Introduction to Federal Renewable Energy Goals and FEMP Services

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Course Overview

- FEMP organizational structure
- Federal renewable energy goals
  - Energy Policy Act of 2005
  - Executive Order 13423
  - Executive Order 13514
- FEMP services
- Contacts and other resources
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>FEMP</td>
<td>Federal Energy Management Program</td>
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<tr>
<td>UESC</td>
<td>Utility Energy Services Contract</td>
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<tr>
<td>ESPC</td>
<td>Energy Savings Performance Contract</td>
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<tr>
<td>PPA</td>
<td>Power Purchase Agreement</td>
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<td>RPS</td>
<td>Renewable Portfolio Standard</td>
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<tr>
<td>REC</td>
<td>Renewable Energy Certificate</td>
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<tr>
<td>RE</td>
<td>Renewable Energy</td>
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<tr>
<td>EE</td>
<td>Energy Efficiency</td>
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<tr>
<td>EO</td>
<td>Executive Order</td>
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<td>GHG</td>
<td>Greenhouse Gas</td>
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<tr>
<td>SWH</td>
<td>Solar Water Heating</td>
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<tr>
<td>TA</td>
<td>Technical Assistance</td>
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</table>
Facilitates the Federal Government’s implementation of sound, cost-effective energy management & investment practices to enhance the nation’s energy security & environmental stewardship
FEMP Organizational Structure

**Project Transaction Services**
Facilitate the use of alternative finance mechanisms
- ESPC, UESC, PPA
- State and federal incentive programs

**Applied Technology Services**
Provide technical support services enabling agencies to meet their RE and other goals

**Decision Support Services**
Energy outreach, guidance, training, and education to embrace energy efficiency and renewable energy
- Reporting and guidance for energy legislation and regulations
- Education and training
- Outreach and communication
- Budget and planning
FEMP Organizational Structure

Richard Kidd
Program Manager

Project Transaction Services
Skye Schell
- Rebecca Dyer
- Tracy Logan
- David McAndrew
- Bill Raup
- Ab Ream
- Tishisa Braziel

Applied Technology Services
Brad Gustafson
- Anne Crawley
- Matthew Gray
- Shawn Herrera
- Boyan Kovacic
- Will Lintner
- Mark Reichhardt
- Amanda Sahl
- Steven Walder

Decision Support Services
Scott Richlen
- David Boomsma
- Annie Haskins
- Hayes Neely Jones
- Joe Konrade
- Cyrus Nasseri
- Chris Tremper
Renewable Requirements
Energy Policy Act (EPAct) of 2005

- Renewable energy goals:
  - 3% of electric energy by FY2007
  - 5% of electric energy by FY2010
  - 7.5% of electric energy by FY2013 and beyond

- Your agency may have additional renewable requirements
  - Example DOD and BLM

- Must be a separate purchase (renewables that are part of the system mix or that are used to meet state RPS requirements do not count towards the goal)
• “Renewable energy" is **electric energy** generated from:
  - Solar, wind, biomass, landfill gas, ocean, geothermal, municipal solid waste, or new hydroelectric generation capacity achieved from increased efficiency or additions of new capacity at an existing hydroelectric project.
    - Hydrokinetic (run of the river) also qualifies, per RE Guidance
    - Detailed biomass definition in EPAct 2005, Section 203

• Bonus Provision
  - Double credit if *produced* on Federal or Indian land and *used* by Federal agency
  - Biomass generation on Federal or Indian land qualifies even if fuel supply comes from other locations
  - For electric projects only (non-electric projects do not receive bonus)
  - For “New” projects only (placed in service after 1/1/1999)
“Used” - Renewable energy certificates (RECs) must be retained for an on-site project to count towards RE goal and receive the on-site bonus

- If RECs are sold, then replacement RECs must be purchased in order to get credit towards the goal (REC swap option, described in Renewable Guidance Section 3.2.2)
  - Good option for solar and other projects with “high value” RECs
  - “REC swap” allowed at agency level
    - Calculated automatically by FEMP if an agency reports enough RECs to “swap” for RE projects that did not retain RECs
  - Projects completed before 1/28/08 final publication of FEMP guidance are exempt from the REC retention requirement until Sept. 30, 2011

  - Section 4 describes when RE can be used for EE goals and the planned phase out for use of RE purchases towards EE goal by FY2012
On-Site Project REC Options

Case 1: On-site project and RECs retained (ie. renewables are “used”)

RE project on a Federal Site

Produces 10 GWh of electricity
Creates 10 GWh of RECs

10 GWh of Renewable Electricity
+10 GWh Bonus for on-site gen.
Case 2: On-site project and RECs sold to improve project economics. This case does not count towards federal RE goal.
Case 3: On-Site Project with “REC swap”, so project counts towards the RE goal (“used”)

On-Site Project REC Options

RE project

10 GWh of RECs (low price)

Produces 10 GWh of electricity

SOLD!

