



The Beta Renewables plant that was commissioned at the end of 2013 at Crescentino (Italy), produces second-generation bioethanol from biomass waste.

FABRIZIO GIRALDI/NOVOZAMES



6.8%

the drop in biofuel consumption in European Union transport between 2012 and 2013

BIOFUELS BAROMETER

A study carried out by EurObserv'ER.  EurObserv'ER

The growth of biofuel consumption for use in transport in the European Union (EU-28) has dwindled in the past few years and finally dropped by about 1 million toe (6.8%) between 2012 and 2013 according to EurObserv'ER, to a consumption level of 13.6 million toe. Nevertheless, sustainable biofuel consumption, certified and thus eligible for inclusion in European targets increased slightly by 1.1% to 11.8 Mtoe.

4.7%

the biofuel incorporation rate in European Union transport in 2013

13.6 Mtoe

total biofuel consumption in European Union transport in 2013

European Union biofuel consumption for transport also suffered a downturn in 2013 put at 6.8% year-on-year by EurObserv'ER, which equates to a fall from 14.6 to 13.6 Mtoe (tables 1 and 2).

If we look at historical data published by Eurostat, the European Union's statistics office, the fall marks the first drop in consumption since the industrial expansion of biofuel sought by the European Union

(graph 1), which started with the implementation of the biofuel directive 2003/30/EC adopted on 8 May 2003 ... the first to set quantified targets for biofuel consumption, namely 2% in 2005 and 5.75% in 2010. It was followed six years later by the adoption on 23 April 2009 of the 2009/28/EC Directive on the promotion of renewable energies, which rescinded its predecessor and imposed a binding renewable energy target of 10% in transport by 2020 instead.

Its target also differs slightly from the previous one in that it also factors in the production of renewable electricity used by electric vehicles (cars, trains, trams and underground trains). Nonetheless, most of the target will be covered by the use of biofuel, be it first-, second- or third-generation (see box). At the same time, a change to the fuel quality directive set transport a binding greenhouse gas intensity reduction target of 6% by the 2020 timeline.

Tabl. n° 1

Biofuel consumption for transport in the European Union in 2012* (toe)

| Country | Bioethanol | Biodiesel | Biogas fuel | Others biofuel* | Total consumption | % certified sustainable |
|--------------------|------------------|-------------------|----------------|-----------------|-------------------|-------------------------|
| Germany | 805 460 | 2 190 767 | 30 266 | 22 093 | 3 048 587 | 100% |
| France | 417 014 | 2 268 977 | 0 | 0 | 2 685 992 | 100% |
| Spain | 201 445 | 1 899 294 | 0 | 0 | 2 100 739 | 0% |
| Italy | 79 597 | 1 263 288 | 0 | 0 | 1 342 885 | 100% |
| United Kingdom | 388 220 | 497 349 | 0 | 0 | 885 570 | 100% |
| Poland | 153 888 | 669 437 | 0 | 0 | 823 325 | 100% |
| Sweden | 199 773 | 335 126 | 82 230 | 0 | 617 129 | 100% |
| Austria | 68 174 | 389 670 | 0 | 0 | 457 844 | 92% |
| Netherlands | 124 463 | 210 328 | 0 | 0 | 334 790 | 95% |
| Belgium | 48 578 | 281 531 | 0 | 0 | 330 109 | 100% |
| Portugal | 2 833 | 284 187 | 0 | 0 | 287 020 | 2% |
| Czech Republic | 59 965 | 221 169 | 0 | 0 | 281 134 | 100% |
| Finland | 93 329 | 149 972 | 347 | 0 | 243 647 | 0% |
| Denmark | 0 | 212 279 | 0 | 0 | 212 279 | 100% |
| Romania | 36 268 | 156 287 | 0 | 9 989 | 202 544 | 88% |
| Greece | 0 | 124 606 | 0 | 0 | 124 606 | 19% |
| Hungary | 45 787 | 76 885 | 0 | 0 | 122 671 | 100% |
| Slovakia | 23 789 | 76 566 | 0 | 688 | 101 042 | 94% |
| Bulgaria | 0 | 85 899 | 0 | 0 | 85 899 | 0% |
| Ireland | 29 137 | 55 790 | 0 | 85 | 85 012 | 100% |
| Lithuania | 8 707 | 51 810 | 0 | 0 | 60 517 | 100% |
| Slovenia | 5 290 | 46 337 | 0 | 0 | 51 627 | 100% |
| Luxembourg | 1 286 | 45 582 | 0 | 163 | 47 031 | 100% |
| Croatia | 1 320 | 34 792 | 0 | 0 | 36 112 | 0% |
| Latvia | 6 703 | 12 514 | 0 | 0 | 19 217 | 100% |
| Cyprus | 0 | 16 136 | 0 | 0 | 16 136 | 0% |
| Malta | 0 | 4 419 | 0 | 0 | 4 419 | 0% |
| Estonia | 0 | 0 | 0 | 0 | 0 | 0% |
| Total EU 28 | 2 801 027 | 11 660 993 | 112 843 | 33 018 | 14 607 881 | 79.8% |

* Pure used vegetable oil and unspecified biofuel. Source: EurObserv'ER 2014.

THE EUROPEAN UNION IN A DITHER OVER BIOFUEL

THE ILUC DIRECTIVE IS STILL PENDING

When these two directives were adopted, the European Parliament and Council asked the European Commission to examine the potential impact on greenhouse gas emissions arising from increasing land use for producing first-generation

biofuel, also called the ILUC effect (Indirect Land Use Change impacts of biofuels), and if necessary present a legislative proposal. The European Commission acquiesced by taking into account in its draft directive of 17 October 2012 the ILUC effect in the calculation of greenhouse gas emissions. In this first project, the Commission had proposed to limit to a maximum of 5% the share of first generation biofuels in the incorporation targets. The proposal that was submitted to the European Parliament aroused the

anger of the biofuel players, who had already invested to meet the demands of the renewable energies directive. Since then, the sector has continued to challenge the Commission's model for calculating the ILUC effect.

