

# New Energy Economy

## **New Energy Economy**

**Making profit with green energy**

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## Making Profit

Currently the oil from *Jatropha curcas* seeds is used for making biodiesel fuel in Philippines and in Brazil, where it grows naturally and in plantations in the Southeast, and the North/Northeast Brazil.

*Jatropha* oil is being promoted as an easily grown biofuel crop in hundreds of projects throughout India and other developing countries.

The railway line between Mumbai and Delhi is planted with *Jatropha* and the train itself runs on 15-20% biodiesel

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## Secretary Chu Announces \$3.18 Billion Investment for Carbon Capture and Sequestration [1]

- \$979 million to support new commercial-scale CCS technologies

"These Federal stimulus dollars for carbon capture and storage will help ensure that West Virginia coal continues to heat and light our homes and businesses for many years to come. Clean coal can be a green, competitive 21st Century fuel. This investment is to select technologies that:

- make progress toward a target CO<sub>2</sub> capture efficiency of 90%;
- make progress toward a capture and sequestration goal of less than 10% increase in the cost of electricity for gasification systems and less than 35% for combustion and oxycombustion systems;
- capture and sequester or put to beneficial use an amount of CO<sub>2</sub> emissions in excess of the minimum of 300,000 tons per year required by CCPI.

[1] Secretary Chu Announces \$3 Billion Investment for Carbon Capture and Sequestration

<http://energyandenvironmentblog.dallasnews.com/archives/2009/12/laura-miller-gets-her-clean-co.html>

Power plants' coal smoke tarnishes halo of electric cars. Dallas News December 5, 2009

<http://www.dallasnews.com/sharedcontent/dws/bus/stories/120509dnbusnuelectriccars.189e3e2.html>

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## **Oil-palm**

Oil-palm plantations cover millions of hectares across Malaysia, Indonesia, and Thailand.

Oil palm is the most productive oil seed in the world. A single hectare of oil palm may yield 5,000 kilograms of crude oil, or nearly 6,000 liters of crude. For comparison, soybeans and corn generate only 446 and 172 liters per hectare, respectively.

Palm oil is becoming an increasingly important agricultural product for tropical countries around the world, especially as crude oil prices top \$70 a barrel. For example, in Indonesia, currently the world's second largest producer of palm oil, oil-palm plantations covered 5.3 million hectares of the country in 2004, generating an export value of US\$4.43 billion.

Almost half of Malaysia's cultivated land consists of oil palm, and the country has become the world's largest producer and exporter of palm oil, though Indonesia is quickly gaining ground. Both Indonesia and Malaysia are exporting large amount of the product to China

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At \$400 per metric ton, or about \$54 per barrel, palm oil is competitive with conventional oil. In the future, palm oil prices are expected to fall further as more oil palm comes under cultivation. With cheap land, abundant labor, and ideal climate, investors and developers are eyeing tropical Africa as the next major producer of palm oil.

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According to Fargione Converting rainforests, peatlands, savannas, or grasslands to produce food crop-based biofuels in Brazil, Southeast Asia, and the United States creates a "biofuel carbon debt" by releasing 17 to 420 times more CO<sub>2</sub> than the annual greenhouse gas (GHG) reductions that these biofuels would provide by displacing fossil fuels.

In contrast, biofuels made from waste biomass or from biomass grown on degraded and abandoned agricultural lands planted with perennials incur little or no carbon debt and can offer immediate and sustained GHG advantages. [1]

Searchinger from the University of Princeton says that production of ethanol from corn increases the emission of CO<sub>2</sub>. He is not against biofuel but says that tropical forests should not be exchanged. [2]

According to Crutzen from the Max Planck Institute/Germany the fertilizers (ammonium nitrate), used in these farms, produce even more N<sub>2</sub>O as predicted by the IPCC. [3]

[1] J. Fargione et al., Land Clearing and the Biofuel Carbon Debt, Science (Published Online, February 7, 2008).  
<http://dx.doi.org/10.1126/science.1152747>

[2] T. Searchinger et al., Use of U.S. Croplands for Biofuels Increases Greenhouse Gases Through Emissions from Land Use Change, Science (Published Online February 7, 2008).  
<http://dx.doi.org/10.1126/science.1151861>

[3] P. J. Crutzen et al., N<sub>2</sub>O release from agrobiofuel production negates global warming reduction by replacing fossil fuels, Atmos. Chem. Phys. 8, 389 (2008).  
<http://www.atmoschemphys.net/8/389/2008>

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## German solar energy fundings are increasing [1]

Year	Solar energy amount of total renewable energy	German Government fundings
2005	2,9 per cent	679.110.000
2006	4,3 per cent	1.176.800.000
2007	4,6 per cent	1.597.480.000
2008	6,2 per cent	2.218.620.000

[1] EEG-Jahresabrechnungen  
<http://www.spiegel.de/wirtschaft/soziales/0,1518,665401,00.html>

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The German funding for solar electricity will amount 53 Billio EUR, until 2010, paying 0.43 EUR/ KW hour.

