US PACIFIC COMMAND

ENERGY SECURITY PERSPECTIVE (U)

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USPACOM J81

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This brief is:

UNCLASSIFIED//RELEASABLE TO ALL AUDIENCES

Overview

Purpose of this briefing is to inform members and friends of the Hawaii Energy Policy Forum of Department of Defense clean energy efforts in the State of Hawaii, with emphasis on those that pertain to the economy, infrastructure, or security of the state.

- **Federal energy mandates**
- **PACOM Strategy in Cooperation with Hawaii Clean Energy Initiative (HCEI)**
- **PACOM Cybersecure Smart Grid Demonstration (SPIDERS)**
- **Advanced biofuel supply chain initiative (GIFTPAC)**

- **Service briefings**
  - **Navy**
  - **Marine Corps**
  - **Army (tentative)**

Federal Energy Mandates Apply to DoD

- **Energy Independence and Security Act, 2007**
  - **30% solar hot water for new or renovated federal buildings**
  - **Reduce fossil fuel usage in new federal buildings 55% by 2010, 65% by 2015, 80% by 2020, 90% by 2025, 100% by 2030**
  - **Section 526 requires that DoD fuel purchases have carbon lifecycle "no worse than conventional" fuels**

- **Energy Policy Act of 2005**
  - **Design new federal buildings to use 30% less energy**
  - **Install advanced meters on all federal buildings by FY12**
  - **75% of new light-duty vehicles will be alternate fuel vehicles**
  - **Use 3% renewable energy by FY07, 5% by FY10, 7.5% by FY13, 25% by FY25**

Executive Orders Apply to DoD

- **Executive Order 13123 Sec. 201**
  - **Reduce GHG emissions from federal facilities 30% by 2010**

- **Executive Order 13423, 2007**
  - **Ensure 50% of renewable goal is from new renewable**
  - **Reduce energy consumption 3%/yr, 30% total by 2015**
  - **Increase use of alternative fuel consumption by 10%/yr**
  - **Reduce non-tactical vehicle petroleum consumption 2%/yr**
  - **Ensure 15% of facilities meet the Federal Leadership in High Performance & Sustainable Buildings MOU by 2015**

Department Of Defense Energy Objectives

- Nat'l Defense Authorization Act of 2010
  - Establishes Director for Operational Energy Plans and Programs
- Nat'l Defense Authorization Act of 2009
  - Relocation projects in Guam will be LEED®* Silver designs
  - DoD will set renewable energy goals for mil bases on Guam
- Nat'l Defense Authorization Act of 2008
  - DoD may sign renewable energy contracts for up to 10 years
- Nat'l Defense Authorization Act of 2002
  - 10% of EPACT trucks procured in FY07+ will be hybrids
- OSD Energy Security Strategic Plan (ESSP) – 2008
  - Reduce total operational fuel demand 15% by 2015
  - Reduce fuel consumption 2%/yr for training and steady state
- Federal Leadership in High Performance & Sustainable Buildings MOU, 2006
  - Design major renovations to use 20% less energy

* Leadership in Energy and Environmental Design (LEED) Green Building Rating System™

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PACOM Energy Strategy in Cooperation with the State of Hawaii

Vision Statement:

"USPACOM, in cooperation with the State of Hawaii, will develop key strategies and implement innovative solutions to harness clean, efficient, secure, renewable and sustainable energy for the benefit of the people of Hawaii and the Asia-Pacific Region."

- **Strategic Goal:**
  "Match or exceed the State of Hawaii goals."

