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· August 15-18, 2010 · Dallas, Texas ·
· Dallas Convention Center ·

Fort Bliss Renewable Energy Program

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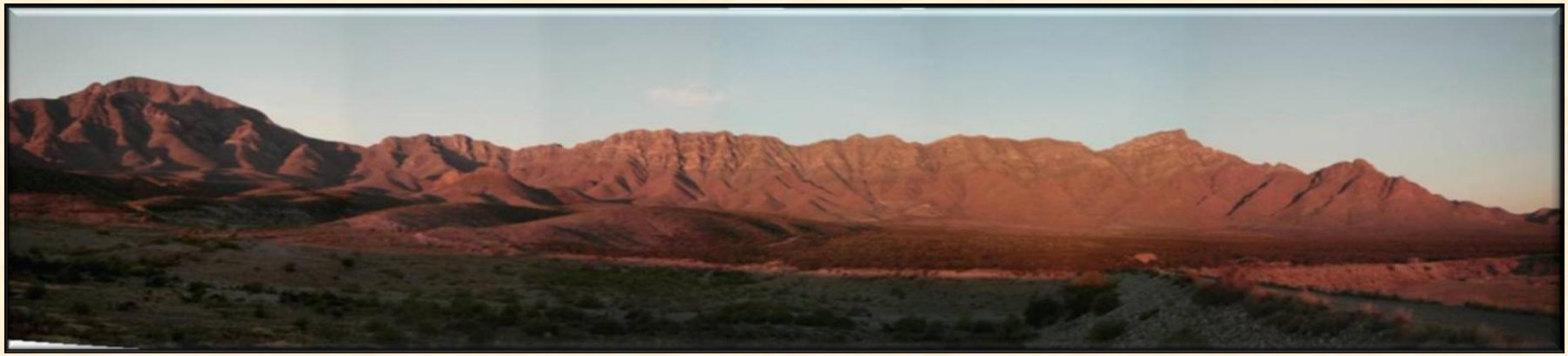

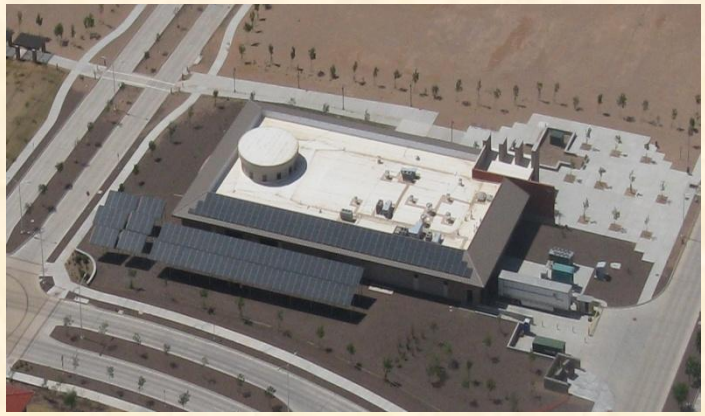

VISION

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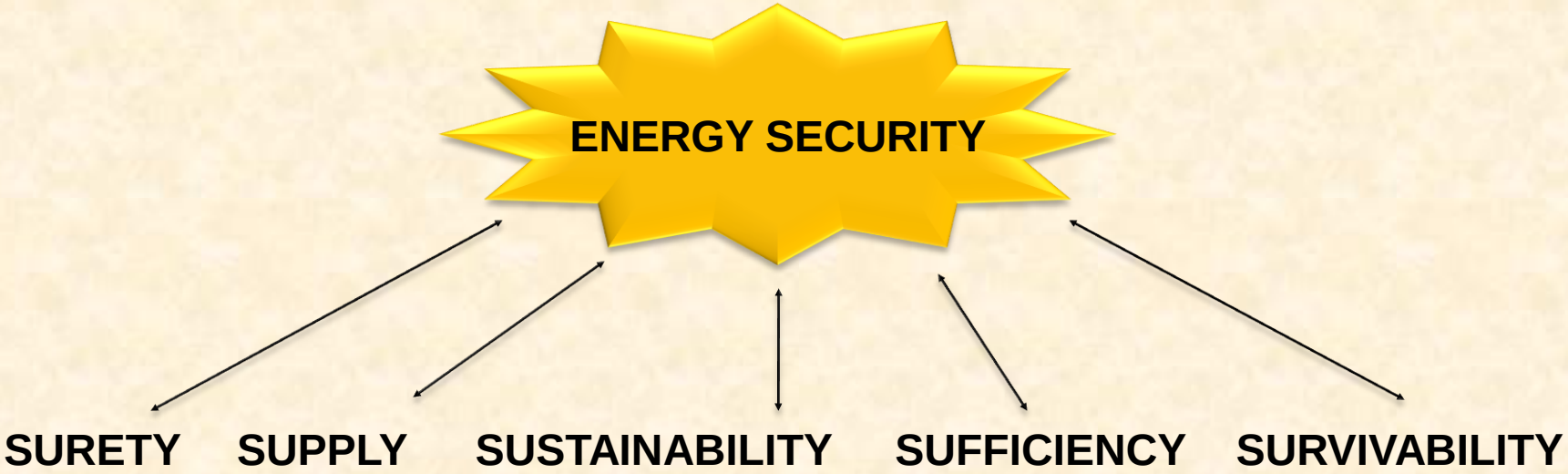
Fort Bliss becomes the Army's Center for Renewable Energy by 2015



Status Quo Is Not An Option!

