

Alternative Energy Systems and Bioproducts

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V(A). Planned Program (Summary)

1. Name of the Planned Program

Alternative Energy Systems and Bioproducts

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
511	New and Improved Non-Food Products and Processes			100%	
	Total			100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	5.1	0.0
Actual	0.0	0.0	1.7	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	92088	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	487358	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	485881	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Conduct Research Experiments
- Develop new culture strains and metabologic engineering tools
- Develop simulation models
- Conduct Workshops, meetings.
- Develop Products, Curriculum, Resources.
- Provide Training.
- Provide Counseling.
- Assessments.
- Work with Media.
- Partnering.

2. Brief description of the target audience

The target audiences for this research are potential producers and industrial manufacturers of hydrogen and bio-diesel.

V(E). Planned Program (Outputs)**1. Standard output measures****Target for the number of persons (contacts) reached through direct and indirect contact methods**

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	600	6000	60	60
2008	300	1000	30	30

2. Number of Patent Applications Submitted (Standard Research Output)**Patent Applications Submitted**

Year Target

Plan: 0

2008: 3

Patents listed

1. Single chamber microbial electrolyzer
2. Pressurized microbial electrolyzer
3. Precious metal free catalysts

3. Publications (Standard General Output Measure)**Number of Peer Reviewed Publications**

	Extension	Research	Total
Plan	0	7	
2008	0	24	24

V(F). State Defined Outputs**Output Target****Output #1****Output Measure**

SCHOLARLY excellence in referred articles, book chapters, and books; participation on professional boards and panels, as well as science panels.

Year	Target	Actual
2008	9	36

Output #2**Output Measure**

DEVELOP IMPROVED BIOPRODUCT PRODUCTION SYSTEMS – boost solar energy capture for hydrogen production through development of a variety of feedstocks – improved microbial feedstocks for biodiesel production

Year	Target	Actual
2008	1	3

V(G). State Defined Outcomes

O No.	Outcome Name
1	Improved knowledge about feedstocks for biofuels and bioenergy: - Researchers learn new methods of metabolic engineering for photobiological H ₂ production on a 24-hour basis - Energy sector will learn that the electrical energy required with the photobiological approach could be much lower than the typical energy requirement of hydrogen produced by water electrolysis. - Growers learn to produce algae as a biofuel feedstock
2	Applications will advance production systems for bioenergy: - Peers develop biomimetic models to create biobased generators to produce molecular H ₂ and O ₂ from water and light, and these generators are incorporated into integrated H ₂ energy systems, providing generation, storage, and utilization of H ₂ in one unit. - Energy producers optimize the photobiological process to yield higher energy efficiencies. - Construction and operation of bioenergy facilities close to potential feedstocks will generate additional economic activity in rural areas. - If waste biomass, such as animal wastes and organic component of urban wastewater is used as feedstocks, not only biohydrogen can be harvested, but also the wastes can be treated. - Algae can produce 30 times more oil per unit area of land than terrestrial oilseed crops

Outcome #1

1. Outcome Measures

Not reporting on this Outcome for this Annual Report

2. Associated Institution Types

3a. Outcome Type:

3b. Quantitative Outcome

Year	Quantitative Target	Actual
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3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
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V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}