U.S. Coast Guard
Office of Energy Management (CG-46)

Combined Heat and Power + Kitchen Sink at Coast Guard Academy
Presentation Outline

- Review of contingency status quo & need for resiliency
- Why are these projects so difficult?
- U.S. Coast Guard approach to projects
- Coast Guard Academy (New London, CT) Case Study
Contingency Energy prior to Maria
Challenges to Fuel Logistics
(aka the generator’s Achilles heel)

- All aspects of fuel logistics were disrupted and/or exacerbated
  - Fuel demand increased
  - Inventory management, burn rate (gals/hour) analysis, ordering, acceptance, delivery, payment all disrupted
  - Quality assurance limited, test kits/filter supplies exhausted

- Loss of electricity at USCG locations and at Sources of supply
  - Fuel transfer pumps, and potentially purification systems INOP
  - Increased need for back-up and portable generators to provide electricity
  - Not enough on-site fuel storage for increased fuel demand

- Loss of phones (land line & mobile), loss of internet

- Roads and bridges not passable

- Personnel mismatch & lack of personnel
  - Surge operational/security personnel vice petroleum logisticians

- New or increase in waste streams
# Major Types of Alternatively-Financed Projects

<table>
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<tbody>
<tr>
<td>42 USC 8256</td>
<td>42 USC 8287</td>
<td>40 USC 501 FAR Part 41</td>
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<tr>
<td>With a servicing electric, natural gas, or water utility</td>
<td>Alternatively-financed project with an Energy Services Company (ESCO)</td>
<td>Power generation project, various potential providers</td>
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*These contracts represent the most robust performance-based public-private partnerships within the federal government.*

*But there are others and we need to remain creative (e.g. Cyber).*
Typically longer payback items centered well past normal 5 (or even 10) year budget cycle

Multiple interdependencies
- Electromechanical obviously
- But also geographic specific constraints/opportunities

Impact to mission
- Needs to address likely “overdue or immediate need”
- Yet needs to be able to evolve over the entire contract term
How to navigate the complexity

- Define simple roles and responsibilities
- Shift work through phases
  - It shouldn’t feel like a sprint for everyone at the same time all the time
- Engage multiple stakeholders
- Define performance objective end state, not just the problems
- All funding streams should be considered
- Combine/collapse/accelerate multiple acquisitions

“It will all have to get fixed with my signature anyway…”

– USCG Alt-financed project Contracting Officer
Some CG-46 Stakeholders

Deep understanding of tactical asset energy informs robust facility energy options.
Core Acquisition Team

Financial Oversight & Approval, COMDT (CG-832)

Contracting Officer

Utility or ESCO Partner

Energy Project Manager (Civil Engineering)

Project Financial Analyst COMDT (CG-46)

Legal

Base Personnel

Additional Stakeholders
COMDT (CG-43)
COMDT (CG-46)
COMDT (CG-47)
Housing Officers
- Academy is 3rd largest energy consumer in Coast Guard portfolio

- 26-month selection and specification development phase
  - COMDT (CG-46), COMDT (CG-43), SILC, CEU, LSC, utility (20+ member team)

- Academy UESC has a two-year construction post award
  - Largest modernization of academy infrastructure since 1938

- ~$2M annual energy cost avoidance during performance
Natural gas line installation through main gate, down Tampa Drive and Harriet Lane.
CGA – How it started vs Results

- **COUPLED TO PLANNED WORK (e.g. acquisition team formalization)**
  - $2M boiler retrofit project approval
  - $39M capital investment, entirely self-funded through savings
    - Included $1M state incentives + $500K credits
  - Major infrastructure improvements
    - Central boiler plant RENEWAL and fuel switch
    - Chiller plant expansion and optimization
    - Resilient and distributed electrical power generation (1 MW micro turbine)
    - Expansion of main electrical feeder to Smith and Waesche Hall transformers
    - Chemistry laboratory hood replacement and exhaust modifications
    - Reduction of environmental liability (removal of #6 fuel oil tanks)
CGA – Engagement Points

1. Facility Engineering Branch
2. CGA Superintendent (Flag Officer)
3. Utility and contingency operational folks
   - “What is our restoration priority?”
4. Academic Department Heads (Chemistry and Mechanical Engineering, etc)
5. Alumni Association
   1. Offered capital potential
   2. Brought “brand image” and parental perspective  [example: To have visible or non-visible PV arrays?]
6. Board of Directors
7. Recruiting / Public Affairs / New London municipality stakeholders
8. U.S. Navy
Impacts to CGA

- Fence to Fence, Street to River – looked at entire property, not just a subsection

- Microturbine and solar power reduce utility power by 82%
  - Solar was evaluated to be both visible (carport) and hidden (roof)

- Net energy demand ↓ 16%, water ↓ 7%

- Smith Hall chemistry lab hood replacements double student capacity, enhance safety, and broaden curriculum

- Operations and maintenance burden for major systems dramatically reduced

- 2,933 water, 17,882 lighting fixtures, insulation

- Smoke stack is being demolished – BIG DEAL!
  - Cost avoidance to the budget for demolition, and enabling MAJOR alumni project to advance years ahead of schedule

- Roof membrane on Roland Hall two years faster, $600K cheaper
CGA UESC – Highlights

- Had to fight for the mission impact (e.g. Chemistry HVAC)
- No loss in Agency “technical authority” – 15+ design iterations
- Fuses specifically not changed to breakers (It’s a college after all.)
- Student population not able to evacuate during predominante risk (e.g. Blizzard.) Must shelter in place.
- “Uninterruptable” NG line vs. No 2 diesel backup
  - Muscle memory / cultural change is hard
- Full term O&M is the leadership directed mandated goal
  - ... which of course means savings must be huge and projects therefore driven to be more complex and comprehensive.
Point of Contact

Sam Alvord
Chief, Office of Energy Management,
COMDT (CG-46)

Sam.L.Alvord@uscg.mil