Applying the Army Fully Burdened Cost of Fuel Methodology to Analyses of Alternatives

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Bottom Line Up Front

- This methodology is intended specifically for Acquisition System Analyses of Alternatives (AoAs)

- Question this methodology is intended to answer: What is the Fully Burdened Cost of Fuel for a specific acquisition system?

- Types of questions this methodology is not intended to answer:
  - What is the Fully Burdened Cost of Fuel of a unit currently operating in a wartime theater?
  - What are the Fully Burdened Cost of Fuel implications of moving a unit from one theater to another?
Fully Burdened Cost of Fuel: What It Is and Why We Are Doing It

• Fully Burdened Cost of Fuel (FBCF) Defined: The Defense Energy Support Center (DESC) standard price for fuel plus apportioned costs of everything needed to get fuel to a system

• Why We Are Doing It:
  – Our large logistical tails in Iraq and Afghanistan are being attacked by the enemy
  – Fuel Inefficiency is thought to be one reason our logistical tails are so large
    – Deputy Under Secretary of Defense for Acquisition, Technology, and Logistics (DUSD(AT&L)) issued a Policy Memorandum, 10 April 2007, calling for FBCF inclusion in all acquisition trade analyses to improve energy efficiency and cost effectiveness
    – Office of Secretary of Defense Cost Assessment and Program Evaluation (OSD CAPE) Office conducted a pilot FBCF study in 2007 on the Joint Light Tactical Vehicle (JLTV) system
## OSD CAPE Seven Step FBCF Methodology

<table>
<thead>
<tr>
<th>Step</th>
<th>Burden Element</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DESC Commodity Cost of Fuel</td>
</tr>
<tr>
<td>2</td>
<td>Primary Fuel Delivery Asset O&amp;S Cost</td>
</tr>
<tr>
<td>3</td>
<td>Depreciation Cost of Primary Fuel Delivery Assets</td>
</tr>
<tr>
<td>4</td>
<td>Direct Fuel Infrastructure O&amp;S and Recapitalization Cost</td>
</tr>
<tr>
<td>5</td>
<td>Indirect Fuel Infrastructure O&amp;S Cost</td>
</tr>
<tr>
<td>6</td>
<td>Environmental Cost</td>
</tr>
<tr>
<td>7</td>
<td>Other Costs (i.e. Force Protection)</td>
</tr>
</tbody>
</table>
FBCF Defined From an Army Perspective

TSC = Theater Support Command
PPTO = Petroleum Pipeline Terminal Operating Battalion
OPDS = Offshore Petroleum Discharge System

SUST = Sustainment Brigade
SBCT = Stryker Brigade Combat Team
HBCT = Heavy Brigade Combat Team
IBCT = Infantry Brigade Combat Team
BSB = Brigade Support Battalion
Defense Acquisition Guidebook (DAG) Guidance

• DAG guidance requires all future trade-off analyses for acquisition systems to include FBCF estimates

• For all future AoAs, cost analysts are being required to:
  – Develop both a wartime and peacetime estimate
  – Allocate fuel down to specific systems
Since this is a relatively new requirement that has not been implemented to date, incorporating FBCF presents challenges:

– How does an analyst calculate a peacetime FBCF estimate?
– How does an analyst properly apportion fuel delivery and force protection assets to a specific system?
– Where does an analyst start when they are required to produce a wartime FBCF estimate?
– How can FBCF results be displayed so that they will be meaningful to decision makers?
Peacetime FBCF Calculations for AoAs

• Following the OSD CAPE 7 Step Methodology:
  – DESC price
  – Calculate Operation and Support (O&S) and Depreciation Costs for fuel truck convoys and associated units (Brigade Support Battalions and Sustainment Brigades)
  – Calculate Direct and Indirect Fuel Infrastructure costs of fuel infrastructure on military posts that are not operated by DESC
  – Environmental Costs
  – Force Protection Costs are not included in peacetime FBCF calculations

