



Answer to the European consultation

Renewable Energy Directive

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Summary

CEA welcomes the strengthening of the objectives for the deployment of renewable energies in Europe, although it regrets that these objectives do not cover all low-carbon energies. In particular, CEA would like to stress the following point of caution: although necessary, the development of renewable energies is not intrinsically sufficient to reduce fossil fuel consumption, especially if energy consumption increases or if renewable energies replace other low-carbon energies such as nuclear energy (which is the case in some countries). Achieving carbon neutrality requires first and foremost a reduction in fossil fuel consumption.

While CEA supports the definition of differentiated targets between renewable fuels of non-biological origin (RFNBOs) and biofuels, it regrets that RFNBOs only include those whose production process is based on renewable energies and not on low-carbon energies in general. This penalises the Union's climate policies.

The Guarantee of Origin (GO) system for electricity is increasingly used to trace electricity, which it was not designed to do. In order for it to fulfil this role properly, the improvement of the system needs to be tackled in the revision of the Renewable Energy Directive.

- **First, the lifetime of GOs should be reduced to one month at the earliest** (down from one year currently) to begin taking into account the difficulties of storing electricity and to encourage investment in this area.
- **Additionally, the Commission should explicitly define a timetable for the gradual reduction of the validity of GOs to 1 hour.** This is necessary to encourage investment in flexibility (demand side management, controllable electricity production and storage).
- **Exchanges of guarantees of origin between States must be limited in volume to bookings of interconnection capacities between States.** This development will make it possible to increase the value of GOs by avoiding market saturation, without any link with the reality of physical electricity exchanges.
- **The system of guarantees of origin must be opened to all energies and the issuance of guarantees of origin and their transfer to the final consumer must become mandatory.** This would improve transparency for the consumer and allow him/her to choose which energies he/she wants to support (the primary objective of the guarantee of origin system). Finally, it would allow low-carbon electricity to be channelled to electrolyzers to produce low-carbon hydrogen.
- **Guarantees of origin must include information on the CO₂ emissions of the guaranteed electricity,** again for the sake of transparency to consumers.

CEA welcomes the Commission's reopening of the Renewable Energy Directive. In addition to updating this directive to align it with the Union's new climate objectives, a modernisation of this text is necessary. While this modernisation is relatively complete (although some points may be debatable)

as regards to the inclusion of new technologies such as hydrogen, other essential points have not been corrected. First, the correction of the electricity guarantee of origin mechanism. Currently dysfunctional, this mechanism allows any electricity to be labelled as renewable, without providing any incentive for the development of flexibilities (supply, demand and storage side), which must necessarily accompany the deployment of renewable energies.

1. Renewable energies should be used as a priority to replace fossil fuels

CEA welcomes the strengthening of the targets for the deployment of renewable energies in Europe, although it regrets that these targets do not cover all low-carbon energies.

However, raising the target for the percentage share of renewable energies in the European energy mix is not intrinsically sufficient to ensure that the EU's climate objectives are met. Indeed, in order to achieve a 55% reduction in greenhouse gas emissions in 2030 compared to 1990, the European Union will have to significantly reduce its consumption of fossil fuels (at least when not equipped with carbon capture and storage mechanisms). However, it is quite possible to imagine a stagnation or a too slow decrease in the absolute consumption of fossil fuels, while witnessing an increase in the share of renewable energies. This would be possible if energy consumption were to increase and/or if renewable energies were to substitute other low-carbon energies such as nuclear (as is the case in a number of Member States) rather than fossil fuels.

It is therefore important to ensure that the development of renewables (and low-carbon energy in general) is a substitute for fossil fuel consumption.

2. Liquid and gaseous fuels

Extreme caution should be exercised when encouraging the use of biofuels. Their impacts on the climate and the environment strongly depend on their origin and can be particularly high: incentive to deforestation (local and imported), competition with food crops, competition of use with livestock farming or other sectors of the bio-economy, contribution to soil artificialisation, rapid release into the atmosphere of carbon that will at best be restocked over several decades in the case of forest biomass (second generation biofuels), etc.¹

Thus, the use of biofuels should only be encouraged when there are solid and verifiable criteria for their production. In this respect, the import of vegetable oils for biofuels must not be a means of relocating and masking these impacts.

