

Consumption and production patterns in 2050 - context & uncertainties

Prelim review of key sources by Ms KHOR Yu Leng
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Plenary Session: Future proofing the RSPO: The State of Palm Oil in 2050,
RSPO RT2022, 30 Nov 2022, Kuala Lumpur





Forecast for vegetable oils world market & evolution of end uses (for EU Commission report), LMC 2018

From 2018 outlook for the EU Commission report on palm oil, what are the drivers of the latest (changing) view on the future?

Vegoil in food use is the biggest driver (population + urbanisation) but expectations are moderating. Biofuels had a big boost in the 2000s, then slowed, and will bump up again in the 2020s with political support. Other uses - oleochemicals jumped from a small base (HPC & animal feed). 80% food share drops to 70%, with 2nd biofuel boom (renewable diesel-SAF driven plus animal feed).

Vegoil supply. Palm oil growth is revised down, and soybean oil, sunflower oil are revised up.

Table 32: World forecast of vegetable oil demand by end use (million tonnes)

| | 2015 | 2016 | 2017 | 2020 | 2030 | 2040 | 2050 |
|------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Food | 136.8 | 141.9 | 146.7 | 158.7 | 199.0 | 248.1 | 309.4 |
| Policy-Driven Biofuels | 25.0 | 29.6 | 31.3 | 38.3 | 41.2 | 44.6 | 48.2 |
| Other Industrial | 11.6 | 12.0 | 12.4 | 13.5 | 18.4 | 22.6 | 27.8 |
| Total | 173.5 | 183.5 | 190.3 | 210.6 | 258.5 | 315.2 | 385.3 |



Table 33: World forecasts of demand for major vegetable oils (million tonnes)

| | 2015 | 2016 | 2020 | 2030 | 2040 | 2050 |
|--------------------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Soybean | 48.0 | 51.7 | 59.9 | 74.3 | 91.5 | 113.0 |
| Sunflower seed | 14.1 | 15.1 | 17.4 | 19.0 | 20.6 | 22.4 |
| Rapeseed | 27.2 | 28.1 | 30.4 | 37.5 | 46.1 | 56.7 |
| Coconut | 3.3 | 3.2 | 3.5 | 3.8 | 4.0 | 4.3 |
| Palm Oil | 58.6 | 59.9 | 69.5 | 89.6 | 113.3 | 142.2 |
| Palm Kernel Oil | 7.2 | 6.8 | 7.8 | 10.0 | 12.7 | 15.9 |
| Total incl others | 173.5 | 183.5 | 210.6 | 258.5 | 315.2 | 385.3 |



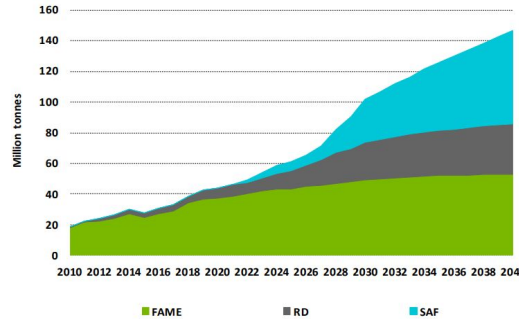


The Outlook for Commodities Amidst Geopolitical Challenges, LMC 2022

2022: The EU and US are currently engaged in two “wars”: (i) Russia-Ukraine, (ii) against ‘carbon’ to reach “net zero”. Both have pushed up commodity prices by creating additional demand while producing uncertainty and encouraging underinvestment (in fracking & vegoil supply).

