



**NISA**

# Nordic Initiative for Sustainable Aviation

”Nordic cooperation on aviation biofuels”

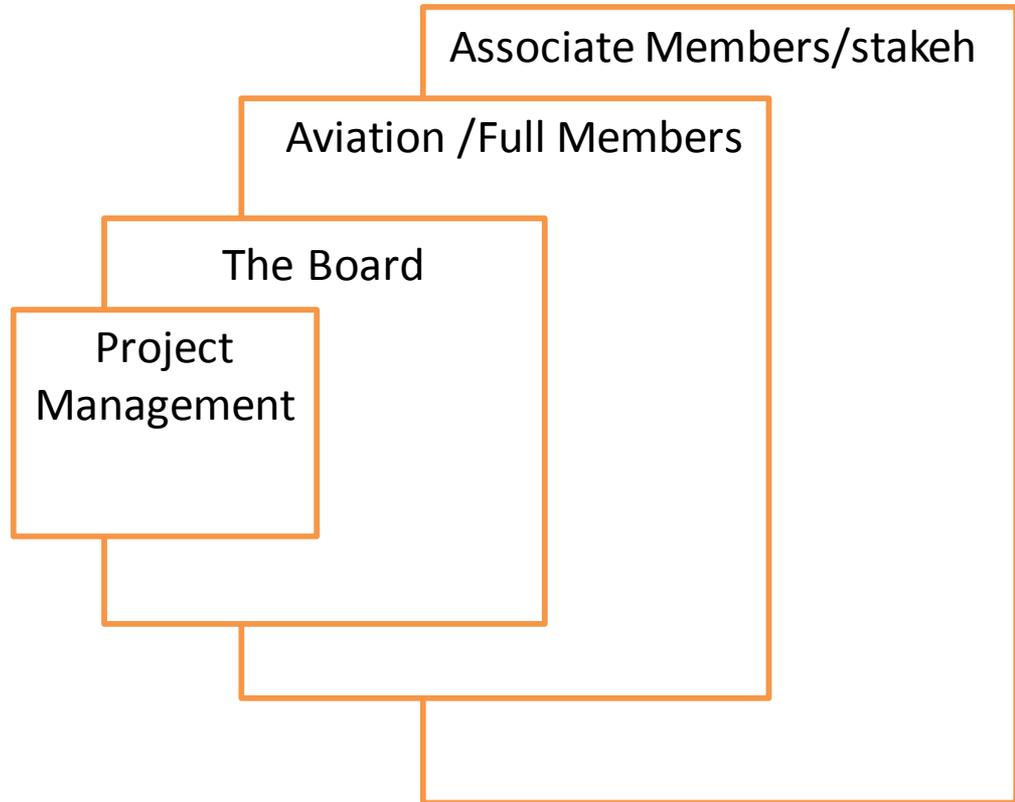
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Martin Porsgaard

[www.cleancluster.dk/nisa](http://www.cleancluster.dk/nisa)

# Organization

SAS
Swedavia
Avinor
Copenhagen Airports
Airbus
Boeing
Finnair
Finavia
Atlantic Airways
Air Greenland
Icelandair
TUI Fly Nordic
Danish Confederations/BDL
NHO Luftfart
IATA
Svenskt Flyg
FlygBranschen
Ministry of Transport
Danish Transport Authority
Isavia, Reykjavík
Swedish Transport Agency
Energimyndigheten
Energistyrelsen
SkyNRG



- The aviation industry has so far been involved in many different activities regarding emission reductions
- Biofuel for aviation has been in focus for SAS and Finnair for several years
- On the global scene IATA and ATAG has initiated a lot of activities over the last 7-8 years
- In Norway, Avinor has together with AirBP, Lufthansa Group, KLM and SAS made Oslo Airport into the world's first hub to offer jet biofuel to all airlines on a commercial basis
- Finnair and SAS have carried out several commercial flights using biofuel
- Swedavia has established an offset model where a premium price goes directly to the use of biofuel
- Finavia is working with other relevant parties in Finland to find a model that can strengthen an interest in the production and use of biofuel
- Copenhagen Airports are involved in a feasibility study converting waste streams to new fuels
- Establishment of NISA to coordinates activities, projects, reports and initiating the Nordic Report. -  
- A nonprofit organization, representing the whole sector

