# ff

June 2023

Transport Ministry

Prepared By

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# Executive Summary

| | |
|---|---|
| Report Name: | ff |
| Sector(s): | Transport |
| Year(s): | 2010,2019,2020,2021,2023,2034 |

Table 1: Summary of the assessments of climate actions in Transport sector

| Aggregated Actions | Specific Climate Actions | Year | Type | Emission Reduction ($tCO_2e$) | MAC ($tCO_2e$/USD) |
|---|---|---|---|---|---|
| 25% trucks and buses using CNG by 2030 | 5 diesel powered trucks convered to CNG in 2023 | 2023 | GHG Ex-ante | 184 | N/A |
| 30% trucks and buses using CNG by 2040 | Shift fossil fuel freight vehicle-(YY0001) to CNG | 2023 | GHG Ex-ante | 184 | N/A |
| Generic enabling activities | Implement a national fuel levy (4.2%) on gasoline and diesel cars by 2030 | 2023 | GHG Ex-post | 565180 | N/A |
| Generic enabling activities | Implement national fuel levy on gasoline (5%) and diesel (4%) by 2030 | 2023 | GHG Ex-post | 701146 | N/A |
| Generic enabling activities | Test Project Pasan | 2019 | GHG Ex-post | 292640 | N/A |
| Introduce taxes and other instruments to promote public transport | Introduce cordon pricing for Colombo Metropolitan | 2023 | GHG Ex-post | 23 | N/A |
| NDC | Shift passengers from motor cars to buses in Sri Lanka | 2034 | MAC Ex-post | 1292 | 472 |
| NDC | Introduction of new electric buses in Colomobo Distric | 2020 | GHG Ex-post | 338681 | N/A |
| NDC | Redesign the route of bus from Colombo to Kandy | 2021 | GHG Ex-post | null | N/A |
| Promote public passenger transport | Shifting from petrol cars to diesel bus | 2010 | GHG Ex-post | 452 | N/A |
| Promote public passenger transport | Shifting from petrol cars to diesel bus | 2010 | MAC Ex-post | 452 | -295 |

Figure 1 illustrates the status of achieving emissions reduction targets of Transport sector of Sri Lanka. The expected emission reduction of the Transport sector by 2030 year is 140 $MtCO_2e$ conditionally, and 153 $MtCO_2e$ unconditionally. Mitigation actions implemented by year 2030 were able to reduce Transport sector emissions from 1898122 tCO2e.

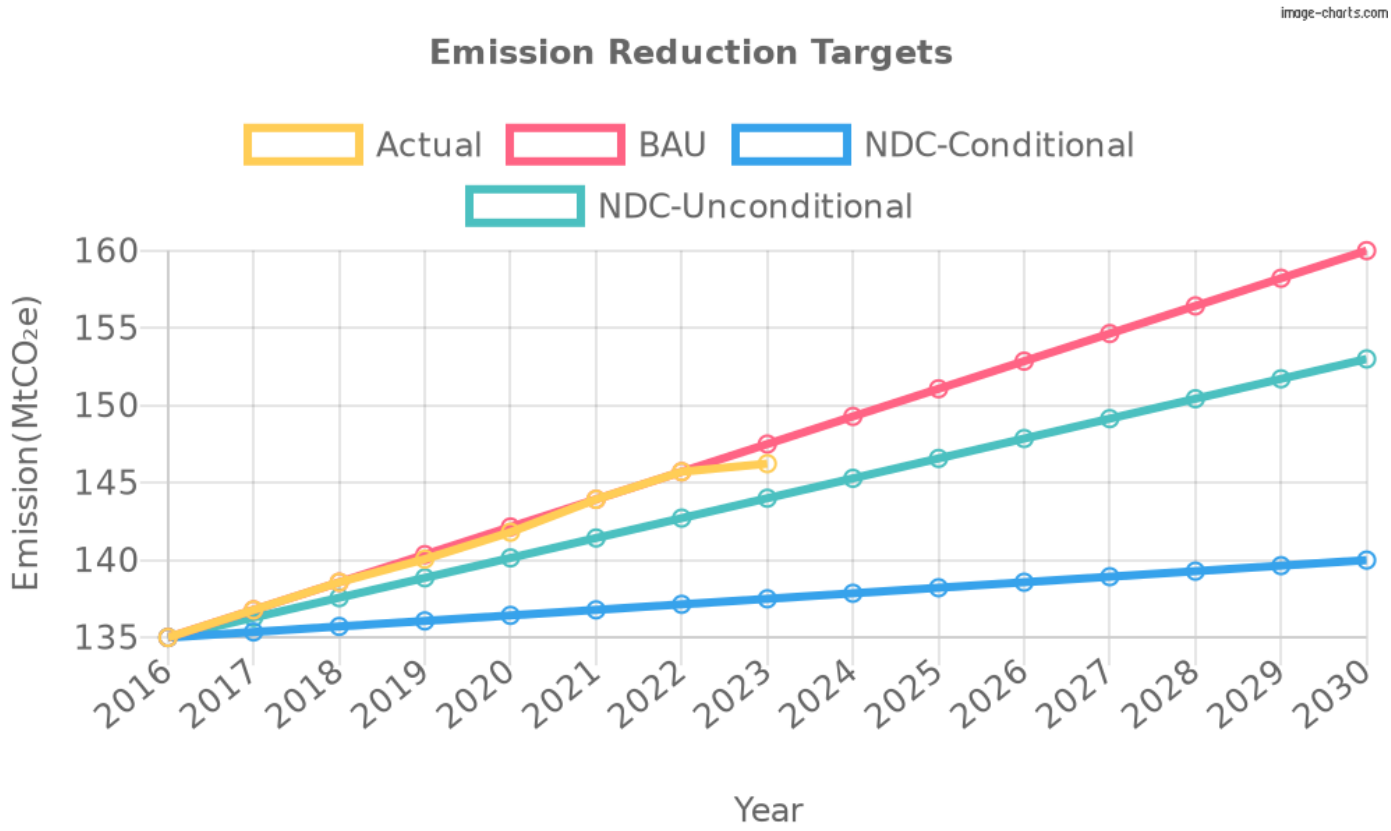


Figure 1 Emissions reduction of Transport sector of Sri Lanka

**Note:** Only the emission reductions of Climate Actions calculated Ex-post using the tool are reflected in the Actual Emissions curve

# NDC

## Sri Lanka_Renewabale

Sri Lanka_Renewabale ClimateSI Test by Private to Benefits from using renewable energy. Action includes Test Renewable energy Solar_1. The geographical boundary of the project includes null, null, null. Adopted It is expected that the project will . In addition, mitigation action has various sustainable development benefits such as null and null

## Test 12345

Test 12345 MOE by International to test. Action includes Test. The geographical boundary of the project includes null, null, null. Adopted It is expected that the project will null. In addition, mitigation action has various sustainable development benefits such as null and null

## Test SCA for testing

Test SCA for testing Ministry of Education by Government to null. Action includes This is for test purposes.. The geographical boundary of the project includes Central, Kandy, Gampola. Implemented It is expected that the project will null. In addition, mitigation action has various sustainable development benefits such as null and null

## Test 123

Test 123 MoT by Government to null. Action includes g. The geographical boundary of the project includes null, null, null. Adopted It is expected that the project will null. In addition, mitigation action has various sustainable development benefits such as null and null

## Redesign the route of bus from Colombo to Kandy

Redesign the route of bus from Colombo to Kandy Ministry of Transport by Government to null. Action includes Redesign the route of bus from Colombo to Kandy. The geographical boundary of the project includes null, null, null. Planned It is expected that the project will Redesign and add infrastructures to the current route. In addition, mitigation action has various sustainable development benefits such as null and null

