HYDROGEN GENERATOR, ADDITIONAL INFORMATION©



by www.agua-luna.com

STOP GLOBAL WARMING
USE ALTERNATIVE ENERGY

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PREFACE

What is alternative energy anyway?

Alternative Energy or Alternative Fuels, are any materials or substances that can be used as a fuel, other than conventional fuels. Conventional fuels include: fossil fuels (petroleum (oil), coal, propane, & natural gas). Some well known alternative fuels include biodiesel, ethanol, butanol, chemically stored electricity (batteries & fuel cells), hydrogen, methane, natural gas, vegetable oil, biomass, & peanut oil.

In the year 2000, there were about eight million vehicles around the world that ran on alternative fuels, indicating an increasing popularity of alternative fuels. There is growing social interest, & a perceived economic & political need for the development of alternative fuel sources.

Since burning fossil fuels are known to increase greenhouse gas concentrations in the atmosphere, they are a likely contributor to global warming. Another concern is the peak oil theory, which predicts a rising cost caused by severe shortages during an era of growing energy consumption. According to the 'peak oil' theory, the demand for oil will exceed supply & this gap will continue to grow, which could cause a growing energy crisis starting by 2010. Lastly, the majority of the known petroleum reserves are located in the middle east. There is a concern that worldwide fuel shortages could intensify the unrest that exists in the region, leading to further conflict & war.





Biofuel

Plants use photosynthesis to grow & produce biomass, or biomatter, biomass can be used directly as fuel. Agriculturally produced biomass fuels, such as biodiesel, ethanol & bagasse (often a by-product of sugar cane) can be burned in internal combustion engines or boilers.

Biodiesel can be used in modern diesel vehicles with little or no modification to the engine & can be made from waste, vegetable, animal oil & fats (lipids). Vegetable oils can be used in modified diesel engines. In fact the Diesel engine was originally designed to run on vegetable oil rather than fossil fuel. A major benefit of biodiesel is lower emissions. The use of biodiesel reduces emission of carbon monoxide & other hydrocarbons by 20 to 40%.

In some areas corn, cornstalks, sugarbeets, sugar cane, & switchgrasses are grown specifically to produce ethanol (also known as grain alcohol) a liquid which can be used in internal combustion engines & fuel cells. Ethanol is being phased into the current energy infrastructure. E85 is a fuel composed of 85% ethanol & 15% gasoline that is sold to consumers.

Solid biomass

Direct use is usually in the form of combustible solids, either wood, the biogenic portion of municipal solid waste or combustible field crops. Field crops may be grown specifically for combustion or may be used for other purposes, & the processed plant waste then used for combustion. Most sorts of biomatter, including dried manure, can actually be burnt to heat water & to drive turbines. Sugar cane residue, wheat chaff, corn cobs & other plant matter can be, & is, burnt quite successfully.

Biogas can easily be produced from current waste, such as: paper, sugar production, sewage, animal waste & so forth. These various wastes have to be slurried together & allowed to naturally ferment, producing methane gas. When a biogas plant has extracted all the methane it can, the remains are sometimes better suitable as fertilizer than the original biomass.

Other Fuels



Methanol (methanol economy) from any source can be used in internal combustion engines with minor modifications. It usually is made from natural gas, sometimes from coal, & could be made from any carbon source including CO2. Flexible fuel vehicles may run with a high percentage of ethanol (ethanol economy) (up to 85% Ethanol plus 15% gasoline for cold-starting vapor pressure) with no modifications.
Hydrogen

Interest in vehicles powered by alternative energy sources has been gaining traction in large part due to high gas prices & an increased awareness of global warming, which according to a recent Intergovernmental Panel on Climate Change (IPCC) report is 90% likely caused by humans.

