Transforming Transport: innovative renewable-based solutions in road freight, shipping and aviation

7 October 2020 • 16:00-20:00 CEST • Virtual
Welcoming remarks

Dolf Gielen
Director
IRENA Innovation and Technology Centre
Ministerial perspectives on the way ahead

H.E. Seamus O’Regan
Minister of Natural Resources
Canada
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Please make sure to mute yourself during the session to avoid background noise.

If you have questions for our panelists, please use the Q&A.

If you encounter any technical issues, please write your issue to Cisco Webex Events.

This session will be recorded and recording along with the slides will be available on the Innovation Week website.
Setting the scene
Setting the scene

Roland Roesch
Deputy Director
IRENA Innovation and Technology Center
Decarbonising Transport with Renewables

Roland Roesch
The transport sector, as a whole, accounts for nearly a quarter of global CO$_2$ emissions.
Decarbonising shipping with renewables

Shipping accounted for 10% of all transport emissions, or 2.3% of global CO$_2$ emissions in 2017.

**2 options compatible with reaching zero emissions**

**Advanced biofuels**
- Use biomass-based fuels such as biodiesel, renewable diesel, bio-methanol, bio-fuel oil and liquefied biogas.

**E-fuels**
- Use green hydrogen or synthetic fuels such as green methanol, ammonia and methane.

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**Estimated role of key CO$_2$ emission reduction measures to reduce shipping Planned Energy Scenario emissions to zero.**

- **1 Gt**
  - 49%
  - 40%
  - 10%
  - 1%

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- Reduced demand and improved energy efficiency
- Direct use of clean, predominantly renewable, electricity
- Direct use of renewable heat and biomass
- Indirect use of clean electricity via synthetic fuels & feedstocks

#IVIW2020
Decarbonising aviation with renewables

Aviation accounted for 11% of all transport emissions, or 2.5% of global CO₂ emissions in 2017.

3 options compatible with reaching zero emissions

- **Biojet fuel**: Use fuels produced from sustainably sourced biomass.
- **E-fuels**: Use synthetic fuels produced from cleanely sourced CO₂ and green hydrogen.
- **Battery-powered aircraft**: Use propulsion systems powered by batteries charged with renewable electricity.

Estimated role of key CO₂ emission reduction measures to reduce aviation Planned Energy Scenario emissions to zero.
Decarbonising road freight transport with renewables

Road freight transport accounted for 27% of all transport-related emissions or over 6% of global CO$_2$ emissions in 2017.

- **Battery electric vehicles**: Use electric motors powered by a battery pack, charged with renewable electricity.
- **Fuel cell electric vehicles**: Use electricity produced by fuel cells powered by compressed (green) hydrogen.
- **Advanced biofuels**: Use biomass-based fuel substitutes, such as biodiesels and renewable diesels.

**Estimated role of key CO$_2$ emission reduction measures to reduce road freight Planned Energy Scenario emissions to zero.**

- 44%
- 22%
- 19%
- 15%

**2.3 Gt**
Upcoming work on the transport sector


2020 Innovation Outlooks on:
- Renewable Methanol
- Biofuels for aviation (update)

2021 Innovation Landscape on Smart Electrification
- Systemic innovation for smart electrification of the transport, industry and buildings sector

2021 Navigating the way to a renewable future 2.0
- A pathway to decarbonise the shipping sector by 2050.
Thank you!
Setting the scene

Jari Kauppila

Head of Quantitative Policy Analysis and Foresight
International Transport Forum
Transforming Transport: innovative renewable-based solutions in road freight, shipping and aviation

IRENA Innovation week 2020
October 7, 2020
The ITF

- Intergovernmental organisation
  - OECD framework, 62 member countries
  - More than 70% of road transport 80% of global air transport and 90% of maritime
- The only global body covering all transport modes
- Think tank for transport policy
  - Data and statistics
  - Analysis, identification of best practices
  - Knowledge sharing
- Organising global dialogue for better transport
  - Annual Summit, largest gathering of transport ministers
  - Corporate Partnership Board
  - “Platform for discussion and pre-negotiation”
Focal areas of ITF work

