-Level 1 EPSS
 - Refined cost-effectiveness assumptions, including source testing, fuel, and O&M costs
 - Expanded evaluation of natural gas infrastructure

Engine Tier Breakdown



■ Tier 0 ■ Tier 1 ■ Tier 2 ■ Tier 3 ■ Tier 4

Clean Water SoCal Comment Letter

- South Coast AQMD received a comment letter from Clean Water SoCal on July 14, 2026
- The letter raised concerns regarding:
 - Reliability
 - Natural gas infrastructure
 - Wastewater facility requirements
 - The use of alternative emergency backup technologies
- Staff expanded the reliability, regulatory, and technical evaluation to assess these issues
- The complete comment letter is available on the PR 1110.4 Proposed Rules page*



July 14, 2026

South Coast Air Quality Management District
Attn: Mike Morris
Planning and Rules Manager
21865 Copley Drive
Diamond Bar, CA 91765

Subject: Essential Public Services and Critical Reliability Concerns Regarding Proposed Rule 1110.4

Dear Mike,

On behalf of Clean Water SoCal, we appreciate the meeting with you and your team to provide feedback regarding **Proposed Rule 1110.4 (PR 1110.4)**. While we support the District's ongoing efforts to evaluate Best Available Retrofit Control Technology (BARCT) and lower regional emissions, we urge the District to carefully evaluate the unintended, regulatory and public health consequences of restricting the use of emergency diesel generators at essential public service facilities—specifically, water and wastewater treatment plants.

Clean Water SoCal represents over 80 public water/wastewater agencies in Southern California. Clean Water SoCal members provide essential water supply, wastewater treatment and water disinfection for approximately 20 million people in San Diego, Orange, Los Angeles, Santa Barbara, Riverside, San Bernardino, and Ventura counties. Our members provide environmentally sound, cost-effective management of more than two billion gallons of wastewater each day and, in the process, convert wastewater into resources for beneficial uses such as recycled water and renewable energy.

As currently conceptualized, any technology-forcing requirements under PR 1110.4 that push facilities away from on-site emergency diesel generators toward alternative technologies, such as natural gas-fired engines, introduce potentially catastrophic vulnerabilities to water and wastewater infrastructure. As illustrated in the attached summary, which includes a natural gas supply interruption during the 1994 Northridge Earthquake, natural gas pipelines are subject to supply outages, volumetric restrictions, fire related shutdowns, and seismic vulnerabilities during regional disasters—the exact moments when our infrastructure must rely on 100 percent dependable back-up power 24 hours per day, seven days per week (24/7).

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Staff Evaluation of Emergency Power Reliability Concerns



Reliability of Natural Gas

- Staff reviewed a California Energy Commission (CEC) reports, a California Public Utilities Commission analysis, and historical natural gas interruptions
 - Only two interruption events identified in the comment letter occurred within South Coast AQMD's jurisdiction
 - Natural gas is subject to seismic, safety shutoff, and supply interruption risks
 - Natural gas and diesel have different vulnerabilities; neither fuel supply is immune from disruption

Title 22 California Code of Regulations Division 5

Title 22 Social Security

Title 22 Social Security California Code of Regulations provides information about nurse-to-patient ratios, licensing and

Emergency Power Regulatory Requirements

- Staff reviewed NFPA 110, Title 22, California Water Code, and Federal Emergency Management Agency (FEMA) guidance
 - Requirements emphasize reliable emergency power without prescribing a specific fuel or technology, except for certain applications such as fire pump engines
 - FEMA identifies risks associated with utility-dependent fuels but does not prohibit natural gas emergency power

Staff Findings from Reliability and Regulatory Review

Staff did not identify regulations that prohibit natural gas-fueled emergency standby technologies at water or wastewater facilities

Diesel fuel storage and natural gas infrastructure each provide viable, but different, approaches to emergency fuel supply

Facility and equipment-specific reliability requirements inform the technology pathways, including NFPA 110 Level 1 EPSS requirements

These findings informed the proposed BARCT emission limits and additional details are provided later in the presentation

Staff recognizes the critical role of water and wastewater treatment facilities and will continue working with stakeholders to address specific emergency power needs

BARCT Assessment Status

- During WGM #3, staff will present:
 - Technology feasibility determinations for the evaluated emergency standby technologies and initial BARCT emission limits
 - Cost-effectiveness and incremental cost-effectiveness analyses for technologies determined to be feasible
 - Proposed BARCT emission limits

Assessment of
South Coast
AQMD
Regulatory
Requirements

Assessment
of Emission
Limits for
Existing
Units

Other
Regulatory
Requirements

Assessment
of
Technologies

Technology Assessment

Initial BARCT
Emission
Limits and
Other
Considerations

Cost-
Effectiveness
and Incremental
Cost-
Effectiveness
Analyses

BARCT
Emission
Limits

Initial BARCT Emission Limits and Other Considerations

Technology Feasibility Evaluation

Technologies for emergency backup power were evaluated to determine technological feasibility and emission profiles

