AACO 7th Aviation Fuel Forum

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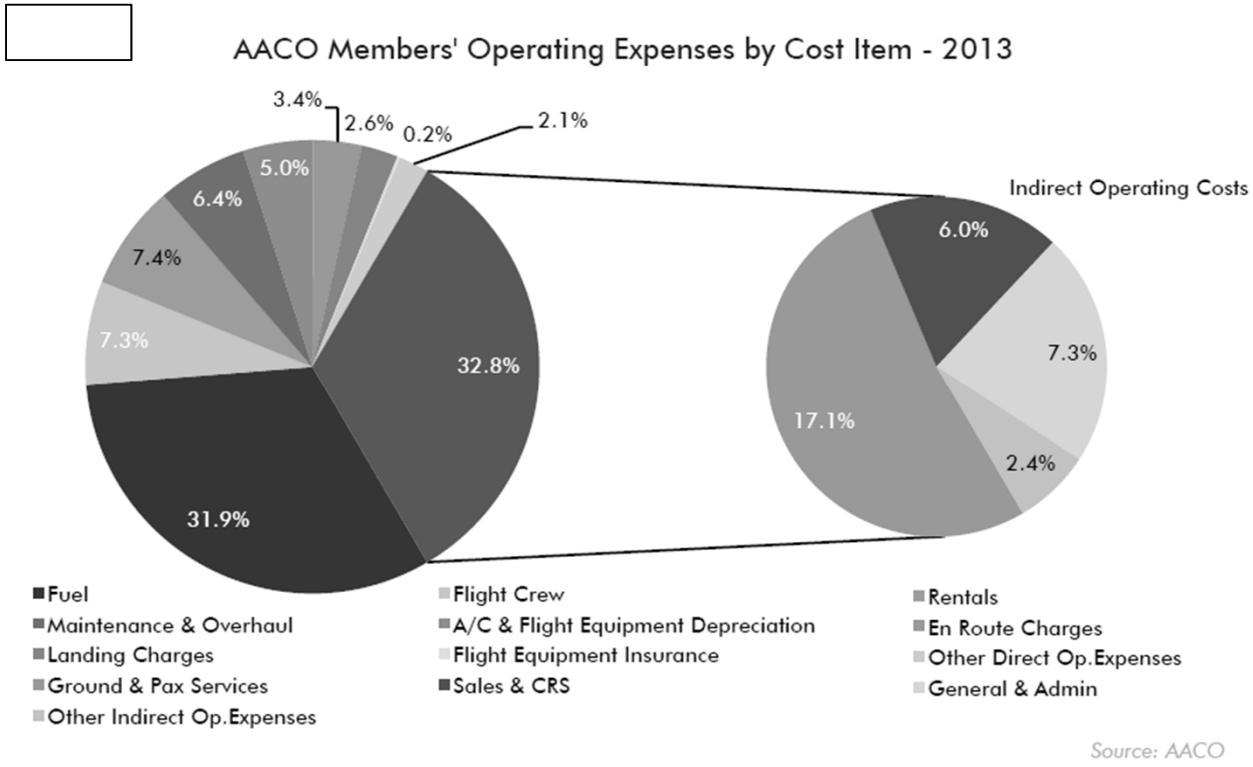
Flight Operations Consultant

Fuel and Flight Efficiency Services by Airbus

Why fuel is key in your expenses?



Fuel expenses represent more than **30%** of airlines cost

How can Airbus help you?

We are your ideal partner in all these fuel initiatives

How can Airbus help you?

Ground operations - Taxiing

- 4% of trip fuel is burnt during taxiing (short haul flights)
- 50% of Foreign Object Ingestion are during ramp and taxiing operations
- Taxiing with engines at low power setting is the major contributing phase for carbon monoxide and unburned hydrocarbons

Taxiing systems to replace engines Taxi out/in : a promising concept for eco-efficient operations

TaxiBot and eTaxi

TAXIBOT

- Tractor type equipment
- Pushback and Taxi Out operations
- Narrow body (A320s/B737) and wide body (B747/A380)
- Hybrid diesel-electric drive
- Already used at Frankfort airport

eTaxi egts™

- Main wheel equipment
- Pushback, Taxi Out and Taxi In operations
- Narrow body
- eTaxi powered by APU
- Under development

