

# AIM developed a 2050 net-zero scenario of Luang Prabang City

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NGUYEN THAI HOA (IGES)

BOUNEUA KHAMPHILAVANH (MONRE, LAO PDR)

LOCARNET 11<sup>TH</sup> ANNUAL MEETING BY ZOOM

MARCH 17<sup>TH</sup>, 2023

# Introduction

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## 2015: 2015NDC

## 2019: the Decree on Climate Change

- Defines principles, regulations, and measures on management, monitoring of climate matters.
- Climate change must be mainstreamed into the national socio-economic development plans, sectoral and local strategies and plans.

## 2020: 2020 NDC

- National level 2030 unconditional mitigation target: 60% GHG emission reductions compared to baseline scenario, or around 62,000 ktCO<sub>2</sub>e.

The 60% GHG emission reductions national level 2030 target demonstrates the enhanced contribution of the country to the Paris Agreement, considering the 34% GHG emission reductions compared to the baseline scenario achieved in 2020.

- 2030 Conditional mitigation scenario and targets towards net zero emissions 2050

The conditional mitigation scenario and targets are the GHG emission reductions efforts that Lao PDR could achieve by 2030 contingent upon increased levels of financial support from developed country Parties.

# Background of Luang Prabang Municipality

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- Area: 760 km<sup>2</sup>.
- Population: Approx. 92,000 persons.

## **To 2030, vision to 2050:**

- Upper-middle income and with innovative, green and sustainable economic growth
- Develop Luang Prabang to become central of tourism site, protecting sustainable world heritage site, includes ensure green and sustainable economic growth.
- Increase forest areas.
- Promote clean agricultural production.

# Annual GDP growth rate and proportion of economic structure of Luang Prabang

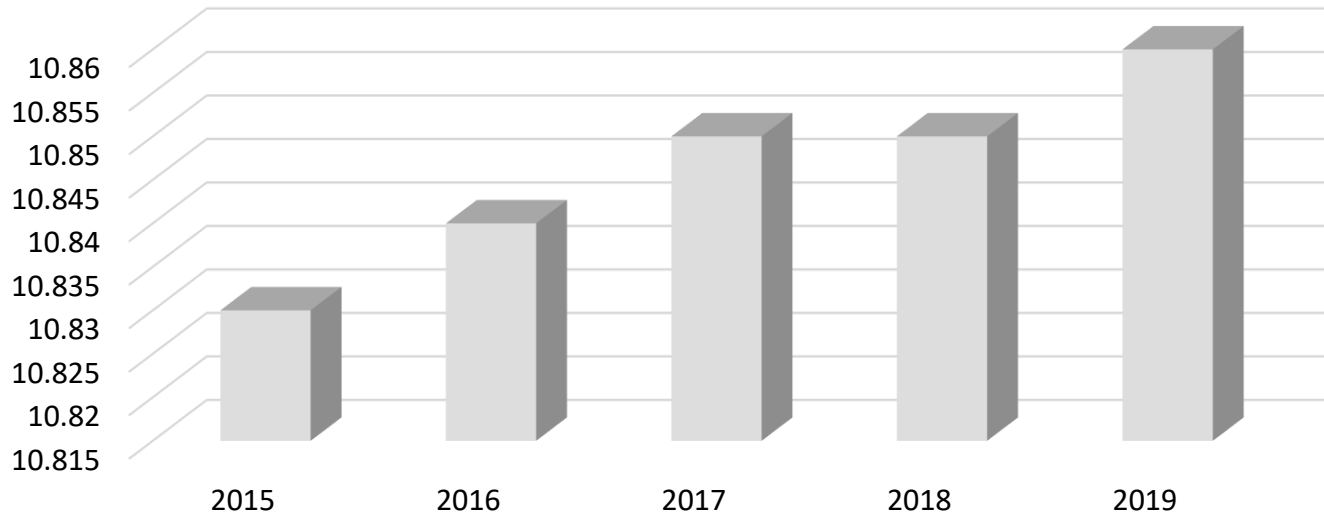


Fig. 1. Annual GDP growth rate

Source: Report on provincial social-economic development, 2020

- Average economic growth rate during 2015-2019 was 10% that very high growth needs to consider sustainably.
- Services are the main economic driver that means that urbanization growth have been very fast.

