

‘Door-to-door’ carbon emission calculation for airlines – Its decarbonisation potential and impact

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Institute of Transport and Logistics Studies | The University of Sydney Business School

iMOVE Australia (project partner)



THE UNIVERSITY OF
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A reminder:
Airlines connect us

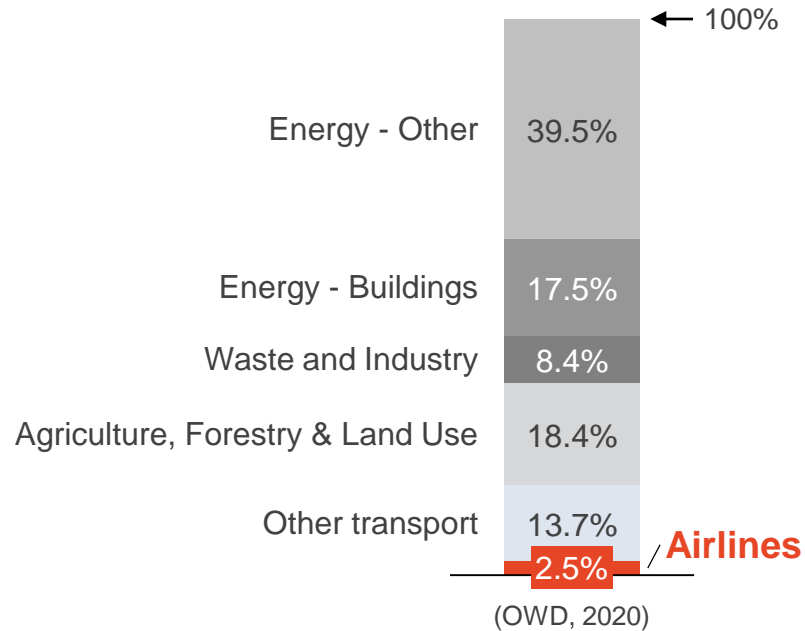


My
Door-to-door
moment

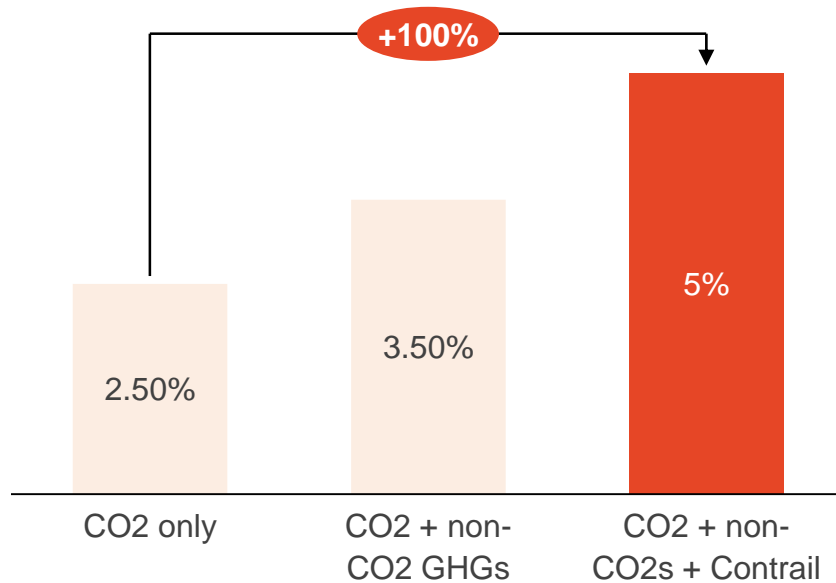




Global airlines contribute 2.5% towards climate change



However, aviation's real impacts are higher than it seems...