It took the European Parliament almost a year to state its intentions and on 11 September 2013 it placed a 6% cap on first-generation biofuel and a 2.5% incorporation threshold of advanced biofuel

Tabl. n° 2

Biofuel consumption for transport in the European Union in 2013* (toe)

| Country | Bioethanol | Biodiesel | Biogas fuel | Others biofuel** | Total consumption | % certified sustainable |
|--------------------|------------------|-------------------|----------------|------------------|-------------------|-------------------------|
| Germany | 777 730 | 1 954 811 | 34 909 | 884 | 2 768 334 | 100% |
| France | 393 541 | 2 293 324 | 0 | 0 | 2 686 865 | 100% |
| Italy | 56 234 | 1 169 175 | 0 | 0 | 1 225 409 | 100% |
| United Kingdom | 410 791 | 603 755 | 0 | 0 | 1 014 546 | 100% |
| Spain | 180 274 | 816 461 | 0 | 0 | 996 735 | 0% |
| Poland | 170 249 | 744 101 | 0 | 0 | 914 350 | 100% |
| Sweden | 181 276 | 535 760 | 85 223 | 0 | 802 258 | 99% |
| Austria | 55 259 | 425 112 | 0 | 0 | 480 372 | 92% |
| Belgium | 49 011 | 282 794 | 0 | 0 | 331 805 | 100% |
| Netherlands | 125 108 | 194 421 | 0 | 0 | 319 528 | 96% |
| Denmark | 0 | 297 365 | 0 | 0 | 297 365 | 100% |
| Portugal | 4 725 | 273 582 | 0 | 0 | 278 307 | 3% |
| Czech Republic | 51 765 | 221 007 | 0 | 0 | 272 772 | 100% |
| Finland | 93 508 | 118 420 | 930 | 0 | 212 858 | 0% |
| Romania | 36 885 | 159 413 | 0 | 10 059 | 206 356 | 89% |
| Greece | 0 | 138 746 | 0 | 0 | 138 746 | 18% |
| Slovakia | 55 872 | 79 570 | 0 | 0 | 135 442 | 76% |
| Hungary | 23 723 | 66 457 | 0 | 16 526 | 106 705 | 85% |
| Ireland | 29 095 | 73 119 | 0 | 51 | 102 265 | 100% |
| Bulgaria | 0 | 85 899 | 0 | 0 | 85 899 | 0% |
| Lithuania | 6 769 | 51 907 | 0 | 0 | 58 675 | 95% |
| Slovenia | 5 589 | 51 353 | 0 | 0 | 56 942 | 100% |
| Luxembourg | 647 | 52 721 | 0 | 137 | 53 504 | 100% |
| Croatia | 1 184 | 29 016 | 0 | 0 | 30 200 | 100% |
| Latvia | 6 449 | 12 372 | 0 | 0 | 18 821 | 100% |
| Cyprus | 0 | 15 907 | 0 | 0 | 15 907 | 0% |
| Malta | 0 | 4 419 | 0 | 0 | 4 419 | 0% |
| Estonia | 0 | 0 | 0 | 0 | 0 | 0% |
| Total EU 28 | 2 715 685 | 10 750 984 | 121 062 | 27 656 | 13 615 387 | 86.5% |

* Estimate. ** Pure used vegetable oil and unspecified biofuel. Source: EurObserv'ER 2014.

(known as second- and third-generation biofuel), produced from biomass waste or algae. The European MEPs also approved factoring in the ILUC effect but only from 2020 onwards. The European Council rejected both the proposal and a compromise text proffered by the Lithuanian presidency on 12 December 2013 that aimed to impose a 7% limit. An alliance of circumstance between the most and least ambitious countries thwarted efforts to reach a political agreement. The European Energy ministers took a further six months to concur on the draft directive on the change in land use. The 13 June 2014 text, which falls far short of the European Commission's initial ambitions, imposes a minimum level of 7% of final energy consumption in transport in 2020 for first-generation biofuel. However the agreement does not provide for a binding incorporation target for advanced second- and third-generation biofuel. It only encourages transition to these advanced forms of fuel by asking Member States to set national targets on the basis of a minimum reference value of 0.5 of a percentage point of the 10% target. Moreover the agreement enables the Member States to set lower targets, provided they can justify their action. A new annex to the renewable energy directive also prescribes the raw materials to be



Neste Oil is developing a process using yeasts and fungi to convert sugars from waste into second-generation (NE xBTL) biodiesel.

used for producing advanced biofuel that can be double-counted for the purposes of achieving targets. The central issue of integrating the ILUC effect in the sustainability criteria is unresolved in the draft directive, which only provides for a clause for re-examining these criteria on the basis of better knowledge of the ILUC effect. The agreement also favours the production of renewable electricity for use in transport, by establishing a mul-

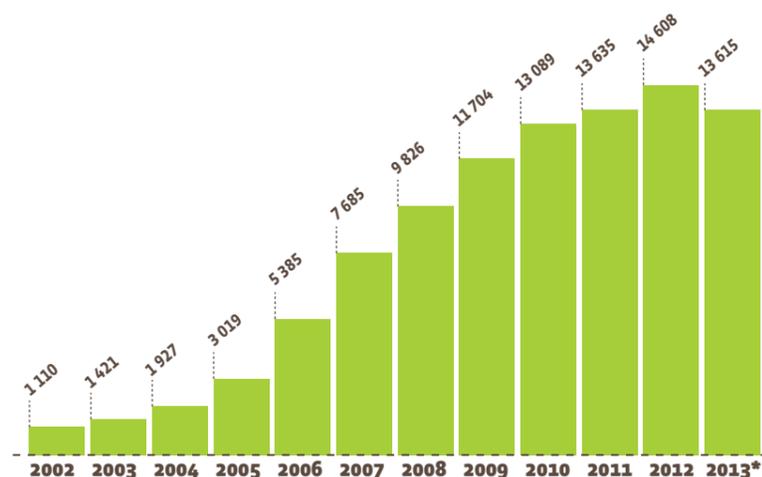
tiplication factor of 5 for the renewable electricity fuelling electrically-powered road vehicles and 2.5 for the electricity used by electrified rail transport. The agreement is still a draft in its current state. Further negotiations will have to be held with the European Parliament and will certainly postpone adoption of a common text between the European Parliament and the European Council to 2015.