10 GWh of RECs (high price)

BOUGHT!

10 GWh of Renewable Electricity

+10 GWh Bonus

On a Federal Site

Produces 10 GWh of electricity

BOUGHT!

10 GWh of RECs (low price)
Executive Order 13423 (2007)

- At least half of RE required under EPAct05 must come from "new" renewable sources
- "New" = placed into service after January 1, 1999*
  - Refurbished, rebuilt or modified significantly (>80% or original costs) counts as "New"
- Encourages on-site projects
- Non-electric energy (thermal, mechanical, daylighting) count towards the EO13423 "New" requirement
  - Thermal includes solar water heating, solar ventilation pre-heat, ground source heat pumps, biomass heating/cooling, ocean or geothermal thermal
  - Mechanical include pumps driven by wind or qualifying hydro

* EO13423 revokes EO13123 requirement that all renewables used to meet federal goals must be installed after 1/1/1990
### RE Goals – Electric versus Non-Electric

- ‘New’ *electric* and *non-electric* capacity counts towards EO13423 goal
- ‘New’ *electric* capacity counts towards both EO13423 and EPAct05 goals
- ‘New’ *non-electric* capacity *does not* count towards the EPAct05 goal

### Possible options for meeting EPAct and EO13423 FY2010 RE goals

<table>
<thead>
<tr>
<th></th>
<th>One possible option</th>
<th>Another possible option</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EPAct</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5% of <em>electricity</em> from renewables by <strong>FY2010</strong></td>
<td>5% electric</td>
<td>5% electric</td>
</tr>
<tr>
<td><strong>EO 13423</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>½ of renewable energy <em>must be “new”</em></td>
<td>2½% “new” electric is “new”</td>
<td>0% “new” electric</td>
</tr>
<tr>
<td>0% “new” thermal, mech., day lighting</td>
<td>2½% “new” thermal, mech., day lighting</td>
<td></td>
</tr>
<tr>
<td><strong>EPAAct and EO FY2010 goals met</strong></td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Total RE produced</strong></td>
<td>5%</td>
<td>7½%</td>
</tr>
</tbody>
</table>

• Section 523: 30% hot water demand in new/renovated Federal buildings met with solar hot water equipment, provided life-cycle cost-effective (LCC)
  ▪ Life-Cycle Cost-Effective: Savings Investment Ratio (SIR) >1
    – 10 CFR 436 specifies LCC methodology
    – Utilize Building Life-Cycle Cost (BLCC) program
      ◆ http://www1.eere.energy.gov/femp/information/download_blcc.html
      ◆ NIST specifies fuel escalation rate, discount and inflation rates on an annual basis
    – EISA Section 441 allows analysis period of up to 40 years (instead of 25 years) as applicable

• Section 433: Fossil fuel-generated energy use in Federal buildings reduced by: 55% in 2010, 65% in 2015, 80% in 2020, 90% in 2025, 100% in 2030
  ▪ Compared to similar building in 2003
Executive Order 13514 (Oct 5, 2009)

- EO13514 information available at:
  [http://www1.eere.energy.gov/femp/regulations/EO13514.html](http://www1.eere.energy.gov/femp/regulations/EO13514.html)
  [http://www1.eere.energy.gov/femp/program/greenhousegases.html](http://www1.eere.energy.gov/femp/program/greenhousegases.html)

- EO13423 is *not* revoked by EO13514

- Each agency establish Scope 1 & 2 greenhouse gas (GHG) goals within 90 days (Section 2a) and Scope 3 GHG goal within 240 days (Section 2b)
  - Consider reductions associated with increasing agency use of RE and implementing RE generation projects on agency property

- Advance regional and local integrated planning by aligning Federal policies to increase the effectiveness of local planning for energy choices such as locally generated renewable energy (Section 2f)
Executive Order 13514 (Oct 5, 2009)

- High performance sustainable buildings (Section 2g)
  - All new Federal buildings entering planning process in 2020 and thereafter are designed to achieve zero-net-energy by 2030
  - All new construction, major renovation, or repair and alteration of Federal buildings complies with the Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings ("Guiding Principles")
  - At least 15% of existing buildings & building leases (above 5,000 gross feet$^2$) meet Guiding Principles by FY2015, with annual progress toward 100% conformance
• **Scope 1**: direct GHG emissions from sources that are owned or controlled by the Federal agency
  - Boilers, furnaces, emergency generators, vehicles
  - Chemical production in owned or controlled process equipment

