Green Pool

Mapping tomorrow's markets

Indian Sugar – The Impact of Over-production on Sugar Industry Revenues

For:

Australian Sugar Milling Council Pty Ltd

IBM Building

Level 11, 348 Edward St,

Brisbane, Australia

By:

Green Pool Commodity Specialists

Brisbane, Australia

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About Green Pool Commodity Specialists

Who we are

Green Pool Commodity Specialists Pty Ltd is an independent and privately owned company based in Brisbane, Australia, which specialises in global sugar and biofuels market analysis, reports and consultancy.

Green Pool was launched in 2011 and has since developed a reputation as one of the leading independent sugar and ethanol analysts.

The Green Pool team

Green Pool consists of a well-established and experienced team comprised of both commercial practitioners, many of whom also have significant experience on the producer, marketing and/or trading side.

In addition to the Australian team, Green Pool has a biofuels analyst in the UK and a market analyst based in New York, plus representatives in the US.

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Executive Summary

In the recent past, India's government has regulated the price of sugarcane at prices well above global levels, and directly subsidised surplus sugar through the export of up to 6.0 million tonnes per annum, through government payments to both farmers and mills. Over the four years 2017/18 to 2020/21 this subsidy, based on the government's export quotas, is estimated to have cost Indian taxpayers US $1.998 billion (A$2.578 billion at current exchange rates) (Figure ES 1). The highest subsidy payment was in 2019/20, when US$853 mln (A$1.108 bln) was paid against exports of 6.0 mln mt sugar. Besides export subsidies and regulated cane prices, India's government also fixes domestic sugar prices well above global prices and provides soft loans to milling companies to build ethanol distilling operations to utilise sugar and processing by-products (eg molasses).

Sugar export subsidies have been paid by the Indian government many times during periods of oversupply in the past 20 years. However, they have become an almost permanent feature of government expenditure since the 2017/18 season. Given India's current sugar production capacity (33 mln mt plus) greatly exceeds domestic sugar consumption (25-26 mln mt), export subsidies are likely to be an ongoing feature for many years, unless an attempt is made to reign in over-production.

Federal and State Indian governments set industry minimum cane prices which are very high by global standards. The federal government also compels mills to accept all cane grown. For example, in 2019/20, Indian farmers were paid US$38.6/mt of cane for FRP (federal government-set Fair and Remunerative Price), while Uttar Pradesh's State Advised Price (SAP) equated to $46.4/mt (Figure ES 2). This compared to an average of US$26/mt that Australian farmers received that year, and an average US$22.5/mt that Brazilian farmers (Consecana, SP state) were paid. For comparison, Thai cane farmers in 2019/20 were paid an average US$27.1/mt.

India's high, government-set domestic sugar prices are far higher than global white sugar prices. Indian farmers and millers have no incentive to prevent over-production – since the government picks up the tab for the difference between the mill's cost and the lower export price on global markets.

Sugar prices in India are higher than they would otherwise be because of the high, government-set cane price (Figure ES 3). Cane purchase is a sugar millers' highest single cost. Indian taxpayers underwrite government subsidies for sugar exports to global markets, including into countries where Australia competes for market share (eg Indonesia, Malaysia etc).

Exports of large volumes of subsidised Indian sugar distort global markets, forcing prices lower, and hurt other exporters such as Brazil, Guatemala, Australia and Thailand which export a large portion of their total sugar production to global buyers. India is now the world's largest or second largest producer of sugar. The volatility in India's deficits/surpluses is highly correlated to global supply and demand and to price fluctuations (Figure ES 4). The effect is that India's large domestic surpluses are converted to large export tonnages which depress global prices and reduce other producers' revenues from what they would have otherwise been.

Brazil, Guatemala and Australia made a formal complaint to the World Trade Organisation (WTO) on 28 February 2019 regarding India's subsidies to its sugar industry and the harm done to other exporters in the global sugar market. After consultations, a formal panel was requested in July 2019 with first and second hearings held in December 2020 and March 2021 respectively. The panel's report is expected to be handed down during 2021.

Figure ES 1

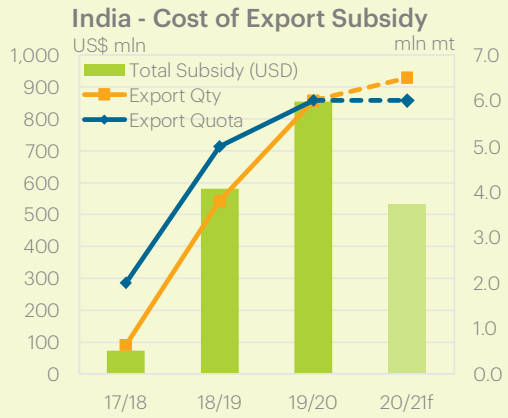
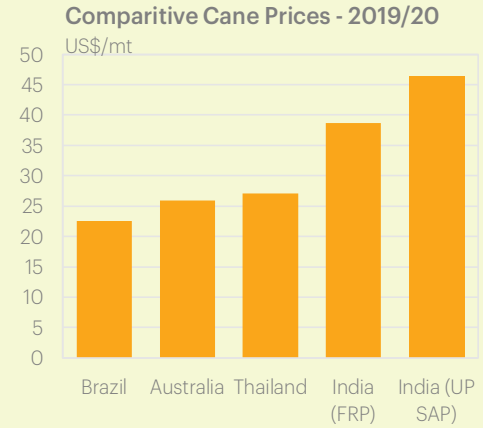


Figure ES 2



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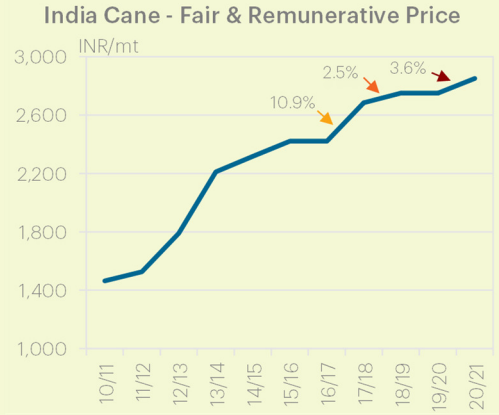

