

Environment - Aviation Emissions and Impacts



Federal Aviation
Administration

Presented to: Public Meeting for Center of Excellence
for Alternative Jet Fuels and Environment

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Date: November 15, 2012

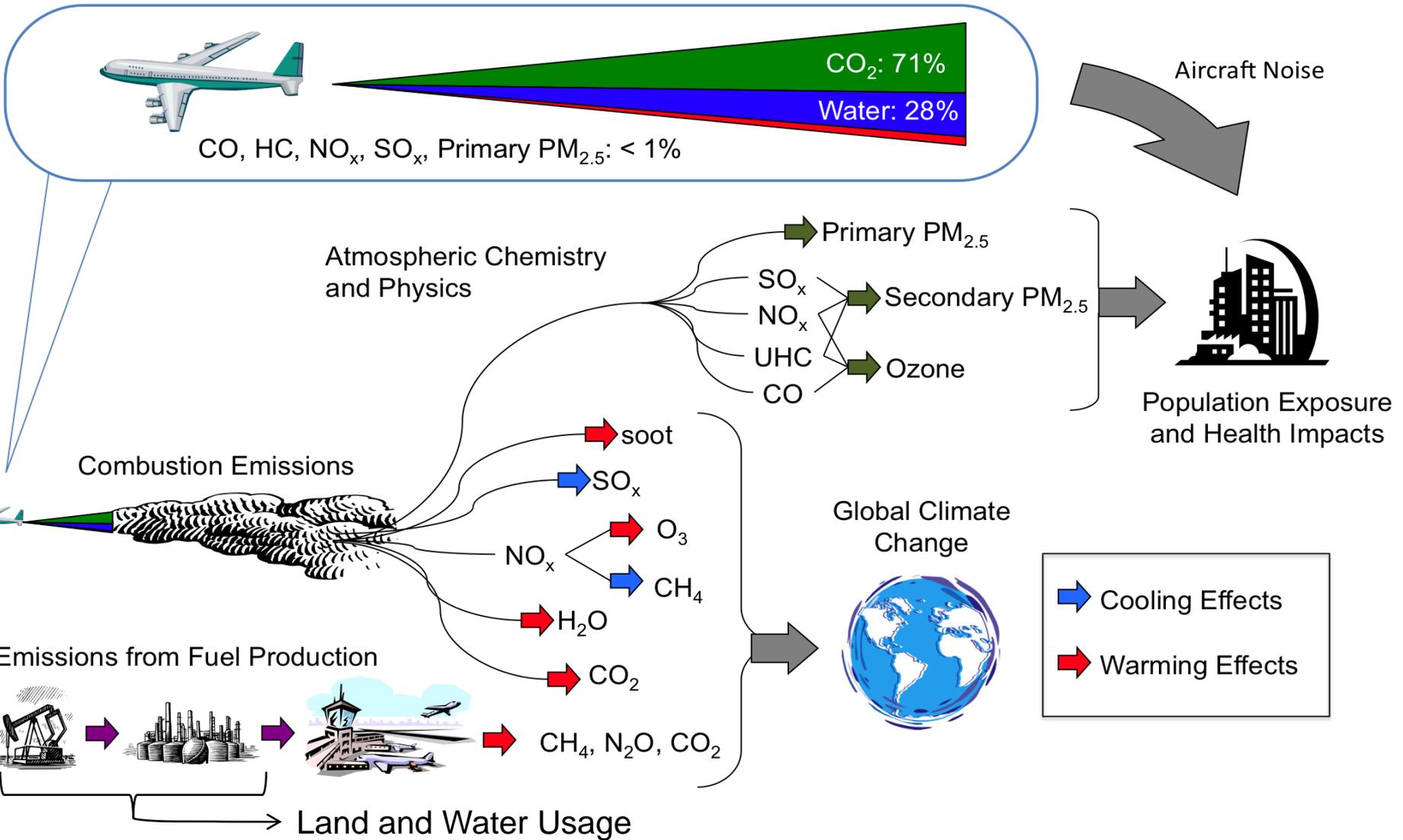


Important Drivers of Research

