

## Commercializing Liquid Biofuels from Biomass

# Task 39

IEA Bioenergy

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### From the Task

*By Jack Saddler and Jim McMillan*

This has been a busy time for the Task 39 network with several successful meetings being held. We first want to congratulate and thank our Danish colleagues for organising both a successful business meeting for our Task 39 country representatives (as well as a parallel Task 42, Biorefinery business meeting) and the joint symposium entitled, “Advanced Biofuels in a Biorefinery Approach” in Copenhagen in late February of this year. As noted by one of our network members, with an acronym like ABBA, the meeting could have been held in Sweden (home of the pop-group of many of our member’s era) but Denmark, and Copenhagen in particular, proved to be an excellent venue! Many of the presentations from the business meeting are on the “members only” section at [www.task39.org](http://www.task39.org) and info on the ABBA symposium is also available on the website.

Since the last Newsletter, we continue to make progress on the various Task 39 commissioned reports. Our colleague, Don O’Connor, has been looking at the energy and GHG emissions balance of the various biofuel technologies that are or will soon be operating at a demonstration stage. The LCA (Life Cycle Analysis) model used is the GHGenius with a “cradle-to-grave” approach. Various feedstock conversion technologies and fuel types were included in the analysis. Data was mainly derived from US national laboratory (NREL and PNNL) techno-economic analyses. The results indicate that depending on the choice of end fuel and feedstock, different technologies are more favourable for both energy and GHG balances. Overall, the report indicates that the LCAs of all of the biofuel

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technologies analyzed were sensitive to the product yield and even more so to the source of electric power (biomass or fossil, etc.). The report is currently being reviewed by Task 39 colleagues and should shortly be available for distribution.

Task 39 previously published two updates of the Biofuel Implementation Agenda Reports (Comparing and contrasting policies in member countries to help catalyze biofuel use and development). These summaries of national progress towards biofuel production targets have become an important tool for our members. The most recent version of this report will include an expanded section detailing the various biofuels policy approaches while comparing the relative successes of the different policies that have been used by the various member countries to try to develop or stimulate their respective biofuels industries. A draft report will be ready for review by May/June 2012.

A third report, which looks at the potential of so-called “drop-in” biofuels, is also in progress. Conventional (previously called “first generation”) biofuels (sugar and starch ethanol and oil crop-derived FAME) are not readily compatible with the existing petroleum/oil refining infrastructure. Newer, more petroleum-like biofuels (drop-in” hydrocarbon biofuels) now represent a major area of interest and development in many research labs and companies around the world. This report will build on the excellent expertise of several of the groups associated with Task 39 and is expected to be released later in 2012.

As we approach the end of the current triennium our Task members will be participating in the Biotechnology for Fuels and Chemicals Symposium in New Orleans (30 Apr-3 May) ([www.simhq.org/sbfc](http://www.simhq.org/sbfc)) and the Pretreatment Workshop in Vancouver (4-6 June) ([www.nsercbioconversionworkshop.com](http://www.nsercbioconversionworkshop.com)). However, the main event will be IEA Bioenergy Conference that will be held in Vienna (13-15 November) [www.ieabioenergy2012.org](http://www.ieabioenergy2012.org).

Finally, we want to thank our colleague, David Chiaramonti, for continuing our tradition of profiling the biofuel initiatives that are underway in one of Task 39 member countries. As you will see, there is a lot happening in the biofuels area!

*Jim and Jack*



We welcome your feedback. Please direct your comments to Jana Hanova, editor of the Newsletter  
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# Transportation Biofuels in Italy



Università degli Studi di Firenze



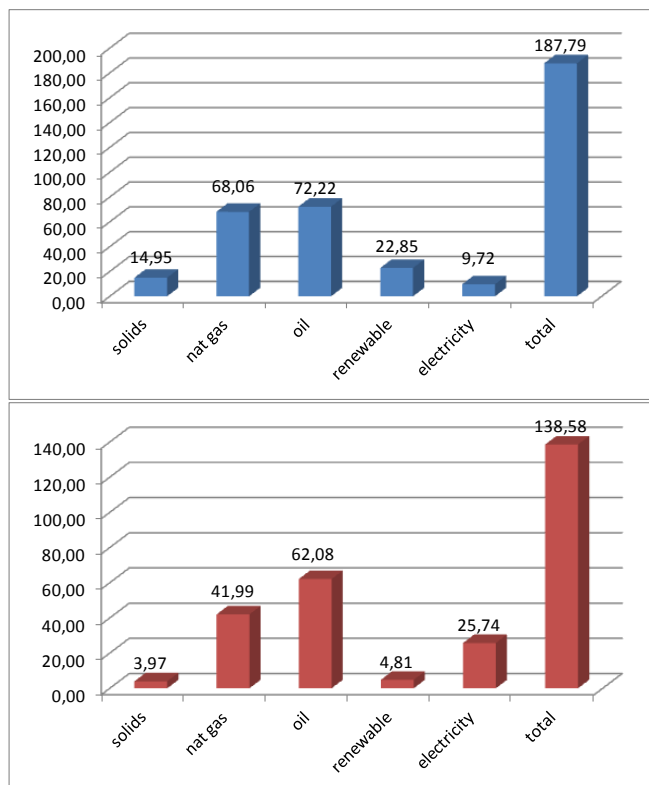
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## 1. Introduction

In 2010, Italy's energy supply reached 188 Mtoe, and of this amount, renewables accounted for approximately 23 Mtoe (12.2%), while natural gas was at 15 Mtoe, coal at 68 Mtoe and oil at 72 Mtoe. In the same year, around 10 Mtoe of Italy's energy was imported as electricity. Consumption losses in the energy sector reached 49 Mtoe.



