NISA
Nordic Initiative for Sustainable Aviation

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An association working to promote and develop a more sustainable aviation industry

**Main purposes:** Facilitate, coordinate and push forward the development of sustainable and alternative fuel for the aviation industry

**Overall objectives are:**
Helping catalyzing and promoting by no later than 2016 at least 3 pilot projects covering the value chain for sustainable jet fuel

Catalyzing the development of a business case by 2015-2016 for a project covering a full scale biofuel production for aviation in the Nordic Region

Contribute to ensure the Nordic region as a minimum meets its share of the EU Flight Path target of 2 million tons or more of sustainable jet fuel in 2020
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Reduction through investments in:

- technology
- operational measures
- infrastructure

CO₂-neutral growth

unavailability of biofuels

new technologies and biofuel

Source: IATA annual report, 2010; ATAG presentation
This licence permits the growth of aviation in a responsible and sustainable manner, for the benefit of the global economy and citizens around the world.
OUR CLIMATE ACTION

2010
1.5% p/a fuel efficiency
Working towards carbon-neutral growth

2020
Carbon-neutral growth
Implementation of global sectoral approach

2050
-50% CO₂
Half the net aviation CO₂ of 2005

Targets are at the global level – not on States or operators and targets do not mean slowing down the growth of aviation
Sustainability is key
(Corporate social responsibility)

- Not just a word - but a safeguard for a growing future aviation
- Push for solid sustainability criteria for biomass and processes
- Total sustainable supply chains
- Sufficient Life Cycle Analysis
- Encourage the development and adoption of a global sustainability standard (RSB)

SAFUG
- Exhibit minimal impact on biodiversity
- Meet a sustainability standard with respect to land, water, and energy use
- Do not displace or compete with food crops
- Provide a positive socioeconomic impact
- Do not require any special fuel handling equipment, distribution systems, or changes to engine design
Regional Biofuel-consortia/initiatives established

Brazilian Alliance for Aviation Biofuels, ABRABA Brazil

Aviation Initiative for Renewable Energy in (AIREG) (Germany)

AlfaBird, Sustainable Way for Alternative Fuels in Aviation and Flight Path 2020 (EU)

Initiatives for the Production and Consumption of Biojet Fuel for Aviation (Spain)

Saltwater Tolerant Biomass As A Source of Aviation Fuel, (Abu Dhabi)

Commercial Aviation Alternative Fuels Initiative (CAAFI) (US)

Flight Path to Sustainable Aviation Fuels CSIRO (Australia and New Zealand)

NISA, The Nordic Countries

Also initiatives in Indonesia, China, Mexico, Qatar, Italy and more....

Airbus and Boeing, - several engagements globally, - and as well ICAO and IATA of course plays overall coordinating and supporting roles
• There is a clear requirement for stronger political and economic support as well as cooperation both nationally and internationally

• There is a need to create global solutions and guidelines for production of sustainable aviation fuels, while reducing emissions of greenhouse gases

• Sustainable jetfuel (sustainable future for aviation) is a serious issue for society

• It is important to engage and facilitate the public interest in the industry's efforts to create a sustainable future for aviation

• Biofuels for aviation should become part of National Energy Plans worldwide

• Need to establish public-private partnerships to coordinate the development to ensure access to sustainable fuel, regional cleantech solutions and consequently, additional employment and growth

• NISA intention to co-ordinate and co-operate more with international bodies and NGO’s
Aviation
Sustainable jetfuel

NISA Progres
Plan:

National studies to
Nordic Flight Path
Network/pre-studies/initiatives
Sweden

Network/pre-studies/initiatives
Norway

Network/pre-studies/initiatives
Denmark

Network/pre-studies/initiatives
Finland

Network/pre-studies/initiatives
Other/International initiatives

Prestudy phase - February / Aug 2014

Nordic Workshop
Invited stakeholders from authorities, researchers and the supply chain

Outcome:
1. Dialogue and collaboration - cross borders
2. First step to a Nordic Study in sustainable jetfuels

September 2014

Nordic study
Nordic perspectives in the use and production of advanced biojetfuels
Co-funded by Nordic Council of ministers
Steering group: Representatives from authorities in all the Nordic countries and NISA

