CATALYSING DECARBONISATION IN SRI LANKA

Key Takeaways

1. Sri Lanka is very vulnerable to climate change impacts such as temperature rise, rainfall variability, and sea-level rise.
2. The current economic crisis the country is experiencing can act as a catalyst to tap into green financing and place Sri Lanka on a path towards decarbonisation. This could potentially resolve many problems the country is currently facing while also building resilience to face future crises.
3. Transport sector is the largest contributor of greenhouse gas emission with a significant contribution coming from carbon emissions. This has been a causal effect owing to the increase in private vehicles and the dependence on fossil fuel.
4. Energy sector is the second highest contributor of carbon emissions. The sector's main generation capacity is from coal and oil with over 60% contribution to the overall generation mix in 2019 and 2020.
5. Manufacturing sector is facing key business risks owing to the rapid pace at which its partner countries are moving towards carbon neutral targets. This can have detrimental effects on export earnings and Foreign Direct Investments(FDIs).
6. Agriculture sector is the highest contributor of both methane emissions and nitrous oxide emissions, albeit having low carbon emissions. These are produced through activities such as rice production, and from the use of chemical and organic fertilisers.
7. Strategies to achieve low carbon emissions can come in the form of introducing direct power purchase agreements with power wheeling; implementing a roadmap for circular economy; state-owned enterprise reform; solarisation; electric vehicle policy; and a strategy for the public transport sector.

We often ask the question as to why Sri Lanka should decarbonise when our carbon emissions are relatively low. This is true as the country's share of global carbon emissions is only 0.06% and has been plateauing at the same rate for the last five years since 2015[1]. However, as an island nation, Sri Lanka is very vulnerable to climate change impacts and hence joining hands with global decarbonisation initiatives is imperative for the country. The global climate risk index 2021, ranked Sri Lanka as the 23rd most affected country from extreme weather conditions during the period of 2000–2019.

Therefore, Sri Lanka is susceptible to temperature rise, rainfall variability, and sea-level rise. A rise in sea level will hamper sectors of the economy such as tourism and fisheries. A significant population of the country is also dependent on livelihoods connected to agriculture and will be adversely affected due to impacts of climate change. The World Bank estimates that the country's GDP could decline by 7.7% by 2050 in a worst-case scenario where no action is taken to combat climate change. This is estimated to result in a loss of USD 50 billion to the economy over the course of the period.

Sri Lanka also contains hidden hotspots that are often not discussed in public fora. Climate change poses an economic risk to these hotspots. The World Bank identifies hotspots as a location where changes in average temperature and precipitation will have a negative effect on living standards. The

[1] Annual emission data for 2021 is not yet available

World Bank assessments show that approximately 19 million people in Sri Lanka are currently living in locations that could become moderate or severe hotspots by 2050 under a situation where no action is taken to limit emissions. This population is equivalent to about 90% of the country's population.

The top two emerging hotspots for Sri Lanka are the Northern and North Western provinces, followed by the less populated province of North Central. The Western province, is also moderately vulnerable to climate changes, however, as it is heavily populated and contributes to about 40% of country's GDP, the potential impact is larger.

Sri Lanka has a global responsibility to achieve climate change commitments as well, since, the country signed and ratified the Paris Climate Agreement. This resulted in Nationally Determined Contributions (NDCs) being developed initially in 2016[2] and renewed every 5 years in accordance with the 21st Conference of the Parties (CoP) commitments. Currently, the updated NDCs in 2021[3] accounts for 4% and 10.5% of unconditional and conditional actions, respectively, for reducing greenhouse gas (GHG) emissions against the Business-As-Usual (BAU) scenario during the period of 2021-2030.

It must be noted that in spite of abiding by these international climate commitments, it would still put the world on course for 2.7°C of warming this century while, net-zero pledges could reduce warming by 0.5°C. The UN Environment Programme (UNEP) reports that the new and updated global climate commitments only accounts for an additional 7.5% reduction of emissions while a 30% reduction is needed for 2°C and 55% is needed to meet the 1.5°C Paris goal.

