



Air Quality Improvement Program in Cambodia

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Air Quality Improvement Program in Cambodia

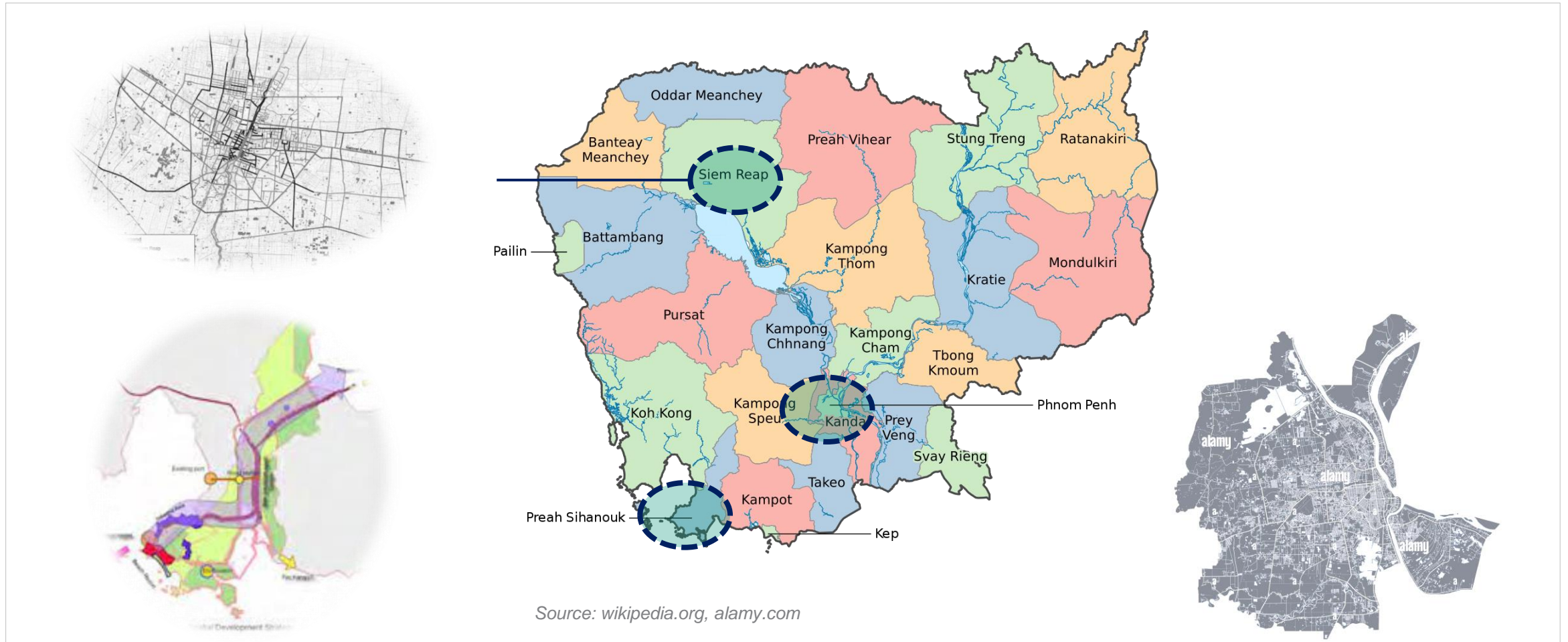


Project title	Air Quality Improvement Program (AQIP) in Cambodia
Main goal <i>(impact & outcome)</i>	Improve air quality; hence public health and economic growth (through the attractiveness and competitiveness of low-carbon cities), with a focus on transportation sector.
Project outputs	<ol style="list-style-type: none">1. Air quality assurance / quality control (QA/QC) procedure developed on air quality data system.2. Construction of an emissions inventory (EI) with a focus on the transportation sector + Development of regulatory measures and policy-making for vehicles emissions control.3. Roadmap for e-bus management in Siem Reap & low carbon transportation strategy + investment plan for Apsara Authority. <p>Knowledge sharing and capacity building activities across the three main outputs.</p>
National Government partners	Ministry of Environment (MoE) Ministry of Public Works and Transport (MPWT) <i>Ref. MOU between MOE, MPWT, AFD in the framework of the AFD Regional Program for Air Quality Improvement in Southeast Asia, dated 10th May 2022.</i>
Implemented by	Global Green Growth Institute (GGGI)
Funded by	AFD (French Development Agency)
Duration	May 05 th 2023 – May 04 th 2025 (24 months)

