NDC TRANSPORT INITIATIVE FOR ASIA

Implemented by
giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Supported by:
Federal Ministry for Economic Affairs and Climate Action

on the basis of a decision by the German Bundestag

IKI INTERNATIONAL CLIMATE INITIATIVE

VIETNAM NET ZERO EMISSION SCENARIOS IN FREIGHT TRANSPORT

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MAIN CONTENT



- Sub-sector Planning Overview
- Current Status of Freight Transport Sector
- NZE Scenarios of freight transport
- Recommendations

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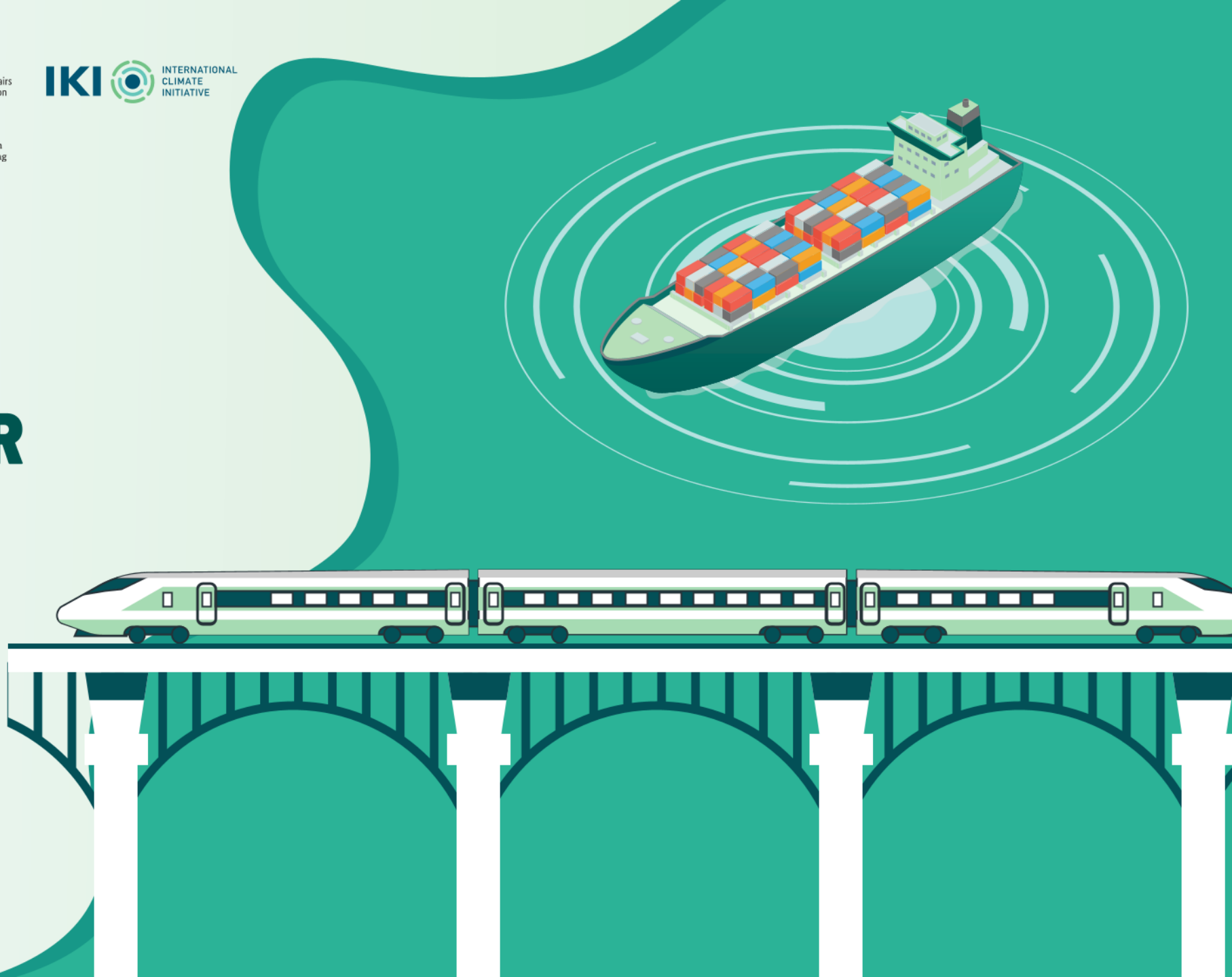