Diesel type biofuels: Hempseed oil fuel or other straight vegetable oils, Biodiesel
Others with internal combustion, Ethanol, E85, Hydrogen internal-combustion, Ammonia, Natural gas, compressed or liquified, Autogas (LPG, LP gas, propane), Synfuel, synthetic fuels, Plug-in hybrid electric vehicle
External combustion, Organic waste fuel, Wood gas on-board gasification, Steam engine cars (like the Stanley Steamer)
No combustion, Electric vehicle, Solar cell-powered or -charged electric cars, Hydrogen fuel cell, MAGLEV with induction drive (a variety of electric mass transit), Air car working on compressed air
Some less conventional alternative fueled cars:, Nuclear powered, Solar Radiation, Sail

Ok, what is renewable energy then?

Renewable energy flows involve natural phenomena such as sunlight, wind, tides & geothermal heat. Each of these sources has unique characteristics which influence how & where they are used.

Wind power

Wind power is the fastest growing of the renewable energy technologies. Over the past decade, global installed maximum capacity increased from 2,500 MW in 1992 to just over 40,000 MW at the end of 2003, at an annual growth rate of near 30%. Globally, the long-term technical potential of wind energy is believed to be five times current production global energy consumption or 40 times current electricity demand. Wind power is renewable & produces no greenhouse gases during operation, such as carbon dioxide & methane.



Offshore wind turbines near Copenhagen

Water power

Energy in water (in the form of motive energy or temperature differences) can be harnessed & used. Since water is about a thousand times denser than air, even a slow flowing stream of water, or moderate sea swell, can yield considerable amounts of energy.

There are many forms of water energy:

Hydroelectric energy is a term usually reserved for large-scale hydroelectric dams.
Micro hydro systems are hydroelectric power installations that typically produce up to 100 kW of power. They are often used in water rich areas as a Remote Area Power Supply (RAPS). There are many of these installations around the world, including several delivering around 50 kW in the Solomon Islands.
Wave power uses the energy in waves. The waves will usually make large pontoons go up & down in the water, leaving an area with reduced wave height in the "shadow". Wave power has now reached commercialization.
Tidal power captures energy from the tides in a vertical direction. Tides come in, raise water levels in a basin, & tides roll out. Around low tide, the water in the basin is discharged through a turbine.
Tidal stream power captures energy from the flow of tides, usually using underwater plant resembling a small wind turbine. Tidal stream power demonstration projects exist, but large scale development requires additional capital.
Ocean thermal energy conversion (OTEC) uses the temperature difference between the warmer surface of the ocean & the colder lower recesses. To this end, it employs a cyclic heat engine. OTEC has not been field-tested on a large scale.
Deep lake water cooling, although not technically an energy generation method, can save a lot of energy in summer. It uses submerged pipes as a heat sink for climate control systems. Lake-bottom water is a year-round local constant of about 4 ℃.
Blue energy is the reverse of desalination. This form of energy is in research.

Solar energy use

A photovoltaic (PV) module that is composed of multiple PV cells. Two or more interconnected PV modules create an array.

In this context, "solar energy" refers to energy that is collected from sunlight. Solar energy can be applied in many ways, including to:

Generate electricity using photovoltaic solar cells.
Generate electricity using concentrated solar power.
Generate electricity by heating trapped air which rotates turbines in a Solar updraft tower.

Heat buildings, directly, through passive solar design.
Heat foodstuffs, through solar ovens.
Heat water or air for domestic hot water & space heating needs using solar-thermal panels.
Heat & cool air through use of solar chimneys.

Geothermal energy



Krafla Geothermal Station in Iceland

Geothermal energy is energy obtained by tapping the heat of the earth itself, usually from kilometers deep into the Earth's crust. It is expensive to build a power station but operating costs are low resulting in low energy costs for suitable sites.

Potential

While currently renewable energy sources only supply a modest fraction of current energy use (ca. 14% of primary energy use), there is much potential that could be exploited in the future.

The Renewable Energy Resource Base (Exajoules a year)

	Current use (2001)	Technical potential	Theoretical potential
Hydropower	9	50	147
Biomass energy	50	>276	2,900
Solar energy	0.1	>1,575	3,900,000
Wind energy	0.12	640	6,000
Geothermal energy	0.6	5,000	140,000,000
Ocean energy	not estimated	not estimated	7,400
Total	60	>7,600	>144,000,000

Current use is in primary energy equivalent.
For comparison, the current global primary energy use (2001) is 402 Exajoules a year.
Source: World Energy Assessment 2001.

