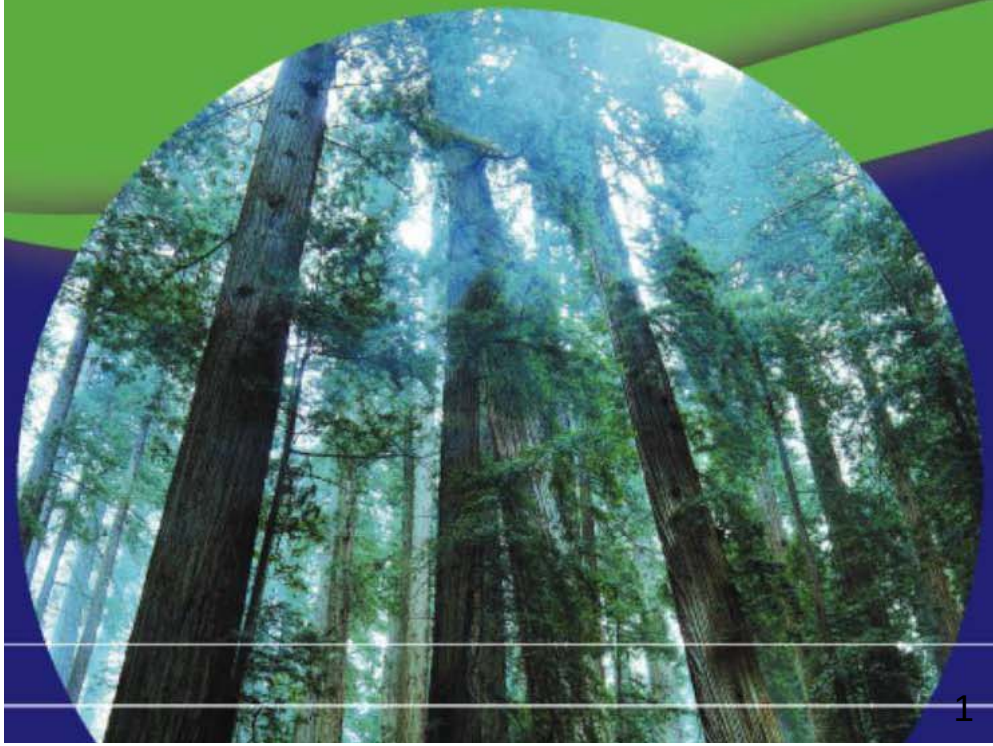
Renewable Energy in the Federal Government



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Agenda

- Renewable Energy Goals
- Renewable Sources & Assessment
- Successful Federal Renewable Energy Projects
- Benefits
- Q&A

Renewable Energy Goals

EPACT 2005 Section 203:

- Use of renewable energy reaching 7.5% of electricity consumed incremental 3% by FY 2007; 5% by FY 2010 (Sep of this year); and 7.5% by FY 2013 and each year thereafter
- Thermal energy does not count
- Target Date of 2013

Executive Order 13423:

- Use of renewable energy of 7.5% from new renewable energy sources
- Thermal energy counts

Renewable Energy Sources

- Biomass
- Solar
- Wind
- Geothermal/GSHP
- Alternate methane fuels
- Ocean source

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Biomass Sources

- Forest Residues
- Agricultural Waste/Crops
- Construction & Demolition Waste
- Municipal Waste
- Waste oils & grease

Renewable Energy Assessment

- Location of Site
- End use (thermal vs. electrical)
- Energy demand profile
- Accessibility of site
- Energy Rates
- Project Structure

National Renewable Energy Laboratory- Golden, CO

Renewable Fuel Heating Plant

- Fuel Source: Woodwaste from local area (~3,000 tons a year)
- Energy System: ARE Biomass Combustor and heat recovery boiler (13.5 MBtu), annual green energy of 40,000 MBtu/yr
- Fuel Delivery System: Live bottom pit and fuel feed conveyor
- Project Status: Currently in commissioning/operation phase
- Annual savings: $420,000 by natural gas displacement
- Project Cost & Term: $3.3 M & 20 year contract
- Contributed to LEED Certification of building on distribution