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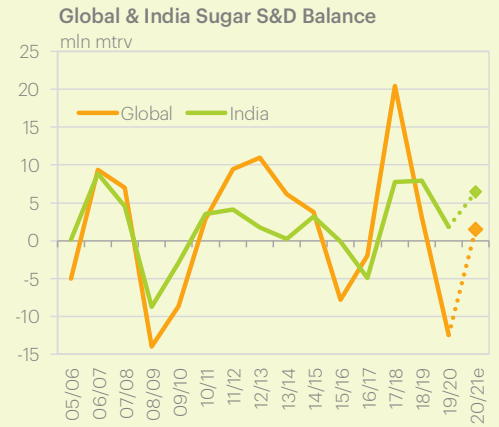


Using a measure of global stocks-to-use (STU) versus price (Figure ES 5) we calculate India's exports from 2017/18 to 2020/21 have lowered global sugar prices by an average 13.1%, costing Australian sugar producers an average of A$63/mt of sugar over each of those four years, for a total loss of A$1.023 billion (nominal terms) (Table ES 1). Additional costs are incurred due to displacement of Australian sugar exports from favoured higher-returning markets, and through lower regional premiums for Australian exports.

In summary, India's sugar export subsidy programme since 2017/18 has become virtually institutionalised. India is now a structural exporter of sugar, with subsidies on exported sugar of up to one-third of an Indian mill's cost of production of raw sugar (which is less than that of white sugar). In Figure ES 6, the Indian subsidy programme is compared to the NY11 global raw sugar price, both in US cents per pound (with India's rupee subsidy converted to US c/lb at prevailing exchange rates). Subsidies were first announced in this latest surplus/subsidy cycle on 8 May 2018, at the equivalent of US$116/mt (5.26 c/lb). With uncertainty as to whether these subsidies would be continued from October 2018, the market rose, then fell when even higher subsidies were announced. **Global prices spent much of their time since India has been heavily subsidising exports, between 10 and 12 c/lb, which is below the cost of production for most efficient producers.** In Oct/Dec 2020, no new subsidy programme was announced (orange line on graph) and prices rose, after which India announced a reduced subsidy, into a tightening world sugar market.

Ethanol Blending - India's government first introduced a programme to boost ethanol usage blending into petrol/gasoline in 2005/06. This programme has been reinvigorated in the past three years to boost ethanol production from sucrose, not just molasses (attempting to reduce sugar surpluses). A higher sucrose percentage in fuel ethanol is now more highly remunerated by India's (mostly government-owned) oil companies than is molasses ethanol (despite it being the same product). The government target has been 5% for some years, growing to 10% blend by 2022 and 20% by 2030 (this has recently been revised back to 2025, and perhaps 2023). We estimate that 7.5% blending of ethanol is currently being achieved (Figure ES 7). There is further scope for ethanol to displace imported oil/gasoline in India's fuel market. However, India's fuel ethanol production capacity is close to maximum utilisation, and further gains will require the construction or expansion of more distilleries.

Addressing the structural oversupply of cane/sugar in India will take more than simply relying on a diversion of cane juice from sugar to a slowly-building ethanol blending programme, because of current and anticipated distillery capacity limits. Also, even if India were able to achieve a 20% blend rate for ethanol by 2025, there remains residual risk to Australia and other sugar exporters. First, a subsequent or even current Indian government could decide to alter the blend programme to reduce retail fuel costs. Second, car manufacturers in other countries have raised substantial resistance to anything more than a 10% blend, and India does not yet produce engines for Flex-Fuel Vehicles (FFVs). Third, if India was to privatise any or all government-owned oil companies, they may not feel compelled to blend high rates of expensive ethanol if global oil prices were lower. Those factors present risks to other sugar exporters, raising doubts over the ability of India's current ethanol programme to address structural oversupply of cane/sugar.

So, it is likely to require real curbs – cane and sugar price liberalisation and market signals to grow alternative crops – to ensure sugar stocks are manageable. Achieving this will almost certainly require the government to deregulate the industry. That has been the part recommendation of several previous review committees that India's government appointed to overhaul sugar industry structures (including India's Rangarajan Panel on Decontrol, in the report of 5 October 2012).

Figure ES 5

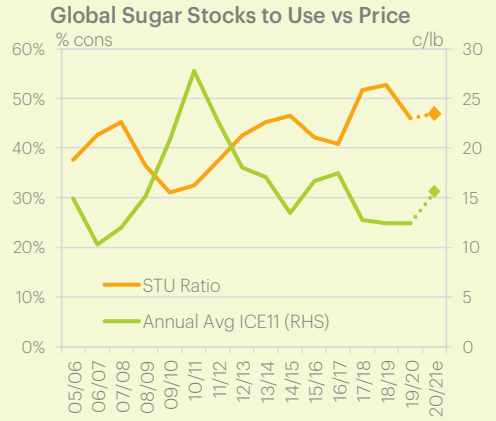
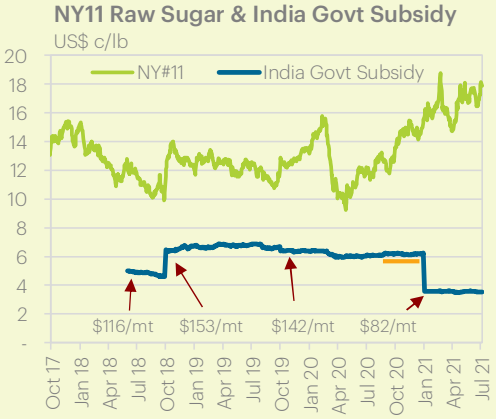


Table ES 1

Australia Sugar Production

ooo mttq	17/18	18/19	19/20	20/21*
Crop Year (Jun/May)	4,330	4,555	4,130	4,180
Statistical Year (Oct/Sep)	4,605	4,000	3,920	4,330
US TRQ (Oct/Sep)	90	110	115	80
Exposed Tonnage	4,515	3,890	3,805	4,250
Est. Damages (A$/mt)	$45	$36	$122	$51
Est. Damages (A$/ mln)	$203	$140	$463	$217

Figure ES 6



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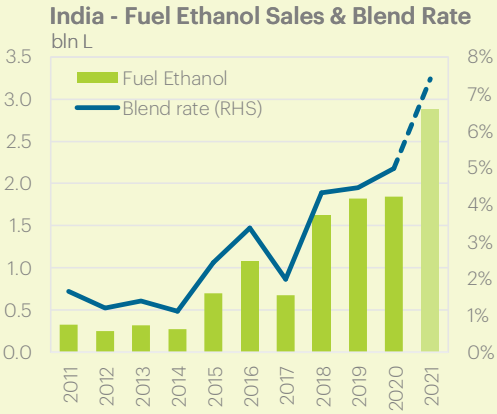