1. SUB-SECTOR PLANNING OVERVIEW

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Development Planning by 2050

	2023	2030	2050
Highways	1.827 km	5.000 km	9.014 km
Railway system	Not yet	Invest in construction	1,900 km (Hanoi – HCMC)
Gateway seaports, international transit ports	Lach Huyen, Cai Mep	Lach Huyen, Cai Mep, Lien Chieu, Can Gio, Tran De	Lach Huyen, Cai Mep, Lien Chieu, Can Gio, Tran De
Hub airports		Long Thanh, Tan Son Nhat, Noi Bai, Da Nang, Cam Ranh, Phu Quoc	Long Thanh, Tan Son Nhat, Noi Bai, Da Nang, Cam Ranh, Phu Quoc

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- 2021: **~188,300** million tkm
- Continue growing
- Dependent on fossil fuels (2021)

- Commit to reduce GHG emissions when participating in the Paris Agreement on Climate Change (COP 21)
- By 2030: ↓ **15.8%** and **43.5%** of GHG emissions compared to the BAU Scenario, corresponding to the unconditional scenario & conditional scenario (NDC 2022)
- **By 2050**: The net zero emissions target (COP 26)
- Law on Environmental Protection No. 72/2020/QH14: specific regulations on climate change response and GHG mitigation



Transport

Decision 876 – towards NZE

VIETNAM CONTEXT

Development orientation

Transport GHG emissions



Targets in 2050

100% motorized road vehicles, machinery and equipment use electricity and green energy.

100% of vehicles (locomotives, wagons) and equipment at the station use electricity and green energy.

The infrastructure is fully eligible for green transformation

100% of vehicles use electricity and green energy.

100% of equipment at ports and inland waterways are converted to electricity and green energy

100% of existing ships operating on domestic routes are converted to electricity and green energy.
All means of transport and equipment at ports, marine signaling devices use electricity, green energy or equivalent measures.

Convert to 100% green energy, sustainable aviation fuel for aircraft.

SAF Depending on technological conditions, residual emissions are compensated by carbon offsetting to achieve net zero emissions

- 2020: ~18% of total energy of the sector, equivalent to ~45.5Mt CO2eq
- 2030: ~88.1 Mt CO2eq estimation

(Source: Decision 876/QĐ-Ttg 2022, Roadmap towards Low Carbon Transport, WB, GIZ, 2019)

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SOLUTION FRAMEWORK FOR EMISSION MITIGATION SCENARIOS

03 main pillars on freight of NDC 2022, integrating additional solutions specified/supplemented in Decision 876

Use energy efficiently

- Increase the load factor of trucks

Shift freight transport from road to railway and waterway

- Shift freight transport from road to railway
- Shift freight transport from road to inland waterway and maritime (coastal)

Fuel/energy transition

- Including solutions on using biofuels, alternative fuels for traditional fossil fuels.

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2. CURRENT STATUS OF FREIGHT INDUSTRY





