

“Waste Residues and Advanced Low Carbon Fuels”

Implementation of Low Carbon Fuels in International Aviation

July 2019



➤ CATHAY PACIFIC

➤ CATHAY DRAGON

air Hongkong



- Based in Hong Kong, with services to 200 destinations
- Fleet of 203 aircraft
- Consume around 2 billion gallons of fuel a year



From an airline perspective.....



1. Why should we be interested in biofuel?
2. What are our plans and hope?
3. What are some challenges to making it happen?

Recent material shift in the climate change debate means biofuel will become an increasingly important differentiator for airlines



Lifestyle › ES Magazine

How flygskam (or flight shame) is spreading across Europe

Fears over climate change have led many to rethink the way they travel and, in Sweden, they've even invented a new word for the shame associated with flying

JULIANA PISKORZ | Wednesday 17 April 2019 13:07 | 2 comments

*Investment bank UBS reports **22%** of people it surveyed in the US and Germany **were already cutting back on air travel** for environmental reasons. For those under 44, it exceeded 50%.*



A need to be ahead of the public debate, with biofuel increasingly important in offering a strong story in our decarbonisation efforts

Decarbonisation of aviation is particularly difficult with limited alternative options, with biofuel the only real alternative



- Electrification is exciting, but not likely to replace long haul, cross ocean travel anytime soon

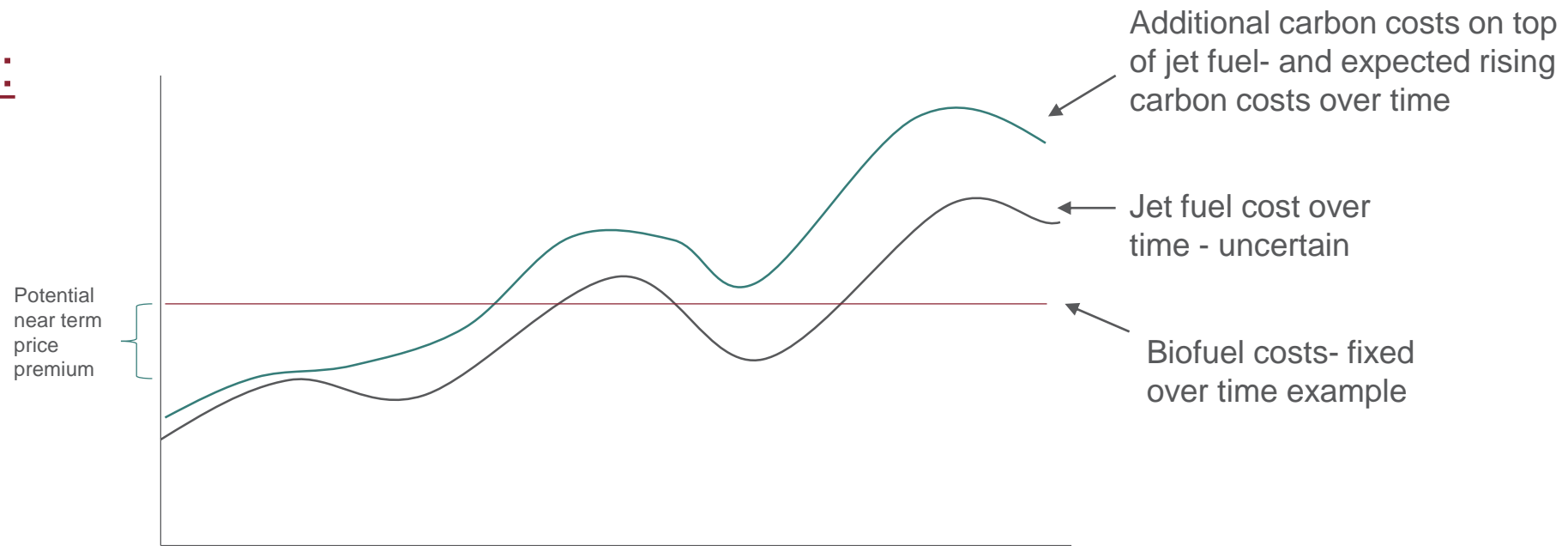


Biofuel can also potentially help de-risk against jet fuel and carbon markets



- With CORSIA, there will be a price on carbon for international aviation
- Cost base/ structure of biofuels, and subsequently offtake pricing can be different to jet fuel

