

Presented by:

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Regional MRO Market – Trends, Challenges & Opportunities

May 5th, 2015 – Budapest



Today's Agenda:



BEER Forecast



Russia/Ukraine Crisis



Impact of Falling Jet Fuel Prices



MRO Industry Dynamics



May 2010–May 2014



*founded 2001,
joined ICF in 2011*



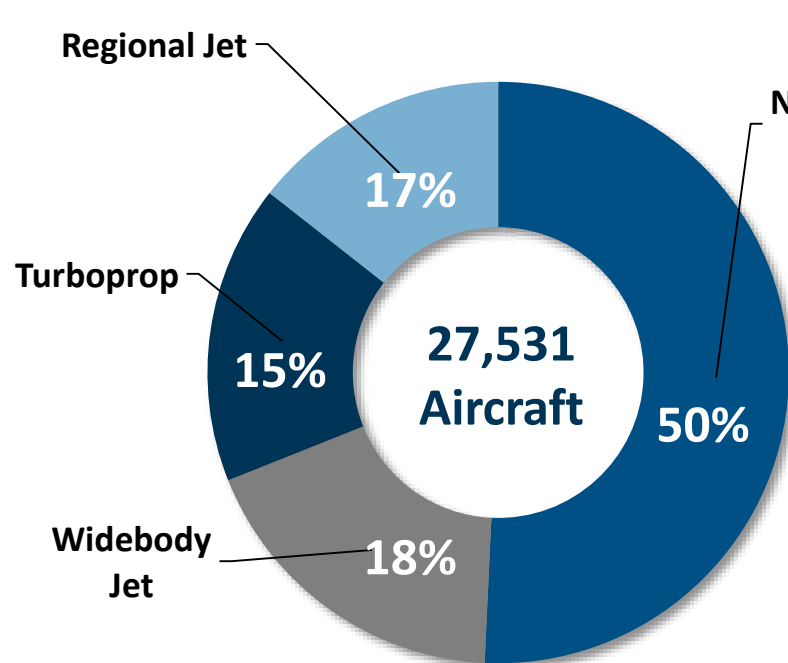
*founded 1963,
joined ICF in 2007*

BEER Fleet & MRO Forecast

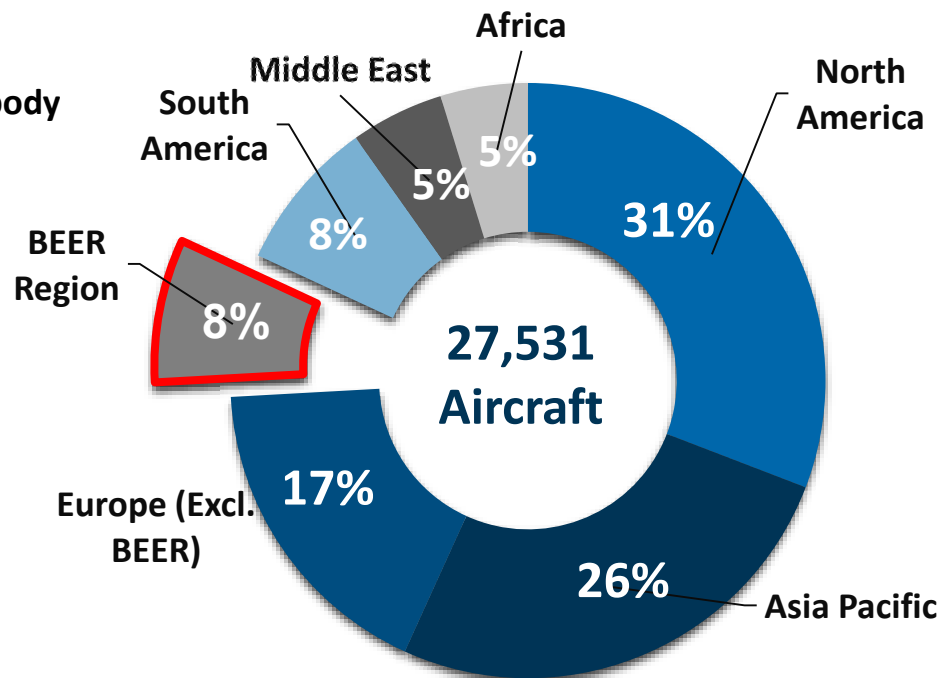


The current civil air transport fleet is over 27,500 aircraft;
The BEER region represents 8% (~2,100 aircraft)

