*JTTRI Seminar*

# A Keynote Presentation

# The Future Transport Research Needs in the Changing Global Economic and Political Environments: Some Focus on Air Transport

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# Agenda

(A) Transport Research in the de-globalizing and new cold war world

(B) Research Needs Arising from Covid Policy Responses:

- Roles of Governments in Crisis Situations
- Post-Covid Airline Industry Structure

(C) Transport Sector and Climate Change

- Research Needs for Electric Vehicle Adoption
- Air Transport and Climate Change
- Competition During the Course of Decarbonization

(D) Chicago Convention and International Air Transport Policy

(E) Issue on the Global Aviation Technology Leadership

(F) Concluding Remarks

# (A) Effects of the Reshaping Globalization and Cold War II on Supply Chain and Transport Network being caused by Putin Invasion of Ukraine - *1/3*

Petersen Inst. for International Economics (PIIE) calls it '**Accelerated Corrosion of Globalization**'

- **Corrosion began earlier in the USA; Trump admin became an outlet for anti-immigration, and anti-globalization forces.**
- **Ukraine war and China-Taiwan issues turning the world into cold war II: world market of democracies** may emerge – expanding competition while maintaining scale where possible.
- **China-Taiwan issue is 10 times more serious than Ukraine**
  - **China has long been a production factory for the world**
  - In 2021, US-Russia trade, $36billion; US-Ukraine trade $4 billion
  - In 2021, US-China trade, $656billion; US-Taiwan, $114billion
  - **Taiwan produces 70+% of the world's high density semi-con**
  - **One of the busiest shipping channels in the world**

## *(A) Effects of the Reshaping Globalization and Cold War II on Supply Chain and Transport Network being caused by Putin invasion of Ukraine - 2/3*

**This will have major impacts on the way we need to organize int'l logistics and transport system:**

- **Just-in-Time (JIT)** Supply Chain and transport – thrown out the window
- **Strategic reserve inventories** becoming increasingly important (e.g., semi-conductors, oil, natural gas, etc.)
- **Coldwar II and balkanization of the world economic system will change spatial distribution of supply sourcing ➔➔** reshaping global transport networks
- **Aviation – the 1st Freedom Right** – Russia's closing its airspace ➔ increased travel time, fuel consumption, and carbon emissions; **raises serious competition issues** (e.g., favor Chinese carriers against N. American, European carriers)
- Less efficient but necessary adjustments to the int'l transport network will occur ➔➔ **Research needs for reshaping of the transport network for changing supply sourcing**

## *(A) Effects of the Reshaping Globalization and Cold War II – 1st Freedom Right - 3/3*

**Russia closes its airspace**

- The Asia-Europe air route is greatly affected.
- Resulting in increased fuel consumption and carbon emissions.
- Less efficient but necessary adjustments to the int'l transport network will occur ➔➔ **Research needs for reshaping of transport network for changing supply sourcing**
- **Would** inter-continental flight routings over Russian airspace go back similar to the cold war I situation (pre-1990s) ?

# (B) Roles of Governments in crisis situation, forms of financial assistance to e.g., airlines

- The COVID crisis demonstrated that **governments are the powers of last resort to make sure that the private sector markets function when facing the scale of natural/economic disasters that the insurance system cannot handle.** e.g., Govts decided which firms to survive, and which firms to go bankrupt or be liquidated during the Covid pandemic.
- **When govts invest in private firms at times of crisis:**

  **for example, the 'initial' responses to airlines**
  - **USA: allocated $62 billion to the airlines from CARES Act; $25b low-interest loan; the rest are largely wage subsidies**
  - **German govt bought 20% of Lufthansa ownership for €6 bn** (+ €3bn loan guarantee)
- **Research needs: How do we choose the bailout form: e.g. USA vs. German style or some other forms?**