Energy conservation and management efforts alone cannot achieve directed goals

WHY FORT BLISS

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Fort Bliss Renewables

- Geothermal
- Solar Thermal
- Solar Day Lighting
- Solar PV
- Wind
- Biomass

330+ Days of Sunshine!

- **Confirmed potential by three independent studies**
- **Largest DoD Growth**
  - **$4.8B in Construction**
  - **300% Population Increase**
- **Home of BCT Modernization**
- **Premier Joint Mobilization Station**
- **Power Projection Platform**
- **Joint/Interagency Training Capability**
- **Superb Community Support/ Partnership Potential**

" Fort Bliss is ideally situated to generate renewable energy to meet mandated goals and will play a significant role in contributing to Army-wide performance."

- Tiger Team Assessment (Final Report)

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ENERGY DRIVERS

2015 Energy Goals

30% consumption reduction 24MBtu/ksf

7.5% renewable ~9MWe

Installation Population Quick Facts		
Growth Element	2005	2012
Installation Population	24,660	90,418
Number of Buildings	217	300
Building Space, SF million	10	20

Installation Energy Quick Facts		
Energy	2008	2015 (est)
Consumption, MWh	250K	425K
Equivalent Generation Capacity (Base load), MW	28.5	48.5
Renewable Power Target, 7.5% of 2015 Consumption, MWe	---	8.6
Consumption intensity, 30% reduction of 2003 81MBtu/kSF baseline	102	57

GOALS AND OBJECTIVES

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- Advance energy security at Ft. Bliss by raising the share of renewable energy to at least 7.5%, and increasing energy efficiency by 30% or more by 2015

- Based on conducted studies, implement projects without adversely impacting training mission and operations

- Establish an energy action plan integrating existing recommendations and advancing overall energy security lifecycle planning, programming and execution

- Develop a strategy and framework within the Army Energy Security Implementation Strategy, to ensure that our action plans are linked to the Army's Energy Security Goals.

Doing nothing is not an option !

Goals directed by:

- EPACT '05
- EO 13423
- EO 13514
- EISA '07
- NDAA

Energy Milestone Projection

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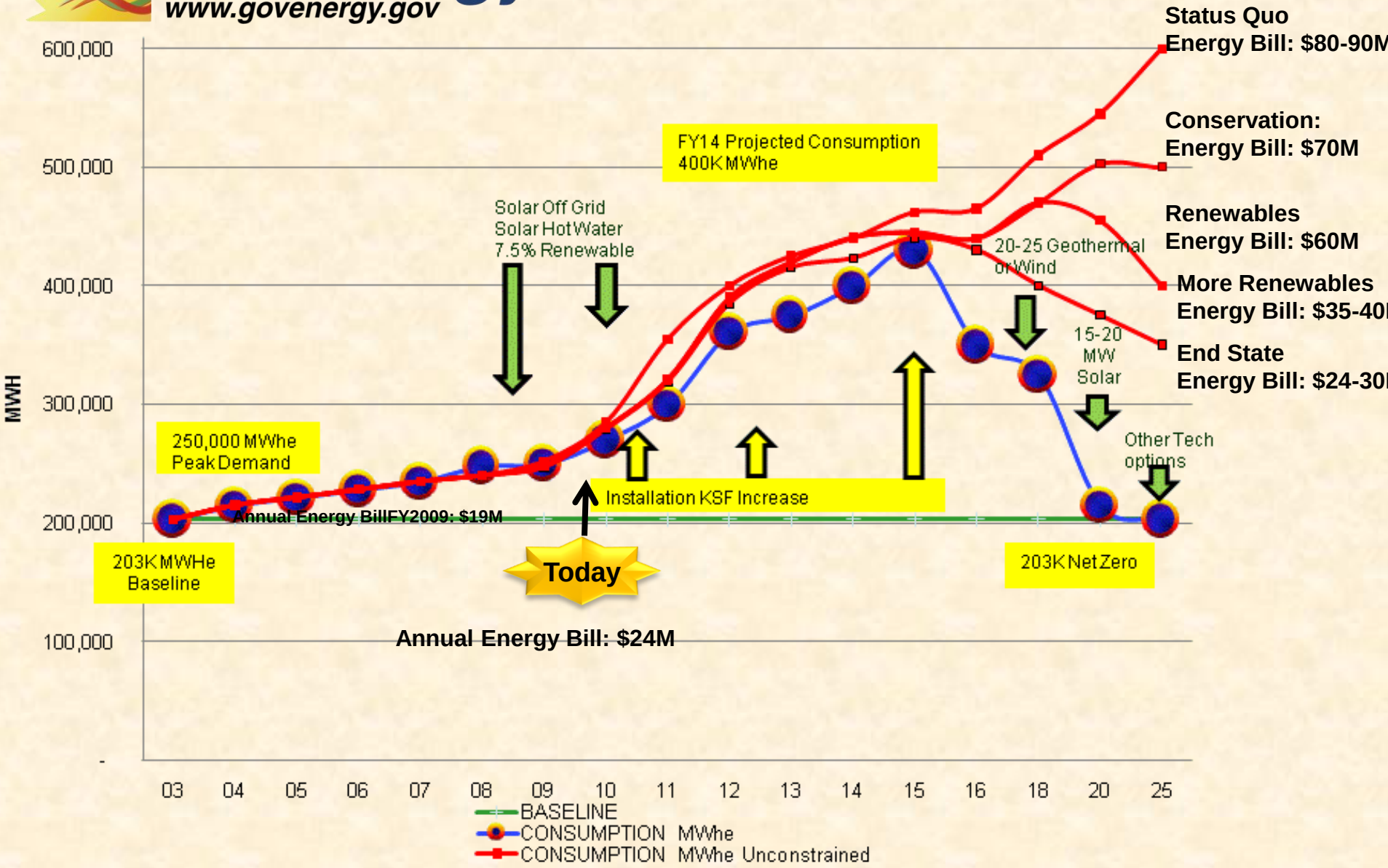