2014 Global Air Transport Fleet



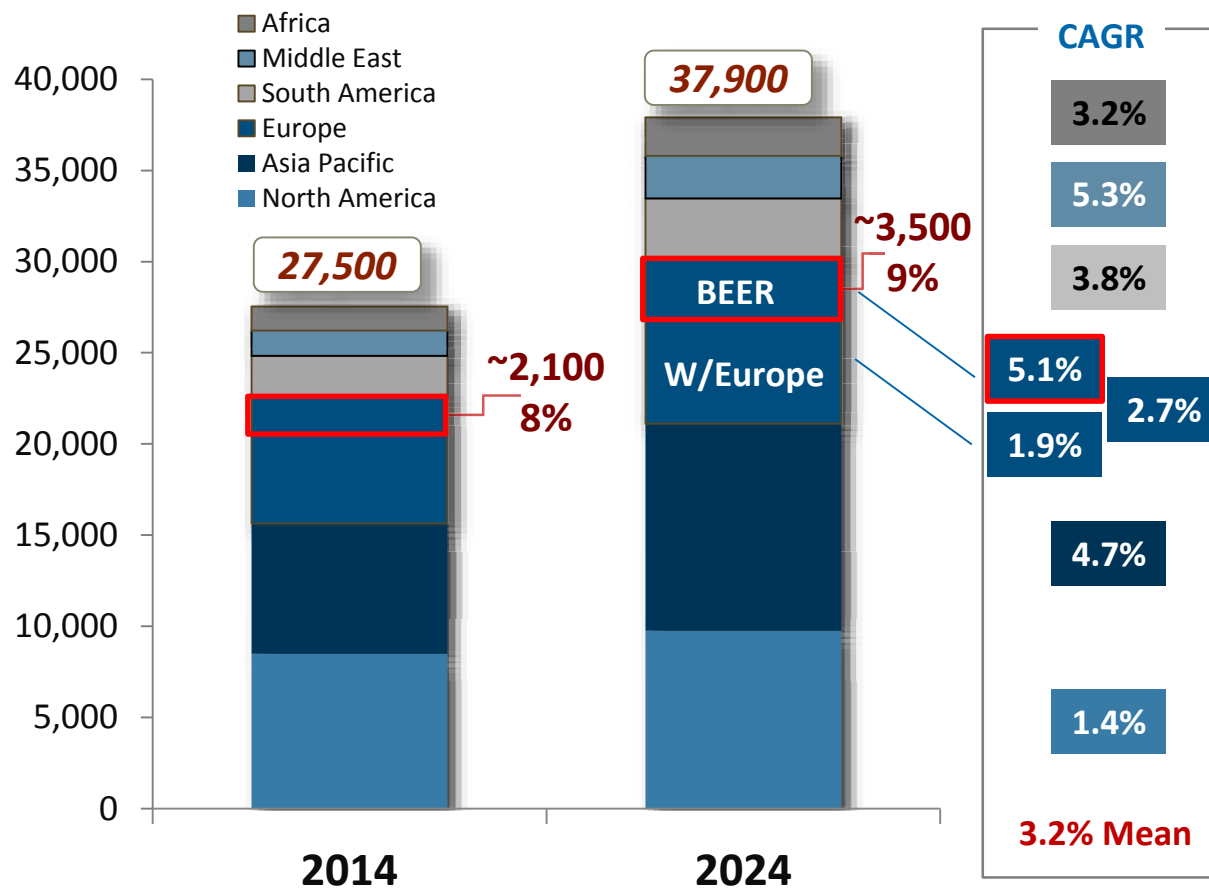
By Aircraft Type



By Global Region

At 5.1% CAGR, BEER is one of the fastest-growing of the world's fleets: while overall European growth is below the global mean