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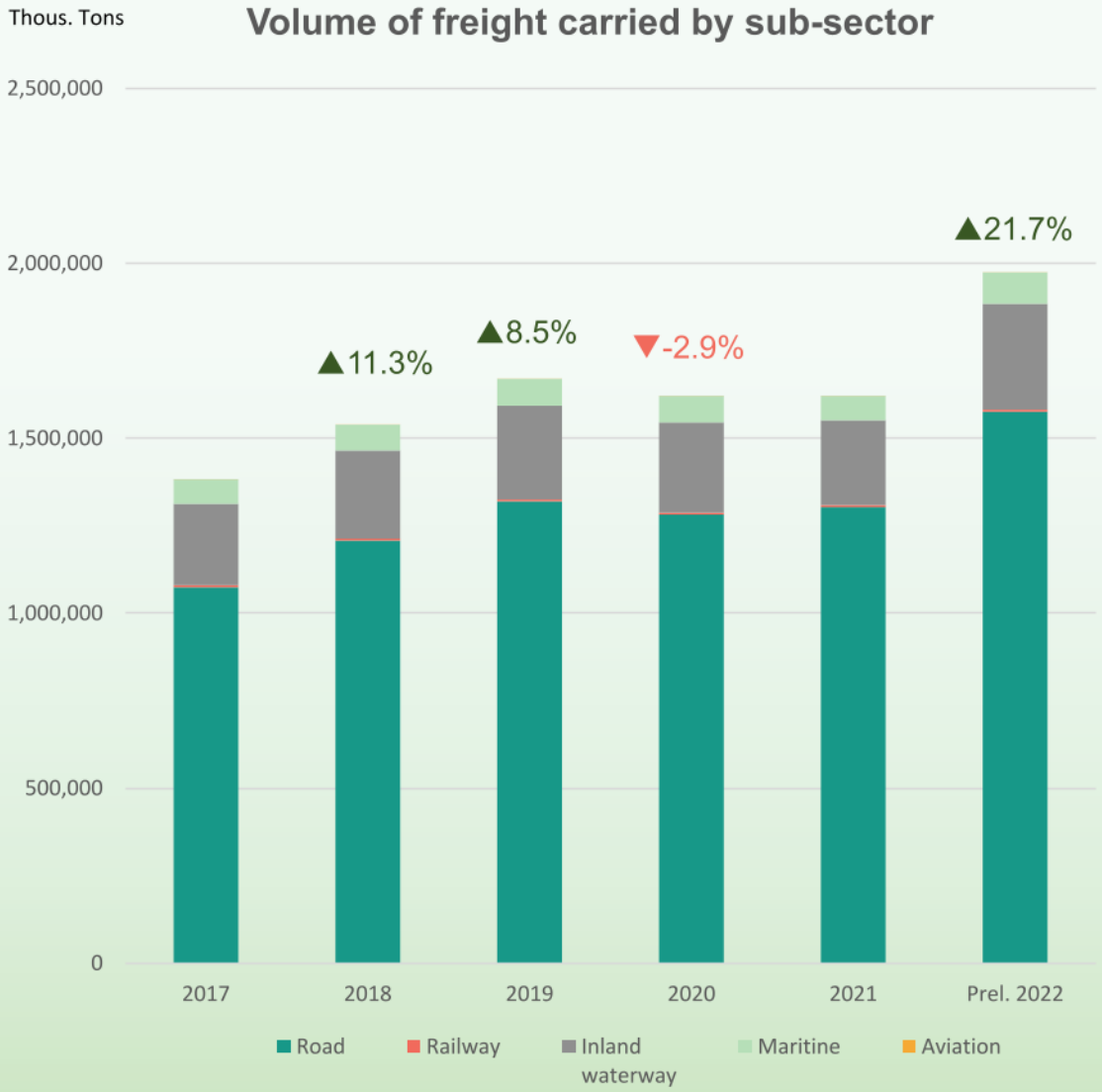
