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14 March 2019

Positive Action Against Transport cuts
email: HookSchoolBus@gmail.com

Dear Suzanne Scobie and colleagues,

Environmental Impact of Alternative School Bus Transport Scenarios

Please find enclosed our independent report in response to your request for the above analysis.

Our report shows that if 50% of families affected choose to drive their children to school, then local emissions will increase by 235%.

Yours sincerely

Dr Belinda Howell, BSc (Hons), MBA, DipIOD
Managing Director
Decarbonize Limited

Client:

Positive Action Against Transport cuts

Report:

Environmental Impact of Alternative School Bus Transport Scenarios

Date:

14 March 2019

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About Decarbonize

Decarbonize Limited is a strategic sustainability consultancy, advising private sectors, governments and non-governmental organisations in the UK and internationally.

Our vision is for a more sustainable world, in which we live within the resources and capacity of our one planet. In everything we do, our principles are always to:

- apply sound science - using analysis, technologies and standards that deliver real sustainability impacts
- stimulate innovation - growing sustainable solutions
- add value - mitigating risk, increasing income and saving cost.

Project Director: Dr Belinda Howell MBA, Dip IOD – Managing Director, Decarbonize

Belinda has extensive experience of working with Boards and Executive Teams in multi-national companies on sustainability and climate change strategy; leading the growth of early stage clean technology companies; and as Non-Executive Director on the boards of multi-stakeholder, public sector and not-for profit organisations.

Previously, Belinda was the first CEO of Greenstone+, which provides secure software to the corporate and public sectors for corporate, project, process, product and supply chain environmental and social impact assessment and reporting.

Belinda holds a Diploma and Certificate in Company Directorship (Institute of Directors, 2015 with Distinction). She was nominated CNBC Business Europe 'Low Carbon Pioneer' Top 50 in 2007 and Top 100 in 2008. Awarded Bass prize for best MBA of the year.

Executive Summary

Positive Action Against Transport cuts commissioned Decarbonize to provide an independent assessment of the **environmental impact** of potential alternative scenarios they foresee, as follows:

- Scenario A: Current, 5 School buses from Hook to Robert May's School and return per day
- Scenario B: School bus transport cuts, supplemented by private transport, cycling and walking. Please note that our analysis does not include the impact on biodiversity that would result from creating a safe cycle/walking path through the Hook Common and Bartley Heath Site of Special Scientific Interest (SSSI) in this scenario.
- Scenario C: School bus transport cuts, supplemented by private transport. This scenario is based on the assumption that 50% of families affected choose to drive their children to school.

Our analysis shows that:

- Journey distance by vehicles increases from **50 km** / day currently, to
  - **575 km** / day in Scenario B
  - **1,567 km** / day in Scenario C.

- Life Cycle Greenhouse Gas emissions increase from **82 kg CO_2-eq** / day currently, to
  - **110 kg** CO_2-eg / day in Scenario B (**+34%**)
  - **273 kg** CO_2-eq / day in Scenario C (**+235%**).

Our analysis shows that Hampshire County Council's proposed cuts to School Bus Transport contravene the recommendations of the Aldersgate Group report published on 11 March 2019.

Introduction

Positive Action Against Transport cuts is campaigning to save all school bus services from Hook to Robert May's School in Odiham, which are threatened by cuts from Hampshire County Council.

Robert May's School is a popular and highly successful secondary school in Odiham with a wide catchment from surrounding villages. The main village of Hook lies just within a 3 mile boundary.

School pupils between 5 and 16 years qualify for free school transport if they go to their nearest suitable school and live at least:

- 2 miles from the school if they are under 8 years
- 3 miles from the school if they are 8 years or older.

If there's no safe walking route, they must be given free transport, however far from school they live.

The campaign group commissioned Decarbonize Limited to provide an independent assessment of the **environmental impact** of potential alternative scenarios they foresee.

This report presents the policy context, our approach, assumptions, findings and references used.

