Summary of Sustainable Alternative Aviation Fuels Activity

11 February 2011							
Region	**Country**	**Comments**	**Date**	**Company/ Organization**	**Feedstock/ Process**	**Summary**	**Links**
Asia & Pacific	Australia, U.S.		10/02/11	Solazyme, Qantas	Microbial biomass processing	Solazyme, Inc. announced that it has begun a collaboration with Qantas to pursue the potential for commercial production of Solazyme's microbial derived aviation fuel, Solajet™, in Australia. This represents the first collaboration in the Asia-Pacific region to explore the use of Solajet™ in commercial aviation. The companies intend to use Solazyme's technology platform to help provide the Australian market with renewable aviation biofuel. There is currently a six billion liter a year demand for aviation fuel in Australia. Through this collaboration, both Qantas and Solazyme are striving to help meet this demand.	Solazyme and Qantas Launch Collaboration Working Toward Commercial Production of Solajet™
NACC	U.S.		10/02/11	US Air Force	Biofuels	The C-17 Globemaster III was recently certified for unlimited usage of hydroprocessed blended biofuels known as hydrotreated renewable jet fuels. The certification marks the Air Force's first platform to be fully certified using an HRJ blend. The blended fuel evaluation combined additional analyses from Boeing, Parker ESD and Pratt & Whitney. The evaluation found no significant differences in engine stability, thrust response or engine steady-state performance. This certification clears the C-17 to fly on a volumetric blend of up to 50 percent HRJ fuel with 50 percent JP-8, as well as a blend of 25 percent HRJ, 25 percent synthetic paraffinic kerosene fuel, and 50 percent JP-8. The Air Force expects to conclude HRJ flight testing within the next 12 months, supporting fleetwide HRJ certification within the next 22 months.	Officials certify first aircraft for biofuel usage Air Force OKs biofuel jet fuel mix in aircraft
NACC	U.S.		2007	US Dept. of Agriculture, Colorado State University	Biofuels	Bioenergy crops offset carbon dioxide emissions by converting atmospheric CO_2 to organic C in crop biomass and soil, but they also emit nitrous oxide and vary in their effects on soil oxidation of methane. Growing the crops requires energy (e.g., to operate farm machinery, produce inputs such as fertilizer) and so does converting the harvested	Life-Cycle Assessment of Net Greenhouse-Gas Flux for Bioenergy Cropping Systems

						product to usable fuels (feedstock conversion efficiency). Overall, bioenergy cropping systems could help offset greenhouse gas emissions, but quantifying that offset is complex. The objective of this study was to quantify all these factors to determine the net effect of several bioenergy cropping systems on greenhouse-gas (GHG) emissions. The study used the DAYCENT biogeochemistry model to assess soil GHG fluxes and biomass yields for corn, soybean, alfalfa, hybrid poplar, reed canarygrass, and switchgrass as bioenergy crops in Pennsylvania, USA. DAYCENT results were combined with estimates of fossil fuels used to provide farm inputs and operate agricultural machinery and fossil-fuel offsets from biomass yields to calculate net GHG fluxes for each cropping system considered. Displaced fossil fuel was the largest GHG sink, followed by soil carbon sequestration. N_2O emissions were the largest GHG source. All cropping systems considered provided net GHG sinks, even when soil C was assumed to reach a new steady state and C sequestration in soil was not counted. Hybrid poplar and switchgrass provided the largest net GHG sinks. Compared with the life cycle of gasoline and diesel, ethanol and biodiesel from corn rotations reduced GHG emissions by 40%, reed canarygrass by 85%, and switchgrass and hybrid poplar by 115%.	
NACC	U.S.		28/01/11	US EPA	Biofuels	The Energy Independence and Security Act (EISA) required EPA to revise the Renewable Fuel Standard (RFS) program to increase the volume of renewable fuel blended into transportation fuel from 9 billion gallons per year in 2008 to 36 billion gallons per year by 2022. The revised standards (RFS2), finalized in 2010, established new specific annual volume requirements for cellulosic biofuel, biomass-based diesel, advanced biofuel, and total renewable fuel in transportation fuel. Section 204 of EISA directed EPA to conduct a study of the environmental impact associated with current and future biofuel production and use. The mandate asks for consideration of environmental issues including air quality, water quality and soil quality as well as resource conservation impacts of increased biofuel production and use, including air and water quality, soil quality and conservation,	Biofuels and the Environment: First Triennial Report to Congress

						water availability, energy recovery from secondary materials, ecosystem health and biodiversity, invasive species, and international impacts. The report reviews impacts across the entire biofuel supply chain, including feedstock production and logistics, and biofuel production, distribution, and use. The report is currently undergoing peer review. After updates are made to the report, the final report will be published in 2012 on the EPA Biofuels web site.	
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Region	**Country**	**Comments**	**Date**	**Company/ Organization**	**Feedstock/ Process**	**Summary**	**Links**
NACC	U.S.		06/02/11	BioJet	Biofuels	BioJet International Ltd**.** announced that it received a US $1.2 Billion funding facility. BioJet is a leading international supply chain integrator in renewable (bio) jet fuel and related co-products, which include green diesel, etc. for the aviation and transportation sectors. The funding agreement is designed to allow BioJet a significant source of capital for its supply chain capital projects program including feedstock and refining projects, as well as investment and strategic acquisitions. The funding agreement enables BioJet to expand their camelina, jatropha, and algae feedstock projects as well as renewable jet refining projects in Latin America, Asia, and Europe. BioJet invests in projects throughout the entire biofuel value chain including feedstock generation, technology, refining, logistics, sustainability certification, distribution, and eventual end use by the aviation sector user. BioJet is also the first Alternative Fuels Strategic Partner of the International Air Transport Association.	BioJet Receives $1.2 Billion funding facility Renewable Jet Fuel Developer Gets Financial Boost
EUR/ NAT	Italy		03/02/11	Alitalia, Solena, Enalg	Biofuel from waste	Italian carrier Alitalia and Solena have agreed to start a study similar to one underway by Qantas and Solena (*See related entries for* 03/01/11 *in the* 21/01/11*report*). Solena is currently in the process of raising finance and identifying a potential site in London following an offtake agreement signed a year ago with British Airways. Unconfirmed reports suggest Solena is also in discussions with various airlines about the possibility of a similar plant in Dublin. Under the Solena model, its proposed facility aims to convert around 500,000 tonnes of MSW into 16 million gallons of jet fuel and nine million gallons of bionaphtha per year.	Alitalia becomes the latest airline interested in partnering with Solena on a municipal waste to jet fuel project

						Also involved with the study is Italian algae biofuel company Enalg, a partner company of Solena Group and controller of Solena Italia. Alitalia said it expected a Solena-run plant would provide a "significant portion" of the jet fuel needed by its aircraft fleet and would result in a major reduction – up to 96% – in greenhouse gas emissions. Solena said it planned to involve national and local authorities in the project.	
EUR/ NAT	Finland		31/01/11	Finnair	Biofuels	The Finnish state-owned airline Finnair has reversed an earlier decision to start using biofuel in some of its commercial flights this year. (*See related entries for* 14/12/10 *in the* 21/01/11*report)* Finnair was to have started to use kerosene produced by Neste Oil from biological sources as soon as certification is implemented. Now the airline is going back on its decision.	Finnair postpones introduction of biofuel Finnair postpones early plans to use jet biofuel on commercial flights citing sustainability and price issues
	World	Overview article of aviation biofuel development and the need for the aviation industry to be committed.	12/10	IATA	Biofuels	If airlines wait until the price is right and commercial quantities are available, biofuels might never happen. Biofuels offer the greatest hope for aviation to reduce its carbon emissions. Savings of up to 80% are on the table if the industry can get it right. There are tough challenges to overcome: aside from technical issues, biofuels must be competitive in price and available in quantity. But the difficulties that appear to be holding them back may also contain the solutions necessary to drive biofuels forward.	Environment - The Growth of Biofuels
EUR/ NAT	E.U.	Overview article of aviation biofuel development in response to the upcoming EU ETS	01/02/11	The Economist	Biofuels	Spooked by the spike in oil prices in 2008 and warily eyeing the latest spurt in fuel charges, airlines have noted that the costs of not going green are growing. In particular, they fret about the painful levies on carbon-spouting planes to be imposed under the European Union's Emissions Trading Scheme (ETS). From 2012 all airlines operating in the EU will be expected to cut emissions to 3% below the average annual figure for the period between 2004 and 2006, and by a further 2 percentage points in 2013. In the face of this challenge, the queue of carriers hopping on the biofuel bandwagon is growing.	Off into the wild, green yonder
Asia & Pacific	**China, U.S.**		**31/01/11**	**Air China, Boeing, PeroChina, UOP, Pratt & Whitney**	**Jatropha**	**Air China and Boeing have signed a Memorandum of Understanding with the intention of carrying out a trans-Pacific biofuel flight between China and the US, and will follow China's first biofuel demonstration flight planned for the second half of this year. The**	**Air China and Boeing make plans for the first trans-Pacific sustainable biofuel-powered flight** **Boeing, Air China to Strengthen Cooperation in**

						sustainably-sourced biofuel for the trans-Pacific flight will be produced both in the US and China to test and compare the respective qualities and capabilities of the fuels. This venture was initiated following the signing of a series of Sino-US cooperation agreements in May 2010 (*See related entries for 26/05/10 in the 17/09/10 report and 27/05/10 in the 24/09/10*), which included the joint development of a sustainable aviation biofuel industry in China based on jatropha that is grown widely in the south of the country. The demonstration flight is likely to be carried out on an Air China Boeing 747-400 with one of its four Pratt & Whitney engines powered by a 50-50 blend of biofuel and Jet A-1 conventional kerosene. It will help verify the feasibility, supply capacity and commercial potential of Chinese-produced biofuel that meets ASTM fuel standards, and aims to build a platform for an industrial supply chain in the country, says Air China.	**Biofuel R&D** **Air China plans transpacific biofuel test flight in 2011**
NACC	U.S.	Non-expert view of aviation biofuels development notes encouraging progress as well as concern about scale of investment and land development	16/01/11	AVwebInsider – blog	Biofuels	Aviaiton biofuels production is an industry operating on an underlying assumption that biofuels are an inevitability. There are aspects of this story that I find encouraging. Specifically, the sheer amount of research work in this area is staggering. There are probably dozens of processes using just as many bio feedstocks and the fact that the Navy and Air Force are throwing money at the problem will have inevitable spinoffs for the commercial side. The fuels themselves—specifically hydrotreated renewable jet—seem to perform well, so well in fact that the Navy is satisfied that the principle part of its testing is done. It wants to run all of its airplanes and ships on a 50/50 blend of petroleum by 2020, an ambitious timeline.	Aviation Biofuels: Real or Green Fantasy?
NACC	U.S.	Biofuels Digest presents a detailed rebuttal to the RAND report on military biofuels, casting them	03/02/11	Biofuels Digest	Alternative Fuels	The RAND organization recently published a report assaying and critiquing the military efforts to develop advanced biofuels – in particular focusing on Fisher-Tropsch renewable fuels, fuels from algae and fuels from oilseed crops. (*See related entries for* 25/01/11 *in the* 28/01/11*report)*The renewable fuels industry and the US Navy were, in particular, aghast at the report's findings. In particular, the algal biofuels industry was incensed at the characterization of algal biofuels as "a	RAND Van Winkle: an inside look at RAND's controversial survey of military alternative fuels