How can Airbus

Ground Oper

Maintenan

Aircraft technology

Sharklets retrofit

Taxi In without APU

Neo aircraft

Sharklets retrofit

A320

1 Line Fit
A/C delivered with
⊕ **Reinforced structure**
⊕ **Sharklets**
⊕ **Flight computers functionality**

Optional on A320 ceo
>1100 A/C delivered (up to Dec 2015)
- Option on A320ceo: 90% of the A/C delivered are sharklet-equipped
- Standard on A320neo

2 Production Retrofit
A/C delivered with
⊕ **Reinforced structure** (modifications to be performed)
⊕ **Sharklets**
⊕ **Flight computers functionality**

Above MSN 5514
Available NOW
Elapsed-time: 1 day
FEB13
EIS

3 In-service Retrofit
Modifications to be performed
⊕ **Wing structure reinforcement**
⊕ **Sharklets**
⊕ **Flight computers functionality**

Above MSN 1200
Available for purchase NOW
Elapsed-time: 13 days
Q3 2015
EIS

Up to 4% of fuel savings on top of enhanced performance, environmental benefits, increased residual value

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Taxi In without APU

A320

- Wiring modification
  - In the pylon
  - Around the engine fire nacelle

- Availability
  - SB lead time: 3 months
  - Kit lead time: 4 months

- Aircraft and Airport environment to be considered
  - Engine cool down time
  - Aircraft weight
  - Taxi slope

Reduction of APU maintenance costs on top of fuel savings

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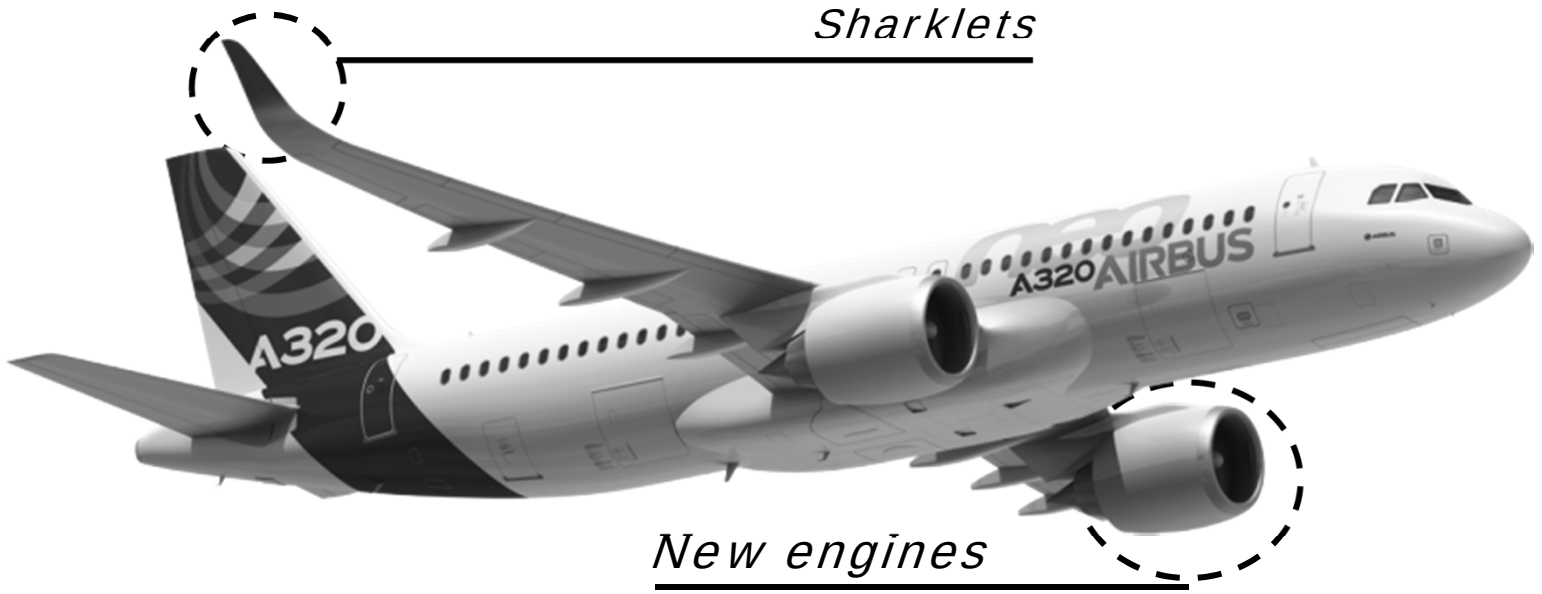
Neo aircraft