*Choosing Forms of Govt Financial Assistance – cont'd*

- **When Government invests in equity shares, should it be voting shares (e.g., Germany-Lufthansa) or 'non-voting' shares (US-Delta)** e.g., US govt agreed on a $1.6 billion 10-year low interest loan to Delta in exchange for **Delta giving the warrants that allow the govt to buy up to 1% of Delta's non-voting shares at $24.39 over three years so that the taxpayers may profit from taking the risk;** Delta share price increased to $46.57 (3rd May 21) – **Taxpayers profit while saving Delta!**
- **Research needs: Which form of govt bailout is better?** For airlines, to the industry and for the country as a whole including strategic needs? USA vs. Germany?

# (B) Post-Covid Airline industry structure: some comments

- **Many airlines went bankrupt worldwide; many LCCs and regional carriers with weaker Balance Sheet went bankrupt;** e.g., Flybe (Europe's largest regional airline co) and Latin America's three major carriers (Avianca, LATAM Airlines Group, Aeromexico, filed for bankruptcy protection in 2020 (have resumed operations).
- **Post-Pandemic market structure depends significantly on what the national govt did to help FSA vs. LCC** (e.g., UK helped EasyJet as much as IAG (BA)
- USA: **more bankruptcies of LCCs than major airlines** ➔ reduced LCC competition as compared to the pre-pandemic period;
- China: during the Pandemic, **LCCs were allowed to enter trunk routes to major hub airports** while they were strictly restricted in pre-Pandemic era; As a result, more frequent market contacts and increasing **head-to-head FSC-LCC competition in the mainland China market.**
- The impact of the pandemic on air cargo was less severe than on passenger market
- **Research needs: In the medium to long term,** would the market structure return to the pre-pandemic situation?

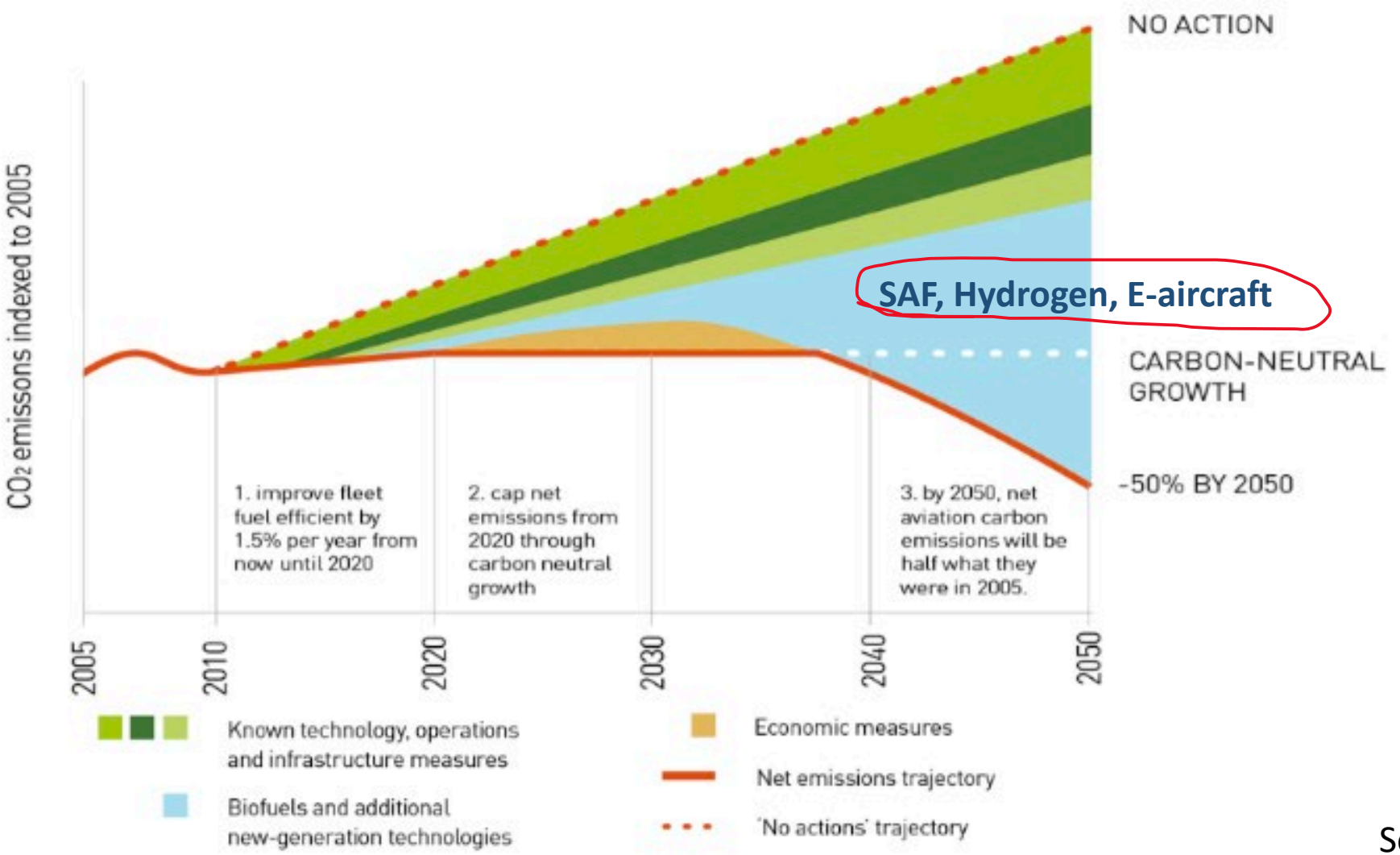
# (C) Transport Sector and Climate Change:
## *Research Needs for Electric Vehicle Adoption*