- **Five Parts**
  1. **Minimize dependence on fossil fuels**
  2. **Develop renewable energy resources**
  3. **Reduce greenhouse gas emissions**
  4. **Emphasize sustainability**
  5. **Exercise leadership**

- **Signed Oct 2009 by MG Steven Tom, PACOM Chief of Staff**
- **Full text at: http://www.pacom.mil/web/PACOM_Resources/pdf/PACOM%20Energy%20Cooperation%20Strategy.pdf**

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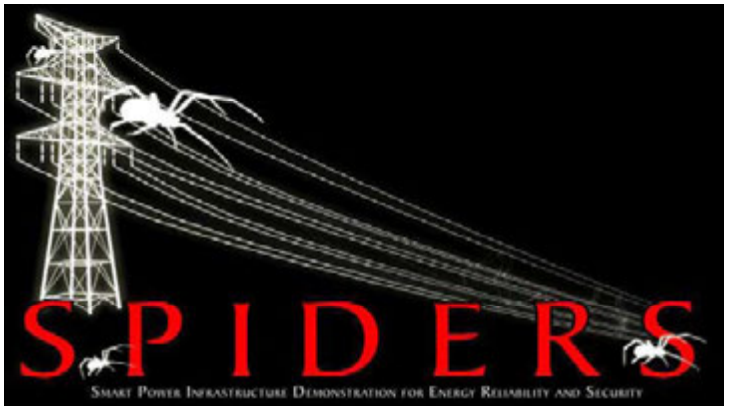
Joint Experiments - SPIDERS

4. Approved Joint Capability Technology Demonstration (JCTD) on Energy Security – FY11 start
   - Will demonstrate
     1. Cyber defense
     2. Smart grids
     3. On 3 military installations



   - Partners
     NORTHCOM, DOE, DHS, OSD, local utilities, state governments

   - Nicknamed SPIDERS: Smart Power Infrastructure Demonstration for Energy Reliability and Security

   - Problem: The joint warfighter's ability to command, control, deploy, and sustain forces is adversely impacted by a fragile, aging, and fossil fuel-dependent electricity grid that makes our military installations, and their critical infrastructure, vulnerable to incident, whether natural event or deliberate attack, posing a significant threat to national security

Expected SPIDERS Outcome

STAIRWAY TO ENERGY SECURE INSTALLATIONS

Year 1

HICKAM AFB CIRCUIT LEVEL DEMO

- Renewables
- Hydrogen Storage
- Hydrogen Fuel Cell
- Energy Management
- VSE SCADA Test at Idaho National Lab

Year 2

FT CARSON MICRO-GRID

- Large Scale Renewables
- Vehicle-to-Grid
- Smart Micro-Grid
- Critical Assets
- CONUS Homeland Defense Demo
- COOP Exercise

Year 3

CAMP SMITH ENERGY ISLAND

- Entire Installation Smart Micro-Grid
- Islanded Installation
- High Penetration of Renewables
- Demand-Side Management
- Redundant Backup Power
- Makana Pahili Hurricane Exercise

TRANSITION

- Template for DoD-wide implementation
- CONOPS
- TTPs
- Training Plans
- DoD Adds Specs to GSA Schedule
- Transition to Commercial Sector
- Transition Cyber-Security to Federal Sector and Utilities

VIRTUAL SECURE ENCLAVE (VSE) CYBER-SECURITY

RIGOROUS ASSESSMENT WITH RED TEAMING IN EACH PHASE

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Green Initiative for Fuels Transition Pacific (GIFTPAC)

GIFTPAC Membership

Working Group:

– Mission Manager:	PACOM and Navy DASN Energy
– Acquisition Manager:	DLA-Energy
– Federal Representation:	DoD: DARPA, DPA Title III, OSD OEPP, ONR, AFCO, NAVAIR, TARDEC, NAVFAC HAWAII, IMCOM PAC, PACOM J4/JPO
	USDA: RDP, ARS, NRCS
	USDOE: OBP , EERE
	EPA Office of Transportation AQ
– State Sponsors:	Hawaii DBEDT, Dept of Ag
– Industry Cooperation:	Air Transport Association, HECO

Listening to Industry/Stakeholders:

