



An Energy-Efficiency Workshop and Exposition
Orlando, Florida

29 Palms Energy Security & Distributed Generation



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Utilities Manager



Marine Corps Air Ground Combat
Center Twenty-nine Palms



What Will be discussed:

- Master planning, Energy Security, and distributed generation have to be integrated
- Energy Conservation can fund energy security
- Additional benefits to using energy conservation



Video clip of combined
services activities only
possible at 29 Palms...



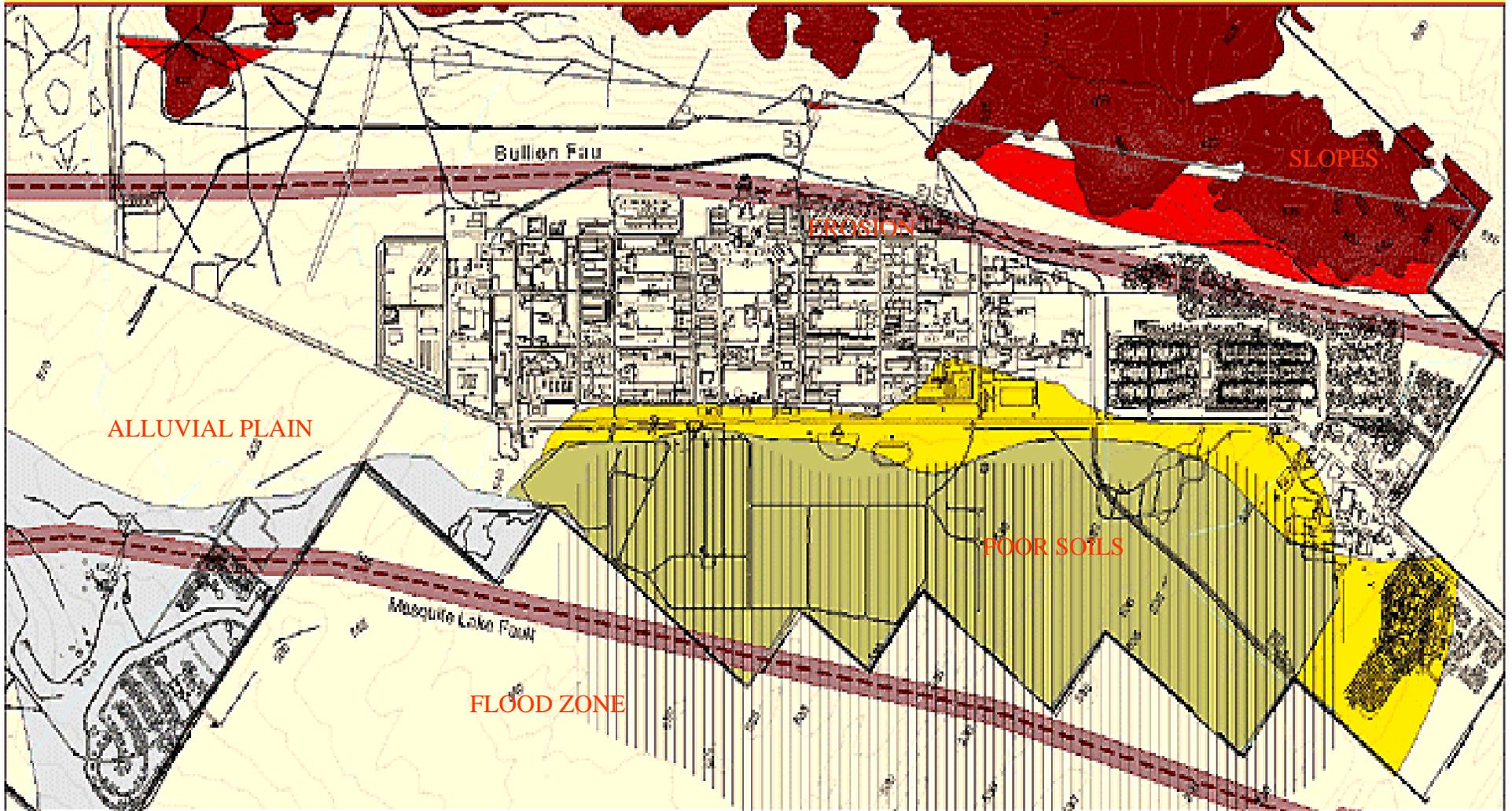
29 Palms Marine Corps Base



MAINSIDE
6 Square Miles



Mainside Site Plan





Security Concerns

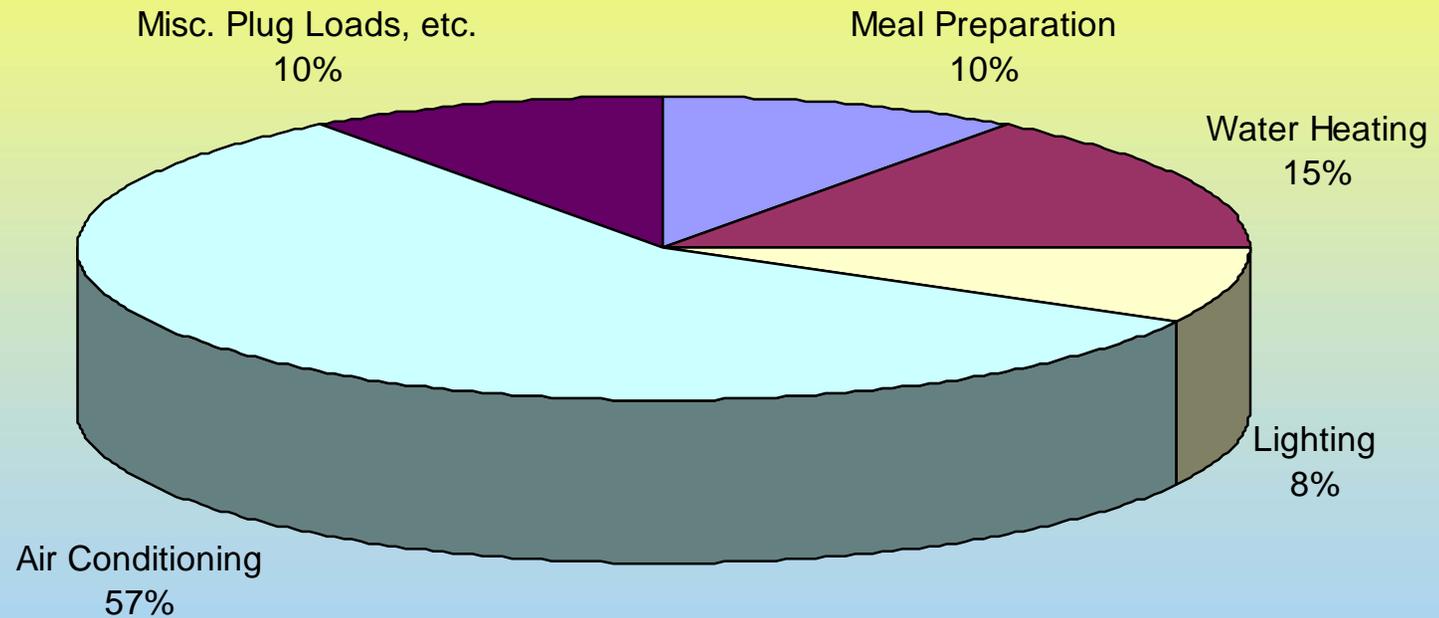
- Location of the Base and distance concerns
- Adequate gas line capacity and pressure
- Electrical line condition and location
- Single electrical and gas points of entry to the base
- High density Barracks
- Hospital and emergency services



