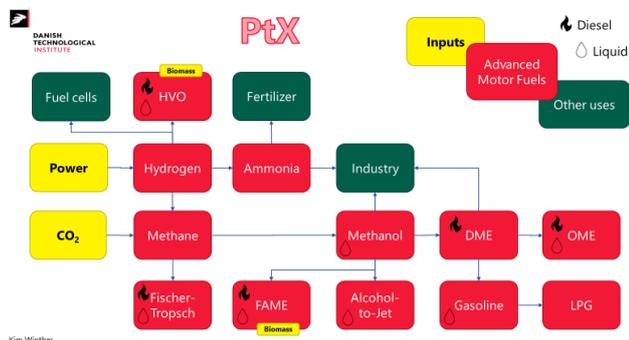


December 2021, ISSUE NO. 3/2021

Advanced Motor Fuels News



Power to fuels technologies are gaining interest in all transport applications. AMF has now started a new project on E-fuels and End-Use Perspectives

[Read more...](#)

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IMPRINT

DEMONSTRATION / IMPLEMENTATION / MARKETS

Challenges of decarbonizing shipping

Shipping is the backbone of international trade, accounting for approximately 80 percent of global transportation measured by volume. But shipping is also responsible for 2-3 percent of global GHG emissions. Bringing it to zero is challenging due to the industry's global and competitive nature, vast energy needs and the uniqueness of each vessel. Simone Staal Kibæk, director of the Zero-Emission Shipping Mission, was recently interviewed by the Mission Innovation team. Read more about the challenges of setting up the Shipping Mission, its goal and first achievements in the linked article.

Link: <http://mission-innovation.net/2021/10/06/shipping-out-the-challenges-and-opportunities-of-decarbonizing-the-worlds-most-global-industry/>

New Software Tools to Speed Up Biojet Fuel Development

Researchers have released two new publicly available web-based software tools to help researchers and companies quickly test different scenarios and explore viability of bio-based fuels and products. The first tool, Feedstock to Function, addresses one of the biggest hurdles involved in starting biojet fuel research: knowing whether a molecule could be viable as a fuel. The tool lets users sort through a database of almost 10,000 potential molecules and allow them to either search for a specific molecule or explore multiple molecules that match the properties they are trying to achieve. Once a user identifies a potential molecule, they can then use another tool, Bio-Cradle-to-Grave (BioC2G), to explore potential locations and process configurations for scaling up their production. The tool provides information to help companies decide which locations are optimal based on the potential feedstock availability nearby, and what greenhouse gas emissions and costs are associated with developing a new production facility.

Source: <https://www.energy.gov/eere/bioenergy/articles/lab-jet-engines-new-software-tools-will-speed-biojet-fuel-development>

Road freight volumes continued to grow

Road freight volumes continued to grow in 2020, while goods transport by other modes slowed down compared to the 2017-2019 baseline period.

Rail tonne-kilometres declined in almost all ITF countries with available data for 2020, with the greatest decrease in Latvia (-50%).

Road freight transport increased in most countries, with tonne-kilometres growing most in the Czech Republic (+35%).

Container shipments at seaports stabilised in 2020 compared to the 2017-2019 baseline period in OECD

countries, with a slight decrease of -0.1% for gross tonnage, whereas it had grown between 2010 and 2019 (+42%).

Both rail and car passenger transport decreased in all ITF countries with available data, especially in Canada for rail (-86%) and Kazakstan for cars (-52%).

Road fatalities decreased in almost all regions, most notably in European countries and Turkey (-20% on average), except in the United States (+5%).

Sources: [https://www.itf-oecd.org/road-freight-volumes-continued-grow-2020?ct=t\(2018_Sept_Newsletter_COPY_02\)&mc_cid=eccd76cd8d&mc_eid=01ebf964b8](https://www.itf-oecd.org/road-freight-volumes-continued-grow-2020?ct=t(2018_Sept_Newsletter_COPY_02)&mc_cid=eccd76cd8d&mc_eid=01ebf964b8)

Isuzu LNG truck released

For the past 30 years, Isuzu has been working to promote the development and popularization of natural gas vehicles from the perspective of energy security and reduction of environmental impact. Isuzu believes that the "GIGA LNG vehicle", which has the excellent environmental performance of LNG and the same usability as before, is one of the options in the transition period to a carbon-neutral society. Isuzu also states that it will continue to consider the characteristics of commercial vehicles for various applications and develop optimal technologies for each application, thereby curbing global warming and contributing to a carbon-free society.