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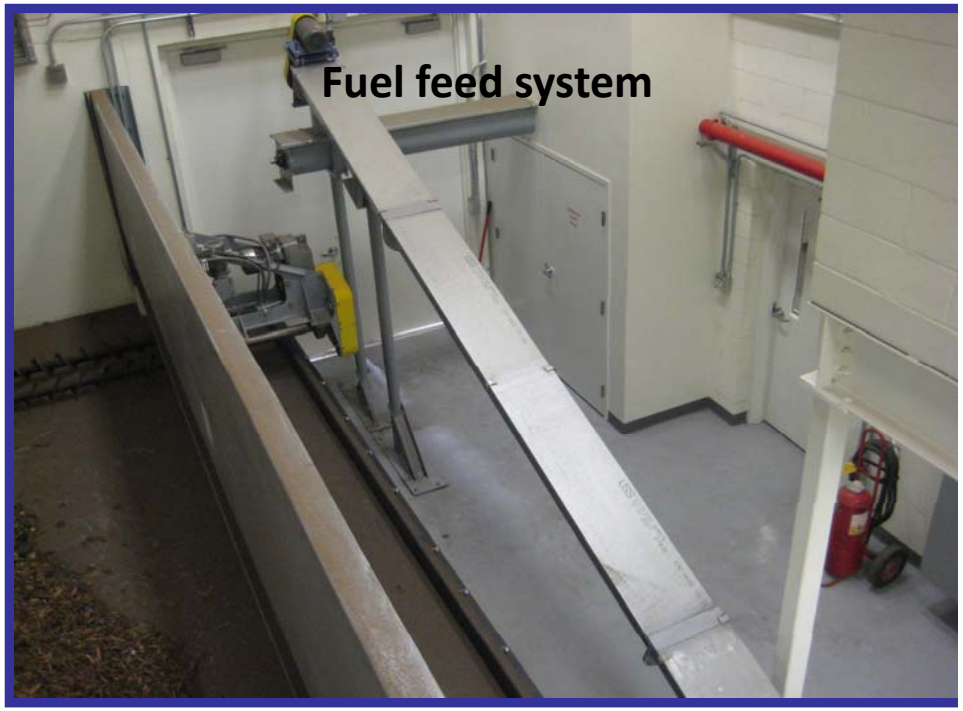
Inside fuel storage
EXIT


Truck entrance


Fuel feed system


Inside of
combustor


Grinder for off
spec fuel


Ash Storage

USCG Yard- Baltimore, MD

Renewable Energy Center

- Fuel Source: Landfill Gas from City landfill (~1800 cfm)
- Energy System: (4) Jenbacher IC engines with heat recovery boiler & modification to existing gas boiler
- Fuel Delivery System: 1 mile gas transmission line & compressor system from Quarantine Road Landfill
- Project Status: Currently in construction/startup phase
- Annual Savings: Natural Gas - $840,00 ; Electric - $1,675,000
- Renewable Energy Source is the primary source for thermal and electrical energy for the USCG Yard (67,000 MBtu/yr & 18,055,000 kWh/yr)
- Meets Renewable Energy Goals for entire Department of Homeland Security

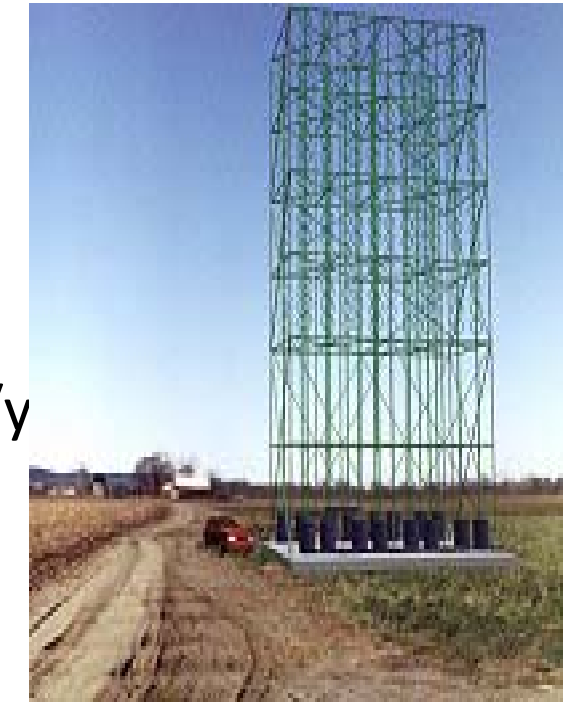
Flare station at the Quarantine LF

Engines & HRSG at the USCG

Fort Huachuca – Arizona

Wind Turbine Installation

- Install of 50 kW MAT prototype unit
- Capable of expansion up to 1 megawatt
- Measures 24’ x 27’ x 128’ tall
- Project Measure Cost: $178,000
- Annual energy reduction: 120,000 kWh/y
- Annual energy savings: $ 3,000



