FEDERAL UTILITY PARTNERSHIP WORKING GROUP (FUPWG)
SPRING 2011 MEETING REPORT
PORTLAND, OR

WELCOME – MIKE WEEDALL, BPA (MJWEEDALL@BPA.GOV)

- Bonneville Power serves 130+ distribution companies, or 85% of the transmission in the region in the Pacific Northwest
- BPA encourages energy efficiency improvements with their customers
- Agencies assisted: Army, Navy, GSA, Forest Service, National Parks
    - Projects completed: lighting, HVAC, controls, specific processes, building shell
- Working to build sustainability plans to achieve carbon reduction goals
- Efficiency has proven to be less expensive than other resources available - energy efficiency is BPA's third largest resource (viewed seriously by BPA)

DAVID MCANDREW, DOE FEMP (DAVID.MCANDREW@EE.DOE.GOV)

- Welcome & schedule reminders
- All attendees should abide by the FUPWG Code of Conduct: "*All delegates are required to honor the Federal Utility Partnership Working Group guidelines developed by the Working Group Steering Committee. Hospitality/social functions (on and off site) are strictly prohibited from conflicting with the timing of official Working Group activities listed in the "Schedule of Events". Aggressive sales techniques are to be avoided while attending Working Group meetings. Signs and flyers may not be displayed or distributed in the meeting or guestroom areas of the hotel reserved for Working Group participants.*"
- Tim Unruh (new FEMP Program Manager) is very interested in growing the UESC Program; the Utility Team is developing a plan to grow the program, but we need your input! Please inform the Utility Team through e-mail, in person or through the post-FUPWG survey on ways to improve the program.

WASHINGTON UPDATE – SKYE SCHELL (SCHUYLER.SCHELL@EE.DOE.GOV)

- FEMP is focused on project assistance, training and outreach to reach FEMP's mission to facilitate the Federal government's implementation of sound, cost-effective energy management and investment practices. FEMP is also focused on job creation to facilitate the recovery from the recession.
- Technical assistance is provided through contractors, national labs and partnerships with utilities.
- Training is offered live as well as "on-demand"; on-site workshops are also available
- FEMP Energy and Water Management Awards: nominations are due on Friday, May 13; visit http://www.fempcentral.com/awards to submit a nomination. Senior officials are actively involved to celebrate the successes in energy efficiency efforts.
- Staff changes:
    - New FEMP Program Manager: Dr. Timothy Unruh (former FEMP Program Manager: Richard Kidd); great enthusiasm for private financing such as UESCs and ESPCs
    - Assistant Secretary Kathy Zoi has moved to a private sector role; Henry Kelly is the new acting Assistant Secretary; Dept. Assistance Secretary: Kathleen Hogan
- Federal efforts in energy:
    - Federal energy requirements in sustainability, water, renewable energy, etc. are not new, but continue to be challenging; each can be impacted in a major way with private financing programs
    - One of the indicators in meeting federal energy requirements is the level of investment by agencies in UESC and ESPC as well as in direct appropriations. The challenge lies in growing private financing.
    - Most of FEMP's data is lacking. Please help us improve our database by sending UESC projct data. In addiiton, provide ideas on how to improve FEMP's data collection efforts to capture information regarding completed projects, the performance of projects throughout the contract and pipeline projects. Please send data to Sarah Mabbitt (smabbitt@energetics.com)
    - The federal government is in danger of not meeting energy reduction goals; RECs will no longer be considered an offset for meeting energy efficiency goals in FY2012.
- EISA Section 432 Compliance Tracking System (CTS) Update:
    - FEMP is responsible for tracking Federal agency progress and issuing guidance toward meeting Section 432 of the Energy Independence and Security Act (EISA) of 2007 for Federal facility energy and water management and benchmarking.

    - The EISA Section 432 Compliance Tracking System (CTS) tracks agency performance of energy and water evaluations, project implementation and follow-up measures, and annual building benchmarking requirements.
    - New CTS version was released on April 7
    - FEMP Lead: Chris Tremper, chris.tremper@ee.doe.gov
- GovEnergy 2011: August 7-10 in Cincinnati, OH
    - 15 tracks – over 130 individual sessions
    - New tracks: GovEnergy Roundtable, Complying with Federal Directives, Energy 501, Utility Infrastructure (particularly relevant to the FUPWG audience)
    - Additional training opportunities include:
        - Pre/post workshops and agency meetings
        - ESPC Users Group Meeting
    - Visit www.GovEnergy.gov to register

CHAIRMAN'S CORNER –KELLY KING, PACIFIC BIODIESEL (KTK@BIODIESEL.COM)

- Pacific Biodiesel is a leading pioneer and advocate for the establishment of community-based biodiesel.Pacific Biodiesel works with a community-based model with the following subsidies: Pacific Biodiesel Texas, Cleanway, Encore Oils, Pacific Biodiesel Technologies, Big Island Biodiesel
- Biodiesel is a non-toxic, biodegradable fuel for diesel engines; has low emissions and is 100% renewable/recycled (Pacific Biodiesel only uses used cooking oil). Biodiesel is not vegetable oil and it does not require costly modifications to diesel engines. Biodiesel does *not* contain any fossil fuel (although it can be mixed).
- Biodiesel benefits: reduction in emissions, carbon monoxide, particulate matter, sulfates, carbon dioxide; easy to use – no noticeable changes in power/economy.
- Sustainable Biodiesel Model:
    - Community-based feedstock supply (smaller footprint than centralized plants)
    - Expanded processing capacity with increase local feedstock supply
    - Efficient fuel process
    - Locally sold product
    - Integration of other renewable energy supplies
    - Zero-waste technology
    - Develop co-products and high value side streams to reduce costs
    - Huge benefits for the community: more jobs, new businesses, stable fuel prices and diversified agriculture (90 cents per dollar stays in the community)
- Sustainable Biodiesel Alliance (www.fielresponsiblity.org) offers the best practices for producing biodiesel working on a national certification for biodiesel
- Biodiesel Technologies:
    - Continuous R&D in OR and HI to adjust formulas and processes; waterless process, refinement for glycerin, methanol recapture, efficiency labor/energy costs
    - 15M gallon production capacity at the newest plant
    - Feedstock: multi-feedstock, recover all usable waste oil, encourage sustainably grown biofuel crops
- Average biodisel fuel prices: $4.39/gallon (in between regular and premium, 25 cents cheaper than petroleum diesel)
    - Pacific Biodiesel has sold at $3.85 for the past 2 years
- Questions:
    - What is the storage life of biodiesel? 6 months (diesel is 1 year)
    - At what temperature are issues experience with viscosity: dependant on the type of feedstock; used cooking oil is right around freezing (with 100%); blends do not experience issues (on par with petroleum diesel); meets ASTM requirements (Pacific Biodiesel issues a test sheet with each truck)
    - What is the approximate operating cost? Continuing to analyze production and operating costs (operating costs are somewhat high, currently).
    - Biodiesel in renewables for federal agencies? Pacific Biodiesel program RINs; produced by Pacific Biodiesel, but not a "credit" for the end-user; agencies could count it (if not counted by the supplier)
    - How is the end-cost established? In Maui it is tied to production costs; all other locations are tied to the price of oil
    - How do the emissions compare to petroleum biodiesel? Most emissions are substantially less in biodiesel