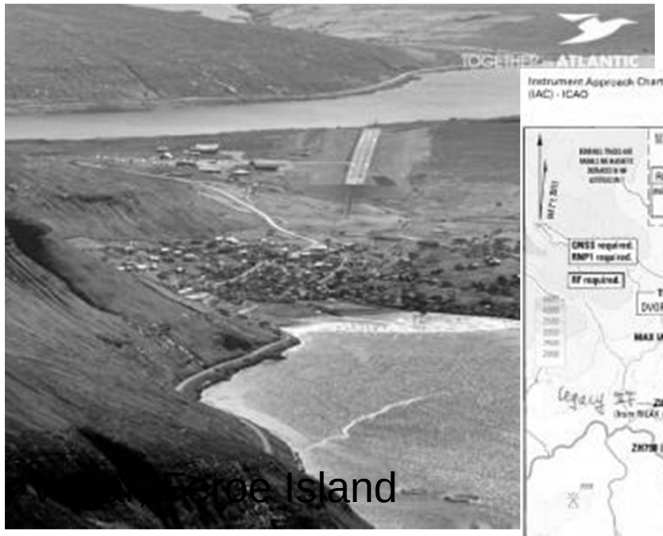


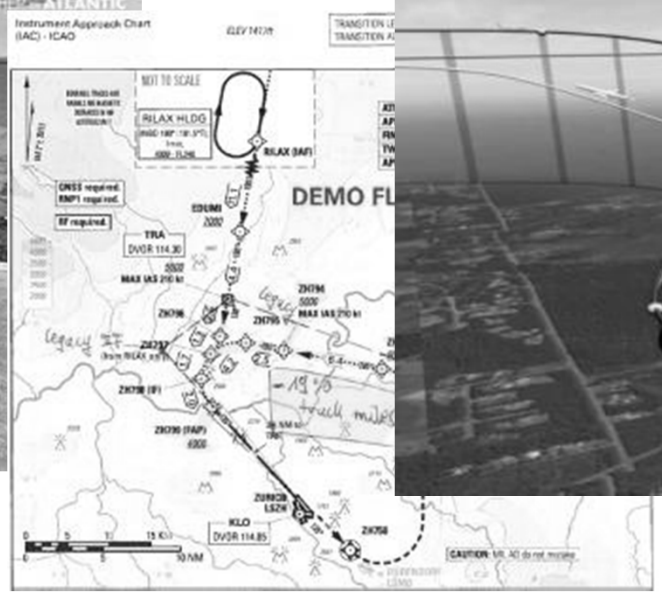
High Bypass ratio

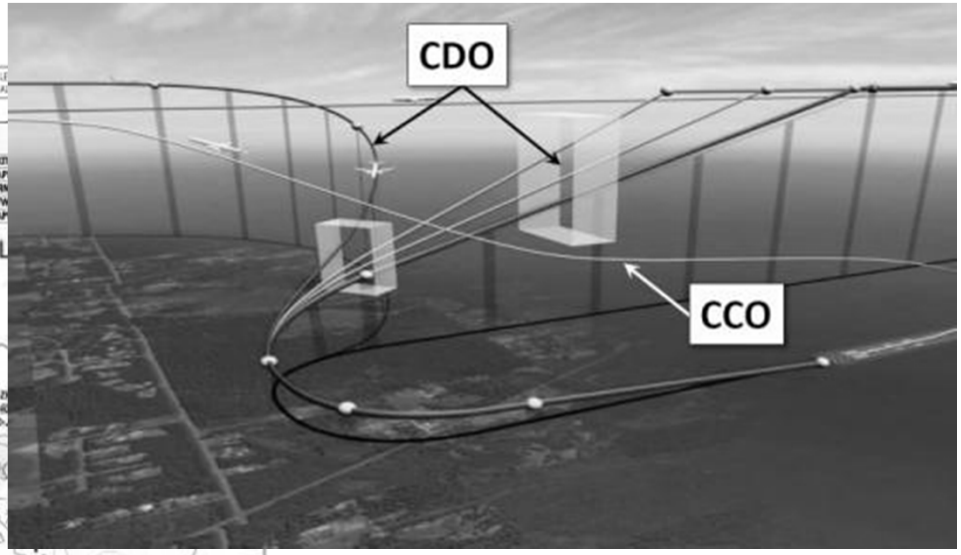
Minimum change, maximum benefits: **15% overall fuel burn reduction**

