/ OPPORTUNITIES AND CHALLENGES WITH ELECTRIFIED REGIONAL AVIATION

1. The challenges
2. Current state of electrified aviation
3. Update from Skellefteå
4. Update from Kokkola-Pietarsaari
5. The opportunities

/ The challenges

- Need for regional transportation
- Limited improvements in road and rail infrastructure
- “Passenger-pay-principle”
- High costs - limited revenue
- Sustainability
- Strong overall support from the European Union but hard to access money for commercialisation
- Requires both regional and national support, action and funding

					
Type	**Drones**	**Hydrogen**	**Hybrid**	**Battery**	**eVTOL**
Capacity (seats)	Cargo, surveillance, etc. 1-20 kg	10-70	20-50	5-10	2-6
Introduction	Now	2028	2029	2028	2028
Distance	0-200 km	100–700 km	400 km (200 km electricity)	100–400 km	15-200 km
Challenges (examples)	• Airspace regulation • Noise • Costs • Ground infrastructure • Standardisation • Operation in cold weather	• Certification • Infrastructure • Production, distribution and handling of hydrogen • Costs • Demand • Operation in cold weather	• Certification • Complexity • Costs • Charging solutions • Infrastructure • Demand • Operation in cold weather	• Certification • Battery development • Costs • Low capacity • Power demand • Charging infrastructure • Cargo • Demand • Business models • Operation in cold weather	• Certification • Airspace regulation • Acceptance • Costs • Infrastructure • Noise • Ground infrastructure • Safety • Business models • Operation in cold weather

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/ DEVELOPMENT PROGRAM AND TEST BED FOR ELECTRIC AVIATION

SKELLEFTEÅ SCIENCE CITY

Skellefteå kommun

Skellefteå Airport

Skellefteå Kraft

elis program

Test bed for battery- and hydrogen electric aviation

Help to speed up the way to commercial operations

Foster cooperation in the ecosystem

/ Why a testbed for electric aviation in Skellefteå?

- Cold climate and harsh weather conditions
- Empty airspace
- Green and affordable electricity and 1MW power supply at the airport dedicated to electric aviation
- Competence within electrification, batteries and hydrogen
- Top 3 airport in the world regarding movements with electric aircraft
- Local demand regarding fast, innovative and sustainable transport solutions

System demonstrator to deliver green hydrogen flights

Skellefteå Kraft

Skellefteå Airport

GREEN FLIGHT ACADEMY

BRA

Lycksele airport

ZEROAVIA

What is included in the system demonstrator?

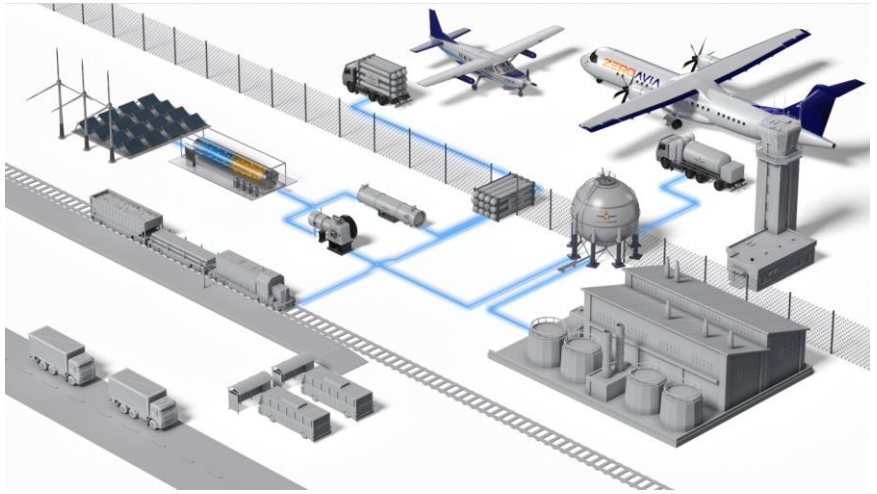
1. Hydrogen production
2. Hydrogen transportation and handling
3. Technical infrastructure
4. Permits
5. Safety requirements
6. Actual flights
7. Communication and collaboration
8. Evaluation regarding if and how to enter a commercial phase

What to verify through flights in real conditions

1. Flying in different types of weather, not least tough weather conditions and very low temperatures
2. Verify actual hydrogen consumption
3. Flight times
4. Technical handling, maintenance, training needs, pilot-related issues
5. Need for infrastructure, permits, safety, etc. at the airport for a complete turnaround
6. Understand actual costs
7. Early understanding of possible problems, challenges, obstacles, etc. that occur when making real flights
8. Confidence among future users of hydrogen flights
9. Demonstrate real flights for politicians, the public, the media, etc.

