A brief assessment of the proposed methodological changes for the RED and FQD

Memo
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1 Introduction

On October 17th, the European Commission has published the final proposal for a Directive of the European Parliament and of the Council amending the Renewable Energy Directive (RED) and the Fuel Quality Directive (FQD). Among other things, this proposal contains some changes in the original calculation methodology of the RED and FQD in order to take into account indirect land use change (to a limited extent) and to stimulate the use of biofuels from waste and residues.

In the following pages we will explore the consequences of the proposed changes based on model calculations as also has been done for the original RED and FQD methodologies in the study 'Sustainable alternatives for land-based biofuels in the European Union'.

In this memo, we focus on the following changes that were proposed:

- The maximum joint contribution from biofuels and bioliquids produced from cereal and other starch rich crops, sugars and oil crops shall be **no more than 5%**, the estimated share at the end of 2011, of the final consumption of energy in transport in 2020.
- Biofuels produced from certain types of waste and residues (Part A of Annex IX) and renewable liquid and gaseous fuels of non-biological origin shall be considered to be **four times** their energy content.
- Introduction of the reporting of **estimated emissions from carbon stock changes caused by indirect land-use change** for the purposes of the calculation of the life cycle greenhouse gas emission savings from biofuels and bioliquids, as reported by Member States in Article 22.

2 Scenarios

Four scenarios were designed, as depicted in Table 1. For these, the following impacts are calculated:

- Required biofuels from waste and residues to meet the 10% target.
- Contribution to the FQD target.
- GHG emission savings.

Table 1 Definition of scenarios

	0% energy demand reduction	15% energy demand reduction
0% land-based biofuels	**Scenario 1a**	**Scenario 2a**
5% land-based biofuels	**Scenario 1b**	**Scenario 2b**

In all scenarios, it is assumed that

- All biofuels from waste and residues (i.e., all biofuels that are not land-based) will count four times towards the target. This is quite optimistic, as most current biofuels from waste and residues (mainly biodiesel from UCO) will be counted double also in the new methodology.
- Scenarios 1b and 2b assume that no land-based bioliquids are deployed to meet the overall RED target.
- The contribution of renewable electricity is estimated based on the current electricity demand (mainly for rail transport) and the expected

share of renewable electricity in 2020. Renewable electricity in non-road is taking into account using the RED methodology, i.e. no multiplication factor is applied here.

3 Scenario 1: 0% energy demand reduction

This scenario shows the quantity of biofuels needed if no additional measures are taken to reduce the energy demand in the transport sector. In this case, total EU road transport energy demand is expected to be about 11,500 PJ in 2020.

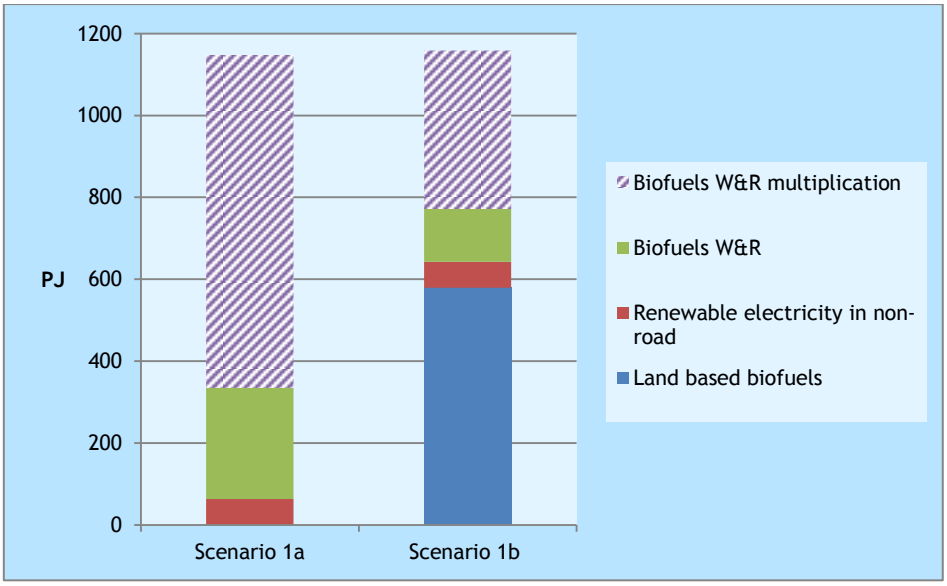
Required PJ from waste and residues
As can be seen in Table 2, 271 PJ of quadruple counting biofuels from waste and residues are needed when no land based biofuels are counted towards the target. In case 5% of land-based biofuels is also counting for the target (579 PJ), only 129 PJ from waste and residues are required.

