

Charting a Course to Energy Independence

**Providence, RI
August 9-12, 2009**





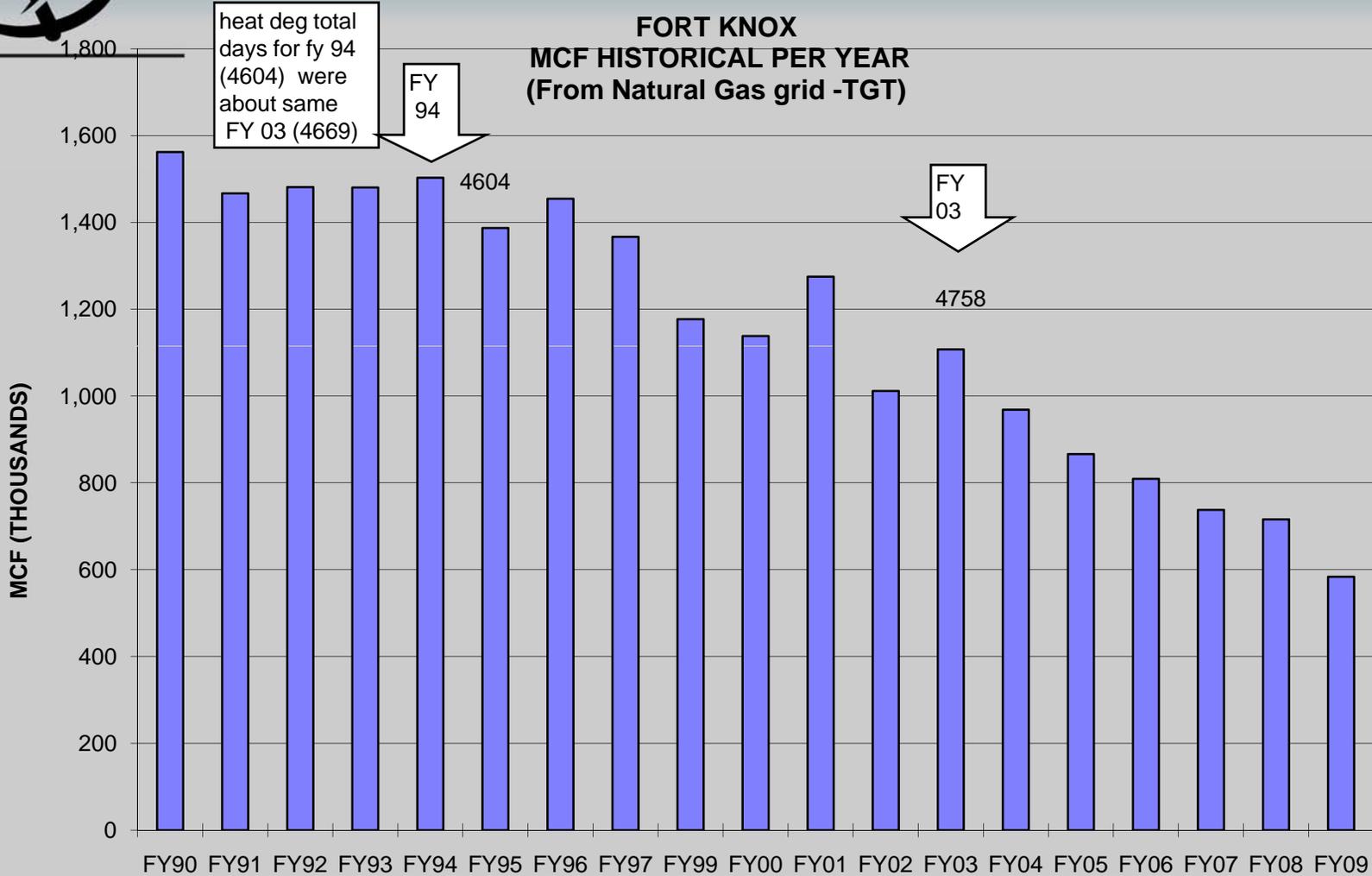
Fort Knox, KY

- Have to know where you have been to decide where you are going
- Using almost 1/3 of the natural gas from the gas grid we purchased in the 90's
- Use lots of contract tools and partners
- We feel that we truly have best “Energy Team” in the Army
- We use specialized teams for different projects



