

**SOUTHERN CALIFORNIA GAS COMPANY**  
**CPUC-ENERGY DIVISION DATA REQUEST 6- Verbal**  
**RE: VENTURA COMPRESSOR STATION**  
**DATE REQUESTED: May 2, 2022**  
**DATE RESPONDED: May 6, 2022**

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On May 2, 2022, SoCalGas briefed CPUC Energy Division staff (ED) about the Ventura Compressor Station (station) all-electric alternative evaluated in the Feasibility Study of Potential Alternatives: Ventura Compressor Modernization Project (feasibility study). ED asked follow-up questions listed below.

**QUESTION 1:**

Can you provide the rates used for the feasibility study analysis – the costs for both electric & gas (include cost spreadsheet)?

**RESPONSE 1:**

SoCalGas' March 2022 feasibility study developed cost assumptions based on information available as of the date of the feasibility study and relied on publicly accessible data for Southern California Edison (SCE) assumptions. Operational costs were developed for the ongoing annual cost incurred to operate the compressor station.

The fuel cost assumptions included in Appendix C are based on the following:

**Electric:** SoCalGas based electric costs on SCE publicly accessible electric rates and actual use at the station in 2020. Electric costs are highly variable based on usage and can change over the course of a day and even over the course of a few hours. Peak electric use is between 4 pm and 9 pm, which results in a higher hourly rate. There are time-of-use charges (when electricity is used), demand charges (additional fees that utilities charge non-residential or commercial customers for maintaining a constant supply of electricity), and charges for the actual electricity.

SoCalGas calculated the estimated rate based on 2020 actual station use by:

Electric Driven Compressor (EDC) use = Estimated rate \$0.0840/KWh

EDC use + Administrative/Auxiliary use + Demand Charge = Estimated rate \$0.2633/KWh

**Natural Gas:** SoCalGas assumed that the hybrid configuration (two natural gas compressors and two electric driven compressors) would require the equal use of the electric and gas compressors (50 percent natural gas/50 percent electric based on 2020 actual use hours) at a cost of \$2.71 per million British thermal unit (MMBtu), which was the US Energy Information Administration (USEIA) published Henry Hub Natural Gas Spot Price in January 2021.<sup>1</sup>

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<sup>1</sup> USEIA. 2022. Henry Hub Natural Gas Spot Price. Accessed online May 3, 2022: <https://www.eia.gov/dnav/ng/hist/rngwhhdm.htm>

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**Feasibility Study Table 37. Ventura Compressor Station Alternatives – Cost Estimates**

Alternative	Project Development Cost (Nonrecurring)	Operational Cost (Annual Recurring)
1.A: Planned Project	\$421MM	\$0.904MM
1.B: Current Site – Hybrid	\$464MM	\$1.778MM
2.A: Avocado Site – Natural Gas	\$677MM	\$0.949MM
2.B: Avocado Site – Hybrid	\$707MM	\$1.823MM
3.A: Ventura Steel – Natural Gas	\$607MM	\$0.909MM
3.B: Ventura Steel – Hybrid	\$635MM	\$1.783MM
4.A: Devil's Canyon Road – Natural Gas	\$566MM	\$0.919MM
4.B: Devil's Canyon Road – Hybrid	\$594MM	\$1.793MM
5.A: County Line – Natural Gas*	\$593MM	\$1.124MM
5.B: County Line – Hybrid*	\$622MM	\$2.522MM
<p>Source: SCE 2019.</p> <p>Notes: MM = million.</p> <p>Costs are presented in 2022 dollars with escalation/inflation included.</p> <p>Electric rates were based on SCE fixed tariff Schedule TOU-GS-2 (SCE 2019).</p> <p>*The County Line Alternative would require five compressors (either five natural gas [Alternative 5.A. in feasibility study] or two natural gas and three electric [Alternative 5.B. in feasibility study]), which is the reason for the greater cost differential compared to other sites with four compressors.</p>		

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**Feasibility Study Appendix C – Cost Estimate**