- How wide is the source feedstock? All of HI is considered "local"; mainland sources are from OR, WA. If trucks can pick it up for a low-cost it is considered "local". Plants are built in proportion to the amount of feedstock that is available in the area.

TECHNOLOGY PANEL –

NON-DOD TECHNOLOGY EVALUATION PROGRAMS - STEVEN PARKER, PNNL (STEVEN.PARKER@PNL.GOV)

- Lack of marketing/outreach: talk to utilities, state energy offices, university energy programs
- It is important to keep in mind potential bias
- Seek Different opinions: one pilot/demonstration does not provide enough information
- State-supported programs:
  - California Energy Commission (CEC) (www.energy.ca.gov/research); look for publications
  - UC Davis Energy Institute (energy.ucdavis.edu); great resources for specific technologies
  - Florida Solar Energy Center (www.fsec.ucf.edu); cooling or humidity reduction technologies (look at the publication section of the website)
  - Iowa Energy Center (www.energy.iastate.edu); great for controls technology
  - New York State Energy Research (NYSERDA) (www.nyserda.org)
  - Rensselaer Polytechnic Institute (RPI) (www.lrc.rpi.edu); lighting research center
  - Washington State University (www.energy.wsu.edu)
  - Energy Center of Wisconsin (www.ecw.org)
- Utility Energy Centers & Research Programs:
  - Emerging Technologies Coordinating Council: asses new technologies, working to solve CA's energy issues, have a large budget for testing technologies, very detailed and very well documented research
  - Energy Design Resources
  - Food Service Technology Center: fishnick.com; test technologies for kitchens and restaurants
  - Sacramento Municipal Utility District (SMUD); small program but produce great technical reports on a wide range of technologies; all are available on their website
  - Southern California Edison, Energy Centers
  - Lighting Design Lab (www.lightingdesignlab.com): receive support funding from utilities in the pacific northwest, great local resource
  - All utilities study new technologies internally, but reports may not be publically available – agencies should talk to their account reps, but remember to consider the utility's potential bias
  - Professional/Trade Associations: all product professional publications (usually fees involved), but remember to consider the potential bias
  - Other organizations/associations:
    - Alliance to Save Energy (ASE)
    - American Council for and Energy Efficient Economy (AEEE)
    - CEE
    - Northwest Energy Efficiency Alliance (sponsored by local utilities)
    - New Buildings Institute: lighting, envelope design – starting to become available on the website
  - Other resources:
    - Portland Energy Conservation, Inc. (PECI)
    - E Source (must be a paid member to access publications)
    - EPRI: must be a utility-member to access the information; primarily serves utilities (publications presented from the utilities perspective)
- When completing research, remember: the internet is a tool, not a resource; keep the source in mind when evaluating the information (peer-reviewed, screening process, publication date, etc..); new technologies have risk
- Call to action: take proactive steps to make more (reliable)….
- Interagency Technology Deployment Working Group: first meeting on May 19, 2011, 10:00am-12:00noon at 901 D St SW,

DOE EMERGING LIGHTING TECHNOLOGY - BRUCE KINZEY, PNNL (BRUCE.KINZEY@PNL.GOV)

- GATEWAY Solid-State Lighting (SSL) Demonstration Program: demonstrates new, SSL products in real-world applications that save energy, match or improve illumination and are cost-effective
- Demonstrations generate critical field experience providing feedback to manufacturers, data for utility incentives, market readiness of specific applications and advancement in lighting knowledge

- LEDs are not yet a universal lighting solution:
    - Have not been out very long, little standardization, little knowledge of life time
    - the characteristics of the application and the characteristics of the product must be clearly understood before matching the two
    - LED technology is still evolving at a rapid pace
- Illumination quality is also a factor to consider in selecting the proper LED lighting product for the correct application; light distribution is very important light can be more centralized or angled to cover a wider area. The minimum threshold of lighting ranges from site to site and should be considered in choosing the correct LED product. One size does not fit all in LED products.
- Manufacturer claims are not necessarily accurate, understand the needs of your application and the product characteristics before choosing a product. Manufacturers have improved reporting in a more standard fashion.
- Successful applications:
    - DOL Francis Perkins Building; integral occupancy sensor dims fixture to 10% power, ~80% kWh energy savings, 8-year simple payback (retrofit)/5-year simple payback for a new
- Less successful applications: LED T-8 replacement products
    - GATEWAY is completing a laboratory-based comparison of T-8 replacement products
    - Selected the 3 best performers (out of 17) identified in CALiPER testing
    - The final report is still under preparation, will be released soon
        - Sample results: saved about 20W, did not experience a noticeable drop in illumination of the workspace, average price of products $90 (expensive)
- EPAct 2005 established financial incentives for Lighting Power Densities
- Parking structures are low-hanging fruit in lighting (large footprint, low equipment density)
- FEMP Advisory Committee for Exterior Lighting: Bill Sandusky and Linda Sandahl

TESTING PROMISING TECHNOLOGIES - JACK CALLAHAN, BPA (JMCALLAHAN@BPA.GOV)

- BPA Emerging Technologies Program perform R&D on commercially available products; early adopters are key to taking the first steps
- BPA's Emerging Technologies Criteria:
    - Emerging
    - Small market share
    - Energy efficiency (main focus)
    - Technically sound
    - Relevant
- Preferred product lifetime: 15 years
- Savings over time are very hard to determine in field testing
- Currently testing:
    - Residential Heat Pump Water Heater
    - Web-Enabled thermostats
    - LED Down Lights
    - Ductless heat pumps
    - VRF Systems
    - Smart plug strips
    - LED Street Lights
    - Premium Demand Controlled Ventilation
    - PTHP with Occupancy Controls
- Plans for testing:
    - Ductless heat pumps and variable refrigerant flow systems
    - LED streetlights
    - Bi level w/ lighting occupancy sensors
    - Municipal….see slide
- Looking for assessment projects:
    - Address gap in knowledge
    - Answer a specific question
    - Favorable cost/benefit/risk balance