Target Areas



GGGI has identified three cities including **Phnom Penh**, **Siem Reap**, and **Sihanoukville** for the project in collaboration with AFD and concerned governments.



First Main Output & Focal Ministries: Air quality monitoring



#1 Air quality data collection and quality control capacity enhanced



Ministry of Environment

- Situational analysis of air quality monitoring stations in Cambodia
- Air quality assurance / quality control (QA/QC) procedure developed on air quality data system and institutionalize with MOE.

Situational Analysis of Air Quality Monitoring in Cambodia



Current Situation

- Total of 10 reference stations in Cambodia (2 in Phnom Penh)
- Total of 40 sensors in 24 provinces across Cambodia
- Policy on air quality assessment is old and standards need to be updated
- Limited capacity and resources at the central level on monitoring, maintenance and repair

Key Recommendations

- National regulation framework should be established.
- Expanding air monitoring stations to accommodate growth of cities.
- Ensuring reference stations are in good condition requires a well-planned maintenance and calibration strategy, with strong support from top management.
- Guidelines for maintenance and calibration should be developed and implemented to maintain data quality.
- Use of low-cost sensors is highly suitable for Cambodia's context, offering broad coverage of air monitoring stations at a low installment and maintenance fee.
- Management structure of air monitoring network should be decentralized & provincial departments' capacity should be built.

Second Main Output & Focal Ministries: Vehicle emissions control



2. A regulatory framework on reducing polluting vehicles and introduction of clean vehicles developed

Ministry of Environment &
Ministry of Public Works and Transport



- Construction of an emissions inventory with a focus on the transportation sector
- Guidelines for vehicle emissions control
- Capacity building

High Transport Sector Emissions



- Cambodia's transportation sector is the largest source of GHG emissions, accounting for 53.1% of total emissions in the energy sector.
- MOE projected that the GHG emissions from the transportation sector would rise from 785 GgCO₂ equivalent in 2000 to 11,376 GgCO₂ by 2050, indicating a 27% yearly increase.

Table 37. Percentage of contribution to energy GHG emissions by category (%)

Inventory category	1994	2000	2005	2010	2015	2016
1A1. Energy Industries	11.1%	14.5%	14.8%	21.1%	33.1%	33.9%
1A2. Manufacturing Industry	6.9%	7.6%	8.3%	12.9%	5.5%	7.8%
1A3. Transport	70.3%	64.6%	63.8%	54.6%	55.4%	53.1%
1A4. Other	11.7%	13.3%	13.0%	11.4%	6.1%	5.3%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: [Cambodia's 1st Biennial Update Report](#)