What We Use

MAGTFTC Energy Usage

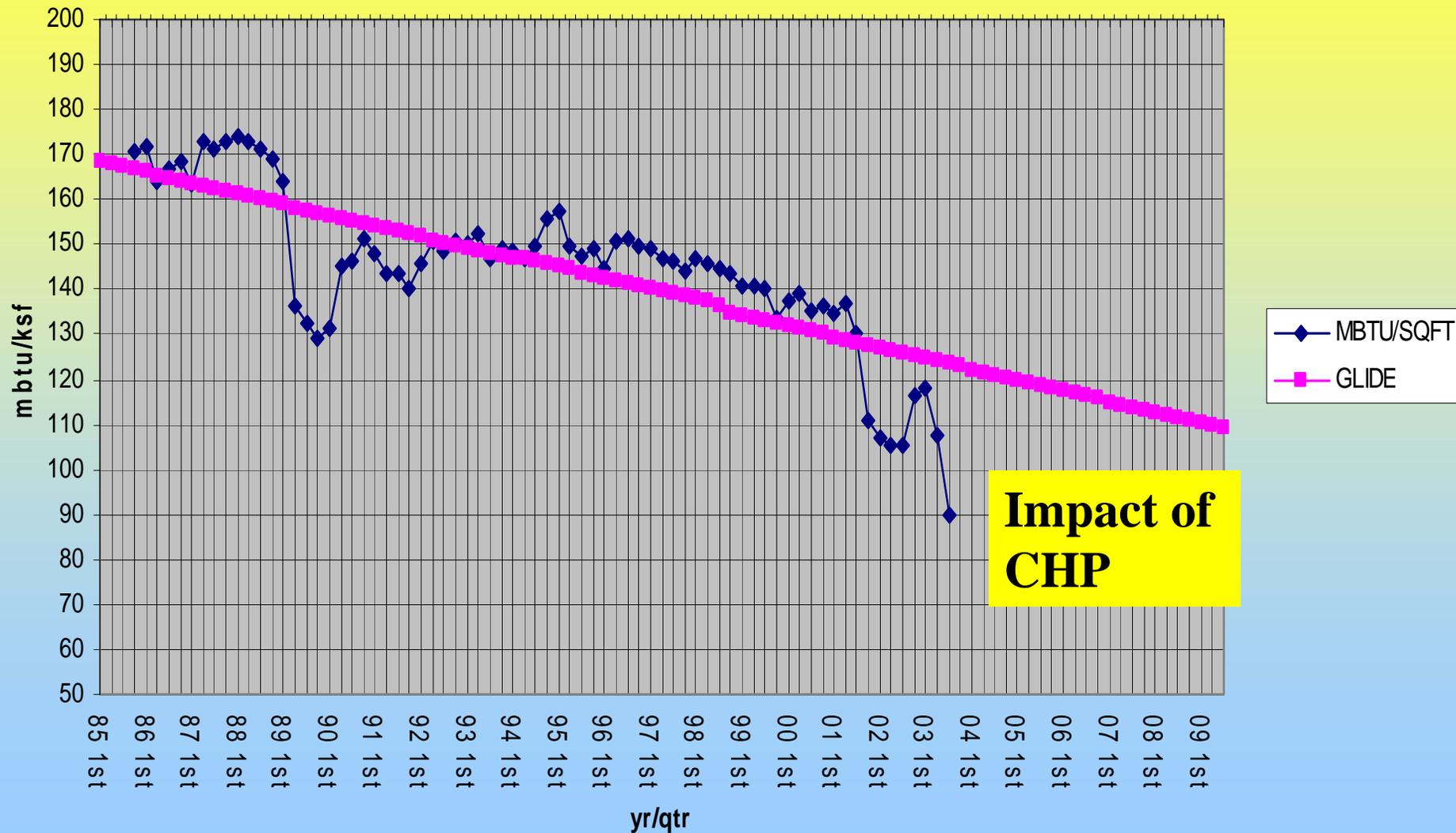
Estimated Summer Energy Consumption Breakdown