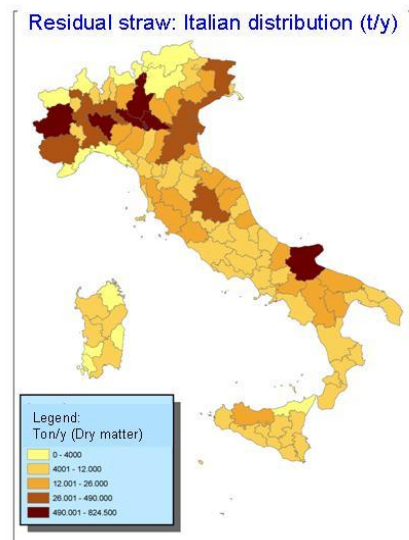
**Figure 1. Primary Energy Supply (left) and Energy Consumption (right) in Italy (2010) in millions of tons of oil equivalent (Mtoe). Source: Italian Ministry for Economic Development.**

According to the last agricultural census, Italy covers approximately 30 Mha, with approximately 40% of land being used for agriculture. Some of the land is still available, and up to 6 Mha could potentially be available for energy crops. However this area includes also forests (15%), meadows (13.7%) and marginal lands (7.5%), which are spread over the entire Italian territory [Venturi, 2011]: it would therefore not be possible to convert all available Italian land to dedicated energy crops. Taking into account realistic limitations, the maximum actual potential of energy crops is estimated to be 0.8 -1 Mha.

Based on the current European target, 17% of energy is to be derived from renewable energy sources, which amounts to 22.3 Mtoe. It is important to note that bioenergy is expected to contribute 45% (9.8 Mtoe) of this overall goal.

According to ENEA elaborations [ENEA Biomass Atlas, 2011], the Italian bioenergy potential is estimated to be approximately 15-18 Mtoe (this figure excludes microalgae potential).

Biomass	2010 (Mtoe)
Residual straw	6
Pruning	2
Forests	0.9
MSW (organic fraction)	0.6
Bovine and swine manure	0.9
Animal slaughter waste	0.03
Dedicated crops	4
Firewood	2
TOTAL	15



**Figure 2. Biomass availability in Italy. Source: Figure and data from ENEA National Atlas (courtesy by I. De Bari, ENEA, 2011).**

## 2. Biofuels policy, goals and promotion

With respect to the biofuel sector, Italy is highly responsive to EU Directives. In 2011, two important Decrees have been issued:

1. Legislative Decree n. 28 of 3<sup>rd</sup> March 2011, transposing Directive 2009/28/CE pertaining to renewable sources and
2. Legislative Decree n. 55 of 31<sup>st</sup> March 2011, transposing Directive 2009/30/CE on fuels quality and sustainability.

Two other relevant legislative acts have already been issued in 2012:

1. Decree from 14<sup>th</sup> January 2012, about methodology (within the National statistical system) for the assessment of bioenergy targets fulfilment, and a
2. Decree from 23<sup>rd</sup> January 2012, that instituted the National biofuels certification system, regulatory norm in accordance to Legislative Decree n. 55/2011.

A new Ministerial Decree will soon be finalised, which will cover specifics on obtaining bioenergy increase bonuses; these bonuses are reserved for biofuels produced in the EU and from EU raw materials.

In terms of biofuel production, Italy has the EU's second largest production capacity, with around 2 million tonnes per year, and the 4<sup>th</sup> largest fuel ether production capabilities, with 645 kt/year. For illustrative purposes, Italy's domestic petrol consumption reached 10.6 million tonnes per year.

Rank in EU on	Rank	Details
Number of Refineries	1	Italy = 16, Germany = 13, France = 12, UK = 11, Spain = 9
Number of Fuel retail stations	1	Italy = 22900, Germany = 14785, France = 12522, Spain = 9226, UK = 8921
Refinery capacity	2	Germany = 121,7 Mt/y, Italy = 111,3, France = 99,6, UK = 95,0, Netherlands = 64,5, Spain = 64,3
Vehicles fleet (000's)	2	Germany = 41321, Italy = 36105, France = 30850, UK = 30309, Spain = 22145, Poland = 16080
Number of fuel-ethers production unit	2	Germany = 8, Italy = 7, Spain = 7, Romania = 6, France = 5
Domestic petrol consumption	3	Germany = 26019 kt/y, UK = 19863, Italy = 13531, France = 10868, Spain = 7519
Domestic diesel consumption	3	France = 39770 kt/y, Germany = 37877, Italy = 30328, Spain = 27912, UK = 24693

**Figure 3. Italian statistics from the transportation sector. Source: Courtesy of GFR Federchimica.**

The biomass sections of the "Italian Action Plan for Renewable Energy" lay out the following bioenergy and renewable energy goals by 2020. The proportion of renewables is expected to reach 17% (6.94 Mtoe) and transport fuels are to increase from 0.2 Mtoe in 2005 to 2.5 Mtoe by 2020. This represents more than ten-fold increase in transport biofuel use in this 15 year period.