		in a more positive light.				research project" and a range of companies were miffed by findings that actively discouraged the military's current activities in the development of diesel and jet fuel from biomass.	
28 January 2011							
Region	**Country**	**Comments**	**Date**	**Company/ Organization**	**Feedstock/ Process**	**Summary**	**Links**
NACC	U.S.	This article casts quite a negative view of biofuels, however, it seems to have a very short-term perspective and discounts climate benefits.	25/01/11	RAND Corporation	Alternative Fuels	The United States would derive no meaningful military benefit from increased use of alternative fuels to power its jets, ships and other weapons systems, according to a government-commissioned study by the RAND Corporation. The report also argues that most alternative-fuel technologies are unproven, too expensive, or too far from commercial scale to meet the military's needs over the next decade. In particular, the report argues that the Defense Department is spending too much time and money exploring experimental biofuels derived from sources like algae or camelina, and that more focus should be placed on energy efficiency as a way of combating greenhouse gas emissions.	Alternative Fuels Don't Benefit the Military, a RAND Report Says
NACC	U.S.		25/01/11	University of California, Berkeley, Lawrence Berkeley National Laboratory, Energy Biosicences Institues	Life-Cycle Assessment of Biofuels	Addressing the world's need for near-term, cost-effective, and reliable production systems for biofuels requires research to overcome technological barriers but it is also necessary to address social, economic, and environmental challenges in parallel. These challenges include constraints imposed by economics and markets, resource limitations, health risks, climate forcing, nutrient- cycle disruption, water demand, and land use. Responding to these challenges effectively requires a life-cycle perspective. This article summarize seven grand challenges that must be confronted to enable life-cycle assessment (LCA) to effectively evaluate the environmental "footprint" of crop/plant-based biofuel alternatives.	Grand Challenges for Life-Cycle Assessment of Biofuels Challenges for Biofuels: Not Just Technical Hurdles To Overcome
NACC	U.S.	Educational overview and opinion on biofuels development	22/01/11	Vinod Khosla, Khosla Ventures	Biofuel	This is part 1 of an article describing a range of factors that are important for understanding current biofuel production technologies, their economics, and commercial prospects. The author offers many opinions that drive his personal investments, however, it is a very good summary of biofuel technology development today.	Vinod Khosla on the Technology Pathway to Biofuels
NACC	U.S.	The proposed legilslation is primarily	25/01/11	U.S. Senate	Biofuel	U.S. Senator Tom Harkin (D-IA) introduced new legislation, called the "Biofuels Market Expansion Act of 2011." The bill would ensure an increasing number of automobiles in the U.S. be flexible fuel	Sen. Harkin Introduces "Biofuels Market Expansion Act"

		applicable to ethanol but federal loan guarantees for biofuel pipelines may be applicable to biojet fuel as well.				vehicles (FFVs), expands the number of blender pumps, and make renewable fuel pipelines eligible for the federal loan guarantee pipeline program. The bill is co-sponsored by Senators Tim Johnson (D-SD), Richard Lugar (R-IN), Amy Klobuchar (D-MN), and Al Franken (D-MN).	
	World	This article raises some concerns about jatropha as a biofuels feedstock.	24/01/11	Friends of the Earth	Jatropha	Jatropha, a biofuel-producing plant often discussed as an excellent feedstock, is turning out to be much less dependable than first thought, both environmentalists and industry players say. One industry expert noted that it does grow on marginal land, but if you use marginal land you'll get marginal yields. Developers are finding the plants will require fertile soil and nutritional supplements to produce satisfactory crops. That in turn raises concerns over competition with food production.	Biofuel Jatropha Falls From Wonder-Crop Pedestal
21 January 2011							
Region	**Country**	**Comments**	**Date**	**Company/ Organization**	**Feedstock/ Process**	**Summary**	**Links**
Middle East	Abu Dhabi, UAE		19/01/11	Masdar Institute of Science and Technology, Boeing, Etihad Airways, UOP	Salicornia	Masdar Institute of Science and Technology (MI), the Boeing Company, Etihad Airways, and Honeywell's UOP announced today the completion of a Sustainability Assessment of the Integrated Seawater Agriculture System (ISAS) for production of aviation biofuels and other bioresources. This study makes a significant contribution to current knowledge on the viability of using salt-tolerant plants irrigated with seawater as a sustainable feedstock for biofuels. The researchers confirmed the potential of ISAS to yield high value fuels and resources, including aviation fuel, biodiesel, electricity, aquaculture products, and others, without competing for freshwater resources and arable land used by conventional agriculture.	Masdar Institute Completes First Sustainability Assessment for Biofuels Production from an Integrated Seawater Agriculture System
South America	Brazil		08/12/10	TAM Airlines, Curcas Diesel Brasil and Brazil Ecodiesel	Biofuel	TAM Airlines, Curcas Diesel Brasil and Brazil Ecodiesel have formed a collaborative alliance to conduct feasibility studies for an integrated project to produce sustainable biokerosene jet fuel in Brazil. The joint effort has the support of aircraft maker Airbus and Air BP, BP's aviation fuel distribution division. The group intends to use diverse sources of biomass with a particular focus	Consortium to study biojet fuel in Brazil

						on jatropha produced by family farms and large plantations in Brazil. TAM Airlines is implementing a jatropha placement trail in an area of 4.35 hectares (approximately 11 acres) with the purpose of assessing the sustainability of different production models in order to identify the best techniques and genetic material.	
Asia & Pacific	Australia		18/01/11	Murdoch University, University of Adelaide, Aurora Algae	Algae	Western Australia is set to become a future biofuels hub. Western Australia has abundant sunshine, a key requirement for high productivity; large areas of marginal land, and, for algae production, abundant sources of saline water such as saline groundwater and seawater. Two algae biofuel pilot plants have been established in the Pilbara (the sunniest part of Australia). One constructed by Murdoch University and the University of Adelaide is already in operation and the other is being constructed by California-based Aurora Algae.	Commercial-scale algae production could be on the horizon in Australia
NACC	U.S.		04/01/11	ASTM, CAAFI, Airbus	Biofuel	Authorisation of biofuels by certificating body ASTM International was expected in mid-December, but the anticipated date for authorisation has slipped to the first quarter of 2011. Richard Altman, executive director of the Commercial Aviation Alternative Fuels Initiative (CAAFI), had been hoping an ASTM subcommittee would authorise hydrotreated renewable jet (HRJ) fuel during a series of meetings in December. The work is nearly done and the full ASTM committee will still be able to vote on whether to approve the fuels before the end of the first quarter, as originally planned. There are biofuel cost concerns, with Airbus chief Tom Enders recently estimating that biofuel is 25 times as expensive as normal jet fuel. Ausilio Bauen, director of sustainable energy consultancy E4tech, says: "It is difficult to see the cost of biofuels at less than $100 a barrel."	Forecasts 2011: Environment - Turning on to biofuels
EUR/ NAT	Germany		05/01/11	German Biomass Research Center	Life cycle assessment of rapeseed-based biodiesel	The German Biomass Research Center has conducted a study on optimizing greenhouse gas (GHG) emissions from rapeseed-based biodiesel. The goal of the study was to analyze the current default values for GHGs from rapeseed-based biodiesel, and to outline areas that would improve current GHG levels. The study was conducted partially in response to the German Biofuel	German study shows rapeseed GHG potential

						Sustainability Ordinance that calls for biofuels used by 2017 to reach a GHG reduction target of 50 percent when compared to fossil fuels, and 60 percent by 2018. According to the study, most biofuels at their current default levels for GHG reductions will not be sufficient in meeting the goals set for 2017.	
NACC	U.S.	Encouraging overview of the current state of biofuels development	19/01/11	Vinod Khosla, Khosla Ventures	Biofuel	I believe the medium term (five year) "safe" price target for biofuels is to be under $60 to $70/bbl crude oil equivalent, unsubsidized for global competitiveness. In the U.S., subsidies and the RFS II mandate make significantly higher prices viable. Direct-to-liquid thermochemical conversion that yields a crude oil or diesel and gasoline blendstock are nearer term candidates for economic viability and appear to be much lower risk technologies that can globally (read unsubsidized) compete near term with oil at today's $90/bbl price and in the mid-term at prices as low as $60/bbl.	What Matters in Biofuels?
EUR/ NAT	Finland		12/14/10	Finnair, Neste Oil	Biofuel	Finnair is set to become the first airline in the world to use fuel produced from renewable sources on regular flights. The airline aims to start fuelling its planes with biofuel next spring. Finnair airplanes could soon be powered by lard or logging waste, as the airline moves to adopt a new biofuel. Finnair is prepared to use the new fuel on a significant proportion of its flights. Finnish company Neste Oil will start producing the fuel with bio-kerosene in Porvoo as well as in Rotterdam and Singapore.	Finnair Set to Fly with Biofuel Finnair aims to become a launch customer for commercial airline jet biofuel flights in 2011
NACC	U.S.		21/12/10	U.S. Senate, NASA	Biofuel	U.S. Sen. Mark Warner, D-Va., is spearheading a potential multibillion-dollar endeavor to make Hampton Roads a leader in the emerging field of green aviation. Preliminary plans include tapping NASA Langley Research Center and partner organizations, such as the National Institute of Aerospace and Science and Technology Corp., all of which are based in Hampton. The public/private partnership would also draw upon state resources and academia.	$3 billion for 'green aviation'?
NACC	U.S.		20/12/10	US House of Representatives, US DOD	Biofuel	The "Domestic Fuel for Enhancing National Security Act" has been introduced in the U.S. House of Representatives. Rep. Jay Inslee (D-Wash.) introduced the bill which would authorize the Department of Defense to continue its leading role in helping to commercialize next generation biofuels by extending the multi-year contracting authority for advanced biofuels from 5 years to 15	Defending the Skies with Algae: U.S. Congressman Introduces Aviation Biofuels Bill Domestic Fuel Bill for National Security Legislation Could Ensure National Security by Encouraging Development of Domestic

