IFAR – International Forum for Aviation Research – Contribution to Research and Education on International Level

READ 2102 - Research and Education in Aircraft Design
17-19 October 2012, Brno, Czech Republic

Richard Degenhardt, Joachim Szodruch

German Aerospace Center

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Overview

- Challenge: International cooperation
- State-of-the-art in aviation
- Motivation
- IFAR History
- IFAR Objectives
- IFAR activities
- Next steps

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Challenge:
Different languages

Audience expectations

Source: Lewis 1999

MOANA perspektiven

USA	UK	Germany	Japan
France	Finland	Arab and Latin cultures	China

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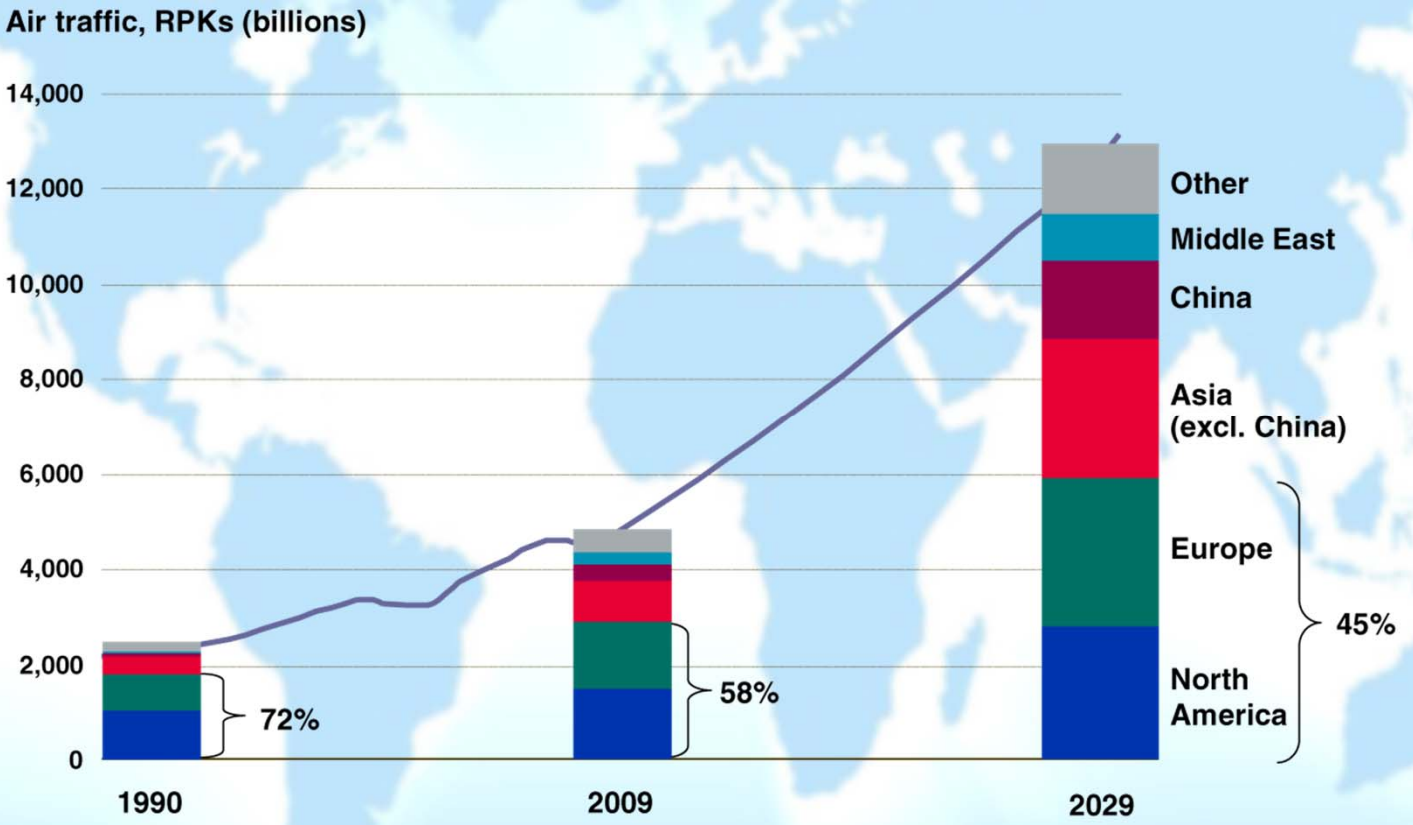
The Air Transport System is growing every year by 5%.