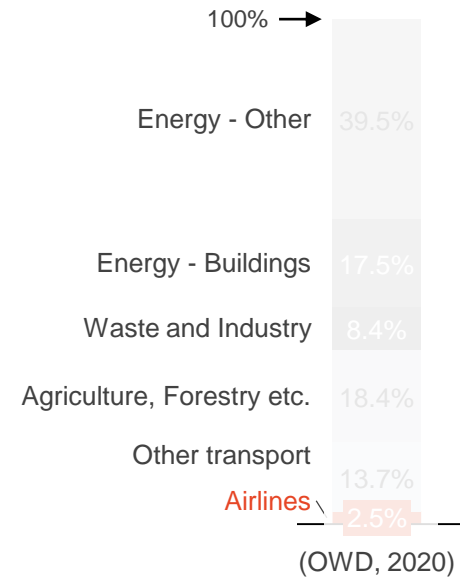


(Pearce, 2020)





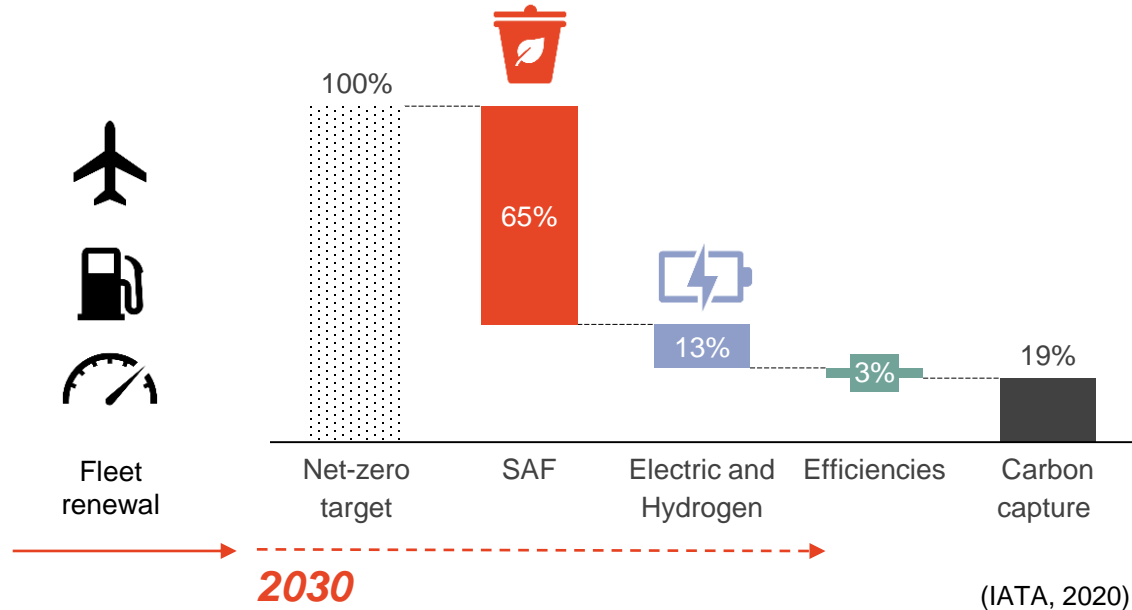
Airlines' share could soon reach 10%



Airline decarbonisation is hard










*If we want to keep flying,
how can we make a difference
today?*

Airlines rely on future technologies to achieve net-zero



Unlike other emitters,
airlines could face a ‘**decarbon-ceiling**’
once fleet renewal is exhausted by 2030.

