



*Presented by:*  
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Principal

**The Surplus Parts Market**

**ASAAFRA**

Washington DC - 16 June 2014

# Today's Agenda

**ASAAFRA**



**Aircraft Retirement Tsunami**



**Surplus Parts Market**



**Implications**

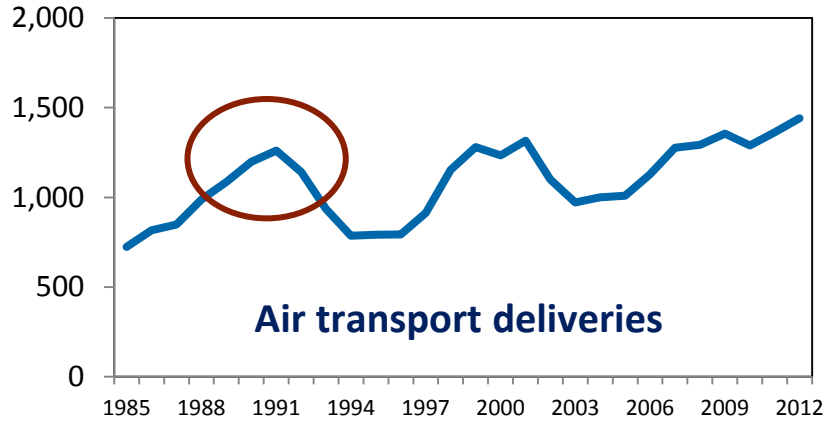


# Aircraft Retirement Tsunami

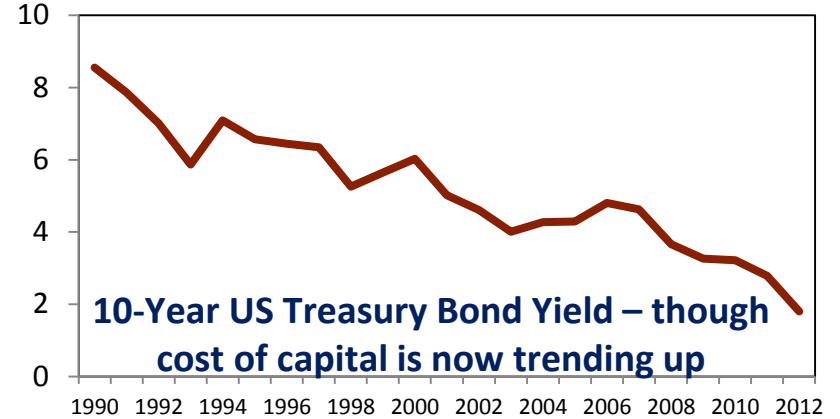


# Four market factors are reshaping aircraft economics and MRO

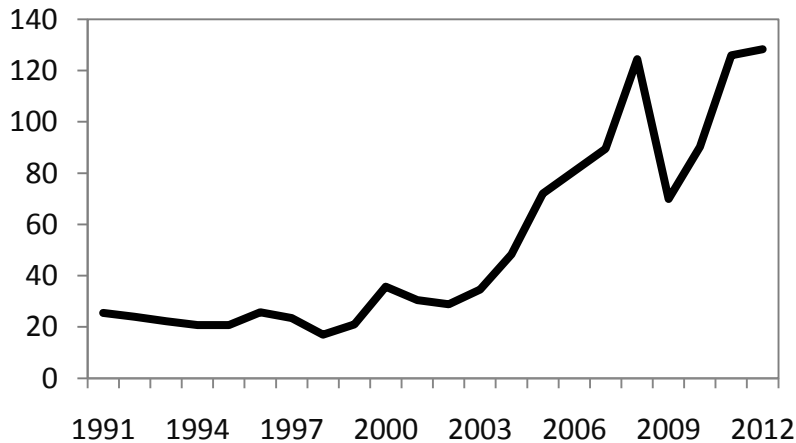
**Fleet Demographics—the 1990 Bulge**



**Historically Low Interest Rates (%)**



**Historically High Jet A Fuel Prices (\$/BBL)**



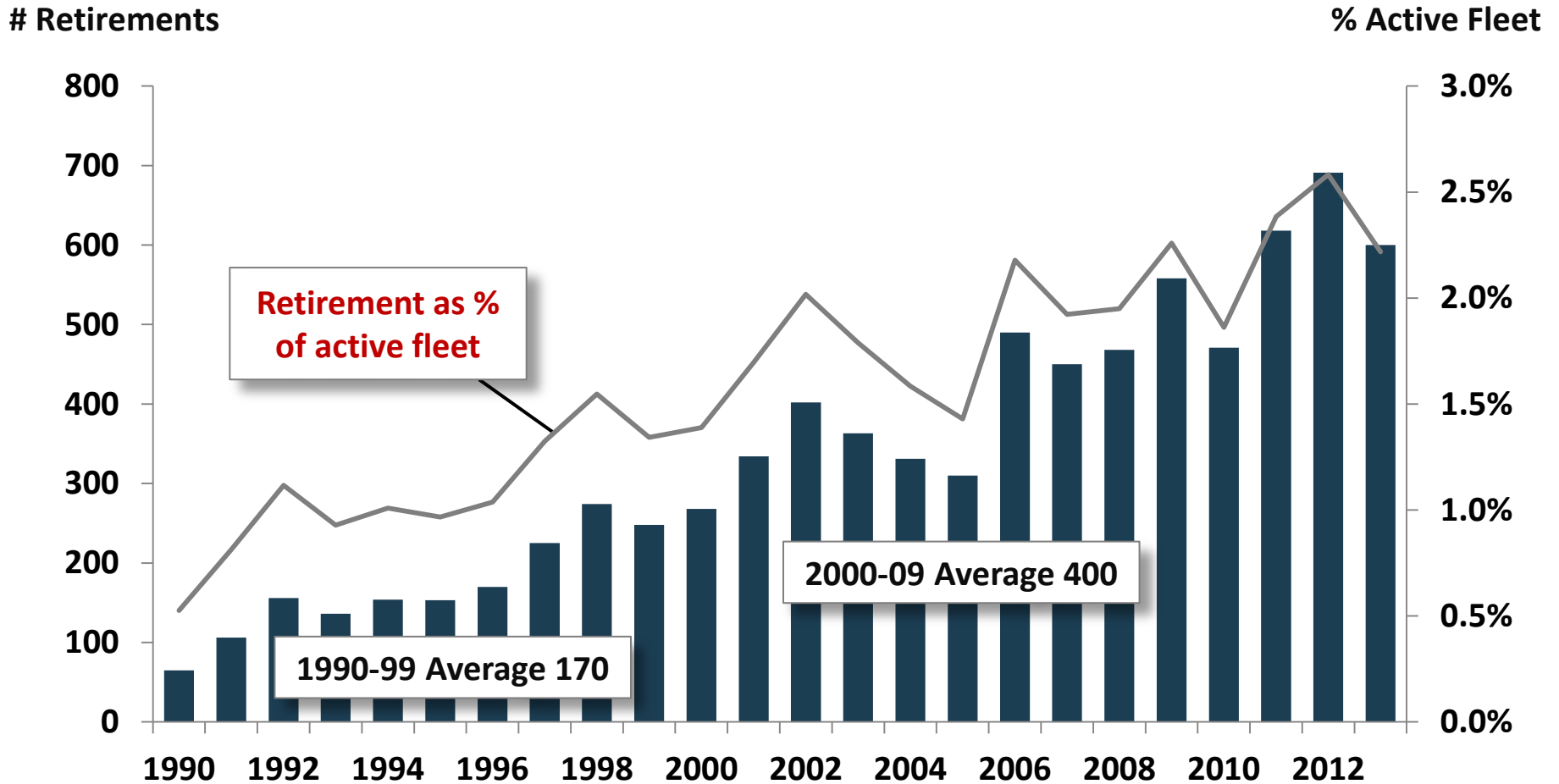
**New Technology & OEM Production Rates Exacerbate Retirements**



Source: ICF International Analysis; FlightGlobal ACAS 2013, ATA, US Federal Reserve

