



trinitair

## Plug & Fly

Retrofit Wingtip Solution



The Aircraft Performance Company GmbH

# We start with a cleaner sky.

A wide array of important green projects are in various stages of their realization all around the world to help restore a healthy ecosystem.

Many of these programs will contribute to reduce CO<sub>2</sub> emissions, driven by research and development resulting in a process chain of new technologies.

There is no, nor will be a shortage of great ideas.

**Harald Zirngibl**

Managing Director

We make aircraft novel

# Plug & Fly

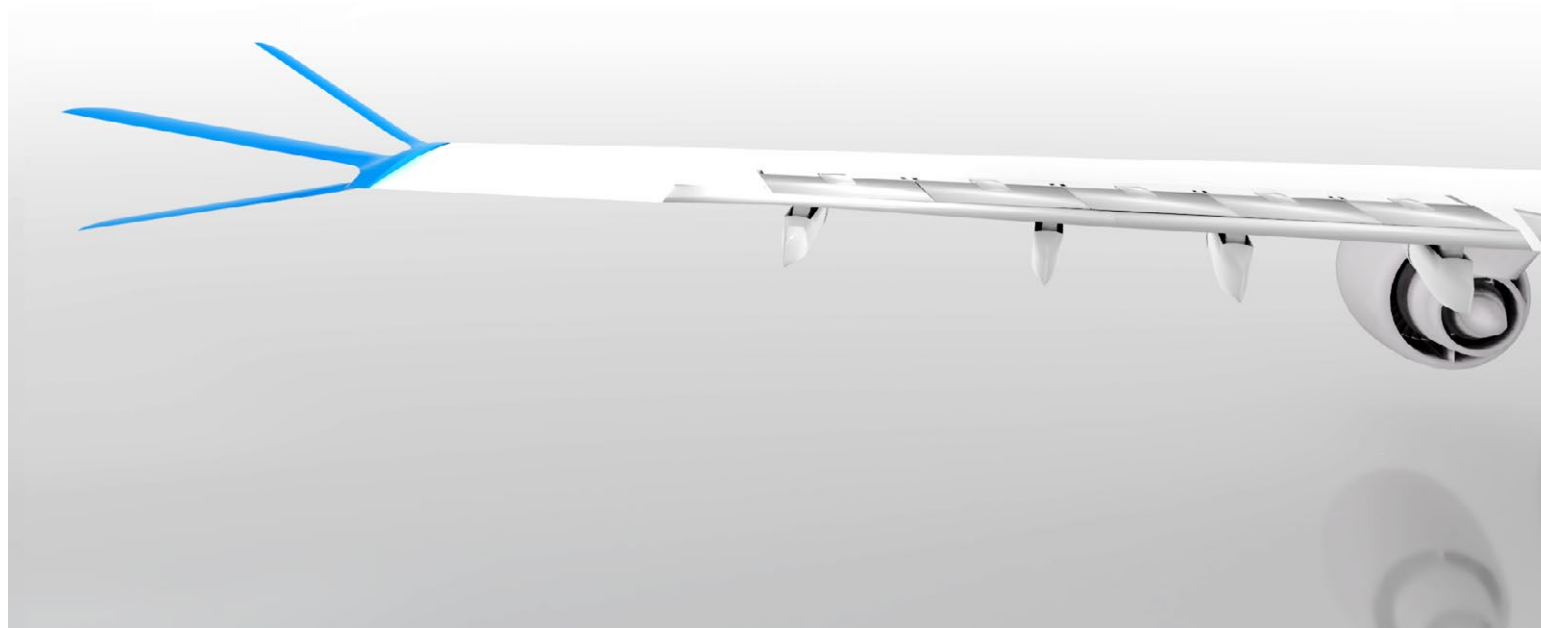
With expertise and ingenuity we make a significant impact on the future of today's and tomorrow's aviation regarding lower emissions and environmental pollution.

TRINITAIR was designed as a cost-effective retrofit solution for valuable in-service aircraft.

The new wingtip technology TRINITAIR is the first step towards our goal to make a notable contribution to reduce aviation-related greenhouse gas emissions in the currently existing fleets.

Our Plug & Fly concept increases the number of aircraft which will be retrofitted and by this the number of aircraft which generate less emissions.

TRINITAIR will have the maiden flight for this new green technology on an AIRBUS A330 in 2021.



## Who we are

The Aircraft Performance Company GmbH has been founded in 2016 by the two aviation engineers and aeronautics enthusiasts Hans-Jörg Petscher and Raymond Lucas.

