



California Energy Commission
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September 17, 2012

California Energy Commission
1516 Ninth Street
Sacramento, CA 95814-5512

Re: Docket # 12-ALT-2 / 2013-2014 Investment Plan Update / California Biodiesel Alliance Funding Request for AB118 Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP)

Dear Commissioners, Staff and Members of the ARFVTP Advisory Committee,

The California Biodiesel Alliance (CBA) is a not-for-profit trade association promoting the increased use and production of high quality, renewable biodiesel fuel in California. CBA membership includes California producers, feedstock providers, marketers and other stakeholders.

Attached is a report summarizing the state of the biodiesel industry in California, and describing recommendations for expanding the production and use of biodiesel in California to meet the goals of AB118. Over the past several months CBA polled its members to determine production capacity, actual production, and the best means for expanding the production and use of biodiesel. The suggestions for expanding the production and use of biodiesel from each CBA member were compiled and sent back to the CBA members to be ranked on a scale of 1-10 to determine which suggestions had the greatest support. The results were then tabulated and then distributed to the members for review prior to being used as the basis for the attached report.

The three most highly rated recommendations regarding the AB118 budget are, (1) grants and loan guarantees are needed to expand Ultra Low Carbon Intensity (ULCI) biodiesel production at existing in-state facilities and then create new capacity, (2) support is needed for the development of plentiful and inexpensive low Indirect Land Use Change (ILUC) feedstocks, and (3) grants and loan guarantees are needed for new blending and storage infrastructure at petroleum distributors' and terminal racks.

There is also a common view among CBA members that biodiesel has not received funding commensurate with its merits, especially when compared to other alternatives on a cost-benefit basis. In fact, as the white paper illustrates, AB118 investments in biodiesel are 9 to 20 times more effective on a dollar per dollar basis than any of the other alternatives, and yet biodiesel projects have received only 4.8% of AB118 funding while delivering 34.7% of the benefits. We feel that it is imperative that the AB118 budgets should reflect these basic metrics and that the funding level for biodiesel should be substantially increased.

Please consider and act upon the recommendations described in more detail in the attached report, and the presentation made by our representative on the ARFVTP Advisory Committee, Joe Gershen. Joe is the primary author of the report and should be able to respond to any of your questions.

Respectfully submitted,

Vice Chairman
California Biodiesel Alliance



September 17, 2012

Funding Request for AB118 Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP)

INTRODUCTION

The California Biodiesel Alliance (CBA) is a not-for-profit trade association promoting the increased use and production of high quality, renewable biodiesel fuel in California. CBA membership includes California producers, feedstock providers, marketers and other stakeholders.

The purpose of this document is to re-introduce the California Energy Commission (CEC) and the ARFVTP Advisory Committee to the biodiesel industry and its potential to expand volumes and to help California meet its 2020 goals and 2050 vision¹.

- Based on CEC's own calculations from the [2011 IEPR Benefits Section](#), biodiesel use in California provides 34.7% of results (Table 1) – more than all other modalities – and yet has only received 4.8% of the funding. In comparison, a Cost Benefit Analysis of the numbers from that same section of the 2011 IEPR shows that other programs were 9 to 20 times more expensive in achieving the same goals (Table 2).

We will explain biodiesel benefits with respect to achieving ARFVTP goals; provide an update on current production in California, and propose increasing the share of program funds going toward biodiesel (and other diesel substitutes) projects to match funding levels with achievement metrics based on CEC's own calculations.

- Biodiesel is the lowest cost, commercially available low carbon fuel on the market today. It can be produced from diverse low impact feedstocks grown in California, creating in-state jobs. All OEM's support the use of B5 and there is no increase in NOx in new diesels.**

CBA has conducted in-depth industry-wide surveys as well as discussions with CEC staff over the last few months. We have also reviewed CEC's data on biodiesel vs. other technologies that have received funding through the ARFVTP as described in the [2011 IEPR Program Benefits Section](#) (Chapter 11). We have found that the California biodiesel (and diesel substitutes, including renewable diesel) industry has been grossly under-funded to date by the ARFVTP, especially relative to biodiesel's further potential to meet stated program goals of

¹ State Alternative Fuels Plan, 2007



September 17, 2012

displacing petroleum, reducing GHGs, reducing exhaust emissions and creating/maintaining jobs in California. Based on the IEPR benefits metric, biodiesel provides the greatest return on taxpayer dollars invested – yet receives the least funding support. As required under AB 109, we urge CEC to re-examine, and update, its analyses.