Source: Randy Tinseth, Boeing Market Forecast, Presentation at Farnborough Air Show 2010

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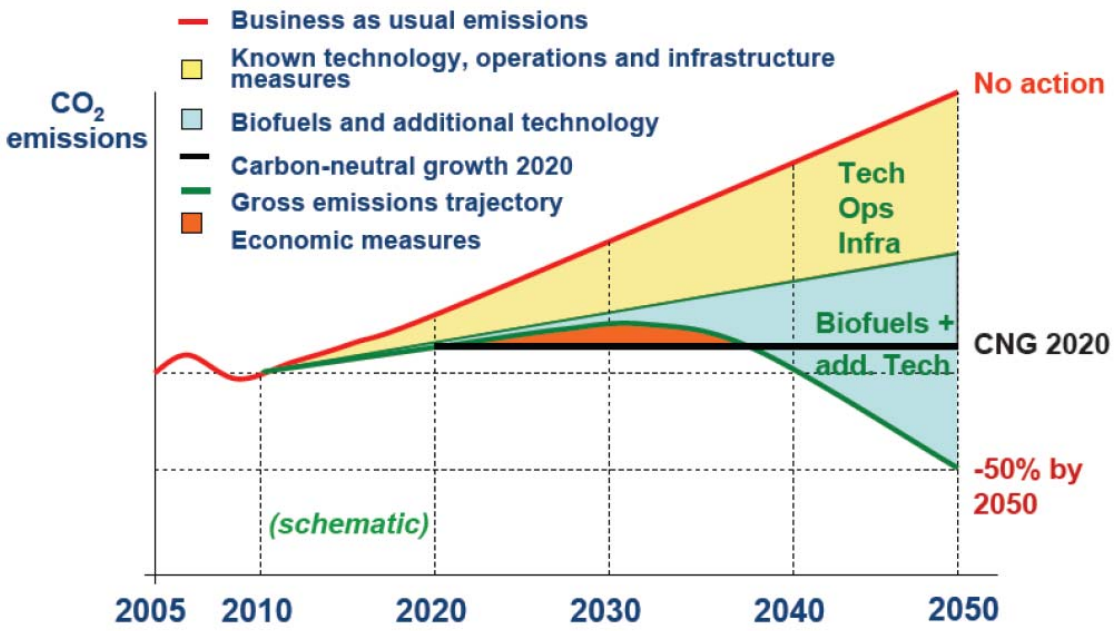
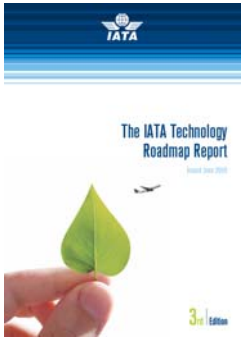
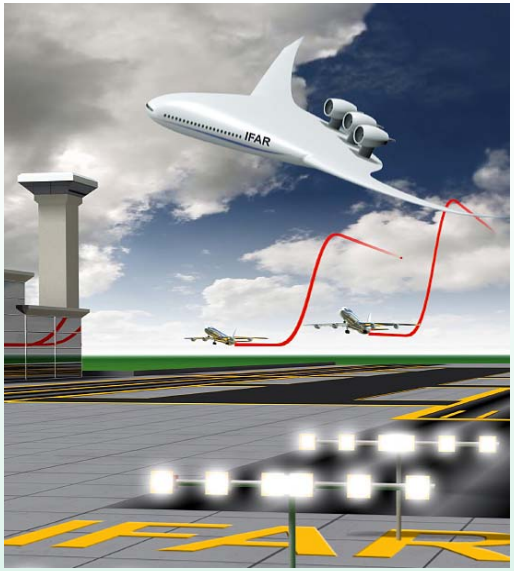
Prediction of aircraft CO_2 emissions (IATA)





Challenges for the Air Transport System:

- Economic Challenge: fuel prices ecological taxes (emission trading)
- Ecological Challenge: change of climate pollution of the environment
- Safety Challenge: growth in flights and introduction of new technologies



Global organisations challenge aviation

Need for new technologies for an economically viable and sustainable air transport system of the future.