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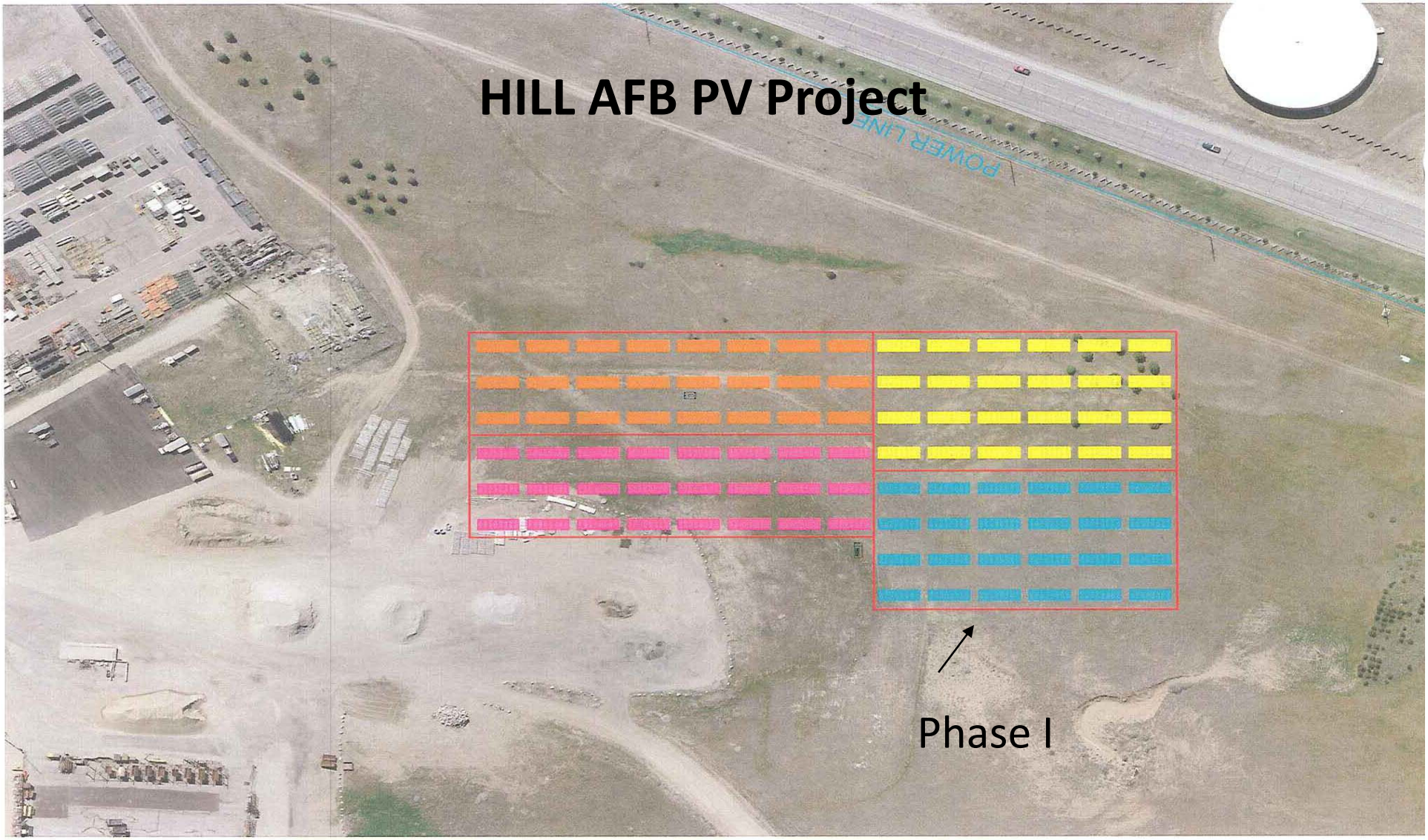
Hill Air Force Base- Layton, UT

Renewable Energy Program

- Landfill Gas to Energy plant
  - (3) IC engines, 2.2 megawatt capacity
  - On-line in January 2005, expanded in January 2008
- Solar Heating Installation
  - Modification of building shell to use solar heat for space heating
- Photovoltaic System
  - 210 kW ground mount panels
- Procurement of steam produced from combustion of trash

