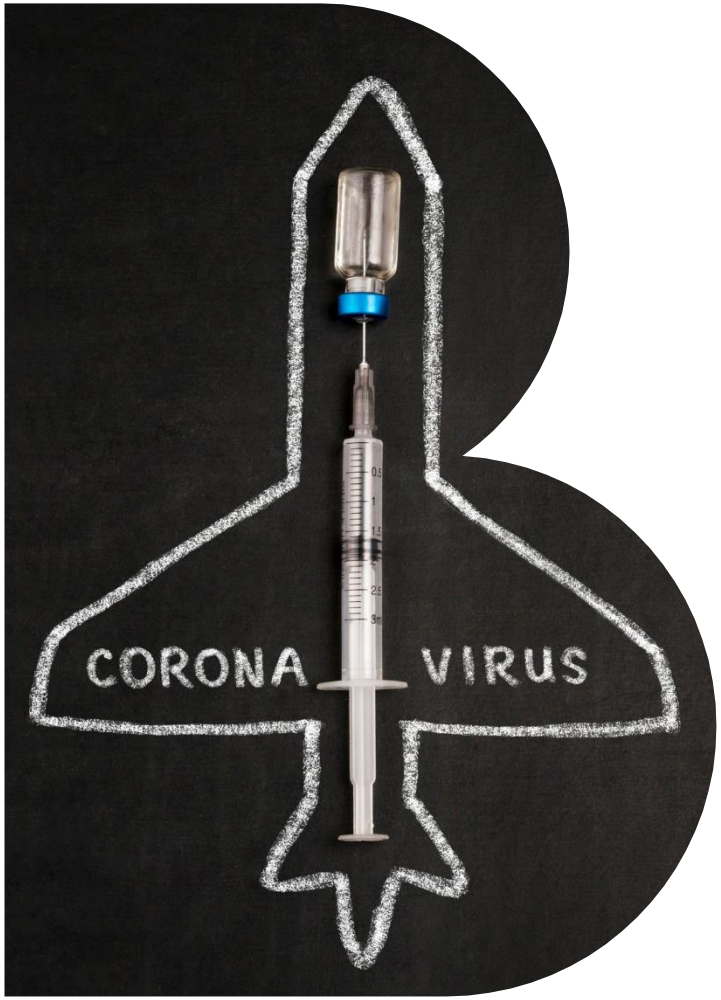
COVID-19 Scenarios for the Aerospace industry

Webinar for EACP members



EACP
EUROPEAN AEROSPACE CLUSTER PARTNERSHIP

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A. What is driving COVID-19's impact on aerospace

COVID-19 has caused a major drop in travel demand and is already significantly impacting the aviation and aerospace sectors

COVID-19's impact on aerospace

1 Virus progression

> Number of regions/ countries affected
> COVID-19 induced deaths

- COVID-19 infections have risen, driven by:
  - Natural infectivity of the virus
  - Contact rate
  - Contagious period
- COVID-19 has a higher case fatality rate than other common ailments
- Deaths have accelerated due to hospitalisations exceeding the local critical care facilities[1)]

2 Mitigation actions

> Government restrictions
> Corporate travel policies
> Individual travel reduction

- Lack of global control of COVID-19 infection has resulted in drastic measures to prevent virus transmission between people
- Without reliable and widespread test data, governments are resorting to extreme travel restrictions

3 Demand for travel

> Drop in air traffic (RPKs[2)])

- COVID-19 is a "perfect storm" for the travel sector due to a combination of:
  - Economic downturn
  - Changes in passenger behaviour (corporate and personal)
  - Government restrictions on travel

4 Aviation impact

> Fleet grounding, early retirement of aircraft, employee layoffs, etc

- Airlines have reacted by:
  - Grounding fleets (~70% of global passenger fleet now grounded)
  - Laying off staff
  - Deferring a/c deliveries
- 2020 passenger revenues expectations have fallen by 55% vs pre-crisis est.
- Numerous airlines in discussion with respective governments on bailouts

5 Aerospace impact

> Drop in MRO[3)] and other services activity
> Drop in aircraft production

- Immediate drop in MRO due to aircraft grounding and deferral of maintenance by airlines
- Short-term site closures as OEMs and suppliers introduce emergency protective anti-transmission measures
- Re-evaluation of future production plans in light of drop in demand

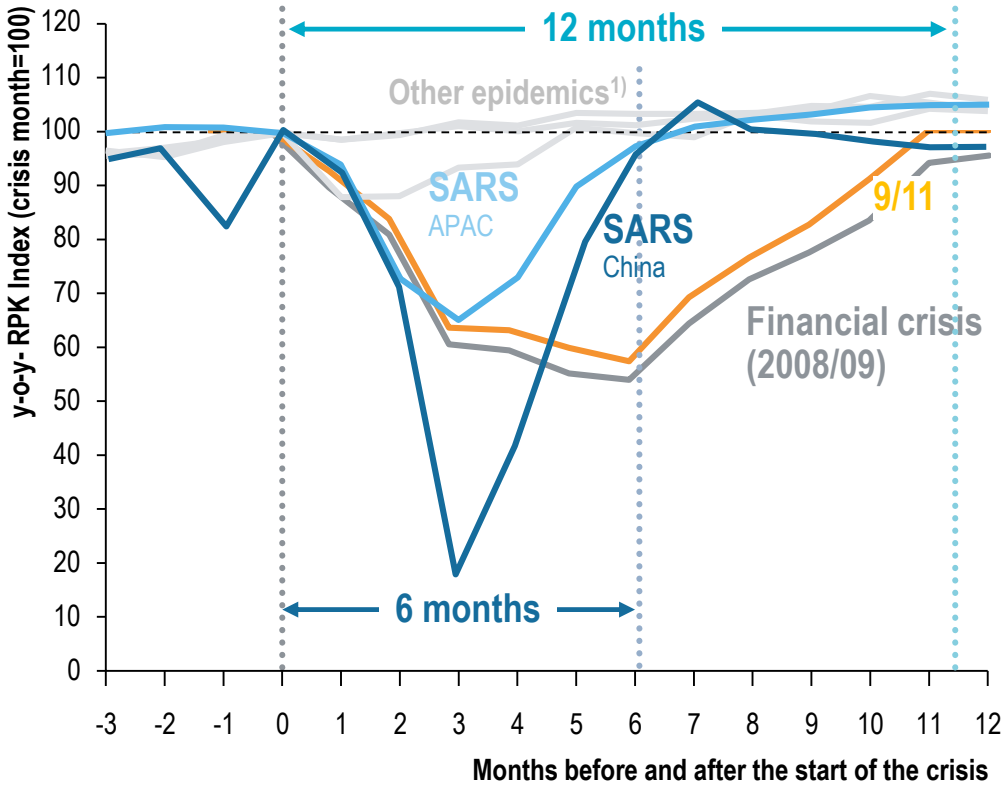
Secondary drivers and feedback loops also exist; they complicate the interaction and make it less predictable