• **Scope 2**: direct GHG emissions resulting from the generation of electricity, heat, or steam purchased by a Federal agency
  - Physically occur at the facility where electricity is generated
  - GHG emissions vary by location and resource
  - Solar and wind have zero emissions.
  - Emissions study required for biomass due to varying resource types

• **Scope 3**: GHG emissions from sources not owned or directly controlled by a Federal agency but related to agency activities such as vendor supply chains, delivery services, employee travel and commuting
E-Grid Regions and CO₂ Equivalent Emission (lbs/MWh) – Non Baseload

Values in Red are above national average (i.e., SRVC at 1790)

Values in Green are below national average, (i.e., SRMV at 1261)

Table with emission factors: [http://cfpub.epa.gov/egridweb/ghg.cfm](http://cfpub.epa.gov/egridweb/ghg.cfm)
<table>
<thead>
<tr>
<th>Source of Requirement</th>
<th>Produce, Use, or Both</th>
<th>Level…</th>
<th>Applies to…</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPAct 2005 Federal Use Goal</td>
<td>Use, Electric</td>
<td>3% FY07-09 5% FY10-12 7.5% FY13 and beyond</td>
<td>All Agencies</td>
</tr>
<tr>
<td>Executive Order 13423</td>
<td>Use, All RE</td>
<td>½ of EPAct Federal Goal from “New” Sources</td>
<td>All Agencies</td>
</tr>
<tr>
<td>DoD National Defense Reauthorization Act of 2007</td>
<td>Produce or Use, All RE</td>
<td>25% of electricity by 2025</td>
<td>DoD</td>
</tr>
<tr>
<td>EPAct 2005 BLM Production Goal</td>
<td>Produce, Electric</td>
<td>10,000 MW by 2015</td>
<td>BLM</td>
</tr>
<tr>
<td>EISA 2007 SWH Requirement</td>
<td>Use, Solar Water Heating</td>
<td>30% of hot water needs in all new buildings or major renovations</td>
<td>All Agencies</td>
</tr>
</tbody>
</table>
Options to meeting the goals

• Install RE projects on-site
  ▪ Emphasized in new EO13514
  ▪ Reminder: must purchase replacement RECs if project RECs are sold
  ▪ Use appropriations or alternative financing (PPA, UESC, ESPC)

• Purchase RECs, renewable power in a competitive electricity market or through local utility
  ▪ Must meet RE guidance renewable definition
  ▪ Must include RE & non-energy attributes (GHG, other emissions/attributes)
  ▪ RECs from non-electric renewables count towards EO13423 “New” req’t
  ▪ Vintage and third party verification requirements (Renewable Guidance Sections 3.3.4 and 3.35)
Where we are currently…

Renewable Energy Use

EPAct Goals

2013 +
2010 - 2012
2007 - 2009
FEMP Renewable Services
FEMP Services

- Information
  - Web site
  - Resource maps

- Project assistance
  - Renewable screenings
  - Call for projects
  - Financing support

- Purchasing renewable power

- Training and outreach
Federal Energy Management Program

The Department of Energy's Federal Energy Management Program's (FEMP) mission is to facilitate the Federal Government's implementation of sound, cost-effective energy management and investment practices to enhance the nation's energy security and environmental stewardship.

Federal Energy Management Resources
- Meet Energy Goals and Regulatory Requirements
- Purchase Energy-Efficient Products
- Manage Energy-Efficient and Alternative Fuel Vehicle Fleets
- Cultivate Change to Embrace Energy Efficiency and Renewable Energy
- Design, Operate, and Maintain High-Performance Buildings
- Deploy Renewable Energy Technologies
- Finance and Contract Assistance for Energy Projects
- Get Answers to Questions in the FEMP Information Center

Highlights:
Commissioning for Federal Facilities Online Training Now Available
Sept. 10, 2009 - Commissioning for Federal Facilities online training course provides participants with skills to resolve operational issues, improve comfort, reduce energy use, and identify best practices.

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Renewable Energy

Renewable energy leveraged from natural, renewable energy, Federal agencies increase national security.