### GHG impact assessment

#### System boundary

Table System boundary of the GHG impact assessment of Redesign the route of bus from Colombo to Kandy

| Boundary elements | Description |
|---|---|
| Geographic Boundary | N/A, N/A, N/A |

| Boundary elements | Description |
|---|---|
| Temporal Boundary | 2022 - 2021 |
| Transport subsector | Passenger |
| Upstream/downstream | No |
| GHGs Included | Only CO2 |

## Measurement

| | |
|---|---|
| Assessment Approach | Ex-post |
| Base Year | 2020 |
| Assessment year(s) | 2021 |
| Methodology | JICA_Modal Shift (Passenger) |

## Baseline Scenario

asd

Table Data required to assess baseline emissions of Redesign the route of bus from Colombo to Kandy

| Key indicators | Unit |
|---|---|
| Average occupation rate of transport mode - Petrol-car | passenger/vehicle |
| Share of passengers by transport mode - Petrol-car | % |
| $CO_2$ emission factor - Petrol | t-$CO_2$/MWh |
| Net calorific value - Petrol | TJ/t |
| $CO_2$ emission factor of transport mode - Petrol-car | t-$CO_2$/km |
| Fuel consumption rate of transportation mode - Petrol-car | t/km |

Baseline emissions attributed to the Redesign the route of bus from Colombo to Kandy are given in Table.

Table Baseline emissions of Redesign the route of bus from Colombo to Kandy

| Year | Emissions (MtCO2e) |
|---|---|
| 2021 | - |

## Project Scenario

Table: Data required to assess project emissions of Redesign the route of bus from Colombo to Kandy

| Key indicators | Unit |
|---|---|
| No of passenger transported by the project per year - Common | passenger/y |
| Average trip distance of the passenger of the project activity in year y - Common | km |
| $CO_2$ emission factor - Diesel | t-$CO_2$/MWh |
| Net calorific value - Diesel | TJ/t |
| Fuel consumption - Diesel-bus | t/y |
| Fuel consumption rate of transportation mode - Diesel-bus | t/km |

Direct project emissions attributed to the Redesign the route of bus from Colombo to Kandy are given in Table 6.

Table: Direct project emissions attributed to Redesign the route of bus from Colombo to Kandy

| Year | Emissions (MtCO2e) |
|---|---|
| 2021 | - |

## Install digital tachograph systems in freight vehicles and/or commercial passenger vehicles

Install digital tachograph systems in freight vehicles and/or commercial passenger vehicles Ministry of Transport by Government to null. Action includes Install digital tachograph systems or another device that monitors vehicle and driver performance and provides real-time feedback to drivers in freight vehicles and/or commercial passenger vehicles.. The geographical boundary of the project includes null, null, null. Planned It is expected that the project will null. In addition, mitigation action has various sustainable development benefits such as null and null

## Displacement of more-GHG-intensive fossil fuel for combustion in vehicles and/or stationary installations

Displacement of more-GHG-intensive fossil fuel for combustion in vehicles and/or stationary installations Sri lanka sustainable energy authority by Government to Emission reduction. Action includes Displacement of more-GHG-intensive fossil fuel for combustion in vehicles and/or stationary installations. The geographical boundary of the project includes null, null, null. Planned It is expected that the project will Reduce air pollution. In addition, mitigation action has various sustainable development benefits such as SDG 13 and SDG 11

## Introduction of new electric buses in Colomobo Distric

Introduction of new electric buses in Colomobo Distric ClimateSI by Government to null. Action includes Introduction of new electric buses. The geographical boundary of the project includes null, null, null. Implemented It is expected that the project will null. In addition, mitigation action has various sustainable development benefits such as null and null

### GHG impact assessment

#### System boundary

Table System boundary of the GHG impact assessment of Introduction of new electric buses in Colomobo Distric

| Boundary elements | Description |
|---|---|
| Geographic Boundary | N/A, N/A, N/A |
| Temporal Boundary | 2022 - 2020 |
| Transport subsector | Passenger and Freight |
| Upstream/downstream | No |
| GHGs Included | Only CO2 |

#### Measurement

| | |
|---|---|
| Assessment Approach | Ex-post |
| Base Year | 2016 |
| Assessment year(s) | 2020 |
| Methodology | AMS-iii-C - Emission reductions by electric and hybrid vehicles |

#### Baseline Scenario

Diesel Bus

Table Data required to assess baseline emissions of Introduction of new electric buses in Colomobo Distric

| Key indicators | Unit |
|---|---|
| Total distance - Common | km |
| Specific fuel consumption - Diesel-Lorry | g/km |
| Number of operational vehicles - Diesel-Lorry | N/A |
| Technology improvement factor - Common | N/A |
| Total distance - Common | km |
| Technology improvement factor - Common | N/A |
| CO2 emission factor - Diesel | gCO2/J |
| Net calorific value - Diesel | J/g |

Baseline emissions attributed to the Introduction of new electric buses in Colomobo Districare given in Table.

Table Baseline emissions of Introduction of new electric buses in Colomobo Distric

| Year | Emissions (MtCO2e) |
|---|---|
| 2020 | 339033 |

### Project Scenario

Electric Buses

Table: Data required to assess project emissions of Introduction of new electric buses in Colomobo Distric

| Key indicators | Unit |
|---|---|
| Number of operational vehicles - Electricity-Lorry | N/A |
| Specific fuel consumption - Electricity-Lorry | g/km |
| Average technical transmission and distribution losses - Electricity-Lorry | % |
| Total distance - Common | km |
| Total distance - Common | km |
| CO2 emission factor - Electricity | kgCO2/kwh |

Direct project emissions attributed to the Introduction of new electric buses in Colomobo Distric are given in Table 6.

Table: Direct project emissions attributed to Introduction of new electric buses in Colomobo Distric

| Year | Emissions (MtCO2e) |
|---|---|
| 2020 | 352 |

Emissions estimated for 2020 are summarized in Table 9. According to the table, Introduction of new electric buses in Colomobo Distric reduce 338681 tCO2e in the 2020.

Table Emissions reduction due to Introduction of new electric buses in Colomobo Distric

| Scenario | 2020 Emissions (MtCO2) |
|---|---|
| Baseline emissions | 339033 |
| Project emissions | 352 |
| Lekage reductions | N/A |
| Emission reductions | 338681 |

## Shift passengers from motor cars to buses in Sri Lanka

Shift passengers from motor cars to buses in Sri Lanka Acceed Lanka by Private to Objective 1. Action includes Shift passengers from motor cars to buses in Sri Lanka. The geographical boundary of the project includes null, null, null. Planned It is expected that the project will N/A. In addition, mitigation action has various sustainable development benefits such as N/A and N/A

### Cost of climate action

The marginal abatement cost (MAC), in general, measures the cost of reducing one more unit of pollution. Table 10 indicates the MAC of Shift passengers from motor cars to buses in Sri Lanka.

