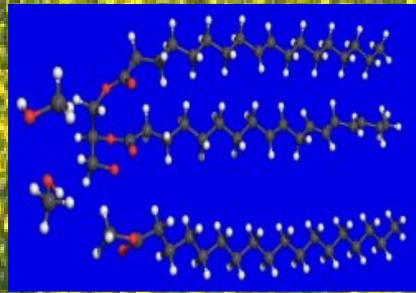




BioFuels Proposers Day

25 July 2006

Dr. Doug Kirkpatrick





Agenda



- 10:30 – 11:00 am Check-in
- 11:00 – 11:05 am Welcome
Ken Bailey
- 11:05 – 11:10 am Program Manager's Welcome
Dr. Doug Kirkpatrick
- 11:10 – 11:20 am BioFuels Program Motivation
Dr. Doug Kirkpatrick
- 11:20 – 12:10 am Proposal Requirements,
Structure, and Eval Criteria
Dr. Doug Kirkpatrick
- 12:10 – 01:00 pm Working Lunch
- 01:00 – 04:00 pm Discussion & Questions
- 04:00 – 04:15 pm Closing Remarks
Dr. Doug Kirkpatrick



BioFuels Government Team



Doug Kirkpatrick	PM (DARPA/ATO)
Patty Matyskiela	Contracting Officer (DARPA/CMO)
Robert Mantz	COR (ARO)
Ken Bailey	SETA (SRS)
Anita Santiago	SETA (SRS)
Craig Hugger	SETA (SRS)
Amanda Haspert	SETA (SPC)
Hugh Maupin	SETA (SPC)



BioFuels Motivation



BioFuels Objective



- Develop affordable substitute for petroleum based JP-8 using oil rich crops
 - Compliant with MIL-DTL-83133E, excluding Section 3.1
 - Achieve required energy density and cold-flow characteristics
 - Achieve 60% conversion efficiency and explain a path to 90%
 - Deliver minimum of 100 liters for Government qualification
- Deliver production cost model to support affordability assertions
- Multi-disciplinary approach required – Process Chemistry, Materials engineering; biotechnology; Propulsion Systems Engineering; etc.
- Genetic Engineering or modification of crops not part of the program

Outcome-Focused, Technology Neutral

- SECDEF mandate to explore alternative fuels
- DoD Single Fuel Initiative
- DESC increased spending 165% on Bulk Jet Fuel from FY03 to FY05
- DoD consumes ~15% of Kerosene Based Jet Fuel Produced by US.



We have learned

- Biodiesel chemically unacceptable as alternative Jet Fuel
- Post-processing biodiesel to JP-8 inefficient and expensive
- World demand increasing, supply of cheap oil decreasing

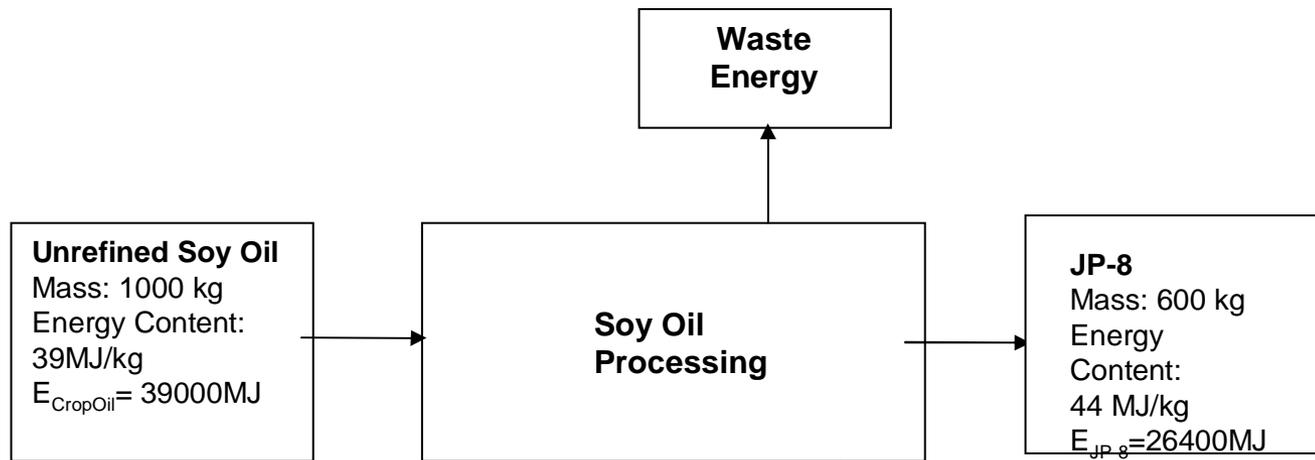




Energy and Mass Efficiency Example



- Assumptions:
 - Start with 1000kg triglyceride rich crop oil (i.e. Soy)
 - Triglycerides have linear chain carbon chains with a carbon count of 16



Energy Conversion Efficiency:

$$\eta_E = \frac{E_{JP-8}}{E_{CropOil} + E_{Input}}$$

$$\eta_E = \frac{26,400MJ}{39,000MJ + 4,500MJ} = 60.7\%$$

Mass Conversion Efficiency:

$$\eta_M = \frac{M_{JP-8}}{M_{CropOil}}$$

$$\eta_M = \frac{600kg}{1000kg} = 60\%$$



BioFuels Program Strategy



Solicitation Objective



A cross-disciplinary team spanning the fields of process chemistry & engineering, materials engineering, biotechnology and propulsion systems engineering with the breadth and depth of expertise to maximize the probability of development success and the transition to a commercial product.



