AVIATION CO_2 REDUCTIONS

STOCKTAKING SEMINAR

TECHNOLOGY · OPERATIONS · SUSTAINABLE AVIATION FUELS

Boosting innovation and implementation

Robert Thompson

Managing Partner – Roland Berger

Aviation Sustainability The Roadmap to True Zero

Seminar summary

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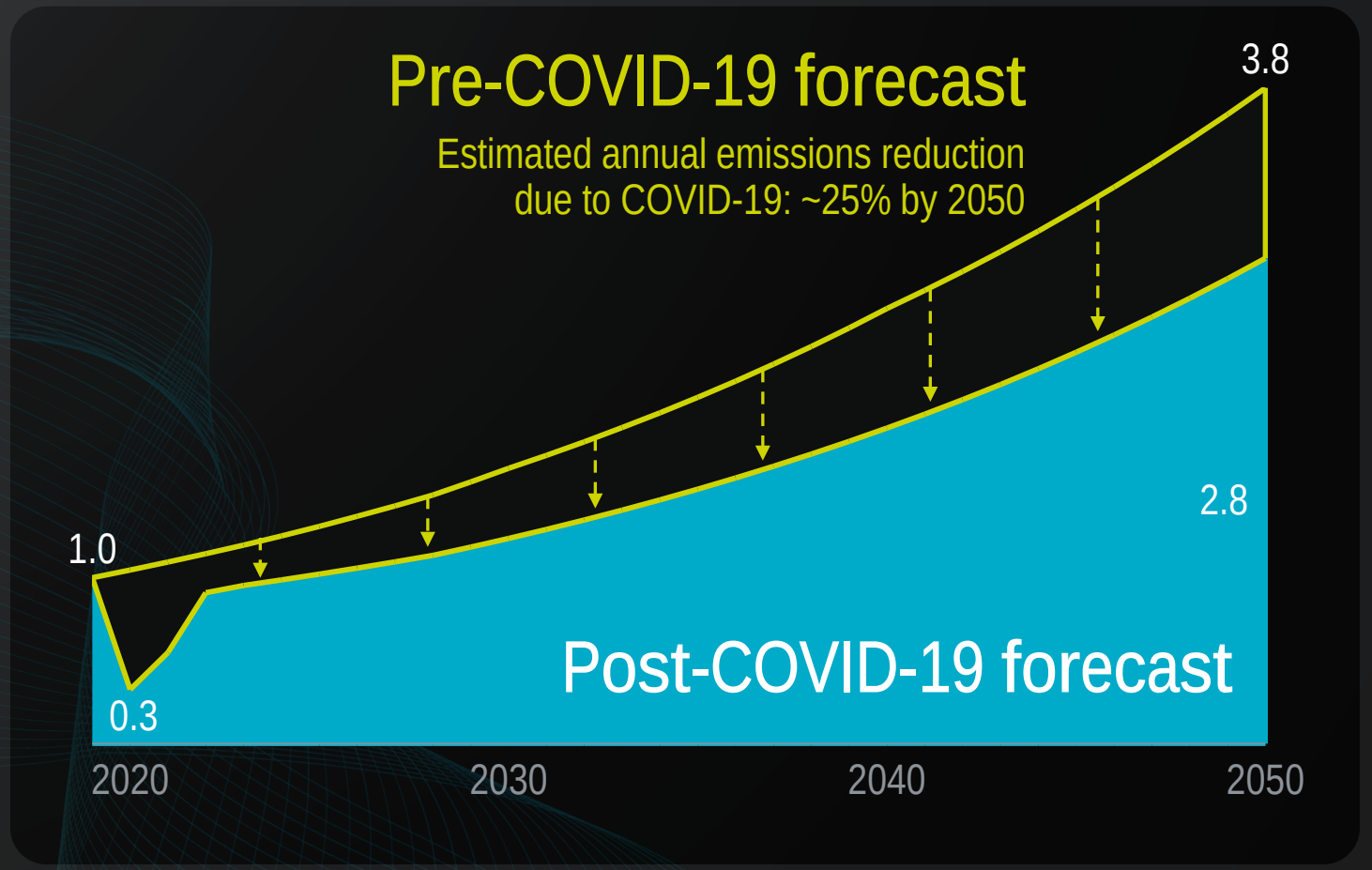
RB COVID-19 Recovery Scenario 3A