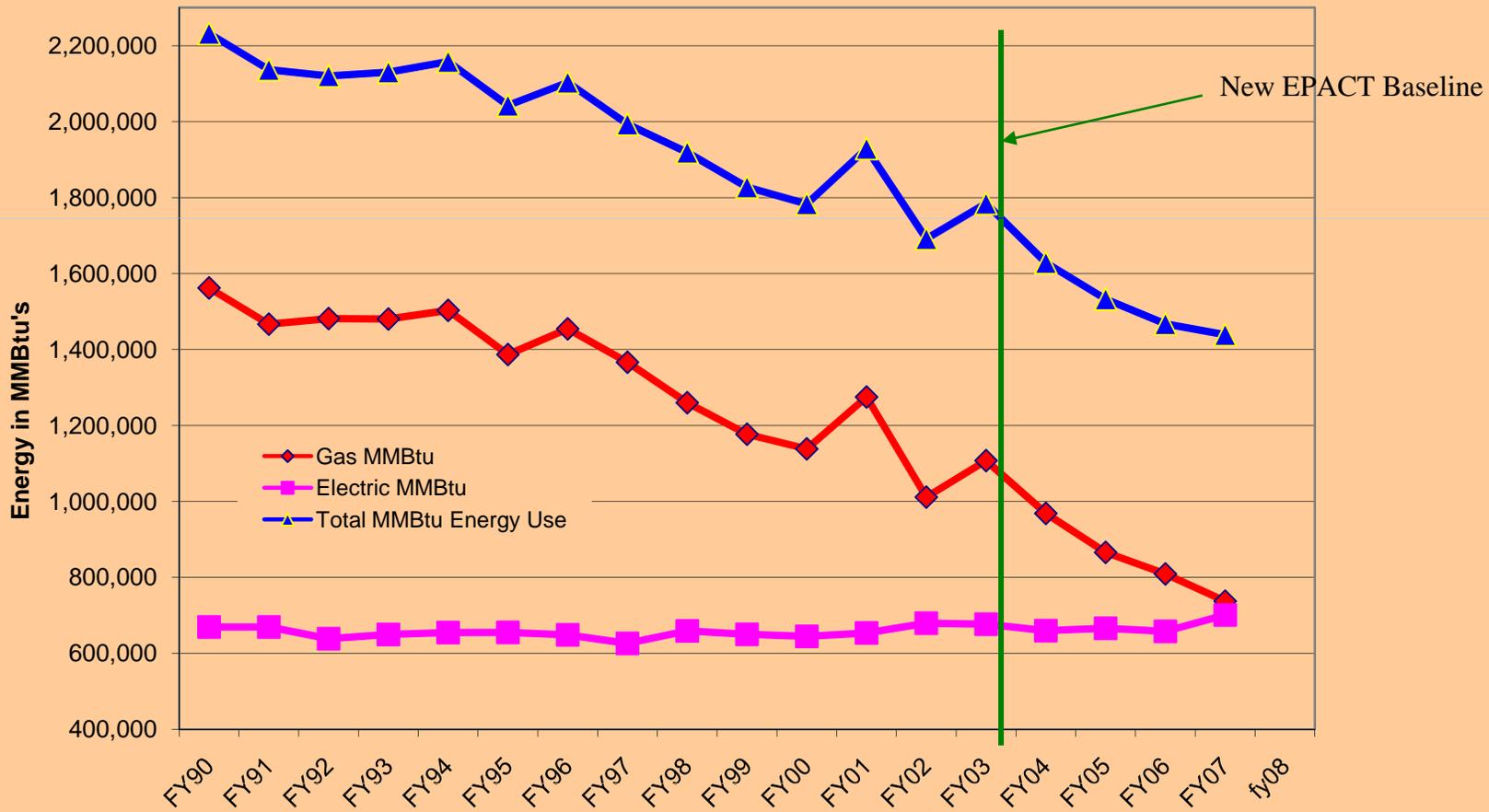
FORT KNOX MCF HISTORICAL PER YEAR





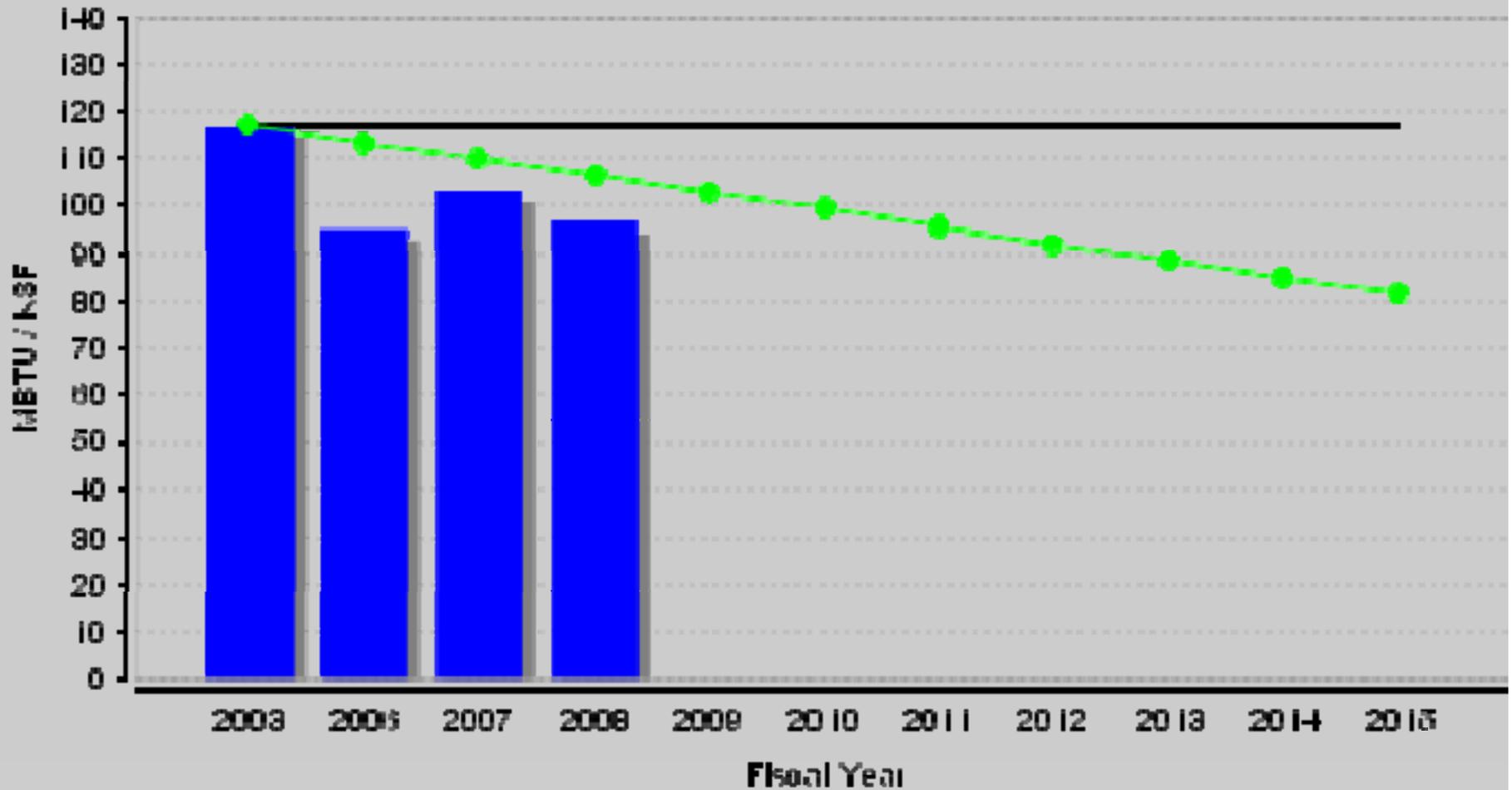


Master Meter Data





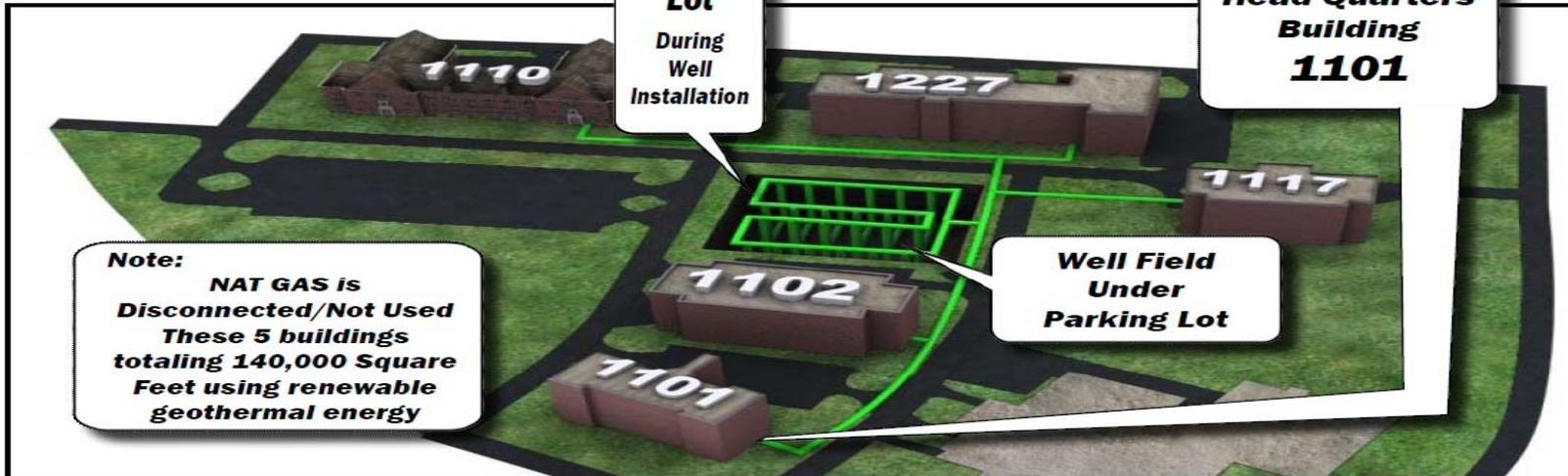
Knox AWERS status





Ground Coupled Heat Pumps

FORT KNOX - Ground Coupled Heat Pumps





Ground Coupled Heat Pumps

LESSONS LEARNED:

- ~6 of 11.5 million sf now heated and cooled from renewable earth energy
- ~5000 wells to couple with the earth temp of 57 degrees.
- ~900 miles of pipe
- 2 leaks 8 years fixed by installer
- HVAC-automate team Nolin/Trane



Renewable Methane gas





Renewable Methane @ Knox





Renewable Methane

LESSONS LEARNED:

- New technology is not easy to accept
- Began this renewable methane project April 2005
- Government laws are viewed 1,000 ways
- Even after 7 months of successful production adjustments still needed with all new projects
