



NextGen Technology Acceleration Assessment

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TRANSPORTATION INNOVATION SINCE 1970

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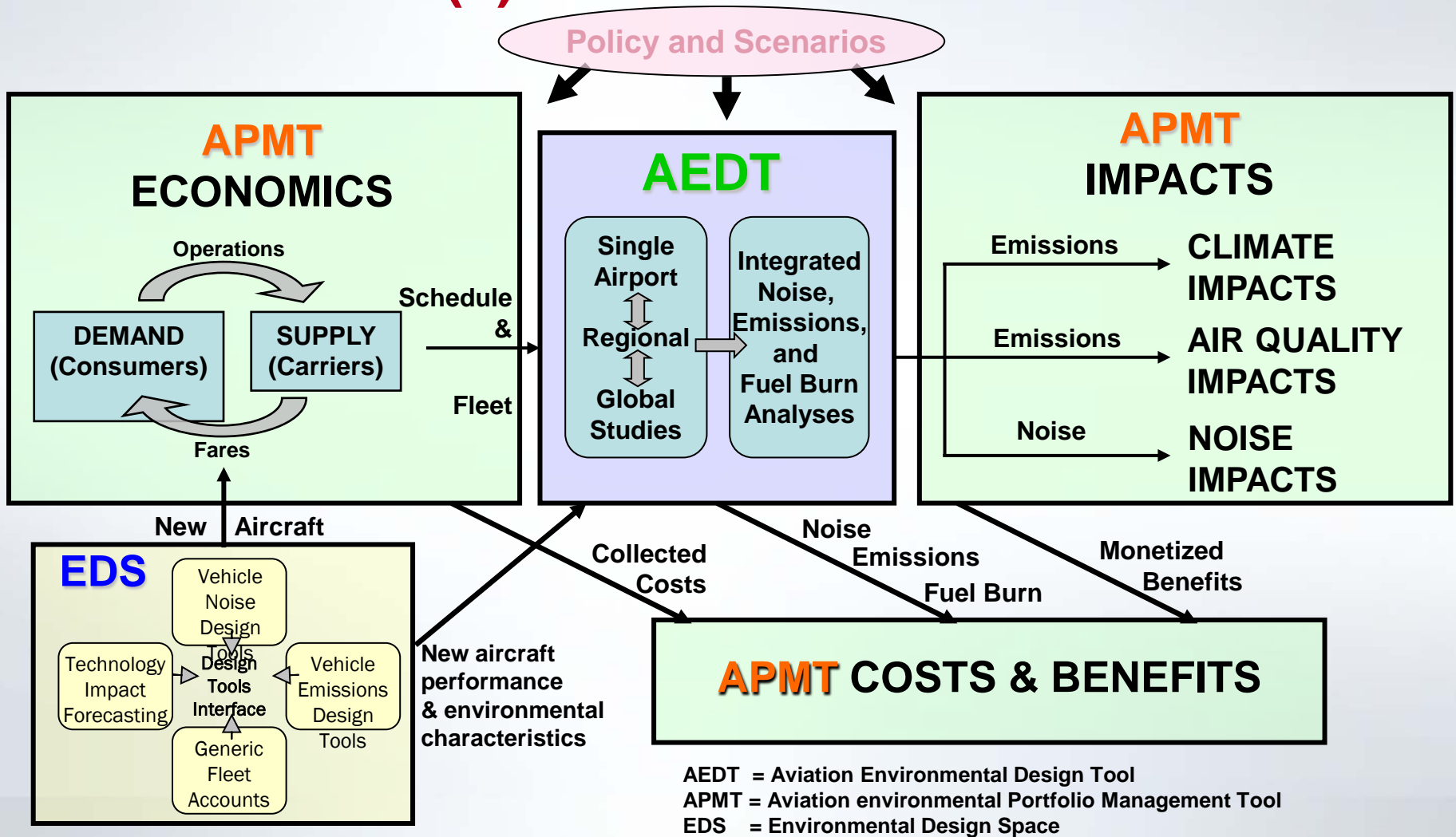
Overview

