

The Climate and Renewable Energy (CARE) Package of the EU, 20:20:20 by 2020

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The package also establishes a regulatory framework for the capture and underground storage of CO₂ to help support this new technology before it becomes commercially viable.

Abstract

The Climate and Renewable Energy Package is intended to meet the EU's 2020 climate goals to reduce greenhouse-gas emissions by 20% below 1990 levels and boost the share of renewables in the total energy mix to 20% by the same date.

The 'package' is composed of six measures. The revision of the EU's flagship emissions trading scheme will enter into force in 2013, obliging power installations to buy all their emissions allowances at auction to correct the deficiencies of the previous scheme, in which free allocations resulted in massive windfall profits. For other ETS sectors, auctioning will be gradually phased in, with 20% of emissions permits bought at auction by 2013 and 70% by 2020. Full auctioning will not kick in before 2027. Moreover, member states with significant coal-based production negotiated substantial derogations to their industries that are deemed to be at risk of 'carbon leakage', that is, reallocation to third countries where environmental protection laws are less strict.

The package sets binding renewable targets for Member States including 10 e% general target for renewable energy in transport sector. Biofuels shall be used towards the target only if they fulfil sustainability criteria. The fuel quality directive provides another incentive for low-carbon biofuels by setting an obligation of fuel suppliers to reduce greenhouse gas intensity of the fuel pool.

Összefoglalás

A Klíma és Megújuló Energia Csomag azért készült, hogy teljesüljenek az EU 2020-as klímaváltozással kapcsolatos céljai, az üvegház hatású gázok kibocsátása az 1990-es szinthez képest 20 %-kal csökkenjen, valamint a megújuló energia aránya 20%-ra nőjön a teljes energia mixben.

A „csomag” hat jogszabályból áll. Az EU zászlóshajójának számít kibocsátás kereskedelmi rendszer (ETS) átalakított változata 2013-ban lép életbe, kötelezve a villamos energia előállítóit, hogy teljes kvóta igényüket aukción vásárolják meg, megszüntetve ezzel a korábbi rendszer hiányosságait, amelyben a szabad allokáció extraprofitot eredményezett. Más ETS szektorokban az aukciós kvóta beszerzést fokozatosan vezetik be, 2013-ig kvótaigényük 20%, 2020-tól pedig 70%-át aukción kell vásárolniuk. 2027 előtt nem vezetik be a teljes aukciót. Továbbá a túlnyomóan szén használó tagországok elérték, hogy olyan mentességet vezessenek be, mely csökkenti a carbon leakage kockázatát, vagyis olyan harmadik országokba történő áttelepítését, ahol a környezetvédelmi előírások kevésbé szigorúak.

A csomag kötelező megújuló célokat fogalmaz meg a tagállamok számára, ezen belül 10 e% általános célszámot a közlekedési szektorban használt energia esetében. A bioüzemanyagok csak akkor használhatóak a cél telje-

sítése érdekében, ha megfelelnek a fenntarthatósági kritériumoknak. Az üzemanyag minőség irányelv további ösztönzést biztosít az alacsony carbon intenzitású bioüzemanyagok felhasználásának elősegítésére, kötelezve az üzemanyag forgalmazókat az általuk forgalmazott üzemanyagok üvegházi gázintenzitásának csökkentésére. A csomag ezenfelül meghatározza a CO₂ geológiai tárolásának szabályozási kereteit, hogy ezzel segítse ezen új technológia mielőbbi elterjedését.

In December 2008 the European Parliament and Council reached an agreement on the Climate and Renewable Energy Package (CARE). It includes the following 6 legislations: directive modifying the EU Emission Trading Scheme (ETS), the Renewable Energy Sources Directive (RES-D), decision on Effort Sharing in non-ETS sectors, directive on Carbon Capture and Storage (CCS) and directives regulating fuel quality and CO₂ emission of cars. These directives will drive to 20% energy efficiency improvement, an increase of the share of renewables in energy use in the European Union to 20%, a reduction of carbon intensity of transport fuels by 6%, will enforce car technology developments and support development of new technology aimed at safe carbon capture and storage. By these measures the EU is committed to reducing its overall greenhouse gas emissions to at least 20% below 1990 levels by 2020, which contributes to the levels of reductions that are considered scientifically necessary to avoid dangerous climate change.