Table 10 MAC of the Shift passengers from motor cars to buses in Sri Lanka

| Year | MAC (USD/tCO2e) |
|---|---|
| 2020 | 472 |

## Shift passenger from motor cars to 170 buses in Colombo

Shift passenger from motor cars to 170 buses in Colombo Ministry of Public Transport by Private to null. Action includes Description. The geographical boundary of the project includes null, null, null. Planned It is expected that the project will Reduce traffic congestion, reduce air pollution, increase the average speed of transport modes, and reduce private automobiles . In addition, mitigation action has various sustainable development benefits such as Goal 11 sustainable cities, and communities and Goal 13 climate actions, Goal 5 gender equity

## Establishment of 20 vehicle inspection centers

Establishment of 20 vehicle inspection centers Ministry of Public Works and Transport by Government to Improve vehicle efficiency by inspections . Action includes Introduce new inspection centers to improve efficiency of vehicles . The geographical boundary of the project includes null, null, null. Adopted It is expected that the project will Reduce traffic congestion, reduce air pollution, increase the average speed of transport modes, . In addition, mitigation action has various sustainable development benefits such as Goal 11 sustainable cities, and communities and Goal 13 climate actions, Goal 5 gender equity

# 25% trucks and buses using CNG by 2030

## Test 1234

Test 1234 MoT by Government to asda. Action includes asd. The geographical boundary of the project includes null, null, null. Planned It is expected that the project will null. In addition, mitigation action has various sustainable development benefits such as null and null

## ppp-test

ppp-test test by Government to ssssss. Action includes sssssssssss. The geographical boundary of the project includes null, null, null. Adopted It is expected that the project will null. In addition, mitigation action has various sustainable development benefits such as null and null

## kasulTest

kasulTest kasulTest by Government to kasulTest. Action includes kasulTest. The geographical boundary of the project includes null, null, null. Adopted It is expected that the project will kasulTest. In addition, mitigation action has various sustainable development benefits such as kasulTest and kasulTest

## 5 diesel powered trucks convered to CNG in 2023

5 diesel powered trucks convered to CNG in 2023 Ministry of Industry by Government to 5 diesel powered trucks convered to CNG in 2023. Action includes 5 diesel powered trucks convered to CNG in 2023. The geographical boundary of the project includes null, null, null. Planned It is expected that the project will null. In addition, mitigation action has various sustainable development benefits such as null and null

### GHG impact assessment

#### System boundary

Table System boundary of the GHG impact assessment of 5 diesel powered trucks convered to CNG in 2023

| Boundary elements | Description |
|---|---|
| Geographic Boundary | N/A, N/A, N/A |
| Temporal Boundary | 2023 - 2030 |
| Transport subsector | Not specified |
| Upstream/downstream | No |
| GHGs Included | Only CO2 |

#### Measurement

| | |
|---|---|
| Assessment Approach | Ex-ante |
| Base Year | 2023 |
| Assessment year(s) | 2023 |
| Methodology | ICAT methodology for cordon pricing |

#### Baseline Scenario

Diesel powered trucks

Table Data required to assess baseline emissions of 5 diesel powered trucks convered to CNG in 2023

| Key indicators | Unit |
|---|---|
| Total annual distance - Diesel-Truck - YY0001 | km |
| Total annual tonnes of goods transported - Diesel-Truck - YY0001 | tons |
| The annual average distance of transportation per tonnes of freight - Diesel-Truck - YY0001 | km |

| Key indicators | Unit |
|---|---|
| Fuel efficiency - Diesel-Truck - YY0001 | fuel/km |
| CO2 emission factor - Diesel | t-CO2/TJ |
| Net calorific value - Diesel | TJ/t |

Baseline emissions attributed to the 5 diesel powered trucks convered to CNG in 2023 are given in Table.

Table Baseline emissions of 5 diesel powered trucks convered to CNG in 2023

| Year | Emissions (MtCO2e) |
|---|---|
| 2023 | 770 |

## Project Scenario

### CNG powered trucks

Table: Data required to assess project emissions of 5 diesel powered trucks convered to CNG in 2023

| Key indicators | Unit |
|---|---|
| Fuel efficiency - CNG-Truck - YY0001 | fuel/km |
| Total annual tonnes of goods transported - CNG-Truck - YY0001 | tons |
| Total annual distance - CNG-Truck - YY0001 | km |
| The annual average distance of transportation per tonnes of freight - CNG-Truck - YY0001 | km |
| Net calorific value - CNG | TJ/t |
| CO2 emission factor - CNG | t-CO2/TJ |
| Consumption of fuel - CNG-Truck - YY0001 | t/y |

Direct project emissions attributed to the 5 diesel powered trucks convered to CNG in 2023 are given in Table 6.

Table: Direct project emissions attributed to 5 diesel powered trucks convered to CNG in 2023

| Year | Emissions (MtCO2e) |
|---|---|
| 2023 | 586 |

Emissions estimated for 2023 are summarized in Table 9. According to the table, 5 diesel powered trucks convered to CNG in 2023 reduce 184 tCO2e in the 2023.

Table Emissions reduction due to 5 diesel powered trucks convered to CNG in 2023

| Scenario | 2023 Emissions (MtCO2) |
|---|---|
| Baseline emissions | 770 |
| Project emissions | 586 |
| Lekage reductions | N/A |
| Emission reductions | 184 |

## Projection of GHG Emissions

GHG emissions attributed to the 5 diesel powered trucks convered to CNG in 2023 are projected to undefined considering the 2023 based on the Gross Domestic Production (GDP). Figure 3 illustrates the BAU and project emissions of the 5 diesel powered trucks convered to CNG in 2023.