Aviation's carbon emissions are set to triple from 2019 to 2050 reaching 3 bn tCO_2, despite a reduction due to COVID-19

Forecast global aviation CO_2 emissions[1], 2019-2050 [bn tCO_2]

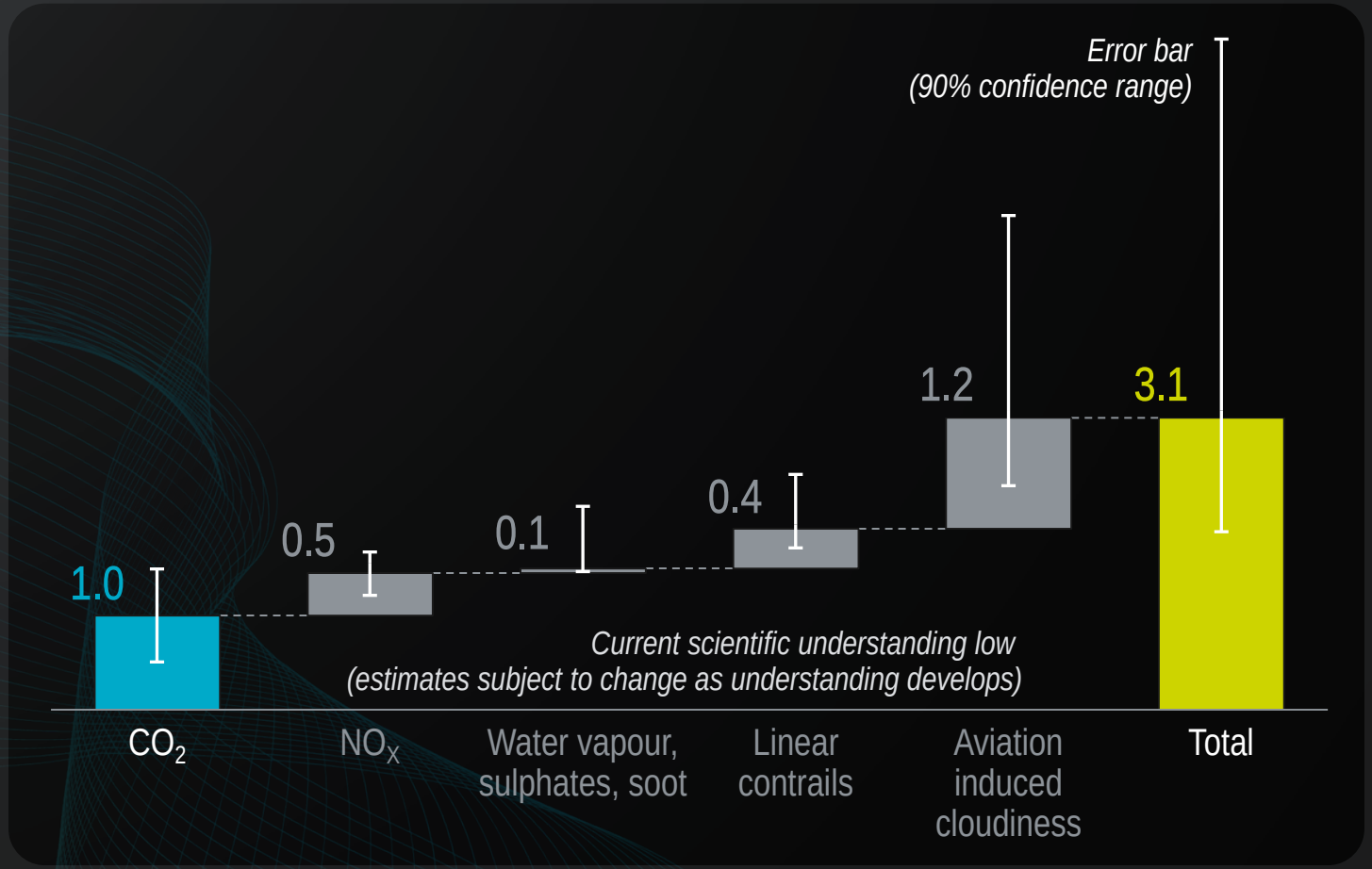


1) For scheduled flights incl. regional turboprops, regional jets, narrowbodies and widebodies; excludes non-scheduled flights related to general aviation and military operations

