



*An Energy-Efficiency Workshop and Exposition*  

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*Orlando, Florida*

# **Fun-dah-mentals for Energy Managers**

## **The Big Picture**

**Why a Federal Energy Program and  
what are some key components?**



*An Energy-Efficiency Workshop and Exposition*  
*Orlando, Florida*

*Please be courteous to our speakers*



*Turn off all cell phones  
and*

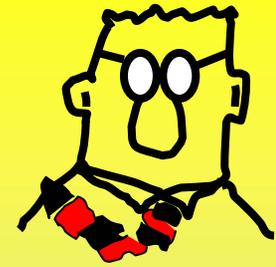
*Set pagers to vibrate*



*(Phasers will be set to stun)*



# Ask Questions

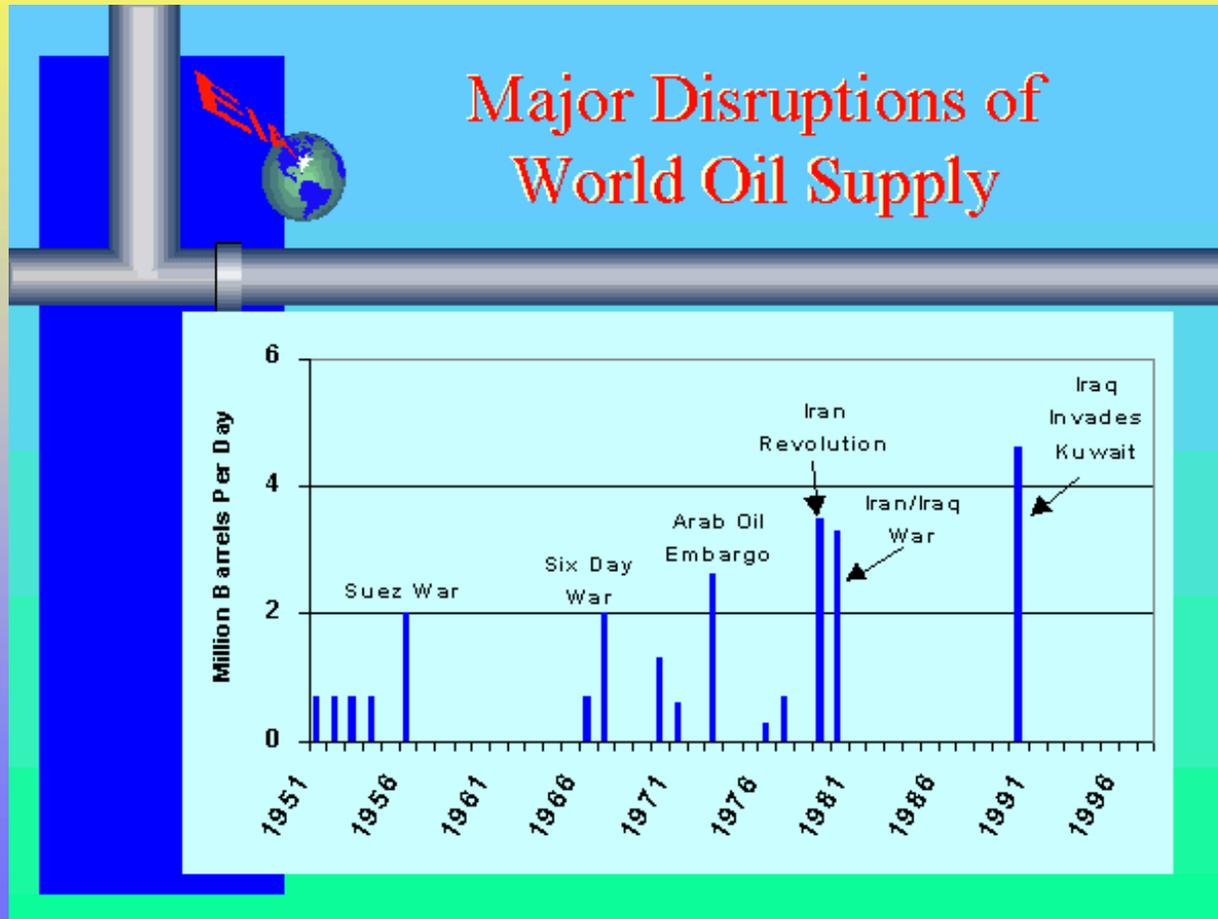


## INTERESTING FACTS

- **Standard US Rail Gage** **4.708 FEET**
- **Letters in the Hawaiian alphabet** **12**
- **Hours in the day** **24**
- **Beers in a case (coincidence?)** **24**
- **TOTAL** **64.708\***