Commercial Fleet Growth 2014–2024

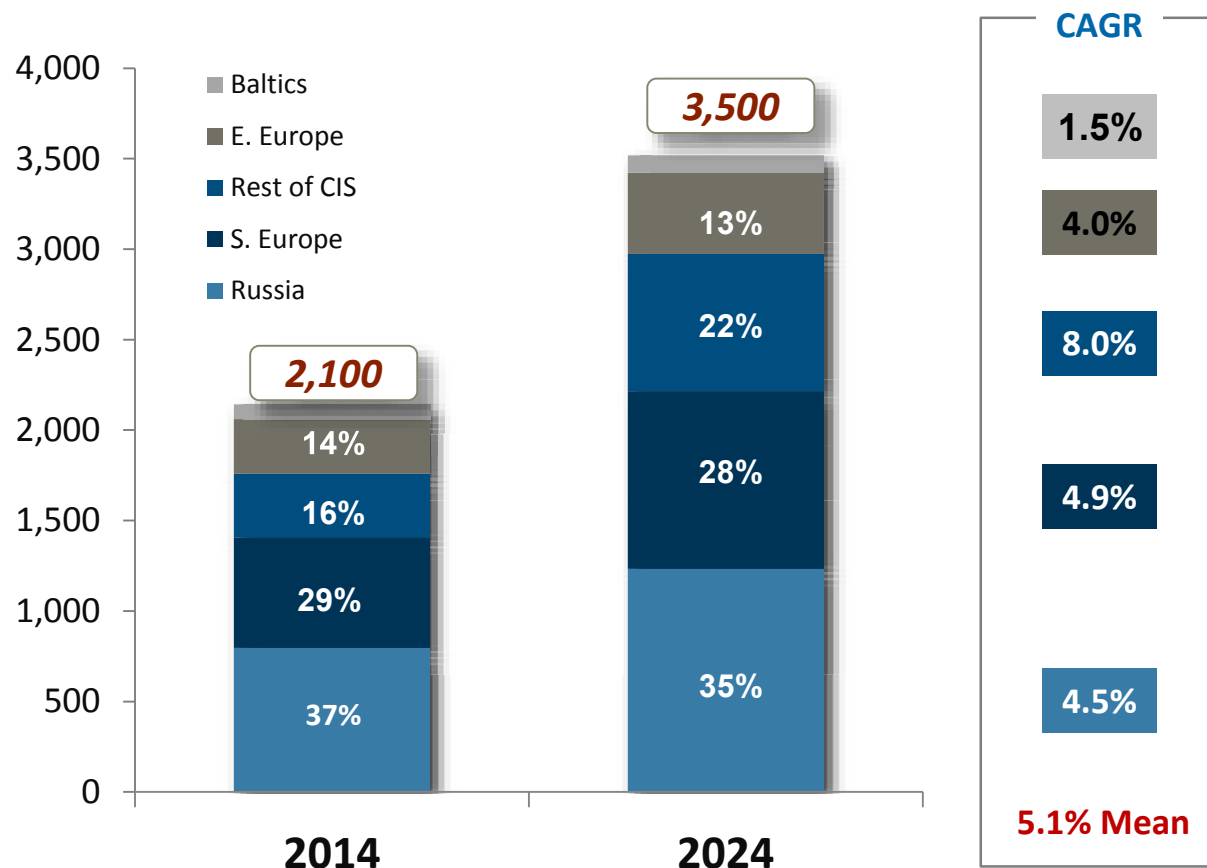


Key Assumptions

- Air travel growth of 3.8% (global)
- Fuel costs ~\$80/bbl
- 19 000 aircraft deliveries
- 8 600 aircraft retirements

Within the BEER Region, the CIS countries will grow the most, at an annual rate of 8%

Commercial Fleet Growth 2014–2024



Source: Flightglobal Acas September 2014, ICF Analysis
(NB/ Southern Europe includes Turkey, Greece: CIS includes Ukraine, Georgia)

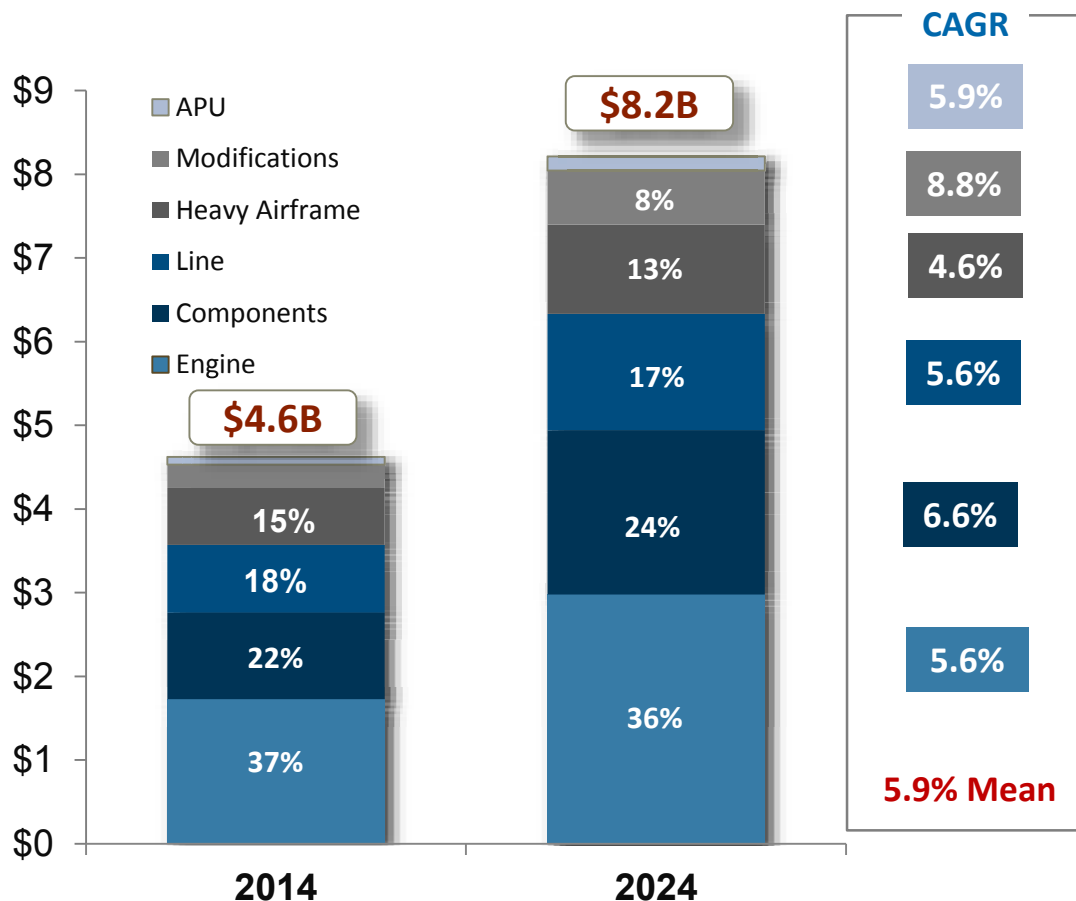


Key Assumptions

- Air travel growth of 3.8%
- Fuel costs ~\$80/bbl
- 19 000 aircraft deliveries
- 8 600 aircraft retirements