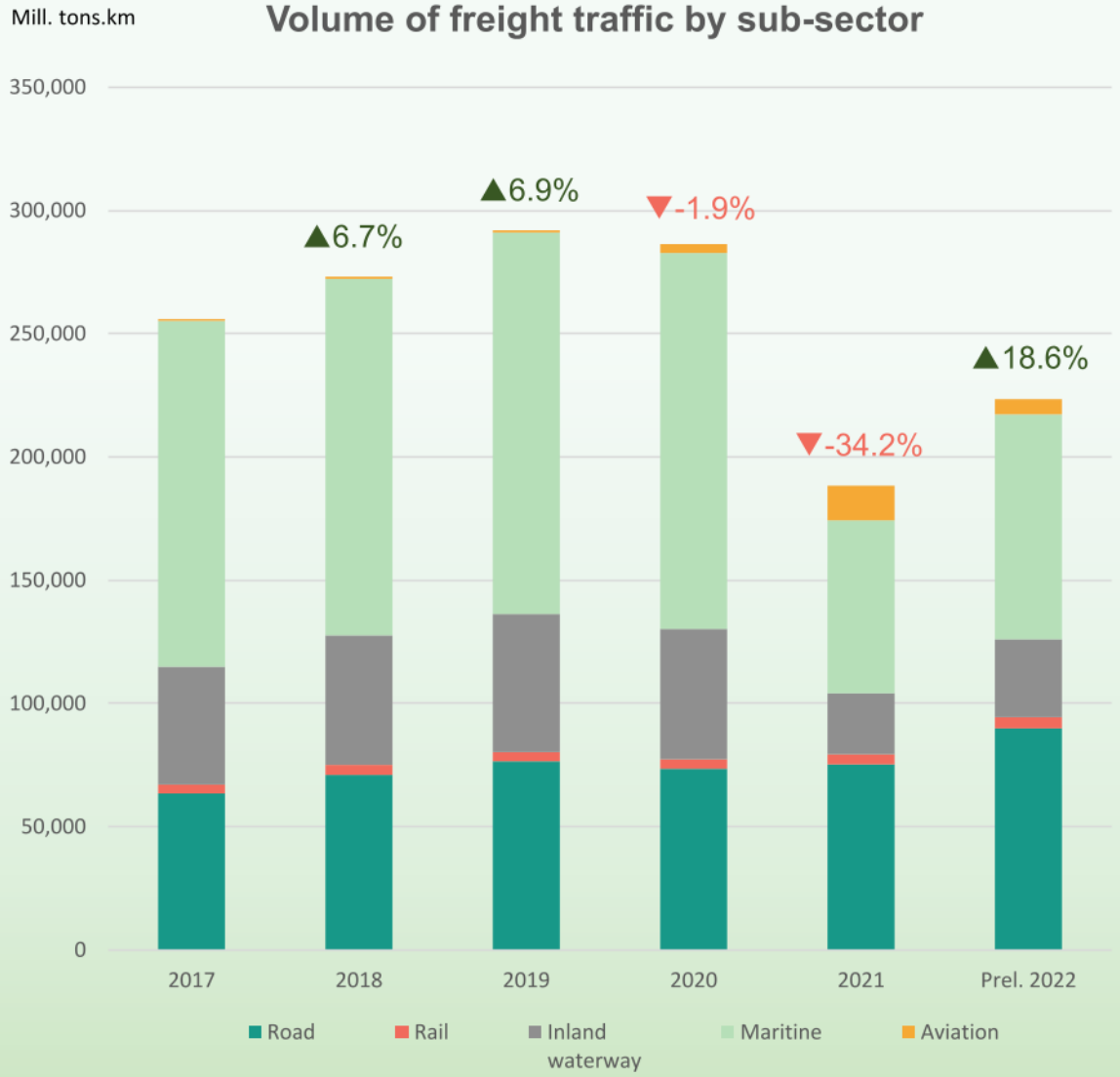
Volume of freight carried by sub-sector



