

KINGDOM OF CAMBODIA
NATION RELIGION KING



MINISTRY OF AGRICULTURE, FORESTRY AND FISHERIES

POLICY ON
BIODIGESTER DEVELOPMENT IN CAMBODIA
2021-2030

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Preface

The Royal Government of Cambodia (RGC), under the strong and ideal leadership of **Samdech Akka Moha Sena Padei Techo HUN SEN, Prime Minister of the Kingdom of Cambodia**, agriculture sector remains considered one of the priority sectors of RGC. The agricultural sector has been contributing to the national economic growth, ensuring food security, promoting rural economic development, and improving livelihood of Cambodians.

The National Biodigester Program (NBP) has been operating since 2006. The program has been managed by the Ministry of Agriculture, Forestry and Fisheries (MAFF), and executed by the General Directorate of Animal Production and Health (GDAHP). In response to the remarkable development in the biodigester sector, in 2016, the Policy on Biodigester Development 2016-2024 was developed to manage the sector. Since 2016 however, the sector further diversified with investments in large scale biodigesters not only for farms but also agri-businesses such as cassava factories.

Have been seen these developments, MAFF established the technical working group in January 2021 to update the policy on biodigester development in Cambodia. As result, the policy on biodigester development framework for the period, 2021-2030 has been developed and is guided by MAFF policies and strategies with the overall objective to promote the development and effectively and sustainably use of biodigesters and the implementation of sustainable development goals in Cambodia.

In this occasion, I would like to express my appreciation for the efforts of the leaders in the ministry, the technical working group, the GDAHP, and all relevant stakeholders that have supported the policy on biodigester development in Cambodia.

Finally, I would like to encourage all relevant stakeholders to participate in the effective implementation of the policy on biodigester development in Cambodia 2021-2030, in order to enable farmers, rural communities and agribusinesses to improve their livelihoods and business profitability in a good and sustainable environment by increasing their business profitability through the use of biodigesters in efficient, safe and sustainable manner. *ST*

Phnom Penh, Date: *26* Month: *July* Year 2021

Minister

Ministry of Agriculture, Forestry and Fishery



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Table of Contents

Preface

1	Introduction	1
1.1	Status of and prospect of the livestock sub-sector	2
1.2	Status of the agro-processing industry	3
1.3	Agriculture and climate change	4
1.4	Status of Biodigester Development in Cambodia	4
1.5	Opportunities and barriers	8
1.6	Biodigester and contributions to Cambodia Sustainable Development Goals	9
2	Vision	10
3	Goal and Objectives	10
3.1	Goal	10
3.2	Objectives	10
4	Strategies to achieve objectives.	11
4.1	Improve sector governance	11
4.2	Promote biodigester construction and utilization	12
4.3	Improve biodigester quality and maximize benefits of biodigester	12
4.4	Promote incentives and subsidies	13
4.5	Increase marketing of carbon credits to reduce greenhouse gas emission	13
5	Activity plan	14
5.1	Establishment of the implementation mechanism	14
5.2	Legal framework	18
5.3	Finance	18
5.4	Human resource development	19
5.5	Policy implementation	19
5.5.1	Biogas promotion	19
5.5.2	Improve sector governance, coordination, and reporting.	21
5.5.3	Improve the biodigester quality infrastructure.	22
5.5.4	Fiscal and non-fiscal support mechanism	22
5.5.4.1	Domestic scale biodigesters	22
5.5.4.2	Medium and large-scale biogas	22
5.5.5	Establish and Promote DSB Biodigester User Community	23
5.5.6	Promote research and development and the use of biodigester.	23

5.5.7	Increase budget allocation to GDAHP for biogas development	24
5.5.8	Attract climate finance.	24
6	Policy Monitoring and Evaluation	24
7	Conclusion	25
	Acronyms	27
	Annex A: Matrix of Legal Framework implementation	28
	Annex B: Matrix of Policy measures and Action plan	29
	Glossary	38

POLICY ON BIODIGESTER DEVELOPMENT IN CAMBODIA, 2021-2030

1 Introduction

Cambodia has experienced rapid socio-economic development, thanks to sustained economic growth, peace, and stability over the recent decades. The Royal Government of Cambodia (RGC) has the vision to reach the status of an upper-middle income country by 2030. Agriculture is one of the prioritized sectors in the development trajectory as indicated in the 4th Rectangular Strategy (RS) and the National Strategic Development Plan (NSDP) 2018-2023.