						years. The bill would help scale up advanced biofuel production in the U.S.	Advanced Biofuels
	World		04/01/11	ASTM, CAAFI	Biofuel	Securing enough investment to scale up the production of biofuels for use in commercial aviation hinges on the authorisation of such fuels by certificating body ASTM International. This approval was expected in mid-December, but the anticipated date for authorisation has slipped to the first quarter of 2011. Richard Altman, executive director of the Commercial Aviation Alternative Fuels Initiative (CAAFI), describes 2011 as a "critical year" for initial investment in production programmes aimed at scaling up feedstock availability to commercially viable levels.	Forecasts 2011: Environment - Turning on to biofuels
EUR/ NAT	U.K.		10/01/11	British Airways, Rolls Royce	Biofuel	British Airways and Rolls-Royce will begin work on validating 10 different alternative fuel programs this year, with the hope of completing work on the initiative by early 2012. The two solicited fuel suppliers to provide 60,000 liters of fuel for testing. The airline and Rolls will examine 10 of those in a laboratory environment in the next few months, with rig tests of about five fuels due in the second quarter, followed by full engine tests using two fuels in the second half.	BA, Rolls-Royce Ramp Up Biofuel Effort
Asia & Pacific	Australia		20/01/11	Qantas	Algae	Qantas confirmed that it is in advanced talks with an unnamed algal biofuels producer ("with strong ties to Australia") that are expected to result in a letter of intent for an offtake agreement for algal jet fuel, with the potential that Qantas may take a financial stake in the venture. The company, hopes to complete feasibility work on its first biofuels project within six months. Qantas signed LOI with Solena earlier this year, and launched what was described at the time as a 12-month investigation of the potential to develop a 19 million gallon waste-to-jet fuel plant in Australia.	Qantas to sign LOI for algae-based aviation biofuel
Asia & Pacific	Australia		03/01/11	Qantas, Solena	Biofuel from waste	Qantas and Solena Group have announced that they expect to finalize a partnership in the next two weeks to determine the feasibility of a Fischer-Tropsch based biofuels plant in Australia that will produce aviation biofuels from waste.	Qantas, Solena Group to partner in aviation biofuels effort Qantas on brink of £200m biojet fuel joint venture Qantas may build a jet biofuel plant in Sydney Qantas looks to garbage to create biofuel for jets
NACC	**U.S.**		**06/01/11**	**Pratt & Whitney, US Air Force**	**Biofuel**	**A Pratt & Whitney F100-PW-220 engine recently powered its first biofuel test flight of a U.S. Air Force F-15 Eagle at Eglin Air Force**	**Pratt & Whitney Military Engines Power Biofuel Tests for U.S. Air Force**

						Base, FL using Pratt F117 engines. This flight test directly supports the U.S. Air Force's goal of acquiring half of its domestic jet fuel requirements from alternate sources by 2016.	**Pratt Adapting Jet Engines To Biofuel Blends**
NACC	U.S.		11/01/11	Washington State, Washington State University, Boeing	Forest biomass	Washington State's Department of Natural Resources announced phase 2 of its Forest Biomass Initiative. A pilot facility will be developed to produce bio-aviation fuel from forest biomass found on state lands. [*See also report of 12/07/10 from the 16/07/10 reporting period.*] The state Senate also authorizied the department of natural resources to conduct a forest biomass to aviation fuel demonstration project to facilitate Washington leading the nation in aviation biofuel production.	Washington's Forest Biomass Initiative to pilot bio-aviation fuel HOUSE BILL 1422 Washington State House of Representatives Bill Analysis HB 1422 SENATE BILL REPORT SB 5273
NACC	Mexico		3/12/10	ASA	Biofuel	The work that is being done by ASA on developing a sustainable aviation biofuel industry in Mexico is significant and may provide a model for similar industries in developing nations around the world. The link includes a video on biofuel developments in Mexico that has been described as inspiring to the extent it is showing how the aviation industry is looking at real climate solutions.	Pumping the biofuels in Mexico
3 December 2010							
Region	**Country**	**Comments**	**Date**	**Company/ Organization**	**Feedstock/ Process**	**Summary**	**Links**
NACC	U.S.	Life cycle analysis of alternative jet fuel from camelina demonstrates positive climate benefits	1/12/10	Sustainable Oils	Life cycle assessment of camelina-based alternative jet fuel	A life cycle analysis of the carbon footprint of camelina-based biojet fuel concludes that the renewable fuel reduces CO_2 emissions by 75 percent compared to traditional petroleum-based jet fuel, according to a peer-reviewed paper published in the journal *Environmental Progress & Sustainable Energy*. The study also found that "green" diesel made through the same process reduces CO2 emissions by 80 percent.	Peer-Reviewed Life Cycle Analysis Shows Camelina-Based Renewable Jet Fuel Reduces Emissions by 75 Percent
EUR/ NAT	U.K.		30/11/10	World Wildlife Fund	Cryogenic fuels	The aviation industry should focus research and development programmes on liquid hydrogen rather than third-generation biofuels in the quest to reduce carbon dioxide emissions, according to World Wildlife Fund. Liquid hydrogen and algae-derived biofuels should be the focus of investment over other alternative fuels because they are less likely to interfere with land used for food production. *See related entry for 23/02/10 in the 17/11/10 report.*	Hydrogen should take priority over biofuel in aviation: WWF
EUR/ NAT	**Germany**		**29/11/10**	**Lufthansa, Neste**	**Vegetable oil and animal**	**In April 2011, Lufthansa is to begin a six-month trial with an Airbus A321 on scheduled**	**Lufthansa to commence 6-month aviation biofuel trial on**

					fats	**commercial flights on the Hamburg-Frankfurt-Hamburg route. Pending certification, one of the aircraft's engines will use a 50-50 mix of biofuel and traditional kerosene. The primary purpose of the project is to conduct a long-term trial to study the effect of biofuel on engine maintenance and engine life. During the six months trial, Lufthansa will save around 1,500 tonnes of CO_2 emissions. This is part of Lufthansa's 'burnFAIR' project dedicated to testing biofuel.**	**commercial routes** **Lufthansa to begin flights in the spring powered by renewable fuel from Neste Oil** **Lufthansa to use Neste Oil NExBTL renewable jet fuel in 6-month commercial flight trial**
NACC	U.S.		25/11/10	CAAFI	Sustainable alternative fuels for aviation	Overview of the current developments in sustainable alternative fuels for aviation. The three challenges for alternative fuels development are stated to be (1) qualifying the fuel, (2) finding sufficient investment to keep developments moving quickly, and (3) ensuring that feedstocks come along as quickly as the fuels could be used in engines. The industry could be in a position where it could actually consume more of these fuels than crops could be grown to produce them.	A&S Interview: Richard Altman Executive Director, Commercial Aviation Alternative Fuels Initiative
NACC	**U.S.**		**23/11/10**	**US Air Force**	**Biofuel**	**The Air Force recently conducted an alternative fuel test of the Global Hawk UAV. This was considered one of the most challenging yet for the Air Force. The drone flies at high altitudes and low temperatures and was one of the last that the Air Force needed to test in its current spate of trial runs before its fleet is certified to run on a 50-50 blend of jet fuel and alternative fuels.**	**UAV is latest Air Force plane tested to run on alternative fuel** **The U.S. Air Force Tries Alternative Fuels**
NACC	**U.S.**		**22/11/10**	**US Navy**	**Camelina**	**The U.S. Navy flew a MH-60S Seahawk helicopter on a 50/50 biofuel blend as part of its "green" fuel efforts. The helicopter from the Air Test and Evaluation Squadron Two One used a fuel mixture made from camelina seed.**	**Seahawk helicopter flies on biofuel blend** **US Navy tests aviation biofuels**
NACC	U.S.		23/11/10	New Mexico State University, University of Central Florida	Algae fuels	New Mexico State University and the University of Central Florida will share in a $2.3 million U.S. Air Force grant to study algae as an alternative jet fuel. NMSU will study the best ways to grow and refine algae. UCF will examine the effects of algae-based fuel on jet engines. The research could help produce a replacement for petroleum-based jet fuels.	NMSU shares in $2.3M for algae jet-fuel study NMSU In Las Cruces Receives Federal Grant For Algae Fuel Research
EUR/ NAT	U.K.	Positive, general article supporting	25/11/10	British Airways, Solena	Biomass waste to FT fuels	The aviation industry has agreed on a set of global climate change targets which would cap net carbon emissions from 2020 and see net emissions from aviation reduce by 50% below their level in 2005,	Feature: GreenSky thinking