New single technologies and efficient systems
are developed and validated by
Research Institutions around the globe.

Current situation

- Increasing need for international mobility in a globalized economy.
- World-wide growth in air traffic.
- Impact on climate change and environment.
- Limited resources.
- Demands in reduction of CO2.
- Need for economical and environmental friendly air transport.
- Worldwide Aerospace Research Organisations
    - are not focused in their “option forming”, developing of joint objectives and strategies and
    - have no representation that can react to the global questions and demands

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Motivation

- Merge of the available resources and interests of all continents.
- Involvement of concerned stakeholders in the process, i.e. also active integration of the aerospace research and their institutions worldwide.
- Challenge of simultaneously developing new solutions
    - e.g. to balance reduction of the climate effects by aviation with worldwide reconciled research, new strategies and projects.

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Connecting in a globalized world

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The International Forum for Aviation Research
founded in 2010 is working for
a new generation of future air transport and
a socially responsible mobility of all our citizens.

IFAR History

2008: Berlin Summit

- Proposed by DLR
- 12 leaders of int. aeronautical research organisations
- Topic: Climate change

2010: 1st IFAR Summit in Berlin

- 16 leaders of int. aeronautical research organisations
- Topic: Climate change
- Set-up of IFAR
- Outcome: Declaration
- Creation of website
- www.ifar.aero

History

2011: 2nd IFAR Summit in Méry-sur-Oise / Paris (18-19 June)

- 21 leaders of int. aeronautical research organ.
- Initial endorsement of the IFAR Charter
- Topics: Climate change and Noise
- Outcome: Declaration
- Plan for Framework document

History

2012: 3rd IFAR Summit in Nagoya, Japan (13-14 October)

- IFAR charter signed by all
- 2 new members (IAE from Brazil and KTN from UK)
- Preliminary technology lists on efficiency, noise and alternative fuels
- First pilot cases for promotion and education
  - Preliminary concept for internal network
  - External communication (e.g. webpage, flyer, video)
- Working groups established
  - internal network and database
  - alternative fuels
  - Promotion and education (PhD list)

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IFAR Members

1. Autonomous Systems Laboratory CSIRO ICT Centre, Australia
2. Budapest University of Technology and Economics, Hungary
3. Central Aerohydrodynamics Institute of Russia (TsAGI), Russia
4. Centro Italiano Ricerche Aerospaziali (CIRA), Italy
5. Chinese Aeronautical Establishment (CAE), China
6. Czech VZLU-Aeronautical Research and Test Institute, Czech Republic
7. French Aerospace Lab (ONERA), France
8. German Aerospace Center (DLR), Germany
9. CSIR-National Aerospace Laboratories (CSIR-NAL), India
10. Institute for Aerospace Research – NRC, Canada
11. Japan Aerospace Exploration Agency (JAXA), Japan
12. Korea Aerospace Research Institute (KARI), Korea
13. Middle East Technical University (METU) Ankara, Turkey
14. National Aerospace Laboratory of the Netherlands (NLR), Netherlands
15. National Institute of Aerospace Research “Elie Carafoli” of Romania (INCAS), Romania
16. National Institute of Aerospace Technology of Spain (INTA), Spain
17. Polish Institute of Aviation (ILOT), Poland
18. Technical Research Centre of Finland (VTT), Finland
19. The Swedish Defence Research Agency (FOI), Sweden
20. U.S. National Aeronautics and Space Administration (NASA), USA
21. von Karman Institute for Fluid Dynamics, Belgium
22. Institute of Aeronautics and Space (IAE), Brazil
23. Aerospace, Aviation and Defence Knowledge Transfer Network, UK

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The Mission

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The Opportunities

- connects 23 aerospace research organisations worldwide
- enables information exchange
- facilitates opportunities for networking
- offers opportunities for multilateral cooperations
- coordinates views and makes recommendations