# Historically, the aircraft retirements as percentage of active fleet has increased from one percent to 2.5% in 2012

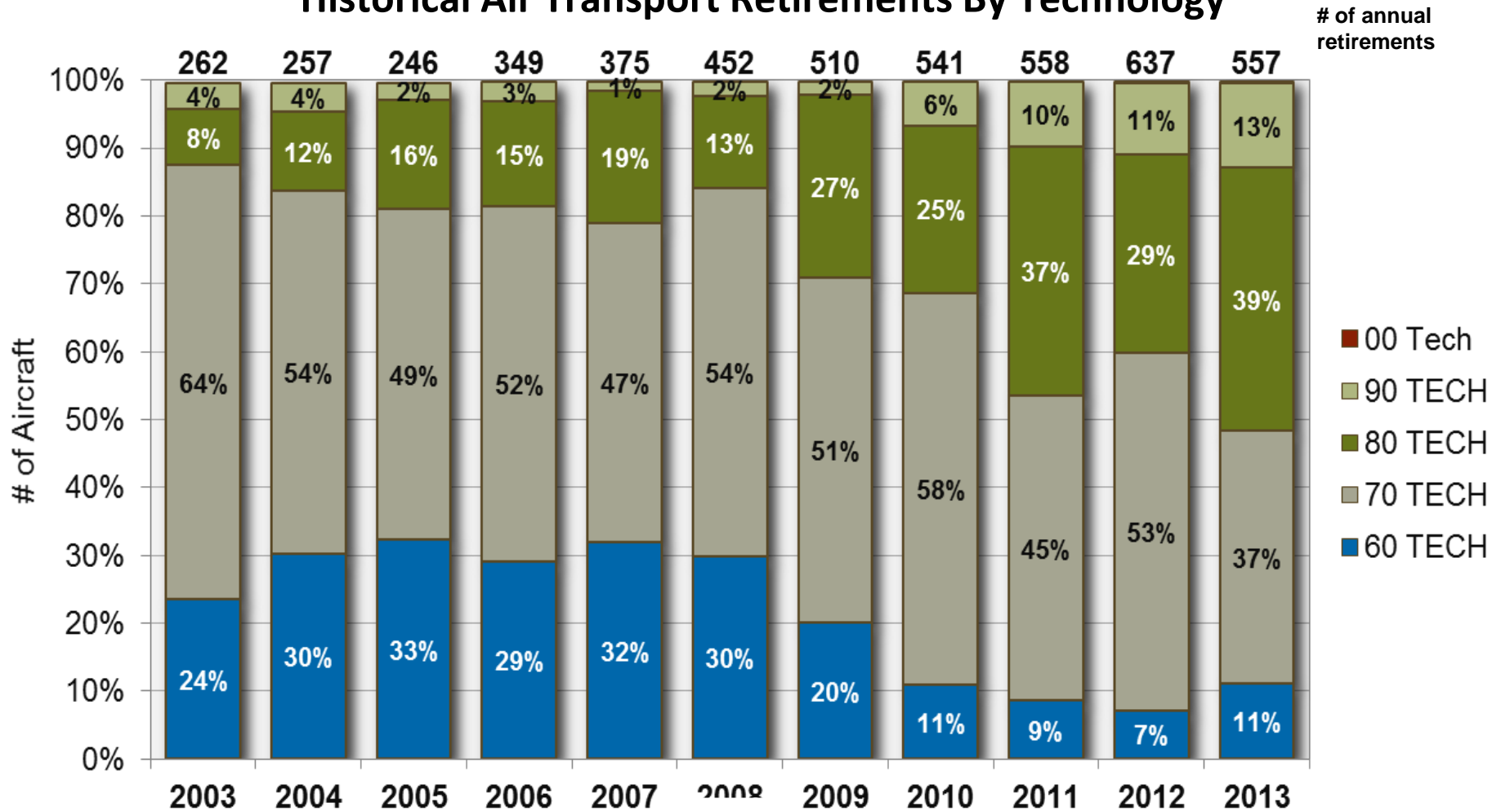
## Historical Air Transport Annual Aircraft Retirements



Includes Turboprops  
 Source: Airline Monitor Jun 2013, FlightGlobal ACAS Sept 2013

# In 2013 ~80% of all retirements were aircraft of 1970/80s technology

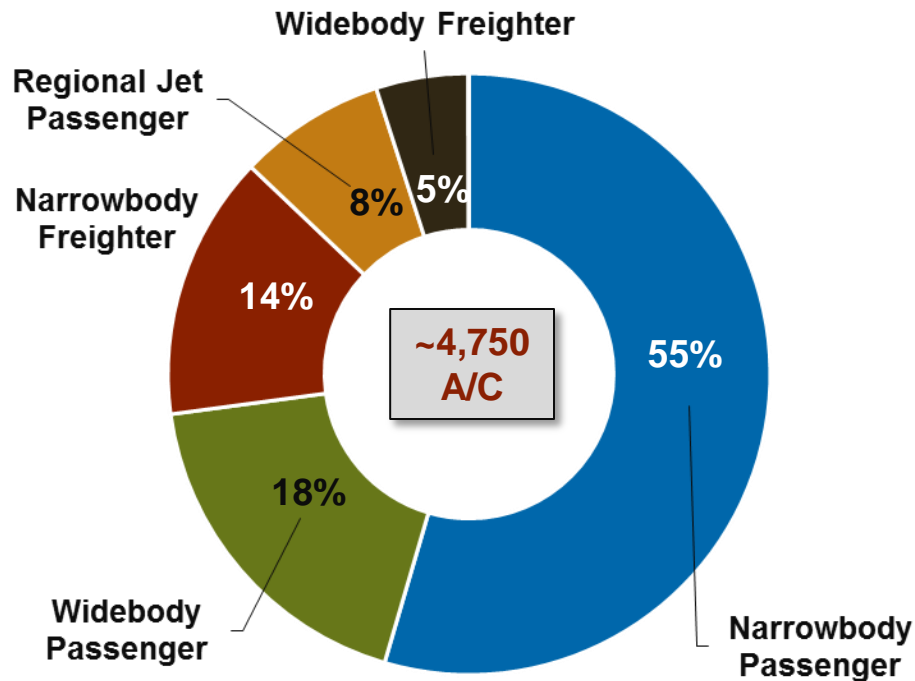
## Historical Air Transport Retirements By Technology



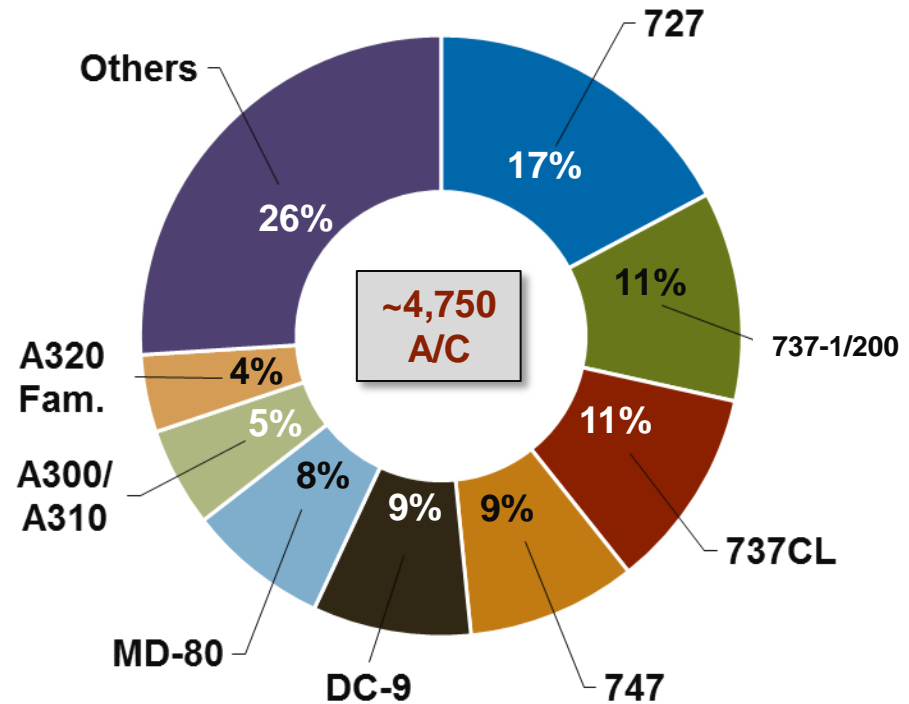
Source: FlightGlobal ACAS, ICF International Analysis

# In the last decade ~55% retired aircraft were narrowbodies

2003-2013 Total retired aircraft  
(By aircraft category)