    - Support from advocates and partners
- Technology Field Tests: demonstrates what works and what doesn't
    - Provide NW test installation
    - Quantify energy savings (main focus)
    - Document occupant acceptance
    - Testing product: case studies
- Federal sites can help by identifying emerging technologies, proposing ET assessment projects, hosting field tests, participating in technical advisory groups and sharing stories for case studies

QUESTIONS:

- BPA: Money available for testing? Incentives are available for test projects; smaller focus tests can be paid for 100% (with a particular research question in mind)
- DOE Emerging Lighting Projects: Are illumination projects re-measured after a period of time? Yes, data loggers for high-state/low-state; measured foot candles on the ground for testing as well. Report in development. Considering additional elements such as dirt accumulation and the depreciation from these elements.

JOINT BASE LEWIS-MCCORD (JBLM) CASE STUDY

PROJECT OVERVIEW – BRAD MILLER, BPA (BDMILLER@BPA.GOV)

- 20-50K troops on base
- JBLM Energy Efficiency History:
    - Sept 2007: UESC Signed
    - Dec 2008: Initial financing for $18M
    - July 2010: Refinancing of loan, saving JBLM $723,000
    - Dec 2010: Project planning assistant hired
- Offer solutions to end-use customers; leverage UESCs with rebate potential on the installed ECMs
- Utility rebates process: identify ECMs and install; the end-user receives rebates from the utility (57% ROI for rebates; BPA has invested $11M and has seen an additional $10M in return); potential of $20M of rebate investment
- Working to maximize investment on the natural gas side as well as lighting/controls
- Current Savings Summary:
    - Electrical
        - Completed: 3,014,537 kWh
        - Active: 5,137,730 kWh
    - Natural Gas
        - Completed: 35,852 MBTU
        - Active: 92,916 MBTU

INNOVATIVE LIGHTING AT JBLM – TIM STEELE, BPA (TRSTEELE@BPA.GOV)

- "Innovative" criteria: energy efficiency, cost-effective, equivalent light, improved light quality, value added, reliable
- Technologies used: induction, LED, T5HO, high performance T-8, occupancy sensors
- Induction: replaced 400 watt metal halide with 200 watt induction, reduced energy use by over 50%
- LED: post top retrofit; 150-175 watt metal halide
- Warehouse lighting: low measured light levels controlled by circuit breakers; replaced existing fixtures with 2-lamp T5HO fixtures with occupancy sensors that reduced wattage, increased light "quality" and reduced energy usage by over 50%
- Also improved lighting on street lamps and in warehouses

STEAM PROJECTS AT JBLM – TODD AMUNDSON, BPA (TMAMUNDSON@BPA.GOV)

- Steam supply at JBLM: hundreds of small, natural gas boilers (dedicated to certain buildings)
- Six central steam plants wtih multiple boilers
- Steam to Natural Gas Savings to date; total completed: 35,852 MBTU/$250,964 per year
- Steam to Natural Gas Savings (Active Projects): 92,916 MBTU (est.)/$650,412 per year (est.)
    - Steam eye monitoring
    - Steam plant
    - HVAC
    - Boiler tune ups
- Annualized dollar loss at $12.50/1,000 pounds

- Steam demand reduction and management:
    - By reducing losses, estimated savings are: 45,527 MBTU in the first year or 11,600 MBTU annually
    - ECMs: steam trap replacements, leak/valve repairs & monitoring system (total cost: ~$2.4M)
    - Payback period of 4 year (25% ROI) before utility incentive
- SteamEye Monitoring System: 2,000 traps in real-time, senses the temperature, sound and conductivity (alarms on trap failure that shows when/where/how the trap failed); a monitored trap service agreement exists to ensure timely repair. Expandable system to allow for system growth.
- Energy tracking: monthly tracking of energy usage over time (baseline – post project = 15,500 MBTU/year savings) demonstrates the impact of the steam projects

LOOKING AHEAD – BRAD MILLER, BPA (BDMILLER@BPA.GOV)

- Future work: audits to identify potential projects
- Looking at projects that can be delivered by 2013 – brought on a project assistant to help with project planning
- Examined 700 "high-achieving" buildings and isolated buildings over 5K square feet: identified 273 buildings (audit pre-work estimate)
    - Estimated targets: 380K MBTU or $3.9M; rebates $16.9 (estimated)
- Next steps:
    - Will perform level 2 audits on the "top" 100-150 buildings in the next 12 to 14 months to identify potential projects
    - Will contract the extra work and bring on additional FTE to complete the extra work

QUESTIONS

- How do you handle agency rebates? Will apply rebates to active projects; the GSA area-wide does not allow for mixing project funding
- Do you perform M&V in your projects? Yes – deemed savings: savings are determined before the project; custom savings: the savings are not pre-determined (M&V is required)

UTILITY BUSINESS PRACTICES ISSUES

COMPETITIVE SUBCONTRACTING – GORDON MAYNARD, SOCAL GAS (GOMAYNARD@SEMPRAUTILITIES.COM)

- Competition: FAR 44.4 (C) states: The contracting officer shall, when contracting by negotiation, insert the clause 52.244-5, Competition in Subcontracting, in solicitations and contracts when the contract amount is expected to exceed the simplified acquisition threshold, unless—
    (1)A firm-fixed-price contract, awarded on the basis of adequate price competition or whose prices are set by law or regulation, is contemplated; or
    (2)A time-and-materials, labor-hour, or architect-engineer contract is contemplated.
- Government concerns:
    - Adequate pricing competition
    - Adequate cost or price analysis
- How SCG and SDG&E subcontract procurement process: internal corporate requirements, periodic audits
    - First tier requirements:
        - Competitive sourcing is required above $75K, but recommended on all company purchases
        - Maintain level playing field
        - Evaluation criteria needs to be developed before a Request for Proposal (RFP) is released to the marketplace
        - Supplier evaluation and selection needs to be thoroughly considered and well documented
        - Avoid conflicts of interest