❑ California passed the law: cannot sell combustion engine cars from 2035; many other countries including Canada adopted similar policy;

❑ **Policies for promoting EV adoption**
- EV Purchase subsidy
- Subsidy for charging station infrastructure
- R&D subsidies for battery cost reduction and charging speed (e.g., Palentir – Steady State EV Battery development)

❑ Recent finding: **Gasoline price appears to be the most important factor for determining EV purchase**; US central and state govts face a major dilemma – while trying to lower fuel prices for political reasons, **the lower fuel prices slow down EV adoption –** contradicting climate change policy goal.

# Global Aviation Emission Reduction Target (IATA)




< 200 M t $CO_2$ in 2005

Source: IATA (2019)

# (C) Transport Sector and Climate Change:

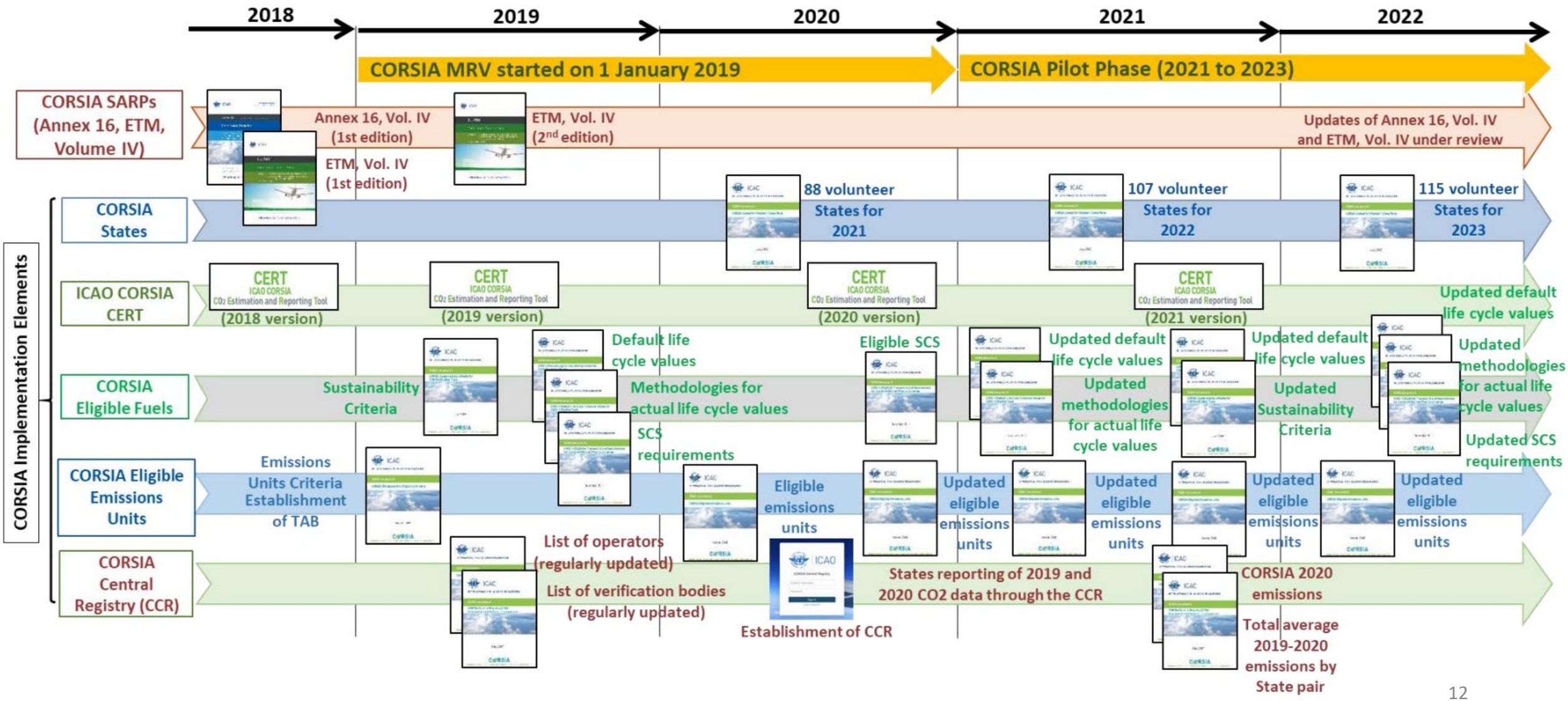
## *Net Zero - Global Aviation Emission Reduction Effort*

- **UN FCCC (Framework Convention on Climate Change)** was formed to establish the international framework for attacking the human interaction to climate change at **the 1992 Rio de Janeiro Earth Summit**
- **Aviation became part of the EU ETS in 2012; Major world powers opposed; EC had to take the 'stop the clock' decision.**
- The Global MBM lead by ICAO was finalized in 2016 as **the Carbon Offsetting and Reduction Schemes for International Aviation (CORSIA)** for aiming to achieve the Aviation part of the Paris Convention Agreement.