• Digitalisation
• Connectivity
• Safety & security
• Universal access
• Decarbonisation

Linking transport sector to other sectors
Decarbonising transport initiative

- Launched in 2016, right after the signature of the Paris Agreement
- Aims to support governments in the definition of policies that help meeting its ambition

**Progress tracking**
- Evaluate how current mitigation measures contribute to reducing transport CO₂
  - NDC analysis

**In-depth sectoral reports**
- Identify effective policies for decarbonising transport sub-sectors
  - urban passenger, road freight, maritime transport, aviation...

**Focus studies**
- Analyse specific decarbonisation issues
  - e.g. Impact of decarbonising road transport on tax revenues, Vehicle technology choice, Regulations & standards for low/zero emission vehicles

**National pathways**
- Help countries define pathways to meet their transport CO₂ reduction ambitions

**Policy dialogue**
- Organise global dialogue on transport and climate change → ITF Summit, roundtables, briefings, workshops
- Act as a conduit for transport sector input to climate change negotiations → Involvement in UNFCCC & COP
- Transport Climate Action Directory
“The International Transport Forum’s TRANSPORT CLIMATE ACTION DIRECTORY is a key tool for moving from ambition to climate action - our most urgent challenge in climate policy today.

Governments now have a new resource to help them choose mitigation and adaptation measures that work in their specific context and that support their objectives.”

www.itf-oecd.org/TCAD

Patricia Espinosa
Executive Secretary
UNFCCC
Decarbonisation

Key pillars

• Manage travel demand
  – Reduce trip distances
  – Shift modal choice towards energy efficient modes
  – Maximise the capacity utilisation of vehicles

• Enhance energy efficiency of vehicles

• Decarbonise energy vectors/fuels

• Minimise emissions beyond vehicle use and energy/fuel production
  – Vehicle manufacturing and infrastructure construction

+ Need to place this in the broader framework of the SDGs
  – Importance of meeting multiple targets: co-benefits for safety, affordability, health/pollutant emission reduction, energy security, accessibility, connectivity, industrial development, economic growth...
Today’s session

• The **pathway** towards net zero GHG emissions is **relatively clear for urban transport**, with central roles possible for travel demand management, changes in modal balance and **direct electrification**

• This is **not always the case for long distance transport** (i.e. road freight transport, shipping and aviation)
  – Key technologies include battery electric, plug-in hybrids, biomass & power to fuels, e-fuels (with or without carbon, e.g. ammonia in shipping), hydrogen
  – Different challenges and opportunities in different transport modes

• **Innovation can help decarbonise these sub-sectors**
  – Progress needs to takes place across different dimensions (e.g. technical, political, regulatory, commercial)

• We see **this session as a precious resource to help inform future technology and policy developments**
Thank you!

Jari Kauppila
Head of ITF Secretary-General’s Office and Head of Quantitative Policy Analysis and Foresight
International Transport Forum
Jari.kauppila@itf-oecd.org
Panel I: Decarbonising Shipping with Renewables
Panel I: Decarbonising Shipping with Renewables

Panellists

- Tue Johannessen
  Senior Innovation Portfolio Manager
  Maersk

- Bart Hellings
  COO
  GoodFuels

- Tristan Smith
  Lecturer
  University College London

- Jakob Steffensen
  Head of Innovation and Partnerships
  DFDS

- Anne Sophie Vinther Hansen
  Investment Manager
  Vækstfonden (Danish Sovereign Fund)

Moderator

Roland Roesch
Deputy Director
IRENA Innovation and Technology Center
Digital Break
Coming up next: Panel II - Decarbonising Aviation with Renewables
Panel II: Decarbonising Aviation with Renewables
Panel II: Decarbonising Aviation with Renewables

