

FEDERAL UTILITY PARTNERSHIP WORKING GROUP SEMINAR

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Utility Rate Structures and the Impact on Energy Efficiency and Renewable Projects

Hosted by:



Agenda

- Rate calculations
- Review a mock energy efficiency and renewable energy project with three different utilities with differing tariffs
- Summary

Energy Efficiency Calculations

- Rates: most common are energy only rates, or a demand rate (kVa or kW)
- Demand Rate
 - Can't use the average cost per kWh for calculations
 - Must use the actual billing determinants
 - Demand, energy, on-peak, off-peak, ratchet charges, contract demand charges, power factor requirements, etc.
- Include any add-on charges like franchise fees, fuel charges, DSM charges, etc.

Energy Efficiency Savings Calculations

- Sample project saves 500 kW and 1.87 million kWh
- Equipment operates 12 hours a day, 6 days a week
- R9 – energy only, \$0.131 / kWh
- R24 – time of use demand
 - On-Peak and Off-Peak Energy and Demand periods
 - Summer, 1 – 9 PM, Mon-Fri, excluding holidays
 - Non-Summer, 6 AM – noon, & 5 – 9 PM
 - Shoulder months

Energy Efficiency Savings Calculations

- Rate 24 tariff
 - Summer Demand, On-Peak \$18.85, Off-Peak \$5.68
 - Non-Summer Demand, On-P \$13.21, Off-P \$5.68
 - Summer Energy, On-P \$0.0883, Off-P \$0.0490
 - Non-Summer Energy, On-P \$0.0638, Off-P \$0.0490
- Savings
 - Demand \$90,500
 - Energy \$105,800
 - Average Cost / kWh = \$0.105 / kWh
 - Customers actual average cost / kWh is \$0.081

Mock EE and RE Project

- Large Military Base
 - 25 MW Peak Load, Summer Peaking
 - 150,000,000 kWh per Year
 - UESC Project will save 8,000,000 kWh per year
 - Project reduces demand 1,333 MW
 - Project Includes a 1 MW PV system
- UESC Project Cost is \$10 M

SCE&G Power Analysis

- Rate 24, time-of-use kW demand rate
- 25 MW Peak Load, Summer Peaking
 - Annual Demand Cost = \$4.0 M
- 150,000,000 kWh per Year
 - Annual Power Cost = \$8.64 M Average Cost \$0.0576
- Project Savings
 - $8,000,000 * (\text{Avg Rate of } \$0.0576/\text{kWh}) = \$460,800$
 - $1,333 + 1,000 (\text{Maybe}) * (\text{Demand Charge } \$15.09/\text{kW}) = \$241,400$
- PV Cost Offset
 - $1000 \text{ kW} * 16\% * 8760 \text{ hours} * \text{average rate } (\$0.0576) = \$80,730$
 - Incentive = \$0
- UESC Project Cost is \$10 M

SCE&G Savings Analysis

- Demand Cost = \$4.0 M
- Power Cost = \$8.64 M
- Project Savings = \$782,930
 - kW Savings + kWh Savings + PV Offset
- Payback \$10 M / Savings
 - Aggregated Project = 12.8 years
- Actual savings are dependent on actual time-of-day operating results

FPL Power Analysis

- Rate Structure: GSLDT-3 (TOU Transmission > 2,000 kW)
- 25 MW Peak Load, Summer Peaking
 - Annual Demand Cost = \$3.06 M
- 150,000,000 kWh per Year
 - Annual Power Cost = \$6.22 M Average Cost \$0.0414
- Project Savings
 - 8,000,000 * (Avg Rate of \$0.0414/kWh) = \$331,200
 - 1,333 * (Demand Charge of \$11.78/kW) = \$188,433
- PV Cost Offset
 - 1000 kW * 20% * 8760 * average rate (\$0.0414) = \$72,533
 - Incentive = \$0
- UESC Project Cost is \$10 M

FPL Savings Analysis

- Demand Cost = \$3.06 M
- Power Cost = \$6.22 M
- Project Savings = \$592,166
 - kW Savings + kWh Savings + PV Offset
- Payback \$10 M / savings
 - Aggregated Project = 16.9 Years
- Blended rate overstates savings and would incorrectly reduce the payback by 3 years.

SCE Power Analysis

- Rate Structure: TOU-8 Sub Trans (>50kV)
- 25 MW Peak Load, Summer Peaking
 - Annual Demand Cost = \$3.76 M
- 150,000,000 kWh per Year
 - Annual Power Cost = \$12.73 M (Total Bill is \$16.5 M using an Average Cost of \$0.11/kWh)
- Project Savings
 - $8,000,000 * (\text{Avg Rate of } \$0.0848) = \$680,000$
 - $1,333 * (\text{Demand Charge}) = \$214,000$
- PV Cost Offset
 - $1000 \text{ kW} * 25\% * 8760 * \text{Rate} = \$241,000$
 - Incentive =
- UESC Project Cost is \$10 M

SCE Savings Analysis

- Demand Cost = \$3.76 M
- Power Cost = \$12.73 M
- Project Savings = \$1.13 M
 - kW Savings + kWh Savings + PV Offset
- Payback
 - EE Measures = 7.2 Years
 - PV System = 14.9 Years
 - Aggregated Project = 8.8 Years
- Final Comments

Summary

- It's critical to talk with your service provider when first thinking about a project, not after it starts
- Use the actual Rate to perform calculations, not an average cost
- EE and self generation projects can alter the billing structure and negatively effect the cost to the facility

Summary

- Contract demand, ratchet clause, departing load charge, supplemental tariff, interconnection costs, etc., must be considered in the calculations
- Are utilities willing to alter the contract?
- What if the project doesn't perform the way it was intended?

Questions

- Gene Beck
 - Florida Power and Light
 - Gene.Beck@FPL.com
- Phil Consiglio
 - Southern California Edison
 - Phillip.Consiglio@sce.com
- Bill Eisele
 - SC Electric & Gas
 - BEisele@scana.com