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TOWARD THE 2050 VISION FOR  
SUSTAINABLE AVIATION FUELS



# Our license to operate - Sustainable aviation fuel

Swedavias ongoing work towards the regular  
use of sustainable aviation fuel

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# Swedavia





# Swedavia

Operates and develops ten airports that are the national basic airport infrastructure of Sweden.

During 2018, 42 million passengers flew to and from Swedavia's airports.

Climate change is our most important challenge and we need to act now!





# In Sweden right now



Photo: NASA

## Anti-flying campaign grows in Sweden

Posted by Howard Jarvis in Aviation on 4 December 2018

Celebrities have added publicity to an initiative launched by two women trying to get 100,000 people not to fly in 2019.

Two Swedish mothers have organised a pledge that 10,000 people so far have signed up for. The pledge commits them to not taking any flights in 2019, BBC Monitoring reports.

## Swedes launch campaign asking people to give up air travel in 2019 | Raw Politics

By Euronews on September 26, 2018



The concept of “flying shame” is growing in Sweden – shame if you fly too much – due to the CO2 emissions

Date added: November 25, 2018

Many Northern Europeans have “flying shame” because of the climate: they stay on the ground while traveling. Rail travel is becoming increasingly popular. Some people in Sweden are cutting down on flying, and believe the carbon emissions are a matter of shame. The word for it is “flugsham” or “flygskam” and this is becoming a common concept, akin to “flying less” in English. A celebrity athlete is well known for only travelling to sporting events if he can get there by train. The Swedes are among the frequent flyers. They fly 7 times more than average global citizens. While Sweden’s total CO2 emissions have fallen by 24% since 1990, air traffic grew by 61% in that time. A prominent writer in a popular newspaper denounced the “idiotic lifestyle” of frequent flying as the “most expensive suicide in world history”. Researchers and artists responded: “Flying is no longer an alternative for them”. People realise that we cannot go on with expanding aviation. A Facebook page on travelling by long-distance rail, rather than flying, had 30,000 followers in a few months. As well as the hashtag #flyngless there is the Swedish counterpart in #jagstannarpåmarken: “I’ll stay on the ground”.

## Skäms du för att du flyger nu igen?

Vi vet att flyget förstör planeten, ändå kan vi inte låta bli. Men nu börjar influencers och makthavare få skit för sina resor. Kommer privatflyget bli måltavla för nästa sociala revolution?



## The Swedish 15-year-old who's cutting class to fight the climate crisis

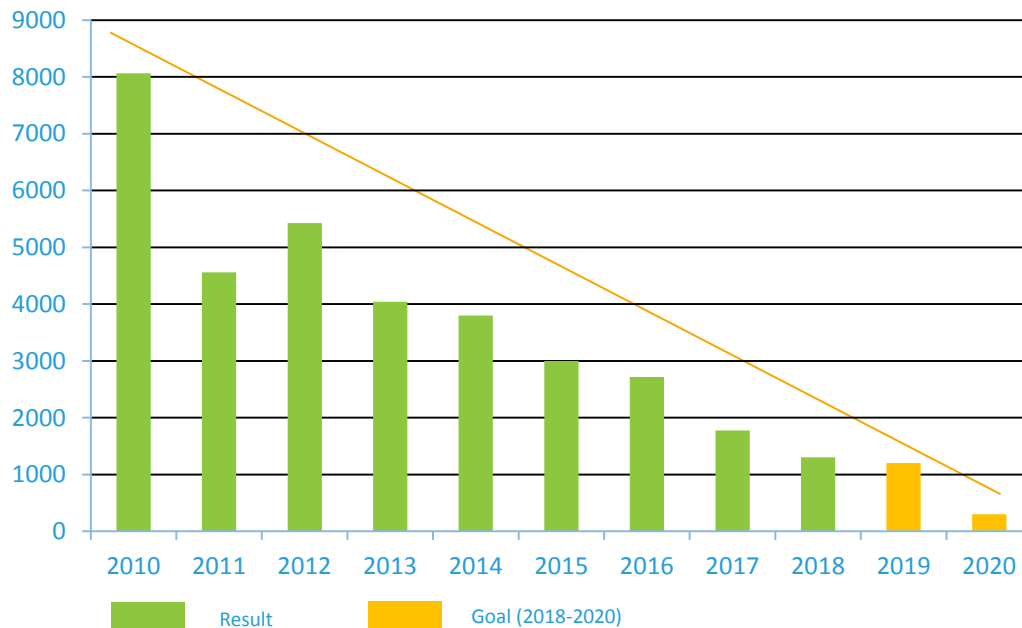
Following Sweden’s hottest summer ever, Greta Thunberg decided to go on school strike at the parliament to get politicians to act