1) Death rates also vary between countries due to variations in the breadth of testing efforts; 2) Revenue Passenger Kilometers; 3) Maintenance, Repair & Overhaul

Source: Roland Berger

SARS has had the strongest impact on travel demand, albeit the impact was limited only to APAC region

Comparison of past crises in aviation [YoY changes by month after crisis start]



Factors impacting aviation travel demand

	Economic downturn	Fear	Health risk	Travel restrictions	Geography
First oil shock	✓	✓			Global
1980s oil crisis	✓				Global
First Gulf War	✓	✓			Global
9/11		✓			Global
Financial crisis (2008/09)	✓				Global
SARS		✓	✓	✓	Regional
COVID-19	✓	✓	✓	✓	Global

1) Including MERS and Avian Flu 2005 and 2013

Source: IATA Economics, Roland Berger

66% of the global passenger fleet has been grounded as part of a range of cost-cutting operational measures taken by airlines

Operational COVID-19 mitigation actions taken by airlines

As of Friday 17th April 2020

Global grounded fleet[1]
66% of total
~19,350 aircraft

	Measure	**Europe**	Lufthansa	British Airways[3]	Air France-KLM	RyanAir	easyJet	Norwegian	**North America**	American Airlines	Delta Air Lines	United Airlines	Southwest Airlines	**China**	China Southern	Air China	China Eastern	HNA	Cathay Pacific	**Other APAC**	All Nippon Airways	Singapore Airlines	Air Asia	**Middle East**	Emirates	Qatar	Turkish Airlines	**Total**
	Airline code		LH	BA	AF/KL	FR	EY	DY		AA	DL	UA	WN		CZ	CA	MU	HU	CX		NH	SG	AK		EK	QR	SV	
	Share of global fleet[1]		2%	2%	2%	2%	1%	1%		6%	5%	5%	3%		3%	3%	2%	2%	1%		1%	1%	1%		1%	1%	1%	**44%**
Fleet/ Flight Ops	Grounding fleet[2]		95%	90%	90%	99%	100%	93%		80%	80%	68%	50%		22%	23%	31%	47%	97%		90%	94%	100%		86%	65%	86%	**69%**
	Early retirement of aircraft[4]		●	●	●	○	●	○		●	●	●	○		○	○	○	○	○		○	○	●		○	○	○	
	Order deferrals		◐	○	○	○	●	○		○	○	○	○		○	○	○	○	◐		○	●	●		◐	○	○	
	Cargo-only pax flights		●	●	○	○	○	○		●	●	●	●		○	○	○	○	●		○	●	○		●	●	●	
Personnel	Salary cuts		●	●	○	●	●	○		◐	●	◐	●		○	○	○	○	○		●	●	●		●	○	◐	
	Layoffs including furloughs		●	●	●	●	●	●		●	●	●	○		●	○	●	●	●		●	●	○		●	●	●	

○ No publicly available information ◐ Potential measure ● Confirmed measure

1) Regional jets, narrowbody jets, and widebody jets only; 2) Based on the latest available information, including approximations based on capacity cuts where no other data available; 3) IAG; 4) Including mothballing

Source: Airlines, Roland Berger

Airlines have sought financing from several sources, with debt a popular option – the threat of insolvency remains very real for many

Financial COVID-19 mitigation actions taken by airlines

As of Friday 17th April 2020

	Measure	**Europe**	Lufthansa	British Airways[2]	Air France-KLM	RyanAir	easyJet	Norwegian	**North America**	American Airlines	Delta Air Lines	United Airlines	Southwest Airlines	**China**	China Southern	Air China	China Eastern	HNA	Cathay Pacific	**Other APAC**	All Nippon Airways	Singapore Airlines	Air Asia	**Middle East**	Emirates	Qatar	Turkish Airlines	**Total**
	Airline code		LH	BA	AF/KL	FR	EY	DY		AA	DL	UA	WN		CZ	CA	MU	HU	CX		NH	SG	AK		EK	QR	SV	
	Share of global fleet[1]		2%	2%	2%	2%	1%	1%		6%	5%	5%	3%		3%	3%	2%	2%	1%		1%	1%	1%		1%	1%	1%	**44%**
New financing	Government debt		●	●	●	○	●	●		●	●	●	●		○	○	○	○	○		●	●	●		○	●	●	
	Government equity		●	○	○	○	○	○		●	●	●	●		○	○	○	●	○		○	●	○		●	●	●	
	Private debt		●	○	○	○	●	●		●	●	●	●		○	○	○	○	○		●	●	○		●	○	●	
	Private equity		○	○	○	○	○	●		○	○	○	○		○	○	○	○	○		○	○	○		○	○	●	
Existing financing	Drawdown of existing credit		○	●	●	○	●	○		●	●	○	●		○	○	○	○	○		○	○	●		○	○	○	