Outcome:
1. Nordic Route Forward
2. Recommendations
3. Nordic potentials

March 2015 – Summer 2016

Ultimo 2016
Sustainable jetfuels/Nordic/national studies - and NISA Workshop Sep 2014:

**Aviation statements:**
A liquid fuel is a prerequisite for still many years
The market is there – will expand in the coming years
Alternative fuel specifications is in place – more will be approved in near future
Infrastructure is a societal condition - Aviation is a part of the infrastructure

**Nordic potentials:**
Non fossil materials/feedstock are available
Technical solutions are within reach - matter of priorities and financing
A lot of strengths and opportunities, - Private/Private and Private/Public visa versa
Clean tech cooperation with solutions that could benefit industry, research and society

**Suggestions on steps ahead:**
Access to money for the necessary developments and decisions (R&D) and projects
Economy of scale – and large break through projects
Integration of new fuels production in existing plants/co-processing
Dialogue on incentives/regulation/blend-in mandates etc
Airline customer-requirements for reducing carbon footprint, Green funds etc
Biofuels for aircraft

The Nordic Council of Ministers has launched a study of the climatic impact and commercial potential of using biofuels for aircraft. Feb 23, 2015

“I hope that a Nordic approach will identify there is potential for green growth in biofuels for aircraft. Denmark can’t propel this by itself, but the prospects may change dramatically if the Nordic countries join forces,” Petersen says. The outcome of these efforts will be presented at a conference in 2016. In addition to their positive climatic impact, biofuels for aircraft may also have significant commercial potential.

Green aviation
At its general meeting in 2016, the UN’s aviation organisation ICAO will discuss policy instruments that will reduce the aviation industry’s CO2 emissions. “I hope that this Nordic initiative will teach us a great deal about advanced biofuels for aircraft and help with global climate ambitions….” Petersen concludes
Next steps

Joint Nordic study / Nordic Council of Ministers, national energy-/transport/environment agencies and the aviation sector (NISA)

Invitation to tender: “Perspectives on the use of advanced biofuels for aviation – Nordic perspectives”

Possibilities, barriers and gaps:

• Building on ongoing and former initiatives like the feasibility studies by Avinor, NIRAS/Denmark, Swedish studies, Finnish Trp Ministry, – Airbus and Boeing, ao projects and experiences globally

• Identify possible cross-cutting initiatives and collaborations (Nordic companies, organisations authorities, institutions etc.), synergy solutions etc

• Identify international actors with whom a Nordic initiative on production could engage

• Opportunities of strategic collaboration processes

• Dialogue with, and stronger pressure on, existing fuel suppliers

• Influencing the political landscape, dialogue, partnerships etc
Further ongoing Nordic projects

- Four Nordic demo-flights (SAS two, Finnair and Norwegian) on sustainable fuel autumn 2014

- A Flight Green Fund under construction (SkyNRG and others)

- Gardemoen (Norway) and Karlstad (Sweden) first biohubs, spring 2015

- FT production in pipeline, Norway, - based on residuals from forests

- Study on Future Liquid Aviation Biofuels Based on Ethers for Gas Turbine Engines – Budget more than 4 Mio € (80% granted) 4 years from Jan 1st 2015

- Neste Oil (Finland) involved in different development projects
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2015

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Pass ways....

“Conventional” AVTUR Pathways:
(crude oil, natural gas liquid condensates, heavy oil, oil shale, oil sands, ...)

Non-“Conventional” pathways to produce AVTUR

Lipid based fuels
(oils, greases, fats, ...)
- camelina, algae, ...
- lipids

Carbohydrate based fuels
(sugars, lignocellulosic fibres, ...)
- sugar cane, ...
- lignocellulosic fibres, ...
- saccharification
- pyrolysis
- fermentation
- alcohol

Non-petroleum fossil based fuels
(coal and natural gas)
- gasification
- syngas

Hydroprocessing
- HEFA (2011) D7566 annex 2
  - Co-processed task force
  - CH task force
- DSHC task force
- ATJ task force
- SK, SAK task force
- HDCJ task force
- FT-SKA task force

Catalytic upgrading

DEF STAN 91-91 AVTUR & ASTM D1655 JET A1 (A) fully miscible and fungible