Historical Context

From the late 1970s onwards climate scientists have raised concerns that burning oil, gas and coal is largely responsible for rising global temperatures.[1] By the 1990s the political climate had shifted towards action, with the publication of the first report by the UN's Intergovernmental Panel on Climate Change (IPCC) and the UN Earth Summit in Rio de Janeiro.

- International climate talks, hosted by the UN, led to the Kyoto Protocol in 1997, a global agreement to reduce greenhouse gas emissions to five percent below 1990 levels by 2012. The agreement was ratified in 2004 [2]. The principle of emissions trading was enshrined in

the Kyoto Protocol, based on the idea that governments would set limits on greenhouse gas emissions, but the market would then find the cheapest ways to make those cuts [3].

- In 1997 the Commission published its White Paper 'Energy for the future: renewable sources of energy - White Paper for a Community Strategy and Action Plan'. Renewables are favoured because of their role in tackling the twin challenge of energy security and global warming.

INSTRUMENTS TO REGULATE GREENHOUSE GAS EMISSION OF THE INDUSTRY

Carbon Taxes Gain Support

Following Kyoto, the EU was legally bound to reduce emissions and needed "to establish instruments which ensure that the overall reduction is effectively achieved". Several member states had enacted a carbon tax in 1990, the first country to have done so was Finland, and the Netherlands followed shortly after. Sweden, Norway and then Denmark later took similar steps [4]. Despite the enthusiasm for carbon taxes among so many member states, the proposal for an EU wide carbon tax in 1991 was dropped. Policy momentum seemed to be gathering instead behind the idea of an emissions trading scheme. A national emissions trading scheme was launched by the UK Department for the Environment (Defra) in early 2002 [5] and Britain actively pushed for a similar scheme to be adopted by the EU [6].

Genesis of the EU ETS Scheme

The European Parliament first adopted a Green Paper on emissions trading within the EU in March 2000 [7] and the Commission's proposal for an EU wide scheme was presented to the Parliament in October 2001. By this time groundwork for the UK scheme was almost complete. The Commission received significant input from the US non-governmental organisation (NGO) Environmental Defense which emerged as a prominent supporter and self-appointed expert on carbon trading during the UN's Kyoto negotiations. The organisation had also been involved in the design of the US sulphur emissions trading scheme, the only large-scale emissions trading scheme to have operated prior to the EU ETS.

The EU ETS adopted in 2003 came into force in January 2005 [8]. According to the scheme no industrial installation may undertake any activity covered by the scheme unless its operator holds a permit issued by a competent authority. An emission cap was defined for each individual plant via National Allocation Plan (NAP) submitted by member states and approved by the Commission. Based on caps free emission allowances (quotas) were provided each year for companies. Companies that exceeded their quotas were allowed to buy unused credits from those that are better at cutting their emissions. Industries covered by the scheme included: power generation, refining, iron & steel, glass, cement, pottery and bricks. Originally, a fine of €40 per excess tonne of CO₂ emitted was imposed on plants exceeding their individual target, which rose to €100 in 2008.

The first phase had several shortcomings. The most catastrophic failure has been the over-allocation of emissions permits.

Phase Two of the ETS

Over-allocation across the EU was so acute that in 2005, the first year of trading under the ETS, installations bound by the scheme emitted 66 million tonnes less than the allocated cap [9]. The Spanish Government was so concerned at windfall profits generated through over-allocation that it imposed a one billion euro tax, aimed at forcing corporations to repay profits made by passing the cost of emissions' allowances on to customers despite having received the allowances for free [10].

The second phase of the scheme (2008 - 2012), introduced a slightly tighter cap on EU-wide emissions and allowed to use credits to be imported to the ETS from projects under the Kyoto Protocol's Clean Development Mechanism (CDM) and Joint Implementation (JI), a system whereby European companies can avoid reducing their own emissions by funding offset projects elsewhere. Chemical industry was included into the scheme.

