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Renewables in Transport: Directive 2009/28/EC – Devils in its Details

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This paper examines EC Directive 2009/28/EC from the perspective of renewables in the Transport sector. It identifies inconsistencies within the sector in general, and specifically related to Electric Vehicles, and recommends some potential solutions.

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Introduction

As part of the 3*20 targets reached in December 2008, the EC decided that the EU should, by 2020, source 20% of its Final Energy Consumption (FEC) renewably. Working towards this aim should in general contribute to the primary objective of reducing emissions, but there are two major issues with the implementation of the target in the Transport sector which run the risk of being irrelevant or even counterproductive. Firstly, the constraining stipulation that all Member States should source 10% of their Transport sector FEC renewably will be a struggle for some Member States to achieve, forcing them to invest large amounts of money which would be better spent elsewhere. Secondly, the relevant legislation gives unrepresentative weight to the benefits of Electric Vehicles (EVs[1]), meaning that Member States which invest in EVs may give the illusion of having reached their national renewable targets without actually having done so.

This paper is based on EC Directive 2009/28/EC (henceforth referred to as 'the Directive') and the National Renewable Energy Action Plans of Denmark, France, Germany, Italy, Spain, and the UK which were submitted in response. Each EU Member State has an individual target for the proportion of its FEC which is to come from renewable sources in 2020. The targets are based on the countries' existing renewable shares (as shown in Table 1 below) and their supposed capacity for improvement. Together, they give an average EU-wide target of 20% across the 27 Member States.

[1] N.B. The term 'Electric Vehicles' in this paper refers to all electrically-powered transport, not just cars.

Table 1: the six Member States studied and their respective renewable energy targets

	Denmark	France	Germany	Italy	Spain	UK
A) RE share of the total FEC in 2005 (%)	16.5	9.6	5.8	4.9	8.7	1.3
B) Target RE share of the total FEC for 2020 (%)	30	23	18	17	20	15

Source: compilation of statistics from respective National Renewable Energy Action Plans of the Member States

The paper first examines the 10% Transport sector sub-target and concludes that it would, in many cases, entail too much effort for too little gain. It then investigates the legislation associated with electric transport and points to several ways in which the environmental contribution thus attributed to EVs is unrepresentative and illusory. As a result of its findings, this paper suggests that the 10% target be abolished; that EV regulations be brought in line with the rest of the sector; and, at the very least, that any future legislation giving further weight to EVs, such as that planned for the end of 2011, be rejected.

The Transport sector and the 10% subtarget

The Directive divides a country's FEC into three sectors: Heating and Cooling, Electricity, and Transport.[2] It does not, however, stipulate exactly how each country should break down future renewable contributions by sector; a country can therefore choose to make disproportionate progress in the Heating and Cooling sector, for example, at the expense of renewable Electricity generation, as long as the nation as a whole meets the target.

The one exception to this is that each Member State must have at least a 10% renewable-sourced Transport sector by 2020, regardless of its overall target.[3] Although this is a significantly lower figure than most Member States' overall targets, even the countries with the highest targets are planning to only just meet or slightly exceed this figure,[4] suggesting that Transport is a difficult sector in which to increase renewables and the 10% stipulation is therefore a very real burden on the Member States.

The table in Annex 1 shows the size of Transport sector FEC for the six Member States in 2005, and the projections for 2020, both in absolute terms and as a percentage of each country's total FEC. It also shows how much of each country's Transport FEC was renewably-sourced in 2005, and the renewable proportion each country hopes to achieve in 2020.

What stands out is that all six of the featured Member States are expecting to hit an RE proportion in the Transport sector of between 10%-14%: a much narrower gap than the overall targets, which range from 15%-30%, suggesting that the 10% Transport target is considered a difficult one to meet. Furthermore, unlike with the RE targets at large, this 10% obligation is not modified according to prior accomplishment, so countries like Germany (3.9% renewable Transport in 2005) will find this target far easier to meet than Denmark or the UK (each with 0.2% renewable Transport in 2005).[5] Facing such a disadvantage, Member States such as Denmark or the UK may find themselves forced to exploit the artificially high EV values outlined below, even if this ultimately works against their greater interests and obligations.

