

ALGAE FUEL PRIZE WORKSHOP

MEETING SUMMARY | APRIL 28, 2009



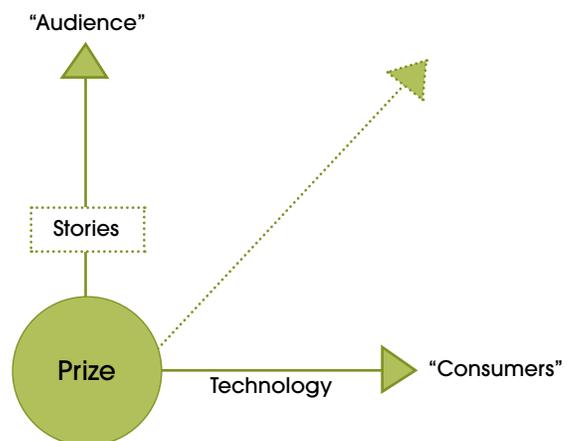


Workshop participants and guests in front of the Robert Paine Scripps Forum for Science, Society, and the Environment in La Jolla, CA.

TWENTY THREE EXPERTS GATHER TO REVIEW PRIZE CAPITAL'S® ALGAE FUEL PRIZE

A meeting of experts and advisors to Prize Capital's® Algae Fuel Prize took place on April 28, 2009 at the Robert Paine Scripps Forum for Science, Society, and the Environment in La Jolla, CA. Providing introductions and comments were: Dr. Tony Haymet, Ph.D., Director of the Scripps Institution of Oceanography; James D. Boyd, Commissioner at the California Energy Commission; Jack Jacometti, Vice President of Future Fuels and CO₂ at Shell Oil, and Anthony Eggert, Advisor for Science and Technology Policy at the California Air Resources Board. Prize Capital Founder and Chairman Lee Stein called the meeting to order and welcomed the participants. Chairman Stein introduced special guests Dr. Haymet, Mr. Boyd, and Mr. Eggert. Each of these speakers provided thoughts on their areas of expertise and how it applied to the group in attendance. Matt Peak, the meeting

organizer and master of ceremonies, discussed the day's events, including the Chatham House Rule detailing the confidentiality standard that the group would adhere to and the workshop methodology. Francis Béland (the X PRIZE Foundation) provided an overview of prize competitions, including their historic success in sparking innovative breakthroughs, the Ansari X PRIZE competition, and components of a strong prize competition. Mr. Béland also created the following graph to illustrate how successful prize competitions are a blend of technology and marketing, which leads to not only the development of new products, but their adoption as well.



Mr. Peak briefly discussed the Prize Capital business model before presenting the art form of creating a good prize and Prize Capital’s current draft (version 9) of its “strawman” document, which outlines the prize platform as applied to algae fuels. Mr. Peak then invited participants to list criticisms and challenges associated with the draft ruleset on a single 3x3 Post-It note. The larger group of participants was then broken into smaller groups, where they shared their individual thoughts and worked towards constructing three points of agreement, which were then presented to the larger group:



GROUP 1	GROUP 2	GROUP 3	GROUP 4	GROUP 5
An annual portion of the competition demonstrates progress, showcases the competition.	How can we accurately audit the various parameters (including energy, water, and cost)?	Accurately auditing?	Accurately auditing? In particular, reporting requirement is invasive. How to ensure safeguards? Maybe only require for finalist(s)?	Is a constraint on CO ₂ already inherent, or do we need to make it explicit?
Is 7,500 aggregate net gallons of fuel the appropriate level?	Is the 200 lbs. weight limit in the Demonstration Prize the appropriate target?	Salinity increases as water is lost during production, so why dictate similar salinity of output water?	Is “pan evaporation” the best criteria to measure water quantity consumption?	Is “pan evaporation” the best criteria? Maybe instead set target relative to other crops?
Why focus on finished diesel fuel instead of simply concentrated biomass?	What about a proxy for price to ensure the fuel created is affordable?	Price proxy to ensure affordability? If concentrated biomass is the output, then what is the quality standard? Is the timeframe appropriate given the production target level as well as the useful life of the competition?	Price proxy to ensure affordability?	Should the prize competition incentivize restorative systems?