There are immediate opportunities
– *carbon labelling is one*

	6:50 AM – 8:30 AM Jetstar	2 hr 10 min SYD–ADL	Nonstop	88 kg CO ₂ -6% emissions ⓘ	 A\$260	▼
	7:15 AM – 8:55 AM Virgin Australia	2 hr 10 min SYD–ADL	Nonstop	94 kg CO ₂ Avg emissions ⓘ	A\$656	▼
	8:50 AM – 10:25 AM Qantas	2 hr 5 min SYD–ADL	Nonstop	94 kg CO ₂ Avg emissions ⓘ	A\$615	▼
	9:15 AM – 10:55 AM Virgin Australia	2 hr 10 min SYD–ADL	Nonstop	97 kg CO ₂ Avg emissions ⓘ	A\$252	▼
	9:25 AM – 11:05 AM Jetstar	2 hr 10 min SYD–ADL	Nonstop	88 kg CO ₂ -6% emissions ⓘ	A\$343	▼
	11:45 AM – 1:25 PM Rex	2 hr 10 min SYD–ADL	Nonstop	97 kg CO ₂ Avg emissions ⓘ	A\$219	▼
	12:05 PM – 1:40 PM Qantas	2 hr 5 min SYD–ADL	Nonstop	94 kg CO ₂ Avg emissions ⓘ	A\$615	▼
	2:15 PM – 3:55 PM Virgin Australia	2 hr 10 min SYD–ADL	Nonstop	97 kg CO ₂ Avg emissions ⓘ	A\$394	13 ▼

There are immediate opportunities – *carbon labelling is one*

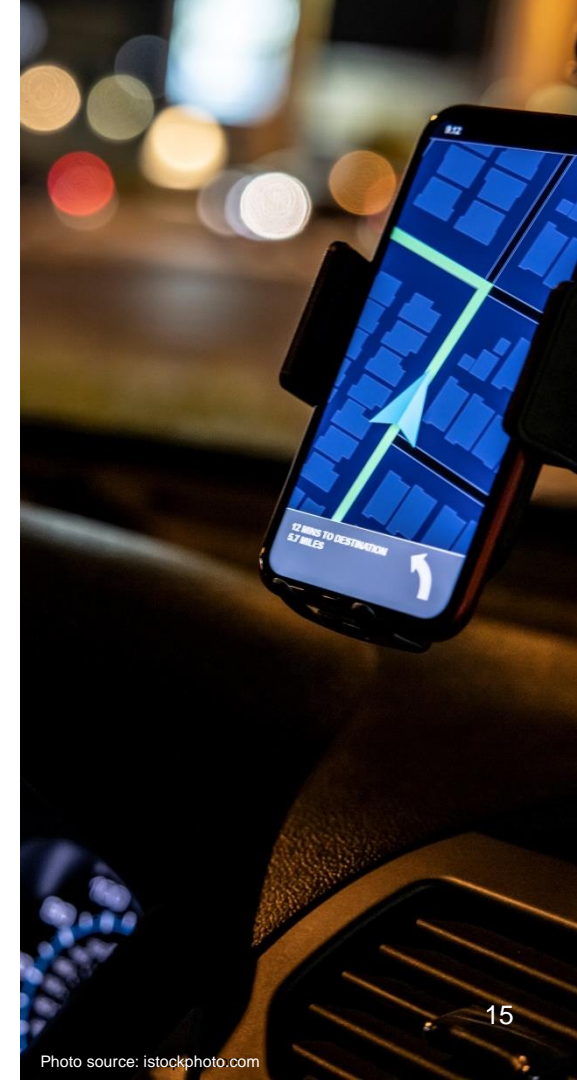
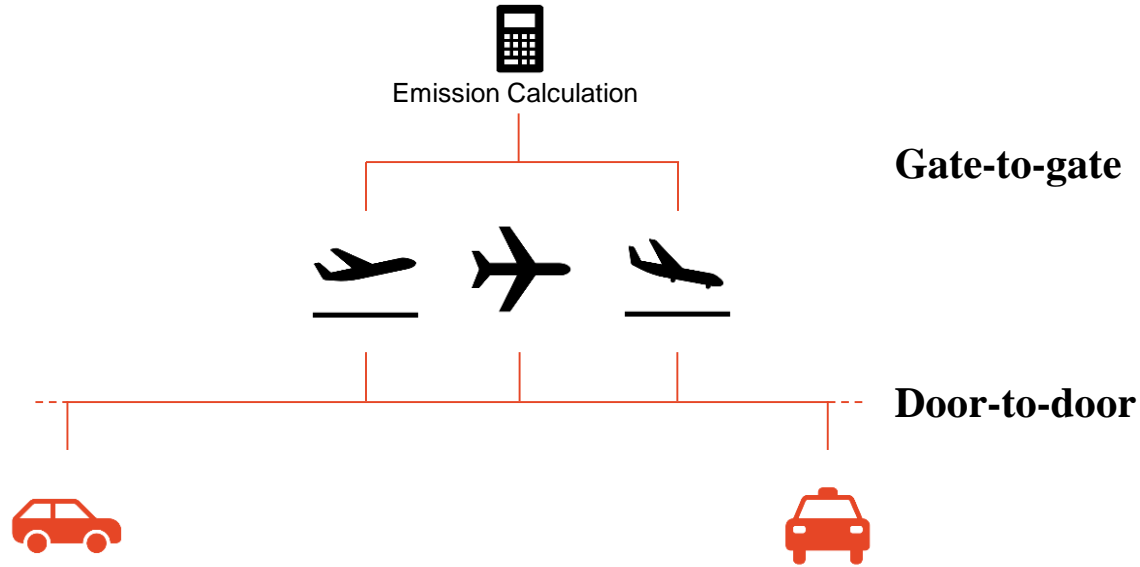
*“Based on the results of the study, we estimate that UC Davis could save more than **79 tons of CO₂E**, or **3.8% total emissions...**”*