Policy Context

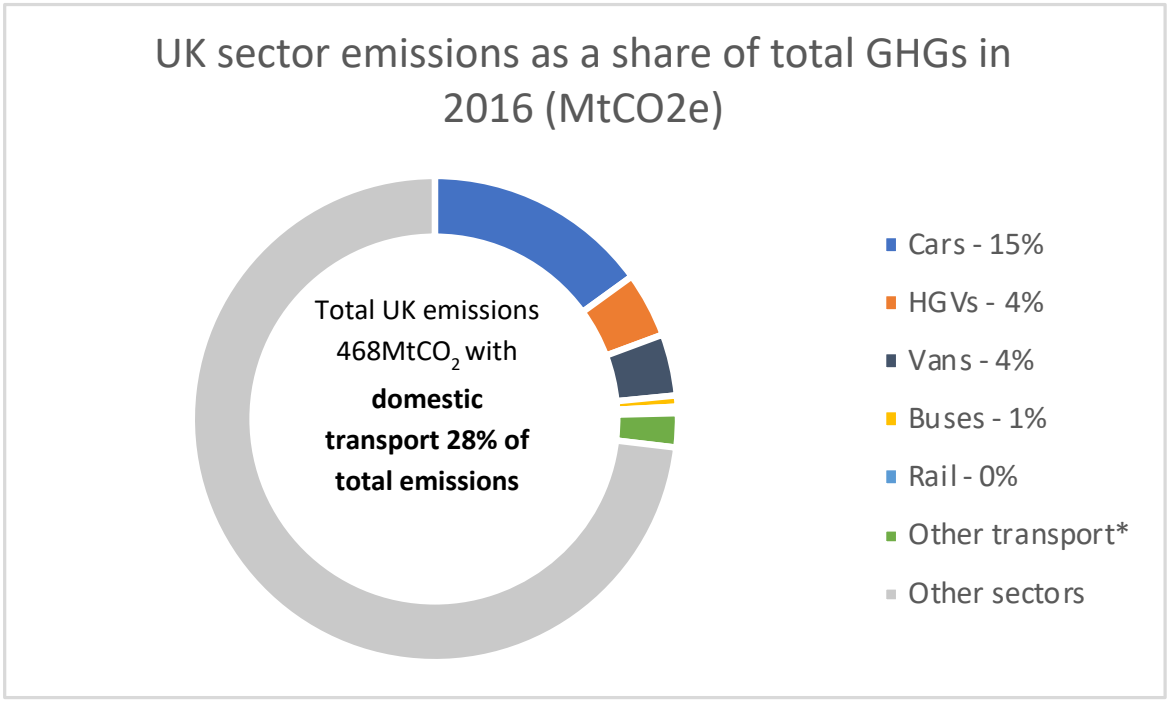

*Figure 1: CCC (June 2018) Reducing UK emissions 2018 Progress Report to Parliament. * 'Other transport' includes domestic aviation and shipping, mopeds and motorcyles, LPG fuelled veicles and other road engine vehicles*

Transport sector is now the largest emitting sector of the UK economy, accounting for 28% of UK greenhouse gases in 2017 (CCC, 2018)

Decarbonising transport has proved challenging, but acting with greater urgency now will reduce long-term costs, according to an Aldersgate Group report published in March 2019.

"Taking a whole system approach to transport planning will help improve the efficiency of the UK's transport network to ensure the most beneficial schemes are taken forward, ***based on emissions savings***"

"***It is essential that local authorities are given the resources to promote more sustainable forms of transport which reduce the need for private vehicles***"

(Aldersgate Group, 11 March 2019, ***our emphasis added***)

Methodology

What is included?

Life Cycle Analysis of Vehicles includes everything from Vehicle production, to the production and use of fuel and other life-time use factors; to end-of-life reuse, recycling and disposal (see Figure 2).