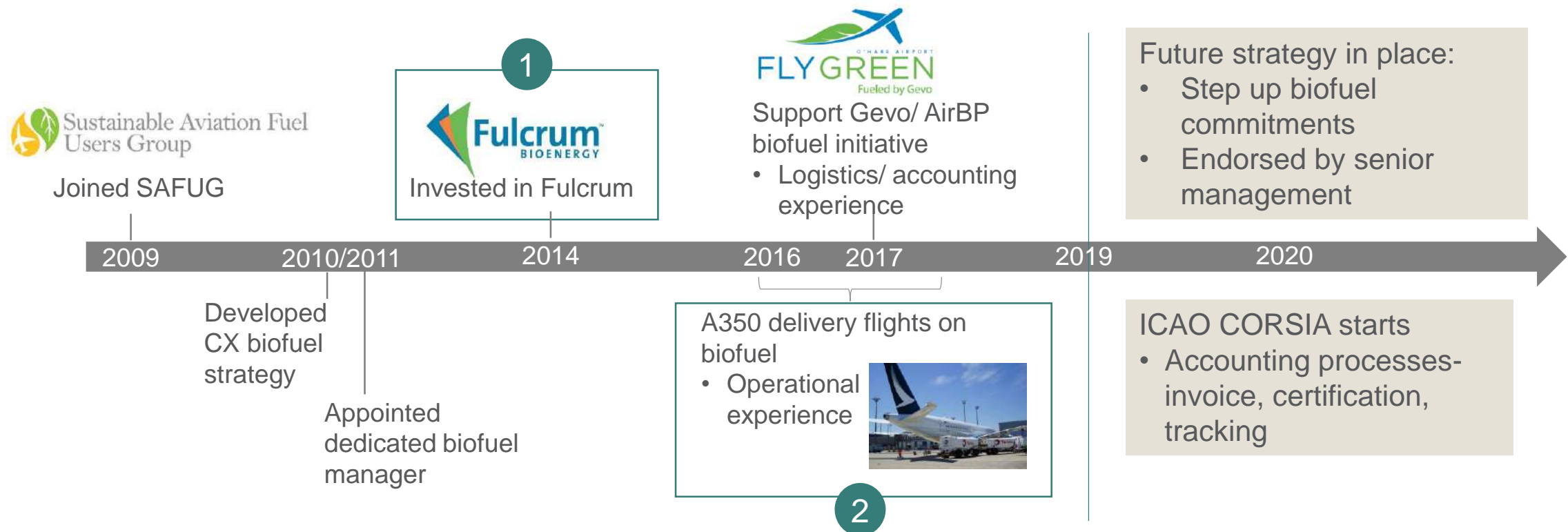
Illustrative:



CX has been involved in biofuel space for 10 years, being one of the first airline to do so



- Earlier efforts by us has been focused on investment, trial flights, policy advocacy



1

Biofuel Initiative: Fulcrum Bioenergy investment and offtake agreement



- Invested in Fulcrum Bioenergy in 2014
- 375m gallons off-take agreement over 10 years
- Sierra Biorefinery (10m gallons/ year) broke ground May 2018- expected completion 2020+



2

Biofuel Initiative: Flying A350 deliveries from TLS- HKG with biofuel blend



- Collaboration with Airbus and TOTAL
- 42 flights in total (22 x A350-900 and 20 x -1000) from 2016- 2021
- 80-100,000 gallons in total



Biojet market is in its infancy with limitless potential, but a real need for greater and faster scaling up

