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Sustainable Renewable and Recycled Carbon fuels: perspectives, opportunities and challenges after the pandemic

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Session 5.1: Covid 19 and Energy Sector: Technical Perspectives and Opportunities

Our analysis

- The EU SEM hindered during the pandemic. Relevance of domestic supply chains and strategic storage became evident
- So far, BIOeconomy & CIRCULAR economy, and so Biofuels, mostly focused on GHG savings, expecially in the EU
- However, these value chains are indeed real ECONOMY
- Sustainable transport fuels are part of a Bio/Circular approach
- Decarbonization and economic recovery are not competing, but can rather be two complementary sides of the same coin
- Domestic supply chains for food, materials and energy are needed in the post Covid-19 scenario

→The economic impact of well-designed sustainable transport fuels chains is as important as their effecst on GHG emissions

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Security of supply, strategic storage and Covid19: Which lessons learnt for renewable and recycled carbon fuels, and their future role in decarbonizing transport?

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HIGHLIGHTS

- The analysis investigates the link among pandemic and energy security/resilience.
- The relevance of strategic storage and short supply chains is highlighted.
- Distinct programs should address Oil and Renewable and Recycled Carbon Fuels chains during post-pandemic recovery.
- Short-term plans should support the immediate impact of Covid-19 on fuel industries, protecting jobs and economic activities.
- Medium to long-term program should promote domestic bio-based and recycled carbon value chains.

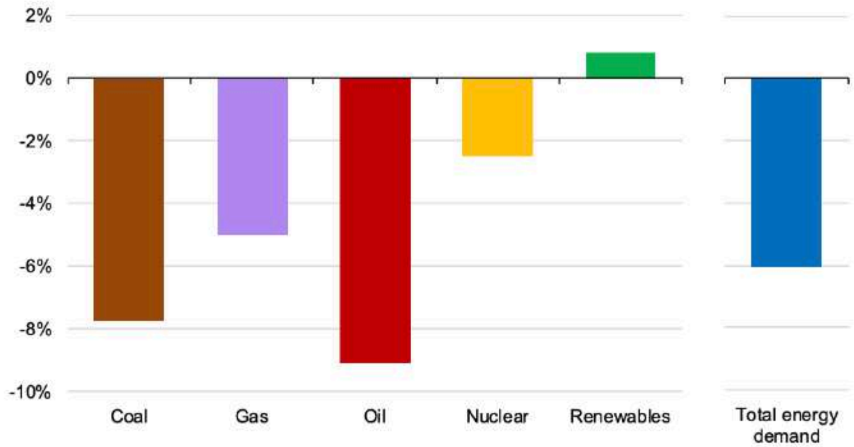
COVID19 AND THE OIL SECTOR

- Global oil supply is set to fall by a spectacular **12 mb/d** in May to a nine-year low of **88 mb/d** *(IEA: Oil Market Report, May 2020)*
- Lack of oil storage capacity due to collapse in demand. In April, > 80 large ships (tankers) wandering offshore.
  - In April, floating storage of crude increased by 9.8 mb to 123.8 mb (IEA)
- Signs of refinery storage bottlenecks in EU, Asia and Africa
  - Some refineries have been shut-down for undefined time
  - Industry stocks covering 90 days forward demand
- Brent prices almost halved compared to last year's average values, reaching 31.11 €/bbl, while those of WTI have fallen to 28.34 €/bbl (5/4/2020). This situation also led to the first-ever observed negative oil price case on 20 April 2020 for the WTI barrel, at −6.79 US$/bbl on 21/4/2020.