HILL AFB PV Project



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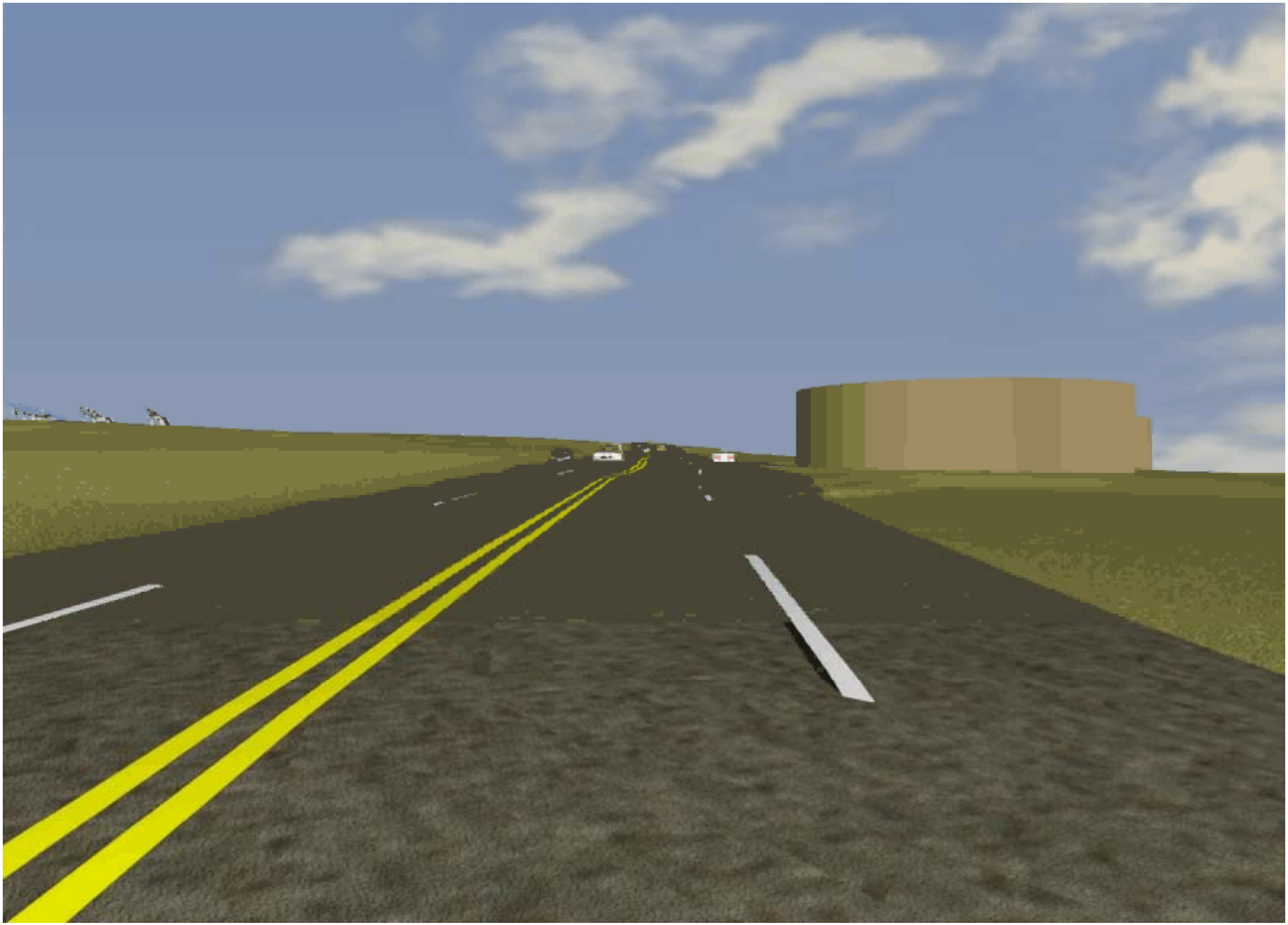