**Table 1. Biomass objectives in Italy**

Biomass	2005 (Mtoe)	2020 (Mtoe)
Electricity	0.40	1.80
Thermal Energy	1.65	5.50
Transport fuels	0.20	2.50
Total Biomass	2.25	9.80
Total Renewables	6.94	22.30

Italian biofuel policy has changed over the years. In fact, during the period from 2006 to 2009, the Italian Government had adopted a policy based on fiscal incentives. Afterwards, the strategy was

changed to include a mix of fiscal incentives and a compulsory quota; however, as of January 2010 the incentives are only based on a compulsory obligation:

- 2011: 4.0%
- 2012: 4.5%
- 2014: 5.0%

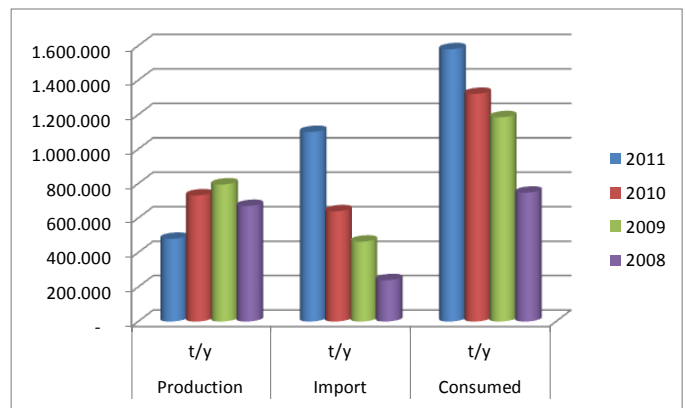
The 2007 Finance Act introduced an incentive program from January 1, 2007 to December 31, 2010, delineating a quota of 250,000 t/y of biodiesel, for the years 2007, 2008 and 2009 (an excise duty of 20% was applied to this diesel fuel). Similarly, gasoline and bioethanol have reduced excise duties that were fixed at 50%. This measure was approved by the European Commission on August 20<sup>th</sup> 2008 - C (2008) 4589.

The Finance Act 2007 provided Eur 73 million over a three-year period (2008-2010) for products including bioethanol and ETBE from agricultural origin. During 2010, the quota of biodiesel was affected by an excise duty reduction, which was fixed at 18.000 tonnes; the budget for this initiative was reduced from 73 million to Eur 3.8 million.

The introduction of lignocellulosic fuels could bring further changes in the coming years.

**BIODIESEL - NATIONAL STATISTICS**

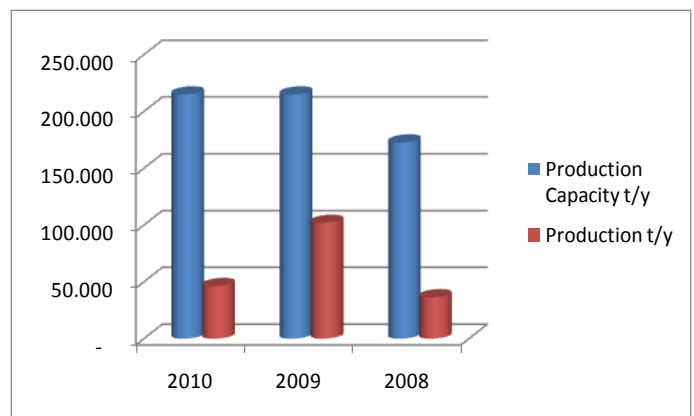
	Production t/y	Import t/y	Consumed t/y
<b>2011</b>	480.000	1.100.000	1.580.000
<b>2010</b>	731.844	639.684	1.321.139
<b>2009</b>	795.118	463.390	1.185.573
<b>2008</b>	670.449	239.887	747.725



**Figure 4. Biodiesel market in Italy. Source: Assocostieri**

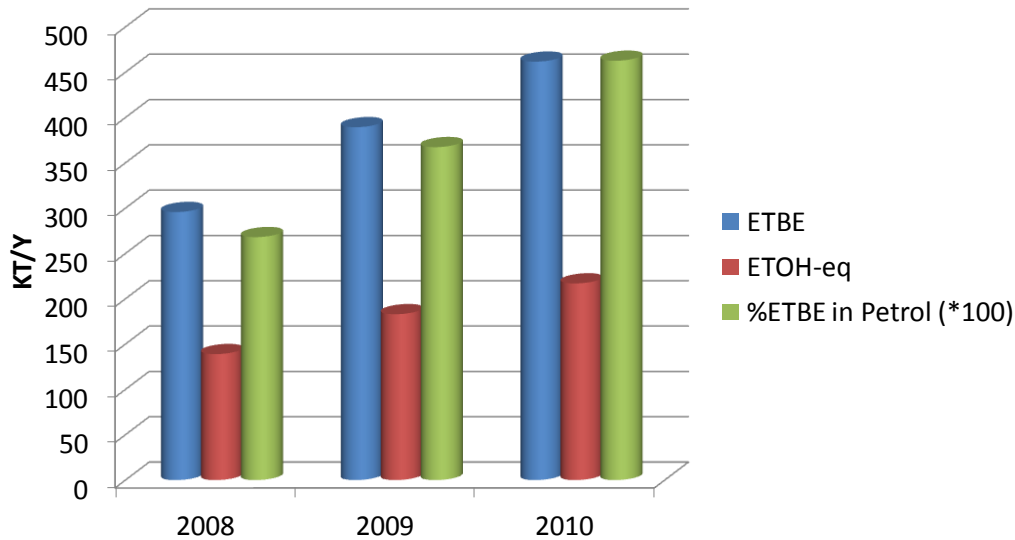
**BIOETHANOL - NATIONAL STATISTICS**

	Production Capacity t/y	Production t/y	Employees	Turnover €
<b>2010</b>	215.000	46.295	19	46.709.640
<b>2009</b>	215.000	102.000	19	37.380.120
<b>2008</b>	172.700	36.510	15	26.071.796



**Figure 5. Bioethanol market in Italy. Source: Assocostieri**

Additionally, the role of ETBE in greening gasoline must also be considered. In fact, during 2010 the only bio-component blended in gasoline was ETBE (Ethyl tert-butyl ether): a total of 462 kt were blended in 9.979 kt of gasoline (as of November 2011), corresponding to 217 kt of biofuel (Source: Unione Petrolifera, and Federchimica-GFR). In addition, ETBE blending is steadily increasing: it was 139 kt ethanol equivalents in 2008 and rose to 183 kt in 2009.