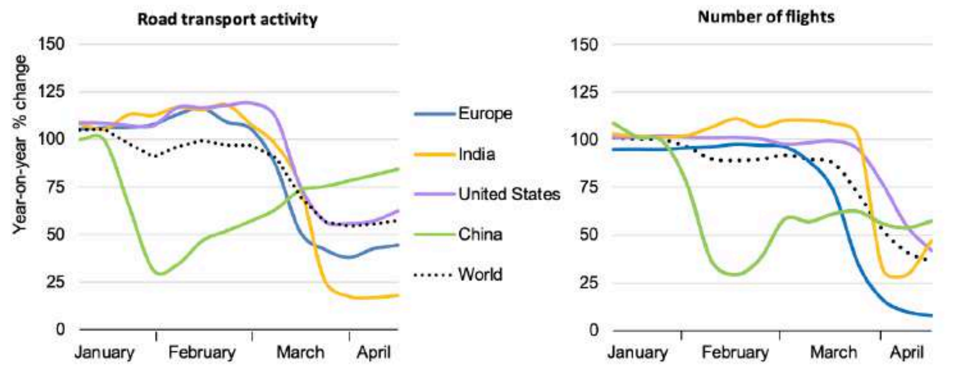
→ *Impact on* ***jobs*** *and* ***economic*** *activities beyond oil sector only*

IEA – Projected Changes in Energy

Projected change in primary energy demand by fuel in 2020 relative to 2019

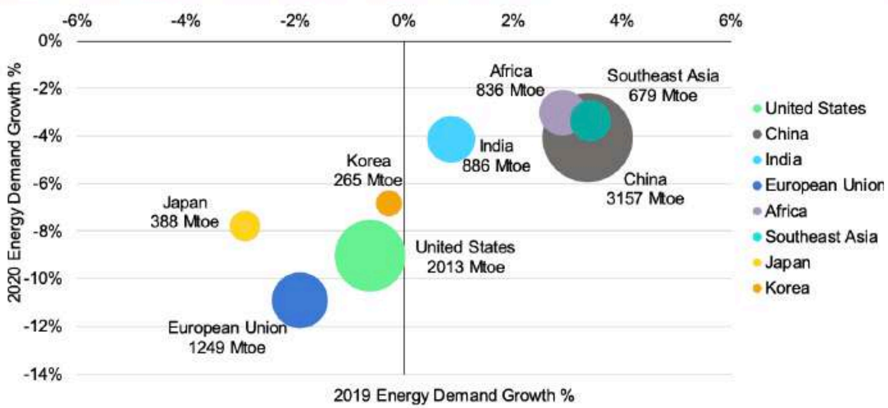


Evolution of road transport and aviation activity in 2020 relative to 2019

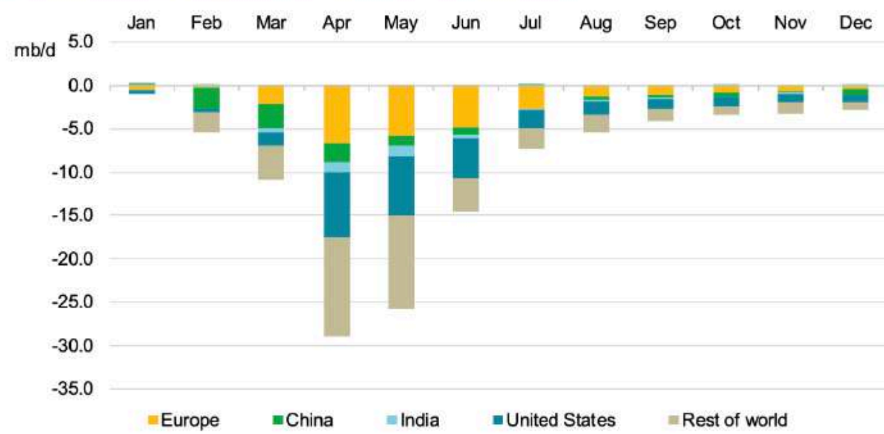


Source: IEA analysis based on Apple Mobility, Rystad Energy and OAG data.

