California Energy Commission Staff Workshop April 27, 2009

By

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and

SWAN Biomass Company

Overview

IVB and SWAN are planning to seek USDOE funding to help build a 30 MMGPY cellulose-to-ethanol Biorefinery

- Would like California collaboration
- Have met AB118 criteria and have completed most Investment Plan activities
- Looking for acceptable collaboration structure

IVB Update

- Cellulose technology is not “5 years away”
  - Engineering companies are committed
  - Process design is set, most permitting done
- Feedstock flexibility limits cost growth to CPI at most
- Technology and financial structure are very robust
- IVB fuel ethanol GGe cost as low as $1.56
- Shutdown (manufacturing) GGe cost $1.07

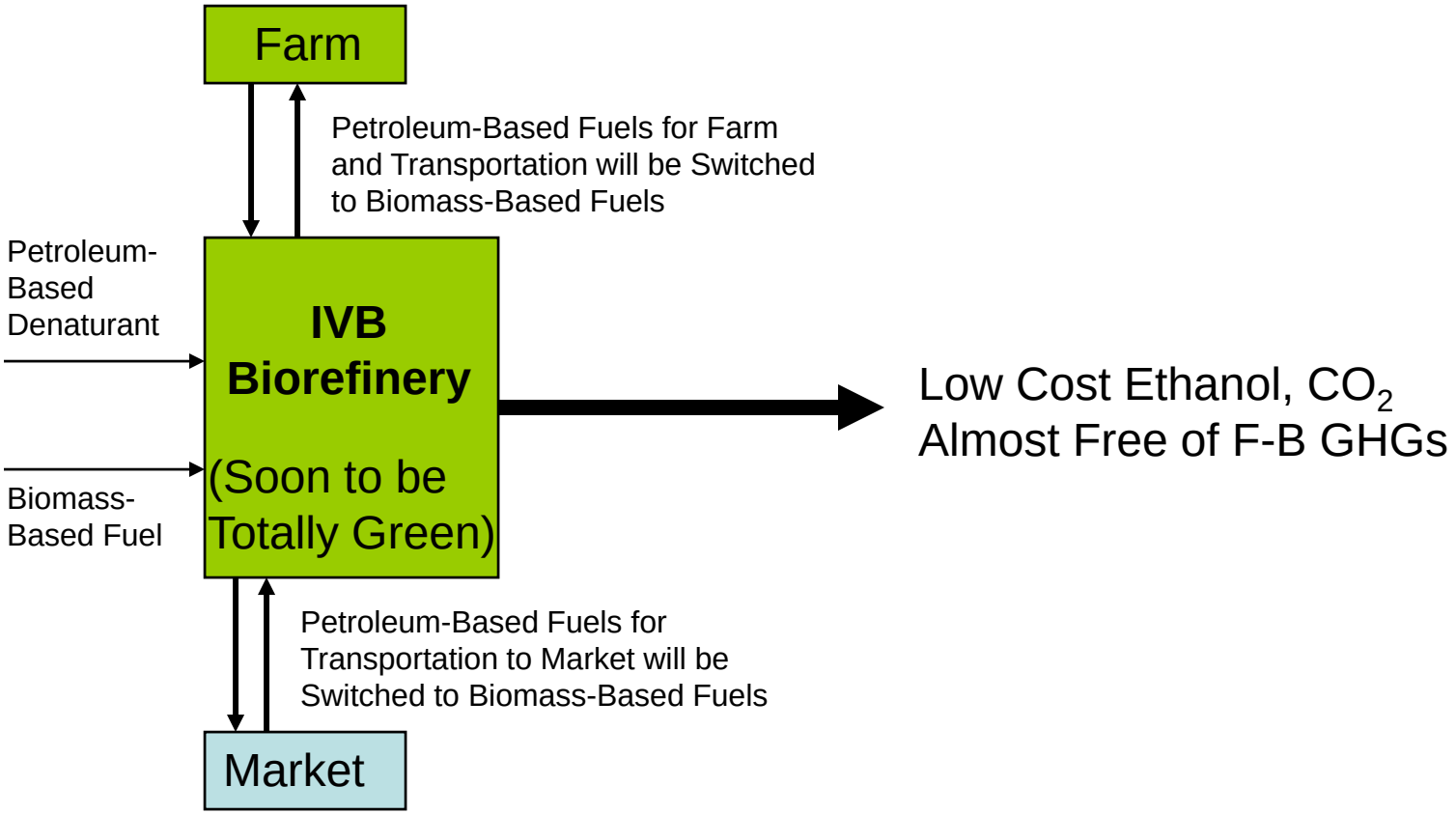
More Pilot Plant Work Is Not Needed

- Extended runs already have been conducted at NREL's highly instrumented 1 ton per day Alternative Fuel User's Facility (AFUF).
- Many feedstocks were tested:
  - Corn, corn fiber, screenings
  - Mixed wheat, barley, oat straws
  - Rice straw
  - Wood
  - Etc.
- Process is fully defined and modeled, profit is optimized.