**Figure 6. Bio-ethers market in Italy** *Courtesy of GFR Federchimica*

### 3. Emerging issues in the biodiesel sector

Two main issues emerged in recent years in the biofuel industry, the first being biodiesel imports and the second being sustainability and RED requirements. Italy has been importing subsidized biodiesel from the Far East and Southern American regions at the following rates (based on the total consumption volumes):

28% in 2008	51% in 2010
36% in 2009	70% in 2011

Out of 1.58 Mt of biodiesel on the national market, 0.48 Mt were produced in Italy, while 1.1Mt were imported. Malaysia and Argentina were the primary exporters from which biodiesel was purchased. Overall, the EU finds itself in a similar situation to Spain – there has been a drastic drop in biodiesel production during 2011 (estimated at 18%, 6000 m<sup>3</sup>), and plants have shut down in many areas.

With respect to sustainability, a National biofuel certification scheme was released on January 23<sup>rd</sup> 2012, however, there are some undefined issues including complications with the deployment and implementation of biofuels.

The EC RED had also noted that "residues" and "wastes" have been double-counted and rules must be applied to imports of these products to EU, thus adding further uncertainty to the sector. These must be resolved for the industry to be successful in Italy.

## 4. Research, development and demonstration (RD&D)

In Italy, biofuel research and development plays an important role and deserves great attention; demonstration projects have also been on the rise, as they have contributed greatly to Italy's progress in the biofuels area.

R&D covers all areas of the biofuels chain, including traditional and advanced (e.g. algae) feedstocks. During the recent International Symposium on Alcohol Fuels, held in Verona (October 2011), the following research topics were addressed by Italian research groups.

- Energy crops (Giant Reed, Populus, Salix, Cynara, Fiber & Sweet Sorghum, Review of crops)
- Ethanol (process, hydrolysis, fermentation yeast, environmental procedures, demo)
- Consolidate bioprocessing of starchy material
- Lignocellulosic ethanol (process, pretreatment, fungi and enzymes) sustainability assesment, demo)
- Chemicals
- Algae (selection, analysis-TGA, cultivation, biodiesel production, sustainability)
- Torrefaction
- Pyrolysis
- Gasification, reforming and upgrading of producer gas
- Catalysts selection
- Biodiesel production
- Glycerine from biodiesel production
- Identification of renewable fraction in fossil/bio fuels mixture
- Slurry and manure conversion into biogas and bioethanol
- Biomethane (LCA)
- LCA and environmental assessment of biofuels production
- Biofuels in engines and gas turbines (performances, testing, adaptation)
- Emissions: monitoring and control in engines
- Aviation biofuels
- Economic studies

### Figure. 6. Overview of Italian R&D efforts

A number of EU and National R&D projects are currently underway, and several groups have organized platforms for testing processes and technologies at pilot and demo scales. Some prominent examples include:

#### University of Florence, CREAR/RE-CORD

- Pyrolyzers and gasifiers
- Biofuel engines
- Micro gas turbines
- Bioliquid production and use
- Microalgae - with F&M
- Chemical lab

#### ENEA

- Biochemical and thermochemical pilot plants
- Chemical labs

#### Politecnico delle Marche

- Pellets
- Solid biofuels
- Chemical lab





**Perugia University**

- Biofuels
- Bioproducts
- Chemical lab

**CRPA**

- Anaerobic digestion

**CNR**

- Catalysts, engine tests

**Pisa, Bologna and Catania Universities**

- Agronomy, biochemistry, genetics, pathology and technologies
- Crop cultivation and biomass production

**CRA**

- Agronomy, biochemistry, genetics, pathology and technologies
- Crop cultivation and biomass production
- Agriculture mechanization
- Bioproducts

**Comitato Termotecnico Italiano (CTI)**

- Biofuel norms and standards
- Organization of technical groups developing draft norms
- Qualification of economic operators involved in the production chain of biofuels and bioliquids

**AIEL**

- Variety of voluntary standards

In addition to R&D activities, noteworthy demonstration projects also are underway in Italy. The most important current initiative is the Lignocellulosic Ethanol Demonstration project by Mossi & Ghisolfi/Chemtex in Crescentino (Vercelli). A 40 t/y ethanol plant are being built (start-up expected in autumn 2012). Upon completion, it will be the world's largest lignocellulosic ethanol plant.

**5. Advanced cellulosic biomass technology for biofuels and biochemicals**

Advanced biofuel R&D activities have been conducted at Rivalta Scrivia over the last six years by the Mossi and Ghisolfi (M&G) Group's division known as Chemtex. Chemtex employs over 100 researchers and operates a demonstration-scale biomass plant with continuous operation since mid-2009.

Significant agronomic research had been completed, while some other initiatives are underway. The goal of this research was the selection of feedstock candidates for bio-ethanol production that could assure increased productivity per hectare and provide efficient land use while not competing with food crops.