THE EUROPEAN UNION AT SIXES AND SEVENS

Although a new stage has begun, these discussions have dragged on for almost two years and are largely to blame for the slowdown and in 2013, the drop in European Union biofuel consumption. The Member States have taken national, politically uncoordinated stances on their incorporation rates of second-generation biofuel development as a result of the delays in adopting a new directive with clearly defined European Union targets. After an analysis of the individual country consumption trends our conclusion is that the European Union no longer has an overall trend, our first observation being that the decline in biofuel consumption in 2013 is essentially down to the drop in consumption of a single country, Spain, which cut its incorporation targets (see further on). Germany's biofuel consumption also declined in 2013 to a lesser

Graph. n° 1

Trend of the European Union (EU-28) biofuel consumption for transport (ktoe)



* Estimate. Sources: Data from 2002 to 2011 (Eurostat 2013), data from 2012 to 2013 (EurObserv'ER 2014).

Methodology note

EurObserv'ER has decided to harmonise its data-gathering method by asking the interviewed experts to express their biofuel consumption data in tonnes rather than energy units (toe or TJ). This is because minor distortions may be emerging between countries since many of them use their own individual weight (tonnes) or energy-equivalent volume conversion ratios. To avoid these discrepancies, Systèmes Solaires has adopted the conversion coefficients specified in Appendix III of the new renewable energies directive for calculating the energy density of transport fuels and expresses them in LHV (lower heating value).

The coefficients are 27 MJ/kg (equivalent to 0.6449 toe per tonne) and 21 MJ/l (equivalent to 0.5016 toe per m³) for bioethanol, 37 MJ/kg (0.8837 toe per tonne) and 33 MJ/l (0.7882 toe per m³) for biodiesel, and 37 MJ/kg (0.8837 toe per tonne) and 34 MJ/l (0.8121 toe per m³) for pure vegetable oil. For purified biogas of natural gas quality it is 50 MJ/kg (1.194 toe per tonne)

extent, prompted by its decision to abolish the last tax exemptions enjoyed by the biodiesel sector from 2013 onwards (see further on). In contrast, a number of countries – the UK, Sweden and Denmark – significantly increased their incorporation rates, while others such as France, Austria and Belgium, kept steady incorporation rates in 2013 with slight upward or downward variations in biofuel consumption in line with total fuel consumption (fossil and non-fossil).

APPA (the Spanish Renewable Energy Association) conducted a comparative

study of minimum national incorporation targets for 2014 that reveals major differences across the European Union's countries, with France (at 7.6%) and Croatia (at 2.1%) at opposite ends of the target rankings respectively (table 3).

BIOETHANOL DOING A LITTLE BETTER

Bioethanol consumption is on the rise if we look at the breakdown of consumption between the various biofuel types within the European Union (on the basis

of energy content rather than volume). Its market share, be it in direct blends with petrol or converted into ETBE (Ethyl tertiary butyl ether), rose from 19.2% in 2012 to 19.9% in 2013 (graph 2), while the biodiesel share shed almost one percentage point, from 79.8% in 2012 to 79% in 2013. The other types of biofuel shares remained stable at 1.1%, essentially represented by biogas fuel (121.1 ktoe or 0.9% in 2013) used in Germany, Sweden and Finland.

Three generations of biofuel

Biofuel is a liquid or gaseous fuel used for transport and produced from biomass. Three types of biofuel are generally distinguished:

- **First-generation biofuel (said to be "conventional")** which includes bioethanol and biodiesel outputs from the conversion of food crops (rapeseed, soy, beets, cereals...). The category also includes the production of vegetable oil that can be used pure and directly by specific engines. The production of biogas fuel (generally in the form of biomethane) obtained by the anaerobic digestion process followed by purification is a somewhat special category because it can be produced both from fermentable waste and energy and food crops.
- **Second-generation biofuel** – sectors totally devoted to energy that do not rely on agri-food crops (no ILUC effect). They offer better yields and are more environmentally-friendly in terms of GHG emissions because they recover all the plant ligno-cellulose contained in the plant cells. The raw materials range from straw, green waste (tree cuttings, etc.) or even fast-growing energy plants such as miscanthus. They enable alcohol to be produced and thus bioethanol. Additionally some of the processes produce biodiesel.
- **Third-generation biofuel** which includes biofuel produced from algae (also known as algofuel) that present the advantage of not competing with food or energy crops (plants and forestry). Recovery is through an oil sector and thus produces biodiesel.

The year-on-year decline in bioethanol consumption was much less (3.1%) than that of biodiesel (8.5%), within the overall drop in consumption of these two types of biofuel.

86% OF CONSUMPTION CERTIFIED AS SUSTAINABLE

Another turning point came in 2011, the year in which biofuel consumption was

tied to the implementation of binding sustainability criteria for eligibility for inclusion in the calculation of the 2009/28/EC directive on renewable energy targets. Certified biofuel consumption is slightly higher and increased from 11.7 Mtoe in 2012 to 11.8 Mtoe in 2013 according to EurObserv'ER. If we bear in mind the overall sharp drop in consumption, its share of total biofuel consumption is therefore surging

and now accounts for 86.5% in 2013 up from 79.8% in 2012. Just a handful of EU countries, including Spain, Finland, Bulgaria, Greece, Cyprus and Malta were in the throes of setting up an effective system for certifying their biofuel consumption in 2013. Some of them have reported modest consumption of biofuel compliant with the sustainability criteria. This biofuel is produced from waste and residue that can be counted as sustainable yet it is not submitted to the same certification procedure.

Finland's biofuel and liquid biomass sustainability law was adopted in 2013 and came into force at the start of 2014. Cyprus is at a similar stage. Uncertainty still surrounds the enforcement date of Spain's certification mechanism, whose system had not been set up when EurObserv'ER carried out its survey in June 2014.

