

Realizing the True Cost of Energy Keeping the DoD Green

**ICEAA Conference – New Orleans, LA
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Agenda

- ▶ **The Cost Impact of Energy**
- ▶ **The Fully Burdened Cost of Fuel (FBCF)**
- ▶ **Booz Allen Hamilton's Energy Tool**
- ▶ **Energy Tool Process**
- ▶ **The Energy Tool User Interface**

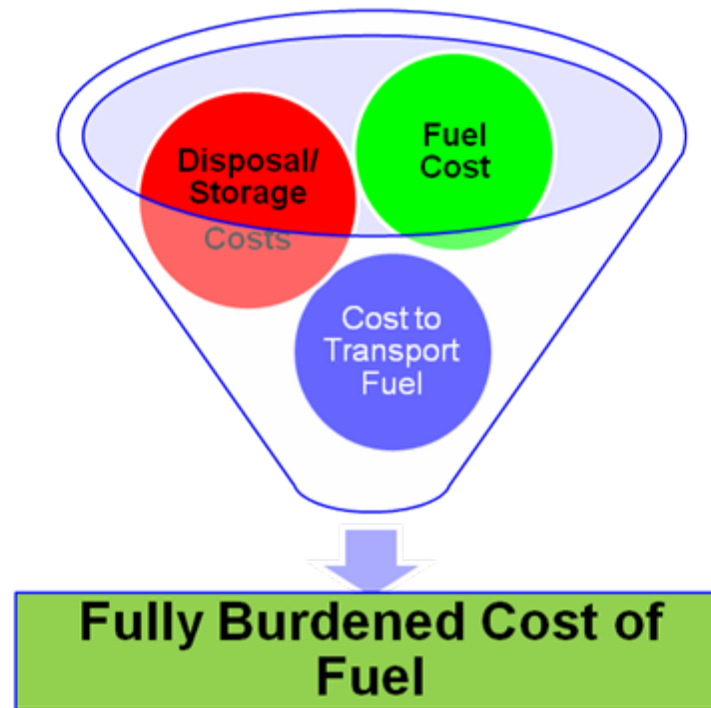
The Cost Impact of Energy

- ▶ Energy costs have become a growing concern for Program Offices for the following reasons:
 - The spike in energy costs have caused the cost of energy to double in the last 5 years
 - Wartime usage rates of equipment in OIF and OEF have caused energy needs to increase by up to 10x
 - High wartime usage rates cause energy costs to represent a significantly large percentage of the equipment's life cycle costs.
 - Fully Burdened Cost of Fuel (FBCF) representing the true cost of fuel is needed to represent the cost of wartime energy requirements

- ▶ To reduce a program's dependence on energy, Program Offices have begun to evaluate more energy efficient alternatives to support their programs.

Fully Burdened Cost of Fuel

- ▶ The Fully Burdened Cost of Fuel represents the true cost of fuel and includes several direct and indirect costs
- ▶ Supporting war efforts in two theaters dramatically increases the burden of costs that energy places on Program Offices



The Booz Allen Hamilton Energy Tool (1 of 2)

- ▶ To address the energy needs of Program Offices, Booz Allen has worked with the Expeditionary Energy Office (E2O) to develop the [BAH Energy Tool](#)

- ▶ The BAH Energy Tool includes:
 - Energy requirements represented in the MEB2024 projections
 - Data from the IEAA, collected
 - Energy cost models for Liquid Fuel, Batteries, Electric Power
 - Energy cost models for direct and indirect costs to calculate the FBCF
 - Wartime and Peacetime usage rates
 - Idle and In-Use usage rates
 - Cost calculations on a Cost per System basis

- ▶ The BAH Energy Tool is an add-on tool with the LRFS Cost Estimating Tool (LRFS CET) and can work in conjunction with the LRFS CET or as a stand-alone tool

The Booz Allen Hamilton Energy Tool (1 of 2)

- ▶ The BAH Energy Tool was developed as an add-in tool to the LRFS CET to help expand the capabilities of estimating the energy needs for Program Offices
- ▶ As part of the Energy Tool effort, the existing LRFS CET Cost Element Structure (CES) was expanded to include the level of detail required by E2O
- ▶ Data collected from E2O and the MEB2024 Projections was used to build cost models for over 750 systems.

How Does the BAH Energy Tool Function?