How can Airbus help you?

Performance Based Navigation

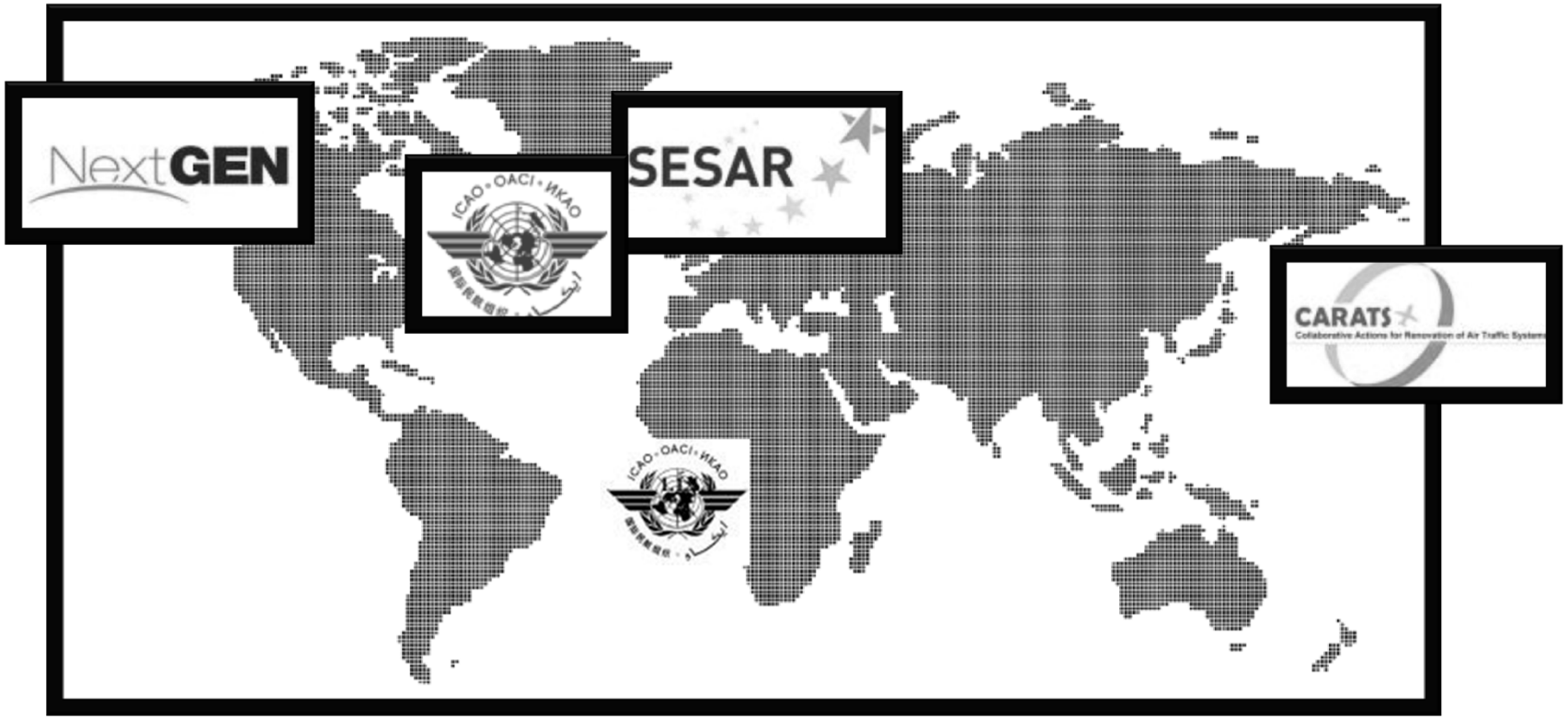






Less cancellations, less diversions, less fuel burn (on top of safety enhancement)

ATM initiatives



How can Airbus help you?