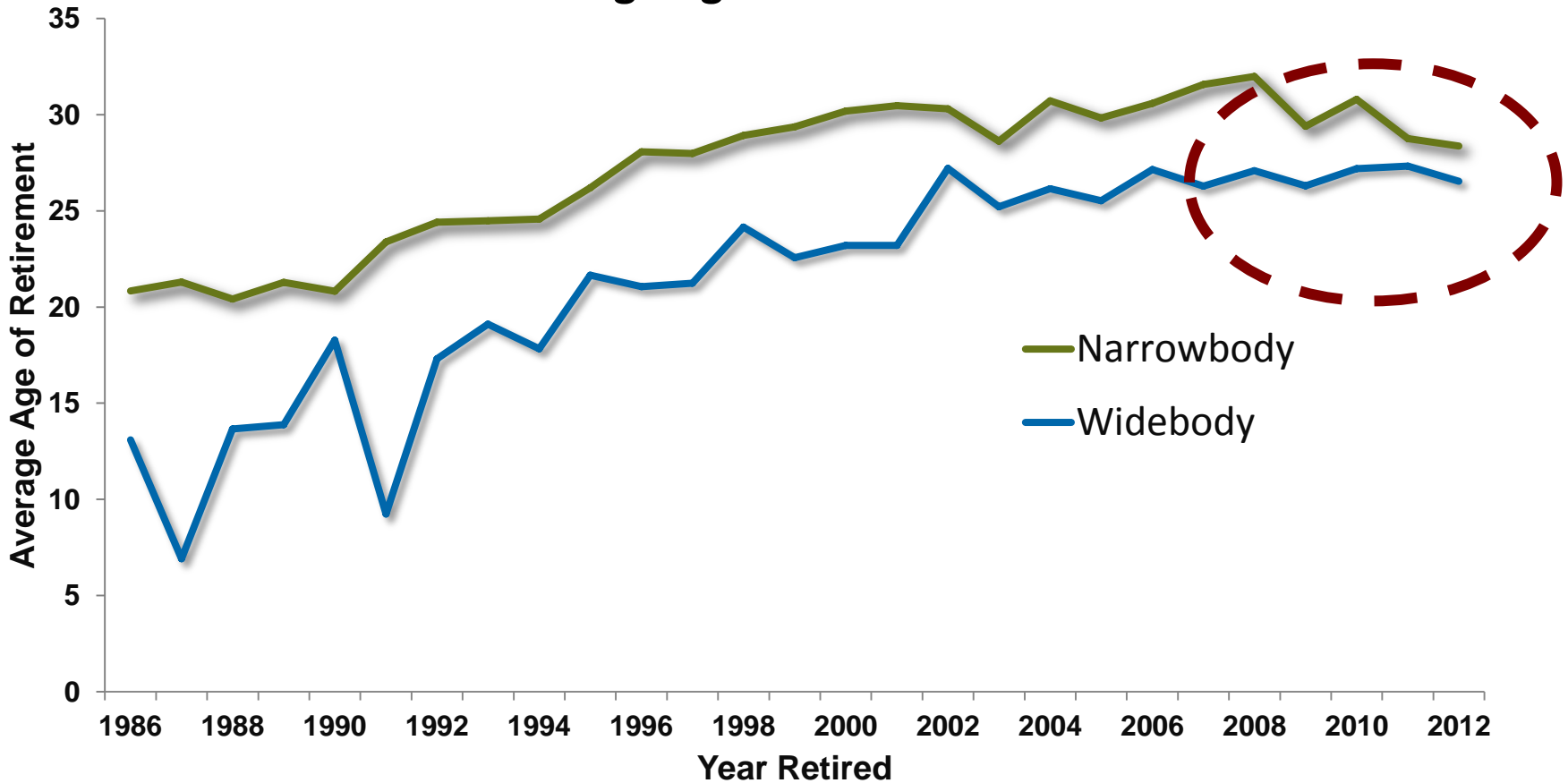
2003-2013 Total retired aircraft  
(By aircraft type)



Source: FlightGlobal ACAS, ICF International Analysis

# Average retirement ages appear to be trending down slightly for certain aircraft...

## Trends in Average Age of Aircraft Retirements

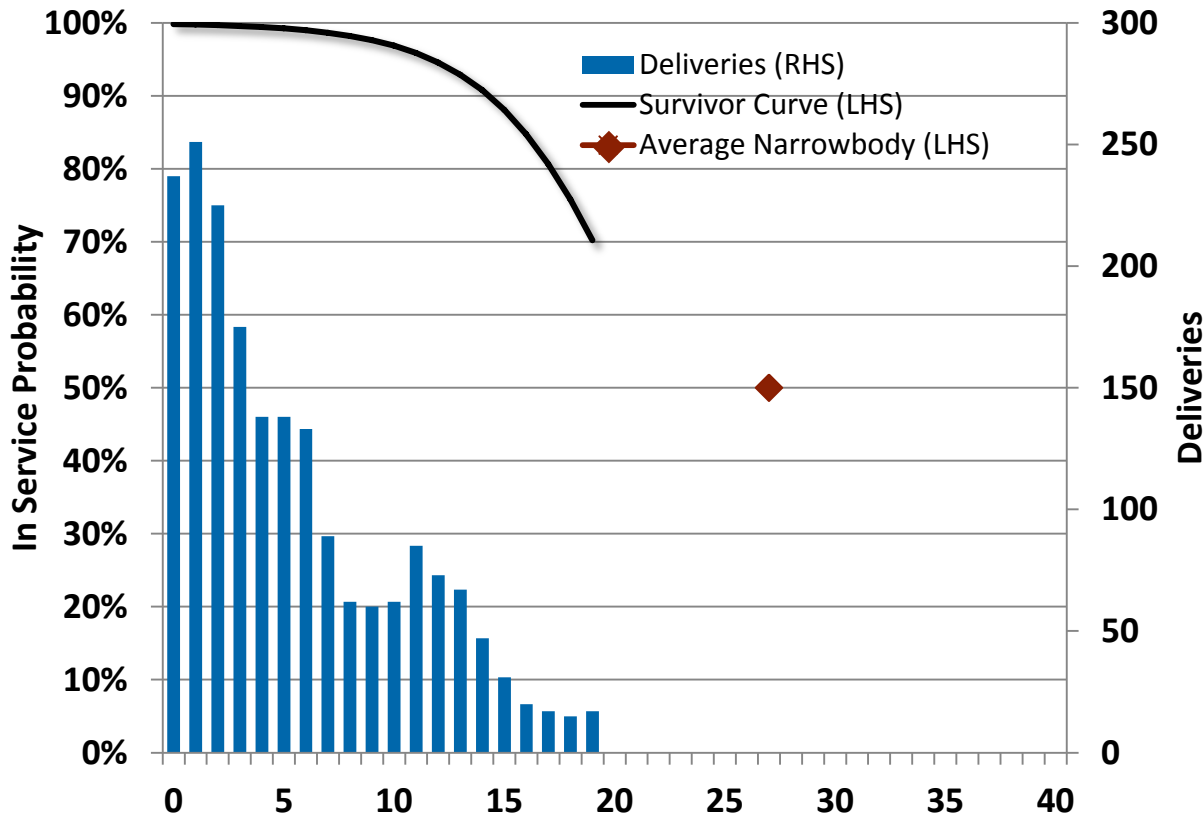


Source: FlightGlobal ACAS, ICF International Analysis



# ...and the impending arrival of aircraft with new technology engines will impact retirements for current models

**A320-200 (CFM56-5B/V2500-A5) Survivor Curve**



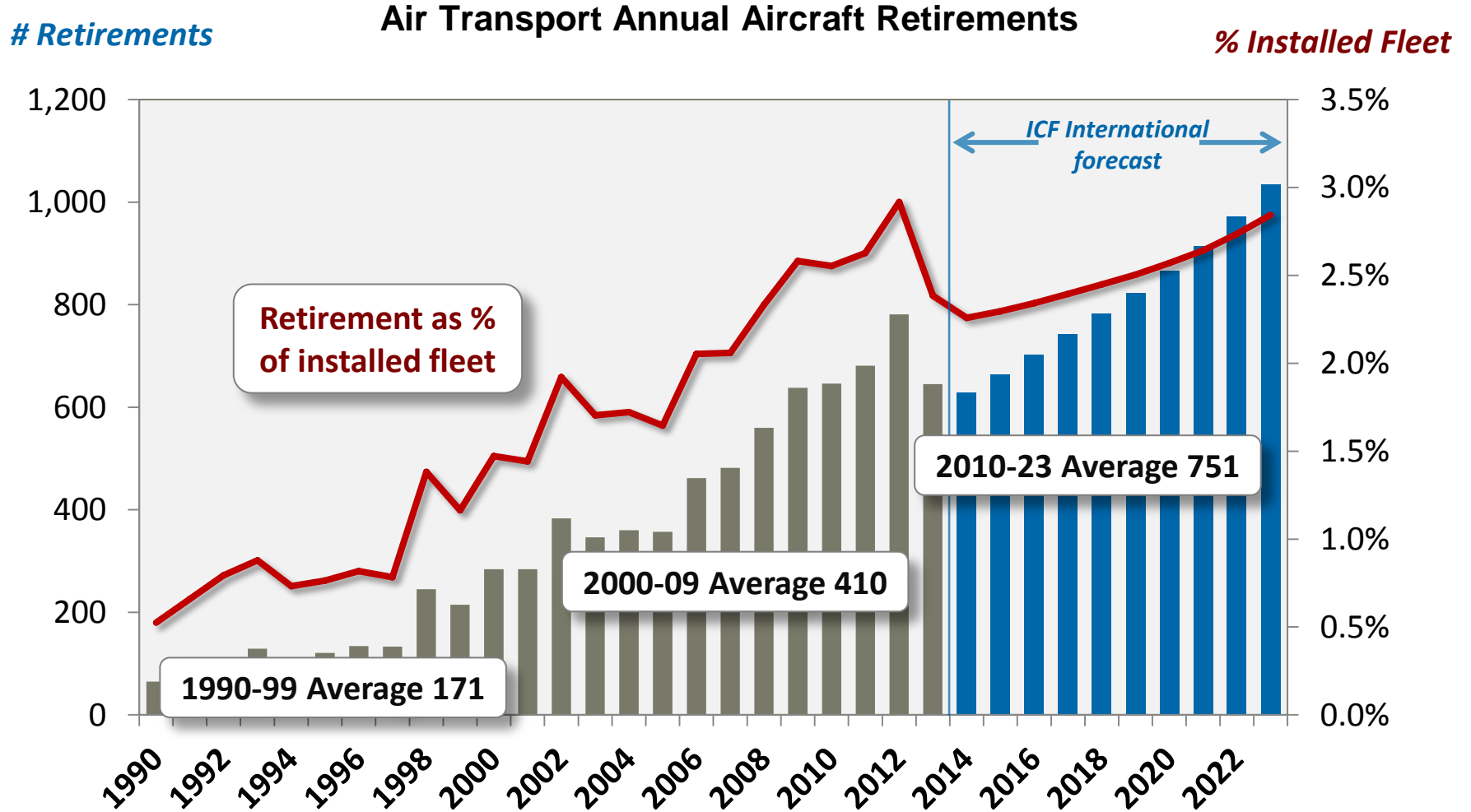
- Oldest aircraft approaching 20 years
- Median retirement age appears on track for less than 25 years



