ASIA-EUROPE
ENVIRONMENT FORUM

OVERVIEW OF CLIMATE CHANGE MITIGATION EFFORTS IN ASEM PARTNER COUNTRIES

WITH AN OUTLOOK ON CIRCULAR ECONOMY TRANSITION

Authors: **Dr Dora Almassy, Dr Rifat Unal Sayman and Grazyna Pulawska**

PUBLISHED BY:
Asia-Europe Foundation (ASEF)
31 Heng Mui Keng Terrace
Singapore 119595

ISN: 978-981-18-5736-2

This publication is made with the financial support of the Asia-Europe Environment Forum
(ENVforum) consortium consisting of: Asia-Europe Foundation (ASEF),
the Stockholm Environment Institute Asia Center, Hanns Seidel Foundation (HSF),
ASEM SMEs Eco-Innovation Center (ASEIC), and
the Institute for Global Environmental Strategies (IGES).

The views expressed herein are in no way reflective of the official opinion or position of the ENVforum Partners.

Overview of Climate Change Mitigation Efforts in ASEM Partner Countries
With an Outlook on Circular Economy Transition

Authors:
Dr Dora Almassy
Dr Rifat Unal Sayman
Grażyna Pulawska

Research Support:
Mihaela Groza
The publication benefitted from a collaboration of ASEF with the Lee Kuan Yew School of Public Policy in Singapore:
Mehtab Ahmed Jagil
Ji Ying
Olga Vitkovska
Shyam Datye

Reviewers:
Dr Peter King

Editor:
Ira Martina Drupady

Cover, Illustrations and Layout:
Natalia Maca

PERMISSIONS AND RIGHTS

This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License.

YOU ARE FREE TO
Share — Copy and redistribute the material in any medium or format.
Attribution — You must give appropriate credit, provide a link to the license, and indicate if changes were made. You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.
NonCommercial — You may not use the material for commercial purposes.
NoDerivatives — If you remix, transform, or build upon the material, you may not distribute the modified material.
No additional restrictions — You may not apply legal terms or technological measures that legally restrict others from doing anything to the license permits.

#ENVFORUM

ASIA-EUROPE ENVIRONMENT FORUM

OVERVIEW OF CLIMATE CHANGE MITIGATION EFFORTS IN ASEM PARTNER COUNTRIES

WITH AN OUTLOOK ON CIRCULAR ECONOMY TRANSITION

ASIA-EUROPE FOUNDATION
SEI Stockholm Environment Institute
Sweden Sverige
Hanns Seidel Foundation
ASEM SMEs Eco Innovation Center
IGES Institute for Global Environmental Strategies

LIST OF ABBREVIATIONS

ASEAN	The Association of Southeast Asian Nations
ASEF	Asia-Europe Foundation
ASEM	Asia-Europe Meeting
BAU	Business as Usual
CAIT	Climate Analysis Indicators Tool
CH4	Methane
CO2	Carbon dioxide
CO2e	Carbon dioxide equivalent
COP	Conference of the Parties
COP	Conference of Parties
CRI	Climate Risk Index
EIB	European Investment Bank
EU	European Union
GCF	Green Climate Fund
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GWP	Global Warming Potential
INDC	Intended Nationally Determined Contribution
IP	Industrial Processes
IPCC	Intergovernmental Panel on Climate Change
IPPU	Industrial processes and product use
LTS	Long-term Strategy
LUCF	Land-use Change, and Forestry
LULUCF	Land Use, Land-Use Change, and Forestry
NAP	National Adaptation Plan
N2O	Nitrous oxide emissions
NDC	Nationally Determined Contribution
NCS	Nature-based Climate Solution
NDP	National Development Plan
NECP	National Energy and Climate Plan
SCCF	Special Climate Change Fund
SCP	Sustainable Consumption and Production
SDG	Sustainable Development Goal
SDS	Sustainable Development Strategy
UNFCCC	United Nations Framework Convention on Climate Chan

1. INTRODUCTION

The average global temperature is currently estimated to be 1.1 °C above pre-industrial times. The latest report of the Intergovernmental Panel on Climate Change (IPCC), published in February 2022, highlighted that human-induced climate change is causing more frequent and severe climate events and resulting in widespread negative impacts on ecosystems and societies, disproportionately affecting the poor.[1] However, reaching a global warming of 1.5 °C or more will have additional adverse impacts. As a result, climate risks and vulnerabilities will become increasingly more difficult to manage.

In spite renewed commitments from countries to tackle the climate change challenge and move towards a low-carbon development pathway set out by the Paris Agreement, global GHG emissions are still increasing. According to the latest estimations,[2] current emissions trends would result in a 2.2-2.7 °C degree increase by 2100. To avoid overshoot pathways, decarbonization efforts must be accelerated towards net zero emissions by 2050, and countries need to aim for climate-resilient development. ASEM partner countries, emitting currently more than half of the global GHG emissions, have a crucial role in contributing to fast paced decarbonization efforts.

1 IPCC, 2022: Summary for Policymakers [H.-O. Pörtner, D.C. Roberts, E.S. Poloczanska, K. Mintenbeck, M. Tignor, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem (eds.)].

2 UNEP (2021) The Heat is On. A world of climate promises not yet delivered. UNEP. URL: https://www.unep.org/resources/emissions-gap-report-2021

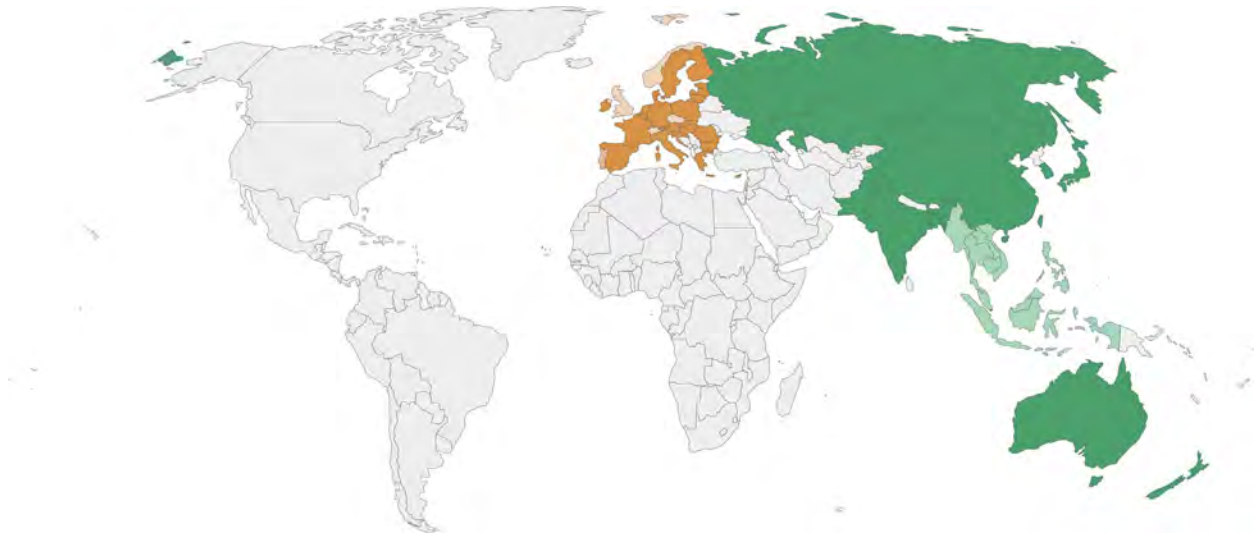
1.1. OBJECTIVES OF THE REPORT

This report aims to provide a detailed overview of climate change mitigation efforts in the 51 partner countries of the ASEM process and offer a set of policy recommendations to strengthen decarbonisation efforts towards net-zero ambitions.[3]

The report offers an in-depth analysis of GHG emissions in ASEM partner countries, studies national climate mitigation commitments via the assessment of Nationally Determined Contribution (NDCs) and the mapping of climate policy frameworks, and analyses implementation actions in key emitting sectors. Recognising climate mitigation efforts cannot be undertaken in a vacuum, the report also discusses climate adaptation needs and actions in the most vulnerable ASEM partner countries. In addition, as part of an ASEM-wide research on circular economy, the report establishes linkages to the United Nations (UN) Sustainable Development Goal (SDG) 12 on sustainable consumption and production (SCP) and reviews how countries link their net-zero commitments and ambitions with circular economy transformations.

"ASEM partner countries, aiming to better understand what type of climate commitment countries have made and how they implement these commitments."

Figure 1: Map of ASEM member countries: Countries marked in green are all Asian partner countries, with light green being the ASEAN region. Countries marked in brown are European partner countries, with light brown being the EU.



Source: Image generated from MapChart

1.2. METHODOLOGICAL APPROACH

To examine ASEM partner countries ambitions to transition to net-zero and circular development pathways, an in-depth analysis was conducted focusing on country emissions, NDCs, national strategy and policy frameworks and implementation activities. The data collection was undertaken in all 51 ASEM partner countries, aiming to better understand what type of climate commitment countries have made and how they implement these commitments.

To carry out the analysis, first, detailed country-level emissions profiles were created. These included:

- Data on historical and current GHG emissions;
- Distribution of GHG emissions according to different sectors; and
- Distribution of GHG emissions according to different type of gases.

GHG emissions data were extracted for the latest available year (2018) from the Climate Watch database of the World Resources Institute (WRI).[4] Unless otherwise not indicated

3 The Asia-Europe Meeting (ASEM) is an informal process of dialogue and cooperation bringing together the 27 European Union member states, 3 other European countries, and the European Union with 21 Asian countries and the ASEAN Secretariat. www.aseminfoboard.org

4 All emissions data were extracted on the 30th of April 2022. The analysis of this report did not consider changes and updates in the original datasets after this date.

GHG emissions include land-use change and forestry (LUCF) data. The collected data was used to identify emissions patterns in both regions, including highest emitting sectors. Using population and gross domestic product (GDP) data, GHG emissions per capita and intensity were also calculated. As a second step, NDCs were reviewed. The data collection focused on the following aspects:

- Status of NDC submissions;
- Assessment of the overall commitments for emissions reduction;
- Coverage of IPCC sectors in the NDCs;
- Coverage of just transition-related issues in the NDCs: and
- Coverage of SDG12-related targets in the NDCs

In the third step of the analysis, we cross-checked the NDC assessments against a review of national climate policies. The exercise included the following topics:

- Coverage of climate change goals and targets in National Development Plans (NDPs) and Sustainable Development Strategies (SDSs);
- Existence of Long-term Emissions Reduction Strategies (LTSs);
- Existence of national climate policy frameworks, including mitigation and adaptation policies;
- Coverage of just transition-related issues in national climate policy frameworks; and
- Coverage of SDG12-related issues in national climate policy frameworks.

Subsequently, we analysed implementation actions and needs in the key emitting sectors of ASEM partner countries. The analysis was completed with an international climate finance overview in the 51 ASEM partner countries, with a focus on the overall funding architecture, main donors and good practice examples.

Based on the analysis of the GHG emissions, national climate commitments and policy frameworks and key emitting sectors, the review identified a list of key policy approaches, which can support ASEM partner countries transition to net-zero and circular economy pathways.

1.3. STRUCTURE OF THE REPORT

The study is structured as follows:

Section 2 provides an overview of ASEM partner countries GHG emissions trends;

Section 3 reviews ASEM partner countries NDCs, their national climate policy frameworks and linkages to SDG 12;

Section 4 presents a climate commitment gap analysis concerning key emitting sectors;

Section 5 is an overview of climate financing efforts in ASEM partner countries; and

Section 6 delivers the conclusions and policy recommendations.

2. GHG EMISSIONS TRENDS IN ASEM PARTNER COUNTRIES

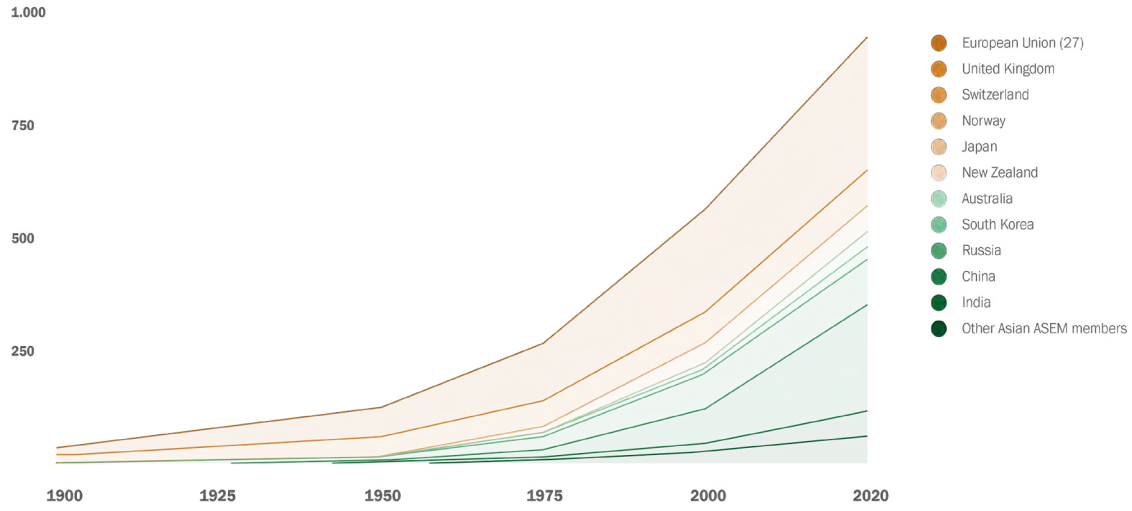
In this section, we provide an overview of ASEM partner countries GHG emissions trends, including regional and national emissions trends as well as a sectoral analysis of key emitting sectors.

2.1. GLOBAL AND REGIONAL GHG EMISSIONS TRENDS

Historically, countries worldwide have emitted more than 1.5 trillion tons of CO2 since 1750.[5] These emissions, together with other GHGs, have caused a global warming of above 1°C degree and resulted in widespread and rapid changes in the atmosphere, in oceans, lakes, on ice sheets and glaciers and on lands.[6] Cumulatively, European countries emitted more than 370 Gt CO2e and high-income Asian ASEM partner countries an additional 220 Gt CO2e. China alone emitted more than 235 Gt CO2e while the other Asian ASEM partner countries' cumulative contribution to global emissions is around 110 Gt CO2e. See also Annex 1.

"Cumulatively, European countries emitted more than 370 Gt CO2e and high-income Asian ASEM partner countries an additional 220 Gt CO2e."

Figure 2: Cumulative CO2 emissions in ASEM partner countries (Gt CO2e)



Source: Authors' calculation based on data from Our World in Data

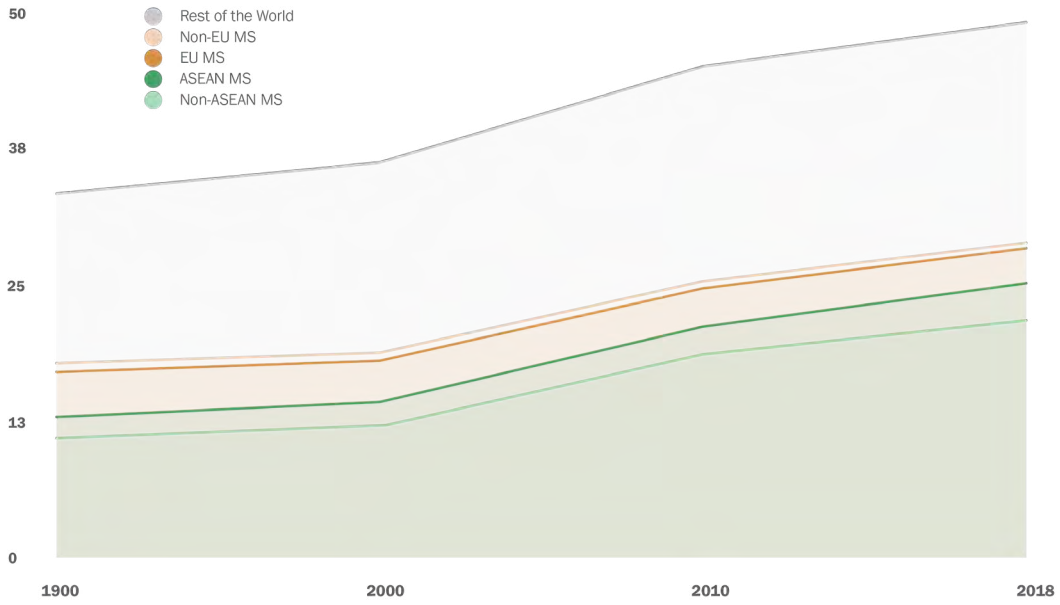
Annual global GHG emissions have increased by 50 percent between 1990 and 2018, from 3265 Gt CO2e to 48.94 Gt CO2e. In 2018, the 51 ASEM partner countries were responsible for 57 percent of the global emissions (27.9 Gt CO2e, with eight percent of the global emissions from European and 49 percent from Asian member countries). Mainly due to population growth and rapid economic development, emissions in Asian ASEM partner countries increased at a fast pace and doubled between 1990 and 2018. With regards to sub-regional trends, Association of Southeast Asian Nations (ASEAN) member countries' GHG emissions were seven percent of the total global emissions. Their emissions increased 74 percent between 1990 and 2018 and compared to the previous period, further accelerated between 2000 and 2018. In Europe, all non-European Union (EU) and most EU member countries reduced their emissions compared to the 1990 baseline year. As a result, the total GHG emissions in Europe have been slowly declining, see Figure 3. Although GHG emissions calculations are not yet available for later years, the 2022 "United in Science" report of WMO and other key international organizations found that GHG emissions increased to record highs, after temporary decrease due to the COVID-19 lockdowns.[7]

5 Hannah Ritchie, "Who has contributed most to global CO2 emissions?," Our World in Data, last modified 1 October 2019, accessed 2 September 2022, https://ourworldindata.org/contributed-most-global-co2

6 V. Masson-Delmotte et al., " Summary for Policymakers," in Climate Change 2021: The Physical Science Basis: Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (Cambridge, UK and New York, USA: Cambridge University Press, 2021), https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf

7 World Meteorological Organization (WMO) ; United Nations Environment Programme ; Intergovernmental Panel on Climate Change ; United Nations Educational, Scientific and Cultural Organization (UNESCO); Intergovernmental Oceanographic Commission (IOC) ; Global Carbon Project. United in Science 2022. (WMO, 2022), https://public.wmo.int/en/resources/united_in_science

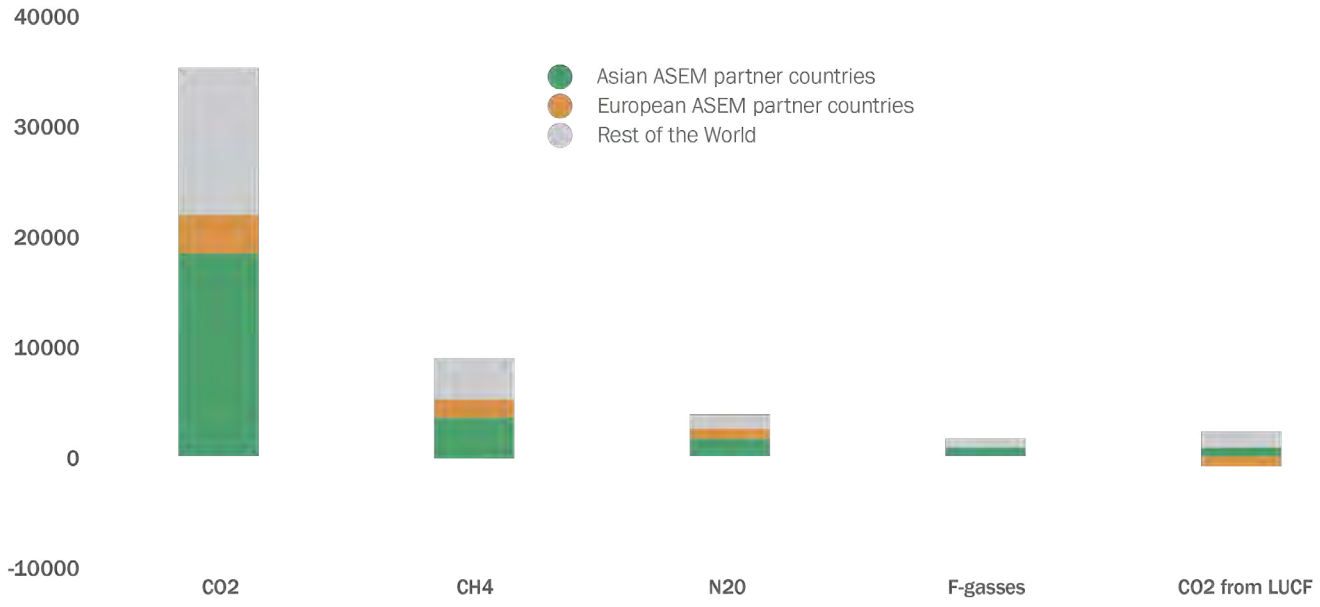
Figure 3: Annual GHG emissions trends, including LUCF (Gt CO2e)



Source: Authors' calculation based on data from Climate Watch, accessed on 30 April 2022

Different types of GHGs have different contributions to global emissions, with CO2 emissions having the highest contribution both globally and regionally in Europe and Asia. Seventy-two percent of the GHG emissions are CO2 emissions which primarily result from fossil fuel usage, and 17 percent are methane (CH4), which is mainly released from agricultural activities, waste, and wastewater. Six percent of the global emissions are from nitrous oxide emissions (N2O), 5 percent from land-use change and forestry (LUCF) related CO2 emissions and two percent from fluorinated gases (F-gases).[8] The contribution of CO2e emissions to total global emissions was above the global average both in the European and Asian regions (at 3.3 Gt CO2e and 18.64 Gt CO2e emissions respectively). Methane (CH4) emissions were below the global average of methane emissions share and both regions had negative emissions from LUCF.

Figure 4: Contribution of different GHGs to global emissions (Gt CO2e)



Source: Authors' calculation based on data from Climate Watch, accessed on 30 April 2022

8 Based on data from "Climate Watch," Climate Watch, last modified 2022, accessed 2 September 2022, www.climatewatchdata.org.

2.2. OVERVIEW OF EMISSIONS IN EUROPEAN AND ASIAN ASEM PARTNER COUNTRIES

The five largest emitters in ASEM are Asian countries, with a total global contribution of 40 percent. China alone emitted 23.92 percent of the global GHG emissions in 2018. Emissions of an additional 12 ASEM (six European and six Asian) countries were above 300 Mt CO2e in the same year. Germany, the highest emitter among European ASEM partner countries, had 776.61 Mt CO2e GHG emissions in 2018 (1.59 percent of the global emissions), followed by South Korea (673 Mt CO2e); Australia (619.26 Mt CO2e) and the United Kingdom (441 Mt CO2e). On the other hand, 33 ASEM partner countries have less than 0.5 percent contribution to global emissions, among which 16 countries have less than 0.1 percent contribution.

Table 1: Map of ASEM partner countries indicating the total emissions of the country in 2018 and its global contribution to emissions

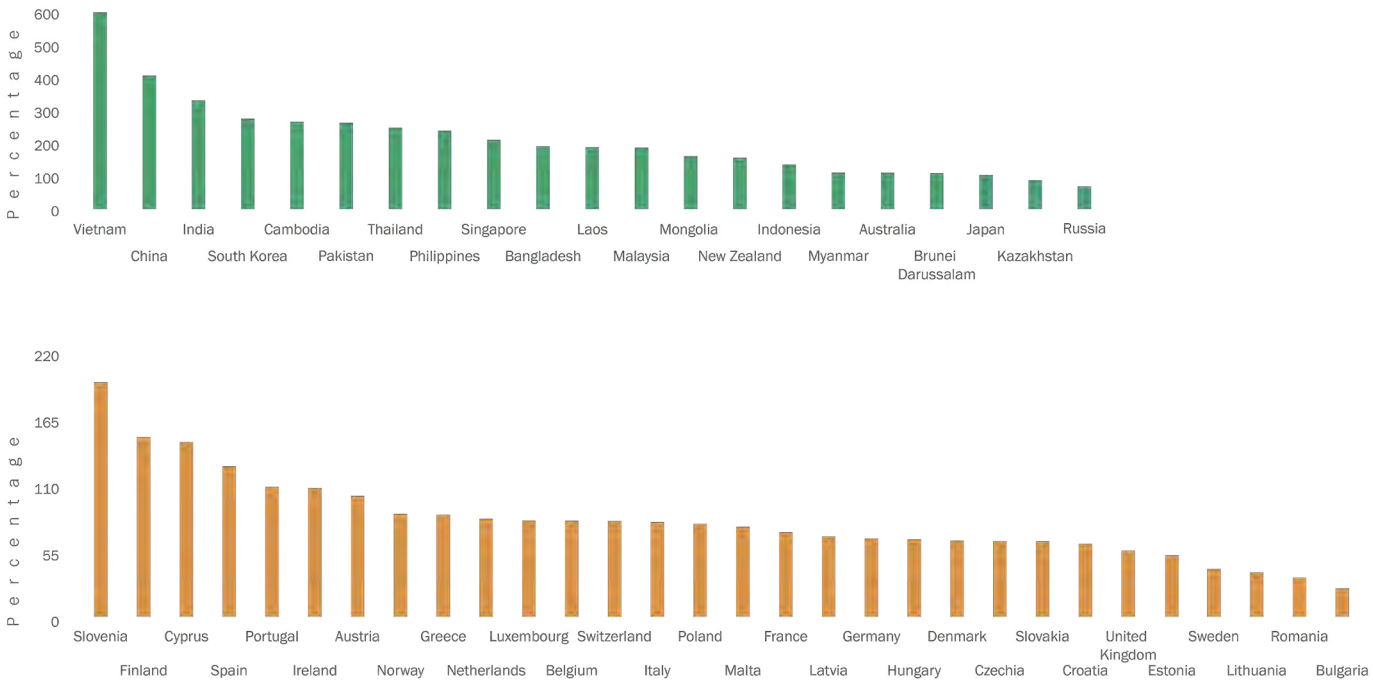
ASEM Region	Country	Million tons of CO2e (2018)	Global contribution to GHG emissions (%)
Asia	China	11705.81	23.92%
Asia	India	3346.63	6.84%
Asia	Russia	1992.08	4.07%
Asia	Indonesia	1703.86	3.48%
Asia	Japan	1154.72	2.36%
Europe	Germany	776.61	1.59%
Asia	South Korea	673.08	1.38%
Asia	Australia	619.26	1.27%
Europe	United Kingdom	441.13	0.90%
Asia	Pakistan	438.22	0.90%
Asia	Thailand	431.22	0.88%
Asia	Malaysia	388.11	0.79%
Europe	Italy	386.78	0.79%
Asia	Vietnam	364.43	0.74%
Europe	France	361.37	0.74%
Europe	Poland	356.74	0.73%
Europe	Spain	313.06	0.64%
Asia	Kazakhstan	271.23	0.55%
Asia	Philippines	234.82	0.48%
Asia	Myanmar	231.62	0.47%
Asia	Bangladesh	220.75	0.45%
Europe	Netherlands	179.99	0.37%
Europe	Czech Republic	117.03	0.24%
Europe	Belgium	108.91	0.22%
Europe	Greece	86.14	0.18%
Europe	Romania	86.13	0.18%
Asia	New Zealand	70.71	0.14%
Asia	Cambodia	69.15	0.14%
Europe	Austria	67.85	0.14%
Europe	Portugal	67.15	0.14%
Asia	Singapore	66.67	0.14%
Europe	Hungary	62.81	0.13%
Europe	Ireland	62.29	0.13%
Europe	Finland	61.43	0.13%
Asia	Mongolia	55.72	0.11%
Europe	Denmark	46.73	0.10%
Europe	Switzerland	43.78	0.09%
Europe	Slovakia	38.86	0.08%
Asia	Lao PDR	38.63	0.08%

Europe	Sweden	30.05	0.06%
Europe	Norway	28.42	0.06%
Europe	Estonia	20.56	0.04%
Europe	Bulgaria	19.52	0.04%
Europe	Lithuania	18.21	0.04%
Europe	Croatia	18.21	0.04%
Europe	Slovenia	17.51	0.04%
Asia	Brunei Darussalam	16.95	0.03%
Europe	Luxembourg	9.94	0.02%
Europe	Latvia	8.89	0.02%
Europe	Cyprus	8.35	0.02%
Europe	Malta	2.03	0.00%

Source: Authors' calculation based on data from Climate Watch, accessed on 30 April 2022

The emissions trend analysis (Figure 5) suggests that most high-income countries, predominantly in Europe, managed to decrease their GHG emissions between 1990 and 2018. For instance, the largest emitters in Europe, Germany and the United Kingdom, achieved considerable emissions reduction, both attributed to the reduction of coal use in electricity generation, and the increased deployment of renewable energy.[9] During the same period, emissions in Asian countries have considerably increased. China and India, which are also are the biggest emitters, have one of the highest increases due to their respective growing population and heavy reliance on coal and oil.[10] High-income economies in Asia also did not manage to reduce their GHG emissions during the studied period: emissions levels stagnated in Japan and Australia and increased in New Zealand and South Korea.