Global sugar market setting

India has always been a major sugar producer and consumer (Figure 1). It has traditionally been a swing importer/exporter of sugar, meaning that supply would normally contract after large production years, because of the non-payment of arears from the millers to the growers. This cycle has now been interrupted by the payment of subsidies to growers and mills and India's structural production surpluses are now the global market's biggest swing factor. Figure 2 shows India's domestic surplus/deficit situation compared to the global situation (Oct/Sep basis). There has been a strong correlation (R^2=0.70 for 2005/06 to 2017/18, R^2=0.51 for 2005/06 to 19/20) (Figure 3) – as is befitting a major swing factor in a commodity where trade accounts for only a limited portion of the global market. This relationship though has weakened over time, as India turned into a relatively stable large exporter. Historically, surpluses and deficits in the global market drive prices, and India's sugar balance has over time driven the global balance. **The market focusses intently on India's balance, because it matters to the global trade situation. India has moved from importer/exporter to a structural exporter.**

Global market Cost of Production

Long term average prices in commodity markets tend to reflect one of two related factors - the cost of production (COP) of efficient producers (in times where the market is adequately supplied) or the cost of bringing new production into the market (when it is suffering structural undersupply). Efficient markets commonly bring in production from the most efficient supplier first. Thus, longer term average market prices tend to reflect the cost of efficient supplier(s) bringing new supply into an expanding market. In the raw sugar market (Figure 4), the price average since Jan 2000 (over 21 years) is 13.94 c/lb while the most recent 5 years since May 2016 was 14.45 c/lb.

Green Pool's estimates of COP for the efficient global raw sugar exporters (Brazil, Thailand, Australia) are between 12-18 c/lb over that 5-year period (and more recently 12-16 c/lb), so for the market to average 14.45 c/lb supports the logic outlined above. India's estimated COP over the same 5-year period has been 22 to 23 c/lb. **India's sugar milling sector is not globally competitive and requires export subsidies to compete with exports from efficient producers such as Brazil, Thailand, Guatemala, and Australia.**

India Cane Prices – a one way street

The most efficient global cane growers and sugar producers, including Australia which is not subsidised by government, have market disciplines thrust upon them – that is, cyclically low prices enforce cost efficiency. Very few farmers globally have the security of an ever-increasing cane price as Indian farmers do (Figure 5 next page) (note State Advised Prices are often higher than the FRP and are also rising). Indian farmers receive further support by way of assistance payments (paid via mills) and further energy, water and fertiliser subsidies. In combination with favourable weather, the effect of these subsidies since 2017/18 was to boost cane and sugar production far in excess of domestic sugar requirements and dramatically build stock levels in India. In consequence, additional export subsidies have been provided by government to incentivise mills to 'offload' sugar externally, due to their high fixed costs, falling domestic sugar prices and lower global prices. In doing so, globally efficient producers have suffered, because they are unable to consolidate their competitive position, thereby incurring operating losses which end up threatening their viability.

Figure 1

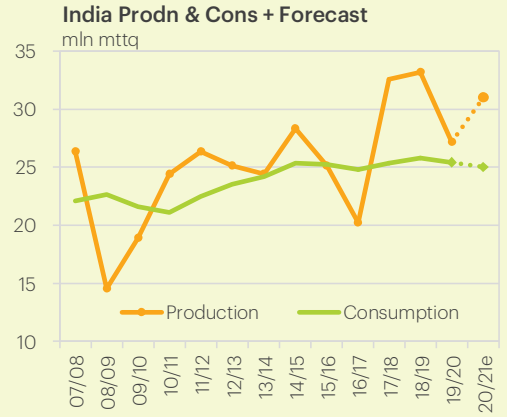
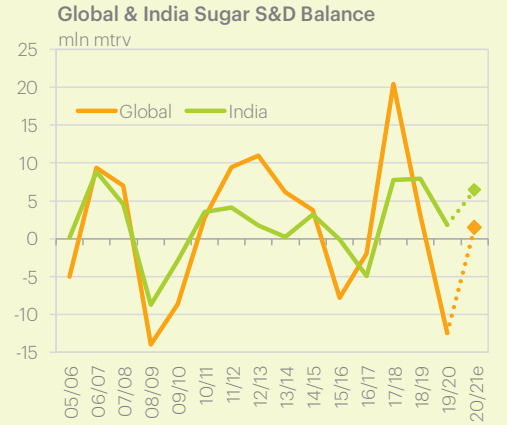


Figure 2



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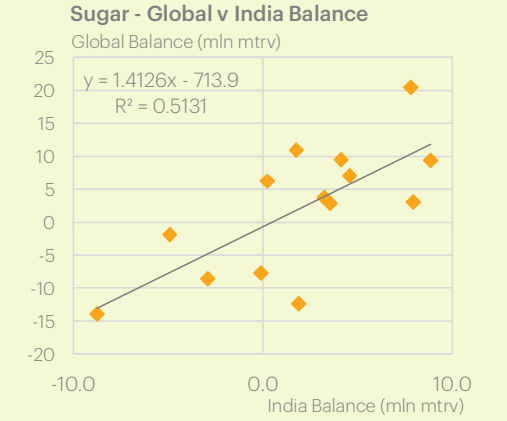

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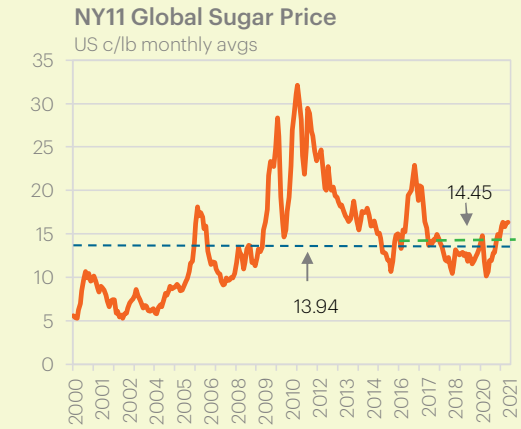


India's fixed prices for cane are never fixed lower than the prior year, and they are not orientated to either domestic price controls or variable export parity prices. **Figure 5 shows that even after the 10.9% rise in the FRP in 17/18, which caused a massive domestic surplus, India's government went ahead in July 2018 and locked in a further 2.5% rise for 18/19 (not by coincidence a National government election year in India).** Cane prices were raised again by 3.6% for the 20/21 harvest season, despite ongoing very high stock levels.