Which will require large amounts of feedstocks

Fatty Acid Methyl-Ester (FAME), Renewable Diesel (RD) and Sustainable Aviation Fuel demand, historical and forecast



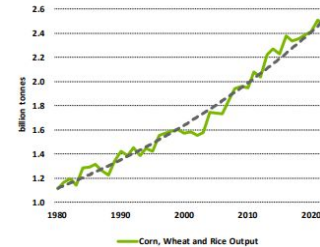
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The Outlook for Commodities

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While vegetable oil output has fallen behind trend

Global cereals output against long run trend

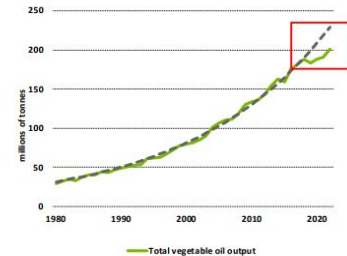


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Global vegetable oil output against long run trend



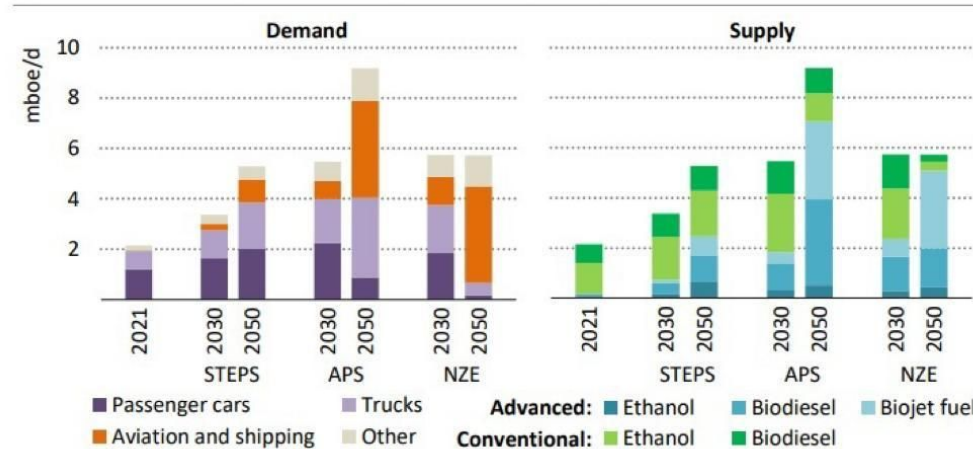


IEA report outlines growth potential for liquid biofuels @EthanolMagazine

Liquid biofuel increases in all scenarios.

“Post 2030 significant slow down in biofuels as mandates are met and diesel consumption declines - though that could change if there were even more commitment to SAF.”

