

## Nordic/Baltic Regional ESTH Hub e-Letter

Welcome to the latest **e-Letter**, our *unclassified* electronic publication sharing regional information, news and events. We encourage you to visit the websites of our Embassies throughout the Hub. Feel free to disseminate to your contacts. At the very end of the e-Letter you will find our featured story, offering background on biofuels.

Enjoy the read!  
Ed Canuel  
Bo Gregersen  
Natalie Hauser  
James Logie

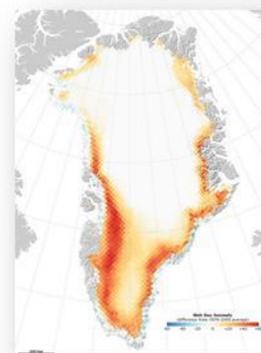
### DENMARK



**U.S. Embassy Day in Vejle.** The U.S. Embassy relocated to Jutland for one day on March 29th. U.S. Ambassador Laurie S. Fulton and Vejle Mayor Arne Sigtenbjerggaard officially opened the “Embassy Day in Vejle.” The ESTH section participated, discussing our regional role, U.S. governmental Arctic initiatives and the U.S.-Greenland-Denmark Joint Committee. For more information on the Joint Committee, see [here](#). (Picture: Ambassador Fulton and Vejle Mayor Arne Sigtenbjerggaard)

### Denmark OKs ambitious green energy deal.

The Danish Parliament passed an ambitious green energy agenda that includes energy consumption and carbon dioxide emissions decreases, a renewable energy target of 35 percent and a target of 50 percent electricity consumption from wind power by 2020. Read more [here](#).



**Seaweed biofuel joint venture.** Danish enzyme company Novozymes formed an agreement with Sea6 Energy, an Indian company, to develop a method of turning seaweed into biofuel. Sea6 Energy will contribute its offshore seaweed cultivation technology to the partnership, while Novozymes will lead R&D and manufacturing efforts. Read more [here](#).

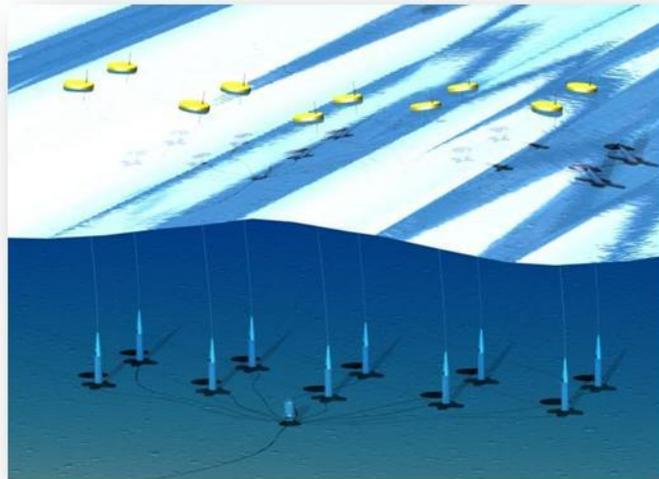
**Greenland’s ice sheet and global warming.** According to researchers in Spain and Germany, Greenland’s ice sheet is more sensitive to global warming than previously thought. The ice sheet may lose its ability to grow once warming reaches 1.6 degrees Celsius (2.9 degrees Fahrenheit). Read more [here](#). (Picture: Greenland ice sheet; <http://earthobservatory.nasa.gov/>)

### ESTONIA

**Estonia under EU limits in primary air pollution categories.** Estonia finished first in the world in least urban particulate pollution last year according to the WHO. The country has now received a clean bill of health from the European Environment Agency concerning all gas and fume pollution. Read more [here](#).

## FINLAND

**Fortum and Seabased to begin construction of wave power park in Sweden.** Finnish utility Fortum has signed a contract with Seabased for the construction of a joint wave power park in Sotenäs, Sweden. The firms aim for marine installation of the first 42 wave power buoys and related equipment during the autumn and winter of 2012. Read more [here](#). (Picture: <http://www.rechargenews.com>)



**New Finnish gasification plant.** The Nordic Investment Bank (NIB) has provided bioenergy company Vaskiluodon Voima Oy with €18 million to build a gasification plant in Vaasa, Finland. The facility will produce 140MW and is to be connected to an already established power plant. Read more [here](#).