Time plan

1. Secure funding (2024-2025)
2. Project regarding ground infrastructure (2025-2026)
3. Project regarding flight demonstrator (2025-2027)
4. Evaluation and first commercial roll-out (2028)

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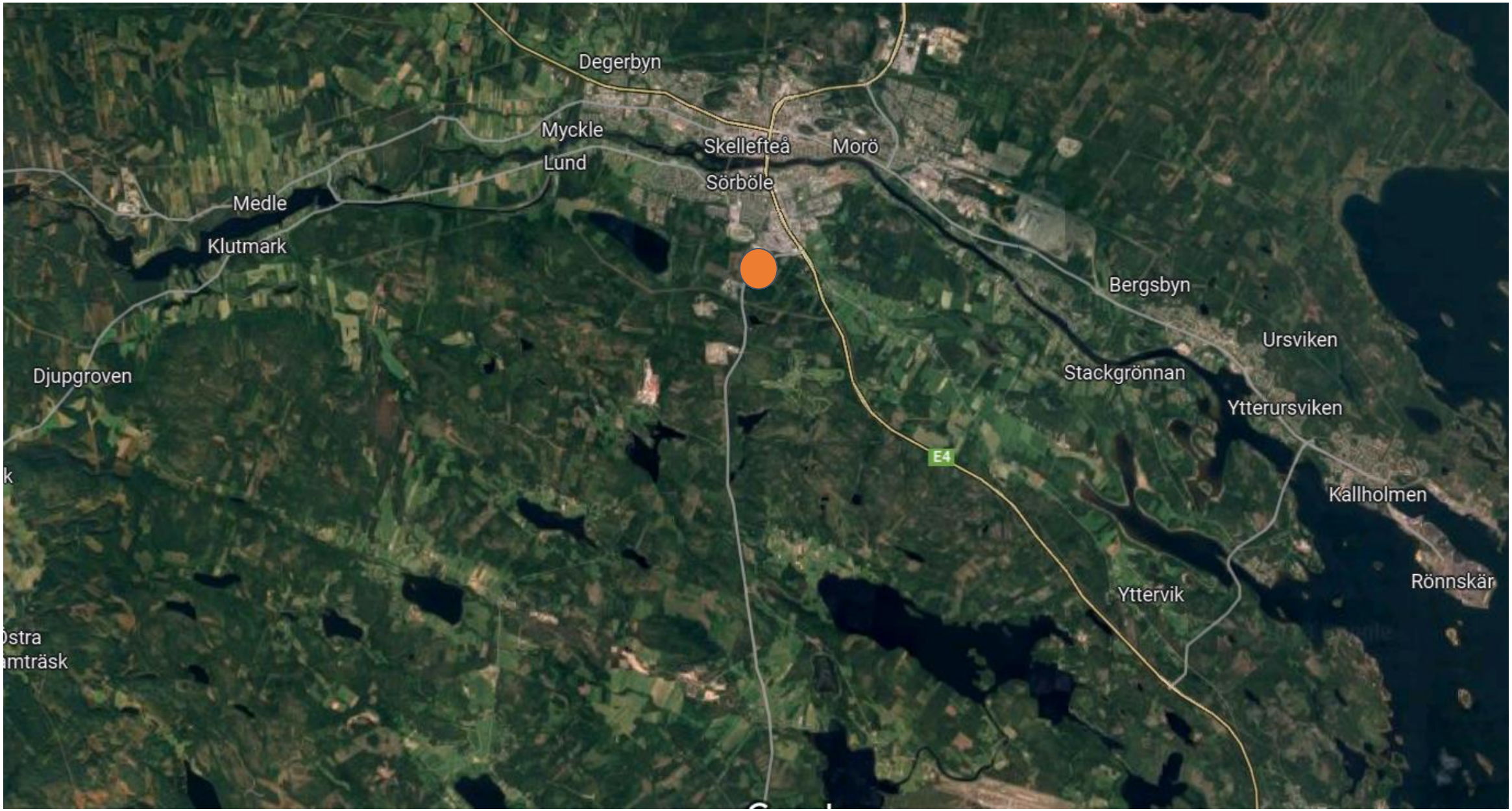
/ DRONEPORT SKELLEFTEÅ
SKELLEFTEÅ SCIENCE CITY
Skellefteå kommun
Skellefteå Airport
Skellefteå Kraft