		aviation alternative fuel use, specifically addressing the GreenSky program near London				by 2050. The development of sustainable biofuels for the industry represents a significant opportunity to help airlines achieve these targets. British Airways is taking a leadership position in the biojet fuels arena. Last year the airline announced a partnership with Solena Group, a US-based renewable energy company, to build Europe's first commercial biojet fuel plant in the UK. The GreenSky project will be the first of its kind in the world and will begin producing sustainable aviation fuels from municipal waste in 2014.	
23 November 2010							
Region	**Country**	**Comments**	**Date**	**Company/ Organization**	**Feedstock/ Process**	**Summary**	**Links**
EUR/ NAT	U.K.		17/11/10	Omega	Cryogenic fuels	Hydrogen is being dropped by the aviation industry. What was a promising green fuel for powering flights of the future has been quietly shelved in favor of biofuels and more fossil fuel-sipping aviation. Energy costs of making hydrogen are enormous and it should be produced using a low-CO_2 source of electricity. Also, researchers found that aircraft would require fuel tanks four times larger than today's. Models showed that the larger exterior surface areas would increase energy consumption by well over a tenth, and overall costs by around 5%.	Aviation industry 'ditches' hydrogen
NACC	U.S.		17/11/10	LanzaTech, Pacific Northwest National Lab	CO_2 bio-fermentation	New Zealand company LanzaTech has announced plans to work with the Pacific Northwest National Laboratory to convert its biofuel products into a replacement jet fuel. LanzaTech, which has its US office in Roselle, Illinois, uses a biofermentation process in which the carbon monoxide gas is converted to hydrocarbons by microbes. The technology can produce 2,3-Butanediol, a hydrocarbon that can be used to make fuels to replace diesel, gasoline or jet fuel without requirements to change existing fuel distribution infrastructure. According to LanzaTech, the biofuels that will succeed must be compatible with existing engines, pipelines and refineries. LanzaTech's integration of the fuels and chemicals value chain enables economic viability, as well as being environmentally sound.	Pacific National Lab to work on 'drop in' jet biofuel
NACC	U.S.	Positive assessment of the growth of	15/11/10	Lux Research	Biofuels	Globally, the biofuels industry is on track to grow 7.8% annually to reach a capacity of 53 billion gallons in 2015 and four forces will dominate the growth of the market. The four forces that will	Lux Research: Innovation Will Grow Biofuels Market

		biofuels generally				drive the growth are government regulation, start-ups with technological innovation, large corporations and oil prices. According to Lux, it's innovation, not mandates, that will be the main driver for biofuels going forward. Because ethanol, the dominant biofuel technology on the market today, is approaching its blend limit, Lux says that new technologies must come into play in order for the industry to grow. Additionally, Lux believes that drop-in fuels will grow in popularity due to the fact that they can be easily integrated into existing infrastructure.	
NACC	U.S.	Positive assessment of sustainable alternative fuel for aviation from a fuel energy content and fuel quality standpoint	11/10	MIT	Sustainable alternative fuels for aviation	This paper examines the chemical composition and energy content of several fuel options that could hypothetically be used with the existing fleet of aircraft. Fuel specific energy (energy per unit mass) is an important consideration in determining alternative-fuel viability, because aircraft must travel fixed distances before refueling. Since most aircraft fly with excess tank capacity, fuel energy density (energy per unit volume) is of secondary concern relative to specific energy. A first-order approach using the Breguet-range equation shows that the fleet-wide use of pure synthetic paraffinic kerosene fuels, such as those created from Fischer–Tropsch synthesis or hydroprocessing of renewable oil sources, could reduce aircraft energy consumption by 0.3%. Conversely, fuels with reduced specific energy, such as fatty acid methyl esters (biodiesel and biokerosene) and alcohols, will result in increased fuel volume usage and also a decrease in fleet-wide energy efficiency. No penalty in energy efficiency would occur were these fuels used in ground transportation; thus, fatty acid methyl esters and alcohols are better suited to use in ground-based applications.	Energy Content and Alternative Jet Fuel Viability
NACC	U.S.	Generally positive assessment of advanced biofuels for transporta-tion	11/10	Boston Consulting Group	Alternative fuels generally	Technologies in some alternative energy sectors are approaching inflection points in their development and are on a path to becoming viable on a standalone basis, either completely decoupled from subsidy programs or requiring much less assistance. And there are clearer lines of sight into the barriers that must be surmounted before these technologies can be adopted broadly and to the triggers that could lead to more rapid adoption. These sectors, such as advanced biofuels for transportation, could have an impact on the global	What's Next for Alternative Energy? Solar, Wind And Biofuels Are Alternative Energy's Most Likely Disruptors, Says New Report

						energy landscape far sooner than is commonly assumed. According to the authors, "Alternative energies have always been 10 years away, but the future may be closer than you think." Other alternative energy sectors, however, will continue to be no more than visions or promises for at least the next decade.	
South America	Chile		17/11/10	Sky Airlines, PetroAlgae	Algae fuels	Florida-based PetroAlgae and Chilean carrier Sky Airline have signed a non-binding offtake collaborative agreement to enable the purchase of feedstock produced by licensees of PetroAlgae's commercial micro-crop technology for conversion into renewable jet fuel. The technology allows licensees to grow aquatic micro-organisms at a rate the company claims exceeds four times natural growth rates. This enables commercial-scale production of two end-products, a fuel feedstock, which can be converted into renewable jet fuel, and a protein that can be used in animal feeds.	Sky Airline signs offtake agreement with PetroAlgae to bring renewable jet fuel to Chile Chilean Sky Airlines signs algae supply deal for bio jet fuel
NACC	U.S.	This report is specific to biodiesel but is indicative of prospects for producing drop-in jet fuel. Probably not appropriate for ICAO website.	17/11/10	NAABB	Algae fuels	The National Alliance for Biofuels and Bioproducts (NAABB), a consortium of leading scientists and engineers from universities, private industry, and national laboratories announced Nov. 17 that they have met a significant benchmark by successfully producing biodiesel using oil extracted from algae that meets specifications set by the American Society for Testing and Materials (ASTM).	National Alliance for Advanced Biofuels and Bioproducts Demonstrates Successful Conversion of Algal Oil to High Quality Biodiesel
NACC	**U.S.**		**23/11/10**	**ASTM**	**Biofuels**	**Commercial production of jet biofuels could be authorization in December under fuel specification amendments being considered by certificating body ASTM International. Fresh test reports supporting a new ballot to revise ASTM D7566-09 and allow HRJ production are being examined by the 160 members of ASTM International Committee D02's Subcommittee J. Negative responses are not expected after seven negatives led to the withdrawal of a similar ballot in June. Those objections were no surprise, with engine manufacturers already asking for safety and performance tests that are now complete.**	**Hydrotreated renewable jet fuel close to certification but scale-up challenges remain**
South	**Brazil**		**22/11/10**	**TAM**	**Jatropha**	**TAM Airlines has undertaken the first**	**TAM Airlines operates 1st**

America						**successful experimental flight in Latin America using aviation biofuel produced from the oil of the Jatropha curcas, a Brazilian vegetable biomass. The flight took place on the afternoon of 22 November and involved an Airbus A320 from its fleet. The plane was equipped with CFM56-5B engines manufactured by CFM International. The flight took off from Rio de Janeiro's international airport and flew in Brazilian air space over the Atlantic Ocean for 45 minutes before returning to its point of origin.**	**flight in Latin America using Jatropha Curcas Biofuel** **TAM Airlines and Airbus first to fly Jatropha-based biofuel in Latin America** **Biofuel closer to commercial viability** **Airbus conducts flight fuelled by sustainable jatropha oil**
12 November 2010							
Region	**Country**	**Comments**	**Date**	**Company/ Organization**	**Feedstock/ Process**	**Summary**	**Links**
EUR/ NAT	Russia		9/11/10	Russian Department of Transport	Sawdust	Russia may start using biofuel made from sawdust to power aircraft. Deputy Transport Minister Valery Okulov said "We have a country full of forests and plenty of sawdust; why not make biofuel from it as an alternative source of energy."	Russia could use sawdust to fuel airplanes Russia Hints At Tax Break For Aviation Biofuel
EUR/ NAT	U.K.		11/11/10	Solena, Rentech	Biomass waste to FT fuels	Bioenergy firm Solena Group has signed a letter of intent with clean energy company Rentech for the use of its proprietary Fischer-Tropsch synthetic fuel technology in Solena's sustainable biojet fuel project – GreenSky. The facility will convert more than 500,000 tonnes of waste biomass feedstock into synthesis gas every year using Solena's plasma gasification technology, BioSynGas. The BioSynGas will then be processed by Rentech's Fischer-Tropsch technology into 16 million gallons of sustainable jet fuel and 9 million gallons of BioNaphtha. Solena has indentified potential sites in east London and is in discussions with various funding sources to finance the project. Construction of the facility is expected to begin in 2012, with the plant anticipated to be operational by 2014. *See related entry for 15/02/10 in the 16/07/10 report.*	Solena signs LOI with Rentech Rentech signs letter of intent with biojet fuel project Rentech Aids Solena's Bio-jet Fuel Economic growth and global connectivity are entirely possible within environmental constraints, says BA's Walsh Solena and Rentech to partner on synthetic fuel technology for Europe's proposed first sustainable jet fuel facility
	World		11/10	SAFUG, RSB	LCA	The aviation industry has strongly committed to achieving carbon-neutral growth by 2020 and reducing net greenhouse gas (GHG) emissions significantly by 2050. Sustainable aviation biofuel will play a major role in helping the industry reach its GHG reduction goals. Currently there is no globally harmonized sustainability standard and certification process for	Aviation Needs a Globally Harmonized Sustainability Standard

						aviation fuel. This could potentially inhibit the use of sustainable aviation biofuel. For example, an airline purchasing biofuel that is certified sustainable in the country of departure may be unable to account for that purchase in the country of arrival, if the sustainability standards in these countries differ. A globally harmonized system streamlines international aviation operations and helps to drive the adoption of sustainable aviation biofuel. Members of the Sustainable Aviation Fuel Users Group (SAFUG) believe the best candidate for a global standard and certification process to date is the one proposed by the Roundtable on Sustainable Biofuels (RSB).	
NACC	U.S.	Positive endorsement of non-petroleum alternative fuels for aviation and other transport. Not aviation specific.	27/09/10	Center for a New American Security	Alternative fuels generally	Since the U.S. wartime fuel supply systems are vulnerable to attack and heavily dependant on a single type of fuel, petroleum, to meet 77 percent of its energy needs, the report recommends that the Department of Defense (DOD) plan now to transition to a future in which it does not depend on petroleum. The authors suggest that DOD should ensure that it can operate all of its systems on non-petroleum fuels by 2040	CNAS Report Urges DOD to Prepare for Post-Petroleum Era
NACC	U.S.	Pessimistic view of the development pace of sustainable alternative fuels. Not aviation specific.	9/11/10	UC Davis	Alternative fuels generally	At the current pace of research and development, replacing gasoline and diesel with renewable fuel alternatives could take some 131 years, according to a new University of California, Davis, study using a new sustainability forecasting approach based on market expectations. The authors note their results suggest that there is a potential danger that crude oil will be depleted before it can be replaced by viable substitutes	New UC Davis market-based sustainability forecasting approach concludes supplanting gasoline and diesel with renewable fuels could take 131 years
NACC	U.S.		8/11/10	Syntroleum/ Tyson Foods	Animal fat and grease	Tyson and Syntroleum say they've begun in recent weeks to make diesel and jet fuel from chicken fat, beef tallow and a range of greases and oils at a plant they've built in Geismar, La., south of Baton Rouge. The raw materials are leftovers from Tyson's meat-processing plants and other food-processing factories and restaurants. The refinery has the capacity to produce 75 million gallons of fat-based fuel annually – current production rates are just under 1 million gallons annually. The US Air Force has contracted to purchase 40,000 gallons for testing the fuel in aircraft. *See related entry for 22/10/10 in the 5/11/10*	Factory Turns Chicken Fat to Diesel Tyson Foods biofuels plant passing quality tests