Figure 5: Total GHG emissions increase in the Asian and European ASEM partner countries, between 1990 and 2018 (percentage)



Source: Authors' calculation based on data from Climate Watch, accessed on 30 April 2022

9 M. A. Jagil et al., Climate Crisis and Imperatives for Action (Singapore: Lee Kuan Yew School of Public Policy, 2022).
10 Ibid.

The assessment of total GHG emissions also needs to be adjusted with population data, to better understand the regional and national emissions trends and mitigation needs. The five largest emitters (China, India, Russia, Indonesia and Japan) are also home to 40 percent of the world's population. At the same time, the ratio of GHG emissions to the countries' population reveals considerable differences among the main emitters. While China's GHG emissions per capita in 2018 were 8.34 tons of CO2e, India's GHG emissions per capita were only one-third of this amount. Other high-income emitters also had high GHG emissions per capita: Australia's GHG emissions per capita was 20 times higher than India's, noting the significant difference in population density. The table below presents an overview of total and per capita GHG emissions trends in the highest GHG emitting countries of ASEM. The complete ASEM overview can be found in Annex 3.

Table 2: Overview of GHG emissions trends of the highest GHG emitting countries of ASEM (2018)

Country	Million tons of CO2e	Contribution to global GHG emissions (%)	Population	Global share of population	GHG emissions per capita in 2018 (tonnes of CO2e/capita)
China	11705.81	23.92%	1402760000	18.45%	8.34
India	3346.63	6.84%	1352642283	17.79%	2.47
Russia	1992.08	4.07%	144477859	1.90%	13.79
Indonesia	1703.86	3.48%	267670549	3.52%	6.37
Japan	1154.72	2.36%	126529100	1.66%	9.13
Germany	776.61	1.59%	82905782	1.09%	9.37
South Korea	673.08	1.38%	51585058	0.68%	13.05
Australia	619.26	1.27%	24982688	0.33%	24.79
United Kingdom	441.13	0.90%	66460344	0.87%	6.64
Pakistan	438.22	0.90%	212228288	2.79%	2.06
Thailand	431.22	0.88%	69428454	0.91%	6.21
Malaysia	388.11	0.79%	31528033	0.41%	12.31
Italy	386.78	0.79%	60421760	0.79%	6.40
Vietnam	364.43	0.74%	95545959	1.26%	3.81
France	361.37	0.74%	67101930	0.88%	5.39
Poland	356.74	0.73%	37974750	0.50%	9.39
Spain	313.06	0.64%	46797754	0.62%	6.69

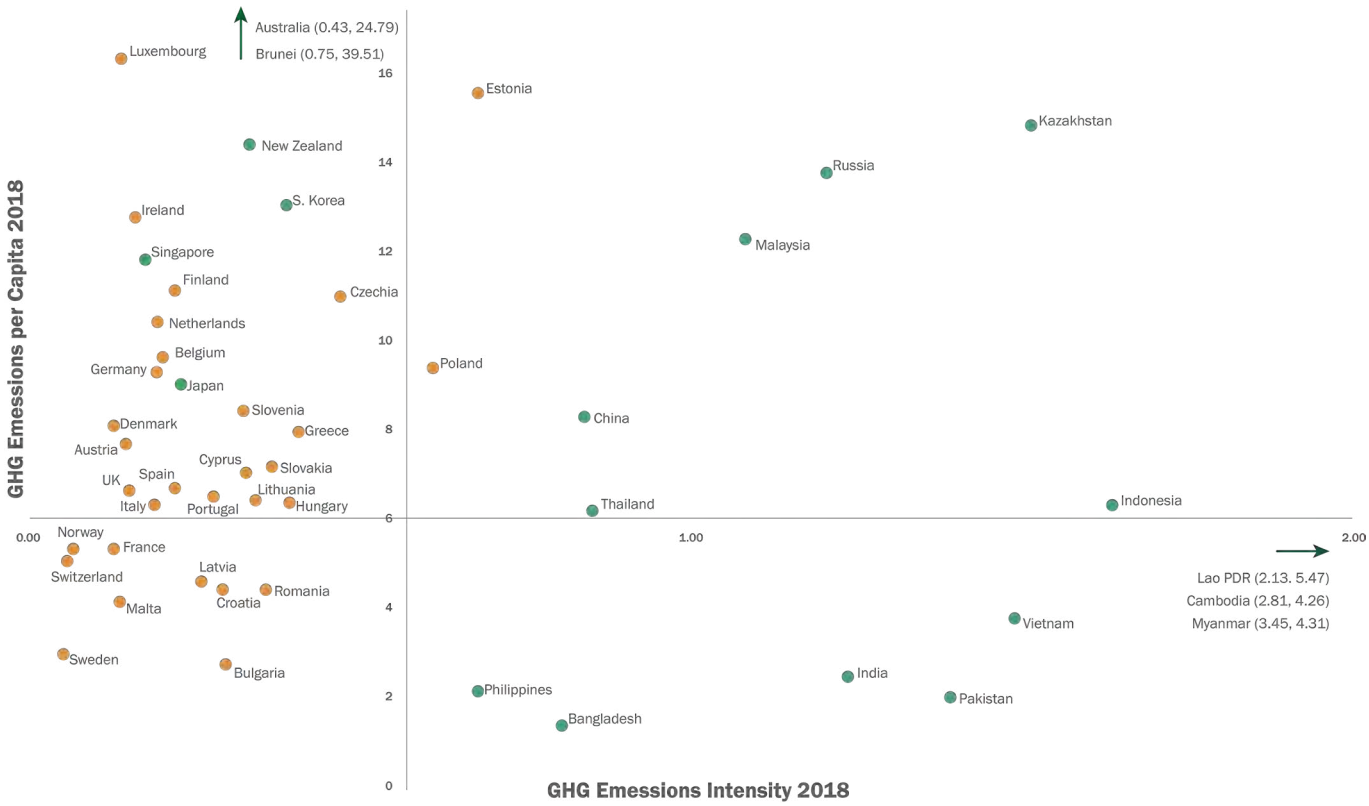
Source: Authors' calculation based on data from Climate Watch, accessed on 30 April 2022

In 2018, ASEM partner countries per capita emissions ranged between 1.37 tons of CO2e per capita (in Bangladesh) to 24.87 tons of CO2e per capita (in Australia) and 39.51 tons of CO2e per capita (in Brunei Darussalam). The average GHG emissions per capita was 6.44 tons of CO2e and in total, 30 ASEM partner countries (19 European and 11 Asian) had GHG emissions per capita above the global average.

Besides GHG emissions per capita trends, the analysis of GHG emissions intensity statistics can further support the understanding of country-level emissions patterns. GHG emissions intensity compares the amount of GHG emissions to the economic value they generate. High GHG emissions intensity means that a country's economy functions inefficiently. To produce one unit of GDP, an inefficient economy emits a higher level of CO2e. In 2018, ASEM partner countries GHG emissions intensity ranged from 0.05 tCO2e/USD (in Sweden) to 4.21 tCO2e/USD (in Mongolia). In total, 33 ASEM partner countries were below the global average of 0.57 tCO2e/USD, among which only five were non-European: Australia, South Korea, Japan, New Zealand and Singapore.

Figure 6 provides an overview of ASEM partner countries GHG emissions per capita in relation to their GHG emissions intensity. Eleven European countries had GHG emissions per capita and intensity below the global average, indicating relatively favourable emissions trends both per capita and in terms of value generation capacity. However, most high-income economies in Europe and Asia had favourable GHG emissions intensity rates but higher GHG emissions per capita values. Among the middle and lower-income countries, ten Asian countries had low GHG per capita values but higher GHG emissions intensity rates. Lastly, seven economies had both high GHG emissions intensity and GHG emissions per capita indicators.

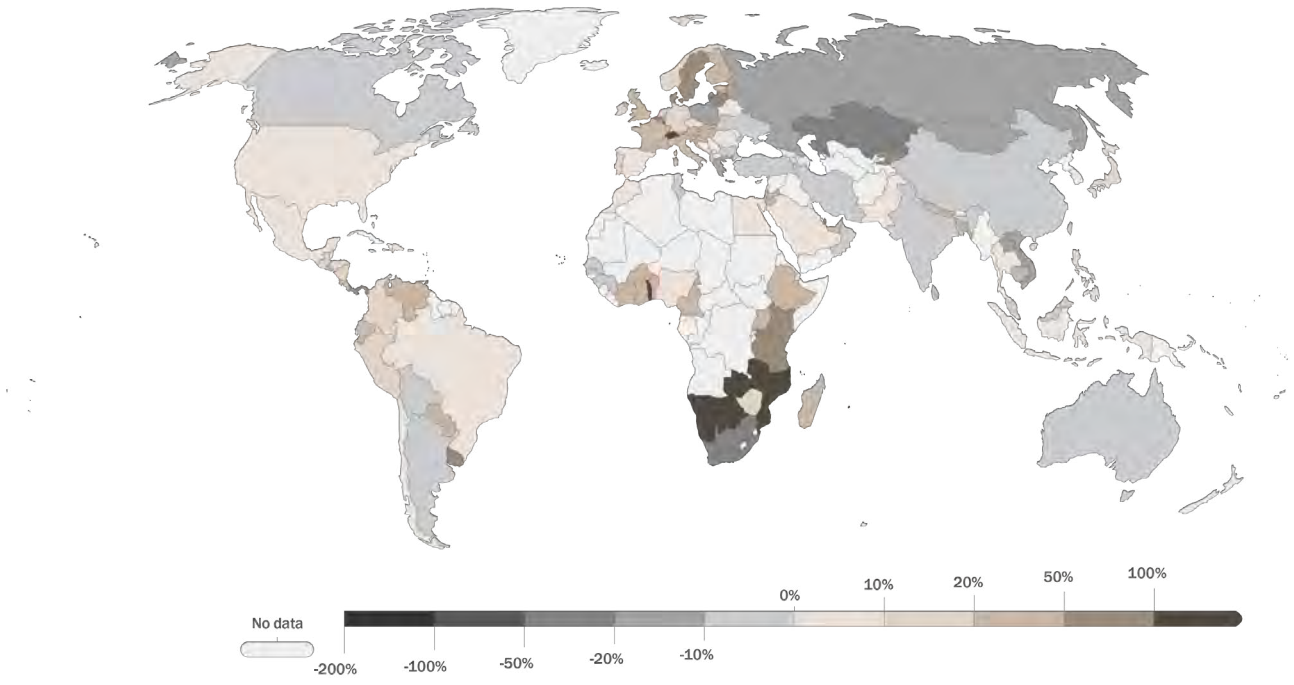
Figure 6: ASEM countries' GHG emissions per capita (tons of CO2e/capita) and GHG intensity(tCO2e/USD) compared to the global averages



Source: Authors' calculation based on data from Climate Watch, accessed on 30 April 2022

Besides the general overview of country-level CO2 emissions, a certain percentage of the largest emitting countries' CO2 emissions (in the Asian region) are to produce goods that are imported to other countries, including most European ASEM partner countries. As a result, Asian ASEM partner countries are net exporters of GHG emissions. See countries with grey in Figure 7. For example, in 2018, China exported 9.7 percent India 9.1 percent and Russia 16.4 percent of its GHG emissions. On the other hand, most European countries were net importers of CO2 in the same year. See countries with brown in Figure 7. In Europe, Switzerland imported 225 percent, Belgium 76 percent, Sweden, Latvia and Lithuania around 68 percent of its GHG emissions.

Figure 7: CO2 emissions embedded in trade

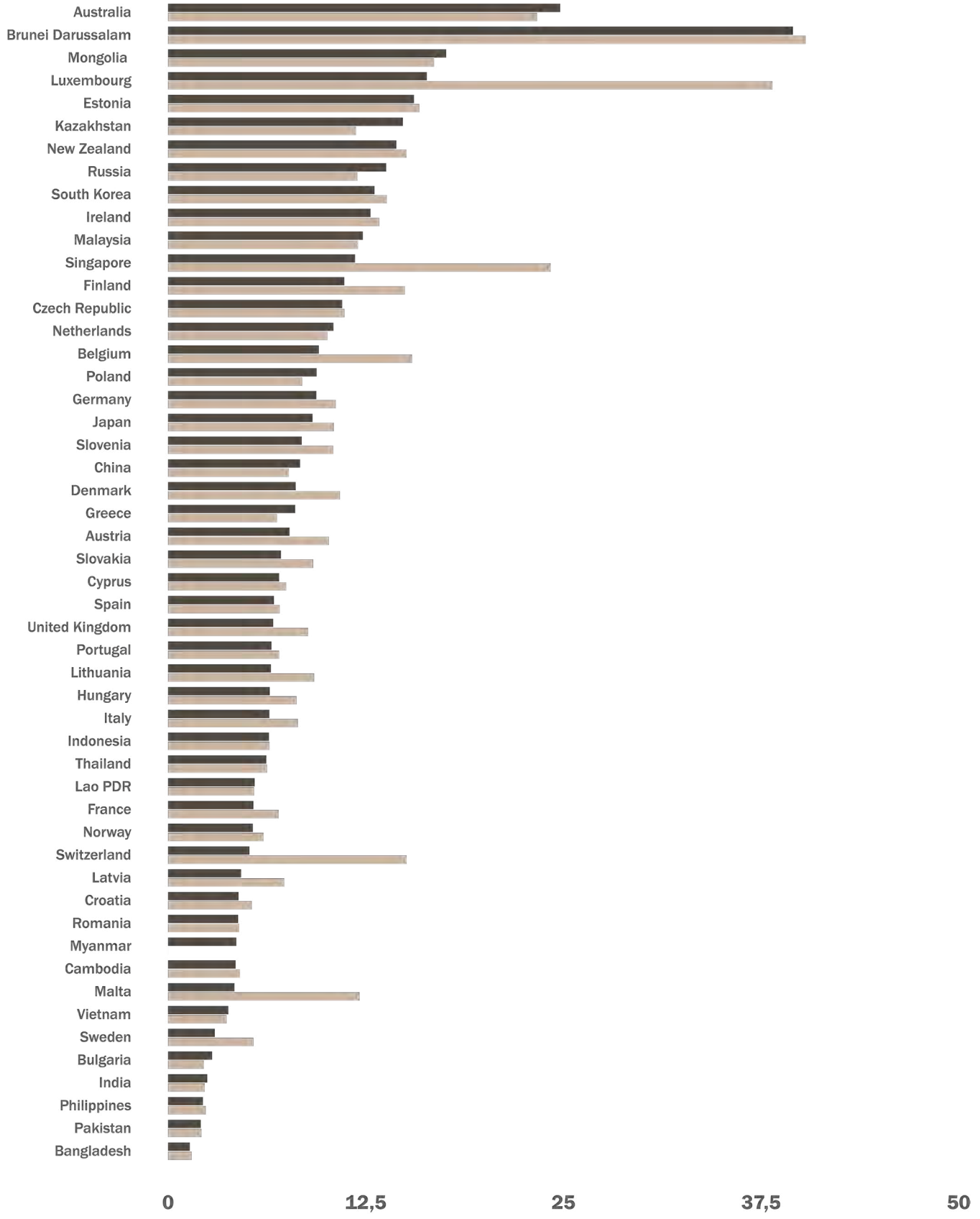


Source: Data from Our World in Data based on the Global Carbon Project

Consequently, most Asian ASEM partner countries CO2 emissions will be somewhat lower when adjusted with emissions from trade, while many European countries' CO2 emissions will be higher. In total, European ASEM partner countries trade adjusted GHG emissions is 743 Mt CO2e higher, while the Asian member countries' GHG emissions would be around 1,491 Mt CO2e lower. Moreover, it can also be observed that the rate of CO2 imported emissions are increasing in many of those European countries, which otherwise, domestically managed to reduce their emissions. As a result, most European countries would have a considerably higher GHG emissions per capita, as shown in Figure 8.

"It can also be observed that the rate of CO2 imported emissions are increasing in many of those European countries, which otherwise, domestically managed to reduce their emissions. "

Figure 8: Country-level GHG emissions per capita and GHG emissions per capita adjusted with trade (tons of CO2e/capita)

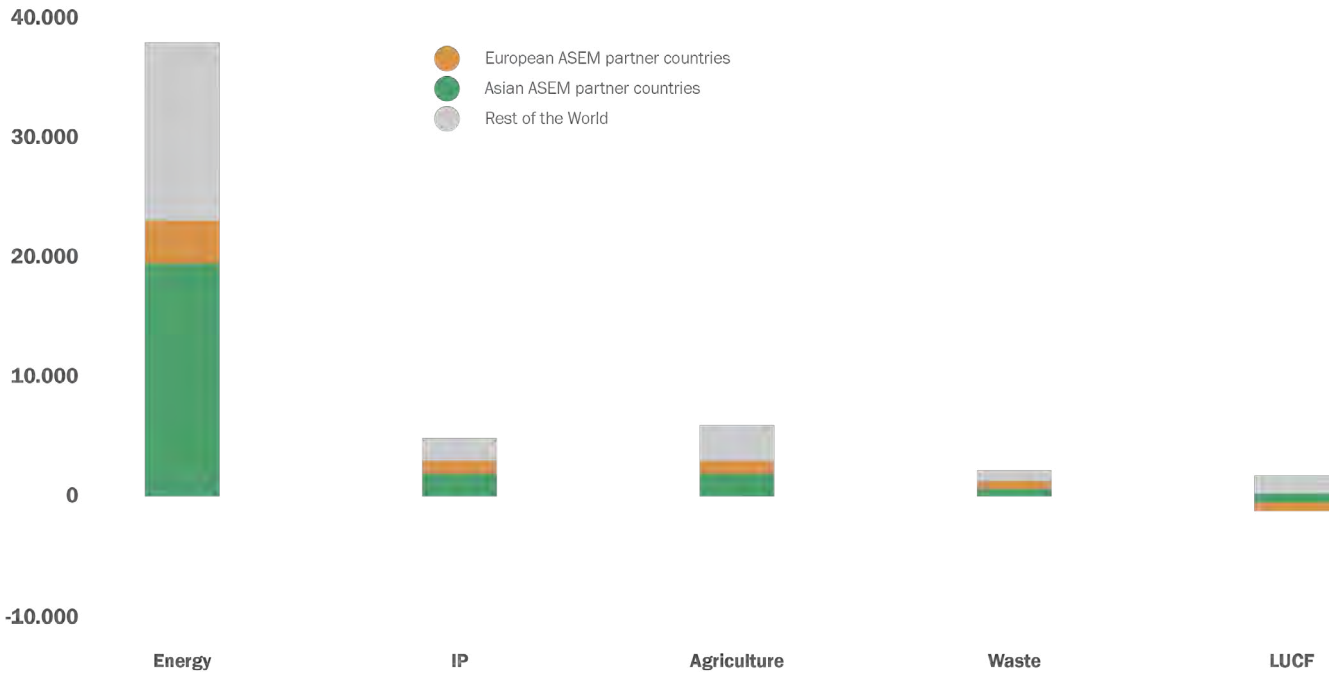


Source: Authors' calculation based on data from Climate Watch and data from Our World in Data - Global Carbon Project, accessed on 30 April 2022

2.3. SECTORAL EMISSIONS OVERVIEW

With regards to sectoral emissions, the energy sector is the largest contributor both in the Asian and the European regions (at 19.38 Gt CO2e and 3.34 Gt CO2e of GHG emissions in 2018, respectively). This is followed by emissions from the agriculture sector and from industrial processes (IP).

Figure 9: Overview of sectoral GHG emissions (Gt CO2e)



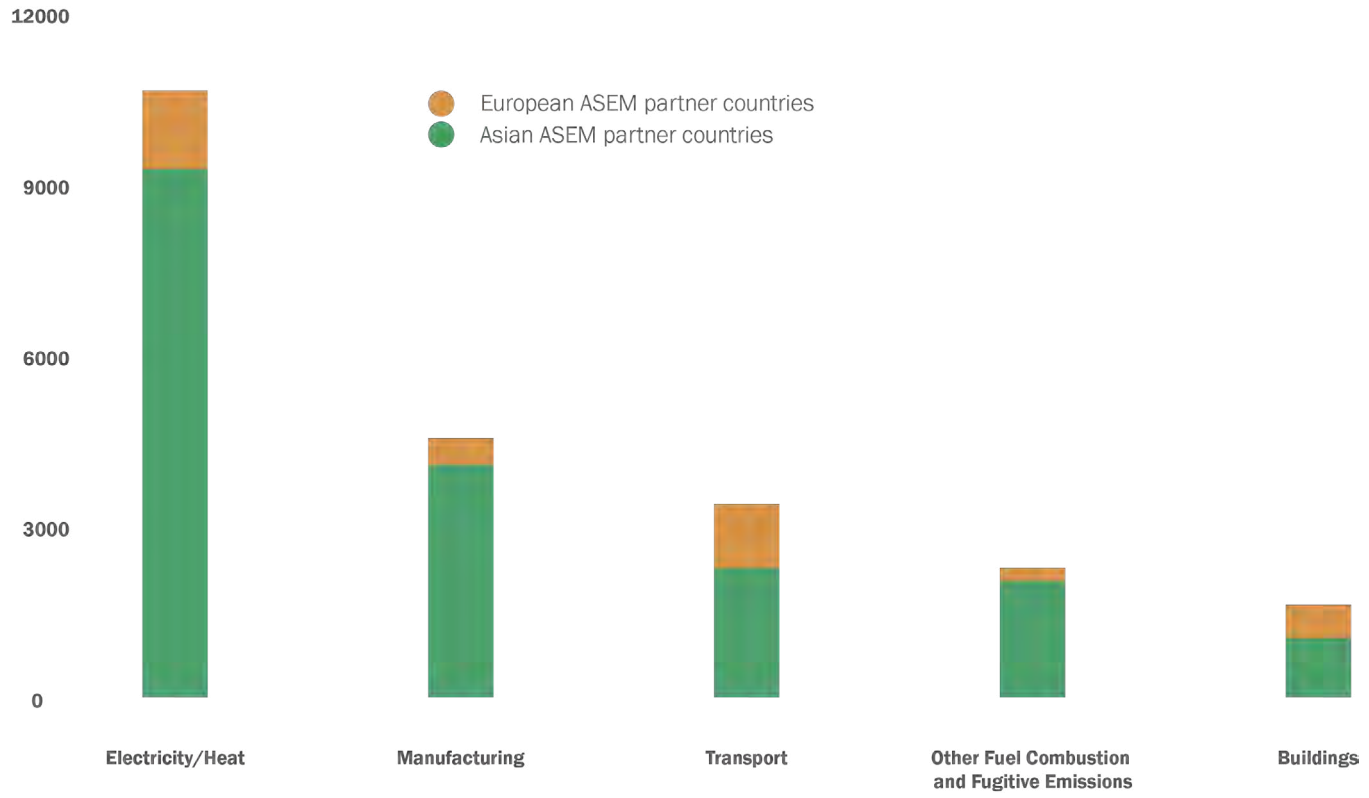
Source: Authors' calculation based on data from Climate Watch

"Some 20.4 percent of the energy-related emissions came from the manufacturing sector but had a higher share in middle-income Asian countries, including the largest emitters in the region: China, India, Indonesia, Pakistan and Vietnam."

In 2018, 43 ASEM partner countries had the highest emissions from the energy sector. See Annex 4.

Within the energy sector, 47 percent of the ASEM partner countries GHG emissions was from electricity and heat generation in 2018. Some 20.4 percent of the energy-related emissions came from the manufacturing sector but had a higher share in middle-income Asian countries, including the largest emitters in the region: China, India, Indonesia, Pakistan and Vietnam. Meanwhile, 14.7 percent of the total energy-related emissions was from the transportation sector. Emissions from this sector were more prevalent in Europe: the transportation sector was responsible for 28 percent of the energy-related emissions in Europe, while only 12 percent in Asian ASEM partner countries, see Figure 10.

Figure 10: Energy-related emissions in the ASEM region in 2018, (Gt CO2e)



Source: Authors' calculation based on data from Climate Watch

With regards to emissions from agriculture, the sector was responsible for 3.03 Gt CO2e emissions in the ASEM region. In five ASEM partner countries, including Bangladesh, Mongolia, New Zealand, Pakistan and Ireland, the agriculture sector was the largest source of emissions. Besides, an additional 10 countries had the second highest emissions from this sector: including low and middle-income economies in Asia (Cambodia, Lao PDR, Myanmar, India, the Philippines and Vietnam) as well as high-income economies both in Asia and Europe: most notably, Australia and France.

In addition, CO2 from land-use change and forestry (LUCF) accounted for the highest percentage of emissions in Cambodia, Indonesia, and Myanmar. Overall, the LUCF sector served as a carbon sink both in the Asian and the European regions. In 2018, carbon sinks removed around 311 Mt CO2e emissions in the Asian region and 266 Mt CO2e emissions in the European region (1.3 percent and 6.9 percent of the regional GHG emissions respectively). China and Russia had the largest carbon sinks, removing 5.6 percent and 22 percent of their emissions respectively. Among the larger GHG emitters, France, South Korea, Poland, Japan and Germany also had negative emissions from their LUCF sector. In Bulgaria, the LUCF sector removed 63 percent of the country's total GHG emissions from other sectors, while in Norway and Sweden carbon sinks reduced the total emissions at 40 percent and 35 percent respectively. At the same time, in over half of the ASEM partner countries, the LUCF sector was responsible for additional GHG emissions (with 1036 Mt CO2e). Most of these emissions are from Indonesia (734 Mt CO2e), Myanmar (111 Mt CO2e) and Malaysia (81 million tons), followed by Cambodia, Bangladesh, and Lao PDR. In Indonesia, 43 percent of the country's total emissions is from the LUCF sector, and the country has the highest emissions from this sector in the world. Similarly, the LUCF emissions take up almost half of the total GHG emissions in Cambodia and Myanmar, 25 percent in Lao PDR, and 20 percent in Malaysia.

3. NDCs AND CLIMATE POLICIES IN THE ASEM REGION

This chapter provides an overview of the national commitments of ASEM partner countries on climate change mitigation and presents the underlying policy frameworks that were created to support the achievement of these commitments. The chapter first reviews each country's NDCs, including an analysis of the sectoral and SDG coverages of each NDC. This is followed by an analysis of the national climate policy frameworks across the ASEM partner countries.

The information presented in this chapter may not be fully comprehensive, since the research is primarily based on a desk review of those national commitments and policy documents, which were available in English. National language sources were only considered to a limited extent. This review aimed to identify the most recent documents: mainly those, which were published and adopted to support the fulfilment of Paris Agreement commitments. However, as the findings presented in the report reflect the information drawn from these identified sources, it is possible that further progress was achieved in the implementation of the Paris Agreement since their publication. Moreover, the data collection was carried out in May 2022, thus documents published after this date were not included in the review.

3.1. OVERVIEW OF NDCS IN ASEM PARTNER COUNTRIES

All ASEM partner countries signed and ratified the Paris agreement.[11] According to Article 4 of the Agreement, NDCs are required from all Parties. The NDCs summarise and communicate the Parties' national emissions reduction intentions and adaptation actions, which countries propose to implement according to their development status. The NDCs are collectively intended to ensure that the world will reach the goal of the Paris Agreement to "hold the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels".[12] The ASEM region, being responsible for 57 percent of the global GHG emissions in 2020 has a major role to play in contributing to achieving this goal.

Parties are required to submit an updated NDC every five years to reflect their progress on GHG emissions reduction and recalibrate their efforts towards more ambitious actions. The update of the first NDCs was due in 2020[13] and countries ramped up efforts to update their first NDCs in the lead up to the COP26 in Glasgow in 2021. The first global stocktake to monitor implementation progress is envisaged to be undertaken in 2023 and every five years after.

In this subsection, we provide an overview of the NDCs submitted by ASEM partner countries and offer a first-order analysis of their targets and content.

3.1.1. NDC SUBMISSIONS

All 51 ASEM partner countries have submitted their first NDCs, with the 27 member countries of the EU acting jointly and submitting one common NDC. Except for five countries in the Asian region, countries also updated their first NDCs (as of May 2022).

As a result, in total 42 ASEM partner countries have strengthened climate commitments, either by reinforcing overall mitigation efforts or with introducing a (more ambitious) GHG emissions reduction target. An overview of the submissions and the status of the submissions is presented in Table 3.