References

U.S. Department of Energy
GTA Energy, Inc.
Small-scale Biogas Use in Costa Rica

Parts and Supplies for building an HYDROGEN GENERATOR

With the exception of the oscilloscope the tools should be found in/around your home. Fittings, misc. items and hardware can be purchased at any hardware store, electronics shop or lumber yard and should be your only expenses. Try these links and locations for FREE or cheap materials: *craigslist.org, ebay.com, freecycle.org, Habitat for Humanity*. For more info on basic electricity check: *www.owlnet.rice.edu/~engi202/electricity.html*

Parts List:

Item	Qty	Price
5 gallon Coleman water tank *(ebay*)	1	$4.50
water pump (*northern tools*)	1	$44
Level sensor (optional) (*northern*	1	$40
Control circuit blank *(radio shack*)	1	$9
Vapor-press kit (Impco)	1	Model specific
Wiring (*radio shack*)	…	$3
Connectors (*radio shack*)	…	$10
4” PVC pips with caps (*HomeDepot*)	2ft	$15
Fittings & misc. hardware	…	$17
SS flex tubing (*HomeDepot*)	2ft	$9

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Carl Cella "A Water-Fuelled Car" Nexus Magazine Oct-Nov 1996
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Stephen Chambers "Prototype Vapor Fuel System" xogen.com

GLOSSARY:

Carb--(Carburetor)
CHT--(Cylinder Head Temperature)
DVM--(Digital Volt Meter)
EGT--(Exhaust Gas Temperature)
FI--(Fuel Injector)
Hz--(Hertz)
IC--(Integrated Circuit)
LED--(Light Emitting Diode)
mm--(Millimeter)mosfet--(Metal-Oxide-Demiconductor-Field-Effect Trans)
mpg--(Miles Per Gallon)
POT--(Potentiometer)
PSI--(Pounds per Square Inch)

ABOUT THE AUTHOR

AguaLuna is an Off-Grid, Family Owned, 100% Alternative Energy / Fuel Run Ranch. We share / teach methods & projects that are designed / compiled & currently running (here on the ranch) with others, in the hope that everyone can accomplish some form of Self-Sustainability / Green Alternative Energy upgrade to their home or vehicle.

The planet IS being Destroyed & Global Warming is no longer questioned. Simply flip through your TV or pick up a newspaper, the subject makes headlines daily...

Global Warming
Melting ice sheets & glaciers
Floods & droughts
Great hurricanes & cyclones

Seasonal extremes
Seasonal phenomena's
Species extinction
New & resurgent diseases

These catastrophes are Natures Natural WAKE UP call & we all need to Answer It !

Advancements in technology & information make going green A LOT easier today. For example, Using Alternative Energy's like Ethanol (corn oil), Biodiesel (fry grease), Hydrogen (water), Solar Power, Wind Power, Water Power, etc., instead of polluting & harmful fossil fuels, is an extremely simple, cheap & HUGE step.

What's better then a cheaper, safer & healthier alternative to Global Warming ? The earth provides for us unlimited FREE Energy, why not use it ?

My husband & I have lived 100% Off the Grid & Bill & Debt Free on our ranch in West Texas for the last 8 years. My husband (a retired Engineer from Boeing Aerospace) has written, compiled & built every project we offer in our Alternative Energy Guides collection, which are all available for viewing / testing in our On-Site Workshop. This is why we not only believe 100% in our Alternative Energy Guide Collection, but are capable to offer FREE unlimited online consultation at no extra cost, with every guide purchased, like no one else can over the Internet. We are standing by to walk you step-by-step trough ANY problems you may experience in building your own Alternative Energy items.

CLICK http://s37.photobucket.com/albums/e88/arcious/Hacienda_Agua_Luna/ to meet us & visit the ranch, where we live completely self sufficient. Let us share our knowledge & experience with you & your family.

