

As a student in the Landscape and Livelihood program I chose to research the feasibility of Northwest Connections using an alternative biofuel for transportation. A local family had recently donated a diesel Suburban to NwC and there was some interest in running that rig on biodiesel.

I was motivated to research this issue by several things. First, during our stay in the Swan Valley, five different grizzly bears got into trouble feeding on spilled waste oil at a local business. I was hoping to see if we could put that waste oil to use as fuel while at the same time removing it as a food attractant for bears. Second, I was hoping to address our over reliance on foreign oil sources and fossil fuels that are contributing to climate change. Lastly, I was curious if alternative fuels that seem to work in urban areas like Portland Oregon where I'm from could work in a rural location.

I investigated three alternatives: 1) buying commercial biodiesel 2) using straight waste vegetable oil and 3) making biodiesel. All three biofuel options, though different in many ways, are similarly based on the combustion of vegetable oil in petroleum diesel engines. Commercial biodiesel and home-made biodiesel are both a combination of vegetable oil and chemical catalysts, though commercial biodiesel is made in an industrial type setting while home-brewed biodiesel involves much smaller batches. Straight waste vegetable oil (WVO) involves putting vegetable oil collected from fryers at local businesses into a vehicle converted for the use of WVO.

There are many environmental advantages to using petroleum diesel alternatives. All three of these biofuels reduce the carbon dioxide emissions that contribute to global climate change. Vegetable oil is produced in a closed carbon cycle; growing oil seed plants used to produce vegetable oil sequesters the carbon dioxide emitted into the atmosphere when biodiesel or WVO is combusted. I also found that using vegetable oil as a fuel instead of petroleum diesel has the capacity to economically benefit farmers in Montana and around the West. Oil seeds such as canola, safflower, mustard, sunflower, and camelina can all be produced in Montana, pressed into vegetable oil and used as a biofuel.

Determining which biofuel is the best

environmentally and economically as well as the easiest to use and the most cost effective was difficult. There are commercial biodiesel stations in Missoula, Kalispell and Columbia Falls that sell biodiesel comparable in price to petroleum diesel. Though cost effective and easy to obtain, the commercial biodiesel sold at these stations is not made in Montana and must be trucked in from out of state, decreasing environmental and economic benefits.

Making biodiesel is more expensive than buying biodiesel and is also the most effort intensive. NwC would have to invest in constructing a small bear-proof and well ventilated building to house the materials and biodiesel processing area as well as a biodiesel processor. In addition, NwC would have to be taught how to make biodiesel. Using WVO is

the most expensive option, but it is easier than making biodiesel. Using WVO involves collecting vegetable oil from fryers at restaurants (for the Swan Valley it would be the Hungry Bear, Swan Valley Cafe and Mission Mountain Mercantile) and putting it into a vehicle converted for the use of WVO. Converter kits, which mainly include a second fuel cell and heated fuel lines, are fairly expensive (\$1000 and upwards) but necessary for the use of WVO. When the vegetable oil is heated, the viscosity of the oil is reduced so that it is similar to diesel and can be injected in the engine.

After researching the issue and reflecting on NwC's situation, I would encourage the business to invest the time, energy and money into using WVO and/or making their own biodiesel. Purchasing commercial biodiesel just doesn't deliver sufficient environmental benefits. It is important that we all begin to take steps to use cleaner forms of energy in our daily lives. ∞



Leora Stein gathering firewood during her Landscape and Livelihood homestay

To learn more visit: National biodiesel board (www.biodiesel.org), National Renewable Energy Laboratory (www.nrel.gov) and Sustainable Systems LLC (sustainable-systems.com).