• Properly allocate fuel to specific acquisition systems by analyzing fuel usage of various Brigade Combat Teams:
  – Stryker Brigade Combat Team (SBCT)
  – Heavy Brigade Combat Team (HBCT)
  – Infantry Brigade Combat Team (IBCT)
  – Aviation Brigade
Wartime FBCF Calculations for AoAs:
Where to Start

• Start with the Effectiveness Scenario that is being run for the AoA and “cost the scenario”

• Following the OSD CAPE 7 Step Methodology:
  – DESC price
  – Calculate Operation and Support (O&S) and Depreciation Costs for fuel truck convoys and associated units (Brigade Support Battalions Sustainment Brigades, and Theater Support Commands) and include attrition
  – Calculate Direct and Indirect Fuel Infrastructure costs of fuel infrastructure on Forward Operating Bases (FOBs)
  – Environmental Costs
  – Calculate Force Protection Costs of armored vehicles and any attack aircraft that protect the convoys

• Fuel allocation is conducted using the same methodology used by the peacetime FBCF calculations
Process for Calculating FBCF in AoAs: Joint Light Tactical Vehicle (JLTV) Example

DASA-CE will take all input metrics and assumptions and calculate both wartime and peacetime JLTV FBCF factors using the following 7 Step Methodology:

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DASA-CE will work with TACOM to decide on the wartime to peacetime ratio that will be used for the O&S portion of the JLTV AoA LCCE.

DASA-CE will work with TRAC-FLVN, TRAC-LEE, TRAC-WSMR, AMSAA, CASCOM, and G-4 to ensure wartime cost input metrics and assumptions are in accordance with doctrine and approved Defense Planning Scenarios utilized during the JLTV AoA.

DASA-CE will provide TACOM with the wartime and peacetime FBCF factors to be input into the JLTV AoA LCCE.

DASA-CE will provide a write-up on the FBCF methodology for the JLTV AoA final report.
Displaying FBCF Results to Decision Makers

• Results are envisioned to be presented as follows:

<table>
<thead>
<tr>
<th>Course of Action (COA)</th>
<th>Wartime FBCF Cost Per Gallon (BY10$)</th>
<th>Peacetime FBCF Cost Per Gallon (BY10$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Case</td>
<td>$8.40/Gallon</td>
<td>$5.80/Gallon</td>
</tr>
<tr>
<td>COA 1</td>
<td>$8.65/Gallon</td>
<td>$6.15/Gallon</td>
</tr>
<tr>
<td>COA 2</td>
<td>$9.20/Gallon</td>
<td>$7.55/Gallon</td>
</tr>
<tr>
<td>COA 3</td>
<td>$7.75/Gallon</td>
<td>$5.35/Gallon</td>
</tr>
</tbody>
</table>

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<tr>
<th>Course of Action (COA)</th>
<th>Total Wartime BCT FBCF Cost Per Year (BY10$K)</th>
<th>Total Peacetime BCT FBCF Cost Per Year (BY10$K)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Case</td>
<td>$280.5K</td>
<td>$167.9K</td>
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<tr>
<td>COA 1</td>
<td>$302.3K</td>
<td>$192.1K</td>
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<tr>
<td>COA 2</td>
<td>$421.7K</td>
<td>$265.8K</td>
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<tr>
<td>COA 3</td>
<td>$248.4K</td>
<td>$129.6K</td>
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</tbody>
</table>

• Total Lifecycle FBCF POL Costs in the bottom chart are only the costs that would fall under CES Element 5.05 POL after the fuel cost has been burdened
• Note: All costs are notional
Path Ahead

• FBCF will be included in a few near-term AoAs:
  – Ground Combat Vehicle (GCV) AoA
  – Joint Light Tactical Vehicle (JLTV) AoA
  – Armed Aerial Scout (AAS) AoA
• Fully Burdened Cost of Alternate Forms of Energy