**Finnish paper producer to build a biorefinery.** UPM is set to build the world's first biorefinery producing wood-based biodiesel in Lappeenranta, Finland. Construction is expected to start in the middle of 2012, with the development costing about €150 million. Read more [here](#).

**Finland will host Europe's Integrated Carbon Observation System (ICOS) headquarters.** ICOS is a network of researchers and research stations set up to monitor the concentration, release and sequestration of greenhouse gases. The ICOS headquarters will be established in connection with the Finnish Meteorological Institute; its other Finnish partners include the University of Helsinki and the University of Eastern Finland. Read more [here](#).

## GERMANY

**EON to cut costs of building offshore wind farms 40% by 2015.** Germany's biggest utility EON expects to cut costs for building offshore wind farms about 40 percent by 2015 as it embarks on a 7 billion-euro (\$9 billion) renewable energy



expansion plan. Read more [here](#). (Picture: <http://renews.biz>)

**Fuel from market waste.** Researchers at the Fraunhofer Institute for Interfacial Engineering and Biotechnology IGB in Stuttgart have developed a new facility that ferments waste to make methane, which can be used to power vehicles. In early 2012, the researchers will begin operating the pilot plant adjacent to Stuttgart's wholesale market. Read more [here](#).

## ICELAND

**Nike and Össur join forces.** Icelandic prosthetic limbs manufacturer Ossur has signed an agreement with the U.S. sports company Nike to develop sport shoe soles for amputees. Read more [here](#).

**Grand opening of Carbon Recycling International (CRI) methanol plant in Iceland.** The plant will produce methanol fuel from industrial carbon dioxide (CO<sub>2</sub>) emissions and will have a production capacity of 2 million liters of liquid methanol per year. The methanol will be blended with gasoline and sold at gasoline



stations throughout the greater Reykjavik area. Read more [here](#). (Picture: <http://smartplanet.com>)

**Iceland storage project turns CO<sub>2</sub> into stone.** The CarbFix pilot program will capture carbon dioxide from the Hellisheiði Power Station and pump it underground in a process that will convert the greenhouse gas into rock. Though the project started in 2007, the team only started injecting the well in January and will begin to inject from the geothermal plant itself in April. Read more [here](#).

**Geothermal Energy Association (GEA) International Geothermal Energy Showcase.** The GEA is hosting the Showcase with collaboration from the USTDA, USAID, Ex-Im and DOE. Industry leaders, government officials and other power sector representatives from the U.S. and around the world are expected to participate.

## LATVIA

**New IT center for Riga.** TechHub Riga, the first expansion location for the eponymous London-based technology incubator, recently opened. The center provides office space, networking opportunities, and



educational events for entrepreneurs in Latvia. Embassy Riga has collaborated closely with TechHub. [Read more here.](#) (Picture: Economics Minister Pavluts, HM Ambassador Soper (UK) and Ambassador Garber celebrate the grand opening of TechHub Riga.)

## LITHUANIA

**Baltic leaders lobby new nuclear plant.** The prime ministers of the three Baltic States are urging energy companies to speed up negotiations on a new nuclear power plant in Lithuania. [Read more here.](#)



## NORWAY

### **ABB wins order on DC-based electric solution for a vessel.**

Technology group ABB won a contract from Norwegian ship owner Myklebusthaug Management to supply the first ever direct current (DC) power grid on board a ship. [Read more here.](#)

**New seeds to the seed vault in Svalbard.** A new shipment of seeds from food plants in Tajikistan, Armenia, Colombia, Costa Rica and the U.S. arrived at Norway's Svalbard Global Seed Vault. The purpose of the seed vault is to

safeguard the world's most important genetic plant resources. [Read more here.](#)

**Yara to help turn the Qatar desert green.** Norwegian fertilizer producer Yara signed an agreement with The Sahara Forest Project AS and the Qatar Fertilizer Company (Qafco) to build a "green" pilot plant in the Qatari desert. The plant will house a combination of salt water greenhouses, concentrated solar power and solar cells, algae cultivation ponds and salt drying facilities. [Read more here.](#) (Picture: <http://news.thomasnet.com>)

**Norway's Skrugard field recoverable oil volume confirmed –Statoil.** Norwegian oil and gas firm Statoil's preliminary Skrugard and Havis field drilling supports earlier oil volume estimates. [Read more here.](#)