CEA welcomes differentiated targets for non-biological biofuels and renewable fuels. Indeed, the latter will probably be more expensive, at least initially, and such support is necessary to enable these sectors to develop and reduce their costs. Given the warnings of various research bodies and associations about the limits of the European biomass resource to meet the combined needs of Member States for bioenergy (including biofuels) and carbon neutrality objectives, these non-biological renewable fuels could play a major complementary and alternative role while reducing the pressure on the biomass resource.

The Commission proposes a target of 2.6% in 2030 (Article 25) for the share of RFNBOs in the transport sector in 2030. **The addition of an intermediate target for 2025 would be desirable.**

The CEA regrets that synthetic fuels of non-biological origin are limited to those produced from “renewable” energies only (in particular in Article 25). The Commission states in the draft revised directive that this choice is explained in particular by the higher potential of renewable fuels. This is an opinion (not a fact) that the CEA does not necessarily share:

- all low-carbon energies will be necessary for the Union to achieve its climate objectives, as Commissioner Thierry Breton made clear on 31 August, as did the French electricity grid operator, RTE, in its Energy Futures 2050 published in October 2021;
- by limiting synthetic fuels to renewable energies only, production will have to follow the load factor of wind turbines and photovoltaic panels, which will lead to a sub-optimal use of electrolyzers intended for the production of hydrogen, thus to additional costs (for an already expensive energy vector) and to a reduced production compared to the installed electrolysis capacity;
- the volumes of synthetic fuels demanded by the aeronautical and maritime sectors will be such that renewable capacities alone will have difficulty in meeting the energy needs required for the production of these fuels. Moreover, considering that the notion of additionality implies a deployment of renewable capacities dedicated to the production of RFNBOs. The implementation time of renewable capacities might not follow the demand for RFNBOs of the sectors concerned, which is constrained by their respective decarbonisation obligations;
- synthetic fuels can play a dual role in achieving carbon neutrality targets provided their deployment is rapid: (i) by contributing to the rapid decarbonisation of sectors in transition by supplying molecules identical to their fossil equivalents, as some sectors require several years before adapting their processes and products to the new low-carbon energy carriers (electricity, hydrogen, etc.) (ii) by making a lasting contribution to the decarbonisation of sectors for which other decarbonisation energy carriers will remain difficult to use effectively (insufficient volumetric energy density compared to synthetic hydrocarbons, for example), particularly for long-haul air transport and maritime freight transport.

CEA suggests that, in addition to biofuels and RFNBOs, the potential role of hybrid fuels based on both biological resources and renewable energy should be considered and recognised.

Some advanced biofuels produced by processes such as the Fischer-Tropsch process for gasifying lignocellulosic biomass residues are already certified by ASTM as Sustainable Aviation Fuels (SAF) and are under-used. Indeed, the composition of biomass is not fully balanced to produce biofuels by fully valuing the biogenic carbon and hydrogen it contains. Due to a higher stoichiometric share of carbon, the latter is not fully recovered and emitted as CO₂ by such installations. Nevertheless, there is a relevant way to valorise this concentrated biogenic CO₂ already captured in the process, which consists in adding renewable or low-carbon hydrogen to this bio-process to rebalance the conversion reaction and produce a fuel valorising the totality of the carbon coming from the biomass^{ii,iii}.

By their definition, which depends on the origin of the energy needed to synthesise them, biofuels and RFNBOs do not include hybrid fuels that rely on both biomass and non-biomass renewable energy. In this respect, and in the interest of an optimal use of biogenic carbon and exploited biomass for the decarbonisation of industry and transport, these hybrid fuels should be recognised as “electro-

biofuels" so that they can benefit from the same support and requirements on their LCA (emission reduction) as biofuels and RFNBOs.

CEA invites the Commission to define a specific framework for low-carbon fuels of non-biological origin, possibly in a text other than that of the renewable energy directive. As these fuels can meet the same life cycle environmental requirements as RFNBOs, they will have a role to play in the decarbonisation of our economies.

CEA is opposed to the Commission's proposal (article 22a) to require Member States to ensure that RFNBOs used as final energy and non-energy uses account for 50% of hydrogen used as final energy and non-energy use in industry. Indeed, some Member States such as France envisage a significant role for low-carbon hydrogen (produced notably from nuclear energy). This constraint on RFNBOs should therefore concern 50% of renewable hydrogen (and not hydrogen in general) used as final energy and in industry.