**Figure The Mossi & Ghisolfi 40,000 t/y lignocellulosic EtOH plant under construction**

The R&D led to the creation of PROESA™, an advanced cellulosic biomass technology. PROESA™ is the result of € 140 million investments into RD&D. PROESA™ uses non-food chain crops, like *Arundo donax* (i.e. Giant Reed) or agricultural residues and wastes (e.g. sugarcane bagasse), and turns them into separate streams of C5 and C6 sugar-based liquids. These sugars can then be economically converted to bioproducts that meet emerging regulations and deliver a better environmental footprint than fuels and chemicals from oil or natural gas. PROESA™ is environmentally superior and competitive at an oil price of \$USD 60-70. Beta Renewables ([www.betarenewables.com](http://www.betarenewables.com)) is the newly formed company responsible for ongoing PROESA™ processes, development and licensing. Beta Renewables is a € 250 million joint venture formed from the Chemtex division of Mossi & Ghisolfi Group along with TPG (Texas Pacific Group) Capital and TPG Biotech.

### **The world's first commercial-scale plant**

The company is building **the world's first commercial-scale plant** in Crescentino, Italy, planned to start operations autumn 2012, with a capacity of 40,000 metric tons per year (expected to grow to 60,000 t/y). This plant is anticipated to demonstrate PROESA™ technology, which will likely be capable of converting lignocellulosic biomass from energy crops and residues (e.g. *Arundo donax*, wheat straw) into bioethanol utilizing a proprietary process and component design, novel enzymes cocktails and high efficiency fermenting microorganisms.

These demonstration activities are supported by the European Commission and DG Energy, through the FP7 BIOLYFE project, as well as by the Italian Ministry for Economic Development (MISE) via the Industria 2015 programme (PRIT project).

### **Essential aspects of the PROESA™ process**

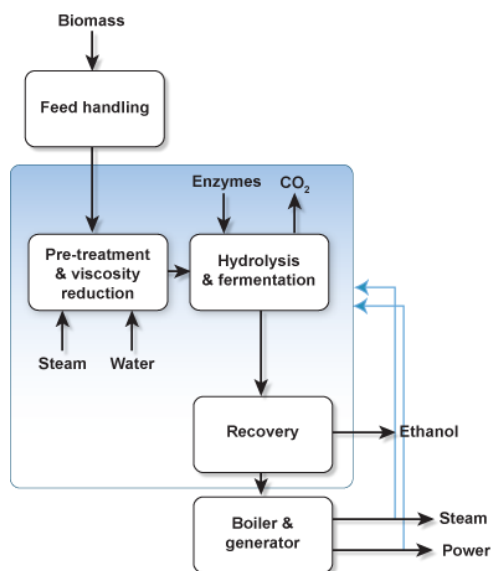
**Pretreatment:** the goal of this unit is the disruption of lignocellulosic material structure (cellulose, hemicellulose and lignin) in order to make C5 and C6 sugar fractions more easily hydrolysable. Chemtex R&D activities have led to the design of an **energy efficient proprietary pretreatment**

**process.** This process optimizes enzymatic activity by limiting the formation of degradation products that inhibit enzyme and microorganism performance.

- **Viscosity Reduction (VR)/Enzymatic Hydrolysis:** the goal of this step is the solubilization of cellulose and hemicellulose by catalytic action of enzymes with the consequent conversion into C5 and C6 sugars. The aim is generate a pumpable stream to be fed to the fermentation process. Chemtex technology enables VR to be performed in a limited amount of time, with reduced volumes and energy consumption.
- **Fermentation:** using yeasts, sugars are fermented to obtain ethanol. PROESA® hydrolysate has been tested using several microorganisms and no complications have occurred even at high solid concentrations.
- **Lignin separation (solid cake) and Waste-water treatment:** it is the final phase where ethanol created via fermentation is separated from by-products and waste water.

## About M&G

M&G ([www.gruppom.com](http://www.gruppom.com)) is a multinational, family-run business established in 1953 by Vittorio Ghisolfi. It is one of the world's leading producers of PET resins and is Italy's second largest chemical company. The Group has operations in Brazil, Mexico, China, India, the USA and Italy with 2,200 employees. Its annual turnover is approximately \$3 billion USD. M&G is a forward-looking company that continues to invest significant funds into biofuels and green chemistry R&D as part of its commitment to sustainability.



## About Chemtex

Chemtex ([www.chemtex.com](http://www.chemtex.com)) is a global engineering and technology company, wholly-owned by Italy's Gruppo Mossi & Ghisolfi (M&G). Chemtex specializes in delivering value-added project solutions to its clients in the biofuels, renewable chemicals, energy, environmental, petrochemical, polymers and fiber industries. It has operations in Italy, the United States, India and China. Chemtex is currently the prime engineering contractor to build Beta Renewable's 40,000 ton per year plant in Crescentino.

## 6. The Renewable Sources Group (Gruppo Fonti Rinnovabili) of Federchimica

In October 2010, Federchimica created the Renewable Sources Group (GFR). The group aims to represent chemical enterprises transforming various biomass types into chemicals that can be converted into fuels and chemicals using a biorefinery approach. The fuels include bio-ethers, bio-ethanol and bio-diesel, while chemicals of greatest interest are intermediates (e.g. monomers) that can be converted into new derivative products (e.g. bio-polymers).

Various chemical manufacturers can also become associate members of GFR. Chemical products used for the following can become affiliated since they indirectly enable alternative energy production and bio-based chemical intermediates.

- Renewable energy generation
- Carbon nano-tubes for wind-mill blades
- Polymeric films for photovoltaic, etc.
- Transformation of biomass (reagents, catalysts, enzymes)

Federchimica's GFR promotes technologies that utilize biomass to the fullest extent; GFR provides a sustainable and competitive advantage without the need for subsidies. GFR does not promote the development of technologies requiring subsidies since this could cause market distortion, waste of public resources and, in the end, it could penalise some sectors and unfairly advantage others.

GFR favours research projects in the field that should be taken into adequate consideration for public funding, especially considering that Italy could play a leading role within this new industry sector.