The Energy Policy Act of 2005 requires the following:

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

FEMP provides technical assistance and resources:

- Federal Requirements
- Renewable Resources and Technologies
- Distributed Energy

Meet Energy Goals and Regulatory Requirements
Design, Operate, and Maintain High-Performance Buildings
Deploy Renewable Energy Technologies
Finance and Contract Assistance for Energy Projects
Get Answers to Questions in the EERE Information Center
Resource Maps

http://www1.eere.energy.gov/femp/technologies/renewable_resourcemaps.html

Solar Hot Water: Electricity Rate Corresponding to Savings to Investment Ratio = 1

Assumptions:
1. Annual average solar resource potential using a tilted collector
2. System cost = $900 per sq. m.
3. System efficiency = 46%
4. Present worth factor = 17.41

U.S. Department of Energy
National Renewable Energy Laboratory
06-JUL-2006 1.23
Provided for free using limited FEMP funding

Or

Through agency-funded Work for Others (WFO) if insufficient FEMP funding or if in-depth assistance desired
Renewable Screening

- FEMP conducts renewable screening for every ESPC project using Renewable Energy Optimization (REO), Solar Advisor Model (SAM) and/or other tools
  - New DOE ESPC contract emphasizes renewable energy and advanced efficiency technologies
  - FEMP assists Federal agencies in identifying and deploying these technologies.
  - Coordinate with Federal Financing Specialist (FFS) to provide data required for screening
    - [http://www1.eere.energy.gov/femp/docs/re_screening_for_espces.doc](http://www1.eere.energy.gov/femp/docs/re_screening_for_espces.doc)
  - Results can be used to ensure that certain renewable projects are evaluated for inclusion in ESCO proposals
- Similar screening for UESC projects
- Screening using TA funding and through Call for Projects
Call for Projects

• Opportunity for federal agencies to request FEMP technical assistance that is provided through the DOE national laboratories and contractors
  ▪ Assistance only, no funds for equipment

• Call for Projects issued on a periodic basis. FY2010 Call for Projects will be issued later this year
  ▪ Renewable screening will be a priority

• Call for Project contacts:
  ▪ Shawn Herrera
    202-586-1511
    shawn.herrera@ee.doe.gov
  ▪ Melinda Latimer
    303-275-4820
    melinda.latimer@go.doe.gov
Call for Projects - Service Options

- Renewable screening
  - Use Renewable Energy Optimization (REO) or other tool
- Detailed feasibility studies
  - Economics
  - Engineering
  - Financing options (ESPC, UESC, PPA)
- Procurement specifications
- Contracting language
- Proposal evaluation
- Acceptance inspection
- Long term monitoring

Note: National Laboratory support geared towards activities that do not compete with the private sector
Project Financing Support

Support from project conception through completion

- ESPC: Well established process. Support provided through Project Facilitators, Federal Financing Specialist (FFS) and National Laboratory Core Team
  - FFS contacts at:
    http://www1.eere.energy.gov/femp/financing/espcs_financingspecialists.html

- UESC: Process varies depending on utility partner

- PPA: Typically partner with Defense Energy Support Center or Western Area Power Administration
  - Market research assistance
    - Applicable incentives and/or solar REC market
    - Possible utility tariff/competitive electric supply impacts, standby charges
    - Interconnection and net metering policies/requirements
  - Assistance with other requirements such as land use agreement (lease, easement, license, other)
  - Assistance with National Environmental Policy Act (NEPA) compliance issues
  - Solicitation and bid evaluation
Purchasing Renewable Power

• Options
  ▪ Renewable Energy Certificates (RECs)
    – Defense Energy Support Center (DESC)
    – General Services Administration (GSA)
    – Western Area Power Administration (Western)
  ▪ Renewable power in a competitive electricity market
  ▪ Utility green pricing programs

• Services
  ▪ Evaluate options
  ▪ Contract or RFP assistance

• Green Power Network is a very helpful resource
FEMP Training and Outreach

- Workshops and webinars
- Networking facilitation
  - Renewable Energy Working Group
  - Federal Utility Partnership Working Group (FUPWG)
    - Next meeting is Nov. 18-19 in Ontario, CA
      [Link](http://www1.eere.energy.gov/femp/news/events_detail.html?event_id=3963)
- Annual GovEnergy training workshop and trade show
  - GovEnergy 2010 is August 15-18 in Dallas, TX
- Events & training calendar:
  [Link](http://www1.eere.energy.gov/femp/news/events.html)
Information Resources

- FEMP Renewable home page: http://www1.eere.energy.gov/femp/technologies/renewable_energy.html
- Renewable contacts http://www1.eere.energy.gov/femp/technologies/renewable_contacts.html
- Other FEMP contacts (including Customer Service Representative) http://www1.eere.energy.gov/femp/about/contacts.html
- Events & training calendar http://www1.eere.energy.gov/femp/news/events.html
- Database of State Incentives for Renewables and Efficiency http://www.dsireusa.org/
Thank You