NEWS FROM AROUND THE MAIN COUNTRIES

Biodiesel taxed at 100% in Germany

Despite its lower level of consumption, Germany was the top European Union biofuel consumer in 2013. AGEE-Stat, the Environment Ministry's statistics office, states that biodiesel consumption dropped by 10.8% to 2 212 000 tonnes (equating to 1 954 811 toe), while for its part bioethanol consumption dropped by 3.4% to 1 206 000 tonnes (equating to 777 730 toe). A token 1 000 tonnes of vegetable oil output (equating to 884 toe) and 31 000 tonnes of biogas with a density of 0.67 kg/m³ (equating to 34 909 toe) have to be added to these figures. Overall biofuel consumption in terms of energy content, declined by 9.2% between 2012 and 2013, with a resulting reduction in incorporation rate from 5.8% in 2012 to 5.2% in 2013 (provisional figures). Biodiesel consumption plummeted once the partial tax exemption enjoyed by biodiesel (levied at 21.40 euros for 1 000 litres in 2012) ended in 2013. The 100% taxation of methyl ester biodiesel from vegetable oil led to an increase in consumption of biodiesel produced from used frying oil (put at more than 200 000 tonnes) which offers distributors the advantages of being double-counted for the purposes of their incorporation

obligation and at that in unlimited quantity. The incorporation quota that factors in double-counting was applied at 6.25% from 2010 until 2014 (therefore this figure cannot be directly compared with the 5.2% in 2013). Implementation of a new system that will indirectly stimulate biofuel use is scheduled from 2015 onwards. It will be based on a greenhouse gas emissions reduction quota compared to regular diesel and petrol fuel. In 2015 and 2016, GHG emissions should drop by 3%, then by 4.5% from 2017 onwards and by 7% from 2020 onwards. This new system exemplifies the country's determination to develop the much lower GHG-emitting second- and third-generation types of biofuel.

Spain cuts its biofuel consumption

The sharp drop in Spain's biofuel consumption can be largely ascribed to its government's decision on 22 February 2013, to reduce its incorporation target to 4.1% in 2014 from 6.5%, with specific incorporation targets in diesel fuel that dropped from 7 to 4.1%, and from 4.1 to 3.9% in the case of petrol. The IDAE (Institute for Diversification and Saving of Energy) claims that biodiesel consumption dropped by 57% in 2013 to 923 880 tonnes (equating to 816 461 toe) and that bioethanol consumption dropped by 10.5% to 279 145 tonnes (equating to 180 274 toe). The purpose of the new targets is to reduce the price of fuel at service stations and thus bring respite to the Spanish economy.

In November 2013, the government published the production quotas awarded to manufacturers for the next two years. They were all awarded to European producers (27 plants in Spain, 5 in Italy, 5 in Germany and 2 in the UK), which effectively curtails the massive biodiesel imports from Argentina, Indonesia and Malaysia. The implementation of anti-dumping barriers on imports of Argentine and Indonesian biodiesel in force since 28 November 2013 has relieved some of the pressure on the Spanish biodiesel industry. Nonetheless this measure was introduced too late for a number of Spanish producers (see further on) that had to withdraw from the market. In 2012, 76% of Spain's biodiesel consumption was imported

and was essentially sourced in Argentina and Indonesia (the 2013 figures are unavailable).

Spain's lower biofuel consumption is aligned to the general fuel consumption trend, which has fallen relentlessly because of the economic situation and policies aimed at reducing fuel consumption (e.g.: limiting motorway driving speed to 110 kph). Cores, the public body responsible for ensuring oil company supplies in Spain claims that the drop in road fuel consumption was lower in 2013 (3.6% compared to 6.7%) than in 2012.

Sweden has an incorporation rate of 11%

According to the Swedish Energy Agency's preliminary data, the country's road fuel biofuel incorporation rate was 11% in 2013 (up from 8.5% in 2012), which is the highest in the EU. It also breaks down biofuel consumption in 2013 as 606 248 tonnes of biodiesel, 281 099 tonnes of bioethanol and 99.5 million m³ of purified biogas (natural gas quality), and claims that 99% of this consumption was certified as sustainable. EurObserv'ER puts the country's consumption at 802 258 toe after converting these values into energy equivalence.

The "Production of Today's and Future Sustainable Biofuels" report, produced by the Bio4Energy environmental research centre and submitted to the Swedish government in October 2013, suggests that a third of Sweden's vehicles could be running on biofuel by 2030 and that most of this target could be obtained by using forest resources and farm waste through the production of second-generation biofuel. Sweden is currently one of the European leaders for advanced biofuel production.

Volume increases by 13% in the United Kingdom

HM Revenue and Customs claims that UK biofuel consumption surged in 2013 and that in volume terms, it increased by 13% to 1 585 million litres. Biodiesel consumption was the main beneficiary of this increase putting on 21%, to 766 million litres in 2013. Bioethanol consumption increased by 6% to 819 million litres in 2013 and now accounts for 52% of biofuel consumption compared to 48% for biodiesel with the incorporation rate in volume terms, of 4.5% in petrol and 2.8% in diesel fuel, making for combined input of 3.5%.

Tabl. n° 3

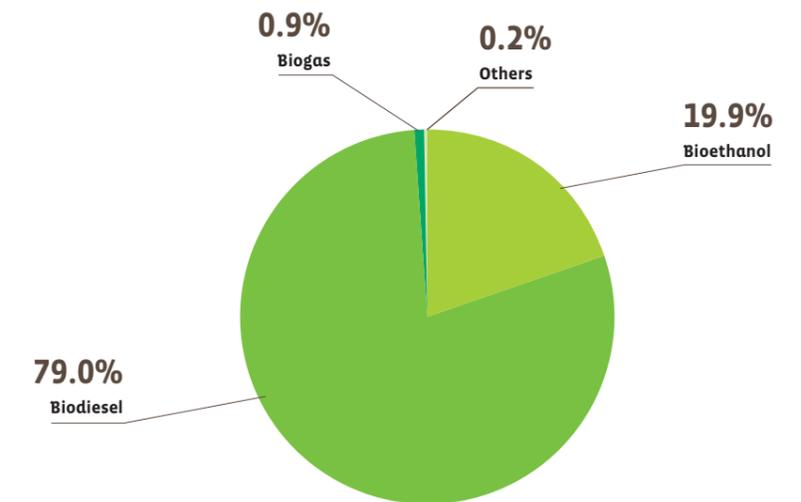
Minimum biofuel incorporation target in energy content for 2014