Environmentally Driven Consumption

DUERS Graph Main Base

MBTU/SQFT





ESPC Project 2: 7.2 MW Cogeneration Plant



- Total cost \$18 million
- Annual Savings: \$5.8 m
- When \$57m of savings is applied to project#3 (PV), the payback time becomes 19 yrs
- Completion of plant July 7, 2003
- BTU output 35Mbtu
- Covers base load
- Payback on Project 2 CHP plant: <4 years

August 17-20, 2003

www.energy2003.ee.doe.gov



2003 Energy Savings Performance Contract (ESPC)

- ESCO is Johnson Controls Inc.
- Close working relationship for project development
- Long term commitment
- 19 year warranty O&M
- Technical support for term of contract



ESPC Project 3

- Reinvest savings from Co-Gen long term to produce revenue of \$67m for project 3
- 1.2 MW Photo Voltaic plant largest in DOD
- 3 Chilled water plants and distribution
- EMCS system upgrade
- Day-lighting



Project 3 *Solar PV Array*

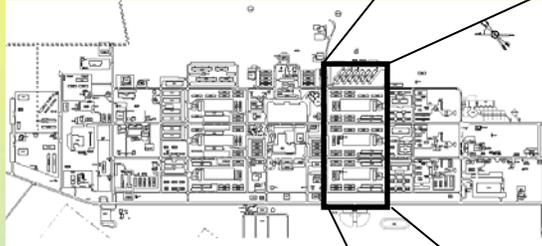


- New 1.2 MW Solar PV Plant
- 6 acres
- Tie into existing Co-Gen facility
- \$4.5M in CPUC rebate from So Cal Gas
- Est. Savings \$392,518/yr.



ESPC Project 3 Chilled Water Plants

- 3 new Chilled Water Plants converting air cooled package A/C to chilled water loop system
- Est. Savings \$433,497/yr.
- Estimated Completion: 2005
- Future expansion for future base growth
- Currently under construction
- Existing chiller will become backup
- Has tie-in for temporary hookups



**PLANT C
(1400/1500 Area Buildings)**

August 17-20, 2003





Project 3: Energy Management Control System Upgrade

- Upgrade Energy Management Control System – Est. Savings \$197,025/yr.
Est. Completion: 2005
- Start replacing 180 old Honeywell systems
- Total 40 buildings installed with new JCI system currently in design
- Monitor, temperature, and on off controls
- Base System uniform to JCI Metasys



Project 3 Skylights

- Skylights and Day-lighting Controls in Warehouses Est. Savings - \$59,080/yr.



- Completion: 2004
- 10 Buildings



ESPC Project 1 Chiller Replacement

- Replaced existing Gas Absorption with high efficiency screw and centrifugal compressor chillers
- Total Project cost - \$2,070,618
- Project payback 16 years
- Simple Payback – 6.71 years
- Total Annual Savings First Year of operation = \$284,955



Annual Project savings

- Project 1 (chiller) \$285,000
- Project 2 (cogen) \$5,800,000
- Project 3 (PV, chiller plants, EMS, lighting) \$1,095,000

- Total project savings \$7.2 million



Project 4 ESPC

- Waste Water Treatment plant upgrades
- DSOM- Central Heat Plant computer upgrades.
- 1MW photovoltaic shade structure
- Bldg. 1663 chilled water loop
- Street lighting



Future Projects



- Wind Power – working w/DOE
- Waste Water Treatment Plant – conserve both water and power
- Additional PV – Another MW with sun shade?
- Combined-Cycle power plant to share power with other federal facilities in the area



Tying it together with Energy Security

- Less reliance on outside sources
- Reduced vulnerabilities (end of grid line)
- Diverse fuel options
- Reduce peak loads and consumption
- Improved monitoring capability
- Improved controls
- Load shed capabilities



Thank you.

Questions?