And don't forget to check out other Alternative Energy Guides
http://www.agua-luna.com/guides.html
We've formatted them in an easy to read, step-by-step way to provide EVERYONE, ANYONE, EVERYWHERE an abundant amount of information, while having in mind all skill levels & have designed the booklets to suit each individuals needs from the beginner to the expert. Titles include...

How to build a Wind Generator
Building a Windmill
How to find Free Solar Panels
Building a Solar Panel

How to build a Solar Stove
How to Build an Arc Welder
How to Live off the Grid
Build a Solar Water Heater

DIY Biodiesel
Build a $10k 5,000sqf home
DIY Automatic Animal Feeder
Super Cooler Plans

How to Convert your car to EV
How to Run your car on Ethenal
Build an Alchohol Still
Build a Solar Panel

... & Much more, specifically written to better assist your Living off the Grid / Alternative Energy Experience.

> **Note:** *For the best savings we Highly Recommend our Feature 40+ Package. It contains over 40 Alternative Energy / Live off the Grid Booklets for the price of just 5. The 40+ Package will kick start you into your NEW Alternative Energy Life Style & will guide you to help us STOP GLOBAL WARMING.*

Because our life style here at agua-luna.com Ranch is 100% Lived Off the Grid, we are familiar with the Day-to-Day aspects of Self Sustainability & how simple it is to actually make the conversion. No one else can offer that.

If you're interested in making your first GREEN steps with our help, we offer a number of affordable options. First take a tour through the site, then check out our instructive Alternative Energy Guides, & if going green sounds good to you, sign up to join us here on the ranch & take part in our On Site Workshop or Online Workshops, gain experience in our Internship Program during one of many Sustainability Projects, catch an Alternative Energy Seminar in your area or simple stay in one of our cozy 100% Off-Grid Cabins, experiencing nature's stress free landscape & what Living Self sufficient / away from society's rat race has to offer.

Because agua-luna.com is a non-profit, 100% Alternative Energy Green Off the Grid run Ranch. All purchases & donations go strictly to costs incurred & future expenses in providing the newest Eco minded projects & information to a larger array of people, in the hopes of helping as many as possible in making some form of Green conversion.

About the Agua-Luna On-Site Self Sufficiency Workshop…

The following procedures are recommended for both first-time enrollees and those who have already experienced a seminar or have previously taken a course/s with agua-luna.com:

AguaLuna Ranch in Far West Texas is an Off-Grid Eco orientated and Green run Ranch, dedicated to creating learning communities for on-going professional sustainable development. Members of the agua-luna.com On-Site Workshop, who are driven by all things environmentally friendly, work to teach others Green and Alternative ways through hands on courses. We invite you to sign up for our Summer Workshop and make the conversion now.

AguaLuna Workshop Information

The Workshop will consist of a series of lab and on-site based tutorial lectures and projects covering alternative energy and / or self sustainability, including past, present, and future applications and techniques, particularly in its application in making the Environmentally Greener conversion.

The workshop will be held on-site at the AguaLuna Ranch. See dates, fee's and course topics at www.agua-luna.com

The Workshop is intended for first-timer enrollees or repeat offenders who are motivated to make an environmental difference in their own lives and in the lives of those around. Travel and accommodations information is available upon request agua-luna@lycos.com Local / primitive camping accommodations, on the Ranch, may be provided at no charge, upon request, to participants for the duration of the workshop.

Participants earn their Green Certificate certifying their knowledge of the latest in "green" building practices, technologies and techniques.

The topics will address economic, ethical, environmental and social aspects of some form of self sustainability and / or alternative energy. Specific topic based projects will be taught and carried out by attendees in a hands-on safe environment. Each of the workshops will feature a 1 week (4 hr/day) eco based component, entirely devoted to some form of Alternative Energy Concepts and is meant as an introductory course to the world of Green living.



