

Cambodia Energy Sector and Sustainability

Natharoun Ngo Son Country Director EnergyLab Cambodia May 2022

Workshop RULE-Rennes University, Institut français du Cambodge



Cambodia's electricity share is half carbon intensive from coal (and oil)

Electricity Production Sources in Cambodia cover about 70% of total supply

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Electricity from the grid generated by solar in 2021

Electricity from the grid generated by coal and oil in 2021

Electricity from the grid generated by hydropower in 2021



30% is imported



BNEF NEO, 2020



This carbon intensive share is set to increase beyond half





A carbon neutral economy depends on a supply of decarbonized energy

Key energy related policy documents





Royal Government of Cambodia

National Energy Efficiency Policy (2021-2030)

KINGDOM OF CAMBODIA Nation Religion King

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Ministry of Mines and Energy

ដែនការសេធម្មភាពឆ្លើយតបនិចការប្រែប្រួល សេកាសឆាតុក្ខុចចស័យថាមពល ៣២០២-២០២៣

> Climate Change Action Plan for Energy Sector 2021 – 2023

Long-Term Strategy for Carbon Neutrality

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Energy and Climate Emissions



- Half Cambodia's emissions from energy by 2050
 - Energy emissions = electricity +

transport +

thermal heat

Figure 5: GHG emissions projections in the BAU scenario by sector

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Figure 7: GHG emissions projections in the LTS4CN scenario with sectoral shares



Lower carbon energy supply is lower cost and more energy secure



	Price			Day	Month	Year	Date
Crude Oil	104.550	•	0.62	-0.59%	3.01%	59.70%	14:50
Brent	106.91	•	0.67	-0.62%	1.18%	55.71%	14:50
Natural gas	7.6990		0.224	3.00%	32.75%	159.18%	14:50
Heating Oil	4.2043	•	0.0006	-0.01%	26.85%	111.11%	14:50
Coal	299.80	•	-26.50	-8.12%	13.56%	223.06%	May/02

https://tradingeconomics.com/commodity/coal

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Difficulty Financing Coal Projects

- 95 % of international public finance won't finance coal
- 53 financial institutions ~1/4 global banking assets joined the UN's Net Zero Banking Alliance

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 160 financial institutions representing over USD 70 trillion of combined assets signed Glasgow Financial Alliance for Net Zero (GFANZ).



Sept 21: CHINA !



Lower carbon energy supply gives room to clean energy and economic opportunities



Figure 16: Total costs and benefits of public and private capital and operating expenditures

Leading Global Manufacturers in Cambodia asking for cleaner energy



(Energy

RE100 overview

The world's most influential companies, committed to 100% renewable power.



And Cambodia understands well the potential for more Clean Energy!



Reducing Industrial Thermal Energy



SWITCH GARMENT PROMOTION OF SUSTAINABLE ENERCY PRACTICES IN THE GARMENT SECTOR

switchasia



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Solar Energy in Cambodia





អគ្គិសនីភាវូបនីយកម្មនៃយានយន្តដើម្បីអនាគតបៃតងសម្រាប់កម្ពុជា Electrification of Vehicles for a Cleaner Cambodia

Raffles Hotel Le Royal, Phnom Penh, Thursday, 4th November 2021 11:50AM ~ 12:30PM

សណ្ឋាគាររ៉ាហ្វិលឡឺរ៉ូយ៉ាល់ ភ្នំពេញ ថ្ងៃព្រហស្បតិ៍ ត្រូវនឹងថ្ងៃទី ០៤ ខែវិច្ឆិកា ឆ្នាំ២០២១ វេលាម៉ោង ១១:៥០ ~ ១២:៣០



Here's the value:





51,400 jobs created from

investing in 11.5GW of

solar and wind

of wind power

reduction in electricity system costs*

Cambodia Electricity Use





Electricity Authority Cambodia 2021

THANK YOU!