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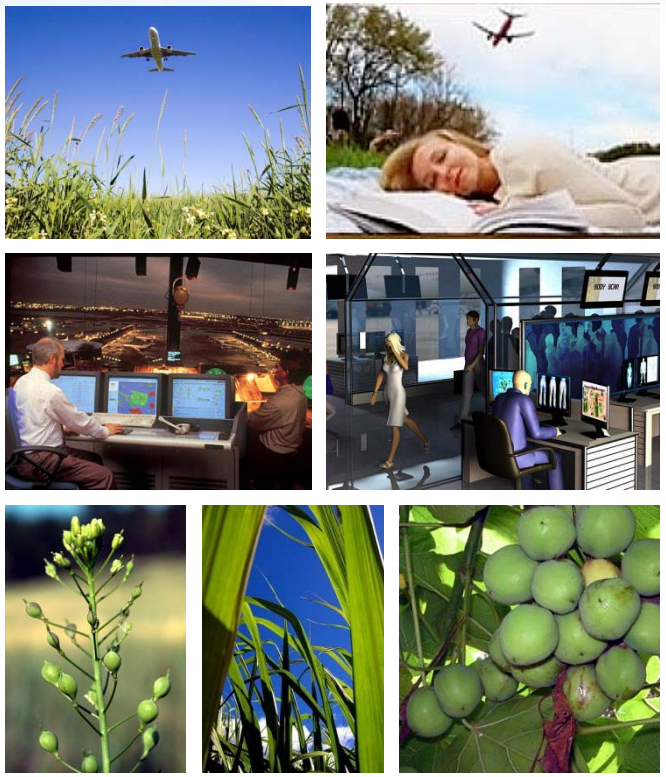
IFAR aims on focusing on global research topics such as

- Emission reduction and reduced climate impact,
- Noise and local emissions,
- Air traffic management,
- Security and safety aspects
- Alternative fuel development and use



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IFAR also engages in:

- Education
- Exchange of scientists
- Capacity building
- Internal social networks

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Main Output: IFAR Framework document

(under preparation)

- outlines global research objectives
- technological opportunities
- comparison of existing goals
- inventory of possible technologies

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IFAR Framework – Considers related documents

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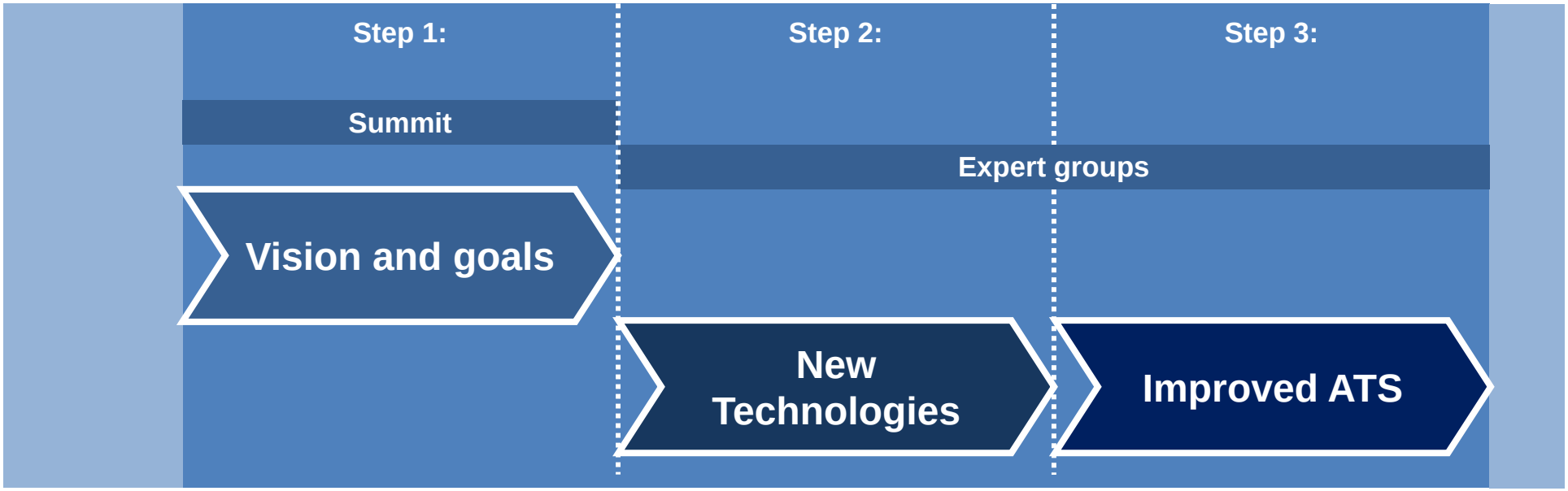
IFAR Framework – 3-Step-Approach