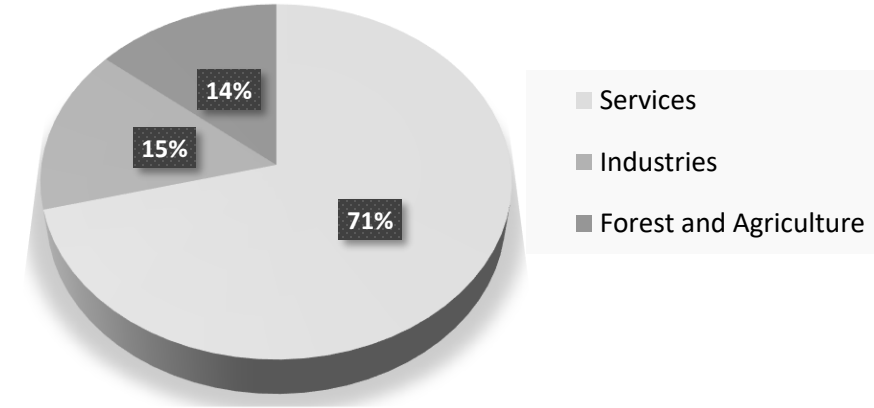


Fig. 2. Proportion of economic structure in 2019

Proportion of economic structure		
	2015	2019
Services	62	71
Industries	17	15
Forest and agriculture	21	14

# Objectives

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- To develop a net-zero carbon scenario for Luang Prabang city
- To support Luang Prabang's government to develop actions and plans to achieve the national mitigation target.

# Framework of study (tentative)

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Base year: 2015 (based on availability of data)

Target years: 2050

Sectors: Energy-use sector

Target GHGs: CO<sub>2</sub>

Scenarios:

- 2050BaU (Business as usual)
- 2050CM (Countermeasure)
- 2050ZE (Zero Emission)

# AIM/ExSS

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ExSS (Extended Snapshot Tool) is a comprehensive estimation tool for socio-economic indicators and GHG emissions designed for a backcasting study.

## Objectives of ExSS

- to illustrate quantitative future snapshot of a country, city, or region, especially as a low-carbon society
- to analyze relationship of socio-economic conditions, energy demand and GHG emissions
- to define a portfolio of the measures to meet the environmental target.

## ExSS estimates

- socio-economic activity level of the sectors in future based on users' assumptions
- future GHG emissions in scenarios
- counter measures necessary to achieve the target

ExSS is a designing tool of a future society, rather than a projection or prediction of likely future.

# Data collection

Data	References
<p>Base year data: Base year 2015</p> <ul style="list-style-type: none"> <li>• Population and Household</li> <li>• Input Output table (or, regional economic accounting)</li> <li>• Transport demand (Passenger &amp; Freight)</li> <li>• Building</li> <li>• Energy demand, energy supply</li> </ul>	<ul style="list-style-type: none"> <li>• Data Collection Survey on Regional Development in Luang Prabang, Lao P.D.R (JICA, 2016)</li> <li>• Country Analysis Report Lao PDR 2015 (UN, 2015)</li> <li>• Lao PDR Energy Statistics 2018 prepared by Ministry of Energy and Mines, Lao PDR; supported by The Economic Research Institute for ASEAN and East Asia (ERIA), 2018</li> <li>• Luang Prabang city 5years Social Economic Development Plan Series VII-2020</li> <li>• Laos IO table 2017</li> </ul>
<p>Reference for future scenarios: 2050BaU, 2050CM and 2050ZE</p> <ul style="list-style-type: none"> <li>• Population projection</li> <li>• Economic projection / planning</li> <li>• Transport planning</li> <li>• Energy strategy</li> <li>• Potential of renewable energy</li> <li>• etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Lao PDR Energy Outlook 2020 prepared by Department of Energy Policy and Planning, Ministry of Energy and Mines, , Lao PDR; supported by Economic Research Institute for ASEAN and East Asia (ERIA), 2018</li> <li>• The Energy Development Plan (2021-2025) for Luang Prabang Province</li> <li>• The Public Works and Transportation Development Plan (2021-2025)</li> </ul>