Table 2 **Scenario 1 - required biofuel quantities**

	Scenario 1a	Scenario 1b
Land based biofuels (PJ)	0	579
Biofuels W&R (PJ)	271	129

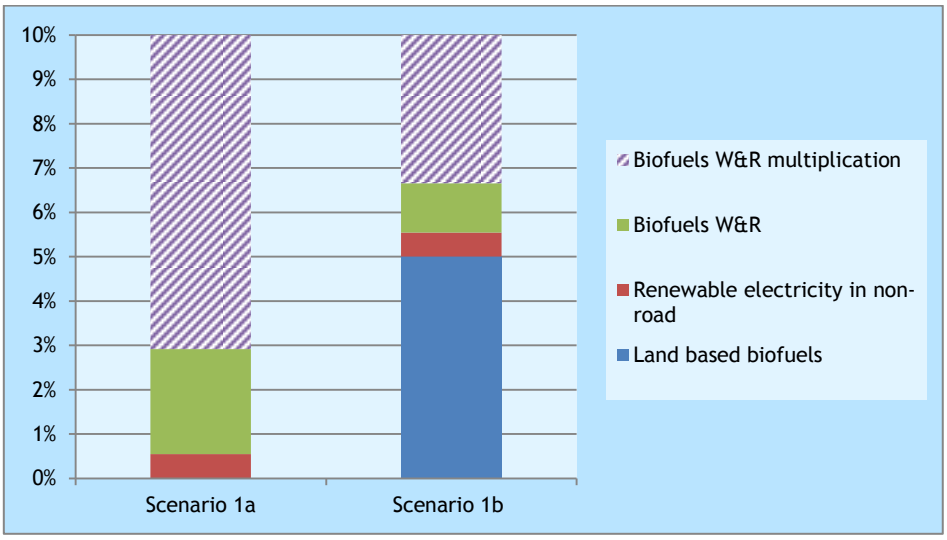
Figure 1 clearly shows the differences in renewable energy counting for the target between the two scenarios. Renewable electricity in non-road (rail) is included, because the electricity mix contains a share of renewable electricity, which also counts towards the target (see the assumption above).

Figure 1 **Scenario 1 - required PJ to meet the RED target**



In Figure 2 the relative contribution to the RED target is depicted. In Scenario 1a, around 7% of the RED target consists of administrative PJs as result of the quadruple counting of biofuels from waste and residues. In scenario 1b this is much less, about 3.5%.

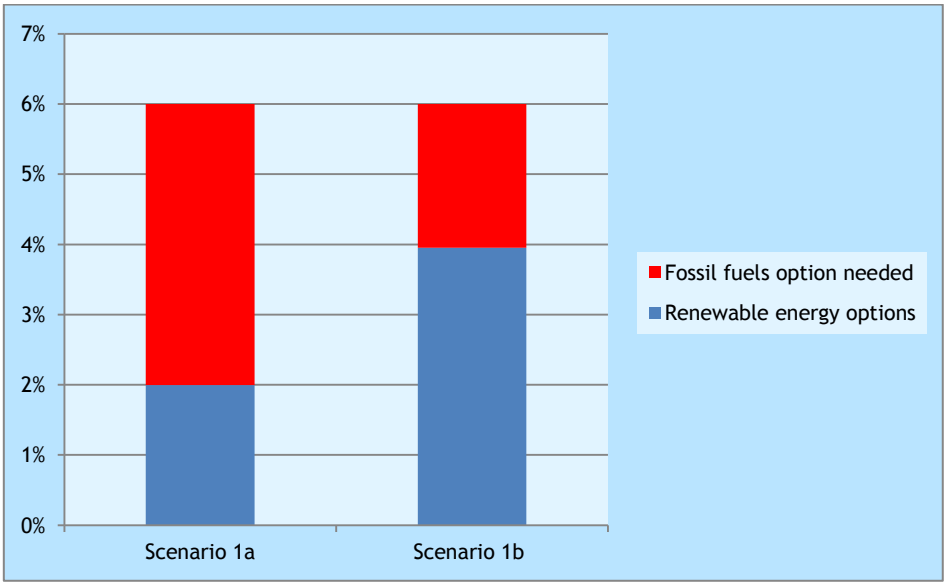
Figure 2 **Scenario 1 - contribution of renewable energy sources to RED target**