○ No publicly available information ● Potential measure ● Confirmed measure

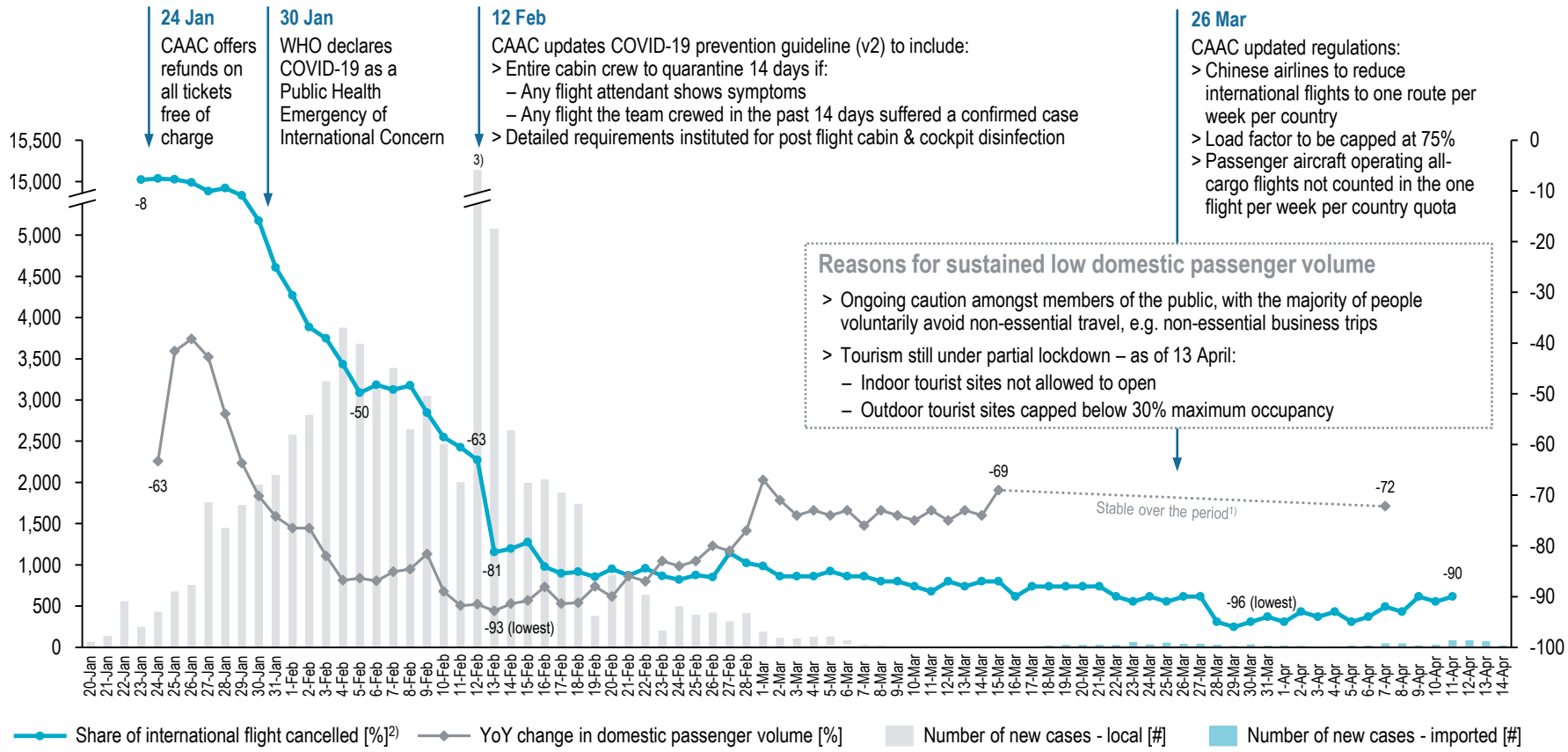
1) Regional jets, narrowbody jets, and widebody jets only; 2) IAG; 3) Assuming no changes to reported cash balance (no new debt or ticket refunds), revenue and COGS both zero

Source: Airlines, Roland Berger

Chinese domestic air travel rebounded slightly after local infections tapered off, but remains at c. 70% below 2019 levels

Evolution of Covid-19 cases vs. air travel in China, January – April 2020

Case study – China



1) Data unavailable, but YoY change in domestic passenger volume known to be stable at c. -70% over the period; 2) Not in comparison with historical value; 3) Spike in new case count due to the change in counting method – cases diagnosed based on lungs imaging and blood testing (but without formal Covid-19 test due to capacity constraints) included since 12th Feb

Source: Civil Aviation Administration of China (CAAC), Ministry of Transport of PRC, Ministry of Culture and Tourism of PRC, VariFlight, Roland Berger

Aerospace companies with significant civil aftermarket exposure are expected to be most impacted by the COVID-19 crisis

A&D industry players revenue mapping – Selection of players [1)]

Indicative

I Civil aftermarket

> **During crisis:** Decrease up to ~40% in 2020 revenue as a direct consequence of reduced air traffic
> **Post crisis:** Recovery trajectory broadly in line with air traffic, with a time lag to be expected if fleet is newer (due to retirement of mid-aged aircraft)

II Civil original equipment

> **During crisis:** Existing orders delayed or cancelled; no new orders, correlated to airlines' financial health
> **Post crisis:** Slow down in new orders following sector consolidation, with recovery focused on narrowbodies (less of a recovery in widebodies)

III Defence

> **During crisis:**
  – Participation in repatriation efforts, patient transport, and military deployment during lockdowns
  – Potential delays in programme deliveries due to labour shortages
> **Post crisis:** No significant impact expected in the US as defence will be more resilient to COVID-19 than civil aerospace, with good market fundamentals in the long-term

1) GE represents GE Aviation; Honeywell represents Honeywell Aerospace 2) Including defence services

Source: Roland Berger

B. Scenarios for the impact of COVID-19 on the Aerospace industry

We have developed three scenarios to show the possible impact of COVID-19 on the civil aerospace industry

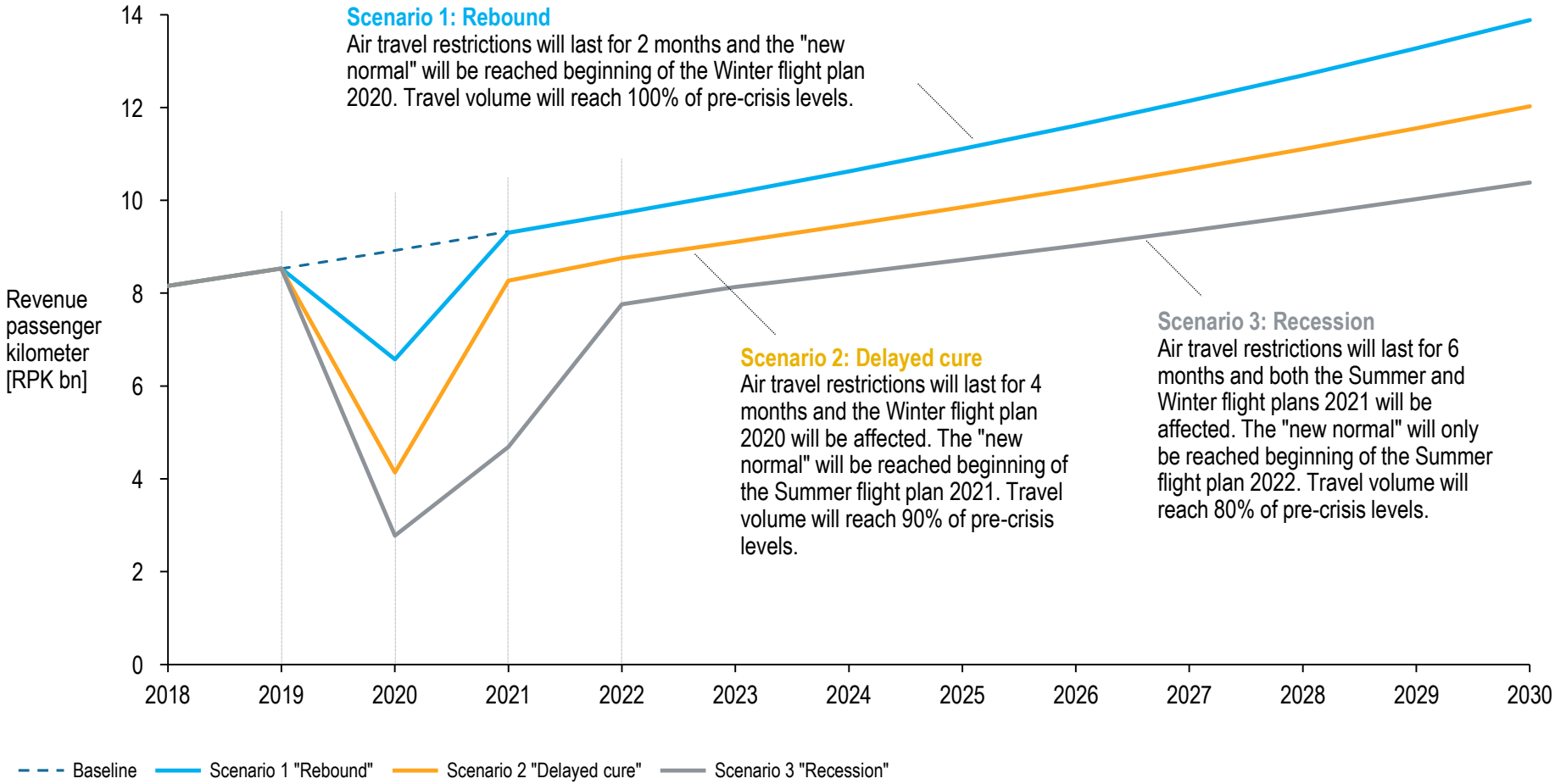
Key parameters of RB post COVID-19 scenarios for civil aerospace

