

# REPOWERING CATALINA ISLAND

August 2020

Southern California Edison provides electric service to Catalina Island and its 4,100 residents, its commercial and industrial customers and its 1 million annual visitors. Since the 1920s, power for the island's electrical grid has been supplied by diesel generators, with fuel barged in from the mainland.

Five of the six current diesel generators do not meet the South Coast Air Quality Management District (SCAQMD) new emissions standards and must be replaced within the next two to three years. This provides SCE with an opportunity to repower the island while improving air quality and increasing the use of renewable energy, in keeping with our commitment to providing 100% clean energy in our service area by 2045.

SCE commissioned an independent analysis, "Santa Catalina Island Repower Feasibility Study," to evaluate the leading repower options:

- **Fossil-Fuel Generation**

Replacing five generators with new, emissions-compliant diesel generators would provide flexibility because fossil-fuel generation is required as backup for all other options. New emissions-compliant generators will then facilitate the integration of more renewable energy, energy efficiency and demand response over time. The analysis looked at two options: replacing two generators in the next two years, and the rest over time, or replacing all five noncompliant generators in the next two years. These two options costs are similar, while other non-diesel forms of fossil fuel, including propane and liquefied natural gas, were less cost-effective.

- **Renewable Energy**

While several forms of renewable energy were examined, the most feasible is a hybrid using some solar energy, paired with energy storage and backed up by diesel generation. The renewable solution was examined at several shares of energy generation, including 5%, 60% and 100%. For now, the 5% share is the most cost-effective of all the repower solutions and a cost-effective renewable solution. As renewable and energy storage technologies improve and costs come down, this share can be increased as suitable land becomes available.

- **Undersea Cable**

Connecting Catalina Island's power supply with the mainland via an undersea cable was studied in 2004-2005 and revisited in this analysis. While this option would enable the island to be connected to the increasingly clean generation mix on the mainland, it would require extensive permitting as well as engineering challenges to span depths of up to 2,600 ft and would need to be paired with a backup system, either a fossil-fuel generator or a second cable to supply power in case of damage or other failure.

## The Way Forward

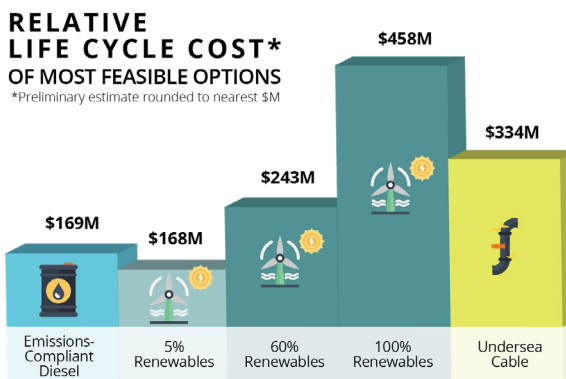
There are challenges to implementing any source of generation on an island, and especially on one as remote and well-preserved as Catalina. However, there is no "do-nothing" option available, as the current diesel generators meet neither emissions standards nor our clean air goals.

Based on the feasibility study and other technical reviews, our conclusion is that using new emissions-compliant diesels is the only feasible way to meet SCAQMD's standards and deadline. Coupled with additional solar energy, it is also the most cost-effective option.

We are also taking steps to increase the use of renewable energy and reduce the demand for electricity on the island. These plans include:

- Working with the major island landholders to discuss siting solar projects
- Launching a Request for Offers in 2021 or 2022 to seek providers for renewable energy, energy storage, energy efficiency and demand response programs.

Costs of the selected project will be shared across our 5 million customers, subject to review and approval by the California Public Utilities Commission as part of SCE's General Rate Case.



For more information and to see the analysis and SCE summary, please visit [sce.com/catalinarepower](https://sce.com/catalinarepower)

# COMPARATIVE ANALYSIS

FOSSIL-FUEL GENERATION		RENEWABLE ENERGY		UNDERSEA CABLE	
TECHNOLOGY					
Phased emissions-compliant diesel generator installation 2 units now 3 later	Immediate emissions-compliant diesel engine replacement 5 units now	5% renewable hybrid: solar, energy storage, emissions-compliant diesel generators	High-penetration renewables		35.5-mile undersea cable clean-burning diesel backup
			60% renewable hybrid: solar, energy storage, emissions-compliant diesel generators	100% renewables: solar, energy storage, emissions-compliant diesel generators	
ADVANTAGES					
<ul style="list-style-type: none"><li>• Technology familiar to plant operators</li><li>• Reuse of existing infrastructure</li><li>• Moderate schedule for installation of 2 engines and deadline extension for remaining engines</li></ul>	<ul style="list-style-type: none"><li>• Technology familiar to plant operators</li><li>• Reuse of existing infrastructure</li></ul>	<ul style="list-style-type: none"><li>• Reduced annual NOx emissions</li><li>• No infrastructure upgrades</li><li>• Familiar technology</li><li>• Least-cost option</li><li>• Steppingstone to potential wider deployment of renewable energy</li></ul>	<ul style="list-style-type: none"><li>• Reduced annual NOx emissions</li><li>• Grid benefits from potential non-SCE solar projects in Two Harbors</li></ul>	<ul style="list-style-type: none"><li>• No annual NOx emissions</li><li>• Grid benefits from potential non-SCE solar projects in Two Harbors</li></ul>	<ul style="list-style-type: none"><li>• Could transport renewable energy from the mainland</li></ul>
DISADVANTAGES					
<ul style="list-style-type: none"><li>• Uncertainty that engines conforming to new emissions standards are commercially available</li><li>• Requires multiple phases of generator installation</li></ul>	<ul style="list-style-type: none"><li>• Uncertainty that engines conforming to new emissions standards are commercially available</li><li>• Aggressive schedule for installation by regulatory service date</li></ul>	<ul style="list-style-type: none"><li>• Uncertainty around land availability</li><li>• Requires compliant fossil-fuel generation to meet SCAQMD deadline</li></ul>	<ul style="list-style-type: none"><li>• Uncertainty around land availability</li><li>• Environmental permitting depends on locations chosen</li><li>• Site selection will affect results and costs of distribution line upgrades</li></ul>	<ul style="list-style-type: none"><li>• Uncertainty around land availability</li><li>• Environmental permitting depends on locations chosen</li><li>• Site selection will affect results and costs of distribution line upgrades</li></ul>	<ul style="list-style-type: none"><li>• Extensive environmental permitting</li><li>• Does not include redundant cabling</li><li>• Requires upgrades to the existing mainland/island substations and routing infrastructure</li><li>• Susceptible to extreme mechanical and environmental exposure or damage</li><li>• Repairs may be very costly or unavailable</li></ul>
TIMING					
Less than 2 years (Phase 1)	Less than 2 years	~3 years	~8 years	~TBD	~5 years
COST*					
\$169M	\$169M	\$168M	\$243M	\$458M	\$334M

\*Preliminary estimate rounded to nearest \$M