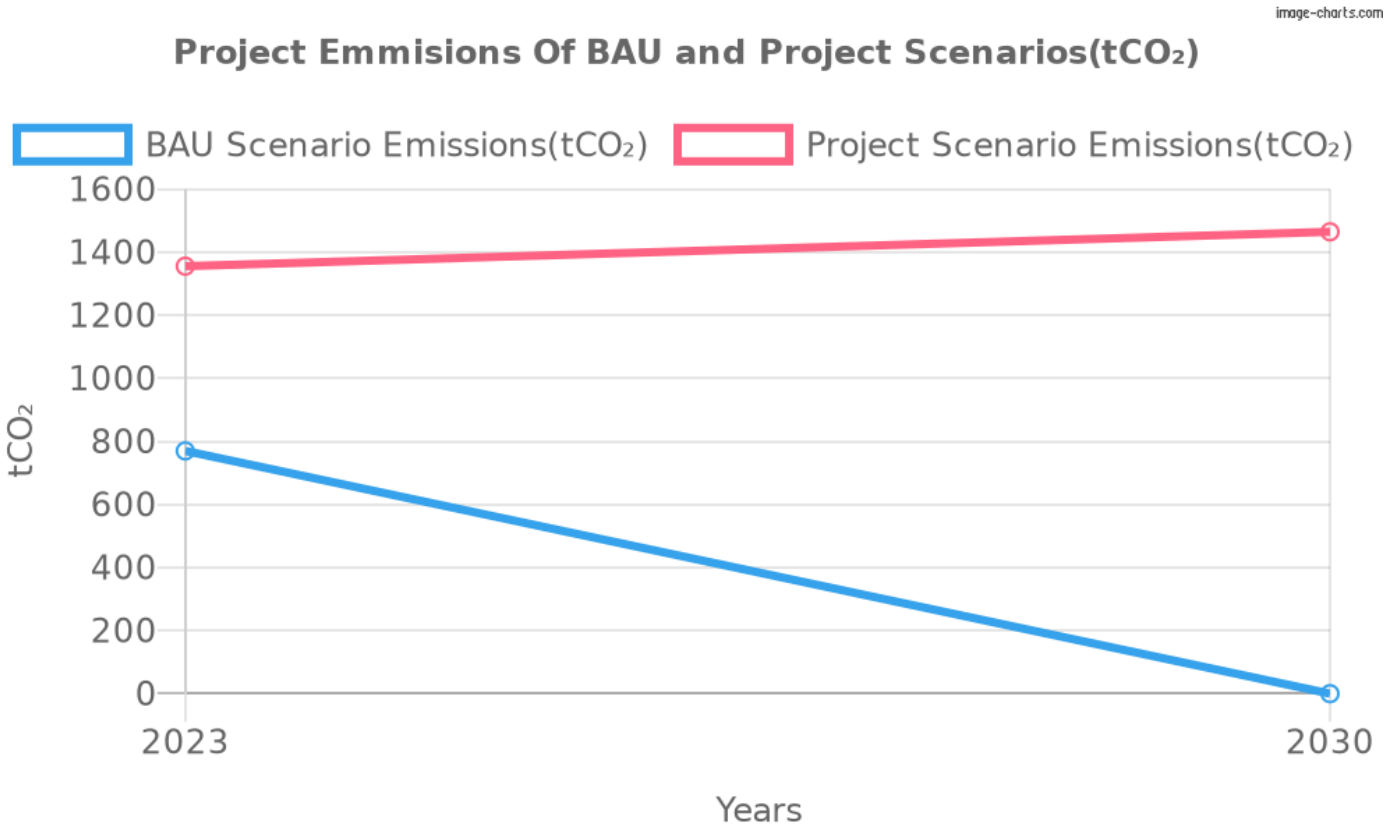


Figure 3: BAU and project emissions of 5 diesel powered trucks convered to CNG in 2023

### Test CA report 2

Test CA report 2 Ministry of Finance by Government to Objective is this. Action includes test data. The geographical boundary of the project includes Test NL 1, Test NL 2, Test NL 3. Adopted It is expected that the project will Test outcoome. In addition, mitigation action has various sustainable development benefits such as SDB and ISDB list

### am-90

am-90 test by Government to test. Action includes test. The geographical boundary of the project includes null, null, null. Adopted It is expected that the project will null. In addition, mitigation action has various sustainable development benefits such as null and null

### pradeep-test

pradeep-test test by Government to null. Action includes null. The geographical boundary of the project includes null, null, null. Adopted It is expected that the project will null. In addition, mitigation action has various sustainable development benefits such as null and null

### testinggggggg

testinggggggg test by Government to fhfjfj. Action includes vhghjghj. The geographical boundary of the project includes null, null, null. Implemented It is expected that the project will null. In addition, mitigation action has various sustainable development benefits such as null and null

### Sri Lanka

Sri Lanka test by Government to dddwd. Action includes null. The geographical boundary of the project includes null, null, null. Implemented It is expected that the project will null. In addition, mitigation action has various sustainable development benefits such as null and null

## Introduce taxes and other instruments to promote public transport

### Introduce distance based charges to Katunayaka to Colombo road

Introduce distance based charges to Katunayaka to Colombo road Ministry of Transport by Government to Emission reduction. Action includes Introduce distance based charges to Katunayaka to Colombo road. The geographical boundary of the project includes null, null, null. Implemented It is expected that the project will Emission reduction. In addition, mitigation action has various sustainable development benefits such as null and null

### Introduce cordon pricing for Colombo Metropolitan

Introduce cordon pricing for Colombo Metropolitan Ministry of Transport by Government to Emission reduction. Action includes Introduce cordon pricing for Colombo Metropolitan. The geographical boundary of the project includes null, null, null. Implemented It is expected that the project will Emission reduction. In addition, mitigation action has various sustainable development benefits such as null and null

## GHG impact assessment

## System boundary

Table System boundary of the GHG impact assessment of Introduce cordon pricing for Colombo Metropolitan

| Boundary elements | Description |
|---|---|
| Geographic Boundary | N/A, N/A, N/A |
| Temporal Boundary | 2022 - 2023 |
| Transport subsector | Not specified |
| Upstream/downstream | No |
| GHGs Included | Only CO2 |

## Measurement

| | |
|---|---|
| Assessment Approach | Ex-post |
| Base Year | 2022 |
| Assessment year(s) | 2023 |
| Methodology | ICAT methodology for cordon pricing |

## Baseline Scenario

Without

Table Data required to assess baseline emissions of Introduce cordon pricing for Colombo Metropolitan

| Key indicators | Unit |
|---|---|
| Density of Diesel - Diesel | Kg/m3 |
| Specific fuel consumption - Diesel-Other | L per VKT |
| Vehicle kilometres travelled - Diesel-Other | VKT |
| Vehicle travel reduction percentage - Diesel-Other | % |
| Net calorific value of Diesel - Diesel | TJ/t |
| CO2 emission factor of Diesel - Diesel | t-CO2/TJ |

Baseline emissions attributed to the Introduce cordon pricing for Colombo Metropolitan are given in Table.

Table Baseline emissions of Introduce cordon pricing for Colombo Metropolitan

| Year | Emissions (MtCO2e) |
|---|---|
| 2023 | 29 |

## Project Scenario

With

Table: Data required to assess project emissions of Introduce cordon pricing for Colombo Metropolitan

| Key indicators | Unit |
|---|---|

Direct project emissions attributed to the Introduce cordon pricing for Colombo Metropolitan are given in Table 6.

Table: Direct project emissions attributed to Introduce cordon pricing for Colombo Metropolitan

| Year | Emissions (MtCO2e) |
|---|---|
| 2023 | 6 |

Emissions estimated for 2023 are summarized in Table 9. According to the table, Introduce cordon pricing for Colombo Metropolitan reduce 23 tCO2e in the 2023.

Table Emissions reduction due to Introduce cordon pricing for Colombo Metropolitan

| Scenario | 2023 Emissions (MtCO2) |
|---|---|
| Baseline emissions | 29 |
| Project emissions | 6 |
| Lekage reductions | N/A |
| Emission reductions | 23 |

# Generic enabling activities

## Test SCA for purpose

Test SCA for purpose Ministry of Education by Government to null. Action includes This is for SCA testing. The geographical boundary of the project includes Central, Kandy, Gampola. Implemented It is expected that the project will null. In addition, mitigation action has various sustainable development benefits such as null and null

## Implement a national fuel levy (5%) on gasoline and diesel cars by 2025

Implement a national fuel levy (5%) on gasoline and diesel cars by 2025 Ministry of Transport by Government to Implement a national fuel levy (5%) on gasoline and diesel cars by 2025. Action includes Implement a national fuel levy (5%) on gasoline and diesel cars by 2025. The geographical boundary of the project includes null, null, null. Implemented It is expected that the project will Emission reduction. In addition, mitigation action has various sustainable development benefits such as null and null

## Implement a national fuel levy (5%) on gasoline cars by 2025

Implement a national fuel levy (5%) on gasoline cars by 2025 Ministry of Transport by Government to Emission reduction. Action includes Implement a national fuel levy (5%) on gasoline cars by 2025. The geographical boundary of the project includes null, null, null. Implemented It is expected that the project will Emission reduction. In addition, mitigation action has various sustainable development benefits such as null and null

## Passenger modal shift from private vehicle to train

Passenger modal shift from private vehicle to train Ministry of Transport by Government to Emission reduction. Action includes Emission reduction. The geographical boundary of the project includes null, null, null. Planned It is expected that the project will null. In addition, mitigation action has various sustainable development benefits such as null and null

## unfccc-90

unfccc-90 test by Government to ssssss. Action includes sssssss. The geographical boundary of the project includes null, null, null. Adopted It is expected that the project will null. In addition, mitigation action has various sustainable development benefits such as null and null