Contribution to the FQD

The large share of administrative PJ counting for the target consequently results in a low contribution to the FQD where the multiplication factors do not apply. Scenario 1a results in a contribution to the FQD target of only 2%, while scenario 1b results in almost a double contribution of 4%. In both scenarios fossil fuel options are needed to meet the 6% target.

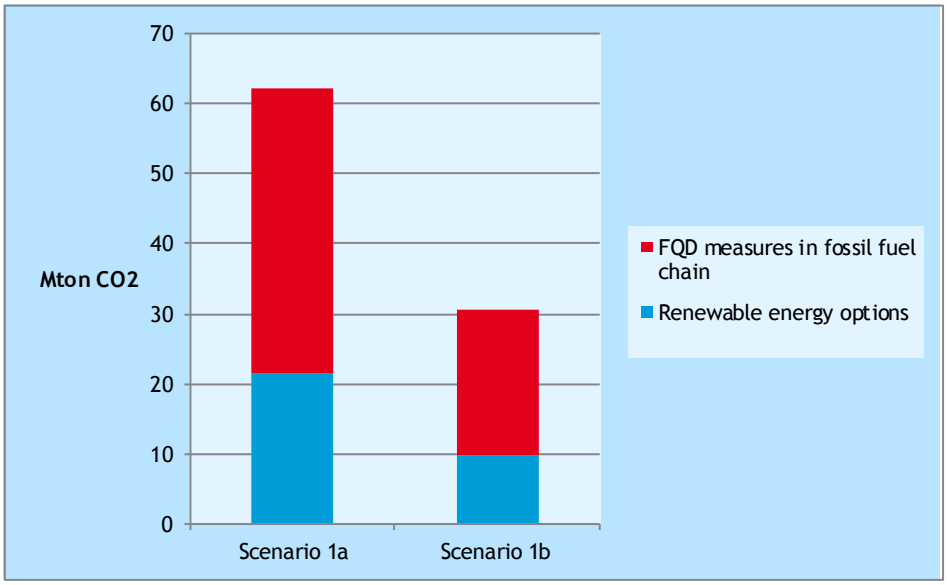
Figure 3 **Scenario 1 - contribution to FQD target**



CO_2 reduction

Although the contribution to the FQD target is related to the actual GHG emission savings, Figure 4 shows higher CO_2 emissions savings for Scenario 1a compared to Scenario 1b. This can be explained by the ILUC emissions, which are taken into account in Figure 4 and have not been taken into account in Figure 3 (as they have not been included in the FQD calculation methodology, only in the Member State reporting).

Figure 4 **Scenario 1 -Total GHG emission savings**



4 Scenario 2: 15% energy demand reduction

The difference between Scenario 1 and Scenario 2 is the transport energy demand: Scenario 2 assumes a transport energy demand reduction of 15%, compared to Scenario 1. The results for this scenario are presented in this section.