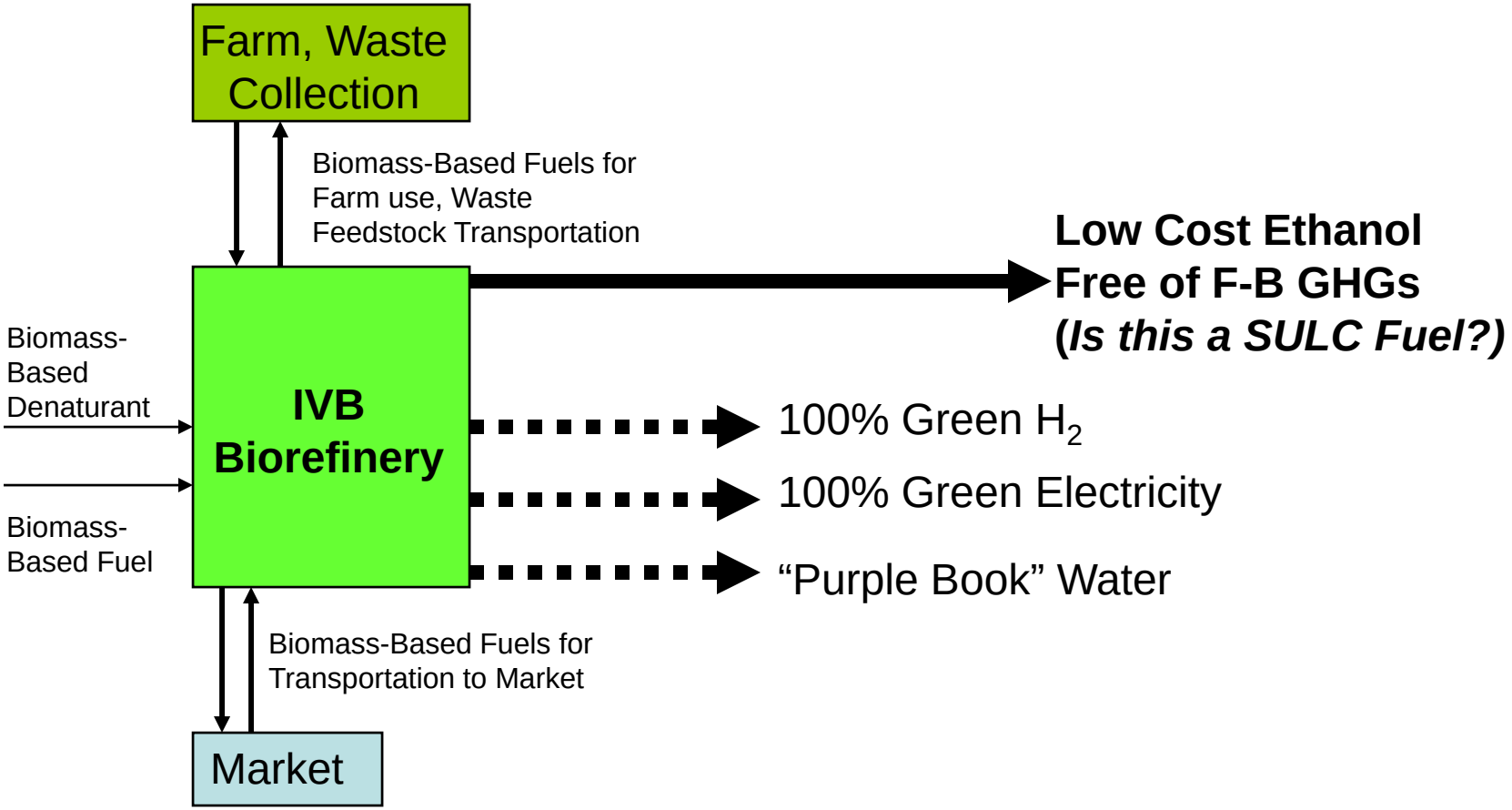
Biomass Conversion Center of Excellence (BCCE)

- Engineering companies agree that no more pilot plants are needed.
- SWAN's 24,000 sq. ft. BCCE is better suited to serve commercial needs:
  - Characterizing new feedstocks
  - Center for operator training
  - Center for expert advice
  - Test bed for new vendor equipment

Eliminating Fossil-Based GHGs



Providing Bridges to Future Transportation Paradigms



Proposed Collaboration Structure

- Allocate portions of the Plan budget that would have been sought if IVB/SWAN had not already accomplished them.
- Grant the combined amount to IVB for use as equity in a proposal to USDOE for an 80/20 D/E loan guarantee.
- Provide for the return of the amount granted to the State for recycling to advance additional progress within AB118 programs.
- **CEC reward will be program development acceleration in many activities, and a 15X leveraging of AB118 money.**

Hypothetical Sources of Funds For IVB From CEC Investment Plan

Fuel/ Technol.	Project/Activity	Number	Alloc. $MM	Allocation/ Project, $
Ethanol	New Plants	20	3	150,000
	Pilot Plant	2	4	2,000,000
	E85 Station	50	5	100,000
Nat. Gas	Vehicles	700	23	32,857
	Biomethane	10	10	1,000,000
Devt.	Training, Etc.	4	15	3,750,000
	Sustain. Studies	2	4	2,000,000
CEC	**Contribution**			**$10,032,857**

CEC Hypothetical Leverage

Source	**Amount, $**
CEC Contribution	10,032,857
Leverage (From IVB/SWAN)	10,032,857
Leverage (From 3rd Party)	10,032,857
Equity	$30,098,571
Project Total (with USDOE 80/20 D/E Loan Guarantee)	$150,492,857
Total Leverage of CEC Funds **(CEC funds to be returned to maintain state program revolving source of funds)**	**15 Times**

Questions

- Is the offered proposal feasible?
- Can it be made better?
- Other questions, comments?

Thank you for your interest and contributions.