Table 3: ASEM NDC submissions (as of May 2022)

	NDC	Updated first NDC	Second NDC	Status of the NDC
Australia	yes	yes	no	Not strengthened
Bangladesh	yes	yes	no	Strengthened
Brunei Darussalam	yes	no	no	Not strengthened
Cambodia	yes	yes	no	Strengthened
China	yes	yes	no	Strengthened
India	yes	no	no	Not strengthened
Indonesia	yes	yes	no	Not strengthened
Japan	yes	yes	no	Strengthened
Kazakhstan	yes	no	no	Not strengthened
South Korea	yes	yes	no	Strengthened
Lao PDR	yes	yes	no	Strengthened
Malaysia	yes	yes	no	Strengthened
Mongolia	yes	yes	no	Strengthened
Myanmar	yes	yes	no	Strengthened
New Zealand	yes	yes	no	Strengthened
Pakistan	yes	yes	no	Strengthened
Philippines	yes	no	no	Not strengthened
Russia	yes	no	no	Not strengthened
Singapore	yes	yes	no	Not strengthened
Thailand	yes	yes	no	Not strengthened
Vietnam	yes	yes	no	Not strengthened
European Union	yes	yes	no	Strengthened
Norway	yes	yes	no	Strengthened
Switzerland	yes	yes	no	Not strengthened
United Kingdom	yes	yes	no	Strengthened

Source: Authors' analysis based on the national NDCs included in the UNFCCC NDC registry and data from Climate Watch

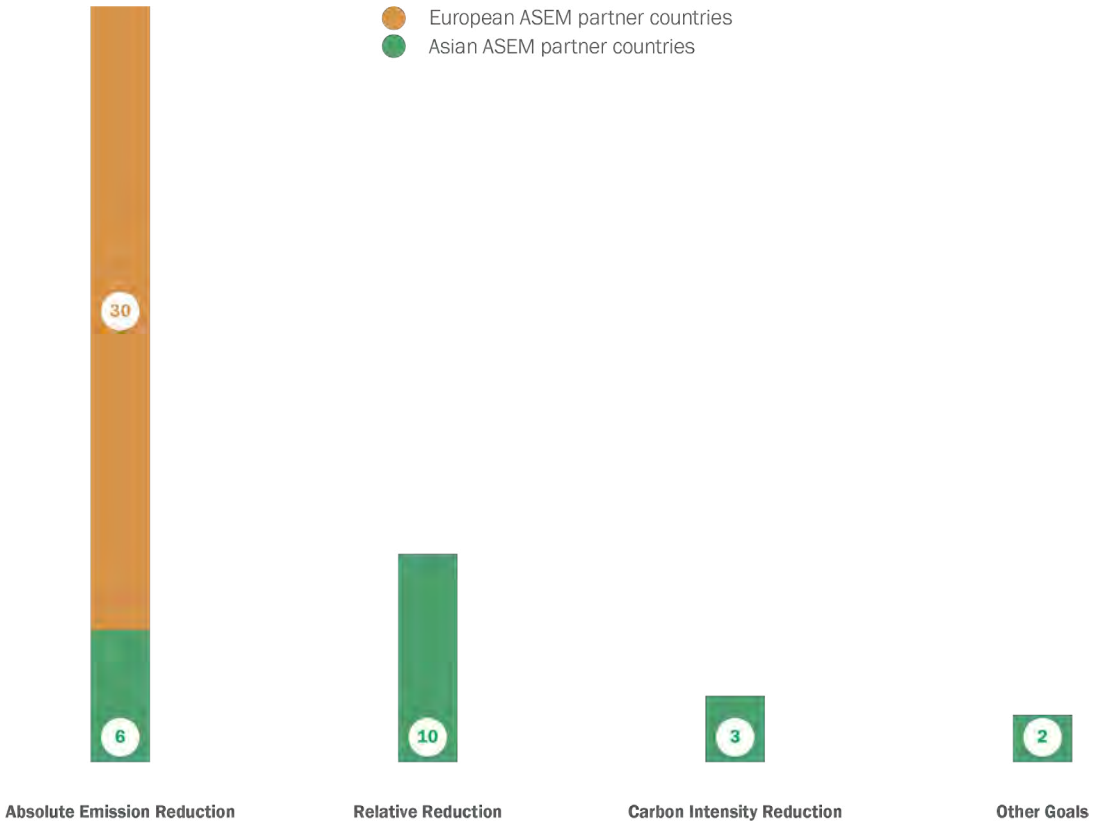
11 United Nations Framework Convention on Climate Change, Paris Agreement (Paris: UNFCCC, 2015), https://unfccc.int/files/meetings/paris_nov_2015/application/pdf/paris_agreement_english_.pdf

12 Ibid. Article 2, 1.a, p.2

13 United Nations Framework Convention on Climate Change, Nationally determined contributions under the Paris Agreement (Glasgow: UNFCCC, 2021), https://unfccc.int/sites/default/files/resource/cma2021_08E.pdf

With regards to the type of commitment, most ASEM partner countries (including all European and six Asian members) aim for absolute emissions reduction by 2030. An additional ten countries from the Asian region committed to relative emissions against their business-as-usual (BAU) emissions scenario by 2030. Three countries, including China, India, and Malaysia, declared ambitions to reduce the carbon intensity of their economies by 2030 compared to the 2005 baseline year. An overview of the types of commitments is presented in Figure 11 and a detailed analysis of the national mitigation goals is presented in chapter 3.2.2.

Figure 11: Overview of NDC commitments of ASEM partner countries



Source: Authors' analysis based on IGES and the NDC Database version 7.6

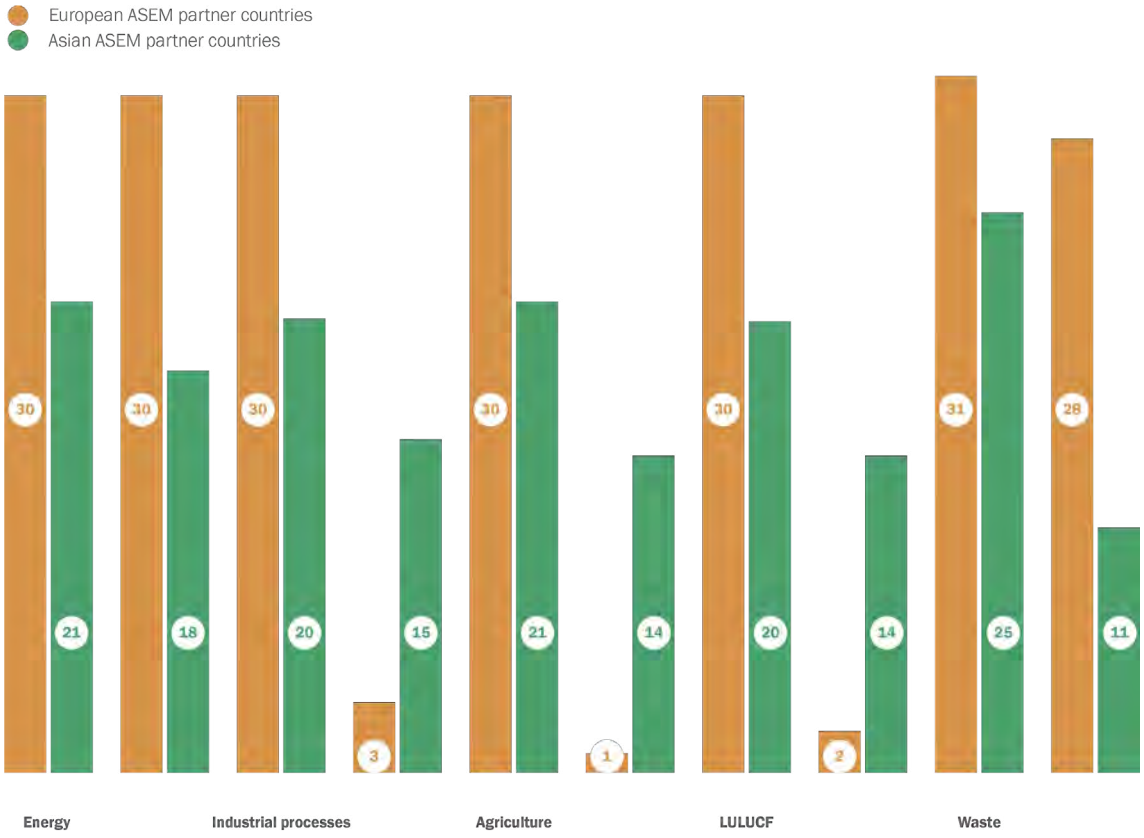
3.1.2. ANALYSES OF NDC CONTENT

The United Nations Framework Convention on Climate Change (UNFCCC) requires the Parties of the agreement to report their emissions inventories across six sectors (and underlying individual sources and sink categories) defined by IPCC Guidelines for National Greenhouse Gas Inventories. These sectors are energy; industrial processes (IP); solvent and other product use; agriculture; LULUCF; and waste.

All 51 ASEM partner countries have established economy-wide emissions mitigation commitments, with almost all NDCs covering the six UNFCCC inventory sectors. Many NDCs also provided details on sectoral targets and specified the planned implementation actions to fulfil their mitigation commitments. At the same time, the joint NDC of the EU (detailing the commitments of the 27 EU members) did not mention specific emissions mitigation actions in the IP, agriculture and LULUCF sectors. See Figure 12 and for a detailed overview, Annex 6.

"All 51 ASEM partner countries have established economy-wide emissions mitigation commitments, with almost all NDCs covering the six UNFCCC inventory sectors."

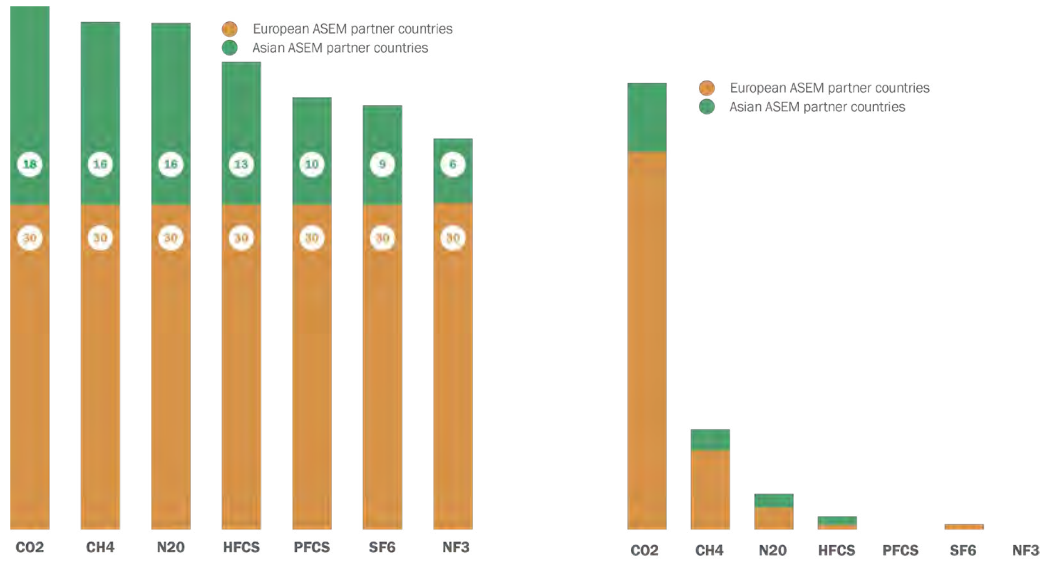
Figure 12: Sectoral coverage in NDCs



Source: Authors' analysis based on the review of ASEM NDCs and data derived from IGES and the NDC Database version 7.6

With regards to the various GHGs, almost all ASEM partner countries covered CO2 emissions in their latest NDCs and almost all also covered CH4 and N20 emissions. However, many Asian ASEM partners did not report their F-gas emissions.

Figure 13: GHG gas coverages in NDCs (number of countries and the amount of covered gases, million tons of CO2e)



Source: Authors' analysis based on the review of ASEM NDCs and data derived from IGES and the NDC Database version 7.6

3.1.3. ADAPTATION NEEDS AND ACTIONS IN ASEM NDCS

The analysis of the NDCs suggests that high-income ASEM partner countries place primary emphasis on mitigation and discuss mainly GHG emissions and related reduction targets in their NDCs. Middle and low-income countries were more likely to centre their actions around adaptation and emphasise development-related goals, see Figures 14 and 15.

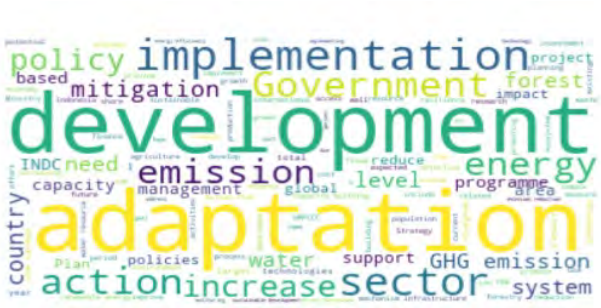
"Middle and low-income countries were more likely to centre their actions around adaptation and emphasise development-related goals."

Figure 14: Text analysis results of European ASEM partner countries; Australia, Japan, Russia, South Korea and Singapore

(a) First NDCs

(b) Updated NDCs

Figure 15: Textual analysis results of middle and lower-income ASEM partner countries NDCs.



(a) First NDCs

(b) Updated NDCs

Source: M. A. Jagil et al., Climate Crisis and Imperatives for Action (Singapore: Lee Kuan Yew School of Public Policy, 2022)

More specifically, adaptation related needs and activities were included in 15 of the Asian countries' NDCs. These mainly focused on sustainable ecosystems and the protection of livelihoods and biodiversity; the resilience of the agriculture sector and food security; water resource management; disaster risk reduction and disaster management, including flood protection; public health protection; and the general resilience of the buildings and infrastructure; as well as the industry or tourism sectors. Table 4 provides an overview of the sectors covered by the relevant NDCs.

Table 4: Adaptation areas (needs and activities) in ASEM partner countries NDCs

	Sustainable Ecosystems	Agriculture And Food Security	Water Resource Management	Public Health	Disaster Management	General Climate Resilience*
Bangladesh	•	•	•	•	•	
Brunei Darussalam					•	•
Cambodia	•	•	•		•	•
China					•	•
India	•	•	•		•	•
Indonesia	•					•
Lao PDR	•	•	•	•		•
Malaysia	•	•	•		•	
Mongolia	•		•			
Myanmar	•	•	•	•		•
Pakistan			•			
Philippines	•	•		•	•	
Singapore	•	•	•	•	•	•
Thailand	•	•	•	•	•	•
Vietnam	•	•		•	•	•

**(buildings, transport, industry, tourism)*

Source: Authors' analyses based on the review of ASEM NDCs and data derived from IGES and the NDC Database version 7.6

3.1.4. SDG COVERAGE IN NDCS WITH A SPECIFIC FOCUS ON SDG12

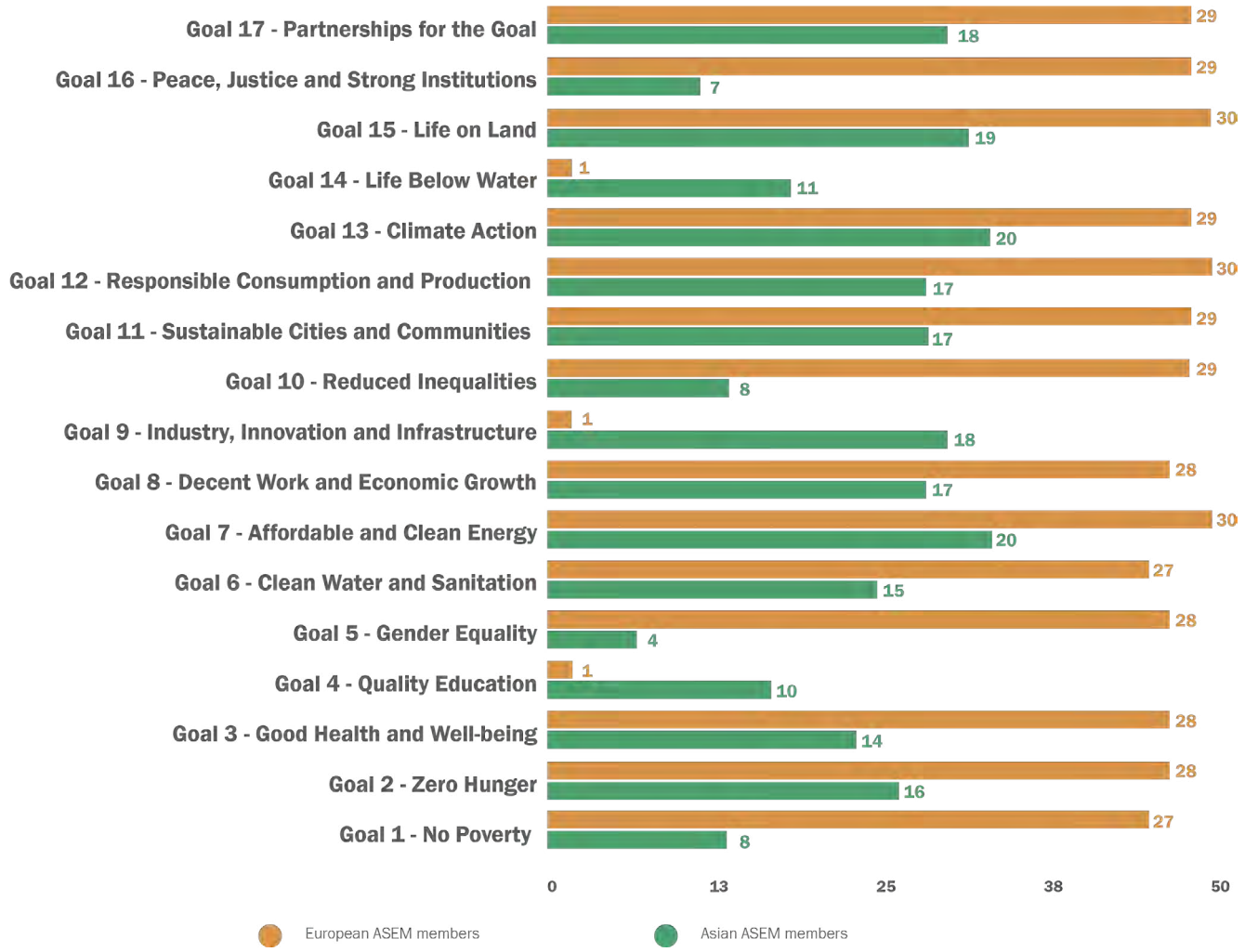
With regards to commitments to the wider SDGs, linkages were identified in the NDCs to most UN SDGs by the majority of the ASEM partner countries.[14]

Besides Goal 13 on Climate Action, all ASEM NDCs identified linkages to Goal 7 for Affordable and Clean Energy. Most ASEM partner countries also identified connections of their national climate commitments to Goal 8 for Decent Work and Economic Growth, Goal 11 for Sustainable Cities and Communities, Goal 12 for Responsible Consumption and Production, Goal 15 for Life on Land and Goal 17 for Partnerships. Most Asian ASEM partner countries also outlined the influence of their actions to Goal 9 for Industry, Innovation, and Infrastructure. However, commitments related Goal 1 for No Poverty, Goal 4 for Gender Equality, Goal 10 for Reduced Inequalities and Goal 16 - Peace, Justice and Strong Institutions were identified in less than half of the Asian ASEM partner countries, see Figure 16.

"Most ASEM partner countries also identified connections of their national climate commitments to Goal 8 for Decent Work and Economic Growth, Goal 11 for Sustainable Cities and Communities, Goal 12 for Responsible Consumption and Production, Goal 15 for Life on Land and Goal 17 for Partnerships. "

14 Authors' analyses based on data from "Climate Watch," Climate Watch, last modified 2022, accessed 30 April 2022, www.climatewatchdata.org.

Figure 16: NDC-SDG Linkages in ASEM partner countries[15]



Source: Authors' analysis based on data sourced from Climate Watch, accessed on 30 April 2022

All European and 17 Asian ASEM partner countries noted climate comments related to SDG 12 (SCP) targets. For example, South Korea highlighted that circular economy development is one of the areas that will be coordinated with sectoral strategies in order to achieve its NDC.[16] The NDC of the EU highlighted that "Waste legislation was reviewed, tightening landfilling and recycling targets and increasing the circularity of the EU economy".[17]

However, country commitments were predominantly connected to target 12.5 (substantially reducing waste generation through prevention, reduction, recycling and reuse). Target 12.2 (achieving the sustainable management and efficient use of natural resources) were included by several Asian ASEM MS, while target 12.6 (encouraging companies to adopt sustainable practices and sustainability reporting) appeared in most European country commitments.

15 *For EU member countries, the jointly submitted NDC was analysed; New Zealand was not included in the original dataset.

16 Republic of Korea, The Republic of Korea's Enhanced Update of its First Nationally Determined Contribution (Seoul: Republic of Korea, 2021),), https://unfccc.int/sites/default/files/NDC/2022-06/211223_The%20Republic%20of%20Korea%27s%20Enhanced%20Update%20of%20its%20First%20Nationally%20Determined%20Contribution_211227_editorial%20change.pdf

17 European Commission, Update of the NDC of the European Union and its Member States (Berlin: European Commission, 2020), https://unfccc.int/sites/default/files/NDC/2022-06/EU_NDC_Submission_December%202020.pdf

Figure 17: SDG12 coverage in ASEM NDC commitments

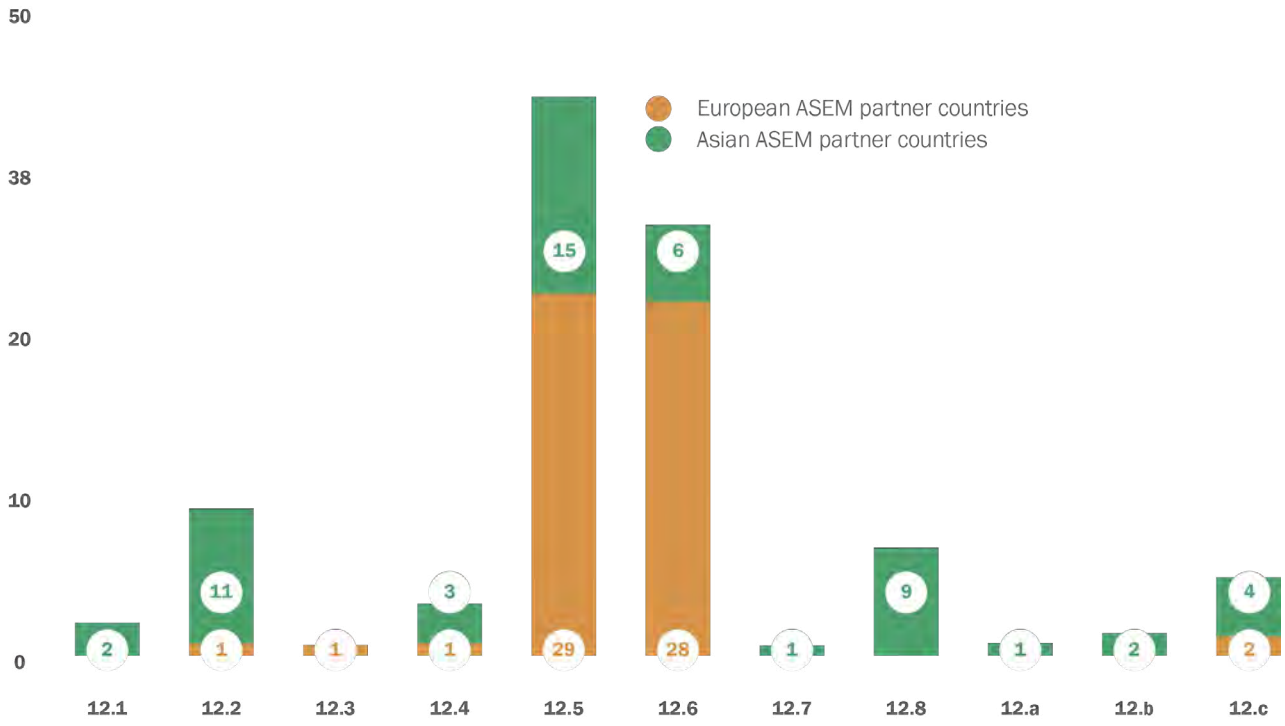


Figure 18: SDG12 coverage in ASEM NDC commitments

Target 12.1, to implement a 10-year framework of programmes on SCP, appeared in the commitments of Brunei Darussalam and China. The Chinese NDC recognised that to "achieve the nationally determined action objectives on climate change by 2030, China needs to...make a sustained effort in further implementing enhanced policies and measures in areas such as production mode and consumption patterns."[18] Target 12.3, to halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, was included in the NDC of the United Kingdom. The NDC noted that the United Kingdom "is committed to delivering a national shift to healthy diets supported by a sustainable food system. in which natural resources are used efficiently and waste is minimized."[19] Commitments linked to 12.4 to achieve the environmentally sound management of chemicals and all wastes throughout their life cycle were included in the NDCs of Bangladesh, Cambodia, India and the United Kingdom. Regarding target 12.7, only China included objectives, namely, to improve green government procurement policy systems of low-carbon and energy-conservation products. Target 12.8 on awareness raising for sustainable development and lifestyles appeared in nine Asian ASEM partner countries' NDCs but in no European commitments.

18 "Enhanced Actions on Climate Change: China's Intended Nationally Determined Contributions," Climate Watch, accessed 2 September 2022, https://www.climatewatchdata.org/ndcs/country/CHN/full?document=indc-EN&query=just%20transition&searchBy=query.

19 UK Government, United Kingdom of Great Britain and Northern Nationally Determined Contribution (London: UK Government, 2020), https://unfccc.int/NDCREG.

Table 5: Overview of SDG12 target coverage in ASEM NDC commitments

	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.a	12.b	12.c
Bangladesh				•	•	•					
Brunei Darussalam	•	•			•						
Cambodia		•		•	•	•		•	•	•	
China	•	•			•	•	•	•			•
India				•	•			•			•
Indonesia					•						
Japan		•			•	•		•			
Kazakhstan					•						
Lao PDR		•						•			
Malaysia		•									
Mongolia		•			•			•			•
Myanmar					•			•			•
Pakistan		•			•						
Philippines		•			•						
South Korea					•	•					
Thailand					•			•		•	
Viet Nam					•	•		•			
European Union					•	•					•
Norway		•		•	•						
Switzerland											•
United Kingdom		•	•		•	•					

Source: Authors' analyses based on data sourced from Climate Watch, accessed on 30 April 2022

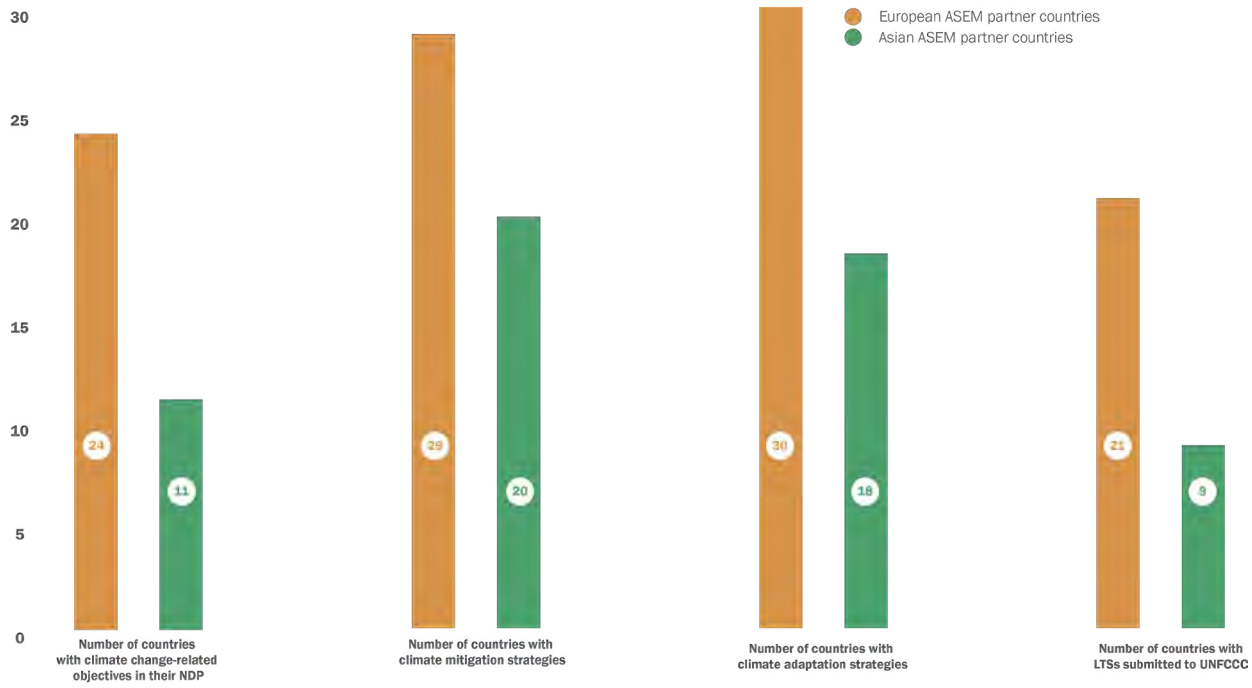
3.2. NATIONAL CLIMATE CHANGE POLICIES

This section reviews the extent to which climate commitments are embedded in the national policy frameworks. It provides an overview of whether and how climate change goals appear in overarching national development policies (NDPs) and specifically, which countries submitted a Long-term Strategy (LTS) to the UNFCCC. Climate mitigation and adaptation strategies are also reviewed. Lastly, linkages to gender equality, a just transition and a circular economy are also analysed.