	Duration of air travel restrictions	Passenger traffic reaching the "new normal" by beginning of	Level of the "new normal"	Passenger traffic growth after reaching the "new normal"	Deferred aircraft replacement
Pre-crisis **Baseline**	-	-	100%	4.6 %	-
Scenario 1 **Rebound**	2 months	Winter 2020	100%	4.6 %	12 months
Scenario 2 **Delayed cure**	4 months	Summer 2021	90%	4.1 %	18 months
Scenario 3 **Recession**	6 months	Summer 2022	80%	3.6 %	24 months

Source: Roland Berger

Global air traffic is expected to be hit hard by the COVID-19 crisis – Our three scenarios span the range from Rebound to Recession

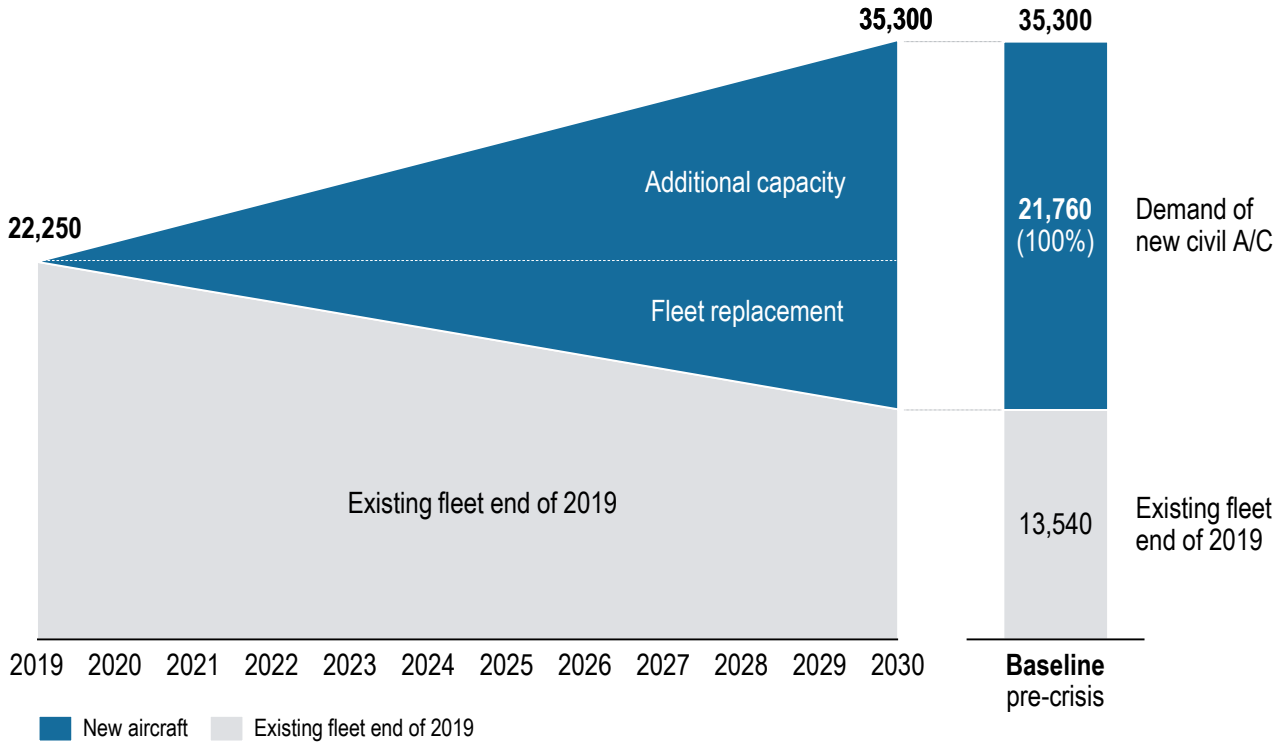
Projected global passenger air traffic (RPK bn)



Source: Roland Berger

Approximately 22,000 new civil aircraft were expected to be delivered by 2030 before the impact of the COVID-19 crisis