The BEER MRO market is expected to grow from \$4.6B to \$8.2B by 2024, at 5.9% per annum

BEER MRO Spend 2014–2024 (\$B)



Key Assumptions

- Mean global growth is forecast to be **3.8% CAGR**, with a 2024 total spend of \$90B
- The strongest driver of growth is expected to be the **engine market**
- Reduced labor intensity** of airframe heavy checks as the fleet renews and increased intervals...offset in emerging markets by increasing labor rates
- Aircraft upgrades** (e.g. interiors, winglets) drive high modifications growth

Source: ICF analysis
Forecast in 2014 \$USD, exclusive of inflation

Russia/Ukraine Crisis



Horrificating Developments – directly impacting our professional life



“Keep your kids out of the war”

Facebook Group “Freight-200 from Ukraine” in Russia
(Freight-200 : soldier’s coffins)

Can we foresee Russia's economic prospects ?

The Strategic Questions

What's the risk of social unrest ?

Political instability ?

Major or Sovereign default ?

How long a recession ?

The Detail

- Return of migrant workers to Central Asia
- Salaries cut rather than workers fired
- Russia's demographic pyramid reduces pressure
- Vigorous shadow economy
- Sanctions solidify Putin's popularity
- Negligible tradition of social activism
- Negligible political opposition
(fragmented, ignored and suppressed)
- Neither EU nor Kremlin can afford to use their "nuclear options" or permit defaults
- Oil prices have done the major damage, with sanctions secondary
- Kremlin's calculus is cash management to minimise inflation ?
- Sanctions defined by events in Ukraine, and political attention span
- Long-term low oil may damage Russia's headline economy

The Scorecard

9% drop in real incomes in 2015 ?

Election due late 2016

Reserves remain at 2009 levels

**Consensus 2-3 years
Why ? Until what ?**

Russia GDP Growth Forecast



NB/ 5% unemployment & external debt ~30% of output would be ambitious targets for many EU members...

And Aviation/MRO ?

The Strategic Questions

When will passenger revenue recover ?

How's the investment environment ?

What about short-term survival ?

What's the effect on the region ?

The Detail

- Both business and personal travel severely curtailed
- Russia's demographics are a structural weakness longer-term
- Rouble strength does improve revenue
- An oil price recovery would benefit Russian air travel
- Substantial reductions in investment & trading since 2013
- Significant reputational damage (eg. Ulyanovsk/Q400 spy allegations)
- Multiple examples of significant distress
- Government attention to airlines historically sporadic
- Significant damage to passenger flows to/from Russia, particularly also from Ukraine and to an extent Central Asia
- Possible benefit to Eastern Europe from investments which had been targeted at Russia