## Implement national fuel levy on gasoline (5%) and diesel (4%) by 2030

Implement national fuel levy on gasoline (5%) and diesel (4%) by 2030 Ministry of Transport by Government to Emission reduction. Action includes Implement national fuel levy on gasoline (5%) and diesel (4%) by 2030. The geographical boundary of the project includes null, null, null. Implemented It is expected that the project will Emission reduction. In addition, mitigation action has various sustainable development benefits such as null and null

### GHG impact assessment

#### System boundary

Table System boundary of the GHG impact assessment of Implement national fuel levy on gasoline (5%) and diesel (4%) by 2030

| Boundary elements | Description |
|---|---|
| Geographic Boundary | N/A, N/A, N/A |
| Temporal Boundary | 2022 - 2023 |
| Transport subsector | Not specified |
| Upstream/downstream | No |
| GHGs Included | Only CO2 |

#### Measurement

| | |
|---|---|
| Assessment Approach | Ex-post |
| Base Year | 2022 |
| Assessment year(s) | 2023 |
| Methodology | ICAT methodology for fuel subsidy removal and increased fuel tax or levy _Approach B (top-down |

| | |
|---|---|
| | energy-use data_Gasoline & Diesel) |

### Baseline Scenario

Without

Table Data required to assess baseline emissions of Implement national fuel levy on gasoline (5%) and diesel (4%) by 2030

| Key indicators | Unit |
|---|---|
| Net calorific value - Diesel | TJ/t |
| CO2 emission factor - Diesel | t-CO2/TJ |
| Net calorific value - Petrol | TJ/t |
| CO2 emission factor - Petrol | t-CO2/TJ |
| Total Diesel used for ground transport (Gg) - Diesel | Gg |
| Total Petrol used for ground transport (Gg) - Petrol | Gg |

Baseline emissions attributed to the Implement national fuel levy on gasoline (5%) and diesel (4%) by 2030 are given in Table.

Table Baseline emissions of Implement national fuel levy on gasoline (5%) and diesel (4%) by 2030

| Year | Emissions (MtCO2e) |
|---|---|
| 2023 | 49620521 |

### Project Scenario

With

Table: Data required to assess project emissions of Implement national fuel levy on gasoline (5%) and diesel (4%) by 2030

| Key indicators | Unit |
|---|---|
| Relative fuel price increase - Petrol | % |
| Relative fuel price increase - Diesel | % |
| Diesel own-price elasticity - Diesel | N/A |
| Petrol own-price elasticity - Petrol | N/A |

Direct project emissions attributed to the Implement national fuel levy on gasoline (5%) and diesel (4%) by 2030 are given in Table 6.

Table: Direct project emissions attributed to Implement national fuel levy on gasoline (5%) and diesel (4%) by 2030

| Year | Emissions (MtCO2e) |
|---|---|
| 2023 | 48919376 |

Emissions estimated for 2023 are summarized in Table 9. According to the table, Implement national fuel levy on gasoline (5%) and diesel (4%) by 2030 reduce 701146 tCO2e in the 2023.

Table Emissions reduction due to Implement national fuel levy on gasoline (5%) and diesel (4%) by 2030

| Scenario | 2023 Emissions (MtCO2) |
|---|---|
| Baseline emissions | 49620521 |
| Project emissions | 48919376 |
| Lekage reductions | N/A |
| Emission reductions | 701146 |

## Implement a national fuel levy (4.2%) on gasoline and diesel cars by 2030

Implement a national fuel levy (4.2%) on gasoline and diesel cars by 2030 Ministry of Environment by Government to Emission reduction. Action includes Implement a national fuel levy (4.2%) on gasoline and diesel cars by 2030. The geographical boundary of the project includes null, null, null. Implemented It is expected that the project will Emission reduction. In addition, mitigation action has various sustainable development benefits such as null and null

## GHG impact assessment

### System boundary

Table System boundary of the GHG impact assessment of Implement a national fuel levy (4.2%) on gasoline and diesel cars by 2030

| Boundary elements | Description |
|---|---|
| Geographic Boundary | N/A, N/A, N/A |
| Temporal Boundary | 2022 - 2023 |
| Transport subsector | Not specified |
| Upstream/downstream | No |
| GHGs Included | Only CO2 |

### Measurement

| | |
|---|---|
| Assessment Approach | Ex-post |
| Base Year | 2022 |
| Assessment year(s) | 2023 |
| Methodology | ICAT methodology for fuel subsidy removal and increased fuel tax or levy Approach A (top-down energy-use data_Fuel mix) |

### Baseline Scenario

Without

Table Data required to assess baseline emissions of Implement a national fuel levy (4.2%) on gasoline and diesel cars by 2030

| Key indicators | Unit |
|---|---|
| Share of fuel - Petrol | % |
| Total fuel used for ground transport(Fuel mix) - Common | TJ |
| CO2 emission factor - Petrol | t-CO2/TJ |
| Share of fuel type - Diesel | % |
| CO2 emission factor - Diesel | t-CO2/TJ |

Baseline emissions attributed to the Implement a national fuel levy (4.2%) on gasoline and diesel cars by 2030 are given in Table.

Table Baseline emissions of Implement a national fuel levy (4.2%) on gasoline and diesel cars by 2030

| Year | Emissions (MtCO2e) |
|---|---|
| 2023 | 56069400 |

### Project Scenario

With

Table: Data required to assess project emissions of Implement a national fuel levy (4.2%) on gasoline and diesel cars by 2030

| Key indicators | Unit |
|---|---|
| Fuel mix own - price elasticity - Fuel Mix | N/A |
| Relative fuel mix price increase - Fuel Mix | % |

Direct project emissions attributed to the Implement a national fuel levy (4.2%) on gasoline and diesel cars by 2030 are given in Table 6.

Table: Direct project emissions attributed to Implement a national fuel levy (4.2%) on gasoline and diesel cars by 2030

| Year | Emissions (MtCO2e) |
|---|---|
| 2023 | 55504220 |

Emissions estimated for 2023 are summarized in Table 9. According to the table, Implement a national fuel levy (4.2%) on gasoline and diesel cars by 2030 reduce 565180 tCO2e in the 2023.

Table Emissions reduction due to Implement a national fuel levy (4.2%) on gasoline and diesel cars by 2030

| Scenario | 2023 Emissions (MtCO2) |
|---|---|
| Baseline emissions | 56069400 |
| Project emissions | 55504220 |
| Lekage reductions | N/A |
| Emission reductions | 565180 |

# Promote public passenger transport

## Shifting from petrol cars to diesel bus

Shifting from petrol cars to diesel bus Ministry of Environment by Government to null. Action includes Shifting from petrol cars to diesel bus. The geographical boundary of the project includes null, null, null. Implemented It is expected that the project will Emission reduction. In addition, mitigation action has various sustainable development benefits such as null and null

### GHG impact assessment

#### System boundary

Table System boundary of the GHG impact assessment of Shifting from petrol cars to diesel bus

| Boundary elements | Description |
|---|---|
| Geographic Boundary | N/A, N/A, N/A |
| Temporal Boundary | 2017 - 2010 |
| Transport subsector | Passenger |
| Upstream/downstream | No |
| GHGs Included | Only CO2 |

#### Measurement

| | |
|---|---|
| Assessment Approach | Ex-post |
| Base Year | 2020 |
| Assessment year(s) | 2010 |
| Methodology | JICA_Modal Shift (Passenger) |

#### Baseline Scenario

Test

Table Data required to assess baseline emissions of Shifting from petrol cars to diesel bus

| Key indicators | Unit |
|---|---|
| Average occupation rate of transport mode - Petrol-car | passenger/vehicle |
| Share of passengers by transport mode - Petrol-car | % |
| $CO_2$ emission factor - Petrol | t-$CO_2$/MWh |
| Net calorific value - Petrol | TJ/t |
| $CO_2$ emission factor of transport mode - Petrol-car | t-$CO_2$/km |
| Fuel consumption rate of transportation mode - Petrol-car | t/km |

Baseline emissions attributed to the Shifting from petrol cars to diesel bus are given in Table.

