



Technical and Policy Assistance for Biofuels Market Development in Dominican Republic and El Salvador

Judy Siegel
Energy and Security Group

Hart Energy Consulting
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Project History

- Project conducted under U.S – Brazil Biofuels Agreement
- Advances introduction of biofuels for local, vehicular use
- Technical assistance provided to stimulate early introduction of bioethanol
 - DR/ES both looking at E10 in near term
 - In El Salvador helping ready country to implement the law when passed
 - In DR, supporting implementation of the 2007 RE Law (57-07), and regulations
- Looks ahead to increasing ethanol use in medium to long term (E25)



Team Participants

- Energy and Security Group and Hart Energy Consulting
 - Offer range of technical/managerial skills resources for project
- ESG brings expertise in all biofuels/renewable energy areas
 - Policy support, program planning, development and implementation, market assessment, project development and financing, modeling
 - Created decision support model –Bio-Energy Evaluation Tool (BEET)—to evaluate country level impacts of bioenergy policies/strategies
- Hart Energy Consulting offers high-level services on fuel, refining, and automotive related issues
 - Runs International Fuel Quality Center, Global Biofuels Center, International Sustainable Energy Exchange, Advanced Biofuels Coalition

Project Overview

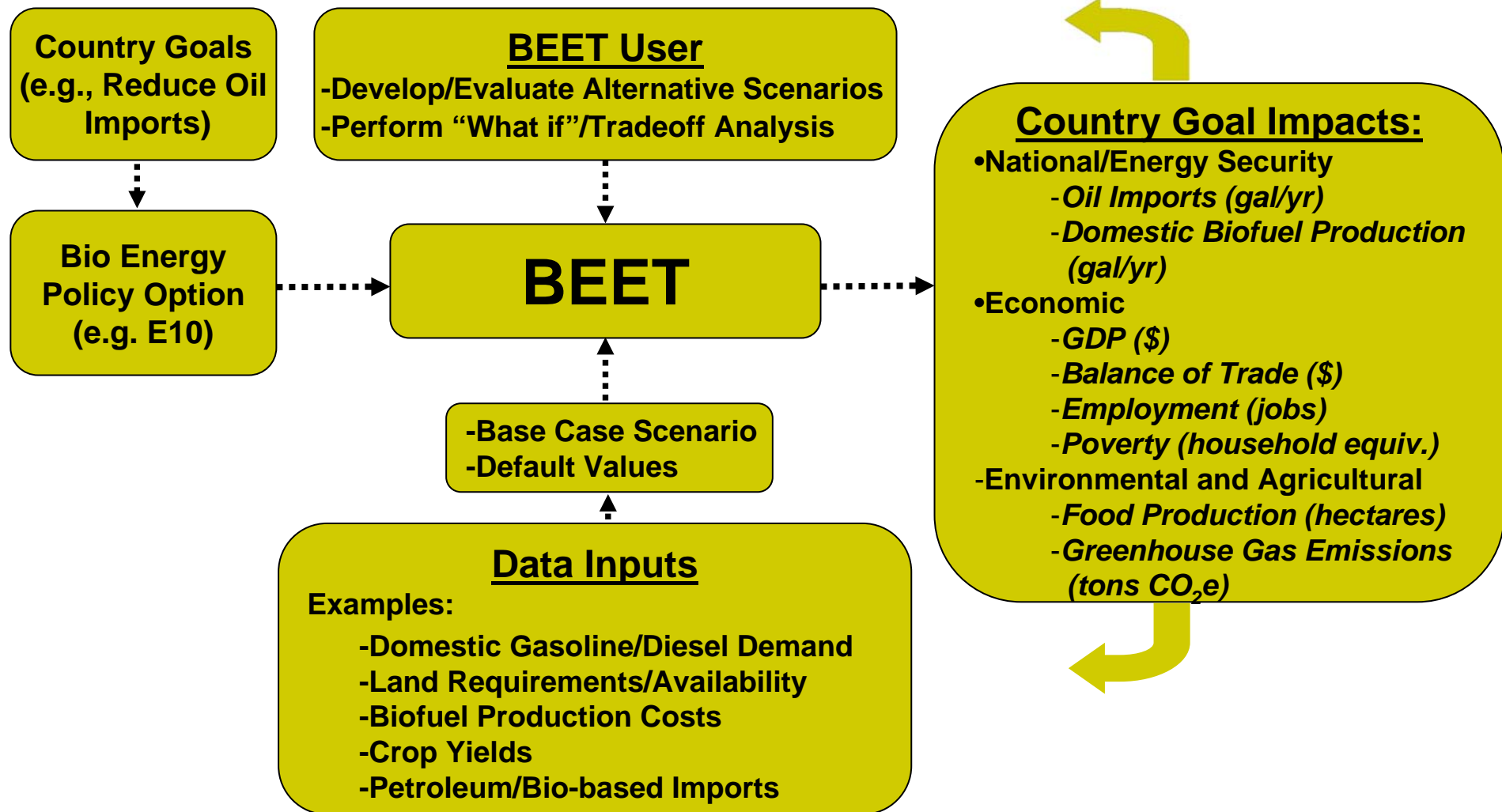
- **Objectives**
 - Augment the knowledge base on ethanol market development
 - Inform decision makers and prepare for rapid implementation of blending program
- **Expected Output-** Report to include recommendations for needed investments in:
 - Infrastructure
 - Equipment
 - Refinery changes
 - Technical capacity to perform relevant standards and certification procedures
- **Key Government counterparts**
 - El Salvador: Salvador Rivas, Ministry of Economy
 - DR: Onil Tabar, National Energy Commission (NEC)
- **Schedule**
 - El Salvador to be completed by March 2009, Dominican Republic by June 2009