It is the combination of high and increasing federal and state-determined cane prices and other generous subsidies, together with increasing cane yields (and therefore efficiencies) and high reservoir levels coupled with increasing water efficiency (water storage) that results in ongoing surplus production in India. The only restraints currently appear to be very dry weather and/or mills payment defaults (ie farmer cane payment arrears).

The Cost of Surplus Production

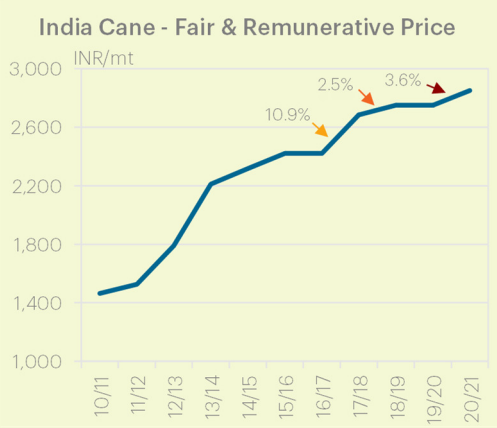
High cane prices and improved cane varieties and agronomy have virtually locked India into an ongoing structural surplus cycle (Figure 1 above). Its only solution to escaping the mounting high-cost domestic stocks in the short term is to export this surplus production onto the global market. The Indian milling industry spends a large amount of time and energy lobbying the Indian government to provide export subsidies and other government assistance to facilitate sugar exports, and to improve the sector's financial viability. The global sugar market has reacted strongly to these significant subsidies and volume of exports – such as the sharp fall in 2018 in response to the threat of large compulsory exports under generous subsidies.

Figure 6 shows India's status regarding imports/exports since 2009/10. In reaction to India's variable import/export status, several toll refineries were built to import raw sugar and refine it if India was in deficit, but able to toll refine Brazilian raw sugar for re-export if India was in surplus. This has developed into a commercial trade, whereby even if India is in a surplus year, Indian toll refiners will import Brazilian raw sugar and re-export it in the region. These toll refiners sometimes buy Indian raw or domestic white sugar (Low Quality White or LQW) for processing into refined sugar for export. Some Indian toll refiners are globally competitive, setting regional benchmarks.

India's taxpayers ultimately pay for the subsidies offered to mills and farmers. Figure 7 shows the quantity of exports allowed under the Indian government's subsidised export programme, and the cost of that export subsidy. From a low volume of exports in 2017/18 (stock rebuilding after the drought-impacted 2016/17 crop), India began to ramp up its subsidy amount and volume of exports in 2018/19 onwards. Even when drought again impacted in 2019/20 (production fell to 27.2 mln mt, a surplus of around 1.76 mln mt), the government incentivised 6.0 mln mt of exports, which (with extensions to end December 2020) was completely utilised. The per tonne subsidy in 2019/20 equated to around US$142/mt. Again in 2020/21, the government has kept the subsidised volume of exports steady at 6.0 mln mt (Figure 7 orange dotted line), while cutting the monetary amount of the subsidy from $142 to $81/mt (green bar) due to global sugar prices having moved higher in the meantime.

It is possible that in 2020/21 (Oct-Sept), India may export the full 6.0 mln mt quota covered by government subsidy, and then export more without subsidy if the market moves over an estimated 18.5 c/lb (currently near 17 c/lb). Millers appear ready to export at such levels, given domestic market prices are now set by government, and exporting can assist millers to avoid substantial storage and financing costs for a full year or more.

Figure 5



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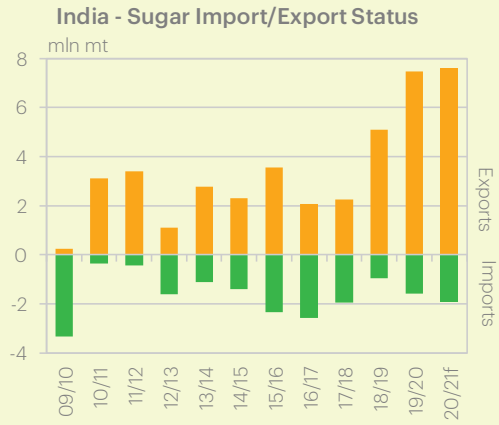
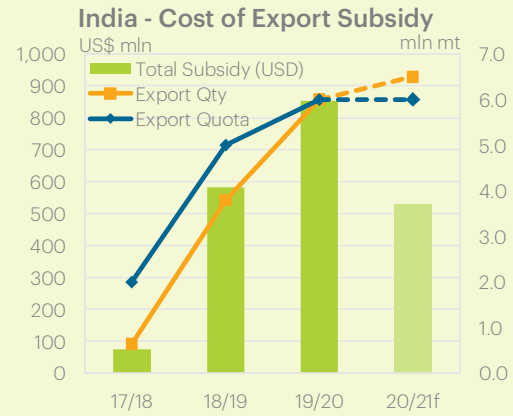


Figure 7



In short, the decision of India's government to financially support significant levels of exports (initially compulsory) has had a real and perverse impact on the global market. Since 2017/18 with very large domestic surpluses, India's government has provided subsidies directly to mills, to allow them to pay farmers – this is revenue they would otherwise not have received. Some mills characterise this revenue in their annual reports as "other revenue" and say that without it, they would have been unable to pay for cane crushed.

Brazil adopts "least-loss" strategy

Brazilian sugar and ethanol producers (millers) are unique in having a large domestic market for ethanol and being able to switch production substantially between the two products. If sugar pays well, Brazil's millers switch sucrose to sugar production, if ethanol pays better, they switch to ethanol output. Brazil was forced to react to India's overproduction - which took global market prices down with it – as India pushed out subsidised sugar to global importers. With low global sugar prices, Brazil (the world's largest exporter) was forced to focus on ethanol, despite ethanol prices also being unfavourable – but ultimately more favourable than global sugar prices.