INSTRUMENTS TO INCREASE THE SHARE OF RENEWABLES

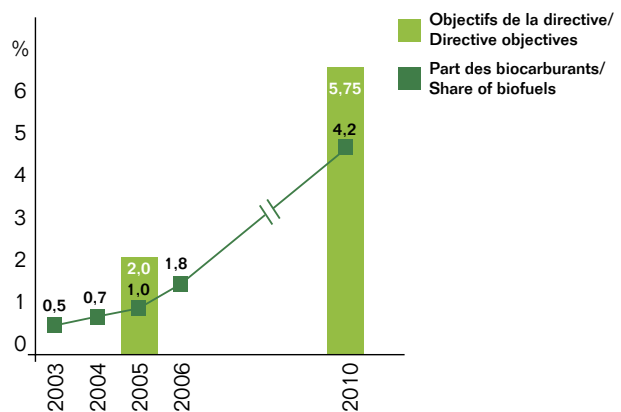
Since the energy crises of the 1970s, several industrial nations have launched programmes to develop renewable energy solutions. Examples of these local initiatives in transport sector are Brasilia, USA and some EU countries. Volatile oil prices, high production costs and growing environmental concerns prevented transport renewable energies from picking up on a large commercial scale.

Past EU policy developments include: The White Paper for a Community Strategy and Action Plan' set the EU target of increasing the share of renewable energy to 12 per cent of total energy consumption by 2010 [11].

In 2001 the Directive on the Promotion of Electricity produced from Renewable Energy Sources was adopted [12]. The directive set an EU-wide target of 21% of renewables share in electricity production by 2010.

In 2003 the Biofuels Directive setting "reference values" of 2% market share for biofuels in 2005 and 5.75% share on energy bases in 2010 was adopted [13]. Figure 1 shows the trend of biofuels' consumption in the EU. According to this graph 2010 biofuel targets will not be achieved. There are different reasons behind slower take off. The CARE package aims to tackle these barriers.

COMPARISON OF THE CURRENT TREND WITH THE DIRECTIVE BIOFUELS OBJECTIVES



Source: EurObserv'Er

Figure 1. Trends of biofuels' consumption in the EU



Content of the Climate and Renewable Energy Package

The CARE package often mentioned as “20:20:20 by 2020” roadmap was approved at first reading in under a year with a very active diplomatic work of the French Presidency. It integrates all activities emitting greenhouse gases and makes an attempt to show the right direction how to reduce emissions. The new policy framework sets market-based instruments which enable some projects – e. g. renewable energy, energy efficiency, carbon sequestration – to become viable that otherwise may not be, plus they may bring extra investments to EU member states. The main elements of legislations included in the CARE package:

1. Central to the policy framework is the revision of the EU ETS and establishing requirements for the third phase of the system. In this third phase beginning in 2013 emissions from the sectors covered by the system will be cut by 21% by 2020 compared with levels in 2005. A single EU-wide cap on emissions in the ETS sector will be set, and free allocation of emission allowances will be progressively replaced by auctioning of allowances by 2027 [14]. Free quotas will be distributed in line with sector specific benchmarks considering top performers within the sector.
2. Emissions from sectors not included in the EU ETS – such as transport, housing, agriculture and waste – will be cut by 10% from 2005 levels by 2020. Each Member State will contribute to this effort according to its relative wealth, with national emission targets ranging from -20% for richer Member States to +20% for poorer ones.
3. National renewable energy targets were set for each Member State and a minimum 10% share for renewable energy in transport by 2020. The package also sets out sustainability criteria that biofuels will have to meet to ensure they deliver real environmental benefits [15].
4. The package also seeks to promote the development and safe use of CCS, a suite of technologies that allows the

carbon dioxide emitted by industrial processes to be captured and stored underground where it cannot contribute to global warming. Revised guidelines on state aid for environmental protection will enable governments to support CCS demonstration plants.