Volume of freight traffic by sub-sector



Source: GSO Vietnam

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3. NZE SCENARIOS OF FREIGHT TRANSPORT



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GENERAL PRINCIPLES & DEFINITION OF SCENARIO

GENERAL PRINCIPLES

- Appropriate and consistent with the goals and direction of the policy
- In line with the development trend of energy and vehicle technology
- Consider integrating with other mitigation solutions on a cost-effective basis

BAU Scenario

Developing transport towards BAU emissions

- Includes all policies and interventions enacted up to the base year 2019

→ Not yet implemented measures to reduce GHG emissions according to Decree 06/ND-CP/2021

Net Zero Emission Scenario – NET Scenario

Scenario with international support

- Integrate all policies and mitigation measures to achieve net zero emissions by 2050 in the transport sector
- The scenario reflects the ambitious target of vehicle technology & energy transition, in line with the development trend in the world

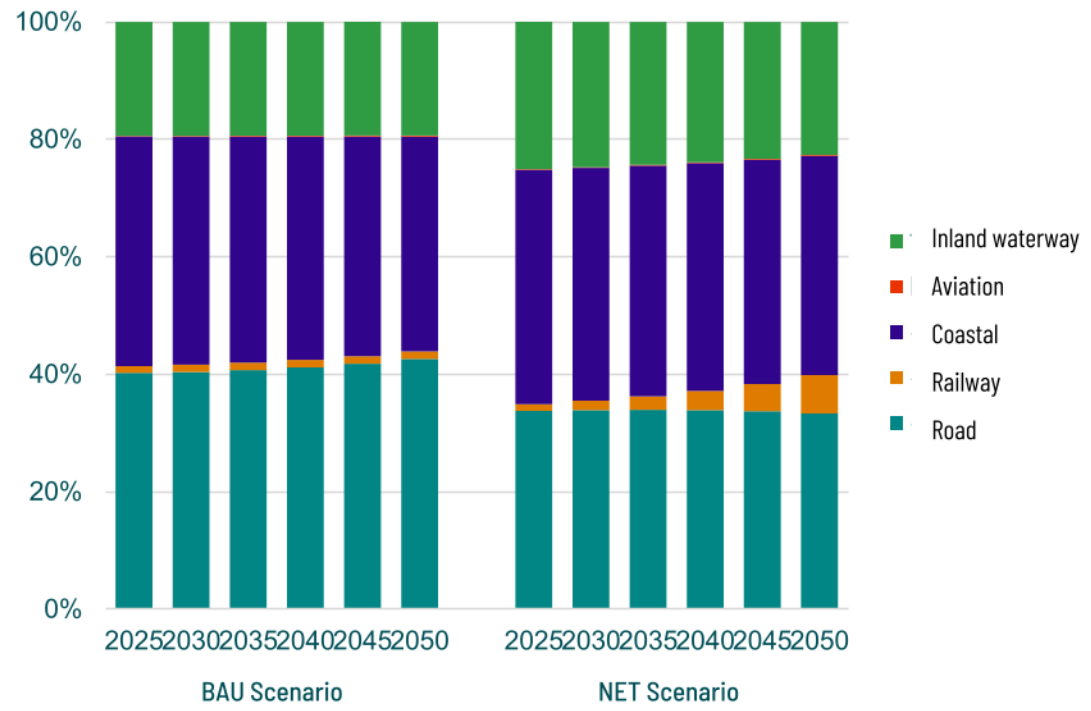
BAU Freight transport

2030 $0.5x10^6$ million tkm

2050 $1.5x10^6$ million tkm

Transport infrastructure planning to 2050 in order to meet the socio-economic development growth according to Resolution 29/NQ-TW

FREIGHT TRANSPORT MARKET SHARE



There is a similarity between road and coastal. Next is inland waterways.

In the NET Scenario: there is a shift towards a decrease in road market share and a clear increase in railway market share.