According to Schmidt the reduction of CO2 emission should be activated using the cap and trade system, or Schmidt is President des Rheinisch-Westfälischen Institute for Economics (RWI) and is one of five experts which are advisors of the German Government.

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## **Solar lamps replacing kerosene lamps of the village of Dakhshin Dimoia/District of Assam/India.**

The population hesitates to accept the innovation because the government keep the price of kerosene and rice down with heavy subventions. The investment of solar lamps is therefore not attractive.

Institute for Resources and Energy (Teri) developed and introduces the lamps which are charge during daytime by central solar photovoltaic stations.

The kerosene lamps produce soot which harms lungs and eyes.

Solar lamps improve the air quality of houses. The bright light also keeps wild elephants away.

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## **Alcohol**

Sugar cane cannot solve the global energy demand.  
Burning leaves of the cane produces environmental harm

## **Energy bills hurt**

The average household spends more than \$2,200 a year on energy bills, with nearly half of this going to heating and cooling costs.

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## **Geothermal heat pumps**

Geothermal heat pumps use ground temperature air instead of outside air to provide heating, cooling and often water heating. GHPs can be installed in new and existing homes. Because they use the constant temperature of the earth, GHPs are among the most efficient heating and cooling technologies currently available in the marketplace.

The new requirements for water-to-water equipment complements existing efficiency and performance requirements for water-to-air and direct geoexchange GHP models. Homeowners who install geothermal heat pumps with the Energy Star are eligible for a 30 percent federal tax credit.

[http://www.energystar.gov/index.cfm?c=geo\\_heat.pr\\_geo\\_heat\\_pumps](http://www.energystar.gov/index.cfm?c=geo_heat.pr_geo_heat_pumps)

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## **Air-Source Heat Pumps**

Heat pumps provide both heating and cooling in one integrated system.

**Electric Air-Source Heat Pumps (ASHPs):** ASHPs, often used in moderate climates, use the difference between outdoor and indoor air temperatures to cool and heat.

**Geothermal Heat Pumps (GHPs):** GHPs are similar to air source heat pumps, but use the ground instead of outside air to provide heating, cooling, and often water heating. Because they use the earth's natural heat, they are among the most efficient and comfortable heating and cooling technologies currently available. Although initially expensive, you can achieve significant cost savings on energy bills. GHPs are most often installed in new homes and require a duct system.

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## Russian Pipelines

Every year, when the temperature goes down, Russia cuts the European supply of natural gas alleging a billing dispute with Ukraine. The gas dispute between Russia and Ukraine escalated further in January leaving several countries in Central and Eastern Europe out of gas, and supplies of Russian gas to Bulgaria, Turkey, Greece and Macedonia had been halted. Austria and Germany are using up their reserves. The Russian Gazprom delivered meager 92 million cubic meters of gas for EU states, compared to 300 million on previous days.

Gazprom alleged that the Ukraine was to be blamed for the shortfall shutting three of the four export pipelines which cross their country.

The Caucasian pipeline bringing natural gas from Baku through Georgia was recently endangered during the military conflict between Georgia and Russia.

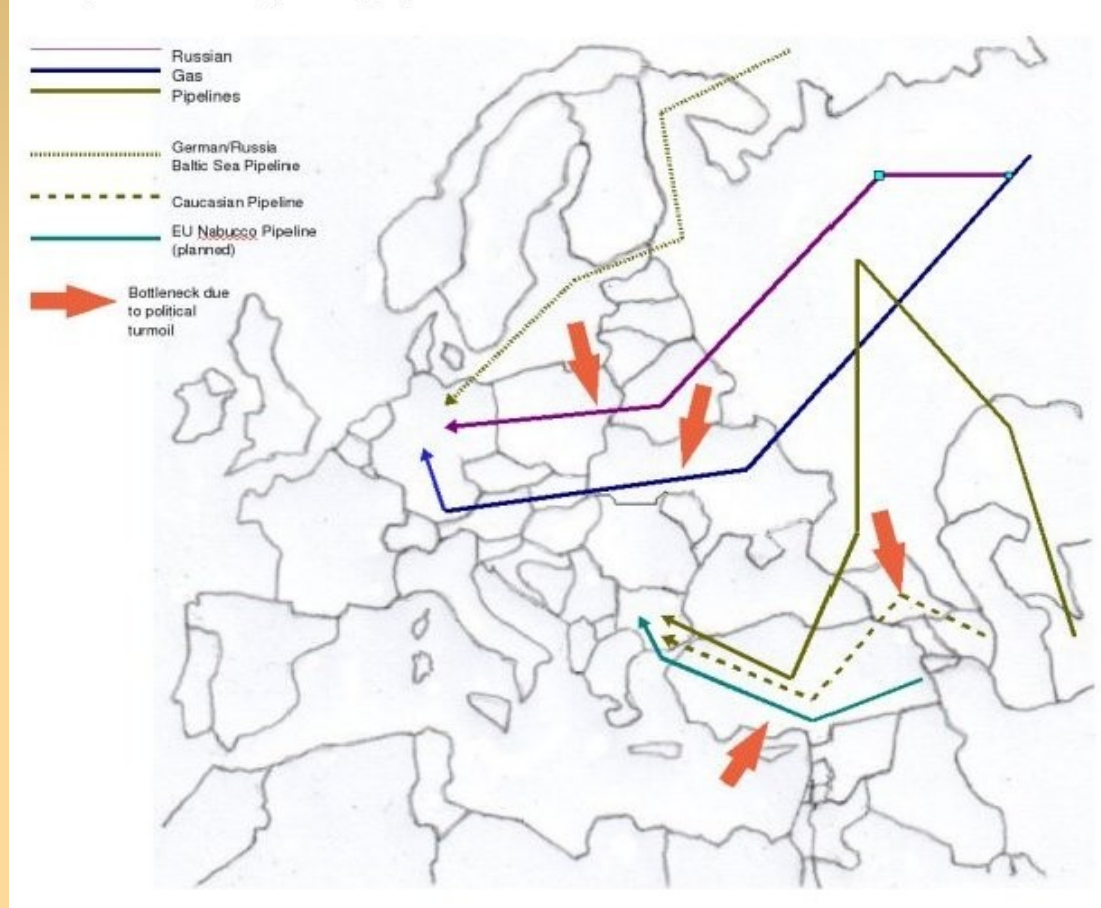
The pipeline through Poland has a low capacity.