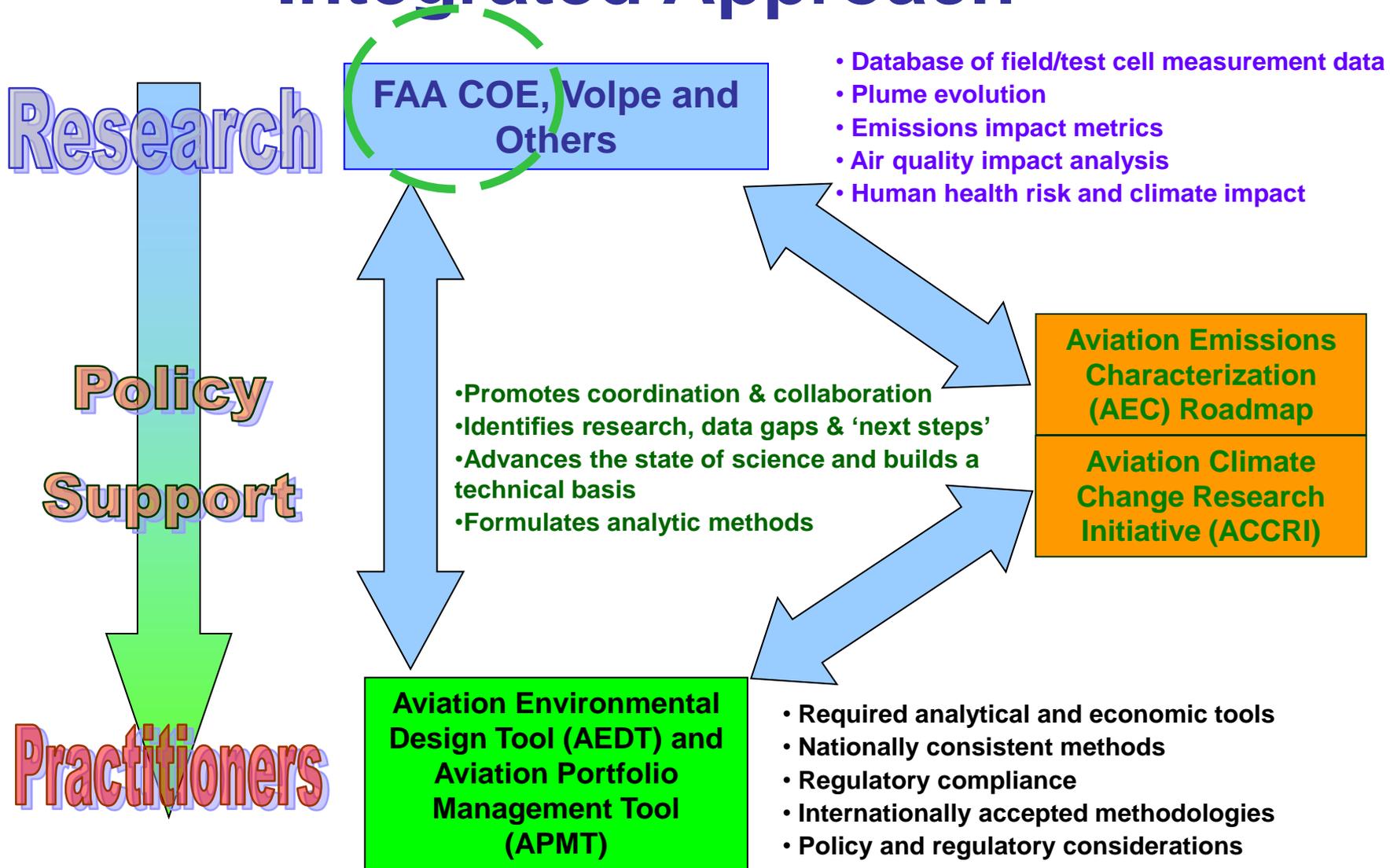
- **Clean Air Act**
 - Control of Air Pollution from Aircraft and Aircraft Engines
 - National Ambient Air Quality Standards
 - General Conformity Rule
- **National Environmental Policy Act**
- **ICAO Committee on Aviation Environmental Protection**
- **Next Generation Air Transportation System**