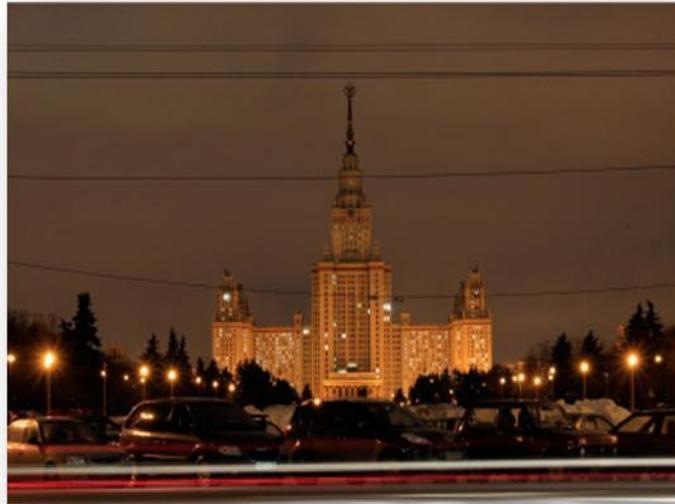
## POLAND

**Poland's PKN Orlen to increase shale-gas investments.** Poland's top refiner, PKN Orlen SA (PKN.WA), will increase "several-fold" its planned investments in shale-gas exploration and

production. Poland's shale-gas and conventional reserves combined could cover 35-65 years of the country's demand for natural gas. Read more [here](#).

## RUSSIA

**“Earth Hour” in Russia.** Moscow saved 2,850 megawatts of electricity, enough to power a 200- household village for a day, when 75 buildings and 10 bridges in the city went dark for an hour on March 31. Read more [here](#). (Picture: <http://thedailyedge.thejournal.ie>)



**MNRE and WWF swim icy waters to protest arctic pollution.** On March 28, Ministry of Natural Resources and Environment (MNRE) Department of General Affairs and Personnel head Anton Chernov, WWF-Russia director Igor Chestin, and other activists swam in an icy lake to demonstrate against Arctic pollution. Read more [here](#).

**Rusnano and U.S. Domain to invest \$760 Million in medicine production.** The Russian state nanotechnology corporation Rusnano and U.S. Domain Associates venture fund will invest \$380 million each in the development and production of next-generation medicine in 2012-2015. The partners will also build a \$190 million medicine production facility in Russia, with a plan to launch it in 2015. Read more [here](#).

## SWEDEN

**Native American Tribe Onondaga and Swedish Plantagon build world's first greenhouse for urban agriculture.** The first Plantagon Greenhouse is about to break ground in [Linköping](#), Sweden. The greenhouse will increase the municipality's capability to grow vegetables and grains locally and will utilize excess heating and CO2 from industries. Read more [here](#). (Picture: <http://www.swedishamericangreenalliance.org>)

**Swedish American Green Alliance - celebrating two years of sustainable success.** Through SAGA, Sweden and the United States have joined forces, bringing together students, universities, businesses,



NGOs and cities in the fields of clean technology, energy efficiency and environmental sustainability to develop the solutions critical to combating climate change. Read more [here](#).

**US Energy Department awards \$19 Million to Volvo for more fuel-efficient trucks.** Through the Department's SuperTruck program, the Swedish Volvo Group was awarded \$19 million – which the company is matching dollar for dollar – to improve the efficiency of heavy-duty vehicles like the Mack and Volvo Trucks. Read more [here](#).

**Sweden's clean tech sector 5th largest in the EU.** Sweden has the fifth largest clean tech sector in Europe, totaling over 54,000 jobs, trailing only Germany, France, Italy and Spain. Read more [here](#).

**U.S. National League of Cities takes trip to Sweden.** On April 17-18 a delegation from the National League of Cities (NLC), a prominent organization representing municipal governments throughout the United States, visited Stockholm and Malmö. Read more [here](#).

## EUROPEAN UNION

**Wind power generates 6% of EU electricity.** In a report published by the European Wind Energy Association (EWEA), there is enough wind energy capacity in the European Union to generate more than six per cent of its electricity. In 2011, 9,616 Megawatts of wind energy capacity was installed, bringing the total capacity to 93,957 Megawatts. Read more [here](#).