Figure 7.8 ▶ Liquid biofuel demand and supply by scenario



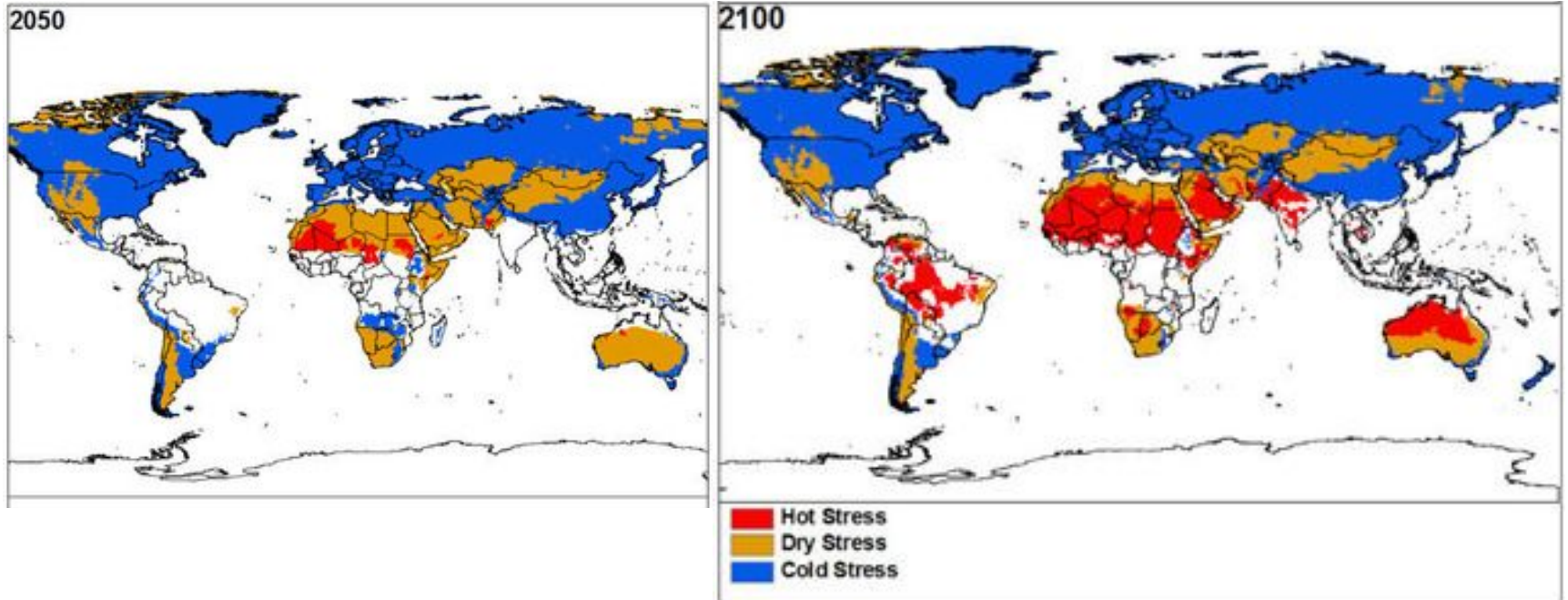
IEA. CC BY 4.0.

Liquid biofuel use increases in all scenarios, more than doubling to 2030 in the APS and NZE Scenario, with increasing shares produced from non-food crop feedstocks

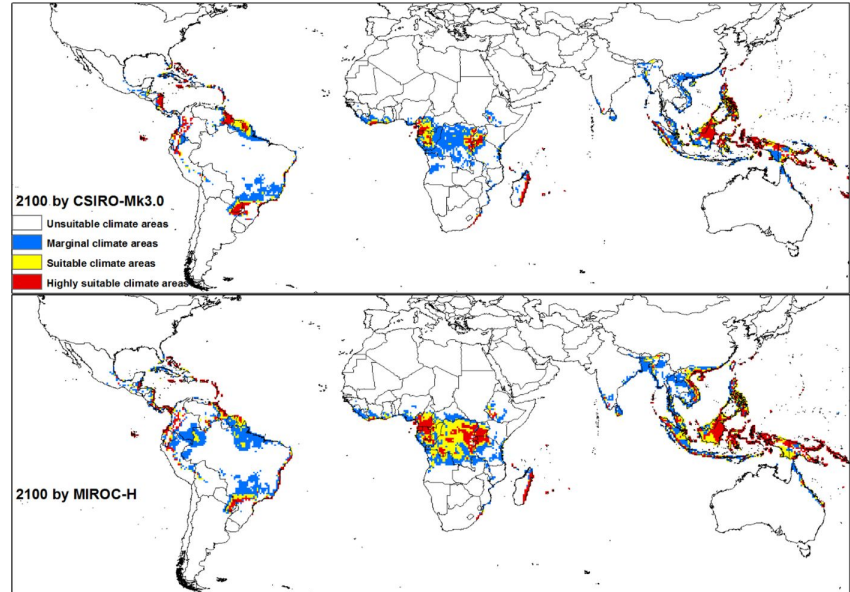
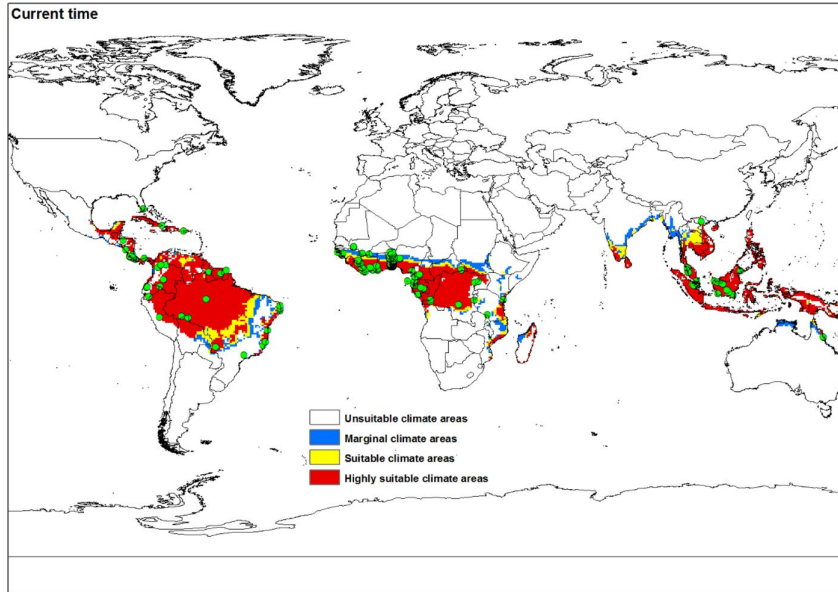
Note: Other includes other transport, industry, buildings and agriculture.