Task Activities and Progress

Task	Activities
Develop Logistics for Ethanol Supply and Delivery to End Users	<ul style="list-style-type: none"> •Identify storage tanks/capacity, material compatibility requirements, recommend locations, equipment/piping needs, and/or needs for new tanks •Work with tank vendors on delivery/set up times at terminals •Identify/evaluate roads (quality), routes, number of trucks needed •Investigate alternative transport modes to trucks •Devise cost effective scheme for serving ethanol value chain
Assess Urban Air Quality Impacts and GHG Reductions and Benefits	<ul style="list-style-type: none"> •Analyze urban air quality impacts of emission exhaust changes of ethanol blends •Acquaint officials with air quality models for local air shed; apply in evaluating fuel composition alternatives • Evaluate impact of GHG emissions due to ethanol introduction at various blends
Develop Standards, Testing and Quality Control Procedures	<ul style="list-style-type: none"> •Review applicable fuel standards (ASTM/ISO) •Assess local lab capabilities to carry out lab tests •Monitor regional activities to establish ethanol fuel standards •Recommend where testing should reside; produce list of equipment/training costs
Design Media Strategies & Public Relations Campaigns	<ul style="list-style-type: none"> •Originally requested in DR but also plan to conduct in ES •Focus on intermediaries: service stations, auto suppliers first •Then broader public outreach through workshops, press
Develop Plan of Action for Ethanol Blending(E10+)	<ul style="list-style-type: none"> •Builds upon studies/activities in country, regionally, and throughout LAC •El Salvador 5 year plan; Dominican Republic 10 year plan

BEET™ Methodology



BEET™ Output Table-Quantitative Results

Bio Energy Evaluation Tool - Ethanol; Results Screen (Tabular)

Return to Data Input Screen 1	View Results Screen (Graphical)	ETHANOL POLICY SCENARIOS				
Return to Data Input Screen 2	View Results Summary	Base Case Scenario El Salvador	Alternative Scenario A Use Existing Unused Land Suitable for Sugar Cane	Alternative Scenario B Use Existing Sugar Cane Land	Alternative Scenario C Scenario Deactivated	Alternative Scenario D Scenario Deactivated
Return to Main						

National/Energy Security

Gasoline Imports (gallons/year)	113,343,965	97,811,604	97,811,604	-	-
Crude Oil Imports (gallons/year)	298,176,446	298,176,446	298,176,446	-	-
Domestic Ethanol Production from Crops (gallons/year)	-	15,532,361	15,532,361	-	-

Economic

Gross Domestic Product (billion \$)	20.37	20.41	20.41	-	-
Balance of Trade (billion \$)	(4.70)	(4.66)	(4.66)	-	-
Imports (billion \$)	8.68	8.64	8.64	-	-
Exports (billion \$)	3.98	3.98	3.98	-	-
Total Jobs Required for Ethanol Production and Transportation (FTE)	-	5,881	49	-	-
Reduction in Poverty (Household Equivalents)	-	8,662	76	-	-