**Fifty-five airports transparent over their carbon footprint.** Fifty-five European airports have pledged to reduce their CO2 emissions. These airports are part of the Airport Carbon Accreditation program. The best result has been achieved by the Swedish airport Gothenberg-Landvetter, which is considered carbon neutral. Read more [here](#).  
(Picture: <http://triparoundworld.info>)

**EU sees thirsty China as a partner at Rio.** China's growing water problems make it a likely ally for European efforts to press global action on sustainable development at a UN conference later this year. Read more [here](#).

**Climate adaptation information tool launched.** The European Environment Agency (EEA) has launched a website providing advice to EU policymakers on how to prepare and adapt to climate change. It gathers information on strategies, guidelines and studies on this topic. Read more [here](#).

## UNITED STATES

**U.S. backs plan to produce algae crude oil.** The U.S. Department of Energy and OriginOil Inc. of California plan to work together help algae growers develop their businesses and enter the renewable algae crude market. Read more [here](#).



**Hawaii gets “EV Ready.”** Hawaii is revving up its state electric vehicle program, “EV Ready,” thanks to \$4.5 million in funding from the Energy Department’s State Energy Program and the Recovery Act. As part of the program residents and businesses can apply for rebates and grants to purchase electric vehicles and construct charging stations. Read more [here](#). (Picture: <http://energy.gov>)

**Positive federal review of offshore wind farms.** Offshore wind farms from

New Jersey to Virginia took a big step closer to reality with the completion of a review that showed the renewable energy source would leave no major environmental damage. Read more [here](#).

**USDA announces funding for energy programs.** Agriculture Secretary Tom Vilsack announced funds for Fiscal Year 2012 for two key programs to encourage the use of renewable biomass and production of advanced biofuels. About \$25 million will be made available through each program. Read more [here](#).

**Study shows oceans becoming much more acidic.** The world's oceans are turning acidic at what could be the fastest pace of any time in the past 300 million years, European and US scientists say in a new study. Read more [here](#).

**Chicago coal plants to close.** Under pressure from Chicago’s mayor, two of the city’s coal power plants have announced that they will close. Mayor Rahm Emanuel previously presented an ultimatum to the plants; they either clean up their pollution or risk being shut down by the city. Read more [here](#). (picture: <http://www.csmonitor.com>)



**Siemens to implement US Army's largest solar PV**

**system.** The solar PV system will help White Sands Missile Range, a military installation that spans 3,200 square miles, achieve 10.8 percent renewable energy by the end of 2012. The system will also provide the Army with approximately 10,000 solar renewable energy credits annually. Read more [here](#).

**Nanofiber breakthrough holds promise for medicine and microprocessors.** A new method for creating nanofibers made of proteins, developed by researchers at Polytechnic Institute of New York University (NYU-Poly), promises to greatly improve drug delivery methods and additional aid in the regeneration of human tissue, bone and cartilage. Read more [here](#).



**Federal Energy Regulatory Commission issues first tidal power project license.** The Federal Energy Regulatory Commission (FERC) has approved the first-ever commercial license for a U.S. tidal energy project, which will use New York City's East River tidal currents to generate electricity. Read more [here](#). (picture: <http://www.maritime-executive.com>)

## **ZeaChem signs contract to develop "drop-in" advanced biofuels.**

ZeaChem, a company focusing on integrated cellulosic biorefineries, has announced that it has successfully completed contract negotiations to receive \$12 million in grants from USDA's National Institute of Food and Agriculture (NIFA) through the Agriculture and Food Research Initiative (AFRI) Regional Coordinated Agricultural Project (CAP). Read more [here](#).

**GE Energy Financial Services more than doubles global solar power investments.** GE Energy Financial Services has announced it has more than doubled its global solar power investment commitments in the past year to \$1.4 billion, for nearly \$5 billion in projects. Read more [here](#).

### **Amtrak measures its carbon footprint.**

Amtrak recently achieved Climate Registered™ status by successfully measuring its carbon footprint. Read more [here](#). (Picture: <http://www.Amtrak.com>)

**SolarCity and Shea Homes introduce the "No Electric Bill" home.** U.S. companies SolarCity and Shea Homes have partnered to make "no electric bill" houses. The homes aim



to achieve net-zero electric bills by generating as much electricity as they consume through a blend of energy-efficient features and a solar power system. Read more [here](#).

**Nanotrees harvest the sun's energy to turn water into hydrogen fuel.** University of California, San Diego electrical engineers are building a forest of tiny nanowire trees in order to cleanly capture solar energy and harvest it for hydrogen fuel generation. Read more [here](#).

