



Desert Biofuels

Desert Biofuels Initiative, Inc.: a non-profit social venture advancing *sustainable regional biofuels* through policy analysis, education, and applied research projects

"In the great chess-board of human society, every single piece has a principle of motion of its own, altogether different from that which the legislature might choose to impress upon it. If those two principles coincide and act in the same direction, the game of human society will go on easily and harmoniously, and is very likely to be happy and successful. If they are opposite or different, the game will go on miserably, and the society must be at all times in the highest degree of disorder."

Adam Smith, *The Theory of Moral Sentiments*

Introduction

On February 3, 2009 [Desert Biofuels Initiative](#) hosted a workshop at [ASU SkySong](#) focused on homebrew biodiesel safety. Part of the motivation for this meeting was the formation (by the City of Phoenix) of a "biodiesel taskforce" tasked with drafting a regulatory response to the perceived risks of homebrew biodiesel occurring at residences within city limits.

Attendees at the workshop included stakeholders from the regulatory, emergency response, biofuel coop, equipment maker and homebrew communities.

What follows is the note-form summary of our meeting.

Please note: the sections below appear by presenter, but the format of the meeting was an open discussion, so that **all the points in a particular section are not attributable** to that presenter.



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Attendees/presenters

Hans Huth, [home brewer](#), creator of [Biodiesel 101](#), a guide for home brewers, with a focus on Arizona-specific information

Mark Howard, [Arizona Emergency Response Commission](#)

Dennis Karstetter, [City of Chandler Fire Department](#)

Martin Gero, [NWR Biodiesel](#)

Doug Bernstein, NWR Biodiesel

Victor Merino, [City of Phoenix, Economic Development](#)

Gene Leach, [Dynamite Biofuels Co-op](#)

Also attending from [Desert Biofuels Initiative](#):

Eric Johnson, Operations Director

Brad Biddle, Policy Director

Sam West, Acting Executive Director

Greg Goss, Intern



Hans:

Chemicals that are being used can range from 1B to 3B flammables

- 1B has a flashpoint at 73 degree's Fahrenheit.

Always keep an appropriately rated fire extinguisher on hand

- Copious amounts of water can be used to put out a chemical/grease fire as a last resort
- If used so best to spray water so that it moves the source next to a wall so that you may better control the damage.

Oily rags are extremely dangerous. Dispose of properly.

Methanol Storage and Disposal

- Keep methanol in a grounded container
- Ground containers to a copper spike in the ground
- When transferring methanol from a barrel to a container, ensure methanol barrel is grounded
- When transferring methanol from a barrel to a container, ensure methanol barrel is bonded to receiving container
- Do not drain residual methanol from carboys on the ground
- Place empty carboys/containers upside down and let them air out away from any nearby flame sources
- Keep your area clean
- Be sure to store you're cleaning equipment appropriately

City of Gilbert proposed regulations that are a nice progressive approach to home brew

- You only have to report storage of a class 1A (?) flammable liquid if you are storing more than 10 gallons outside or 5 gallons inside
- This policy limits the amount of flammable liquids a person could have on hand to safer and more controlled quantities.
- Does this apply for activities *other than home brew*?



Hans (con't):

Based on our discussions we came up with some consensus points for home brew.

1. Communicate with local emergency units what and where chemicals are located
2. Be aware of the MSDS sheets for the chemicals being used
3. Fire extinguishers on hand rated appropriately
4. Open dialogue is the best recourse
5. A site map is a good resource for first-responders, developing one for a home brew operation is recommended

Additional safety considerations and MSDS sheets are in Hans' [Biodiesel 101](#).

Mark: Normally doesn't deal with such small scale stuff as home brew his experience with corporations doing similar situations helped in our conversations

The 4 emergency areas: prepare, respond, mitigate and recover are good for even something a small as home brewing

Suggested disclosing chemicals being used to local emergency departments as unknown chemicals are extremely dangerous to those trying to save our lives

Does insurance cover home brewing? Yes/no answers given.