Environmental and Agricultural

Total Land for Ethanol Production (hectares)	-	12,185	12,185	-	-
<i>From Existing Sugar Cane Land</i>	-	-	12,185	-	-
<i>From Existing Unused Land Suitable for Sugar Cane</i>	-	12,185	-	-	-
Total Greenhouse Gas Emissions (tons CO2e)	1,693,649	1,603,561	1,603,561	-	-

Other Impact Factors

Investment in New Ethanol Production Facilities (\$)	-	25,064,722	25,064,722	-	-
New Ethanol Production Capacity (gallons/year)	-	12,532,361	12,532,361	-	-
Annual Cost of Imported Hydrous Ethanol (\$)	138,622,084	138,622,084	138,622,084	-	-
Annual Cost of Domestic Ethanol Production (\$)	-	31,098,053	31,098,053	-	-

BEET™ Output Table –Percentage Impacts

Bio Energy Evaluation Tool - Ethanol; Results Summary

Return to Data Input Screen 1	View Results Screen (Tabular)
Return to Data Input Screen 2	View Results Screen (Graphical)
Return to Main	

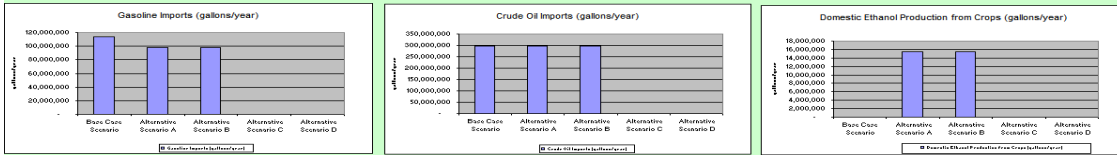
	Alternative Scenario A	Alternative Scenario B	Alternative Scenario C	Alternative Scenario D
National Security Impacts				
Gasoline imports (% change in gallons from Base Case)	-13.7%	-13.7%	-	-
Crude Oil imports (% change in gallons from Base Case)	0.0%	0.0%	-	-
Domestic Ethanol Production (% of Total Ethanol Demand)	16.8%	16.8%	-	-
Economic Impacts				
GDP (% change in \$ from Base Case)	0.2%	0.2%	-	-
Balance of Trade (% change in \$ from Base Case)	-0.7%	-0.7%	-	-
Imports (% change in \$ from Base Case)	-0.4%	-0.4%	-	-
Exports (% change in \$ from Base Case)	0.0%	0.0%	-	-
New Jobs Created (#)	5,881	49	-	-
Reduction in Poverty (Household Equivalents)	8,662	76	-	-
Environmental & Agricultural Impacts				
Portion of Existing Sugar Cane Land Used for Ethanol Production	0.0%	20.3%	-	-
Portion of Existing Unused Land Suitable for Sugar Cane Used for Ethanol Production	3.8%	0.0%	-	-
GHG Emissions (% change from Base Case)	-5.3%	-5.3%	-	-
Operations and Maintenance Costs (\$)				
Cost of Feedstock Used to Produce Ethanol	\$ 20,910,525	\$ 20,910,525	-	-
Ethanol Production Cost Excluding Feedstock Cost	\$ 10,187,528	\$ 10,187,528	-	-
Ethanol Production Cost Including Feedstock Cost	\$ 31,098,053	\$ 31,098,053	-	-
Annual Cost of Imported Hydrous Ethanol	\$ 138,622,084	\$ 138,622,084	-	-