The agricultural sector has grown with a robust 4% per annum in the period 2011-2017¹, albeit that the agricultural GDP contribution declined in the period with 1.8% per annum. In addition, the sector is the main source of local employment (37% of total labor force) and income in rural areas.

The Agriculture Sector Master Plan 2020-2030 envisions to modernize and increase the sector's competitiveness, inclusiveness and resilience to climate change and sustainability with the following objectives: i) promote the growth of the sector's value added to the economy at 3% per year by 2030; and ii) increase the annual agricultural labor productivity from US\$ 1,839- to US\$4,625/capita by 2030. At the strategic level, the Ministry of Agriculture, Forestry and Fisheries (MAFF) has adopted the Agriculture Sector Strategic Development Plan 2019-2023 targeting an annual sector growth of 1.6%-1.8%. Key strategies to achieve this growth include improving productivity, diversification, and commercialization of agriculture, animal husbandry and aquaculture, in a sustainable manner and thereby conserving and protecting forests and fisheries.

The livestock sector is the 3rd largest contributor to the sector's growth and grew with 11% in the period 2010 to 2019². This sub-sector is governed by Prakas 549 which stipulates the requirements to ensure sustainable supply, both in terms of quality and quantity of animal products, to serve the domestic and export markets. Furthermore, the Prakas stipulates the farm classification, technical regulations, and procedure for livestock production, and particularly the requirements for biotreatment and management of animal manure. The Prakas requires all commercial farms to comply with a set of standards including the ones on the bio-security system, manure waste management, sanitation, and environment safeguards such as preventing odor and noise pollution.

Next to the livestock sector, this biogas policy supports the implementation of the National Cassava Policy and the Industrial Development Policy, in particular related to supporting the agro-processing facilities with adequate treatment of wastewater in biogas plant to recover energy for production processes. This in turn will improve the economic performance of those facilities, increase trade and innovations. At the international level, this policy is also strongly linked to Cambodia's updated Nationally Determined Contributions (NDC) to climate change, both in terms of reducing greenhouse gas (GHG) emissions and improving climate resilience.

This biogas policy ameliorates and replaces the policy on biodigester development 2016-2025 for the period 2021-2030 guided by the rapid developments in the biogas sector, changes in rural

¹ down from 5.8% per annum during 2004-2010. The sector's share to gross domestic products (GDP) declined from 34.6% in 2011 to around 23.6% in 2017.

² Agriculture Sector Strategic Development Plan 2019-2023

economy and to align the policy with the Agriculture Sector Development Plan 2019-2023 and other sectoral policies and plans pertaining to biogas. This policy provides clear goals and objectives to direct and accelerate biodigester uptake at all scales in the livestock and agro-processing sector in Cambodia.

1.1 Status of and prospect of the livestock sub-sector

Table 1 tabulates the head of livestock held by farm type and the changes in the period 2016 to 2020. Evident is that the share of livestock produced by family-based farming remains the dominant suppliers of livestock with the exception of swine. Commercial farms have gradually become the main supplier for swine (pork). The share of swine commercially raised increased to 55% in 2020 (increased from 599,341 heads in 2016 to 1,379,623 heads in 2020). As of 2020, there were a total of 551 commercial swine farms, most of which are fattening farms (489) and some are breeding farms (62)³.

Table 1: Total livestock production (heads) in the period 2016-2020

Animal	Type	2016	2017	2018	2019	2020
Cattle	Family	2,897,126	2,951,359	2,917,302	2,769,885	2,835,360
	Commercial	23,188	20,363	11,232	9,877	13,216
Buffalo	Family	523,320	508,458	500,778	447,167	423,614
	Commercial	194	198	217	218	211
Swine	Family	2,371,283	2,331,512	1,934,917	1,030,494	1,137,056
	Commercial	599,341	742,771	812,934	1,155,431	1,379,623
Poultry	Family	28,402,486	28,652,409	28,956,342	27,763,479	30,553,233
	Commercial	7,331,275	7,592,530	9,210,409	12,631,974	17,508,936
Horse	Family	5,610	5,055	4,207	3,771	2,971
	Commercial	64	82	89	30	-
Sheep	Family	400	461	459	648	944
	Commercial	67	-	-	-	781
Goat	Family	22,719	28,542	25,747	27,740	29,981
	Commercial	6,258	365	700	-	300

Note: "-" no data

Source: GDAH, 2021

³ GDAH 2021

Livestock businesses, despite the growth, face barriers including high production costs (particularly electricity) leading to low competitiveness compared to imported live pigs. In terms of operating costs, swine farms with evaporative cooling system (known as EVAP farms) are more energy intensive, compared to ones without such a EVAP system. Farms that are not connected to the grid rely mainly on generators powered by diesel and biogas is viewed as an effective way to reduce the fuel cost⁴.