The country is also reliant on its export earnings and Foreign Direct Investments (FDI), and there are key business risks associated with lackluster attempts at decarbonisation. The rapid pace at which countries are moving towards becoming net-zero carbon economies is also determining the global demand for products and services. This has led to consumers and investors seeking products and services that underpin low carbon emissions. Hence, it will be crucial for the country to latch onto the shift in demand and reap benefits of having products and services that produces less carbon emissions.

Therefore, quick decisive and implementable actions are needed to decarbonise the country, since decarbonisation of an economy or a business takes a significant amount of time. As observed in other countries, climate change impacts disproportionately to the poorest and marginalised communities. This is more so applicable in Sri Lanka, as a majority of the population are living in rural areas and engaged in small-scale agricultural activities or fisheries activities that are increasingly threatened by extreme weather events and irregular monsoon rainfall patterns. This is in return can exacerbate poverty and inequality within regions of the country.

Sector Overview

Observing the carbon emissions by sectors in 2018, the transportation sector is the highest contributor of carbon emissions followed by electricity and heat sector (refer figure 01). While

[2] This document can be referred at; https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Sri%20Lanka%20First/NDCs%20of%20Sri%20Lanka.pdf

[3] This document can be referred at; http://env.gov.lk/web/images/pdf/policies/NDCs_of_Sri_Lanka-2021.pdf

carbon dioxide is the most dominant GHG produced by burning fossil fuels and industrial production, there are others as well that are driving global climate change. This includes methane, nitrous oxide, and trace gases, which have contributed to a noteworthy amount of global warming. Here again, transportation sector in Sri Lanka is leading on GHG emissions followed by electricity and heat and, agricultural sector (refer figure 02). A brief overview of these sectors, which are of economic importance to the country is given in the sections below the graphs.

Figure 01: Carbon Emissions by Sector in 2018

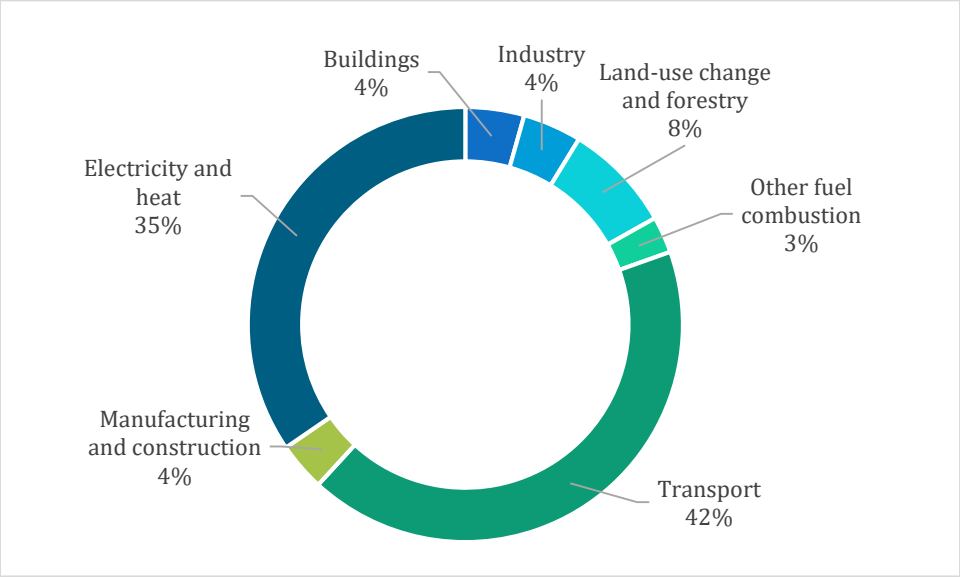
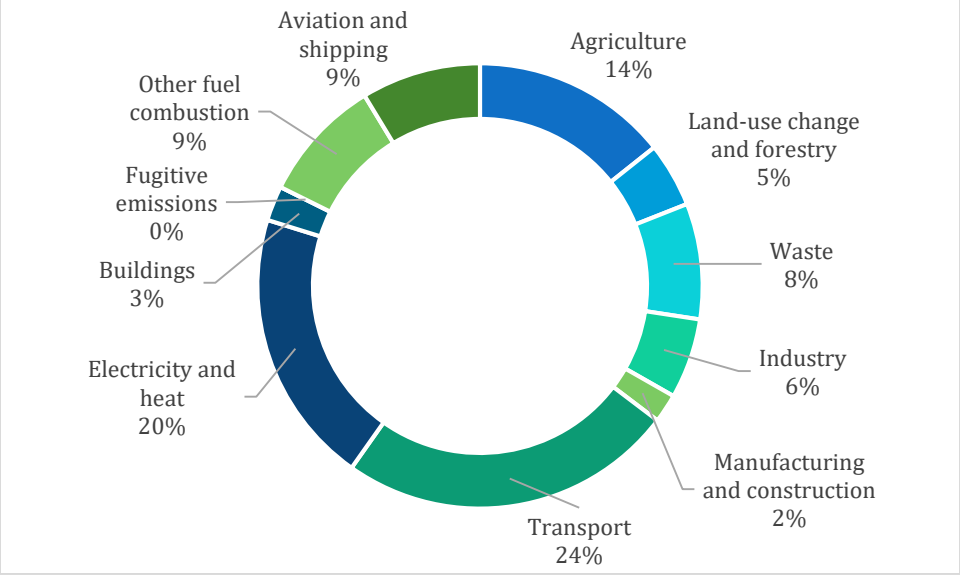