The fuel efficient way to fly the aircraft – Green Operating Procedures (GOP)

AFTER START ← **Flight Phase**

Ident.: PRO-SUP-93-10-00015333.0001001 / 03 DEC 13
Applicable to: ALL

APU ← **System**

- **If the APU is necessary during or after taxi:**
  APU BLEED.....KEEP ON
  When the engines are running, exhaust gas ingestion may occur during use of the APU bleed.

AIR CONDITIONING ← **System**

- **If one PACK is sufficient to supply air during taxi:**
  ONE PACK.....OFF
  Change between the packs on each flight, in order to prevent excessi

Applicable procedure

PACK FLOW SELECTION

PACK FLOW.....LO (ECON)
The SOP provide the pack flow settings.
When passenger numbers permit, LO (ECON) mode saves up to 0.5 % of fuel.
When the APU bleed supplies air, the pack flow-setting has no effect on fuel consumption.

ANTI-ICE ← **System**

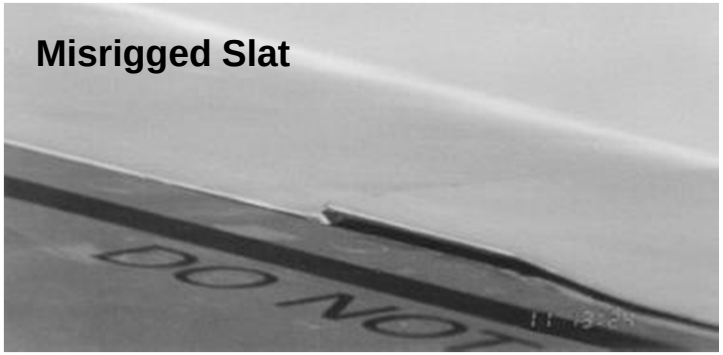
The selection of anti-ice increases engine thrust and fuel consumption.
Therefore, the flight crew should only select the anti-ice when necessary.

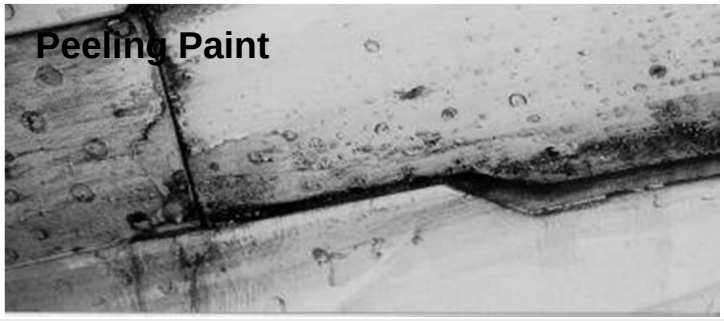
GOP: Collaborative work with Airlines to adapt our procedures to your needs