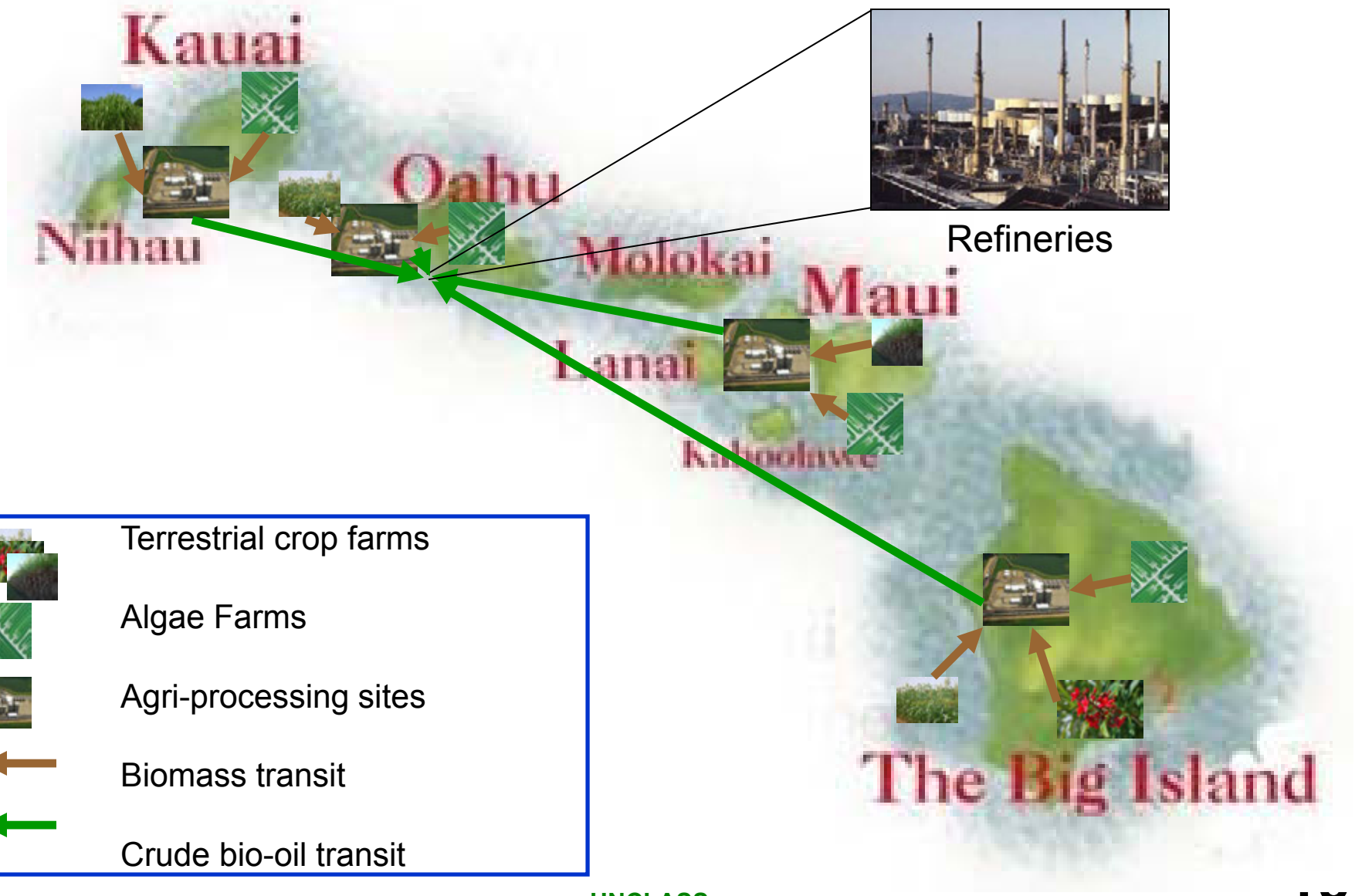
- Land owners
- Farmers
- Seed/crop developers
- Engineers
- Refiners/Biorefiners
- Ranchers
- Cellulosic converters
- Equipment suppliers
- Capital sources
- Ag processors
- Utilities
- Algae developers