5. The revised directive on fuel quality has two elements linking with climate policy. It will introduce new fuel specifications allowing higher biofuel content in gasoline and diesel fuel. The other element is the decarbonisation provision obliging fuel suppliers to reduce life-cycle greenhouse-gas-emission of fuels they sell by 6% between 2010 and 2020. 4% more reduction is subject to revision in 2014.
6. Regulation sets emission performance standards for new passenger cars in order to reach an average level of emissions of 120g CO₂/km for the entire car industry by 2012. Average CO₂ emissions for new passenger cars shall be 130 g CO₂/km. It will be complemented by additional measures corresponding to 10 g CO₂/km as part of the Community's integrated approach. The average emissions for new cars shall be 95 gCO₂/km from 2020.

I will present the main elements of the revised ETS directive, the Renewable Directive and the climate related part of the Fuel Quality Directive.

DIRECTIVE REVISING THE EU'S EMISSION TRADING SYSTEM - THE THIRD PHASE

The Directive provides for the reductions of greenhouse gas emissions to be increased so as to contribute to the levels of reductions that are considered scientifically necessary to avoid dangerous climate change. It also lays down provisions for assessing and implementing a stricter EU reduction commitment exceeding 20%, to be applied upon the approval by the Community of an international agreement leading to emissions reductions exceeding those required by the Directive (as reflected in the 30% commitment endorsed by the Spring 2007 European Council).

The Community-wide quantity of allowances issued each year starting in 2013 shall decrease in a linear manner beginning from the mid-point of the period 2008 to 2012. The Commission shall, by 30 June 2010, publish the absolute Community-wide quantity of allowances for 2013.

Number of quotas in 2020 will represent 21% emission reduction in ETS sectors compared with levels in 2005.

Part of allowances will be distributed free of charge to companies, the other part will be sold by EU member states in auctions. The system for setting the number of free company allowances – rules for allocation – will be modified and community-wide ex ante benchmarks will be used instead of national allocation. No free allocation will be provided to the power sector and the number of free allowances will be gradually decreased in manufacturing sectors. No free allocation will be provided in these sectors in 2027. Sectors imposed to international competition will be exempt from this rule until 2020 – this special derogation is called derogation for sectors at significant risk of “carbon leakage”.

Auctioning of allowances

By 31 December 2010, the Commission shall determine an estimated amount of allowances to be auctioned by Member States and shall adopt a Regulation on timing, administration and other aspects of auctioning to ensure that it is conducted in an open, transparent, harmonised and non-discriminatory manner. The total quantity of allowances to be auctioned by each Member State shall be composed as follows:

- 88% of the total quantity of allowances to be auctioned being distributed amongst Member States in shares that are identical to the share of verified emissions under the Community scheme for 2005 or the average of the period 2005-2007, whichever one is the highest, of the Member State concerned;
- 10% of the total quantity of allowances to be auctioned being distributed amongst certain Member States for the purpose of solidarity and growth within the Community;
- 2% of the total quantity of allowances to be auctioned being distributed amongst Member States whose greenhouse gas emissions in 2005 were at least 20% below their emissions in their levels in the base year applicable to them under the Kyoto Protocol.

Usage of revenues from auctioning of allowances

According to the plans of the Commission revenues from auctioning of allowances will serve as one of the sources of climate actions.

At least 50% of the revenues generated from the auctioning of allowances will be used for one or more of the followings:

- to reduce greenhouse gas emissions by contributing to different EU and international climate and renewable funds;
- to develop renewable energies to meet the commitment of the Community to use 20% renewable energies by 2020, as well as to develop other technologies contributing to the transition to a safe and sustainable low-carbon economy and to help meeting the commitment of the Community to increase energy efficiency by 20% by 2020;
- for measures to avoid deforestation and increase afforestation and reforestation in developing countries that have ratified the future international climate agreement, to transfer technologies and to facilitate adaptation to the adverse effects of climate change in these countries;
- for forestry sequestration in the EU;
- for the environmentally safe capture and geological storage of carbon dioxide, in particular from solid fossil fuel power stations and a range of industrial sectors and sub-sectors, including in third countries;
- to encourage a shift to low emission and public forms of transport;
- to finance research and development in energy efficiency and clean technologies in the sectors covered by the scope of the directive;
- for measures intended to increase energy efficiency and insulation or to provide financial support in order to address social aspects in lower and middle income households.

