الاتحاد العربي للنقل الجوي
ARAB AIR CARRIERS ORGANIZATION

Arab Aviation Summit
2020: A Clear Vision for the Arab Aviation

Panel on Environmental Challenges

Prof. Vahid Motevalli, PhD, PE

The George Washington University

16 November 2008

Panel Speakers

- ***The Honorable Jeffrey Shane***
  Partner, **Hogan & Hartson**,
  Former Under Secretary for Policy - USDOT
- ***Mr. Olivier Onidi***
  Head of Unit, DG Energy & Transport-Internal Market, Air Transport Agreements & Multilateral Relations – **European Commission**
- ***Mr. Robert Nuttall***
  VP Strategic Marketing, Civil Aerospace – **Rolls Royce**
- ***Mr. Richard Jory***
  Regional General Manager MEA, South & Central Asia, Africa - **Shell Aviation**

Air Transportation
Environmental Challenges

Air Transportation is under the spot light by public opinion and regulators as a culprit in global warming.

Europe is poised to introduce an emission trading scheme which will affect the airlines.

Introduction of new technologies and fleet modernization has to meet certifications standards

Though aviation as a whole has invested heavily in new technology to minimize its environmental foot print, the Arab airlines stand out with one of the youngest fleets in the world.

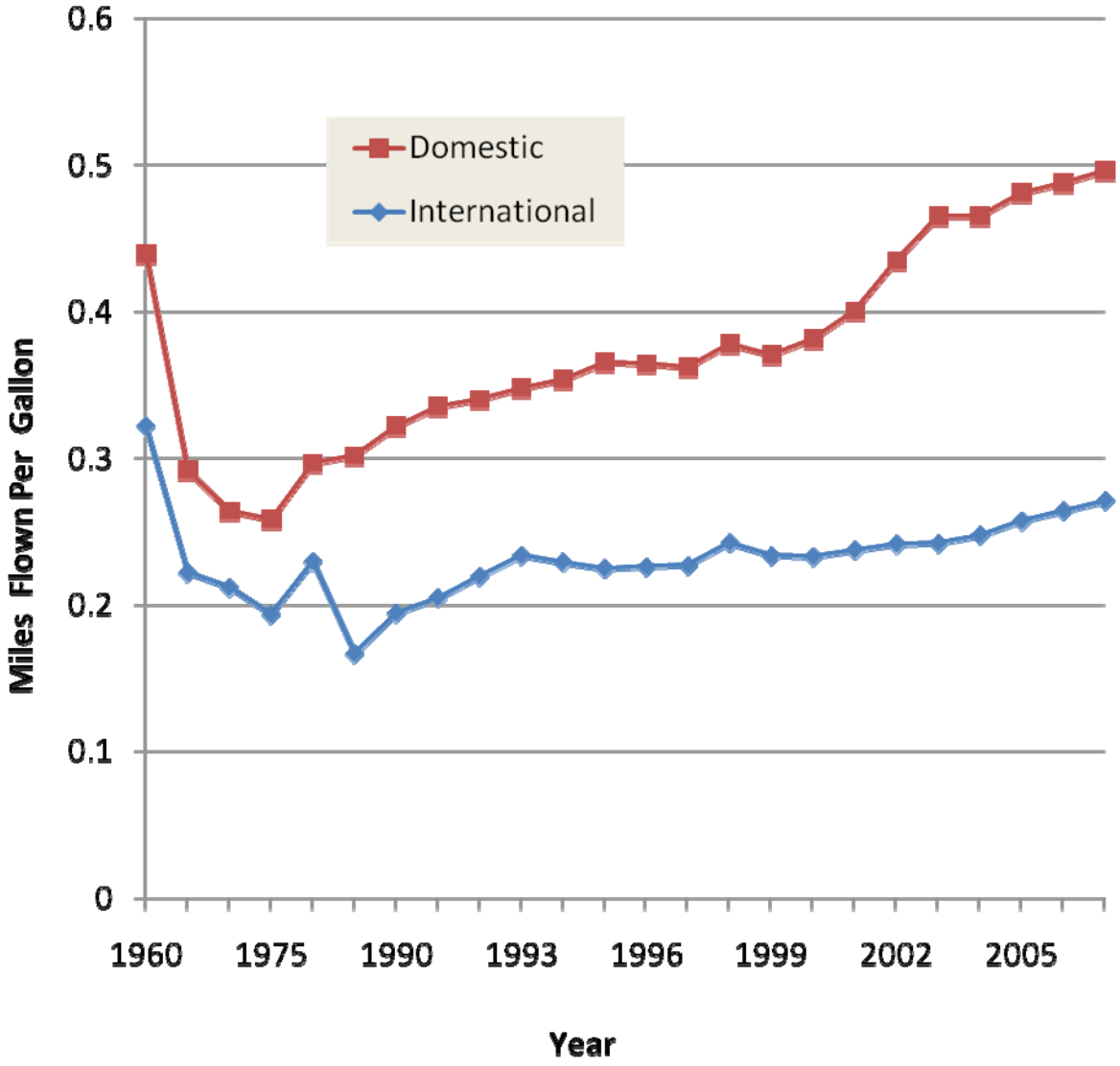
Passenger Transportation

Source: US Transportation Energy Data Book for Passenger transportation in 2006:

Transport mode	Average passengers per vehicle	Efficiency per passenger
Vanpool	6.1	2.7 L/100 km (87 $MPGe_{US}$)
Motorcycles	1.2	3.8 L/100 km (62 $MPGe_{US}$)
Rail (Commuter)	31.3	6.1 L/100 km (38 $MPGe_{US}$)
Rail (Transit Light & Heavy)	22.5	5.7 L/100 km (41 $MPGe_{US}$)
Rail (Intercity Amtrak)	20.5	5.4 L/100 km (43 $MPGe_{US}$)
Cars	1.57	7.2 L/100 km (33 $MPGe_{US}$)
Air	96.2	6.7 L/100 km (35 $MPGe_{US}$)
Buses (Transit)	8.8	8.7 L/100 km (27 $MPGe_{US}$)
Personal Trucks	1.72	8.1 L/100 km (29 $MPGe_{US}$)