**\* All accurate and factual – but does the total make sense?**

# Historical Perspective





## **Federal Energy Program History**

- **1960s Mil Dept.s' initiatives - Facilities energy cost reduction**
- **1974 first Oil embargo**
  - **Pres. Nixon issued Ex. O. - 7% Federal energy use reduction**
- **1975 Energy Conservation Policy Act**
- **1977 Ex. O. 12003 - 20% BTU/FT<sup>2</sup> facility goal (1975 - 1985)**
- **1978 second oil embargo**
  - **National Energy Conservation Policy Act**
- **1986 DoD set FY1985-1995 goal of add'l. 10%**
- **1988 Fed. Energy Management Improvement Act (10% goal)**
- **1990 Ex. O. 12759 goal of 20% BTU/FT<sup>2</sup> (FY1985-2000)**



# History Continued

- **1992 Energy Policy Act**
  - **10% BTU/FT<sup>2</sup> reduction goal (FY1985-1995)**
  - **20% BTU/FT<sup>2</sup> reduction goal (FY1985-2000)**
  - **(incl. ESPC authority and UESC encouragement)**
- **1994 Ex. O. 12902**
  - **30% BTU/FT<sup>2</sup> reduction goal (FY1985-2005)**
  - **20% Industrial Energy Efficiency Improvement**
- **1996 New Congress cut agencies energy appropriations**
- **1999 Ex. O. 13123**
  - **35% BTU/FT<sup>2</sup> reduction goal (FY1985-2005)**
  - **25% Industrial Energy Efficiency Improvement**
- **2001 National Energy Plan – “Reliable, Affordable, Environmentally Sound Energy for Americas’ Future”**
- **2002 Continuing Congressional emphasis – HR 4 Comprehensive Energy Bill**



# Recent History

- **House H.R. 6 4/7/03**
- **Senate S. 14 4/30/03**
- **House passes H.R. 6 to Senate 4/11/03**
- **Senate substitutes S. 517 into H.R. 6 and asks for Conference**
- **Conference Committee Chair says they will completely rewrite the bill.**



# Federal Interest? “non-controversial” Issues

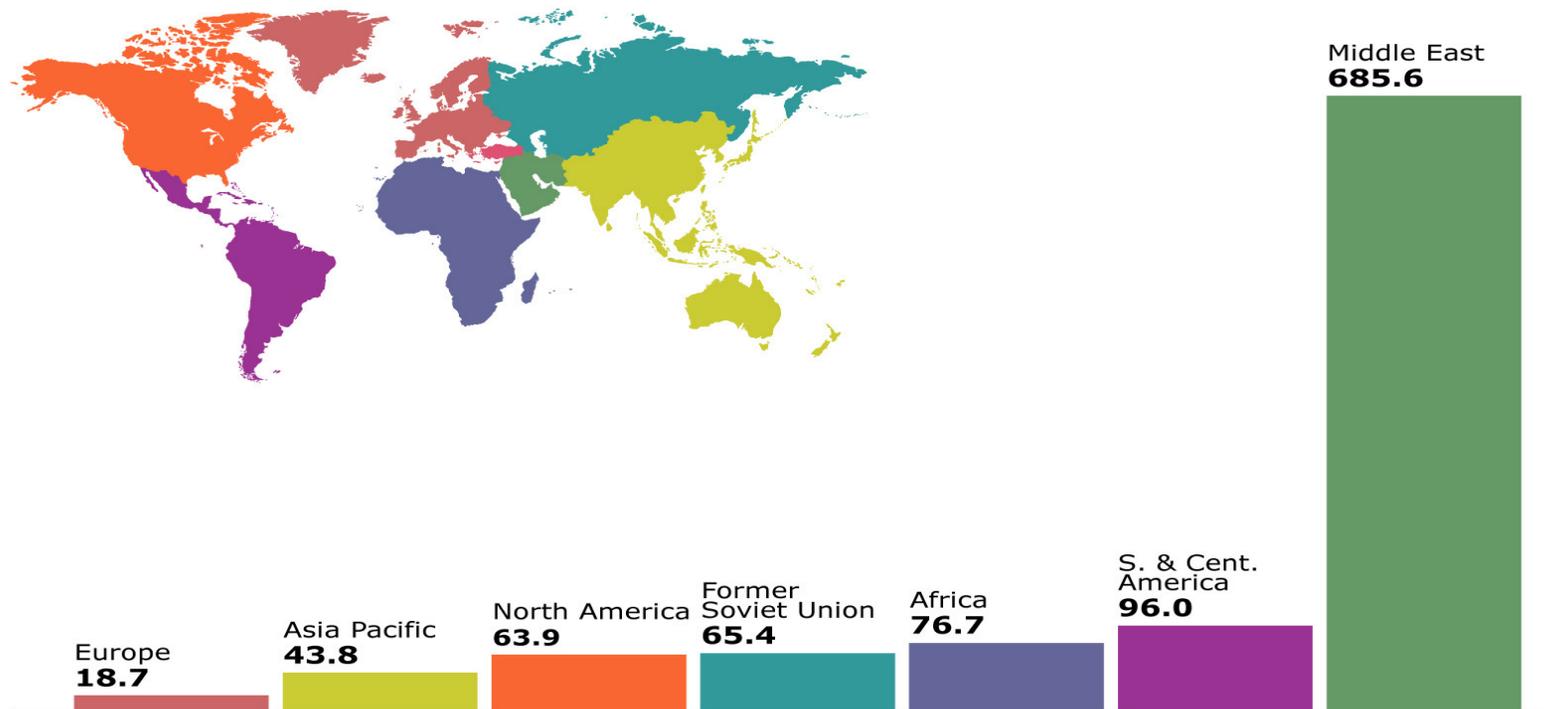
- **Revised Goals – 2000 new baseline**
  - 2% a year starting in 2004 to 2013 (20%)
- **Energy Measurement and Accountability**
  - by 2010 all buildings metered or sub-metered (within reason)
- **Federal new building standards** – 30% below IEC Code
- **ESPC Sunset repealed** + water added, new buildings add.
- **Procurement of Energy Efficiency Products**
- **Federal Energy Bank**



