



Sustainable Taxiing at Schiphol Airport

Trial results and perspective



Project by Simon Prent &
Dirk Bresser

Background

Dutch sector program 'Slim én Duurzaam' (Smart and Sustainable)

Signed by, amongst others, KLM, LVNL, Schiphol

Primary goal: to reduce CO₂ emissions from Dutch civil aviation originating in the Netherlands by 35% by 2030

In 2030, all Royal Schiphol Group airport ground operations will be climate neutral

A potential important way to achieve this is by sustainable taxiing aircraft

Sustainable Taxiing solutions

	Wheeltug	Safran-Airbus	Single engine taxiing	Aircraft Towing System	Taxibot
Type	Aircraft Based	Aircraft Based	Aircraft Based	Airport Based	Airport Based
Certification	No, 2021	No, 2022	Aircraft/airline specific	Concept	Yes (B737, A320)
Implementation	Nose gear	Main gear	Engine	Rail system	Human-controlled truck
Additional Weight	Est. 160kg	Est. 350kg	0 kg	0 kg	0 kg
Fuel consumption	Est. 0,3kg/min. (APU)	Est. 0,3kg/min. (APU)	Est. 7,5 kg/min (jet engine)	Est. 0,3kg/min. (APU)	Est. 0,5kg/min. (Diesel)
Zero emission possible	No	No	No	Yes	Yes

Pilot Results

Mission figures

170 missions / >25 test days

8 'live' flights

3 Airlines, 2 handlers,

LVNL, Schiphol, Smart Airport Systems

Potential annual savings

50-70% Fuel

124.700 ton CO₂ / 647.800kg NO_x

Noise and (ultra) fine particles reduction

€ 25 million fuel costs



ATC and sustainable taxiing



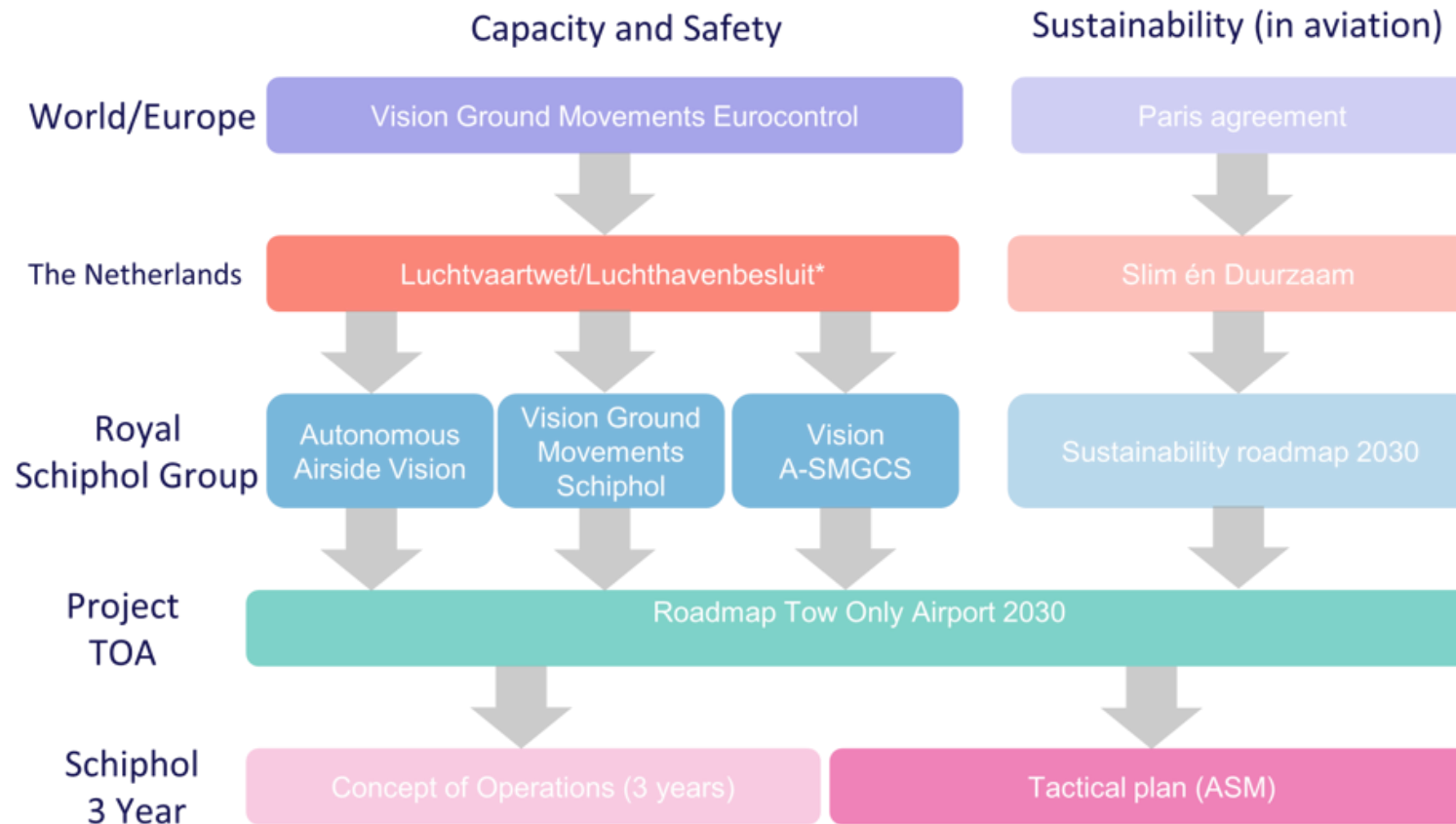
Observations

- Shift from focus on uncoupling in apron bay towards new position
- Taxiway blockages while uncoupling on taxiways
- Right of way tow-taxi challenges

Potential mitigations

- Infrastructural: build out-of-flow uncoupling positions
- Procedural: Change way of working ground controller
- Technical: decrease uncoupling times

Need for balancing sustainability, safety and capacity: From vision to implementation



Collaboration in greener aircraft taxiing

How can we help each other?

The need for standardization (opposed to Schiphol-specific solution)

- Training needs (current pilot CBT is airport specific)
- Rules and regulations
- Standard operating procedures

Demand for knowledge and expertise by other airports and ANSPs

Knowledge and expertise of other airports and ANSPs can be used at Schiphol