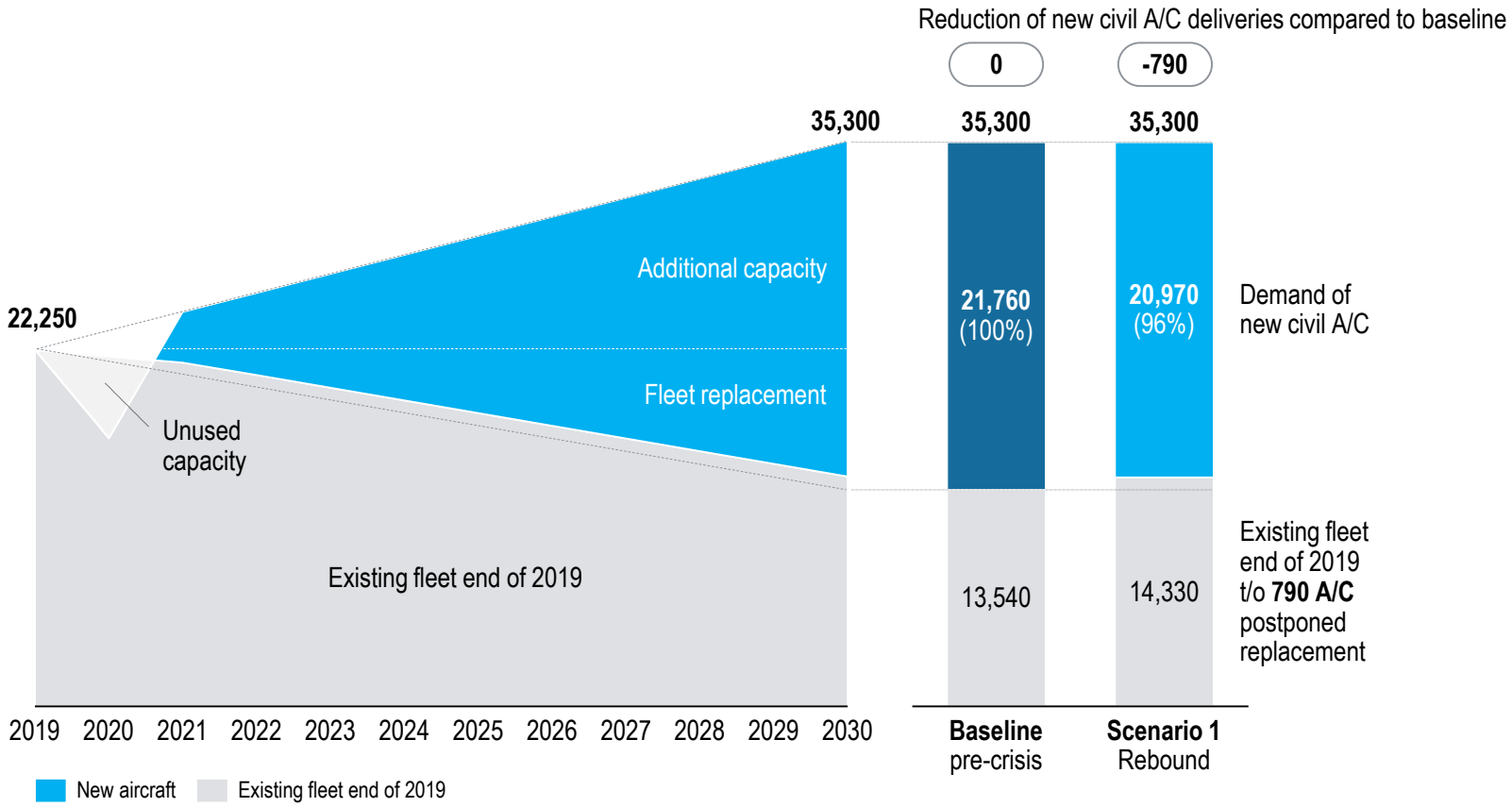
Pre-crisis demand for civil aircraft 2020-2030 (units)



Source: Roland Berger

Scenario 1 has limited impact on the overall demand for new aircraft until 2030 since traffic recovers to pre-crisis levels

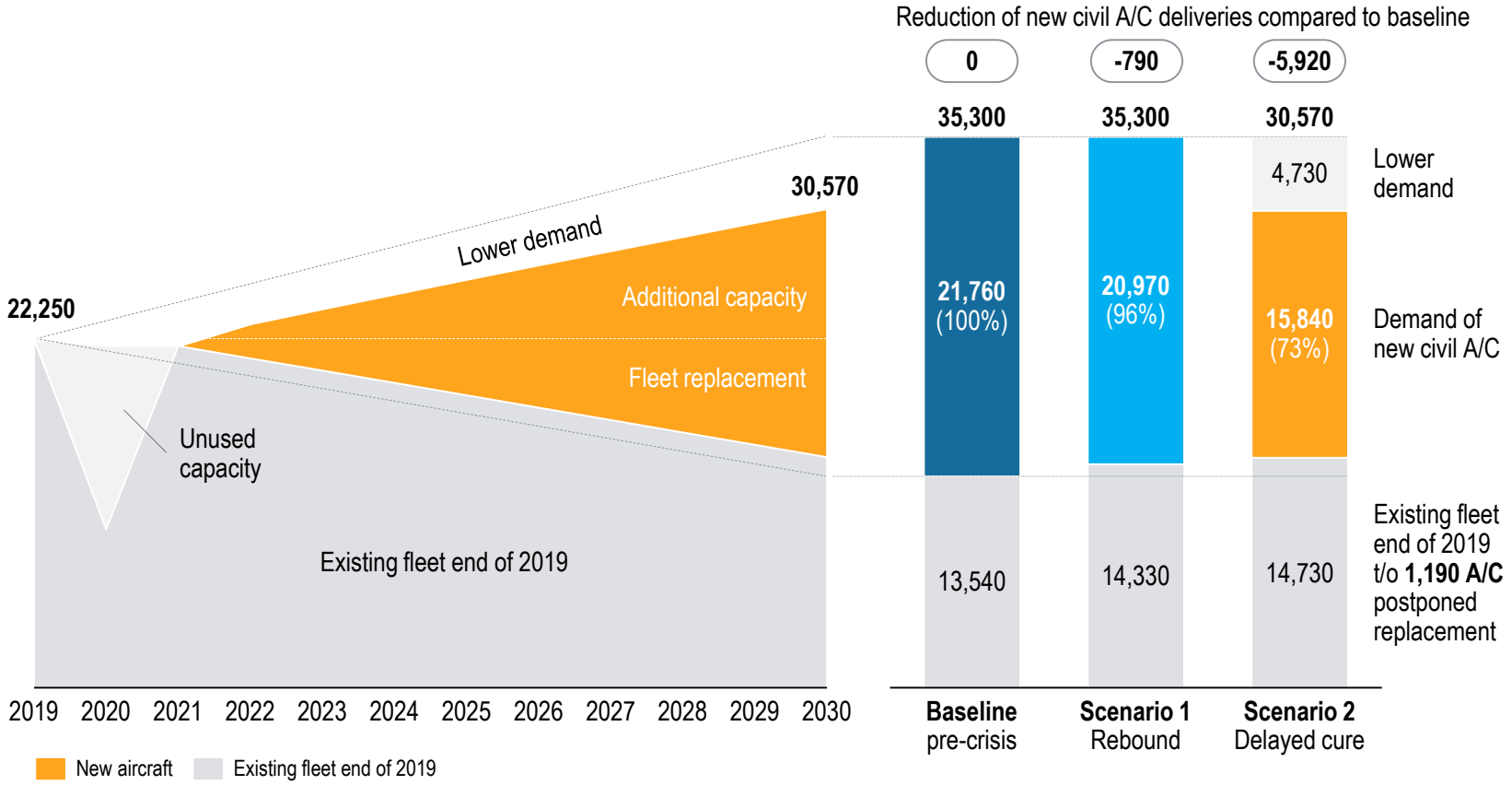
Scenario 1 (Rebound) – impact on demand for new aircraft (units)