| Country | Overall target | Target for petrol | Target for diesel |
|----------------|----------------|-------------------|-------------------|
| France | 7.57% | 7.00% | 7.70% |
| Poland | 7.10% | | |
| Slovenia | 7.00% | | |
| Sweden | 6.41% | 3.20% | 8.78% |
| Germany | 6.25% | 2.80% | 4.40% |
| Finland | 6.00% | | |
| Lithuania | 5.80% | 3.34% | 6.45% |
| Austria | 5.75% | 3.40% | 6.30% |
| Denmark | 5.75% | | |
| Portugal | 5.50% | | |
| Netherlands | 5.50% | 3.50% | 3.50% |
| Belgium | 5.09% | 2.66% | 5.53% |
| Ireland | 4.94% | | |
| Bulgaria | 4.94% | 3.34% | 5.53% |
| Hungary | 4.90% | 4.90% | 4.90% |
| Romania | 4.79% | 3.00% | 5.53% |
| Luxembourg | 4.75% | | |
| Czech Republic | 4.57% | 2.73% | 5.53% |
| Slovakia | 4.50% | 2.73% | 6.27% |
| Italy | 4.50% | | |
| Malta | 4.50% | | |
| Spain | 4.10% | 3.90% | 4.10% |
| United kingdom | 3.90% | | |
| Greece | 2.64% | | |
| Croatia | 2.06% | | |
| Mean target | 5.15% | 3.58% | 5.81% |

Note: Twenty-five EU Member States have set binding incorporation targets for 2014. All the percentages are expressed in energy content, which means that the percentages of the countries that set their targets in volumetric terms have been recalculated (Sweden, Lithuania, Belgium, Ireland, Bulgaria, Romania, Czech Republic, Slovakia, the United Kingdom, Greece and Croatia). Those countries that have set specific incorporation targets for petrol and diesel (France, Sweden, Lithuania, Belgium, Bulgaria, Hungary, Romania, Czech Republic and Greece) have also been recalculated to produce an overall target, bearing in mind each individual country's petrol and diesel figures.
Source: APPA press release, 20 May 2014.

Graph. n° 2

*Share of each type of biofuel in total biofuel consumption by energy content for European Union transport in 2013**



* Estimate. Source: EurObserv'ER 2014.

The growth in consumption is even greater if these volumetric figures are converted to energy equivalence. According to EurObserv'ER, it is 14.6% for total consumption of 1 014 546 toe where the breakdown is advantageous to biodiesel, which accounts for 59.5% of total biofuel consumption.

The UK is also in the sixth year of its Renewable Transport Fuel Obligation (RTFO) implementation, that provides for a 4.75% incorporation volume over the year from 15 April 2013 to 14 April 2014 (it was 4.5% over the previous period). The initial target was 5%, but the government decided to include non-road vehicles (including inland water vessels) and farming machinery from 13 April 2013 onwards. The government reduced its target as it did not want to increase the country's biofuel consumption volume. Even if these periods do not match exactly, the difference in incorporation rate by volume between that of the RTFO and the incorporation rate for the calendar year can be put down to the double-counting of biofuel produced from waste (especially frying oil) and non-farming raw materials. This is because 917 million of the 1 412 million certificates fulfilling the sustainability criteria were issued through double-counting.

France sets its sights on a 7.7% biodiesel incorporation rate

France is now set to increase its biodiesel incorporation rate. The 2014 Budget left the 7% incorporation targets for raw oil unchanged, but added 0.35% of non-edible ester lipids. As this consumption counts double, the biodiesel incorporation target is 7.7% for 2014. The bioethanol incorporation target for petrol is held at its 7% level. In order to be applicable, this political commitment will have to await a new regulatory standard on biofuel composition. Sofiprotéol, the French biodiesel producer is ready to meet this new target as soon as the new standard is published by the authorities (see just below). In the interim, the Ministry of the Ecology, Sustainable Development and Energy's Observation and Statistics Office has published its first biofuel consumption estimates which point to stability at 2.7 million toe, i.e. an incorporation rate of about 6.5%. At 2.3 million toe France is again the top European bio-

diesel consumer, accounting for more than 20% of EU biodiesel consumption (21.4% in 2013).

THE EUROPEAN INDUSTRY ON THE DEFENSIVE

The biofuel industry, both first- and second-generations, has been left hanging in the absence of decisiveness and clear vision on the part of Europe's institutions on the future of biofuel, their spread by 2020 and 2030 in the longer term. Accordingly, the biofuel industry is even more dependent on the implementation of national policies and has had to tailor its capacities to the prospects of demand in Europe. In clearer terms, this adjustment translates into production capacity reductions for first-generation biofuel and reorientation towards production that can take advantage of double-counting, namely animal fat or vegetable oil methyl ester production and the production of second-generation biofuel such as cellulose ethanol.