Domestic meat demand is projected to increase from 290,000 ton in 2019 to 328,000 ton in 2024. In 2020, domestic meat production met 85% of total demand⁵. This rapid increase will promote growth of the livestock industry as foreseen by the Agriculture Sector Master Plan 2030. In addition, government has released several rounds of immediate and long-term measures to support the economy including a special lending programme via the Agricultural and Rural Development Bank in response to the COVID-19 pandemic, aiding the agricultural sector. It is expected that the tourism sector will rebound strongly in the near future aiding to an increased demand for food and meat. Moreover, Cambodia has signed a free bilateral trade with China, and soon with Korea, the livestock production will also serve these markets.

In light of these aspects, Cambodia will continue working on developing and enforcing the legal frameworks that promote competitiveness, good animal husbandry practices, in particularly hygiene standards for animal products and at slaughterhouses, as well as management of manure and wastewater to prevent the transmission of zoonotic diseases, comply with export requirement and reduce production costs.

1.2 Status of the agro-processing industry

Over the last decade, agro-industrial crops have increased noticeably at an average of 13% per annum: from 6.14 in 2010 to 15.13-million-ton agro-products in 2019. Rubber production has increased at the annual rate of 20% during 2010-2019 reaching 287,630 tons. At the same period, export of rubber rose 7 times: from 42,000 tons in 2010 to 282,000 in 2019. Other agro-industrial crops shared the same trends, except in 2018 when the cassava production dropped to 13.5 million tons due to Mosaic disease⁶, followed by cashew 0.2 million tons and red corn 0.9 million tons.

Cassava has become the second largest crop in the country after paddy rice, resulting from the rapid expansion of cassava planting areas over the last decade. Currently the cassava sub-sector accounts between 3 to 4% of national GDP⁷. Most of the cassava is exported in the form of fresh roots and dry chips. Increasingly however, cassava is processed to tapioca starch (15 factories) or distilled to ethanol (7 ethanol plants) with focus on export and creation of added value.

To further support the cassava sector, the Government approved National Cassava Policy in 2020 to position Cambodia to the home of cassava processing industries and a reliable supplier of cassava-based products for global markets. As cassava wastewater can generate biogas and be transformed into electricity, the policy stipulates that *“MME shall encourage cassava processors to invest in biogas facilities by supporting legal procedures, granting permits, and complying with requirements, as well as*

⁴ According to the NBP Market Survey (2019), farms investing biogas system can recover the investment in 2 years (for those with EVAP farms), and up to 18 years for the open farms.

⁵ According to the GDAHP Annual Report 2020 (released 2021),

⁶ The cassava mosaic virus causes leaf mottling and may kill host plants.

⁷ National Cassava Policy 2020-2025

buying back remaining electricity at a reasonable rate [to Electricité du Cambodge (EdC)] or allowing its sale directly to nearby households at the same rates as local private and/or state suppliers.”

1.3 Agriculture and climate change

The agriculture sector in Cambodia is the second largest source of greenhouse gas (GHG) emissions after the Forest and Other Land Use (FOLU) sector, emitting an estimated 18,398 GgCO₂e⁸ in 2016 or around 11.2% of total emissions or 56.4% of total emissions excluding the FOLU sector⁹. Therewith, the emissions in the agricultural sector are larger than the Energy, the Industrial Processes and Product use (IPPU), and Waste sector combined. Cambodia’s updated Nationally Determined Contributions (NDCs) report projects that GHG emission in the business-as-usual scenario will grow from 21,200 GgCO₂e in 2016 to 27,100 GgCO₂e by 2030, but with the implementation of 17 identified mitigation actions, including biodigesters¹⁰, emissions by 2030 can be reduced with 6.2% to 20,200 GgCO₂e.