- How will the A320neo affect retirements?

Notes: (1) Survivor curves represent delivery-weighted curve fits. (2) Late A320-200 aircraft powered by CFM56-5B and V2500-A5 engines.  
Source: ICF International Analysis; FlightGlobal ACAS 2013

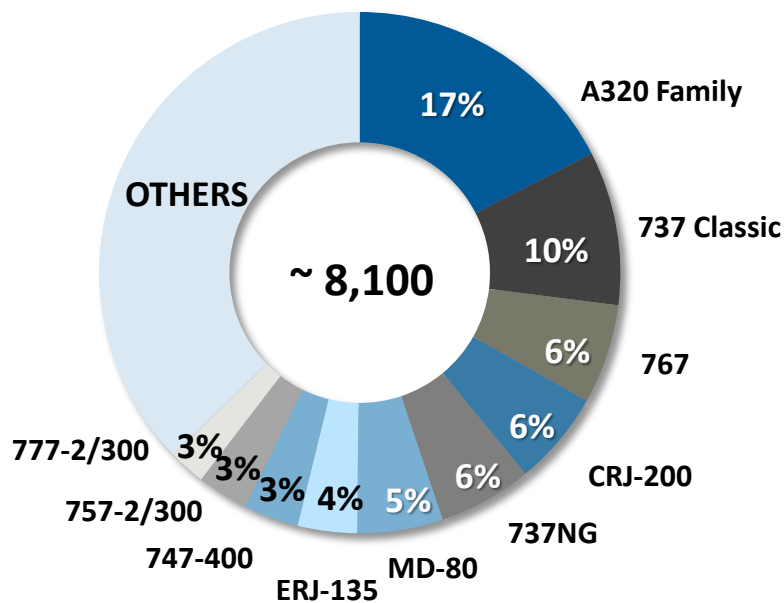
# For the first time, annual retirements are expected to reach over 1,000 aircraft by 2023



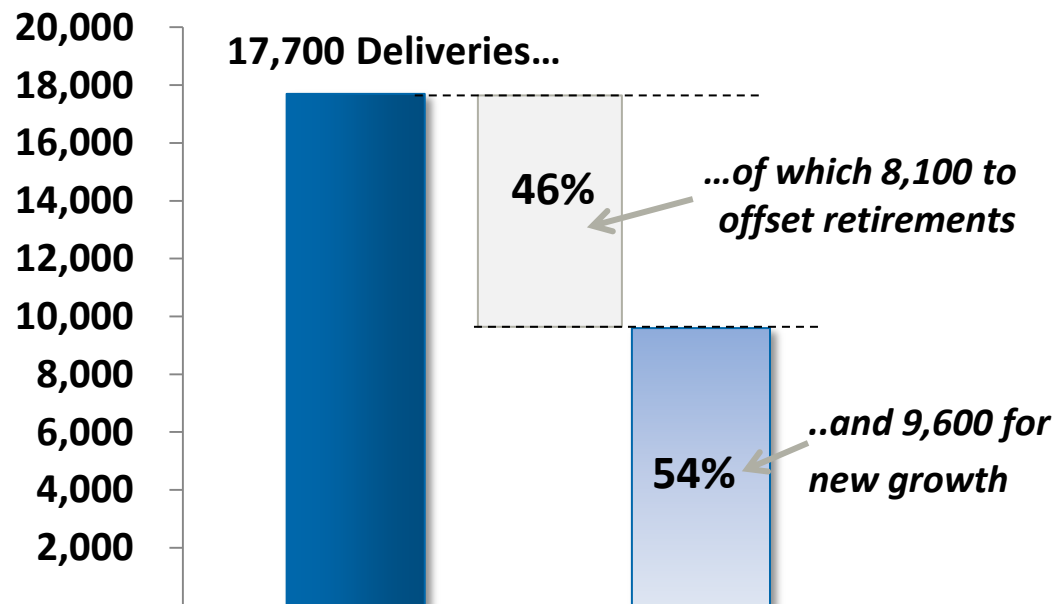
Includes Turboprops  
 Source: FlightGlobal ACAS Dec 2013, ICF International Analysis

# 45-50% of new aircraft deliveries in the next decade will be for aircraft replacements, versus the historical norm of ~20 %

Air Transport Retirements 2014 – 2023



Composition of Demand 2014 – 2023



**Retirements historically drive 20% of deliveries**

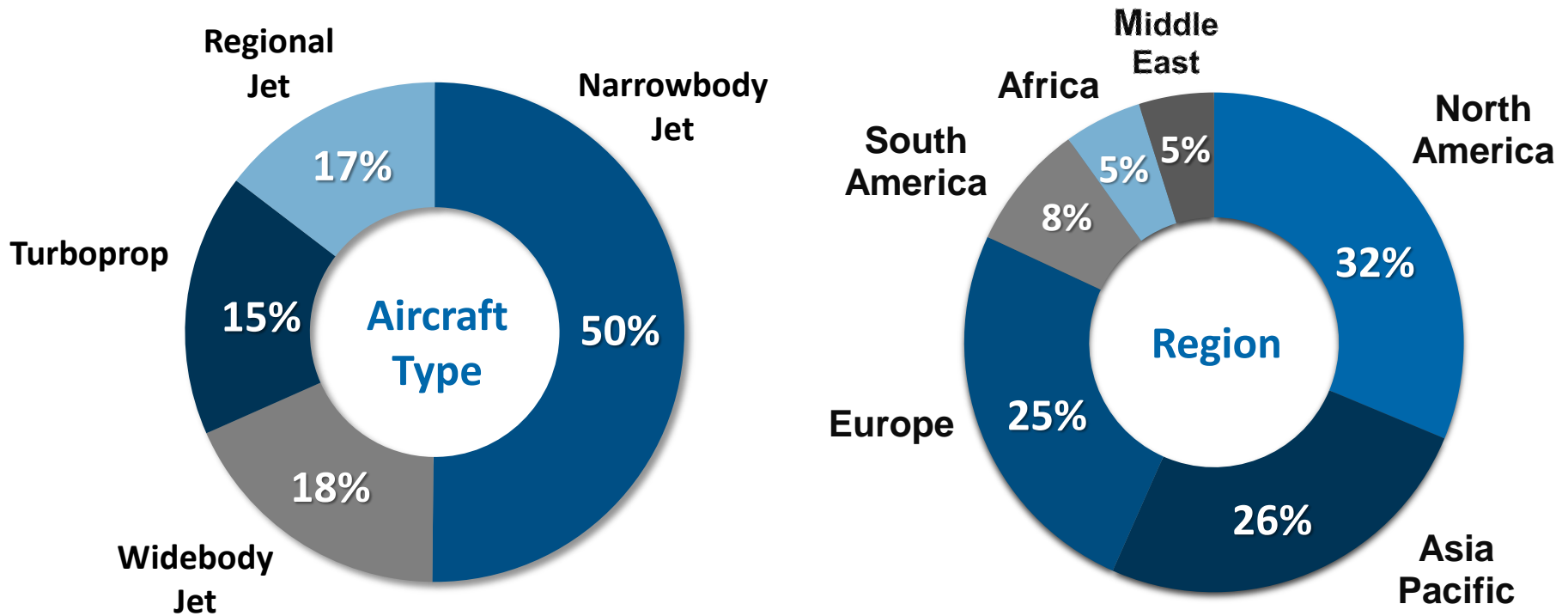
Source: ICF International  
Note: includes turboprops and regional jets

