

# AVIATION CO<sub>2</sub> REDUCTIONS



## STOCKTAKING SEMINAR

TECHNOLOGY · OPERATIONS · SUSTAINABLE AVIATION FUELS



# Clean energy



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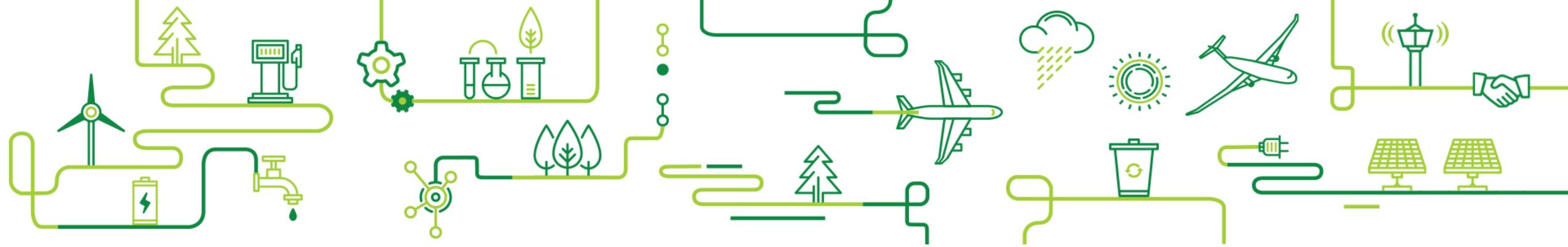


Brice LALONDE



Balance of energies





## Could zero carbon be a goal for aviation?

there are only 2 ways of getting there:

- **Either a radical new design for aircrafts (powered by green hydrogen or electricity).**

Hydrogen is the complement of the necessary electrification of energy consumption. 20 countries have issued hydrogen roadmaps including cheap decarbonized electricity, efficient electrolysers, transport and storage of hydrogen, new markets for use of hydrogen in industry, energy storage, heavy haul transport, and ultimately **universal fuel**.

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**Either sustainable aviation fuels (SAF)  
produced through a decarbonized life cycle**

**The ideal feedstock for SAF will be CO<sub>2</sub>**

While **biofuels** take carbon from biomass and waste (many **partnerships**), **synfuels** get it from CO<sub>2</sub>, reacting with water, energy, with or without hydrogen, to produce hydrocarbons.

The CO<sub>2</sub> comes from

industrial capture (cement, steel, chemicals, power plants...) **Regulations are needed to capture, transport, store and reuse CO<sub>2</sub> produced by energy intensive industries**

or **from the air** (reducing the presence of greenhouse gases in the atmosphere)

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**Wed 22 July 2020 Aircraft company Aerion is teaming with Canadian clean energy company Carbon Engineering (CE) to develop synthetic fuel from atmospheric CO<sub>2</sub>**



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**Icelandic Carbon Recycling International produces renewable methanol from geothermal CO<sub>2</sub> and energy**



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# What do we need?

Regulation, incentives, partnerships, multilateral agreements

**Cheap zero carbon electricity**, new generation of biofuels (algae ?), increasing supplies of pure CO<sub>2</sub>, steep learning curve for synfuel production

Industries and countries partnerships, involving fossil fuel consumer companies

Priority access to biofuels for aviation, agreement on SAF and fast track certification, blending increasing in time, airports delivering SAF,

Electric or hydrogen aircraft for short haul flight, progresses in batteries and fuel cells, ESG for mining companies

Conditional bailouts, fleet renewal compensation, better, lighter planes

State plans for low carbon aviation and SAF consistent with national climate programmes (INDC), strong R&D policies with clear targets, timetables, incentives and public expenditure

Multilateral agreement through ICAO for 1) a trajectory of increasing mandatory SAF blending and 2) putting a **price on fossil jet fuel** with revenues earmarked for SAF

Demand side management, linking air companies to fast trains networks, preparing for the possibility of individual carbon quotas

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# Thank You