						report.	
NACC	U.S.	This is an "early" announce-ment of progress in developing algae fuels, including jet fuel. Suggest it not be added to ICAO website.	31/10/10	Photon8, Inc.	Algae fuels	Photon8 has eliminated the need for blending: The company's scientists have figured out how to produce hydrocarbons from algae that are identical to those from conventional fuels. Around the time the company was looking into how to make jet fuel, came the realization that the firm's algae cell growth rate was high enough that it could use some of the cells to make hydrocarbons once they'd been "milked" of oily lipids, an essential ingredient for algae-based biofuel, rather than using the cells exclusively for lipid production.	Brownsville biofuel firm announces further progress
NACC	U.S.	Generally pessimistic view of the pace of biofuels scaleup. Not aviation specific.	2/11/10	Lawrence Berkeley National Laboratory	Algae fuels	A report from Lawrence Berkeley National Laboratory's Energy Biofuel Institute says developing and testing biofuel based on algae will likely take at least a decade. The authors estimate that it cost $21 million to set up a 250-acre facility and about $1.5 million a year to run it. The facility would produce about 12,300 barrels of oil a year, meaning it would break even if oil cost $330 a barrel.	Algae biofuel business won't bloom soon
	World	Biofuels forecast. Not aviation specific.	9/11/10	Fredonia Group	Biofuels	Growth in world biofuel demand will continue to expand at a rapid double-digit annual pace, reaching 121 million metric tons in 2014. Bioethanol will experience the greatest gains, as continued steady growth in the large North American market will be accompanied by more rapid advances in the Asia/Pacific region and Europe. Much faster growth will occur in the smaller biodiesel market as the maturation of biodiesel in Western Europe is offset by robust gains in all other regions. Additionally, demand for other biofuels such as biobutanol and renewable diesel will begin to reach commercially significant volumes. While historically not a factor, global trade in biofuels will rise rapidly going forward as large biofuel consuming countries are forced to seek additional supply, and a number of smaller developing countries seek to exploit biofuel exports.	World Biofuel Demand to Reach 121 Million Metric Tons in 2014
EUR/ NAT	E.U.	Input assumptions are not reasonable. Suggest it	9/11/10	Nine environmental groups (ActionAid, Birdlife	Biofuels	European plans to promote biofuels will drive farmers to convert 69,000 square km of wild land into fields and plantations, depriving the poor of food and accelerating climate change. As a result, the extra biofuels that Europe will use over the next	Biofuel Worse For Climate Than Fossil Fuel: Study Biofuel plan will cause rise in carbon emissions Study: Biofuel not the answer for

		not be added to ICAO website.		International, ClientEarth, European Environment Bureau, FERN, Friends of the Earth Europe, Greenpeace, Transport & Environment, Wetlands International)		decade will generate between 81 and 167 percent more carbon dioxide than fossil fuels.	EU
5 November 2010							
Region	**Country**	**Comments**	**Date**	**Company/ Organization**	**Feedstock/ Process**	**Summary**	**Links**
NACC	U.S.		23/10/10	USDA, FAA	Alternative aviation fuels	US Department of Agriculture (USDA) and the FAA will unite their experience in research, policy analysis, and air transportation sector dynamics to assess the availability of different kinds of feedstocks that could be processed by bio-refineries to produce jet fuels. The participants will develop a tool to evaluate the status of different components of a feedstock supply chain, such as availability of biomass from farms and forests, the potential of that biomass for production of jet fuel, and the length of time it will take to ramp up to full-scale production. *See related entries for 21/10/10 in the 22/10/10 report.*	US farmers to produce jet biofuel from feedstock Boeing, Aviation Industry Applaud Biofuel Agreement FAA Researching Biomass for Aviation Fuel Jet fuel and biomass among USDA's sharp biofuels focus US Department of Agriculture and FAA sign five-year agreement to evaluate rural feedstocks for jet biofuels USDA & FAA join forces on aviation biofuel Agriculture unites with aviation to develop biofuels
EUR/ NAT NACC	E.U, U.S.		**25/10/10**	**Joint Industry Group**	**Fuel qualification**	**Joint Industry Group (JIG) on behalf of the aviation fuel suppliers, negotiated an amendment on quality standards for aviation jet fuel in both Europe and the US to set a maximum fatty acid methyl esters (FAME) content of 5ppm. The agreement also allows the use of jet fuel even if it is found to contain FAME up to 30 mg/kg, the equivalent of 30ppm. The emergency protocols will enable individual aircraft to undertake two uplifts of fuel containing FAME in the range of 5 to 30mg/kg. This will reduce disruption at the oil storage depot at the airport in the event of a FAME contamination incident. (See also Bulletin No. 37 - High FAME Content Protocol,**	**Agreement reached on high FAME content in aviation jet fuel**

						October 2010)	
Asia & Pacific	Thailand		27/10/10	Thailand	Palm Oil	PTT Aromatics and Refinery Plc may delay its bio-hydrogenated diesel (BHD) plant because details on the ratio of biofuel in diesel remain unclear. The new plant was slated to enable the company to become the first jet biofuel and biodiesel producer in Southeast Asia. "We have to wait until the government comes up with an official mandate that the ratio of methyl ester in diesel should be 10%, a rate that is large enough to absorb the oversupply of domestic methyl ester," said Bowon Vongsinudom, the company's newly appointed president and chief executive. "Although next year oil traders have agreed to raise the methyl ester content in diesel to 5% from 3% presently, a biodiesel oversupply will still exist." Thailand's biodiesel production capacity is estimated at as high as 5.9 million litres per day, but demand is only 1.8 million litres per day. "We may suspend our ambitious plan to produce jet biofuel for a while, although European countries will force all carriers flying over Europe to replace methyl ester in jet fuel by 2012 or pay a green tax."	PTTAR awaits ruling on biofuel ratio
NACC	U.S.		**22/10/10**	**U.S. Air Force**	**Aviation biofuels**	**The F-15 Eagle is the latest jet fighter to receive the alternative fuels treatment, flying October 22 on a 50-50 blend of conventional jet fuel and an alternative—in this case made from specially processed animal fat: beef tallow bio-jet fuel.**	**"Fatted Eagle" Joins "Green Hornet" in U.S. Military's Alternative Fuels Fighter Fleet** **Eagle soars toward Air Force alternative fuel goal** **F-15 Biofuel Test Aerial Footage**
NACC	U.S.		27/10/10	U.S. Navy, Solazyme	Algae	U.S. Navy in September ordered more than 150,000 gallons of ship and jet fuel from Solazyme and the company received a $21.8 million grant from the U.S. Department of Energy last year to build a new refinery in Riverside, Penn., to help push production to commercial levels. Solazyme produced these fuels from algae.	Military, gov't increase investment in algae fuels
NACC	U.S.		31/10/10	U.S. Navy, commercial aviation, Sapphire Energy, Solazyme	Algae	Overview article on algae fuel research, mentions possibility of biojet fuel production. Video of research lab included in article from MSNBC.	Young algae industry getting government push
NACC	U.S.		3/11/10	U. S. Navy, Cobalt	Biobutanol to jet fuel	The U.S. Navy and Mountain View, Calif.-based biofuel outfit Cobalt Technologies agreed to jointly develop military jet fuel converted from biobutanol. Under the new agreement, Cobalt's biobutanol will be converted to bio-jet and biodiesel fuels using	U.S. Navy, Cobalt to develop military jet biofuel Cobalt Technologies and U.S. Navy to Jointly Develop Military Jet Fuel

						technology developed at the U.S. Naval Air Warfare Center Weapons Division in China Lake, Calif.	US Navy and Cobalt to Create Bio Jet Fuel
NACC	U.S.		26/10/10	U.S. DOT Volpe Center	Alternative aviation fuels	The U.S. Department of Transportation, Research and Innovative Technology Center, Volpe National Transportation Systems Center, issued a Broad Agency Announcement (BAA), soliciting proposals in four research areas: (1) Future Alternative Aviation Fuels, (2) Advanced Jet Fuel Quality and Performance Control R&D Study, (3) Alternative Jet Fuel Sustainability Evaluation Report, and (4) HRJ Aviation Fuel Performance and Durability R&D. A total of $7,300,000 (US) is available to fund the research in these areas.	Broad Agency Announcement Alternative Aviation Fuels BAA Information
22 October 2010							
Region	**Country**	**Comments**	**Date**	**Company/ Organization**	**Feedstock/ Process**	**Summary**	**Links**
NACC	U.S.		**13/10/10**	**University of Southern California**	**Alternative aviation fuels**	**A detailed chemical kinetic mechanism for combustion of alternative jet fuel blends has been developed and validated against fundamental experimental data. The mechanism has been improved by enforcing self-consistency of the kinetic and thermodynamic data for the various surrogate-fuel components represented by the mechanism. These improvements have led to more accurate predictions of flame propagation, flame extinction, and NO_x emissions. Comparison of the model predictions to the available literature data confirms the accuracy of the mechanism.**	**Detailed chemical kinetic mechanism for surrogates of alternative jet fuels**
NACC	U.S.		21/10/10	FAA, USDA	Aviation biofuels	USDA Secretary Vilsack announced jointly with the Federal Aviation Administration (FAA) a five year agreement to develop aviation fuel from forest and crop residues and other "green" feedstocks in order to decrease dependence on foreign oil and stabilize aviation fuel costs. Under the partnership, the agencies will bring together their experience in research, policy analysis and air transportation sector dynamics to assess the availability of different kinds of feedstocks that could be processed by bio-refineries to produce jet fuels. The participants will develop a tool to evaluate the status of different components of a feedstock supply chain, such as availability of biomass from farms and forests, the potential of that biomass for production of jet fuel, and the length of time it will	USDA Secretary Vilsack announces bio-jet fuel research, Biomass Crop Assistance Programs USDA announces new plan to promote aviation biofuels Remarks by Agriculture Secretary Tom Vilsack on Biofuels as Prepared for Delivery at the National Press Club, Washington, D.C. Industry welcomes FAA-USDA biofuels agreement Administration ignites biomass production, advances bio jet fuel, more blender pumps