3.2.1. INTEGRATION OF CLIMATE CHANGE OBJECTIVES INTO NATIONAL POLICY FRAMEWORKS

Overall, 35 ASEM partner countries included climate change mitigation or adaptation objectives in their NDPs and national Sustainable Development Strategies (SDS). Moreover, almost all studied countries have adopted a targeted climate mitigation and an adaptation strategy. Around 30 countries have also submitted their LTS to the UNFCCC (as of May 31, 2022), see Figure 18.

Figure 18: Overview of national climate change policy frameworks



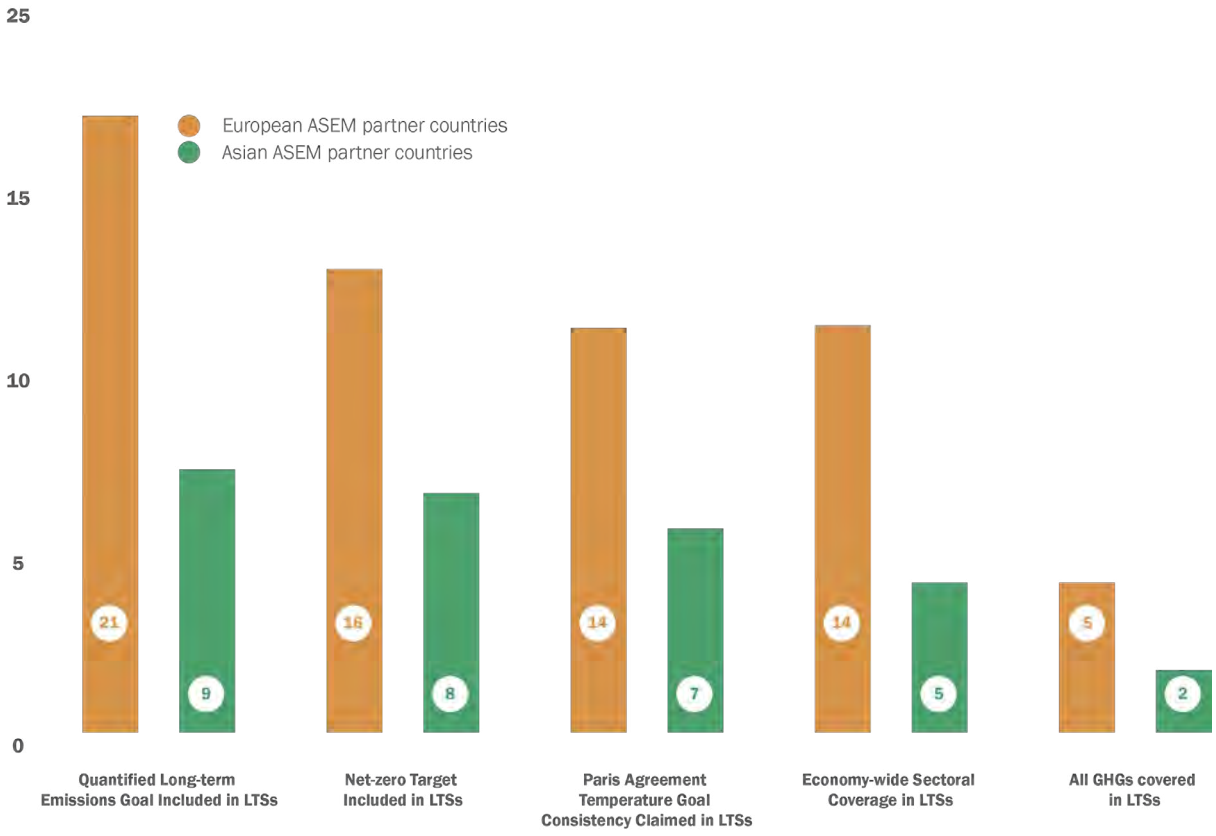
Source: Authors' calculations based on the review of national climate change policy frameworks

An overarching climate change strategic or policy framework could be identified for most ASEM partner countries, see Annex 7. In Asian partner countries, NDPs are more prevalent, while in Europe, long-term sustainability strategies have been adopted. Many of these were updated or revised after the adoption of the UN 2030 Agenda for Sustainable Development and the SDGs in 2015. Climate change mitigation and adaptation objectives could be identified as priority goals (or part of priority goals) in most of these strategic frameworks, see Annex 8. For example, the Estonia 2035 development strategy has a vision "to transform the country to a competitive, climate-neutral country with a knowledge-based society and economy and a high-quality and species-rich living environment, willing and able to reduce the adverse effects of climate change and make the best use of its positive aspects."[20] The Twelfth Development Plan of Malaysia for the 2021-2025 period defined three development objectives for the country. The third theme concerns the advancement of sustainability, which aims to address the issues of climate change, SCP, biodiversity loss and inefficient water management via the adoption of "more sustainable economic practices and lifestyles."[21]

20 "Strategic goals," Republic of Estonia Government, last modified 27 January 2022, accessed 2 September 2022, https://valitsus.ee/en/estonia-2035-development-stategy/strategy/strategic-goals

21 Prime Minister's Department, Malaysia, Twelfth Development Plan of Malaysia for the 2021-2025 (Putra Jaya: Prime Minister's Department, 2021, https://pulse.icdm.com.my/wp-content/uploads/2021/09/Twelfth-Plan-Document_compressed-1.pdf

Figure 19: Analysis of ASEM LTSs' content



Source: Authors' analyses based on the national LTS submissions and data collected by Climate Watch

Almost all ASEM partner countries have adopted a mitigation and an adaptation strategy or in some cases, a general climate strategy that covers both areas. In a growing number of instances, the national climate mitigation strategy was replaced by the UNFCCC required Long-term Strategy. These provide a long-term emissions reduction plan, usually with a time horizon up to 2050. Each EU member country was also required to submit a National Energy and Climate Plan (NECP) to the European Commission for the 2021-2030 period. The NECPs provide details plans for meeting the EU's 2030 energy and climate targets.[22]

As of May 2022, 30 ASEM partner countries submitted their respective LTSs for emissions reduction to the UNFCCC, including 21 countries from the European region and nine from the Asian region. All 30 ASEM partner countries included a quantified long-term emissions goal in their submitted strategies. Yet, not all countries aimed for net-zero targets and consistency with the Paris Agreement temperature goal has only been identified in 18 submissions so far. Out of the 24 analysed ASEM LTS strategies, economy-wide sectoral coverage could be found in 13 LTSs and only nine covered all type of GHG emissions, see Figure 19 and Annex 9.

An overview of the status of the ASEM partner countries climate policy frameworks is provided in Table 6.

22 "National energy and climate plans (NECPs)," European Commission, accessed 2 September 2022, https://energy.ec.europa.eu/topics/energy-strategy/national-energy-and-climate-plans-necps_en.

Table 6: The overview of the status of the ASEM partner countries' climate policy frameworks

	Climate objectives in NDP/SDS	Climate objectives in NDP/SDS	Climate Change mitigation strategy	Climate Change Adaptation Strategy
Australia		X	X, same as LTS	X
Bangladesh	X	no LTS	X	X
Brunei Darussalam		no LTS	X, general climate strategy	X, general climate strategy
Cambodia	X	X	X	X
China		X	X, same as LTS	X
India		no LTS	X, general climate strategy	X, general climate strategy
Indonesia	X	X	X, same as LTS	X
Japan	X	X	X, same as LTS	
Kazakhstan		no LTS	(X)*	X
South Korea		X	X, same as LTS	X
Lao PDR	X	no LTS	X	
Malaysia	X	no LTS	X	X
Mongolia	X	no LTS	X, general climate strategy	X, general climate strategy
Myanmar	X	no LTS	X	
New Zealand		X	X, same as LTS	
Pakistan	X	no LTS	X, general climate strategy	X, general climate strategy
Philippines		no LTS	X	X
Russia		no LTS	X	
Singapore		X	X, same as LTS	X
Thailand	X	X	X, same as LTS	X
Vietnam	X	no LTS	X	X
Austria	X	X	X, same as LTS	X
Belgium	X	X	X, same as LTS	X
Bulgaria	X	no LTS	X	X
Croatia	X	no LTS	X	X
Cyprus	X	no LTS	X	X
Czech Republic	X	X	X, same as LTS	X
Denmark	X	X	X, same as LTS	X
Estonia	X	no LTS	X	X
Finland	X	X	X, same as LTS	X
France	X	X	X, same as LTS	X
Germany	X	X	X, same as LTS	X
Greece		no LTS	X	X
Hungary	X	X	X, same as LTS	X
Ireland	X	no LTS	X	X
Italy		no LTS	X	X
Latvia	X	X	X, same as LTS	X
Lithuania	X	X	X, same as LTS	X
Luxembourg	X	X	X, same as LTS	X
Malta		X	X, same as LTS	X
Netherlands	X	X	X, same as LTS	X
Norway	X	X	X, same as LTS	X
Poland		no LTS	(X)***	X
Portugal		X	X, same as LTS	X
Romania	X	no LTS	X	X
Slovakia		X	X, same as LTS	X
Slovenia	X	X	X, same as LTS	X
Spain	X	X	X, same as LTS	X
Sweden	X	X	X, same as LTS	X
Switzerland	X	X	X, same as LTS	X
United Kingdom	X	X	X, same as LTS	X

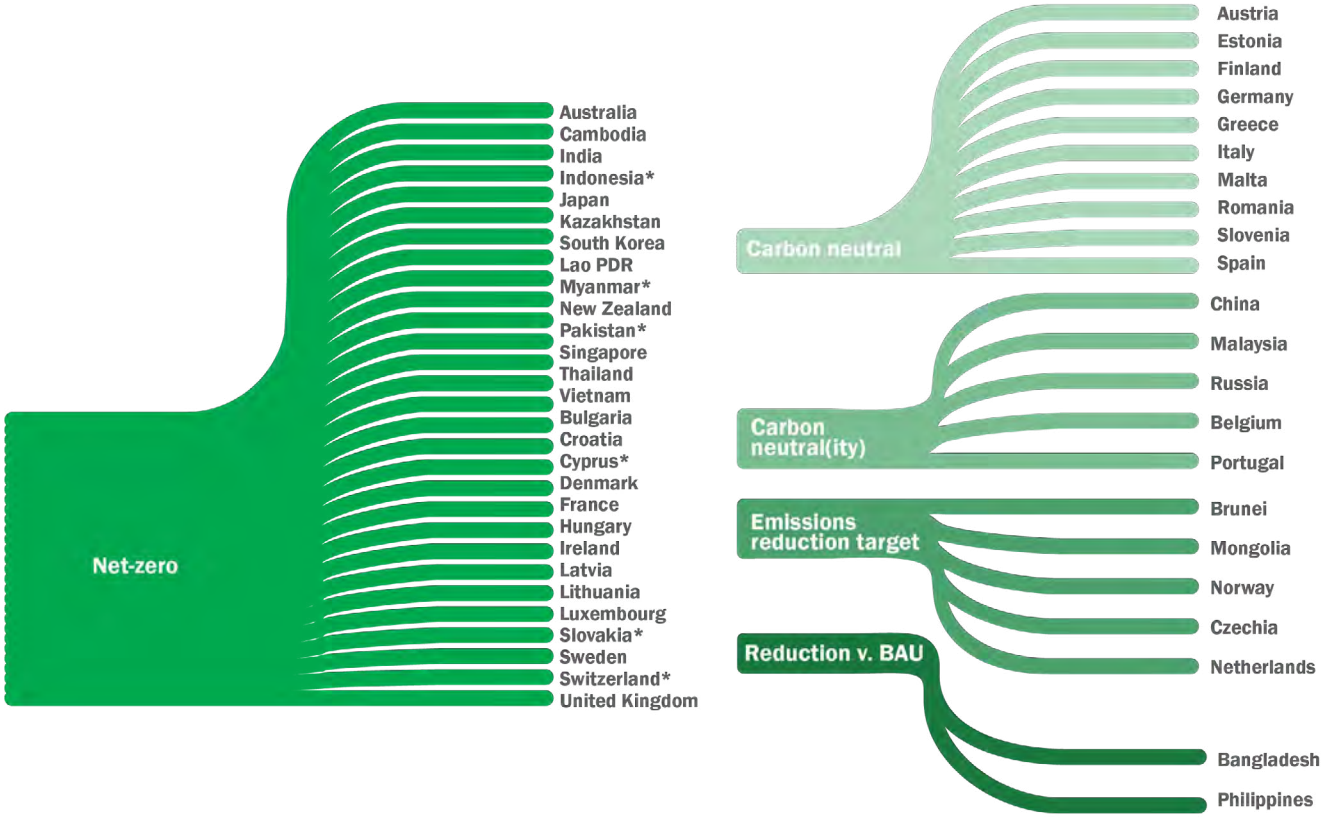
** Kazakhstan has a law on the transition to a green economy, including targets on emissions and energy intensity reduction*
*** A National Adaptation Plan is under development*
****Poland has a NECP, submitted as part of its EU obligation*
Source: Authors' data collection

3.2.2. GHG EMISSIONS REDUCTION COMMITMENTS

Regarding the long-term mitigation commitments in ASEM, as of May 2022, 29 ASEM partner countries aimed for net-zero emissions. These net-zero commitments are usually set to be achieved by 2050. As a forerunner, Sweden aspires for net-zero emissions already by 2045, introduced in its Climate Policy Framework.[23] In addition, 15 ASEM partner countries committed to climate or carbon neutrality, mostly by 2050. Increasing its ambitions with a reform of its Climate Change Act, Finland aims to achieve a balance between its emissions and carbon sinks already by 2035.[24] Germany and Portugal also aspire for climate neutrality by 2045. Seven ASEM partner countries, have not (yet) committed to net-zero or climate neutrality but instead, set emissions reduction targets. The Netherlands and Norway pledged, for example, to 95 percent emissions reduction by 2050 from the 1990 baseline year.

In addition to their long-term commitments, most ASEM partner countries also established quantitative targets for emissions reduction by 2030. The EU adopted a 2030 climate target plan, which aims to reduce net GHG emissions by 55 percent by 2030 (compared to 1990 levels).[25] To contribute to these efforts, EU member countries set up their own emissions reduction targets, ranging from 70 percent (compared to 1990) in Denmark and Estonia to 23 percent in Spain (compared to 1990) and 19 percent in Malta ((compared to 2005). Regarding Asian ASEM partner countries, Japan introduced an emissions reduction target of 46 percent (compared to 2003) and New Zealand aims for 30 percent reduction compared to 2005 levels). China, Malaysia, and India introduced a target focusing on emissions intensity reduction, while Singapore aims to peak emissions at around 65mt by 2030 and reduce emissions to 33mt by 2050,[26] see Table 7.

Figure 20: Overview of GHG emissions reduction commitments



**Proposed or under negotiation*

Source: Based on analyses of NDCs and national strategies

23 Government Offices of Sweden, Swedish climate policy framework (Stockholm: Government Offices of Sweden, 2021), https://www.government.se/495f60/contentassets/883ae8e123bc4e42aa8d59296ebe0478/the-swedish-climate-policy-framework.pdf

24 "Reform of the Climate Change Act," Ministry of the Environment, accessed 2 September 2022, https://ym.fi/en/the-reform-of-the-climate-change-act

25 European Commission, Stepping up Europe's 2030 climate ambition Investing in a climate-neutral future for the benefit of our people (Brussels: EC, 2020), https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0562

26 Vanessa Lim, "Budget 2022: Singapore to progressively raise carbon tax to reach net-zero target 'by or around mid-century," CNA, last modified 18 February 2022, accessed 2 September 2022, https://www.channelnewsasia.com/singapore/carbon-tax-net-zero-target-emissions-singapore-green-plan-2506496.

Table 7: Map of GHG emissions reduction commitments by 2030

Target	Country	Reduction by 2030 (%)	Baseline year
Emissions reduction target	Denmark	70	1990
	Estonia	70	1990
	United Kingdom	68	1990
	Germany	65	1990
	Sweden	63	1990
	Austria	55	1990
	Belgium	55	1990
	Finland	55	2005
	France	55	1990
	Greece	55	2021
	Italy	55	1990
	Luxembourg	55	2005
	Ireland	51	2021
	Norway	50	1990
	Switzerland	50	1990
	Netherlands	49	1990
	Japan	46	2013
	Romania	44	2005
	Australia	43	2005
	Bulgaria	40	1990
	Hungary	40	1990
	Latvia	40	1990
	Lithuania	40	1990
	Portugal	40	2020
	Slovakia	40	1990
	Croatia	36.7	1990
	Slovenia	36	2005
	New Zealand	30	2005
	Poland	30	1990
	Indonesia	29	2030
	Kazakhstan	25	1990
	South Korea	24.4	2017
	Cyprus	24	2005
	Russia	24	1990
	Spain	23	1990
	Malta	19	2005
Reduction v. BAU	Philippines	75	
	Lao PDR	60	
	Pakistan	50	
	Cambodia	41.7	
	Thailand	25	
	Vietnam	9	
Absolute reduction	Singapore		2014
Emissions intensity target	China	65	2005
	Malaysia	45	2005
	India	33	2005
No target	Bangladesh		
	Brunei Darussalam		
	Mongolia		
	Czech Republic		
	Myanmar		

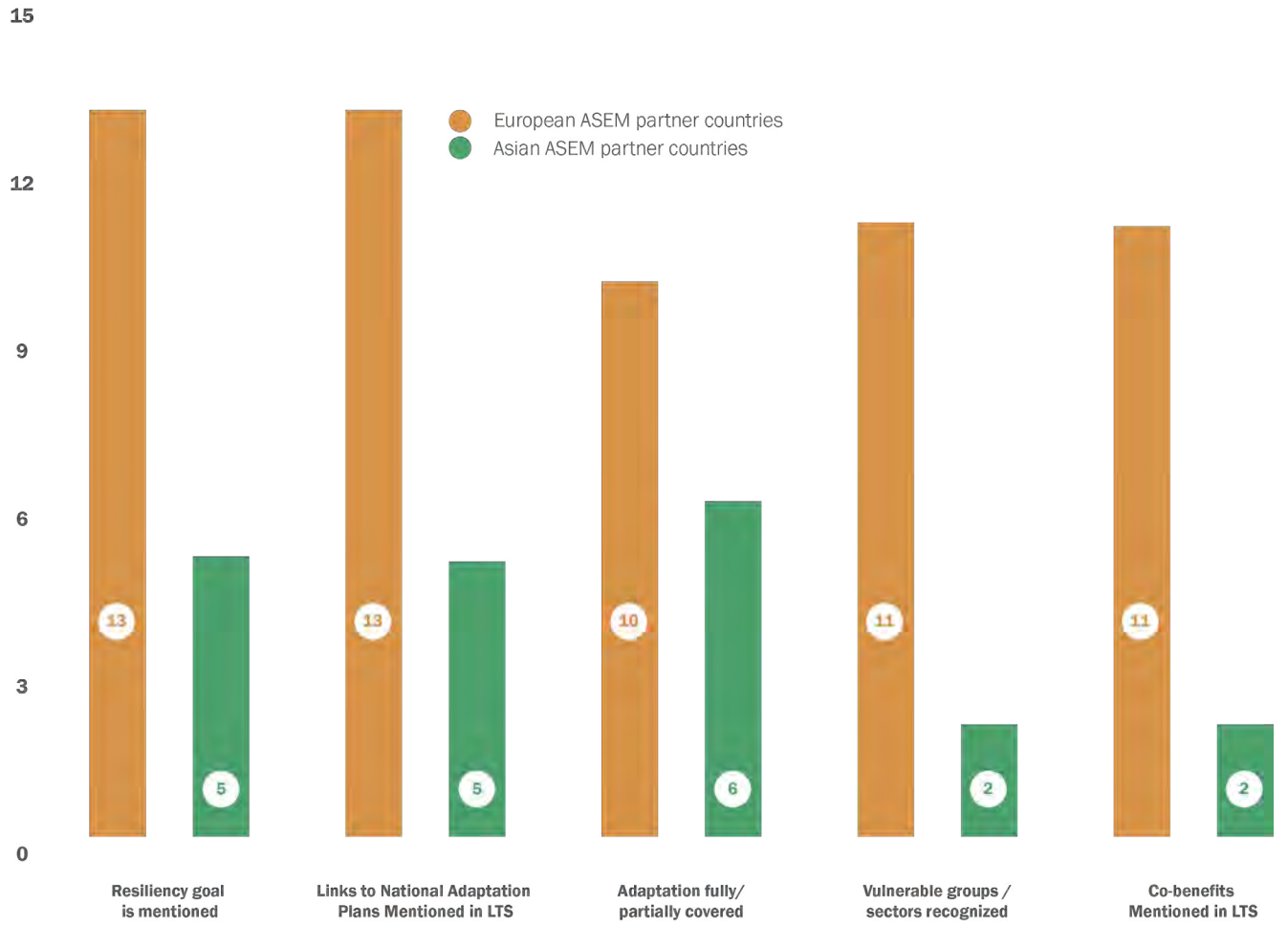
Source: Authors' analyses based on the NDCs and national LTSs

3.2.3. ADAPTATION CONSIDERATIONS IN THE NATIONAL POLICY FRAMEWORKS

Concerning adaptation, our analysis of the LTSs found that around two-thirds of the studied ASEM strategies mentioned goals for resilience and included links to National Adaptation Plans (NAPs). For instance, Indonesia's LTS aims to increase the country's resilience in the areas of food, water, energy and health and reduce expected national GDP losses resulting from climate change by 3.45 percent (in 2050).[27] Around half of the studied LTSs also discussed adaptation needs and actions as well as mentioned co-benefits. Two-third of the LTS also recognised synergies between adaptation and mitigation actions for development gains. South Korea, for example, highlighted the importance of green infrastructure and urban ecosystems that produce co-benefits for adaptation and emissions reduction.[28] Slovenia committed to implement mitigation and adaptation measures together in the fields of energy efficiency of buildings, food self-sufficiency, restoration of degraded ecosystems and green urban infrastructure.[29]

Vulnerable sectors and groups were also mentioned in several national policy frameworks. The need for a just transition was covered by 38 ASEM partner countries (13 Asian and 25 European member countries respectively), mainly discussed in their LTSs. In LTSs specifically, sectoral transitions and just transitions consideration were discussed in 23 and in 21 LTSs, respectively. Linkages to human and environmental well-being were considered by 19 submissions.

Figure 21: Adaptation coverage in ASEM LTSs



Source: Authors' analysis based on the national LTS submissions and data collected by Climate Watch

27 Government of Indonesia, Long-Term Strategy for Low Carbon and Climate Resilience 2050 (Jakarta: Government of Indonesia, 2021), https://unfccc.int/sites/default/files/resource/Indonesia_LTS-LCCR_2021.pdf

28 The Government of the Republic of Korea, 2050 Carbon Neutral Strategy (Seoul: The Government of the Republic of Korea, 2020), https://unfccc.int/sites/default/files/resource/LTS1_RKorea.pdf

29 Government of Slovenia, Slovenia's Long-term Strategy until 2050 (Ljubljana: Government of Slovenia, 2021), https://unfccc.int/sites/default/files/resource/LTS1_SLOVENIA_EN.pdf

Gender-related concerns were also identified by 20 ASEM partner countries (10 Asian and 10 European member countries respectively). However, most policies solely stressed the importance of gender considerations but do not provide specific details about how the country is aiming to support gender equality. Table 8 presents specific gender-focused objectives and actions identified in ASEM climate change policies.

"Policies stress the importance of gender considerations but often do not provide specific details about how to support gender equality."

Table 8: Examples of gender-focused climate objectives in national policy documents

Bangladesh	The National Adaptation Programmes of Action outlined the importance of gender consideration in climate change actions. The Climate Change and Gender Action Plan, proposes several actions to be implemented in the agriculture sector.
Cambodia	Cambodia Climate Change Strategic Plan 2014-2023/Strategic Objective 2 aims to reduce sectoral, regional, gender vulnerability and health risks to climate change impacts.
India	Considerations of gender in India's approach to tackle climate change have been incorporated in its National Action Plan on Climate Change (NAPCC) and also translated into sectoral plans.
Pakistan	The National Climate Change Policy (2012) aims to address the gender aspects of vulnerability from climate change and to achieve this, the Government of Pakistan is taking various policy measures.
Philippines	The National Climate Change Action Plan aims to integrate gender-responsive climate change adaptation and mitigation in agriculture and fisheries plans, programs, and budgets and provide technical assistance on adaptation planning to local communities.
Spain	The LTS recognized that women are key agents of change, and they need to be granted equal access to decision-making.
United Kingdom	The LTS highlights that the UK will continue to encourage industry to ensure equal opportunity for all to work in the green economy, specifically in the global clean energy sector.

Source: Authors' compilation from national policy documents

3.2.4. CIRCULAR ECONOMY OBJECTIVES IN THE NATIONAL CLIMATE POLICY FRAMEWORKS

As discussed in section 3.1.4, the majority of ASEM partner countries identified linkages to SCP objectives (SDG 12) in their NDCs. However, most of these concerned general waste recycling and the sustainable management and efficient use of natural resources.

Our analysis of the national climate policy frameworks suggests that countries also consider linkages between climate change and a circular economy transition beyond their national commitments. For example, Japan stated in its LTS that it will "strongly promote three types of transition towards a decarbonized and decentralized society and a circular economy."[30] France indicated in its LTS that a new and sustainable growth model should be developed which relies on a circular economy model and climate resilience.[31]

30 The Government of Japan, Long Term Strategy under the Paris Agreement (Tokyo: The Government of Japan, 2021), https://unfccc.int/sites/default/files/resource/Japan_LTS2021.pdf

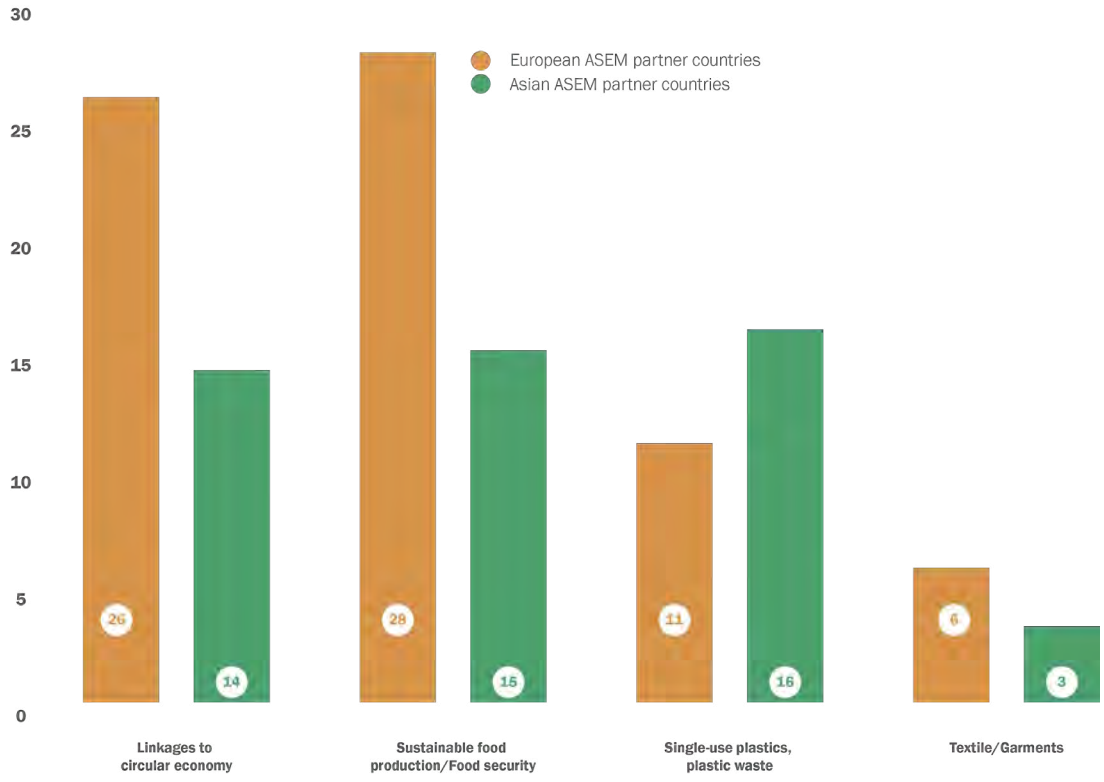
31 Ministry for the Ecological and Solidary Transition, France, National Low carbon Strategy: The ecological and inclusive transition toward carbon neutrality (Paris: Ministry for the Ecological and Solidary Transition, 2020), https://unfccc.int/sites/default/files/resource/en_SNBC-2_complete.pdf

At the same time, and similarly to the NDCs, circular economy-related objectives and actions were mostly mentioned in connection to waste prevention and recycling as a potential tool to reduce emissions from the waste sector. For example, Germany's LTS noted that the transformation in the country's waste management practices resulted in considerable GHG emissions reductions.[32] Such measures included the introduction of a ban on biodegradable waste and the introduction of various recycling practices. The Philippines also highlighted various targets for ecological solid waste management to support climate mitigation and adaptation objectives.[33]

Besides general circular economy objectives, the majority of Asian and European ASEM partner countries identified linkages between sustainable food systems and climate mitigation as well as adaptation needs and food security challenges. In its LTS, Hungary outlined the importance of reducing food waste via the transformation of consumption patterns and the use of digital technologies to connect the different actors along the supply chains more effectively. India stressed that its food production is vulnerable to climate change and the National Mission on Sustainable Agriculture aims to work towards an "ecologically sustainable, climate-resilient production system".[34]

Approximately half of the ASEM partner countries highlighted the relationship between plastic waste reduction and climate mitigation and nine countries also identified actions for reducing the emissions in the textile/garment sector. For example, Vietnam introduced a mitigation initiative to promote energy-saving in the textile industry.[35] India and Thailand introduced energy efficiency standards for their main manufacturing sectors, including textiles. Figure 22 provides an overview of the different SCP issues considered in the climate policy framework of the ASEM partner countries.