Synthetic fuels (RFNBOs and low carbon fuels of non-biological origin) should not be used as a priority in light mobility. Indeed, other more efficient decarbonisation options are available for light mobility (e.g. batteries). In addition, the limited supply of synthetic fuels and biofuels will be necessary (and probably insufficient) to ensure the decarbonisation of certain industrial sectors and heavy mobility, which do not have other decarbonisation options.

3. Guarantee of origin mechanism for electricity

In order to enable consumers to support renewable energies, a "guarantees of origin" (GO) mechanism has been set up, allowing for the contractual tracing of electricity (only renewable). This mechanism is supposed to provide, through the sale of certificates, financing for renewable energies that is complementary to that granted by the States via remuneration supplements. This is an important aspect: the GO mechanism is designed as a support for renewable energies, which works by contractually linking renewable production to consumption in return for payment^{iv}. It was not designed to provide physical tracing^v.

Functioning of Guarantees of Origin

The operator of a renewable generation unit produces electricity and certificates guaranteeing the origin of this electricity. Both can be traded independently^{iv}. The origin of the electricity purchased is therefore not correlated with the origin of the certificates that guarantee its origin (except for the voluntary initiative of some renewable energy producers/suppliers who decide to sell their electricity and their certificates together). In other words, a producer can sell his electricity to an electricity supplier in his country and his certificates to another electricity supplier, in his country or elsewhere in Europe. In addition, the certificates are valid for one year^{vi}.

So, to take an example, electricity consumed at 7pm on 15 December in the east of the European Union, whatever its physical origin, can be guaranteed to be of renewable origin thanks to a certificate issued at noon the previous summer by a solar photovoltaic installation in the south of the European Union.

4. Limits of the Guarantee of Origin mechanism

One-year validity

Thanks to this mechanism, an electricity supplier can offer its customers "100% renewable" contracts. To do so, it is subject to two conditions:

- firstly, it must obtain electricity from any producer by calling on a balance manager responsible for ensuring that the electricity purchased from the producer converges with that requested by the consumer at all times. This real time balance will be ensured by pilotable installations, mainly fossil and nuclear, even if hydropower (renewable) also contributes;
- on the other hand, it must buy enough guarantees of origin on the European market to cover all the "100% renewable" certified electricity it will have sold. These guarantees will ensure that at least the same amount of renewable electricity as is sold is fed into the European grid during the year.

Thus, the burden of managing intermittency is not the responsibility of the supplier of a "100% renewable" contract. It is transferred to the European controllable electricity system. **This mechanism does not oblige nor encourage the supplier to invest in the flexibility means (storage capacities, demand flexibilisation and controllable electricity production capacities), which would be necessary to be able to physically meet the instantaneous demand of its customers thanks to renewable electricity.**

Therefore, the current mechanism of guarantees of origin does not contribute to building a stable low-carbon electricity system, in which supply and demand would evolve together. On the contrary, by denying the need for flexibility, it conceals the difficulties linked to the real-time balancing of the network. This truncated signal can lead States, companies and individuals to consider unrealistic decarbonisation pathways, resulting in a continued long-term dependence on fossil fuels.

In some extreme cases, the current system of guarantee of origin can lead to effects contrary to the very objective of decarbonisation. For example, if hydrogen were to be produced in a country with a high carbon power mix, its carbon intensity could be higher than hydrogen produced by steam methane reforming. However, this hydrogen could be labelled as "renewable" through the purchase of guarantees of origin for the electricity used to produce it.

Guarantees of origin serve as a virtual storage of renewable electricity, free of charge because its cost – to accommodate injections of intermittent electricity not correlated to demand that electricity suppliers must meet – is passed on to the taxpayer^{vii} and to the operators of the controllable power capacities present on the grid.

In order to alleviate this problem, CEA requests that the lifetime of guarantees of origin be reduced to one month as soon as possible in Europe, at least for the AIB member countries¹. This measure is not very restrictive, is realistic (France has already implemented it) and will send a signal to electricity

¹ AIB : Association of Issuing Bodies.

suppliers that they need to gradually start considering the instantaneous adjustment of their customers' demand with the supply they are committed to provide.

In parallel, CEA requests that a trajectory for the progressive reduction of the lifetime of guarantees of origin (month, then week, then day, then hour) be announced, with a timetable. This will give visibility to electricity producers and suppliers as well as to industries in order to encourage them to put in place flexibility solutions. This gradual trajectory will give them time to adapt electricity production, storage and contracts in order to develop flexibilities that will enable them to maintain consistency between electricity supply and demand in a context of decarbonisation.