# Global Petroleum

map of proved oil reserves at end 2001

Thousand million barrels

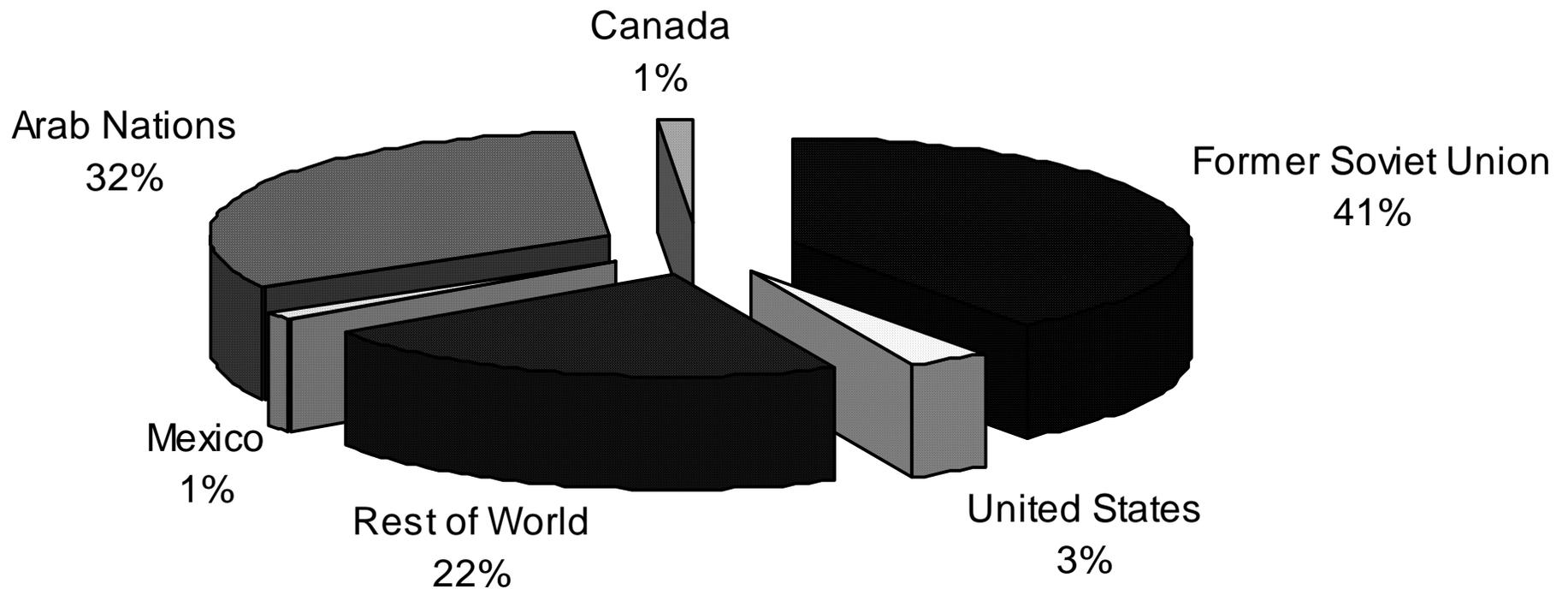


bp statistical review of world energy 2002



# Global Natural Gas Reserves

## Global Natural Gas



Source: Energy Information Administration, International Energy Outlook 1997