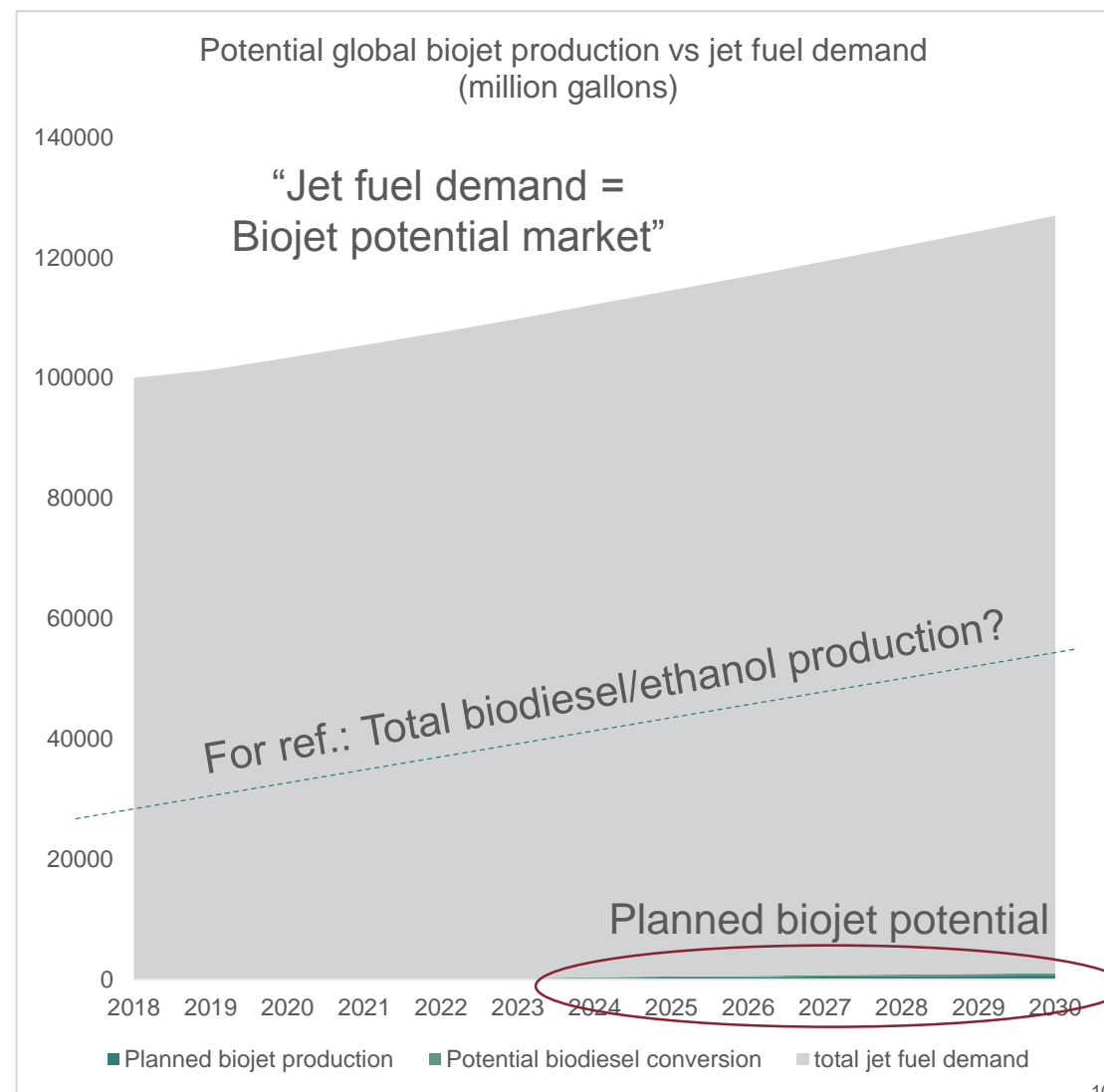


- There are currently negligible biojet production globally
- With optimistic production scenario, biojet will be barely a few % of total jet demand by 2030



Challenge:

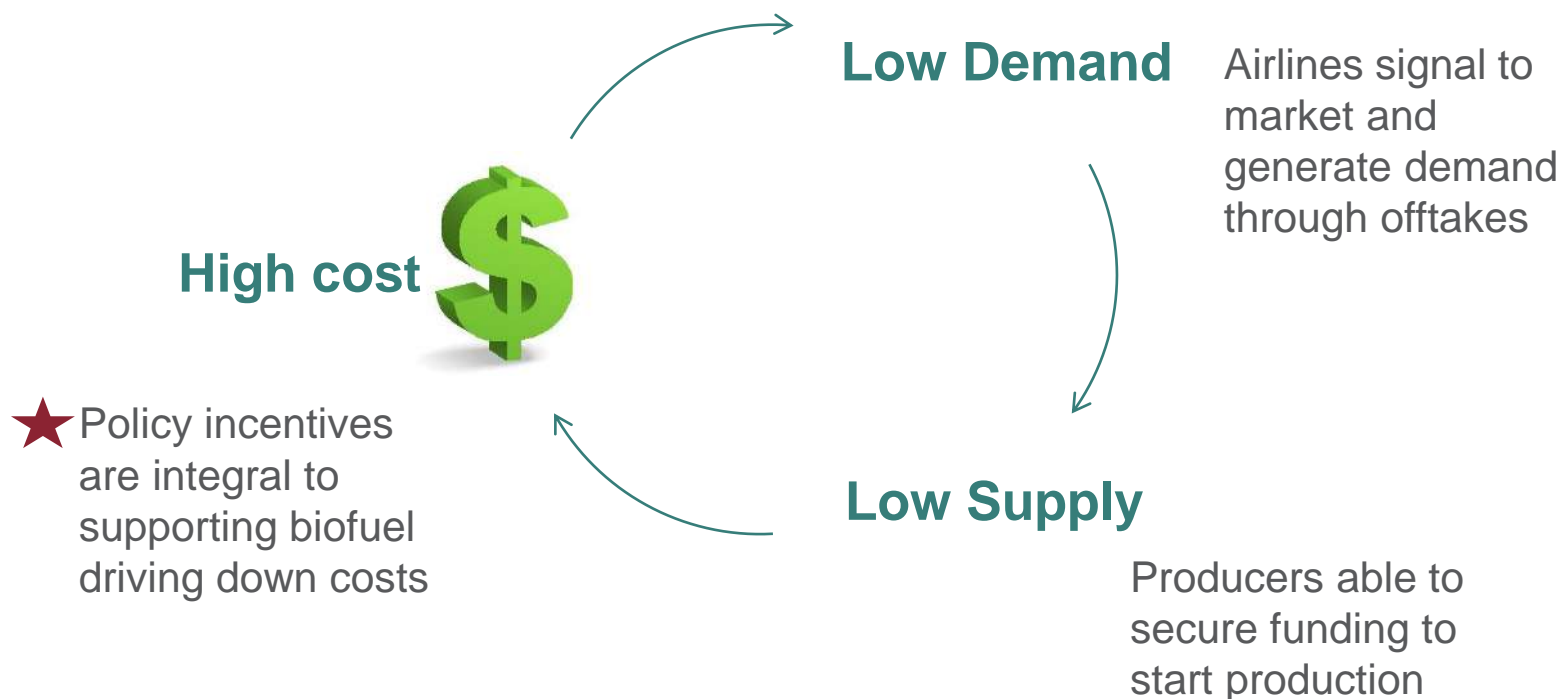
How can we scale up to have meaningful quantities of biojet for aviation?