- The initial BARCT limit reflects the technology or technologies with the greatest emission reductions that is technologically feasible

Evaluation Criteria

- Emission profile
- Startup performance
- Emergency standby reliability
- Infrastructure and operational requirements

Because emergency power requirements differ by application, technological feasibility was evaluated separately for Level 1 EPSS/critical operation units and Non-Level 1 EPSS

Natural Gas Feasibility Considerations

- Approximately 1,500 emergency standby natural gas generators (about 10% of all emergency generators with active permits within South Coast AQMD's jurisdiction) are currently in operation
- Existing installations demonstrate long-term use of natural gas for emergency standby power
 - Some installations serve NFPA 110 Level 1 EPSS applications
 - Staff identified natural gas emergency generators that have operated for 25 years or more
- Existing deployment demonstrates technical feasibility but does not establish suitability for every facility

Initial BARCT
Emission
Limits and
Other
Considerations



California Natural Gas System Resilience

Infrastructure Resilience

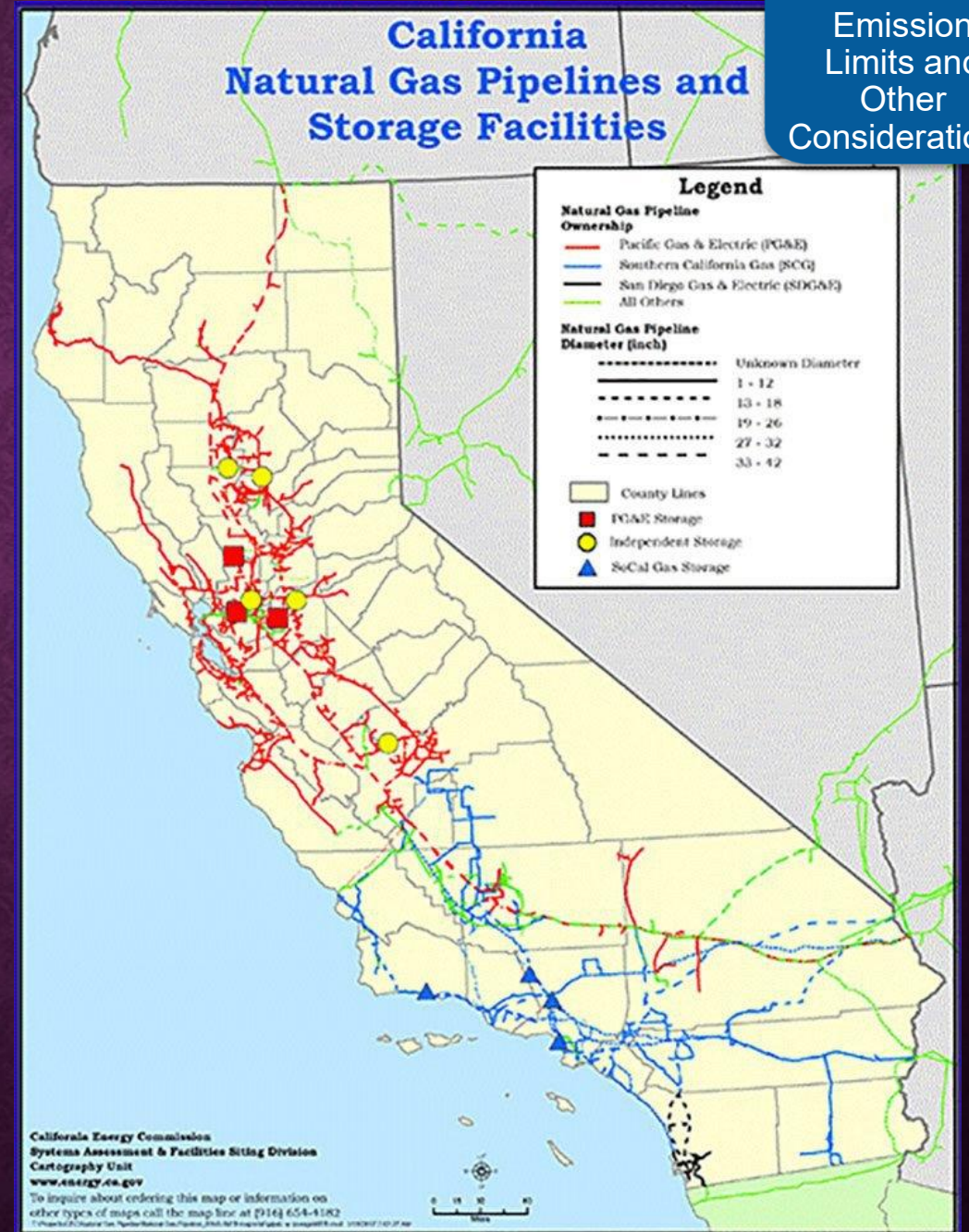
- Utilities strengthened natural gas infrastructure following the 1994 Northridge Earthquake and 2015 Aliso Canyon incident
- Improvements include seismic upgrades and emergency preparedness