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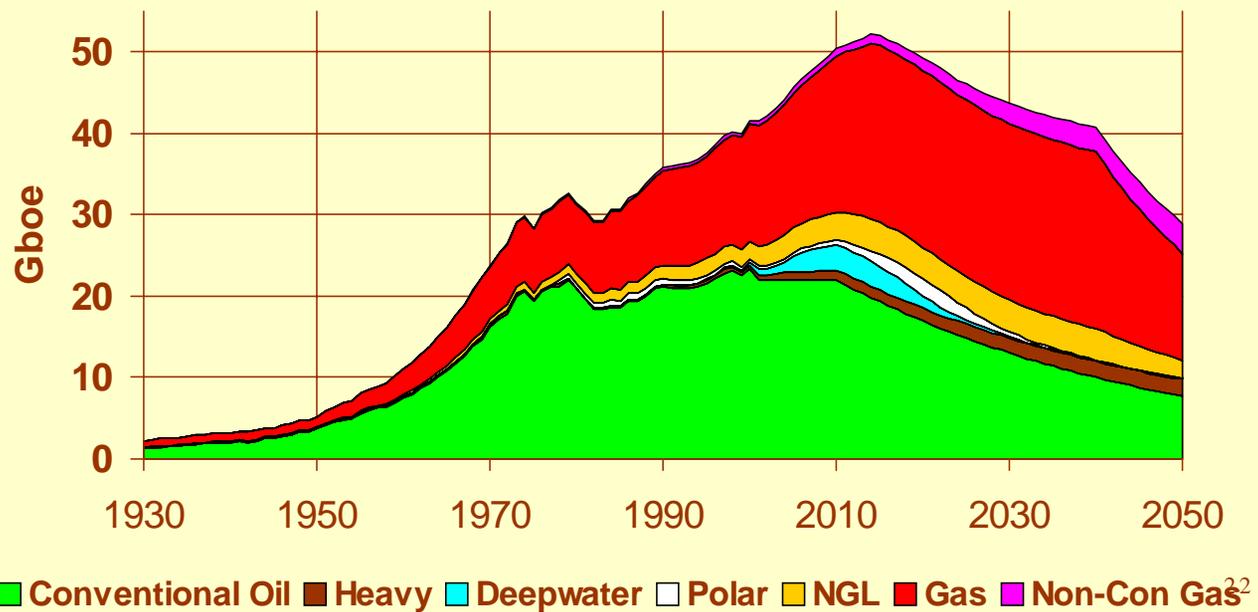
[www.energy2003.ee.doe.gov](http://www.energy2003.ee.doe.gov)

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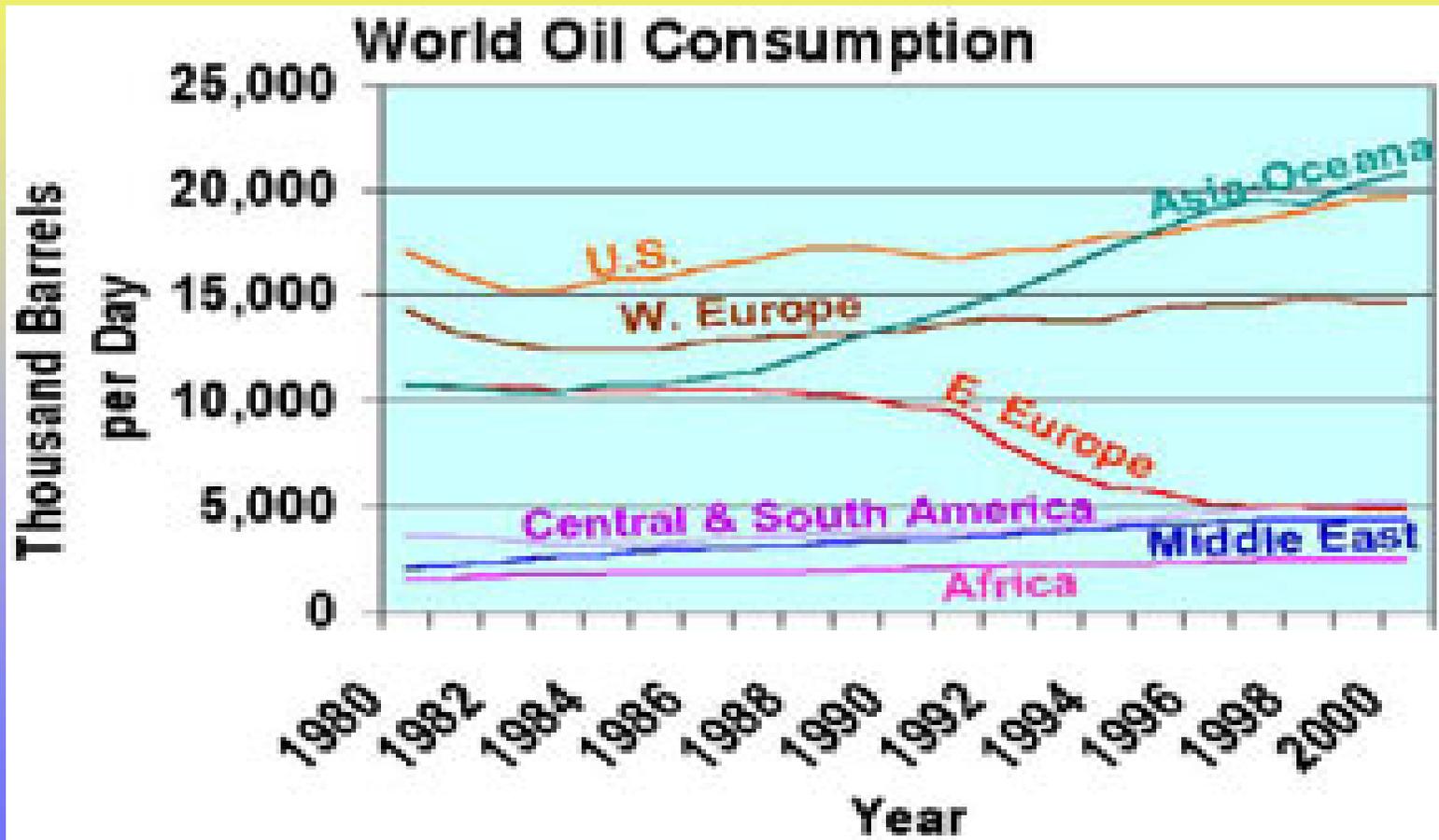
# Crystal Ball Time