Climate change is resulting in less predictable and more variable monsoonal rainfall and the temperature in Cambodia would increase by about 0.60 – 2.5 degrees Celsius by 2100¹¹. This will have various negative effects on the sector. According to the Intergovernmental Panel on Climate change (IPCC), this will reduce milk production in high producing cows and meat production in ruminants because of a reduction in body size, carcass weight, and fat thickness. New diseases may affect livestock immunity and prolonged high temperature may affect livestock health (e.g., protein and lipid metabolism, liver functionality¹²). The temperature increase will reduce plants digestion rate which leads to reduced nutrients for forage plants. The temperature increase will change heat exchange between animal and the environment particularly heat stress will impact on feed eating, growth, reproductive, body support, and age of animals. Climate change may change the disease outbreak and animal disease distribution through various means. The increased temperature, drought and flood will be influential on viral pathogens, animal immunity, transmitted disease and spreading disease.

1.4 Status of Biodigester Development in Cambodia

Since the promulgation of the first biodigester policy, the sector has contributed to managing animal manure and wastewater with the introduction of small, medium and large scale biodigesters at households, livestock farms and other agribusinesses and with a number of new private sector companies entering the market. In the next sections, the status of domestic, small, medium, and large-scale plants is summarized. In this Policy, the following definitions regarding biodigester plant scale are used:

⁸ 1 Gg = 10⁹ gram = 1 kt (1 kiloton). CO₂e = Carbon dioxide equivalent which is a metric measure used to compare the emissions from various greenhouse gases on the basis of their global-warming potential (GWP)

⁹ Cambodia’s First Biennial Update Report 2019

¹⁰ Biodigesters for latex and rubber industry, biodigester for small, medium, and large farms and to treat the organic fraction of municipal solid waste.

¹¹ Cambodia’s Second National Communication under the United Nations Framework Convention on Climate Change (2015)

¹² https://www.ipcc.ch/site/assets/uploads/sites/4/2021/02/08_Chapter-5_3.pdf

Table 2: Definition of plant scale¹³

Digester classification	Farm type animals (animals/farm)	Quantity of manure (kg/day)	Digester/Covered lagoon volume (m ³)
Digester			
Domestic	Bovine <100 head Pigs: <100head Poultry <2 000head	<500	<50 m ³
Covered lagoon			
Small-scale	Bovine: 100-300head Swine: 100-1,000head Poultry: 2,000-20,000head	500 - 3,000	50-300 m ³
Medium scale	Bovine: 301-1000head Swine: 1,001-5,000head Poultry: 20,000-50,000head	>3,000 – 10,000	>300 to 1,000 m ³
Large scale	Bovine: >1,000head Swine: >5,000head Poultry: >50,000head	>10,000	> 1,000 m ³

For the purpose of this policy, measures are identified for non-commercial farms with domestic scale biodigesters (DSB) and for commercial farms or agribusiness with small, medium or large scale biodigesters (SMLSB).

The status, in terms of biodigesters installed, is tabulated in the table below:

Table 3: Cumulative number of biodigesters installed by actor in 2020.

Actor	DSB	SMLSB
National biodigester program	28,685 ¹⁴	6 plants at pig farms (85-180 kVA ¹⁵)
ATEC	1,800 in ¹⁶	-
General Directorate of Animal Health and Production	340 ¹⁷	-
VW Gas	-	10 plants at pig farmers (100 to 300 kVA) 1 plant at a cassava factory (1.5 MVA and a boiler 330 m ³ /h biogas)

¹³ According to Prakas 549 [ပြန်ကြေညာချက်] date 12th December 2018

¹⁴ NBP digester database cumulative up until 31/12/2020

¹⁵ kVA = 1 kilo volt ampere, r

¹⁶ Interview with ATEC - 2016-2020 installations

¹⁷ Cumulative installation of digester donated by the Chinese Government.

		1 plant at a Rice flour mill (boiler: 120 m ³ /h biogas)
Contract farms	-	C.P. Cambodia Co., Ltd: 73 ^[18] (around 22 with biogas utilization equipment) Betagro: 5 plants ¹⁹
Other projects ²⁰	-	3 locations at swine farms: <ul style="list-style-type: none"> • total capacity of 2100 kVA 3 agro-processing factories (starch and ethanol): <ol style="list-style-type: none"> 1. 23 MW thermal power 2. Boiler: 1,375 m³/h biogas for starch drying. 3. Biogas generator with capacity 1,4 MVA

Biogas produced in small-scale biodigesters is mostly used for cooking and thereby displacing wood, charcoal or LPG used otherwise for cooking, while in SMLSB biogas is used to generate electricity or heat for various processing activities.