System Reliability

- California's transmission network includes multiple interstate supply pathways
- CEC analyses indicate the transmission system has historically demonstrated high reliability*

*[CEC 2025 Integrated Energy Policy Report](https://www.energy.ca.gov/publications/2025/Integrated_Energy_Policy_Report)

Initial BARCT
Emission
Limits and
Other
Considerations



Emergency Fuel Supply Reliability

- Diesel fuel storage and natural gas infrastructure provide established, but fundamentally different, approaches to emergency fuel supply
 - Diesel relies on onsite fuel storage and may require resupply during extended outages
 - Natural gas relies primarily on pipeline infrastructure, with optional onsite compressed natural gas (CNG) storage providing an additional reliability safeguard
- Natural gas infrastructure has demonstrated reliable service, while remaining subject to seismic and safety-related interruption risks

Initial BARCT
Emission
Limits and
Other
Considerations



Staff Evaluation and Preliminary Findings

Diesel and natural gas each present different reliability considerations, but both can support emergency standby power

Long-term successful operation of natural gas emergency standby generators demonstrates natural gas fuel reliability and natural gas engine durability

While demonstrated on a large scale for Level 1 EPSS use, natural gas technologies are not feasible for every backup generator

- Site-specific space, safety, and operational constraints limit universal adoption of natural gas generators for Level 1 EPSS units and other critical operations such as potable water and wastewater treatment (e.g. space for CNG storage)

Natural gas technologies are being considered where reliable natural gas service (≥ 5 psi) exists and emergency standby reliability requirements can be maintained

Tier 3 Diesel Engines

- Tier 3 diesel engines provide lower NO_x emissions than legacy-diesel engines (Tier 0, 1, and 2) while maintaining proven reliability
- NO_x Emission Rates:
 - 4.5 g/kW-hr (37–75 kW)
 - 3.8 g/kW-hr (75–560 kW)*

Application	Preliminary Determination
Level 1 EPSS/Critical Operation	Technologically Feasible
Non-Level 1 EPSS	Technologically Feasible