**Smart, self-healing hydrogels open far-reaching possibilities in medicine, engineering.**

University of California, San Diego bioengineers have developed a self-healing hydrogel that binds in seconds and forms a strong bond. The material has numerous potential applications, including medical sutures, targeted drug delivery, industrial sealants and self-healing plastics. Read more [here](#).



**Solar industry more than doubles capacity.** The solar energy industry installed a record 1,855 megawatts of photovoltaic capacity in 2011, more than double the previous annual record of 887 megawatts set in 2010, according to a new U.S. Solar Market Insight report. Read more [here](#).

(Picture: <http://www.energ.gov>)

**Device invented to rapidly detect infectious disease.**

Professors at the University of Tennessee, Knoxville and at the UT Institute of Agriculture Center for Wildlife Health have developed a portable device that can be used onsite to detect infectious diseases, pathogens and physiological conditions in people and animals. Read more [here](#).

**Obama administration outlines Arctic energy policy initiatives.** Obama

administration officials announced a series of initiatives that they said are aimed at bringing the best available science to energy-related decisions in the Arctic. The initiatives include development of an Arctic environmental emergency response mechanism by this summer. Read more [here](#).



**NASA's IceBridge 2012 Arctic Campaign.** Researchers and flight crew with NASA's Operation IceBridge, an airborne mission to study changes in polar ice, began another season of science activity. Daily missions will be conducted out of Thule and Kangerlussuaq, Greenland to measure sea and land ice. Read more [here](#).

**Taking solar and wind out to the ballgame.** With new solar and wind installations at two of its ballparks, Major League Baseball opens the 2012 season showing America that the national pastime is still at the vanguard of social and technological change. Read more [here](#). (Picture: <http://www.greentechmedia.com/>)

**The Blueprint for a Secure Energy Future: one-year progress report.** The report highlights the efforts made by the U.S. government to reduce our reliance on foreign oil, improve energy efficiency and position the United States as a global leader in clean energy. Read more [here](#).

**President Obama announces new fuel economy standards.** These new standards will cover cars and light trucks for Model Years 2017-2025, requiring performance equivalent to 54.5 mpg in 2025 while reducing greenhouse gas emissions to 163 grams per mile. Read more [here](#).

**Obama Administration commitment to American made energy.** President Obama highlighted his Administration's focus on a sustained, all-of-the-above approach to developing American energy. Read more [here](#).



**EPA to impose first greenhouse gas limits on power plants.** The Environmental Protection Agency will issue the first limits on greenhouse gas emissions. The proposed rule will require any new power plant to emit no more than 1,000 pounds of carbon dioxide per megawatt of electricity produced. Read more [here](#). (Picture: <http://www.washingtonpost.com>)

**DOE and USDA to provide \$35 Million for biomass research and development initiative.** The Obama

Administration announced March 22 that it plans to provide up to \$35 million over three years to fund fiscal year 2012 Biomass Research and Development Initiative projects. Read more [here](#).

**Renewables now cheaper than coal in Michigan.** The combined average levelized renewable energy contract prices for two Michigan electric utility companies from 2009-2011 were at least \$12 cheaper per MWh compared to coal, and the actual cost of renewable energy contracts submitted to the Commission to date shows a downward pricing trend. Read more [here](#).

**EPA delays 'Fracking' air pollution rules.** The EPA is again delaying the rollout of final air pollution standards for natural gas wells developed with the controversial method called hydraulic fracturing. Read more [here](#).

**US DOE offers USD 10 million to promote zero-emission cargo transport vehicles.**

The DOE announced on March 20 that up to \$10 million will be available this year to demonstrate and deploy electric transportation technologies for cargo vehicles, such as trucks and forklifts. Read more [here](#).



**FERC Approves Plans for New 300-KW Ocean Power Plant.** The Federal Energy Regulatory Commission has approved plans for a 300-KW tidal energy project near Maine's Cobscook Bay. The permit will allow Portland-based Ocean Renewable Power Company to install turbine generator units on the ocean floor and operate the project for eight years. Read more [here](#). (Picture: <http://www.buffingtonpost.com>)

**Renewables experience explosive growth in first three years of Obama Administration.**

According to the most recent issue of the "Monthly Energy Review" by the U.S. Energy Information Administration (EIA), with data through December 31, 2011, renewable energy sources expanded rapidly during the first three years of the Obama Administration while substantially outpacing the growth rates of fossil fuels and nuclear power. Read more [here](#).

