



• August 15-18, 2010 • Dallas, Texas •
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Renewable Roundup:
Federal Renewable Activity & Projects
August 16, 2010
Schuyler Schell
Federal Energy Management Program
U.S. Department of Energy

Overview

Renewable Energy Goals

FEMP Renewables Services

FEMP Renewable Guidance

Project Financing Options & Project Examples

FEMP Renewable Energy Contacts & Resources

FEMP Renewable Energy Task

- Works to achieve mainstream use of renewable energy in Federal buildings by helping agencies:
 - Build renewable energy systems on-site
 - Purchase renewable energy or renewable energy certificates (RECs)
- Two key areas: Building agency capability and direct technical assistance
- Executive Orders and legislation since 1994 created foundation for renewable energy growth

Renewable Energy Goals

- Rules for Federal renewable energy goals:
 - EPLAct: 5% this year, 7.5% in 2013 and forward
 - E.O. 13423: 50% new requirement (electric or non-electric)
 - E.O. 13514: Section 9 GHG accounting and sustainability plans
 - 30% SWH for new construction and renovation (if cost-effective)
 - FEMP Guidance
- Agency strategies to meet the goals
- DOE actions to meet the goals

E-Grid Regions and Non-Baseload CO₂ Equivalent Emission (lbs/MWh)



FEMP Renewables Services

- Technical Assistance for Renewable Projects and Purchases
 - In Energy Savings Performance Contracts (ESPCs) and Utility Energy Services (UESCs)
 - For Purchases of Renewable Energy Power, RECs, or Power Purchase Agreements (PPAs) for on-site projects
 - For general projects with focus on replicable, large scale, and precedent setting projects
- Lab Resources/Tools
 - Federal Renewable Energy Screening Assistant (FRESA)
 - HOMER – optimization model for distributed power
- Project Calls

FEMP Renewables Services

- Renewable Energy Working Group
 - Quarterly Meetings Involving Agencies, Industry and EERE Programs (Solar, Wind, Geothermal, Buildings)
 - Special Meetings on Urgent Topics, i.e., GHG Accounting
 - Consultations with Individual Agencies (DoD, EPA, NASA, Interior,)
- Training/Education
 - Courses in Renewable Energy and Project Finance/Development Options
 - Webinar and Classroom

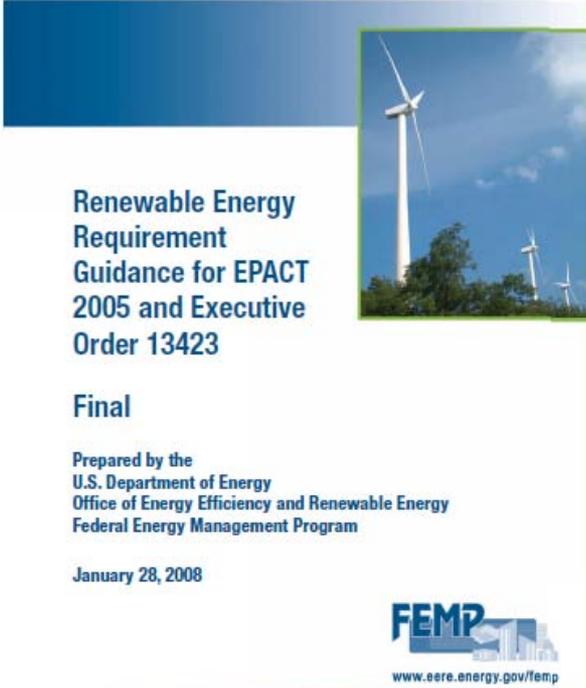
Renewable Energy Training

The FEMP [Introduction to Renewable Energy Requirements and FEMP Services](#) webinar is now available on demand. The webinar offers an introduction to Federal renewable energy goals and FEMP services available for Federal sites.



FEMP Renewable Guidance (EPAAct and EO)

- Agencies must USE the renewable energy
 - For on-site projects, agency must retain or replace RECs to show use
 - Hosting a renewable project is good, but it does not help meet the goal
- New non-electric projects can count toward EO requirement for new generation (placed in service after 1/1/1999) but not EPAAct
- Existing purchases and projects which meet old E.O. 13123 guidelines are grandfathered through 2011
- Excludes system mix energy and energy used to meet state RPS requirements



Renewable Energy
Requirement
Guidance for EPAAct
2005 and Executive
Order 13423

Final

Prepared by the
U.S. Department of Energy
Office of Energy Efficiency and Renewable Energy
Federal Energy Management Program

