

The H₂OPE Biofuels Solution

Today, 85 percent of the world's energy supply comes from fossil fuels: oil, coal and natural gas. Estimates vary on when these resources are going to "run out" but a typical estimate is about 100 years. Energy supply, though, is the least of the planet's problems.

The cost of these industries—on the environment, on the economy, on human health—are too great to ignore.

Fossil fuels create three irrefutable problems:

- It is expensive, and ecologically damaging and dangerous to harvest oil, coal and natural gas.
- The burning of fossil fuels creates air pollution, which kills both humans and natural ecosystems.
- Carbon emissions from fossil fuel use are altering the planet's temperature and weather patterns.

Expensive, Damaging, Dangerous

Getting fossil fuels requires harvesting deep underground or underwater. It is not unusual to have to dig miles into the earth to reach natural gas deposits, or, in the deep ocean, to have to travel hundreds of miles offshore and plunge 10,000 feet below ground.

[Accidents do happen.](#) Remember the disastrous BP Gulf of Mexico oil spill in 2010? By far the worst oil spill in U.S. history, the spill was almost 20 times greater than the Exxon Valdez oil spill in 1989 in Alaska. Two years after the Gulf spill, the health of eight U.S. national parks are still threatened; more than 400 species of animals that live in the Gulf islands and marshlands remain at risk.

Toll on Human Health

Fossil fuel use also kills people. According [to a study](#) by the National Academy of Sciences, the burning of fossil fuels costs the United States about \$120 billion a year in health costs alone, largely due to air pollution.

Those pollutants include small soot particles, which cause lung damage; nitrogen oxides, which contribute to smog; and sulfur dioxide, which causes acid rain. Nearly 20,000 people die prematurely each year from such causes, according to the study's authors, who valued each life at \$6 million based on the dollar in 2000.

Tinkering With Global Temperatures

Carbon emissions are also [raising the planet's temperature.](#) This is witnessed by everything from melting polar ice caps, which then raise the sea levels and sea temperatures. This leads to

soil erosion on the coasts, alterations in animal migration patterns, and wild swings in weather patterns.

The Colorado wildfires of 2012, for example, have been deemed the worst in the state's history. As of July 3, 2012, 45 large active wildfires were burning in 15 states since January, and had charred 2.2 million acres of land.

But there is hope.

Alternative energy sources — such as biomass, wind, solar, geothermal and hydroelectric — are all sources that are renewable, and generate a fraction of the carbon emissions created by fossil fuels. They are the key to limiting environmental damage, reducing carbon emissions and freeing U.S. dependency on foreign oil (and the many complex economic-political ramifications such dependency creates).

But here is the million dollar question: Will American scientists be the ones to find, profit and share the latest advances in clean technology? Or will we pass the opportunity by, because we have failed to invest in the promising technologies here on our home turf?

Unfortunately, a majority of the eco-advanced energy solutions being used today were developed outside the United States. For example:

- Windmill turbines of today were not developed in the U.S. They were developed in Europe, because European governments began funding R&D into these technologies long before we were even thinking about it. India has now become a world leader in wind-power generation.
- Although the first working solar cell was invented by an American, in 1882, solar power is now one of the biggest industries in mainland China. China has over 400 photovoltaic (PV) companies and produces 23% of PV products worldwide.
- Hydropower is being produced in 150 countries, but the Asia-Pacific Region generates the most — about 32% in 2010. China is the largest producer, using hydroelectric power for 17% of its domestic electricity use. Paraguay produces 100% of its electricity from hydroelectric dams, and then exports 90% of its product to Brazil and Argentina. Norway produces an impressive 98-99% of its electricity from hydropower. The United States has reached only 5.74% of total capacity, according to *The Economist*.

The United States may be "the richest country in the world" — but how long are we going to stay that way? How long are we willing to sit in the backseat while the rest of the world takes technological leaps — and then imports them back to us, at a markup?

American investment dollars in American biotech companies *do* matter!