Figure 8 shows Brazil's reaction to low prices in 2018/19 and 2019/20 – it sharply reduced sugar output as the global market surged into surplus, a surplus with a large component of Indian sugar. For both these years, the switch from sugar to ethanol production kept global sugar prices higher than they would otherwise have been if Brazil's sugar production had been maintained at prior levels (Figure 9). In 20/21, a sharp drop in both India's surplus and Thailand's crop allowed Brazil to make more sugar at remunerative prices. In 2021/22, Green Pool predicts that dry weather will reduce Brazil's cane crop in the Centre-South region, but mills will still attempt to produce close to 35 mln mt of sugar, given that it has been "hedged" at remunerative prices over the past year (given Brazil's low currency value).

If Brazil did not have such flexibility to switch out of sugar into ethanol production, global sugar prices over the period of India's overproduction and export since 2017/18 would likely have been significantly lower than has actually occurred.

Market impact of Indian sugar exports

The enormous commercial advantage to the Indian sugar industry from the export subsidies is shown in Figure 10. On an FOB (free-on-board) West Coast India (WCI) basis, the orange line shows the raw sugar export price Indian millers would need, to achieve parity with domestic sales. For comparison, the dark red line shows the FOB raw sugar export price at which it is feasible for Indian millers to export, inclusive of government subsidies. **For much of the period from September 2018 to December 2020, the roughly US 6 to 7 c/lb equivalent given to millers by the government allowed them to export sugar at a price as low as 11-12 c/lb.** Millers took full advantage of these government subsidies to ship product to a wide range of global markets, for all grades of sugar – raws, low quality whites and refined sugar.

It has taken several years, a major drought and production switch in Thailand, and a major switch from sugar to ethanol in Brazil to cope with this subsidised assault on the global market by Indian sellers. Global sugar prices (Figure 10 - green line) have struggled to gain any ground above the Indian export selling price, and have spent considerable time below this level.

Figure 8

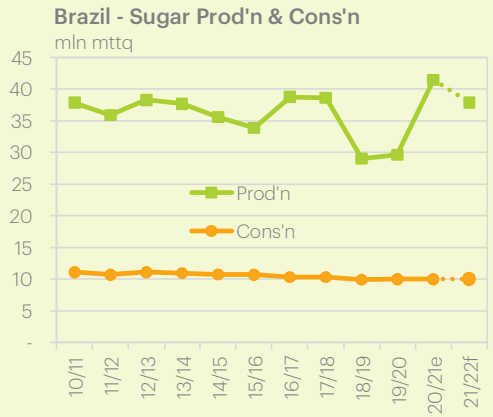


Figure 9

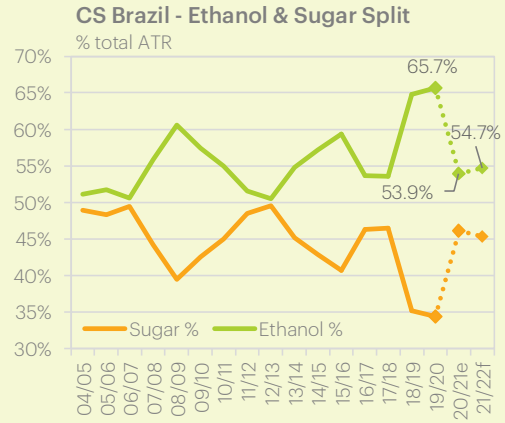


Figure 10

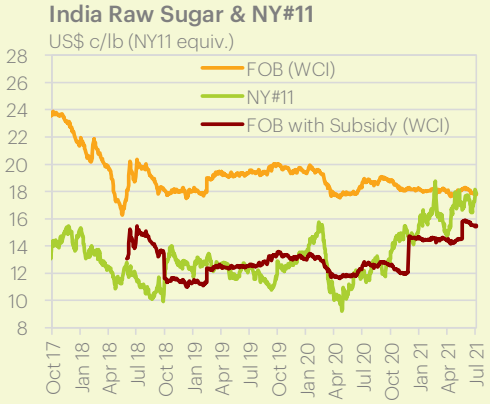
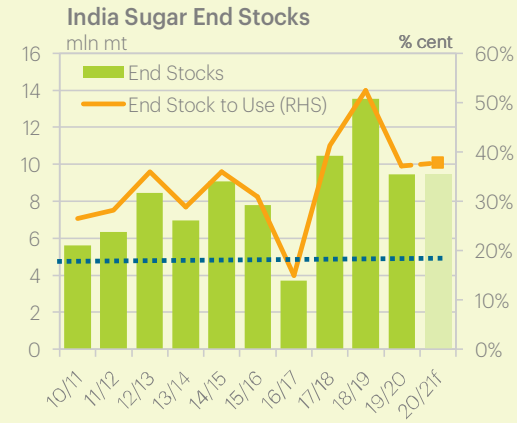


Figure 11



Without reforming its cane pricing policy, and without export subsidies, India's government and industry would have seen already high stock levels spiral out of control. As Figure 11 (previous page) shows, end stocks hit 13.55 mln mt in 2018/19, and probably peaked during that year at well over 20 mln mt. India got by with end stocks of only 3.72 mln mt back in 2016/17, so current stock levels are massively above that minimum stock level. **Without subsidised exports, domestic prices in India would likely have collapsed, and with it some sugar companies in the sector. Indian taxpayers and government have propped up the sugar industry through high cane prices, high sugar prices and export subsidies paid to India's sugar and ethanol sector.**

Note that our balance table in Appendix 1 shows slightly different export and net export figures to the figures above, since it depicts actual exports on an Oct/Sept basis, whereas the government has allowed exports to slip into the following year when the industry has not fulfilled the export quotas. Appendix 1 also shows imports and total exports, including tolled refined sugar.

Assessment of Injury to Australian producers

A relatively simple model which Green Pool has utilised over time with relatively high accuracy is a global stocks-to-use (STU) vs price model. This is a widely used indicator in a range of commodity markets, with inherent appeal – global stocks rise in response to surpluses (production exceeds consumption), lowering prices. Stocks fall in response to deficits (production less than consumption) and this pushes prices higher. Figure 12 shows this STU vs Price relationship for sugar since 2005/06.