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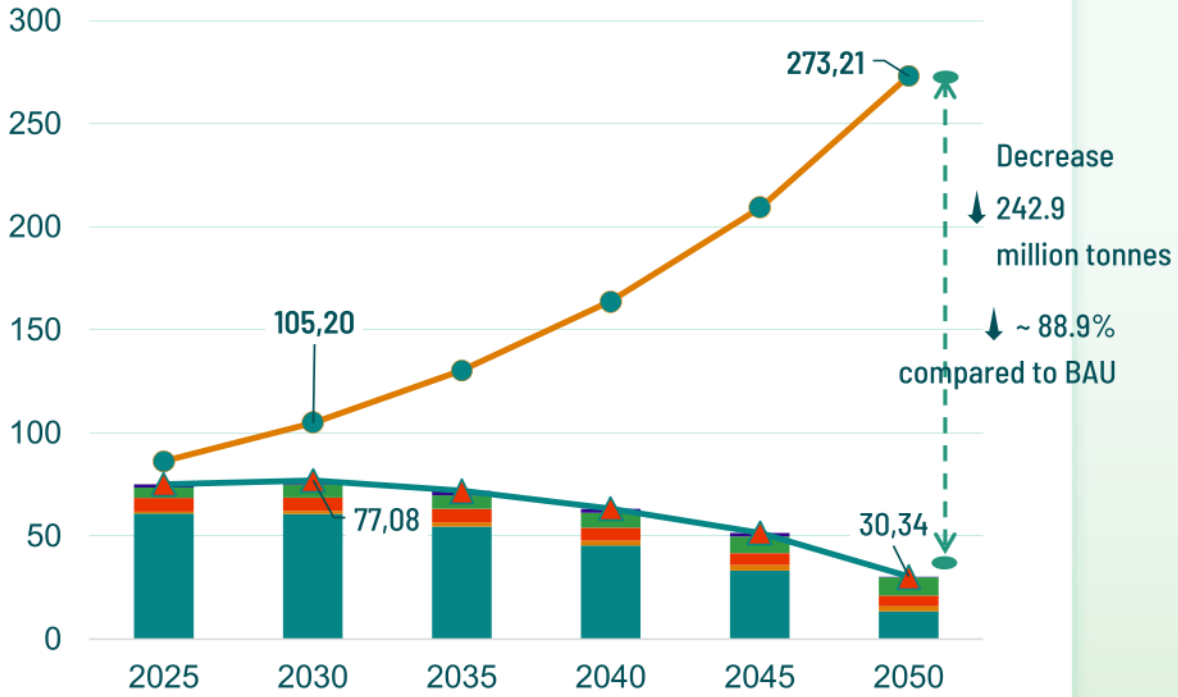
FORECAST OF TOTAL GREENHOUSE GAS EMISSIONS

TOTAL GHG EMISSIONS FORECAST (MILLION TONNES OF CO_2eq)



	2025	2030	2035	2040	2045	2050
Coastal	1.55	1.96	2.05	1.98	1.70	0.27
IWW	5.07	6.36	6.54	7.22	8.06	8.87
Aviation	6.60	6.48	6.53	6.24	5.79	5.14
Railway	0.91	1.47	2.06	2.40	2.63	2.54
Road	61.02	60.79	54.71	45.48	33.36	13.52
Total GHG emissions under NET Scenario	75.15	77.08	71.88	63.32	51.55	30.34
Total GHG emissions under BAU Scenario	86.16	105.20	130.25	163.62	209.48	273.21

Unit: million tonnes CO2eq)