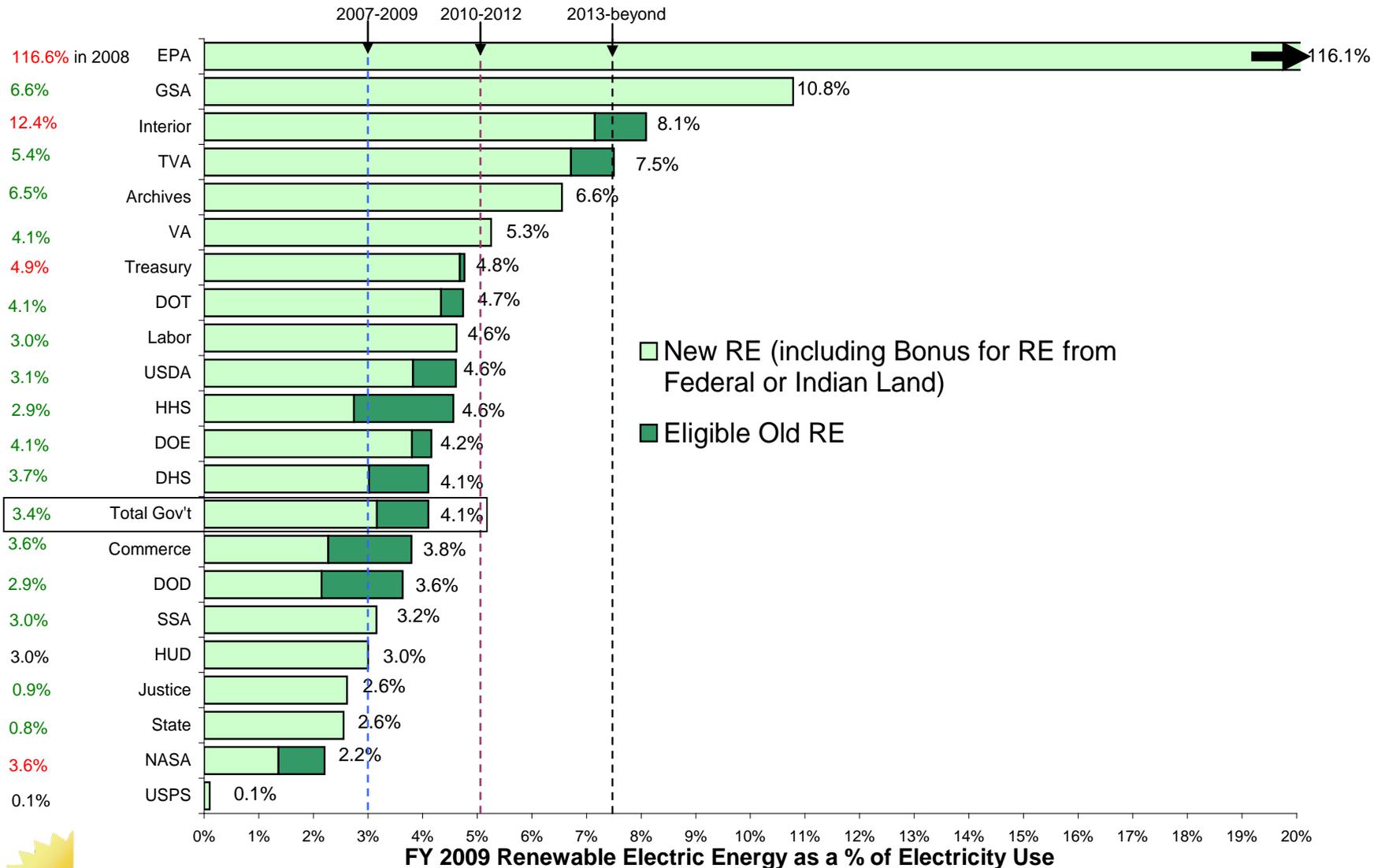
January 28, 2008



U.S. Department of Energy
**Energy Efficiency
and Renewable Energy**
Bringing you a prosperous future where energy
is clean, abundant, reliable, and affordable

www1.eere.energy.gov/femp/pdfs/epact05_fedrenewenergyguid.pdf

Progress Toward Renewable Energy Goal



FY 2009 Renewable Electric Energy as a % of Electricity Use

Project Financing Options

- **Energy Savings Performance Contracts (ESPCs)**
 - No upfront costs to the client – energy savings company (ESCO) secures non-recourse construction and long term financing
 - An ESCO incurs the cost of developing and implementing the energy project and guarantees savings / energy production
 - The customer pays the ESCO over the term of the contract out of the energy and energy-related cost savings resulting from the project
 - Negotiated risk and responsibility sharing of operations, maintenance, repair, and replacement
- **Utility Energy Service Contracts (UESCs)**
 - Similar to ESPC except utility instead of ESCO
 - Guaranteed performance negotiable
 - Utilities more willing to do smaller projects
 - Utilities eligible for renewable investment tax credit
- **Power Purchase Agreements (PPAs)**
 - 3rd party pays for and owns the system, and provides O&M for the life of the contract – customer pays only for the energy