As with most models, there are limitations in using an annual stock measure to generate a market price forecast. Markets increasingly seek longer term supply and demand information as well as focussing on the composition of the speculative elements in futures markets. Its predictive capability may be reduced in transition years from surplus to deficit (the same can be said for the opposite transition also). While stocks-to-use (STU) may be high at that time, the market's forward focus may in fact cause prices to rise, anticipating tighter market conditions ahead. That is despite high stock levels (particularly if stocks are in countries such as China or US, that do not usually export sugar).

The STU vs Price relationship has improved over time – Figure 13 shows that the period 2005/06 to 19/20 generates a moderately strong relationship in the context of commodity markets generally (R squared = 0.5725). However, once the impact of the EU's dumping on the global market finished (2006), and the Brazilian cost of production began to escalate to approach that of other efficient producers (from 2010 onwards), this relationship strengthened further. As per Figure 14, for the period 2010/11 to 19/20, we calculate an R^2 value of 0.9418, which denotes a very strong relationship.

India's part in the global sugar balance: As detailed above, India is probably the biggest contributor to global sugar balance changes (Figure 2 above, but repeated as Figure 15 here). When India's balance moves, the global balance moves. India's domestic surplus (and previously its deficits) form a large part of the global surplus or deficit figure. Were India not in structural surplus currently, other producers would not have experienced years of poor sugar prices, and would logically have expanded production or in Brazil's case, devoted more cane to the production of sugar over ethanol.

Figure 12

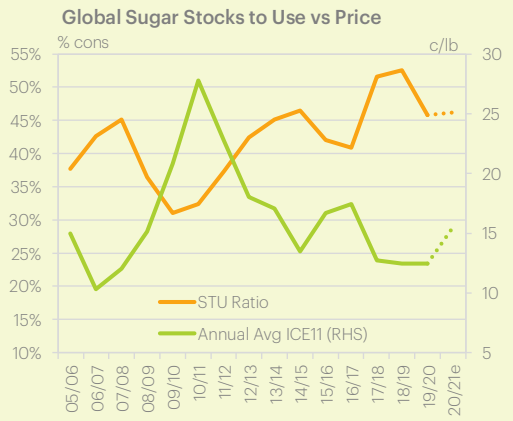


Figure 13

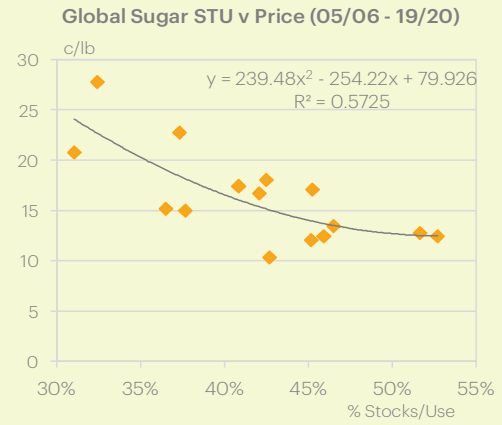


Figure 14

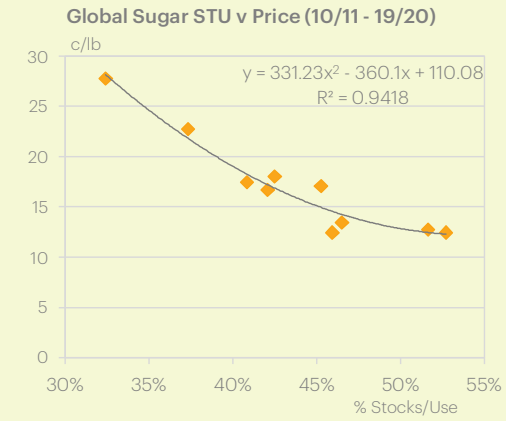
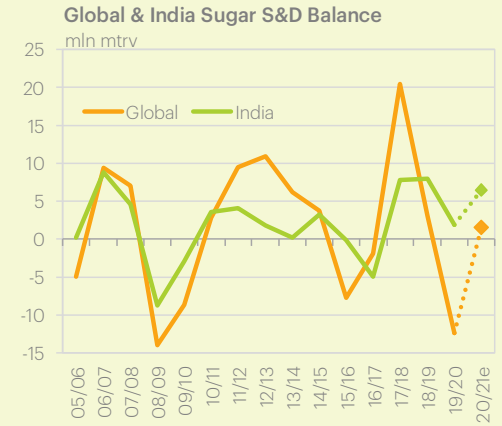


Figure 15



Cost of India's exported surplus

In this analysis, we have derived an estimated cost to the Australian industry of India firstly adding stocks to the global market, which is shown to depress prices particularly in global surplus years. High Indian production adding to global stocks, and then its government subsidising exports, keeps global prices lower than they would otherwise be. Of course, there are further stocks available to export (Figure 11 above) in 2019/20 and further forward.

In Table 1 here, the average sugar futures price for each year has been calculated, and converted into AUD/mt at the average exchange rate for that year. The AUD/mt prices are shown for each year (from A$370/mt in 17/18 to $455/mt which is the to-date price average in 20/21). These are the actual prices being received by Australian producers for domestic and export sales (except for a small tonnage exported each year to the US market, which pays a significant premium, and is not considered in the calculations).

Table 2 then shows the actual prices in US c/lb (as per Table 1), and compares these to the modelled price without India's surplus stocks. In those four years, the difference is between 1.15 and 3.75 US c/lb. In the lower part of Table 2, these US c/lb (cents per pound) calculations are converted into AUD/mt using the average exchange rate applicable to each year. The bottom line in Table 2 shows the losses to Australian producers in AUD/mt of sugar (ranging between $36/mt in 18/19 to $122/mt in 19/20).

Table 3 converts those per tonne of sugar losses into a total damages figure. Australian sugar production has been converted from an Australian crop year basis (Jun/May) to a statistical year (Oct/Sept) basis, so that the modelling is completely consistent. The US Tariff Rate Quota (TRQ) tonnage is then deducted from the total production figure, arriving at an "Exposed Tonnage" to global market prices. This tonnage is multiplied by the estimated damage per tonne from Table 2 and a final damage calculation derived. Table 4 then brings those damages back to a per tonne of cane basis to Australian growers.

Over the four-year period, 17/18 to 20/21, we estimate total Australian sugar industry damages of A$1.023 billion (in nominal terms) due to the global sugar price suppression caused by India's overproduction. This is likely to be a conservative estimate of the impact of the damage.