- 3 stages of CORSIA implementation:
  - **Pilot** phase 1: 2021-2023 (2019 CO2 emissions as baseline); **Phase 1: voluntary 2024-2026 (85% of 2019 CO2 emissions as baseline)**
  - **Phase 2: Mandatory from 2027** (85% of 2019 CO2 emissions as baseline)
- **Aviation operators are required to purchase the carbon credit** established by ICAO; But they can reduce the requirement using SAFs (sustainable aviation fuels) defined by CORSIA eligible fuels (CEFs)

**➔➔ many not-clearly defined areas ➔ meaning serious research needs**

# DEVELOPMENT OF CORSIA IMPLEMENTATION PACKAGE (2018 – 2022)

## ICAO completes all essential components for CORSIA implementation package



# Competition during the course of decarbonization

< very few research papers on this topic>
Based on Hotelling demand model, Jiang et al. (2023 working paper) find that

- **Cost inflation and mandatory quota rate of SAF** impact more to FSC's cost, price and profit than to LCCs;
- With the introduction of SAF, **LCC market share to increase at the expense of FSC's market share**

➔➔LCCs gain competitive edge over FSC, but this could also reduce LCC absolute traffic and profits as well

- **Passengers' stronger green concern (and passengers willingness to pay for SAF) helps both LCC and FSC.** Again, this profit effect on LCC is likely to be higher than on FSC.