						take to ramp up to full-scale production. The agencies already have existing programs and collaborative agreements with private and public partners and resources to help biorefiners develop cost-effective production plans for jet aircraft biofuels.	
Asia & Pacific	China		21/10/10	Boeing, PetroChina	Algae, jatropha	Boeing Co and PetroChina Co are collaborating on research into commercial flights powered by biofuel made from algae and Jatropha. Boeing invests some $500,000 each year into a joint research and development laboratory with the Chinese Academy of Sciences focusing on commercial applications for biofuel. The lab is located in Qingdao City, Shandong Province, which has plentiful algae resources. *See related entries for18/10/10 in the 15/10/10 report and 27/05/10 in the 24/09/10 report.*	Future aviation powered by algae-based fuel? Partnership for a Clean Future
15 October 2010							
Region	**Country**	**Comments**	**Date**	**Company/ Organization**	**Feedstock/ Process**	**Summary**	**Links**
Asia & Pacific	**China**		**18/10/10**	**Boeing**	**Aviation biofuels**	**Boeing Co., in cooperation with Air China Ltd. and others, plans to test a commercial-jet biofuel in China produced from jatropha plant by the middle of 2011**	**Boeing Plans China Biofuel Test**
NACC	U.S.		30/09/10	US Department of Agriculture	Unidentified symposium via Des Moines Register	The U.S. is roughly halfway to achieving its goal of 36 billion gallons of renewable transportation fuel by the year 2022, but the last half likely will be harder, and probably more expensive, than the first. As many as 527 new biofuels plants will be needed, in addition to the 171 ethanol plants now working, to meet the mandate at a cost of $168 billion. The congressionally-imposed mandate sets a 16 billion gallon limit on ethanol's contribution to biofuels. The rest has to come from other sources such as switchgrass and miscanthus, algae, wood biomass and electrification.	Hardest part of renewable fuels work still remains
NACC	U.S., other		10/09/10	Biofuels Digest	Fall 2010 Bioenergy Business Outlook	Government policies favored by respondents, "Increased grants, production subsidies or incentives" was rated as the measure that would create strong opportunities for industry revenue and job growth over the next 12 months, with 55 percent of respondents citing this as the top factor. Carbon price legislation was cited by 44 percent, new mandates by 40 percent, New or extended production or investment tax credits by 39 percent, and better loan guarantee programs and higher blending standards by 38 percent each.	Bioenergy execs expect 144 percent increase in revenues, 68 percent jump in jobs in 2011

						Among fuel types, 66 percent of respondents indicated that they expected Cellulosic ethanol to reach 1 billion gallons or more (3.8 billion liters or more) in global production volume by 2020. 55 percent said that renewable diesel would reach that mark, and 41 percent opted for "military biofuels" hitting the billion gallon mark. Only 37 percent projected that 1 billion gallons of aviation biofuel would be produced in 2020, with 36 percent opting for algal biofuels, 27 percent for biobutanol, and 25 percent for renewable gasoline.	
	World		01/09/10	AIN Online	J. Holmgren (formerly UOP)	"… by the end of 2012, there will be biojet [fuel] production in place. I would say in the range of a couple of hundred million gallons and then working to a billion gallons in the 2015-2016 range."	Alternative fuels still face hurdles
EUR/ NAT	U.K.		13/10/10	British Airways	Aviation biofuels	BA Head of Environment Jonathon Counsell said, in a report from the Reuters Climate Change and Alternative Fuels Summit, "We said biofuels could cut carbon emissions by 10 percent by 2050. My personal view is 20 percent by 2030 for the global aviation industry."	Reuters Summit-BA sees big biofuel role for cutting plane carbon
EUR/ NAT	U.K.		12/10/10	CNN	Algae-based aviation biofuels	This overview report on algae as a feedstock for aviation biofuels references both the research underway at Cranfield University and the BA/Solina Group project in London.	Algae power reaches for the sky
EUR/ NAT	U.K.		10/10/10	British Airways	Aviation biofuels	BA CEO reviewed the company's commitment to sustainable alternative fuels for aviation in speech in Barbados, noting the waste-to-fuel project with Solena in London, a joint biofuels testing program with Rolls-Royce, and the algae research project with Cranfield University. <see project summaries in earlier reports>	CTO Conference Speech: CEO of British Airways
NACC	U.S.		08/10/10	CCA, Penn State, USTAR, SOLIX	Powdered Algae	Some new research indicates that dry processed algal biofuel could be a serious contender for JP-8 replacement in military aircraft engines and aero-derivative gas turbine power systems. The current process, under evaluation, takes dilute algae slurries, with as little as 2% solids, and runs them through a spray drier to produce a dry powdered fuel with excellent flash burn capabilities. The developer claims that advantages of dry process biofuels over liquid biofuels include a smaller energy footprint and lower CAPEX than current technologies.	CCA Developing Powdered Algae as Jet Fuel
NACC	U.S.		26/09/10	Air Transport Association	Aviation biofuels	This PowerPoint deck provides an overview of ATA's view of sustainable alternative fuels for	Commercial Aviation: The Quest for Sustainable and Affordable

						aviation. It identifies challenges in five areas: certification, feedstock readiness, affordability, crediting of environmental benefit, and compatibility of international and domestic acceptance criteria.	Alternative Jet Fuel
NACC	U.S.		28/01/10	University of Virginia	Life Cycle Assessment of algae biofuels	Analysis shows that any harvesting/extraction scheme involving dry algae is energy prohibitive, requiring at least 60% of the energy content of algae. There is thus a need to develop strains of algae with much higher energy content than available today.	Algae Biofuels - Not Sustainable Environmental Life Cycle Comparison of Algae to Other Bioenergy Feedstocks
EUR/ NAT	Russia		22/01/09	Russian Federation	Cryogenic Fuels	A large-scale initiative is currently underway in the Russian Federation where scientists are conducting experimental work on civil aircraft which use non-drop-in alternative fuels. They have tested liquefied petroleum gases (condensed aircraft fuel), liquefied natural gas (LNG), and liquid hydrogen.	Liquid Hydrogen Fuel for Aircrafts
08 October 2010							
Region	**Country**	**Comments**	**Date**	**Company/ Organization**	**Feedstock/ Process**	**Summary**	**Links**
NACC	U.S.		30/09/10	US House of Representatives	Aviation biofuels	Rep. Jay Inslee of Washington state introduced a bill to create a loan program to businesses capable of producing renewable, low-carbon fuel options for aviation that currently suffers from skewed market forces favoring dirtier fossil fuels.	Inslee Introduces H.R. 6343, the Clean Renewable Jet Fuel Act
NACC	Canada		30/09/10	Ocean Nutrition Canada, Dalhousie University, Lockheed Martin, UOP	Algae-based aviation biofuels	Ocean Nutrition Canada in Halifax, Nova Scotia uncovered a single-celled microorganism that produces substantial quantities of triacylglycerol oil — a base for biofuel. In view of its discovery, the company will lead a four-year consortium, formed over the past months and funded by the federal not-for-profit foundation Sustainable Development Technology Canada, to develop its proprietary organism into a commercial-scale producer of biofuels. The project has attracted multinational partners, including the military contractor Lockheed Martin and UOP, a unit of Honeywell that supplies technologies to the petroleum industry and is here focused on converting the algal oil into an alterative jet fuel.	Canada Produces Strain of Algae for Fuel
NACC	**Mexico**		**04/10/10**	**Mexico, ASA**	**Jatropha**	**Mexico's government plans to develop refineries to produce aviation biofuel for commercial flight. The refineries could be built by the private sector or through a public private partnership. Mexico's government will carry out its first biofuel test flight in Cancun during the COP-16 UN climate change conference. The**	**Government looks to build aviation biofuel refineries - Mexico**

						one-hour flight, flown by ASA, will use a 25-50% mixture of jatropha oil and conventional jet fuel, and will be the seventh aviation biofuel test flight in the world to date.	
NACC	U.S.		10/09/10	UOP	Aviation Biofuels	Process technology supplier Honeywell UOP is ready to move its green jet fuel into commercial-scale production within the next two or three years, and has started the certification and licensing processes. Biojet fuel currently costs more than petroleum-based fuel owing to its small-scale production and feedstocks, which are also not yet produced on a commercial scale. As more biological feedstocks, such as camelina and algae, become available and, as the company moves into commercial-scale fuel production in the next few years, they expect that the costs will be comparable,	Biofuel ready for commercial-scale production
01 October 2010							
Region	**Country**	**Comments**	**Date**	**Company/ Organization**	**Feedstock/ Process**	**Summary**	**Links**
NACC	U.S.		27/09/10	Sustainable Oils	Camelina	Sustainable Oils is working to produce advanced biofuels using sustainable methods and feedstocks. One of their prime energy crops is camelina, which has naturally high oil content and relatively low input costs (the crop needs little water or fertilizer and is suited well to grow on marginal land). It is also an excellent rotation crop with wheat. Sustainable Oils' focus is on the aviation market and they have partnered with Boeing Company as well as UOP, a Honeywell Company, to bring renewable aviation fuels to market.	Sustainable Oils Leads in Camelina Biojet Fuel
NACC	U.S.		09/02/10	US National Energy Technology Lab	Life Cycle Assessment	A US interagency workgroup is developing a set of standard guidance on how to evaluate the life cycle GHG footprint of various alternative jet fuel production pathways using a wide-range of feedstock sources. Application of the guidelines can be used by fuel suppliers, military, and commercial airlines to assess the environmental benefits of a specific fuel production pathway when compared to conventional jet fuel.	Interagency Workgroup on Life Cycle GHG Emissions of Alternative Aviation Fuels
NACC	U.S.		27/09/10	Purdue University	Biofuel Sustainability	Purdue University is receiving funding from the US DOE for a project to conduct a sustainability assessment of energy crops for biofuels. Researchers will conduct a watershed-scale sustainability assessment of multiple energy crops such as miscanthus, switchgrass and hybrid poplar to evaluate sustainability in relation to soil erosion,	Purdue Receives Nearly $1.6 Million for Biofuels Crop Research