## *Production Forecast 2002 Base Case Scenario*





# Some Other Trends





## Alternatively Fueled Vehicle



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## Root Causes of Federal Energy Program?

- **Cost effective facilities management is a low priority for all agencies - it's just not "mission essential"**
- **All levels of government focus on short-term optimization**
- **Organizations fixate on the crisis-du-jour**
- **Facilities budgets historically have fostered -**
  - **Lowest first cost**
  - **Maximum new square footage rather than life cycle cost**
  - **Break-down maintenance**
- **No incentives or clear responsibilities for good facilities management**
- **Result = Insurmountable Opportunities**



# **Continuing Constraints**

- **In-house energy project identification expertise is limited**
- **In-house engineering and design talent is limited**
- **In-house operations and maintenance is limited**
- **In-house management span attention is limited (the lack of adequate resource allocation to intelligent facility management was the root of the basic in-efficiency)**
- **Congress is a fickle friend in the best of times**
- **Roller-coaster of program support and resources led to program inefficiencies**





## What's a Poor Energy Manager to Do?

- **Increased in-house effort**
- **Use of Alternatively Financed Options**
- **Get Help**



## Appropriated Funds and In-house Personnel - Pros

- **Funds spent as available**
- **Lowest interest rate on borrowed money**
- **No profit to be paid**
- **In-house personnel rates considered low**
- **Existing knowledge of buildings and systems**
- **Standard design-bid-build process is relatively uncomplicated**
- **Continuing personnel awareness programs really work**



## Cons

- **Appropriated funds are inadequate to meet objectives**  
e.g. DoD needs \$285 M per year ~ \$69 M in FY04
- **Force reduction has significantly reduced technical expertise**
- **Conservation “does not compete well” with mission**
- **Maintenance often on breakdown basis - even new systems**
- **There is little incentive for long term cost-effective focus**
- **Wait for limited appropriated funds results in significant**

### Lost savings ?

- **\$1 billion per year = \$2.7 million per day = \$113,000 per hour**
- **= 23 taxpayers average annual payment per hour of delay**