Source: Roland Berger Aviation Emissions Model

However, there is risk that non-CO_2 climate forcing impacts are even more significant, though the science is still developing

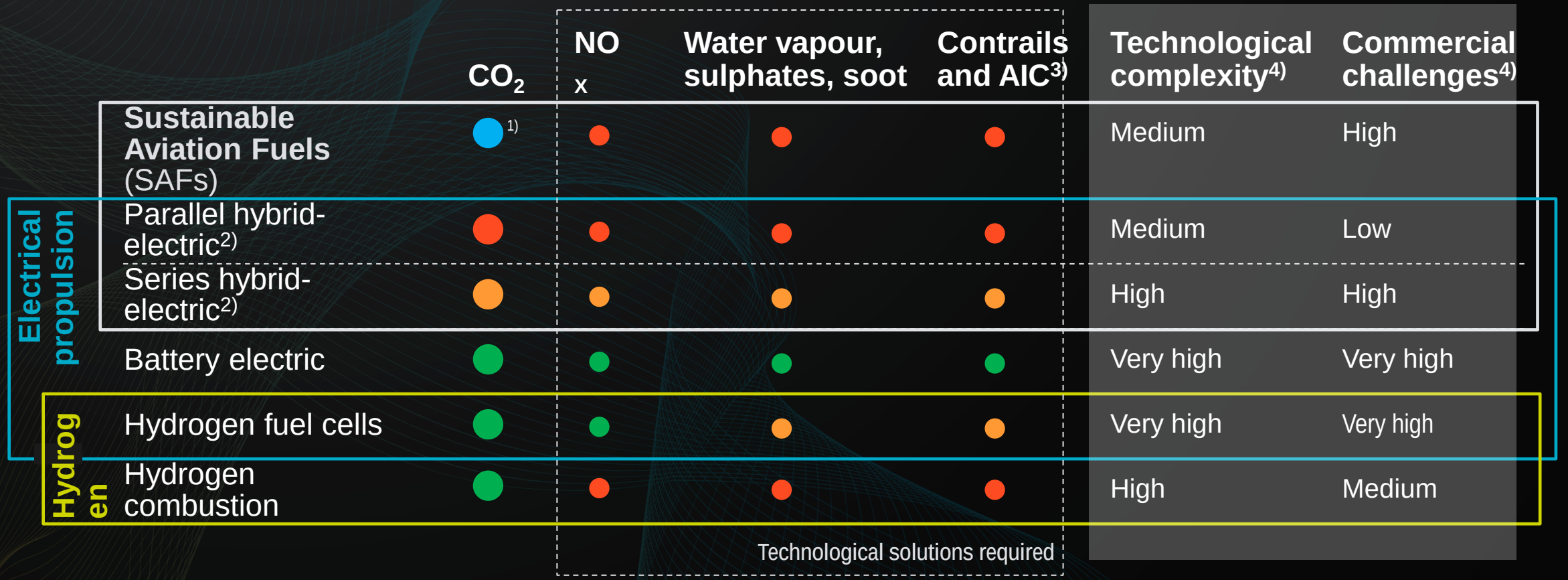
Radiative forcing[1)] contributions due to aviation, 2005 – Indexed to impact of CO_2 (RFI)



1) Radiative forcing (RF) measures the balance of energy moving into vs. out of the Earth's atmosphere (i.e., the instantaneous impact on global warming)

Source: Lee et al. 2009, Secondary research, Roland Berger

There is no silver bullet to resolve this wider climate impact of aviation



Expected full reduction in gross impact | Expected full reduction in net impact | Significant reduction in gross impact | Some reduction in gross impact

1) Assuming SAF pathways and engine designs which allow 100% drop-in; 2) Hybrid solutions also compatible with SAFs, which would reduce net carbon impact; 3) Aviation induced cloudiness; 4) For a narrowbody-scale aircraft

Source: Secondary research, Roland Berger

What must the industry do?