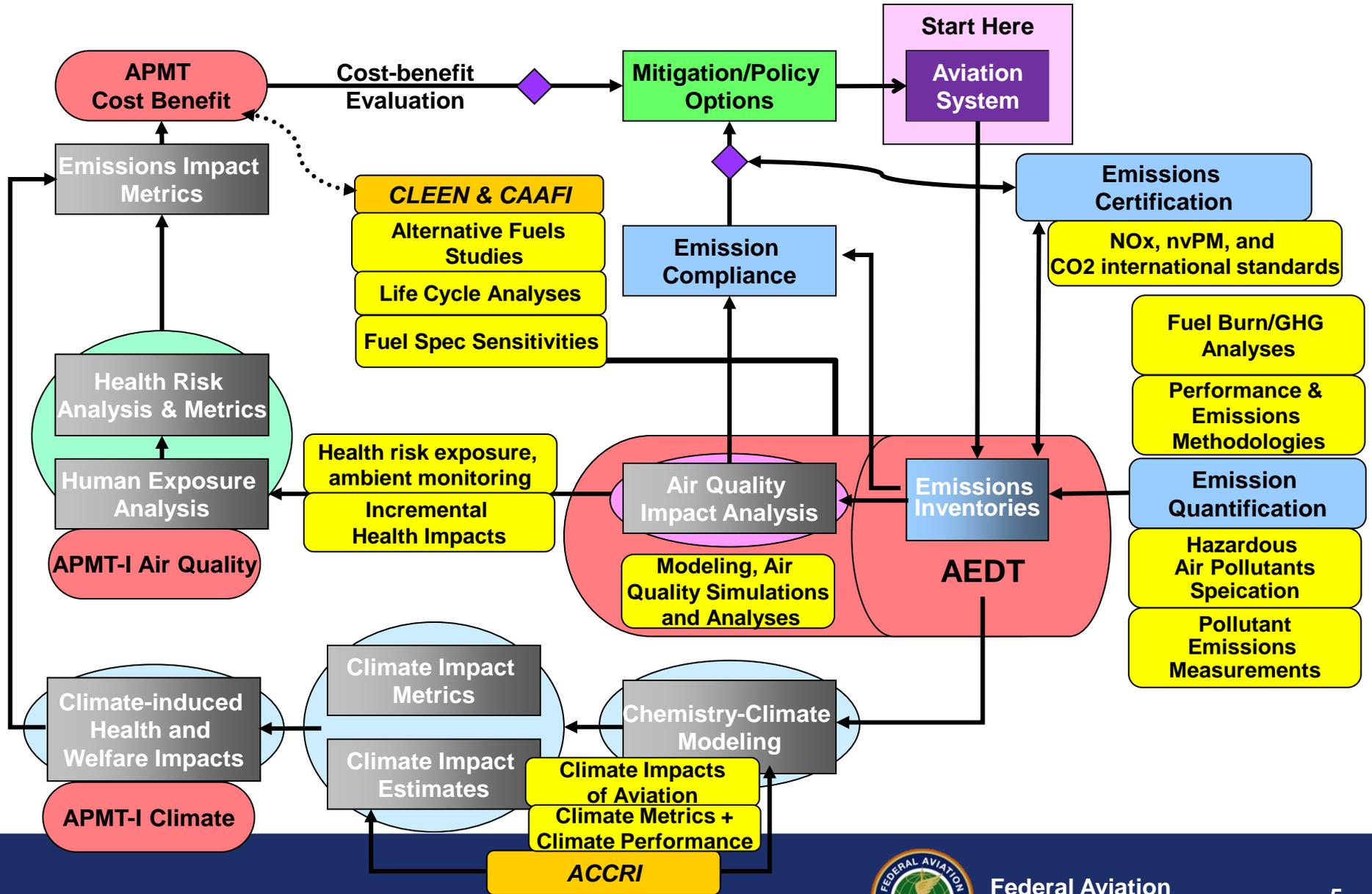
Environmental Impacts



Integrated Approach



Emissions Research Framework



Technical Areas of Interest (1/4)

- Conduct aircraft engine emissions measurements under varied flight conditions for subsequent analysis (see third and fourth bullets below). Conduct testing at the exit plane, within the engine plume and in the near field. Develop sampling and measurement methodologies to support certification and standard setting.
- Characterize the formation of aviation emissions and their chemical speciation during all phases of flight, including the influence of ambient conditions.
- Develop analytical methods and emissions indices from measurement data to model aviation emissions for use in environmental modeling for all phases of flight.



Technical Areas of Interest (2/4)

- Conduct air quality monitoring and atmospheric measurement campaigns and source apportionment studies to develop improved methods to assess relative and absolute impact of aviation emissions on surface air quality.
- Model the full life cycle of aircraft emissions development including dispersion, transport, photochemical and microphysical effects, from plume to global scales and at all relevant timescales and for all phases of flight.
- Evaluate the environmental impacts of aviation combustion emissions from all phases of flight on surface air quality and public health as well as regional and global climate change.



Technical Areas of Interest (3/4)

- Assess the uncertainties in our understanding of aviation's influence on local, regional, and global air quality and climate change and develop means to reduce these uncertainties.
- Explore metrics, approaches to their computation and define threshold levels that can characterize the impact of aviation emissions on the community.
- Quantify the explicit and implicit economic costs of aviation emissions on social welfare, surface air quality, human health, and global climate to aid cost-benefit analysis.



Technical Areas of Interest (4/4)

- Perform research to aid the development of domestic and international policies, measures and standards for aviation emissions and their potential economic and environmental implications on noise, fuel burn, and other emissions species and their impacts.
- Investigate the interdependency between actions to reduce aircraft emission species and the implication for fuel burn, other emissions species, noise, and their impact on the environment.
- Evaluate the context of aviation emissions relative to all other emissions sources, taking into account regulatory constraints domestically and globally.