Panellists

Valentin Batteiger
Lead – Alternative Fuels
Bauhaus Luftfahrt

Hassan El-Houjeri
Climate and Sustainability Technology Strategist
Saudi Aramco

Glenn Llewellyn
VP Zero Emission Technologies
Airbus

Oskar Meijerink
Project Lead – Future Fuels
SkyNRG

Jack Saddler
Professor
University of British Columbia

Moderator

Jagoda Egeland
Advisor to the Secretary-General
International Transport Forum
Digital Break

Coming up next: Panel III - Decarbonising Road Freight Transport with Renewables
Panel III: Decarbonising Road Freight Transport with Renewables
Panel III: Decarbonising Road Freight Transport with Renewables

Panellists

Henrik Engdahl
Chief Engineer - Charging
Volvo Group

Angie Farrag-Thibault
Project Lead for Clean Trucking
World Economic Forum

Elisabeth Fretheim
Head of Business Development
Nikola Motor

Steven Nadel
Executive Director
American Council for an Energy Efficient Economy

Moderator

Francisco Boshell
Analyst, RE Technology Standards and Markets
IRENA
Panel IV: Identifying Cross-sectorial Synergies in Shipping, Aviation and Road Freight Transport
Panel IV: Identifying Cross-sectorial Synergies in Shipping, Aviation and Road Freight Transport

Panellists

Mariette van Empel
Director Sustainable Mobility
Ministry of Infrastructure and Water Management of the Netherlands

Jane Hupe
Deputy Director - Environment,
Air Transport Bureau
ICAO

Randall Krantz
Senior Advisor on Shipping Decarbonisation
Global Maritime Forum

Christoph Wolff
Head of Mobility
World Economic Forum

Moderator

Pierpaolo Cazzola
Advisor on Energy, Technology and Environmental Sustainability
International Transport Forum
Closing remarks
Summary remarks

Pierpaolo Cazzola
Advisor on Energy, Technology and Environmental Sustainability, International Transport Forum
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<td>Monday 5th October 09:30 – 11:30 CEST</td>
<td>High-level opening session</td>
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<td>Monday 5th October 17:00 – 20:00 CEST</td>
<td><strong>Session 2: Smart electrification of end-use sectors:</strong> implications for the power system</td>
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<td>Tuesday 6th October 08:00 – 11:00 CEST</td>
<td><strong>Session 3: Scaling up green hydrogen and green e-fuels production to decarbonise industry &amp; transport</strong></td>
<td>Hydrogen Council</td>
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<td>Tuesday 6th October 17:00 – 20:00 CEST</td>
<td><strong>Session 4: Growing the bio-economy:</strong> solutions for the sustainable supply of biomass &amp; biofuels</td>
<td>GBEP Global Bioenergy Partnership</td>
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<td>Wed 7th October 08:00 – 11:00 CESR</td>
<td><strong>Session 5: Renewable solutions for industry transformation</strong></td>
<td>MPP Mission Possible Platform</td>
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<td>Wed 7th October 17:00 – 20:00 CEST</td>
<td><strong>Session 6: Transforming Transport:</strong> Innovative renewable-based solutions in road freight, shipping &amp; aviation</td>
<td>International Transport Forum</td>
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<td>Thursday 8th October 10:00 – 12:30 CEST</td>
<td><strong>Session 7: IRENA Youth Talk:</strong> Entrepreneurship and Innovation for the green energy agenda</td>
<td>Initiaile SDG7 Youth Coalition</td>
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<td>Thursday 8th October 14:00 – 16:00 CEST</td>
<td><strong>Session 8: The Way Forward</strong></td>
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Thank you!

Coming up next
Session 7: IRENA Youth Talk: Entrepreneurship and Innovation at 10:00 tomorrow

Register at
https://innovationweek.irena.org/