- Steps:
    - Identify internal sourcing team
    - Develop evaluation criteria: varies by project
    - Develop bidder list(narrow down to 6 or fewer subcontractors): consider the company history, client references, proof of insurance, related construction experience (project size, turn-key construction experience, change order history), safety program and history, quality control process, turnaround time in an emergency, standard contract language, historical pricing metrics
    - Create/issue first tier bid document

    - Receive proposals SCG and SDG&E typically allow emailed responses with follow-up signed and dated hard-copy via first class mail, late proposals are automatically rejected
    - Preliminary Response Evaluation: comparative table; bid questionnaire & response
    - Conduct big interviews using pre-determined questions (alternate interviews to limit bidder interaction before or after an interview); discuss line item ECM removal in the event the government wants to scale back the project
    - Final responses evaluation: scorecard evaluation and notify "first position contractor" pending successful UESC agreement (notify "second position contractor" pending unsuccessful first position contractor agreement; notify bid rejections in writing)
- Bid information is not shared

DFAS (DEFENSE FINANCE AND ACCOUNTING SYSTEM) WIDE-AREA WORKFLOW ISSUES – MARK SHVARTZMAN, SOCAL EDISON (MARK.SHVARTZMAN@SCE.COM)

- WAWF was implemented nearly two years ago
- Steps:
    - Review delivery order and task order for accounting lines information
    - Contact the Contracting Officer or Contracting Specialist and request pay DoDAAC and ext. information
    - Create payment log by ACRN (internal log to keep track of invoicing)
    - Begin creating the invoice
- Getting started in WAWF:
    1. Register with Central Contractor Registry (CCR)
    2. Establish an Electronic Business (EB) Point of Contact (POC) in CCR
    3. Register for Electronic Document Access (EDA) – not mandatory, but recommended
    4. Ensure CAGE (Contractor and Government Entity) Code is added to WAWF Group Structure
    5. Establish an Organizational Email Address
    6. Designate a Group Administrator Manager (GAM)
    7. Determine if batch feeds for data input is necessary
    8. Set up PCs to access WAWF
    9. Self Register GAM
    10. Have all users for the CAGE Code(s) self-register on the WAWF website for one of the available vendor roles
- Call the help line for assistance or (for a quicker response) e-mail your question
- Follow the screen prompts – make sure you have all of the pertinent information before attempting to create the invoice
- Use the save draft document feature (if the application times out, all submissions will be cleared)
- A notification is sent via e-mail to notify you of the successful submission of the invoice

ENERGY PROJECT INCENTIVE FUNDS – LIZ STUART, LBNL (ESTUART@LBL.GOV)

- EE funding overview:
    - Ratepayer-funded EE budget $5.3B in 2010; Plus over $1B for DR/LM and $1.5B for renewables
    - Expected to reach $6B for EE in 2011 (Nearly double the 2008 figure ($3.1B))
    - Strong expansion expected to 2020: Total expected to reach $7.5-12.4B (EE only)
    - ~45 states have ratepayer-funded EE. Recent entrants: NM, MI, NC, AR, VA, OH, PA and IN.
    - Expected to reach $6B for EE in 2011 (nearly double the 2008 figure)
- LBNL study:
    - Categorized companies into leaders, up-and-comers and "uncommitteds"
    - Leaders: 1%+ spent of revenues from electric sales
    - Up-and-comers (~15) and "uncommitteds" (~20)
- Trends:
    - Lots of growth, especially in the long run
    - MA and RI passed "least cost procumrent" legislation
- Why the generocity?
    - EE is cheaper and easier than new generation
- Common rebates:
    - Prescriptive measures
    - Custom incentives: non-standard equipment or whole building approaches
    - Design assistance
    - No- or low-cost energy audits

    - Re-/retro-commissioning
    - Incentives for performance contractors
    - Load management
- Common renewable incentives:
    - PV
    - Wind
    - Geothermal
    - Small hyro
    - Biomass
    - Other incentives: RECs, tax credits
- Remember: check the availability of funds – funds can be exhausted before the end of the year
- Enabling Legislation:
    - EPAct 1992: agencies are able and encouraged to use these funds
    - Two attorneys at Federal agencies have argued otherwise (important to keep in mind)
- Accepting Payment: assign directly to the ESCo or apply to utility account and receive credit
- What's available? FEMP website with a clickable map to explore the incentives offered in your state (similar to DSIRE, but excludes non-applicable rebates and adds in demand response)
- Contact your utility to learn what is available for your facility; FEMP or LBNL

QUESTIONS

- What do you provide the government for proof of contracting? Write-up of the subcontractor selection; who was invited – who responded – and who was selected/how
- Rebates: what are active and what are dead? LBNL updates the map annually and tracks policies, programs and contact utilities for new information. Start with DSIRE, but that information is often out of date.

ON THE PATH TO NET ZERO – DAVE HEWITT (DAVE@NEWBUILDINGS.ORG)

- New Buildings Institute: non-profit, think tank on commercial building energy efficiency; receive sponsorships and grants from utilities and research organizations
- Nature of our work: leadership & policy, design guidance, research, building science and performance
- NBI identified about 100 buildings around the country that had energy performance
- Fewer than 1 in 1000 new buildings reach this level of efficiency (owner-driven)
- Frequently used technologies:
    - Daylighting
    - Controls
    - Increased insulation
    - HVAC
    - Natural ventilation
    - Heat recovery
    - Applied PV
    - Glazing performance
    - Demonstration PV
- Buildings study:
    - HP buildings have the "best of the best" such as advanced mechanical, daylighting, advanced controls, natural ventilation and actually monitor the building performance
    - "Worst" buildings were not monitoring the building status
    - 15-20 net zero buildings currently in the US (avg square footage: 6K)
- Bold Goals:
    - All new residential buildings in CA will be zero net energy by 2020
    - All new commercial construction in California will be zero net energy by 2030 and 50% of existing buildings.
        - Heating, Ventilation and Air Conditioning (HVAC) will be transformed to ensure that its energy performance is optimal for California's climate
        - All eligible low-income customers will be given the opportunity to participate in the low income energy efficiency program by 2020.