(Amenta & Sanguinetti, 2020; 2022)

2 hr 5 min SYD-ADL	Nonstop	94 kg CO ₂ Avg emissions ⓘ
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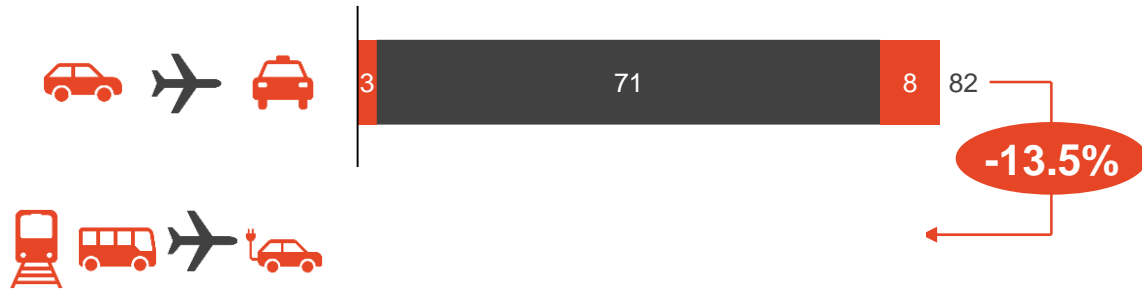
Photo source: googleflights.com