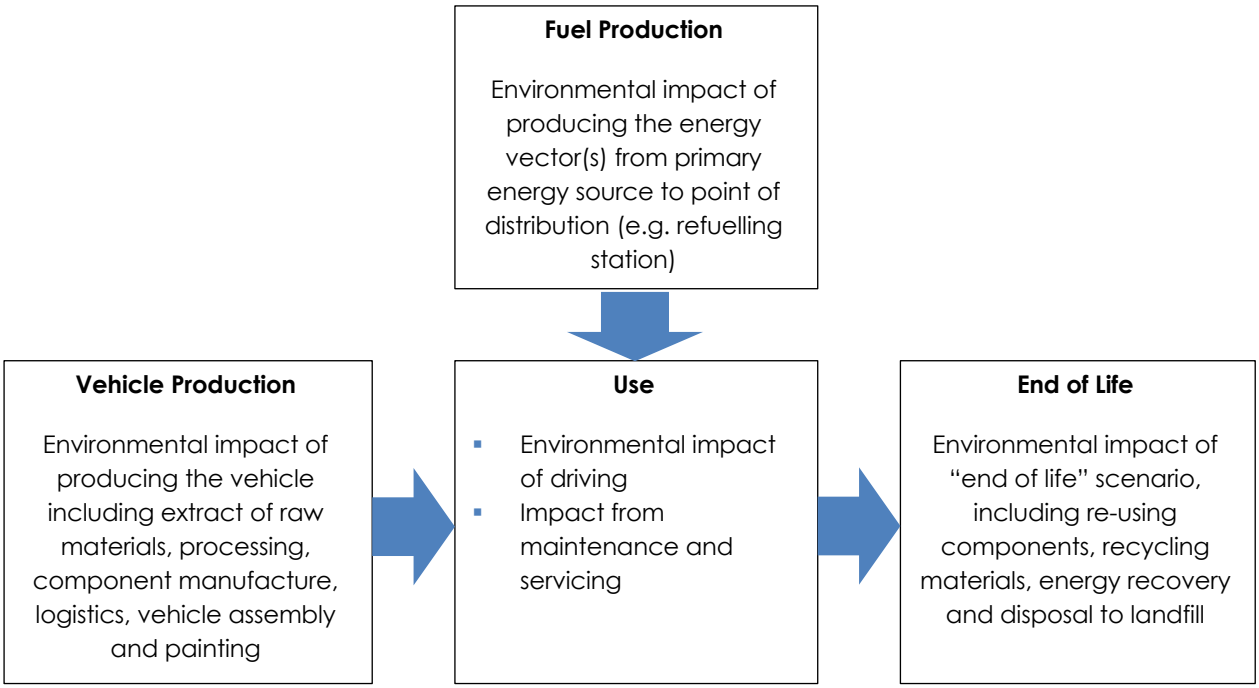

Figure 2: Life Cycle Analysis of Vehicles

What is not included?

In Scenario B, in order to make a safe cycling and walking route between Hook and Robert May's School could involve developing paths and lighting across the protected Hook Common and Bartley Heath Site of Special Scientific Interest (SSSI). The negative impact on biodiversity in Scenario B is not included in this study.

How is it assessed?

Global Warming Potential describes Greenhouse Gas (GHG) emissions that increase the absorption of heat from solar radiation in the atmosphere and therefore increase the average global temperature. The reference substance is carbon dioxide (CO_2). All other substances that impact on this process for Vehicles (e.g. Methane CH_4 and Nitrous oxide N_2O) are measured in CO_2 equivalents (CO_2-eq).

Transport Scenarios

The following three school bus transport scenarios were provided from surveys and projections produced by the Positive Action Against Transport cuts campaign group.

Scenario	Coaches per day	Cars per day
A: Current	5	
B: Cuts with private transport, cycling and walking	1	57 cars + cycling/walking the 3-mile route
C: Cuts with private transport	1	157 cars

Table 1: Scenarios for School Bus Transport services

Current School Bus Transport services

School Bus services – Current		Return journey distance (km)		
NA	Route		Vehicle	Operator
62270	Hook, Holt Lane - RMS	11.6	Double Decker coach, 100 seats	Mortons Travel
62271	Hook, Griffin Way South - RMS	7.8	Double Decker, 80 seats	AS Bone & Sons
62272	Hook, Quince Tree Way - RMS	9.6	Double Decker coach, 100 seats	Mortons Travel
62273	Hook, Butts Meadow - RMS	9.4	Double Decker, 86 seats	Newbury & District Ltd
62274	Hook, Carleton Close - RMS	11.2	Double Decker, 72 seats	Mortons Travel
62275	(Sherfield-Stratfield-Mattingley-) Hook - RMS	not included	Coach, 70 seats	Horseman Coaches

Table 2: Current School Bus Services, Hook - Roberts May's School. Ref. Hants.gov.uk https://dmtrk.net/20SV-5TINX-FLX1O6-3995LJ-1/c.aspx

Life Cycle GHG Emissions factors

Double Decker Coaches

Life cycle GHG emissions for double decker coaches were based on two comparable literature sources (see Table 3).

- The lower factor (**1.48 kg CO_2-eq / km**) was used for the smaller double decker coaches of 70 - 72 seats shown in table 2, above.
- The higher factor (**1.865 kg CO_2-eq / km**) was applied to the larger double decker coaches of 80 – 100 seats shown in table 2, above.

Coaches	Life Cycle GHG emissions (kg CO_2-eq / km)	Reference
Double Decker Coach, diesel	1.480	McCreadie (2016)
	1.865	Cox et al. (2017)

Table 3: Life cycle GHG Emissions factors for Double decker coaches

Cars

Life cycle GHG emissions factors for cars were based on two comparable literature sources, quoted by Ricardo for LowCVP (see Table 4).

- The mid-point between the two Euro 6 standard cars, 1.4L diesel (0.136 kg CO_2-eq / km) and 1.6L gasoline (0.186 kg CO_2-eq / km) was applied for car journeys (i.e. **0.160 kg CO_2-eq / km**).