- CBC Goals and Objectives:
    - Characterize barriers and challenges, then recommend solutions
    - Coordinate with industry to act on those recommendations
    - Provide broad industry perspective to programs and strategy at the state, regional, and national levels
    - Ultimate Goal: to accelerate market transition to net-zero energy commercial buildings
    - CBC publications: Next Generation Technologies Report; Analysis of Cost and Non-Cost Barriers and Policy Solutions
- Themes of net zero buildings:
    - Integrated design is the most critical aspect
    - Next item to focus on: unregulated loads, consistent, long-term metrics to measure the performance of buildings and policy and more measured performance data
- Existing buildings
    - Huge range of operational levels between existing buildings (excluding hospitals and labs)
    - Existing buildings have assets that can be utilized
    - NBI formed a partnership with National Trust for Historic Preservation to examine existing buildings and create innovative technical solution sets that build on the strengths of existing buildings
- Resources:
    - Advanced Lighting Guidelines: refreshed and updated annually, initial levels are free but full subscriptions are available (subscription fees pay for updates)
    - Daylighting Pattern Book: based on 20 of the best buildings in the country
    - Offices Guide
    - Offices of the Future Consortium: integrated technical solutions in existing office space; tenant improvement (applicable to federal office buildings – similar to GSA guidelines)
- Questions:
    - Why the huge usage in plug loads? DOT theory: designers, operators and tenants must work together to reduce usage
    - Should emissions be added to the net-zero theory? NBI focuses on net zero energy (water, energy and waste

AIR FORCE RENEWABLES UPDATE – KEN GRAY, AFCESA/CENR (KEN.GRAY@TYNDALL.AF.MIL)

- Air Force energy usage:
  - Approximately $8.2B in energy (FY2010); an increase of 22% from 2009 – average $7-9B in energy costs annually
  - 84% of energy consumption is in aviation; 12% - facilities
  - Facility energy use (does not include expeditionary energy use such as Iraq or Afghanistan): 64 trillion BTUs (FY2010); electricity and natural gas make up the bulk of energy use
  - AF utility costs are trending upward for the past 16 years; in FY2010 costs are down 13% from FY2009 (6.25% less consumption in addition to 6.75% decrease in commodity costs)
  - It is becoming more challenging to meet reduction goals – most of the low hanging fruit is complete
  - Without RECs, the AF is not doing well. When is phases out the AF will no longer be meeting federal energy mandates; major focus on completing large projects to meet the mandates
- Renewable technologies: solar, wind, landfill gas, hydropower, ground source heat pumps – working to implement additional technologies suc has biomass and waste to energy
  - First priority: on-site renewable resources
  - Second priority: purchase renewable power from off-site resources delivered over the power grid
  - Third priority: purchase RECs (replacement RECs; goal attainment)
  - The AF will not pay a premium for RECs (at or below commercial cost)
  - Renewable energy Power Purchase Agreement (PPA): provides lower cost energy solutions; developers hold and sell RECs in the marketplace; AF does not have statutory authority to sell renewable energy credits (seen as government property) – working with DLA Energy to modify this
  - Investment on government-owned renewable energy
    - RE goal: 25% on AF electric consumption by 2025
    - Nellis PV produces: 28,570 MWH; the AF needs to complete 79 Nellis-sized projects (140 acres each); ~$7.9B capital investment
    - Third party is the way to go for AF
- AF renewable power status:
  - The AF is above EPAct 2005 goals; but anticipate will be meeting goals by 2012
  - 7 projects anticipated to become operational soon (awarded in 2009/2010)
  - 13 projects expected in FY11-12; 7 projects anticipated in FY13
  - Each evaluated for business case, energy security (significant internal approval process
  - Funding strategy: 81% of funding will be from third party investment
  - 10 USC 2911 (DoD-only requirement); AF will meet and exceed the goal – benefits for the AF to meet this goal in other areas; will provide less dependence on fossil fuels. AF is on track and has the success to continue.
- Project development
  - Feasibility study: RE types
  - Looking at the top energy types: biomass looks the most promising
  - AF now focusing on waste energy: developing Dyess AFB as an initial project will establish best practices; estimated completion of opportunity assessments in May 2011
- Challenges with utility solutions:
  - Timely resolution of utility company involvement under 40 USC 591 – requires compliance with state law (use of jurisdictional provider); requests support with RE projects need a timely response on utility interest (propose 120 days); negative response allows AF to seek SAF approval to competitively procure (focus on mutually beneficial opportunities)
  - Developing RE with utility companies: perception issue that the AF did not compete to the public
  - Buy American clause for PV panels (in any ESPC, UESC, utility service, land lease contract installed on DoD property) American-made panels are more expensive – may push projects back.
- AF RE Symposium: June 28-29, 2011 Davis Mothan AFB, AZ; request more utility participation
- AF UESCs – reinvigorating program (new AF policy allow third party financing) with centralized management by AFCESA Conservation Branch (projects do not require AFCESA/CEN approval – POC: Les Martin). UESCs are only performed with the utility contractor (UESCs must be between the federal government and the utility provider – ESCos would be a subcontractor to the utility)
- AF Demand Response Program: AF installations are encourage to participate and use as able; AF interpret the FAR that the federal government cannot accept terms that impose a penalty for non-participation in

- Questions:
  - Is UNICOR producing PV panels? Yes, the AF is engaged with UNICOR to procure panels from UNICOR to satisfy the buy American requirement.
  - Tipping fees on biomass? AF tries to create a partnership with the local community to include their waste in the cost analysis. The AF is interested in hear ideas for other biomass projects. The AF will issue a broad RFI for idea/concepts for solid waste projects (broad, no specific locations)
  - A warranted CO would need to be involved in procuring panels from UNICOR
  - Wise investment to buy RECs that now there is nothing to show from it? At the time (2005) RECs were purchased to reward those building RE projects because the AF did not have any RE projects "shovel-ready" at the time. AF is continuing to adjust their view/activities with RECs in accordance with goal attainment and performance. It was a business decision by the AF – amount of money spent on RECs is not significant (FY2010 $200K; $33K in FY2011)
  - Third party contracts including RECs: the utility takes the RECs to the market – AF still counts these RECs in meeting requirements (the AF buys replacement RECs)
  - Demand response program: structure incentive to credit the UESC (so it doesn't go to the treasury and benefit the base): take the credit off the top and not issue a rebate
  - If you have multiple qualified utilities wanting to do work at the same facility, how do you compete that? Cannot provide an answer, would seek precedent - would seek the best value for the government
  - Biomass to solid waste projects will provide unique challenges for base staff; what help will AFCESA provide? AFCESA will examine the road infrastructure and issue a best practices guide – develop a dedicated gate for trucks. Bases are heavily invested in these projects.
  - AF respects the risk-reward owner