Figure 22: Circular economy and SCP considerations in ASEM climate policy frameworks



Source: Authors' analyses based on ASEM NDCs and the national climate policy frameworks

32 Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety, Germany, Climate Action Plan 2050 (Berlin: Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety, 2016), https://ec.europa.eu/clima/sites/lts/lts_de_en.pdf

33 Climate Change Commission, Philippines, National Climate Change Action Plan (Manila: Climate Change Commission, 2011, https://ec.europa.eu/clima/sites/lts/lts_de_en.pdf

34 Ministry of Environment, Forest and Climate Change, India: Third Biennial Update Report to the United Nations Framework Convention on Climate Change (Delhi: Ministry of Environment, Forest and Climate Change, 2021), p. 26, https://unfccc.int/sites/default/files/resource/INDIA_%20BUR-3_20.02.2021_High.pdf

35 GIZ (n.d.) Nationally appropriate mitigation actions (NAMA), Vietnam, https://www.giz.de/en/worldwide/26246.html

4. SECTORAL ANALYSIS AND RECOMMENDATIONS

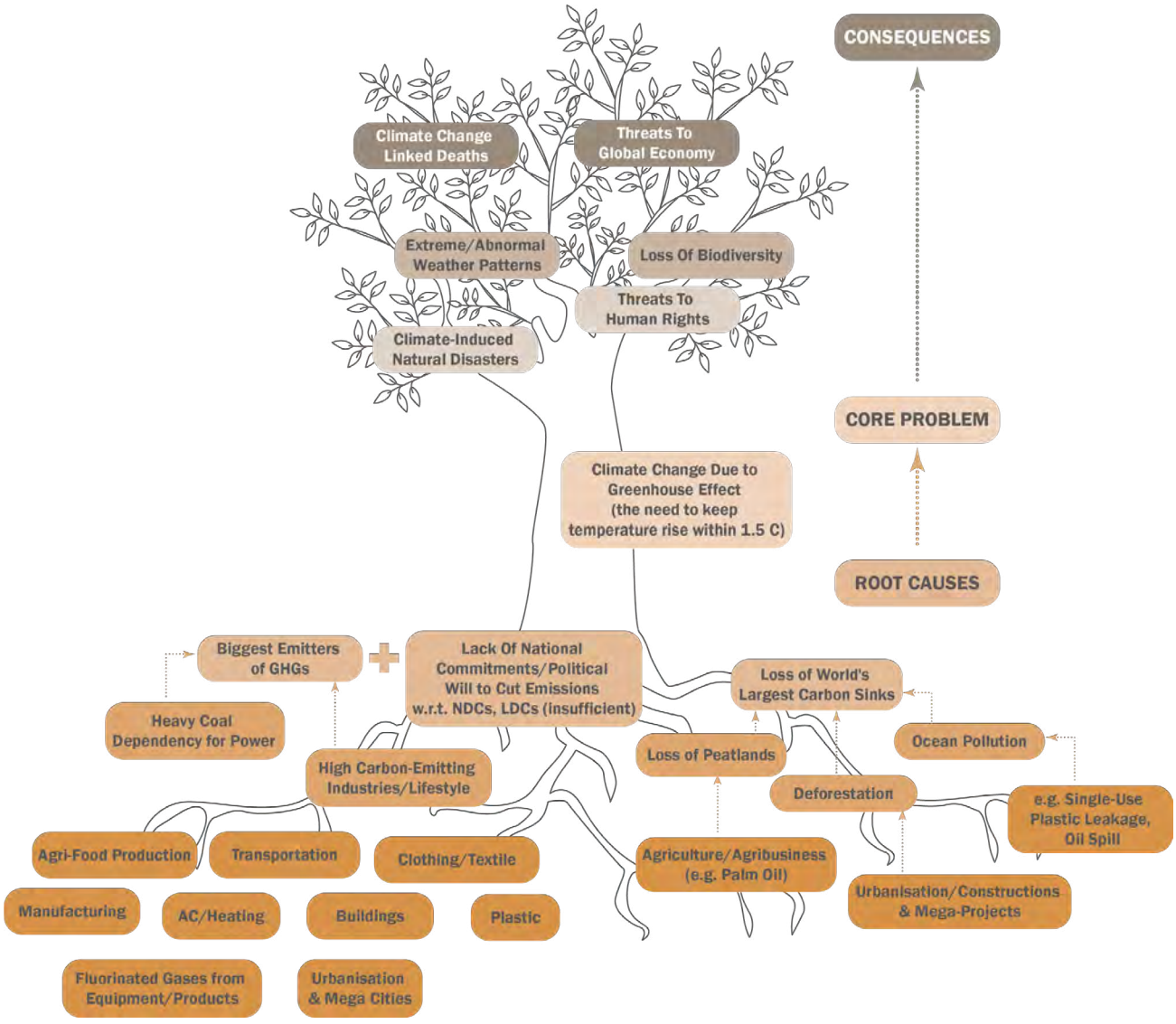
According to the 2021 UNEP Emissions Gap Report, the current NDC commitments are highly insufficient and would result in a 2.2 to 2.7°C degree increase by 2100. Emissions would need to be halted by 2030 to keep global warming below 1.5°C degree.[36] While some progress was reached at the UN Climate Change Conference in Glasgow (Conference of the Parties-COP 26) to further limit GHG emissions causing climate change, it was agreed that accelerated implementation actions are required to implement the commitments of the Paris Agreement.

36 United Nations Environment Programme, The Heat Is On. A world of climate promises not yet delivered (Nairobi: UNEP, 2021), https://www.unep.org/resources/emissions-gap-report-2021.

Prepared by the Asia-Europe Foundation, a problem tree analysis concerning Europe and Asia identified various root causes which render the climate change challenge difficult to address, see Figure 23.

As presented in chapter 2, annual global GHG emissions have increased by 50 percent between 1990 and 2018. GHG emissions are increasing from heavy fossil fuel dependency in many middle-income countries in the Asian region. High-income economies with high-emission industries and/or high-carbon footprint lifestyles further contribute to GHG emissions in both regions. These challenges are also exacerbated with the lack of national commitments and political will to sufficiently cut emissions.

Figure 23: Climate change problem analysis in Asia and Europe (an analysis of the Asia-Europe Foundation)



Source: G. Pulawska and N.A. Razak, Asia-Europe Foundation (2022)

Since ASEM partner countries are responsible for over half of the global GHG emissions, their commitments and how they translate these commitments into actions have a crucial role to help the world achieve the goals of the Paris Agreement. An analysis by Climate Action Tracker (CAT),[37] focusing on national commitments and current mitigation policies, shows that most ASEM partner countries are not on track to sufficiently contribute to the necessary emissions reductions, which can keep global warming at 1.5°C, see Table 9.

"Most ASEM partner countries are not on track to sufficiently contribute to the necessary emissions reductions, which can keep global warming at 1.5°C."

Table 9: Assessment of ASEM partners GHG emissions trends and climate commitments and policies, covering 94% of the ASEM emissions

	Global contribution to GHG emissions (2018)	Emissions per capita tCO2e/capita, 2018	Overall evaluation of current climate mitigation pathways
China	23.92%	8.34	Highly insufficient
EU-27	7.86%	6.6	Insufficient
India *	6.84%	2.47	Highly insufficient
Russia	4.07%	13.79	Critically insufficient
Indonesia*	3.48%	6.37	Highly insufficient
Japan	2.36%	9.13	Insufficient
South Korea	1.38%	13.05	Highly insufficient
Australia	1.27%	24.79	Insufficient
United Kingdom	0.90%	6.64	Almost sufficient
Thailand *	0.88%	6.21	Critically insufficient
Vietnam *	0.74%	3.81	Critically insufficient
Kazakhstan*	0.55%	14.84	Highly insufficient
New Zealand	0.14%	14.43	Highly insufficient
Singapore	0.14%	11.82	Critically insufficient
Switzerland	0.09%	5.14	Insufficient
Norway	0.06%	5.35	Insufficient

** Internationally supported target*
Source: Authors' analyses based on the assessment of the Climate Action Tracker, Country Assessments (November 2021)

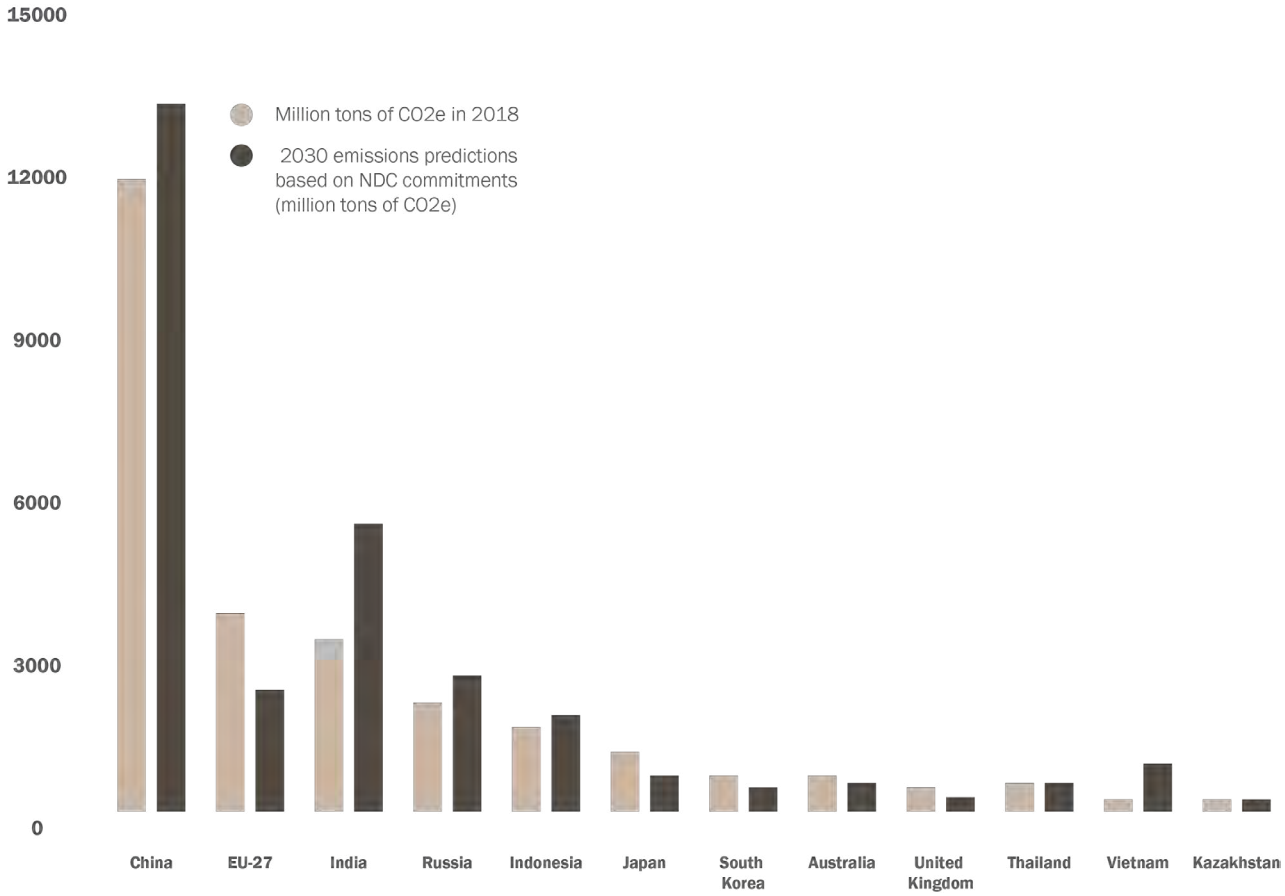
"Achieving high ambition targets will require ASEM partner countries to introduce transformative emission reduction approaches. "

As the latest NDC Synthesis report of the UNFCCC secretariat outlined,[1][38] most Parties to the Paris Agreement formulated clear and quantified emissions reduction targets. Many countries also increased their ambitions compared to their original submissions and identified implementation actions in the key emitting sectors. However, to fulfil the Paris Agreement, all governments will need to considerably increase their ambitions. Achieving high ambition targets will require ASEM partner countries to introduce transformative emission reduction approaches. To do so, governments will need to critically re-examine their current emissions reduction targets, assess the viability and feasibility of their net-zero implementation plans, and identify quantified and time-bound implementation actions across all their economic sectors.

37 "Rating System," Climate Action Tracker, accessed 2 September 2022, https://climateactiontracker.org/countries/rating-system.

38 UNFCCC, "Nationally determined contributions under the Paris Agreement" (Glasgow: UNFCCC, Conference of the Parties, 2021) https://unfccc.int/process-and-meetings/the-paris-agreement/nationally-determined-contributions-ndcs/nationally-determined-contributions-ndcs/ndc-synthesis-report

Figure 24: Current versus predicted GHG emissions (excl.LU LUCF) based on NDCs in the ten largest emitters of ASEM



Source: Authors calculation based on data from Climate Watch and data sources from Climate Action Tracker, Country Assessments, accessed on 31 May 2022

According to the existing NDC commitments, GHG emissions are to decrease in European ASEM partner countries and in high-income Asian ASEM partner countries by 2030. However, the reductions will likely not be sufficient to ensure their compliance with the 1.5°C degree temperature goal of the Paris Agreement. In addition, emissions will continue to grow in middle-income Asian countries, contributing to a further increase in annual GHG emissions. Figure 24 shows current versus predicted GHG emissions in 2030 based on the NDCs in the EU-27, the UK and the ten largest emitters in the Asian region of ASEM. The assessment covers 94 percent of all ASEM partner countries' emissions and 54 percent of the global GHG emissions.

Therefore, it is imperative that ASEM partner countries urgently address the gaps in their climate commitments to further accelerate the transition to decarbonise their economies. To identify those areas where ASEM partner countries must improve and accelerate their mitigationpolicies and actions to thus enable transition to adequate decarbonisation pathways, we connected the available evaluations of national policies and the largest emitting sectors in each country. See Table 10.

Table 10: Assessment of national climate policies and the highest emitting sectors in each ASEM partner country in the European and the Asian region

Countries	Evaluation of climate policies and actions	Highest emitting sector	Emissions in million tons of CO2e in 2018	Second highest emitting sectors	Emissions in million tons of CO2e in 2018
Germany	Insufficient	Electricity/Heat	310.35	Transport	158.3
Poland	Critically insufficient	Electricity/Heat	157.46	Transport	63.48
France	Almost sufficient	Transport	125.42	Agriculture	73.83
UK	Almost sufficient	Transport	120.66	Electricity/Heat	106.64
Italy	Insufficient	Electricity/Heat	113.38	Transport	100.2
Spain	Insufficient	Transport	92.31	Electricity/Heat	89.94
Netherlands	Almost sufficient	Electricity/Heat	63.63	Transport	30.83
Czech Republic	Critically insufficient	Electricity/Heat	57.63	Transport	18.67
Greece	Insufficient	Electricity/Heat	33.86	Transport	17.17
Romania	Critically insufficient	Electricity/Heat	29.81	Transport	18.11
Ireland	Highly insufficient	Agriculture	25.35	Transport	11.87
Belgium	Highly insufficient	Transport	25.31	Electricity/Heat	22.47
Austria	Insufficient	Transport	24.76	Electricity/Heat	17.71
Bulgaria	Critically insufficient	Electricity/Heat	24.19	Transport	9.44
Finland	Almost sufficient	Electricity/Heat	20.91	Transport	11.51
Portugal	Almost sufficient	Electricity/Heat	20.83	Transport	16.82
Sweden	Almost sufficient	Transport	16.49	Electricity/Heat	8.61
Switzerland	Insufficient	Transport	15.82	Buildings	11.34
Norway	Insufficient	Electricity/Heat	15.02	Transport	12.53
Hungary	Critically insufficient	Electricity/Heat	13.69	Transport	13.58
Denmark	Almost sufficient	Transport	12.66	Electricity/Heat	11.5
Estonia	Highly insufficient	Electricity/Heat	11.82	Transport	2.46
Slovakia	Highly insufficient	Electricity/Heat	10.97	Manufacturing	7.73
Croatia	Insufficient	Transport	6.30	Electricity/Heat	3.88
Luxembourg	Almost sufficient	Transport	6.07	Buildings	1.62
Lithuania	Almost sufficient	Transport	6.05	Agriculture	4.92
Slovenia	Insufficient	Transport	5.72	Electricity/Heat	4.82
Cyprus	Insufficient	Electricity/Heat	3.27	Transport	1.99
Latvia	Almost sufficient	Transport	3.24	Agriculture	2.72
Malta	Highly insufficient	Electricity/Heat	0.70	Transport	0.67
China	Insufficient	Electricity/Heat	5214.20	Manufacturing	2667.43
India	Almost sufficient	Electricity/Heat	1241.34	Agriculture	718.7
Russia	Highly insufficient	Electricity/Heat	844.67	Other (energy)	703.55
Indonesia	Insufficient	LUCF	734.28	Electricity/Heat	243.36
Japan	Insufficient	Electricity/Heat	561.86	Transport	204.56
South Korea	Highly insufficient	Electricity/Heat	373.70	Transport	101.66
Australia	Insufficient	Electricity/Heat	221.26	Agriculture	159.54
Pakistan	N/A	Agriculture	186.22	Electricity/Heat	59.76
Malaysia	Critically insufficient	Electricity/Heat	125.36	LUCF	81.44
Kazakhstan	Highly insufficient	Electricity/Heat	120.81	Buildings	36.84
Myanmar	N/A	LUCF	111.97	Agriculture	78.38
Vietnam	Critically insufficient	Electricity/Heat	109.13	Agriculture	70.99
Thailand	Critically insufficient	Electricity/Heat	105.57	Transport	75.88
Bangladesh	N/A	Agriculture	88.53	Electricity/Heat	38.87
Philippines	Highly insufficient	Electricity/Heat	70.44	Agriculture	61.37
New Zealand	Highly insufficient	Agriculture	42.30	Transport	16.02
Cambodia	N/A	LUCF	31.69	Agriculture	21.31
Mongolia	N/A	Agriculture	28.89	Electricity/Heat	13.56
Singapore	Highly insufficient	Electricity/Heat	25.82	IP	14.62
Lao PDR	N/A	Electricity/Heat	14.04	Agriculture	9.58
Brunei Darussalam	N/A	Electricity/Heat	5.21	IP	0.5

Source: Authors calculation based on data from Climate Watch, Climate Action Tracker, Country Assessments (2022) and GermanWatch, Climate Change Policy Index (2022)

According to the above analysis, the sectors where actions are the most urgently needed in the ASEM region include the electricity/heat generation and transportation sectors and emissions from agriculture. As shown in Table 10, the biggest source of GHG emissions was electricity and heat generation in 30 ASEM partner countries and transportation in 13 ASEM partner countries. In eight Asian countries, the emissions were highest in the agriculture, and the LUCF sector.

To better understand how the climate commitment gap can be addressed, the following sections review emissions reduction actions and implementation needs in the highest-emitting sectors of the ASEM partner countries: i.e., energy use for electricity and heat generation, agriculture, and forestry.

4.1. EMISSIONS REDUCTION ACTIONS AND NEEDS IN THE ENERGY SECTOR

As discussed in chapter 2.3, the vast majority of the ASEM partner countries GHG emissions is from the energy sector. The leading source is electricity and heat generation, followed by the manufacturing sector in the Asian region and the transport sector in the European region.

In total, the highest emissions in 14 Asian countries and 16 European countries are from the electricity and heat sector, including eight of the top ten emitters in Asia. Figure 25 shows the contribution of the electricity/heat sector to the ASEM partner countries total GHG emissions in the energy sector.

Figure 25: Percentage of national GHG emissions from electricity and heat generation (as a percentage of the total emissions from the energy sector), 2018

Source: Authors' calculation based on data from Climate Watch

Due to the heavy reliance on fossil fuels in primary energy production and especially coal in electricity production, the energy sector is the major source of GHG emissions in the majority of ASEM partner countries in the Global South, including China. Emissions from electricity and heat generation are also responsible for the highest share of emissions in several high-income economies such as Australia, South Korea, Germany and Poland.

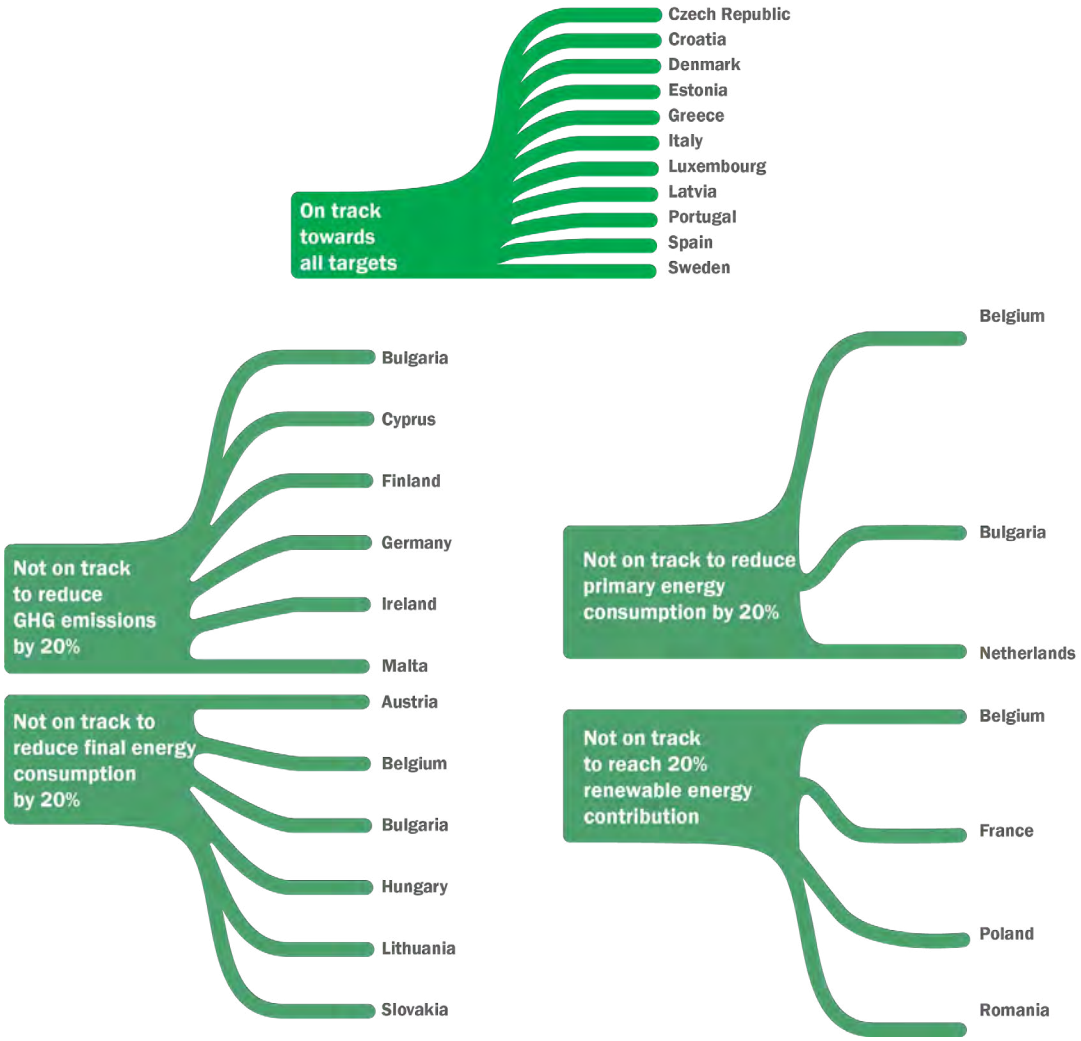
In addition, the highest share of emissions in 13 European countries are from the transport sector, because of high and still increasing motorisation rates and the low share of electric vehicles. The transportation sector was the second highest emitting sector in 16 European and four Asian ASEM partner countries, including large emitters such as Japan and South Korea. Emissions from road transportation have been also showing increasing trends in most middle-income countries in Asia.According to a recent report by the European Environment Agency,[39] the member countries of the European Union achieved their 2020 climate and energy targets, which aimed at reducing GHG emissions by 20 percent compared to 1990 levels, increasing the share of renewable energy use to 20 percent, and improving energy efficiency by 20 percent. GHG emissions were 24 percent

39 European Environment Agency, Trends and Projections in Europe 2021 (Copenhagen: EEA, 2021), https://www.eea.europa.eu/publications/trends-and-projections-in-europe-2021

Figure 26: Percentage of national GHG emissions from transportation (as a percentage of the total emissions from the energy sector), 2018

Source: Authors' calculations based on data from Climate Watch

Figure 27: National progress towards the EU 2020 targets



Source: Based on EEA data (2021)

below the 1990 baseline year in 2019 and 31 percent below in 2020 (partly because of the COVID-19 pandemic). At the same time, not all member countries achieved their national climate and energy targets and only ten countries are on track to reach all their 2020 targets. See Figure 27.

To move towards a climate-neutral economy, the EU adopted its 2030 climate and energy framework, aiming to reduce GHG emissions by 55 percent (from 1990 levels), increase the share of renewable energy by 32 percent,[40] and improve energy efficiency by 32 percent. However, to achieve the 55 percent GHG emissions reduction target by 2030, additional policies and measures will need to be introduced as current measures will only lead to a 41 percent emissions reduction by 2030.[41] For example, while Germany has recently introduced a comprehensive policy plan to speed up renewable energy deployment, its economy remains heavily reliant on fossil fuels, including coal.[42] Poland, which is the fourth largest emitter in EU, has yet to introduce long-term emissions mitigation goals and policies, while its energy system remains coal dependent.[43] In contrast, France performs well and is on track to reach its 2020 climate and energy targets,

There is evidence to suggest that the United Kingdom is almost on track to reach its mitigation goals. The country adopted its Net Zero Strategy in 2021 and committed to 78 percent emissions reduction by 2035 and net-zero emissions by 2050. The strategy aims to decarbonise the country's power system by 2050, ban fossil fuel car sales after 2030 and heavy-duty vehicle sales after 2040, increase the country's offshore wind capacity to 40 GWh by 2030, and remove all diesel trains from its rail network by 2040.[44]

Countries from the Asian region also made ambitious commitments to reduce emissions from energy production and use. China and India both aim to improve energy conservation, to reduce energy intensity and to promote large-scale deployment of wind and solar power generation.[45]Indonesia launched a national policy directive to promote clean and renewable energy sources, aiming at the reduction of fossil fuel uses and 23 percent share of renewables share by 2025 and 31 percent by 2050.[46] Australia aims to decrease emissions via technological innovations and reduced cost of low-emissions energy sources, including clean hydrogen production, renewable electrolysis, ultra-low-cost solar electricity generation and electricity from storage by lithium-ion batteries and pledged USD 20 billion investment for clean energy technologies.[47]

"To move towards a climate-neutral economy, the EU adopted its 2030 climate and energy framework, aiming to reduce GHG emissions by 55 percent."

40 "2030 Climate & energy framework," European Commission, accessed 2 September 2022, https://ec.europa.eu/clima/eu-action/climate-strategies-targets/2030-climate-energy-framework_en.

41 European Environment Agency, Trends and Projections in Europe 2021 (Copenhagen: EEA, 2021), https://www.eea.europa.eu/publications/trends-and-projections-in-europe-2021.

42 "Germany," Climate Action Tracker, last modified 1 June 2022, accessed 2 September 2022, https://climateactiontracker.org/countries/germany/policies-action/.

43 GermanWatch. (2022) Climate Change Performance Index. Poland. https://ccpi.org/country/pol/

44 "UK's path to net zero set out in landmark strategy," Gov.UK, last modified 19 October 2021, accessed 2 September 2022, https://www.gov.uk/government/news/uks-path-to-net-zero-set-out-in-landmark-strategy.