Energy demand growth by region in 2019 and 2020



Change in monthly oil demand in 2020 relative to 2019

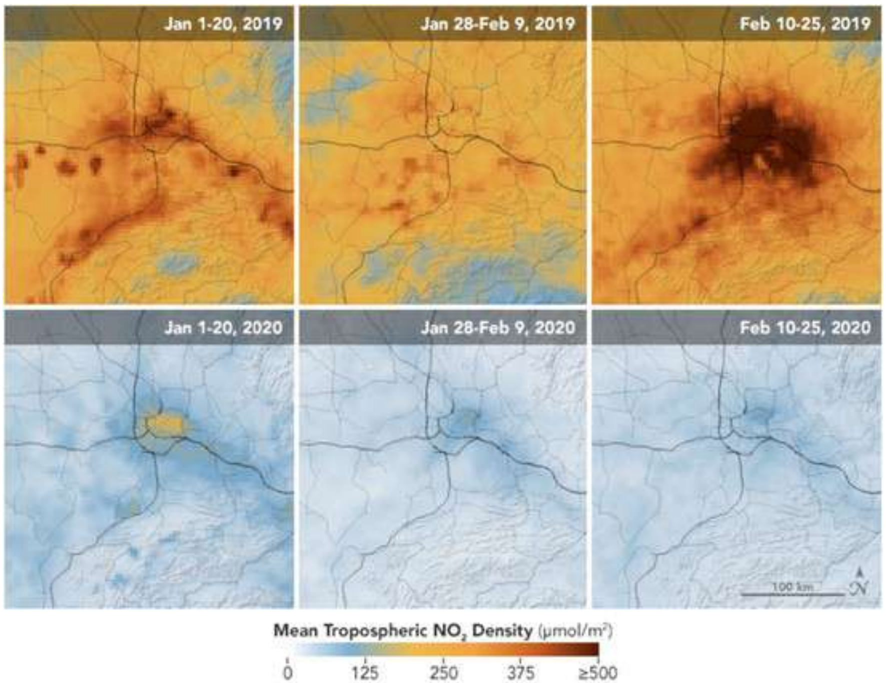


Source: IEA Oil Market Report – April 2020.

COVID-19 AND AIR POLLUTION

NASA earth observatory

The Washington Post
Democracy Dies in Darkness



January 1, 2019 - February 25, 2020

Pollutant drops in Wuhan during Covid19. No rebound effect observed till end of February 2020

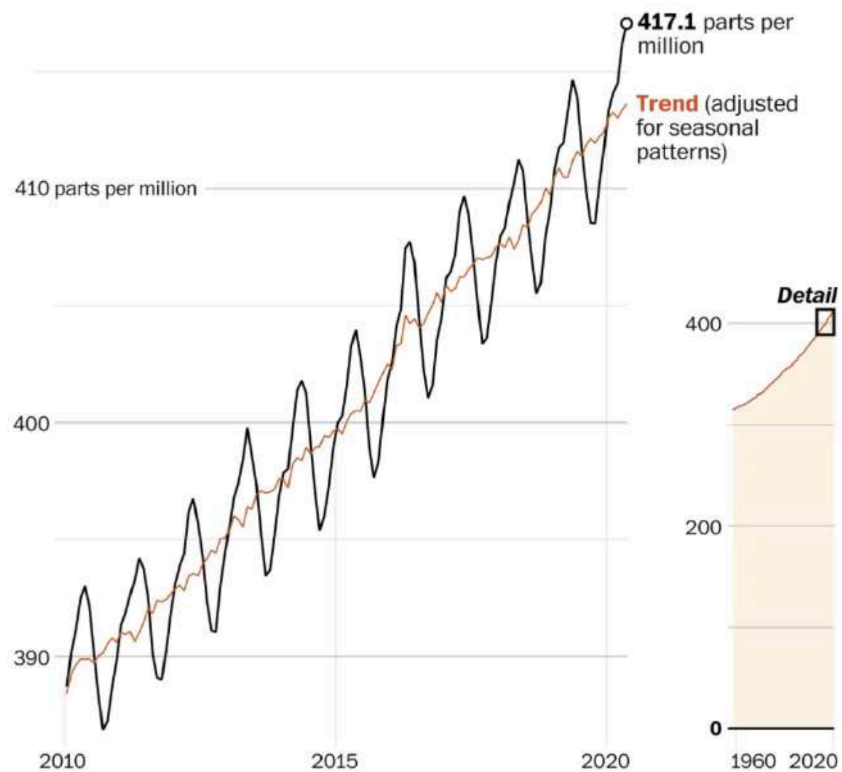
Earth Observatory. Airborne Nitrogen Dioxide plummed over China. Available at [https://earthobservatory.nasa.gov/images/146362/airborne-nitrogen-dioxide- plummets-over-china](https://earthobservatory.nasa.gov/images/146362/airborne-nitrogen-dioxide-plummets-over-china)

