OUTLINE FOR ALL-DAY INTENSIVE
ALCOHOL FUEL PRODUCTION AND USE WORKSHOP

Introduction
- State of current fuel situation
- Peak Oil and what it means
- The environmental effects of fossil fuels and post-petroleum fossil-alternative fuels proposed
- Oil shale, tar sands, coal, methane hydrates, hydrogen and nuclear power
- History of alcohol fuel use around the world
- From the Whiskey Rebellion to the present day
- Where alcohol is being used today and in the near future

Busting the Myths
- Does it take more energy to produce alcohol than you get from it?
- Can we produce enough?
- Do we have to choose between food or fuel?
- Is ethanol practical without tax subsidies?
- Does ethanol increase pollution or global warming?

Agriculture and Ethanol
- How energy crops grow
- Soil, water, photosaturation, monoculture versus polyculture.
- Energy crops
- Discussion of many crops that can be used for fuel
- How to select feedstocks for alcohol production
- Farmers
- Waste products
- Urban/suburban feesdstock choices

Feedstock Preparation and Fermentation
- The sugar method
- The starch method
- Cellulosic feedstocks
- Advanced techniques

Distillation
- Primer on heat and energy
- Distillery design and principles
- Vacuum distillation
- Continuous distillation
- Alternative sources of energy for distillation
- Azeotropic distillation—getting the last 4% of water out of your ethanol

Alcohol Is Only the Beginning—Co-Products
- Animal feeds
- Fertilizer/compost
- Mushroom production
- Aquaculture
- Mariculture
- Earthworm products
- Methane
- Carbon dioxide
- Single-cell protein
- Yeast
- Surplus heat
- Biomass fuels

Designing Your Integrated Feed/Fuel Operation
- Micro-plants (less than 10,000 gallons)
- Small plants (10,000 to 100,000 gallons)
- Medium plants (1 to 5 million gallons)
- Selecting equipment
- Tanks, pumps, grinders, agitators, heat exchangers, methane digesters, safety, and storage

Alcohol Versus Gasoline as a Fuel
- Myths about ethanol as a fuel
- Burns hotter, emissions, mileage, corrosion, blending
- Alcohol and octane
- Starting alcohol engines in cold weather

Converting Carbureted Engines
- Main metering
- Idle
- Acceleration
- General carburetor issues
- Electronic Carbs

Converting Fuel-Injected Engines
- History of fuel injection and how it works
- General issues of alcohol and fuel injection
- Oxygen sensor, catalytic converters, and EFI
- Throttle body and multiport fuel injection
- Older fuel injection systems
- Newer fuel injection systems

Coldstart Systems for E-100
- Addition of volatiles
- Use of a coldstart device—multiple strategies

Tuning for Alcohol
- How ignition timing works
- Making timing changes
- Mechanical systems
- Electronic systems

Assorted Conversion Enhancements
- Taking advantage of alcohol's properties
- Increasing mileage
- Increasing horsepower

High-Compression Conversions
- Mechanical
- Non-mechanical

Smaller Engines
- Motorcycles
- Utility engines
- Two stroke engines

Flex-Fuel and Dual-Fuel Systems
- Origins of flex-fuel and E-85
- Basics of system design

- Modification of flex-fuels for better mileage
- Variable-compression FFVs
- Propane/alcohol dual-fuel

Cogeneration
- Producing both electricity and heat from your alcohol
- Cooking, cooling, and other ways to reduce energy use with alcohol

Diesel Engines and Alcohol
- Five methods for conversion

The Business of Alcohol
- Economics
- Tax credits
- Legal considerations
- Business structures
- Legalities of car conversion
- Legalities in production
- Filling out the federal alcohol, tobacco, and firearms permit
- Dealing with local permitting

Community-Supported Energy
- Driver-owned stations
- How to set one up and my experiences with it
- How to set up a CSE farmer/consumer system

Taking Action
- Where do you go from here?