

Title: Reduce GHG emissions by switching utility provider or existing rate

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Purpose: Reduce GHG emissions derived from campus electricity consumption

Description: The existing contract with Direct Access (DA) provider Shell Energy costs the university roughly \$1.5 million for power that generates over 3,000 MTCO₂e per year (1). Shell Energy is required by California state law to provide 20% of their power from renewable sources, which corresponds to an emissions factor close to the California grid mix of 528.72 lbs CO₂e/kWh (2). Power may be procured from renewable energy sources, but this typically comes at a cost premium for an existing procurement pathway.

Other non-DA power providers offer their customers alternatives to the standard grid mix that boast reduced GHG emissions. PG&E's "Solar Choice" plan promises 100% renewable power (close to 0 lbs CO₂e/kWh), while their basic plan is on track to reach 33% renewable power by 2020. In 2013, power from the PG&E basic plan produced 427 lbs CO₂/kWh (3). The Community Choice Aggregator (CCA) power provider alternative in Sonoma County, Sonoma Clean Power (SCP), offers similar plans as of 2014: 224 lbs CO₂e/kWh for 36% renewable energy, and 51 lbs CO₂e/kWh for 100% renewable energy (4, 5). These parameters, and the costs for each plan, can be found in Table 1.

Table 1: Emissions factors and cost per kWh for each power provider considered

Power Provider	GHG Emissions Factor (lbs CO ₂ e/kWh)	Total \$/kWh (includes generation, delivery, exit fees)
Shell Energy	528.72	\$0.10337
PG&E – basic	427 ¹	\$0.14445
PG&E – 100% RE	0	\$0.18114
SCP – 36% RE	224	\$0.14270
SCP – 100% RE	51	\$0.17770

If HSU were to negotiate a 100% renewable energy plan with Shell Energy, what price could they expect to pay? If the cost trend is similar to that of PG&E and SCP (see Figure 1), the cost per kWh for a 100% renewable energy option through Shell Energy is likely to be roughly \$0.15/kWh. This corresponds to paying a premium of \$0.21 per metric tonne of CO₂e avoided.²

¹ The value quoted by PG&E is for CO₂/kWh, not CO₂e/kWh

² \$0.21/tonne CO₂e, or \$0.000095/lb CO₂e, from the slope of the regression in Figure 1

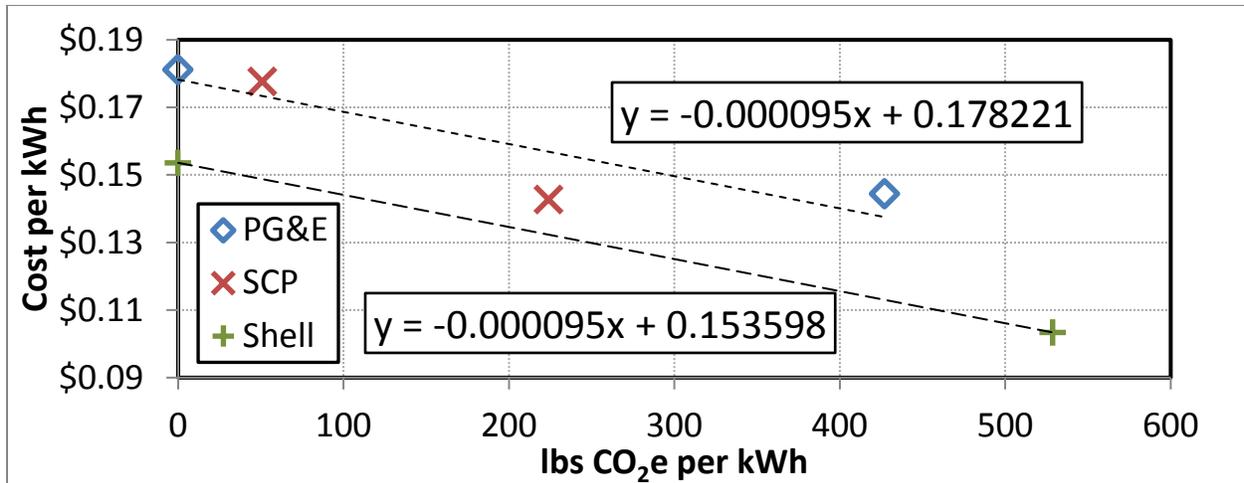


Figure 1: Linear regression of the cost per kWh and GHG emissions factor for three power providers

Recommendation: Consider switching power providers, or to a 100% renewable energy plan from Shell Energy. What quantity of GHG emissions reductions could HSU secure by either: (1) renegotiating the Shell Energy contract to offer a 100% RE option, or (2) switching plans to PG&E or a CCA like SCP? What would be the additional cost to HSU for this change?

HSU could save over 3,300 MTCO₂e each year by switching to a 100% renewable energy plan (see Table 2). The incremental cost to the university to switch to a 100% RE plan through Shell would be approximately \$423,000, and through other non-DA power providers would be \$800,000 to \$900,000 per year. Compared with current electricity expenditures, this would increase the budget by 40% and 75%, respectively.

Table 2: Estimated Incremental annual cost and GHG savings of alternative power plans

Power Provider RE Plan	Marginal Cost to Switch	MTCO ₂ e Emitted	MTCO ₂ e Saved
Shell 100%	\$423,080	0	3,380
PG&E Basic	\$345,000	2,728	652
PG&E 100%	\$861,552	0	3,380
SCP 36%	\$320,291	1,431	1,949
SCP 100%	\$813,115	326	3,054

Current recommendations are to:

- Request a 100% renewable energy option from Shell Energy in the 2018 contract negotiation, and request a quote for cost per kWh for the 100% RE option
- Refine these cost and GHG savings projections as new power provider options become available
- Require greater transparency of emissions factor for undisclosed power sources in the 2018 Shell contract
- **Scale and Scope:** Campus-wide
- **Timing:** Late 2017 in preparation for contract renegotiation in 2018
- **Key Participants:** Administrative Affairs, Facilities Management

Summary of Estimated Costs, Benefits and other Impacts:

Impact	Estimated Resource Costs	Estimated Benefits
Economic	<i>\$423,000 for alternative power provider/plan</i>	
Environmental	<i>Negligible</i>	<i>100% GHG emissions reductions</i>
Social	<i>Backlash against spending more on power than on other needs</i>	

Dollar Spent/GHG Reduction: \$125/MTCO₂e

Purchasing 100% RE from SHELL is the most effective expenditure per MTCO₂e prevented compared to the other power purchasing options. For example, it would cost less per kWh to purchase 36% RE from SCP, but its effectiveness would be \$164/MTCO₂e.

Assumptions:

- *Total annual university electricity consumption is roughly 14 million kWh.*
- *Cost per kWh in Table 1 include generation, delivery, and potential exit fees, such as the PCIA for CCAs, and a similar exit fee for the PG&E Solar Choice plan. The PCIA value used is current as of Jan 2016.*

References:

1. Shell Direct Access Service Fee document
2. California state average grid mix, as reported by the CSU Chancellor's Office
3. PG&E GHG Emission Factor Info Sheet
4. SCP 2015 Annual Report
5. SCP Joint Rate Comparison between PG&E and SCP for E-20P rate