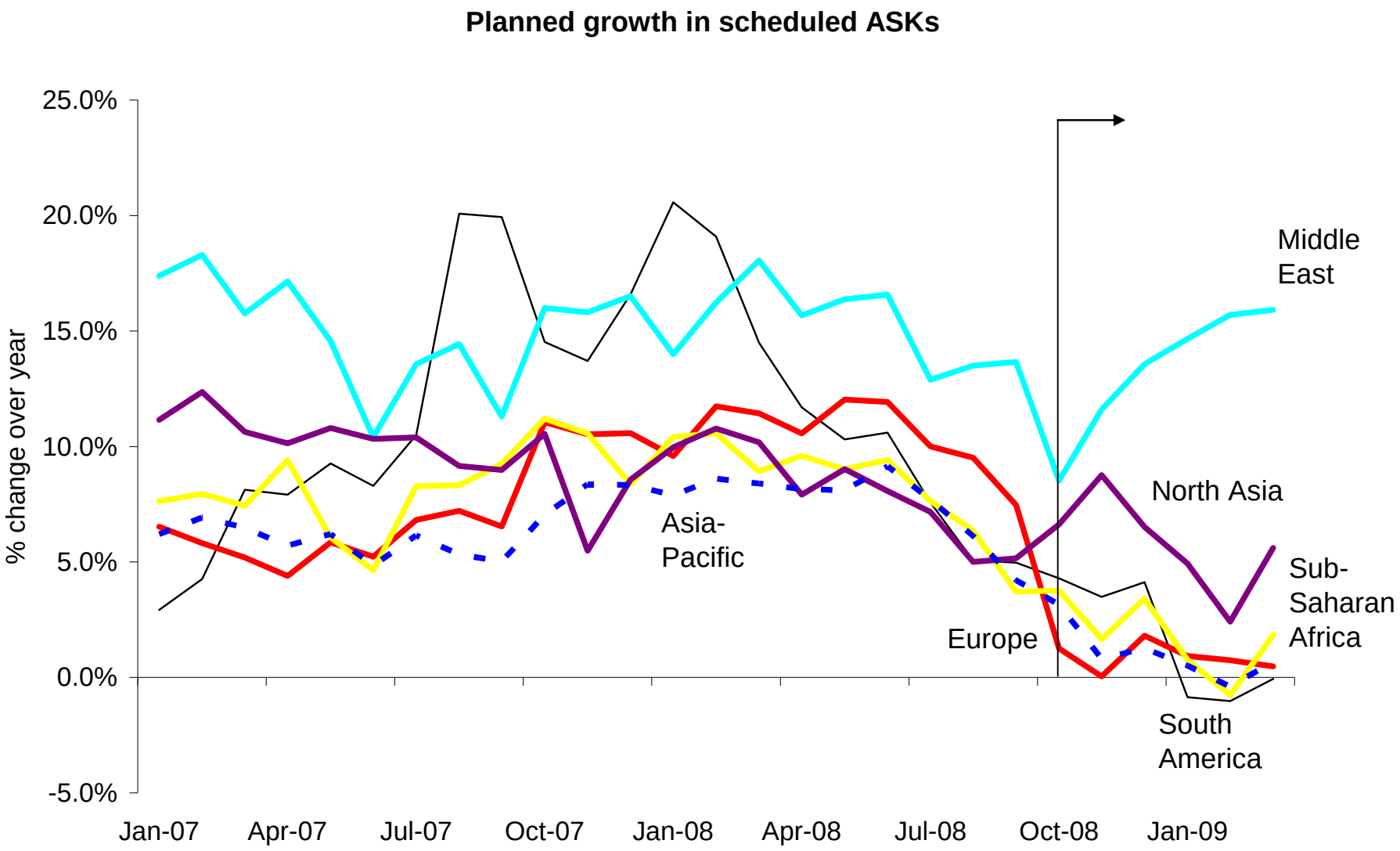
Fuel Consumption for Aircrafts

(US Data)



US Bureau of Transportation Statistics – Oct 2008

Growth only in Middle East/N Asia



ICAO Vision and Actions

"Safe, secure and sustainable development of civil aviation through cooperation amongst its member States."

Strategic Objectives for the period 2005-2010:

Safety, Security, Environmental Protection, Efficiency, Continuity, Rule of Law

- Voluntary emission trading schemes
- Activities coordinated by Committee on Aviation Environmental Protection (CAEP), established by the Council in 1983 (Arab Member: Egypt and Tunisia)

  Observer: ACAC

Technological Solutions

- Engineering options for mitigating the climate impacts of aviation using aircraft and airspace technologies.
- Improvements in fuel efficiency to reduce CO2 emissions
- Measures to reduce non-CO2 impacts including the formation of persistent contrails.
- Integrated solutions to optimize environmental performance including changes to:
  - airframes, engines, avionics, aircraft systems, aircraft operations, airport operations, …
- Alternative Fuels – Flight tested by 3 aircraft manufacturers

Longer Term Solutions

- **FUEL CELL -** Boeing successfully flies fuel cell-powered airplane -- 3 April 2008

  Boeing Research & Technology Europe(BR&TE) in Madrid, with assistance from industry partners in Austria, France, Germany, Spain, the United Kingdom and the United States.

  A two-seat Dimona motor-glider with a 16.3 meter (53.5 foot) wingspan was used as the airframe. A Proton Exchange Membrane

  (PEM) fuel cell/lithium-ion battery hybrid system to power an electric motor coupled to a conventional propeller.

- **Biofuel research could partially power flights by 2013**

Questions to be answered

1. ***Role of policy and regulatory action in the global air transport where much of the emissions occurs outside of sovereign territories of national governments. What are the appropriate mechanisms to address this issue?***
2. ***Role of technology in stabilization and reduction of the impact of emissions. Are these technologies being developed at a fast enough pace to achieve net positive environmental benefits?***
3. ***Should approaches that improve environmental impact of air transport be treated non-competitively? Are there research results, technologies and operational items that can be shared by the industry and governments?***

Questions to be answered

4. ***Would fleet modernization be feasible and can the approach of Arab airlines be recognized as a show case for others to follow?***
5. ***What are the measures that Arab airlines and regulators can implement to play a proactive role in protecting the environment?***
6. ***What is the future direction of regulators in curbing emissions in this region?***