DHS NATIONAL CYBER SECURITY DIVISION CONTROL SYSTEMS SECURITY – RITA WELLS, INL (RITA.WELLS@INL.GOV)

- Roadmap- Framework for Public; continues to serve as the guide for the DOE National SCADA Test Bed (NSTB) Program
  - Cyber security assessments and recommended mitigations for energy control systems
  - Integrated risk analysis
  - Secure next generation control systems technology (R&D)
  - Public-private partnership, outreach and awareness
  - 17 NSTB facilities from six national labs performing analysis
  - Education/outreach work: University of Illinois – game-changing R&D needed to make survivable systems a reality
- Key goals:
  - Measure and assess security posture
  - Develop and integrate protective measures
  - Detect intrusion and implement response strategies
  - Sustain security improvements
- INL focus:
  - Vendor control systems and associated components on-site at utility field installations and at the INL SCADA Test Bed Facility
  - Work with Detroit Edison, Areva, Siemens, GE Energy, Telvent, ATC, OSI, etc.
  - Very detailed legal agreements with each vendor in order to work side-by-side with the vendors
  - Industry outreach: vendors and asset owners
    - Shares information with industry related to cyber vulnerabilities sand mitigations
    - Provides a red-team/blue-team demonstration of a live attack
  - 2010 Lab-led projects:
    - High-Level Language Microcontroller Implementation (Idaho)
    - Control System…see slide
    - Automated Vulnerability Detection for compiled smart grid software (ORNL)
    - New generation secure, scalable communication network for the smart grid (ORNL)
- Critical infrastructure test range complex
  - Traditional phone networks
  - Ethernet
  - Next generation cellular
  - Wireless networks

    - Legacy architectures
    - Non-production configurations
    - Latest versions from vendor partners
    - Emulators/simulators
- Other projects: DHS National Cyber Security Division Control Systems Security Program (www.us-cert.gov/control_systems)
- Smart grid applications: two-way communications for networks for status and control; distribution: advanced metering infrastructure (AMI); vulnerability discovery, exploits (currently being written), consequences (propagating malware, financial)
- Case Study: power theft (threat to energy security); meter tampering - losing $400M/annually
- Networks/Standards Issues
    - Increased dependence on wireless communications
    - Ownership of data communications and cyber security for power
    - Some competing standard (added difficulty)
- Security checks
    - Know the business: coupled/de-coupled rate structures
    - Know the customer profile: support green energy, price conscience and awareness of energy efficiency
    - Quality assurance checks on meters (at installation, after upgrades and periodically during spot checks)
    - Revenue protection applications
- Questions:
    - Inquires from the Defense Standards Board? INL work is extremely deep/detailed – NIST has visited - lack of funding for participating on standards boards
    - Procurement specs – what should we be looking for? Widgets will not save you; do basic engineering – understand your network and what it is doing; evaluate technologies for cyber security; engineering work is required to know what is being procured
    - Suggestion on how to help military base decision-makers to push the process forward? Partnerships – embrace IT folks on base and the chief of information operations/controls. The people in uniforms need to know how to maintain/run the equipment.
    - How can agencies work with the expertise of your team to learn how to make their networks safer? National Vulnerability Database, third-party technology expert, form a partnership with

EDISON ELECTRIC INSTITUTE UPDATE (EEI) – STEVE KIESNER, EEI (SKIESNER@EEI.ORG)

- EEI provides public policy leadership, critical industry data, market opportunities, strategic business intelligence, conferences and forums.
- Current electricity landscape
    - Investment cycle drive by the need to address: generation, transmission and distribution to ensure reliability; energy efficiency; technology deployment; environmental issues
    - Increasing concerns about the environment and the supply mix
    - The electric utility industry is no longer a declining cost industry (cost of raw materials such as copper, cement, etc.) – therefore there is an increasing amount of rate cases to pay for investments
    - Aging workforce during a time of modernization (fewer young engineers in this country)
    - The utility role for driving new technology has become increasingly complicated
    - New congress with vastly different priorities
- Big changes in electricity:
    - Public policy: environmental, nuclear power (concerns over the situation in Japan)
    - Energy sources: shale gas (abundant supply and improved pipelines; volatility likely to flatten)
    - Technology: smart grid system (two way communication between end-users and the utility)
- Infrastructure needs
    - Transmission: $297.8B to support for new non-wind generation and reinforce the grid for reliability
    - Distribution: $581.5B to replace again infrastructure, connect new customers, enhance reliability, improve power quality and deploy “smart grid” components
    - Generation: $951B to serve new load, meet renewable resources mandates, build new nuclear generation, build new cola generation and retire carbon-intensive generation (especially in the southeast and mid-west)
- Actual and planned investment; continued growth expected
- Climate policy

    - No climate legislation likely
    - Eyes on the EPA to regulate GHG' sunder a Cleaner Air Act (CAA)
    - Especially complicated for the electric industry's generation fleet
    - Continued attention is expected on new environmental regulations for coal generation
- Electric industry's climate policy objectives
    - Minimize economic impact on consumers
    - Continue environmental improvements
    - Maintain system reliability
    - Maintain fuel diversity options
    - Develop and deploy new technologies
    - Obtain access to low-cost capital and cost recovery for the planned investments
    - Negotiate myriad political landscapes
- Near term decisions on electric generation
    - Significant environmental regulation
    - Renewables mandates
    - Unknown cost of carbon
    - Low gas prices
    - Slow to moderate economic recovery
    - All of these will result in a natural gas cycle build and renewable investment (mostly wind) and retirements of small (<500 mWh)/old coal fleets; retrofits of new and larger coal flits; little/no new coal; possible nuclear renaissance (despite Japan) – storage of spent fuel rods is a point of contention
- Smart grid
    - Enhanced reliability; more efficient grid; information and tools responsive to the grid conditions through electric devices and new services
    - Modernization in the form of smart meters (AMI), reliability restoration capabilities and energy storage
    - Economic and regulatory challenges stem from slow growth in sales, flat demand, deficit concerns and sustained high unemployment – need further modernization
        - Group such as AARP are raising objections to the smart grid for economic reasons
        - State regulators are hesitant to approve cost recovery for major smart grid investments
        - New competitors and venture capitalists are slow to energy the industry; the "buzz" has faded due to the economic uncertainty
- DoD-Utility Engagement
    - CEO Task Force (formed in 2009) has held four (4) formal meetings Dr. Robyn and the Assistant Secretaries from the Navy, Army and Air Force to improve communications and cooperation between the electric industry and DoD on energy security matters and alignment of goals.
    - Reached an agreements on: an approach on sharing sensitive information; model approaches on grid-scale renewable projects and models for siting utility-owned and operated plants on military land (related to DoD's desire to island assets)
    - Work has been delayed due to FACA concerns (requires open meetings when involving industry)
    - Encouraging members to work with installations in order to develop pilots (as suggested by OSD)
- Questions:
    - What are the environmental concerns on renewables? NGOs and states often drive those requirements
    - Is implementation of net zero a threat for potential loss of revenue? EEI does not have an official view on net zero. Loss of revenue is a concern, but encourages energy efficiency efforts. Alternative regulation is a major concern of EEI – the current structure cannot sustain itself.