# Surplus Parts Market



# The civil air transport fleet is almost 27,000 aircraft

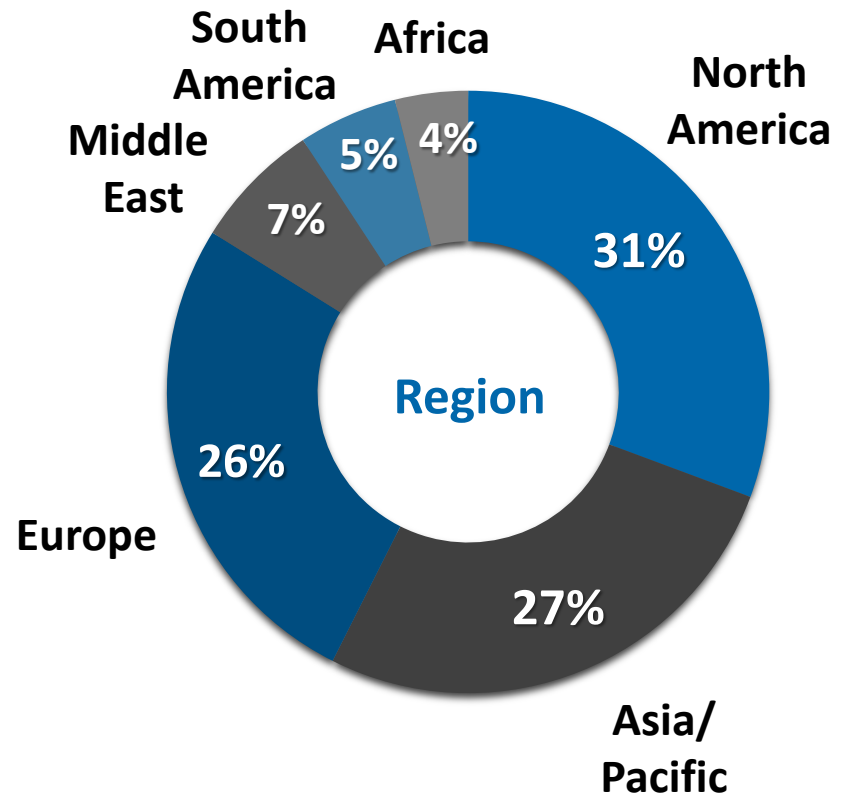
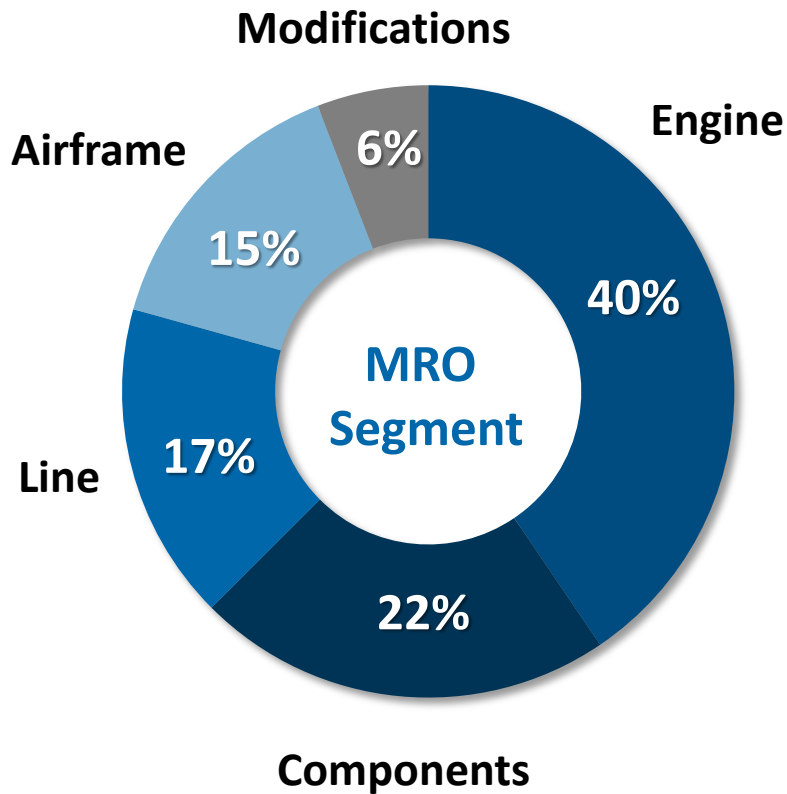
**2013 Global Air Transport Fleet**  
*(Total = 26,770)*