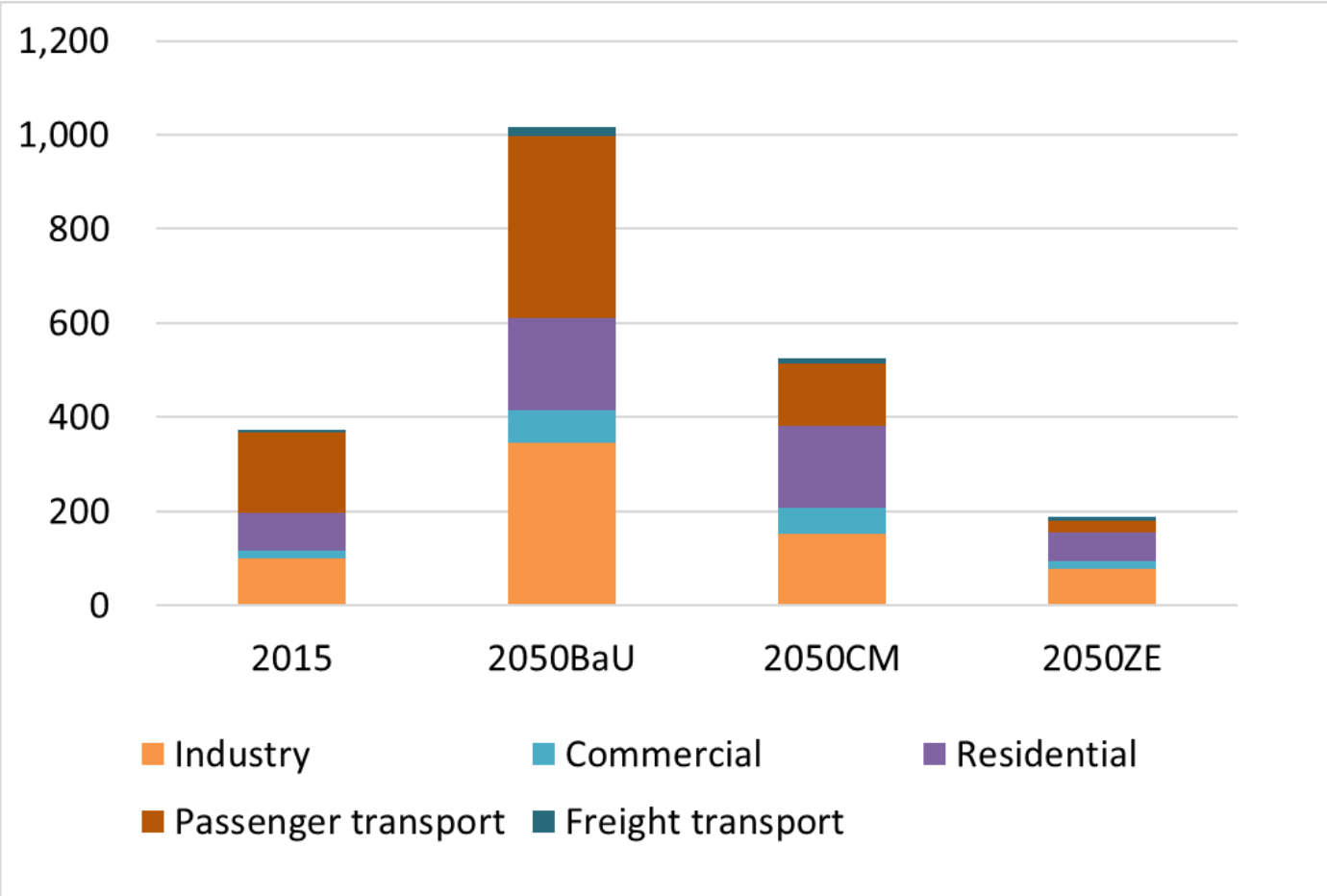
## Related projects /Researches

Luang Prabang	<u>Luang Prabang: Climate change and rapid development</u>	MatteoFumagalli	2020	Overview about the city
Laos	<u>Urban-LEDS (Low emission development strategies)</u>	UN-Habitat and ICLEI	2020	Participating cities: (Luang Prabang not included) Pakse Kaysone Phomvihane Outhoumphone Songkhone Sanasomboun B Chiangchaleunsouk
Luang Prabang	<u>Project for Capacity Enhancement for Sustainable World Heritage Management and Preservation in Luang Prabang in Lao PDR</u>	JICA	2020	
Luang Prabang	<u>Estimation of Greenhouse Gas Emission from Landfill in Luangprabang, Lao PDR</u>	Xaysackda Vilaysouk and Sandhya Babel	2013	57.75 Gg/year of MSW disposed on landfill, of which 83% is biodegradable material (food waste, garden waste, paper and textile), 2.42 Gg CH4 as GHG is produced
Luang Prabang	<u>Benefits of improved municipal solid waste management on greenhouse gas reduction in Luangprabang, Laos</u>	Xaysackda Vilaysouk and Sandhya Babel	2017	The lowest GHG emissions are achieved in the scenario where composting and recycling are proposed, with the total GHG emissions reduction by 18,264 tonnes/year CO2-eq.
Luang Prabang	<u>REDD+ in Luang Prabang city</u>	Japan Forest Technology Association, MURC, Marubeni Cooperation	2014	monitor the effectiveness of REDD+ activities and quantify the amount of GHG emissions reductions by REDD+ activities in a part of Phonxay District, Luang Prabang Province