- *LFG delivered in 2 mile pipeline from adjacent county landfill*

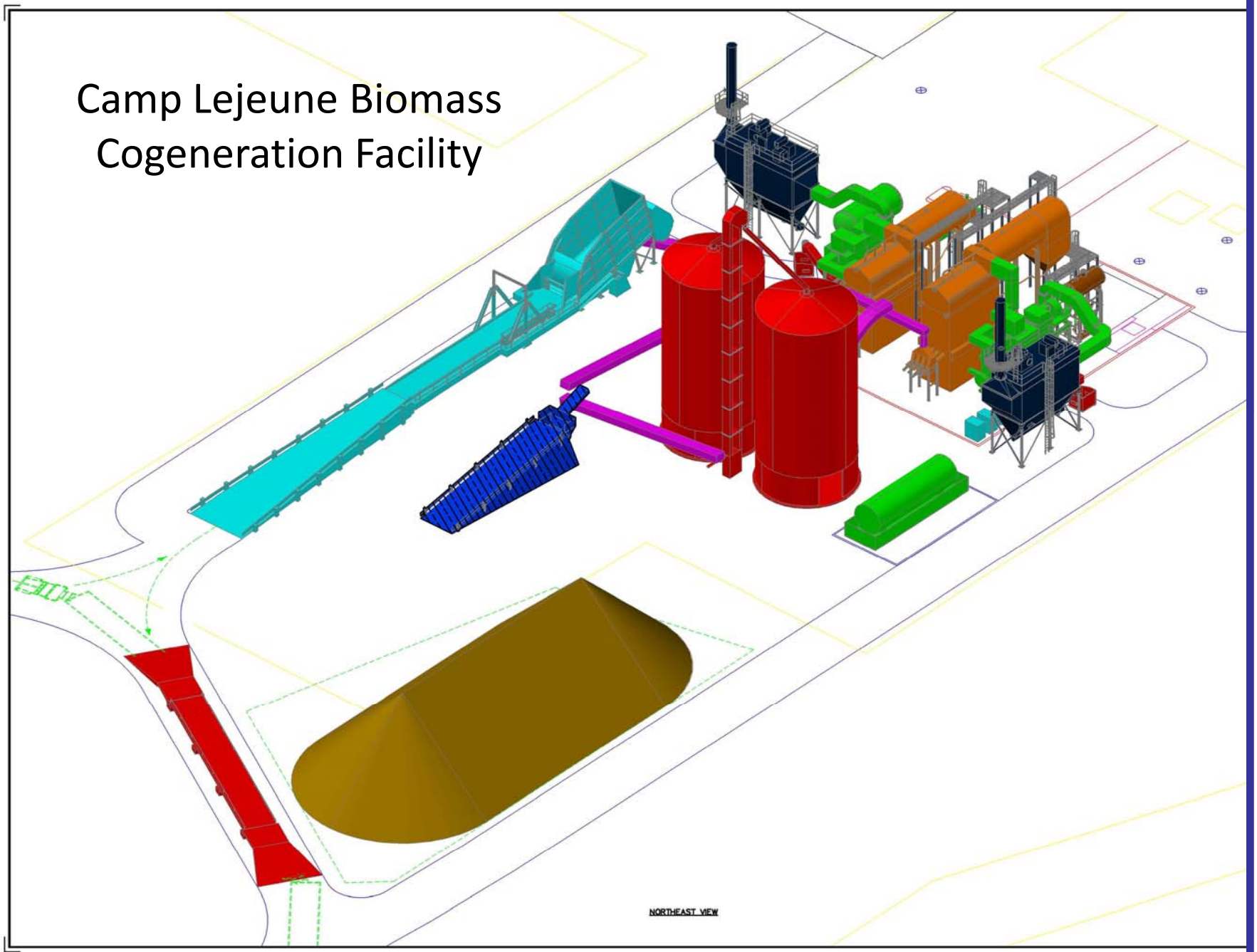
- *Generators use 800 cfm of gas to produce 2.2 megawatts of power*

MCB Camp Lejeune – Jacksonville, NC

Biomass Cogeneration Facility (proposed)

- Fuel Source: Woodwaste from local area & onsite (50,000 tons a year)
- Energy System: (2) stoker fired biomass boiler systems and 600 kW turbine
- Fuel Delivery System: outside storage, truck tipper, (2) silos, grinder
- Project Status: DES (IGA) completed, awaiting contract review & award, construction expected to start summer 2009
- Provides 307,000 MBtu of thermal renewable energy to the site, 20% of total fuel use for heating @ the base
- Provides 2,500,000 kWh annually of green energy

Camp Lejeune Biomass Cogeneration Facility



Benefits of Renewable Energy

- Reduced dependence on Foreign Oil
- Increases energy security
- Replacement of aged infrastructure
- Improves energy supply efficiency (new systems & technology)
- Reduce Energy Costs
- Meets renewable energy goals
- Decreases carbon footprint
- Promotes energy awareness at a site

Q&A