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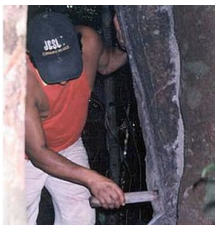
Extraction of copaiba oil

Top 10 Unusual Ecological Sources of Fuel

Escaping petroleum dependence

We live in an oil dominated world: who gets it holds the power. That's why the western world is struggling to find new fuels that would free it from an oil-and-gas based economy, which renders them vulnerable to the blackmail of some oil-and-gas rich countries, like many in Middle East, Russia or Venezuela, where human rights do not mean much. Not to mention the funds terrorism gets from oil trade...Nuclear energy is not a reliable option, as its wastes contaminate the environment for millennia; wind and sun energy are not enough, and by now, hydrogen fuel seems a remote option. Another issue: about 1.6 billion people (a quarter of the Earth's population) still does not benefit from electricity, and 2.4 billion people mainly use coal, dung or wood for cooking and heating. The smoke produced by these conventional fuels kills 2.5 million women and children, annually. No wonder researchers are still looking for new regenerative and sustainable fuel sources. 1.On many Pacific islands, coconut oil is used for generating power and fueling cars. This is the case of Ouvea Island (New Caledonia) or Bougainville (the largest on the Solomon archipelago, Papua New Guinea). A lot of mini-refineries produce the plant oil that replaces diesel. This alternative fuel source has triggered interest from Europe and Iran. Besides being much cheaper, the new energy is a much more sustainable alternative, as these islands are a heaven of coconut palm plantations and many locals refine coconut oil in backyard refineries. Coconut oil is also employed for cooking and making cosmetics like soap, for example. Engines that functions on coconut oil act like generators, which feed a desalting center delivering drinking water for 235 families on Ouvea. The system provides 165 kilowatts, competing with Diesel engines on power and fuel consume. 2.The Brazilian copaiba trees (Copaifera langsdorfi) and other species related to Acacia can be up to 30 m (100 ft) tall. They can live over 100 years and from the trunk of copaiba trees copaiba is extracted, which is a thick, transparent golden to dark brown liquid, used as prime matter in perfume industry and as balsam, for making varnishes and lacquers.(photo) 10-20 liters of copaiba pour from an orifice made in the trunk for two hours, after which the hole is tapped and the tree can be exploited again after 6 months. (Thus, a sole tree will produce about 40 liters of copaiba, annually). Copaiba is the tree's resin and is rich in essential oils. The hydrocarbons in copaiba are terpenes, polymers in this case of the plants form iosoprene, a five-carbon-atom hydrocarbon molecule; that's why in these terpenes, the carbon atoms are always in numbers multiplying five. At high temperatures, terpenes break down their molecules into methanol (CH3OH) and other simple hydrocarbons, which can be used as raw materials in the chemical industry.Diesel engines function very well with fuel obtained from copaiba, which in 1990 provided 20 % of all of Brazil's oil exports. Copaiba production is of 12,000 liters per ha, turning it particularly interesting as a source of biodiesel.Copaiba is also used for its medical properties against stomach cancer and ulcers, and it has an antifungal activity. 3.In the Pacific area and South America, candlenut tree (Aleurites moluccana), up to 15-25 m (45-80 feet) tall, produces 30-80 kg of round nuts with a 4-6 cm diameter. The seed inside has a very hard seed coat and a high oil content (15-20%). The nuts are employed in Malaysian-Indonesian cuisine and the oil is used (like castor oil) as a hair stimulant or an additive to hair treatment systems. In Hawaii, the nuts are used both as food and burned to provide light. A nut burns with a bright and constant flame, without abundant smoke or spreading any scent, and can be used as a measure of time. The nuts were strung in a row on a palm leaf midrib and one end lit. One could then instruct someone to return home before the second nut burned out. 4.A team from the University of Minnesota showed that the best biomass source to produce biofuel was the mixture of native prairie