Capital Weather Gang

Earth's carbon dioxide levels hit record high, despite coronavirus-related emissions drop

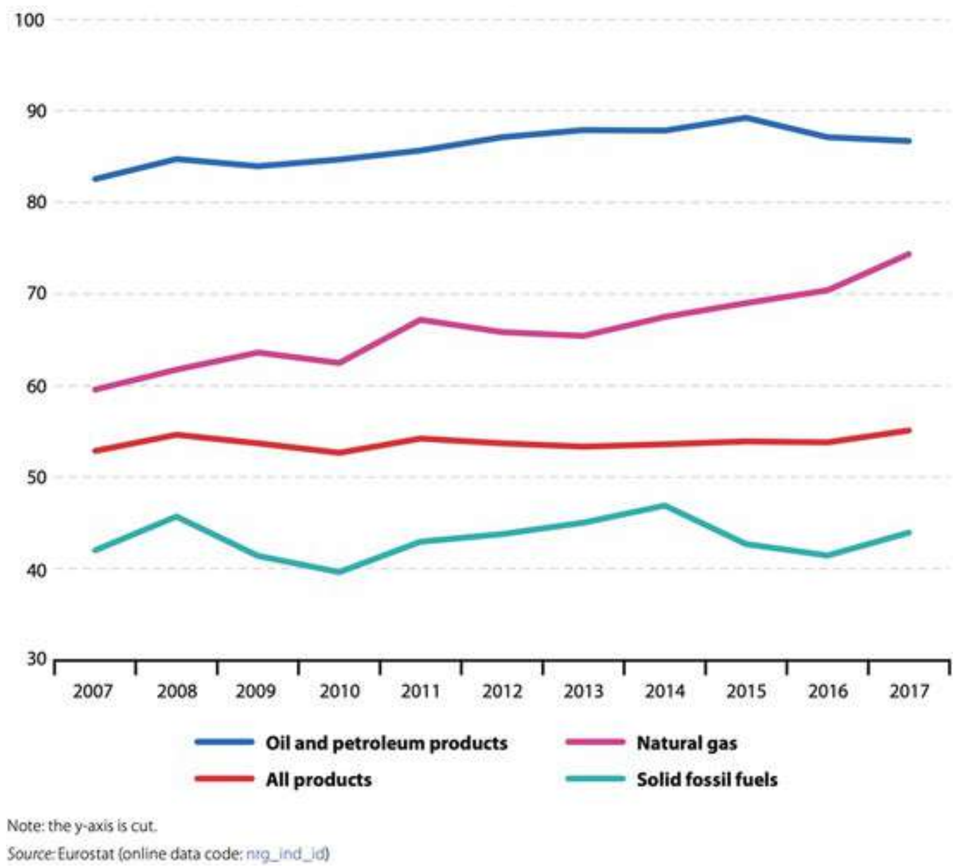
Carbon dioxide in atmosphere at record level

Mauna Loa Observatory measured a record monthly average atmospheric **carbon dioxide concentration** in May, typically the peak of the year.