Source: The Guardian, Euronews, BBC



# Swedavia - zero fossil carbon dioxide emissions 2020





# How to create a market that nearly does not exist?

Roadmap: <http://fossilfritt-sverige.se/roadmaps-for-fossil-free-competitiveness/>

The road map

Sweden use 1 million tonnes of jetfuel annually  
5 per cent target = 50 000 tonnes of SAF needed



Future legislation

<https://www.regeringen.se/493238/contentassets/6d591e58fd9b4cad8171af2cd7e59f6f/biojet-for-flyget-sou-201911>

0

2020: No emissions of fossil carbon dioxide from Swedavia's operations

2020

5%

2025: The share of renewable jet fuel shall be five per cent.

2025



2030: Swedish domestic air transport will be fossil-free.

2030



2045: All Swedish air travel, domestic and international, will be fossil-free.

2045



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## Swedavia stimulates the demand of SAF



The first company in the world to power all flights for business purposes by SAF

450 tonnes annually refuelled since 2016

2016-2018 together with SkyNRG and Fly Green Fund

2019 together with Air BP



We also want to  
create history and  
we do this together  
with others  
-Joint procurement







# Fossil-free Aviation 2045

Together with SAS and RISE we started an innovations cluster which aims to gather the value chain for SAF in Sweden



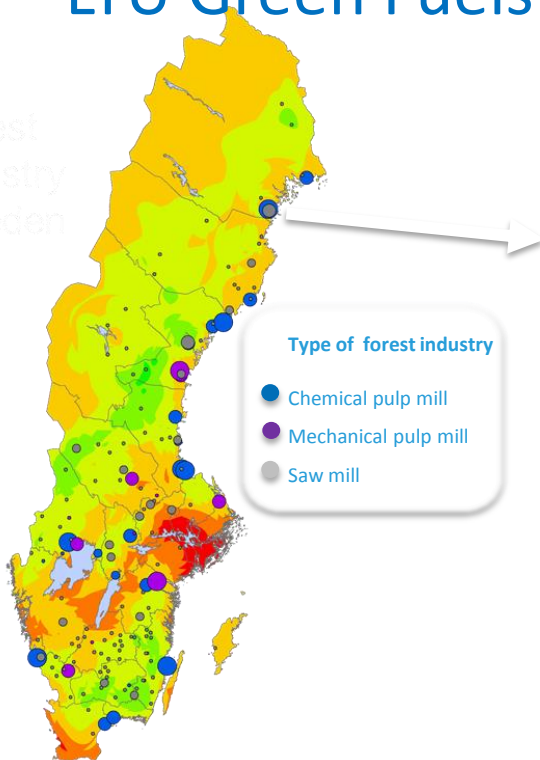
We have the supply of biomass: 12 TWh needed for fossil free aviation in Sweden.





# LTU Green Fuels BioJet initiative

Forest  
industry  
Sweden



Retrofitting of LTU Green Fuels 3 MW gasifier with av Fisher Tropsch and up grading unit has the potential to produce 300 to 600 tonne of biofuel per year using an ASTM certified pathway for a pre-commercial full value chain test evaluation.