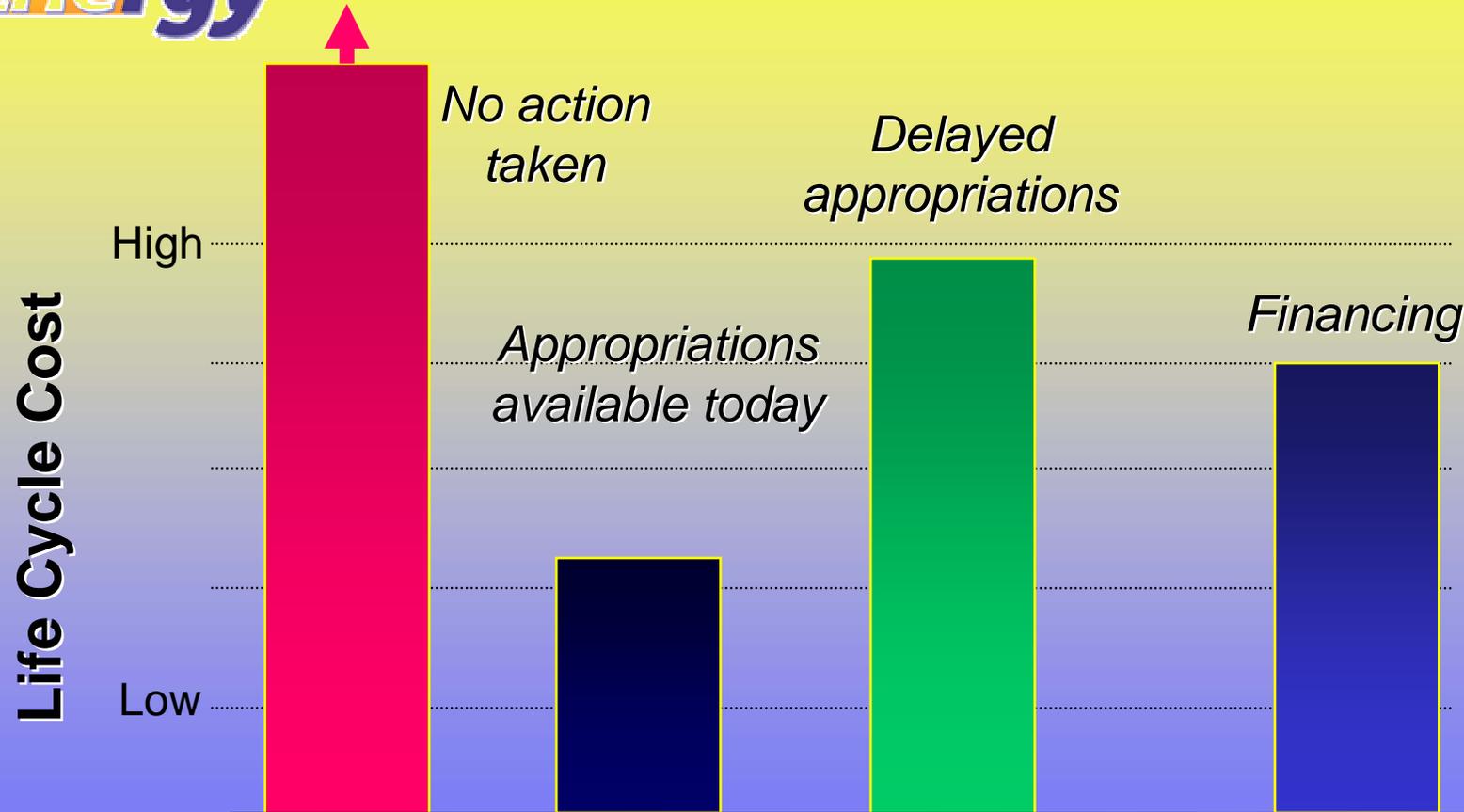


# **Available Alternatives**

- **Utility Company Incentive Programs offered to all customers**
- **Energy Savings Performance Contracts**
- **Enhanced Use Leasing**
  
- **Each have their individual pros and cons - but:**
  
- **Alternatively financed mechanisms allow the government to access resources (money and expertise) to accomplish savings and benefits that can not be attained otherwise.**
- **In most cases alternative financing is more cost effective due to the lost savings from delay in the “normal” process and continual operations and maintenance = savings persistence.**