Figure 02: GHG Emissions by Sector in 2018



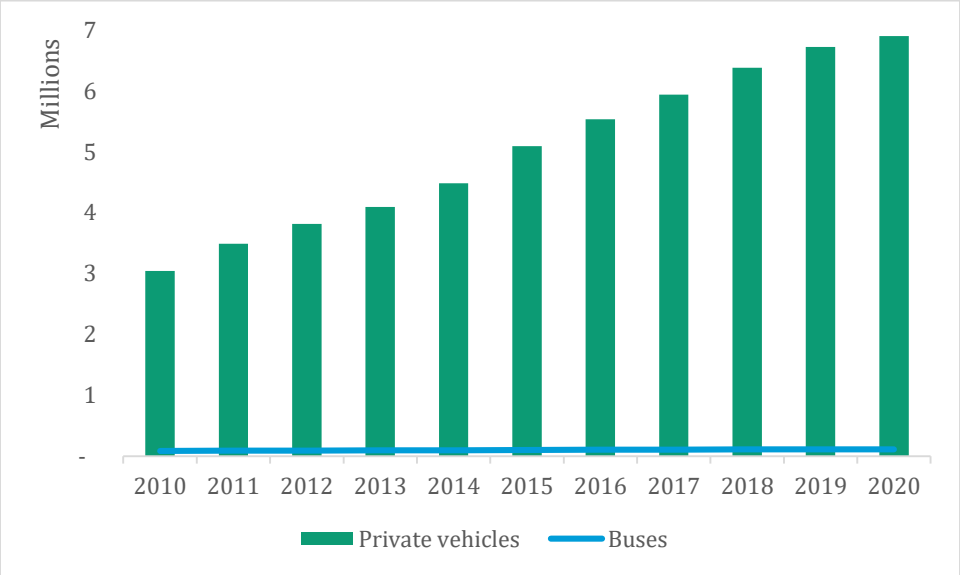
Source: Climate Watch Data

Transportation Sector

The transportation sector is grappling with many issues such as congestion, pollution and a resultant substantial fuel bill. The private and public transportation accounts for nearly 60% of the fuel consumption in the country. Congestion is particularly seen in city limits such as Colombo with about 1.9 million passengers entering the City of Colombo daily[4].

One of the causal factors for these issues has been the growing population of private vehicles in the absence of good public sector transportation modes. About 85% of the vehicle population in Sri Lanka are privately owned vehicles, namely; cars, motor bicycles and trishaws. This percentage of privately owned vehicles as opposed to buses has increased drastically over the past ten years (refer figure 03). The growing disposable income, urbanization, availability of credit, and the need for last mile transport can be identified as the reasons for this trend.