### **The notable GFR members are:**

- 1) Mossi & Ghisolfi, the Italian chemical Company planning the start-up of the world largest ligno-cellulosic ethanol demo plant by the autumn 2012, and
- 2) Novamont, a company that produces a bio-based compostable plastic product.

The Italian chemical industrial system has identified biomass-derived products as a growth opportunity; for instance, an emerging prominent player involved in this industry is Matrica.

Federchimica believes that bio-chemicals are an invaluable part of sustainable chemistry; this sector can grow using a coordinated and holistic approach to further develop biotechnologies, bio-refineries, biofuels and bio-chemicals.

Federchimica is one of numerous national chemical associations in Europe that investigate renewable sources. The association is convinced that the European chemistry industry should become more active in centrally-coordinated way, in order to seize the opportunities these technologies can offer. A recent communiqué of EU institutions on a "Bio-economy Strategy for Europe" fosters a strong cooperation and interconnection between agriculture and forestry, food industry, biotechnology and energy sectors. Italy and Federchimica fully support this approach and hope to significantly contribute toward realizing the potential of this EU based strategy.

### **Acknowledgements**

The author wishes to acknowledge Mossi & Ghisolfi/Chemtex, Federchimica (Renewable Sources Group), Assocostieri, and ENEA for the contributions given to the present article.

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## Reports and Research

### The Future of Ethanol - Brazilian and U.S. Perspectives

A new report from Rabobank's global Food & Agribusiness Research and Advisory department on the future of ethanol provides a look at recent developments and current situations in both the Brazilian and United States markets, and perspectives for 2012 and beyond. [More...](#)

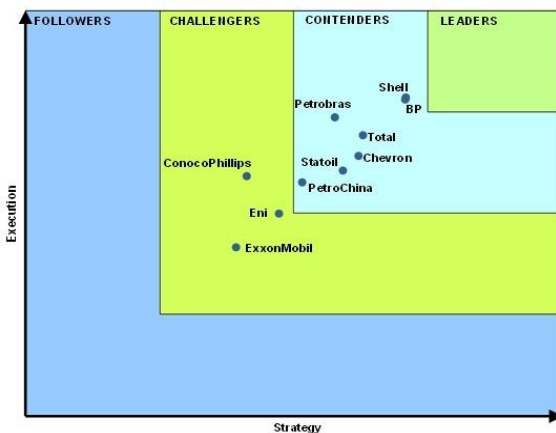


### Forecast Trends and Compliance Planning for 2012

The report covers rules and standards, product prices, strategy and trends as well as the future of RFS. The US gasoline pool has almost reached its maximum absorption of ethanol volumes at a 10% blend rate. U.S. gasoline consumption is predicted to remain flat, while the implied ethanol demand from the RFS continues to grow. [More...](#)

### EU Report Questions Conventional Biofuels' Sustainability

Conventional biofuels like biodiesel increase carbon dioxide emissions and are too expensive to consider as a long-term alternative fuel, a draft EU report says. The study 'EU Transport GHG: Routes to 2050' estimates that before indirect effects are counted, the abatement cost of reducing Europe's emissions with biofuels is between €100-€300 per tonne of carbon. [More...](#)



### Biofuel Scale-up Strategies and Execution of Oil Companies

At 30 billion gallons total production in 2011, the global biofuels industry has become big business. Although conventional biofuels derived from commodity crops account for the bulk of production today, a proliferation of national blending mandates have triggered a stampede to commercialize conversion pathways that rely on non-food feedstocks. With "easy oil" increasingly difficult to source, the world's oil companies have each charted strategies to bring biofuels to market at scale. [More...](#)

### Solar, Wind and Biofuel: A \$246B Market in 2011

The "Clean Energy Trends 2012" report states that the solar photovoltaic, wind, and biofuel markets grew by 31% to \$246.1 billion last year. However, over the past decade the top five oil and gas companies alone reported more than \$1 trillion in profits and another \$71 billion in profits during the first half of 2011. In addition, the oil, gas and coal industries receive massive subsidies, about six times as many as the global clean-energy industry, according to the report. [More...](#)

### European Airlines Enter the Biofuels Market

Biofuels might offer opportunities for achieving improved balance of power to the European airlines in their market environment. The aviation sector in Europe is a highly competitive market. It faces high rivalry and increasing fuel costs due to rising oil prices. Moreover, from 2012 the sector will be subject to stringent rules with respect to maximum allowed carbon emissions. [More...](#)



## In the News

### Policy and Regulatory Developments

#### U.S. EPA approves E15 ethanol blend registrations

The U.S. Environmental Protection Agency approved the first applications for registration of ethanol for use in making gasoline that contains up to 15 percent ethanol - known as E15. To enable widespread use of E15, the Obama Administration has set a goal to help fueling station owners install 10,000 blender pumps over the next 5 years.