Next Step: Download and Fill out the work-shop sign up form by clicking http://www.agua-luna.com/workshop_form.pdf or send an email to the address below requesting the form. Feel free to include any information you feel pertinent.
Send completed applications to:
agua-luna@lycos.com
or
AguaLuna
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79830

AguaLuna Workshops

Alternative Energy Concepts Workshop
$480 per week (fee covers all project materials and lab costs)
This workshop course is directed towards the average person who wants to gain a basic knowledge of Alternative Energy. Participants will learn Passed, Current and Future Energy and fuel resources, alternative fuel and energy options, alternative fuel and energy conversion, and more. Participants and Instructors will prepare and perform theoretical, lab and on-site presentations, examples and projects, leading the learning experience.

Home Small Scale Hydrogen Generation Workshop
$480 per week (fee covers all project materials and lab costs)
This workshop course focuses on the basics of Small Scale Hydrogen Generation and how it can be applied safely in the average Home, vehicle and daily use. The basic technical knowledge and skills in this workshop will be useful in helping family and consumers better understand and incorporate Hydrogen as a safe fuel, limiting if not extinguishing their need for fossil fuels. Hands on electrical and chemical Hydrogen generation will be featured. Participants and Instructors will prepare and perform theoretical, lab and on-site presentations, examples and projects, leading the learning experience.

Self Sufficient House Construction Workshop
$480 per week (fee covers all project materials and lab costs)
This course is designed for any interested in specific techniques and construction methods, utilizing natural or eco friendly materials. The focus will be on material properties in their relationship to different locations, climates and accessibility, but other topics relevant to both environment and human health / need will be covered. Specific topics include different methods in working with and building homes out of Adobe, Cob, Pole, Rock, Papercrete, Recycled materials, Rammed earth, Hay bale Cordwood, Underground and their ecologically-friendly impact on the terrain. Participants will work in the lab as well as hands on through activities and case studies to improve their knowledge and skill in building sustainable / eco friendly, green homes.

How To DIY Wind Generator I Workshop
$480 per week (fee covers all project materials and lab costs)
This course is a workshop focused on the basics of Wind Generations and how it can be applied to the home. The basic technical knowledge and skills in this workshop will be useful in helping the consumer better understand Wind technology as a useful form of electricity and how it will affect their need for alternative energy. Laboratory investigations, instruction and projects will give participants experience with energy extraction and transformation, conversion, practicality, incorporation, maintenance, and more. The course focuses on history, theory, environmental need for, and home applications of the wind turbines as a viable source of needed electricity, with several small hands-on projects carried out. This course is a pre-request to help understand "Practical Wind Generator use and construction" which will be covered in the "How To DIY Wind Generator II Workshop"

How To DIY Wind Generator II Workshop
$480 per week (fee covers all project materials and lab costs)
This advanced workshop is only open to those who have attended one of the previous "How To DIY Wind Generator I Workshops". Attendees will learn how to prepare, construct and install advanced Practical Wind Generators for home or business use. Activities will include parts description and location, generator construction, How to Build your own blades, pole raising, wiring, battery banks, inverters, and more. Participants will prepare and perform preparation lab activities in class, carrying out the remainder of the project in an on-site construction environment.

What to bring:
The weather in Texas is very volatile so bring lots of layers of clothes you don't mind destroying at work, sturdy closed-toed work shoes, sunscreen and a hat with a wide brim to protect you from the intense sun.

- Leather work gloves
- Heavy duty rubber cement gloves
- Safety Glasses
- Ear plugs
- Dust masks
- Hammer
- Utility knife

- Retractable tape measure
- Tool belt

How To Build your own Solar Panels I Workshop

How To Build your own Solar Panels II Workshop

Can't make the On-Site Workshop? Self Sufficiency Workshops are now available online. See below for details, dates and pricing or contact us at agua-luna@lycos.com.

AguaLuna Self Sufficiency Online Workshop / Course

AguaLuna's popular Self-Sufficiency Workshop courses have been updated and will now be offered starting this year online. The courses are designed for first-timer enrollees or repeat offenders who are motivated to make an environmental difference in their own lives and in the lives of those around.

The courses, taught entirely on the Internet, gives participants the knowledge, background, resources, and confidence they need to carry out alternative energy / self sufficient upgrades to their life, home and vehicles. A minimum of 15 hours online, plus an additional 15 hours of reading, writing, research, projects and taking exams is required for each course.