## Avoiding bottlenecks

The EU Nabucco pipeline is planned to transport gas from the Caucasian region and from Iran in case the sanctions against this country will be lifted. The Nabucco pipeline will exert pressure against the monopoly of Russian gas.

The Baltic Sea pipeline, a cooperation between Russia and Germany is planned to avoid bottlenecks from the Ukrainian and the Polish transit pipelines

European natural gas supply



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## **The Trans-Sahara Pipeline**

Nigeria natural Gas pipeline for Europe. It will cross 4,500 Km of unfriendly environment.

On July 3, Algeria, Nigeria and Niger signed an intergovernmental agreement for the development of a 4,128 km gas pipeline that will send gas from the Niger Delta through Niger to Algeria's export terminals. The project is estimated to cost around \$12 billion and will supply up to 30 billion cubic meters of natural gas per year to Europe; in addition, it will enable Nigeria to increase its share of natural gas exports, while helping make Algeria one of the major energy hubs in the region, catering mainly to the European market.

The pipeline would enable European countries to tap directly into Nigeria's 5 trillion cubic meters of natural gas and reduce its reliance on Russia and Algeria (although Algeria's Sonatrach and, potentially, Russia's Gazprom will also be involved in the TSGP project).

Is the Trans-Sahara Gas Pipeline a Viable Project? The Impact of Terrorism Risk

[http://www.jamestown.org/single/?no\\_cache=1&tx\\_ttnews\[tt\\_news\]=35412&tx\\_ttnews\[backPid\]=13&cHash=45e63a0c47](http://www.jamestown.org/single/?no_cache=1&tx_ttnews[tt_news]=35412&tx_ttnews[backPid]=13&cHash=45e63a0c47)

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Germany has only limited resources of lignite.

Hard coal is being imported from Australia because of low price.

Pipeline are therefore of crucial importance for Germany which starten building the Baltic Sealine with a construction cost of 7.5 billion Eur.

The Nabucco pipeline, also a billion Eur project, was planed to relieve the dependence onRussian natural gas.

And also the 4.500 km gas pipeline through Algeria and the Mediterranean Sea whose final costs will be enormous.

## German energy consumption 2008

	in million tons of coal equivalents	total %
Liquid petroleum	166	34,7
Natural gas	109	22,8
Coal	63	13,2
Nuclear energy	55	11,5
Lignite	53	11,1

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## Global Wind Energy 2008

<b>Europe</b>	<b>60.7%</b>
<b>North America</b>	<b>19.8%</b>
<b>Asia</b>	<b>17.1%</b>
<b>Pacific Region</b>	<b>1,2%</b>
<b>Africa, Near East</b>	<b>0.5%</b>
<b>Latin America</b>	<b>0.5%</b>
<b>Others</b>	<b>0.2%</b>

## Green electricity in Germany GigaWatt/hours

<b>Wind Energy</b>	<b>40.400</b>
<b>Biomass</b>	<b>27.061</b>
<b>Hydropower</b>	<b>21.300</b>
<b>Photovoltaic</b>	<b>4.000</b>
<b>Geothermic</b>	<b>1.800</b>

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Wind is a form of solar energy, caused by the uneven warming of the earth's surface. This is why air masses have different temperatures and pressures, and are constantly moving to find a balance. The greater the difference in pressure, the swifter the air moves and the stronger the wind.

The industry develops new profiles of blades for wind turbines.

<http://news.uns.purdue.edu/x/2009a/090501AdamsWind.html>

# New Energy Economy

Germany consumes 600 TerraWatt/h/year

Germany wants to phase out nuclear energy and coal until 2050. Energy strategy focuses on renewables, while France forces the construction of nuclear power plants, despite unsolved nuclear waste disposal.

**The End**