

To:-
Sir Ian McAllister **Chairman**
The Carbon Trust **9th Floor**
3 Clement's Inn
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Dear Sir Ian ,

23 January 2003

Energy waste from vehicle headlights in good daylight

As one of your foot soldiers conducting Action Energy surveys, I strive to identify good cost effective energy saving schemes for the benefit of our clients and the laudable aim of government to meet the Kyoto carbon reduction targets.

Recently I have been castigated by the reviewer of an audit on a hospital for not substantiating more electrical savings, but the current low price of electricity (it was more expensive 10 years ago) makes quantifying viable schemes difficult, particularly on lighting.

However as I drive to site surveys, I witness a huge amount of energy waste from thousands of inefficient 55 watt tungsten halogen car headlamps burning unnecessarily in good daylight. This is outside my sphere of influence but probably, you with your expert knowledge of the motor industry and overall responsibility for saving carbon can do something.

Since 1997 General Motors has forced most USA motorists to use daytime running lights (DRL). Generating electricity from a vehicle engine is extremely inefficient due to mechanical valve gear compression and engine heat losses. To run two 55 watt headlights and associated lamps takes 970 watts of fuel energy. It is calculated that DRL will cost \$600 million dollars using 406 million US gallons of fuel p.a. creating 33 million tones of carbon di-oxide pollution p.a.**

I quantify this for the UK overleaf and summarise the data:

UK Daytime driving only	No. of vehicles	Litres of fuel p.a.	MWh	Costs	Tonnes of CO2 p.a.
Present DRL users	670,000	15.8 million	167,360	£11.8 million	41,840
Total UK vehicle parc	26 million	612,707 million	6,494,694	£495.5 million	1,623,673

Across the EU, probably the emissions would be similar to the USA.

The facts are not firm, it is hard to quantify how many boy racers blaze around with headlights AND fog lights on or how many inconsiderate drivers use rear fog lights on motorways (in contravention of the Highway Code), so I am open to fine tuning of the data.

To put the potential waste in perspective this is more than the annual output of Oldbury on Severn nuclear power station and more than 2.4 TIMES all the power generated by green renewable sources last year in the UK!

President Bush and Prime Minister Blair are about to commit troops to a war on Iraq for which oil supply is perceived the general public to be a major factor. According to the Times (Tuesday 14 Jan) North Sea oil is predicted to end by 2020.

Dangers to other drivers or "Safety claims"

Besides energy waste, the use and abuse of daytime headlights increases the dangers posed to vulnerable less conspicuous groups of road users. They reduce the ability of other drivers to perceive hazards. It is not people cocooned in padded metal boxes with multiple airbags who need protection but walkers, cyclists and motorcyclists who are far less visible to other drivers.

According to DoT figures, it is these groups who are suffering an increase in accidents despite a general reduction elsewhere in the UK. Since General Motors introduced them in the USA, there has been no benefit in fact accidents to motorcyclists have increased. They do not walk or cycle much in the USA but I append an email from an aggrieved cyclist on the basis what happens in the USA always comes over here. Some drivers misguidedly think it is safer, in reality the distraction and eye fatigue caused to other motorists puts all other less conspicuous, more vulnerable road users at risk.

Drivers Against Daytime Running Lights are a group of experienced motorists concerned about the safety of all road users. They have the support of the British Motorcyclists Federation, the Cyclist Touring Club and the Pedestrians Association. As you may be aware, due to representations by the Federation of European Motorcyclists Associations (FEMA) to the EU vehicle manufacturers (ACEA) were prevented from introducing DRL in 2002.

We believe DRL were introduced by the Swedish when they changed from driving on the left to the right and have kept them up as a marketing gimmick. There is no evidence to support extra safety. Various studies by Koornstra 1997, Elvic, Arora 1994, Andersson 1976, NHTSA 2000 et al claiming benefits have been proven to be flawed methodology **. Like the Emperor's new clothes, they are making fools of the world (in particular General Motors) with a marketing gimmick because "safety sells".

In response to pressure from vulnerable road users, starting next week, the EU has commissioned a new report, but this will take two years to conclude.