Source: FlightGlobal ACAS September 2013, ICF International Analysis

# The current air transport MRO market is ~\$61B; Asia Pacific has overtaken Europe for the #2 position

2013 Global MRO Demand  
(Total = \$60.7B)

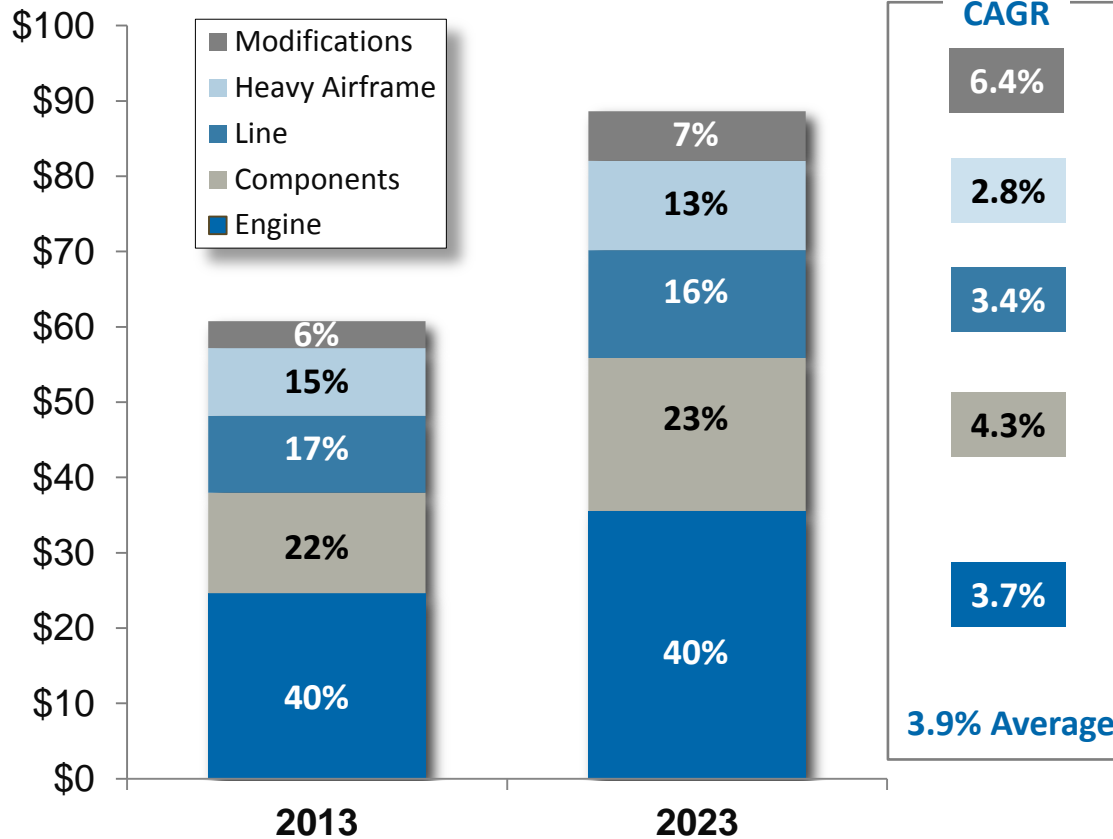


Source: ICF International  
Forecast in 2013 \$USD, exclusive of inflation

# Air transport MRO spend is expected to grow to \$89B by 2023, at 3.9% per annum

## Global Air Transport MRO Spend

2013–2023



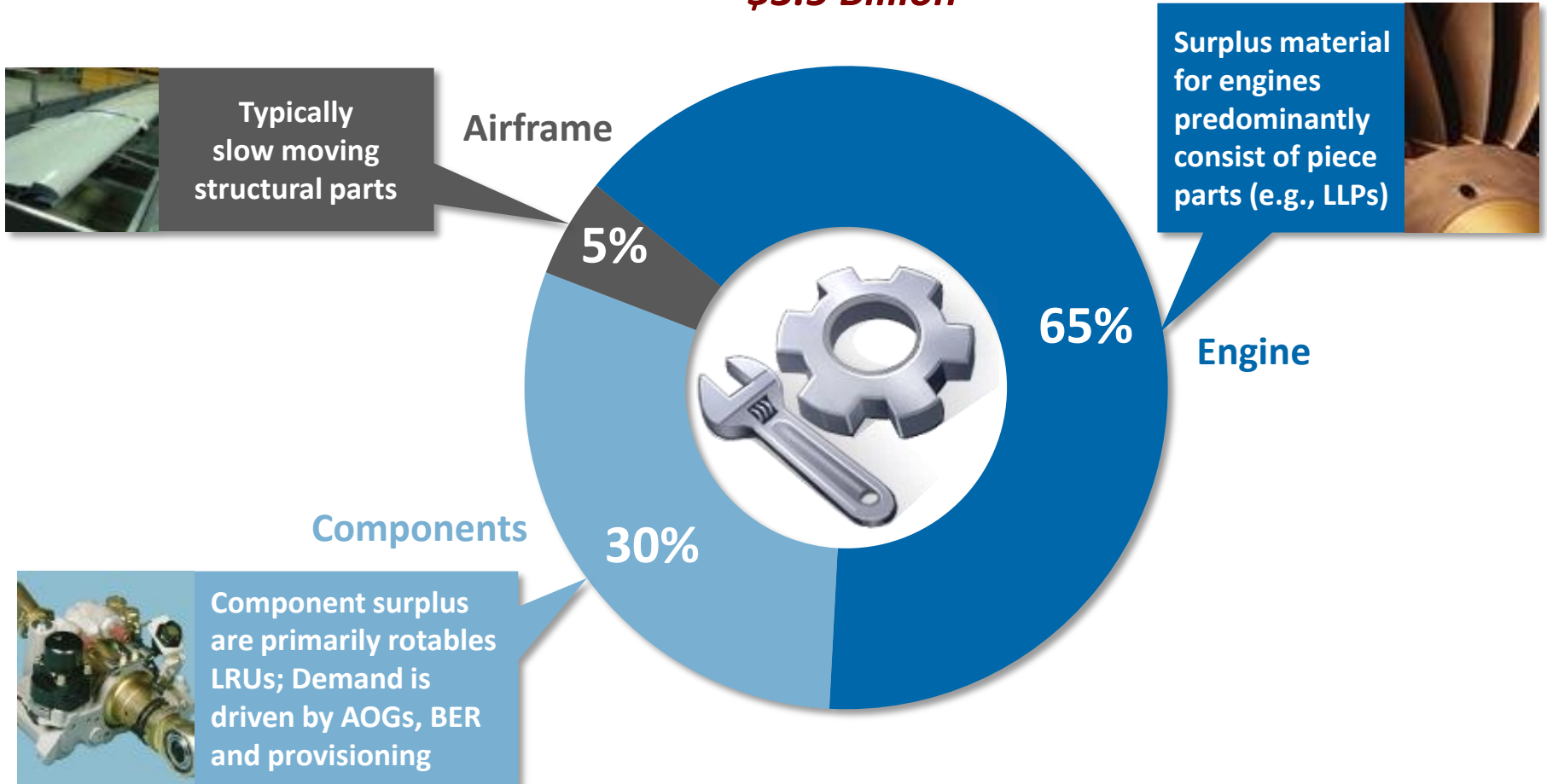
### Highlights

- Average growth is forecast to be 3.9% CAGR to \$89B in 2023
- The strongest driver of growth is expected to be the engine market
- MRO growth is greater than fleet growth – driven primarily by fleet demographics
- Upgrade demand drives high modifications growth

Source: ICF International  
Forecast in 2013 \$USD, exclusive of inflation

# Today, spending on air transport surplus parts is ~\$3.5B

## Air Transport Surplus Parts Market\* ~\$3.5 Billion



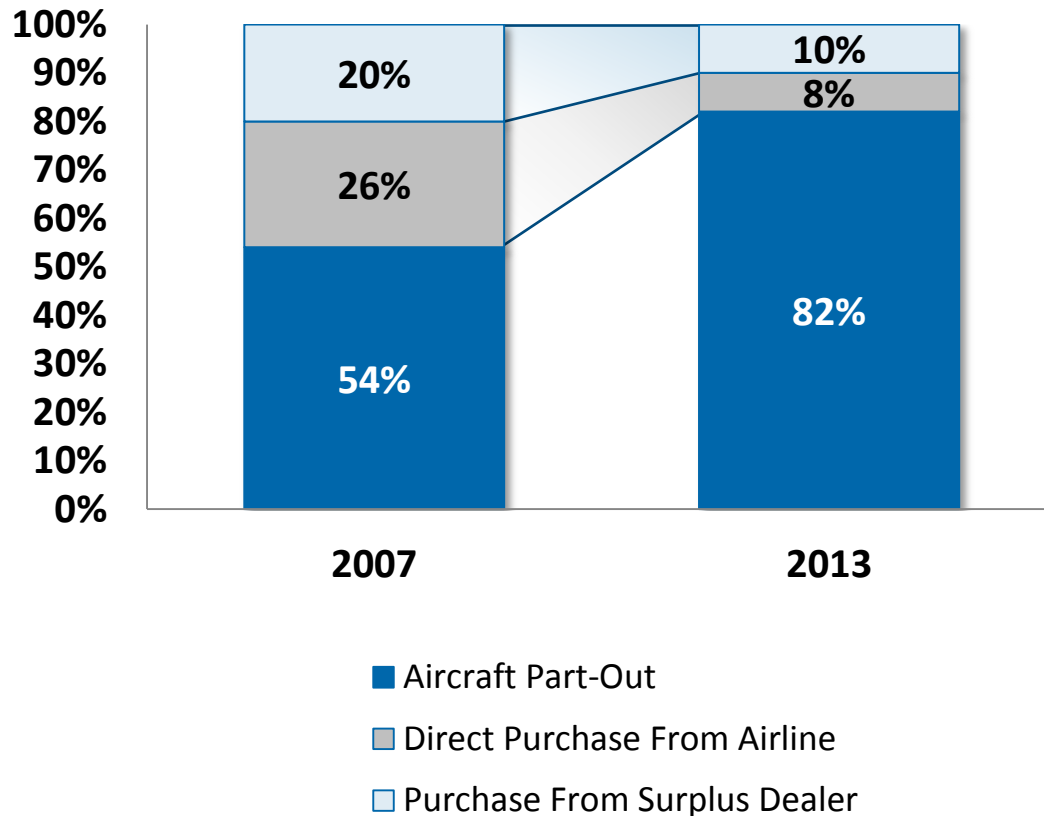
Source: ICF International

\* Sales to end customers; excludes intra-dealer sales



# Surplus dealers now obtain over 80% of their inventory from parted-out aircraft

Supplier Channels for Obtaining Surplus Materials



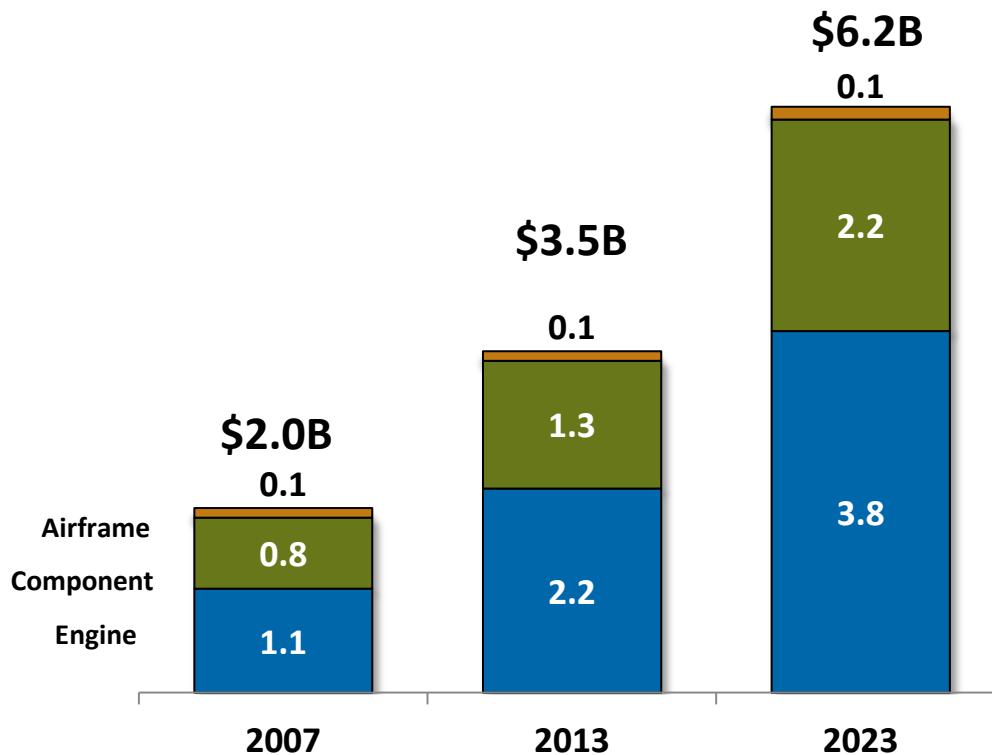
## ICF International Insight

- Leaner airline inventories
- Improved material planning (and MRO IT capabilities)
- Increased component pooling agreements
- OEM after-market material control strategies