Cars	Life Cycle GHG emissions (kg CO_2-eq / km)	Reference
Renault Megan, 1.4L diesel, Euro 6	0.136	Ricardo for LowCVP (2018) ref. #105
Mercedes-Benz 1.6L gasoline, Euro 6	0.186	Ricardo for LowCVP (2018) ref. #093
Most efficient European car	0.170	ICCT (2018)
Average European Car	0.250	ICCT (2018)

Table 4: Life cycle GHG Emissions factors for Cars

Results

Journeys and Distance

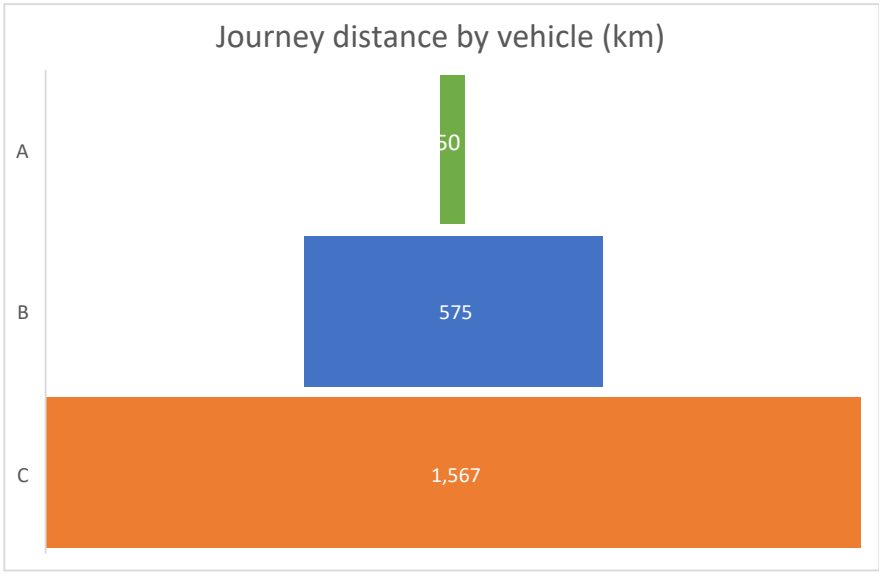

Figure 3: Journey distance by vehicle per day (km)

- Journey distance travelled by vehicles of all types increases from **50 km / day** and 10 vehicle movements / day currently in Scenario A, to
- **575 km / day** and 116 vehicle movements / day in Scenario B
- **1,567 km / day** and 316 vehicle movements / day in Scenario C.

Life Cycle GHG emissions

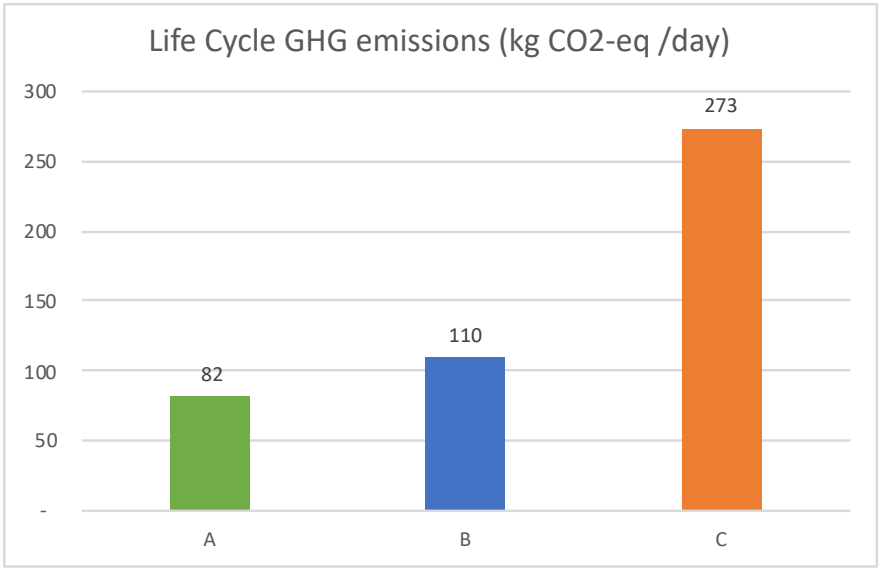

Figure 4: Life Cycle GHG emissions (kg CO2-eq / day)

- Life Cycle Greenhouse Gas emissions increase from **82 kg CO_2-equivalent per day** currently in scenario A to
- **110 kg CO_2-equivalent per day** in Scenario B (+ 34%)
- **273 kg CO_2-equivalent per day** in Scenario C (+ 235%).

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