The Scorecard

Recessions hit air travel

Sanctions paralyse corporate finance

Risk of corporate failures

Primarily, reduced revenues

Financial Woes

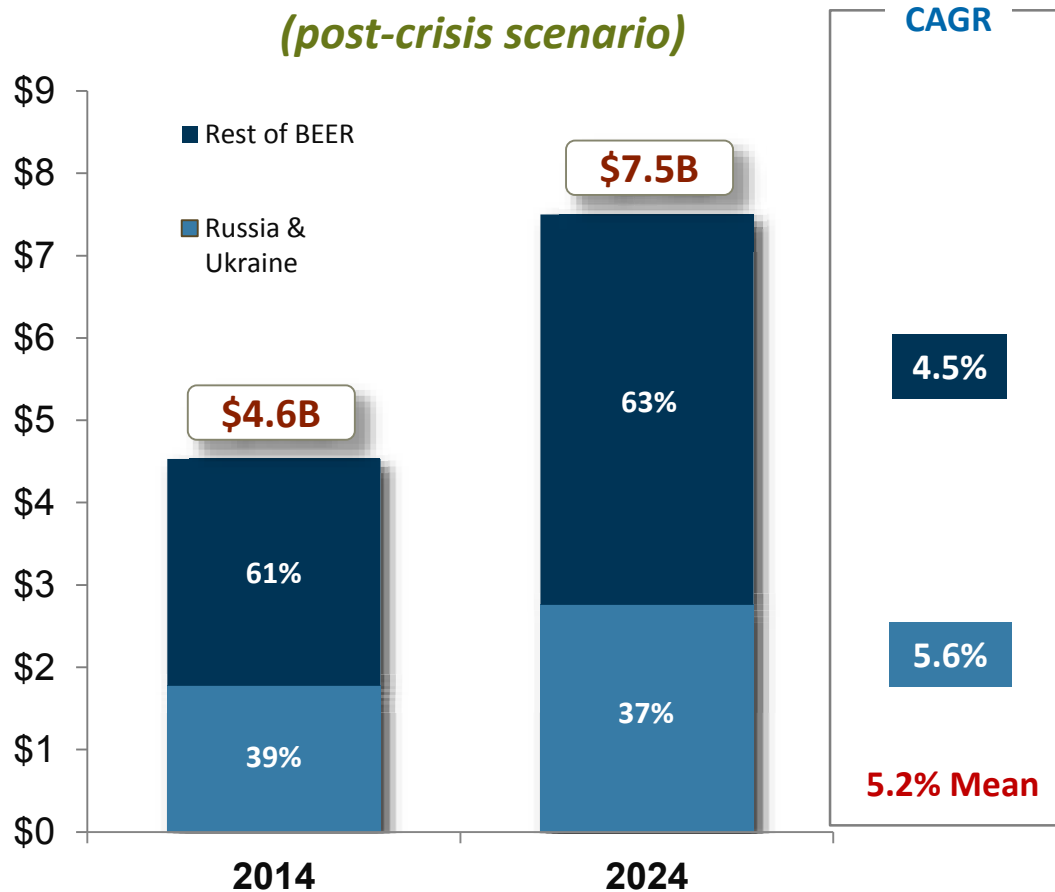


- Traffic drops of ~18% in Russia, ~40% in Ukraine in 2014
- Capacity 2014Q1-2015Q1 has only fallen ~2% (Russia): solely because Aeroflot has picked up most of the slack. Without Aeroflot, the fall would have been ~10%
- Transaero & UTAir have suffered badly from their large short-term debt positions – requesting government bailouts

Image Credit: ato.ru

Three years of lost growth in Russia/Ukraine would result in a 2024 MRO market size reduction of ~\$700M...

BEER MRO Spend 2014–2024 (\$B)
(post-crisis scenario)



Key Assumptions

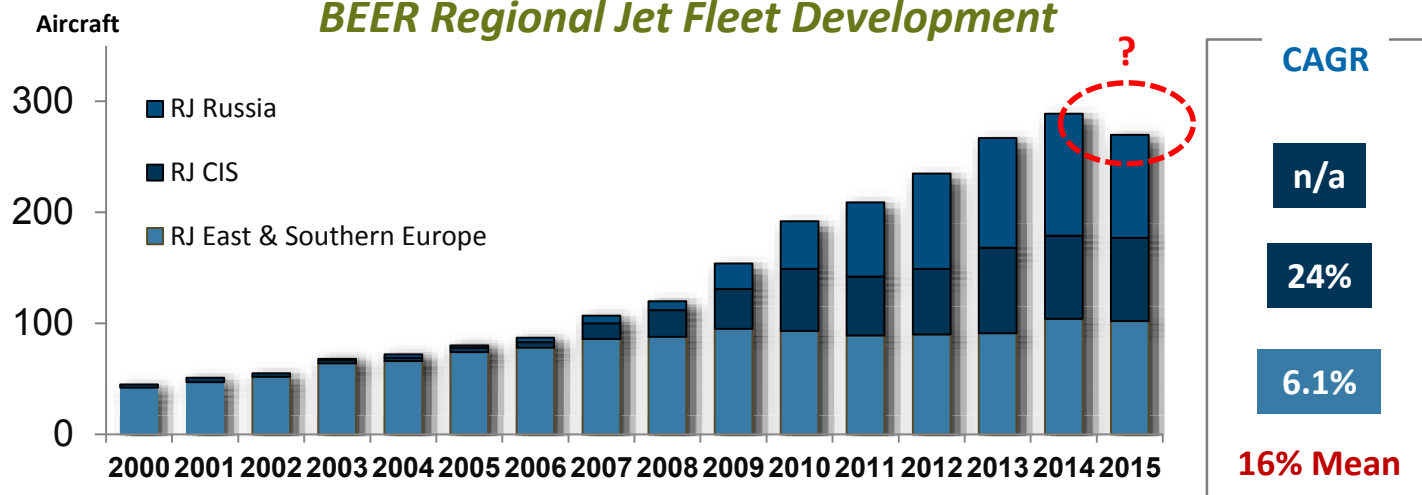
- Russia and Ukraine return to pre-crisis growth profile 2017-2024...
- There is no early return to high oil prices, which would help the Russian recovery significantly

NB/ This is a hypothetical scenario

Source: ICF analysis
Forecast in 2014 \$USD, exclusive of inflation

A network has developed to meet the strong demand for regional aviation in Russia/CIS: will development now be delayed ?