Figure 03: Private Vehicles and Buses in 2010 vs 2020



Source: Ministry of Finance

Energy Sector

Historically growth in electricity demand of the country has seen a direct correlation with the growth in the country's Gross Domestic Product (GDP) and hence, plays a vital role in the economy. In this regard, the sector has seen high level interest from the top most officials in the country including HE president in achieving a 70% renewable energy target by 2030 as announced in the annual budget of 2020. However, the government is yet to gazette this target and make it part of the formal state policy.

The national energy policy gazetted in 2019[5] has a 50% renewable energy target by 2030. This has been incorporated in the Long-Term Generation Expansion Plan[6] (LTGEP) looking at 2022 to 2041.

[4] https://assets.mcc.gov/content/uploads/sri-lanka-transportation-project-presentation.pdf

[5] http://www.energy.gov.lk/images/resources/downloads/national-energy-policy-2019-en.pdf

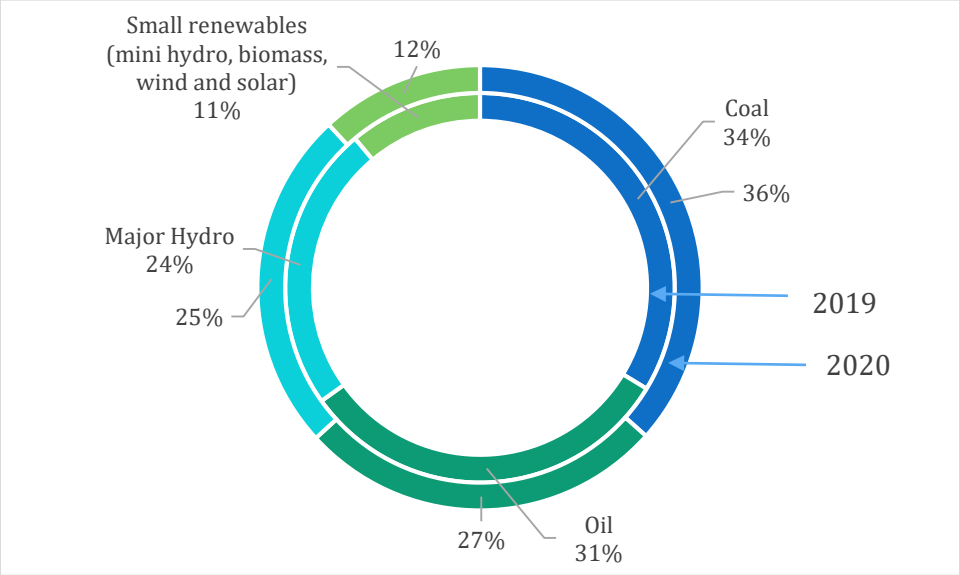
[6] This plans the electricity generation for the country for the next 20 years to ensure energy security as the least cost plant mix for each year is identified by analyzing and evaluating various technology options.

The LTGEP adopted a 70% low carbon electricity generation by 2030 incorporating renewable energy and natural gas, and restricting coal power development beyond 2030.

Solar energy as at end 2020 accounted for 425 MW capacity with the largest contribution coming from rooftop solar particularly by the commercial sector using NetPlus tariff schemes. Wind accounted for 179 MW and biomass accounted for 50 MW of the generation capacity. Large-scale wind and solar power projects in the pipeline include Pooneryn 250 MW hybrid (wind and solar) project and solar project in Siyambalanduwa of 100 MW.

The electricity generation for the last two years are shown in Figure 04 with renewable energy accounting for approximately 35% of the total energy mix in 2019 and 2020. Coal and oil have contributed to more than 60% of total generation mix in the same period. The current power outages experienced by the country is a result of the energy sector's dependence on fossil fuel for generation and lack of reforms in the sector.

Figure 04: Electricity generation mix in 2019 and 2020



Source: Central Bank and Ministry of Finance

Manufacturing Sector

The value added by Sri Lanka's manufacturing sector as a percentage of GDP stood at 18% in 2021. Manufacturing sector exports such as Apparel is the largest contributor to the country's export earnings with a share of 43% in 2021. Therefore, with a change in demand by consumers and investors for products that generate low carbon emissions, it will be imperative for the country's manufacturing sector to adopt low carbon measures in order to attract investors for more local value addition and as well as to cater to a growing market.