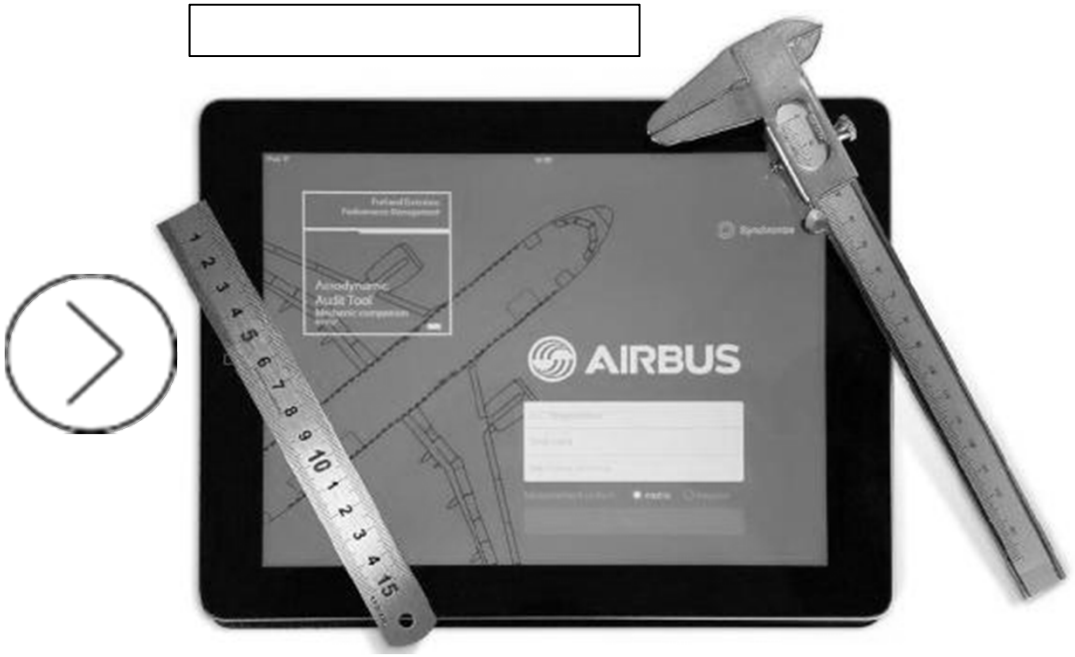
How can Airbus help you?

Managing airframe aerodynamic performance

A320







Aerodynamic Audit Tool: Towards a fuel efficient aerodynamic inspection

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Managing airframe aerodynamic performance

A320

Define what to inspect and how to do

Estimate fuel penalty of each finding

Identify optimum defect correction opportunity

Aerodynamic Audit Tool: Towards a fuel efficient aerodynamic inspection

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How can Airbus help you?

Fuel & Flight Efficiency Consulting Services

1st Phase

Diagnosis

- Operational analysis per flight phase
- Check of existing initiatives
- Identification of further initiatives
- Define areas of improvement & establish recommendations

2nd Phase

Quantify & Monitoring

- Follow, control & report the implementation of initiatives
- Measure their benefits
- Ensure correct use of adopted initiatives
- Continuous monitoring to ensure promotion of fuel and flight efficiency measures

Diagnosis phase - Analysis

Flight phase procedures

Weight & balance parameters

Flight Operations

Cost Index

APU Use

Aircraft performance monitoring

Aircraft weight management

Maintenance & Engineering

Fuel planning

Reserve & Alternate planning

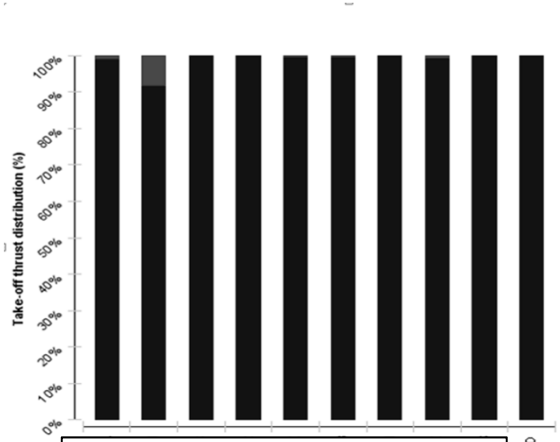
Flight Planning

Pre-flight & Post-flight analysis

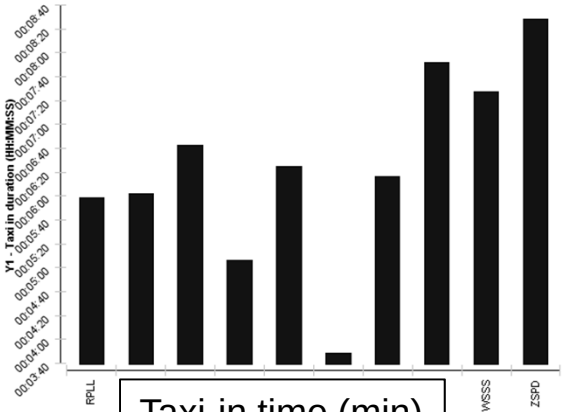
Exchange of relevant data from the airline