Based on our analysis, we have developed a better understanding of some inconsistencies in funding. We believe that the current ARFVTP allocation process has misallocated scarce resources, and recommend that an objective, metric based approach be developed that is transparent to all, especially the AB 118 Advisory Committee. By now the Commission must have enough information on each technology's projected performance to present objective and analytical measures to enlighten the decision-making used in the funding allocation process.

THE CALIFORNIA BIODIESEL INDUSTRY

There are currently 8 functioning biodiesel production facilities in California with a combined capacity of 46 million gallons per year (Mgpy). These green businesses directly provide approximately 150 family supporting jobs. Based on our survey, as of June 30, 2012 these plants expect to produce 26 million gallons during calendar year 2012. This amount represents a theoretical two-thirds of 1% statewide biodiesel blend level within 5 years².

CBA recently conducted a survey of its producer members to find out what the industry needs in order to expand biodiesel production and utilization. The survey found support for the following items in this order of importance:

- 1) Grants and loan guarantees are needed to expand Ultra Low Carbon Intensity (ULCI)³ biodiesel production at existing in-state facilities and to create additional capacity,
- 2) Support is needed for the development of plentiful and inexpensive in-state feedstocks, and
- 3) Grants and loan guarantees are needed for new blending and storage infrastructure at petroleum distributors' and terminal racks.

² As a percentage of total annual California diesel fuel supply (4 Billion gallons by 2017 projected in the 2011 IEPR)

³ Ultra Low Carbon Intensity (ULCI) is used in this paper to signify a Carbon Intensity (CI) value of 20 or less. ULCI includes a basket of existing, approved biofuel pathways under the Low Carbon Fuel Standard (LCFS) ranging from 5.9 to 18.44, and provides room for the inclusion of new technology and feedstock pathways. It is not a defined legislative or regulatory standard; it is an objective used for comparison of approaches that will facilitate compliance with the LCFS.



September 17, 2012

ULTRA-LOW CARBON INTENSITY BIODIESEL

For 2012, our survey indicates that 66% of biodiesel produced in California was made from the following feedstock types and associated carbon intensity (CI) values:

- Used Cooking Oil (UCO) from in-state sources – CI value = 11.76
- Yellow Grease (YG), from in-state sources – CI value = 15.84
- Inedible animal fats (AF) from in-state sources – CI value = 34.11
- Distillers Grain Corn Oil – CI value = 5.9

Both on a volume-weighted, average basis and individually for UCO, YG and Corn, these types of biodiesel are often referred to as Ultra-Low Carbon Intensity (ULCI) fuel. Compared to the CI value of petroleum diesel at 94.71 gCO₂e/MJ, ULCI biodiesel represents an 87.58% reduction using UCO, an 83.28% reduction using YG, and a 93.77% reduction using DDG corn oil⁴. Approximately 200 Mgy of biodiesel (5% blend by 2017) can be absorbed at fuel blends compatible with existing vehicles and retail infrastructure.

As the federal Renewable Fuel Standard (RFS2) has moved forward, relative to its pro-rata share of total US diesel consumption, California has lagged behind national biodiesel production and consumption volumes. In 2011, more than 1 billion gallons of biodiesel were produced in the US to meet the RFS2 volume obligations. ARB's Low Carbon Fuel Standard 2011 Program Review Report states:

*"The federal RFS2 requires fuel importers and refiners to blend substantial amounts of biomass-based diesel fuel in the coming years. . . Many of the same companies are obligated parties under both the federal RFS2 and the California LCFS. These entities would appear to have an incentive to blend biodiesel in California because the same activity would help meet RFS2 obligations while also earning credits toward LCFS compliance obligations. **For this reason, it is possible that biodiesel volumes in California could be significantly higher in the future than those reported in previous years or the projection above.**"*

California contributed less than 3% of national production and consumption to meet this goal compared to a proportional share of 7%.⁵ A recent review of low ILUC feedstock availability concludes that there is the potential to substantially increase these feedstocks, but that current