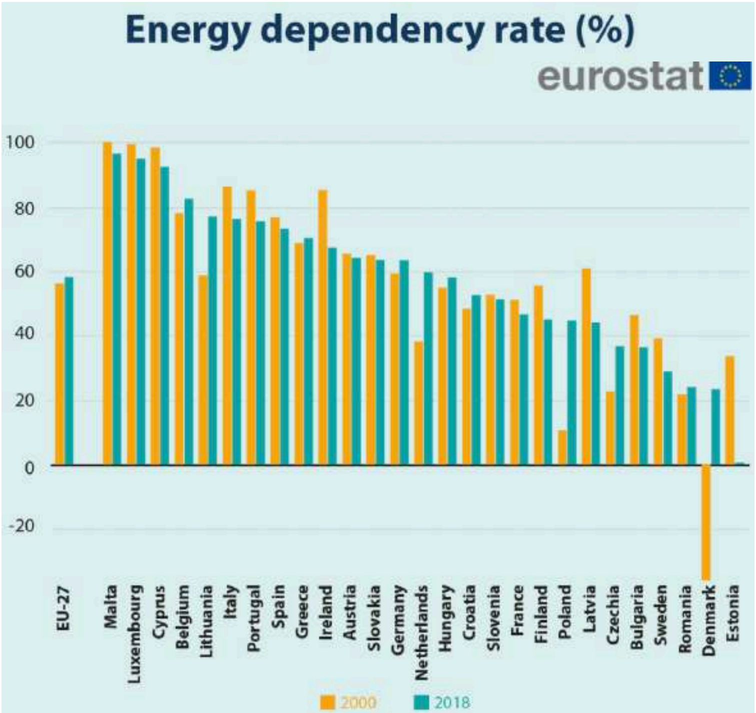
Source: NOAA Global Monitoring Laboratory JOHN MUYSKENS/THE WASHINGTON POST

EU: High Dependence on Imports



Energy dependence rate, EU-28 2007–2017, % of net imports in gross available energy

EUROSTAT. EU imports of energy products – recent developments Statistics Explained. November 2019. Available at https://ec.europa.eu/eurostat/statistics-explained/pdfscache/46126.pdf



- **EU depended on energy import by 58% in 2018** (56 % in 2000). 2/3[rd] of 2017 energy imports refer to petroleum products, followed by NG (26%) and solid fossil fuels (8%).
- Share of extra-EU imports in the energy sector dominated by Petroleum Oils and Oils from Bituminous Minerals (almost 70%), followed by NG and LNG (above 20%, combined).
- Transport in the EU is mostly linked to **imported quotas**.

SHORTER AND MORE SECURE SUPPLY CHAINS

Top economist: US coronavirus response is like 'third world' country

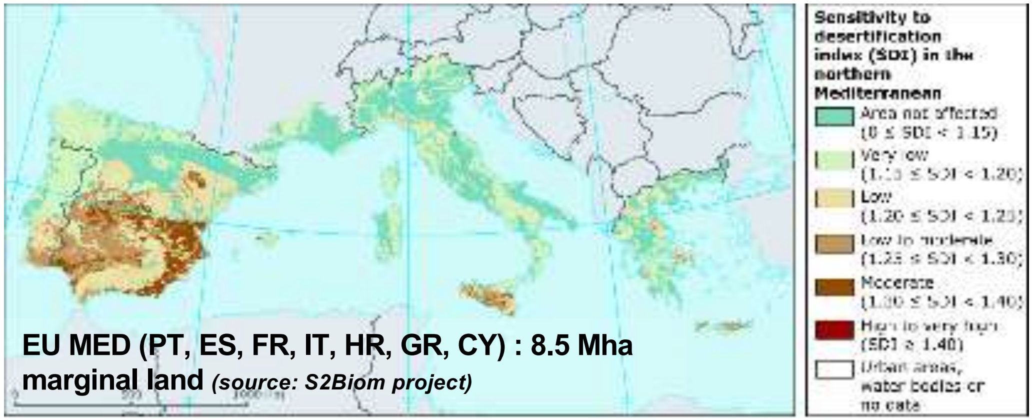
Joseph Stiglitz attacks Donald Trump, saying US on course for second Great Depression

- Coronavirus - latest updates
- See all our coronavirus coverage

The Guardian

Stiglitz said the current crisis would force countries to make themselves less vulnerable, and this would lead to shorter supply chains and a greater emphasis on self-sufficiency in food and energy.