Table Baseline emissions of Shifting from petrol cars to diesel bus

| Year | Emissions (MtCO2e) |
|---|---|
| 2010 | 1225 |

### Project Scenario

Project

Table: Data required to assess project emissions of Shifting from petrol cars to diesel bus

| Key indicators | Unit |
|---|---|
| No of passenger transported by the project per year - Common | passenger/y |
| Average trip distance of the passenger of the project activity in year y - Common | km |
| $CO_2$ emission factor - Diesel | t-$CO_2$/MWh |
| Net calorific value - Diesel | TJ/t |
| Fuel consumption - Diesel-bus | t/y |
| Fuel consumption rate of transportation mode - Diesel-bus | t/km |

Direct project emissions attributed to the Shifting from petrol cars to diesel bus are given in Table 6.

Table: Direct project emissions attributed to Shifting from petrol cars to diesel bus

| Year | Emissions (MtCO2e) |
|---|---|
| 2010 | 773 |

Emissions estimated for 2010 are summarized in Table 9. According to the table, Shifting from petrol cars to diesel bus reduce 452 tCO2e in the 2010.

Table Emissions reduction due to Shifting from petrol cars to diesel bus

| Scenario | 2010 Emissions (MtCO2) |
|---|---|
| Baseline emissions | 1225 |
| Project emissions | 773 |
| Lekage reductions | N/A |
| Emission reductions | 452 |

## Cost of climate action

The marginal abatement cost (MAC), in general, measures the cost of reducing one more unit of pollution. Table 10 indicates the MAC of Shifting from petrol cars to diesel bus.

Table 10 MAC of the Shifting from petrol cars to diesel bus

| Year | MAC (USD/tCO2e) |
|---|---|
| 2010 | -295 |

## Shift passengers from motor cars to 50 buses in Kandy

Shift passengers from motor cars to 50 buses in Kandy Sri Lanka Sustainable Energy Authority by Government to Shift passengers from motor cars to 50 buses in Kandy. Action includes Shift passengers from motor cars to 50 buses in Kandy. The geographical boundary of the project includes null, null, null. Implemented It is expected that the project will null. In addition, mitigation action has various sustainable development benefits such as null and null

## Shift passengers from motor cars to 50 buses in Colombo

Shift passengers from motor cars to 50 buses in Colombo Ministry of Transport by Government to Test. Action includes Introduce 50 new buses to Colombo city for inter-city transportation . The geographical boundary of the project includes null, null, null. Adopted It is expected that the project will null. In addition, mitigation action has various sustainable development benefits such as null and null

## Shift passenger from private vehicles to public vehicles

Shift passenger from private vehicles to public vehicles Ministry of transport by Government to emission reduction. Action includes Emission reduction. The geographical boundary of the project includes null, null, null. Planned It is expected that the project will . In addition, mitigation action has various sustainable development benefits such as and

### Colombo surburban railway system

Colombo surburban railway system Ministry of Environment by Government to Mitigation. Action includes Colombo suburban area. The geographical boundary of the project includes null, null, null. Adopted It is expected that the project will Emission reduction. In addition, mitigation action has various sustainable development benefits such as null and null

### Shift passengers from private vehicles to 170 public buses in Colombo

Shift passengers from private vehicles to 170 public buses in Colombo Ministry of Transport by Government to Reduce the traffic congestion Reduce GHG emissions . Action includes Introducing 170 buses (40 seated) in the Colombo municipal council. The geographical boundary of the project includes Western, Colombo, Colombo. Implemented It is expected that the project will Reduce the traffic congestion Reduce GHG emissions . In addition, mitigation action has various sustainable development benefits such as null and null

### Shift passengers from private vehicles to 170 public buses in Sri Lanka

Shift passengers from private vehicles to 170 public buses in Sri Lanka Ministry of Transport by Government to Promote public transportation Reduce traffic congestion Reduce GHG emissions. Action includes null. The geographical boundary of the project includes null, null, Colombo. Implemented It is expected that the project will Reduce the transportation cost of the public Reduce traffic congestion and reduce travelling time . In addition, mitigation action has various sustainable development benefits such as null and null

### Shift passengers from motor cars to 50 buses in Kandy

Shift passengers from motor cars to 50 buses in Kandy Ministry Of Finance by Private to Improve the modal share of the public buses, reduce the traffic congestion. Action includes Shift passengers from motor cars to 50 buses in Kandy. The geographical boundary of the project includes Central, Kandy, Kandy. Planned It is expected that the project will Reduce traffic congestion, reduce air pollution, increase the average speed of transport modes, and reduce private automobiles. In addition, mitigation action has various sustainable development benefits such as Goal 11 sustainable cities, and communities and Goal 13 climate actions, Goal 5 gender equity

### Shift passengers from private vehicles to public buses

Shift passengers from private vehicles to public buses Ministry of Transport by Government to Objective. Action includes In the colombo city. The geographical boundary of the project includes null, null, null. Adopted It is expected that the project will null. In addition, mitigation action has various sustainable development benefits such as null and null

## 30% trucks and buses using CNG by 2040

### KHtest

KHtest asdas by Government to axdasd. Action includes test. The geographical boundary of the project includes null, null, null. Adopted It is expected that the project will null. In addition, mitigation action has various sustainable development benefits such as null and null

### Test CA

Test CA Ministry of Finance by Government to null. Action includes test. The geographical boundary of the project includes null, null, null. Adopted It is expected that the project will null. In addition, mitigation action has various sustainable development benefits such as null and null

### Passenger Shift from multiple modes (Motor car, Motor bike) to multiple mode (Bus, Van)

Passenger Shift from multiple modes (Motor car, Motor bike) to multiple mode (Bus, Van) Ministry of Transport by Government to improve public transportation. Action includes improve public transportation. The geographical boundary of the project includes Western, Colombo, Battaramulla. Planned It is expected that the project will emission reduction. In addition, mitigation action has various sustainable development benefits such as Climate change and Climate change - Goal 13

### Shift fossil fuel freight vehicle-(YY0001) to CNG

Shift fossil fuel freight vehicle-(YY0001) to CNG Ministry of Industry by Government to reduce the emissions. Action includes Reduce the emissions. The geographical boundary of the project includes null, null, null. Planned It is expected that the project will null. In addition, mitigation action has various sustainable development benefits such as null and null

#### GHG impact assessment

##### System boundary

Table System boundary of the GHG impact assessment of Shift fossil fuel freight vehicle-(YY0001) to CNG

| Boundary elements | Description |
|---|---|
| Geographic Boundary | N/A, N/A, N/A |
| Temporal Boundary | 2022 - 2023 |
| Transport subsector | Frieght |

| Boundary elements | Description |
|---|---|
| Upstream/downstream | No |
| GHGs Included | Only CO2 |

## Measurement

| | |
|---|---|
| Assessment Approach | Ex-ante |
| Base Year | 2022 |
| Assessment year(s) | 2023 |
| Methodology | AMS-III.S - Introduction of low-emission vehicles/technologies to commercial vehicle fleets (Freight) |

## Baseline Scenario

### Fossil fuel used truck

Table Data required to assess baseline emissions of Shift fossil fuel freight vehicle-(YY0001) to CNG

| Key indicators | Unit |
|---|---|
| Fuel efficiency - Diesel-Truck - AB Route | fuel/km |
| CO2 emission factor - Diesel | t-CO2/TJ |
| Net calorific value - Diesel | TJ/t |
| The annual average distance of transportation per tonnes of freight - Diesel-Truck - AB Route | km |
| Total annual tonnes of goods transported - Diesel-Truck - AB Route | tons |
| Total annual distance - Diesel-Truck - AB Route | km |

Baseline emissions attributed to the Shift fossil fuel freight vehicle-(YY0001) to CNG are given in Table.