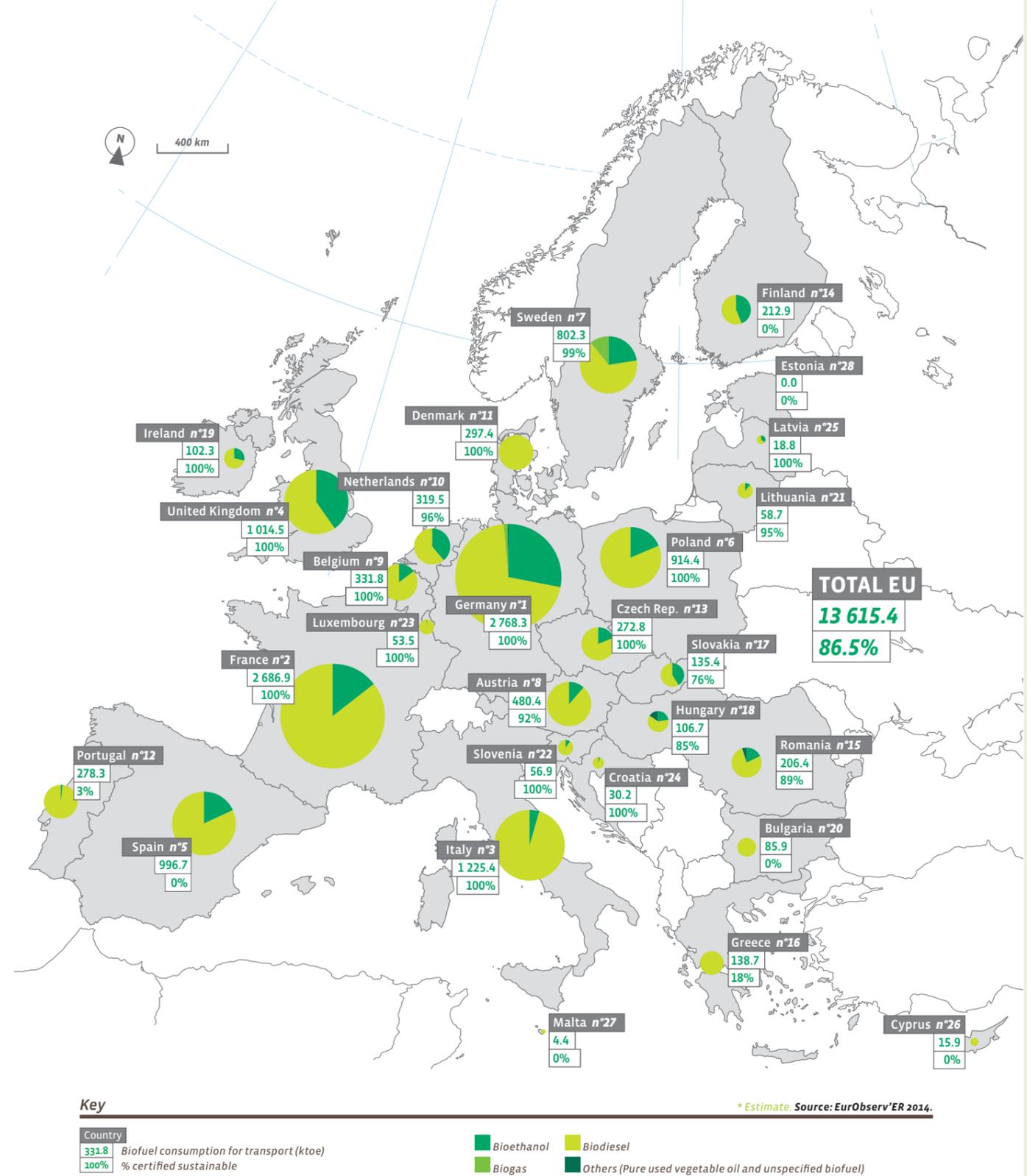
The European biofuel industry's situation is further compounded by the fact that its market is also subject to European Commission and World Trade Organization decisions resulting from their conflicts with the other producer countries. The European Union has delivered a number of decisions in recent weeks and months that should bring some relief to Europe's biofuel industry.

As for the bioethanol sector, our last biofuel barometer, published in July 2013, reported on the European Union's decision of 22 February 2013 to impose antidumping taxes on American bioethanol imports, levied at 62.9 euros per tonne for a 5-year period. Since this decision, a number of American producers found a way around having to pay these duties by routing their production via Norway, which in turn exported the biofuel to the European Union in the form of an ethanol-petrol blend. The European Renewable Ethanol Industry Association (ePURE) alerted the European Commission to this practice at the start of 2014, and on 4 June 2014 the Commission decided to apply the antidumping duties on all American bioethanol regardless of transit country. An important, long-awaited decision affecting the biodiesel sector was taken

by the European Commission a few months ago. Since 27 November 2013, the European Union has imposed definitive duties on Argentine and Indonesian biodiesel imports. The additional customs duties average 24.6% for Argentine biodiesel (215–250 euros per tonne) and 18.9% for Indonesian biodiesel (120–180 euros per tonne). These antidumping measures were the outcome of the opening of an antidumping enquiry started in August 2012 by the European Biodiesel Bureau (EBB) that was followed by the European Commission's decision to apply a temporary antidumping duty on 27 May 2013. The European Commission justified its decision on the grounds that the Argentine and Indonesian producers would have an unfair advantage because they had access to artificially low-priced raw materials in comparison to the world market price. However the two countries do not intend to leave the matter closed. At the end of March 2014, Argentina demanded the WTO to instigate dispute proceedings against the European Union. The WTO set up an expert committee on 25 April 2014 to examine the European Union's antidumping procedure. Indonesia should shortly follow suit and on 10 June 2014 demanded the WTO to enter consultations with the European Union about these antidumping measures. The move is the formal starting point for instituting arbitration proceedings under the auspices of the WTO.

The European Union decision is important for the European industry as since 2010, more than 90% of Europe's biodiesel imports have been sourced from Argentina and Indonesia. These antidumping measures have given the biodiesel industry some respite, and particularly the Spanish industry that was at the receiving end of most of the Argentine and Indonesian biodiesel imports. However they came too late for a number of Spanish companies that were forced to close plants and work below capacity for three years. In an irony of history, Infinita Renovables was bought out on 27 February 2014 by Masol Iberia, a 100%-holding of the Indonesian group Musim Mas. Despite 10 million euros of subsidies, 5 million from

Biofuel consumption for transport in the European Union in 2013* (ktoe) with respective shares of each sector





Straw bales earmarked for second-generation bioethanol production (Beta Renewables plant, Italy).

the Galician Regional Government, the remaining 5 million from the Spanish government, 37 of the 56 employees were laid off during the year, including 6 after the Masol Iberia buy-out. Another example is the bankruptcy of the Bioenergética Extremeña's Valdatorres production plant that cost 70 million euros in 2007 and was sold to the recycling firm Lyrsa for dismantling for 1 million euros in January 2014.

The antidumping measures will enable part of the biodiesel production to be relocated in Europe. However, the European industry, which is beset by produc-

tion overcapacity and lack of visibility, will have to continue to peg its production capacities to market demand.

That is precisely what leading European biodiesel producer Sofiprotéol Group has decided to do with its Diester Industrie business. At the end of 2013, the Group shut down two esterification plants in France with combined production capacity of 380 000 tonnes – Diester Industrie Flandre at Capelle la Grande (Nord) and Novance at Venette (Oise). It also decided to convert the Saipol crushing plant, also on the Venette site that supplied oil to the esterification plant, into

an animal fat and used vegetable oil methyl ester production plant. The new plant, whose production capacity will be 80 000 tonnes, will produce on behalf of a new firm, AD Biodiesel controlled by Sofiprotéol through Diester Industrie, the main shareholder with 60% of the share capital. Three other companies will have holdings: Electrawinds (20%), Akiolis (10%) and Mindest (10%).

