Leveraging Procurement to Achieve Energy Savings

Sustainable Federal Operations Group

Liyang Wang
Sravan Chalasani
Molly Morabito
Current Success & Potential of Federal Procurement
Policy progress so far...

1970s
- Oil Embargo of 1972
- National Energy Conservation Policy Act

1990s
- Requirement to procure energy efficient products

2000s
- Federal Acquisition Regulation Part 23.2
- E.O. 13221: Energy-Efficient Standby Power Devices

2010s
- E.O. 13834: Efficient Federal Operations

E.O. 13834: Efficient Federal Operations
Assisting in the implementation of E.O. 13834

Requirements and Priority Strategies:

Section 2(g): “Mandates for Purchasing Preference: Agencies must give purchasing preference to products that: ....

• Are certified by ENERGY STAR or designated by FEMP as energy efficient products (42 U.S.C. § 8259b, 10 CFR part 436, subpart C).”

Tracking and Reporting:

“data points tracked as indicators currently include:

• Number of applicable contract actions containing sustainable clauses.”
Assisting in compliance with FAR Clause

FAR Part 23.203

“Energy-efficient product means a product that –

(i) Meets Department of Energy and Environmental Protection Agency criteria for use of the Energy Star trademark label; or

(ii) Is in the upper 25 percent of efficiency for all similar products as designated by the Department of Energy's Federal Energy Management Program.”
Covered product categories

- Appliances
- Commercial Food Service Equipment
- Electronics and IT Products
- Heating and Cooling Products
- Lighting Products
Meeting mandates for purchasing preference

This cost calculator is a screening tool that estimates a product's lifetime energy cost savings at various efficiency levels. Learn more about the calculator assumptions and definitions.

**Project Type**

<table>
<thead>
<tr>
<th>Energy Cost Savings</th>
<th>You save $53,028!</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Is this a new installation or a replacement?</strong></td>
<td><strong>New</strong> Replacement How many chillers will you purchase?</td>
</tr>
<tr>
<td><strong>Performance Factors</strong></td>
<td><strong>$0</strong></td>
</tr>
<tr>
<td>What is the new design condition?</td>
<td>Full Load</td>
</tr>
<tr>
<td>What is the cooling capacity of the new chiller?</td>
<td>10 tons</td>
</tr>
<tr>
<td>What is the full-load efficiency of the new chiller?</td>
<td>10.0 EER</td>
</tr>
<tr>
<td>What is the partial-load efficiency of the new chiller?</td>
<td>15.0 EER</td>
</tr>
</tbody>
</table>

A chiller of the efficiency you specified will save $53,028 in lifetime avoided energy costs.

**Cost Factors**

- What is the current cost of energy? $0.01 per kWh
- What are the annual hours of operation in equivalent full-load hours? 2000 hours

You can Save $53,028 more per unit

Make a Cost-Effective Purchase: Reduces Operating Costs by Buying a FEMP-D designating Product

FEMP offers rebates to help cover up to $5000 for purchasing energy-efficient water-cooled chillers. The rebates are available for purchase or new construction projects. Rebates for full-load and partial-load chillers are offered. Also, the rebate caps are $5000 and $2500 for full-load and partial-load chillers, respectively.

**Deem When FEMP-D Designated Products Are Cost-Effective**

An efficient product is cost-effective when the lifetime energy savings from avoiding energy costs over the life of the product exceed the additional purchase cost of an energy-efficient product compared to a non-energy-efficient product. FEMP considers both front-end and lifetime energy savings when assessing energy efficiency levels. When performing an analysis, FEMP-D will perform an estimate of the cost-effective performance. The FEMP-D program requires a detailed cost analysis to avoid the cost savings from using more efficient products. In this case, the analysis will show the cost savings from using more efficient products.

**Claim an Exception to Federal Purchasing Requirements**

FEMP provides rebates for the purchase of water-cooled chillers. These rebates are available for new construction projects. The rebates are offered for full-load and partial-load chillers. The rebate caps are $5000 and $2500 for full-load and partial-load chillers, respectively.