INTER-CONNECT AGREEMENTS – LINDA COLLINS, GSA (LINDAL.COLLINS@GSA.GOV)

- The issue: the government is moving to on-site generation to peak shave and shift demand loads
- Agencies shuold work with their serving utility prior to starting on an on-site generation project
- Exceptions:
    - GAO decision; keys – required source, required service, tariff of PSC action on contract, rejection of government contract.

- If the utility has an AWC, the interconnection can be done under Exhibit “A” to GSA AWC if included by state PUC as a tariffed service; the total contract can also be done as UESC under the AWC; standby tariffs and fees related to on-site interconnect of renewable generation
- You cannot strike or change the language in the tariff requirement – some will change (PUCs may not allow the change); a decision needs to be made to allow for an easier process. Your utility should be able to sign individual task orders.
- Interconnection agreements fall under FAR, Part 41 – but it is subject to the PUC and it is tariffed
- GSA and FEMP should develop a training course on interconnection agreements

NEXT MEETING: GOVENERGY, WEDNESDAY, AUGUST 10 IN CINCINNATI, OH (Please submit panelist suggestions to Julia Kelley, kelleyjs@ornl.gov for the GovEnergy meeting)

ENABLING MASS-SCALE FINANCING FOR FEDERAL ENERGY, WATER AND SUSTAINABILITY PROJECTS - LESLIE NICHOLLS, ENERGETICS (LNICHOLLS@ENERGETICS.COM)

- "ENABLE" mass-scale financing of small federal energy and water efficiency projects through the use of ESCOs and public/private sector financing. ENABLE will provide a viable financing alternative for federal facilities that do not have projects of the size or scope or in the locations suitable for ESPCs and UESCs.
- Financing for small projects is the missing link for FEMP's customers experiencing a lack of appropriations and a growing need to complete projects. ENABLE can fill this gap and is strongly supported by Tim Unruh, FEMP's new Program Manager
- Federal agencies are experiencing increased requirements for federal energy and water efficiency, in addition to new requirements for reducing greenhouse gas (GHG) emissions and implementing sustainable facility operations
    - Most notably, EISA Section 432 requires audits on all "covered facilities" that constitute at least 75% of the total facility energy use for the agency. This requirement will result in 20-25,000 building audits per year that will identify thousands of ECMs. As a result, the backlog of unfunded energy projects will continue to grow.
- ENABLE is geared towards smaller facilities (200,000 square feet or below) that constitute 99.8% of federal buildings. (This vehicle assumes that the ESPC/UESC options will provide 50% of the needs of all federal facilities over 3 million square feet). Specifically, DOE/FEMP is interested in developing a method of financing that will:
    - Target buildings under 200K sq ft and /or projects under $500K
    - Provide a steam-lined, automated process (3-6 months)
    - Offer a select group of ECMs (well-understood performance and little M&V required)
    - Provide an attractive investment package to financiers on a wide scale
    - Increase small business participation
- After the initial working group meeting in March, FEMP visited with DOE GC and received positive feedback. ENABLE is legally viable under the statutory authority for ESPCs.
- Market potential:
    - 150,000 buildings totaling about 1.5 billion sq.ft.
    - At an average annual energy expense of $1.50 to $2.00 per sq.ft., these buildings account for $3.5 – $4.7 Billion annually in energy expenses
    - ENABLE's goal is to capture 10% to 20% savings on average with projects in the 5-10 year simple payback range = finance a total of up to $8 Billion in projects, tune-ups and retro-Cx
    - FEMP assumes that 50% of the need would be satisfied with UESCs and ESPCs, but there is still another 50% that will not be met – ENABLE would fill this gap to stay on track with federal mandates in light of decreasing funding
    - Other means of acquiring financing is necessary in addition to ESPC, UESC, state programs, and utility rebate/incentive programs
- ENABLE elements:
    - Provide a fast track process for feds to get projects reviewed, approved and in the ground as quickly as possible while maintaining technical, legal, contractual, and financial integrity. This would include:
        - Procedures to go directly from EISA energy audits to funding methods.
        - Ensuring that EISA audit recommendations are implemented as soon as possible
        - A ready source of financing for qualified ESCOs
        - A maximum six month cycle time from initiation of request by an agency to a signed contract with an ESCO.
    - Special consideration for O&M and retro-commissioning
    - Standard procedures for common ECMs (such as lighting, motion/occupancy sensors, daylighting, water retrofits, pump/motor replacements, storm windows, retrofit packaged units, or vending machine economizers)
    - Simplified and standardized M&V/acceptance procedures, Rely on existing statutory authority for third party financing
    - Use existing contracting vehicles