⁴ $1 - (11.76/94.71) = 87.58\%$

⁵ Based on 2010 CA on-road diesel consumption vs. the on-road national diesel consumption, per EIA



September 17, 2012

supplies in California are insufficient. Considering (i) the availability of current ULCI feedstock types, (ii) ongoing development of new ULCI feedstock types such as algae and (iii) the tremendous GHG/CI value reduction and petroleum displacement benefits (see Table 1) reductions, **California production of ULCI biodiesel should be increased to meet both the mid-term and longer-term goals of LCFS and AB118.**

COMPARISON TO OTHER FUELS AND TECHNOLOGIES

In an effort to explain our rationale for increased funding for biodiesel (and other diesel substitutes) in the next budget cycle, we have reviewed metrics published in the 2011 Integrated Energy Policy Report Benefits Section (Chapter 11). In Table 1 **Projected 2020 Alternative Fuels Benefits** results shown are derived by averaging the **High** and **Low Case** scenarios separately for petroleum displacement, GHG reduction, and air quality benefits. For example Biodiesel is reported with 9.4 and 378.1 million gallons in 2020. These are averaged to 193.75 million gallons. This is done for each funded option. Then all options averages are totaled for 779.55 million gallons in 2020. Then biodiesel's 193.75 million gallons is divided by the total 779.75 yielding 24.85%. In this example biodiesel provides 25% of the ARFTVP's, first funding round, projected 2020 petroleum reductions. Likewise, biodiesel provides 35% of all funded projects 2020 GHG reductions, and so on. As an oversimplification, to illustrate the holistic benefit of biodiesel using the CEC values, if one values petroleum, GHG and Air Quality equally, then biodiesel provides the most benefits, 34.7% of all benefits, from the funding projects in the first round of funding.

Note that biodiesel provides the most benefits, in terms of petroleum displacement, GHG reduction and air quality improvements, yet receives the least amount of funding support of all competing options.

Table 1
Projected 2020 Alternative Fuels Benefits

Fuel Type	Petro Reduct	GHG	Air Quality	Total	% of Σ Results	% of Funding
Biodiesel*	25%	35%	44%	104%	34.7%	4.8%
Electric Vehicles	24%	20%	40%	84%	28.0%	36.6%
Biogas	19%	28%	4%	50%	16.8%	20.7%
Natural Gas Vehicles	24%	10%	5%	38%	12.8%	18.4%
Fuel Cell Vehicles	4%	3%	8%	14%	4.8%	13.3%
Ethanol	5%	5%	-1%	9%	3.0%	6.1%
	100%	100%	100%	300%		



September 17, 2012

*Modifications were made to biodiesel's Air Quality Results to account for the Air Resources Board's updated emissions and regulations documents: [Guidance on Mixed-Feedstock Biodiesel Production](#) and [California Air Resources Board Guidance on Biodiesel Use](#).

Based on CEC's own calculations from the 2011 IEPR Benefits Section, biodiesel provides 34.7% of results – more than all other modalities – and yet only received 4.8% of the funding.

As illustrated in Table 1, the Commission is investing 50% of its funding in electric and fuel cell vehicles. CBA asks the Commission to share the metrics that were used to justify this investment level, in terms of petroleum displacement, GHG reduction, and air quality benefits from the performance of actual projects funded and proposed funding to the Advisory Committee.

The following table indicates that on an objective cost/benefit basis funding of biodiesel programs is far more efficient. The IEPR Cost Benefit Analysis shown in Table 2 is based upon the data from the 2011 IEPR/ Chapter 11. It shows that the cost of obtaining each percentage of the total benefits obtained by the program expenditures through September 2011 was \$270,000 for biodiesel, compared to an average of \$1,980,000. By comparison all other Fuel Types were 8.9 to 20 times more expensive. We understand that cost-effectiveness is not the only decision factor. However, evidence to date, and a review of past meeting transcripts indicate, that cost-effectiveness has not been used or applied to this program. Should this not be used in some way to guide, not dictate, the funding allocation process?