45 "Enhanced Actions on Climate Change: China's Intended Nationally Determined Contributions," Climate Watch, accessed 2 September 2022, https://www.climatewatchdata.org/ndcs/country/CHN/full?document=indc-EN&query=just%20transition&searchBy=query, India (2016) INDC. https://unfccc.int/NDCREG

46 Republic of Indonesia, First Nationally Determined Contribution: Republic of Indonesia (Jakarta: Republic of Indonesia, 2016), http://ditjenppi.menlhk.go.id/reddplus/images/resources/ndc/First_NDC.pdf

47 Australian Government, Australia's Nationally Determined Contribution: Communication 2022 (Canberra: Australian Government, 2022), https://unfccc.int/sites/default/files/NDC/2022-06/Australias%20NDC%20June%202022%20Update%20%283%29.pdf

Despite emissions reduction commitments and the introduced mitigation policies, further efforts will be needed in both ASEM partner countries to decarbonise the energy sector. Recommendations for the sector include the following:[48]

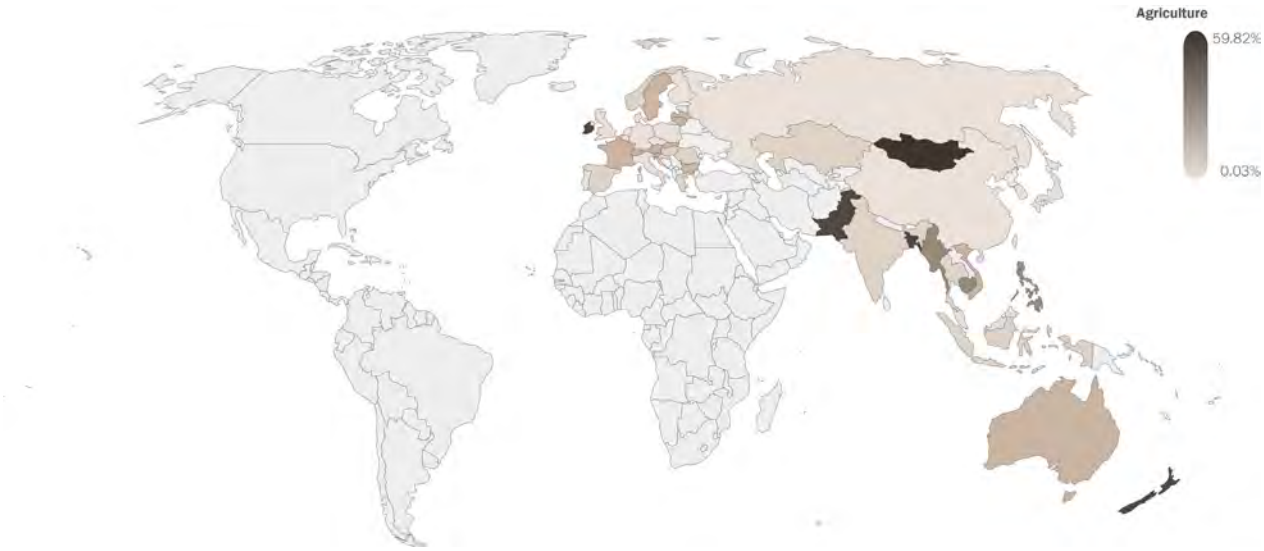
- ntroduce stricter energy conservation and energy efficiency measures;
- Promote large-scale electrification of the energy system coupled with the deployment of renewables;
- Support small-scale renewable energy systems to promote energy independence of communities and neighbourhoods.
- Accelerate the phase-out of coal-based power plants according to a strict timeline;
- Modernise industrial installations and invest in carbon-neutral technologies and systems;
- Develop smart infrastructures;
- Promote the use of electric vehicles and discourage the use of private fossil-fuel vehicles;
- Limit airport expansions and discourage short-haul flights; and
- Encourage the use of sustainable transport modes.

4.2. EMISSIONS REDUCTION NEEDS IN THE AGRICULTURE AND THE FORESTRY SECTOR

The agri-food sector is responsible for almost 25 percent of the global GHGs via direct emissions from agricultural production and deforestation related to agricultural processes.[49] With the adoption of the Paris Agreement, signatory countries have started to improve their mitigation plans but have mainly focused on the energy, industrial and the transportation sectors. If no further actions are taken, the agri-food sector could become the main source of GHG emissions by 2050 and could hamper the achievements of the goals set in the Paris agreement.[50]

In the ASEM region, following the energy sector, the second-largest emitting sector was agriculture in 2018, responsible for 3.03 Gt CO2e emissions. The agriculture sector was the largest emitter in five ASEM partner countries and the second largest emitter in an additional ten economies, see Figure 28. Within the framework of the European Green Deal, which aims to transform the EU into a resource-efficient and competitive economy, the EU agriculture policy is defined by the "Farm to Fork" strategy. This strategy was set out to transform the current food production practices and create a sustainable, healthy, and fair food system, which can also

Figure 28: Percentage of national GHG emissions from the agriculture sector (as percentage of the total national emissions), 2018



Source: Authors' calculations based on data from Climate Watch

48 European Commission, Directorate-General for Climate Action, Going climate-neutral by 2050: a strategic long-term vision for a prosperous, modern, competitive and climate-neutral EU economy (Brussels: EC, 2019), https://data.europa.eu/doi/10.2834/02074., United Nations Environment Programme, Emissions Gap Report 2020 (Nairobi: UNEP, 2020), https://www.unep.org/emissions-gap-report-2020, Paola A. Yanguas Parra et al., Global and regional coal phase-out requirements of the Paris Agreement: Insights from the IPCC Special Report on 1.5°C (Climate Analytics, 2019), https://climateanalytics.org/media/report_coal_phase_out_2019.pdf, Lewis Akenji et al., 1.5-Degree Lifestyles: Towards A Fair Consumption Space for All: Summary for Policy Makers (Berlin: Hot or Cool Institute, 2021), https://hotorcool.org/wp-content/uploads/2021/10/Hot_or_Cool_1_5_lifestyles_EXECUTIVE_SUMMARY.pdf

49 Almut Arneth et al., Climate Change and Land: Summary for Policymakers (Geneva: IPCC, 2020). https://www.ipcc.ch/site/assets/uploads/sites/4/2020/02/SPM_Updated-Jan20.pdf

50 OECD (n.d.) Climate change and the policy implications for agriculture and fisheries, https://www.oecd.org/agriculture/topics/climate-change-and-food-systems/

mitigate climate change and adapt to its impacts.[51] It is envisaged to underpin the legislative framework to support a sustainable food system transformation via the common agricultural policies in EU member countries.

Sustainable agricultural practices are also being promoted in Asian ASEM partner countries. In its NDC, China highlighted that it would aim to use fertilisers and pesticides more efficiently and reduce GHG emissions from livestock and poultry breeding.[52] Cambodia also foresaw introducing and

Figure 29: Conceptual approach of the EU Farm to Fork Strategy

Source: European Commission (2022)

improving sustainable agricultural and land management practices.[53] India is committed to applying ecosystem approaches to agricultural production and management and promoting the resilience of farming systems.[54] South Korea also plans to promote various low carbon farming techniques, including improved practices for irrigation and fertiliser use.[55]

Although plans and actions focusing on emissions reduction in the agriculture sector could be identified in several ASEM partner countries policy frameworks, they lack a systematic approach. Current food production and transportation practices remain highly unsustainable, while the agriculture sector is also increasingly impacted by climate change, especially affecting the most vulnerable and marginalized communities. Since the climate emergency and the sustainability of the food systems are intertwined issues, there is a strong need to advocate the creation of circular food systems, which can improve the reliability of food systems and increase food security while reducing the overall carbon footprint of the food sector. By creating circular food systems, societies can improve the reliability of the food systems and increase food security while reducing the overall carbon footprint of the agriculture and forestry sectors.[56]

Improving production methods and reducing methane emissions from livestock, could reduce emissions by up to 1.44 Gt CO2e per year. However, much greater reductions could be achieved by shifting populations to healthier and more sustainable diets with a higher proportion of plant-based than animal-based foods. Such a transition could avoid emissions of up to 8 Gt CO2e each year.[57] Unfortunately, no current national climate plans explicitly discuss more sustainable diets.

Moreover, countries also launched initiatives to reduce deforestation and create additional carbon sinks. According to its LTS, France strives for the maintenance of carbon in agricultural wetlands and peatland soils and balanced water management that restores ecosystems. Among other measures, the United Kingdom aims to restore 280,000 hectares of peatland by 2050, support the creation of new woodlands and introduce natural flood management practices. Indonesia has taken initial steps to limit land

"India is committed to applying ecosystem approaches to agricultural production and management and promoting the resilience of farming systems."

51 "Farm to Fork Strategy," European Commission, accessed 2 September 2022, https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en

52 "Enhanced Actions on Climate Change: China's Intended Nationally Determined Contributions," Climate Watch, accessed 2 September 2022, https://www.climatewatchdata.org/ndcs/country/CHN/full?document=indc-EN&query=just%20transition&searchBy=query

53 Ministry of Environment, Cambodia, Cambodia's Updated Nationally Determined Contribution (Phnom Penh: Ministry of Environment, 2020), https://unfccc.int/sites/default/files/NDC/2022-06/20201231_NDC_Update_Cambodia.pdf

54 India (2016) INDC, https://unfccc.int/NDCREG

55 Republic of Korea, The Republic of Korea's Enhanced Update of its First Nationally Determined Contribution (Seoul: Republic of Korea, 2021), https://unfccc.int/sites/default/files/NDC/2022-06/211223_The%20Republic%20of%20Korea%27s%20Enhanced%20Update%20of%20its%20First%20Nationally%20Determined%20Contribution_211227_editorial%20change.pdf

56 Dora Almassy, Background document to the ENVforum 2021 on Circular Food Systems (Singapore: Asia-Europe Foundation, 2021).

57 Ingrid Schulte et al., Enhancing NDCs for Food Systems: Recommendations for Decision Makers (Berlin: WWF, 2020), https://wwfint.awsassets.panda.org/downloads/wwf_ndc_food_final_low_res.pdf

clearing for oil palm plantations and other agricultural purposes and India plans to increase the national forest cover to one-third of its total area.[58]

The application of nature-based approaches could be crucial to increase carbon sinks. However, countries must ensure that the introduced solutions are of high-quality and sustainable. Nature-based climate solutions should avoid monoculture planting approaches and the introduction of non-indigenous and invasive species; focus on ecosystem restoration and habitat creation at a systematic, landscape level; consider the needs of local communities and indigenous peoples; and ensure local ownership and female empowerment to secure long-term maintenance.

To systematically reduce emissions from the agriculture sector and from land-use, the following actions are recommended:[59]

- Promote sustainable consumption via changes in dietary habits, with a special focus on reducing meat and dairy consumption;
- Create sustainable production systems, food value chains and management of natural resources;
- Promote climate-smart and regenerative agricultural practices;
- Support innovations for new food production solutions that reduce food waste and promote more sustainable diets;
- Increase support for the most vulnerable and marginalized who are most affected by pressures on the food system;
- Halt deforestation and restore and conserve ecosystems, including wetlands, storing the highest amount of carbon;
- Systematically apply high-quality nature-based climate-solutions at a landscape scale.

58 "India," Climate Action Tracker, last modified 15 September 2021, accessed 2 September 2022, https://climateactiontracker.org/countries/india/., "Indonesia," Climate Action Tracker, last modified 1 November 2021, accessed 2 September 2022, https://climateactiontracker.org/countries/indonesia/

59 High- Level Political Forum on Sustainable Development (2021) Background note. https://sustainabledevelopment.un.org/content/documents/26461Background_note_HLPF_session_ending_hunger_and_achieving_food_security.pdf, United Nations Environment Programme, Emissions Gap Report 2020 (Nairobi: UNEP, 2020), https://www.unep.org/emissions-gap-report-2020, Lewis Akenji et al., 1.5-Degree Lifestyles: Towards A Fair Consumption Space for All: Summary for Policy Makers (Berlin: Hot or Cool Institute, 2021), https://hotorcool.org/wp-content/uploads/2021/10/Hot_or_Cool_1_5_lifestyles_EXECUTIVE_SUMMARY.pdf

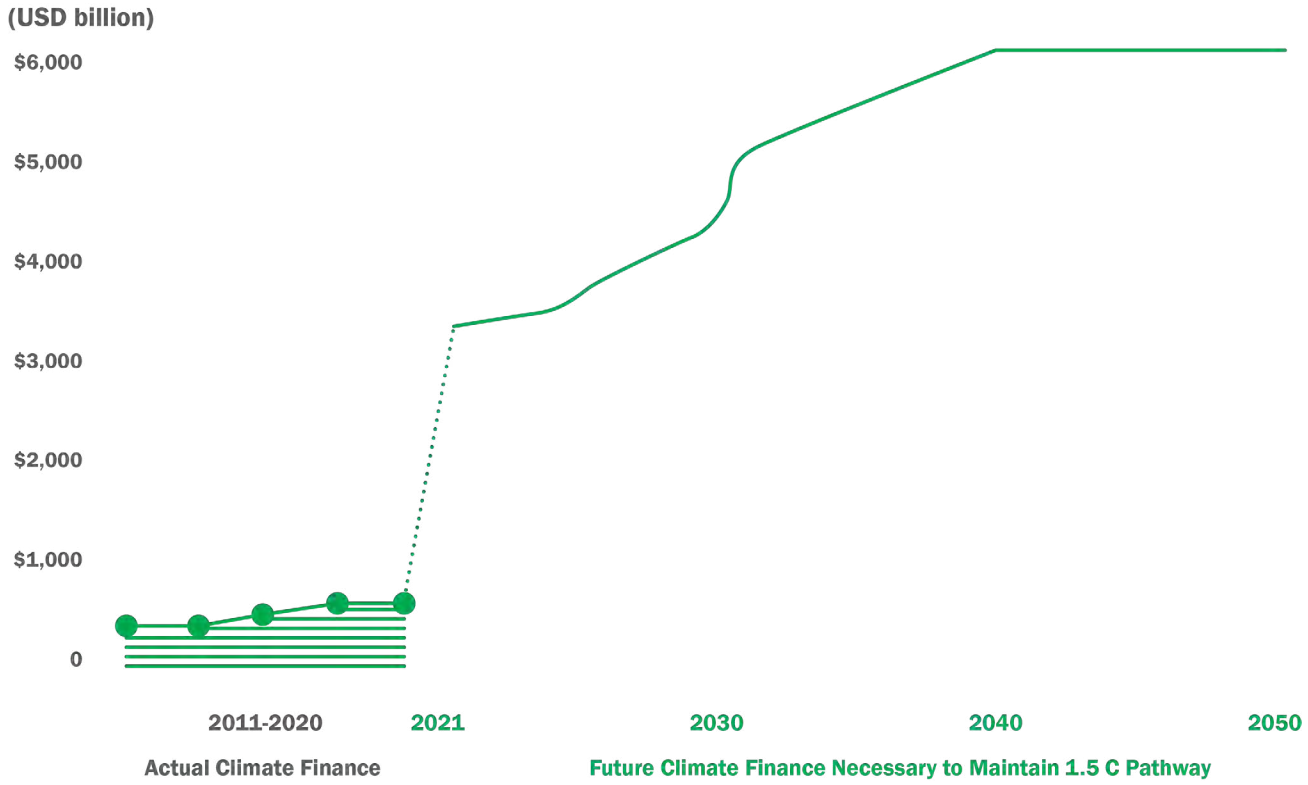
5. CLIMATE FINANCING IN ASEM PARTNER COUNTRIES

This section provides on overview of international climate financing in the context of ASEM partner countries and reviews the main international funds available for ASEM partner countries of the Global South, with an outlook to ASEAN partner countries.

5.1. OVERVIEW OF THE INTERNATIONAL CLIMATE FINANCING LANDSCAPE

International climate financing consists of an array of private and public sources channelled for financing climate mitigation and adaptation actions, including grants, equity investments and loans. Estimations vary, but calculations of the Climate Policy Initiative suggests that climate financing reached USD 632 billion in 2020 and continues to increase – although at a decreasing rate.[60] Currently, the amounts that have been provided are not sufficient to reach the global net-zero target by 2050. To do so would require a six-fold increase by 2030.

Figure 30: Global climate financing flows and the average estimated annual climate investments needs to reach net-zero targets by 2050



Source: Climate Policy Initiative (2022)

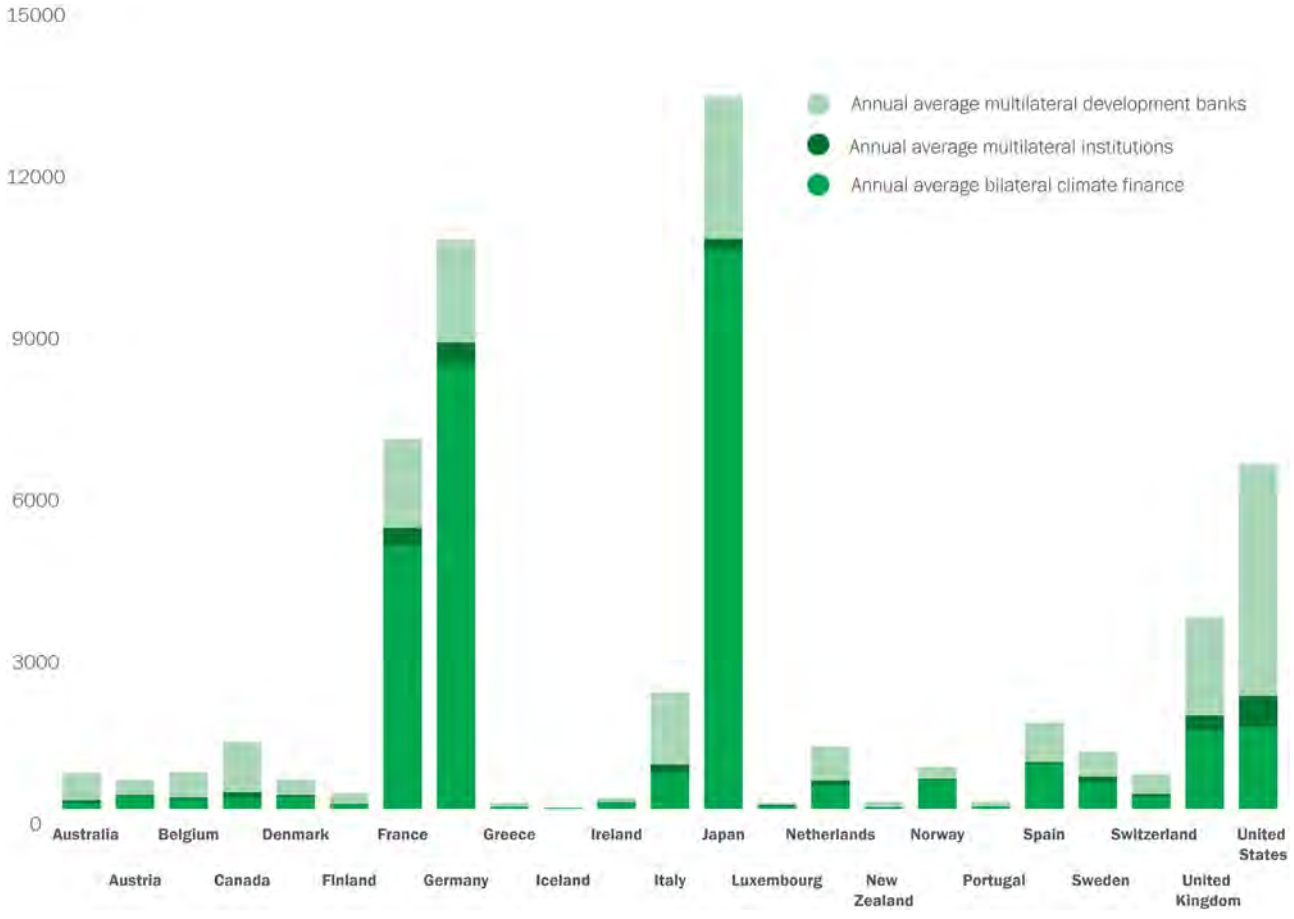
60 Baysa Naran et al., Global Landscape of Climate Finance 2021: Preview (Climate Policy Initiative, 2021), https://www.climatepolicyinitiative.org/wp-content/uploads/2021/10/Global-Landscape-of-Climate-Finance-2021.pdf

High-income ASEM partner countries have an important role to play in financing mitigation and adaptation efforts in Global South countries. The Paris Agreement reconfirmed and strengthened the Copenhagen commitment of the Global North, which was to provide USD 100 billion climate financing from various sources to countries of the Global South originally by 2020, but later extended to 2025.[61] This target has not yet been met, mainly because not all donor countries have accelerated climate financing evenly. The WRI estimated that the total climate financing provided by donor countries averaged about USD 52.6 billion between 2016 and 2018[62], see Figure 31.

According to estimations made by the Organisation of Economic Co-operation and Development (OECD), Global North countries provided USD 64.3 billion of climate financing and mobilised an additional USD 14.6 billion via private channels in 2018. Finance was provided both for mitigation and increasingly for adaptation objectives, primarily in the energy, transport, agriculture, forestry and water management sectors. The share of loans and equity investments increased, while the share of grants decreased compared to the pre-2015 period.[63]

The largest share of the financing was directed towards Asian countries, with India, Indonesia, Bangladesh, China and Vietnam receiving 64 percent of all financing in Asia between 2003 and 2020, see Figure 32. The largest projects in the regions were provided for energy efficiency improvements and renewable investments.[64]

Figure 31: Climate financing by country and channel, annual averages post–Paris Agreement (2016–18)



Source: WRI, 2021

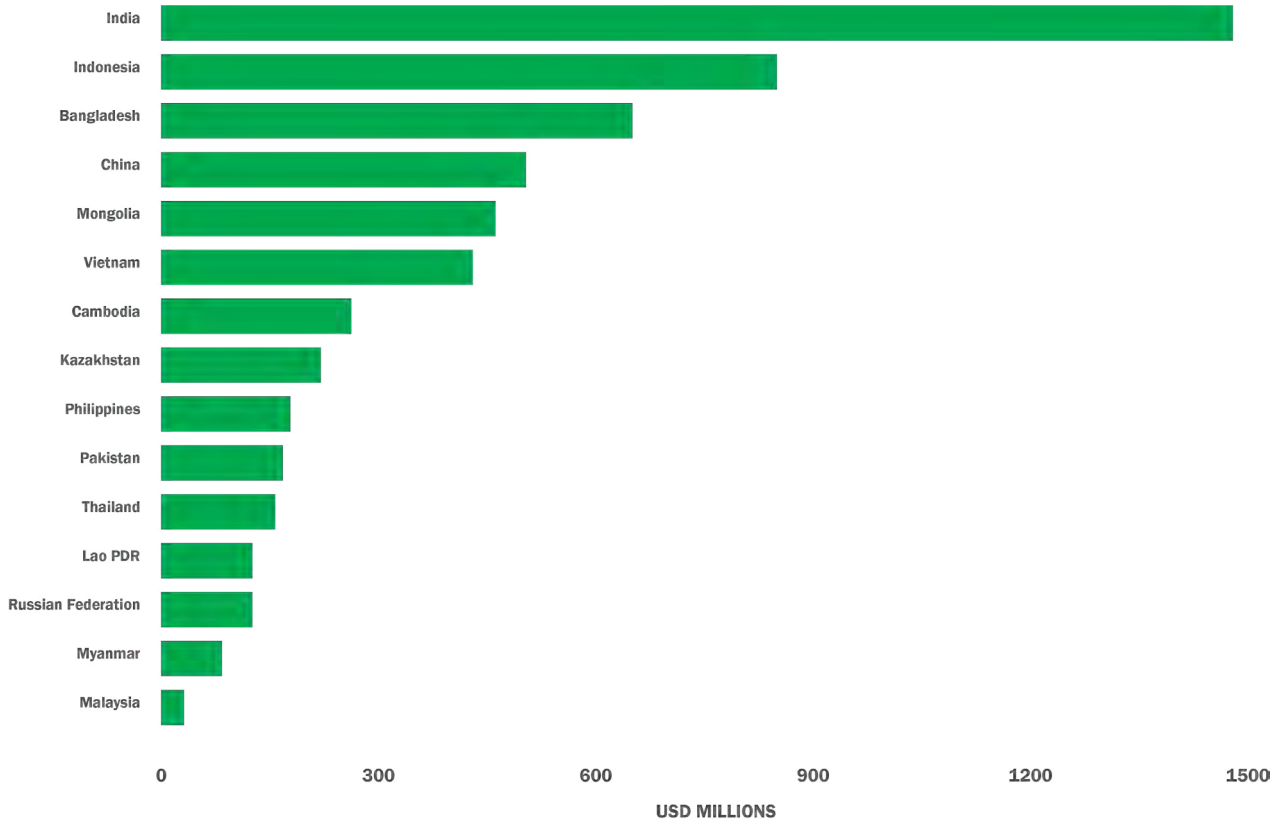
61 United Nations Framework Convention on Climate Change, Report of the Conference of the Parties on its twenty-first session, held in Paris from 30 November to 13 December 2015 (Paris: UNFCCC, 2016), https://unfccc.int/sites/default/files/resource/docs/2015/cop21/eng/10a01.pdf

62 Joe Thwaites and Julie Bos, Technical Note: A Breakdown of Developed Countries' Climate Finance Contributions Towards the $100 Billion Goal (Washington DC: WRI, 2021), https://doi.org/10.46830/writn.20.00145.

63 "Climate Finance and the USD 100 Billion Goal," OECD, accessed 2 September 2022, https://www.oecd.org/climate-change/finance-usd-100-billion-goal/

64 Charlene Watson and Liane Schalatek, "Climate Finance Regional Briefing: Asia," Climate Funds Update (Washington DC: Heinrich Boell Stiftung North America, 2021),), https://climatefundsupdate.org/wp-content/uploads/2021/03/CFF8-ENG-2020-Digital.pdf

Figure 32: Total climate financing provided to middle and low-income ASEM partner countries in Asia between 2003 and 2020 (as of May 2022)



Source: Authors' calculations based on data extracted from Climate Funds Update

5.2. INTERNATIONAL FUNDS AVAILABLE FOR ASEM PARTNER COUNTRIES

The public funds mobilised by economies of the Global North are channelled through various multilateral and bilateral avenues as well as regional and national funds.[65]

The financing mechanism of the UNFCCC has two main operating entities: the Global Environment Facility (GEF) and the Green Climate Fund (GCF). The GEF was established in 1991 to finance environmental projects in multiple thematic areas, including climate change.[66] The GCF was agreed by the COP in 2011 (Durban) and launched in 2015. Over time, it is expected to take over the role of GEF and enable a climate resilient, low-carbon development pathway in countries of the Global South.[67] Financed from the Clean Development Mechanism (CDM) of the Kyoto Protocol, the Adaptation Fund is also part of the UNFCCC.[68] In addition, the GEF also operates the Least Developed Countries Fund (LDCF) and the Special Climate Change Fund (SCCF), both supporting climate change adaptation projects. Table 10 provides an overview of the UNFCCC financing mechanisms.

Developed Countries Fund (LDCF) and the Special Climate Change Fund (SCCF), both supporting climate change adaptation projects.[69] Table 11 provides an overview of the UNFCCC financing mechanisms.

65 Charlene Watson and Liane Schalatek, "The Global Climate Finance Architecture," Climate Funds Update (Washington DC: Heinrich Boell Stiftung North America, 2020), https://climatefundsupdate.org/wp-content/uploads/2020/03/CFF2-2019-ENG-DIGITAL.pdf

66 "What We Do," GEF, accessed 2 September 2022, https://www.thegef.org/what-we-do

67 "Green Climate Fund," accessed 2 September 2022, https://www.greenclimate.fund

68 "Adaptation Fund," accessed 2 September 2022, https://www.adaptation-fund.org

69 "Least Developed Countries Fund - LDCF," GEF, accessed 2 September 2022, https://www.thegef.org/what-we-do/topics/least-developed-countries-fund-ldcf

Table 11: Overview of the UNFCCC financial mechanisms

	Description	Funding results
GEF	The GEF supports the development of more sustainable food systems, forest management, and cities via its projects. It focuses on five thematic areas: biodiversity loss, chemicals and waste, climate change, international waters, and land degradation	USD 4.1 billion 834 climate change projects in the focal area of climate change
Under GEF: Least Developed Countries Fund (LDCF)	The Fund support LDCs to address their resilience needs and reduce climate change vulnerability in priority areas by helping the development of the National Adaptation Programs of Action (NAPAs) and National Adaptation Plans (NAP)	USD 1.3 billion for 285 projects.
Under GEF: Special Climate Change Fund (SCCF)	The SCFF funds adaptation projects in vulnerable developing economies and operates in parallel with the LDCF.	USD 284 million for 72 projects.
Green Climate Fund	The GCF aims to fund mitigation and adaptation projects in a 50:50 ratio and enable transitions in the built environment; energy and industry; human security, livelihoods, and wellbeing; and land-use, forests and ecosystems	USD 10.4 billion (committed) 196 projects implemented
Adaptation Fund	The Adaptation Fund finances to help climate adaptation of vulnerable communities in Global South countries. It is partially financed from two percent share of proceeds of Certified Emission Reductions (CERs) issued under the Kyoto Protocol's CDM projects.	USD 878 million for 127 projects

Additional donor country funding is directed through multilateral development banks to developing countries. The World Bank runs the Climate Investment Funds (CIF), which includes the Clean Technology Fund (CTF) and the Strategic Climate Fund (SCF). The CIF so far has raised a total contribution of USD 10 billion from 14 donor countries and expects an additional USD 62 billion of co-financing. Thirty-four percent of projects financed by CIF are being implemented in Asia.[70] The World Bank also administers the Forest Carbon Partnership Facility (FCPF), the Partnership for Market Readiness (PMR) and the BioCarbon Fund.[71] Besides multilateral funding, some of the ASEM donor countries, also provide bilateral funding, including Norway, Germany, and the United Kingdom. The NAMA facility is a joint initiative of Germany, Denmark, the European Commission and the UK. The Global Climate Partnership Fund (GCPF), which funds energy efficiency and renewable energy projects in selected countries, receives contributions from the United Kingdom, Denmark, and Germany. An overview of climate funds available for ASEM partner countries is presented in Table 12.