Cooking on biogas has multiple benefits, such as convenience, fast cooking time, no soot of pots, time saving and no smoke. Studies conducted on the later in Cambodia have shown biogas is a clean cooking fuel with an estimated 36% reduction in exposure to PM_{2.5} (particulate matter less than 2.5 micrometer) and 88% reduction in kitchen PM_{2.5} concentration compared to cooking on wood²¹. It was estimated that in the period 2006 to 2014 the cumulative number of biodigesters installed by NBP averted 29 premature deaths and 1,442 disability adjusted life-years (DALYs).

Most small, medium and large farms have installed a modified second-hand diesel generator and some use a second-hand biogas generator to produce electricity from biogas. In some cases, the generator operates in dual fuel, biogas and diesel, or hybrid mode. New generators are often deemed too expensive, partly attributed to high import duties.

Biogas has corrosive properties as it contains traces of hydrogen sulfide gas (H₂S). H₂S scrubbing is therefore paramount to ensure long-term generator functioning. However, due to lack of capacity, technology, and equipment to monitor scrubber efficacy, scrubbers are not always installed properly or functioning optimally leading to lower H₂S removal efficiency and ultimately to frequent generator replacement.

Biogas is also used as boiler fuel in some beer factories, in cassava and ethanol factories.

Main biogas actors

1. National Biodigester Programme

The National Biodigester Programme (NBP) is a programme established by the Netherlands Development Organisation (SNV) in 2006, managed by the Ministry of Agriculture, Forestry and Fishery (MAFF) and coordinated by the General Directorate of Animal Health and Production

¹⁸ NBP Market Survey 2019

¹⁹ Company estimate, no data on size and capacity available

²⁰ As per CDM carbon registry including biogas plants at Oknha Mong Reththy's farm

²¹ Buysman, E (2016) <http://www.ccacoalition.org/en/news/report-biogas-and-household-air-quality-rural-cambodia>

(GDAH). NBP²² has installed over 28,683 digesters at the end of 2020. According to the latest carbon monitoring report of 2019 reported that 64% are in operation benefitting 78,853 people and that bio-slurry is applied on a total of 17,055 hectare as fertilizer²³.

The main reasons for the discontinued use of some biodigesters are due to changing lifestyles. People either stop raising animals in favor of other jobs or indicate they are becoming too old to feed their plants or households have switched to cooking on LPG while the younger generation has moved to the cities for work. Biodigester usage in the first 6 years however is much higher and close to 90%. Around 3,012 households have connected their toilets to digesters.

NBP supports three technologies, two masonry fixed dome models (Farmer's friend and the NBP S1) and a prefabricated composite digester (a Vietnamese digester design). Biodigester Construction Agents (BCAs) are responsible for constructing or installing biodigesters and operate under a franchise contract with NBP. Around 77 BCAs are currently active which operate in a semi-commercialized manner and employ 854 masons who are certified for biodigester construction. Another important benefit therefore is employment generation in rural areas.

Next to this, NBP, in cooperation with the Charoen Pokphand Foods Public Company Limited (C.P.) has installed a number of medium and large size anaerobic lagoon digesters at pig farms.

2. ATEC

ATEC, an Australian biogas company, installs prefabricated digesters produced in Cambodia at household farms and has introduced an innovative financing solution: Pay as you go (Paygo). Paygo allows the farmer to pay-back the plant with monthly installments using mobile payment solutions. ATEC has installed around 1,800 digesters in the period 2016-2020.

3. VW Gas

VW Gas is a local company which became active in 2018 in the biodigester sector and focus mostly on medium and large farms and the agro-processing industry. In total they have installed around 10 plants and have an ambitious target to install biodigesters at 30% of all farms and agro-processing industries by 2030

4. Contract farms

Various contract farm sponsors, encourage farmers to install anaerobic lagoon digesters for better environment, animal productivity and provides capital support. In the case of C.P.'s contract farms, round 30% have their manure lagoons covered with a sheet made of high-density polyethylene (HDPE) imported from Thailand to capture biogas and reduce odor pollution²⁴. Not all the plants however utilize biogas to generate electricity and instead either flare or vent it to the atmosphere.

Limited information is available on the digesters installed by other parties.

²² All figures from NBP carbon monitoring reports

²³ NBP monitoring report CPIII MPI.