Objectives Set by GIFTPAC Group

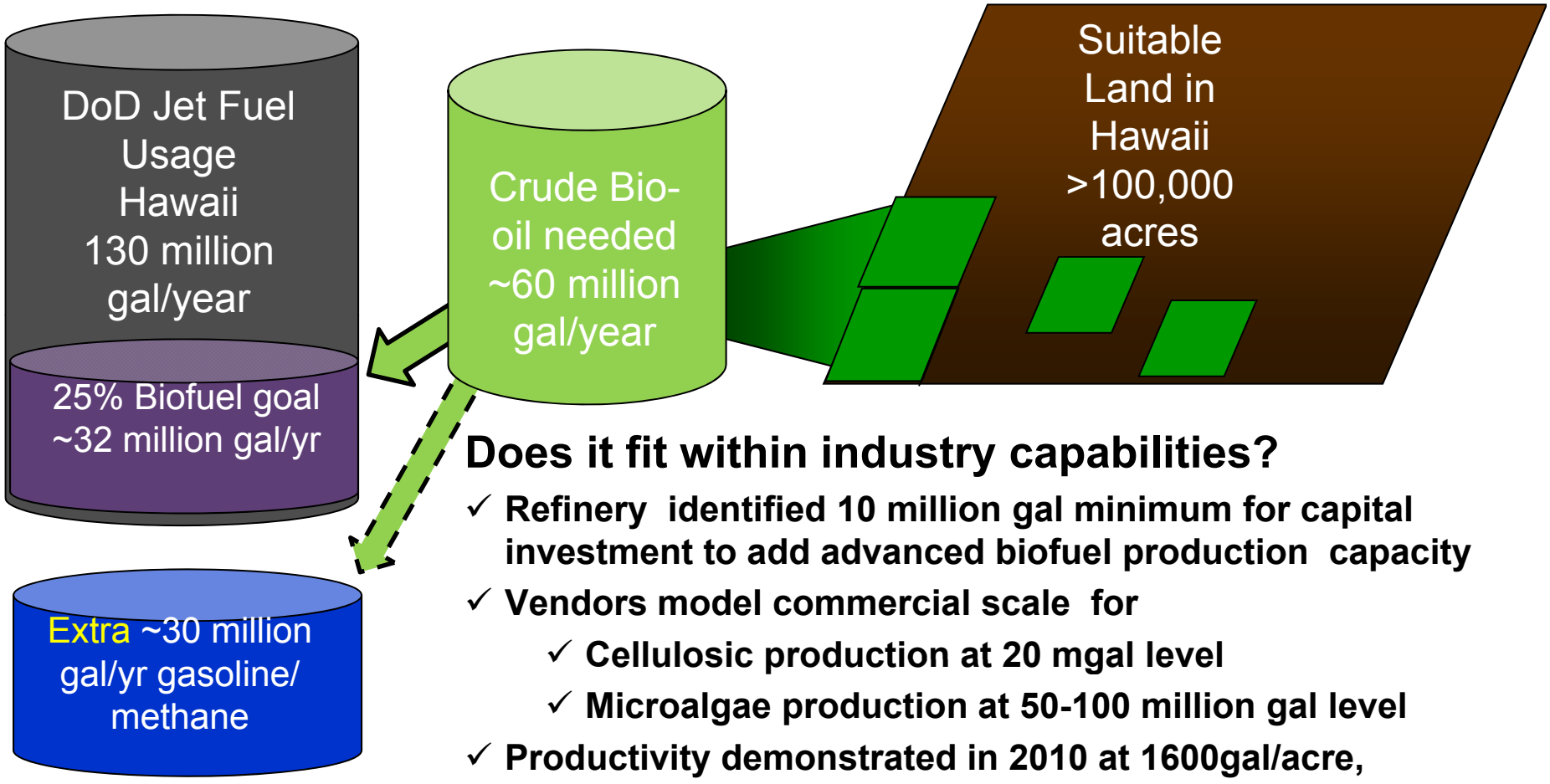
1) Long-term contract by DLA-Energy for multi-year stable-price supply of domestically produced non-fossil fuel to displace at least 25% of DoD petroleum-based fuel in Hawaii; corresponding purchase contracts of renewable/green electricity derived from co-products of fuel process.
2) Enterprise model inclusive of the local energy market that incorporates the agricultural, energy, environmental, government, industrial, and commercial sustainability objectives.
3) End state with sustainable ongoing competition among multiple commercial entities at many levels.