Roland Berger Roadmap to True Zero

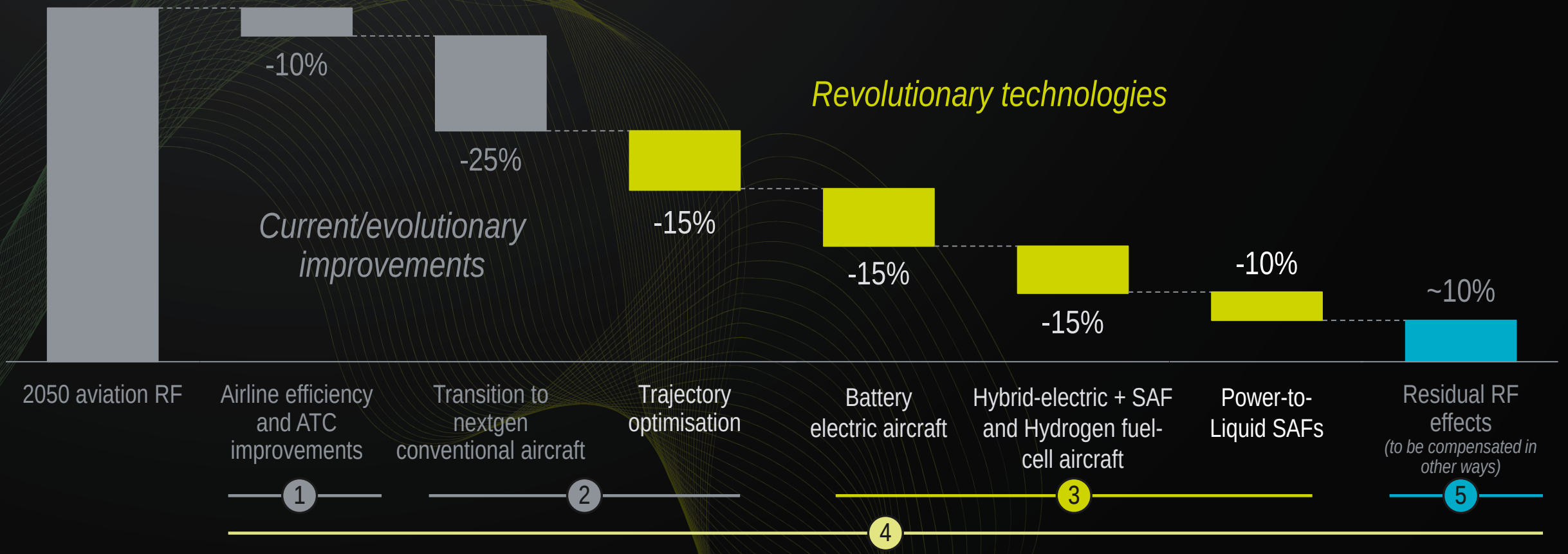
1. Switch to latest generation aircraft (A320neos, B787s, A350s, etc) as soon as possible, and continuously improve operations
2. Invest now in better Air Traffic Control (ATC) and trajectory optimisation to minimise contrails
3. Invest in new propulsion technologies and deploy them for range-appropriate missions

Up to 1,500 km	Fully electric aircraft
1,500-6,000 km	Hybrid-electric aircraft w/ SAFs and Hydrogen fuel cell aircraft
Over 6,000 km	Power-to-liquid SAFs

4. Invest in research to improve climate science
5. Compensate for any residual emissions

Roland Berger

Summary – RB Roadmap to True Zero decarbonises and reduces RF impact by ~90% into 2050



Source: Roland Berger Aviation Radiative Forcing Model

For a deeper look into the Roadmap to True Zero…

Presentation at
Farnborough Connect 2020

→ Click here

Presentation at the
Royal Aeronautical Society, July 2020

→ Click here

For recordings of other past webinars please visit:
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THINK:ACT

Thank You

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