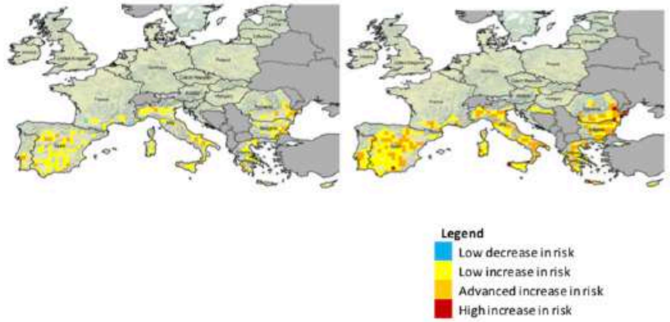
ROOM EXIST FOR MANY VALUE CHAINS: EU-MED



EU MED (PT, ES, FR, IT, HR, GR, CY) : 8.5 Mha marginal land ***(source: S2Biom project)***

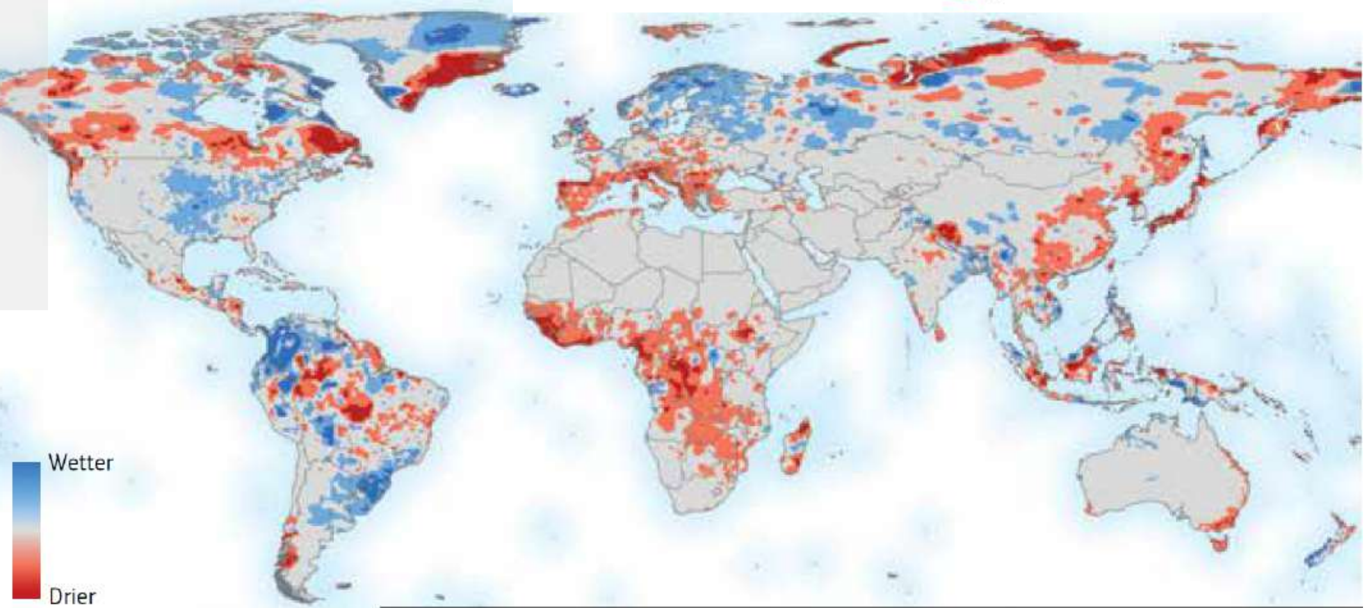
Figure 3 – Predicted change in desertification risk and aridity index in 2071-2100 compared to 1981-2010

– Predicted change in desertification risk[24] under 2.4°C scenario (RCP 4.5 – left) and 4.3°C scenario (RCP 8.5 – right) in 2071-2100 compared to 1981-2010[25].