Isuzu GIGA LNG Vehicle: Specifications: GVW 25 ton, 243kW, 9 gears (Automatic AMT)

Source: https://www.isuzu.co.jp/newsroom/details/20211028_01.html (Japanese)

15-Liter Natural Gas Engine

Cummins is introducing a 15-liter natural gas engine for heavy-duty trucks to North America after previously releasing this platform in China last year. This expands the availability of natural gas engines beyond 12 liters to fit fleet applications that require higher power, with ratings up to 500 hp and 1,850 ft-lb of torque. Cummins is using the 15-liter natural gas engine platform in its testing of a hydrogen-powered internal combustion engine.

Source: <https://www.freightwaves.com/news/cummins-expands-natural-gas-offerings-with-15-liter-engine>

MotoGP will use sustainable fuels from 2024

The Fédération Internationale de Motocyclisme (FIM) Grand Prix World Championship, "MotoGP", has announced that 2024 will see MotoGP move to using sustainable fuels, launching a new global era of zero-carbon fuels. With a unique position as one of the world's most popular and technologically advanced sports, MotoGP is a racing 'laboratory' powered by innovation and development, a global platform with the power to lead the evolution in both the motorcycle and mobility industries.

Source: <https://bioenergyinternational.com/biofuels-oils/2024-will-see-motogp-move-to-using-sustainable-fuels>

POLICY / LEGISLATION / MANDATES / STANDARDS

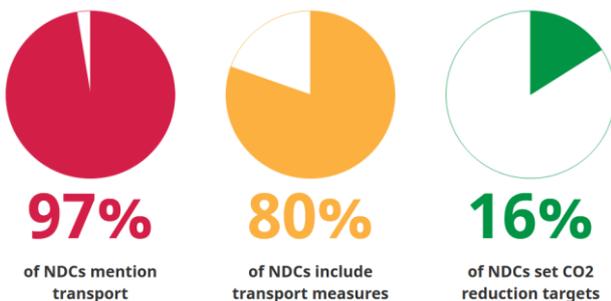
Malaysia B20 Mandate by 2022

According to Plantation Industries and Commodities Minister Datuk Dr Mohd Khairuddin Aman Razali, Malaysia expects its B20 biofuel plan to be implemented nationwide by the end of 2022. B20 programme, which shall entail a 20% mix of palm-biodiesel into petroleum, was initially scheduled to be completed by mid-2021 but later delayed to 2022 as the country prioritises economic recovery from the pandemic.

Source: <https://www.thestar.com.my/business/business-news/2021/06/15/malaysia-targets-full-rollout-of-b20-biodiesel-plan-by-end-2022>

How serious are countries about decarbonising transport?

New "Transport NDC Tracker" monitors how transport appears in national decarbonisation commitments. The new "Transport NDC Tracker" launched today by the International Transport Forum at the OECD monitors how transport appears in the decarbonisation commitments of the countries that have joined the Paris Climate Agreement. The Tracker keeps tabs on whether the "Nationally Determined Contributions" (NDCs) mention transport, include transport decarbonisation measures, or set transport CO₂-reduction targets. Available in ten languages, the Tracker is updated every Monday.



Access the Transport NDC Tracker: <https://www.itf-oecd.org/ndc-tracker/en>

Chile: National Electromobility Strategy

The Chilean government launched its Electromobility Strategy to speed up the country's transition to electric light-duty and heavy-duty vehicles. The government set the goal that by 2035 all sales of light-duty, medium-duty, public transport (buses, taxis and shared taxis), and large off-road vehicles will be zero-emission. In addition, by 2040 all sales of small off-road vehicles and by 2045 all sales of freight transport and intercity buses will be zero-emission. The government plans to meet these goals through a series of initiatives beginning with new vehicle efficiency standards and incentive programs for long-haul fleets.