*There is no Tier 3 NO_x emission rate for diesel engines ≥ 560 kW

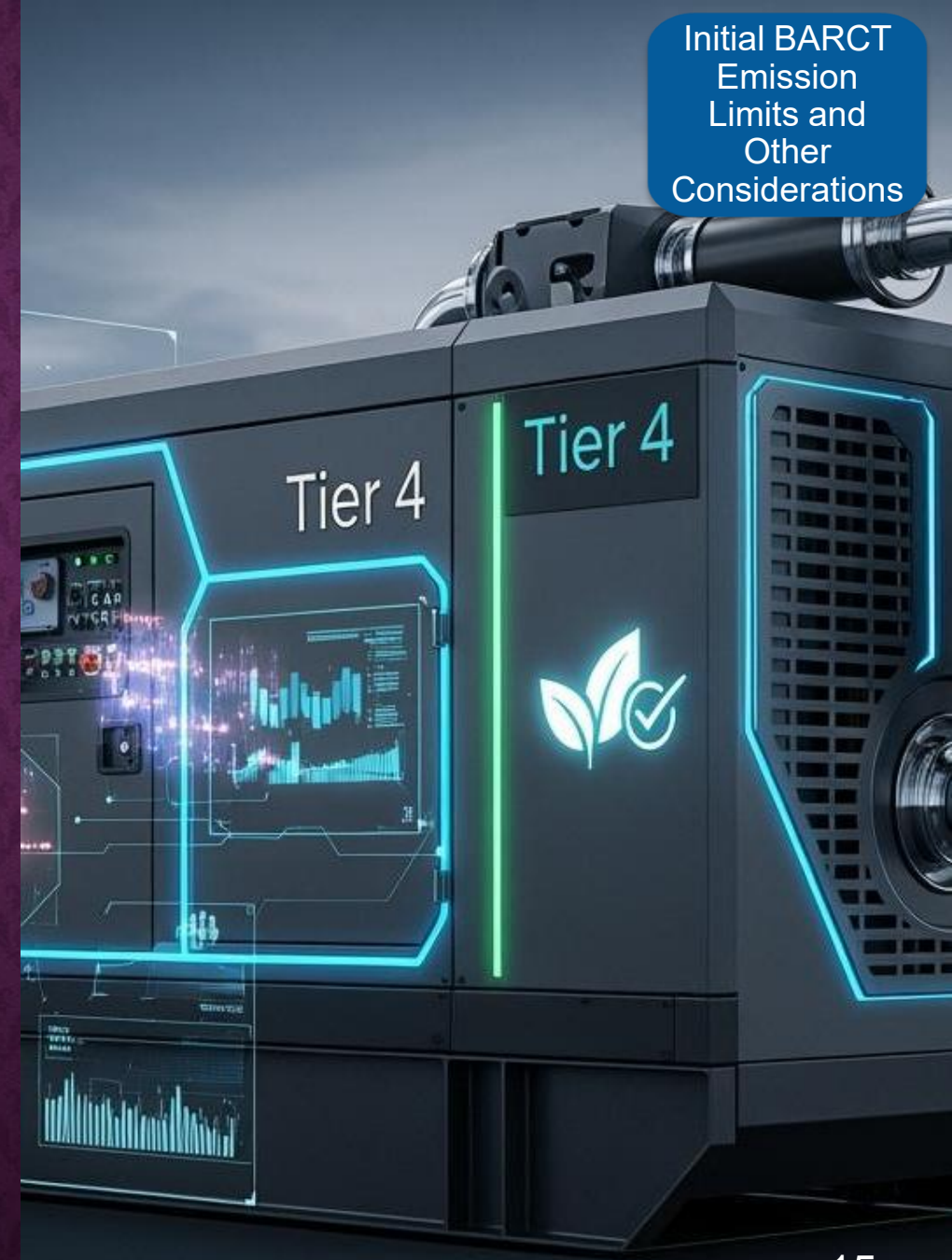


Tier 4 Diesel Engines

- Tier 4 diesel engines represent the lowest-emitting available diesel reciprocating engine technology
 - Tier 4 diesel engines lower emissions through exhaust aftertreatment and engine de-rating (inducement) strategies
- NOx Emission Rates:
 - 0.4 g/kW-hr (37–560 kW)
 - 0.67 g/kW-hr (≥ 560 kW)
- Limitation for Level 1 EPSS
 - Engine inducement is not compatible with Level 1 EPSS reliability requirements under NFPA 110
- Tier 4-compliant configurations eliminate engine inducement while maintaining Tier 4-equivalent emissions
- Staff determined Tier 4 diesel technology is technologically feasible for both Level 1 and Non-Level 1 EPSS applications

Application	Preliminary Determination
Level 1 EPSS/Critical Operation	Technologically Feasible
Non-Level 1 EPSS	Technologically Feasible

Initial BARCT
Emission
Limits and
Other
Considerations



Natural Gas Generators

- Natural gas generators can provide lower NOx emissions than diesel while maintaining performance
 - Can operate using pipeline natural gas or CNG storage
- NOx Emission Rates:
 - 2.28 g/kW-hr (200–500 kW)
 - 0.13 g/kW-hr (≥ 500 kW)
 - 0.03 g/kW-hr (≥ 500 kW with emission controls)
- Limitation for Level 1 EPSS
 - Onsite CNG storage is required
 - Startup performance varies by manufacturer and model
- Staff determined that natural gas generators are technologically feasible for Non-Level 1 EPSS applications

Initial BARCT
Emission
Limits and
Other
Considerations

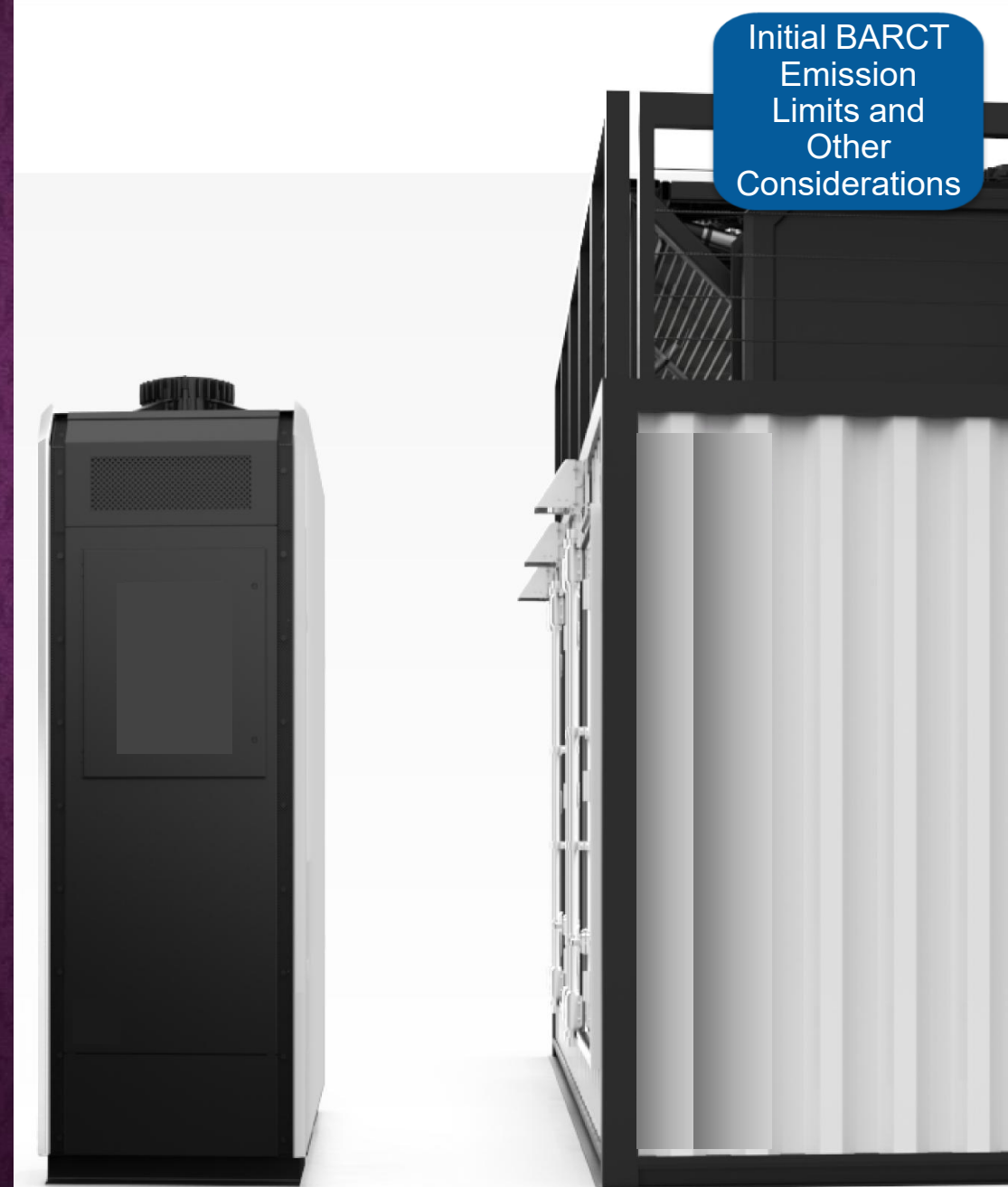
Application	Preliminary Determination
Level 1 EPSS/Critical Operation	Technical Feasibility Limitations
Non-Level 1 EPSS	Technologically Feasible



