



# City of Mesa - Steps Toward Sustainability

# NW Plant Co-generation



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- Co-generation Unit installed in 2001
- Rated at 550 kW
- Original cost - \$400,000
- Usage of co-gen limited by production, storage pressure regulation and operator time required
- In 8 years, only had 200 run hours
- Budget reductions, electric rate increases spur squeezing of available resources

# NW Plant Co-generation

- Biogas produced at rate of 110 CFM with most being flared
- Started experimenting with extended run times in Feb 2009
- Developed run chart based on greatest return
- Chart is net saving after subtracting electrical use by gas compressor and dryer, generator maintenance costs and personnel

## Optimum Co-Gen Run Time

### Savings \$/Hr at Peak Summer Rates, July & August

Time of Day	Biogas Gen @ 250 kW	Biogas Gen @ 500 kW	Nat Gas Gen @ 250 kW	Nat Gas Gen @ 500 kW
Off Peak	1.39	13.57	-20.44	-30.09
Shoulder	11.44	33.66	-10.39	-9.99
Peak	28.66	68.11	6.84	24.46

### Savings \$/Hr at Winter Rates, Nov thru April

Time of Day	Biogas Gen @ 250 kW	Biogas Gen @ 500 kW	Nat Gas Gen @ 250 kW	Nat Gas Gen @ 500 kW
Off Peak	1.06	10.86	-20.76	-32.79
Shoulder	10.26	29.26	-11.56	-14.39
Peak	16.24	41.21	-5.59	-2.44

# Savings

- Net savings Feb through December were \$39,201
- Maximum potential savings for year = \$136,000
  - With available biogas
  - Generator available when needed
  - Coordinating run time with greatest savings



# Demand Response Program

- Demand Response Program is a voluntary reduction of electricity by high use customers during periods of peak demand
- Program offered by SRP and managed by EnerNOC
- Facilities can be called upon to reduce power use within the next 10 to 30 minutes with events lasting up to 4 hours
- Greenfield plant looked at total plant shutdown but cost for plant diesel power generation were prohibitive

# Demand Response Program

- Looked for specific large equipment and narrowed down to blowers and centrifuges, combined 840 HP
- Went through stages of testing with increased outage periods
- Once comfortable that plant could accommodate outage, enrolled in program
- Have had two events since signing on in June
- Are now looking at enrolling the NW plant in same program

# Chemical Reduction

- Mesa has been working with OpenCEL, a private company doing research on cell lysing for more complete digestion.
- Expanded lysing experiment to create carbon source for nitrification/denitrification process and replace use of methanol.
- Carbon source needed due to influence of high ammonia side stream from dewatering process.
- Avg daily methanol usage was 224 gpd at avg cost of \$2.27/gal
- Yearly cost of \$186,000
- Currently, OpenCEL unit not operating and temporarily replaced with glycerine at cost of \$0.20/gal

# Weed Control

- 27 acres of recharge site getting overgrown with brush
- Use of plant personnel was cumbersome, needed 2 men plus back hoe for 2 weeks.
- Use of plant personnel cumbersome and bank areas difficult to reach
- Grazed goats for one year with herd varying from 10 to 40

# Grazing Goats Giving Greening a Go



# Footprint