PPAs

- RE developer eligible for tax incentives, accelerated depreciation
- No agency up-front capital required
- RE developer provides O&M
- Minimal risk to government
- Usually known long term electricity price for portion of site load

PPA Issues

- Contract length

Long-term contract options:

- Use Western Area Power Administration
- Congressional proposals
- Long term land use agreement requiring the developer to give Federal agency right of first refusal on purchase of the power at a pre-determined price

- Transaction costs

- Land use agreement, lease, easement, other

- Renewable energy certificate (REC) ownership

ORNL Biomass Steam Plant

ESPC Example:

- Oak Ridge National Laboratory 60,000 pound per hour Biomass Steam Production Plant

- Upgrade of existing steam plant to woody biomass fuel
- ESPC awarded to Johnson Controls in July 2008
- Expected energy output: 384,103 MMBtu/year
- \$4 million annual savings
- GHG Emissions Reduction: 9,777 MtCO₂e/year
- Scheduled completion in FY 2011

Marine Corps Logistics Base Barstow Wind Project

UESC Example:

- MCLB Barstow 1.5 MW Wind Turbine

- \$4.6 million cost financed by Southern California Edison
 - \$6.1 million total, minus \$1.5 million rebate
- \$515,000 annual savings
- 15 year term
- Operational: March 2009



NREL Mesa Top PV Array

PPA Example:

- National Renewable Energy Laboratory 750-kW ground-mounted photovoltaic array

- Financed, built, owned and maintained by SunEdison
- 20-year PPA with Western Area Power Administration
 - Western's long term contracting authority
- NREL purchases SunEdison delivered electricity through PPA
- Energy output: 1,200 MWh/year
- Operational: December 2009



NREL Research Support Facility (RSF) Complex PV II

ARRA-funding Example:

- National Renewable Energy Laboratory 2,088-kW photovoltaic system on RSF complex
- Contract to design, furnish, and install awarded to SunEdison in June 2010
- High efficiency photovoltaic system – 315 watt modules with conversion efficiency of 19.5%
- This second PV system along with the RSF 430-kW PV system will provide enough annual energy to make the RSF complex a Net Zero Energy Building (NZEB).
- Expected energy output: 3,134 MWh/year



FEMP Contacts

ESPC

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UESC

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PPA

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FEMP Resources

- Information – Renewable Energy FEMP Website
 - www1.eere.energy.gov/femp/technologies/renewable_energy.html

The screenshot shows the U.S. Department of Energy website for the Federal Energy Management Program (FEMP). The header includes the U.S. Department of Energy logo and the text "Energy Efficiency & Renewable Energy". Below this is a green banner for the "Federal Energy Management Program". A navigation bar contains links for "About the Program", "Program Areas", "Laws & Regulations", "Information Resources", "Financing Mechanisms", and "Tech". The main content area is titled "Technologies" and features a sidebar with a tree view of categories: "Energy-Efficient Products", "New Technologies", "Renewable Energy" (selected), "Distributed Energy Resources / Combined Heat & Power", and "Operations & Maintenance". The "Renewable Energy" section is expanded, showing a list of sub-topics: "Federal Requirements", "Renewable Resources & Technologies", "Project Planning", "Resource Maps & Screening Tools", "Purchasing Renewable Power", "Case Studies", "Training", "Working Group", and "Contacts". The main content area for "Renewable Energy" includes a definition, a paragraph about the Energy Policy Act of 2005, a list of requirements, and a list of resources provided by FEMP.

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Federal Energy Management Program

About the Program | Program Areas | Laws & Regulations | Information Resources | Financing Mechanisms | Tech

Technologies

Energy-Efficient Products

New Technologies

Renewable Energy

- Federal Requirements
- Renewable Resources & Technologies
- Project Planning
- Resource Maps & Screening Tools
- Purchasing Renewable Power
- Case Studies
- Training
- Working Group
- Contacts

Distributed Energy Resources / Combined Heat & Power

Operations & Maintenance

Renewable Energy

Renewable energy leveraged from natural, renewable resource facilities and fleets. By using renewable energy, Federal agency regulatory requirements and goals.

The Energy Policy Act of 2005 requires the following amounts renewable energy:

- No less than 3% in fiscal years 2007-2009
- No less than 5% in fiscal years 2010-2012
- No less than 7.5% in fiscal year 2013 and thereafter

FEMP provides technical assistance and resources to help Fed These activities span:

- **Federal Requirements:** Current Federal renewable ene
- **Renewable Resources and Technologies:** Introduction
- **Project Planning:** Overview of how Federal agencies ca
- **Resource Maps and Screening Tools:** Collection of res
- **Purchasing Renewable Power:** Available options to pu
- **Case Studies:** Examples of renewable energy projects o
- **Training:** On-demand training sessions covering Federal
- **Working Group:** Forum for Federal agencies and the rer sources, and technologies available.
- **Contacts:** FEMP and Department of Energy national lab