Using benefit and other performance information in program planning and evaluation

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Suggestions for using benefit and other performance information in program planning and evaluation

Suggestion 1 – Use program logic models to develop performance measures, metrics and targets that are consistent with benefit estimates

Suggestion 2 – Use performance information to:
   a) evaluate the credibility of the benefit estimates
   b) evaluate progress towards achieving benefits
   c) fulfill performance measurement requirements of budget, performance plan, performance report

Suggestion 3 – Use benefit information to:
   a) help establish goals
   b) analyze the portfolio of programs
**Suggestion 1** – Use program logic models to develop performance measures, metrics and targets that are consistent with benefits

**Simplified Logic Model for Energy R&D Program**

- **Funding** (input)
- **Energy R&D** (activity)
- New/Improved Energy Technologies (output)
- Commercialization & Market Penetration (intermediate outcome)
- Economic, Environmental & Security Benefits (end outcome)

Decreasing Program Influence
Suggestion 1 (cont.) – Use program logic models to develop performance measures, metrics and targets consistent w/benefits

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Activities</th>
<th>Outputs</th>
<th>Intermediate Outcomes</th>
<th>End Outcomes</th>
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</thead>
<tbody>
<tr>
<td><strong>Simplified Energy R&amp;D Logic Model</strong></td>
<td>Funding</td>
<td>Energy R&amp;D</td>
<td>New/improved Energy Technology</td>
<td>Commercialization &amp; Market Penetration</td>
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<tr>
<td><strong>Performance Measures (metric)</strong></td>
<td>Dollars spent by - DOE - Other gov’t - Private sector - Total (millions $)</td>
<td>- R&amp;D projects funded (#) - Time to award projects (weeks) - Time to disburse funds (weeks) - Uncosted balance (millions $)</td>
<td>- Prototypes (#) Initial Refined Commercial Energy efficiency improvement (%) - Change in capital cost (%)</td>
<td>- Technologies introduced into market (#) - Avg. market penetration (%) - Net consumer investment (millions $)</td>
</tr>
<tr>
<td><strong>Factors Affecting Performance</strong></td>
<td>- State of the economy - Political makeup of White House, Congress</td>
<td>- #, quality, and funding request of R&amp;D proposals - Date appropriation is received</td>
<td>- R&amp;D results</td>
<td>- Cost &amp; perf. of competing technologies - Energy prices - State of the economy - Gov’t policies</td>
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</table>
**Suggestion 2a – Use performance information to evaluate the credibility of the benefit estimates**

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<td>2006</td>
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<tr>
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<td>2004</td>
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Are funding levels sufficient for the R&D that is required?

Are the timelines realistic?

Are technology performance and cost targets achievable?

Are market penetration times appropriate given technology cost, performance, stock turnover, and industry investment in new technology?

Is the private sector sufficiently involved?
**Suggestion 2b** – Use performance information to evaluate progress towards achieving benefits

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<td>2004</td>
<td>20 yrs</td>
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Reasons why targets were not achieved

- Funding was below expectations
- R&D did not yield hoped-for results
- Took longer than expected to develop prototypes
- Materials costs higher than projected
- Lower cost of competing technology
- Low energy prices

Questions to consider in future analyses

- Are funding projections too optimistic?
- Are timelines too optimistic?
- Have our cost targets been too optimistic?
- Are we considering improvements in competing technology?
**Suggestion 2c** – Use performance information to fulfill performance measurement requirements of the budget, performance plan, performance report

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**Example Output & Intermediate Outcome Targets for Budget Document**

2004
- Initial prototype of technology A developed
- Commercial prototype of technology B developed
- Commercial introduction of technology E that is 30% more efficient and has only 10% greater capital cost than comparable technology

2005
- Refined prototype of technology C developed
- Initial prototype of technology D developed

2006
- Refined prototype of technology A developed
- Commercial introduction of technology B that is 10% more efficient and has 10% lower capital cost than comparable technology
Suggestion 3a – Use benefit information to help establish goals

**Summation of Individual Program Benefits**

(2 mbpd oil)

| Program 1 |
| Program 2 |
| Program 3 |
| Program 4 |
| Program 5 |
| Program 6 |

**Integrated Program Benefits**

(1.7 mbpd oil)

**Technology Competition**

Programs 1-6

**Success Rate**

Benefit Goal

(1.4 mbpd oil)

Programs 1-6
Suggestion 3b – Use benefit information to analyze the portfolio of programs

Characterize the portfolio according to the following measures:

- Benefits – Economic, environment, security
- Type of Benefit – Prospective, options, knowledge
- Timing – Near-term, mid-term, long-term
- Technical and Market Risk – Low, medium, high
**Suggestion 3b (cont.)** – Use benefit information to analyze the portfolio of programs

### Identify anomalies in the portfolio

<table>
<thead>
<tr>
<th>Timing of Benefits</th>
<th>Budget</th>
<th>Size of Bubble = Size of Security Benefit</th>
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<tr>
<td>Near Term</td>
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<td>Long Term</td>
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</table>

 Bubble = Program

- **High Budget for Low Security Benefits**
- **Only 1 long-term program**
Suggestion 3b (cont.) – Use benefit information to analyze the portfolio of programs

Analyze anomalies, adjust the portfolio if necessary

Program also had low economic, environmental benefits; risk about same as other mid-term programs; cancelled program

Added long-term program with higher security benefits, though higher risk

Bubble = Program
Size of Bubble = Size of Security Benefit
Questions to consider about portfolio analysis

- What is a “good” portfolio?
- How will risk be measured?
- What is the tradeoff between benefits and budget? (for portfolio adjustment)
- How much control does DOE have over budget levels?