YL Khor, 30 Nov 2022

Climate change and oil palm suitable regions, Paterson et al., 2017



Climate change and oil palm suitable regions, Paterson et al., 2017





Climate change affecting oil palm agronomy, and oil palm cultivation increasing climate change, require amelioration, Paterson & Lima, 2017

For Indonesia, Malaysia - dramatic decrease in highly suitable climate (HSC) areas by 2100.

Kalimantan and the Philippines may be more suitable for growing OP than Thailand and Myanmar, with Papua New Guinea being intermediate.

Phytophthora palmivora causing devastating outbreaks in Latin America and especially Colombia....likely to reduce the sustainability of the OP industry by 2050 and further by 2070 and/or 2100. Brazil appears less threatened by the disease under these scenarios.

Ganoderma disease of oil palm to significantly reduce production after 2050 in Sumatra if projected CC occurs.

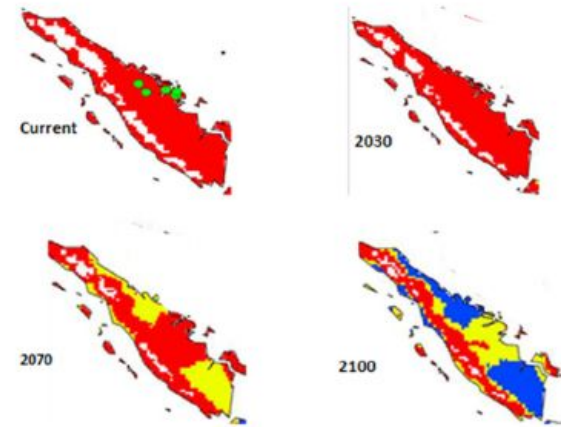


Figure 2. Maps of Sumatra demonstrating suitable climates for growing oil palm at present and in 2030, 2070, and 2100. Red = highly suitable climate; yellow = suitable climate; blue = marginal climate; white = unsuitable climate. The maps represent the CSIRO-Mk3.0 global climate model running the Special Report on Emissions Scenarios (SRES) A1B scenario [13].



Consequences for oil palm industry & voluntary certifications like the RSPO?

- Demand side changes. Tapping into food use markets moving with urbanising population growth trends in developing markets. Staying alongside oleochemicals and animal feed. Mandate-driven biofuels ramps up, but remains out of reach?
- Supply side changes. Climate change and disease surprise risk for origins? Staying relevant with medium and small sized producers and also flexible for novel areas.
- If vegoil supply side is dragging, and higher prices are ongoing, producers can afford to certify. But how to fit in with the reality of newer/more recent cut off dates?