Further possible market impacts: The Indian government's high prices of cane, high domestic price support and subsidised exports are likely to have also caused suppression of regional raw sugar premiums, as well as costs to Australian sellers of being unable to access the highest returning markets due to India's sales into such markets (eg India has been a major new supplier into the Indonesian market so far in 20/21, a traditional market for Thai, Australian and Brazilian raw sugar). Indonesia is also Australia's closest raw sugar market (see Appendix 2 for 2017/18 to 2020/21 Exports by major destination).

India's exports are also likely to have suppressed the white sugar premium over raw sugar (the whites premium) for any export sales of white refined sugar from Australia. Such costs have not been evaluated in this paper.

India – sugar cost of production

Finally, as discussed above, India's cost of production (COP) for sugar is well above that of global efficient producers. Figure 16 shows Green Pool's current US c/lb cost of production at 2021 exchange rates and cost of capital (interest) rates in various countries. It should be noted that Brazil's costs are very low,

Table 1

Actual Price Average	17/18	18/19	19/20	20/21*
Price (US c/lb)	12.75	12.40	12.45	15.60
Exch Rate	0.7605	0.7040	0.6790	0.7565
A$/mt	$370	$388	$404	$455

Table 2

Annual Average ICE11 Prices

US c/lb (Oct/Sep)	17/18	18/19	19/20	20/21*
Actual Price	12.75	12.40	12.45	15.60
Modelled Price	14.30	13.55	16.20	17.35
Difference	1.55	1.15	3.75	1.75
AUD/mt (Oct/Sep)				
FX (AUD/USD)	0.761	0.7040	0.6790	0.7565
Current S&D Balance	$370	$388	$404	$455
Modelled S&D Balance	$415	$424	$526	$506
Difference	$45	$36	$122	$51

Table 3

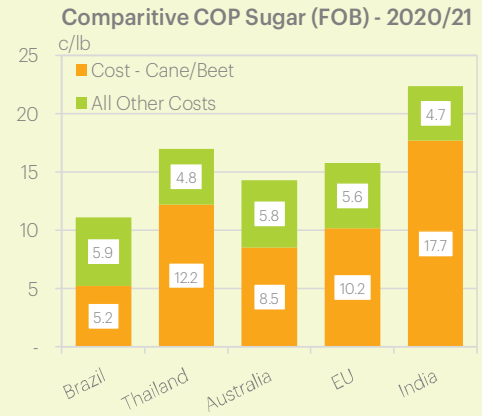
Australia Sugar Production

ooo mttq	17/18	18/19	19/20	20/21*
Crop Year (Jun/May)	4,330	4,555	4,130	4,180
Statistical Year (Oct/Sep)	4,605	4,000	3,920	4,330
US TRQ (Oct/Sep)	90	110	115	80
Exposed Tonnage	4,515	3,890	3,805	4,250
Est. Damages (A$/mt)	$45	$36	$122	$51
Est. Damages (A$/ mln)	$203	$140	$463	$217

Table 4

AUD/mt Cane				
Seasonal Avg CCS	13.27	14.30	14.08	13.77
Current S&D Balance	$29.7	$34.7	$35.4	$38.5
Modelled S&D Balance	$33.4	$37.9	$46.0	$42.9
Difference	$3.6	$3.2	$10.7	$4.3

Figure 16



even compared to its historical costs, due to the extremely low exchange rate prevailing there over the past year or more.

Brazil (at 11.1 c/lb COP) is undoubtedly the lowest cost sugar producer globally. Australia and Guatemala are currently in the 14-16 c/lb cost range. Thailand's COP (around 17 c/lb) has increased in recent years because of the high cost of cane to mills following a severe drought, and under considerable competition from other crops such as cassava and rice.

India's COP of raw sugar is massively inflated by the high price of cane that mills must pay the farmers (under the government's Fair and Remunerative Price or FRP). **The cane price alone is more than the globally efficient band of 14 to 16 c/lb, equating at current exchange rates to 17.7 c/lb.** Processing, storage and transport (assuming the sugar is sold in current year) add a further 4.7 c/lb to give a total production cost of 22.4 c/lb (again India's COP has fallen in the last few years due to a weak INR exchange rate against the US dollar).

It is obvious that Indian sugar that costs 22.4 c/lb to produce, store and transport cannot be sold at world market prices (averaging 14.45 c/lb over the past five years, as shown in Figure 4 above, but repeated here as Figure 17) without either massive losses or massive government subsidies.

India's national and state governments continue to openly support their cane farmers and sugar mills with very substantial government handouts, peaking at export subsidies alone of US$853 million in 2019/20.

Those subsidies are reducing the returns of globally efficient sugar producers such as Brazil, Guatemala, Australia and Thailand. Australian cane and sugar producers have suffered substantial, serious loss of revenue as a result, and their viability in such a market environment made highly questionable.

Ethanol Blending – over-production cure?

Indian officials and sugar industry have for some years sought to characterise sugar overproduction as "temporary" and "fixable", due to the country's ethanol blending programme. It is evident that the ethanol programme is making some headway in reducing sugar overproduction, but it is far from resolving the problem. Ethanol blending (or "doping" as often called in India) was first introduced back in 2005/06, when an E5 blend was "mandated", but state-owned oil companies showed little enthusiasm for it. There was really very little progress until 2015, when the overall blend rate of ethanol in petrol started to approach 2%. It dipped again in 2017 when the sugar industry had a poor cane crop, but then built as the government began implementing higher regulated prices for ethanol from sugar or sugar juices (Figure 18). The overall blend rate is now around 7.5%. India's oil companies incorporate the cost of the blend into their (undifferentiated) petrol price – there is no separate branding of E10 for example as there is in many other countries.

As Figure 19 shows, there is ample scope for India to boost its ethanol blending into petrol. India is a major oil and gasoline importer, having little domestic supply, so that domestically produced ethanol has substantial attraction. Fuel use is increasing quite rapidly, as India's middle class grows quickly (Figure 19).