BEET™ Output Tables- Graphically

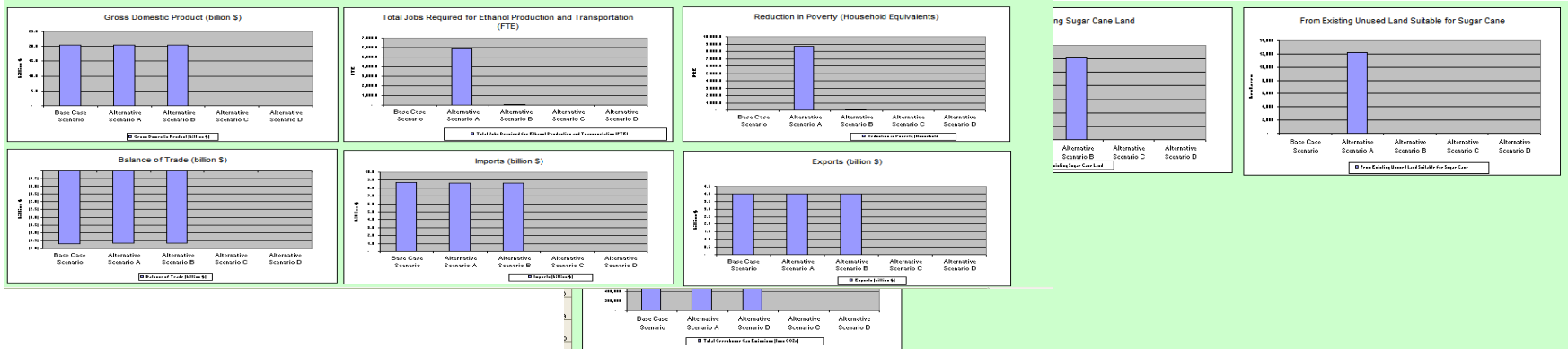
Bio Energy Evaluation Tool - Ethanol; Results Screen (Graphical)

Return to Data Input Screen 1 View Results Screen (Tabular)
 Return to Data Input Screen 2 View Results Summary
 Return to Main

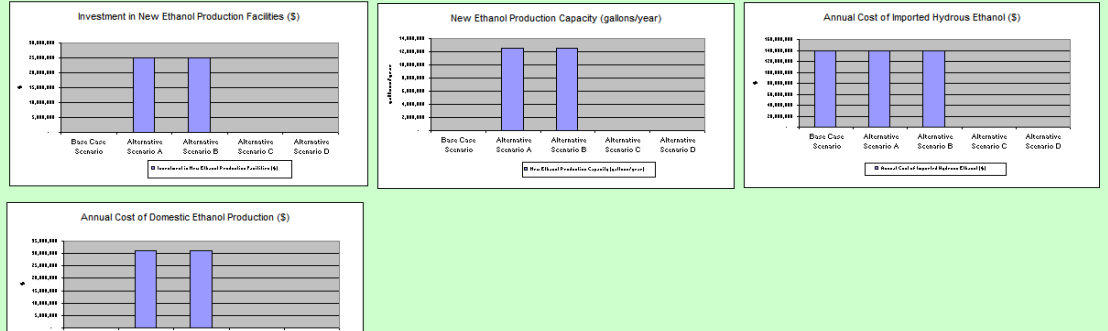
National/Energy Security Results



Economic Results



Other Impact Factor Results



Preliminary Assessment of E-10 Policy in El Salvador

- ***No negative impacts of E-10 as compared to base case***
- National/Energy Security Impacts
 - Gasoline imports decrease
 - Domestic ethanol production (E-10) estimated at about 15 million gallons per year
- Economic Impacts
 - Imports (\$) reduced
 - Balance of Trade and GDP improve due to reduction of gasoline imports
 - Jobs required for ethanol production and transport increase
- Environmental/Agricultural Impacts
 - GHG emissions reduced
 - ***Existing unused land suitable for sugar cane used for ethanol production is small (3.8%)***
 - ***Does not crowd out food***
- ***But at what cost?***
 - ***Study is developing investment costs of ethanol production/blending for cost-benefit comparison***



Expected Benefits of Project

- Help ensure the *infrastructure* to launch an effective ethanol program
- Accelerate *domestic markets* for ethanol
- Provide *technical recommendations* on the production, introduction, and use of ethanol blended with gasoline as a vehicle fuel
- Stimulate interest in *implementation* of biofuels portion of the biofuels laws/regulations
- Prepare *petroleum importing, refining, & distribution industry* to make needed investments
 - Taking advantage of potential for lower cost octane enhancement & improved air quality
- Encourage *domestic ethanol producers* to conduct projects
- Identify needs /opportunities for investments in services/equipment for *fuel testing and certification*
- Enable a smooth transition to *increased ethanol use* in the country
- Support a *model for other LAC countries* that are initiating or contemplating similar programs.
 - Results to be made available to U.S.-Brazil Biofuels Agreement partners





Thank you?

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