[More...](#)



#### European biofuel industry declines due to overcapacities

Recent analysis of the biofuels industry by ecoprog GmbH has suggested a probable 40 new production plants will be constructed in Europe in the next 5 years, regardless of the import pressure and national overcapacities. In early 2012, approximately 380 biofuel plants with a production capacity of 1050 PJ were operational in the European Economic Area due an unprecedented construction boom. [More...](#)

#### Shell builds Virent biofuels pilot plant in Texas

Shell has built a drop-in biofuels pilot plant in Texas, based on Virent's bioforming technology. Shell invested in Virent in June 2010, aiding the opening of Virent's 'Eagle' demonstration plant producing 10,000 gallons per year of the drop-in renewable fuel, biogasoline. [More...](#)

#### China aims to reach 30% biofuel in aviation fuels by 2020

China Petroleum & Chemical, also known as Sinopec, has applied to China's aviation regulator with the aim to produce aviation biofuel commercially. China is reportedly expected to use 12 million metric tons of aviation biofuel a year by 2020. This will equal about 30% of projected total jet fuel consumption, which in itself is predicted to double to 40 million metric tons a year. [More...](#)

#### Japan's New Feed-in Tariff Committee

A new five-member committee met for the first time to start drawing up Japan's feed-in tariffs (FITs) for renewable energy. The country will introduce FITs for solar, wind, biomass, geothermal and small hydropower on 1 July, as part of the Renewable Energy Law passed in August last year. [More...](#)

#### Obama Announces Funding for Breakthroughs in Natural Gas and Biofuels

President Obama announced new funding to catalyze breakthrough technologies for two key alternative fuel types - natural gas and biofuels - as part of his all-of-the-above energy strategy to reduce US reliance on foreign oil and provide American families new choices for vehicles that do not rely on conventional gasoline. Through the Energy department's Advanced Research Projects Agency (ARPA-E), the US will make \$30 million available for a new research competition. [More...](#)

#### Bioenergy Groups Take Their Case to Capitol Hill

Representatives from more than 20 bioenergy stakeholder groups gathered in Washington to participate in the 2012 Bioenergy Partners Capitol Hill Day. Leaders from the biofuels, biopower and bioproducts industries, as well as agriculture and other related industry interests, are encouraging lawmakers and key decision makers to adopt a diversified national energy strategy that includes bio-based renewables as a critical component. [More...](#)

## Sustainability

### The 4th Annual Sustainable Biofuels Awards

This year's winners are:

- Green Shoots Award - Bio Architecture Lab
- Biofuels Leadership Award - Novozymes North America
- Sustainable Biofuels Technology Award - LS9
- Biofuels Adoption Award - City of Stockholm
- Sustainable Bioethanol Award - Abengoa Bioenergy
- Sustainable Biodiesel Award - Vale
- Sustainable Feedstock Innovation - DuPont Stover Harvest Collection Project
- Innovation in Aviation - Boeing
- Sustainable Biopower Generation Facility - Envergent Technologies
- Leader in Bio-based Chemical Industry - Kiverdi

[More on the awards...](#)



### Brazil sugarcane ethanol strategy for maximizing environmental benefits

This article reviews the history and current state of ethanol production from sugarcane in Brazil and presents a strategy for improving ecosystem services and production. The article proposes that it's possible to produce ethanol from sugarcane while maintaining or even recovering some of Brazil's unique neotropical biodiversity and ecosystem climate services. [More...](#)

### Some Biofuels Too Expensive for Anybody Except U.S. Navy

U.S. gasoline prices averaged \$3.87 in late March, 2012. If economists are right, rising prices will trigger the development of less cost-effective alternatives, such as fuel refined from Canadian oil sands and corn ethanol. And so they have. However, alternative fuels that are both better for the environment and help reduce dependence on foreign oil, are lagging behind. The U.S. Navy is trying to change that. [More...](#)

### Accelerating Availability is Key Pillar of Industry's Sustainable Growth Strategy

Boeing Airbus and Embraer today signed a memorandum of understanding to work together on the development of drop-in, affordable aviation biofuels. The three leading airframe manufacturers agreed to seek collaborative opportunities to speak in unity to government, biofuel producers and other key stakeholders to support, promote and accelerate the availability of sustainable new jet fuel sources.

[More...](#)



### Food Versus Fuel - The Debate Continues

Food versus fuel is the alliterative catchphrase we're all beginning to hear more and more of, as the global population increases and the need for a more sustainable source of fuels rises. Debaters fought to find common ground during the Food vs. Fuel discussion at the World Biofuels Markets conference in Rotterdam in March of this year. [More...](#)

## Industry News

### Boeing to Open Aerospace Research and Technology Center in Brazil

Boeing (NYSE: BA) announced today that it will establish Boeing Research & Technology-Brazil, a research and technology center in Sao Paulo that will work with the country's leading researchers and scientists to develop aerospace technologies. [More...](#)

### RPT-Oil, biofuel companies evolve into uneasy 'frenemies'

Rapid growth in the U.S. biofuels markets has often pitted oil companies against small start-ups seeking a foothold in the gasoline markets, despite the need for both sides to work together, according to industry experts. [More...](#)

### Brazil to Boost Sugarcane Output

The Brazilian federal government is developing a strategic plan to increase sugarcane output during the 2012-2015 period, for use as ethanol fuel. The aim of the strategy is to solidify ethanol's role as the leading fuel for Brazil's fleet of light duty vehicles. [More...](#)

### Refining Alternative Fuels Innovators into Winners and Losers

The alternative fuels industry is rapidly approaching maturity: with IPOs and commercialization sharing headlines with failures and cheap acquisitions. Though several of the companies are finding partners, funding, and scale, serious uncertainty - and therefore opportunity - remains. A thorough examination of the field identifies contenders, dark horses, and long-shots. [More...](#)



### LanzaTech takes over from Range Fuels

LanzaTech has bought a failing ethanol plant in Soperton, middle Georgia, with plans in motion to breathe new life into the 280-acre industrial site. After buying the plant for \$5.1 million (€3.85 million) at a foreclosure sale, LanzaTech has subsequently met with suppliers and state officials, pushing forward with plans to resume ethanol production. [More...](#)

### Trial of Biosynthetic Fuel at Lufthansa

Lufthansa says it has finished its six month trial with biosynthetic fuel, during which time more than 1,000 biofuel flights were successfully flown between Hamburg and Frankfurt. However, the airline is ending its trials because it is unable to find reliable suppliers for its aviation biofuels. [More...](#)