Required PJ from waste and residues

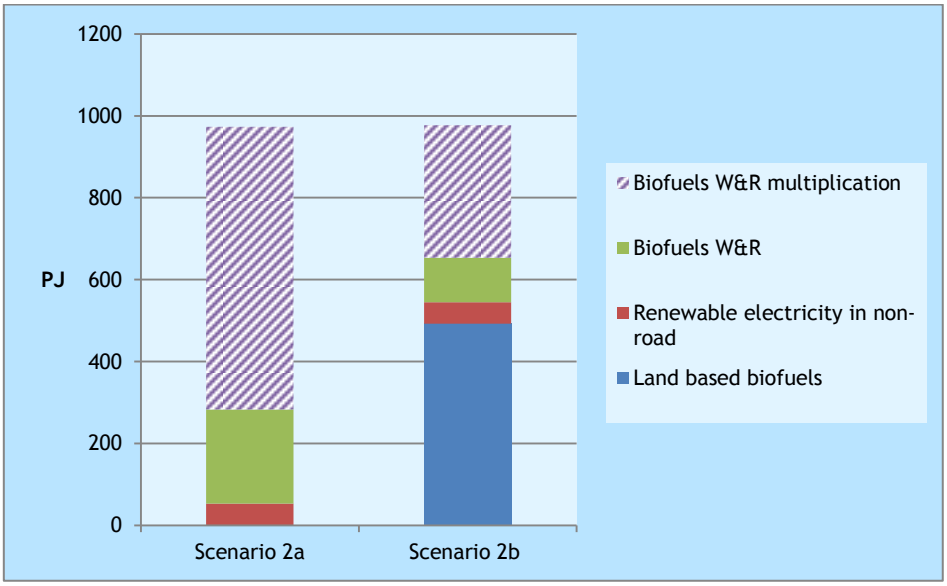
Because the 5% share of land-based biofuels changes as result of the energy demand reduction, less land-based biofuels are needed in Scenario 2b than in Scenario 1b: 492 PJ compared to 579 PJ in Scenario 1b. The reduced energy demand also influences the required biofuels from waste and residues: 230 PJ are required in scenario 1a, while only 108 PJ are required in scenario 1b (again, assuming quadruple counting).

Table 3 **Scenario 2 - required biofuel quantities**

	Scenario 1a	Scenario 1b
Land based biofuels (PJ)	0	492
Biofuels W&R (PJ)	230	108

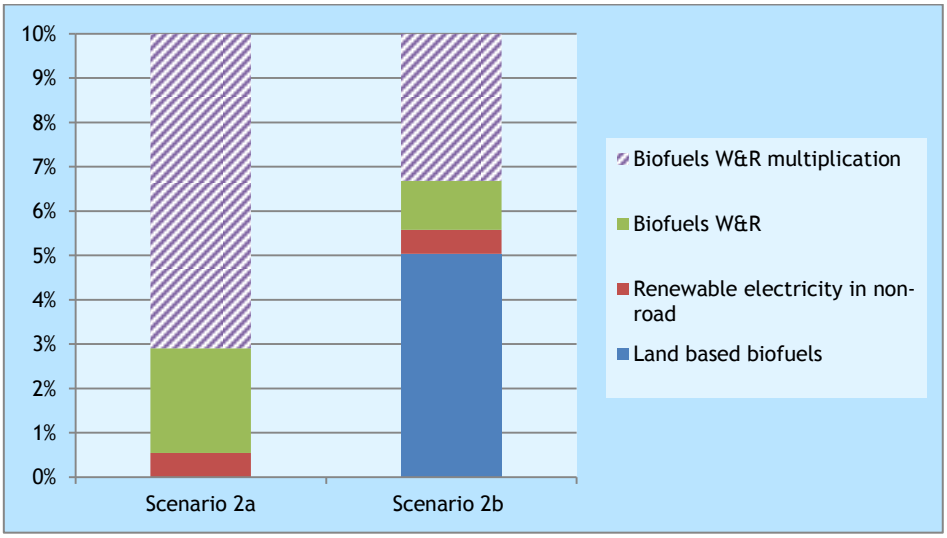
In Figure 5 the contributions of the various measures towards the RED target are depicted for scenario 2a and 2b.

Figure 5 **Scenario 2 - required PJ to meet the RED target**



Because the only difference between the Scenarios 1 and 2 is 15% transport energy demand reduction, the relative contribution of the various renewable energies, shown in Figure 6, is equal to Figure 2. Absolute quantities are lower due to the energy reduction, but the relative shares remain the same.