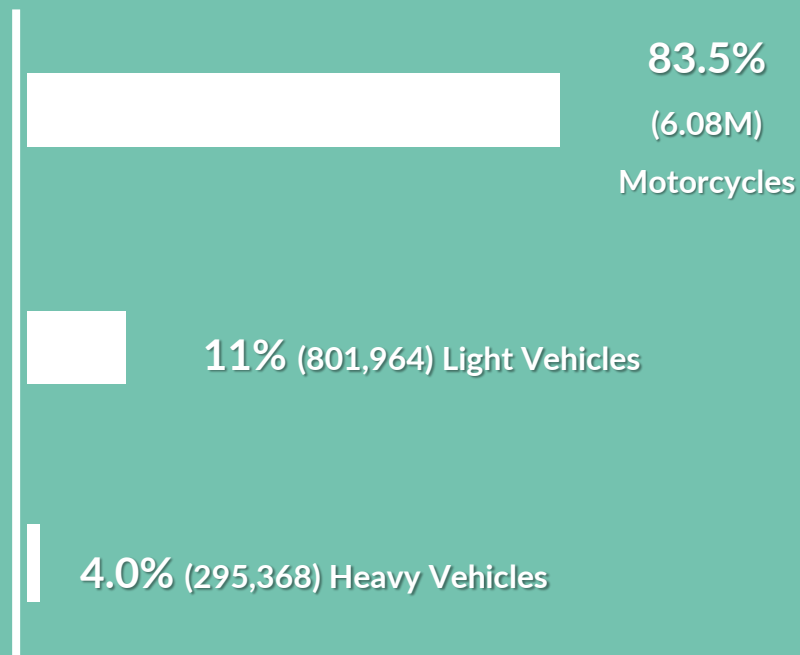
Vehicle Registration in Cambodia



Share of transportation fleet and e-vehicle penetration rate.

CAMBODIA VEHICLE REGISTRATION DATA

(2011-2023)



Source: Cambodia Automotive Industry Federation – Vehicles Registration Statistic

Total registered EVs:

- 4-wheelers = approx. 840
- 3-wheelers = approx. 1,000
- 2-wheelers = >100

Emission Inventory: Approaches to Transport Data Collection



Primary data collection

Conduct transport surveys:

- (1) Travel volume survey
- (2) Travel speed survey
- (3) Questionnaire survey on transport services and system

Secondary data collection

- (1) Population data
- (2) Vehicle Registration data

Siem Reap, Phnom Penh, Sihanoukville

Snapshot of Emissions Inventory



Population data is needed to update regularly.

	A	B	C	D	E	F	G	H	I
1	Number	Province	Capital	Area (km2)	Population(2019)	OD	CO2	NOx	PM
2	1	Banteay Meanchey	Serei Saophoan	6,679	861,883	2,897,707	128,203,168	13,277,292	141,542
3	2	Battambang	Battambang	11,702	997,169	3,230,462	81,667,970	8,481,176	90,413
4	3	Kampong Cham	Kampong Cham	4,549	899,791	3,492,848	124,084,387	12,869,127	137,191
5	4	Kampong Chhnang	Kampong Chhnang	5,521	527,027	2,656,672	95,532,758	9,975,157	106,340
6	5	Kampong Speu	Chbar Mon	7,017	877,523	3,518,076	127,599,739	13,331,995	142,125
7	6	Kampong Thom	Stung Saen	13,814	681,549	2,575,135	133,605,791	13,880,914	147,977
8	7	Kampot	Kampot	4,873	593,829	2,112,707	58,638,042	6,134,169	65,393
9	8	Kandal	Ta Khmau	3,179	1,201,581	4,605,843	142,398,632	14,963,944	159,523
10	9	Koh Kong	Khemarak Phoumin	10,090	125,902	531,215	49,393,673	5,123,284	54,617
11	10	Kratie	Kratie	11,094	374,755	1,391,130	69,615,628	7,143,441	76,152
12	11	Mondul Kiri	Senmonorom	14,288	92,213	358,219	33,583,020	3,424,977	36,512
13	12	Phnom Penh	Phnom Penh	679	2,281,951	11,685,220	5,806,413	8,372,366	86,883
14	13	Preah Vihear	Preah Vihear	13,788	254,827	997,957	62,314,940	6,481,837	69,099
15	14	Prey Veng	Prey Veng	4,883	1,057,720	3,945,134	113,148,409	11,752,755	125,290
16	15	Pursat	Pursat	12,692	419,952	1,613,449	102,789,002	10,583,244	112,822
17	16	Ratana Kiri	Banlung	10,782	217,453	562,247	61,389,465	6,242,318	66,546
18	17	Siem Reap	Siem Reap	10,299	1,014,234	5,109,175	10,575,015	15,228,768	160,570
19	18	Preah Sihanouk	Preah Sihanouk	1,938	310,072	1,507,243	2,922,359	4,008,784	41,816
20	19	Stung Treng	Stung Treng	11,092	165,713	657,800	50,702,061	5,198,832	55,422
21	20	Svay Rieng	Svay Rieng	2,966	525,497	2,039,924	65,275,077	6,758,997	72,054
22	21	Takeo	Doun Kaev	3,563	900,914	3,533,979	116,222,580	12,160,553	129,637
23	22	Oddar Meanchey	Samraong	6,158	276,038	1,067,255	55,071,391	5,736,053	61,149
24	23	Kep	Kep	336	42,665	217,592	8,123,703	849,642	9,058
25	24	Pailin	Pailin	803	75,112	350,669	12,357,596	1,280,158	13,647
26	25	Tboung Khmom	Suong	5,250	776,841	3,017,938	107,536,865	11,075,461	118,070
27	Total				15,552,211	63,675,598	1,818,557,685	214,335,246	2,279,849