Source: <https://www.gob.cl/en/news/national-electromobility-strategy-launch-government-announces-only-electric-vehicles-will-be-sold-chile-2035/>

Zero-Emission Buses for Latin America

At the UN Climate Change Conference, a set of investors committed \$1 billion via the Zero Emission Bus Rapid-deployment Accelerator (ZEBRA) partnership for zero-emission bus projects in Latin America. In addition, a new set of bus manufacturers, including Volvo, Zhongtong, IUSA, Busscar and Rennogy, committed to making zero-emission vehicles commercially available in Latin America. This builds on the commitments of eight manufacturers made in 2020. The ZEBRA partnership focuses on guaranteeing political commitments from Latin American cities to purchase zero-emission buses, bus manufacturers increasing product availability, securing funding for these projects, and sharing best practices between cities.

Source: <https://www.c40.org/news/financial-innovations-latin-america-clean-public-transport/>

U.S. Funds Electric and Alternative Fuel Vehicle Deployment

The U.S. government passed the Infrastructure Investment and Jobs Act, which includes significant funding for electric and alternative fuel vehicles and infrastructure over a five year period from 2022 to 2026. The law includes:

- \$5.6 billion will be available for transit agencies to support the transition (e.g. acquisition, construction, and leasing of required supporting facilities) to low- and zero-emission transit buses
- \$5 billion in funds exclusively for electric vehicle chargers and an additional \$2.5 billion in funds for alternative fuel infrastructure with electric, hydrogen, natural gas, and propane stations eligible
- \$2.5 billion zero-emission school buses and another \$2.5 billion for low- and zero-emission school buses
- \$250 million to support the transition of passenger ferries to low- or zero-emission technologies

<https://www.act-news.com/news/infrastructure-deal-will-expand-clean-tech-adoption-in-the-years-to-come/>

<https://www.cantwell.senate.gov/imo/media/doc/Infrastructure%20Investment%20and%20Jobs%20Act%20-%20Section%20by%20Section%20Summary.pdf>

HD Hydrogen Fueling Hardware Standardization

The Hydrogen Heavy Duty Vehicle Industry Group, which includes Air Liquide, Hyundai, Nel Hydrogen, Nikola Corporation, Shell and Toyota has signed agreements with Tatsuno Corporation and Transfer Oil S.p.A. to industrialize globally-standard 70 MPa (10,000 psi) hydrogen heavy-duty vehicle high-flow (H70HF) fueling hardware components. The group created specifications for the fueling nozzle, vehicle receptacle, dispenser hose, and breakaway device components for this heavy-duty application. The fueling hardware is anticipated to support average hydrogen fueling rates of 10 kg/min, which would meet the U.S. Department of Energy's technical targets for long-haul trucks.

Source:

<https://www.greencarcongress.com/2021/10/20211009-h70hf.html>

SPOTLIGHT ELECTRIC VEHICLES

USDOE SuperTruck 3 Program

The U.S. Department of Energy's program to improve truck efficiency announced the latest projects selected for funding. SuperTruck 3 will fund five projects with a combined \$127 million; these funds are matched dollar-for-dollar by each manufacturer:

- PACCAR will develop 18 Class-8 battery electric and fuel cell vehicles and a megawatt charging station
- Volvo will develop a 400-mile-range Class-8 battery electric tractor-trailer with advanced aerodynamics, electric braking, EV optimized tires, automation and route planning
- Daimler will develop and demonstrate two 2 Class-8 fuel cell trucks with 600-mile range, 25,000-hour durability, equivalent payload capacity and range to diesel
- Ford will develop and demonstrate five hydrogen fuel cell electric Class-6 Super Duty trucks.
- General Motors will develop and demonstrate four hydrogen fuel cell and four battery electric Class 4-6 trucks

Source: <https://www.energy.gov/articles/doe-announces-nearly-200-million-reduce-emissions-cars-and-trucks>

1,000 Electric School Buses

A national school transportation company, Student Transportation of Canada (STC), placed an order for 1,000 electric school buses from Lion Electric. The

order is conditional on grant funding from Infrastructure Canada's Zero Emission Transit Fund, which will provide \$2.75 billion over five years to support public transit and school bus electrification. Bus deliveries are scheduled to begin in 2022 and continue until 2026. This order would make STC the largest operator of zero emission school buses in North America.