Linear Generators

- Linear generators provide low NO_x emissions with modular design and multiple fuel options
- NO_x Emission Rate: ~ 0.03 g/kW-hr (Natural Gas)
- Limitation for Level 1 EPSS
 - Approximately three-minute startup does not satisfy rapid-start requirements (≤ 10 seconds) for Level 1 EPSS
- Staff determined linear generators are technologically feasible for Non-Level 1 EPSS applications

Application	Preliminary Determination
Level 1 EPSS/Critical Operation	Not Technologically Feasible
Non-Level 1 EPSS	Technologically Feasible



Hybrid Tier 4 Generators

Initial BARCT
Emission
Limits and
Other
Considerations

- Hybrid generators combine Tier 4 generators with battery storage to improve operational efficiency
 - Battery can provide instantaneous power and support required startup performance
 - Compatible with both Level 1 and Non-Level 1 EPSS when properly configured
- Operational Considerations
 - Facilities with lower typical loads realize greater fuel savings, reduced runtime, and larger emission reduction benefit
 - The benefits are site-specific and a single representative emission rate cannot be established for cost-effectiveness analysis
- Hybrid Tier 4 generators are technologically feasible but were not advanced to the cost-effectiveness evaluation because representative emission reductions cannot be established



Battery Energy Storage Systems (BESS) and Solar Panel Systems

- BESS and solar panel systems provide zero-emission electricity but cannot independently satisfy emergency standby power requirements for many facilities
- Operational Considerations
 - Battery duration may be insufficient for prolonged outages
 - Solar generation depends on weather and time of day
 - Both technologies typically require supplemental generation to maintain emergency power
 - Multi-technology systems increase space and system complexity and therefore were not evaluated as representative BARCT configurations
- Staff determined BESS and solar panel systems are not technologically feasible as standalone emergency standby power systems

Initial BARCT
Emission
Limits and
Other
Considerations



Fuel Cells

- Fuel cells generate electricity with low emissions but are primarily designed for continuous or prime power applications
- NOx Emission Rate:
 - ~ 0.03 g/kW-hr (Natural Gas)
 - 0 g/kW-hr (Hydrogen)
- Operational Considerations
 - Startup characteristics may not satisfy NFPA 110
 - Large installations require substantial site-specific integration and space
 - Fuel cells are generally intended to supplement or replace continuous facility loads
- Staff determined that fuel cells are not technologically feasible because they are primarily designed for prime power and require facility-specific integration that cannot be easily achieved at most facilities

Initial BARCT
Emission
Limits and
Other
Considerations



R99 Renewable Diesel

- Renewable diesel is a drop in fuel that can be used in conventional diesel engines without equipment modifications
- Operational Considerations
 - Long-term fuel availability for widespread emergency standby use remains uncertain due to evolving production, market conditions, and policy incentives
 - No active R99 production exists within the South Coast region, increasing reliance on fuel transported from outside the region
 - R99 provides only modest NOx reductions (~5%) in uncontrolled Tier 0–3 engines
 - No statistically significant NOx reductions in Tier 4 engines
- Staff is not advancing R99 to the cost-effectiveness analysis due to long-term supply reliability concerns and limited NOx reductions



Preliminary Technology Pathways

Initial BARCT
Emission
Limits and
Other
Considerations

Is the unit a Level 1 EPSS/Critical Operation
OR lack access to ≥ 5 psi natural gas service?