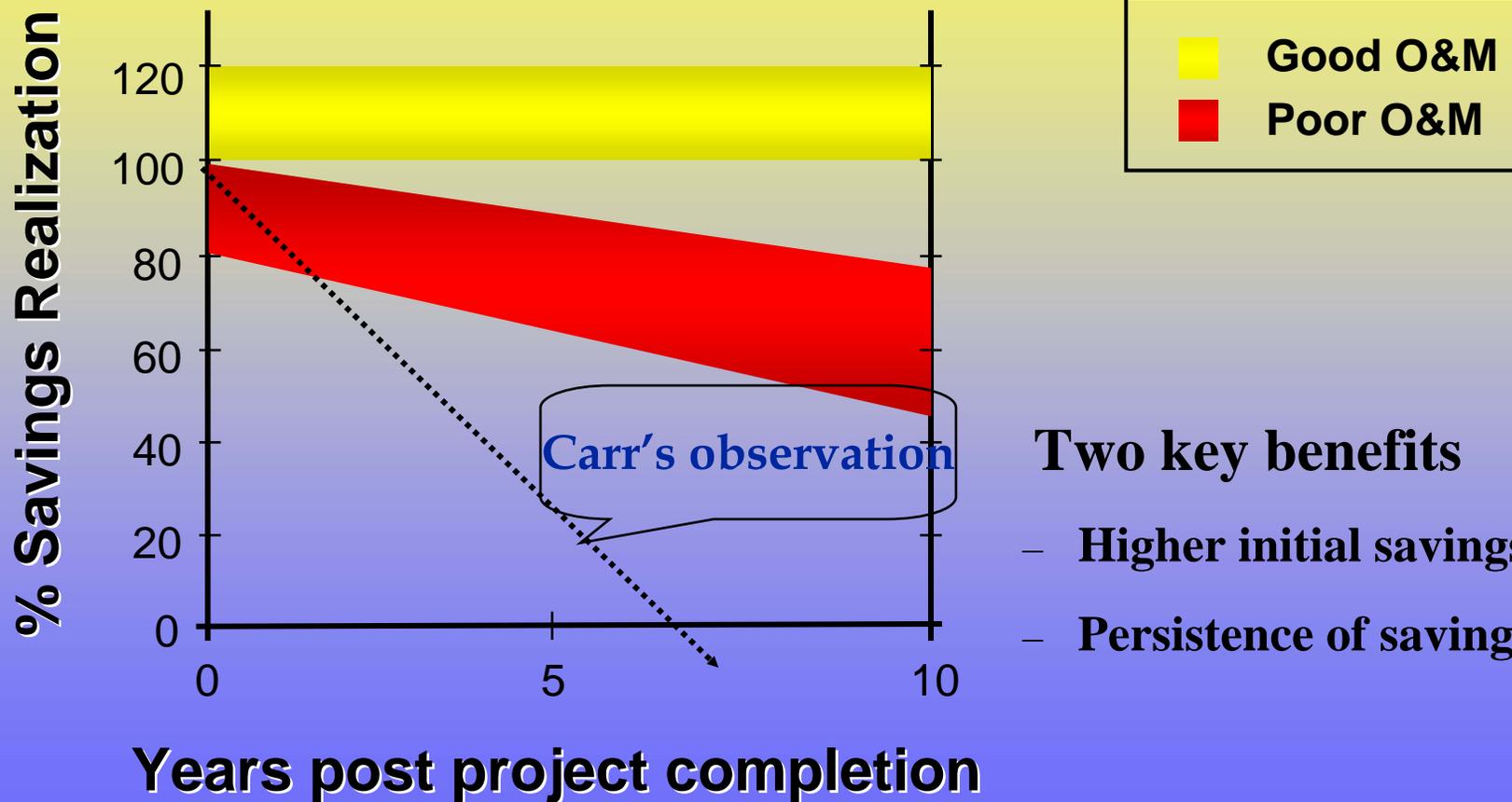
# The Cost of Delaying a Project



**Any delay in project implementation results in loss of life cycle savings**



# Additional REAL Benefits from Alternative Financing



## Two key benefits

- Higher initial savings level
- Persistence of savings



## Utility Incentive Programs Evolution

- **1980 Rebates and Incentives - DSM**
- **1987 Demand Side Management bidding**
  - **approx 30 utility companies in 14 states**
  - **an alternative to plant construction**
- **1990s Customized Programs**
  - **GSA Area-wide contract Attachments**
  - **Basic Ordering Agreements**
  - **Agency Model Agreements**
  - **Site-specific Agreements**



## **UESC LESSONS LEARNED**

- **Financing is not business as usual for Federal folks**

**Understanding Financing Terms**

**Financial Market Fluctuations**

**Ten Ways to Lower Perceived Risk and Rates**

**Using Annual Payments to Reduce Total Interest**

**Recommended Buy Down/Buy Out Approaches**

**Minimizing Prepayment Costs**

**Prepayment Formula Clause**

**[www.eren.doe.gov/femp/utility/lessons\\_learned.html](http://www.eren.doe.gov/femp/utility/lessons_learned.html)**

- **Competition Between Franchised Utilities**
- **Water Conservation Best Practices**



# Energy Savings Performance Contracts

- **DoD experience with Shared Energy Savings Contracts**
- **Individual ESPCs can take years**
  - e.g. DOE Forrestal RFP issued in 1990- project in place in 1994
  - Approximately 40 individual ESPCs in 10 years of authority
- **Regional IDIQ competitively selected ESCOs**
  - agencies/ facilities can negotiate delivery orders
- **DOE - Western, Southeast, Central/Midwest, Northeast/MidAtlantic**
  - Technical specific, e.g. Concentrated Solar, P.V., GeoHP, Biomass
- **Army**
- **Air Force**



## **ESPC Lessons Learned**

- **IDIQs and standard formats make it much easier**
- **The Measurement and Verification Protocol is vital**  
**[www.eere.energy.gov/femp/financing/espc/measguide.html](http://www.eere.energy.gov/femp/financing/espc/measguide.html)**
- **There is lots of effort to make it easier and reduce risk, and help is available**

**[www.eere.energy.gov/femp/financealt.html](http://www.eere.energy.gov/femp/financealt.html)**



## Choosing the Appropriate Alternative

Form an Acquisition Team of All Interested Parties

1. Define Project Goals and Objectives
2. Identify Site-Specific Constraints
3. Estimate the Potential Energy Savings
4. Compare and Evaluate the Funding Options
5. Consider the Site Resources Required
6. Consider the Allocation of Responsibilities
7. Select a Financing Method