Source: Roland Berger

Scenario 2 assumes traffic stabilizes by mid-2021 at 90% of pre-crisis levels, resulting in new aircraft delivered dropped to 73%

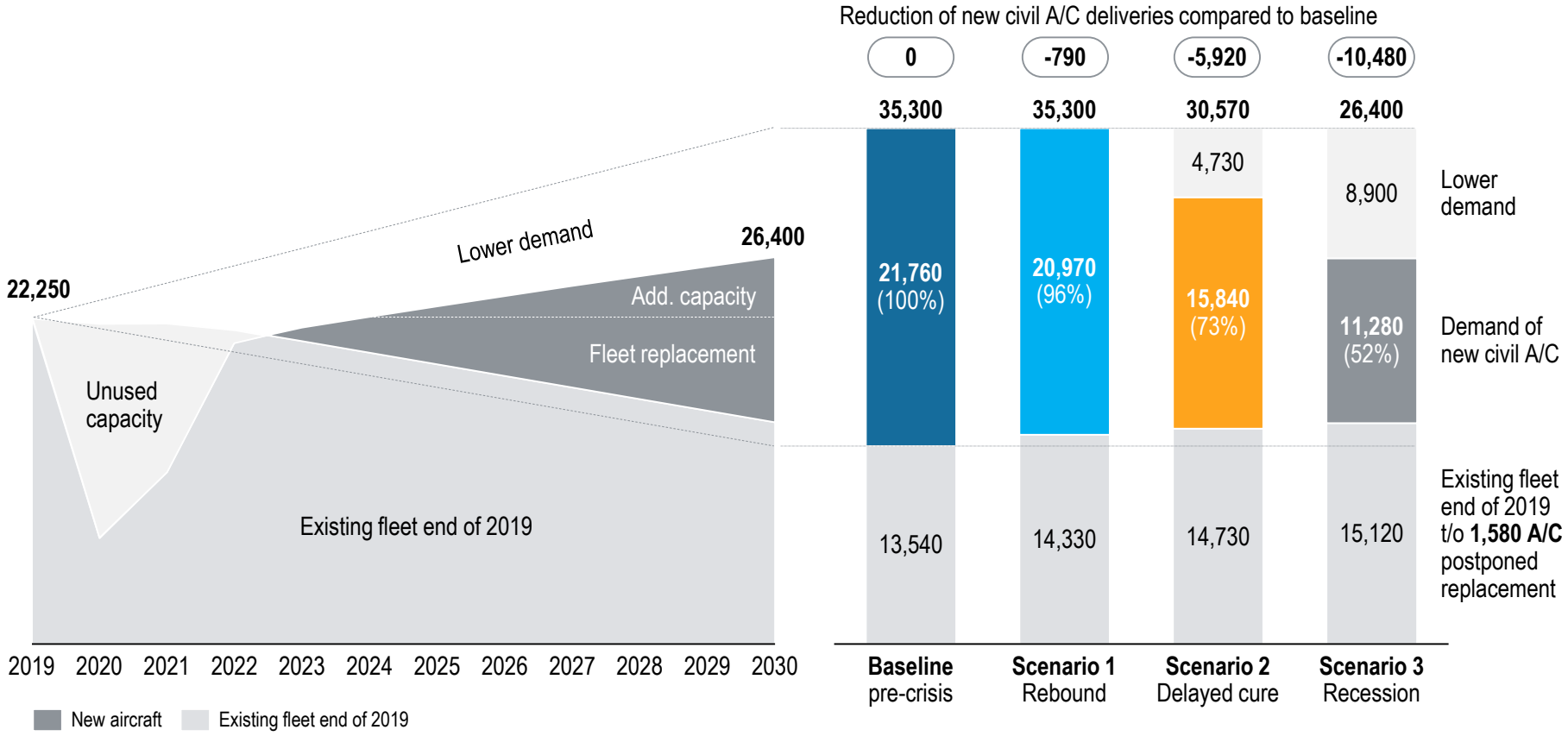
Scenario 2 (Delayed Cure) – impact on demand for new aircraft (units)



Source: Roland Berger

Scenario 3 sees traffic falls to 80% of pre-crisis levels and grow 1% p.a. slower, causing new aircraft deliveries fall to 52%

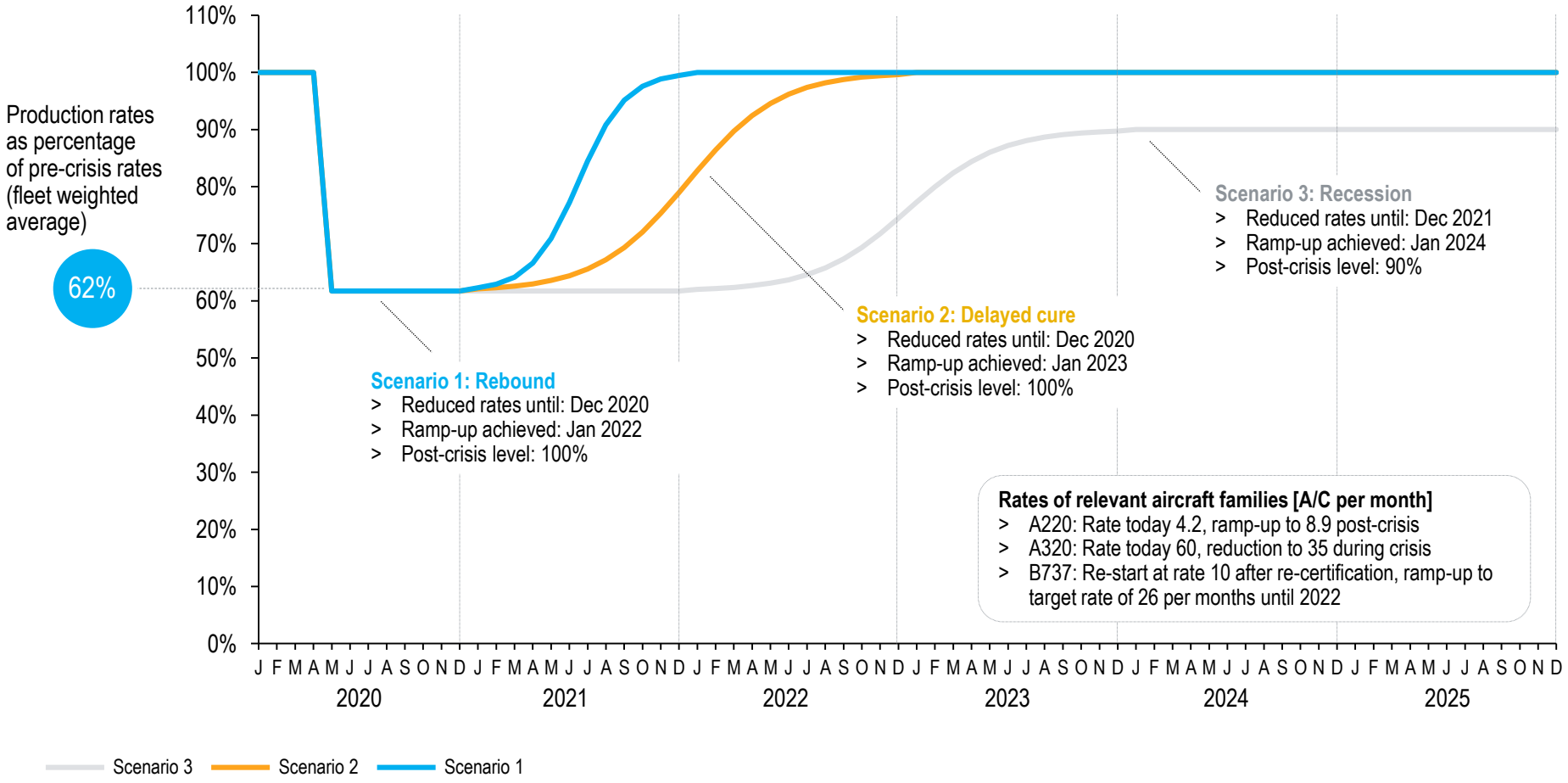
Scenario 3 (Recession) – impact on demand for new aircraft (units)