Source: <https://electricautonomy.ca/2021/10/28/student-transportation-electric-buses/>

SPOTLIGHT AVIATION

Indonesia Plans to use 2.4% Bioavtur

A consortium of Indonesian companies, regulators and one university has begun a series of tests on an aviation fuel containing a small share of biofuel derived from palm oil, responding to a government mandate on the increased domestic use of the commodity through biofuel blending. The consortium started nine days of flight tests on 9 September 2021, for an aviation turbine fuel (avtur) dubbed Bioavtur J2.4, of which 2.4 percent is biofuel made from refined palm oil. The refineries convert palm oil into refined, bleached and deodorized palm kernel oil (RBDPKO), which can be used to make green diesel (D100) and bioavtur. The Cilacap refinery had the technical capacity to produce 8,000 barrels of bioavtur per day, with plans to increase output capacity starting in 2023.

Source:

<https://www.thejakartapost.com/paper/2021/09/12/palm-oil-based-jet-fuel-makes-late-debut-in-indonesia.html>

New SAF off-take agreements

Aemetis signs SAF off-take MoU's with eight members of the oneworld Alliance

US-headed renewable natural gas and renewable fuels company Aemetis, Inc has announced that it has signed Memoranda of Understandings (MoUs) with eight airline members of the oneworld Alliance for 350 million (US) gallons (≈ 1.32 billion litres) of blended fuel containing sustainable aviation fuel (SAF) to be delivered to San Francisco International Airport in California. Once finalized, the agreements will cover the delivery of SAF over a seven-year term starting in 2024.

Source: <https://bioenergyinternational.com/biofuels-oils/aemetis-signs-saf-off-take-mous-with-eight-members-of-the-oneworld-alliance>

British Airways and Phillips 66 Ltd sign first UK-produced SAF supply deal

British Airways (BA) is set to become the first airline in the world to use sustainable aviation fuel (SAF) produced in the UK after signing a multi-year agreement with Phillips 66 Ltd, a wholly-owned subsidiary of US-headed diversified energy and logistics major Phillips 66 Company. The SAF will be produced at scale for the first time in the UK at the

Phillips 66 Humber Refinery near Immingham and will be supplied to BA to power a number of its flights from early 2022.

Source: <https://bioenergyinternational.com/biofuels-oils/british-airways-and-phillips-66-ltd-sign-first-uk-produced-saf-supply-deal>

First Airbus helicopter flight with 100% SAF

An Airbus H225 has performed the first-ever helicopter flight with 100 percent sustainable aviation fuel (SAF) powering one of the Safran Makila 2 engines. The flight, which took place at the company's headquarters in Marignane, France marks the start of a flight campaign aiming to assess the impact of unblended SAF on the helicopter systems in view of certifying the use of SAF blends that exceed today's 50 percent limit.

Source: <https://bioenergyinternational.com/biofuels-oils/first-airbus-helicopter-flight-with-100-sustainable-aviation-fuel>

NREL biomass-derived SAF pilot program receives additional US\$350 000 funding

In the United States, the Department of Energy's Bioenergy Technologies Office has announced that it has awarded an additional US\$350 000 in funding to scientists at the National Renewable Energy Laboratory (NREL) to develop a pilot-scale system for turning biomass into sustainable aviation fuel (SAF).

Source: <https://bioenergyinternational.com/research-development/nrel-biomass-derived-saf-pilot-program-receives-additional-us350-000-funding>

AMF NEWS

New Task: E-fuels and End-Use Perspectives

During its last ExCo meeting, AMF started a new Task focusing on end-use aspects of electrofuels. The focus of the new project is on information exchange on production and application of different e-fuels, and on the respective regulatory framework and standards. The information exchange will be achieved by a series of topical workshops. Under the lead of Switzerland, China, Denmark, Finland, Germany, Japan and USA will contribute to this Task.