						water quality and quantity, biomass yield, profitability and aquatic biodiversity. The overall goal is to identify landscapes within a watershed where different types of bioenergy crops can be produced to meet demand and promote environmental sustainability.	
24 September 2010							
Region	**Country**	**Comments**	**Date**	**Company/ Organization**	**Feedstock/ Process**	**Summary**	**Links**
EUR/ NAT	Sweden		20/09/10	Lund University	Life Cycle Assessment	Lund University conducted an extensive study of the life cycle climate impacts of a variety of biofuels. Their results show that they produce between 65 and 140 per cent less greenhouse gas emissions than gasoline and diesel, even when direct and indirect land use changes are taken into account. Besides greenhouse gases, environmental effects such as eutrophication, acidification, photochemical ozone, emissions of particles and energy balance were included in the study, along with emissions from the use of biofuels in light and heavy vehicles.	Swedish biofuels do have major benefits for the climate
Asia & Pacific	China		27/05/10	Boeing, PetroChina, AECOM, UOP, United Technologies, and Air China	Aviation biofuels	Plans are underway to assess the possibility of establishing a sustainable aviation biofuels industry in China. The collaboration will take a comprehensive look at the environmental and socio-economic benefits of developing sustainable alternatives to fossil-based jet fuels. *See related entry for 26/05/10 in the 17/09/10 report*.	Boeing and PetroChina considering potential for aviation-biofuels industry in China
17 September 2010							
Region	**Country**	**Comments**	**Date**	**Company/ Organization**	**Feedstock/ Process**	**Summary**	**Links**
EUR/ NAT	**U.K**		**16/09/10**	**Airbus, British Airways, Cranfield University**	**Algae**	**The SURF consortium was formed to grow microalgae in near-shore ocean water for the production of renewable biofuels. The consortium, which also includes Rolls Royce, Finnair, Gatwick, and IATA, will evaluate environmental impact; processing, capacity, and distribution; commercial potential; legislation; and regulation.**	**Cranfield powers drive for seaweed as aviation fuel** **Airbus and BA form consortium with Cranfield to explore feasibility of offshore algae for jet fuel production** **BA, Airbus back study to develop algae-derived fuel** **Sea Green Project Accelerates Algae for Aviation** **Industry backs algae project for aviation biofuel**
	World		17/09/10	IATA	Aviation biofuels	The head of the world's biggest airline association, IATA, berated the oil industry and governments on Friday for investing 'peanuts' in cleaner biofuels. Mr Bisignani noted that the air transport industry	Airlines chief slams oil industry for 'peanuts' spent on biofuels

						was overcoming the technical challenge of flying airliners on biofuels. But it faced a huge challenge in ensuring sufficient refining, supply and distribution for the world's airports, with air engine makers, airlines and small developers left largely alone to spur biofuels.	
	World		16/09/10	EnviroCitizen	Aviation biofuels	"The fact that the airline industry is joining the green movement is a sign that environmentalists are going to see some real change soon. This biofuel will provide a more energy-efficient fuel with lower emissions. It will also help to make fuel costs more stable, which will enhance the quality of service throughout the airline industry. EnviroCitizen.org applauds their efforts and hopes that other companies will follow their lead and continue to research, develop and refine alternative fuels for all means of travel."	Bio-Jet Fuel: Fly Through the Skies with a Smaller Carbon Footprint
Asia & Pacific	**China**		**26/05/10**	**Air China, Boeing, and PetroChina**	**Aviation biofuels**	**Boeing, Air China and PetroChina announced that they will partner on the testing of a jatropha-based BioSPK fuel for aviation. The jatropha-based fuel is expected to become available between 2013 and 2015. With China's 15 percent biofuel target for 2020, the country has swung behind jatropha-based cultivation.**	**Air China to test jatropha biofuel**
Asia & Pacific	China		10/09/10	Boeing, CAS Qingdao Institute of Bioenergy and Bioprocess Technology	Algae-based aviation biofuels	A sustainable aviation biofuel lab, jointly established by CAS Qingdao Institute of Bioenergy and Bioprocess Technology and Boeing (China), was officially inaugurated on September 2, 2010. The new lab is designed to speed up commercial applications of sustainable aviation biofuels, supporting Boeing's sustainable aviation biofuels strategy and the needs of aviation industry, with a focus on developing algae plantation, reaping, and processing related technologies and techniques, and associated commercial applications.	Sustainable Aviation Biofuel Lab
10 September 2010							
Region	**Country**	**Comments**	**Date**	**Company/ Organization**	**Feedstock/ Process**	**Summary**	**Links**
NACC	U.S.		10/09/10	UOP	Aviation biofuels	UOP is developing an integrated bio-refinery for producing biofuels for aviation that will include bio-derived aromatics, which could meet ASTM (and DESC) specifications for a drop-in fuel at 100%.	Biofuel ready for commercial-scale production
NACC	Canada		09/10	Environment Canada	Life Cycle Assessment	A study for Environment Canada raised concerns about GHG emissions measurements and environmental footprint determination for biofuel plants. Among other things, better baseline data is	Oilseeds, Oils & Meals Monthly Price and Policy Update

						needed.	
03 September 2010							
Region	**Country**	**Comments**	**Date**	**Company/ Organization**	**Feedstock/ Process**	**Summary**	**Links**
NACC	**U.S.**		**01/09/10**	**U.S. Air Force**	**HRJ & FT**	**The US Air Force has conducted a flight test using a C-17 Globmaster powered with 25% HRJ, 25% FT, and 50% JP-8.**	**C-17 Using Combination of Bio- and Synthetic Fuels in Flight Tests** **C-17 Conducts Flight Test With Biofuel**
NACC	**U.S.**			**U.S. DOD, DOE, USDA, Hawaii**	**HRJ & FT**	**U.S. Pacific Command's (PACOM) established a new Green Initiative for Fuels Transition Pacific (GIFTPAC). The GIFTPAC group is comprised of various different organization including Organizations from the Office of the Secretary of Defense, the U.S. Navy, the U.S Air Force, the U.S. Army, and the U.S. Marine Corps, the Department of Energy, US Department of Agriculture and the State of Hawaii. The goal is to displace at least 25% of the petroleum derived fuels used by the DoD in Hawaii with "green" fuels.**	
NACC	U.S.		25/06/10	U.S. Defense Energy Support Center	HRJ & FT	The DESC has published a Request for Information (RFI) to identify potential sources of bio-derrived alternative fuels for aviation purposes (and potentially marine diesel) for delivery in Hawaii. The fuel must be either HRJ or FT (using a biomass feedstock). The RFI is in support of GIFTPAC.	Green Initiative for Fuels Transition Pacific (GIFTPAC)
	World		31/08/10	Environmental NGOs	Biofuels	Concern is being raised over land purchases for biofuel crops, which could lead to conflicts with local communities, rainforest destruction, and threatening food availability. European and Asian companies were noted as being engaged in contracting for large tracts of land. While not specific to sustainable alternative fuels for aviation, this concern could raise hurdles to production of biofuels.	Biofuel Demand Driving "Land Grab" In Africa: Report
NACC	**U.S.**		**01/09/10**	**Washington State University, Alaska Airlines, Boeing, et al**	**Aviation biofuels**	**Washington State University will lead the Sustainable Aviation Fuels Northwest (SAFN) project, a regional renewable jet fuel collaboration formed to assess four Pacific Northwest states—Washington, Oregon, Idaho and Montana—to determine biomass feedstock growth, harvest, refining and transport options in relation to sustainable aviation fuel production. Other partners include Alaska Airlines, Boeing, Port of Seattle, Port of Portland and Spokane International Airport.**	**WSU to lead Pacific Northwest aviation biofuel project** **Boeing, Alaska Airlines head consortium to promote aviation biofuel development**

						Research will include an analysis of biofuel feedstocks native to the Pacific Northwest, including algae, oilseeds such as camelina and woody biomass. The project will identify potential pathways and actions to make aviation biofuel commercially available to airlines servicing the Pacific Northwest.	
27 August 2010							
Region	**Country**	**Comments**	**Date**	**Company/ Organization**	**Feedstock/ Process**	**Summary**	**Links**
NACC	U.S.		21/07/10	ATA-Boeing-USDA	Sustainable biofuels	ATA, Boeing, and US Department of Agriculture announced the formation of an initiative to advance sustainable aviation biofuels rural development. ATA considers the Farm to Fly program to expand the scope of CAAFI.	ATA Announces Formation of "Farm to Fly" Sustainable Aviation Biofuels Initiative Boeing Part of Aviation Team Supporting Rural Biofuel Development Plan
NACC	U.S.		29/07/10	United-Gevo	Isobutanol-derived jet fuel	GEVO and United signed non-binding letter of intent for the supply of renewable jet fuel to ORD airport. Beginning 4th quarter of 2012, 10,000 bbl/day ramping up to 30,000 bbl/day in 2015 and 60,000 bbl/day by 2020. Fuel price is to be indexed to the price of corn.	GEVO files for $150M IPO; LOI with United Airlines
Asia & Pacific	Thailand		18/08/10	Thailand	Palm oil	Thailand's Alternative Energy Development and Efficiency Department has targeted 2012 for supplying biofuels to European airlines that will need to meet the goals of the ETS. Palm oil will be the initial feedstock with plans to exploit other fuels in the future like sweet sorghum and algae.	Jet biofuel to take flight from 2012
20 August 2010							
Region	**Country**	**Comments**	**Date**	**Company/ Organization**	**Feedstock/ Process**	**Summary**	**Links**
NACC	U.S.		18/08/10	US Army-SLC	Safflower	Safflower is being cultivated on fallow land near Salt Lake City Airport. US Army is investigating to consider these crops for cultivation on bases to product biodiesel	U.S. Army investigates Salt Lake biofuel crop
NACC	U.S.		16/08/10	Boeing	Sustainable biofuels	Boeing acknowledges the benefits of the US military's commitment to using 50% biofuels by 2016.	US military seen as needed friend in biofuel development
	World		01/08/10	Rentec	F-T from biomass	Overview of alternative fuels for aviation.	Jet fuel's future on the front burner
06 August 2010							
Region	**Country**	**Comments**	**Date**	**Company/ Organization**	**Feedstock/ Process**	**Summary**	**Links**
	World		**09/08**	**19 airlines**	**Sustainable biofuels**	**Sustainable Aviation Fuel Users Group (SAFUG) was formed to accelerate the development and commercialization of sustainable aviation fuels. Organizations goals**	**Sustainable Aviation Fuel Users Group**