“Droneport Skellefteå shall enable test, demonstration and commercialisation of drones, drone services and drone related systems in a real urban and rural environment and in harsh weather conditions.”


Degerbyn
Myckle
Lund
Skellefteå
Morö
Sörböle
Medle
Klutmark
Bergsbyn
Ursviken
Djupgroven
Stackgrönnan
Ytterursviken
E4
Kallholmen
Rönnskär
Yttervik

Why a droneport?

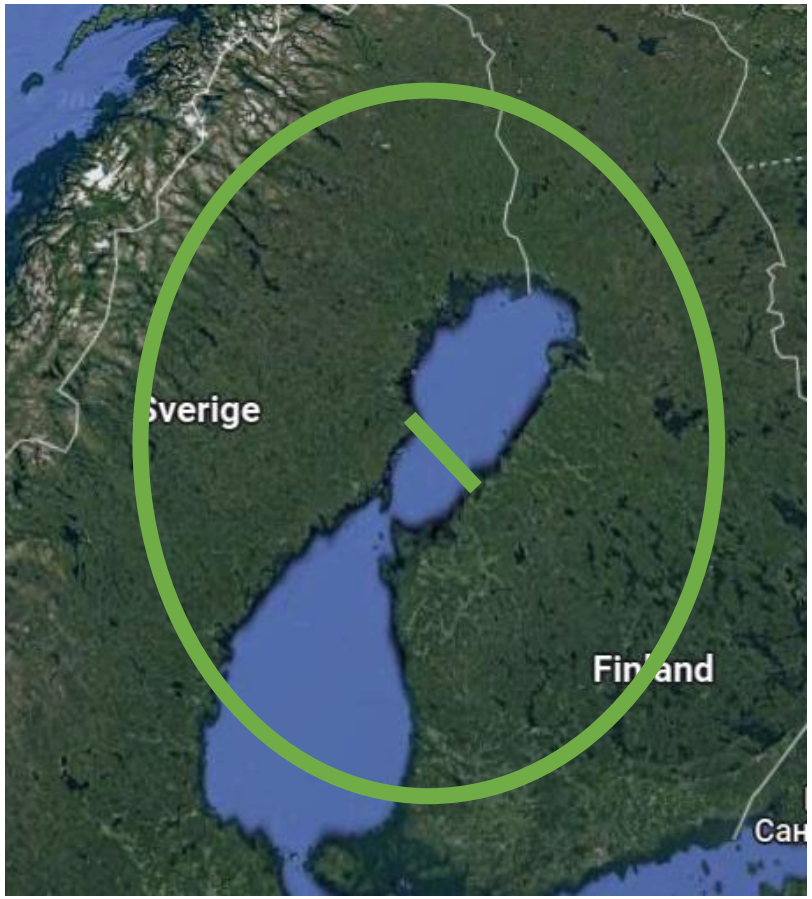
- Drones are already here
- A number of possible use cases
  - Police, Rescue Services, First-response, surveillance, deliveries etc.
- A way to build competence, learn and shorten the time to large scale use
- Drone-as-a-service

KOK

KOKKOLA-PIETARSAARI AIRPORT

- Kokkola-Pietarsaari Airport will install a 1 MW power facility dedicated for charging electric aircraft.
- This creates a unique 150 km test track for electric aircraft and wing drones between two countries and over water.
- LOI hopefully to be signed between SFT and KOK with the goal of introducing zero emission flights between the cities as soon as there are certified commercial aircraft ready to use.
- Need to understand potential regulatory barriers - implementing cross-country PSO routes, safety regulations etc.