Participants earn their Green Certificate certifying their knowledge of the latest in "green" building practices, technologies and techniques.

All course work can be done on a home computer. Course participants will be introduced to ethical theory before moving on to evaluating self-sufficiency and alternative energy issues. The course incorporates activities on specific topics about environmental solutions, carbon foot prints, self sufficient building, and alternative energy. Course participants are welcome to use these activities in their own teaching or outreach work as long as that work is not for profit. There will be extensive online discussion with other enrollees.

Dan Martin, a retired Boeing Engineer who majored in Theoretical and Structural physics now living 100% Off-the-Grid, The Author of 10 How to DIY Self Help / Self Sufficiency / Alternative Energy Guides will be this instructor. For more information about this years course content, please contact him directly attn: Dan Martin at agua-luna@lycos.com or visit www.agua-luna.com.

Simply Download and Fill out the work-shop sign up form by clicking HERE or send an email to the address below requesting the form. Feel free to include any information you feel pertinent.
Send completed applications to:
agua-luna@lycos.com
or
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79830

For more details about the agua-luna.com workshops, please contact us agua-luna@lycos.com or call 206-333-0321, leave a message with your phone number and email.

Again, I thank you for your interest in our programs. I hope you will be able to join us this summer.

AGUALUNA INTERNSHIP INFO

The agua-luna.com Internship program is open to anyone with an interest in sustainability / alternative energy and a willingness to work hard. People of all ages and backgrounds are encouraged to sign up.

Six applicants will be chosen for each session (schedule at www.agua-luna.com). Accepted interns will have the opportunity to learn alternative eco friendly building concepts and techniques while working full time alongside the agua-luna Mentor Team for approximately 1 month to 2 months.



Internships are unpaid positions. Interns are responsible for providing their own accommodations, food, transportation, supplies, etc. or primitive camping and meals are available at no charge on-site.



There is no application deadline.

During the session interns may attend any scheduled on-site workshops and seminars. Upon completion of the session interns receive a Certificate of Clean Green Building, and the new found skills of environmental construction.

Note: All applicants will receive a response.

What to expect:
Each session will start with a brief orientation meeting at the Agua-Luna Visitors Center. This will include a small tour of the Agua-Luna Ranch, projects and potential work sites, showing a few finished projects as well as the job site where you will show up for work at 9 am the next day.

Expect to be challenged physically and mentally, to work hard and play hard. Some have found it difficult to be away from their homes and jobs for a month. Please come prepared to support yourself for the entirety of your stay. Also, please keep in mind you will be working on a construction site.



What to bring:
It is very difficult to attend an internship without a vehicle as the Taos area is so spread out. Interns have gotten by with carpooling with other interns and/or hitchhiking, but it can be a challenge.



The weather in Texas is very volatile so bring lots of layers of clothes you don't mind destroying at work, sturdy closed-toed work shoes, sunscreen and a hat with a wide brim to protect you from the intense sun. If you are camping you'll want a tent, a tarp, a campstove (open fires are ok), a sleeping bag, a five gallon water jug, a good flashlight, etc.

Tools: Having a few simple tools will make your internship more comfortable and add a wider variety of work. Here is a list of some helpful tools you can choose to bring (all tools are supplied).

- Leather work gloves
- Heavy duty rubber cement gloves
- Safety Glasses
- Ear plugs
- Dust masks
- Hammer
- Utility knife
- Retractable tape measure
- Tool belt
- Any other hand tools may be useful, i.e. a speed square, combo square, bevel square, chalk line, torpedo level, pliers, chisel as well as small power tools (drill, circular saw)

Participants earn their Green Certificate certifying their knowledge of the latest in "green" building practices, technologies and techniques.

Next Step: Download and Fill out the internship application by clicking http://www.agua-luna.com/internship_form.pdf or send an email to the address below requesting the form. Feel free to include any information you feel pertinent.
Send completed applications to:

agua-luna@lycos.com
or
AguaLuna
Hc 65 276 G
Alpine Tx
79830