**Water-Chilling Packages: Minimum Efficiency Requirements**

<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>Size Category</th>
<th>Units</th>
<th>Minimum Efficiency Path A (Full-load Optimized Applications)</th>
<th>Path B (Part-load Optimized Applications)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air-cooled</td>
<td>&lt;150 t</td>
<td>EER</td>
<td>0.05 g. FL</td>
<td>0.55 g. FL</td>
</tr>
<tr>
<td>Air-cooled</td>
<td>150 t - 300 t</td>
<td>EER</td>
<td>0.10 g. FL</td>
<td>0.70 g. FL</td>
</tr>
<tr>
<td>Air-cooled</td>
<td>&gt;300 t</td>
<td>EER</td>
<td>0.15 g. FL</td>
<td>0.90 g. FL</td>
</tr>
<tr>
<td>Water-cooled, electric-operated positive displacement</td>
<td>&lt;75 t</td>
<td>kw/t</td>
<td>0.05 g. FL</td>
<td>0.70 g. FL</td>
</tr>
<tr>
<td>Water-cooled, electric-operated positive displacement</td>
<td>&lt;100 t</td>
<td>kw/t</td>
<td>0.05 g. FL</td>
<td>0.75 g. FL</td>
</tr>
<tr>
<td>Water-cooled, electric-operated positive displacement</td>
<td>&gt;100 t</td>
<td>kw/t</td>
<td>0.05 g. FL</td>
<td>0.80 g. FL</td>
</tr>
<tr>
<td>Water-cooled, electric-operated positive displacement</td>
<td>&lt;150 t</td>
<td>kw/t</td>
<td>0.05 g. FL</td>
<td>0.85 g. FL</td>
</tr>
<tr>
<td>Water-cooled, electric-operated positive displacement</td>
<td>&gt;150 t</td>
<td>kw/t</td>
<td>0.05 g. FL</td>
<td>0.90 g. FL</td>
</tr>
<tr>
<td>Water-cooled, electric-operated positive displacement</td>
<td>&lt;200 t</td>
<td>kw/t</td>
<td>0.05 g. FL</td>
<td>0.95 g. FL</td>
</tr>
<tr>
<td>Water-cooled, electric-operated positive displacement</td>
<td>&gt;200 t</td>
<td>kw/t</td>
<td>0.05 g. FL</td>
<td>1.00 g. FL</td>
</tr>
<tr>
<td>Water-cooled, electric-operated centrifugal</td>
<td>&lt;150 t</td>
<td>kw/t</td>
<td>0.05 g. FL</td>
<td>0.80 g. FL</td>
</tr>
<tr>
<td>Water-cooled, electric-operated centrifugal</td>
<td>&gt;150 t</td>
<td>kw/t</td>
<td>0.05 g. FL</td>
<td>0.85 g. FL</td>
</tr>
<tr>
<td>Water-cooled, electric-operated centrifugal</td>
<td>&lt;200 t</td>
<td>kw/t</td>
<td>0.05 g. FL</td>
<td>0.90 g. FL</td>
</tr>
<tr>
<td>Water-cooled, electric-operated centrifugal</td>
<td>&gt;200 t</td>
<td>kw/t</td>
<td>0.05 g. FL</td>
<td>0.95 g. FL</td>
</tr>
</tbody>
</table>

Download table
Additional FEMP resources

These guides are aimed at educating and enabling COs to communicate the specific energy-efficiency requirements to vendors in solicitations.
FEMP provides direct technical assistance for

- Energy-efficient products & technologies
- ESPC
- Fleets
- Laboratories
- Metering
- Operation & Maintenance
- Resilience planning
- Water management
- Awards
- Distributed Energy (renewables, storages, CHP)
- Auditing

and more!
Cumulative potential program savings

- **Graph**: Cumulative Energy Cost Savings ($ million) from 2000 to 2018, showing a significant increase with full compliance.
Potential program savings
Analyzing Federal Procurement Activities
FedBizOpps Database
Key terms and caveats

• Evaluated two “compliance” types:
  • FAR
  • Effective

• Defined two solicitation categories:
  • Direct
  • Indirect

• Solicitation ≠ Awards
  • Indicator of federal compliance with energy-efficient requirements
Our analysis shows that during the procurement process, federal buyers request energy-efficient products only 55% of the time.
What does a 55% compliance rate mean?
We’ve saved some already …

- Federal Operational Energy Savings of 4.3 - 7.9 trillion Btu in 2018

Federal Facility Energy Usage in 2018
317 trillion Btus

Federal Facility Energy Costs in 2018
$5,391 million

Federal GHG emissions in 2018
36.2 million tons of CO₂ eq

Federal facility energy data source: FEMP’s Comprehensive Annual Energy Data and Sustainability Performance website
Energy Cost Savings in 2018

- Heating & Cooling, $41.2 million
- Electronics & IT Products, $34.3 million
- Lighting, $24.5 million
- Commercial Food Service Equipment, $13.9 million

Additional Savings of $195 million
But we could have saved more ...

Foregone Savings = $4.8 billion

$195 million

$116 million
So what?

Energy Savings (2018)
• 16 trillion BTU/year
• $300 million/year in energy cost

Social Benefits
• Reduce public spending
• Demand-pull power
• Lead the adoption of emerging technologies
What more could we save in the future?

- Full Compliance Best Available: $189 million
- Full Compliance: $118 million
- Effective Compliance-All Products: $78 million
- Yearly Cost Savings ($ million)

[Graph showing cost savings over time]
To get there, we need to understand what is keeping compliance rates at 55%...
What is causing the annual variance in compliance rates?
What is causing the annual variance in compliance rates?
Why are there large variances when everyone follow the same rules?