DRL – a danger to users

The technology does not exist to allow the continued use of full power DRL, on a trip to Scotland I counted twelve Volvo's with one headlight - imagine an overtaking driver mistaking one of these for a motorcycle. According to Phillips Lighting, the standard life of a H1 tungsten halogen lamp is 225 hours and only 150 hours for the 55watt dipped beam of a H4 lamp. This means at an average speed of 40mph, new lamps can be required on average from 6000 to 9000 miles – this is less than the service interval on most modern cars. When a DRL user really needs the light he only has one head light – a danger to himself and others!

A solution

It is accepted that some form of low intensity DRL may be beneficial. As most vehicles have 5watt side lights built into the headlamp reflector giving a wide spread of luminance, would not the use of front side lights (not rear lights which detract from brake lights) be a more reasonable and acceptable solution? Long life Light emitting diodes could easily be developed for these lamps as light output is not critical and no extra costs would be incurred by manufacturers. Maybe the boy racers using blue illuminated screen washer nozzles are onto something?

Sir Ian, as head of the Carbon Trust and with your extensive experience of the motor industry, you are in a unique position to help. Please can we ask for your assistance by taking against this prolific waste?

Yours sincerely,

Roy Milnes UK co-ordinator Drivers Against Daytime Running Lights

References:

www.dadrl.org.uk

www.lightsout.org

** www.howstuffworks.com question 424,

Stephen Prower 30 years on: Do motorcar daytime lights reduce accidents? Plus other reports.

Present DRL usage estimate	imported		Lifespan	UK total		
	p.a.	years				
Volvos	40000	12		480,000		
Saab	9000	10		90,000		
Copycat drivers				90,000		
Foreign cars				10,000		
Estimated total cars on UK roads using DRL				670,000	DRL parc	
Each vehicle	qty	watts		watts total		
Headlamps	2	55		110		
Rear lamps	4	5		20		
Instrument lamps	10	2		20		
Side bumper lamps	4	5		20		
Daytime lighting load				170 watts		
Alternator and drive belt efficiency losses		70%		243		
Chemical energy conversion into mechanical power		25%		971 Watts of fuel per vehicle		
Average vehicle mileage p.a. (RAC)				12,000		
Say 25% nighttime so daytime driving				9,000		
Average speed				35 mph		
Hours running in daytime				257 hours		
kWh per vehicle p.a.				250		
kWh total UK DRL parc				167,363,265 kWh	mWh	167,363
kWh per litre of fuel say diesel to be conservative				10.60		
Carbon Dioxide emissions				0.0002500 tonnes/kWh	Gallons	
Litres of fuel				15,788,987 p.a.	3,477,751	
Cost of fuel 23 Jan 2003	75 p/litre			£11,841,740		
Tonnes of fuel				15,789 p.a.		
Tonnes of CO2 emitted onto UK roads				41,841 Tonnes p.a.		

Total UK vehicle parc	imported		Lifespan	UK total		
	p.a.	years				
If all 26 million UK vehicles used DRL				26,000,000	DRL parc	
Estimated total cars on UK roads using DRL				26,000,000	DRL parc	
Each vehicle	qty	watts		watts total		
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Hours running in daytime				257 hours		
kWh per vehicle p.a.				250		
kWh total UK DRL parc				6,494,693,878 kWh	mWh	6,494,694
All UK renewable generation 1014MW @ 30% load fact	304	8760			times	2.4
kWh per litre of fuel say diesel to be conservative				10.60		
Carbon Dioxide emissions				0.0002500 tonnes/kWh	Gallons	
Litres of fuel				612,706,970 p.a.	134,957,482	
Cost of fuel 23 Jan 2003	75 p/litre			£459,530,227		
Tonnes of fuel				612,707 p.a.		
Tonnes of CO2 emitted onto UK roads				1,623,673 Tonnes p.a.		

Data sources

DEFRA "Environmental Reporting Guidelines for Company Reporting on Greenhouse Gas Emissions" revised guidelines March 2001.

www.dti.gov.uk/newreview/nr54.pdf

British motorcyclists federation www.bmf.org.uk