Regional demonstration of a national security concept

Straw Man: Potential Supply Chain



Straw Man: Scalability Test for Hawaii

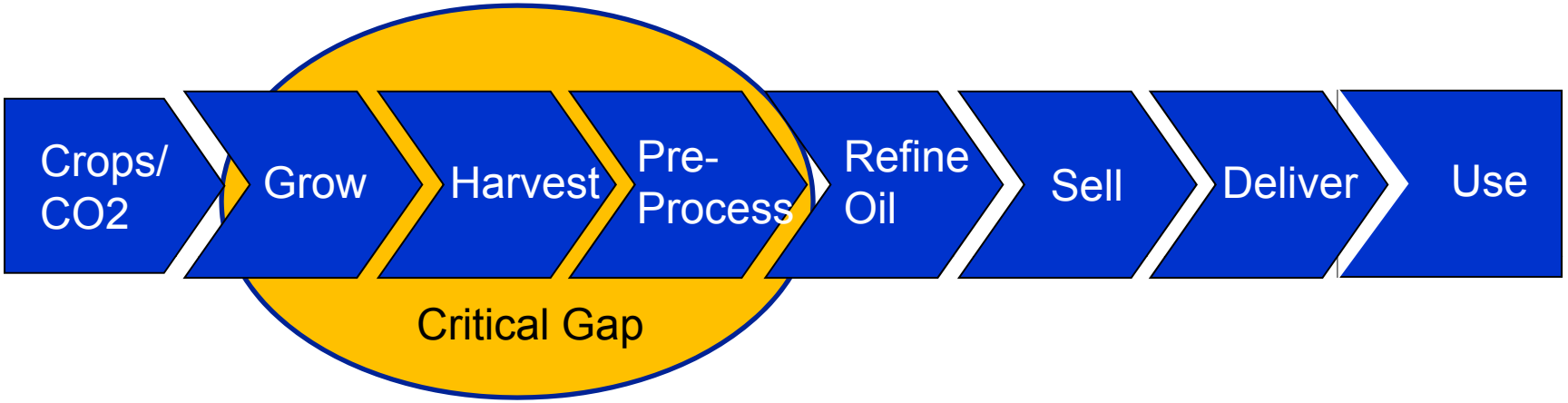


Does it fit within industry capabilities?

- ✓ **Refinery identified 10 million gal minimum for capital investment to add advanced biofuel production capacity**
- ✓ **Vendors model commercial scale for**
  - ✓ **Cellulosic production at 20 mgal level**
  - ✓ **Microalgae production at 50-100 million gal level**
- ✓ **Productivity demonstrated in 2010 at 1600gal/acre,**
  - ✓ **before optimization and scale increase**
- ✓ **At least 100,000 acres in Hawaii reported available**
- ✓ **Minimum parcel size dropping; now 2000 acre parcels OK**