Evaluation Criteria	Option 1: Ventura- Existing Site North Olive Street		Option 2: Avocado Site- Ventura		Option 3: Ventura Steel		Option 4: Devil's Cyn Rd		Option 5: County Line	
	Natural Gas (1A)	Hybrid (1B)	Natural Gas (2A)	Hybrid (2B)	Natural Gas (3A)	Hybrid (3B)	Natural Gas (4A)	Hybrid (4B)	Natural Gas (5A)	Hybrid (5B)
<b>Project Cost (Class 5)</b>										
Property/ROW(road/pipeline/power/temp construction easements). Acquisition Included Here Plus All Loaders.	\$2,000,000	\$2,000,000	\$18,000,000	\$19,000,000	\$82,000,000	\$82,000,000	\$47,000,000	\$47,000,000	\$6,000,000	\$6,000,000
EPC + everything else to execute the project	\$419,000,000	\$462,000,000	\$659,000,000	\$688,000,000	\$525,000,000	\$553,000,000	\$519,000,000	\$547,000,000	\$587,000,000	\$616,000,000
<b>Project Cost Totals</b>	\$421,000,000	\$464,000,000	\$677,000,000	\$707,000,000	\$607,000,000	\$635,000,000	\$566,000,000	\$594,000,000	\$593,000,000	\$622,000,000
<b>Operational Cost (Annual)</b>										
Cost for Fuel -Typical Annual Usage - Gas and Electric + Auxiliary Loads. Assumes 50/50 Usage for Hybrid	\$299,200	\$1,447,500	\$299,200	\$1,447,500	\$299,200	\$1,447,500	\$299,200	\$1,447,500	\$374,000	\$2,096,625

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Annual Maintenance Costs - compressors are same regardless of drive type; lower maintenance for electric motor drive; additional personnel training if hybrid; NSCR, CEMS (1/2 FTE) and higher compressed air needs for engines.	\$600,000	\$325,000	\$600,000	\$325,000	\$600,000	\$325,000	\$600,000	\$325,000	\$700,000	\$375,000
Fuel Modification - landscape maintenance re brush fire defensible space. (\$2500/day for a landscape crew)	\$5,000	\$5,000	\$50,000	\$50,000	\$10,000	\$10,000	\$20,000	\$20,000	\$50,000	\$50,000
<b>Operational Cost Totals</b>	\$904,200	\$1,777,500	\$949,200	\$1,822,500	\$909,200	\$1,782,500	\$919,200	\$1,792,500	\$1,124,000	\$2,521,625

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**QUESTION 2:**

Can you explain the current operations of Ventura compressor station? How often are the units currently running?

**RESPONSE 2:**

The Ventura Compressor Station (station) is crucial to reliably and safely deliver natural gas to customers north of the facility given (1) the location of this facility, (2) the need to meet the La Goleta Storage Field’s summer injection requirements to maintain core reliability, and (3) the need to meet gas demand on SoCalGas’ Coastal System, which has been impacted by reduced local gas production. There are approximately a quarter million customers alone on SoCalGas’ Coastal System. The station is monitored 24/7/365 by SoCalGas’ Gas Control Department (Gas Control), which employs innovative technology to operate the SoCalGas system. Onsite operations are overseen by the station manager, and routine maintenance, including rigorous safety checks and inspections, are performed by the onsite staff and other specialists (e.g., field environmental specialist).

The three existing compressors operate to maintain system integrity based on system conditions, which may warrant one, two, or all three compressors to run simultaneously. Historically, each compressor has run an average of 4,000 hours per year, however, operational needs now and in the future will dictate the frequency with which the compressors operate. Operating hours are only indicative of the amount of time a unit is operating but do not indicate overall system demand requirements . Demand varies on a daily basis and during peak demand, all units are essential to maintain system reliability. Table 1: Ventura Compressor Station Annual Run Hours provides detailed information about the station use.

<b>Table 1: Ventura Compressor Station Annual Run Hours and Maintenance Events</b>					
<b>Year</b>	<b>Compressor 1</b>	<b>Compressor 2</b>	<b>Compressor 3</b>	<b>Maintenance Events per Year</b>	<b>Days per Year 1 or More Unit Out of Service</b>
2016	4,228.1	3,016.7	4,059.7	10	33
2017	4,868.0	4,764.1	5,479.2	19	190
2018	4,461.1	3,822.9	3,853.7	10	30
2019	3,503.2	4,510.1	3,679.4	18	101
2020	3,168.1	3,954.3	3,856.4	13	74
2021	2,982.3	3,463.7	3,312.0	9	60

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**QUESTION 3:**

Does the current electric compressor station outage at Aliso Canyon Storage Field (capacitor switch which is affecting injection) inform our analysis?