Yes

Technologies Advanced to
Cost-Effectiveness Analysis

- Tier 3 Certified Diesel Engine
- Tier 4 Compliant Diesel Engine

No

Technologies Advanced to Cost-
Effectiveness Analysis

- Tier 3 Certified Diesel Engine
- Tier 4 Certified Diesel Engine
- Natural Gas Engine
- Natural Gas Engine with Controls
- Linear Generators

Technologies are evaluated for cost-effectiveness; resulting proposed BARCT emission limits are technology-neutral

Fire Pump Engines

- Fire pump engines warrant separate consideration due to NFPA 20 requirements
- Fire pump engines must use UL-listed engine and pump assemblies that are specifically evaluated for fire pump service
- Tier 4 diesel engines and natural gas engines are not currently available as UL-listed fire pump engine configurations
- For these reasons, staff evaluated fire pump engines separately from the two primary compliance pathways developed for emergency standby generators

Engine Size (kW)	U.S. EPA Fire Pump Engine NOx Emission Rate (g/kW-hr)
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37 to <75	4.5 (Tier 3)
75 to <560	3.8 (Tier 3)
≥560	6.1 (Tier 2)

Initial BARCT
Emission
Limits and
Other
Considerations



Initial BARCT Emission Limits

Initial BARCT
Emission
Limits and
Other
Considerations

Level 1 EPSS/Critical
Operation or No Reliable
Natural Gas Supply (< 5 psi)

Non-Level 1 EPSS/Critical
Operation and Reliable
Natural Gas Supply ($\geq$ 5 psi)

Fire Pump Engines

Size (kW)	Proposed BARCT NOx Limit (g/kW-hr)	Technology Basis
37 to <560	0.4	Tier 4 Compliant Diesel Engine
$\geq$ 560	0.67	Tier 4 Compliant Diesel Engine

Size (kW)	Proposed BARCT NOx Limit (g/kW-hr)	Technology Basis
37 to <200	0.4	Tier 4 Certified Diesel Engine
$\geq$ 200	0.03	Linear Generator and Natural Gas Engine w/Controls*

Engine Size (kW)	Proposed BARCT NOx Limit (g/kW-hr)	Technology Basis
37 to <75	4.5	Tier 3 Certified Diesel Engine
75 to <560	3.8	Tier 3 Certified Diesel Engine
$\geq$ 560	6.1	Tier 2 Certified Diesel Engine

* Natural gas engines with controls rated $\geq$ 500 kW can meet the proposed BARCT limit of 0.03 g/kW-hr

Cost-Effectiveness and Incremental Cost- Effectiveness Analysis

Cost-Effectiveness Methodology

Cost-Effectiveness
and Incremental
Cost-Effectiveness
Analyses

Cost-effectiveness compares the increased cost of each proposed technology with the NOx reductions achieved

- Cost Baseline: Technology associated with new equipment installation requirements (Best Available Control Technology (BACT))
- Emissions Baseline: Weighted-average emission rate of existing engines

Cost-effectiveness is expressed as dollars per ton of NOx reduced (\$/ton reduced)

$$\frac{\text{Increased Capital Costs} + (\text{Increased Annual Operating Costs} * \text{Present Value Factor})}{\text{Emissions Reduced Over Equipment Life}}$$

The 2022 AQMP cost-effectiveness threshold (\$325,000/ton NOx reduced) was adjusted to \$407,134/ton NOx reduced (2025 dollars) and applied throughout the cost-effectiveness analysis

Overview of Cost-Effectiveness Analysis Assumptions

Cost-Effectiveness
and Incremental
Cost-Effectiveness
Analyses

Equipment Costs

- Vendor cost estimates used for representative 200 kW, 500 kW, and 1 MW configurations
- Turn-key installation
- Load bank if applicable
- Fuel cost increase or savings
- Source testing if applicable
- Diesel Exhaust Fluid (DEF) consumption if applicable

Equipment Life

- Manufacturer supported 30-year useful life
- 30-year equipment life backed by a 2023 study on healthcare emergency power reliability*

Emission Rates

- Existing permitted engines compared to proposed technology
- Used weighted-average NOx emission rates based on size category for existing permitted engines

Operating assumption: 17.28 hr/yr (based on inspection report data)

[*LA County Healthcare Facility Emergency Power Resilience Playbook](#)

Source Testing Considerations

Tier 4 compliant engines remove the U.S. EPA-certified inducement strategy and emissions must be verified

Staff assumed the following source testing costs for the cost-effectiveness analysis:

- Initial source test plus ongoing source testing every two years (consistent with Rule 1110.2 Emissions from Gaseous - and Liquid-Fueled Engines)
- Testing costs based on a recent vendor quote using the Tier 4 source test protocol

Source test cost assumptions are conservative estimates, and staff is continuing to evaluate alternatives that could reduce compliance costs, including:

- Longer time intervals between source tests
- Portable analyzer emissions monitoring
- Alternative equipment certification