Guarantees of origin should ultimately be valid only for the very hour at which they were issued. Thus, in order to assure a customer that the electricity consumed on a windless night is indeed renewable, the supplier would be obliged to invest or to encourage investments in controllable renewable capacities (hydro, etc.), the flexibilisation of the demand of its customers and/or storage. Only an hourly time step will allow the need for flexibilities to be properly taken into account down to the intraday scale.

Double counting?

In countries with an electricity mix with a high share of renewables, the population does not necessarily demand the guarantees because they know that the electricity physically comes from renewables. Guarantees that are not requested can therefore be – and in fact are – sold elsewhere in Europe (see Figure 1). Thus, while one consumer may think he/she has renewable electricity (physical link), it is another one, elsewhere in Europe, who can legally claim it if he/she has purchased the guarantees of origin. While there is no double counting as such, the current scheme leads to confusion between the perception of a renewable electricity supply by consumers (backed by a physical reality) and its formal character. Paradoxically, some countries with a very high penetration of renewables in their mix should only be able to claim this if they have the corresponding guarantees of origin.

To limit this phenomenon, international intra-European trade of certificates should be limited to the volumes of interconnections reserved. Thus, a country could not sell more certificates than its electricity interconnections allow. This would also make it possible to limit the quantity of certificates available on the European market and to increase their value (currently very low, which makes them of little use in terms of their primary function, which is to provide financial support to renewable energy).

Supply of Guarantees of Origin by countries 2011-2018

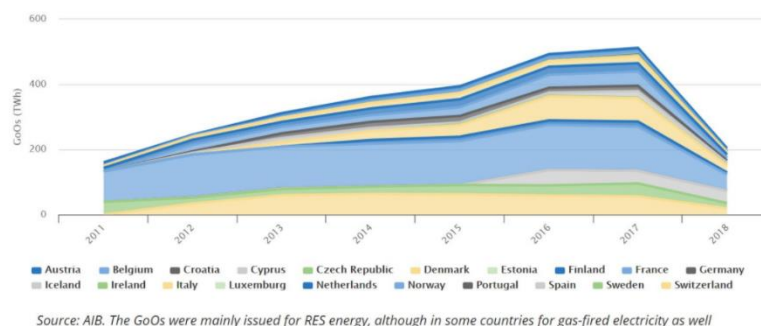


Figure 1 - Country of origin of guarantees of origin traded on the European market (source: ICIS)

Extend the scope of guarantees of origin to all sources of electricity

Guarantees of origin currently only concern renewable energy. Considering that they are increasingly used to trace the origin of electricity in order to claim a given consumption, **this system should be extended to all sources of electricity** (renewables but also nuclear, coal, gas and fuel oil), **while making it compulsory to generate certificates at the time of electricity production and to transmit them to the final consumer.**

This would guarantee **the traceability of electricity and the transparency of the market.** The final consumer would be able to know the breakdown by origin of the electricity supplied to him/her. Thus, consumers in countries with a predominantly renewable mix would see that if they do not request the guarantees of origin associated with their country's electricity production, the residual mix supplying them with electricity may be highly carbon intensive.

To ensure full transparency, **guarantees of origin should also include information on the carbon content on the standardised life cycle of the electricity they guarantee.** This would allow the final consumer to know the total emissions resulting from the choices made by his/her electricity supplier, which may themselves be guided by his supply contract.

It should be noted that such a development would not take away the primary function of supporting renewable energies which was at the heart of the guarantee of origin mechanism. On the contrary, it would strengthen it. Access to information on the origin of the electricity consumed would encourage consumers to request guarantees of origin (renewable or low-carbon) to reduce their carbon footprint, which would increase their value. Indeed, a consumer who does not request guarantees of origin would receive by default the guarantees that have not been requested, i.e. *a priori* those covering electricity produced from fossil fuels.

Such a system would ensure transparency for the consumer as to the origin of the electricity he buys and the related carbon content, while at the same time strengthening his freedom to support or not to support this or that energy via the categories of guarantees of origin he could request.

Guarantees of Origin and the Emergence of a Hydrogen Industry

In their current format, guarantees of origin, because they are tradable without limit in Europe, would allow the use of electrolyzers to produce “renewable” hydrogen anywhere, even in countries where the electricity mix is highly carbon intensive. Valid for one year, guarantees of origin mask the problem of intermittence. Electrolyzers producing hydrogen labelled as “renewable” would be able to do so with a high load factor, incompatible with what wind and solar production would physically allow.