BEER Regional Jet Fleet Development



- Even the smaller Regional Jets are transitioning Eastwards

2005-2014: 50 seat jet intra-European routes



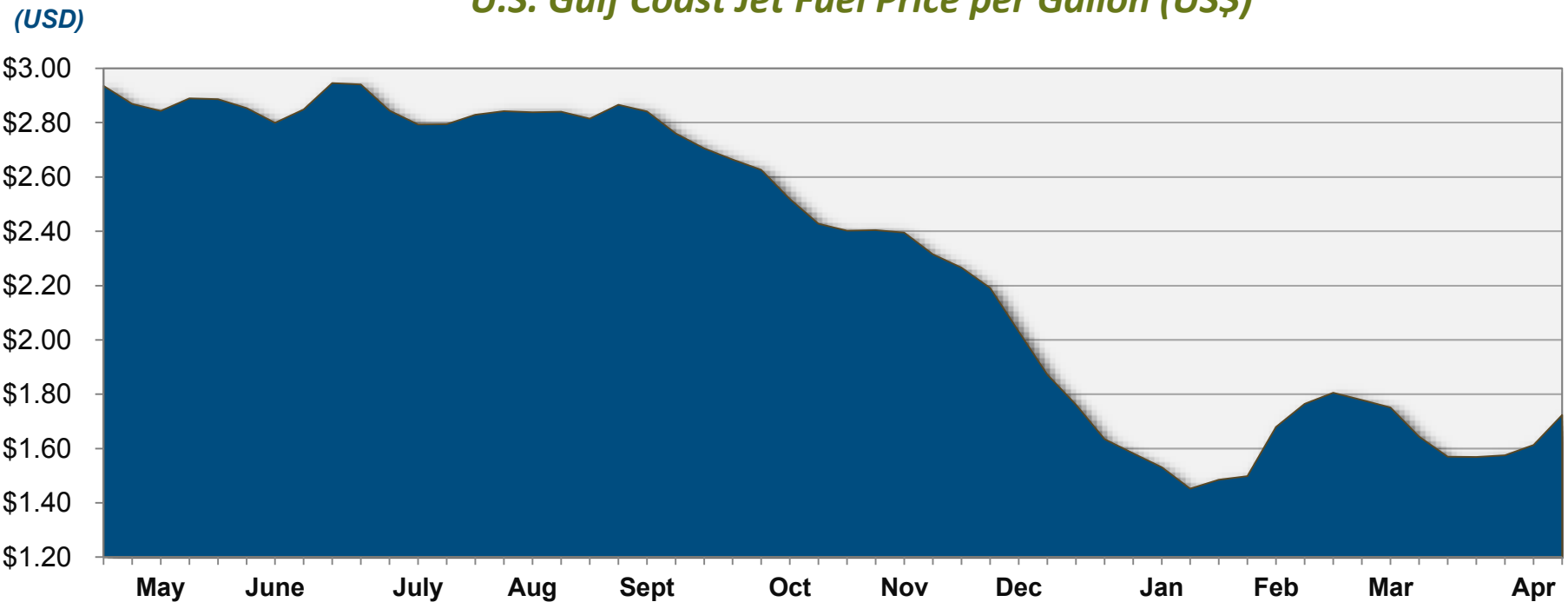
Source: ICF International Analysis / OAG (Month: August) / IATA Pax-IS, ACAS post-Soviet aircraft only

Impact of Falling Jet Fuel Prices



Aviation fuel costs have *dropped significantly* during the past year to ~\$70/bbl (~45% lower than one year ago)

U.S. Gulf Coast Jet Fuel Price per Gallon (US\$)



Should these low fuel costs continue, there will be dramatic repercussions throughout the aviation & MRO supply chain

If sustained, low fuel prices could bring dramatic changes throughout the industry



ICF sees a number of potential impacts on Aviation if low oil prices are sustained

Near Term

Sustained Low Prices

Air Travel Demand



Increase of disposable income
→ higher air travel demand

Lower airline operating costs can flow through to increased travel demand due to lower ticket prices

Passenger Airlines



Higher profits
Older airplanes kept in service longer
No big fleet decisions in 2015

Capacity increases at a slightly greater rate
More new entrants/start-up carriers (especially in emerging markets)
More risk-taking on marginal routes

Cargo Airlines



Increased traffic

Cargo market recovery

Leasing Companies



Older airplanes kept in service longer

Higher residual values for older aircraft
Lower threat of decreasing economic lives

ICF research suggests that meaningful market impacts will only be seen once low oil prices are sustained for more than a year

Industry consensus is it's too early to tell if the reductions will be long-term

- Airlines are hedged and won't realize fuel declines for months to come
- OEMs are not reporting impacts to order books

Interest rates remain low but are a key driver as well

- According to a recent Bank of America study, a 200 bps capital cost increase plus a 30% fall in fuel prices from summer 2014 levels would result in a 35% reduction in aircraft retirements

Slowing aircraft retirements would impact multiple parts of the industry

Near Term

Sustained Low Prices

Aircraft Retirements



Older aircraft in service longer

Slowing from projected
~1000/yr to 700/800

Engine & Component OEMs



Higher pressure to reduce acquisition
and maintenance cost (engine OEMs)

Increased aftermarket parts sales
(fewer aircraft retirements means less
competition from surplus)

MROs



Increased maintenance demand
Reduced deferrals

Increased demand for airframe heavy,
modifications, engine MRO
Opportunity for secondary MRO
clusters in emerging markets

Surplus Houses



Increased competition for fewer retiring
airplanes

Lower supply of surplus parts should
drive up prices

In the shorter term, fuel price presents both *Threats & Opportunities* for BEER executive management...