Cost and Emission Baselines for BARCT Analysis

Cost-Effectiveness
and Incremental
Cost-Effectiveness
Analyses

- **Cost Baseline**

- BACT generally represents the technology that would be required for a new installation
- Increased costs are calculated relative to the applicable current BACT technology

- **Emission Baseline**

- Weighted-average NO_x emission rates were developed from the existing permitted engine sample set
- Separate averages were calculated based on engine size
- Calculated emission reductions are the difference between the weighted-average emission rate for existing permitted engines and the emission rate of the technology evaluated

Engine Size (kW)	Weighted Average Emission Rate (g/kW-hr)	Cost Baseline
37 to ≤200	6.2	Tier 3 Diesel Engine
201 to ≤500	4.4	Tier 3 Diesel Engine
≥501	6.6	Tier 2 and Tier 3 Diesel Engines

**Level 1
EPSS/Critical
Operation
Units or
Facilities
Without Natural
Gas
Infrastructure**

- Evaluation focuses on units requiring the highest level of emergency power reliability or lacking natural gas infrastructure
- Technologies being evaluated for this group are:
 - Tier 3 Certified Diesel Engines
 - Tier 4 Compliant Diesel Engines

Tier 4 Compliant Diesel Engines

Cost-
Effectiveness and
Incremental Cost-
Effectiveness
Analyses

Metric	≤200 kW	200< kW ≤500	>500 kW
Weighted-Average Existing NOx Emission Rate(g/kW-hr)	6.2	4.4	6.6
Tier 4 Emission Rate NOx (g/kW-hr)	0.40	0.40	0.67
Lifetime NOx Reduction (tons reduced)	0.80	1.2	3.4
Increased Cost	~\$550k	~\$655k	~\$1M
Cost-Effectiveness	~\$700k	~\$575k	~\$315k

- The post-combustion emission control system is the primary driver of increased lifetime costs
 - Recurring source testing further increases compliance costs
- Tier 4 compliant diesel engines are cost-effective only for units >500 kW

**Non-Level 1
EPSS/Critical
Operation
Units with ≥ 5
psi Natural Gas
Service**

- Units in this group are not required to meet Level 1 EPSS reliability requirements, allowing additional technologies to be considered
- Technologies being evaluated for this group are:
 - Tier 4 Certified Diesel Engines
 - Natural Gas Engines
 - Natural Gas Engines with Controls
 - Linear Generators

Tier 4 Certified Diesel Engines

Cost-
Effectiveness and
Incremental Cost-
Effectiveness
Analyses

Metric	≤200 kW	200< kW ≤500	>500 kW
Weighted-Average Existing NOx Emission Rate(g/kW-hr)	6.2	4.4	6.6
Tier 4 NOx Emission Rate (g/kW-hr)	0.40	0.40	0.67
Lifetime NOx Reduction (tons reduced)	0.80	1.2	3.4
Increased Cost	~\$345k	~\$450k	~\$860k
Cost-Effectiveness	~\$430k	~\$390k	~\$250k

- Lifetime costs reflect the Tier 4 certified engine including DEF consumption, but does not include recurring source testing
- Tier 4 certified diesel engines are cost-effective for units >200 kW

Natural Gas Engines

Cost-
Effectiveness and
Incremental Cost-
Effectiveness
Analyses

Metric	≤200 kW	200< kW ≤500	>500 kW
Weighted-Average Existing NOx Emission Rate(g/kW-hr)	6.2	4.4	6.6
Natural Gas NOx Emission Rate (g/kW-hr)	2.3	0.13	1.1
Lifetime NOx Reduction (tons reduced)	0.51	1.2	3.2
Increased Cost	~-\$65k	~\$360k	~\$340k
Cost-Effectiveness	~-\$130k (Cost Savings)	~\$290k	~\$105k

- Although natural gas engines generally have higher capital costs than their diesel equivalent, lower lifetime fuel and operating costs improve their overall cost-effectiveness
- All natural gas engine size categories evaluated were determined to be cost-effective

Natural Gas Engines with Controls

Metric	200< kW ≤500	>500 kW
Weighted-Average Existing NOx Emission Rate(g/kW-hr)	4.4	6.6
Natural Gas With Controls NOx Emission Rate (g/kW-hr)	0.03	0.03
Lifetime NOx Reduction (tons reduced)	1.3	3.8
Increased Cost	~\$70k	~\$60k
Cost-Effectiveness	~\$55k	~\$15k

- The additional cost of emission controls is offset by lower fuel costs and substantial NOx reductions
- Natural gas engines with controls are cost-effective for all size ranges evaluated (>200 kW)

Linear Generators

Cost-
Effectiveness and
Incremental Cost-
Effectiveness
Analyses

Metric	≤200 kW	200< kW ≤500	>500 kW
Weighted-Average Existing NOx Emission Rate(g/kW-hr)	6.2	4.4	6.6
Linear Generator Emission Rate (g/kW-hr)	0.03	0.03	0.03
Lifetime NOx Reduction (tons reduced)	0.85	1.3	3.8
Increased Cost	~\$565k	~\$1.3M	~\$2.2M
Cost-Effectiveness	~\$665k	~\$1.0M	~\$590k