### EU must stop bio-fuelling injustice and hunger in Africa

The European Union's biofuel policy continues to threaten food security and increase land grabs in Africa, shows a new report '(Bio)fuelling injustice: Europe's responsibility to counter climate change without provoking land grabbing and compounding food insecurity in Africa,' presented in Brussels in March of this year by the EuropAfrica platform and FIAN International. [More...](#)

### Australian Govt Invests €16M in Advanced Biofuels

The Australian Government has awarded a AUS\$5 million (€4 million) grant to James Cook University, funding the development of Australia's first freshwater and marine macro-algae to biofuels project. A new AUS\$15 million Advanced Biofuels Investment Readiness (ABIR) Program has been created. [More...](#)



### US Senate Fails to Pass Biofuel Tax Incentive

The US Senate failed to pass the Stabenow amendment extending key biofuel tax incentives, such as the Cellulosic Biofuels Producer Tax Credit (PTC) the Accelerated Depreciation Allowance for Cellulosic Biofuel Plant Property, and the Alternative Fuel Infrastructure Tax Credit available to blender pumps and other ethanol fueling infrastructure. [More...](#)



## Policy and Standards News

### USDA plays biofuels supply chain match-maker

The USDA hosted an event to facilitate communication between feedstock producers and biofuels producers with the goal of improving awareness and understanding of the complexities of the biofuels supply chain. Dubbed “match making day” by the agency, the complimentary daylong event will include presentations from the USDA, U.S. Department of the Navy, U.S. DOE, Federal Aviation Administration and stakeholders highlighting each section of the supply chain and relating their experiences in each respective sector. [More...](#)

### A fragrant new biofuel

A class of chemical compounds best known today for fragrance and flavor may one day provide the clean, green and renewable fuel with which truck and auto drivers fill their tanks. Researchers at the U.S. Department of Energy's Joint BioEnergy Institute (JBEI) have engineered Escherichia coli (E. coli) bacteria to generate significant quantities of methyl ketone compounds from glucose. [More...](#)

### Algae Biofuel Proposal, Now Mocked By Republicans, Used To Have Their Support

US republicans mounted an all-out offensive against President Obama's energy initiatives Tuesday, even mocking him for an idea many of them used to like. Senate Minority Leader Mitch McConnell declared in a Senate floor speech that ridiculed the energy plan Obama detailed, which included the use of biofuel sources such as algae. [More....](#)



### Aqualia eyes large-scale algae biofuel production

Water management company Aqualia plans to launch a commercial-scale demonstration project using waste water to cultivate algae for biofuel production, which could fuel 400 vehicles, the firm said on Monday. Spain's Aqualia, owned by construction and services company FCC, in collaboration with European partners, has already started construction of algae culture ponds at a waste water treatment plant that could produce 500 litres of biodiesel a year and 1,500 cubic metres of biomethane. [More...](#)

## Upcoming Meetings & Conferences

### The BIO World Congress on Industrial Biotechnology and Bioprocessing

April 29- May 2, 2012                      Orlando, Florida, USA

The Congress on Industrial Biotechnology and Bioprocessing is the world's largest industrial biotechnology event for business leaders, investors and policy makers in biofuels, products, and chemicals.

### The 34<sup>th</sup> Symposium on Biotechnology for Fuels and Chemicals

April 30-May 3, 2012                      New Orleans, Louisiana, USA

The premier international scientific meeting highlighting recent advances in the biotechnologies and biotechnology-based routes for producing fuels and chemicals from renewable resources.

### World Bioenergy

May 29-31 2012,                              Jönköping, Sweden

Sweden will be hosting the World Bioenergy, with World Pellets 2012 being an integral part of the event.

### Perspectives on Land Use and Food Production

May 30-June 2 2012                      Tübingen, Germany

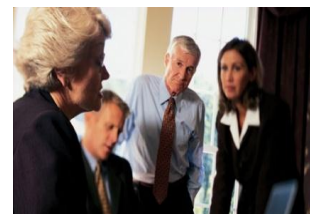
This is connected to ongoing changes in and of land-use practices that are related to local, regional and global scales, often dubbed as 'glocal' situations.

### The 2nd International Conference on Algal Biomass, Biofuels and Bioproducts

June 10-13                                      San Diego, California, USA

The conference provides a new level of interaction between scientific, strategic partners and the delegates, with emphasis on unpublished scientific results, discussion and direct interactions.

For more events visit [www.task39.org](http://www.task39.org)



## IEA Bioenergy Task 39 Meetings

The following is a tentative schedule of Task 39 meetings over the course of the next few years. Please [contact us](#) for more detailed information:

- New Orleans - April 2012 (Meeting at 34<sup>th</sup> Symposium on Biotechnology for Fuels and Chemicals (SBFC))
  - Vancouver - June 2012 (Pretreatment workshop)
  - Vienna, Austria - November 2012 (IEA Bioenergy Conference)
- 
- |             |                          |  |
|-------------|--------------------------|--|
| ▪ 2013 Feb  | S. Africa (Stellenbosch) | Business Meeting - Task 39 Participation in ISAF       |
| ▪ 2013 May  | US (Portland)            | Business/evening session – with 35 <sup>th</sup> SBFC  |
| ▪ 2014 Jan  | Germany (Berlin)         | 10th BBE/UFOP International Congress on Biofuels       |
| ▪ 2014 May  | Sweden                   | Business Meeting/World Bioenergy Symposium - Jönköping |
| ▪ 2014 Sept | South Korea              | TBD  |