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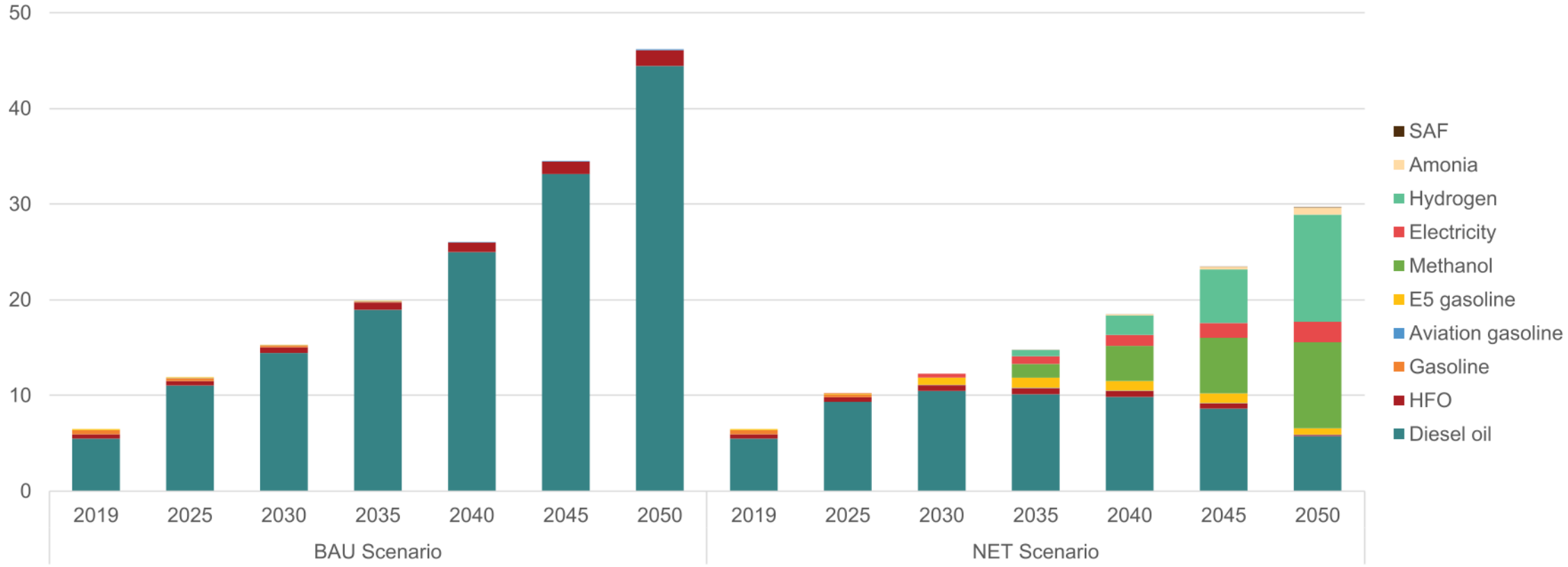
ENERGY DEMAND AND SHIFTING TRENDS (Freight transport)



Energy demand in the emission mitigation scenarios will decrease compared to the BAU Scenario.

- **2050: 46.2 Mtoe (BAU) ⇢ 29.7 Mtoe (NET)**

Fossil fuels account for the majority of the BAU Scenario but decrease in the NZE mitigation scenarios

- **2050: ≈100% (BAU) ⇢ 19.9% (NET)** *(including: gasoline/diesel/HFO/aviation gasoline)*

2035 is forecasted to be the year of strong penetration of several types of green energy (Ammonia, Hydrogen, Methanol & SAF) under the NET Scenario

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4. CONCLUSION AND RECOMMENDATIONS



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CONCLUSION

BAU Scenario

- GHG emissions increase during the period 2025 - 2050, at an average rate of 4.7% per year *(no peak of emissions)*
- By 2050: about 273.21 million tonnes CO2eq emissions

NET Scenario: a reduction of 86% in GHG emissions compared to the BAU Scenario in 2050

- In other words, GHG emissions in 2050 will be only about 14% of the BAU Scenario emissions - this ratio is basically similar to the scenario developed in the National Strategy on Climate Change for the period up to 2050.
- The energy/technology transition will take place strongly from 2030 in the road sector. For other transport sectors, the transition milestone will be clear from 2035. Basically, the direct transition from fossil fuels to electricity and green energy (Hydrogen, Ammonia, Methanol, and SAF)
- The total green energy demand in the transport sector in emission mitigation scenarios is within the energy sector's response threshold (according to Power Development Plan 8, National Energy Master Plan)





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RECOMMENDATIONS



- State management, inter-sectoral coordination
- Resource mobilisation and investment allocation mechanisms.
- In particular, the important role of infrastructure investment to enhance capacity, ensure energy transition and mode transformation.
- Develop science and technology, promptly responding to green transition in the transport sector
- Train human resources suitable for green energy transition in the transport sector
- International cooperation
- Implementation monitoring mechanism
- Communicate to raise awareness and engage the implementing community

THANK YOU!



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