Table 2: IEPR Cost Benefit Analysis					
Budget Expenditures ending 9/2011 = \$198.40			(all \$ in millions)		
Fuel Type	% of Results ¹	% of funds ¹	Budget	\$/% of Results	Ratio
Biodiesel	34.7%	4.8%	\$9.52	\$0.27	1.0
Electric Vehicles	28.0%	36.6%	\$72.61	\$2.59	9.4
Biogas	16.8%	20.7%	\$41.07	\$2.44	8.9
NG Vehicles	12.8%	18.4%	\$36.51	\$2.85	10.4
Fuel Cell Vehicles	4.8%	13.3%	\$26.39	\$5.50	20.0
Ethanol	3.0%	6.1%	\$12.10	\$4.03	14.7
	100%	100%	\$198.40	\$1.98	7.2

1. Data from Table 1

To further illustrate biodiesel's merits we have compared ULCI B5 deployment in California to other technologies in CEC's 2011 IEPR Benefits Section:

- Hydrogen fuel cell (FCV) and Electric (EV) vehicles are estimated to displace 425 gallons of petroleum fuel per vehicle per year. In this direct comparison, a 200 million gallon



September 17, 2012

(B5) deployment in California is equivalent to putting 470,588 FCVs or EVs on the road in the state⁶. Although [HybridCars.com](#) reported that only 7146 EVs were sold in the first 7 months of 2012 *nationwide*, if we optimistically assume 10,000 EVs and FCVs will enter the California market each year over the next several years, which is very optimistic, **it would take more than 47 years to accomplish the equivalent petroleum displacement and carbon reduction that ULCI biodiesel blended to B5 in California can achieve near term**⁷.

- According to the [California Fuel Cell Partnership](#) (CaFCP), to accommodate a hypothetical rollout of 53,000 FCEVs by 2017 it will cost \$65 million for 68 stations around the state. [Toyota does not anticipate introducing its first FCEV until 2015](#) and most other automakers regard this technology as about 10 years from being marketable. A B5 implementation of biodiesel **would be equivalent to almost 10x that displacement of petroleum and GHGs** while providing a near term solution. Biodiesel is being produced in the state now and should be expanded to create immediate benefits.
- ⁸The average petroleum reduction per heavy-duty natural gas vehicle (NGV) is 7,000 gallons. Heavy-duty CNG vehicles are reported at 11-16% GHG reduction (per mile driven) and heavy-duty LNG vehicles are 1% increase to 4% decrease in GHG (per mile driven) ([CEC Wells to Wheels 2007 Report](#)). **A B5 implementation in California would be equivalent to putting 28,571 heavy-duty NGVs on the road⁹, which would take more than 22 years to accomplish otherwise¹⁰. And from a GHG-reduction perspective that is equivalent to placing at least 127,819 heavy-duty NGVs on the road¹¹.**
- Note: To put this into real-world perspective, this year the California biodiesel industry's estimated production of 26 million gallons is equivalent to putting over 61,000 EVs/FCVs¹² or over 3700 heavy-duty NGVs¹³ on the road in California.

FUNDING RECOMMENDATION

We recommend that in-state biodiesel (diesel substitutes) production and feedstock and

⁶ $200,000,000/425 = 470,588$ FCVs/EVs

⁷ $470,588/10,000 = 47.76$ years

⁸ According to CEC (File Pass of DMV Data), in 2009 60% of natural gas vehicles (NGVs) were heavy-duty (1283 units), 40% were light fleet (consumer vehicles), and 75% of petroleum reduction from all NGVs comes from the heavy-duty fleet (CEC 2011 Total Fuel Use Analysis).

⁹ $200,000,000/7000 = 28,571$ heavy-duty NGVs

¹⁰ $28,571/1283 = 22$ years

¹¹ $(87.58/16) - 1 \times 28,571 = 127,819$ heavy duty NGVs

¹² $26,000,000/425 = 61,176$ EVs/FCVs

¹³ $26,000,000/7000 = 3714$ heavy-duty NGVs



September 17, 2012

distribution infrastructure development projects receive \$24 million in each of the next two funding cycles, to be allocated as follows:

- \$6.5M – In-state production expansion grants with preference provided to Ultra-Low Carbon Intensity Biodiesel production (defined as CI less than 20 gCO₂e/MJ) / Implementation of CI-lowering technologies and feedstocks
- \$6M – Low Interest / Loan Guarantee programs for expanding in-state production with a preference provided to ULCI biodiesel
- \$4M – In-state Low Indirect Land Use Change, purpose-grown energy crop research, development and implementation grants
- \$4M – \$0.10/gallon in-state ULCI production incentive program
- \$3.5M – Distribution infrastructure development grants
 - o \$1.75M – Large terminals
 - o \$1.75M – Wholesale / jobber distribution sites