Need a set of standards or best practices so that safety is maintained and emergency dept's know what they are getting into? *Hans' guide to home brew is a good step in that direction.*

Dennis:

How much more dangerous is home brew biodiesel and its chemicals over the standard chemicals that people have at home for cleaning, car repair, lawn work, etc?

Reasonable amounts should not be subject to permitting requirements

Martin/Doug:

Our equipment (home brew processors) are built to be safe

Task Specific materials for the chemicals used

We ship processors with MSDS sheets

Equipment is Insured



Martin/Doug (con't):

Certification? (How to get machine certified, who to talk to? Possibly a mechanical engineer)

Discussion: Glycerol is a byproduct of the biodiesel transesterification reaction, what do we do with it, how do we dispose of it?

Possible solutions

- Soap and given to waste water treatment plants (Nogales Water Treatment Plant)
- Home brewers would need a third party to act as a collection site for glycerol. Collective batches could be tested for suitability prior to use in waste water treatment, animal feed, etc.

Victor:

Regulatory Issues

[AZ Biodiesel](#) was lost to another city because they did not choose a site appropriate for scale of business, which interfered with getting the required permits

Other concerns:

- Questions about certification of processing equipment
- Correct materials for production, storage and handle the appropriate pressure during production

City of Phoenix Biodiesel Task Force – looking at options and issues with home brew biodiesel production and storage.

City of Phoenix Fire Department

- Wants a garage that is detached from the house, allowing up to 40 gals of total liquid stored, 10 of which can be methanol.
- The detached garage's should be on 1 acre lots with 10-15' separation or more
- Encourage Co-op due to be able to control things more, safer chemicals

Comment: These proposed requirements were criticized as overly restrictive and would result in less, not more compliance, and therefore a greater risk to first-responders.



Victor (con't):

City of Phoenix Water Department views glycerol collection as a non-option

- Concerns about what other chemicals are in the glycerol waste
- Has no system for collection at this time, not interested in setting one up
- Water/Waste water system is high security
- Possible direct contamination to source if they allow people to drop off waste from biodiesel home brew.

Comment: currently home brewers (or anyone else for that matter) can dump toxics down the toilet, which enters the treatment facilities. Questionable effectiveness of this approach.

Proposed that we look at biodiesel as the byproduct and make the Glycerin the primary product

Glycerol/glycerin alternative uses

- Grease
- Degreaser
- Form release for concrete blocks
- Soap
- Can convert it back to methanol



Conclusion

Home brew biodiesel is a hobby not unlike other unregulated activities, like soap making, welding, wood working, etc. Unfamiliarity is, in part, influencing calls for more regulation. Being a “good neighbor” while home brewing biodiesel largely a matter of common sense.

Individual liberty in home brew activity should be respected when it doesn’t pose an *unreasonable risk* to others. The tradeoffs between increased safety and decreased liberty require thoughtful discussion. Decreased liberty via regulation does not *necessarily* increase safety.

There is a pressing need to work with the City of Phoenix Biodiesel task force to ensure home brew activity is not overregulated to the point of being unrealistic. Overly restrictive requirements on home brewers will drive the activity “underground” and result in *less* (not more) compliance and *less* (not more) safety for neighbors and first responders.

We have an opportunity through this process to do education and outreach to the home brew community.

Standard operating procedures, checklists, and other “best practices” for home brewers are important goals.

Standards for training and certification would also enhance the credibility of the home brew process.

Standards for home brew processors and other equipment should be based on professional engineering or other relevant certification.

Safe storage of chemicals is critical.

Communication with local emergency departments of what chemicals are being stored onsite is another important goal that can be advanced by education and outreach, possibly in conjunction with appropriate regulation.

We need to differentiate between low (or no) fee registration / permits for home brew biodiesel production vs. actual licenses / permits / zoning requirements for commercial biodiesel production, keeping in mind the goal of increased safety.

- How to differentiate between the two is a question that requires more discussion, but it likely hinges on **quantities** of chemicals used, amount of onsite storage, and the **distribution** of finished fuel.
- The City of Gilbert has a [proposal](#) that strikes a good balance.

What are “Best Practices”?

- Hans Huth’s [Biodiesel 101](#) is a de-facto guide for best practices that is available **now**, and for **free** via the Internet.