# SEC Solar Energy Conversion LLC

## A Total Energy, Food and Water Production System

This proposed system integrates: Archer Daniels Midland style hydroponics subsystems, Archer Daniels Midland style aqua culture subsystems, Archer Daniels Midland style ethanol biorefinery subsystems, concentrating solar power plant subsystems and our Solar Energy Conversion LLC patent pending solar thermal energy storage subsystem to produce 1.5 million kilowatt hrs. of energy per acre per year. Energy is in three forms: Ethanol which can be produced at 35¢ per gallon, Off grid continuous split phase electricity which can be generated at 2¢ per kilowatt hour.and cogeneration low pressure steam.

## DETAIL:

It is now possible to produce a non poluting, carbon neutral liquid fuel for 35¢ per gallon to power existing liquid fueled:

1. automobiles
2. trucks
3. farm tractors
4. aircraft
5. electricity generators
6. lawn mowers
7. sawmills
8. brick kiln burners

This price per gallon is based on an Ethanol Biorefinery producing 2 million gallons per year. This ethanol biorefinery will cost 8 million dollars and will pay for itself in 16 months. Smaller ethanol biorefineries can be constructed which would result in slightly higher ethanol costs per gallon.

2. Use captured carbon dioxide from the biorefinery fermentation tanks to double or triple the growth of organic fruits and vegetables in the aquaponics greenhouse.

3. Periodically flood the aquaponics greenhouse with carbon dioxide to kill all the bugs.

4. Compress the carbon dioxide to form dry ice that can be used to ship frozen fish through the UPS postal system.

5. Extend growing season in the aquaponics greenhouse to 12 months by heating the aquaponics greenhouse using solar cogeneration steam energy that was stored up during the summer months using our patent pending thermal storage system.

6. Grow hydroponic fruits and vegetables using 90% less water.

7. Use distiller's grains from the biorefinery to feed tilapia or salmon in the aquaponics greenhouse. 1 ½ pounds of distiller's grains will produce 1 pound of fish.

8. Use stillage from the ethanol biorefinery stripper to resupply nutrients to the corn fields for next year's corn crop.

9. Use stillage from the ethanol biorefinery stripper to produce corn oil, then combine this corn oil with ethanol to produce biodiesel and glycerin.

# Solar Energy Advancements

1. Increase the efficiency of solar panels by 400% while providing "off grid" continuous split phase 240 VAC and 120 VAC electricity. Electricity can be generated at 2¢ per kilowatt hour. Steam turbine generator cogeneration steam, instead of being vented to atmosphere, can be put to good use for the following typical applications:

1. Heating buildings
2. Air conditioning buildings using steam powered adsorption chillers
3. Heating potable hot water
4. Cook corn for an ethanol biorefinery using steam
5. Power an ethanol biorefinery stripper column using steam
6. Power an ethanol biorefinery rectifier column using steam
7. Regenerate an ethanol molecular seive dehydrater using vacuum generated using steam ejectors
8. Dry ethanol biorefinery distiller's grains using steam rotary dryers
9. Desalinate sea water using vacuum generated using steam ejectors powering multi stage flash distillation systems.
10. Generate water from air using steam powered atmospheric water generators
11. Heat greenhouses in the winter using steam.
12. Warm aquaponics fish tanks in the winter using steam.
13. Cool artificial intelligence data center servers using steam powered adsorption chillers

2. Inexpensively store up excess solar energy in the summer months and then use this stored solar energy in the winter months.

3. Even though 70% of our planet is covered in water, two billion people today do not have safe and clean water. We can use solar cogeneration steam energy that was stored up during the summer months using our patent pending thermal storage system to power multi stage flash distillation water desalination equipment. (Also atmospheric water generation is possible). No green house gasses are produced and the desalination brine does not kill aquatic sea bed life using this system.

4. Use concentrated brine from the desalination equipment to produce Magnesium using the DOW process. Magnesium can then be extruded into solar space frame collector tubes and also Magnesium wire that will be chopped into pellets and then used in the magnesium hydride energy storage system.

5. Use 70% less land to collect solar energy by using our total energy system.

# Green Haber Bosch Ammonia Anhydrous Fertilizer

50% of the world's food is produced using anhydrous ammonia fertilizer produced using the Haber Bosch process. Ammonia is also an excellent refrigerant. Solar Energy Conversion LLC can design and build “green” Haber Bosch ammonia plants.

Unlike conventional ammonia plants which generate ammonia (NH3) from fossil fuels, the Solar Energy Conversion LLC “Green” Ammonia plant uses no fossil fuels.

Hydrogen is generated by electrolyzing water using electricity which is generated using our proprietary solar technology. Nitrogen is extracted from the air using pressure swing adsorption equipment using electricity which is generated using our proprietary solar technology. Hydrogen and Nitrogen are compressed using rotary compressors. A Casale Haber Bosch reactor then converts the compressed Hydrogen and Nitrogen into ammonia (NH3).

No fossil fuels are used to generate ammonia using this “green” ammonia technology. Units can be preassembled in shipping containers and then shipped using inter modal freight (sea, rail and truck) to the erection site. The final ammonia plant can then quickly be inter connected and comissioned.