"Besides multilateral funding, some of the ASEM donor countries, also provide bilateral funding, including Norway, Germany, and the United Kingdom."

70 "Climate Investment Funds," accessed 2 September 2022, https://www.climateinvestmentfunds.org/

71 Charlene Watson and Liane Schalatek, "The Global Climate Finance Architecture," Climate Funds Update (Washington DC: Heinrich Boell Stiftung North America, 2020),), https://climatefundsupdate.org/wp-content/uploads/2020/03/CFF2-2019-ENG-DIGITAL.pdf

Table 12: Overview of climate funds available for ASEM partner countries

	Bangladesh	Cambodia	China	India	Indonesia	Kazakhstan	Lao PDR	Malaysia	Mongolia	Myanmar	Pakistan	Philippines	Thailand	Vietnam
Under GEF: Least Developed Countries Fund (LDCF)		•					•			•				
Under GEF: Special Climate Change Fund (SCCF)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Green Climate Fund (GCF)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Adaptation Fund (AF)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Climate Investment Funds (CIFs)	•	•		•	•	•	•		•	•	•	•	•	•
Clean Technology Fund (CTF)	•	•		•	•	•	•		•	•	•	•	•	•
Strategic Climate Fund (SCF)	•	•		•	•	•	•		•	•	•	•	•	•
Under SCF: Pilot Program for Climate Resilience (PPCR)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Under SCF: Forest Investment Program (FIP)	•	•			•		•							
Under SCF: Scaling Up Renewable Energy Program in Low Income Countries (SREP)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Forest Carbon Partnership Facility (FCPF)		•			•		•				•		•	•
Partnership for Market Readiness (PMR)			•	•	•								•	•
BioCarbon Fund	•				•					•				
Norway's International Climate and Forest Initiative (NICFI)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
IKI, International Climate initiative of Germany	•	•	•	•	•	•	•	•	•	•	•	•	•	•
International Climate Finance (ICF) of the United Kingdom		•			•			•		•		•	•	•
NAMA facility	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Global Climate Partnership Fund (GCPF)	•			•					•					•

While Asia receives the highest share of climate funding, Southeast Asian countries per capita share remains the lowest among all regions.[72] In total, ASEAN countries received USD 56 billion between 2000 and 2019, which accounts for 10.56 percent of the cumulative global funding provided by developed countries.[73] Among ASEAN member countries, Indonesia, the Philippines and Vietnam received the highest share of funding, and most funding was channelled towards the transport, energy and agriculture sectors.[74] In addition, funding from multilateral and bilateral donors was mostly received in the form of loans, and awarded grants constituted less than 15 percent of the total funding directed towards Southeast Asia.[75]

As a result, funding for adaptation purposes is still limited in many ASEAN countries, despite their high level of climate vulnerability. For example, from the 196 projects of the GCF (funded until May 2022), ASEAN countries received 23 projects with 16 focusing on mitigation and only seven on adaptation.

Examples of some adaptation and mitigation projects funded in the region are presented in Table 13.

Table 13: Examples of funded climate mitigation and adaptation projects in ASEAN

Country	Name of project	Grant amount	Funding mechanism
Cambodia	Early warning systems introduction in vulnerable communities in Cambodia	USD 4.9 million	GEF/LDCF
Indonesia	Jambi Sustainable Landscape Management Project	USD 19 million	BioCarbon Fund
Lao PDR	Strengthening the natural capacity of ecosystems to regulate water flows and limiting the exposure of local populations in vulnerable areas to climate effects	USD 11.5 million	GCF
Malaysia	Nature-based Climate Adaptation Programme for the Urban Areas of Penang Island	USD 10 million	Adaptation Fund
Myanmar	Rural Renewable Energy Development Programme	USD 3,985 million	GEF
Philippines	Renewable Energy Development (PHRED)	USD 44 million	CIF/CTF
Thailand	Promoting Energy Efficiency in Commercial Buildings in Thailand	USD 3,637 million	GEF
Vietnam	Strengthening the resilience of smallholder agriculture to climate change-induced water insecurity in the Central Highlands and South-Central Coast regions of Vietnam	USD 30,205 million	GCF

72 "Climate Finance and the USD 100 Billion Goal," OECD, accessed 2 September 2022, https://www.oecd.org/climate-change/finance-usd-100-billion-goal/

73 Melinda Martinus and Qiu Jiahui, "Climate Finance in Southeast Asia: Trends and Opportunities," Perspective (Singapore: ISEAS, 2022), https://www.iseas.edu.sg/wp-content/uploads/2022/01/ISEAS_Perspective_2022_9.pdf

74 Ibid.

75 "All Donors to South East Asia for Climate Change (total) during 2002-2019," Aid Atlas, accessed 2 September 2022, https://aid-atlas.org/profile/all/south-east-asia/climate-change-total/2002-2019?usdType=usd_commitment

6. BROAD POLICY RECOMMENDATIONS

Since the ASEM region is responsible for over half of the global GHG emissions, it has a crucial role in helping the world achieve the net-zero ambitions of the Paris Agreement. To do so, ASEM partner countries will need to accelerate decarbonisation and their transition towards a climate-resilient development pathway. In view of the 2030 and 2050 cut-offs it is imperative that we work together to make significant progress in the next few years.

While in Section 4 we have already identified some of our sectoral recommendations, in this section we try to bring together these ideas to cover broad policy recommendations that ASEM partner countries should be pursuing. Collectively, these recommendations cut across the various sectors and transcend national and regional borders.

EMISSIONS REDUCTIONS

INTERNATIONAL COMMITMENTS:

ASEM partner countries in both regions need to critically re-examine their 2030 and 2050 emissions reduction commitments and validate their compliance with the 1.5°C degree temperature goal of the Paris Agreement and, where possible, increase the level of ambition.

As the details of many net-zero plans are now being questioned, ASEM partner countries should re-examine the viability/feasibility of these plans and adjust the planned measures as necessary.

ENERGY

Since most of the GHG emissions in both ASEM regions are coming from the energy sector, energy conservation and energy efficiency measures should be the low hanging fruits that are further prioritised. All countries should aim to increase the share of renewable energy sources in their respective energy mixes, upgrade the electricity grid (including for transboundary electricity trading) and explore low-carbon technologies in a meaningful manner.

As the challenges to exploit the full potential of renewables, let alone upscale their deployment remain vast and unique to each country, countries should be open to pursue a diverse set of policies and technologies to be able to identify and tailor solutions best suited to their respective national contexts.

Electricity demand at the household level should be minimised through enabling policies, such as tax concessions and subsidies, to promote measures such as rooftop solar, insulation, battery systems, smart meters, and energy efficient appliances. Particular attention needs to be paid to those in public housing and rental accommodation.

Moreover, the phase-out of coal needs to be accelerated in many European and Asian ASEM partner countries. However, considering the need to ensure a just transition for all stakeholders, different adjustment timelines should be introduced for different countries, especially ASEM partner countries of the Global South. Ultimately, however, clear phase-out timelines need to be set, aiming for a global phase-out prior to 2050. Naturally, the development of new coal-fired plants should be halted and resources re-channelled into developing low-carbon alternatives and infrastructures for renewable energy. The workforce engaged in the coal mining and coal-fired power plants (along with associated industries) need to be given opportunities for retraining and engagement in renewable energy and/or other “green” jobs.

TRANSPORT

A consensus is that one of the most effective measures to rapidly decrease emissions from the transport sector is if cities shift from private motorised transport to services that integrate multiple public transport modes, cycling, micro-mobility, and walking. In many cities, this can be done through incentives such as free public transport options and increasing the availability and quality of urban infrastructure. In this regard, urban planning should be centred on shared transport, following models such as the 15-minute city and the 8 80 city.[76]

At the regional and inter-regional levels, cities, regions, and countries can work together to develop and strengthen the availability of inter-regional transport options that allows more people to avoid high-emitting modes of transport such as air and sea travel. On the other hand, governments should create a better enabling environment to encourage transport companies to invest in low-carbon transport infrastructure and technologies.

Several countries are moving towards banning fossil-fuel vehicles, promoting electric vehicles, and establishing charging stations (including making it mandatory for new high-rise buildings to have charging stations). The contribution of electric vehicles to climate change, however, depends on making renewable energy the main source of electricity. Additional attention also needs to be paid battery recycling.

76 “Paris, the 15-minute city”, Tomorrow city, accessed 2 September 2022, https://tomorrow.city/a/paris-the-15-minute-city “Creating cities for all,” 880 cities, accessed 2 September 2022, https://www.880cities.org/.

CIRCULAR ECONOMY

Considering the importance of the agriculture sector, the transition to a circular economy centred on net-zero goals can only be achieved by scaling up collaboration and partnerships among stakeholders involved in the agri-food supply chains.[77]

Therefore, policies and enabling frameworks supporting the agri-food supply chain ecosystem actors are essential to stimulate innovation and transition towards SCP practices, specifically:

- Reduction of consumption and production of animal products with a specific focus on removing incentives for producing high carbon foods.
- Supporting innovation and innovative agricultural practices such as precision agriculture, and the systematic application of ecosystem-based approaches in the agriculture and forestry sectors can contribute to emissions reduction in a cost and resource-efficient way.
- Offering financial support such as tax relief, preferential loans or grants for organisations that introduce circular and climate-friendly products.[78]
- Consider digitalisation as a vehicle for change in driving circular transformation.[79]

Consumption-related emissions reduction efforts should go beyond general waste recycling objectives and instead address specific sectors, aiming for waste minimisation in the agriculture and food production, plastics, and garments sectors.

Industrial production should gradually move away from the current reliance on mining raw materials such as iron ore to increased recycling of materials and use of recycled (and/or re-purposed) materials. In particular, cement production is a major source of GHG emissions and ASEM partner countries should begin to require the construction industry to recycle building materials as older buildings are being replaced.

Increasing attention should be paid to embedded carbon in all production processes, so that the carbon footprint of production and consumption can be gradually minimised.

NATURE-BASED CLIMATE SOLUTIONS (NBCS):

NbCS, including urban green and blue infrastructure projects, the protection and the restoration of natural ecosystems and regenerative agricultural and forest management practices, have an immense potential to address both climate change and biodiversity challenges and provide multiple additional environmental, social and economic benefits.

To realise their potential, NbCS should be applied systematically, designed and implemented at the landscape scale. NbCS should define and follow a clear set of goals and targets and simultaneously aim to support climate mitigation, build resilience, support biodiversity protection and ecosystems and deliver societal benefits.

NbCS should be applicable in and tailored according to local contexts and circumstances and promote stakeholder involvement and inclusive governance approaches. This could contribute to the design and implementation of projects that deliver positive outcomes and are maintained in the long-term.

CLIMATE POLICY FRAMEWORKS

Net-zero targets by 2050 can only be achieved if decarbonisation efforts and implementation actions are significantly accelerated.

ASEM partner countries should mainstream their climate change mitigation and adaptation objectives into their respective national policy frameworks including building sound monitoring systems. Climate change mitigation pathways should be aligned with the 1.5oC aspirational target of the Paris Agreement, which sets the benchmark for emission reductions needed to avoid the worst impacts and related costs of climate change.

Sectoral policies need to be accompanied by action plans with quantifiable and measurable objectives as well as defined output and result indicators and supported by committed implementation budgets. Progress towards emissions reduction targets should be regularly monitored, and according to the outcomes of the implementation actions, relevant policies and plans should be regularly revised.

77 Asia-Europe Environment Forum (ENVforum), Policy Brief on SMEs Decarbonisation Enablers for Circular Transition (Singapore: ASEF, 2022), https://asef.org/projects/envforum-2022/

78 Ibid.

79 Ibid.

It is also important to develop comprehensive policies that can simultaneously address mitigation targets and adaptation needs, while considering the requirements of just transitions and prioritising the needs of the most vulnerable and marginalised groups:

Gender priorities should be mainstreamed into policy development from the outset;

Participatory processes in policy planning could allow for better stakeholders input, leading to more targeted and inclusive policies that are supported by all relevant actors.

The role of businesses, especially small and medium-size enterprises, should be carefully considered as they can play a major role in upscaling innovative low-carbon solutions across different industries and ensuring the participation of local communities.

Climate policies and actions should be considered and assessed within the overall framework of the UN SDGs to create synergies among various efforts to transition to net-zero.

CLIMATE FINANCING

High-income countries in the ASEM region are important contributors to the global climate funding and financing efforts. Nevertheless, there is still a gap between pledges and actual climate funds and finance available to support economies of the Global South in reaching their emissions reduction targets and addressing their adaptation needs.

As net-carbon importers, economies of the Global North are direct beneficiaries of the increasingly high emissions resulting from production activities in Global South countries. Thus, ASEM partner countries of the Global North need to hold themselves to a higher level of accountability by making good on pledges already made, and ramping up their funding and financing commitments, especially to the most climate vulnerable ASEM partner countries.

Coordination among the different funding and financing channels should be also improved to identify and create synergies, perhaps under the aegis of the UNFCCC.

It is crucial that donor countries explicitly avoid supporting fossil-fuel projects via other international funding and financing schemes and shift available funds and subsidy schemes towards investing in the development of clean energy technologies.

Middle and lower-income ASEM partner countries should strengthen their institutional capacities to identify and assess their climate funding and financing needs and coordinate efforts to access and use these sources horizontally, across the different sectors and vertically, at different implementation levels. Considering their vulnerability to the impacts of climate change, countries of the Global South, especially in ASEAN, should also put more emphasis on pursuing funding and financing for their adaptation needs.

ANNEXES

ANNEX 1: CUMULATIVE CO2 EMISSIONS OF ASEM PARTNER COUNTRIES (GT CO2)

	1900	1925	1950	1975	2000	2020
Australia	0.10	0.58	1.34	4.07	10.69	18.64
Bangladesh	0.00	0.00	0.00	0.07	0.41	1.56
Brunei Darussalam	0.00	0.00	0.03	0.09	0.21	0.36
Cambodia	0.00	0.00	0.00	0.01	0.03	0.16
China	0.00	0.44	1.87	15.57	74.88	235.56
India	0.12	0.83	2.00	5.43	18.94	54.42
Indonesia	0.01	0.16	0.58	1.27	5.22	14.40
Japan	0.18	1.48	4.12	14.64	41.01	65.63
Kazakhstan	0.05	0.18	0.72	3.64	9.08	13.91
South Korea	0.00	0.00	0.02	0.73	6.86	18.34
Lao PDR	0.00	0.00	0.00	0.00	0.02	0.18
Malaysia	0.00	0.02	0.07	0.30	1.84	6.07
Mongolia	0.00	0.00	0.00	0.05	0.25	0.79
Myanmar	0.00	0.00	0.05	0.12	0.27	0.61
New Zealand	0.03	0.13	0.25	0.57	1.17	1.89
Pakistan	0.00	0.00	0.01	0.37	1.86	5.16
Philippines	0.00	0.00	0.01	0.38	1.50	3.39
Russia	0.48	1.65	6.66	33.39	83.32	115.34
Singapore	0.00	0.00	0.00	0.18	1.17	2.16
Thailand	0.00	0.00	0.00	0.24	2.42	7.36
Vietnam	0.00	0.04	0.14	0.46	1.08	3.98
EU-27	15.71	38.08	65.64	128.65	223.11	290.13
Norway	0.07	0.21	0.42	0.86	1.75	2.63
Switzerland	0.08	0.26	0.47	1.14	2.19	3.02
United Kingdom	16.74	28.14	39.16	54.04	68.47	78.16

Source: Authors' calculation based on data from www.ourworldindata.org

ANNEX 2: REGIONAL EMISSIONS OVERVIEW TABLES

GHG emissions trend, million tons of CO2e (including LUCF)

	1990	2000	2010	2018	Percentage of world total emissions
Asia	11,388.53	12,803.48	19,974.73	24,093.68	49.23%
Non-ASEAN MS	9,349.54	10,513.04	17,326.93	20,548.22	41.99%
ASEAN MS	2,038.99	2,290.43	2,647.81	3,545.45	7.24%
Europe	5,107.67	4,690.85	4,310.91	3,846.49	7.86%
EU MS	4,279.18	3,933.88	3,646.50	3,333.16	6.81%
Non-EU MS	828.49	756.97	664.41	513.32	1.05%
Total Asia and Europe	16,496.20	17,494.33	24,285.64	27,940.16	57.09%
World	32,645.91	35,607.73	44,758.58	48,939.71	100.00%

Contribution of different GHGs to global emissions, million tons of CO2e

2018	CO2	CH4	N2O	F-gases	CO2 from LUCF
Asian ASEM partners	18,641.95	4,010.46	1,303.99	525.75	-388.48
European ASEM partners	3,304.59	457.67	247.77	102.56	-266.11
Other countries (World)	13,302.20	3,830.13	1,511.99	507.83	1,847.40
World Total	35,248.74	8,298.27	3,063.75	1,136.14	1,192.81

Overview of sectoral GHG emissions, million tons of CO2e

2018	Energy	Industrial Processes	Agriculture	Waste	LUCF
Asian ASEM partners	19,375.63	1,772.98	2,579.19	676.92	-311.04
European ASEM partners	3,341.99	191.64	450.92	127.98	-266.04
Other countries (World)	14,507.34	938.06	2,787.54	801.96	1,964.65
World Total	37,224.95	2,902.68	5,817.65	1,606.86	1,387.56

Source: Authors' calculation based on Climate Watch. 2022. Washington, DC: WRI. Data accessed on 30th April 2022

ANNEX 3: TOTAL GHG EMISSIONS OF ASEM PARTNER COUNTRY IN 2018, MILLION TONS OF CO2E AND THEIR GLOBAL CONTRIBUTION TO GHG EMISSIONS

ASEM Region	Country	Million tons of CO2e (2018)	Global contribution to GHG emissions	Population	Global share of population	GHG emissions per capita 2018
Asia	China	11705.81	23.92%	1402760000	18.45%	8.34
Asia	India	3346.63	6.84%	1352642283	17.79%	2.47
Asia	Russia	1992.08	4.07%	144477859	1.90%	13.79
Asia	Indonesia	1703.86	3.48%	267670549	3.52%	6.37
Asia	Japan	1154.72	2.36%	126529100	1.66%	9.13
Europe	Germany	776.61	1.59%	82905782	1.09%	9.37
Asia	South Korea	673.08	1.38%	51585058	0.68%	13.05
Asia	Australia	619.26	1.27%	24982688	0.33%	24.79
Europe	United Kingdom	441.13	0.90%	66460344	0.87%	6.64
Asia	Pakistan	438.22	0.90%	212228288	2.79%	2.06
Asia	Thailand	431.22	0.88%	69428454	0.91%	6.21
Asia	Malaysia	388.11	0.79%	31528033	0.41%	12.31
Europe	Italy	386.78	0.79%	60421760	0.79%	6.40
Asia	Vietnam	364.43	0.74%	95545959	1.26%	3.81
Europe	France	361.37	0.74%	67101930	0.88%	5.39
Europe	Poland	356.74	0.73%	37974750	0.50%	9.39
Europe	Spain	313.06	0.64%	46797754	0.62%	6.69
Asia	Kazakhstan	271.23	0.55%	18276452	0.24%	14.84
Asia	Philippines	234.82	0.48%	106651394	1.40%	2.20
Asia	Myanmar	231.62	0.47%	53708318	0.71%	4.31
Asia	Bangladesh	220.75	0.45%	161376713	2.12%	1.37
Europe	Netherlands	179.99	0.37%	17231624	0.23%	10.45
Europe	Czech Republic	117.03	0.24%	10629928	0.14%	11.01
Europe	Belgium	108.91	0.22%	11427054	0.15%	9.53
Europe	Greece	86.14	0.18%	10732882	0.14%	8.03
Europe	Romania	86.13	0.18%	19473970	0.26%	4.42
Asia	New Zealand	70.71	0.14%	4900600	0.06%	14.43
Asia	Cambodia	69.15	0.14%	16249795	0.21%	4.26
Europe	Austria	67.85	0.14%	8840521	0.12%	7.68
Europe	Portugal	67.15	0.14%	10283822	0.14%	6.53
Asia	Singapore	66.67	0.14%	5638676	0.07%	11.82
Europe	Hungary	62.81	0.13%	9775564	0.13%	6.42
Europe	Ireland	62.29	0.13%	4867316	0.06%	12.80
Europe	Finland	61.43	0.13%	5515525	0.07%	11.14
Asia	Mongolia	55.72	0.11%	3170214	0.04%	17.58
Europe	Denmark	46.73	0.10%	5793636	0.08%	8.07
Europe	Switzerland	43.78	0.09%	8514329	0.11%	5.14
Europe	Slovakia	38.86	0.08%	5446771	0.07%	7.13
Asia	Lao PDR	38.63	0.08%	7061498	0.09%	5.47
Europe	Sweden	30.05	0.06%	10175214	0.13%	2.95
Europe	Norway	28.42	0.06%	5311916	0.07%	5.35
Europe	Estonia	20.56	0.04%	1321977	0.02%	15.55
Europe	Bulgaria	19.52	0.04%	7025037	0.09%	2.78
Europe	Lithuania	18.21	0.04%	2801543	0.04%	6.50
Europe	Croatia	18.21	0.04%	4087843	0.05%	4.45
Europe	Slovenia	17.51	0.04%	2073894	0.03%	8.45
Asia	Brunei Darussalam	16.95	0.02%	428960	0.01%	39.51
Europe	Luxembourg	9.94	0.02%	607950	0.01%	16.36
Europe	Latvia	8.89	0.02%	1927174	0.03%	4.61
Europe	Cyprus	8.35	0.02%	1189262	0.02%	7.02
Europe	Malta	2.03	0.00%	484630	0.01%	4.19

Source: Authors' calculation based on Climate Watch. 2022. Washington, DC: WRI. Data accessed on 30th April 2022

ANNEX 4: GHG EMISSIONS PER CAPITA AND INTENSITY INDICATORS OF ASEM PARTNER COUNTRIES IN 2018

	GHG emissions per capita 2018 (tons of CO2e/person)		GHG emissions intensity 2018 (tons of CO2/USD)
Bangladesh	1.37	Sweden	0.05
Pakistan	2.06	Switzerland	0.06
Philippines	2.20	Norway	0.07
India	2.47	France	0.13
Bulgaria	2.78	Denmark	0.13
Sweden	2.95	Malta	0.14
Vietnam	3.81	Luxembourg	0.14
Malta	4.19	Austria	0.15
Cambodia	4.26	United Kingdom	0.15
Myanmar	4.31	Ireland	0.16
Romania	4.42	Singapore	0.18
Latvia	4.61	Germany	0.20
Switzerland	5.14	Netherlands	0.20
Norway	5.35	Belgium	0.20
France	5.39	Spain	0.22
Lao PDR	5.47	Finland	0.22
Thailand	6.21	Japan	0.23
Indonesia	6.37	Latvia	0.26
Italy	6.40	Portugal	0.28
Hungary	6.42	Croatia	0.29
Lithuania	6.50	Bulgaria	0.29
Portugal	6.53	Slovenia	0.32
United Kingdom	6.64	Cyprus	0.33
Spain	6.69	New Zealand	0.33
Cyprus	7.02	Lithuania	0.34
Slovakia	7.13	Romania	0.36
Austria	7.68	Slovakia	0.37
Greece	8.03	South Korea	0.39
Denmark	8.07	Hungary	0.39
China	8.34	Greece	0.41
Slovenia	8.45	Australia	0.43
Japan	9.13	Czech Republic	0.47
Germany	9.37	Poland	0.61
Poland	9.39	Estonia	0.67
Belgium	9.53	Philippines	0.68
Netherlands	10.45	Bangladesh	0.81
Czech Republic	11.01	China	0.84
Finland	11.14	Thailand	0.85
Singapore	11.82	Malaysia	1.08
Malaysia	12.31	Russia	1.20
Ireland	12.80	India	1.24
South Korea	13.05	Brunei Darussalam	1.25
Russia	13.79	Pakistan	1.39
New Zealand	14.43	Vietnam	1.49
Kazakhstan	14.84	Kazakhstan	1.51
Estonia	15.55	Indonesia	1.63
Luxembourg	16.36	Lao PDR	2.13
Mongolia	17.58	Cambodia	2.81
Australia	24.79	Myanmar	3.45
Brunei Darussalam	39.51	Mongolia	4.23

ANNEX 5: GHG EMISSIONS, SECTORAL TRENDS IN ASEM PARTNER COUNTRIES

	Sectoral emissions (millions CO2e), 2018					Sectoral emissions ranking				
	Energy	Agriculture	IP	Waste	LUCF	Energy	Agriculture	IP	Waste	LUCF
Brunei Darussalam	15.83	0.12	0.50	0.17	0.33	1	5	2	4	3
Cambodia	14.15	21.31	1.45	0.56	31.69	3	2	4	5	1
Indonesia	598.17	200.24	37.34	133.84	734.28	2	3	5	4	1
Lao PDR	18.39	9.58	1.09	0.21	9.36	1	2	4	5	3
Malaysia	252.03	14.14	19.88	20.62	81.44	1	5	4	3	2
Myanmar	35.12	78.38	1.00	5.15	111.97	3	2	5	4	1
Philippines	138.51	61.37	18.68	13.77	2.48	1	2	3	4	5
Singapore	48.78	0.02	14.62	3.22	0.03	1	5	2	3	4
Thailand	263.51	68.82	71.90	12.72	14.27	1	3	2	5	4
Vietnam	248.02	70.99	37.13	20.40	-12.09	1	2	3	4	5
Kazakhstan	238.08	25.44	5.11	5.58	-2.98	1	2	4	3	5
Australia	426.09	159.54	17.44	12.31	3.89	1	2	3	4	5
Bangladesh	85.84	88.53	3.97	20.64	21.78	2	1	5	4	3
China	10,318.51	672.87	1,166.29	197.57	-649.43	1	3	2	4	5
India	2,424.58	718.70	148.54	83.17	-28.36	1	2	3	4	5
Japan	1,090.42	21.56	67.97	6.80	-32.05	1	3	2	4	5
Mongolia	23.04	28.89	0.45	0.25	3.10	2	1	4	5	3
New Zealand	32.96	42.30	2.18	3.89	-10.61	2	1	4	3	5
Pakistan	210.75	186.22	25.03	9.23	7.00	1	2	3	4	5
Russia	2,275.62	95.99	54.58	117.21	-551.32	1	3	4	2	5
South Korea	617.23	14.18	77.85	9.62	-45.80	1	3	2	4	5
Austria	62.66	7.41	3.44	1.46	-7.12	1	2	3	4	5
Belgium	92.89	9.40	5.35	1.11	0.16	1	2	3	4	5
Bulgaria	41.53	5.26	2.60	3.94	-33.81	1	2	4	3	5
Croatia	16.08	2.79	1.82	1.86	-4.34	1	2	4	3	5
Cyprus	6.39	0.42	1.24	0.55	-0.25	1	4	2	3	5
Czech Republic	106.48	6.69	4.97	4.69	-5.82	1	2	3	4	5
Denmark	32.96	10.22	1.82	0.88	0.86	1	2	3	4	5
Estonia	16.00	1.84	0.52	0.25	1.95	1	3	4	5	2
Finland	44.61	5.92	2.07	1.88	6.94	1	3	4	5	2
France	310.38	73.83	24.35	14.78	-61.98	1	2	3	4	5
Germany	713.82	58.30	25.34	8.63	-29.48	1	2	3	4	5
Greece	63.09	7.88	9.19	4.59	1.39	1	3	2	4	5
Hungary	47.32	7.79	2.54	3.26	1.89	1	2	4	3	5
Ireland	35.86	25.35	2.98	0.91	-2.79	1	2	3	4	5
Italy	329.13	31.97	21.51	16.99	-12.81	1	2	3	4	5
Latvia	7.60	2.72	0.68	0.67	-2.78	1	2	3	4	5
Lithuania	11.77	4.92	1.24	0.91	-0.63	1	2	3	4	5
Luxembourg	9.06	0.65	0.43	0.08	-0.28	1	2	3	4	5
Malta	1.551	0.09	0.23	0.17	0.00	1	4	2	3	5
Netherlands	153.68	18.57	3.50	2.88	1.36	1	2	3	4	5
Poland	331.78	32.16	15.68	10.03	-32.91	1	2	3	4	5
Portugal	48.17	7.02	5.28	6.35	0.32	1	2	4	3	5
Romania	82.35	15.59	5.38	5.69	-22.88	1	2	4	3	5
Slovakia	33.73	2.54	2.16	1.49	-1.06	1	2	3	4	5
Slovenia	14.23	1.62	0.80	0.51	0.35	1	2	3	4	5
Spain	254.03	41.36	18.45	13.10	-13.88	1	2	3	4	5
Sweden	35.59	7.24	2.48	1.04	-16.31	1	2	3	4	5
Norway	38.11	5.13	3.00	1.09	-18.92	1	2	3	4	5
Switzerland	36.26	5.54	3.42	0.79	-2.24	1	2	3	4	5
United Kingdom	364.85	50.70	19.14	17.39	-10.96	1	2	3	4	5