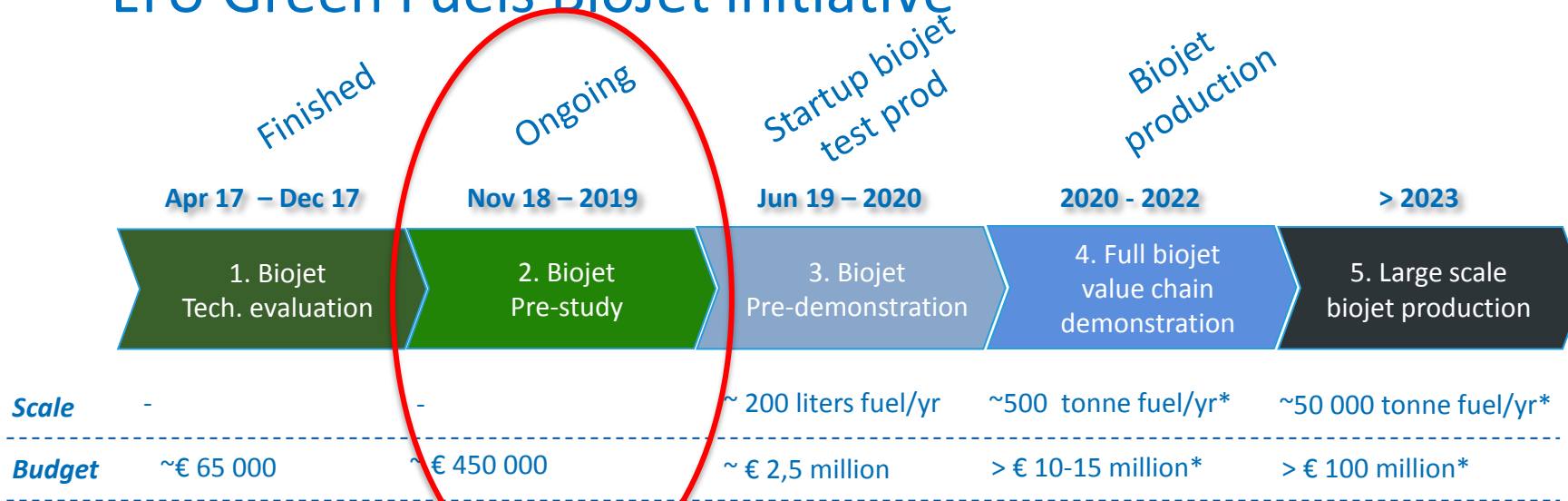
**LTU GREEN FUELS**  
<https://www.ltu.se/org/tvm/Avdelningar/LTU-Green-fuels>

Gasification, (Pressurized, oxygen-blown Chemrec technology )	Gasification + Synthesis
3 MW, 20 t DS/day of black liquor	6 t/d methanol or 4 t/d DME
>28 000 h op. since 2005	>12 000 h op. since 2011
Recovery of cooking chemicals without difficulties	> 1 500 ton MeOH produced
Co-gasification with PO (150 ton) tested >1000 h	> 1 000 ton DME produced

Source : : IVL, LTU Biojet Tech. Evaluation. 2017, Biojet fuels from forest feedstock, Vinnova UDI



# LTU Green Fuels BioJet initiative



\* Indicative

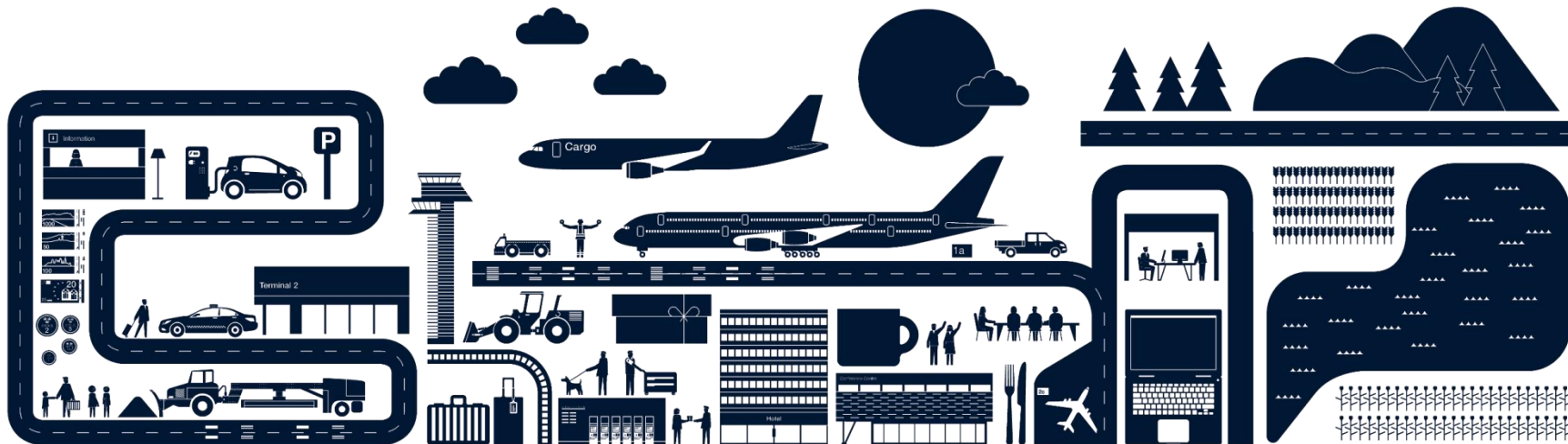




*By having the courage to invest and learn from our experiences, we will be able to achieve more than if we continue to wait for the perfect solution*

Thank you!

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THANK YOU