Contact: Zoe Stadler, zoe.stadler@ost.ch

Lessons Learned from Alternative Fuels Experience

AMF has successfully concluded the Task on "Lessons Learned from Alternative Fuels Experience", which has evaluated 16 market introduction case studies of 6 countries. The Task has found that consistent policies and integration of all stakeholders are both necessary to overcome barriers for a successful market implementation of alternative fuels and propulsion systems.

There is the need for long-term and comprehensive policies, on national and international level, which include markets, stakeholders and different technologies to gain benefits for all types of stakeholders along the value chain of the transportation system.

More information: https://iea-amf.org/content/projects/map_projects/59

Current AMF projects

The full list of current AMF projects include:

- New Task: E-fuels and End-Use Perspectives
- New Task: Sustainable Aviation Fuels
- Task 62: Wear in engines using alternative fuels
- Task 61: Remote Emission Sensing
- Task 60: The Progress of Advanced Marine Fuels
- Task 28: Information Service & AMF Website

PUBLICATIONS

IEA World Energy Outlook 2021

Published every year based on objective data and dispassionate analysis, The World Energy Outlook (WEO) provides critical analysis and insights on trends in energy demand and supply, and what they mean for energy security, environmental protection and economic development.

Sources: <https://www.iea.org/topics/world-energy-outlook>

Progress towards biofuels for marine shipping

Biomass has the potential to supply the marine sector with sustainable fuel and is a promising solution for both reducing net carbon emissions and meeting sulphur regulations, which were thoroughly described in the 2017 IEA bioenergy report on Biofuels for the marine shipping sector.

Biofuels consist of many promising candidates and are closer to commercialization than other alternative fuels/technologies such as ammonia, hydrogen or batteries for marine vessels. Moreover, compatibility with existing fleets is a big asset for several (diesel-type) biofuels, making biofuels a promising short- to medium-term solution to reduce the carbon footprint of the maritime sector and to meet more stringent sulphur regulations.

The 2021 update of the 2017 report includes information on barriers to commercialization of biofuels in marine applications.

Source:

<https://www.ieabioenergy.com/blog/publications/progress-towards-biofuels-for-marine-shipping/>

Global Hydrogen Review 2021

Governments need to move faster and more decisively on a wide range of policy measures to

enable low-carbon hydrogen to fulfil its potential to help the world reach net zero emissions while supporting energy security, according to a new report we've just released today.

Currently, global production of low-carbon hydrogen is minimal, its cost is not yet competitive, and its use in promising sectors such as industry and transport remains limited – but there are encouraging signs that it is on the cusp of significant cost declines and widespread global growth, according to IEA's new Global Hydrogen Review 2021.

Sources: <https://www.iea.org/reports/global-hydrogen-review-2021>

Global GHG emissions 2021 report

The Emissions Database for Global Atmospheric Research provides emission time series from 1970 until 2020 for fossil CO₂ and until 2018 for non-CO₂ GHGs for all countries, and covers the emissions and removals from land use and forestry for the years 2000 to 2015. This report is contributing to the Paris Agreement process with an independent and quantitative view of global GHG emissions.

Source: Publication Office of the European Union, <https://op.europa.eu/en/publication-detail/-/publication/45c88a84-2d65-11ec-bd8e-01aa75ed71a1/language-en>

Download:

https://edgar.jrc.ec.europa.eu/booklet/GHG_emissions_of_all_world_countries_booklet_2021report.pdf

Trends and projections in Europe 2021

The year 2020 saw remarkable progress towards meeting the EU's climate and energy targets. Rarely in the publication of the annual "Trends and projections in Europe" report has this executive summary presented such substantial progress as this edition does. Preliminary estimates indicate that, in 2020, we witnessed the full achievement — and even overachievement — of Europe's 20-20-20 goals for climate change mitigation, renewable energy deployment and energy efficiency gains. This keeps Europe well on track in its journey towards climate neutrality by mid-century.