						are to reduce CO_2 by 1.5% annually, achieve carbon neutral growth in 2020, and 50% reduction in net emissions by 2050 working through the Roundtable for Sustainable Biofuels (RSB)	
EUR/ NAT	Germany		09/05/10	Lufthansa	Sustainable biofuels	Lufthansa announced they will begin blending biofuels with their jet fuel within two years.	Lufthansa to Use Biofuel on Flights by 2012 - CEO
	World		2010	World Bank	Alternative aviation fuels	Article provides overview of alternative aviation fuels: history of use, energy security and environmental drivers for future development, production and consumption challenges, as well as scale up and economic concerns. Good summary for a general audience.	Are Alternative Fuels an Alternative? PDF of article available at ICAO
	World		07/10	World Bank	Biofuels	Broad assessment of biofuels that discusses technologies, production/consumption/trade, policies/mandates, cost/investment, impacts on food prices, and environmental impacts. Key findings include: declining production costs (yet subsidies still required), impact on food prices less significant than other studies have shown, and second generation biofuels are essential but may still compete with food. Commercial scale plants in near future are unlikely.	Biofuels: Markets, Targets and Impacts
Asia & Pacific	**Australia**		**09/07/10**	**Jatoil**	**Jatropha**	**Commercial shipment of jatropha oil (3,200 gal) as feedstock for jet fuel production. Company plans to expand production of the plant and oil.**	**Jatoil Delivers Fuel**
EUR/ NAT	E.U.		19-25/07/10	Farnborough Air Show	Sustainable biofuels	Multiple announcements related to aviation biofuels: • Boeing says commercial airlines bay get 1% of fuel from biofuels by 2015 • EADS says algae holds promise to make aviation carbon-neutral • Solena/BA say biofuels project remains on track; site announcement expected soon • IATA et al describe rapid progress on developing sustainable alternative jet fuels	Boeing EADS EADS2 Solena BA IATA
NACC	**Canada**		**23/07/10**	**Targeted Growth Canada**	**Camelina**	**A 6 partner consortium led by Targeted Growth Canada (TGC) will test camelina-based biofuel in a Porter Airlines Bombardier Q400 in early 2012. In addition to TGC, Porter, and Bombardier, P&W Canada, Sustainable Oils, and UOP are participating.**	**Canadian Programme Formed to Undertake Camelina-Sourced Biofuel Test Flight of a Bombardier Turboprop Bombardier Q400 in new biofuel test program**
South America	World, Columbia		26/07/10	Avianca-TACA	Sustainable biofuels	Avianca-TACA joined SAFUG to affirm its commitment to promoting a more environmentally friendly airline industry.	AVIANCA-TACA JOINS THE GROUP OF SUSTAINABLE AVIATION FUEL USERS <News release in Spanish>
Asia &	Indonesia		02/08/10	Garuda	Sustainable	Garuda announced its plans to switch to biofuels	Garuda Indonesia Planning to

Pacific				Indonesia	biofuels	although no schedule was announced.	Switch to Biofuel <quotes Hupe>
16 July 2010							
Region	**Country**	**Comments**	**Date**	**Company/ Organization**	**Feedstock/ Process**	**Summary**	**Links**
NACC EUR/ NAT	U.S., plus Mexico, Canada and Germany		15/12/09	14 Airlines, AltAir, Sustainable Oils	Camelina	AltAir Fuels (Seattle) signed a MOU with 14 major airlines from the United States, Mexico, Canada and Germany, led by the Air Transport Association (ATA), to purchase up to 750 million gallons of renewable jet fuel and diesel derived from camelina.	14 Airlines Sign Landmark MOU for Camelina-based Renewable Jet Fuel & Green Diesel E. Washington Studied for Camelina Biofuel AltAir Fuels may fly you on biofuel AltAir Fuels may fly you on biofuel sooner than you think
NACC	U.S.		24/12/09	13 Airlines, Rentech	F-T from coal and coke	Rentech signed a MOU with 13 major airlines for jet fuel made from coal and petroleum cike via FT. Only a minor life cycle benefit, even with carbon capture. (This MOU does not reflect a biofuel.)	Airlines Turn to Biofuel
Middle East	U.A.E.		19/01/10	Boeing, Etihad Airways	Sustainable Biofuels	UOP, the Masdar Institute of Science and Technology, Boeing and Etihad Airways announced an agreement to establish a research institute in Abu Dhabi dedicated to pioneering sustainable energy solutions. The institute, the Sustainable Bioenergy Research Project (SBRP), will use integrated saltwater agricultural systems to support the development and commercialization of biofuel sources for aviation and co-products.	Honeywell's UOP, Masdar Institute, Boeing and Etihad Airways to Establish the UAE's First Sustainable Biofuels Advancement Project
EUR/ NAT	U.K.		15/02/10	British Airways, Solina Group	Biomass Waste	BA is to begin using fuel produced from waste in 2014. 500,000 tonnes of waste converted into 16 million gal green jet fuel/year. LCA shows 95% benefit compared to conventional jet. Process uses high temp gasification (biosyngas). F-T production of biojet fuel. Price expected to be competitive with conventional jet (assuming a 12.4% premium on jet due to EUETS.	BA Fuels Green Revolution British Airways to Build Europe's First Biojet Fuel Plant
South America	Bolivia		06/03/10	TAM	Jatropha	TAM will operate biofuel demonstration flight using an A320 fuelled with jatropha-based biofuel. Analysis shows LCA of 65-80% less GHG compared to conventional petroleum	TAM to conduct first Latin American biofuel flight this year
NACC	U.S.		19/03/10	ATA/ DESC	Alternative Fuels	The Defense Logistics Agency's Defense Energy Support Center and Air Transport Association of America, Inc., signed a strategic alliance agreement today in Washington, D.C., recognizing a partnership for the development and deployment of alternative aviation fuels.	**ATA/DESC Announce Strategic Alliance for Alternative Aviation Fuels**
NACC	**U.S.**		**08/04/10**	**US Air Force**	**Camelina**	**US Air Force flew an A-10C Thunderbolt on a 50/50 blend of conventional jet fuel and a**	**First flight takes place of an aircraft solely powered by jet**

						camelina biofuel.	**biofuel blend derived from plant biomass**
NACC	**U.S.**		**22/04/10**	**US Navy, Sustainable Oils**	**Camelina**	**US Navy flew supersonic flight test of an F/A-18 Green Hornet using 50/50 blend of conventional jet fuel and a camelina fuel. Fuel cost was $67.60/gal. 15 flight tests are planned between April and June 2010**	**Navy Tests Biofuel-Powered 'Green Hornet'**
NACC	U.S.		26/04/10	Sustainable Oils	Camelina	14 major airlines agree to purchase up to 750 million gallons of camelina-based biofuel	E. Washington studied for camelina biofuel
NACC	U.S.		**02/05/10**	**United Airlines, Rentech**	**Natural gas F-T fuel**	**Flight test of United A320 using 60/40 blend of conventional jet fuel/ natural gas synthetic jet fuel produced by Rentech in one engine.**	**United Airlines jet takes off from DIA to test new natural-gas synthetic fuel**
EUR/ NAT	Germany		09/06/10	EADS	Algae	Demonstrating 100% biofuel for powering an aircraft engine – Berlin, Germany – running one of two engines of Diamond DA42 on 100% biofuel (2,000 L fuel available for test)	EADS Sets First Public Algae-Biofuel Flight at ILA Berlin Aviation Industry Harnesses Algae for Biofuel EADS completes the world's first flight powered entirely by algae-based biofuel
NACC	U.S.		02/07/10	FAA		FAA Releases Request for Information On Alternative Aviation Jet fuels – seeking white papers on a)future alternative aviation fuels, b) jet fuel quality tracking and control, and c) alternative jet fuel sustainability evaluation	
NACC	U.S.		08/07/10	Evogene	Castor	Testing HRJ with AFRL, NASA, and UOP – Rehovot, Israel – fuel produced from castor to be tested by NASA and AFRL; price target $45/bbl oil equivalent; LCA 90% reduction compared to pet diesel (company analysis)	Evogene Castor Oil Demonstrates Suitability as Biojet Feedstock
NACC	U.S.		12/07/10	Boeing, SeaTac, Alaska Air, et al	Algae, camelina, wood byproducts	Regional assessment of aviation biofuel production – Seattle, WA – regional initiative formed to evaluate biomass production, harvest, refining, transport, and aviation use	Boeing, Alaska Air, SeaTac hunt biofuels
NACC	U.S.		15/06/10	Presentation at Executive Briefing Session on Climate Change Leadership	IATA Conference	• Tipping point for biofuels is oil at $100/bbl • Biofuels will account for 40% of fuel usage by 2050 • Full replacement by 2035 (best case)	Imperium Renewables CEO is cautious on aviation biofuels
	World		06/2010	GTM Research		• Biofuels are projected to achieve cost parity with petroleum fuels in 2017-2018. • While third and fourth generation biofuels will have a chance to compete in the broad petroleum market, they will likely have their greatest impact on the jet fuel market. • Biofuels account for less than 0.1% of jet fuel	Third and Fourth Generation Biofuels: Technologies, Markets and Economics Through 2015

						consumed today, but that will rise to 1.5% in 2015 and 8.9% in 2022.	
EUR/ NAT	E.U.		22/03/10	Aviation Week		Jean Botti, EADS Chief Technology Officer says the goal is to have 15% of all commercial aviation fuel derived from algae by 2030.	EADS Backs Algae As Future Biofuel
NACC	U.S.			US Air Force		US Air Force sets goal of 50% alt fuels by 2016, which would represent about 800 Mgal/year	

Note: Items in bold are references for GFAFF additions summarized in separate file (Updated to GFAFF Website).