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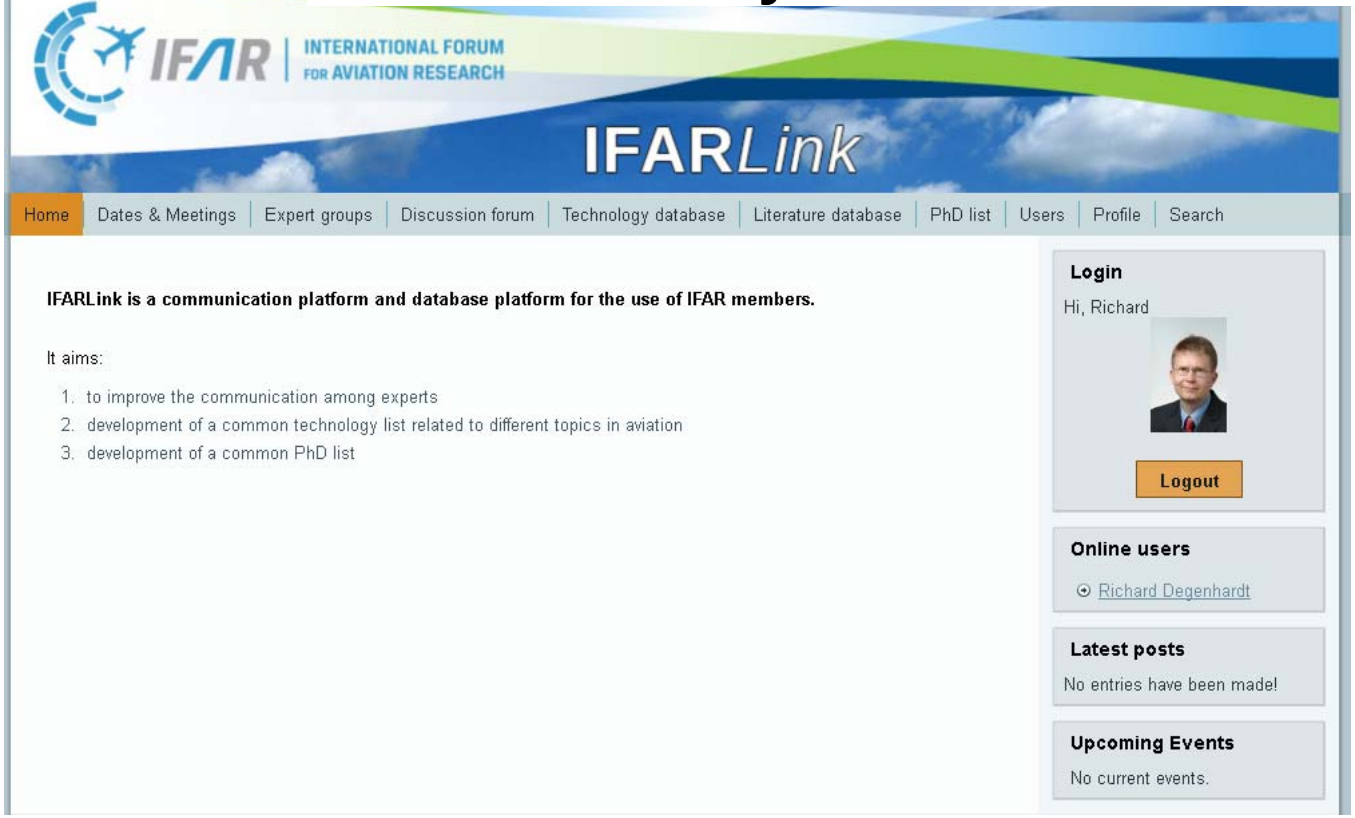
Planned activity – Internal network