Source: European Environment Agency (EEA) - Publications <https://www.eea.europa.eu/publications/trends-and-projections-in-europe-2021>

Download: https://www.eea.europa.eu/publications/trends-and-projections-in-europe-2021/at_download/file

EU Fuel Quality Directive report

The study "Support study on the evaluation of Article 7A of the Fuel Quality Directive and assessment of approaches to reduce greenhouse gas emissions from transport fuels" for the European Commission focuses on the evaluation of Article 7A of Directive 98/70/EC relating to the quality of petrol and diesel fuels, so-called Fuel Quality Directive (FQD Art.7A) and on the assessment of policy options under various fuel mix scenarios to

steer the progressive reduction of transport fuels' GHG intensity towards 2030 and 2050. It was conducted by Technopolis Group (lead), COWI and Exergia. Through desk research, interviews, surveys, and stakeholder workshops (Task 4) it assesses the effectiveness, efficiency, relevance, coherence, and EU-added value of FQD Art.7A, identifying enabling and hampering factors for its environmental, economic, and social impacts, and drawing lessons for future efforts to reduce GHG emissions from transport (Task 1). Based on the projected fuel-mix under the scenarios underpinning the 2030 Climate Target Plan (CTP), the study calculates the GHG emission intensity of the overall fuels used in transport based on the life-cycle approach of the FQD, and its reduction from the FQD 2010 baseline. (Task 2). The evidence collected was used to detail and assess policy options (Task 3) to reduce the GHG intensity of transport fuels to deliver on the targets set forth in the 2030 CTP and the 2050 climate neutrality objective.

Source: Publication Office of the European Union, and link for download: <https://op.europa.eu/en/publication-detail/-/publication/aea4d643-48ed-11ec-91ac-01aa75ed71a1/language-en/format-PDF/source-243971196>

Waste and residue availability

The ICCT study "Waste and residue availability for advanced biofuel production in the European Union and the United Kingdom" presents current (2020) waste and residue feedstock availability in the European Union and the United Kingdom and provides projections for 2030 and 2050. The study considers the availability of agricultural residues, forestry residues, and biogenic waste. The study deems available only the feedstock that can be collected with no harm on the environment, and thus, takes into consideration the protection of soil quality and agricultural, forestry, and waste management. It also takes into account how much of the feedstock is currently used or combusted for energy, since displacing a feedstock from its current use can lead to indirect increases in greenhouse gas emissions.

Source: icct - the International Council on Clean Transportation <https://theicct.org/publications/eu-uk-biofuel-production-waste-nov21>

Download:

<https://theicct.org/sites/default/files/publications/eu-uk-biofuel-production-waste-nov21.pdf>

GHG emissions of biomethane and hydrogen pathways in the EU

The ICCT study "Life-cycle greenhouse gas emissions of biomethane and hydrogen pathways in the European Union" aims to support European policymakers with a better understanding of the uncertainties regarding gaseous fuels' roles in meeting EU climate goals. Life-cycle GHG analysis (LCA) is complex, and differences in methodology as well as data inputs and assumptions can spell the difference between a renewable gas pathway

qualifying or not for REDII eligibility at the 50% to 80% GHG reduction level. It is thus important for European policymakers to use robust LCA to ensure that policy only supports gas pathways consistent with a vision of deep decarbonization. For this purpose, the study conducts sensitivity analysis of the life-cycle GHG emissions of a number of low-GHG gas pathways, including biomethane produced from four feedstocks: wastewater sludge, manure, landfill gas (LFG), and silage maize; and hydrogen produced from eight sources: natural gas combined with carbon capture and storage (CCS), coal with CCS, biomass gasification, renewable electricity, 2030 EU grid electricity, wastewater sludge biomethane, manure biomethane, and LFG biomethane.