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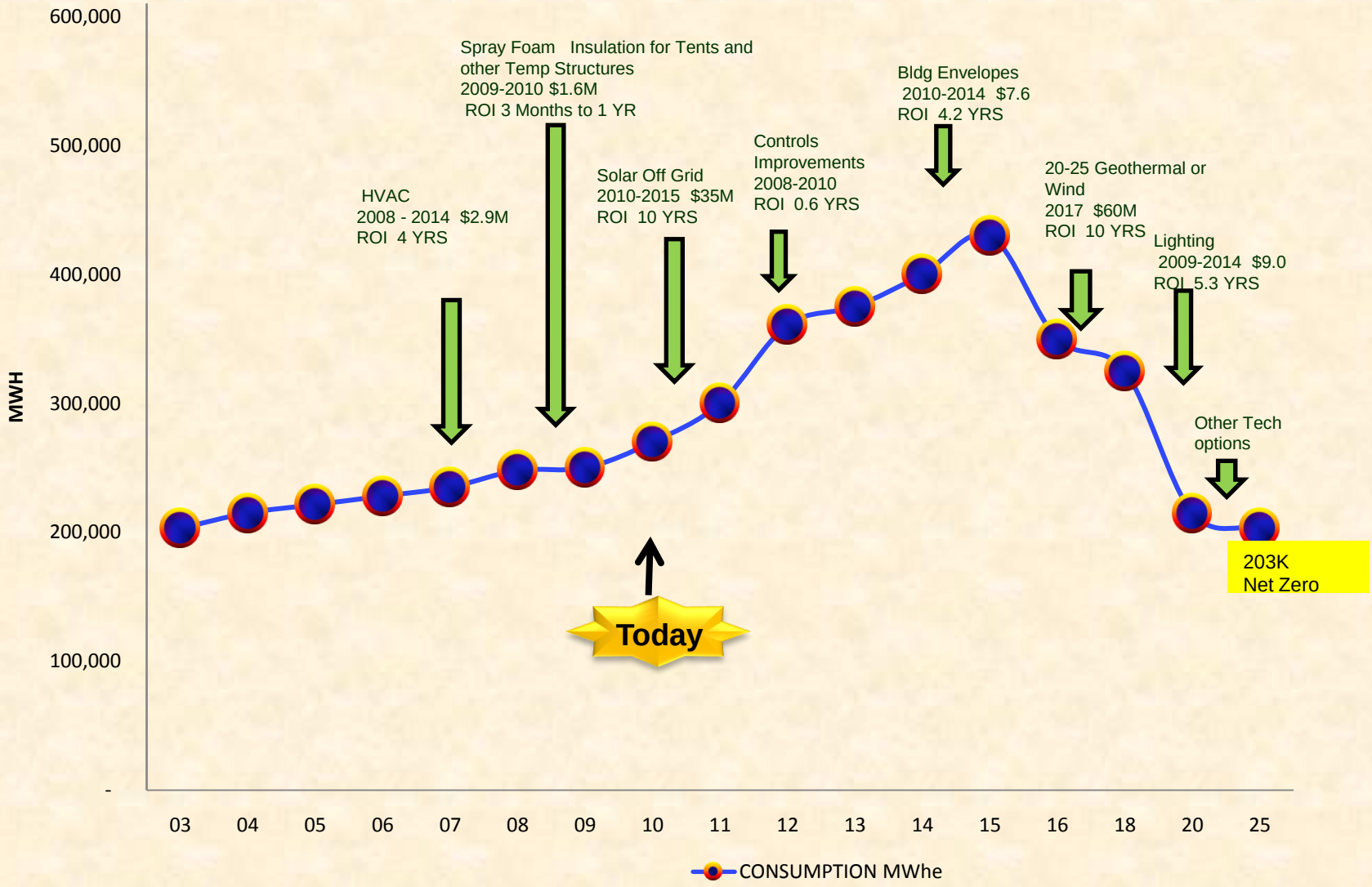
PAYBACK OF ENERGY INITIATIVES