- How will airlines spend the cash windfall ?
- Who will focus on riskier routes and market share growth ?
- In a region with multiple low-profit carriers, who will use the breathing space to take the chance for internal investment ?



- Regional MROs are at different stage of a transition...

Low-cost hangar-based
Marginal capacity sales
Labour arbitrage

Productivity & strategy development

High performance
Differentiation

- Who will take the chance to better themselves ?

- Numerous regional MROs have focused on the parting-out opportunity
- Retired aircraft at the right price will become even rarer as aircraft stay in service longer... and surplus parts demand increases
- Which players have scale and access to supply, and which will struggle ?



MRO Industry Dynamics



MRO Industry Dynamics create several strategic questions to consider

Engine & Component MRO

- Independent MROs
- Component OEMs
- Engine OEMs
- MRO Integrators
- Airlines

Strategic Considerations



Airframe Maintenance

- Independent and airline MROs (inc. Integrators)
- Aircraft OEMs

Considerations for *Airlines*

Key Questions

What is the business case for retaining engine and component MRO activity in-house today? What are the winning MRO business models and why?

Should the airline MRO make/buy strategy change with the introduction of new platforms such as A350XWB and 787?

How to maintain and/or protect a competitive market-place moving forward, especially as certain segments become more OEM-centric and data/manual access more limited?

How to continue to reduce costs and improve efficiencies – when the easy things have been done already?

How best to reduce the additional management and cost burden of a growing leased fleet?



NB/ Examples are solely illustrative



small planet
AIRLINES

POLISH AIRLINES



AEROFLOT
Russian Airlines



Considerations for *Independent MROs*

Key Questions

What value proposition can independent MROs offer to stay attractive versus the pricing, material, data power of an OEM? Is the financial cost of relying on pricing to differentiate sustainable?

Is independence a sustainable position? How and where to work with OEMs or integrators? Can independent MROs make sufficient returns for shareholders if tied to OEM material agreements?

Can independents gain sufficient control of assets to become a valuable partner to airlines?

Is strong engine parts repair capability sufficient differentiation to enable an independent to compete in the market versus the OEMs?



NB/ Examples are solely illustrative



Considerations for *Independent MROs and Airline MROs*



 CROATIA AIRLINES



TURKISH TECHNIC

Jat  Tehnika

ADRIA *tehnika*

NB/ Examples are solely illustrative

Conclusions



Opportunity shifting Westwards – and maturing ?

**For ~40% of the region,
Growth and Investment
now stagnant**

- Internal and external investments stalled
- The maturing of MRO strategies and growing organic capability of the last five years is now ended
- Focus on short-term survival

- A cash windfall from fuel price reductions ?
- Slight reduction in customer cost pressure ?
- Slight refocus of investment plans Westwards ?

**Further West,
A strategic opportunity ?**

The last 3-5 years have seen new capacity in the region attempt to differentiate itself by value proposition rather than cost competition:

Those strategic choices are now playing out... Watch this region !

ICF is one of the world's largest and most experienced aviation and aerospace consulting firms



Airports • Airlines • Aerospace & MRO • Asset Advisory • Safety & Security

- 52 years in business (founded 1963)
- 100+ professional staff
 - Dedicated exclusively to aviation and aerospace
 - Blend of consulting professionals and experienced aviation executives
- Specialized, focused expertise and proprietary knowledge
- Broad functional capabilities
- More than 10,000 private sector and public sector assignments
- Backed by parent company ICF International (\$949M 2013 revenue)
- Global presence — offices around the world

New York • Boston • Ann Arbor • London • Singapore • Beijing • Hong Kong



SH&E

an ICF International Company

joined ICF in 2007

AeroStrategy
Management Consulting

joined ICF in 2011

G | H | K

joined ICF in 2012

ICF provides end-to-end aviation industry consulting capability and insight delivered through four strategic practice areas



Airports

Financing and
operational
support



Airlines

Operational,
strategic &
investment
support.



Aerospace & MRO

Strategy
& transaction
support



Aircraft

Valuation and
management of
aircraft and
equipment

...with products and services spanning all industry sectors

Airlines

Consulting

- Litigation Support
- Public Policy/Economic Research
- Strategic Planning
- Management Consulting/ Process Improvement
- Business & Industry Analysis
- Financial Services Support (Due Diligence, Valuations)

Airline Decision Support

- Revenue Management Systems
- Network Planning System
- Consulting

Safety & Operations

- Internal Evaluation Program (IEP)
- Cockpit Resource Management
- Interactive Technical Manuals
- Fuel Farm Quality & Spill Prevention
- Control and Countermeasure
- Fixed Base Operator / Airport Loss Control
- Cargo Security Audits

Privatization

- Restructuring
- Privatization Implementation
- Post-Privatization

Aerospace & MRO

Market Analysis & Strategy Consulting

- Market Studies
- Raw Material & MRO Forecasts
- Competitive Assessment
- Strategy Development
- Cluster Strategies

M&A Support

- Market Due Diligence
- Operations Due Diligence
- Post M&A Integration

Operations & Supply Chain

- Supply Chain Risk Management
- Cost Reduction
- New Product Introduction
- Data Analytics