Source: *icct - the International Council on Clean Transportation* <https://theicct.org/publications/lca-biomethane-hydrogen-eu-oct21>

Download:

<https://theicct.org/sites/default/files/publications/lca-biomethane-hydrogen-eu-oct21.pdf>

Sustainable biomass availability in the EU, to 2050

The aim of this report is to provide an estimation of the sustainable biomass potential availability in the European Union and the UK by 2030 and 2050 and to provide an evaluation of the advanced biofuel potential. The work presented covers only domestic (EU27 & UK) feedstocks of agricultural, forest and waste origin included in Annex IX of RED II (Part A and B). A short overview of the potential for imports and algae, based on other studies has been included as an Annex. Food and feed crops, and other sustainable feedstocks accepted by RED but not included in Annex IX, are not included in this study.

Source: *concaawe publications*

<https://www.concaawe.eu/publication/sustainable-biomass-availability-in-the-eu-to-2050/>

Download: <https://www.concaawe.eu/wp-content/uploads/Sustainable-Biomass-Availability-in-the-EU-Part-I-and-II-final-version.pdf>

Japan: IEEJ Outlook 2022

The IEEJ (The Institute of Energy Economics, Japan) Outlook 2022 shows the energy transition in the world. The contents are; (1) Study to quantify the future global energy supply and demand situation until 2050, (2) Outlook with forecast-approach, using economic models etc., (3) Scenario analysis on progress and trends in technologies and politics.

Source: <https://eneken.ieej.or.jp/data/9868.pdf>

Improving Environmental Performance of Freight in Brazil

The report examines the truck market in Brazil to evaluate possible obstacles and opportunities to develop a green freight program similar to the U.S. EPA's SmartWay initiative. The operational characteristics of freight transportation, recent truck

sales and the profile of the truck fleet, and the perceptions of transporters were analysed. The report found developing a methodology to quantify emissions by transported product would help to incorporate actions to reduce GHG emissions for companies that have already set reduction targets. In addition, eco-driving programs stood out as an important way to not only reduce emissions, but also improve traffic safety. The authors believe voluntary green freight programs can provide support, especially by providing data, for the creation of national heavy-duty vehicle efficiency standards.

Source: <https://theicct.org/publications/brazil-freight-assessed-sept21>

U.S. DOE VTO/HFTO R&D Benefit Analysis

For more than 20 years, Argonne has been evaluating on a regular basis the impact of U.S. Department of Energy (DOE) Vehicle Technologies Office (VTO) and Hydrogen and Fuel Cell Technologies Office (HFTO) R&D on vehicle energy consumption and cost using Autonomie. The number of vehicles considered has grown over the year to become one of the largest and more complete study, including:

- Five timeframes (current to 2045)
- >30 vehicle classes and applications from light duty (10) to medium and heavy duty (20+)
- 6 powertrains configurations including conventional, start-stop, HEVs, PHEVs, BEVs and FCEVs
- 5 fuels (gasoline, diesel, natural gas, hydrogen, electricity)
- 2 technology uncertainties

The study evaluates the impact of numerous technology improvements on:

- Component sizes (i.e., power, energy, weight)
- Energy consumption
- Manufacturing cost...

Source and Download: <https://vms.es.anl.gov/case-studies/u-s-doe-vto-hfto-r-d-benefits/>

Future Fuels and Vehicles Strategy

The Future Fuels and Vehicles Strategy is the Australian Government's technology-led approach to reducing emissions in the transport sector. Under this strategy, the government will work with the private sector to increase the uptake of hybrid, hydrogen, electric and biofuelled vehicles.

Link:

<https://www.industry.gov.au/sites/default/files/November%202021/document/future-fuels-and-vehicles-strategy.pdf>

EVENTS

Transportation Research Board 101st Annual Meeting

9-13 January 2022, Washington, D.C., USA

<https://www.trb.org/AnnualMeeting/AnnualMeeting.aspx>

2022 Nor-Shipping Ocean Leadership Conference

10-13 January 2022, Oslo, Norway

<https://www.nor-shipping.com/>

Abu Dhabi Sustainability Week

15-19 January 2022, Abu Dhabi, UAE

<https://abudhabisustainabilityweek.com/en>

National Biodiesel Conference and Expo

17-20 January 2022, Las Vegas, USA

<https://www.biodieselconference.org/>

World Economic Forum (WEF) Annual Meeting

17-21 January 2022, Davos, Switzerland

<https://www.weforum.org/events/world-economic-forum-annual-meeting-2022>

19th International Conference on Renewable Mobility "Fuels of the Future"