In preparation for the scheduled end of tax exemption (primarily in Germany), the Group has redefined the European scope of Diester Industrie International (DII), the subsidiary it has in common with

Tabl. n° 4

Production capacity of the main biodiesel producers in Europe in 2013 (tons)

| Company | Country | Number of plants in 2013 | Production capacity in 2013 (tons) |
|---|-------------|---|------------------------------------|
| Diester Industrie & Diester Industrie International (Sofiprotéol) | France | France (5), Germany (1), Italy (1), Belgium (1) | 2 500 000 |
| Neste Oil | Finland | Finland (2), Netherlands (1) | 1 180 000 |
| Biopetrol Industries | Switzerland | Germany (2), Netherlands (1) | 1 000 000 |
| ADM Biodiesel | Germany | Germany (3) | 975 000 |
| Infinita (Musim Mas) | Spain | Spain (2) | 900 000 |
| Marseglia Group (Ital Green Oil and Ital Bi Oil) | Italy | Italy (2) | 560 000 |
| Verbio AG | Germany | Germany (2) | 450 000 |
| Cargill/Agravis | Germany | Germany (2) | 250 000 |
| Petrotec | Germany | Germany (2), Spain (1) | 185 000 |

Source: EurObserv'ER 2014.

the Bunge Group. After its January 2013 disposal of its Brück an der Leitha (Austria) and Mannheim (Germany) plants to its partner, the Bunge Group, DII disposed of its Livorno plant (Italy) in June 2013 to the Indonesian group Musim Mas, that further strengthens its foothold in the European market. DII still holds 100% of its Italian subsidiary Novaol Srl as well as 50% of the German company, NEW. DII's biodiesel production capacity has thus fallen from 1 million tonnes in 2012 to 500 000 tonnes in 2013, reducing the group's overall exposure to biodiesel. The combined sales of Diester Industrie and Diester Industrie International were put at 2.4 billion euros in 2013 (2.7 billion in 2012) for a production volume of 2.1 million tonnes.

BIODIESEL OUT OF THE FRYER IS A SUCCESS

Investments are flowing into second-generation European Union biodiesel production plants to make methyl esters primarily from used frying oil and animal

fat. On 9 January 2014, Simadan Holding announced that it was investing 65 million euros in a second second-generation biodiesel production plant of this type in the Port of Amsterdam, in the Netherlands. The new plant will be designed to produce 150 000 tonnes of biodiesel and at the same time will produce 50 000 tonnes of pharmaceutical-grade glycerine from different types of raw materials, partly supplied by the collection of used frying oil. This holding has already invested in a 100 000-tonne capacity plant of the same type – still the largest in the world, through its Biodiesel Amsterdam subsidiary. Portugal has also jumped on the bandwagon. On 19 July 2013, it commissioned its first biodiesel production plant at Sines with 25 000 tonnes of production capacity using waste feedstock (animal fat and frying oil). The project carried by Enerfuel initially kicked off in 2006 had run into a number of problems and was halted in 2008. New investments (3 million euros added to the initial 10 million euros), decided on in September 2012, finally

ensured that this plant could be fully operational.

CELLULOSE ETHANOL ... NEW PLAYERS HAVE ENTERED THE FIELD

Cellulose ethanol is also finding its feet in the bioethanol sector with the appearance of new players. Beta Renewables is one of them. The venture was founded in 2011, by Biochemtex, a firm in the Italian Mossi Ghisolfi Group together with the American TPG (Texas Pacific Group), thanks to an initial investment of 250 million euros. A third player, Novozymes from Denmark, a biotechnology firm that specialises in enzyme production, took 10% of the share capital at the end of 2012 (90 million euros). In October 2013 Beta Renewables commissioned construction of the biggest second-generation bioethanol plant close to Crescentino, in Northern Italy. The plant has been designed to pro-

Tabl. n° 5

Production capacity of the main bioethanol producers in Europe in 2013* (millions of litres)

| Company | Country | Location of the units | Production capacity in 2013 (million litres) | Raw materials |
|-------------------|----------------|---|--|---|
| Abengoa Bioenergy | Spain | Spain (4), Netherlands (1), France (1) | 1 281 | Barley, wheat, cereals, raw alcohol, maize, ligno-cellulose |
| Tereos | France | France (6), Czech Republic (3), Belgium (1), United Kingdom (1) | 1 260 | Sugar refinery juices, sugar beet, cereals, wheat |
| CropEnergies | Germany | Germany (1), Belgium (1), France (1), United Kingdom (1) | 1 200 | Sugar refinery juices, sugar beet, wheat |
| Cristanol | France | France (4) | 550 | Sugar refinery juices, sugar beet, glucose, raw alcohol |
| Vivergo | United Kingdom | United Kingdom (1) | 420 | Wheat |
| Agrana | Austria | Austria (1), Hungary (1) | 400 | Wheat, maize |
| Verbio | Germany | Germany (2) | 340 | Sugar refinery juices, cereals |
| Agroetanol | Sweden | Sweden (1), Czech Republic (1) | 210 | Cereals |

* Only units in Europe are taken into account. Source: EurObserv'ER 2014.

duce 40 000 tonnes of cellulose ethanol using its Proesa™ enzyme conversion process. Production capacity is scheduled to rise to 60 000 tonnes. The raw materials used will be wheat straw, rice straw and a herbaceous plant, *Arundo Donax*, which will be grown nearby. The plant will be totally self-sufficient with its own power plant fuelled by its lignin production. Beta Renewables has ambitions for international expansion, and at the beginning of 2014 announced that it was commissioning another project that uses its process in Brazil. The Bioflex 1 project with 65 000 tonnes of production capacity, is held by Brazil's Granbio and produces cellulose ethanol from sugar cane waste ("straw"). Three more plants will be up and running by 2016 – two in the United States – the Alpha project in North Carolina (60 000 tonnes) and the Canergy project in California (74 000 tonnes). The third plant will be in the Fuyang region of China (with a capacity of 200 000 tonnes). Italy appears to want to get involved in second-generation biofuel.

In May 2014, Biochemtex, one of Beta Renewables' owners, signed an accord with the Italian Ministry of Economic Development to construct three new plants, all in Southern Italy, at Sulcis

(Sardinia), Termini Imerese (Sicily) and another in the Apulia region. Each project will be designed to produce 100 million litres (about 80 000 tonnes) and will use non-food energy crops and straw. The projects could start as soon as the banks have agreed on the finances ... which should happen in the second half of this year.