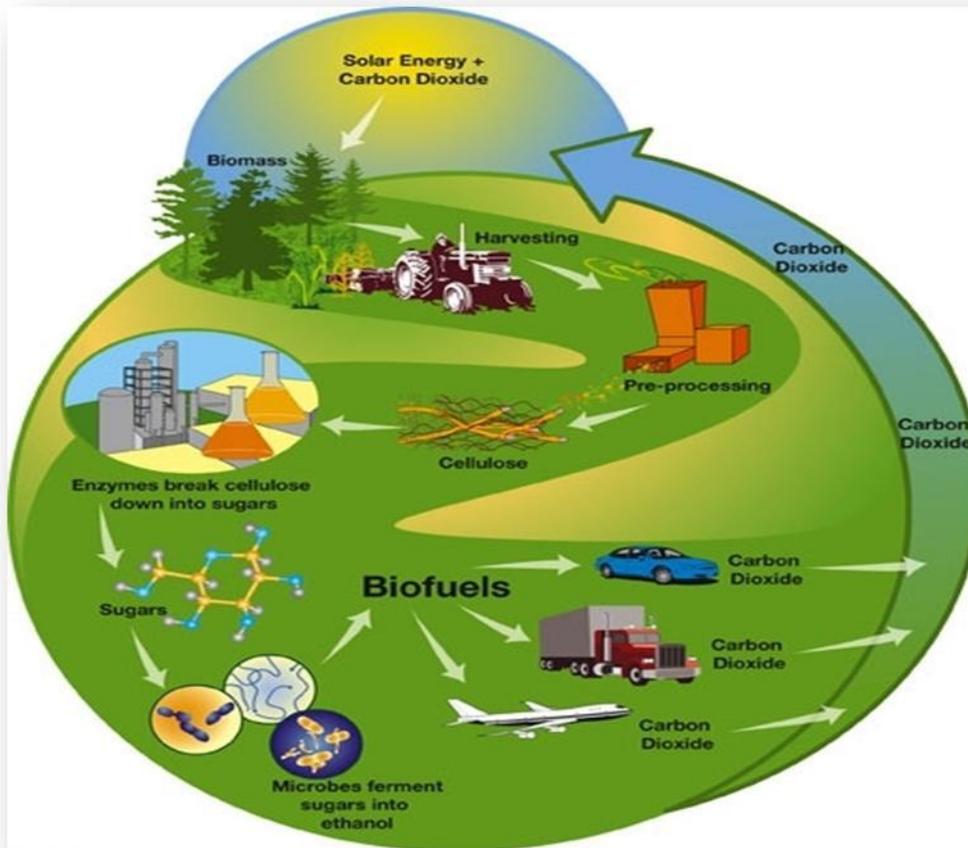
**New rules to curb pollution from oil, gas drilling.** The Environmental Protection Agency announced new rules to control the problem of air pollution coming from wells being drilled by the oil and natural gas drilling industry. The new rules will require waste products to be captured by 2015, and flared — or burned off — in the meantime. Read more [here](#).

**EVENTS**

May 23 2012. Ronald Reagan Building in Washington, DC. Geothermal Energy Association (GEA) International Geothermal Energy Showcase. Read more [here](#).

**FEATURED STORY: Biofuels**

## Biofuels



Government and private industry view biofuels as an answer to the challenges of climate change and the growing concern over imported energy dependency. With biofuel capabilities, countries with minimum oil reserves may achieve some fuel self-sufficiency. Local air pollution in most areas can also be reduced by using biofuel instead of traditional fuel. Biofuel research and development, which the U.S. government supports, has become an international priority. Despite this increased focus, the biofuel industry has yet to transition to a mainstream market due to high production costs and limited infrastructure.