From *Gate-to-gate* to *Door-to-door* emission calculation

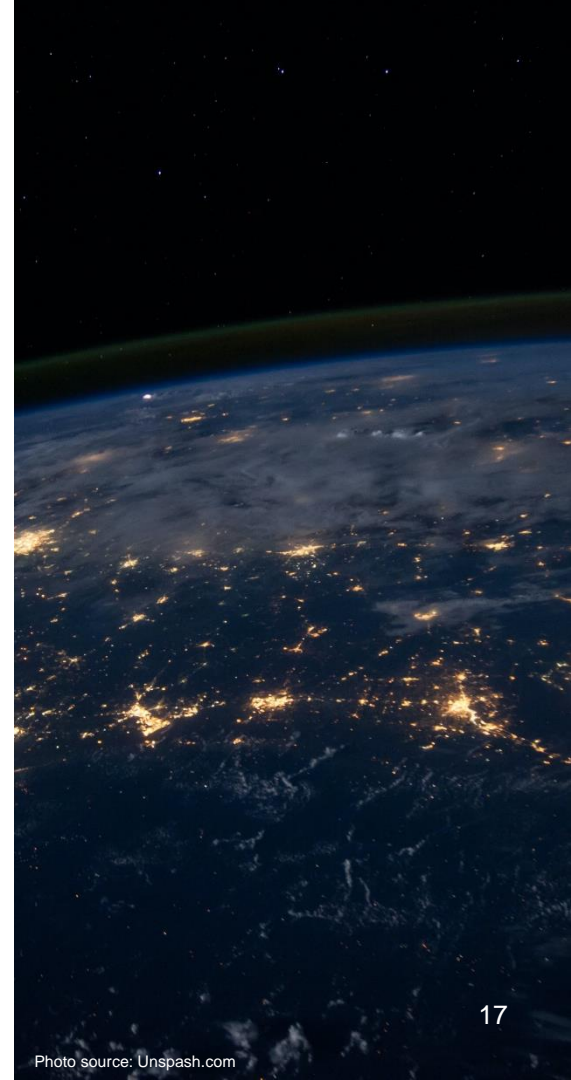
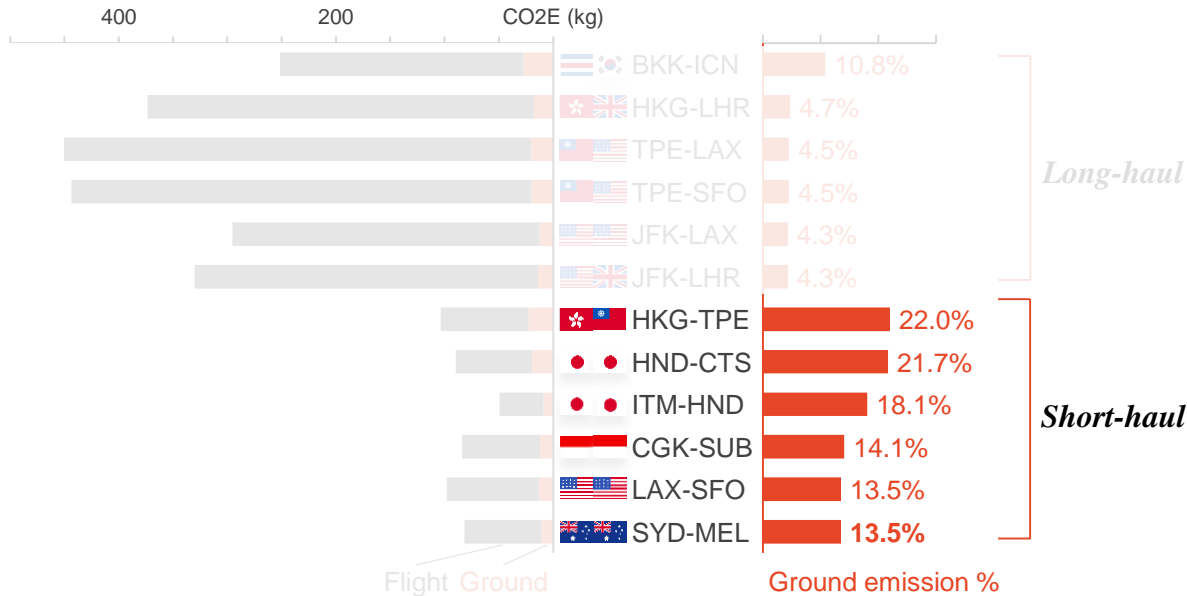