[2] Article 4.1. N.B. For clarity, the name of the sectors will be capitalised throughout this paper.
[3] Article 3.4
[4] See Denmark or France, for example, in Table 2, Annex 1
[5] N.B. even though Germany is aiming for a 13.2% renewable proportion, representing an increment of almost 10%, the fact that it already sources 3.9% of its Transport sector FEC renewably suggests that it already has some infrastructure in place which will make it easier to achieve the target.

Problems relating to electric transport

Calculating the contribution of electric vehicles is complicated. In fact, when the EC first began considering the plan in early 2007 (and with it, the 10% requirement for the Transport sector), it disregarded electric transport and aimed simply for a 10% biofuel component in vehicle fuel by 2020.[6] This would have been calculated by the following relatively simple equation:

$$\frac{\text{Biofuels}}{\text{All Vehicle Fuels (= Petrol + Diesel + Biofuels)}}$$

This target – essentially, to increase biofuel market share from its 2006 level of 2%[7] right up to 10% by 2020 - was broadly criticised by environmental groups,[8] many of which claimed that biofuels (particularly those of the first generation), although burning cleanly, had a significant negative impact on the environment at other stages, such as their cultivation, and thus did not so much solve the problem as move it elsewhere.

In the face of this criticism, the EC set out stringent measures in the Directive to ensure the environmental credentials of biofuels used – something which is beyond the scope of this paper.[9] Furthermore, in response to a growing interest in electric transport, it expanded the 10% requirement from fuel-driven vehicles to the entire Transport sector, essentially including all electrically-powered modes of transportation (cars, trains, trams *et al.*). However, as not all electricity is renewably sourced, the consumption of EVs would be counted in the same proportion as "the average share of electricity from renewable energy sources in the Community *or* the share of electricity from renewable energy sources in their own country as measured two years before the year in question",[10] depending on which is most advantageous. In the case of electric road vehicles only, presumably as an incentive for development of this technology, the renewables proportion was to be multiplied by 2.5.[11] The current equation, therefore, looks like this:

$$\frac{\text{Biofuels} + (\text{Off-road electric transport} * \text{Renewable proportion of Electricity sector}^{\dagger}) + 2.5(\text{Electric road transport} * \text{Renewable proportion of Electricity sector}^{\dagger})}{\text{Total FEC in Transport (= Petrol + Diesel + Biofuels + Electric)}}$$

† where "Renewable proportion of Electricity sector" refers to either that Member State's Electricity sector, or the EU average – whichever is higher.

While going some way to mitigating the problems associated with biofuels and recognising the potential contribution of EVs, this equation results in the electricity consumed by EVs being counted multiple times: once at charging in the Electricity sector, and once at consumption in the Transport sector (two and a half times for electric road transport). Thus electric trains count twice what they should, and electric cars three and a half times. The problem, then, can be split into an active element (the artificial 2.5x multiplier) and a passive element (the double-counting caused by the sectoral overlap). The former of these could be solved simply by removing it from the legislation;

[6] http://plateforme-biocarburants.ch/en/infos/eu-directive200928.php
[7] http://www.thebioenergysite.com/articles/370/eu-27-biofuels-annual-report-2009
[8] For example, see http://www.biofuelwatch.org.uk/files/lettertomeps.pdf
[9] See Articles 17-19 for details.
[10] Article 3.4(c). Emphasis added.
[11] *Ibid.*

the latter by calculating the Transport sector renewables credit of EVs and removing an equivalent value from the Electricity sector.[12]

As it stands, given that Member States may choose to use the EU-wide average renewable Electricity figures when making their renewables calculations for their EVs, the situation could theoretically arise where a Member State with zero renewable electricity production could count the 'contribution' of their electric cars two and a half times, using the higher EU-average proportion of renewably-sourced electricity, while not actually running any of them on renewably-sourced electricity! This presents an artificial boost to Member States in reaching their targets.