Source: ICF International

# ICF forecasts the surplus market to grow to \$6.2B by 2023 – a 5.5% CAGR

ICF International Air Transport Surplus Market Growth Forecast (\$B)



### Low Growth Scenario

- Significant increase in interest rates
- Decrease in fuel price
- Delays in new aircraft introduction
- Successful OEM surplus strategies

### Nominal - Assumed

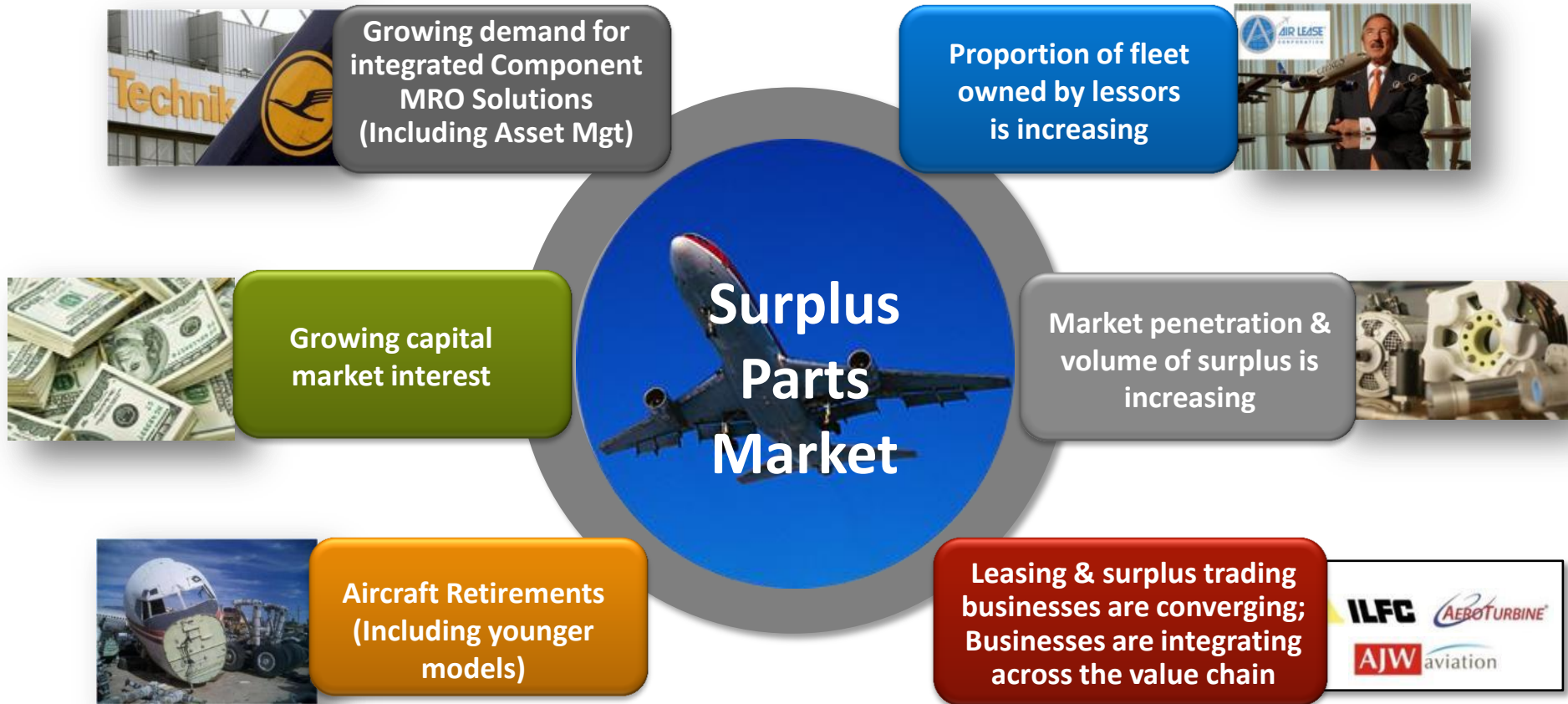
- Moderate increase in interest rates
- Fuel prices slightly lower than current
- Minor delays to new aircraft programs
- OEM have limited impact on surplus

### High Growth Scenario

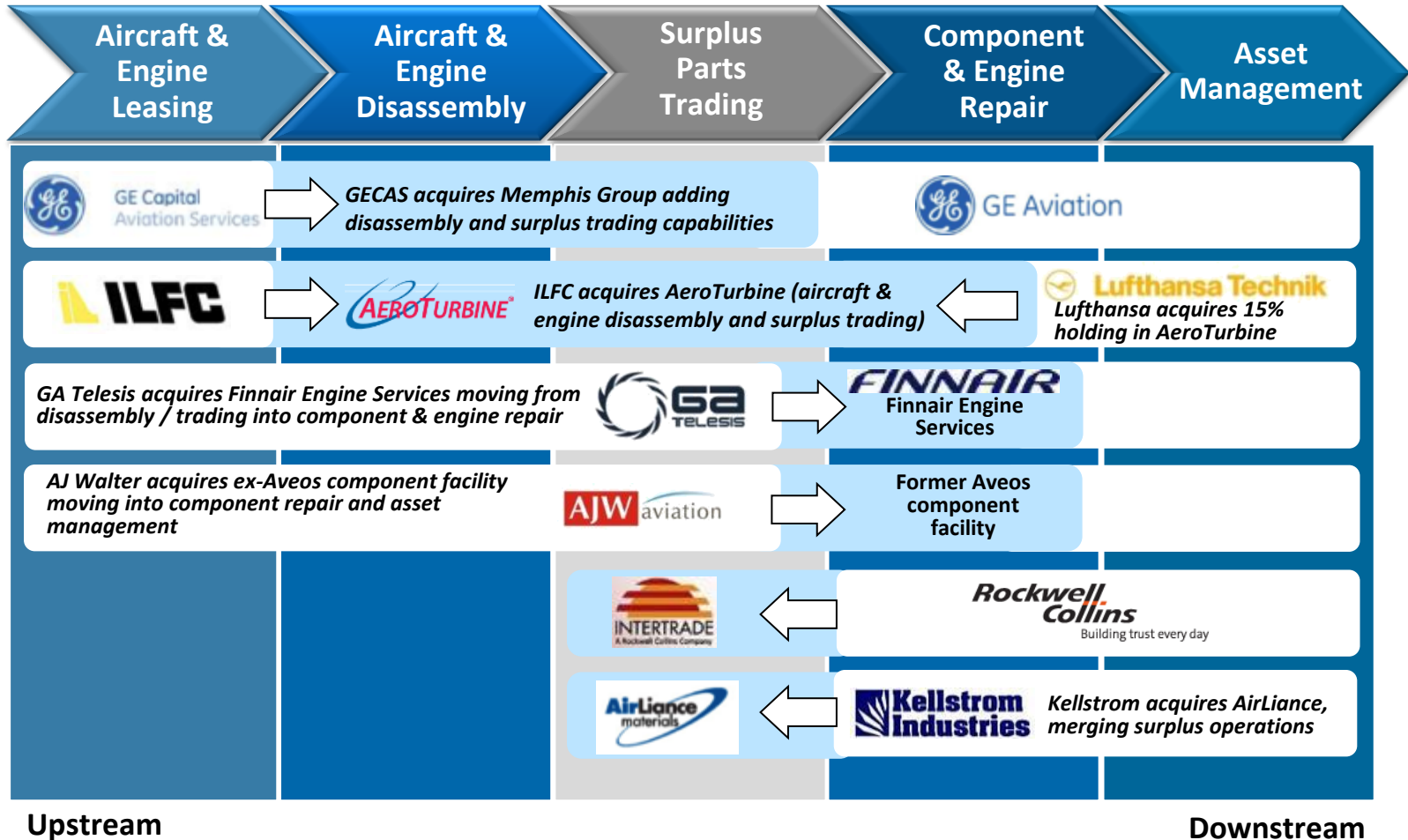
- Ultra low interest rates
- Fuel price remains high
- Increased retirements
- On time aircraft delivery
- No OEM counter measure