Algae Prize Draft v9: Criticisms and Challenges

Participants came together to review and provide thoughts on these points. Some points were immediately addressed.

The group consensus regarding what the final product should be indicated that the prize should be a commercialization challenge. The distinction that the desired outcome would be a finished fuel product, rather than simply oil or biomass, is essential.

Participants also quickly agreed on the issues raised about salinity of output water and the prize competition’s timeframe.

Based on the points presented in the table and during subsequent discussion, the primary lingering issues that the majority of participants agreed upon included:

- Establishing an appropriate price proxy.**
 Participants acknowledged that a scaled industry is a primary goal. Some participants stated that the current cost of algae fuel is between \$500 and \$800 per barrel, while another participant said the price was as high as \$1,200 per barrel. The group recognized that the industry would be “scaled” once the price of algae fuel was below \$100 per barrel. Accordingly, it’s essential to include a proxy in the competition.
- Accurately auditing energy and costs**
 The group agreed that a reporting component could be invasive and dissuade competitors from participating. Instead, Mark Warner (Harris Group) discussed how price and energy usage can be easily captured through monitoring carbon, water, and energy, which his firm regularly performs on a confidential basis.



Workgroup in Action
 Aaron Fyke (center) reviews Algae Fuel Prize ruleset criteria with fellow workgroup participants (left to right) Joe Hankins, Dallas Weaver, and Jerry Brand.



Refining Prize Criteria

Dallas Weaver and Chris Reddy (left) discuss Algae Fuel Prize ruleset challenges, as a workgroup comprised of Francis Béland, Cai Steger, Kurt Thomas, Bryan Willson, and Peizhen Yang (background, left to right) works towards a common Algae Fuel Prize vision.

Participants also discussed the potential for including an explicit proxy for carbon, a component that the public might better understand, thereby opening up a potential component for a prize for net CO₂ displacement. Other participants commented that such a proxy was inherent in “net gallon” modeling. After talk on prize criteria concluded, participants engaged in a visioning exercise. Participants were again invited to share their views on how the world will be different because of the Algae Fuel Prize. The larger group of participants was then broken into smaller groups, where they shared their individual views and worked towards constructing three points of agreement, which were then presented to the larger group:

GROUP 1	GROUP 2	GROUP 3	GROUP 4
Scalable, economic, and sustainable industry	A price-competitive fuel	A fungible drop-in replacement for diesel or gasoline	Ability to produce at scale (i.e. \$100/ barrel over one year)
Demonstration of long-term stability	A sustainable fuel	Empowering of the “little guys” (i.e. the industry’s unusual players)	Reduction of transportation fuels’ CO ₂ intensity to <1/2 of fossil fuels’
Moving the industry’s technology forward	A scalable fuel	Integrated suite of technologies that enable production in diverse locations	Energy positive



Group Dynamics

Workshop participant Brian Fan enjoys one of the day’s lighter moments.

Mr. Peak noted that these views will be incorporated into a single, unified vision and incorporated in the next draft of the strawman document.

Next Steps

- Prize Capital will revise and update its draft strawman to address and reflect the issues presented above and throughout the day. This next draft strawman will be circulated to all participants, and feedback will be encouraged.
- Prize Capital will engage participants to determine and encourage interest in continued participation in this prize development process.

- Prize Capital will begin working to establish a prize sponsor, and is appreciative to participants for passing on leads.
- Subsequent steps could include breaking down the larger participant group into smaller groups to address issues of interest and expertise (e.g. energy, water, production, etc.)
- Future workshops are envisioned, building off the principles and progress made during this workshop, and moving the prize competition towards launch.

ALGAE FUEL PRIZE WORKSHOP PARTICIPANTS

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