Source: Roland Berger

Although there is no simple mathematical link from fleet models to aircraft production, scenarios enable a projection of production rates

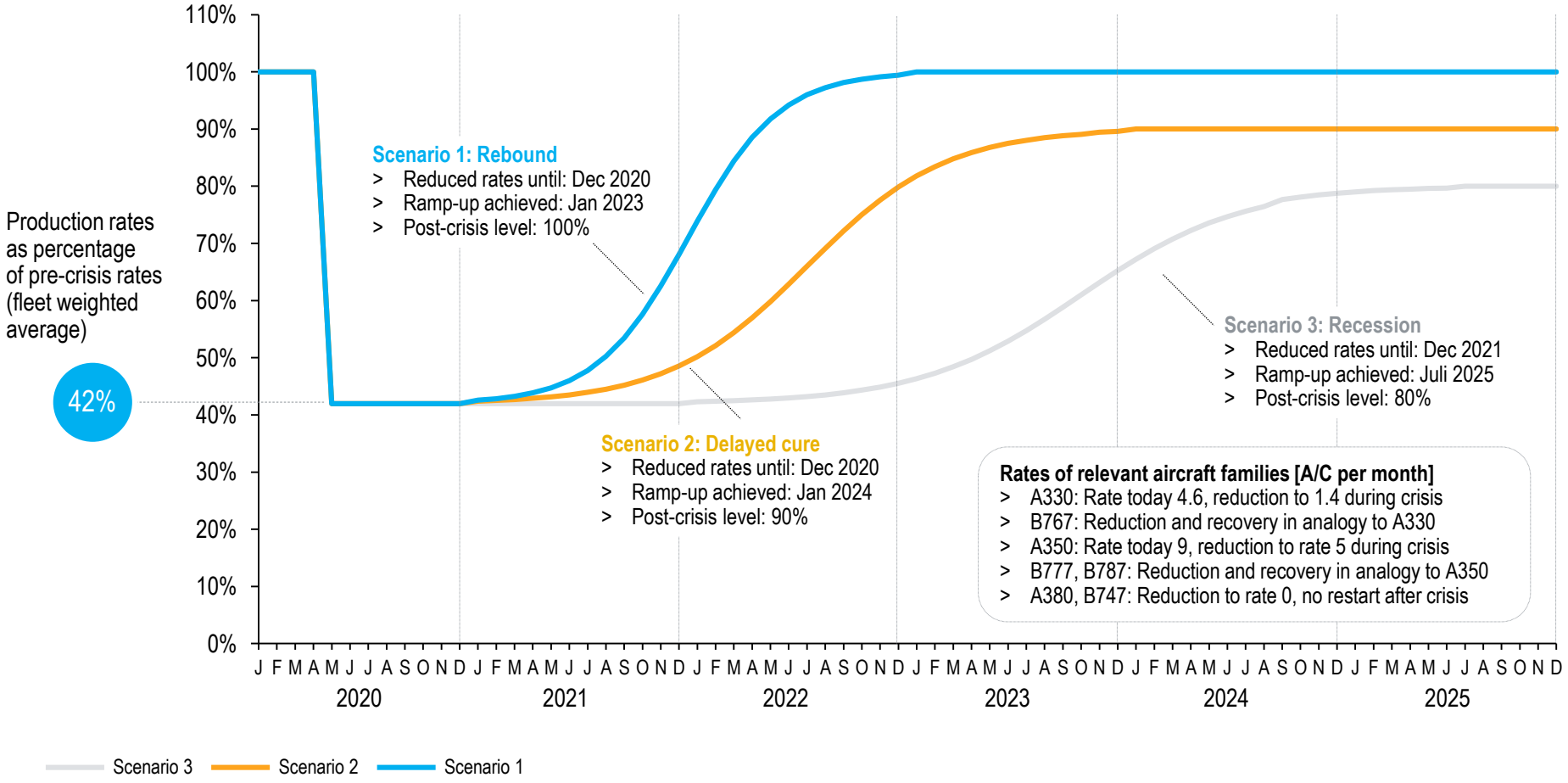
Single Aisle production rates [% of pre-crisis rates]