The problem is that India's ethanol distillation capacity is close to full utilisation. Already, India's supply of industrial ethanol is mostly imported from the US, since industrial ethanol can be imported, but fuel ethanol cannot. The government has introduced soft loans and subsidies (through high fixed ethanol prices from sugar) to boost distillation capacity, but progress now will be slow considering that all capacity increases must come from either building

Figure 17

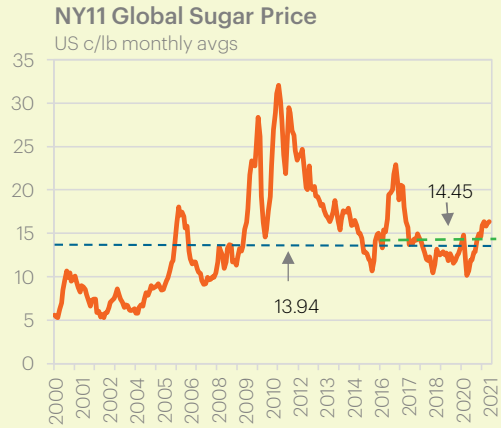


Figure 18

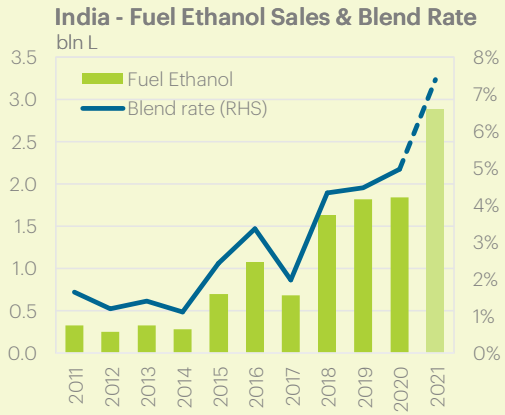
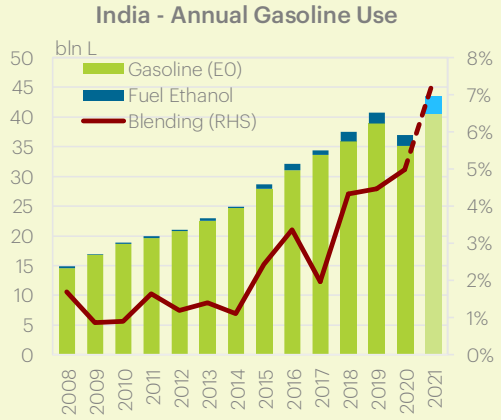


Figure 19



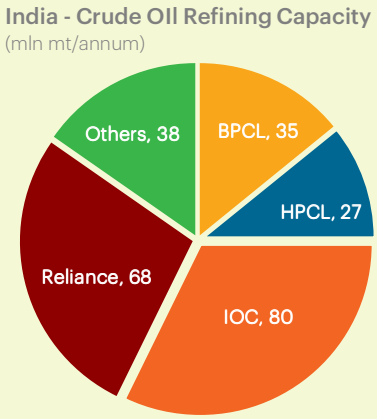
new distilleries or expanding existing plants. We figure that in the 20/21 season, around 1.93 mln mt of sugar equivalent (sucrose) has been diverted into ethanol production. Further gains will take time. For 21/22, the industry's target is for more than 2 million tonnes sugar diversion, but with a likely 5-6 million tonne sugar surplus (over and above that 2 mln mt diversion), there is a big job ahead of the industry to boost the blend percentage.

Addressing the structural oversupply of cane and sugar in India is likely to take more than simply relying on a diversion of cane juice from sugar to a slowly-building ethanol blending programme because of current and further anticipated distillery production limits. Additionally, even if India were able to achieve a 20% blend rate for ethanol by 2025, there remains some residual risk to Australia and other global sugar exporters.

First, the current or a subsequent Indian government could decide to alter the current programme to lower fuel costs for consumers. Second, car manufacturers in other countries have raised substantial resistance to anything more than a 10% ethanol blend, and India does not yet produce engines for Flex-Fuel Vehicles (FFVs) which could take higher blends (the government has very recently "instructed" car companies to make some models as FFVs). Third, if India was to privatise any or all government-owned oil companies, such companies may not feel compelled to blend high rates of expensive ethanol if global oil prices were lower (Figure 20 shows the composition of India's oil companies – all but Reliance at 27% refining capacity are government-owned).

All those factors present risks to other countries that export sugar in sizeable volumes, and seek changes to India's current sugar regime. A better solution is needed, and at a pace faster than the current pace of progress.

Figure 20



Appendix 1

Table – India Annual Sugar Balance (incl. forecasts) in '000 mt TQ

MY Oct - Sep	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21e
Opening Stocks	9,084	7,782	3,718	10,442	13,550	9,433
Production	25,100	20,225	32,300	33,025	27,150	31,000
Imports	2,354	2,578	1,967	970	1,587	1,740
- raws	*2,299*	*2,508*	*1,937*	*950*	*1,567*	*1,700*
- whites	*55*	*70*	*30*	*20*	*20*	*40*
Exports	3,556	2,067	2,243	5,087	7,454	7,717
- raws	*61*	*97*	*102*	*1,578*	*2,624*	*2,820*
- LQ whites	*1,429*	*42*	*631*	*1,531*	*2,681*	*2,780*
- Refined	*2,066*	*1,928*	*1,510*	*1,978*	*2,149*	*2,117*
Consumption	25,200	24,800	25,300	25,800	25,400	25,000
Balance	-1,302	-4,064	6,724	3,108	-4,117	23
Closing Stocks	7,782	3,718	10,442	13,550	9,433	9,456
Stocks to Cons	*31%*	*15.0%*	*41.3%*	*52.5%*	*37.1%*	*37.8%*

Notes: The above table contains verified trade and production figures, as well as estimates for consumption and 20/21 trade estimates. Forecast net exports can be derived from exports less imports ie for 19/20, net exports = 5.87 mln mt.

All figures in the table are thousand mt, tel quel ('000 mt TQ).

Appendix 2

Table – India Annual Sugar Exports by Major Destination ('000 mt TQ)

MY Oct-Sep	2017/18	2018/19	2019/20	2020/21*
Total Exports	654,818	3,793,927	5,847,404	4,846,087
Raws Exports	59,365	2,139,773	2,953,241	2,950,249
Iran		705,107	1,104,311	
Indonesia			401,947	1,283,940
Malaysia	44	89,892	344,485	70,755
LQW's Exports	593,109	1,531,344	2,680,759	1,766,574
Afganistan		233,208	638,257	596,474
Sri Lanka	199,020	357,200	551,444	253,763
Refined Exports	2,344	122,810	213,405	129,264

Notes: The export figures for 2020/21* are confirmed volumes shipped or under movement by mid-May 2021.