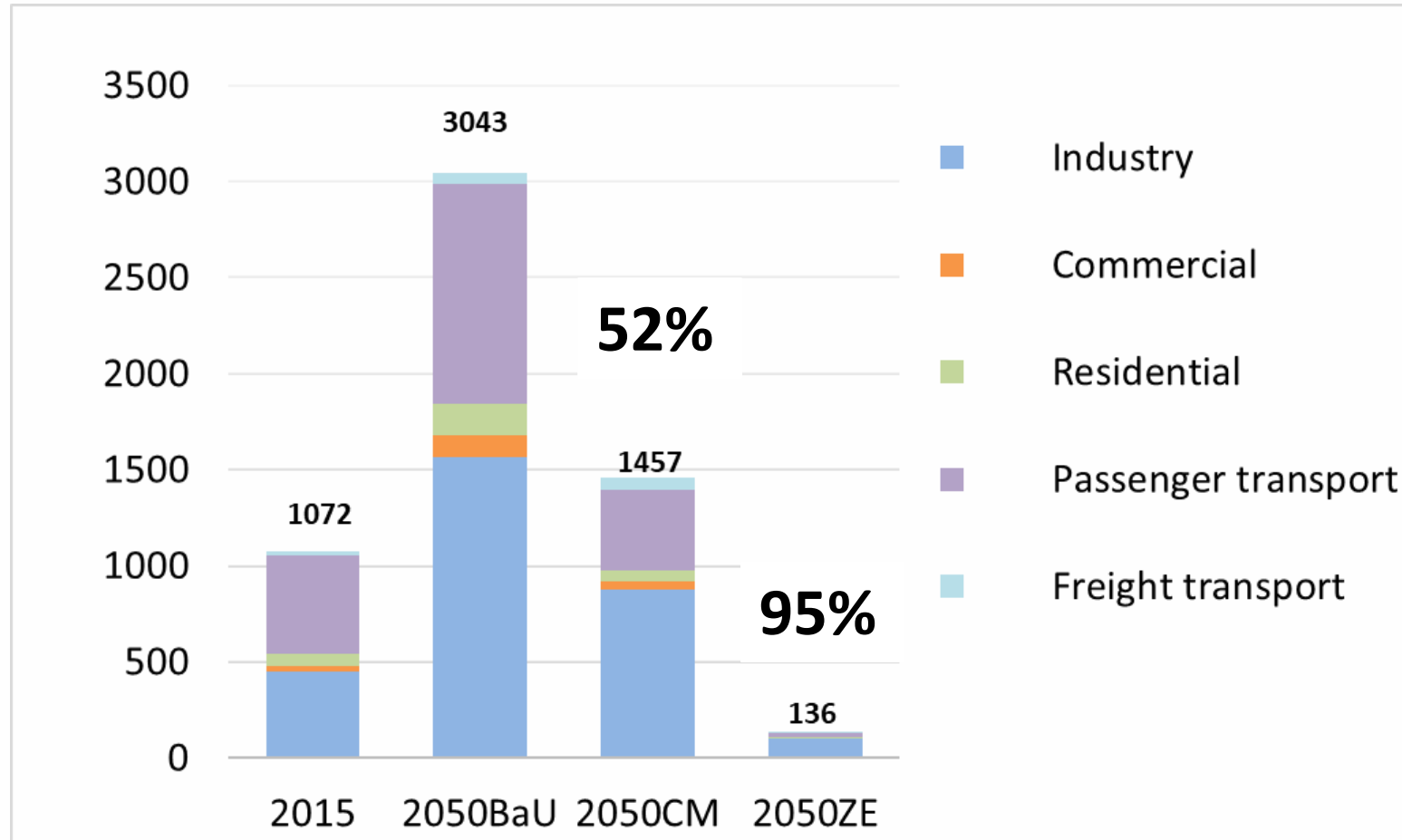
# Socio-economic vision 2050

	Unit	2015	2050	2050/2015	CAGR
Population	persons	431,900	645,127	1.49	1.2%
No. of households	households	81,000	174,359	2.15	2.2%
GDP per capita	USD	1,384	3,209	2.32	2.4%
GDP	mil. USD	598	2,070	3.46	3.6%
Passenger transport	mil.per.km	8,342	17,452	2.09	2.1%
Walk		14	32	2.29	2.4%
Bicycle		164	375	2.29	2.4%
Motorbike		7,908	13,790	1.74	1.6%
Car		204	2,472	12.12	7.4%
Bus		52	783	14.98	8.0%
Freight transport	mil.ton.km	73	302	4.13	4.1%
Truck		51	147	2.87	3.1%
Ship		22	155	7.05	5.7%