**Document the Decision Process**

**[www.eren.doe.gov/femp/utility/finance\\_option.html](http://www.eren.doe.gov/femp/utility/finance_option.html)**



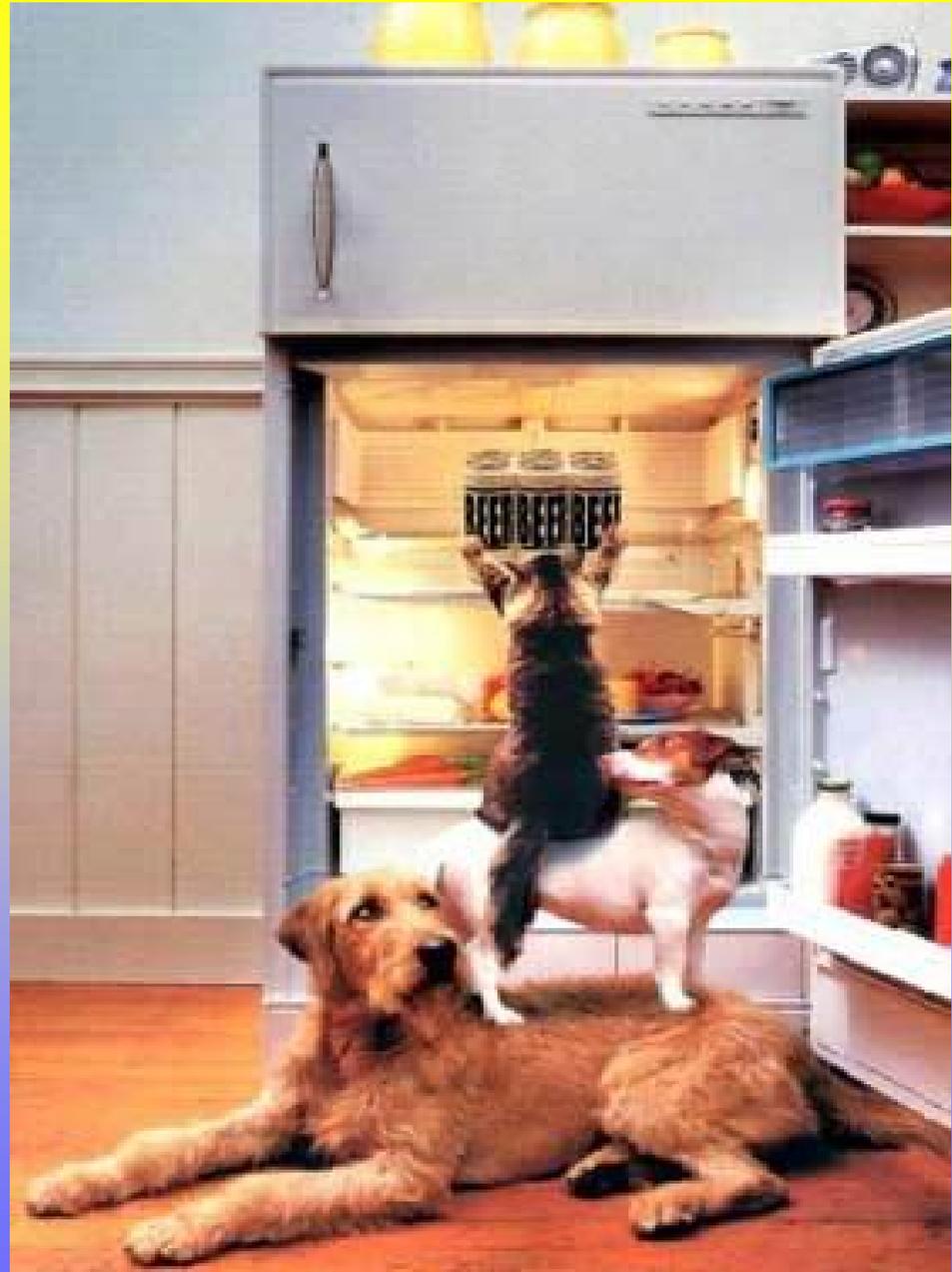
## **The Key to Success is a Different Attitude**

**Financing is a Partnership - working together  
Communicate with each other**

- **Make all expectations clear from day one**
- **Make sure all are part of the party**
- **Make sure all information is shared**
- **Make sure all problems are shared**
- **Identify whose responsible for what - when**
- **Try to see it from the other guys viewpoint**
- **Establish reasonable and meaningful performance verification measures**



# Partnerships Work



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## **Program Lessons Learned**

**Energy Champion is critical**

**All parties should be involved from the beginning, and be comfortable with the process**

**Partnership formation is critical**

**POA&M with responsibilities is critical**

**The Devil is in the Details**

**Experience is the best teacher - get help from someone who has done it.**



# **Lots of Help is Available**

- **DOE FEMP is the fount**

**[www.eere.energy.gov/femp/](http://www.eere.energy.gov/femp/)**

- **Training, Products, Resources, Detailed Technical Information, Advice, and Assistance**
- **Regional Offices, National Labs, Project Facilitators, Contractors**

**A full range of program and project support**



# Private Sector Help

- **Utility Companies**
- **ESCOs**
- **GSA Schedule Contractors**

<http://www.fss.gsa.gov/schedules>

- *871-200 - Energy Management Program Support*
- Energy planning and strategies,
- Energy choice analysis,
- Risk management,
- Metering services,
- Billing and management oversight, and
- Preparing statements of work.
- *871-201 - Energy Audit Services*
- Energy audits,
- Resource efficiency management,
- Use of alternative energy sources, and
- Building commissioning services.



The truth is Time Dependant, so keep asking questions.

# Questions? Comments?

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