- Airline Operating Manuals
- List of fuel & flight efficiency initiatives already in place
- Flight operations and flight planning data (APU statistics, Reserve fuel policy, fuel reports…)

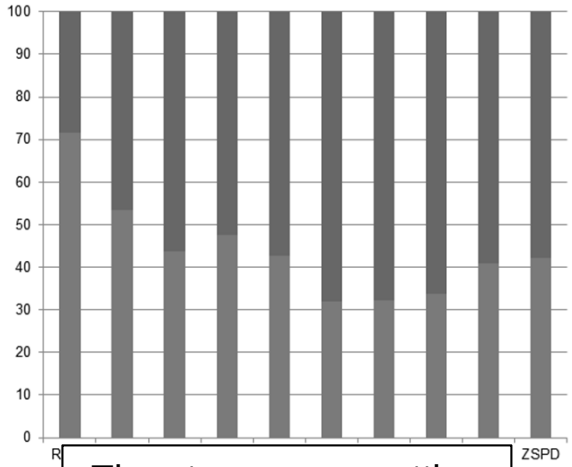
Diagnosis phase – Airline status



Takeoff thrust per airport



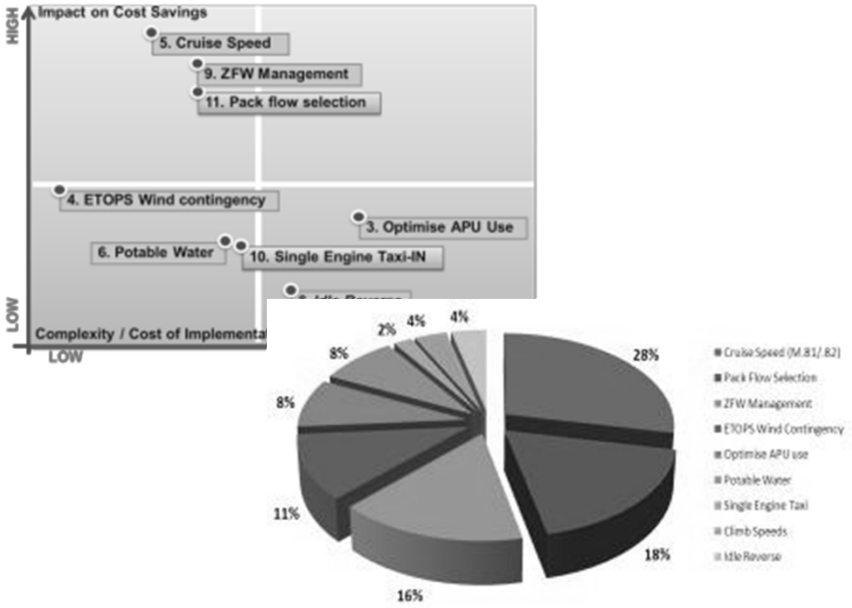
Taxi-in time (min)



Thrust reversers setting per arrival airport)

Privileged visibility on worldwide fleets records and practices

One step further



- Status on Company's current fuel & flight efficiency program
- Assessment of potential savings & Areas for further improvement
- Quick wins and key performance indicators identified
- Methods of implementation & next steps

Benefits from Airbus technical know how and wide product knowledge

Customer feedback

Fleet of 30 Airbus single aisle aircraft

العربية للطيران airarabia.com

"The consultation was extremely useful.
We have already saved ***up to 3%*** *of our total fuel bill…"*

Capt. Mohamed Ahmed - Director of Operations

Fleet of 200 Airbus single aisle aircraft

easyJet

"We had a useful and comprehensive exchange of ideas and suggestions that covered the Flight Operations, Engineering, Flight Planning and Ground Operations domains"

Capt. Chris Foster, Flight Operations Fleet Manager

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Conclusion

CONCLUSION

Conclusion

Review of key domains where you can seek for fuel efficiency

Key for success

To have full engagement in the fuel initiatives: from the CEO to the engineers, ramp agent, …

Airbus Fuel & Flight Consulting Services

> the first step in your Airline fuel program

Airbus Consulting Services

Meet your challenges with Airbus