- Renewable industry experts team- Nolin/Trico



100Kw Solar PV @ Knox





Solar PV

LESSONS LEARNED:

- Has to look good when you are done.
- Will your wife like how it looks?
- Five small sites in operation
- Largest “Appelman Array” is 100 KW, thin film purchased with a new roof
- Team ~Nolin/Lusk/Trane/Earthwell/AGT~



Wind powered electricity





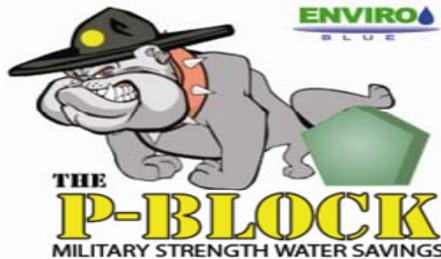
Wind powered electricity

LESSONS LEARNED:

- Expensive to survey wind speeds etc.
- Must have enough wind to turn propellers
- Slow payback. ~9000 kwh to date...
- Building occupants want to charge admission to all the people stopping to look.
- Team Nolin/gov



Waterless Urinals



The P-Block Semi-Waterless Urinal System



- Excellent water savings
- \$\$\$ Cost effective
- Retro fit ready (works with all urinals)
- Easily maintained
- Smells good (no urine odor)
- Organic, aggressive bacteria
- USA made, for Military





Law requires waterless in new construction in Army

LESSONS LEARNED:

- People don't like change!! "It's the law"
- Trying to set a standard to prevent every brand being stocked for supplies
- Don't forget the budget process when setting up, program. J-account pays for water.. this is a new bill for supplies to them.
- Nolin/Will Equip team



Spray Urethane Foam Air Barrier





Spray Foam Air/Vapor Barriers

LESSONS LEARNED:

- Air & Vapor barriers just as big as “R”
- Required in new specs
- Huge benefit to reduce HVAC needs in existing & new buildings. CERL now training on this subject.
- Nolin/Spray-tec.com team



Contact info

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