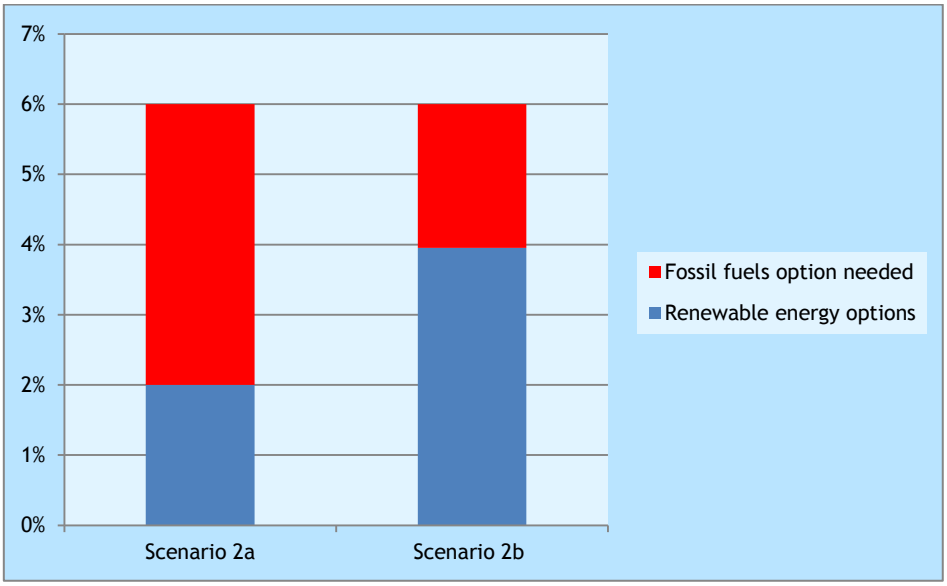
Figure 6 **Scenario 2 - contribution of renewable energy sources to RED target**



Contribution to the FQD

For the same reason, the contribution to the FQD target is also very similar to the contribution in Scenario 1.

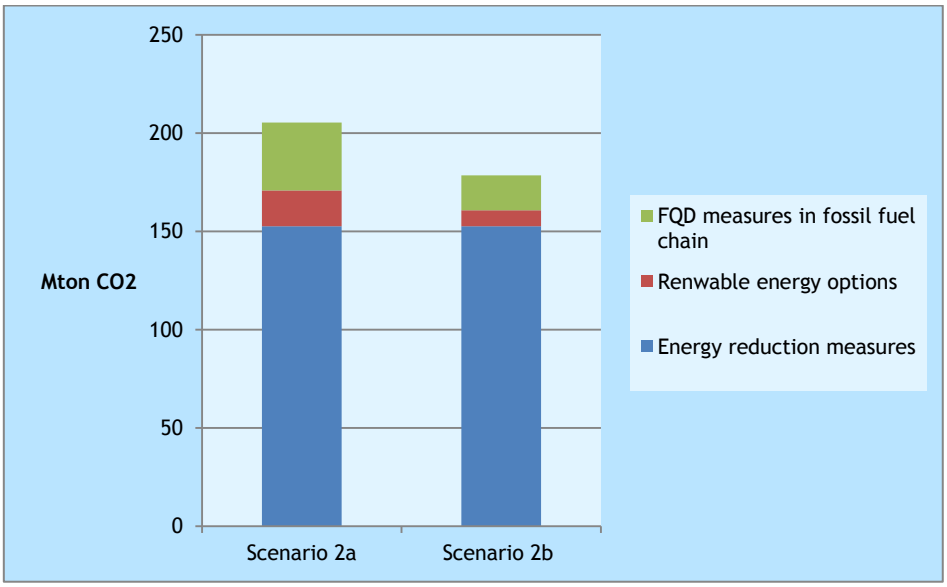
Figure 7 **Scenario 2 - contribution to FQD target**



CO_2 reduction

However, the CO_2 reduction of Scenario 2 is far larger than that of Scenario 1: the main reason for this are the emissions saved by the 15% energy demand reduction (around 150 Mton CO_2). The GHG emissions saved by the renewable energy options are lower compared to Scenario 1, because less renewable energy is needed in Scenario 2 to meet the RED target.

Figure 8 **Scenario 2 - GHG emission savings**



5 Conclusion

Based on the outcomes of Scenario 1 and 2 the following conclusions can be drawn:

- If a large share of the non-land-based biofuels would be quadruple counting, a very significant part of the RED target will be fulfilled in an administrative way. This negatively affects the actual GHG emission savings.
- The quadruple counting has the potential to significantly reduce the renewable energy volumes needed to meet the RED target and therefore the GHG emissions savings achieved by the renewable energy. The latter effect, however, appears to be compensated adequately through the
- FQD target: if the renewable energy contributes less to this target, more alternative GHG reduction measures will need to be deployed.
- Since ILUC factors are not included in the RED and FQD methodologies, the actual GHG emission savings of the land-based biofuels are likely to be limited in practice.