According to the CEC technology break out in Table 1, there are 6 core technologies; equal funding would suggest 16% per technology area. Biodiesel and Ethanol are the two options funded below the parity level to date. Increasing biodiesel's share to \$24 million in each of the next two funding cycles would start to bring this towards parity. However, we request that the Energy Commission provide an assessment of the projected benefits per the awarded projects to the Advisory Committee so we can be better informed about how and where to place program emphasis.

In order to achieve this funding increase, we recommend that a 20% incremental amount of funding be re-allocated to biodiesel from the other fuels and technologies funded above the parity line. With this adjustment biodiesel is still 10% under-funded compared to its performance metrics in meeting stated ARFVTP goals, but at this funding level the CEC still retains the ability to fund innovative programs that are not yet justified by the metrics.

We also would like to work with CEC to devise and implement a policy for all Program Opportunity Notices to require all proposals to contain a dollar per metric unit improvement analysis.

CONCLUSION

Biodiesel has the very real potential to displace 200 Mgy of petroleum fuel if blended at 5% near term. B5 would more than satisfy the diesel fuel LCFS GHG reduction targets through 2016. This would be equivalent to removing almost half a million cars from California roads or putting that many EVs or FCVs *on* California roads. It is equivalent to taking over 28,000 heavy-duty vehicles off the road or putting that many heavy-duty NGVs *on* the road.



September 17, 2012

With biodiesel we can achieve in a very short period what these other technologies will take decades to accomplish.

The biodiesel industry strongly believes we must address our energy and climate challenges with multiple solutions. Technologies such as EVs and hybrids have the potential to address California's light fleet and should be funded in accordance with their proven successes, reasonable potential impact and implementation costs. But in addressing long haul trucking, there is no solution that approaches biodiesel's effectiveness in the near-, mid- and long-term, and this is borne out when reviewing CEC's own data.

Based on current data, statewide support for B5 would create another 500 production jobs, not including all of the ancillary employment this industry would generate. In addition to these production jobs, up to 10,000 new agricultural jobs will be created to support biodiesel feedstock cultivation, harvesting and processing.¹⁴

These jobs would be generated in the highest unemployment areas of the state. These are new jobs growing new crops on underutilized land. In order to produce ULCI biodiesel these feedstocks need to have very low indirect land use change impacts.

In conclusion, we wish to express our conviction that improved communication between CBA and CEC is needed to improve the quality of information in policy making circles and the marketplace. In order to keep up with the rate of technology evolution and enable good decision-making, CBA is committed to keeping CEC updated and informed about the progress of our industry, including the benefits of biodiesel and renewable diesels and their potential to meet ARFVTP goals.

We urge your serious and timely consideration of the proposals in the paper, especially the request for funding for California's biodiesel industry and that an objective metric-guided approach be developed, and wish to call attention to the following important facts:

- Biodiesel is the lowest cost, commercially available low carbon replacement fuel on the market today;
- Biodiesel is the most diverse commercial biofuel on the planet. It is produced from agricultural byproducts and co-products such as used cooking oil, waste animal fats, plant oils, and other co-products, and does not compete with food or feed;
- Biodiesel creates in-state manufacturing and agricultural jobs;
- All manufacturers selling diesel vehicles and equipment in the U.S. support at least B5;

¹⁴ Based upon rotational biodiesel feedstock crop program with Biodico & Red Rock Ranch under CEC grant PIR-11-030



September 17, 2012

- Model year 2010 and later diesel vehicles, known as New Technology Diesel Engines, significantly reduce all emissions in the engine technology, so biodiesel does not increase NOx in these engines, regardless of blend level;
- Biodiesel can be lower cost than diesel, considering current RFS RIN prices; and
- Biodiesel has clear advantages when comparing ULCI B5 to other technologies and fuels in real world settings.

Now is the time to support the California biodiesel industry. We look forward to working closely with the Advisory Committee, CEC staff and commissioners toward that end going forward.