    - If needed, initiate a DOE HQ IDIQ contract for small federal sites/projects and small businesses (should be determined by mid-May)
    - FEMP-managed, electronic, automated system that manages the critical path and track each project in accordance with EISA
- FEMP has received word that ENABLE can be performed under the existing legislation, however a simplified M&V strategy is being considered to assure compliance with EISA performance tracking requirements
- Similar programs exist on the state level:
    - Iowa Building Energy Management Program provides: http://www.state.ia.us/government/governor/energy/Energy%20Efficiency/BEST.html
    - Pennsylvania Small Energy Service Company (SESCO) Program http://www.portal.state.pa.us/portal/server.pt/community/energy/1300/small_energy_service_company_%28sesco%29_program/547755
    - Texas LoanSTAR Revolving Loan Program http://www.seco.cpa.state.tx.us/ls/
    - New York – NYSERDA – Residential Program: http://www.nyserda.org/GreenNY/gjgny-financing.asp
- ENABLE Timeline
    - Working group kick-off meeting: March 2011
    - Issue investigation
    - Working group meeting: May 2011
    - Working model: July 31, 2011
    - Program roll-out: August 2011
    - Fully functioning program by December 31, 2011
- Questions?
    - When an agency bundles sites-does each site have to independently pay for itself or will it be at the bundled level? This question is currently under review by DOE General Counsel (GC)
    - ENABLE appears to be a brand-new concept, why is it being compared to UESC and ESPC? ENABLE incorporates similar elements to ESPC and UESC, however agencies expressed concern regarding the legal statue in which federal sites can engage in this – the current ESPC legislation allows for ENABLE as long as M&V Option A is included. It is not simply an IDIQ. The ESCos would guarantee the savings from the standard list of "approved" ECMs. ENABLE is outside the realm of the UESC legal authority.
    - Multiple serving utilities at one installation is an issue in UESC. Will this be an issue in ENABLE? Will the contract have to be recompeted? This question is currently under review by DOE General Counsel (GC), however it is not to replace UESC or ESPC. ENABLE can solve the issue of attracting financing/ESCo attention by bundling small sites.
    - Would there be a "stair-step" agreement for bundling? The process for agency bundling is still being established in the parameters. Agencies have also asked for the maximum amount available in financing (as the minimum begins a $500K).
    - How will the paybacks be addressed? Will it be based on the entire bundle or for each project? A legal opinion is currently being drafted by two agencies.
    - How will FEMP help during the review and approval process? Via a FEMP-managed, electronic, automated system that manages the critical path and track each project in accordance with EISA. The database will provide the expected savings.
    - Are contractors willing to accept the information provided by the database? Contactors would still need the current utility information for establishing the baseline at the facility.
    - Regarding EISA audit requirements: who is responsible for conducting the audit? This question is under consideration. FEMP will address if the agency can perform the audit, or if the ESCo be brought in to perform the audit. Many agencies indicated that they already had audits completed.
    - Do you envision this mechanism (ENABLE) including the audit portion, or does it assume that the audits are already complete? This question has been asked and it is project-specific. Two possible scenarios: one: facilities already have an audit – will piece out the ECMs and move forward ("auditing the audit"). Another scenario: facilities do not have audits complete. Therefore, the facilities will be evaluated for ECMs on the "approved" list.
    - With the short timeframe, how will ESCo competition be handled? The ESCo competition process will be determined once the source list is established (either from DOE's "sweet 16" or the GSA Schedule). The goal is to have a pre-selected pool and then choose 3-5 to compete for the project.

- How will pricing be determined? Fixed pricing? A decision will be reached in mid-May or June. Products will be picked from an approved list with pricing, general life-span, etc. The ECMs and expected savings will be industry-accepted across the board.

POWER PURCHASE AGREEMENT UPDATE – CHANDRA SHAH, NREL (CHANDRA.SHAH@NREL.GOV)

- DLA Energy has an updated PPA template; the template will be posted on the FEMP sample documents page: http://www1.eere.energy.gov/femp/financing/ppa_sampledocs.html
- PPA Request for Information: issued March 2, 2011 (11 responses received and are currently being evaluated)
  - The template will be revised based on common issues identified in the RFI responses
  - Common issues:
    - Contract length limitations
    - End of Contract, Disposition of Renewable Project
    - Termination for Convenience
    - Site Access/Land Use Agreement Options
    - Creation of Special Purpose Entities for Project Development

-This presentation covers contract length & termination only-

CONTRACT LENGTH LIMITATIONS

- Options presented in the RFI
  - Ten year PPA contract (using FAR Part 41) with long term land use agreement (LUA)
    - Government has right of first refusal for electricity at pre-determined price at end of PPA contract
    - Contractor can sell electricity on open market if government elects not to purchase electricity
  - Ten year PPA contract, with ten year option
    - Price could be negotiated at time of option or established in original contract
    - Must be a "true" option, requiring:
      1) No assumption that the option will be exercised
      2) No penalties if the option is not exercised
    - NOTE: DOE is still investigating whether this is a viable option.
  - Indefinite term with a one year termination notice (Nellis AFB model)
    - Either with or without a long term LUA
- Key Findings: Contract Length Limitations
  - Long contract length key for financially viable projects
    - 10 year contract term raises PPA prices 25 to 65% compared to a typical 20 or 30 year PPA
  - None of the proposed options were compelling as financiers would consider them to be high risk
  - 10 year contract with long term LUA
    - Varying opinions on whether this is viable option
    - Market for power must exist, with buyer willing to pay more than market price due to RPS or other policy
- Suggested alternatives
  - A 10 year contract with 10 year option would have little or no impact on PPA price relative to 10 year contract with no option
  - Indefinite term with one year termination would be considered risky by most financiers
    - Inclusion of a 20 year termination value schedule (TVS) helps
    - The "indefinite" term is limited by tax regulations, as term cannot extend beyond useful life
- Suggested Alternatives from Respondents (Note: DOE does not endorse the following options, as it is not clear whether they are viable from a practical or legal standpoint. Check with your contracting and legal counsel staff before proceeding.)
  - Use Power Marketing Administration such as Western Area Power Administration
  - 20 year PPA with host termination right in year 10, triggering TVS
  - Contractor has put option to sell renewable asset at price equal to net present value of revenues contractor would have recovered during a twenty-year term PPA
  - Pre-paid contract : Federal agency pays for renewable power in advance
  - 10 year contract structured with option to extend contract in years 5 & 11
    - Low PPA rates for first 5 years
    - Significant PPA rate increase in year 6 unless option is exercised

        - Similar option in year 11

TERMINATION FOR CONVENIENCE

- Key Findings
    - Concern that unilateral right by Government to terminate, per the FAR 52.212-4(l) Termination for Convenience (T4C) clause, increases project costs and reduces project viability from investor standpoint
    - Inclusion of Termination Value Schedule (TVS) reduced/eliminates risk
        - TVS must be detailed and specific
        - Must include all costs (including tax penalties for termination in first 5 or so years) necessary to make investor whole
        - Termination must be completed in reasonable timeframe
        - Consider contractor's ability to mitigate losses
    - Termination ceiling does not provide sufficient assurance that investor will be made whole
        - A TVS or termination floor is preferable
        - Termination ceiling is better than no termination provision at all
- Next Steps
    - Conduct a more comprehensive review of the RFI responses
    - A detailed RFI response summary will be presented at GovEnergy

Contact Julia Kelley (kelleyjs@ornl.gov) to be added to the Energy Lawyers and Contracting Officers Working Group distribution list, or to submit topic suggestions for future meetings.