Decreasing free allocation in the manufacturing sector

As it was mentioned above companies producing electricity for their own use or for sale will need to buy allowances equal to their total greenhouse gas emissions. Full auctioning will be gradually introduced in the manufacturing sector. It will be granted 80% of its emission allowances for free in 2013, which will be reduced to 30% by 2020 in order to reach full auctioning in 2027 (and not in 2020 as proposed by the Commission and the European Parliament).

A large derogation has been introduced for sectors at significant risk of ‘carbon leakage’, in

other words the relocation of production to third countries with a less strict climate policy, leading to increased CO₂ emissions by these countries. Until an international agreement is concluded, these sectors may receive up to 100% of free allowances until 2020, under certain conditions. European oil and gas production, refining and chemicals sectors might be amongst these sectors. The precise list of sectors imposed to carbon leakage will be identified on the bases of principles set by the directive. The Commission will determine the list of exposed sectors or sub-sectors by 31 December 2009. Sector or sub-sector is "deemed to be exposed to a significant risk of carbon leakage if:

- the extent to which the sum of direct and indirect additional costs induced by the implementation of this directive would lead to a substantial increase of production cost, calculated as a proportion of the Gross Value Added, of at least 5%; and
- the Non-EU Trade intensity defined as the ratio between total of value of exports to non EU + value of imports from non-EU and the total market size for the Community (annual turnover plus total imports) is above 10%."

A sector or sub-sector is also deemed to be exposed to a significant risk of carbon leakage:

- if the sum of direct and indirect additional costs induced by the implementation of this directive would lead to a particularly high increase of production cost, calculated as a proportion of the Gross Value Added, of at least 30%; or
- if the Non-EU Trade intensity defined as the ratio between total of value of exports to non EU + value of imports from non-EU and the total market size for the Community (annual turnover plus total imports) is above 30%.

For the sectors deemed to be exposed, the revised Directive provides for 100% of allowances allocated free of charge, at the level of the benchmark.

Community-wide rules for harmonised free allocation

The Commission shall, by 31 December 2010, adopt Community wide and fully-harmonised implementing measures for allocating the allowances. These measures shall determine Community-wide ex ante benchmarks on the bases of the performance of companies representing the best 10% of the sector. Take example of

plant A performing better than the benchmark and plant B emitting more greenhouse gases than the emission calculated on the bases of the benchmark. Plant A will have extra allowances while plant B will need to buy quotas.

Free allocation for modernisation of electricity generation

Member States may give a transitional free allocation to installations launched operation by 31 December 2008 or to installations for which the investment process was physically initiated by the same date for electricity production if they meet certain conditions listed in the Directive.

State aid to cope with indirect carbon leakage

Member States may adopt financial measures in favour of sectors or sub-sectors determined to be exposed to a significant risk of carbon leakage due to costs relating to greenhouse gas emissions passed on in electricity prices, in order to compensate for those costs and where this is in accordance with state aid rules applicable and to be adopted in this area.

Supporting CCS projects

Projects for the environmentally-safe capture and storage of carbon dioxide: up to 300 million allowances in the new entrants reserve shall be available until 31 December 2015 to help stimulate the construction and operation of up to 12 commercial demonstration projects that are aiming at the environmentally safe capture and geological storage of carbon dioxide as well as the demonstration projects of innovative renewable energy technologies, in the territory of the EU.

Exclusion of small installations

Member States may exclude, from the Community scheme, installations which have reported emissions to the competent authority of less than 25 000 tonnes of carbon dioxide equivalent and, where they carry out combustion activities, have a rated thermal input below 35 MW.