perennial grasses and other flowering plants, producing per acre more biofuel than corn grain ethanol or soybean biodiesel; it is far more environment-friendly, as these plants do not require fertilizers and also grow on infertile soils.10 years of research revealed that degraded agricultural land planted with diverse mixtures of prairie plants come with 238 % more biofuel on average than the same land planted with various single prairie plant species, including switchgrass.Biofuel made from this prairie biomass yielded 51 % more energy per acre than ethanol from corn grown on fertilized land. Prairie plants require little costs to grow and all parts of the plant above ground are usable. At present, all biofuels - including nonfood energy crops such as switchgrass, elephant grass, hybrid poplar and hybrid willow - are produced as monocultures grown primarily in fertile soils. Growing mixed prairie grasses on degraded land could deliver a stable bioenergy production that could replace 13% of global petroleum consumption and 19% of global electricity consumption, besides environmental benefits, like renewed soil fertility, cleaner ground and surface waters, preservation of wildlife habitats, and ecotourism. 5.In an Indian village from Gujarat (India), cattle are used for generating power. A team developed this: four beasts wheel a pivot connected to a gear box, which actions upon a small generator. The generator is attached to several batteries which feed a water pump and a mill. The whole cost of this energy is about 10 cents, compared to one dollar for wind mill obtained energy or 24 dollars the energy obtained by solar shields. Because cattle are required three months annually at the field work, the inventors are looking for an effective way to store energy that could be used while the cattle are missing. 6.Animal power comes with a new meaning. And pigs will save the planet. Oil company ConocoPhillips will collaborate with Tyson Foods, world's biggest meat producer, to produce biodiesel from pork fat, but also cattle and chicken fat. This source is cleaner than petroleum diesel, and in US you could already be pumping this type of fuel, which is zero sulfur. By 2010, ConocoPhillips can produce about 175 million gallons of animal diesel annually, about 3 % of the company's total diesel production, with the pre-processed fat delivered by Tyson Foods. Currently, animal fat is processed in soap, cosmetics and pet food industries. US oil companies benefit a dollar-per-gallon tax incentive, for developing renewable fuel from animal and food wastes. Biofuels, like ethanol made from plants (such as corn, palm oil and sugar cane), come at a cost of crop production and processing, while this source is a by-product. 7.Here is another by-product for getting energy: olive kernels. This energy source has already delivered heating and warm water to 300 households in Madrid. This cheap fuel costs 60 % less than oil fuels and 20 % less than coal. The resulting CO2 amount is the same with that resulted from natural fermentation. The olive kernels are by-products of the olive oil extraction, and Spain is the world leader in olive oil production...8.What's the link between Diesel oil, forage, soap, and margarine? The turnip (Brassica rapa), a plant with yellow colored flowers. This relative of the mustard is cultivated in Europe, Asia and North America for its oil-rich seeds (up to 40 %). 90 % of the turnip production is used for making margarine, biscuits, soups, ice cream and sweets. But, the turnip oil can be used for achieving Diesel oil, a less contaminant solution than the petroleum variant. The oil is also employed for smearing fine gears, and the by-product of the oil extraction can be used for achieving animal forage. 9.Biofuel can be obtained from almost any organic product, from agriculture wastes to dung, including that of wild animals. Algae are a natural oil-producer as well, and a possible source of biofuel. They can easily be genetically engineered to achieve varieties that generate high amounts of oil that can be turned into biocrude and refined into gasoline, diesel, and jet fuel; those with less carbon atoms can be processed and fermented in order to make ethanol. An oil-per-acre production from algae can be much higher than for industrial crops like soybeans. And their oil production can be boosted even more. 10.Palm oil has been regarded as the ideal cheap solution for biofuel. Energy companies converting generators and energy production from palm oil have increased. But, new researches show that the benefits of palm oil outcome the ecological disaster, from wiping out virgin Asian rain forests to growing lucrative new plantations. This oil was for long a primary ingredient in food and

cosmetics, but about five years ago, scientists started looking on it as a source of renewable energy, spurred by subsidies in many European Union countries and imports have increased by 65 %, since 2002. Palm oil is relatively abundant, cheap (roughly $550 per ton), and needs few or no changes to current power stations. But, the cultivation of the palm trees unleashes far more carbon dioxide than it would be saved by oil's burning. Huge carbon amounts are released from peat swamps in Indonesia and Malaysia, drained and burnt to make place for the palm oil trees. About 85 % of the world's palm oil is produced by the two countries, and about 25 % of Indonesian plantations are on drained peat bogs. 600 million tons of carbon dioxide enters the atmosphere yearly from the drained swamps and another 1.4 billion tons is expelled while firing the rain forests to make place for plantations. The subsequent smoke often shrouds Singapore and Malaysia in a dense fog, for weeks sometimes, and this CO2 can make 8 % of the world's fossil fuel emissions. Clearing peat swamps for plantations also destroys the most efficient ecosystem on the planet for sucking CO2 from the atmosphere. Still, the production of palm oil has risen 6.6 % in 2006 and will grow another 5.5 % in 2007 to 37 million tons, while prices have risen 35 % in 2006.