Source: ICF International. Forecast in 2013 constant \$

# Several trends are shaping the surplus parts market



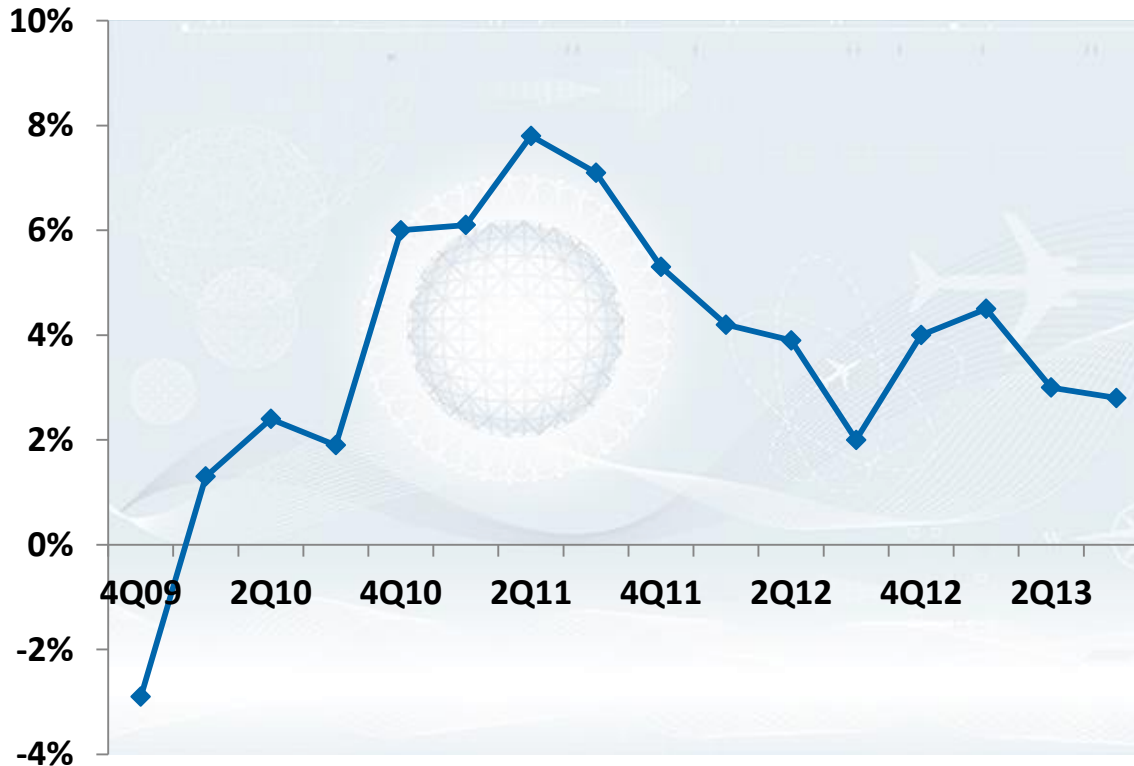
# There are many changes in the surplus parts value chain as suppliers pursue broader offerings for their customers



Source: ICF International Research

# Growing surplus usages means cost savings for operators and lumpy aftermarket demand for OEMs

Industry MRO Historical Growth (year-over-year)



- Surplus is one of several factors contributing to “lumpy” aftermarket demand
- Surplus has the largest impact on engines and rotables for mature aircraft

Source: Canaccord Genuity 3Q13, based on a survey of over 100 operators and MROs

# The aircraft part-out and recycling business will continue to grow as a result of a confluence of several key factors

1. Continued increase in aircraft retirements
2. Strong global demand for surplus material
3. Growth and expertise of global parts distribution firms
4. Low cost of capital (low interest rates)
5. Increased demand for raw material (recycled metal)

## Example Part-Out Players



# Implications



# Relations between suppliers such as OEMs, integrators and independent MROs continue to evolve

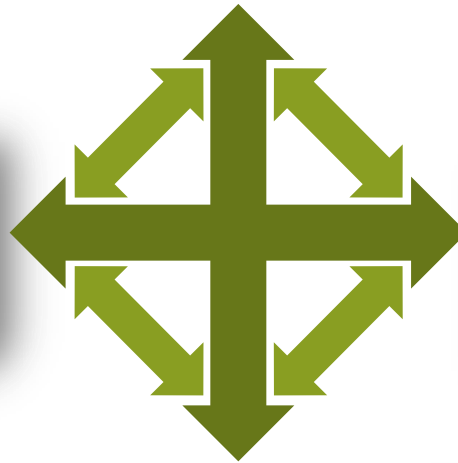


## Airframe OEMs

- Drive to grow services revenue
- Competing with integrators
- Key challenge is to demonstrate value/success

## Component OEMs

- Continued focus of aftermarket
- Increased support in growth regions via licensed service centers
- Competing with integrators for component contracts



## Integrators

- Increasing competition from all OEMs
- JV opportunities?
- Repair vs. replace based strategies?
- Data access?



## Independent MROs

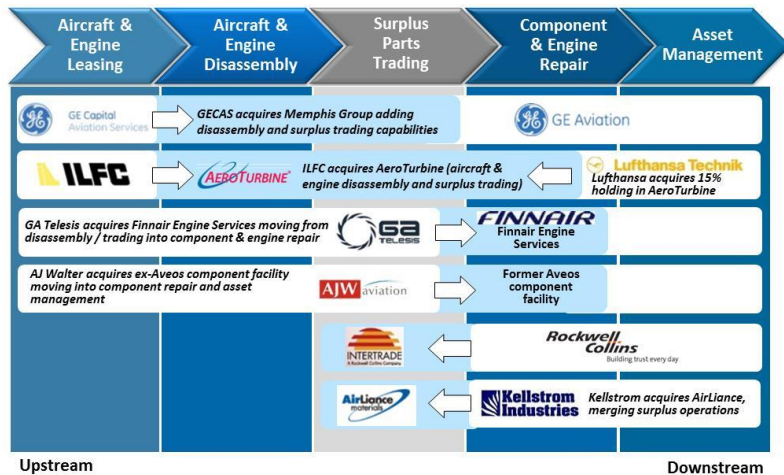
- How to secure access to new aircraft IP, data, manuals?
- Partnerships? JVs?
- Surplus/PMA/DER usage?





# Surplus players are evaluating how to grow beyond 'trading' to offer more value added services

## Key Surplus Parts Provider Implications



- The oversupply of sunset and some mature products is causing downward pricing pressure
- Whether to add additional services such as MRO (airframe / engine or component) or services such as component leasing / asset management
- Growth opportunities in emerging regions such as Asia
- Consider aligning with OEMs

Source: ICF International

# Aftermarket revenue streams of Engine and Component OEMs will continue to be challenged by surplus

## Key Engine / Component OEM Implications



- New parts sales reduced by surplus for affected mature aircraft
- Engine OEMs have been the main OEM participants in the surplus market; System OEMs are so far limited - only Honeywell and Rockwell Collins have active surplus trading divisions
- MRO and spares activity for vulnerable aircraft/engines reduced by short-term leases, inventory burn-down and consumption of spares
- New aftermarket opportunity for OEMs – sell surplus / pre-owned parts. Will more system OEMs actively participate in surplus parts?

Source: ICF International

# Independent MROs face challenges and opportunities from the new environment

## Key Independent MRO Implications



- Adapt capabilities to align with shifting aircraft utilization patterns and demographics
- Migration of fleet to new technology aircraft strengthens position of OEMs
- Downward MRO pricing pressure where in competition with surplus aircraft, components and engines
- Leverage availability of surplus parts to reduce maintenance costs...and prices
- Develop value propositions to help airlines cope with sunset aircraft

Source: ICF International

# Airlines are well-positioned to capitalize on the low interest rates and maintenance cost savings opportunities

## Key Airline Operator Implications



- Historically low interest rates and easy access to capital resulted in record breaking aircraft orders by airlines in recent years
- New and more fuel efficient aircraft reduces aircraft operating cost
- Airlines can also lower maintenance burden with new aircraft maintenance honeymoon and retirement of older aircraft with higher maintenance requirements
- High retirement rates and the subsequent availability of surplus parts provide airlines with substantial maintenance cost savings opportunities
- Airlines can save 30% or more by acquiring parts, rotables and aeroengines from surplus dealers that salvage components from retired aircraft

Source: ICF International

# Thank You!

ICF International's Aerospace & MRO advisory services include the following:

- M&A Commercial Due Diligence
- MRO Market Research & Analysis
- Aerospace Manufacturing Strategy
- Aviation Asset Valuations & Appraisals
- MRO Cost & Performance Benchmarking
- MRO Information Technology (IT) Assessment
- MRO Strategic Sourcing Support
- Supply Chain Management
- LEAN Continuous Process Improvement
- Military Aircraft Sustainment





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