# Competition during the course of decarbonization - 2/2

With a focus on the European Commission's proposal for a blending mandate, Grimme (2023) discusses economic issues associated with the introduction of SAFs.

- Long-haul itineraries and the competition with hubs and airlines outside the scope of the EU's blending mandate: European airlines would face disadvantage predominantly in long-haul travel.
  - In case of the **Frankfurt-Singapore** itinerary, the full flight distance is subject to to blending mandate.
  - In comparison, in case of the **Frankfurt-Istanbul-Singapore itinerary**, only 20% of the flight distance is subject to the mandate.
- **Intra-EU holiday traffic would be affected by traffic flows shifting to non-EU locations.**
  - e.g., diverted to Tunisia or Turkey, instead of Spain, Italy and Greece, where the return segment is not subject to the mandate.

# (D) Chicago Convention and Air Transport Policy issues

❑**The regulatory system for governing int'l airline services is hopelessly outdated and needs a major reform:**

- The 1944 Chicago Convention on Civil Aviation sets out the system of **bilateral Air Service Agreement (ASA)** between each pair of countries. This bilateral negotiation system has shown major limitations for forming a unified global leadership to deal with the issues for opening air services as the Covid-19 gets eased.
- **This is the time for the global community to work together for creating a better regulatory system for int'l air services suitable for the modern world.**
- **Air transport should be included in GATS (General Agreement on Trade in Services) within the WTO multilateral system.**
- **ATRS is the only organization that can take this as a long-term policy initiatives. I encourage the ATRS to establish a Task Force as a contribution to the world economy.**

# (E) Issue on Global Aviation Technology Leadership

- Since ICAO does not have enough expertise on aircraft technology, **FAA has served as a global technology leader for a long time**. ICAO by and large followed FAA's technological leadership.
- **FAA's policy of alloweing Boeing experts to do *'de facto'* aircraft certification was responsible for the Boeing 737 Max's catastrophic accidents** (Indonesia and Ethiopia) ➔➔ **FAA lost credibility as the aviation technology leadership in the eyes of the world**
- Given that, **USA, Europe, Japan and China** are contenders of aviation technology leadership, **there may be a need for forming a global organization for aircraft certification instead of relying on a single country to do their own aircraft certification.** This requires serious research and political considerations.

# (F) Concluding Remarks

- **Less efficient but necessary adjustments to the int'l transport network will occur ➔➔ Research needs for reshaping of transport network for changing supply sourcing**
- **Roles of Governments in crisis situation ➔➔ How do we choose the bailout form: USA vs. Germany?**
- **Aviation operators are required to purchase the carbon credit** established by ICAO; But they can reduce the requirement using SAFs (sustainable aviation fuels) defined by CORSIA eligible fuels (CEFs) **➔➔ many not-clearly defined areas ➔ meaning serious research needs**
- **Faster EV adoption requires comprehensive research: Gasoline price, optimal subsidy levels (EV churchase and Charging Infrastructure), Standardization of charging infrastructure**
- **There is a need for forming a global organization for aircraft certification instead of relying on a single country to do the certification.**


**The 16th Triennial World Conference (17-21 July, 2023 in Palais de Congres in Montreal, Canada**

Hosts: The WCTR Society and Montreal Politeknique, CIRRELT

**Prof. Catherine Morency and Prof. Martin Trepanier**

Hearty Grazie !!!

Thank you !!!
Merci !!!
Danke !!!
Obrigado !!!
Gracias !!!

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