Source: Authors' calculation based on Climate Watch. 2022. Washington, DC: WRI. Data accessed on 30th April 2022)

	Energy-related emissions (Gt CO2e)					Energy-related emissions ranking				
	Electricity/ Heat	Buildings	Manufacturing	Transport	Other	Electricity/ Heat	Buildings	Manufacturing	Transport	Other
Brunei Darussalam	5.21	0.12	0.37	1.35	8.78	2	5	4	3	1
Cambodia	3.30	0.61	0.72	5.77	3.75	3	5	4	1	2
Indonesia	243.36	25.12	114.44	154.01	61.24	1	5	3	2	4
Lao PDR	14.04	0.04	0.63	3.12	0.56	1	5	3	2	4
Malaysia	125.36	3.38	35.47	60.83	26.99	1	5	3	2	4
Myanmar	9.76	1.45	8.52	6.13	9.25	1	5	3	4	2
Philippines	70.44	10.03	15.39	35.64	7.03	1	4	3	2	5
Singapore	25.82	0.60	14.01	6.92	1.43	1	5	2	3	4
Thailand	105.57	6.73	43.94	75.88	31.39	1	5	3	2	4
Vietnam	109.13	15.79	63.91	36.32	22.87	1	5	2	3	4
Kazakhstan	120.81	36.84	36.78	17.41	26.25	1	2	3	5	4
Australia	221.26	15.10	39.32	99.64	50.77	1	5	4	2	3
Bangladesh	38.87	9.82	17.72	12.01	7.42	1	4	2	3	5
China	5,214.20	542.13	2,667.43	917.02	977.74	1	5	2	4	3
India	1,241.34	118.84	571.38	305.33	187.69	1	5	2	3	4
Japan	561.86	106.11	191.68	204.56	26.22	1	4	3	2	5
Mongolia	13.56	1.69	1.96	2.17	3.67	1	5	4	3	2
New Zealand	6.36	1.45	6.28	16.02	2.86	2	5	3	1	4
Pakistan	59.76	20.82	55.66	56.98	17.53	1	4	3	2	5
Russia	844.67	217.99	250.55	258.86	703.55	1	5	4	3	2
South Korea	373.70	51.09	71.97	101.66	18.81	1	4	3	2	5
Austria	17.71	7.45	10.82	24.76	1.94	2	4	3	1	5
Belgium	22.47	22.41	19.22	25.31	3.49	2	3	4	1	5
Bulgaria	24.19	1.02	4.79	9.44	2.10	1	5	3	2	4
Croatia	3.88	2.08	2.37	6.30	1.45	2	4	3	1	5
Cyprus	3.27	0.39	0.56	1.99	0.19	1	4	3	2	5
Czech Republic	57.63	10.72	12.44	18.67	7.02	1	4	3	2	5
Denmark	11.50	2.77	3.67	12.66	2.36	2	4	3	1	5
Estonia	11.82	0.43	0.66	2.46	0.63	1	5	3	2	4
Finland	20.91	1.96	7.58	11.51	2.65	1	5	3	2	4
France	61.75	64.42	40.08	125.42	18.71	3	2	4	1	5
Germany	310.35	120.82	99.33	158.30	25.02	1	3	4	2	5
Greece	33.86	4.65	5.08	17.17	2.33	1	4	3	2	5
Hungary	13.69	9.98	6.81	13.58	3.26	1	3	4	2	5
Ireland	10.57	8.06	4.15	11.87	1.20	2	3	4	1	5
Italy	113.38	63.58	32.26	100.20	19.71	1	3	4	2	5
Latvia	1.96	0.84	0.71	3.24	0.84	2	3	5	1	4
Lithuania	2.49	1.14	1.23	6.05	0.86	2	4	3	1	5
Luxembourg	0.24	1.62	0.96	6.07	0.16	4	2	3	1	5
Malta	0.70	0.11	0.04	0.67	0.03	1	3	4	2	5
Netherlands	63.63	23.91	25.88	30.83	9.44	1	4	3	2	5
Poland	157.46	42.68	31.26	63.48	36.91	1	3	5	2	4
Portugal	20.83	2.85	5.54	16.82	2.12	1	4	3	2	5
Romania	29.81	9.03	12.52	18.11	12.89	1	5	4	2	3
Slovakia	10.97	4.28	8.41	7.73	2.34	1	4	2	3	5
Slovenia	4.82	0.88	1.94	5.72	0.87	2	4	3	1	5
Spain	89.94	25.46	33.62	92.31	12.70	2	4	3	1	5
Sweden	8.61	1.52	6.91	16.49	2.06	2	5	3	1	4
Norway	15.02	1.37	6.17	12.53	3.02	1	5	3	2	4
Switzerland	3.08	11.34	4.92	15.82	1.11	4	2	3	1	5
United Kingdom	106.64	87.01	31.96	120.66	18.59	2	3	4	1	5

ANNEX 6: OVERVIEW OF NDC SECTORAL COVERAGES IN ASEM PARTNER COUNTRIES

	Energy		Industrial Processes		Agriculture		LULUCF		Waste	
	Covered	Specific action	Covered	Specific action	Covered	Specific action	Covered	Specific action	Covered	Specific action
Australia	yes	yes	yes	yes	yes	no	yes	yes	yes	no
Bangladesh	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Brunei Darussalam	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Cambodia	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
China	yes	yes	yes	yes	yes	yes	yes	yes	no	no
India	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Indonesia	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Japan	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Kazakhstan	yes	no	yes	no	yes	no	yes	no	yes	no
South Korea	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Lao PDR	yes	yes	no	no	yes	yes	yes	yes	yes	yes
Malaysia	yes	no	yes	no	yes	no	yes	no	yes	no
Mongolia	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Myanmar	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
New Zealand	yes	yes	yes	yes	yes	no	yes	yes	yes	no
Pakistan	yes	yes	yes	yes	yes	yes	yes	yes	yes	no
Philippines	yes	no	yes	yes	yes	no	yes	no	yes	no
Russia	yes	yes	yes	no	yes	no	yes	no	yes	no
Singapore	yes	yes	yes	no	yes	yes	yes	no	yes	no
Thailand	yes	yes	yes	yes	yes	no	no	no	yes	yes
Vietnam	yes	yes	yes	no	yes	yes	yes	no	yes	no
European Union	yes	yes	yes	no	yes	no	yes	no	yes	yes
Norway	yes	yes	yes	yes	yes	no	yes	yes	yes	no
Switzerland	yes	yes	yes	yes	yes	no	yes	yes	yes	no
United Kingdom	yes	yes	yes	yes	yes	yes	yes	no	yes	yes

Source: Source: Authors' analysis based on the review of ASEM NDCs and data derived from the IGES, NDC Database, version 7.6

ANNEX 7: OVERVIEW OF LONG-TERM STRATEGY DOCUMENTS OF ASEM PARTNER COUNTRIES

Country	Name of the long-term strategy document	Year of adoption	Climate change considerations		
			Included as target/priority	Included	No/Unknown
Australia	N/A				x
Bangladesh	8th Five Year Plan 2021-2025	2020	x		
Brunei Darussalam	11th National Development Plan (2018-2023)	2018		x	
Cambodia	National Strategic Development Plan 2019-2023	2019	x		
China	14th Five-Year Plan (2021-2025)	2021		x	
India	Three-Year Action Agenda (2017-18 to 2019-20)	2017			x
Indonesia	National Medium Term Development Plan 2020-2024	2020	x		
Japan	The SDGs Implementation Guiding Principles	2016	x		
Kazakhstan	Strategy Kazakhstan 2050	2012			x
South Korea	The Third Basic Plan for Sustainable Development 2016-2035	2016			x
Lao PDR	9th Five-Year Socio-Economic Development Plan (NSEDP)	2021	x		
Malaysia	12th Malaysia Plan 2021-2025	2021	x		
Mongolia	Sustainable Development Vision 2030	2016	x		
Myanmar	Myanmar Sustainable Development Plan (2018-2030)	2018	x		
New Zealand	Growing and Protecting New Zealand	2017		x	
Pakistan	Vision 2025	2014	x		
Philippines	Philippines Development Plan 2017-2022	2017			x
Russia	Presidential Decree On national objectives and strategic tasks of Russia's development in the period up to 2024	2018			x
Singapore	Sustainable Singapore Blueprint (updated)	2016		x	
Thailand	12th National Economic and Social Development Plan	2017	x		
Viet Nam	The 5-year Socio-Economic Development Plan (SEDP)	2016	x		
Austria	Austrian Strategy for Sustainable Development	2010*	x		
Belgium	National Sustainable Development Strategy	2017	x		
Bulgaria	National Development Programme 2030	2020	x		
Croatia	Sustainable Development Strategy of Croatia	2009	x		
Cyprus	Sustainable Development Strategy of Cyprus	2007	x		

Country	Name of the long-term strategy document	Year of adoption	Climate change considerations		
			Included as target/priority	Included	No/Unknown
Czech Republic	Czech Agenda 2030	2017	x		
Denmark	SDG Action Plan	2017	x		
Estonia	"Estonia 2035" development strategy	N/A	x		
Finland	The Finland We Want by 2050 — Society's Commitment to Sustainable Development	2016 (2013)	x		
France	National Strategy of Ecological Transition Towards Sustainable Development	2014	x		
Germany	Sustainable Development Strategy	2021	x		
Greece	National Strategy for Sustainable and Fair Growth 2030	2018			x
Hungary	National Framework Strategy for Sustainable Development	2013	x		
Ireland	Our Sustainable Future - the framework for sustainable development	2012	x		
Italy	National Sustainable Development Strategy 2017/2030	2017			x
Latvia	Sustainable Development Strategy for Latvia until 2030	2010	x		
Lithuania	Lithuania's Progress Strategy "Lithuania 2030" National Strategy for Sustainable Development	2012	x		
Luxembourg	National plan for smart, sustainable and inclusive growth	2013	x		
Malta	Sustainable Development Vision 2050	2011	x		
Netherlands	Dutch National Strategy	2020	x		
Norway	Norway Sustainable Development Strategy	2011**	x		
Poland	Strategy for Responsible Development	2017			x
Portugal	N/A				x
Romania	Romania's National Sustainable Development Strategy 2030	2018	x		
Slovakia	Government manifesto adopted in April 2016	2016		x	
Slovenia	Slovenian Development Strategy 2030	2017	x		
Spain	Sustainable Development Strategy 2030	2020	x		
Sweden	A Swedish Strategy for Sustainable Development	2003	x		
Switzerland	Sustainable Development Strategy 2016-2019	2016	x		
United Kingdom	National Planning Policy Framework	2018	x		

*Adopted in 2002, updated in 2010
** Adopted in 2002, updated in 2011

ANNEX 8: OVERVIEW OF CLIMATE CHANGE POLICY FRAMEWORK IN ASEM PARTNER COUNTRIES

	Long-term strategy	Scope	Mitigation strategy	Scope	Adaptation Strategy	Scope
Australia	Long-Term Emissions Reduction Plan	2021-2050	Long-Term Emissions Reduction Plan	2021-2050	National Climate Resilience and Adaptation Strategy	2021-2025
Austria	Long-Term Strategy 2050 - Austria	2019-2050	Long Term Strategy 2050 - Austria	2019-2050	The Austrian Strategy for Adaptation to Climate Change (NAP)	2017
Bangladesh	no LTS		Bangladesh Climate Change Strategy and Action Plan	2009	NAPA	2005
Belgium	Stratégie à long terme de la Belgique	2020-2050	Belgium's Long Term Strategy	2020-2050	Belgian National Adaptation Plan	2017-2020
Brunei Darussalam	no LTS		National Climate Change Strategy	2020-2035	National Climate Change Policy	2020-2035
Bulgaria	no LTS		Climate Change Mitigation Act	2014-2020	National Climate Change Adaptation Strategy and Action Plan	2019-2030
Cambodia	Long Term Strategy for Carbon Neutrality	2021-2050	Cambodia Climate Change Strategic Plan 2014-2023 (CCCSP 2014-2023)	2014-2023	National Adaptation Plan	not yet available/ in planning stage
China	China's Mid Century Long Term Low Greenhouse Gas Emission Development Strategy	2020-2060	China's Mid Century Long Term Low Greenhouse Gas Emission Development Strategy	2020-2060	National Strategy on Climate Adaptation 2035	2022-2035
Croatia	no LTS		Low Carbon Development Strategy of the Republic of Croatia	2021-2050	Climate Change Adaptation Strategy	2017-2040/ 2070
Cyprus	no LTS		Cyprus' Long-term low GHG emission development strategy	2020-2050	National Strategy for Climate Change Adaptation	2021-2050
Czech Republic	Climate Protection Policy of the Czech Republic	2017-2030/2050	Climate Protection Policy of the Czech Republic	2017-2030	Adaptation Strategy to Climate Change in the Czech Republic	2015-2020/ 2030
Denmark	Climate Programme 2020	2020-2030/2050	Climate Programme 2020	2020-2030/2050	Danish strategy for adaptation to a changing climate	2008-2012
Estonia	no LTS		Resolution of the Riigikogu General Principles of Climate Policy until 2050	2017-2030	Climate Change Adaptation Development Plan until 2030	2017-2030
Finland	Finland's long-term low greenhouse gas emission development strategy	2020-2050	Finland's long-term low greenhouse gas emission development strategy	2020-2050	Finland's National Climate Change Adaptation Plan 2022	2014-2022
France	National Low-Carbon Strategy	2020-2050	National Low-Carbon Strategy	2020-2050	National Climate Change Adaptation Plan	2018-2022
Germany	Climate Action Plan 2050	2020-2050	Climate Action Plan 2050 2020-2050	2020-2050	https://www.bmu.de/fileadmin/bmu-import/files/english/pdf/application/pdf/das_gesamt_en_bf.pdf	

	Long-term strategy	Scope	Mitigation strategy	Scope	Adaptation Strategy	Scope
Greece	no LTS		EU climate neutrality and the 2050 targets	2020-2050	National Strategy for Adaptation to Climate Change	2016-2026
Hungary	National Clean Development Strategy 2020-2050	2020-2050	National Clean Development Strategy 2020-2050 National Climate Change Strategy	2020-2050	National Climate Change Strategy	2008-2025
India	no LTS			2008	National Action Plan on Climate change	2008
Indonesia	Long-Term Strategy for Low Carbon and Climate Resilience 2050	2021-2050	Long Term Strategy	2021-2050	National Action Plan on Climate Change Adaptation	2007
Ireland	no LTS		National Mitigation Plan	2017-2050	Climate Action Plan 2019	2019-2030/2050
Italy	no LTS		Strategia Italiana di lungo termine sulla riduzione delle emissioni dei gas a effetto serra	2020-2050	National Adaptation Strategy to Climate Change	2016-2021
Japan	Long Term Strategy under the Paris Agreement	2021-2050	Long Term Strategy under the Paris Agreement	2021-2050	Climate Change Adaptation Plan (to be renewed every 5 years)	2020-2025
Kazakhstan	no LTS		N/A		Planned	
Lao PDR	no LTS		Strategy on Climate Change	2010-	N/A	
Latvia	Strategy of Latvia for the Achievement of Climate Neutrality by 2050	2020-2050	Strategy of Latvia for the Achievement of Climate Neutrality by 2050	2020-2050	Latvian National Plan for Adaptation to Climate Change	2021-2030
Lithuania	Lithuanian Climate Change Management Agenda 2021	2021-2050	Lithuanian Climate Change Management Agenda 2021	2020-2051	The National Strategy for Climate Change Management Policy	2012-2050
Luxembourg	Stratégie nationale à long terme en matière d'action climat « Vers la neutralité climatique en 2050 »	2021-2050	Stratégie nationale à long terme en matière d'action climat « Vers la neutralité climatique en 2050 »	2021-2050	Strategy and action plan for adaptation to the effects of climate change	2018-2023
Malaysia	no LTS		Green Technology Master Plan	2017-2030	12th Malaysia Plan	2021-2025
Malta	Malta Low Carbon Development Strategy	2021-2050	Malta Low Carbon Development Strategy	2021-2050	National Climate Change Adaptation Strategy	2012
Mongolia	no LTS	2011-2021	National Action Programme on Climate Change	2011-2021	National Action Programme on Climate Change	2011-2021
Myanmar	no LTS		Myanmar Climate Change Strategy	2018-2030	Myanmar's National Adapatation Programme of Action	2012-2017

	Long-term strategy	Scope	Mitigation strategy	Scope	Adaptation Strategy	Scope
Netherlands	Long term strategy on climate mitigation	2020-2050	Long term strategy on climate mitigation	2021-2050	National Climate Adaptation Strategy 2016	2016
New Zealand	Transition to a Low-Emission and Climate Resilient Future	2022-2050	Transitioning to a low emissions and climate resilient future	2022-2050	National adaptation plan	2020-2026
Norway	Norway's long-term low-emission strategy for 2050	2020-2050	Norway's long-term low-emission strategy for 2050	2020-2050	Climate change adaptation in Norway	2012-2013
Pakistan	no LTS		National Climate Change Strategy Pakistan Climate Change Act, 2017	2012-	National Climate Change Strategy	2012
Philippines	no LTS		National Climate Change Action Plan	2011-2028	National Climate Change Action Plan	2011-2028
Poland	no LTS		N/A		Polish National Strategy for Adaptation to climate Change (SAP 2020)	2013-2020/2030
Portugal	Roadmap for Carbon Neutrality 2050 (RCN2050): Long-term Strategy for Carbon Neutrality of the Portuguese Economy by 2050	2020-2050	Roadmap for Carbon Neutrality	2020-2050	National Adaptation to Climate Change Strategy (ENAAC 2020)	2015/2020-2030
Romania	no LTS		Strategia națională privind schimbările climatice și creșterea economică bazată pe emisii reduse de carbon pentru perioada 2016-2020	2016-2020	Strategia națională a României privind schimbările climatice 2013 - 2020	2013-2020
Russia	no LTS		Strategy plan on low level emissions	2021-2050	NAP	2019-2022
Singapore	Charting Singapore's Low Carbon and climate resilient future	2020-2050	Charting Singapore's Low Carbon and climate resilient future	2020-2050	Singapore's Climate Action Plan	2016-2030
Slovakia	Low-Carbon Development Strategy of the Slovak Republic until 2030 with a View to 2050	2020-2050	Low-Carbon Development Strategy of the Slovak Republic until 2030 with a View to 2050	2020-2050	National Adaptation Strategy	
Slovenia	ON SLOVENIA'S LONG-TERM CLIMATE STRATEGY UNTIL 2050	2020-2050	Resolution on Slovenia's Long-Term Climate Strategy Until 2050	2020-2050	STRATEGIC FRAMEWORK FOR CLIMATE CHANGE ADAPTATION	2016-2030
South Korea	2050 Carbon Neutral Strategy	2020-2050	2050 Carbon Neutral Strategy	2020-2050	Planned	2021-2025
Spain	Spanish Long Term Low GHG Emission Development Strategy	2020-2050	ESTRATEGIA A LARGO PLAZO PARA UNA ECONOMÍA ESPAÑOLA MODERNA, COMPETITIVA Y CLIMÁTICAMENTE NEUTRA EN 2050.	2020-2050	National Climate Change Adaptation Plan	2021-2030
Sweden	Sweden's long-term strategy for reducing greenhouse gas emissions	2020-2045	Sweden's long-term strategy for reducing greenhouse gas emissions	2020-2045	National Strategy for Climate Change Adaptation	2017

ANNEX 9: ANALYSIS OF ASEM LONG-TERM STRATEGIES

Country	Quantified Long-term Emissions Goal Included in LTS	Net-zero Target Included in the LTS	Paris Agreement Temperature Goal Consistency Claimed in LTS	Economy-wide Sectoral Coverage is included in LTS	All GHG is covered in the LTS
Australia	Yes	Yes	Yes	Yes	Partial GHG Coverage
Cambodia	Yes	Yes	Analysis in progress	Analysis in progress	Analysis in progress
China	Yes	Yes	Yes	Partial Sectoral Coverage	Not mentioned
Indonesia	Yes	No	Yes	Yes	Partial GHG Coverage
Japan	Yes	Yes	Temperature Goal Mentioned in LTS	Partial Sectoral Coverage	Yes
Singapore	Yes	Yes	Yes	Yes	Yes
South Korea	Yes	Yes	Yes	No	Not mentioned
Thailand	Yes	Yes	Yes	Partial Sectoral Coverage	Partial GHG Coverage
New Zealand	Yes	Yes	Yes	Yes	Partial GHG Coverage
Austria	Yes	Yes	Yes	Yes	Not mentioned
Belgium	Yes	No	Yes	Partial Sectoral Coverage	Not mentioned
Czech Republic	Yes	No	Temperature Goal Mentioned in LTS	Partial Sectoral Coverage	Yes
Denmark	Yes	Yes	Yes	No	Not mentioned
Finland	Yes	Yes	Yes	Yes	Not mentioned
France	Yes	Yes	Yes	Yes	Yes
Germany	Yes	No	Yes	Yes	Not mentioned
Hungary	Yes	Yes	Yes	Yes	Yes
Latvia	Yes	Yes	Temperature Goal Mentioned in LTS	Yes	Not mentioned
Lithuania	Yes	Yes	Analysis in progress	Analysis in progress	Analysis in progress
Luxembourg	Yes	Yes	Analysis in progress	Analysis in progress	Analysis in progress
Malta	Yes	Yes	Analysis in progress	Analysis in progress	Analysis in progress
Netherlands	Yes	No	Yes	Yes	Not mentioned
Portugal	Yes	Yes	Paris Agreement Temperature Goal Mentioned in LTS	Yes	Yes
Slovakia	Yes	Yes	Yes	Yes	Yes
Spain	Yes	Yes	Paris Agreement Temperature Goal Mentioned in LTS	Yes	Not mentioned
Sweden	Yes	Yes	Yes	No	Not mentioned
Slovenia	Yes	Yes	Yes	Yes	Not mentioned
Norway	Yes	No	Yes	Yes	Not mentioned
Switzerland	Yes	Yes	Yes	Yes	Yes
United Kingdom	Yes	Yes	Yes	Yes	Yes

Source: Authors' analysis based on Climate Watch. 2022. Washington, DC: WRI. Data accessed on 30th April 2022).

Country	Resiliency goal is mentioned	Yes	Adaptation fully/partially covered	Vulnerable groups and sectors recognized	Yes
Australia	No	Yes	Partially Covered	No	Yes
Cambodia	Analysis in progress	Analysis in progress	Analysis in progress	Analysis in progress	Analysis in progress
China	Yes	No	Partially Covered	No	No
Indonesia	Yes	Yes	Fully Covered	Yes, both	Yes
Japan	Yes	No	No	Yes, Vulnerable Sectors	Yes
Singapore	No	Yes	Partially Covered	Yes, both	Yes
South Korea	No	No	No	Yes, Vulnerable Groups	Yes
Thailand	Yes	Yes	Partially Covered	Yes, Vulnerable Groups	No
New Zealand	Yes	Yes	Partially Covered	Yes, both	Yes
Austria	Yes	Yes	Partially Covered	No	Yes
Belgium	Yes	Yes	Partially Covered	Yes, both	No
Czech Republic	Yes	Yes	No	No	No
Denmark	Yes	No	No	Yes, both	No
Finland	Yes	Yes	No	No	No
France	No	Yes	Partially Covered	No	Yes
Germany	Yes	Yes	Partially Covered	No	Yes
Hungary	Yes	Yes	Fully Covered	Yes, both	Yes
Latvia	Yes	No	No	No	No
Lithuania	Analysis in progress	Analysis in progress	Analysis in progress	Analysis in progress	Analysis in progress
Luxembourg	Analysis in progress	Analysis in progress	Analysis in progress	Analysis in progress	Analysis in progress
Malta	Analysis in progress	Analysis in progress	Analysis in progress	Analysis in progress	Analysis in progress
Netherlands	No	Yes	Partially Covered	No	No
Portugal	Yes	No	Partially Covered	No	Yes
Slovakia	No	Yes	No	Yes, Vulnerable Sectors	Yes
Spain	Yes	Yes	Fully Covered	Yes, both	Yes
Sweden	Yes	Yes	No	Yes, Vulnerable Sectors	No
Slovenia	No	Yes	Fully Covered	No	Yes
Norway	Yes	No	No	No	No
Switzerland	No	No	No	No	No
United Kingdom	Yes	Yes	Fully Covered	Yes, both	Yes

THE ENVFORUM PARTNER CONSORTIUM CONSISTS OF THE FOLLOWING INSTITUTIONS:

The Asia-Europe Foundation (ASEF) promotes understanding, strengthens relationships and facilitates cooperation among the people, institutions and organisations of Asia and Europe. ASEF enhances dialogue, enables exchanges and encourages collaboration across the thematic areas of culture, education, governance, economy, sustainable development, public health and media.

ASEF is an intergovernmental not-for-profit organisation located in Singapore. Founded in 1997, it is the only institution of the Asia-Europe Meeting (ASEM).

ASEF runs more than 25 projects a year, consisting of around 100 activities, mainly conferences, seminars, workshops, lectures, publications, and online platforms, together with about 150 partner organisations. Each year over 3,000 Asians and Europeans participate in ASEF's activities, and much wider audiences are reached through its various events, networks and web-portals.

For more information, please visit www.ASEF.org

Stockholm Environment Institute (SEI) is an international non-profit research and policy organization that tackles environment and development challenges. We connect science and decision-making to develop solutions for a sustainable future for all. Our approach is highly collaborative: stakeholder involvement is at the heart of our efforts to build capacity, strengthen institutions, and equip partners for the long term. Our work spans climate, water, air, and land-use issues, and integrates evidence and perspectives on governance, the economy, gender and human health. Across our eight centres in Europe, Asia, Africa and the Americas, we engage with policy processes, development action and business practice throughout the world.

For more information, please visit www.sei.org

The Hanns Seidel Foundation (HSF) is an official German Political Foundation. It is entrusted by the German Parliament with a mandate, which lies at the core of the task of promoting democratic and sustainable structures worldwide. This mandate involves the strengthening of the relevant institutions and persons, procedures and norms and the requisite attitudes enabling such development to take place.

For more information, please visit www.hss.de or www.hss.de/southeastasia

ASEM SMEs Eco-Innovation Center (ASEIC) was established in 2011 with the principal mandate of promoting Asia-Europe cooperation to create and enhance eco-innovation of small and medium-sized enterprises (SMEs) in both regions.

For more information, please visit www.aseic.org/main.do

Established in 1998, the Institute for Global Environmental Strategies (IGES) is an independent, not-for-profit think tank, based in Japan. It goes beyond research to provide practical ways to protect the earth's environment and to realise greater sustainability and equity in the global community.

For more information, please visit www.iges.or.jp

Partially funded by:

Sweden
Sverige

ABOUT THE ASIA-EUROPE MEETING (ASEM) PROCESS:

The Asia-Europe Meeting (ASEM) is an informal process of dialogue and cooperation bringing together the 27 European Union member states, 3 other European countries, and the European Union with 21 Asian countries and the ASEAN Secretariat. The ASEM dialogue addresses political, economic and cultural issues, with the objective of strengthening the relationship between our two regions, in a spirit of mutual respect and equal partnership. www.aseminfoboard.org

ASIA-EUROPE ENVIRONMENT FORUM

Established in 2003, the Asia-Europe Environment Forum (ENVforum) is a partnership of the Asia-Europe Foundation (ASEF), Hanns Seidel Foundation (HSF), ASEM SMEs Eco-Innovation Centre (ASEIC), Institute for Global Environmental Strategies (IGES) and the Government of Sweden through the Strategic Collaborative Fund administered by Stockholm Environment Institute (SEI).

ENVforum Consortium Partners:

ASIA-EUROPE FOUNDATION

SEI Stockholm Environment Institute Sweden Sverige

Hanns Seidel Foundation

ASEM SMEs Eco Innovation Center

IGES Institute for Global Environmental Strategies