Adjustments applicable upon the approval of a future international agreement on climate change

At the latest 3 months after the signature by the Community of an international agreement on climate change leading, by 2020, to mandatory

reductions of greenhouse gas emissions exceeding 20% compared to 1990 levels, the Commission shall submit a report. On the basis of this report, the Commission shall, as appropriate, submit a legislative proposal to the European Parliament and to the Council amending the ETS directive.

CARBON REDUCTION TARGET BY THE FUEL QUALITY DIRECTIVE

The original Fuel Quality Directive has been regulating only non-climate related environmental characteristics of fuels like sulphur content before. The idea of introducing a new feature demonstrating carbon footprint of transport fuels has been invented by the CARE package. The new requirement sets in respect of fuels for road vehicles, and non road mobile machinery a target for the reduction of life cycle greenhouse gas emissions. As one of the ways of reducing greenhouse gas emissions associated to fuels is replacement of a part of the fuel pool with low-carbon biofuels new fuel specifications have been introduced allowing higher biofuel blending than before – 10 v/v% ethanol in petrol and 7 v/v% FAME in diesel fuel.

Greenhouse gas emission reductions

Fuel suppliers will be obliged to reduce as gradually as possible life cycle greenhouse gas emissions per unit of energy from fuel and energy (greenhouse gas intensity of fuel) supplied by up to 10% by 31 December 2020, compared with the fuel baseline standard to be set later by the Commission and Member States.

In life-cycle (LC) GHG emission of fuel or energy all net emissions of CO₂, CH₄ and N₂O in all stages (extraction, cultivation, incl. land-use changes, transport, distribution, combustion) in CO₂ equivalent are calculated.

$$\text{GHG intensity of fuels} = \frac{\text{LC GHG emission of fuel or energy [kg]}}{\text{Total energy content of the fuel or energy (low heating value) [MJ]}}$$

The reduction target shall consist of:

- 6% by 31 December 2020. Member States may require suppliers, for this reduction, to comply with the following intermediate targets: 2% by 31 December 2014 and 4% by 31 December 2017;
- an indicative additional target of 2% by 31 December 2020, to be achieved through one or both of the following

methods: (i) the supply of energy for transport, supplied for use in any type of road vehicle, non-road mobile machinery (including inland waterway vessels), agricultural or forestry tractor or recreational craft; (ii) the use of any technology (including carbon capture and storage) capable of reducing greenhouse gas intensity from fuel or energy supplied;

- an indicative additional target of 2% by 31 December 2020, to be achieved through the use of credits purchased through the Clean Development Mechanism of the Kyoto Protocol, under the conditions set out in Directive 2003/87/EC.

With effect from 1 January 2011, suppliers shall report annually on the greenhouse gas intensity of fuels and energy supplied within each Member State to the authority designated by the Member State.

In formulation of the greenhouse gas reduction target there are some missing elements – the starting point for reduction, methods of calculating reductions from flaring at production sites, CCS and others. During the debate of the directive in the EU different solutions have been discussed for setting the baseline standard. What is similar in all solutions is that some kind of European benchmark – EU average, best 10 suppliers – should be taken as the bases. Two main scenarios are presented below. Pictures 2 and 3 help to understand different scenarios:

- a) The Commission identifies fixed constants as 2010 baseline for diesel fuel and petrol with no biofuel content on the bases of scientific data provided by JRC (EU Joint Research Centre) – shown with green line. Fuel suppliers will use this data for calculation of their data in the annual report. As some biofuels have lower greenhouse gas intensity than fossil fuels they can be used for meeting the reduction obligation. As demonstrated on picture 3 blending 10 volume % of rape seed biodiesel and biodiesel from waste and 10 volume % corn ethanol 5% reduction might be reached in greenhouse gas intensity (the picture is only demonstration).
- b) The other, more severe scenario – proposed by the European Parliament during the debate – would be to ask all European fuel suppliers to calculate the greenhouse gas intensity of their own

fuel mix using calculation methodology similar to the one for biofuels, pick up the best 10 suppliers and draw the 2010 cap according to their average data. The green line would be lower in this case.