- Introduction
- Approach and Assumptions
- Results
 - Fuel Burn
 - NOx
- Aggregate Savings
- Summary
- Questions

Introduction (1)

- NextGen is a transformation of U.S. aviation that will employ technologies and operational advances to provide necessary future safety, security, capacity, and environmental performance
- Stakeholders advocating an acceleration of various aspects of NextGen– often referred to as – NowGen
- The current Administration and the FAA are interested in better understanding the benefits of an acceleration of NextGen
- Study conducted to estimate the fuel burn and NOx savings associated with an accelerated introduction of aircraft technology
 - 2015 target year introduction
 - aggregate savings out to 2020

Introduction (2)



Approach and Assumptions (1)

- ICAO/CAEP/MODTF developed global trends in fuel burn and NOx for 2006, 2016, 2026 and 2036
- Future-year ***fleet mix*** used as a surrogate for accelerating the introduction of aircraft technology
- Current analysis was a U.S. subset of the global work
- Forecast developed by ICAO/CAEP's FESG

ICAO=International Civil Aviation Organization

CAEP=Committee on Aviation Environmental Protection

MODTF=Modelling and Databases Task Force

FESG=Forecasting and Economics Support Group

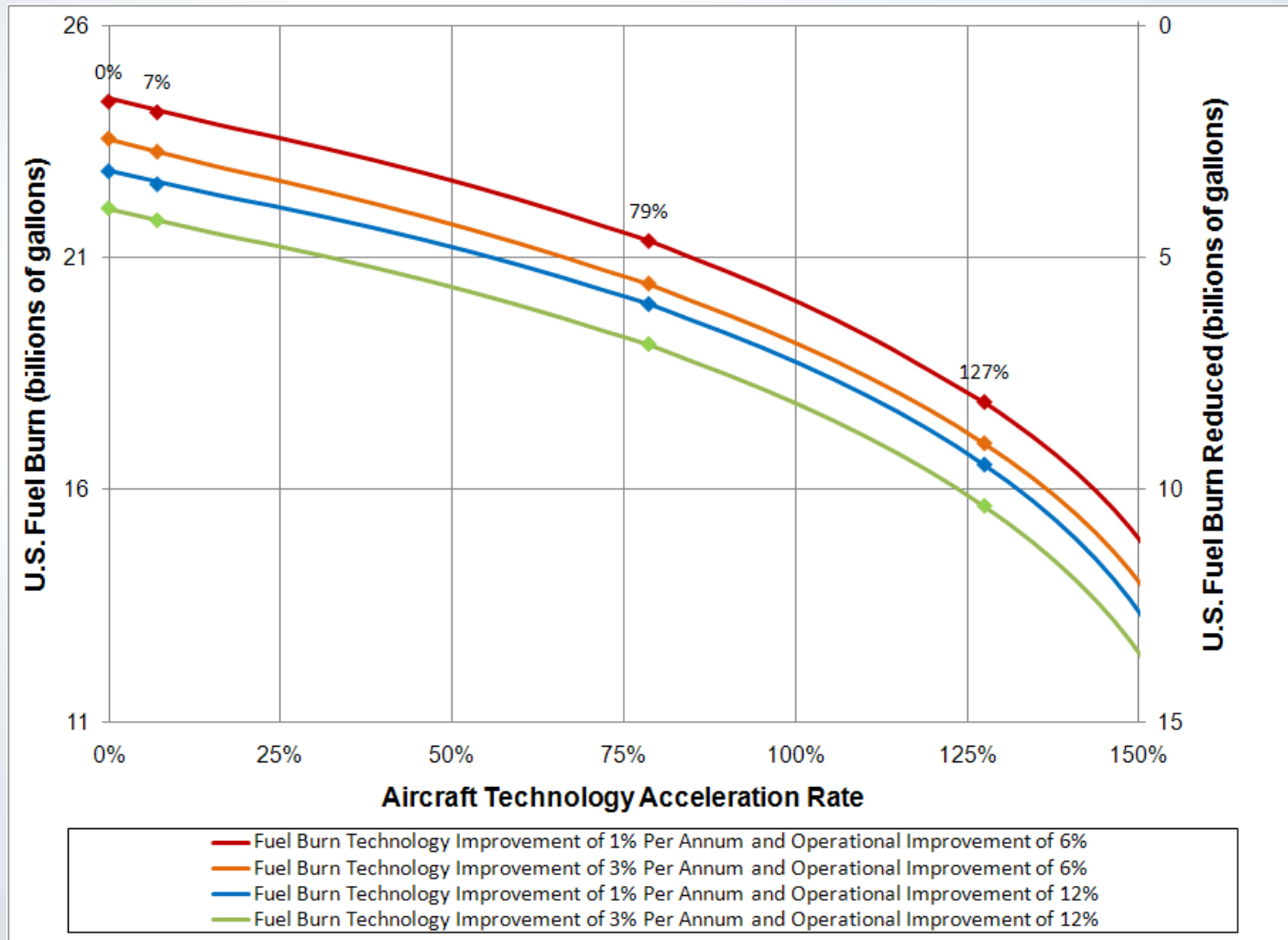
Approach and Assumptions (2)