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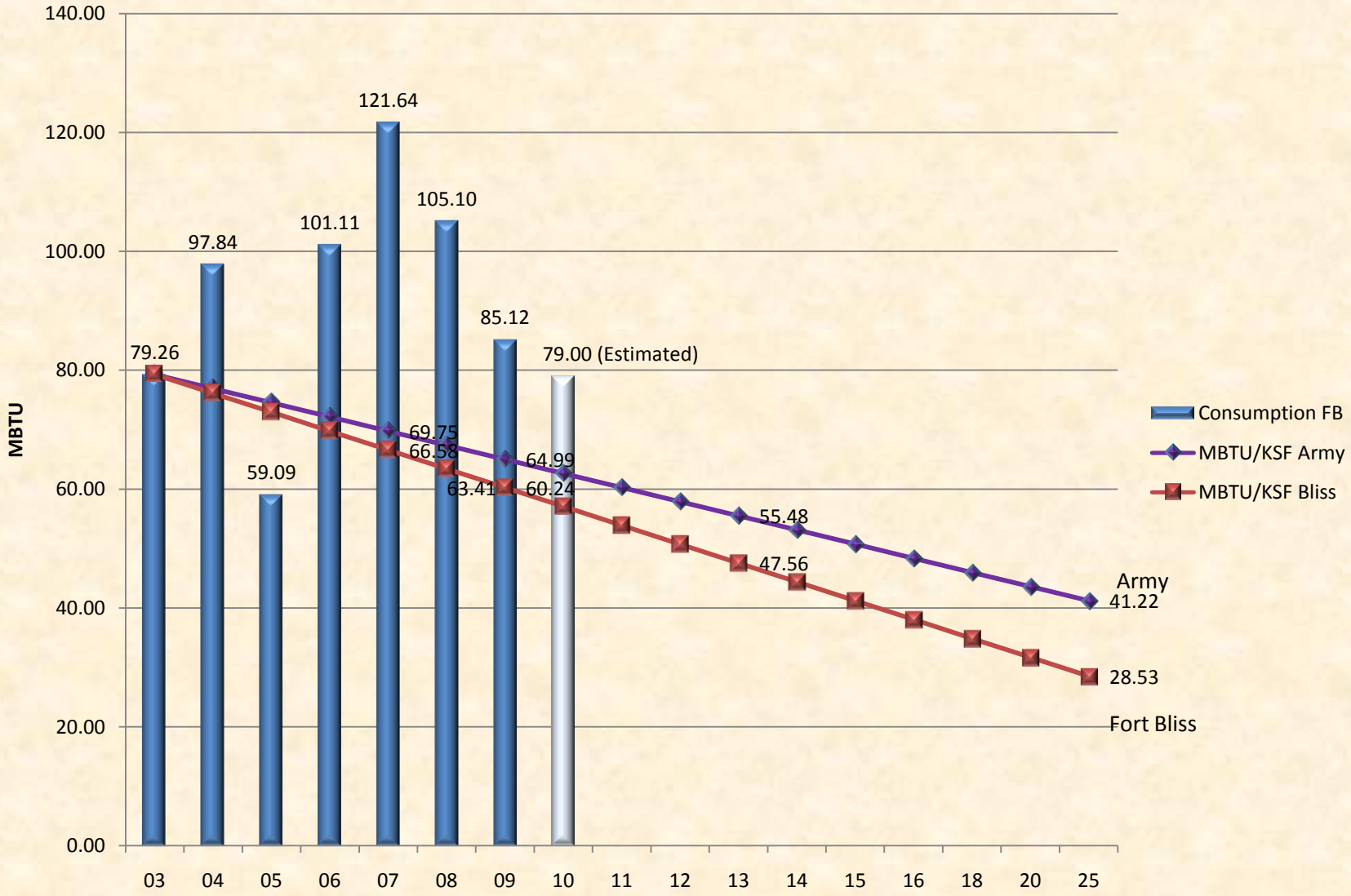