# Nordic Flight Path - Business case(s)

- **The Nordic Study and after:**

- **Mapping of opportunities:** Feedstocks, materials, residuals, methods, co-production, cross cuttings, existing and new producers etc
- **Identification of the complexity in choices and decisions:** Sustainability criteria, Calculations, GHG and CO2 emissions, accessibility, pricing etc
- **Identification of ownership:** Customer-supplier-relationship, partners and collaboration, political landscape, priority and competition, investor aspects
- **Barriers, difficulties and resistance (also passive):** Complexity, lack of prioritization and decisions, lack of policy
- **Recommendations etc:** How to proceed, Identify partners, Tendering process, Feasibility Studies, potential solutions national, Nordic, EU, Global....
- **Constellations for specific / closer cooperation:** National, Nordic funding/ new applications, EU participants, NGO's etc, - FlyGreenFund (FGF)
- **Nordic Pilot Projects:** 1, 2, 3.....

## **A complete Nordic sustainable jet fuel supply chain**

- will be highly complex
- consist of many different actors and stakeholders in addition to facing technological-, economic-, sustainability- and political challenges
- addressing the challenges could be the forming of partnerships or/and strong agreements and contracts
  - Private / public
  - Stakeholders across the different components of the supply chain
  - Stakeholders across companies, countries, institutions etc

# Recommendations:

- The report contains a number of relevant recommendations.
- Aimed at policy makers, refineries, producers, suppliers and developers, investors and others. We see it as an important call for swift response and broad involvement
- The overarching recommendation is that we all see the report as an instrument to take further steps!

## What the next steps could be, - in a Nordic view:

- Policies and decisions to kick start long sighted development in the Nordic countries
- The market is there for using a new jetfuel in each of the Nordic countries, - but limited in order to produce it, - much stronger position on a Nordic and EU level
- We suggest a specific targeted study focused on possible constellations and collaborations
- Crucial to promote cross-border cooperation, both between public knowledge institutions and private businesses, - and between countries
- Creating a “Nordic Panel for sustainable Aviation”
- Nordic Council of Ministers/Nordic Energy Research to play an important role
- Strong pressure on fuel suppliers to deliver sustainable fuel for aviation
- Possible to develop a Nordic innovation tender process in collaboration with relevant parties?

**Overall:**

- There is an explicit need for stronger political and economic initiation, cooperation and coordination
- Sustainable jetfuel (sustainable future for aviation) is a serious issue for society, jobs, cleantech etc
- Important to engage and facilitate the public interest in the industry's efforts to develop a sustainable future for aviation, - the establishment of FGF etc
- Sustainable jetfuel should become part of National Energy Plans and coordinated on Nordic level
- Partnerships to coordinate a stronger development to create access to the most efficient pathways
- Coordinate and cooperate with international initiatives and with NGO's

# Emerging technologies

- Lanzatech - developing a technology for converting industrial waste gases into high value chemicals and ethanol by fermentation/chemical conversion into jet fuel
- Solazyme microalgae feedstock, world's first 100% algae-derived jet fuel. Produced from algae oil by fermentation + UOP HEFA process technology
- Joule Unlimited produced both diesel and jet fuel - sunlight and concentrated CO<sub>2</sub> source to drive hydrocarbon production by photosynthesis in microbial organisms
- SOLAR-JET and German Sunfire, - Power to Liquid by capture CO<sub>2</sub> and convert into syngas – Electro fuels
- SWESTEP: Catalytic Pressureless Depolymerisation (CPD) multiple feedstocks
- SynSel: Catalytic pyrolysis - lignocellulosic feedstock
- Cumulus Bio: Develops advanced bio- and renewable hydrocarbon products
- Hydrothermal liquefaction (HtL) wet biomass processed in a medium-temperature, high-pressure thermochemical reaction to produce a bio-crude.

## **A subject with many names:**

*Renewable Fuels*

*Renewable Jetfuel*

*Alternative Aviation Fuels*

*Sustainable Aviation Fuels*

*Sustainable Jetfuel*

*Biofuel*

*Biokerosen*

*Sustainable Alternative Aviation Fuels*

*Advanced sustainable jet fuel for aviation*

**As an industry, we should now, in the light of the report and based on the experience we have done, finding ways as soon as possible to create sustainable solutions**

**The need is there, the market is there - and the possibilities are there!**