- 2015 was base year for study
- Per annum technology improvements in fuel burn
 - 1% per annum (low)
 - 3% per annum (high)
- Per annum technology improvements in NOx
 - Achievable reduction based on ICAO Independent Experts
- Operational improvements in fuel burn and NOx
 - 6% (low)
 - 12% (high)

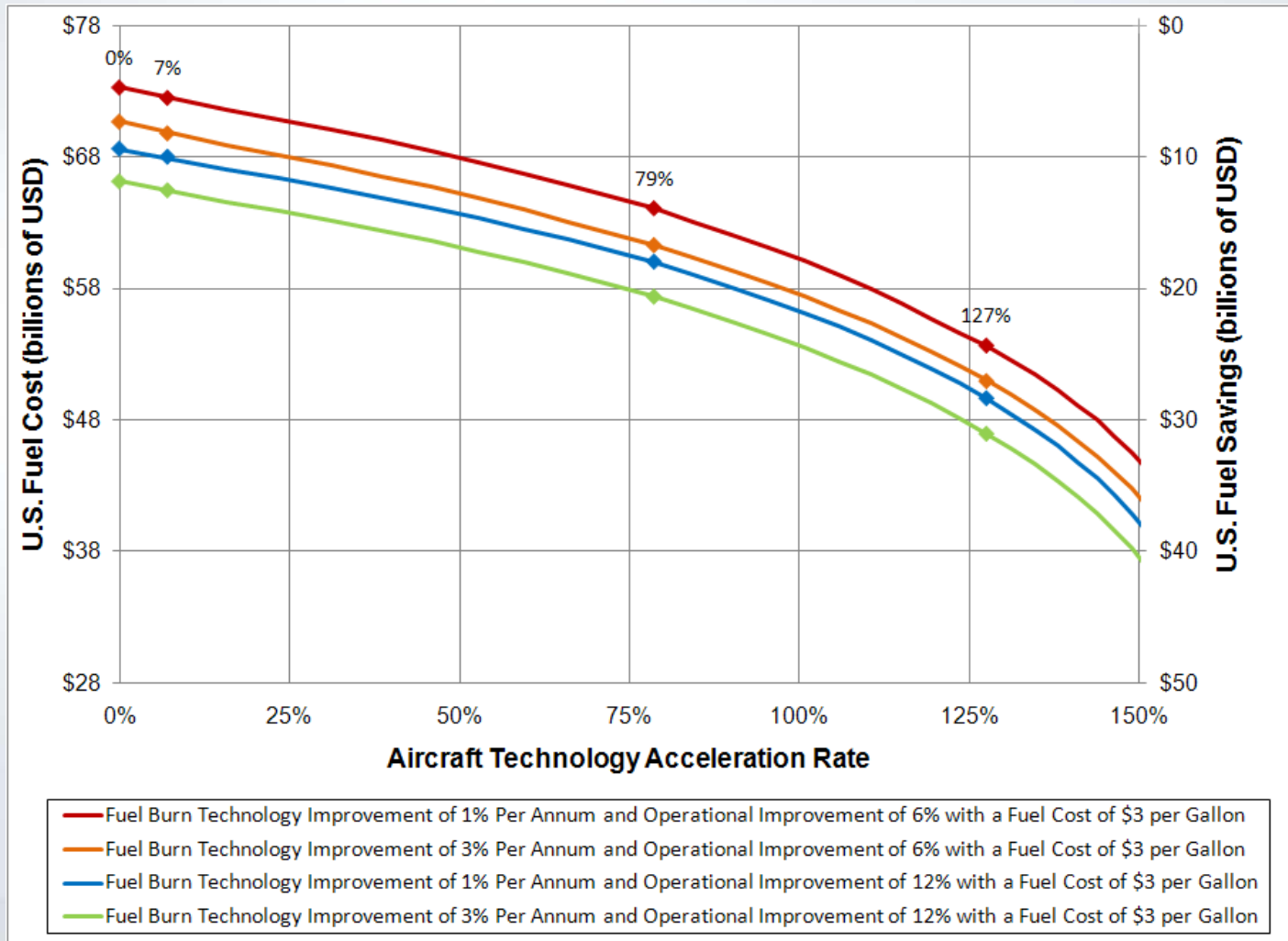
Approach and Assumptions (3)