Table Baseline emissions of Shift fossil fuel freight vehicle-(YY0001) to CNG

| Year | Emissions (MtCO2e) |
|---|---|
| 2023 | 770 |

## Project Scenario

### CNG used trucks

Table: Data required to assess project emissions of Shift fossil fuel freight vehicle-(YY0001) to CNG

| Key indicators | Unit |
|---|---|
| Fuel efficiency - CNG-Truck - AB Route | fuel/km |
| Total annual tonnes of goods transported - CNG-Truck - AB Route | tons |
| Net calorific value - CNG | TJ/t |
| CO2 emission factor - CNG | t-CO2/TJ |
| Total annual distance - CNG-Truck - AB Route | km |
| The annual average distance of transportation per tonnes of freight - CNG-Truck - AB Route | km |
| Consumption of fuel - CNG-Truck - AB Route | t/y |

Direct project emissions attributed to the Shift fossil fuel freight vehicle-(YY0001) to CNG are given in Table 6.

Table: Direct project emissions attributed to Shift fossil fuel freight vehicle-(YY0001) to CNG

| Year | Emissions (MtCO2e) |
|---|---|
| 2023 | 586 |

Emissions estimated for 2023 are summarized in Table 9. According to the table, Shift fossil fuel freight vehicle-(YY0001) to CNG reduce 184 tCO2e in the 2023.

Table Emissions reduction due to Shift fossil fuel freight vehicle-(YY0001) to CNG

| Scenario | 2023 Emissions (MtCO2) |
|---|---|
| Baseline emissions | 770 |
| Project emissions | 586 |
| Lekage reductions | N/A |
| Emission reductions | 184 |

### Projection of GHG Emissions

GHG emissions attributed to the Shift fossil fuel freight vehicle-(YY0001) to CNG are projected to undefined considering the 2023 based on the Population Growth (POP). Figure 3 illustrates the BAU and project emissions of the Shift fossil fuel freight vehicle-(YY0001) to CNG.

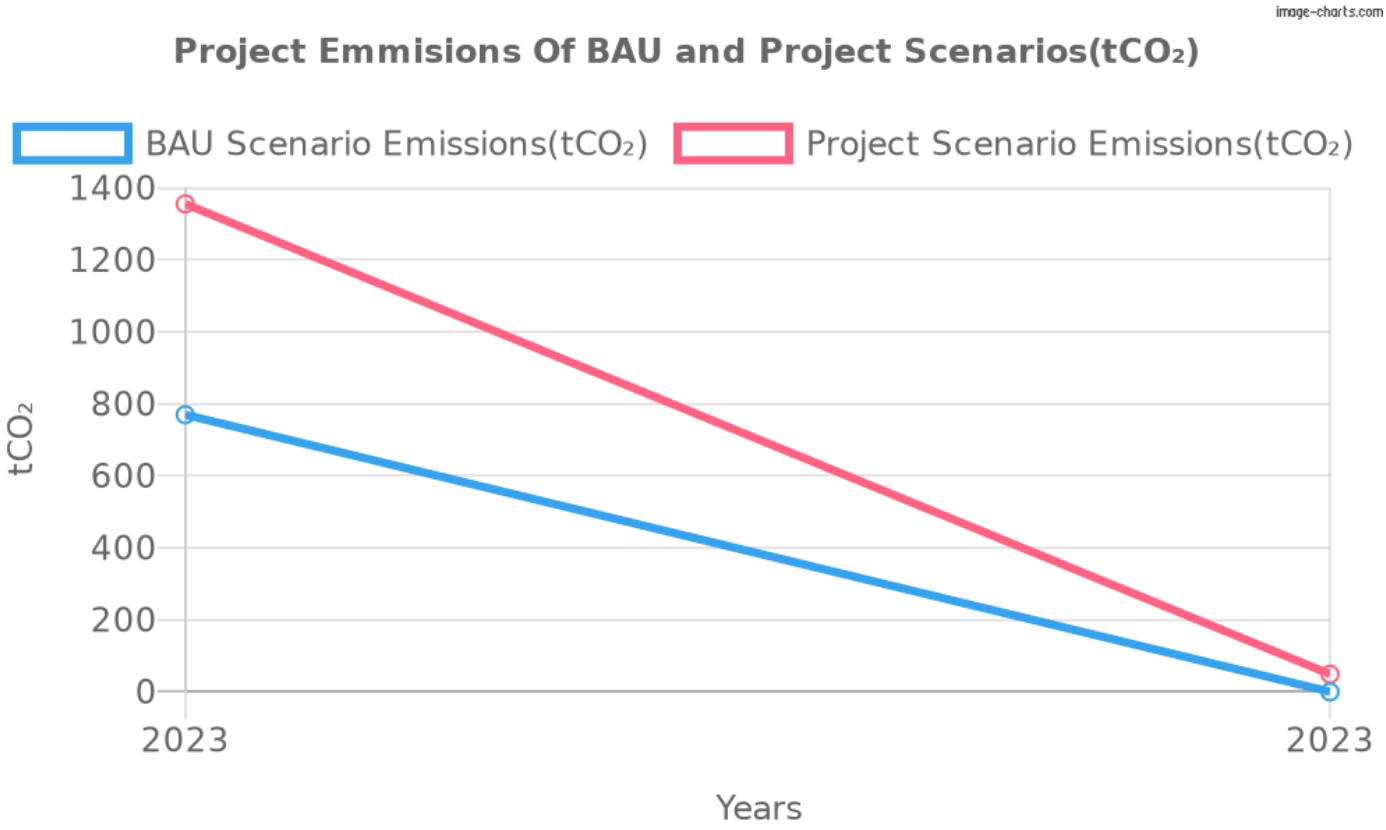


Figure 3: BAU and project emissions of Shift fossil fuel freight vehicle-(YY0001) to CNG

# Switch back to rail from road transport

## shift in transportation of cargo from road transportation to water or rail transportation

shift in transportation of cargo from road transportation to water or rail transportation ClimateSI by Private to 1. shift in transportation of cargo from road transportation to water or rail transportation. Action includes shift in transportation of cargo from road transportation to water or rail transportation. The geographical boundary of the project includes null, null, null. Planned It is expected that the project will . In addition, mitigation action has various sustainable development benefits such as null and null

# Activity data

## Redesign the route of bus from Colombo to Kandy

| Parameter | Unit | 2021 |
|---|---|---|
| Average occupation rate of transport mode - Petrol-car | passenger/vehicle | 1.5 |
| Share of passengers by transport mode - Petrol-car | % | 29 |
| $CO_2$ emission factor - Petrol | t-$CO_2$/MWh | |
| Net calorific value - Petrol | TJ/t | |

| Parameter | Unit | 2021 |
|---|---|---|
| No of passenger transported by the project per year - Common | passenger/y | 4423456 |
| Average trip distance of the passenger of the project activity in year y - Common | km | 10 |
| $CO_2$ emission factor - Diesel | t-$CO_2$/MWh | |
| Net calorific value - Diesel | TJ/t | |
| $CO_2$ emission factor of transport mode - Petrol-car | t-$CO_2$/km | 0.00016 |
| Fuel consumption - Diesel-bus | t/y | 278 |