**RESPONSE 3:**

SoCalGas is in the process of making electrical repairs to the EDCs at the Aliso Canyon Storage Field (Aliso Canyon), as noted in ENVOY on April 25, 2022.<sup>2</sup> The electrical repair is scheduled to be completed by May 27, 2022. As such, the EDCs at Aliso Canyon have not been available for injection of natural gas into the storage reservoir.

The outage at Aliso Canyon does inform SoCalGas' analysis of an all-electric compressor station configuration and supports the selection of a hybrid configuration (Preferred Alternative noted in the feasibility study). Aliso Canyon has three EDCs and five gas compressors. While the EDCs are out of service for maintenance, the five gas engine-driven compressors can provide compression for natural gas injection as needed. Natural gas withdrawal can occur without any compression equipment ("free flow") because the natural gas reservoir pressure is higher than the incoming pipeline pressure.

As compared to a storage field, a mainline compressor station must be able to move gas through the system at any time in order to avoid service disruption. A single or multiple incident interruption in service could have a substantial and immediate impact on Coastal System customers. In an all-electric scenario, if the station was offline for an extended period of time due to a wildfire, PSPS event, or capacitor issues as we are currently experiencing at Aliso Canyon, natural gas could not flow north because the pressure of gas flowing into station from the south is lower than that of gas flowing out of the station and therefore requires compression to overcome the pressure differential. For Ventura and Coastal System core customers, the only option would be to withdraw from the La Goleta Storage Field to meet demand, which assumes that the storage field has adequate supply in storage to meet demand on that day.

As demonstrated by the Aliso Canyon maintenance event, the selected Preferred Alternative for the Ventura Compressor Station (i.e., hybrid configuration) provides greater reliability compared to an all-electric alternative.

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<sup>2</sup> The repair is related to a capacitor switch that supports the electrical start-up of the EDCs and minimizes the initial draw from the SCE power grid to avoid a brownout on the circuit.

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**QUESTION 4:**

In the planned hybrid configuration, will SCG operate the electric compressors more than the gas compressors? Do you plan to run the electric compressors more frequently to lower the emissions? (Include emissions chart).

**RESPONSE 4:**

SoCalGas anticipates operating the hybrid configuration based on maintaining system integrity and meeting injection requirements for the La Goleta Storage Field. Typically, operating regimes take into account items including, but not limited to, unit efficiency, unit outages, and emissions; however, for this analysis, SoCalGas assumed a 50/50 usage of natural gas engines and electric motors based on actual use at the station in 2020. If electric motors operate more than 50%, operational costs will increase due to the greater cost of electricity compared to natural gas, however emissions will decrease. Conversely, costs will decrease, and emissions will increase with natural gas engines operating more than 50%.

It is important to note that emission profiles are based on the equipment's Potential to Emit (PTE), which is the maximum capacity of a stationary source to emit under its physical and operational design. SoCalGas filed an Authority to Construct application with the Ventura County Air Pollution Control District in March 2020 for the original planned project with four natural gas engine driven compressors. A hybrid configuration will require a modification to the permit application to authorize the two new natural gas engine driven compressors. The new natural gas engine driven compressors will be permitted based on an assumed operational profile of 24/7/365, which is very conservative, and will comply with applicable air emission requirements.

Ventura County, where the compressor station is located, is in nonattainment with both the 2008 and 2015 federal 8-hour ozone standards. Both the all-natural gas option and the hybrid option significantly reduce permitted oxides of nitrogen (NO<sub>x</sub>) emissions, which contributes to ozone formation, as compared to the existing station's permitted emissions. Moreover, a hybrid option will reduce permitted emissions beyond those of a natural gas option. Specifically, a hybrid option would result in a reduction of approximately 75% in permitted NO<sub>x</sub> emissions as compared to the existing station's permitted NO<sub>x</sub> emissions.

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Table 2: Criteria Pollutant Summary provides the estimated annual emissions.

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Pollutant	Current PTE	All NG PTE	Hybrid PTE
NOx	21	11	6
ROC	23	11	6
PM10	1	2	1
CO	14	44	22
SOX	0	0	0

PTE: Potential to Emit  
 NG (Natural Gas) = 4 NG units  
 Hybrid = 2 NG units + 2 EDCs

Figure 1: Ventura Compressor Station Modernization Criteria Emissions Summary depicts graphically the criterial emissions summary.