# Final energy consumption (Ktoe)



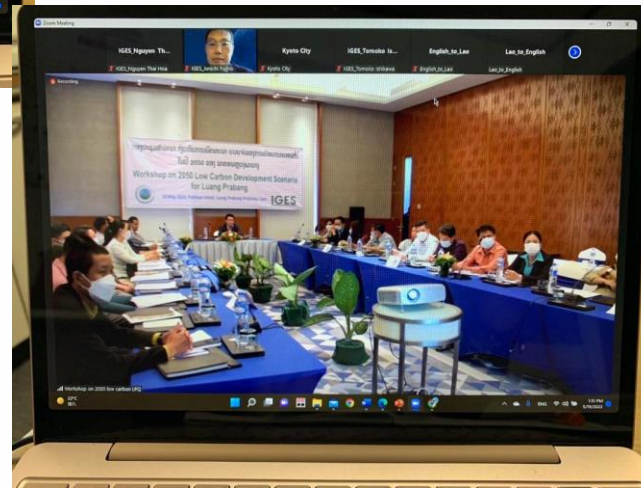
# CO2 emissions (KTCO2)



# Actions towards a 2050 net-zero

	Industry	Commercial	Residential	Passenger Transport	Freight Transport	Total (ktCO <sub>2</sub> )
<b>Action 1. Green Industry</b> Promotion of energy efficient equipment and fuel shift	237					237
<b>Action 2. Green Building</b> Diffusion of low-energy building (EMS, Insulation, Fuel shift)		24	59			83
<b>Action 3. Green Transport</b> Energy efficient vehicle and modal shift				107	89	196
<b>Action 4. Green Power</b> Renewable energy, reduce transmission loss	1,362	467	130	405	27	2,391
<b>Total (ktCO<sub>2</sub>)</b>	<b>1,599</b>	<b>491</b>	<b>189</b>	<b>512</b>	<b>116</b>	<b>2,907</b>

# Consultation Workshop on Low Carbon Development Scenario for LPB on 19 May 2022 by Virtual Meeting



Time	Description	Speakers
8:00-8:30	Registration	
8:30-9:00	Opening remarks	<ul style="list-style-type: none"> <li>- Mr. Phengkham Thammavong, Deputy Director, Department Natural Resources and Environment, Luang Prabang Province</li> <li>- Mr. Immala Inthaboualy, Deputy Director General, DCC</li> <li>- Mr. SAKOGUCHI Sadamitsu, Assistant Director, Office of Director of International Cooperation for Transition to Decarbonization and Sustainable Infrastructure Ministry of the Environment, Japan</li> <li>- Dr. FUJINO Junichi, Programme Director, Integrated Sustainability Centre, IGES</li> </ul>
9:00-9:20	Background of climate change	<ul style="list-style-type: none"> <li>- Mr. Ka Xaysana, Director, Climate Change Awareness Division, DCC</li> </ul>
9:20-9:40	Climate change policies	<ul style="list-style-type: none"> <li>- Mr. Suphaxay Kormanay, Climate Change Policy Division, DCC</li> </ul>
9:40-10:00	Q and A	All
10:00-10:15	Coffee break	All
10:15-10:40	Background of LCS	<ul style="list-style-type: none"> <li>- Mr. BounEua Khamphilavanh, Deputy Director, Division of GHG Inventory and Mitigation, DCC</li> <li>- Dr. Nguyen Thai Hoa, Fellow, IGES</li> </ul>
10:40-11:10	Kyoto's experiences towards realizing a decarbonized city	<ul style="list-style-type: none"> <li>- Mr. TERUNUMA Takeshi, Assistant Director, International Cooperation, Global Environment Policy Office, Kyoto City</li> <li>- Mr. KIKUTA Shoichiro, Assistant Director, Project Promotion Section, Kyoto City</li> </ul>
11:10-11:50	Q and A	All
11:50-12:00	Closing remarks	

# Expectation of the next FY's activities

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- Discussion with LPB authorities on simulation results;
- Asking for more information for other sectors analysis;
- Apply other methods for economic impact analysis;
- Seeking for city-to-city cooperation for implementing the identified actions.

Thank you for your kind listening!

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