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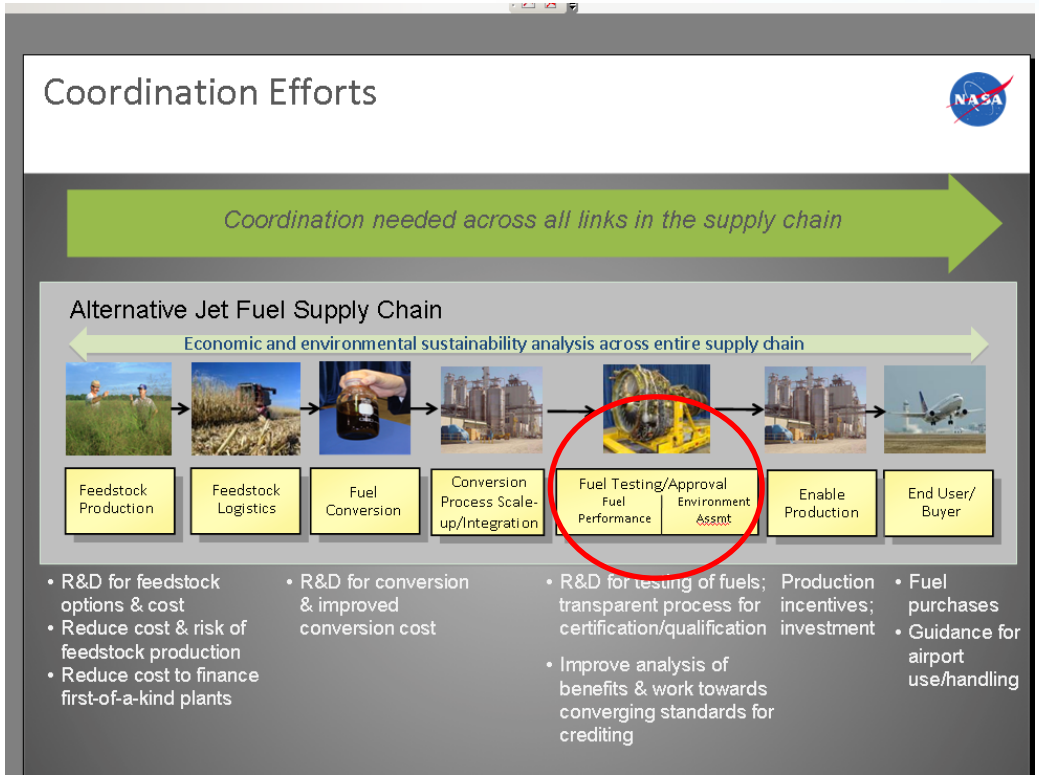
Expert group alternative fuels (e.g. fuel testing)



Proposal: IFAR collaborative PhD program

Many of the members of IFAR provide already on site training opportunities for PhD candidates, or provide grants to PhD candidates (working at university).

Concrete and unique opportunity for *intercontinental* collaboration at increasing levels discussed in the following:

1. inventory of PhD projects: open communication
2. Organize/stimulate communication between PhD's: thematic workshops, conference
3. exchange visits - internships
4. targeted collaboration: define common PhD projects

Competition on original ideas?

Dr. Jozsef Rohacs
Budapest University of Technology and Economics

World Aeronautics competition on original ideas of students and young scientist

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Next steps

- IFAR Framework document
- Develop internal IFAR network and database
- Expert group on alternative fuels
- IFAR initiative on education and promotion of graduate students
- World Aeronautics competition on original ideas of students and young scientists?

Acknowledgements

- IFAR members work on voluntary basis.
- The IFAR secretariat is supported until mid 2014 by
  - DLR and
  - the European Commission within the project IFARs (International Forum for Aviation Research Support Action).
- Some of the material used courtesy to DLR, NASA and ACARE

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