Source: Roland Berger

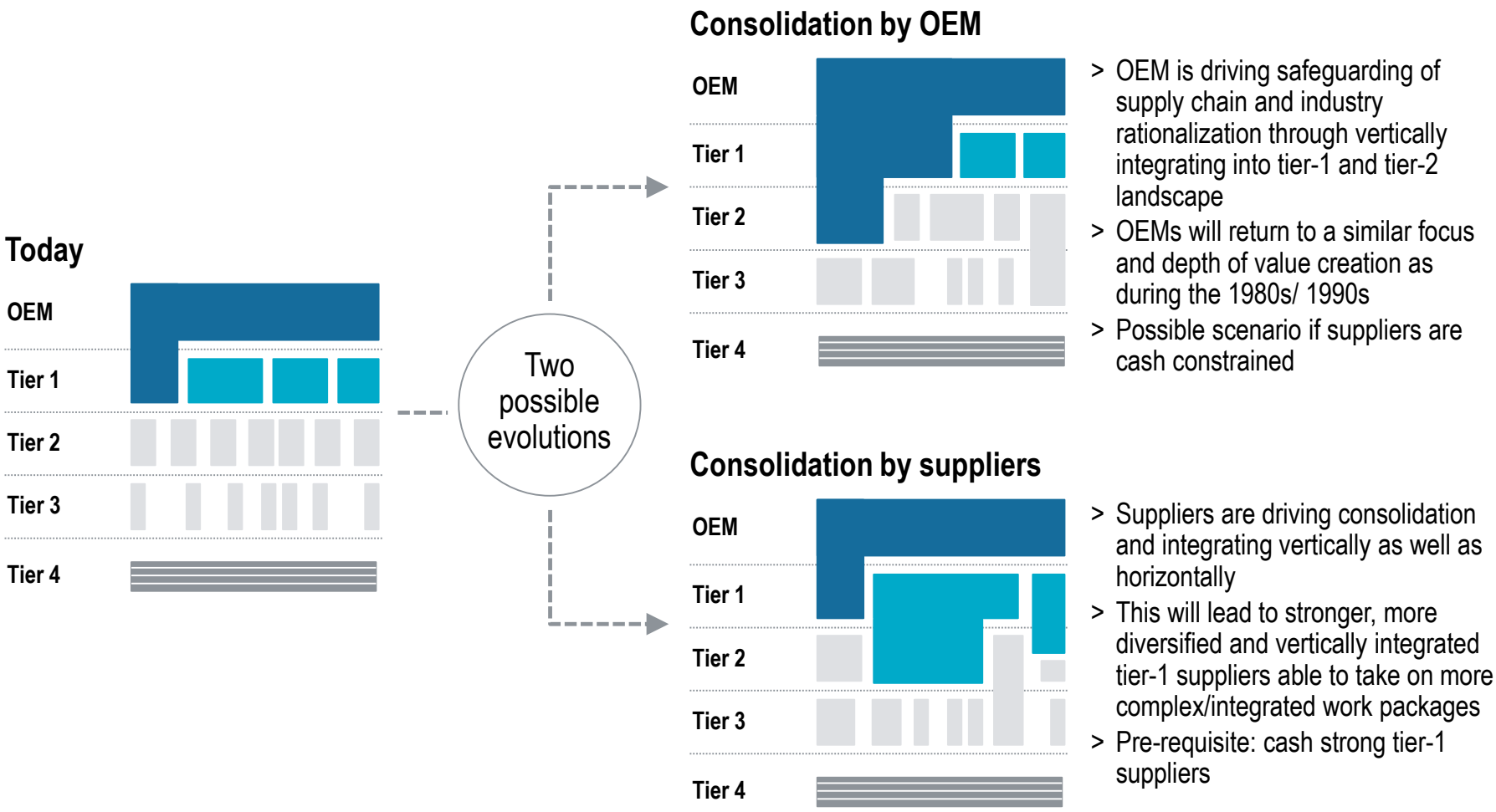
While Single Aisle rates are expected to drop only to 62% of 2019 levels, Widebody rates are forecasted to be go down to 42%

Widebody production rates [% of pre-crisis rates]



Source: Roland Berger

The contraction of demand can lead to two possible evolutions of the aerospace ecosystem



Source: Roland Berger

C. How aerospace suppliers can survive and thrive in the "new normal"

The number one priority is surviving the crisis; however, the crisis also presents opportunities for aerospace suppliers to capitalise on

What should aerospace suppliers prioritise?

1 Survive the crisis

> Suppliers need to survive the initial cash squeeze as:
  – Customers defer orders and consume already-delivered inventory
  – Suppliers still have to pay their sub-tiers for parts ordered against previous production rates, as well as pay their own staff and perform essential maintenance
> In addition, all levels should carefully monitor the health of critical sub-tier suppliers

2 Prepare for efficient re-start of operations

> Take advantage of the crisis-driven pause in production to re-engineer operations
> Eliminate inefficiencies that have inevitably built up over years of chasing ever-higher production rates
> Review footprint and future operational requirements
> Re-size production capacity for the "new normal"

Source: Roland Berger

What aerospace companies need to do to manage the crisis

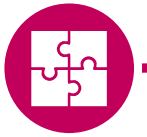
I. Crisis Management
Immediate future

- O Establish a crisis mgmt. taskforce to manage/monitor crisis response
- O Secure and monitor ongoing liquidity position
- O Adjust operations to hygiene rules and secure continuity of critical functions
- O Leverage capabilities in less affected sectors (e.g. defense)
- O Compress spending and launch cost optimization measures
- O Ensure commercial continuity and link with the customer
- S Define the "New Normal" and identify opportunities to pursue

II. Transition
2020-21

- O Secure operational transition in both MAKE and BUY
- O Monitor health and longevity of business & supply chain operations
- O Re-plan operations to run efficiently in the "New Normal"
- S Revisit and revise corporate strategy to fit with the "New Normal" (incl. portfolio)
- S Capitalize on opportunities (e.g. M&A, renegotiation of terms, securing talent)

III. "New Normal"
2021+



- O Conduct operations efficiency programs
- O Integrate acquired businesses
- O Optimize existing footprint in line with changes in industry demand/landscape
- S Review product and innovation strategy in light of changed market needs
- S Assess and revise operating model in line with changes in strategy
- S Review supply chain strategy and configuration to fit with the strategy
- S Anticipate and prepare for future Black Swans

O Operational measure S Strategic measure

We offer a comprehensive suite of support throughout the crisis

I. Crisis Management

- Liquidity securing prog.
- Refinancing support
- 360° Checkup
- Emergency Room / War Rooms
- Supply Chain Monitoring & Recovery
- Value Chain "Stand-by"
- Spend Compression
- Procurement quick-wins
- Medical market screening

II. Transition

- Demand modelling and capacity planning
- Scenario planning
- Rate readiness assessment
- SC Monitoring, Recovery & Transformation
- Value Chain Recovery & Ramp-up
- M&A support
- Negotiation support
- War gaming
- Scenario analysis

III. "New Normal"

- Footprint optimisation
- **Operations Efficiency**
  - > Engineering efficiency
  - > Procurement cost reduction
  - > Plant performance boost
  - > Supply Chain cost reduction
- Post Merger Integration
- Corporate/Portfolio/Product strategy
- Service profitability
- Supply Chain Excellence
- Operating model redesign
- War gaming
- Scenario analysis

Relevant Roland Berger offering (operational)

Relevant Roland Berger offering (strategic)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