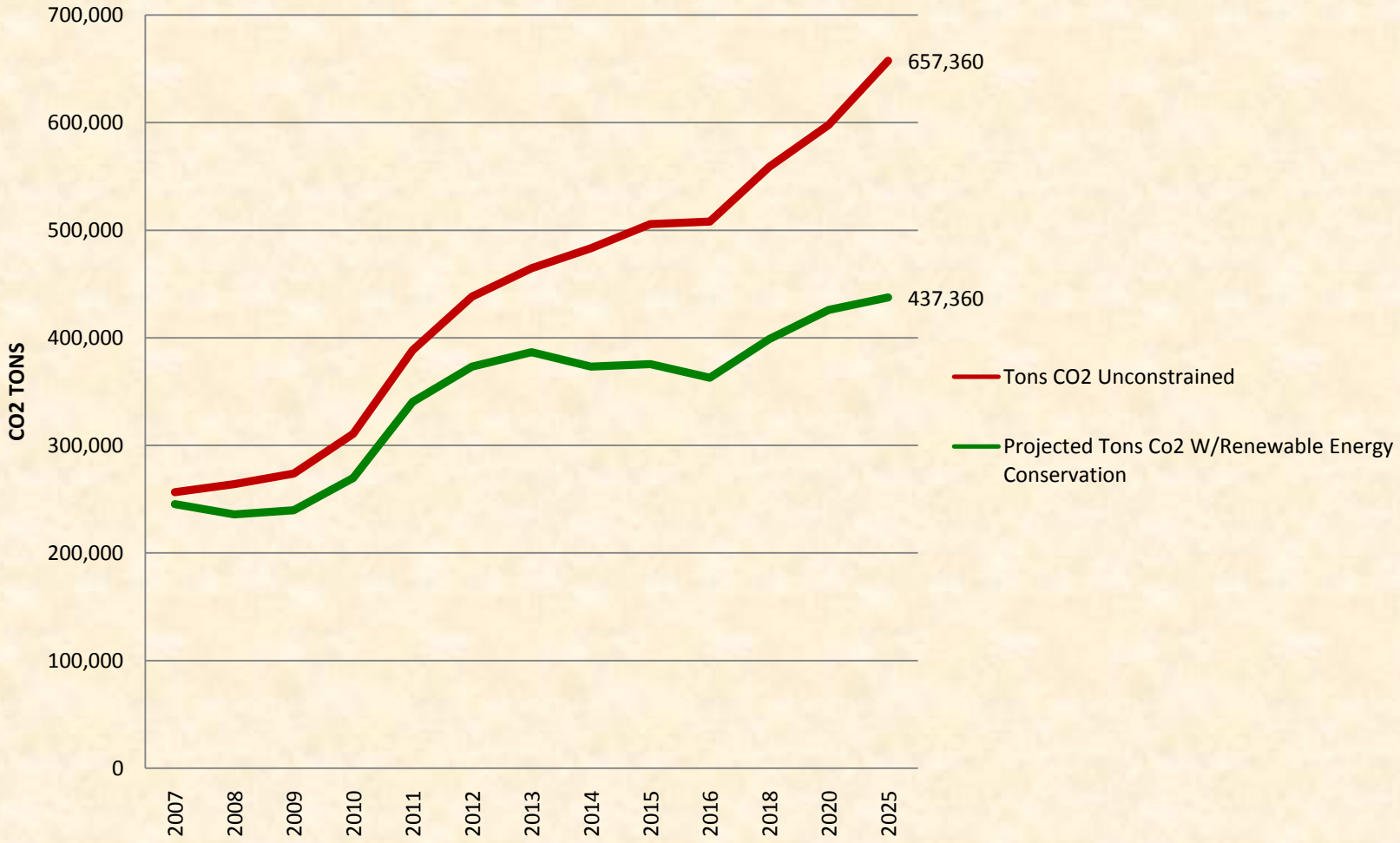
Progress Chart