Period of Performance



- **Phase 1**
 - **18 Months from effective date of award**



Deliverables



- Minimum of 100 liters of JP-8 surrogate biofuel for Government testing
 - This in addition to interim materials for intermediate testing
- Commercialization plan defining a path to commercially viable production
- Qualification plan that specifies a path to full DoD qualification
- Analysis of development opportunities to drive conversion efficiency to greater than 90%
- Final Report summarizing the project and tasks
- Number and types of in-process reports and meeting will be specified in the award document



Proposal Requirements, Structure, and Evaluation Criteria



Solicitation Schedule



- BAA Released
 - 5 July 2005
- Proposals
 - Due 4:00 pm EDT, 19 September 2006
- Anticipated Contract Award: November 2006



Proposer Requirements



- Technical qualifications most important
- Non-traditional defense contractors encouraged
- Foreign firms may compete
 - Effort must be unclassified



Proposal Requirements



- Details will be found in the “Proposers Information Pamphlet”
 - Proposal format
 - Volume 1 – Technical & Management (32 pages)
 - Volume 2 – Cost (No Page Limit)
 - Intellectual property disclosures
 - Document marking
- PIP is available online:
 - fedbizopps (www.fbo.gov)
 - DARPA/ATO solicitations (<http://www.darpa.mil/baa/#ato>)



Evaluation Criteria



1. Technical Approach
2. Potential Contribution and Relevance to the BioFuels Program Objectives and the DARPA Mission
3. Proposer's Capabilities and Related Experience
4. Technology Transition Approach
5. Cost Reasonableness and Realism



EC1: Technical Approach



- Does the proposed demonstration plan enable the program vision and meet the program objectives and goals?
- Must show a credible approach to achieving the Program Metrics within the 18-month timeframe.
- Must be feasible, achievable, complete, and supported by a technical team that has the expertise and experience to accomplish the tasks.
- Task descriptions and associated elements must be complete and in a logical sequence with all deliverables clearly defined such that a final product that achieves the goal can be expected.
- Must identify major technical risks; planned mitigation efforts must be clearly defined and feasible. In particular, the following items will be considered and evaluated:
 - Understanding of the Problem
 - Scientific and Technical Merit
 - Soundness of the Proposed Work
 - Probability of Success
 - Scalability
 - Reasonableness of Schedule and Milestones



EC2: Potential Contribution and Relevance to the DARPA Mission



- This criterion establishes a link between this work and the DoD mission.
- The work need not be immediately usable in military systems.
- This work must contribute to technical areas of need by the DoD.
- Dual use technology enabling DoD systems to ride on commercial development is essential to keeping the cost of DoD systems low.
- In particular, the following items will be considered and evaluated:
 - Contribution and relevance of the work to achieving the stated objectives of the program (see Section 2.1).
 - The extent that this project will support the DARPA and DoD mission.
 - The impact that the proposed technology will have on military systems, yet sufficient commercial impact to be able to support itself (eventually) in the commercial market.



EC3: PROPOSER'S CAPABILITIES AND RELATED EXPERIENCE



- The qualifications of Principal Investigators
- The range, depth, and mix of expertise of the key personnel evaluated to ensure that they are qualified in the theory and application of the technologies involved in the development, testing, and evaluation of the proposed technology.
- Reasonableness of schedules, level of planning, and management performance at each stage of the project will be evaluated to ensure they are appropriate for the proposed research.



EC4: TECHNOLOGY TRANSITION APPROACH



- **Approach to technology transition, capability and likelihood of transitioning the technology to the industrial manufacturing and operational military communities in such a way as to enhance U.S. defense**



EC5: COST REASONABLENESS AND REALISM



- Establish that the proposed costs are reasonable and realistic for the technical and management approach offered
- Determine the proposer's practical understanding of the effort. This will be principally measured by cost per labor-hour and number of labor-hours proposed.
- Undue emphasis on cost may motivate proposers to offer low-risk ideas with minimum uncertainty and to staff the effort with junior personnel in order to be in a more competitive posture. DARPA discourages such cost strategies.
- Cost reduction approaches that will be received favorably include innovative management concepts that maximize direct funding for technology and limit diversion of funds into overhead.