- Linear generators achieve near-zero NOx emissions, but relatively high costs resulted in high cost-effectiveness values
- Linear generators are not cost-effective across the size ranges evaluated

Cost-Effectiveness Summary

Cost-
Effectiveness and
Incremental Cost-
Effectiveness
Analyses

- Natural gas fueled technologies are generally more cost-effective than Tier 4 diesel engines
- Tier 4 compliant diesel engines are cost-effective only for units >500 kW
- Tier 4 certified diesel engines are cost-effective for units >200 kW
- Natural gas engines are cost-effective across all size ranges evaluated
- Linear generators are not cost-effective across the size ranges evaluated

Technology	≤200 kW	200 < kW ≤500	>500 kW
Weighted-Average Existing NOx Emission Rate (g/kW-hr)	6.2	4.4	6.6
Tier 4 Compliant Diesel	✗	✗	✓
Tier 4 Certified Diesel	✗	✓	✓
Natural Gas	✓ (Cost Saving)	✓	✓
Natural Gas with Controls	—	✓	✓
Linear Generator	✗	✗	✗

Incremental Cost-effectiveness

When more than one technologically feasible control option is available, incremental cost-effectiveness compares the additional cost and emission reductions between those options

Incremental cost-effectiveness compares each progressively more stringent control option to the next less expensive option

The incremental cost-effectiveness analysis determines whether the additional emission reductions achieved by a more stringent technology justify the additional cost

$$\textit{Incremental Cost-Effectiveness} = \frac{\textit{Cost}_2 - \textit{Cost}_1}{\textit{NOx Reductions}_2 - \textit{NOx Reductions}_1}$$

Incremental Cost-Effectiveness Summary

Engine Size (kW)	NG vs. Tier 4 Certified	Tier 4 Certified vs. NG	Linear Generator vs. Tier 4 Certified	Linear Generator vs. Natural Gas	NG with Controls vs. Natural Gas	NG Controls vs. Tier 4 Certified
200	N/A	\$1.5M	\$4.0M	\$2.0M	N/A	N/A
500	-\$1.2M	N/A	\$7.7M	\$1.9M	-\$10M	-\$3.5M
1,000	N/A	\$1.4M	\$3.7M	\$750k	-\$460k	-\$2.1M

- Incremental cost-effectiveness did not change the proposed BARCT emission limits established through the cost-effectiveness analysis
- Natural gas engines with controls remained the most cost-effective option where natural gas is available (≥ 5 psi)

Proposed BARCT Emission Limits

Level 1 EPSS/Critical Operations or No Reliable Natural Gas Supply (< 5 psi)

Non-Level 1 EPSS/Critical Operations and Reliable Natural Gas Supply (≥ 5 psi)

Fire Pump Engines

Size	Proposed BARCT NOx Limit (g/kW-hr)	Technology Basis
37 ≤ kW ≤ 75	4.5	Tier 3 Certified Diesel Engine
75 < kW ≤ 500	3.8	
500 < kW < 560	0.4	Tier 4 Compliant Diesel Engine
≥ 560 kW	0.67	

Size	Proposed BARCT NOx Limit (g/kW-hr)	Technology Basis
37 ≤ kW ≤ 200	2.3	Natural Gas Engine
> 200 kW	0.03	Natural Gas Engine with Emission Controls

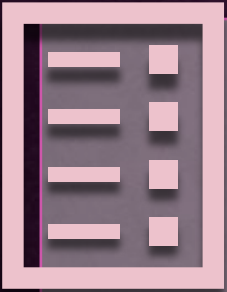
Engine Size	Proposed BARCT NOx Limit (g/kW-hr)	Technology Basis
37 ≤ kW ≤ 75	4.5	Tier 3 Certified Diesel Engine
75 < kW ≤ 560	3.8	Tier 3 Certified Diesel Engine
> 560 kW	6.1	Tier 2 Certified Diesel Engine

Incentive Funding Opportunity for Emergency Power Systems

- Pending California Air Resources Board approval, incentive funding will be available for emergency generators
- An incentive funding program is being developed to support replacement of existing emergency standby generators with lower-emission backup power technologies
- Pending South Coast AQMD Governing Board approval, a Program Announcement is anticipated in Q4 2026
 - Will provide initial information on eligibility, funding priorities, and application requirements
- Rule development and incentive program development are being coordinated to identify opportunities to optimize emission reductions and support deployment of cleaner technologies

Next Steps

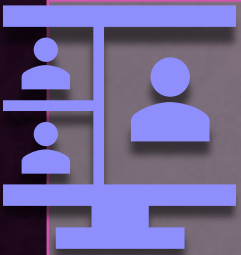
Next Steps



Develop Rule
Concepts



Next Working Group
Meeting 4th Quarter
2026



Tentative Public
Workshop 4th
Quarter 2026



Tentative Public
Hearing Early 2027

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