Step 1

Users select alternatives to be evaluated

Step 2

Cost models are used to calculate the direct and indirect costs for each alternative

Step 3

Users can compare the costs per system and view the cost methodologies used to develop estimates for each alternative

Step 4

Users can select the alternative that best fits their needs and use the cost information in the LRFS CET to build estimates

The BAH Energy Tool Process (1 of 2)

- ▶ The BAH Tool utilizes cost models to develop cost estimates for each system within the cost model library.
- ▶ Users can select systems from an array of [Liquid Fuel systems](#), [Battery Systems](#) and [Electrical Systems](#) which are each accessible through individual user forms for each group.
- ▶ System specification details are provided to enable users to review and confirm that specifications are current and accurate.
- ▶ Users are able to override/replace the values shown in the System specifications and corresponding cost model variables if values are not current.
- ▶ These system specifications (which can be overridden/replaced) are used to estimate the costs for each system.

The BAH Energy Tool Process (2 of 2)

- ▶ **Users must also provide the expected usage rates (i.e., OPTEMPO) for the system for the year.**
- ▶ **Providing usage rates enables the Energy Tool to calculate costs on either a per mile basis or a per hour basis.**
- ▶ **Costs estimated for a system are calculated on a cost per system basis.**
- ▶ **The Energy Tool can be used within the LRFS CET or be used as a stand-alone tool. Costs estimated by the tool can be applied to the fielding schedule for the system in the LRFS CET or can be used separately.**

The Energy Tool – Standard User Interface (Liquid Fuel)

The screenshot displays the 'Energy Analysis' software interface with three columns representing different vehicle options. Each column includes a dropdown menu for the vehicle type, a small image of the vehicle, a 'Commodity' field, a 'Configuration ID', a 'S Character TAPCON', a 'TAPCON', and a text input for 'What is the OPTETMPO in Miles Per Year for the System?'. Below these are 'System Specifications' including Engine (hp), Gross Vehicle Weight (Bw), Curb Weight (Bw), hp/ton ratio, Max speed (mph), Fuel Tank Capacity (gal), Range (miles), HPG, GPH, kW/Hour, HPD, and OPTETMPO (Hours/Year). At the bottom of each column is the 'Annual Cost Per System' with three rows: 'Liquid Fuel Costs (based on miles)', 'Liquid Fuel Costs (based on hours)', and 'Electric Costs (based on hours)'. The interface also features a 'Help' icon, a 'Returns to Interview' button, an 'Output Comparison Report to PDF' button, and an 'Output Selected to USMC LRFS CET' button.

Option 1	Option 2	Option 3
EFV (Personnel)	Expeditionary Fighting Vehicle (Commander)	Assault Amphibious Vehicle, Recovery, AAVR7A
Commodity: Combat Vehicle Configuration ID: 0 S Character TAPCON: 00017 TAPCON: E0007K	Commodity: Combat Vehicle Configuration ID: 0 S Character TAPCON: 00010 TAPCON: E0007K	Commodity: Combat Vehicle Configuration ID: 0 S Character TAPCON: 00004 TAPCON: E0007K
What is the OPTETMPO in Miles Per Year for the System? 1000	What is the OPTETMPO in Miles Per Year for the System? 1000	What is the OPTETMPO in Miles Per Year for the System? 1000
System Specifications Engine (hp): 0 Gross Vehicle Weight (Bw): 0 Curb Weight (Bw): 0 hp/ton ratio: 0 Max speed (mph): 0 Fuel Tank Capacity (gal): 324 Range (miles): 0 HPG: 1.1 GPH: 22.5 kW/Hour: 0 HPD: 2.6 OPTETMPO (Hours/Year): 940.0	System Specifications Engine (hp): 150 Gross Vehicle Weight (Bw): 75,000 Curb Weight (Bw): 0 hp/ton ratio: 22.40	System Specifications Engine (hp): 0 Gross Vehicle Weight (Bw): 0 Curb Weight (Bw): 0 hp/ton ratio: 0 Max speed (mph): 0 Fuel Tank Capacity (gal): 171 Range (miles): 0 HPG: 1.2 GPH: 21.4 kW/Hour: 0 HPD: 2.6 OPTETMPO (Hours/Year): 940.0
Annual Cost Per System Liquid Fuel Costs (based on miles): \$2,836.00 Liquid Fuel Costs (based on hours): \$46,620.00 Electric Costs (based on hours): \$0.00	Annual Cost Per System Liquid Fuel Costs (based on miles): \$2,836.00 Liquid Fuel Costs (based on hours): \$46,620.00 Electric Costs (based on hours): \$0.00	Annual Cost Per System Liquid Fuel Costs (based on miles): \$2,447.00 Liquid Fuel Costs (based on hours): \$43,304.00 Electric Costs (based on hours): \$0.00

Users can provide key requirements that are used to calculate the system's energy costs.

Users can view the energy costs calculated for the system (on a cost per system basis)

Users can view and override system performance parameters if values are not current.

Users can select the option to be used (from a total of 3 options) and forward the costs to the LRFS CET to build an LRFS.

Questions?

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