These columns provide overview of results including OD(origin/destination), CO2, NOx, and PM With diagram.



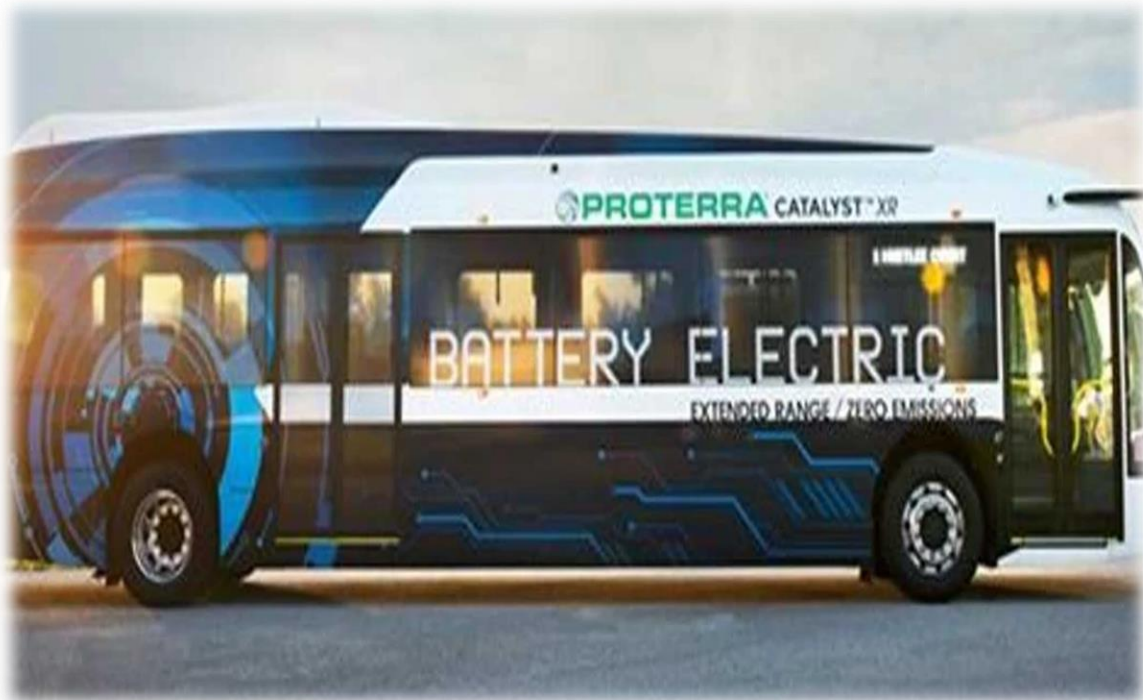
Based on collected emission data and information, GGGI developed an excel file-based emission inventory for transport sector, which shows GHG emissions by vehicle and provinces.

Third Main Output & Focal Ministries: Low Emission Transport in Siem Reap



#3 Investment mobilization for e-bus in Siem Reap & e-vehicle uses for Angkor World Heritage site.

Ministry of Public Works and Transport + Apsara Authority + Siem Reap



- **Institutional framework for operationalization of e-bus in Siem Reap**
- **Low carbon transportation strategy for Apsara Authority**

Thank You



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