24-28th of January 2022, online

<https://www.fuels-of-the-future.com/en>

LignoFuels 2022

2-3 February 2022, Helsinki, Finland

<https://www.wplgroup.com/aci/event/lignocellulosic-fuel-conference-europe/>

Renewable Fuels Association National Ethanol Conference

21-23 February 2022, New Orleans, Louisiana, USA

<https://www.nationalethanolconference.com/>

World Hydrogen 2022 Summit & Exhibition

8-10 March 2022, Rotterdam, The Netherlands

<https://www.world-hydrogen-summit.com/>

The Work Truck Show & GreenTruck Summit

8-11 March 2022 Indianapolis, Indiana, USA

<https://www.worktruckshow.com/>

International Biomass Conference and Expo

14-16 March 2022, Jacksonville, USA

<http://www.biomassconference.com>

biofuels international Conference & Expo

15-16 March 2022, Brussels, Belgium

https://biofuels-news.com/conference/biofuels/biofuels_index_2022.php

Conference on CO₂-based Fuels and Chemicals

23-24 March 2022, hybrid event – ONLINE and Cologne, Germany

<https://co2-chemistry.eu/>

39th Annual International Battery Seminar

28-31 March 2022, Orlando, Florida, USA + online

<https://www.internationalbatteryseminar.com/>

WCX SAE World Congress Experience

5-7 April 2022, Detroit, Michigan, USA

<https://www.sae.org/attend/wcx>

10th European Algae Industry Summit

27-28 April 2022, Reykjavik, Iceland

<https://www.wplgroup.com/aci/event/european-algae-industry-summit/>

Advanced Clean Technology (ACT) Expo

9-12 May 2022, Long Beach, California, USA

<https://www.actexpo.com/>

Oleofuels 2022

18-19 May 2022, Marseille, France

<https://www.wplgroup.com/aci/event/oleofuels/>

CAAFI General Meeting

1-2 June 2022, Washington, USA

<https://advancedbiofuelsusa.info/caafi-biennial-general-meeting-june-2-4-2021-washington-dc/>

2022 International Fuel Ethanol Workshop & Expo and Biodiesel & Renewable Diesel Summit

13-15 June 2022, Minneapolis, Minnesota, USA

<http://2022.fueethanolworkshop.com/>

Electric & Hybrid Vehicle Technology Expo

13-15 September 2022, Novi, Michigan, USA

<https://evtechexpo.com/>

NEW DATE: Argus Panama Bunker Fuels Conference - POSTPONED to May 2023

May 2023, Panama City, Panama

<https://www.argusmedia.com/en/conferences-events-listing/panama-bunker-fuels>

Argus Mexico Fuel Markets Summit 2023

May 2023, Mexico

<https://www.argusmedia.com/en/conferences-events-listing/mexico-fuel-markets>

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The Advanced Motor Fuels Technology Collaboration Programme (AMF TCP) is one of the International Energy Agency's (IEA) transportation related Technology Collaboration Programmes. These are multilateral technology initiatives that encourage technology-related activities that support energy security, economic growth and environmental protection.

AMF provides an international platform for co- operation to promote cleaner and more energy efficient fuels and vehicle technologies. This newsletter contains news articles on research, development and demonstration of advanced motor fuels, information about related policies, links to AMF projects, and an overview over publications and events.

The newsletter is prepared based on contributions from Werner TOBER and Robert ROSENITSCH, TU Vienna, Shinichi GOTO, AIST, and Andy BURNHAM, ANL. It is edited by Andrea Sonnleitner and Dina Bacovsky, BEST – Bioenergy and Sustainable Solutions. The Newsletter is available online at: www.iea-amf.org.

AMF welcomes interested parties to make contact and to become members of the AMF family. If you wish to get in touch please contact the AMF Secretary, the AMF ExCo Chair or your national AMF Delegate.

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