## Introduction of new electric buses in Colomobo Distric

| Parameter | Unit | 2020 | | | |
|---|---|---|---|---|---|
| Total distance - Common | km | 4050323 | 45050323 | 51200 | 51200 |
| Specific fuel consumption - Diesel-Lorry | g/km | 265.44 | | | |
| Number of operational vehicles - Diesel-Lorry | | 9 | | | |
| Technology improvement factor - Common | | 0.99 | 0.99 | | |
| CO2 emission factor - Diesel | gCO2/J | 0.00074 | | | |
| Net calorific value - Diesel | J/g | 4300 | | | |
| Number of operational vehicles - Electricity-Lorry | | 9 | | | |
| Specific fuel consumption - Electricity-Lorry | g/km | 1.23 | | | |
| Average technical transmission and distribution losses - Electricity-Lorry | % | 8.45 | | | |
| CO2 emission factor - Electricity | kgCO2/kwh | 0.5684 | | | |

## Shift passengers from motor cars to buses in Sri Lanka

| Parameter | Unit | 2034 |
|---|---|---|
| Project Scenario Annual O&M | $ | 543270 |
| Discount Rate | % | |
| Reduction | tCo2e | 1292 |
| Baseline Scenario Total Investment | $ | 150000 |
| Baseline Scenario Annual O&M | $ | |
| Baseline Scenario Project Life | years | 15 |
| Baseline Scenario Other Annual Cost | $ | 0 |
| Baseline Scenario Annual Fuel | $ | |
| Project Scenario Total Investment | $ | 250000 |
| Project Scenario Other Annual Cost | $ | 24300 |
| Project Scenario Project Life | years | 3 |
| Project Scenario Annual Fuel | $ | |

## 5 diesel powered trucks convered to CNG in 2023

| Parameter | Unit | 2023 |
|---|---|---|
| Fuel efficiency - CNG-Truck - YY0001 | fuel/km | 0.005865057 |
| The annual average distance of transportation per tonnes of freight - Diesel-Truck - YY0001 | km | 0.7488 |
| Total annual tonnes of goods transported - CNG-Truck - YY0001 | tons | 50000 |
| Fuel efficiency - Diesel-Truck - YY0001 | fuel/km | 0.0068 |
| CO2 emission factor - Diesel | t-CO2/TJ | 75.243 |
| Net calorific value - Diesel | TJ/t | 0.043 |
| Total annual distance - CNG-Truck - YY0001 | km | 35000 |
| Net calorific value - CNG | TJ/t | 0.048 |

| Parameter | Unit | 2023 |
|---|---|---|
| CO2 emission factor - CNG | t-CO2/TJ | 59.471 |

## Introduce cordon pricing for Colombo Metropolitan

| Parameter | Unit | 2023 |
|---|---|---|
| Density of Diesel - Diesel | Kg/m3 | 835 |
| Specific fuel consumption - Diesel-Other | L per VKT | 0.5 |
| Vehicle kilometres travelled - Diesel-Other | VKT | 21538400 |
| Vehicle travel reduction percentage - Diesel-Other | % | 20 |
| Net calorific value of Diesel - Diesel | TJ/t | 0.043 |
| CO2 emission factor of Diesel - Diesel | t-CO2/TJ | 74.1 |

## Implement national fuel levy on gasoline (5%) and diesel (4%) by 2030

| Parameter | Unit | 2023 |
|---|---|---|
| Relative fuel price increase - Petrol | % | 5 |
| Net calorific value - Diesel | TJ/t | 0.043 |
| CO2 emission factor - Diesel | t-CO2/TJ | 74.1 |
| Net calorific value - Petrol | TJ/t | 0.0443 |
| CO2 emission factor - Petrol | t-CO2/TJ | 69.3 |
| Relative fuel price increase - Diesel | % | 4 |
| Total Diesel used for ground transport (Gg) - Diesel | Gg | 8000 |
| Total Petrol used for ground transport (Gg) - Petrol | Gg | 7860 |
| Diesel own-price elasticity - Diesel | | -0.38 |
| Petrol own-price elasticity - Petrol | | -0.26 |

## Implement a national fuel levy (4.2%) on gasoline and diesel cars by 2030

| Parameter | Unit | 2023 |
|---|---|---|
| Share of fuel - Petrol | % | 50 |
| Total fuel used for ground transport(Fuel mix) - Common | TJ | 782000 |
| Fuel mix own - price elasticity - Fuel Mix | | -0.24 |
| CO2 emission factor - Petrol | t-CO2/TJ | 69.3 |
| Share of fuel type - Diesel | % | 50 |
| CO2 emission factor - Diesel | t-CO2/TJ | 74.1 |
| Relative fuel mix price increase - Fuel Mix | % | 4.2 |

## Shifting from petrol cars to diesel bus

| Parameter | Unit | 2010 |
|---|---|---|
| Average occupation rate of transport mode - Petrol-car | passenger/vehicle | 1.5 |
| Share of passengers by transport mode - Petrol-car | % | 26 |
| $CO_2$ emission factor - Petrol | t-$CO_2$/MWh | |
| Net calorific value - Petrol | TJ/t | |
| No of passenger transported by the project per year - Common | passenger/y | 4418271 |
| Average trip distance of the passenger of the project activity in year y - Common | km | 10 |
| $CO_2$ emission factor - Diesel | t-$CO_2$/MWh | |
| Net calorific value - Diesel | TJ/t | |
| $CO_2$ emission factor of transport mode - Petrol-car | t-$CO_2$/km | 0.00016 |

| Parameter | Unit | 2010 |
|---|---|---|
| Fuel consumption - Diesel-bus | t/y | 242.7 |

| Parameter | Unit | 2010 |
|---|---|---|
| Discount Rate | % | |
| Reduction | tCo2e | 452 |
| Baseline Scenario Total Investment | $ | 1000000 |
| Baseline Scenario Annual O&M | $ | |
| Baseline Scenario Other Annual Cost | $ | 2000 |
| Baseline Scenario Project Life | years | 15 |
| Baseline Scenario Annual Fuel | $ | |
| Project Scenario Total Investment | $ | 100000 |
| Project Scenario Annual O&M | $ | |
| Project Scenario Other Annual Cost | $ | 4300 |
| Project Scenario Project Life | years | 15 |
| Project Scenario Annual Fuel | $ | |

## Shift fossil fuel freight vehicle-(YY0001) to CNG

| Parameter | Unit | 2023 |
|---|---|---|
| Fuel efficiency - CNG-Truck - AB Route | fuel/km | 0.005865 |
| Fuel efficiency - Diesel-Truck - AB Route | fuel/km | 0.0068 |
| CO2 emission factor - Diesel | t-CO2/TJ | 75.243 |
| Net calorific value - Diesel | TJ/t | 0.043 |
| Projection Year POP 2023 | population | 50000 |
| Total annual tonnes of goods transported - CNG-Truck - AB Route | tons | 50000 |
| Net calorific value - CNG | TJ/t | 0.048 |
| CO2 emission factor - CNG | t-CO2/TJ | 59.471 |
| The annual average distance of transportation per tonnes of freight - Diesel-Truck - AB Route | km | 0.748844 |
| Projection Base Year 2023 | population | 600000 |
| Total annual distance - CNG-Truck - AB Route | km | 35000 |