![Bar graph showing the number of compliant and noncompliant solicitations for various departments]
Why are there large variances among the same agencies?
But we still had questions

• **Who** is involved in the procurement process?

• What impact do they have on buying energy-efficient products?

• What are the **rules and practices** that guide procurement behavior related to energy efficiency?

• What are the **tools and resources** used in the procurement process and do they help agencies buy energy-efficient?
The Federal Procurement Survey

Survey objectives

- To what extent do federal procurement officials take energy efficiency requirements into account when making purchasing decisions?

- How do organizational factors (i.e., roles, rules, and tools) impact the inclusion of energy efficiency requirements in purchasing?
Survey respondents

We received a total of **105** responses from respondents representing **26** different agencies. Most of our respondents were from agencies outside the Department of Defense (DoD).
What **roles** do respondents have?

Over half of survey respondents were either **contracting officers** or **contract specialists**.
How does energy efficiency rank as a priority for procurement?

Over 50% of respondents indicated ‘Lowest purchase cost’ was the highest procurement priority.
Who is **primarily responsible** for ensuring contract compliance with energy efficiency requirements?
Opportunities to Increase Compliance Among Federal Agencies
1. Improve training on how to meet energy efficiency requirements
Is guidance on how to meet energy efficiency contracting requirements included during the training process at your agency?
What **additional practices** would help encourage energy-efficient purchasing at your agency?
What **kind of training** do respondents want?

- Hands on
- Provide specific examples and scenarios
- Provide the ‘why’
- Tailor to different procurement roles
- Include additional ways to support energy efficiency goals
2. Improve communication around energy efficiency requirements
How is commitment to meeting energy efficiency requirements communicated at your agency?

- About 25% of respondents indicated that commitment to energy efficiency requirements is NOT communicated at their agency.
What would make you or your colleagues more likely to consider energy efficiency requirements when purchasing?
How can communication about energy efficiency requirements be improved?

- Establish energy efficiency commitment in early project stages
- Target efforts to engage agency leadership
- Provide more salient information about energy-efficiency
- Match messaging to procurement roles
3. **Improve tools** for contracting & evaluation
Do your current tools prompt you to include energy efficiency requirements in contracts?
What kinds of feedback do you receive for evaluating compliance with energy efficiency requirements, and how helpful is that feedback?

<table>
<thead>
<tr>
<th>Category</th>
<th>Very helpful</th>
<th>Somewhat helpful</th>
<th>Not at all helpful</th>
<th>Do not receive</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE discussed in individual performance review</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual EE compliance rate for contracts</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Summary of annual energy cost savings</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
What **improvements** to existing tools would be most useful?

- Automatically include energy-efficiency requirements (contracting)
- Set energy-efficient products as the ‘default’ option (specifying)
- Add a feature for tracking energy-efficient contracts
- Collect data on number of annual energy-efficient products purchased
Where should agencies focus efforts to achieve the greatest savings?
Project types to prioritize ...

- FAR Compliance
- Commercial and Institutional Building Construction
- Electronic Computer Manufacturing
- Plumbing, Heating, and Air-Conditioning Contractors

Frequency of compliance over the years: FY15, FY16, FY17, FY18, FY19 Q3
Product Categories to prioritize ...

- **Linear Fluorescent Lamps (GSFLs), 21%**
- **Commercial Central Air Conditioners, 17%**
- **Replacing Incandescent Lamps with LEDs, 14%**
- **Desktop Computers, 8%**
- **Enterprise Servers, 5%**
- **Replacing CFLs, 4%**
- **Commercial Air-Source Heat Pumps, 3%**
- **Multifunction Devices, 7%**
- **Fluorescent Ballasts, 2%**

**Other Product Categories, 21%**
Key Takeaways
The story so far

On the one hand, we’ve had some real success to date

● Energy efficiency is becoming more prioritized in federal sector
● Achieving big cost and energy savings through procurement

On the other hand, there’s a clear opportunity to improve

● Only 55% compliant with energy efficiency requirements for purchasing
● Loss of $4.8 billion in potential savings
We have further to go …

Full compliance with energy efficiency requirements could save us an additional **$300 million** in cumulative savings by 2025.

To get there, we can start with the following interventions:

- Improved training
- Better communication
- Adopt new tools
Why does this matter?

Leveraging federal procurement to increase energy efficiency will ...

• Save up to $500 million in taxpayer dollars
• Significantly reduce energy use and GHG emissions
• Spur the development and adoption of new technologies
• Improve national energy resiliency
Questions?
Solicitations review process → tracks compliance rates

Energy and cost savings model → quantifies potential savings

Federal procurement survey → identifies organizational barriers