### ***What are biofuels and where do they come from?***

Biofuels are liquid fuels made from biomass. Biomass refers to biological material of living or recently living organisms. Unlike fossil fuels, the use of biofuels is not considered to alter carbon ratios in the atmosphere given that the CO<sub>2</sub> emitted was recently absorbed from the atmosphere. Biofuels are often classified by the biomass used to create them: first generation biofuels use food crops as their feedstock, while second generation biofuels are produced from non-food crops and crop residue. Additionally, some biofuels are further classified as “drop in fuels,” which can be used in a conventional engine without modification. Numerous countries are redirecting research toward these biofuels, which

work within the existing transportation structure. In August 2011, President Obama announced that the U.S. government will be investing \$510 million toward the development of aviation and marine drop in fuels. (Picture: Path of 2<sup>nd</sup> generation biofuels; <http://www.eoearth.org>)

### **What are the prominent biofuel types?**

#### **Bioethanol**

Commonly made from food crops like corn and sugarcane, first generation bioethanol is the primary biofuel being produced today. In 2010, U.S. suppliers produced 13.5 billion gallons. Scientific advances in cellulosic ethanol production are allowing for increased second generation bioethanol production. Though not yet commercially viable, this method would alleviate concerns regarding the depletion of food supply for fuel production. A major shortcoming of bioethanol is that it has less stored energy compared to gasoline, ultimately decreasing fuel mileage in gasoline/ethanol blends. Additionally, pure ethanol or high blends have corrosive effects on traditional engines. Presently, E85 blends (85% ethanol/15% gasoline) cost approximately \$3.14 per gallon in the U.S.



#### **Biobutanol**

Biobutanol is often compared to bioethanol due to their similar feedstocks (corn, sugar, etc.) and function. Unlike bioethanol though, it is a drop in fuel. Biobutanol is also not hampered by the corrosive properties of ethanol and has a comparable energy density to gasoline. This allows for little to no reduction in fuel mileage. The production costs are still relatively high, averaging around \$4 per gallon.

#### **Biodiesel**

Biodiesel is produced from vegetable and animal oils. As a drop in fuel, it's compatible with all diesel engines. Biodiesel produces fewer pollutants than conventional diesel, is less toxic and contains practically no sulfur. Research is currently underway on generating biodiesel from algae and bacteria. These organisms are being genetically engineered to produce biodiesel lipids with little to no feedstock (only CO<sub>2</sub> and sunlight). Price is the main obstacle to biodiesel production; a gallon of biodiesel in the U.S. is currently \$4.20 per gallon, while petroleum diesel is \$3.86 per gallon.

## ***Biofuels and the US***

In a 2012 speech given at Miami University, President Obama ensured continued government support for research and development in renewable energy. Notably the president spoke about U.S. government investment in algae-based biofuel research, which recently received \$14 million dollars in federal R&D grants.

## ***Biofuel developments in the Nordic/Baltic region***

The Finnish paper company UPM has announced plans to build the world's first industrial-sized plant to turn paper by-product into biodiesel. Danish-based company Novozymes recently announced a new enzyme, set to increase the efficiency of second-generation bioethanol production. Additionally, Novozymes opened a new plant in Nebraska which will be fully



operational by mid-2012. Scania, a Swedish bus and truck manufacturer, is switching to bioethanol for all its internal transport services. The Danish shipping company Maersk and the U.S. Navy recently collaborated on a test of algae-based biofuel. Dong Energy, Denmark's largest energy company, recently ceased operations in its large-scale second generation bioethanol plant. The company will continue with R&D. Danish company Maabjerg Energy Concept is to receive up to 9.8 million Kroner for developing their business plans for a future bio ethanol plant. The venture would be the world's first full-scale plant for production of bio ethanol based on straw. (Picture: Scania truck; <http://www.scanianewsroom.com>)

## ***Further Reading:***

EIA Biofuel Production: <http://www.iea.org/techno/essentials2.pdf>

Biochemical Conversion Process: [http://www.nrel.gov/biomass/biochemical\\_conversion.html](http://www.nrel.gov/biomass/biochemical_conversion.html)

Biofuel Facts: [http://www.eere.energy.gov/basics/renewable\\_energy/biofuels.html](http://www.eere.energy.gov/basics/renewable_energy/biofuels.html)

Fuel Price Information: [http://www.afdc.energy.gov/afdc/pdfs/afpr\\_jan\\_12.pdf](http://www.afdc.energy.gov/afdc/pdfs/afpr_jan_12.pdf)

U.S. Investment in Drop in Fuels: [http://www.navy.mil/search/display.asp?story\\_id=64163](http://www.navy.mil/search/display.asp?story_id=64163)

White House Announcements: <http://www.whitehouse.gov/the-press-office/2011/08/16/president-obama-announces-major-initiative-spur-biofuels-industry-and-en>

<http://www.whitehouse.gov/the-press-office/2012/02/23/remarks-president-energy>



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