The Apparel industry's key customers in export destinations are increasing the pressure to decarbonise supply chains with specific targets on emission reduction. Initiatives such as Science Based Targets initiative (SBTi) to reduce 45% in absolute emissions from 2020 to 2030 and G7 Fashion Pact are proof of the additional pressures created on the industry.

In 2021, the EU Parliament approved a Carbon Border Adjustment Mechanism (CBAM) that taxes the carbon content of emission-intensive imports to the EU. The CBAM is to include six high emission industries from January 2023. Apparel, metal, ceramics and rubber are likely to be added to this list with time. Other countries with internal carbon Emission Trading Schemes (ETS) or carbon prices too are expected to progressively adopt such schemes.

Agricultural Sector

The agricultural sector contributes to the country's economy in the form of income, employment, food and raw material along with linkages to all the other sectors. It also contributes to key exports of Sri Lanka such as Tea and Rubber that accounted for 11% and 8% of the export earnings in 2021. The agriculture sector, accounts for 7% of the GDP and employs nearly 30% of the country's labour force. About 70% of the rural population is dependent on livelihoods attached to Agriculture. The sector also utilizes 43% of the total land area of the country and thus remains a pivotal part of the Sri Lanka's economy. Climate change impacts such as irregular rain patterns, and extreme shifts between droughts and rainfall, directly affects agricultural activities. This thereby affects not only the livelihood of the majority of the population but also affects food supply and has cascading effects on the whole economy owing to the linkages agriculture has with the entire economy.

The agriculture sector in Sri Lanka as assessed by Climate Watch data is the highest contributor of both methane emissions and nitrous oxide emissions, albeit contributing to low emissions in carbon during 2018. Methane and nitrous oxide are mainly produced through agricultural activities such as rice production, and from the use of chemical and organic fertilisers.

Way Forward

1. Introducing direct power purchase agreements together with power wheeling

Globally countries are offering power purchase agreement models that yields financial as well as environmental benefits to the organisation. For example, Vietnam has created direct power purchase agreements where companies can advance their climate commitments. This allows companies to work with a renewable energy developer and receive renewable energy directly from the developer. This is a model Sri Lanka can look to implement where organisations can buy the equivalent energy at their point of use directly from renewable energy developers.

However, for this model to be successful, power wheeling within Ceylon Electricity Board's (CEB's) transmission network has to be allowed through amendments to the legislation. This will allow renewable energy developers to use existing transmission and distribution networks to supply renewable electricity to prospective buyers. An appropriate fee for the grid can be charged for this purpose. These measures will lead to significant investment in power generation by industries and help Sri Lanka achieve its renewable energy generation targets while also reducing the energy sector's dependence on fossil fuel.

2. Roadmap for circular economy

The country lacks a road map for encouraging a circular economy in Sri Lanka. As a first step, identifying sectors that have linkages within other sectors can be explored, where output waste can be translated into input material of another sector. This can be carried out through research and

findings, and identifying the by-products of sectors that could be used for the input of other industries. This can lead lower cost to the input industry while generating an income to the output industry and will lower the carbon foot print on the industries. This is already taking place in the brewing industry and in the case of PET bottles.

Coupling waste management and energy generation is another area for the circular economy. This will address the growing issue of waste management. Establishing proper land fill sites together with methane collection and conversion to energy would reduce emissions while also reducing the issue of waste disposal. These initiatives can be done beyond the key urban areas with the involvement of local industry and government. This can also provide more employment opportunities in the rural sector and help reduce regional disparities in the country. The World Bank analysis shows that increasing nonagricultural jobs by 30% can reduce climate change impacts and improve living standards from a negative 7% to positive 0.1% by 2050.

