[youtube:http://www.youtube.com/watch?v=yTBSJl9gabA auto]Turning food into fuel has been widely promoted by many national leaders as a great way to beat the fuel crisis, while also reducing reliance on unstable oil and gas suppliers. However biofuels have also been blamed for higher food prices, food shortages in the poorest nations, hunger riots and fall of governments.

Biofuels are solid, liquid or gas carbon-based fuels which are made from biological material – mainly plants. Examples include making petrol substitutes from sugar, biodiesel from wheat or recycled cooking oil, or making fuel out of agricultural waste such as straw stubble or manure.

Why they matter

Biofuels are essentially a form of solar power, of which there is a vast, reliable supply at zero cost. Plants use light to make carbon, which is later burn in vehicles. In theory biofuels could contribute significantly to the global energy shortage, but even if all grain produced in the entire world was converted to biofuels, it would only produce an amount equivalent to 10-15% of total world energy consumption.

Case study: Stagecoach is one of the world's largest public transport corporations, based in the UK. In Scotland, five of their buses run on fuel made from used cooking oil. Passengers are given free travel in return for their bottles of used oil. The scheme has been hugely popular with travellers, who have spread the campaign across the community. Stagecoach benefits not only from reduced fuel costs, but also from free publicity and a stronger, energy-conscious image.

Difference they make

Biofuels are likely to remain highly controversial. Scientists are unable to agree what difference biofuels make in terms of carbon saving, when you factor in energy used in fertilisers, tractors, food transport and lost in the conversion process.
However it is clear that converting food to fuel has caused a significant rise in global food prices.
A World Bank report published in July 2008 suggested that up to 70% of the massive price jump is directly due to competition with biofuels.

Businesses have not only been busy converting food into vehicle fuel, but also stockpiling for tomorrow's biofuel factories that have yet to be built.

Food prices really matter. In Asia and Africa we are seeing mass migration of the land by subsistence farmers, drifting into megacities. China alone is seeing 30 million people a year on the move and Africa will have 750 million in cities by 2025.
Most of these people are very poor and now depend on buying food in the markets.
Up to 80% of the daily income of such people is spent buying rice or other grain.
As food prices doubled, hundreds of millions
of people struggled to eat.
When they increased further, hunger began to take a heavy toll.
Parents had to chose between feeding themselves or their children, selling furniture and even cooking equipment to buy basic food.

And then the riots began. Tens of thousands of hungry people in many different towns and cities began to protest by setting fire to cars and smashing shops. But this is nothing to what we could see in the future if it is widely perceived that the reason hundreds of millions cannot afford food is because America, the EU and other wealthy regions have burnt too much food in cars, lorries,
trains
and planes.

Challenges

First generation biofuels (food into fuel) have directly linked energy prices with food. The poorest will never be able to compete with industrial giants and vehicle owners,
and the end result is likely to be further food shorgages.
Second generation biofuels using biowaste also face major hurdles.
It is technically more difficult to make fuel from cellulose (plant stalks), and those stalks would normally have been ploughed back into the ground.
Harvesting biowaste means more fertilizers need to be used, reducing the net energy gain.
Non-food crops can also be grown and harvested, but only by using land that could otherwise be used to grow food, or to grow trees.
Food price rises have triggered a new global tree-cutting frenzy in a rush to plant more crops.

Third generation biofuels can be made using algae which produce up to 30 times more energy per acre per year. Growth can be encouraged by cultivating them in a a high CO2 atmosphere, using processed gases from power stations for example. The US Department of energy calculates that if all petroleum fuel in America was produced from algae, it would

reguire new algae farms covering 15,000 square miles or the size of the State of Maryland.
A fourth generation approach is to use genetically modified microorganisms which convert carbon dioxide into carbon.
However, microorganism fuel farms can require large amounts of water, which may become an additional challenge.

Business Opportunities

Expect huge growth of investment in all kinds of biofuels. Be ready also for major changes in government regulations, and withdrawal of tax benefits for biofuels produced from food.

The US market for biodiesel is already larger than a billion gallons a year and Federal directives require this to rise to at least 36 billion gallons a year by 2022. The European Union requires at least 5.75% of all transport fuel to be made from biofuel by 2010, rising to 10% by 2020.

Fortunes will be won and lost in biofuels.

Many more Global Warming Videos by Futurist Dr Patrick Dixon and Sustainagility book.

Articles and Videos on Global Warming

Here are more resources on this site that you may find helpful.

True Cost of Global Warming
How business will help solve global warming with green technology
CARBON DIET to save the World
Global Warming - Science Summary
Future of Oil Prices: Middle East, global economy
Roof Gardens Impact on Energy Saving
Biofuels Controversy and Climate Change
Iceland Volcano Eruption - Geothermal Power Potential
Energy Use Consulting - Boom Industry
Smart Power Regulation - Energy Saving
Green Technology Innovation Awards Chaired by Patrick Dixon
Product Exchanges and Climate Change

Wind Turbines and Global Warming
Solar Cell Roofing and Climate Change
Low Energy Streetlights and Global Warming
Polymer Cement - to save 2% global CO2
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Future of Oil Industry when will oil run out? Kuwait and region
Heat Pumps - to prevent global warming
Cost of global warming - practical answers
The $40 trillion climate change business
Impact of Global Warming on Human Life
The Future of the Environment
Green Technologies innovation will help with climate change
Sustainability, climate change and crazy biofuels policy
Sustainagility: innovation will help save world. Sustainable business future
Sustainable business: $40 trillion green tech boom will help save world
How Green IT saves money and energy, improves image and environment - keynote
Water Wars Risk? Futurist Q&A with Patrick Dixon
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