

# ***7th Bomb Wing***

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## ***Dyess AFB Energy Program***



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# *Dyess AFB Agenda*

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- Uniqueness of Dyess AFB
- Drivers for the Dyess Energy Program
- Achievements using Performance Contracts
- Lessons learned
- What's next
- Ice plants
- Diesel Generators
- Effluent water



## *Uniqueness of Dyess AFB*

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- Same energy manager for over 20 years, excellent higher HQ support for most of that time
  - Dyess has always had a low civilian to military ratio of maintenance technicians resulting in low manning for repair and maintenance functions
  - Lack of proper O&M funding, Facility repairs compete with flight-line mission operations improvements i.e. runway and taxiway repairs- High cost items
  - Dyess is in the ERCOT/De-regulated Grid area (Electric Reliability Council of Texas)
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# *Drivers for the Dyess AFB Program*

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- Normal legislative reduction goals, i.e. EO's, Public Laws
  - High utility bills/aged infrastructure/lack of funding streams/limited manpower,
    - Primarily used UESC's (Utility Energy Service Contracts) and ESPC's (Energy Savings Performance Contracts)
  - Allows facility improvements to be made by using the energy dollars saved to fund them
  - Using all available technologies not just using the low hanging fruit, allowing long term maintenance by ESCO's
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# ***Dyess AFB Achievements using Performance Contracts***

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- Dyess has met the prior energy goals by reducing energy use and \$ using creative energy procurements and 2 UESC 5 ESPC projects
  - Reduced utility budget and infused valuable \$ into the aging infrastructure
  - Both interior and exterior lighting have been upgraded several times to keep current with new technologies
  - Two working Ice plants have reduced the equipment footprint and shifted maintenance responsibilities from the short-staffed Operations flight.
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# Dyess AFB Achievements using Performance Contracts



- Converted all irrigation to effluent water from the local municipality
- Utilized effluent for a cooling pond, instead of potable water cooling tower for the first ice plant
- 11 Megawatts of diesel backup generation allows entry into the ERCOT load reduction programs, allows safe procurement of real time pricing for electric and gives the base resiliency in times of grid outages

*Anytime ~ Anywhere*



# ***Dyess AFB Lessons Learned***

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- Obtaining buy-in from base and HQ leadership- Success breeds success.
  - Using DOE awards platform to gather leadership involvement.
  - Performance contract development and buy in at higher levels takes a considerable effort and time.  
Last one took 4 years! Persistence pays off!
  - Develop a good working relationship with ESCO's since it's a long term relationship- Kind of like a marriage
  - Energy Manager must be a self starter and work through obstacles to be successful
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# *Dyess AFB What's Next*

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- Establish another ESPC platform- Awarded through CoE Huntsville effective January 11, 2018
- Continue to create a better base infrastructure and resiliency using long term performance task orders
- To eventually leave my replacement with a stable manageable energy/utilities program

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# *Dyess AFB Thermal Energy Storage*



## Project Benefits

- 2 Plants serve 26 buildings, 864,353 Sq Ft or 25% of base
- Peak energy reduced by 950 kW
- Evaporative cooling of chillers increases chiller efficiency
- Use of recycled effluent saves scarce water resource
- Created an aesthetic benefit to base

## Project Data

- Three 300 ton glycol chillers produce ice at night
- Ice plant cools campus during peak hours
- 500Ton Chillers at B1 simulator and 7223 serve base at night while ice is being made
- 9400 Ton-Hrs of ice reduces peak energy by as much as 950KW or 9% of total base peak load



1st ice plant



2nd ice plant

# *Dyess AFB Diesel Generators*

## Fact

- 5 each 2.25 Megawatts= Total of 11.25 Megawatts - 85% of max load
  - Runs on diesel

## Benefit

- Allows safe procurement of Market Clearing Price electricity = Reduced electric cost over \$2M/yr
- Allow full electric operation 95% of the yr at times of emergency due to grid failure
- Allow participation in ERCOT ERS (Emergency Response Service) and TDSP (Transmission Distribution Service Provider) programs = Upwards of \$1M/yr saved.



# ***Dyess Effluent Water - A Lesson in Partnering***

## **The Partnering Story**

- Irrigation impossible due to severe drought – soil conditions deteriorated
  - Effluent water available from the city but 7 miles and a town were in between
- Partnering was the answer!
- Dyess partnered with Siemens to develop and finance a project to bring effluent to the base
  - Economics would not support building a new line across town. Siemens brokered a partnership with Chevron to use an existing abandoned pipeline – free gratis
  - Base partnered with city to build connection from Chevron line to the base
- Result: A successful project which saves 160 Mgal of water annually

## **Reclaimed Water = Good Economics**

**Reservoir Size – 22 Mgal**

**Annual Water Use – 160 Mgal**

**Project Cost – \$ 3.3M**

**Cost of Potable Water – \$ 2.41**

**Cost of Effluent Water – \$ 0.45**

**Project Payback – 9 years**

**Reduced City of Abilene's Potable Water Usage 2%**