CARBON FOOTPRINT REDUCTION



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FORT BLISS ENERGY STRATEGY

ENERGY CONSERVATION

Day Lighting
Building Insulation
Solar Hot Water
Transportation
Off Grid Strategy
ARRA/Energy Projects
Business Operations Command Center
Energy Savings Performance Contract
Energy Conservation Improvement Pgm

>$50 M
Funded/ Programmed To-Date by Fort Bliss

+

RENEWABLE
10 YEAR TARGET

10-15 MW Geothermal
20+ MW Wind
15-20 MW Solar
Off Grid Projects

=

Energy Independence
Security
Mission

Partnerships

RDECOM
TARDEC
White Sands Missile Range
Department of Energy
New Mexico State University
46th Test Group
City of El Paso Texas
The State of Texas
UTEP
FEMP Federal Energy Management Program

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ACHIEVING THE VISION

- Implement the Tiger Team's recommendations to meet national goals
- Near Term/Ongoing : $7M FY10
- SRC Short Term ECIP
  - $5.6 M Install Micro-Grid at Main Cantonment
  - $2.4M Solar Induction powered lightning
  - $1.2M Solar Electric PV Charging facilities
  - $6.4 Solar PV/ Power Generation Off Grid (Main Cantonment and Ranges)
  - $4.7 Solar PV Power Facility (DFACS Off Grid)
  - $2.2 Solar Day lighting Several Bldgs within footprint (MP, Admin, Maint Shops)
- SRC ESPC/UMCS
  - ESPC – 3 Task Orders ($20M)/UMCS ($4M)
- LRC Long Term: Fund the following in 12 – 25 POM
  - $70M investment for 10-20 MW of Geothermal at the Ranges
  - $10M for a Solar Array Project
  - $10M for a Wind Project
  - $40M for Biomass/MSW Project (
  - $100M CSP Trough Thermal Electric Hybrid with MSW Plant (feasibility study)

Geothermal application

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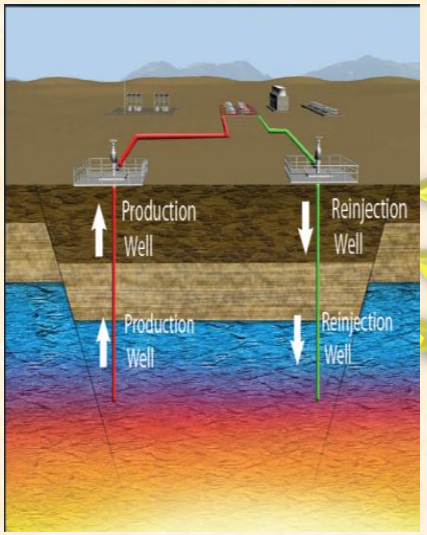

McGregor Range Base Camp

Training Mission Continues

- **The best evaluated in the Army renewable assessment**
- **1996 test wells found 170° - 190°F water**
- **No negative environmental impact**
- **Takes the base camps and other training camps off the grid**
- **Cost effective – once implemented, price is fixed**
- **Great potential for PPP partnership**

The Road Ahead

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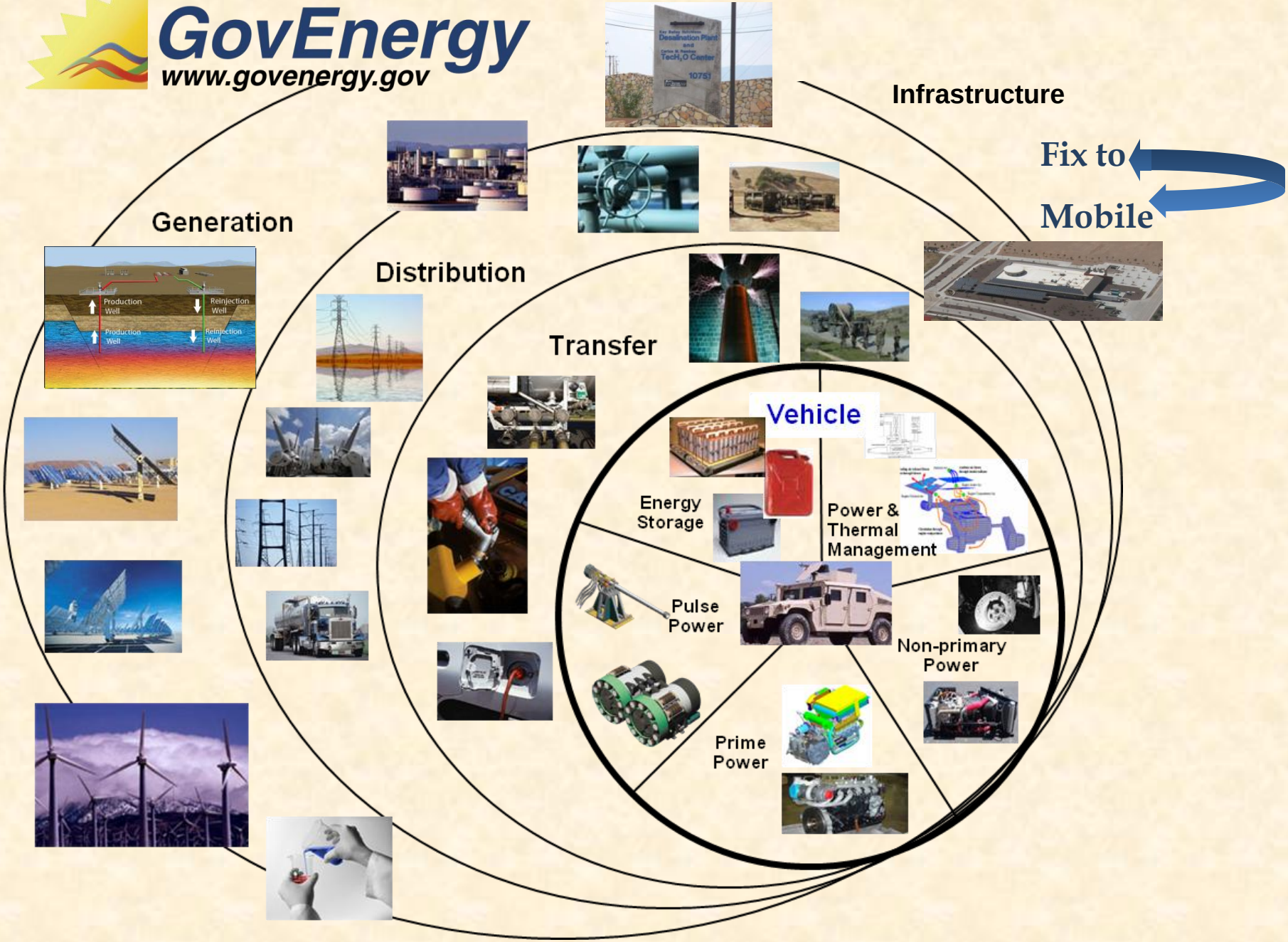