Enterprise Model to Reduce and Share Risk

- **Steps in the Enterprise Model**



- **Participants to include**

…Landowners… Regulatory Agencies …Refiners…Distributors…

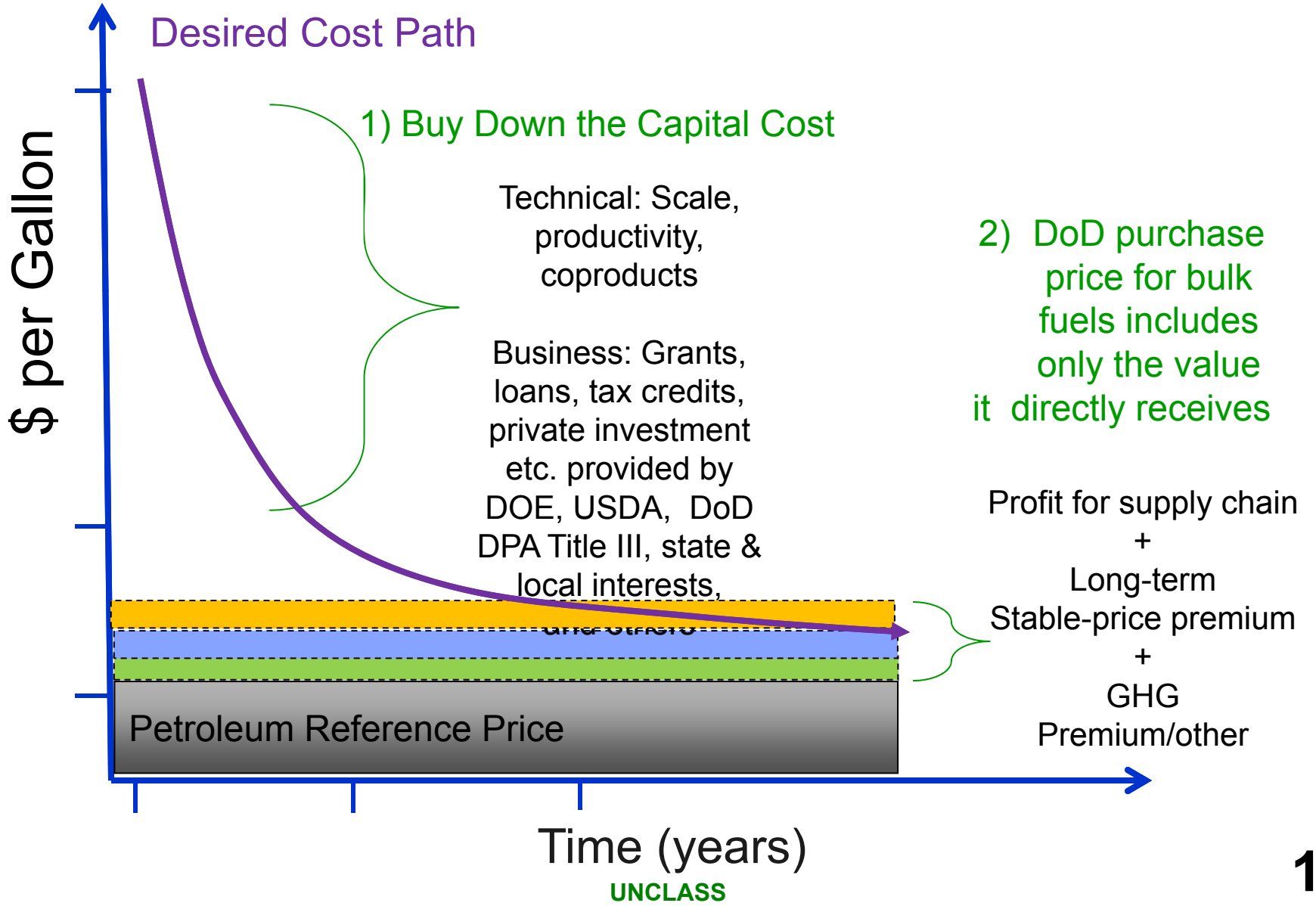
Technologists…Farmers… Ag Processors… Trade Groups... DESC…Services

