An Airbus takes off or lands every 1.4 seconds

End of February 2018 figures

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total workforce</td>
<td>134,000+</td>
</tr>
<tr>
<td>Order book</td>
<td>€1,060 billion</td>
</tr>
<tr>
<td>Annual revenue</td>
<td>€67 billion</td>
</tr>
</tbody>
</table>

A commercial aircraft manufacturer with the two Divisions Defence and Space, and Helicopters.
### 2017 Airbus commercial aircrafts highlights

<table>
<thead>
<tr>
<th>Deliveries</th>
<th>Orders</th>
<th>Backlog</th>
</tr>
</thead>
<tbody>
<tr>
<td>718</td>
<td>1,109</td>
<td>7,265</td>
</tr>
</tbody>
</table>

#### Deliveries

- **A350 XWB Deliveries**
  - On track for rate 10 by end 2018
  - 2014: 1
  - 2015: 14
  - 2016: 14
  - 2017: 78

#### Orders

- A380: 15
- A350: 78
- A330: 67
- A320neo: 558

#### Backlog

- Value > 1000bn USD at list prices

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**A330 NEO first flight**

**A350-1000 Type Certificate**

**AIRBUS & C-Series Partnership**

- Airbus Production sites close to customers
- Leasing: 31%
20-year demand for almost 35,000 new passenger and freighter aircraft

**Number of aircraft**

- 20500 Beginning 2017
- 22030 Growth
- 12870 Replacement
- 7630 Stay
- 34900 New Deliveries
- 24,810 Single Aisle
- 8,690 Twin Aisle
- 1,410 Very Large Aircraft

**Key Message:** 5.3 $US Trillion market forecasted for the 20Y demand worldwide

*Source: Airbus GMF 2017*
Airbus Performance
Our backlog secures our future

<table>
<thead>
<tr>
<th>Aircraft</th>
<th>Backlog</th>
</tr>
</thead>
<tbody>
<tr>
<td>A320</td>
<td>6,126</td>
</tr>
<tr>
<td>A330</td>
<td>308</td>
</tr>
<tr>
<td>A350XWB</td>
<td>700</td>
</tr>
<tr>
<td>A380</td>
<td>109</td>
</tr>
</tbody>
</table>

Total order backlog: 7,243

Data as of end February 2018

1- AIRBUS brings a strong backlog, giving long term visibility
2- AIRBUS continuously invests to keep its aircraft at competitive edge
3- AIRBUS masters aircraft developments
Airbus Global Supply Chain Titanium demand

• Airbus production rate increase and introduction of new programmes such as A350XWB and neo (Ti Pylon) has almost doubled Titanium demand over the decade.

• Titanium demand is driven by the increase of CFRP usage in Aerostructures and the introduction of “neo” pylons for the new generation of engines with increased weight and temperatures.

• The massive introduction of Titanium (18 times more Titanium on A350XWB vs A330) is creating cost challenges on Aerostructures that will be addressed from 2019/20 through competitiveness challenges and “Buy to Fly” optimization.

Massive introduction of Ti in Airbus Products over last decade is calling for cost optimization.
Airbus Strategic & Procurement Business Priorities 2018/2022
Airbus aims at transforming its End to End industrial efficiency for high rates.

**“Step Change”**

AS-IS

Incremental steps towards the factory of the future adapted to Product policy, Rate increases and major industrial transformation projects.

As Airbus, each material value chain to develop a value proposition contributing to an efficient E2E industrial system securing Quality, Industrial robustness and Competitiveness at high production rates.
What is the value generated by Materials & Structures on an new Aircraft?

Wing of Tomorrow
Fuselage of Tomorrow,
Pylon of Tomorrow
....

No Material, no Aircraft!

The metal value chain shall innovate in terms of products *and* industrial models to increase its industrial value proposition.
Competition between Materials

- The long term attractiveness of the Aerospace industry is creating an environment with increasing competition at each layer of the value chain.

- The most recent programmes developments and entry into service confirmed the competition among materials calling for an **E2E transformation of the fragmented metal value chain**.

- The metal industry need to innovate all along its industrial value chain to **remove the current waste** (Buy to Fly ratio) and to develop the metallic products of tomorrow for Airbus programmes incremental developments & future aircrafts.

The Titanium value chain, (as the overall metal) shall significantly improve its “Buy to Fly” ratio to remain the material of choice on Airbus incremental developments and future new products.
Innovation for series and for next A/C generation: A 2 steps approach

Short Term

- **E2E Industrial Excellence** (OTD/OQD & RC improvement) for a sustainable Competitiveness & high rates
- Foster Innovation for incremental development of *Airbus products*

Mid & Long Term

- **Develop & Mature new solutions**
  - **R&T**
  - **Dev. & Prod**

- **Next A/C generation**
- **Material Choice**

- **Cooperation Research Agreement (CRA)**
- **Multi actors** (industrial, academic, research centers, etc.) & **Different funding models** (self-funded, state funding, etc.)

- Innovation shall address **Industrial value (RC) & Product value for both series & future programmes**
- **Material competition + incremental a/c product policy = Innovation time to market is critical**
Additive Manufacturing – Airbus Roadmap

Airbus continue to invest on all additive manufacturing technology.
Airbus is investing in an Integrated Metallic Material Management (IM³) vision

- Current metal value chain model is limiting performance on current designed parts and being challenged by alternative materials on DtC trade-off.
- Emergence of digitalization is opening new opportunities calling for a E2E transformation making metal the material of choice for current & future a/c material decisions.
- The scope will address:
  - Aluminium & Titanium
  - FRP, Forgings, Extrusions
  - Airbus Plants, Airbus divisions/subs and supply chain volumes
- “As-Is/To-Be” in 2018/19 for a deployment in 2020/21

Building on high demand and digitalization opportunities, Airbus is investing into an IM³ vision to build with the supply chain our tomorrow’s efficiency & sustainability.
Conclusion

- Airbus order backlog reached an industry record proving long term visibility for Titanium partners and their investors
- A350 and Neo ramp up are inducing high Titanium demand creating key opportunities into the Airbus Supply Chain for value chain transformations & product innovations. Focusing on:
  - Reaching a sustainable industrial excellence 100% on time, 0% defects
  - Improve lead time and agility to cope with build rate evolution
  - Significantly improving Buy to Fly by E2E value chain optimization and product innovation
- Taking benefit of high demand and digitalization opportunities, Airbus is investing into an Integrated Metallic Material Management (IM³) vision to build with the supply chain our tomorrow’s efficiency & sustainability
Thank you