Electronic Power Conditioning & Control – Distributed Generation

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Vehicle Inputs

Plug-in Hybrid Electric Vehicles (PHEV)

Demand Management
Control & Conditioning
Plug and Play
Transportable

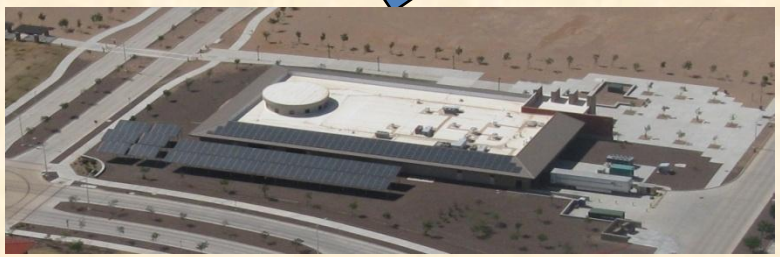
Renewable Inputs

Mobile Encampment Waste to Electrical Power (MEWEPS)

Electric Power Control and Conditioning (EPCC)

Reduced Petroleum Consumption & Energy Security

Generator Inputs



Solar..

Tactical Quiet Generator (TQG)

Supply – Infrastructure - Demand

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Energy Projects completed To Date

- SOLAR THERMAL – Heating of Replica Swimming Pool - Bldg 5035 - 32,000 CCF Natural Gas Saved per Year
- SOLAR DAY-LIGHTING: Dinning Facility, Five Motor-Pools, Warehouse, Gym - 1007 Sun Lights - Off-Setting approximately 1007 400 Watt Electric Lamps.
- SOLAR PV RENEWABLE: Bldg. 1030 – 21.6 kW Solar PV / Bldg. 2915 – 21.6 kW Solar PV / Bldg 20226 – Dining Facility (DFAC) – 100 kW Solar PV
- BUILDING ENVELOPE RENOVATIONS: Large Wide Bay, Single Pane Windows replaced with small energy efficient windows and Exterior CMU covered with EIFS (Exterior Insulation and Finish System)) - - many Single Story, 2,500 Sq Ad Min Buildings.
- UMCS (Utility Monitoring and Control System): Building Operations and Control Center (BOCC) controls the HVAC in approximately 70 Buildings, and an additional 557 building should be completed by 2012.
- ADVANCED METERING: 92 buildings have advanced meters all BCTs will integrated
- ELECTRICAL LIGHTING AND CONTROLS: 71 Buildings converted to modern efficient fixture/lamp combination with electronic ballasts.

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The Road Ahead

Renewable Energy Rodeo and Symposium

Ft. Bliss, TARDEC, Co-hosted the first Energy Rodeo/Symposium (RERS) in June 2010 to demonstrate current energy technologies that support the Army's energy security goals.

The RERS displayed the latest mature technologies and innovations in renewable energy concepts and alternative fuel technologies available. Subject Matter Experts (SME) panel discussions and guest speakers featured some of the nation's top experts in these fields and technologies. SME panel sessions convened to brief and discuss critical energy topics affecting the military and the nation.