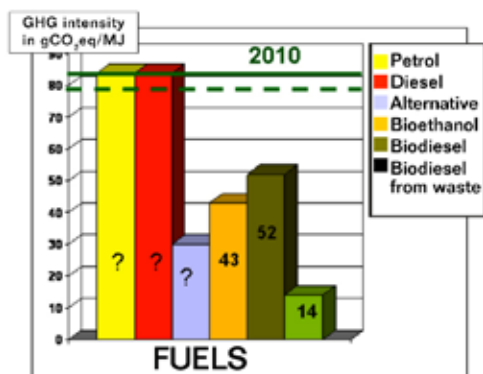


Figure 2. Greenhouse gas intensity of different fuels

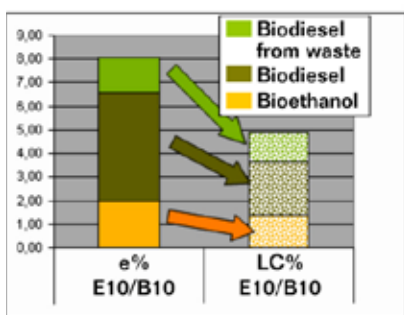


Figure 3. Reduction of greenhouse gas intensity of fuels with biofuels

Sustainability criteria for biofuels

The directive ensures that only biofuels that fulfil the sustainability criteria will be used for meeting the greenhouse gas intensity reduction target. With effect from 2010, the greenhouse gas emission saving from the use of biofuels shall be at least 35%. This means that during cultivation, transportation, production and consumption 35% less greenhouse gases are emitted than during extraction, transmission, production and consumption of fossil fuels. After 2017 it shall be 50% for existing installations and 60% for biofuels produced in installations whose production has started from 2017 onwards.

Biofuels taken into account shall not be made from:

- raw material obtained from land with high biodiversity value: (i) primary forest and other wooded land, where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed; (ii) areas designated for nature protection

purposes or areas for the protection of rare, threatened or endangered ecosystems or species recognised by international agreements; (iii) highly biodiverse natural or non-natural grassland;

- raw material obtained from land with high carbon stock: (i) wetlands; (ii) continuously forested areas; (iii) land spanning more than 1 hectare with trees higher than 5 metres and a canopy cover of between 10% and 30%;
- raw material obtained from land that was peatland in January 2008, unless it is proven that the cultivation and harvesting of this raw material does not involve drainage of previously undrained soil.

Verification of compliance with the sustainability criteria for biofuels: where biofuels are to be taken into account for the purposes of greenhouse gas emission reductions, economic operators will have to show that the sustainability criteria have been fulfilled. For this purpose they shall require economic operators to use a mass balance system. This will require a completely new certification system.

The Community shall endeavour to conclude bilateral or multilateral agreements with third countries containing provisions on sustainability criteria that correspond to those of this directive.

Calculation of greenhouse gas emissions from biofuels

The Directive lays down the rules for the calculation of life cycle greenhouse gas emissions from biofuels: it focuses on: (a) typical and default values for biofuels if produced with no net carbon emissions from land use change; (b) estimated typical and default values for future biofuels that are not or in negligible quantities on the market in January 2008, if produced with no net carbon emissions from land use change; (c) the methodology for the calculation of emissions.

The Commission shall, by 31 December 2010, submit a report to the European Parliament and to the Council reviewing the impact of indirect land use change on greenhouse gas emissions and addressing ways to minimise this impact.

At the latest in 2014, the Commission shall submit a report to the European Parliament and the Council relating to the achievement of the greenhouse gas

emission target for 2020. The Commission shall, if appropriate, accompany its report by a proposal for modification of the target.

DIRECTIVE ON RENEWABLE ENERGY SOURCES

The directive sets mandatory national targets for the overall share of energy from renewable sources in gross final consumption of energy to contribute to the EU-level 20% target and for the share of energy from renewable sources in transport. It lays down rules relating to statistical transfers between Member States, joint projects between Member States and with third countries, guarantees of origin, administrative procedures, information and training and access to the electricity grid for energy from renewable sources. It contains the same sustainability criteria for biofuels and other bioliquids as the above introduced Fuel Quality Directive.