- Fuel costs
 - \$3 USD (low)
 - \$5 USD (high)
- Results presented for a wide range of technology acceleration rates from 0 to 150%+
- Analysis based on operational fleet not on registered fleet
- Unconstrained production assumed and any associated costs not considered
- Any costs associated with implementation (e.g., training, maintenance, etc.) not considered

Fuel Burn Results



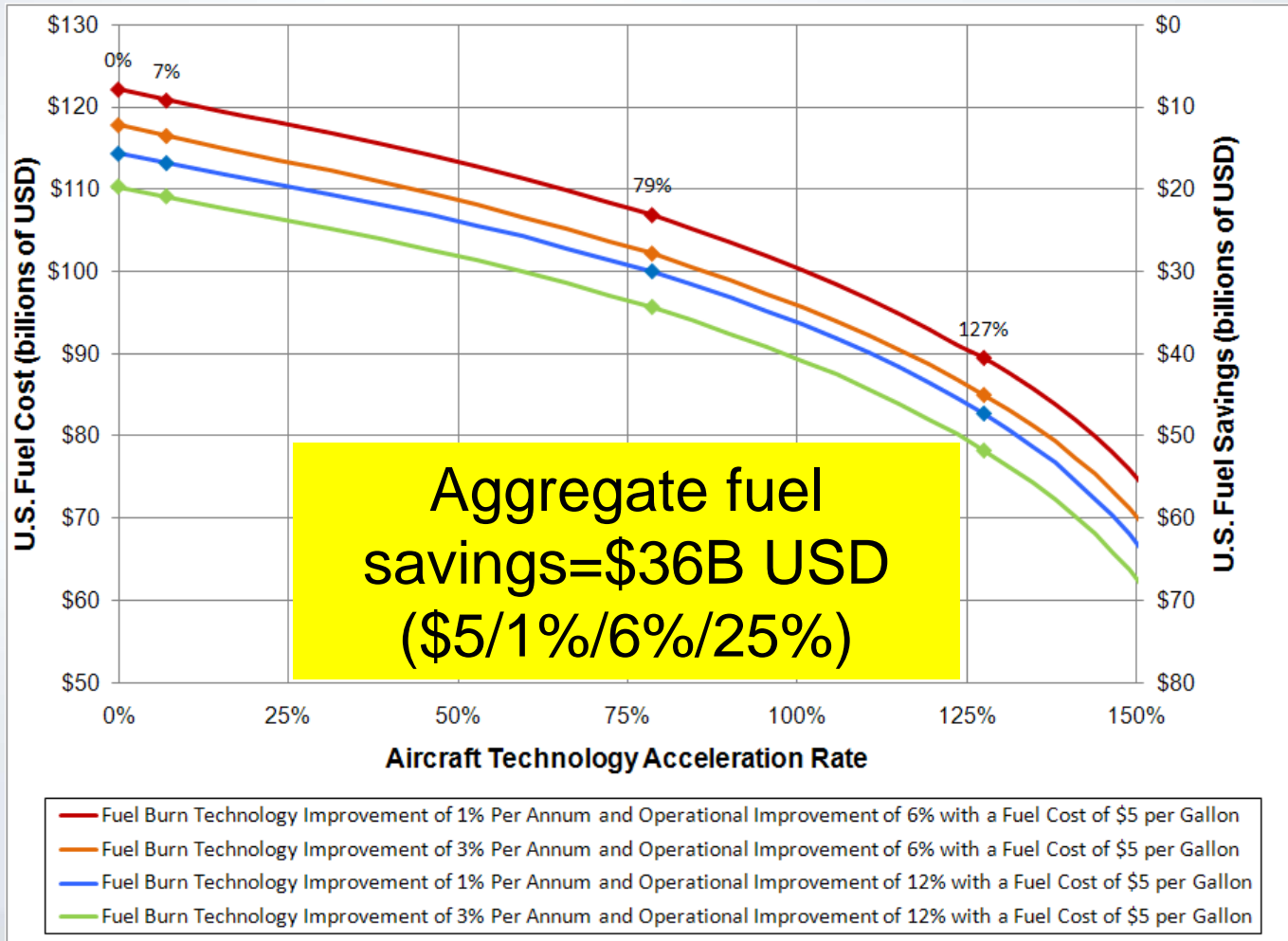
Fuel Cost and Savings (\$3 USD/Gal)