- Established a network amongst products developers
- Established a plan for a similar sustainable, recurring event

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CURRENT CHALLENGES

- **On-going massive construction of new facilities now and over the next four years will increase water and electricity requirements**
- **Twenty new ranges will be adding power requirements without any additional square footage**
- **New Weapon Systems with high wattage plug-in requirements with no SF added.**
- **Over 2 Million SF of re-locatable (trailer/tent) facilities are being used to sustain the growing mission. Ft Bliss is the largest MOB/DEMOB location for training in the US with prolonged hot season requiring A/C cooling of training tents and LAMS.**
- **Post-wide conversion from evaporative to refrigerated air conditioning to improve quality of life for soldiers is on-going. Many old buildings with poor insulation and existing infrastructure not up to current standards.**
- **The demand for a reliable and secure supply of water for a growing region**
  - **The Kay Bailey Hutchison Desalination Plant is a reflection of these realities.**

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Recommendation – Establish a Regional Center for renewable energy

- **Current proposals for Fort Bliss expansion require innovation and excellence**
  - **Ft. Bliss is on the leading edge of Army growth.**

- **Solar is excellent at Ft. Bliss**

- **Use these a demonstration platform of how to plan, design and build renewable resources**
  - **A model for sustainable facilities/cost effective**
  - **Conditional commitments to a partnership from:**
    - **DOE National Laboratories**
    - **Army Corps of Engineers**
    - **Universities - NSMU/UTEP**
    - **Johnson Controls**
    - **State officials (TX, NM)**

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RECCOMENDATIONS

- **Installation Energy Surety and Critical Infrastructure Planning**
  - **Fund a "boots on the ground" audit of energy surety and critical infrastructure (ES/CI)**
  - **Develop standardized ES/CI analysis methods, tools and metrics to assist installations with expanding energy security plans.**

- **Existing Infrastructure**
  - **Further evaluation of specific energy conservation measures identified by ERDC EEAP report**
  - **An energy master planning process for installations**

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A New Partnership Outside the Fence

- Fort Bliss and El Paso Water formed a public-public partnership to sustain the growth in water and energy demand, which resulted in the world's largest inland desalination plant with the capacity to meet the needs of both Ft. Bliss and El Paso Water Utilities.
- This is the largest public-public project of its kind in the country involving the Defense Department and a local community.
- The facilities included in the El Paso/Ft. Bliss Desalination Project are:
  - Rehabilitation/replacement of 17 existing wells.
  - The desalination plant producing 15.5 MGD of permeate
  - 16 new blend wells producing 12 MGD
  - Total Supply -27.5 MGD
  - Concentrate disposal facilities 3MGD
  - Pipelines for collection, transmission and concentrate disposal.

TeamBliss "Serving the Nation"

EL PASO WATER UTILITIES PUBLIC SERVICE BOARD

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Water in the Desert
An Opportunity for Innovation

El Paso Water Utilities provides water to over 160,000 households and 10,000 businesses in a rapidly growing region. Adjacent to El Paso, Ft. Bliss, a 1.2 million acre base, is home to more than 18,000 troops and their families. Ft. Bliss is expected to grow significantly this decade. Located in the Chihuahuan Desert with an average annual rainfall of 8.8 inches, a secure and sustainable water supply is critical for both the base and the city.

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Setting the Stage for the Future

- El Paso is the site of the world's largest inland desalination plant. This plant represents a forward-looking strategy in water supply — not only for a region but also for a world that is increasingly challenged by short supplies of fresh water.
- A joint project of El Paso Water Utilities and Ft. Bliss, El Paso's desalination facilities produces 27.5 million gallons of fresh water daily (MGD) making it a critical component of the region's water portfolio. Using a previously unusable brackish groundwater supply, the Kay Bailey Hutchison Desalination Plant is creating a new supply of water - water from water.
- The water pumped to the desalination plant protects El Paso's and Ft. Bliss' fresh groundwater supplies from brackish water intrusion by capturing the flow of brackish water toward freshwater wells.

- This desalination process not only removes salts, but also is the most comprehensive water treatment technology available, removing other potential pollutants from the water.

- The facilities augment existing supplies to make sure El Paso and Ft. Bliss have sufficient water for growth and development for 50 years and beyond. The desalination facilities increase El Paso Water Utilities' fresh water production by approximately 25%, based on current demand.

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Fort Bliss and EPWU Explore Solar Energy for the Desalination Plant

- El Paso Water Utilities is considering solar power for the Kay Bailey Hutchison Desalination Plant. And while many factors must be weighed before making the decision, implementing solar power can be advantageous under the right circumstances.
- The Hutchison Plant currently uses 356,000 kilowatt-hours (kWh) of electricity per month compared to 500 kWh in a typical El Paso home. At full capacity, the plant will use 1.64 million kWh of electricity per month, which is enough to power more than 3,200 homes.
- The solar project offers many advantages, including reduced operating costs for El Paso Water Utilities and reduced greenhouse gases. Using a renewable energy source also reduces peak demands on El Paso Electric Company's system grid.
- The plant is located on Fort Bliss property, so the project complements the Fort Bliss designation as the Army's Center of Renewable Energy. It also helps the City of El Paso meet its Sustainability Plan goals by reducing El Paso's carbon footprint. The City hopes to implement 20 renewable energy projects by 2015.

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- Questions?