- **Resources to bring to enterprise to reduce process risk**

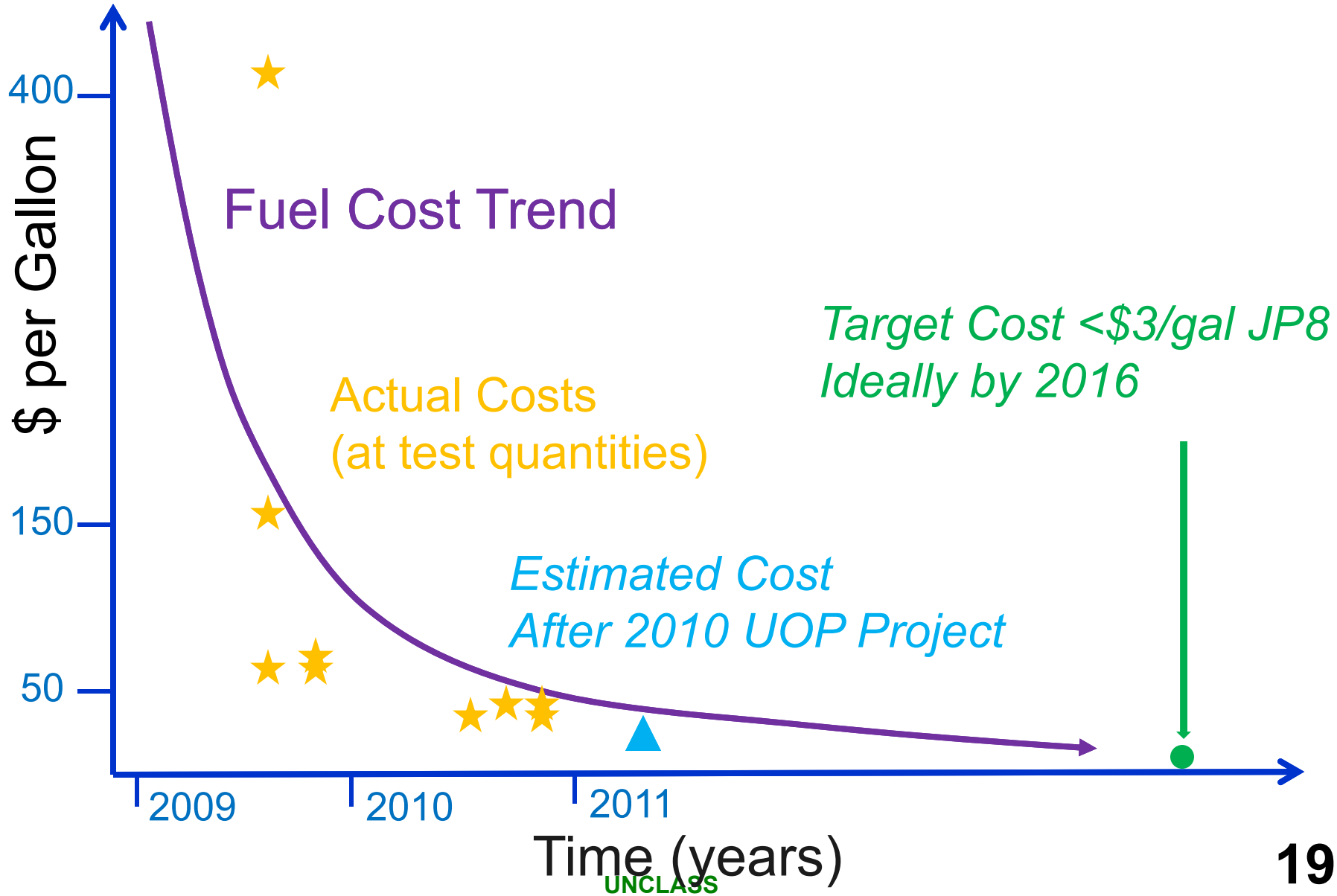
USDA State of Hawaii Private Sector DOE DOD

Biofuels are traditionally feedstock limited. How does industry produce enough to be meaningful to operations and to market?

Concept to Achieve Competitive Price for DoD



Progress as Intended Along Cost Reduction Path



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Navy's Great Green Fleet Biofuel Needs