To avoid this, the Commission is considering setting up a strict electricity tracking mechanism, with a time step of 15 minutes, and a geographical constraint between electricity and hydrogen production.

Creating a double system of guarantees of origin for electricity – one for the general case and one for hydrogen – is not the right approach:

- the new system would not correct the flaws of the first one which would remain applied everywhere (except for hydrogen production);
- the differentiated treatment between hydrogen production, which would be subjected to a functional and rigorous mechanism, and other industries, which would continue to be

subjected to a deficient mechanism, constitutes a lasting breach of equity between industrial sectors and does not meet the requirements of technological neutrality;

- the multiplication of certification systems induces an additional degree of complexity, whereas a single, corrected system would offer far greater benefits for the electricity system.

CEA therefore requests that the origin of electrolytic hydrogen be determined thanks to the electricity guarantee of origin mechanism, corrected thanks to the proposals in the previous section so that it takes into account the need for spatial and temporal coherence between electricity production and consumption. This need is general to the electricity system. It is not specific to hydrogen production alone.

However, in the case of hydrogen, the guarantees of origin of the electricity used should have a one-hour validity from the start. This will prevent the hydrogen industry from being structured around unsustainable business models that would then be difficult to challenge: i.e. producing hydrogen continuously, independently of the instantaneous low-carbon electricity production.

Furthermore, using the guarantee of origin system while limiting the lifetime of hydrogen to one hour would send a signal to other users of guarantees of origin that the hourly time step is the horizon towards which this system should move.

Finally, the CEA reiterates its call not to limit hydrogen and derived fuels to renewable production alone but to consider all low-carbon energies. Firstly, this is within the right of Member States to decide on their energy mix. Secondly, it will increase the speed and chances of success of decarbonisation by offering a less restrictive range of available energies. Finally, by confining itself to renewable energies only, hydrogen production will be more limited – which will constrain its uses, and therefore its decarbonisation potential – and its cost will be higher due to a less optimised use of electrolyzers. CEA would like to stress the need to limit hydrogen price escalation the confinement to renewable energies would induce, as the issue of competitiveness is already a major obstacle to its deployment.

ⁱ Searchinger, T.D., Beringer, T., Holtsmark, B. et al. Europe's renewable energy directive poised to harm global forests. *Nat Commun* 9, 3741 (2018). <https://doi.org/10.1038/s41467-018-06175-4>

ⁱⁱ G. Boissonnet, 'Coupling electricity and biomass to biofuels increase performances in mobility. An overview in Europe (1BP.1)', presented at the 27th European Biomass Conference & Exhibition EUBCE, Lisbon, May 2019.

ⁱⁱⁱ E. Peduzzi, G. Boissonnet, G. Haarlemmer, and F. Maréchal, 'Thermo-economic analysis and multi-objective optimisation of lignocellulosic biomass conversion to Fischer-Tropsch fuels', *Sustain. Energy Fuels*, vol. 2, no. 5, pp. 1069–1084, 2018, doi: 10.1039/C7SE00468K.

^{iv} OJEU, Directive of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources, L 328/117, article 19: "To that end, Member States shall ensure that a guarantee of origin is issued in response to a request from a producer of energy from renewable sources, unless Member States decide, for the purposes of accounting for the market value of the guarantee of origin, not to issue such a guarantee of origin to a producer that receives financial support from a support scheme."

^v OJEU, Directive of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources, L 328/90, recital 55: "A guarantee of origin can be transferred, independently of the energy to which it relates, from one holder to another."

^{vi} OJEU, Directive of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources, L 328/118, article 19: "For the purposes of paragraph 1, guarantees of origin shall be valid for 12 months after the production of the relevant energy unit. Member States shall ensure



that all guarantees of origin that have not been cancelled expire at the latest 18 months after the production of the energy unit."

^{vii} This term covers both the legal or natural person paying taxes. Before 2017, subsidies to RE in France came from the "Contribution au service public de l'électricité (CSPE)", a tax on electricity. Between 2017 and the end of 2020, they were taken from the TICPE, a tax on petroleum fuels. Since 2021, there is no longer any earmarking; the subsidies for renewable energies are financed directly by the State budget.