Company Performance Improvement

- Customized Forecasts
- Engineering Diagnostic
- Additive Manufacturing Diagnostic

Airports

Economics

- Passenger Service Demand Forecasting and Marketing
- Financial Feasibility
- Cargo Demand and Facilities
- Public Policy/Regulatory Issues
- Environmental Analysis
- Rates and Charges
- Privatization

Management

- Concessions Planning, Solicitation, Selection and Performance
- Airport Revenue Improvement
- Terminal Planning/Design
- Parking Facilities
- Airport Hotel Planning

Aircraft

Financial

- Financial Management Audits
- Airline & Aircraft Valuations
- Other Asset Valuations
- Due Diligence
- Bankruptcy & Financial Restructuring
- Business & Restructuring Plan Analysis

Technical Services

- Asset Management
- Aircraft and Engine Repair Oversight
- Reliability Analysis
- Interiors
- Inspection Services
- Litigation Support



For questions regarding this presentation, please contact:

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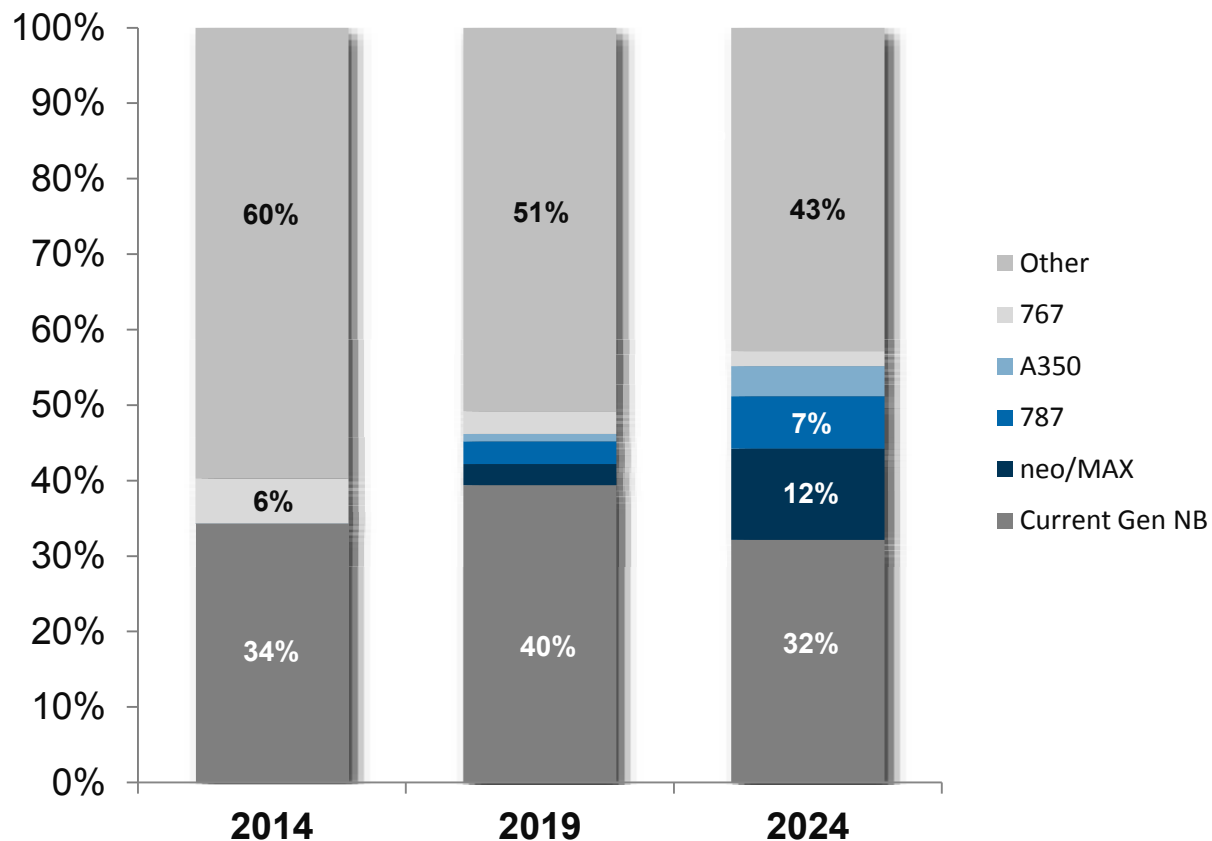


Next Generation Aircraft Impact On MRO



By 2019, New Aircraft Types will represent ~7% of MRO spend globally: By 2024, ~21%

Global MRO Spend 2014–2024 By Aircraft Type



Source: ICF analysis
Forecast in 2014 \$USD, exclusive of inflation



ICF Insights

- On the five-year timeframe, little change in MRO delivery will be visible: a high proportion of the fleet will be narrowbody, and under or only just out of warranty
- By 2024, the 787 spend will be significant (>5%) and greater than 767 spend
- In Europe, change will be less pronounced than on a global level, with a greater emphasis on the transition to new narrowbody types