While the first commercially-viable projects are starting to appear, new industrial pilot plants continue to be announced or commissioned. The Finnish energy group, St1 Biofuels Oy, announced in May 2014 that it was constructing a plant in Gothenburg to produce 5 million litres per annum (about 4 000 tonnes) of bioethanol from process residue and wood waste. The plant will start running early in 2015.

In June 2013 Abengoa commissioned its first bioethanol plant using household waste as feedstock. The Babilafuente (Salamanca, Spain) demonstration plant is designed to treat 25 000 tonnes of household waste and will produce 1.5 million litres of bioethanol. It uses W2B (Waste-to-Biofuels) technology that works on the basis of fermentation and enzymatic hydrolysis. During the conversion process, the organic matter is processed to produce organic fibres

rich in cellulose that is subsequently converted into bioethanol.

TARGETS FOR 2030?

Since the European Commission decided to submit a draft directive to the European Parliament on indirect land use changes two years ago, the task of projecting biofuel consumption has become very difficult. According to the data gathered by EurObserv'ER, biofuel accounted for a 4.7% share of fuel consumption in European Union in 2013 transport (not allowing for double-counting), yet the share was put at 5.1% in 2012. If we take account of certified biofuel alone, the share would drop to 4.1% in 2013, which suggests that it is stable when compared to 2012. This figure will rise mechanically when the remaining countries have implemented their certification systems. For 2020, the share devoted to biofuel should amount to about 8 of the 10 percentage points of the Directive's target. Yet it is still difficult to gauge the energy content of this percentage accurately without knowing what precise proportion will be allocated to double-counted biofuel.

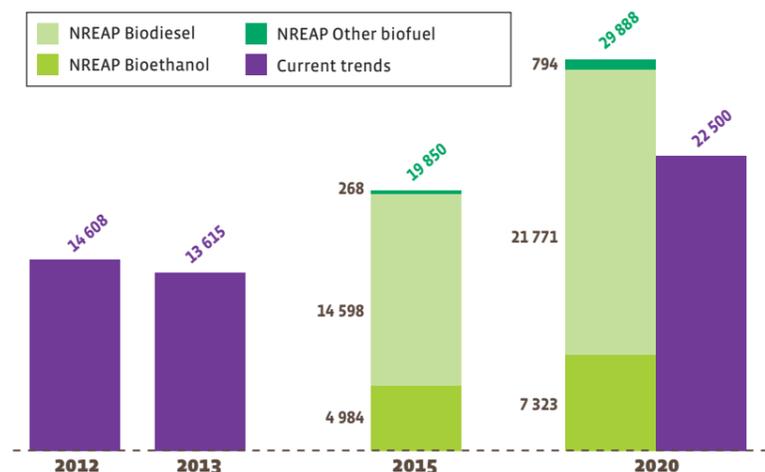
Requirements will certainly be much lower than those envisaged in the NREAP plans that forecast consumption of 27 of the 29 745 ktoe of biofuel in 2020 for the EU, because of greater development of advanced types of biofuel and because of final energy consumption in transport that could be less than predicted in the reference scenario.

The EurObserv'ER projection (graph 3) is partly based on the draft directive that is subject to a political agreement within the Energy Council ... the incorporation, in energy content, of conventional types of biofuel up to 7% and 0.5% of advanced types of biofuel (thus accounting for 1% of the European target). If 300 Mtoe of final energy consumption is assumed in 2020, biofuel consumption could rise to 22.5 Mtoe by 2020.

Forecasting to the 2030 timeline is even harder as the uncertainties are greater. This is because at the start of the year, on 22 January 2014, the European Commission published proposals to set up the framework for its climate-energy policy to the 2030 timeline that opens the negotiations on the implementation of the

Graph. n° 3

Comparison of the current biofuel consumption for transport trend against the NREAP (National Renewable Energy Action Plan) roadmaps (ktoe)



*Subject to possible changes in line with the new European regulation. Source: EurObserv'ER 2013.



Research laboratory working on producing 3rd-generation biofuel from microalgae (Bielefeld University, Germany).

European Union's forthcoming Energy/Climate package. It suggests a 2030 target of 27% of renewable energies in energy consumption (only binding at the scale of the European Union), but the Commission did not consider it useful or relevant to set a specific transport target. This lack of visibility at European Union level is particularly detrimental to the development of advanced types of biofuel, which will be naturally called on to follow on from first-generation biofuel. Thus in the short- and medium-term, their growth prospects will depend on their nationally-defined incorporation targets. As it stands, the 2030 Energy/Climate package is taking the form of an economic compromise with no state roadmaps. Each country is free to keep pace with or lag behind the most advanced countries.

International current events involving the inter-religious conflicts in the Middle-East and the Ukraine-Russia crisis could prompt the EU to adopt a more proactive policy to reduce its reliance on hydrocarbons. According to the European Commission, the European Union imports 94% of its oil consumption and 30% of these imports of crude oil and refined products are sourced from Russia. □

The next barometers will cover the subjects of biogas and Renewable municipal waste

Sources: AGEE-Stat (Germany), SOES (France), DECC (United Kingdom), IDAE (Spain), Ministry of economic development (Italy), The Institute for Renewable Energy (Poland), Swedish Energy Agency, Statistics Netherlands, Statistics Austria, DGGE (Portugal), University of Miskolc (Hungary), Ministry of industry and trade (Czech Republic), SPF Economy (Belgium), Ministry of Environment, Finnish biogas association, Energy and Climate Change (Greece), Energy Center Bratislava (Slovakia), Ministry of Economy of the Slovak Republic, Statistics Lithuania, Econet Romania, SEAI (Ireland Republic), STATEC (Luxembourg), APEE (Bulgaria), Environmental Agency of the Republic Slovenia, ENS (Denmark), Ministry of Economy (Croatia).

Download

EurObserv'ER is posting an interactive database of the barometer indicators on the www.energies-renouvelables.org (French-language) and www.eurobserv-er.org (English-language) sites. Click the "Interactive EurObserv'ER Database" banner to download the barometer data in Excel format.



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