Underpinning the challenge is the current economics of biofuel



- Biofuel are between 2-4 times the cost of jet fuel at the moment
- Only way costs will go down is for industry to reach a 'critical mass'- overcoming the vicious cycle of high cost, low demand and supply scenario



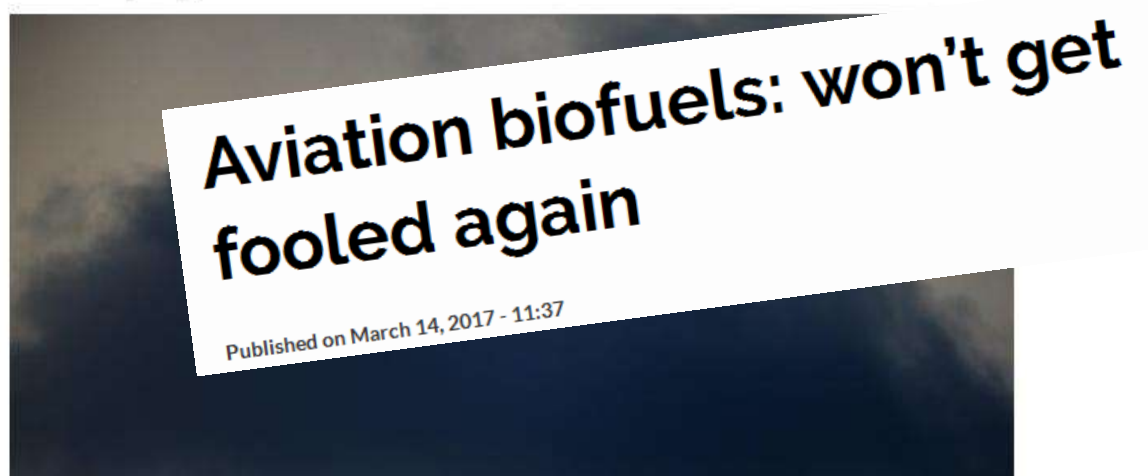
Sustainability certification/ standards are also critical aspects for the industry



- Need for ensuring biofuels are sustainable. Our stakeholders demands it.
- Work of certification standards like ISCC and RSB are critical for the industry

New airplane biofuels plan would 'destroy rainforests', warn campaigners

Plan to accelerate production of biofuels for passenger planes would lead to clearing of rainforests to produce 'vast' amount of necessary crops



Policy support is key to help bridge price premium and support development



1

Policy incentives to shift towards biojet

2

Ideally consider aviation global context

3

Greater collaboration—
(fuel producers, supply chain, buyers, customers)

Role of airline:

- We are large fuel buyer- sends the signal to market
- Commit to offtake agreements, and/or investment to help scale production
- Support policy advocacy and collaboration between stakeholders

Key conclusions



- Biofuel is and will become an imperative for airlines, driven by public expectation and lack of alternative solution
- There is also a potential commercial case for biofuel in long term, de-risking from jet fuel and carbon market volatility
- Current price premium is still a major barrier to scaling of biojet use
- Policy support and collaboration with supply chain will be key to scaling the industry
- Sustainability is crucial and needs to be an integral part of the whole biofuel debate

LET'S
MOVE
BEYOND
FOSSIL
FUEL