Developing biofuel value chains in these areas will promote both **socio-economic recovery & decarbonization**

BIO4A: >10 M€ H2020 project on SAF from marginal land and UCO



Changes in Aridity Index: NE Brazil, S Argentina, the Sahel, Zambia and Zimbabwe, the Mediterranean area, NE China and Sub-Himalayan India have been identified as areas with a significant increase of dryland extent, while on average these decreased in the Americas [30].

Source: EC-JRC. World Atlas of Desertification, 3rd Edition. Mapping Land Degradation and Sustainable Land Management Opportunities. 2015. http://wad.jrc.ec.europa.eu

WELL DESIGNED VALUE CHAINS DESERVE HIGH ATTENTION IN POST-COVID ERA

Feedstock Production → Feedstock Conversion → Fuel Delivery → Fuel Use → GHG Chain Assessment

How *to make this linear biofuel thinking* ***sustainable (GHG) enough****?*

Multi-Feedstock Multi-Annual Production Design → Multiple Products → Multiple Markets → Product Use →

- Food
- Feed
- Energy
- Fuels
- Materials

Products for Sustainable Agriculture Model and Soil Recovery & Improvement

Bioenergy & Bioeconomy can make ***agriculture more sustainable*** *(beyond GHGs, towards* ***SDGs****)*

This approach will ***boost the Economy***

From linear to circular, from energy-driven to sustain.agricultural models

Bioenergy / Bioeconomy enabling Sustainable Agriculture

Well designed biomass value chain support post Covid19 economic recovery and bring Carbon back to soil

Transport fuels: a Policy Driven economy

- The large-scale deployment of RRCF is a **(multiple) policy-driven matter** (EU: LULUCF in CAP)
- **Multiple policies** should interact to improve impacts. Studies needed to provide policy makers with recommendations. e.g.

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ELSEVIER

Research paper

Policy measures for sustainable sunfl
lands amended by biochar: case stud

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ABSTRACT

The aim of this
profitability of la
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ELSEVIER

Impacts on industrial-scale market deployment of advanced biofuels and recycled carbon fuels from the EU Renewable Energy Directive II

Check for updates

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HIGHLIGHTS

- EU issued REDII on Dec.2018, to be incorporated by Member States in 18-months.
- We investigated industry implications of the new policy framework over 2020–2030.
- The impact on market development of some Delegated Acts (DA) is also discussed.
- Pathways where the DAs can delay the market deployment have been identified.
- Aviation was specifically considered under the forthcoming UN ICAO CORSIA programme.

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Advanced biofuels

ABSTRACT

Alternative and Renewable Transport Fuels, grouping both Advanced Biofuels and Recycled Carbon fuels, are key routes for the decarbonisation of European Union (EU) and global transports: being sustainable transports a policy-driven area, the development and deployment of advanced biofuels and recycled carbon fuels will depend

Conclusions

Based on Covid-19 first analysis of impacts on the transport fuel sector, Policy Makers should act at two different timescales:

- Support to meet **SHORT/MEDIUM-TERM** goals – **Assist fuel companies to overcome the collapse of demand** and the economic shock, preserving direct and indirect **jobs and business**

- Support to meet **MEDIUM/LONG-TERM** goals – Increase the ambition and promote **higher amounts of domestic Renewable and Low Carbon Fuels, injecting economic resources on green domestic supply and conversion chains**.

- **Rebound effects** to be carefully monitored (shift to private transports)

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