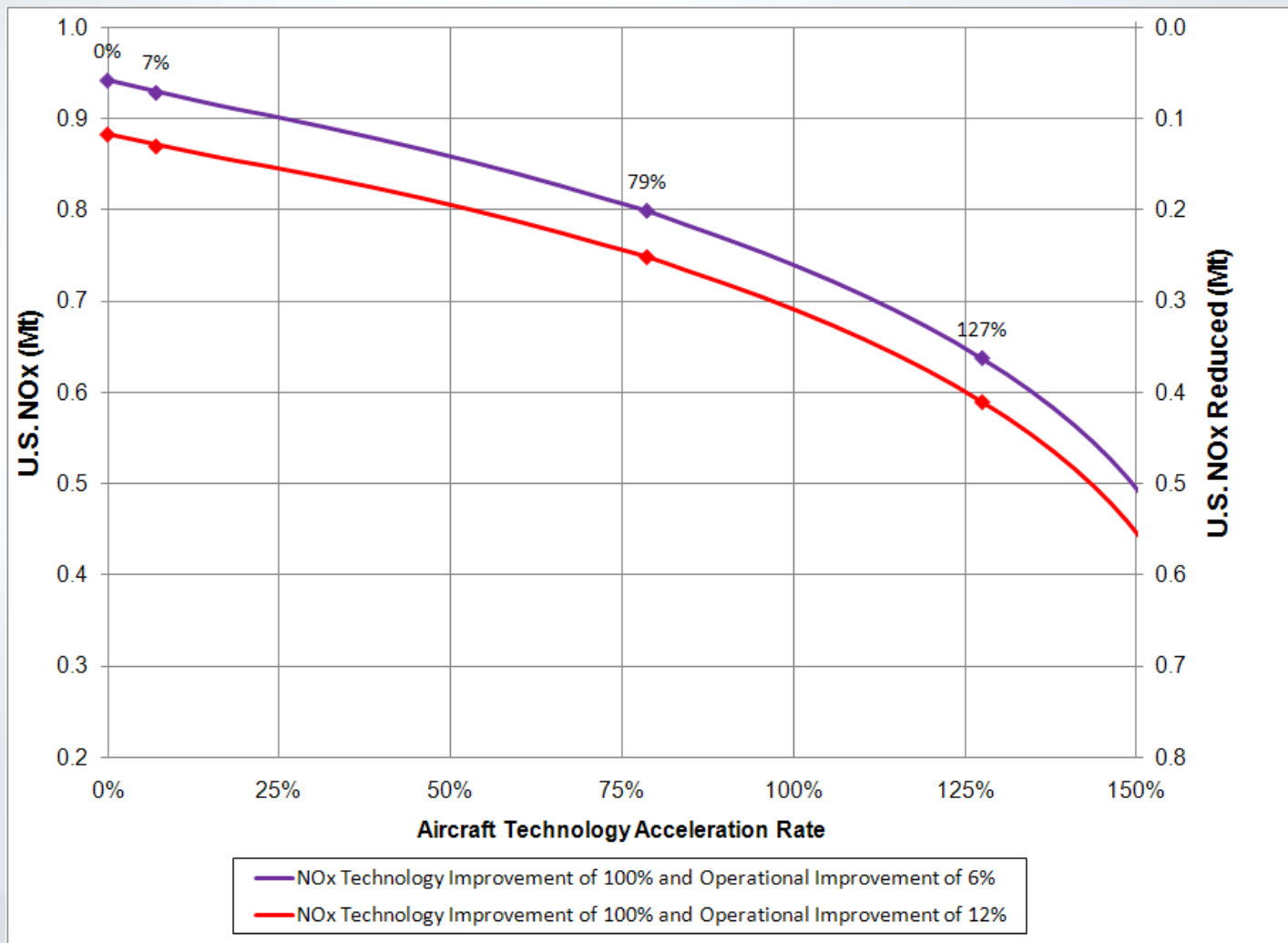
Aggregate Savings – Fuel Cost

- Savings presented to date are one-time savings in 2015
- Additional savings in subsequent years until baseline is attained
- Example savings (Fuel)
 - Assume \$3/gallon USD, 1% per annum in technology, 6% operational improvement
 - 25% acceleration rate=2.4B gallons saved=\$7.3B USD in 2015
 - Assume a baseline (no acceleration) year of 2020 and linear annual savings
 - Aggregate fuel savings of 7.3B gallons saved=\$21.9B USD

Fuel Cost and Savings (\$5 USD/Gal)



NOx Results



Aggregate Savings - NOx

- Savings presented to date are one-time savings in 2015
- Additional savings in subsequent years until baseline is attained
- Example savings (NOx)
 - 25% acceleration rate=0.1 Mt in 2015
 - Aggregate NOx savings of 0.31 Mt by 2020

Summary

- A rich aviation noise, emissions and fuel burn database exists which can be extensively mined to assist policy makers at the flight, airport, regional, national and global levels
- Fuel cost savings of \$7.3B USD can be achieved in 2015, with an aggregated savings of \$21.9B USD by 2020 (\$3/1%/6%/25%)
- NOx savings of 0.1 Mt can be achieved in 2015, with an aggregated savings of 0.31 Mt by 2020 (\$3/1%/6%/25%)
- AEDT is being used extensively to support NextGen and ICAO/CAEP activities

?Questions?



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