The built up of an interdisciplinary core team starts in Hamburg, Germany.

## Our mission

The focus of our company is set on design and performance improvements resulting in increased fuel efficiencies of legacy and next generation aircraft.

We offer turnkey programs that emanate from creativity and curiosity and transform hands-on solutions into a tangible reality.

## Our solution

Our first product is a retrofitable multi-finger-wingtip we named TRINITAIR.

This technology provides an enhanced aerodynamic solution supporting aircraft-manufacturers and airlines in their commitment to reduce CO2 emissions.

The APC's new wingtip technology TRINITAIR is the first step to make a notable contribution to reduce aviation-related greenhouse gas emissions in the currently existing fleets.

Winglets are a truly great invention. They increase the effective aspect ratio of a wing without adding greatly to the structural stress and the weight of its structure.

With most wing designs, winglets are key to achieve a fuel burn reduction. Our three-finger-wingtip configuration TRINITAIR enhances the efficiency of this proven technology.

TRINITAIR Wingtip

# Inspired. Designed. Evolved.

It is possible to make a valuable contribution when it comes to reducing fuel burn.

Waiting until science and industry can present solutions which allow CO2-neutral flying is not an option.

Meanwhile we open and create new paths to decrease greenhouse gas emissions caused by civil air-traffic. Reducing a few percent of fuel burn on a single flight might at first sight not sound impressive.

**But sum it up!**

A cargo flight from Frankfurt FRA to New York JFK with a modern twin engine long haul freighter carrying a payload of 90 tons and a flight time close to 8 hours shows a trip fuel of about 60 tons.

Hence, 1% lower fuel flow saves about 600 kgs trip fuel.

In addition the amounts for contingency, alternate and final reserve fuel will be reduced as well, adding

up to savings of about 100 kgs additional. The overall reduced gross weight during the entire mission lowers the fuel consumption by another approximately 250 kgs per ton, so all effects together reduce the amount of used fuel for the mission by about 1 ton.

For one flight from Frankfurt FRA to Hong Kong with the same aircraft and equal payload, fuel savings in the range of 1.1 to 1.2 tons would be achieved.

GENERAL FLIGHT DATA



**PAYLOAD**

FRA – New York JFK 90t    FRA – Hong Kong 90t



**FLIGHT TIME**

FRA – New York JFK 8h    FRA – Hong Kong 11h



**TRIP FUEL**

FRA – New York JFK 60t    FRA – Hong Kong 83t

EFFECTS OF TRINITAIR



**SAVED FUEL**  
FRA – New York JFK  
> 1t



**REDUCTION OF CO2 EMISSION**  
> 3160kgs CO2



**SAVED FUEL**  
FRA – Hong Kong  
> 1.2t



**REDUCTION OF CO2 EMISSION**  
> 3800kgs CO2

Retrofit Wingtip Solution

# The benefits of Trinitair

We support the transformation towards a greener environment.

35 – 40% of the total air resistance of an aircraft in cruise configuration is caused by induced drag. Winglets have made a significant contribution in lowering this induced drag.

Enhancing the positive effect of conventional winglets, TRINITAIR incorporates a profound patented knowledge of various interdisciplinary interactions addressing an optimal circulation distribution.

## PLUG & FLY

Retrofit Wingtip Solution

**Aircraft downtime less than one day.**

## LOWER FUEL BURN

Greenhouse Gas Reduction

**Lower fuel burn to reduce emissions of CO<sub>2</sub>\* and NO<sub>x</sub>.**

\*1kg of JET A-1 aircraft fuel generates 3.16kg of CO<sub>2</sub>

## PERFORMANCE OPTIMIZATION

Performance Enhancement

**Lower drag in cruise results in lower thrust settings**

Lower engine wear  
Range extension  
Payload increase

This provides more than the before exemplified 1% fuel savings from Frankfurt to Hong Kong or to New York JFK.

Join and expand our path with us

# Sometimes the best ideas begin on a napkin

It started on a blank napkin and made its way to a Retrofit Wingtip Solution.

TRINITAIR was designed as a climate saving project in mind.

Focusing on near to medium term CO2 objectives, we want a cost-effective solution to improve the carbon footprint of valuable in-service aircraft.

There is no, nor will there be, a shortage of great ideas turning into products towards sustainable air-travel and air-cargo transport if we collaborate in this endeavor.

We wish to encourage others to join us on this journey to a climate-friendly world.