Case study – Sydney to Melbourne

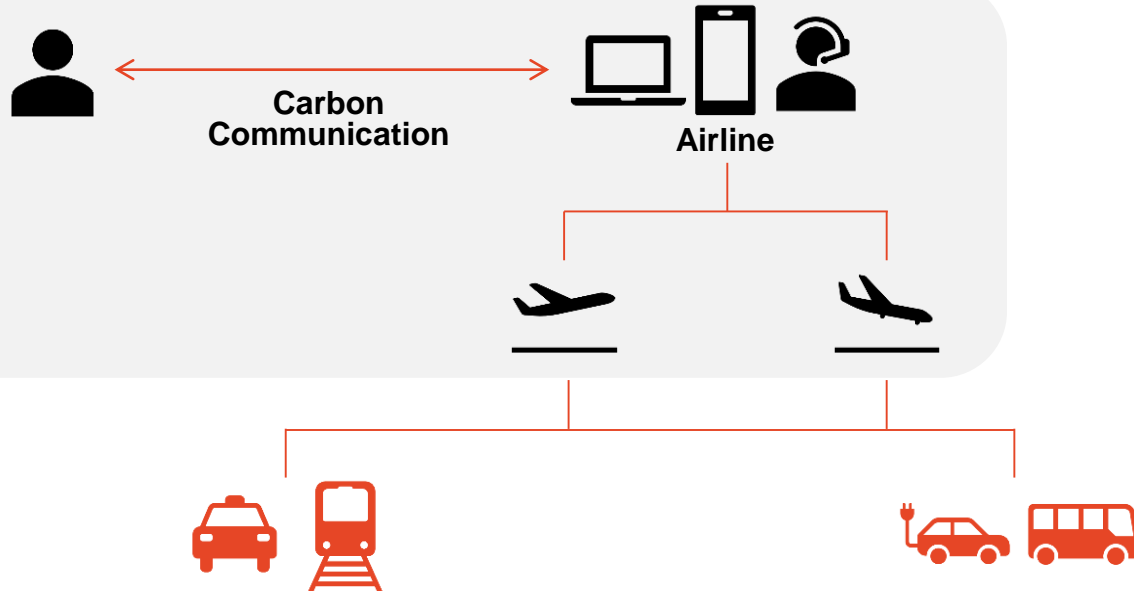
door-to-door air travel emission calculation



Door-to-door emission calculation at a global scale



Airline - a better candidate to drive ground changes



Costs of decarbonisation are comparable

- *SAF* and *Airport Train*



To conclude



Photo sources: Unsplash.com; istockphoto.com; shutterstock.com



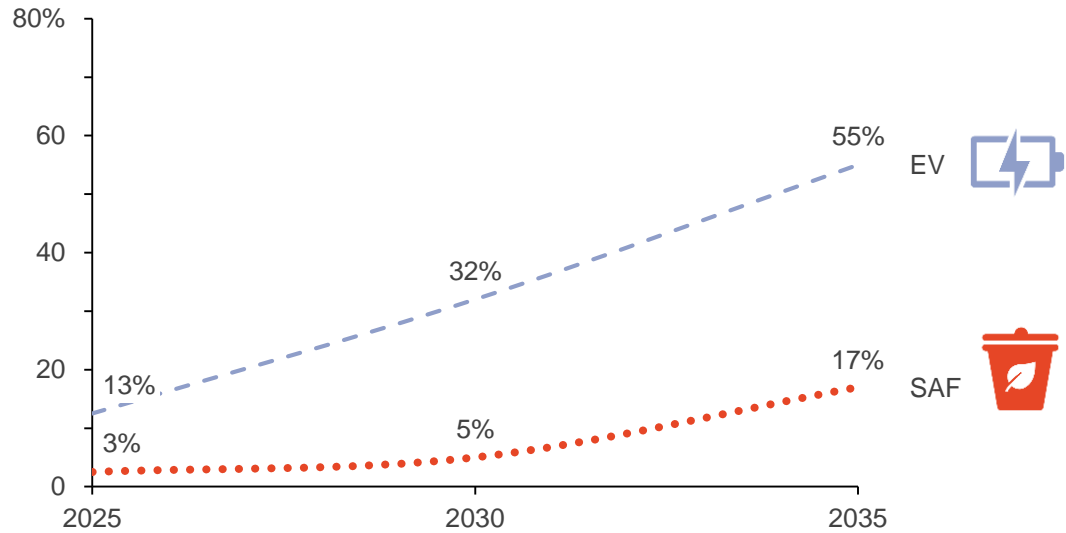


To find out more on this topic, please access our paper online:

Li, D.C. and Merkert, R. (2023). “Door-to-door” carbon emission calculation for airlines—Its decarbonization potential and impact, *Transportation Research Part D: Transport and Environment*, 121, 103849



The EV transition is expected to be much faster than SAF



(Deloitte, 2020)