3. State-Owned Enterprise (SOE) reform[7]

Reforming SOEs can not only result in productivity and efficiency gains but also facilitate innovations in the enterprises that will aid in carbon reduction mechanisms. It will also provide the entities with additional revenue to pursue the carbon neutral targets. Reforms can be carried out to the main loss-making entities that are also high foreign currency intensive businesses. This includes reforms for Sri Lanka Transport Board and unbundling of the CEB. Partially listing a percentage of SOEs[8] on the stock market would also help to increase public oversight and increase accountability for achieving carbon emission targets.

4. Solarisation

Highway solarisation is one form of solarisation where solar panels are laid above and along the highway to supply electricity to the main grid or even to generate electricity to charge electric vehicles on highways. The solarisation of railway and bus stations is another avenue of solarisation where its feasibility can be looked at. For example, Delhi metro station is producing over 32 MW of solar power through rooftop solar plants at its premises and is planning to meet all its energy requirements from solar energy.

Conversion of existing industrial zones to renewable energy industrial zones is also another prospect of solarisation. This will allow the manufacturing sector to achieve its carbon neutrality targets as well. However, alongside these developments, it is important to develop sufficient grid capacity to facilitate high renewable energy integration in order to meet real time electricity demand. Sufficient storage capacities with technologies such as pump hydro and battery storage is also vital for this process. A significant amount of investments too is required for this and hence can be opened up for investors with conducive policy to support it.

[7] More details on SOE reform can be accessed at; https://www.chamber.lk/images/COVID19/pdf/SOEReformsPostPandemicEconomicRevival_25June.pdf

[8] The role of listing a percentage of SOEs on the stock market can be accessed at; https://www.chamber.lk/tradewatch/backend/public/uploads/attachments/article/TheRoleofDivestmentsinOvercomingPresentEconomicChallenges_Final_1645150425.pdf

5. Electric vehicle policy

Sri Lanka lacks a policy for Electric Vehicles (EVs) with a proper mechanism of disposing batteries of EVs. This is an ideal time for EVs with the global market share of EVs expected to reach 29% by 2025. Therefore, a policy on EVs together with a proper mechanism for disposing batteries will be imperative in reducing the fuel dependency of the country, which thereby can reduce forex outflows. Further, establishing more charging stations for EV and solarisation of EV charging stations will make EVs more sustainable as the charge is sourced from a renewable energy source. Local value addition for batteries can also be explored as about 70% of the value of EV's are in the battery.

6. Public transport strategy

A public transport strategy covering both bus and railway sectors is imperative for the country. This will enable the public transport systems to be safe, affordable and attractive to the public with modern technology. This can encourage the shift from private vehicles to public transportation modes, which in return can reduce congestion and pollution in the country. The strategy can encompass the following areas to enable an improved public transport system in the country.

- Sector reforms to improve quality of service by reexamining existing regulations that are impediments to the development of public transport and the role of the private sector in it.
- Smart technologies, digitalised operation and management
- Standards and quality assurance processes
- Rationalised pricing regimes

Introducing parking facilities at city entry points, especially in the Colombo city limits with shuttle bus services is another area that can be looked at. This again will aid in transferring passengers from private vehicles to public transportation at least within the city limits, reducing congestion and pollution. The shuttle bus service can be operated with electric buses to support the initiatives of reducing fuel dependencies.

Conclusion

Climate change does not stop at borders, as with the on-going pandemic, and requires the same level of urgent and decisive measures to avert its detrimental impacts. The above-mentioned strategies can help the country to be placed on a path towards achieving carbon neutrality. This will result in improved growth and development for the economy, improved living standards for the citizens, and help reduce poverty and inequality.

The economic crisis the country is currently experiencing, presents an opportunity for Sri Lanka to decarbonise. This can act as a catalyst to tap into green financing that can help in closing the gap between financing and infrastructure needs of the country while also improving the country's foreign reserves. Hence, this is an opportune time for Sri Lanka to reduce its dependency on fossil fuel and reduce its strain on the import bill. This can bring in new avenues of FDI to the country and improved performance of export earnings. This can also ensure that sustainable projects are in place to build resilience for future crises.

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Author:
Imesha Dissanayake, Research Associate
imesha@chamber.lk

Series Editor:
Shiran Fernando, Chief Economist
shiran@chamber.lk