Young Cambodian Start Up part of Energy Lab Incubator program (Switch to Solar)

Please do feel free to contact me: natharoun@energylab.asia



Following slides left only for "archives" in this final draft version



A carbon neutral economy depends on a supply of decarbonized energy

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Figure 6: GHG emissions projections in the BAU and LTS4CN scenarios



Thermal energy in Cambodia

Industrial Thermal Energy Use



- Brick kilns
- Garment factories

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Cement kilns

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Key Mitigation Actions to 2050



Industrial processes and product use

- Clinker substitution in cement production
- Carbon capture and storage for cement kilns
- Use of recycled aggregate concrete
- Increasing use of refrigerants with low global warming potential
- Regular inspection of refrigeration and airconditioning equipment and recovery of spent refrigerants



• 79% rural HHs in Cambodia use wood for cooking

• 14,000 people die in Cambodia each year from household air population

Contact Bastiaan Teune <u>bteune@snv.org</u> Philipp Waigel <u>philipp.waigel@giz.de</u> Website: https://snv.org/country/cambodia Facebook: @SNVCambodia and @SmokeFreeVillage

SNV

Traditional stoves emit ~2.5tCO2e/year

Cooking is about more than just energy





- Chey Sothy

Reducing Cooking Emissions

"PAYGO made it affordable and eCook makes my life easier and more convenient to cook."

- Im Srey

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Transport and Energy in Cambodia

Key Mitigation Actions to 2050



Transportation

• More use of public transportation – 30 percent modal share in urban areas by 2050

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- Moderate penetration of electric vehicles 70 percent for motorcycles and 40 percent for cars and urban buses by 2050
- Increased fuel efficiency for internal combustion engine vehicles
- Rail for freight and passengers
- CNG penetration of 80 percent for interregional buses and 80 percent for trucks until 2050



Energy and Economic Sustainability



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Figure 20: Implications of LTS4CN for economic growth

New Power Projects since 2019



Coal & Oil Proje	cts	Solar Projects			
Han Seng – Odor Meanchey	270MW	Shneitec Solar	230MW		
CIIDG Coal 2 – Sihanoukville	700MW	Pursat, K. Chnang, K Speu	60+30+60+80		
Roval Group – Koh Kona	700MW	Risen Solar Battambang	60MW		
Royal Group Kon Kong		B Grimm Banteay Meanchey	30MW		
Sekong Coal – Laos	600MW	Green Sustainable Ventures Bavet	20MW		
Xekong Coal - Laos	1,800MW	ADB EDC Auction K Chnang	<i>60</i> +40MW		
Kandal Fuel Oil EDC	400MW	TOTAL	440MW		
OTAL 4,070MW		Hydro Projects			
		Upper Tatay Hydro	150MW		
		Wind Projects			
		Bokor Wind Farm	80MW		



Opportunities to invest in clean energy infrastructure to shape Cambodia energy system for decades to come

Existing Renewable Energy Project

Type of Project	Capacity	Status	Location	Operation
Solar Power Plant	10MW	In operation	Svay Rieng	2013
Solar Power Plant	60MW+20MW	In operation	Kampong Speu	2019
Solar Power Plant	60MW	In operation	Kampong Chhnang	2020
Solar Power Plant	60MW	In operation	Pur Sat	2020
Solar Power Plant	60MW	Under construction	Battambang	2021
Solar Power Plant	20MW	Under construction	Svay Rieng	2020
Solar Power Plant	30MW	In operation	Banteay Meanchey	2021
Solar Power Plant	30MW	In operation	Pur Sat	2020
Solar Power Plant	60MW	Under construction	Kampong Chhnang	2022
Solar Power Plant	40MW	Under bidding	Kampong Chhnang	2022
Total	450MW			



Source: MME

Solar Energy in Cambodia



Wind Energy (not yet operational in Cambodia)



Energy and System Balancing





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Key Mitigation Actions to 2050



Energy

- No new coal generation capacity beyond already committed projects
- Use of natural gas as a dispatchable transition fuel
- Investments in LNG import, storage and infrastructure
- Increase in solar, hydro, biomass and other renewables to 35 percent of the generation mix by 2050, of which 12 percent is from solar
- Investments in grid modernization, flexibility and storage
- Energy efficiency measures in buildings and industry
- Fuel switching to electricity for cooking
- Substitution of coal in the industrial and power sector

Recommendations



- 50% renewable energy share by 2030
- No new coal energy projects are being developed in Cambodia, except where coal plants are already under construction or with closed finance;
- Fix a clear and ambitious policy target for the amount of solar and wind power to be installed each year, so that investors, development partners and Electricité du Cambodge (EDC) can have certainty and time to plan the amount;
- Consider how natural gas is used to balance the electricity system to allow for increased solar and wind power and not use baseload gas turbine power under traditional contracts;
- Remove penalties for businesses who wish to install solar power. Many small and large businesses in Cambodia are keen to invest in a solar system to produce their own sustainable energy, reduce their environmental impact and aid achieving global and regional climate goals
- Endorse the Energy Efficiency Policy developed by the Ministry Mines and Energy.