The Directive then states, near the bottom of Article 3.4, that the EC "shall present, if appropriate, a proposal permitting, subject to certain conditions, the whole amount of the electricity originating from renewable sources used to power all types of electric vehicles to be considered."[13] Or, in plain English, if a vehicle can be proven to run entirely on renewably-sourced electricity, its FEC may be considered 100% renewable. This refers to a fashion among certain power suppliers[14] of claiming to provide only renewably-sourced electricity by paying subsidies to renewable producers, as per the Renewable Energy Certification System (RECS)[15]. However, given that all electricity (apart from tiny quantities produced locally e.g. by a residential solar panel or diesel generator) goes through the same central grid, its provenance is impossible to guarantee. A further problem is that there is no EU standard RECS – rather, each country has its own – which will necessarily lead to inconsistencies.

Moreover, even if one does assume that the RECS allow users to specify exactly which renewable source their power comes from, this still does not change the overall market share of renewables any more than would direct investment in that source. It can, however, be taken advantage of, in the case of electric vehicles, in order to increase the value of the sectoral overlap. Thus, if a government were to invest a certain amount of money in a renewable source through RECS, ostensibly to charge its electric public transport systems, it would achieve twice as much in the eyes of the Directive than if it had simply invested the money directly, even though the use of this method would have added nothing whatsoever to its share of renewably-sourced electricity; it would simply have added a layer of bureaucracy and in so doing, gained something for nothing.

Conclusion: Shortcomings and Solutions

This paper has shown that the Directive gives disproportionate weight to the environmental benefits of Electric Vehicles by allowing their renewables proportion to be counted in both the Electricity and Transport sectors. Indeed, allowing countries to take the EU-average Electricity renewables proportion and apply it to their EVs distorts the data even further. This, in combination with the 2.5x multiplier granted to road-going EVs, will facilitate Member States' compliance with the letter of the Directive while going against its spirit: the reduction in emissions. Furthermore, the rigidity of the 10% Transport sector target may leave some countries with no choice but to do so. The legislation planned for the end of 2011, which is founded on the dubious pretext of being able to pick and choose the source of one's electricity, will provide a further artificial boost for EVs while achieving nothing in terms of emissions reduction – it will simply add more costly bureaucracy and shift the problem elsewhere.

The EC should keep its primary target firmly in sight, and not be tempted to constrain its Member States with precise sectoral stipulations, or to promote one particular method of obtaining the target. It is well within the capabilities and interests of national governments to devise their own individual strategies and provide incentives to industry and commerce accordingly. This paper therefore recommends that the EC abolish the 10% sub-target for the Transport sector, thus giving its Member States freedom to manoeuvre and innovate; that it remove all advantages given actively or passively to Electric Vehicles, allowing technologies to be judged purely according to merit; and to refrain from voting in any measures which would further consolidate this imperfect state of affairs.

[12] Thanks to Lew Fulton of the IEA for proposing this solution .
[13] Article 3.4
[14] For example, Planete-Oui, at http://www.planete-oui.fr
[15] http://www.recs.org

Annex 1: Final Energy Consumption Data

Table 2: 2005 and projected 2020 figures for the FEC and renewable proportion of the Transport sector and national totals

	Denmark		**France**		**Germany**		**Italy**		**Spain**		**UK**	
	2005	**2020**	**2005**	**2020**	**2005**	**2020**	**2005**	**2020**	**2005**	**2020**	**2005**	**2020**
Total national FEC (ktoe)	16475	16419	166689	155268	229092	197178	141226	133042	101845	97041	150900	136700
RE share of the total FEC (%)	*16.5*	*30*	*9.6*	*23*	*5.8*	*18*	*4.92*	*17*	*8.7*	*20*	*1.3*	*15*
Total FEC in Transport (ktoe)	5238	5520	45080	42100	53602	48302	39000	33972	32407	31681	41704	41779
Transport sector proportion of national FEC (%)	*31.8*	*33.6*	*27.0*	*27.1*	*23.4*	*24.5*	*27.6*	*25.5*	*31.8*	*32.6*	*27.6*	*30.6*
Renewably-sourced FEC in Transport (ktoe)	9	439	544	4427	2087	6390	338	3445	366	4322	69	4295
RE share of the Transport sector FEC (%)	*0.2*	*10.1*	*1.2*	*10.5*	*3.9*	*13.2*	*0.87*	*10.1*	*1.1*	*13.6*	*0.2*	*10.3*

Source: compilation of statistics from respective National Renewable Energy Action Plans of the Member States