National targets and measures for the use of energy from renewable sources

The different mandatory national targets are consistent with a target of at least a 20% share of energy from renewable sources in the Community's gross final energy consumption in 2020. Member States may inter alia apply the following measures: (i) support schemes; (ii) measures of co-operation between different Member States and with third countries for achieving their national overall targets.

The Directive sets 10 e% generally binding renewable target for energy used in transport. Based on the text the next formula can be created for calculation of the renewable energy target in transport sector:

$$\frac{2e_{w/c} + 2,5e_e + e_b + e_a + e_s}{2,5e_e + e_p + e_d} \times 100 = 10 \%$$

- $e_{w/c}$ – Biofuels from wastes, residues, non-food cellulosic material count double;
- e_e – Renewable e/c consumed by electric road vehicles shall be taken 2,5 times;
- $e_{a,es}$ – Renewables in aviation and shipping (jet and gas oil, marine fuel) count;
- e_b – Biofuels shall comply with EU sustainability criteria;
- $e_{p,ed}$ – Fossil fuels including blended biocomponents.

National Action Plans

Each Member State shall adopt a renewable energy action plan by 30/06/2010. The national renewable energy action plans shall set out Member States' national targets for the shares of energy from renewable sources in transport, electricity and heating and cooling in 2020, taking into account adequate measures to be taken to achieve these national overall targets and roadmap between 2010-2020.

Joint projects between Member States

Two or more Member States may cooperate on all types of joint projects relating to the production of energy from renewable electricity, heating or cooling. This cooperation may involve private operators. Joint projects with third countries will be also allowed.

Joint support schemes

Two or more Member States may decide, on a voluntary basis, to join or partly coordinate their national support schemes. In such cases, a certain amount of energy from renewable sources produced in the territory of one participating Member State may count towards the national overall target of another participating Member State if the Member States concerned fulfils certain conditions.

Guarantees of origin of electricity, heating and cooling produced from renewable energy sources

For the purposes of proving to final customers the share or quantity of renewable energy in an energy supplier's energy mix, Member States shall ensure that the origin of electricity produced from renewable energy sources can be guaranteed as such, according to objective, transparent and non-discriminatory criteria. Where energy suppliers are marketing energy from renewable sources to consumers with a reference to environmental or other benefits of renewable energy, Member States may require the energy suppliers to make available, in summary form, information on the amount or share of energy from renewable sources that comes from installations or increased capacity that became operational after the date of entry into force of this Directive. Member States or the competent bodies shall put in place appropriate mechanisms to ensure that guarantees of origin shall be issued, transferred and cancelled electronically and are accurate, reliable and fraud-resistant.

Access to and operation of the grids

Member States shall take the appropriate steps: (a) to develop transmission and distribution grid infrastructure, intelligent networks, storage facilities and the electricity system, in order to allow the secure operation of the electricity system as it accommodates the further development of electricity production from renewable energy sources, including interconnection between Member States, as well as third countries; (b) accelerate authorisation procedures for grid infrastructure and to coordinate approval of grid infrastructure with administrative and planning procedures.

Sustainability criteria for biofuels and other bioliquids

Energy from biofuels and other bioliquids shall be taken into account only if they fulfil criteria on sustainability.

Green shift

Analysing corporate responses to climate change one can see a green revolution, a new approach, which is based on marrying the needs of business and the environment. Corporate leaders' recognition of the dangers climate change pose to profitability and humanity is one reason behind the green shift. Another is alertness to the opportunities associated with it. These openings are divided into two categories. First, there are business opportunities associated with climate chaos and its mitigation. Secondly, as concern over climate change advances, opportunities associated with green branding swell. The EU Climate and Renewable Energy package is a step forward forcing EU industry to get "greener" as the present solutions based on the classical market philosophy are not capable confronting the scale of the problem of climate change.

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