/ The opportunities

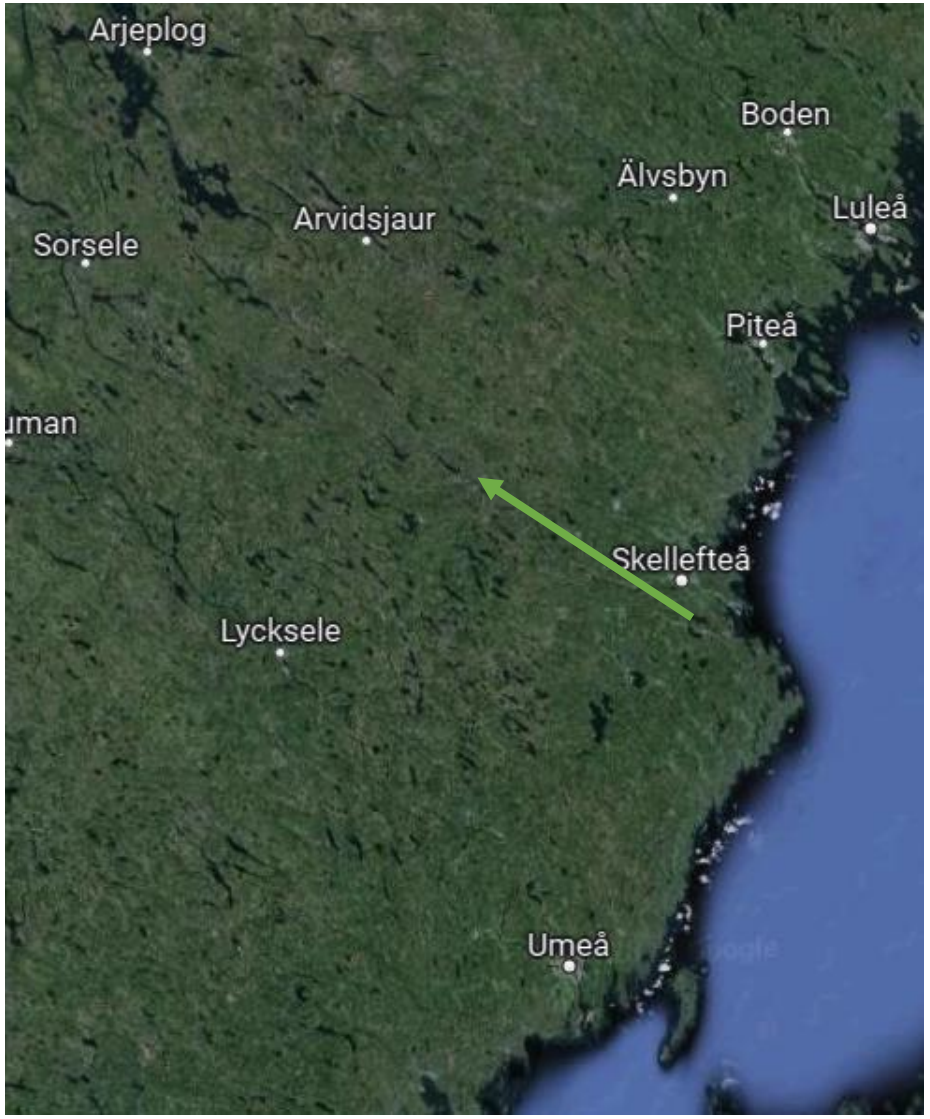


- Probably the only place in the world with a 1MW charging facility at two airports within the reach of the first generation of electric aircraft.
- Paving the way for one of Europe’s first commercial zero emission air routes.
- Saving approximately 5 hours of travel time each way.
- One hub for electric aircraft on each side of the Gulf of Botnia open up opportunities for a wider short-haul network.
- Increased regional connectivity.
- Why not start with buying a Pipistrel Velis Electro?

Time to re-think the way we can travel in a much more sustainable way today and a few years from now

Stockholm - Skellefteå

Sustainable Aviation Fuel
80 percent CO2 reduction
550 km, 1 h
30 EUR



Skellefteå - Svansele

Electric aircraft
80 km, 30 min
Landing on a frozen lake
Silent and fossil free

Svansele - Off grid cottage

Electric snowmobile
5 km
Silent and fossil free

Off grid house in the wilderness

Drones ready to deliver emergency equipment, medicines, powerbanks, food etc making the remote off grid house a safe place to stay

Thank you!

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