²⁴ NBP – Market Survey and Credit Assessment of Medium and Large Scaled Biodigesters in Cambodia 2019

1.5 Opportunities and barriers

Opportunities

- Good agricultural practices are being promoted including incentives, creating a favorable environment for biodigester promotion.
- Agro-processing industry and the commercial livestock sector are growing resulting in a need to sustainably manage waste.
- Increased government focus on agriculture in response to COVID-19
- The Cambodian agro-food market is becoming more integrated with the world market creating export opportunities and investment in agriculture.
- The Law on Animal Health and Production and Prakas 549 stipulates commercial farms to have waste storage facilities or biogas digesters including setting up a fund which could support research and development into biodigesters
- Biogas uptake is encouraged in various policy documents, i.e. Agricultural Sector Development Plan (2014-2023), Agricultural Sector Master Plan 2030, National Cassava Policy, Cambodia Nationally Determined Contributions (NDC), Industrial Development Policy (agro-processing).
- Electricity from biogas is considered by farm owners an effective way to reduce electricity cost and to lower operating costs
- Loan products are available for improving farms as well as managing manure and wastewater at MLS farms (i.e., ARDB, FTB) and for DSB (ARDB, various MFIs)
- Innovate financing models are emerging such lease to own, PayGo and energy service company model (ESCO) models providing an attractive alternative to bank loans
- Utilizing bio-slurry as organic fertilizer addresses decline in soil fertility and organic soil content due to unsustainable agricultural practices, climate change and chemical fertilizer usage.
- An expertise center for commercial biogas established (BTIC at RUA) providing technical assistance, capacity building and university curriculum support on biogas while other universities, institutes, laboratories and TVET schools offer complementary courses/supporting infrastructure on civil engineering, mechatronics, business, and technical skills (welding, testing etc.).
- Need to increase in-country production of organic fertilizers to meet market demand and reduce reliance on fertilizer imports.
- Carbon credit project established for NBP and ATEC ensuring long term financing of their activities.
- Anaerobic treatment of waste in biodigesters can reduce plant and animal disease risks including zoonosis.

Challenges

- Reliance on donor funding and subsidies to support digester construction remains necessary.
- Lack of coherent regulation for all biogas actors resulting in unfair competition due to differences in subsidy and taxation.
- Import tax and custom duties for equipment used for SMLSB including biogas fired generators have not been incentivized by the government.

- SMLSB: Lack of regulation on basic biodigester quality, safety, standards/norms undermine trust in the technology (banks, investors, farmers).
- Biogas power generation is limited to captive purpose only as the framework for selling biogas electricity to national grid is lacking.
- Difficult to access finance for biogas projects due to farmer's indebtedness, high collateral requirements, volatile sector (esp. pig farms) and banks are unfamiliar with biogas or consider biogas projects risky.
- Bio-slurry is not always fully utilized due to insufficient awareness on the financial and environmental benefits or technologies/methods to process, store and sell the product are underdeveloped.
- SMLSB dissemination is hampered by high cost, limited in-country experience and capacity, and unfamiliarity with the technology.

1.6 Biodigester and contributions to Cambodia Sustainable Development Goals

Biodigesters provide various benefits to the users, the installers, the economy, and the environment and directly contribute to 8 SDG goals:

SDG	Biodigester contribution
1. End poverty	Small scale biodigesters provide renewable and a clean energy source for cooking, which reduces fuel expenditure, addresses energy poverty, and reduces health cost compared to cooking on wood due to exposure to hazardous pollutants from biomass stoves.
2. Zero hunger	The use of bio-slurry improves soil health and recycles nutrients which helps farmers to improve yields and makes soil more fertile and resilient against climate change.
3. Good health and well-being	Anaerobic treatment of animal waste in biodigesters reduces pathogen contamination risk and thereby improving animal and human health. cooking on biogas results in a significant reduction in household air pollution resulting in better health and lower medical costs.
5. Gender equality	Access to enabling technology like biogas contributes to women's empowerment as it improves efficient participation of women and equality opportunities. For instance, the workload of women, including children to collect wood is reduced, less time in tending the fire, cooking is faster, and less cleaning is required as pots are not blackened by soot which all, in turn, gives women more time to improve their livelihoods.
7. Affordable and clean energy	Biogas is a clean and renewable source of energy and can be used to generate heat for cooking or other thermal applications or/and can be used to generate power.
8. Decent work and economic growth	The construction of biodigesters creates job opportunities for skilled workers in rural areas which in turn improves the rural economy.
13. Climate action	Biodigesters reduce GHG emissions significantly by reducing methane emissions from animal waste management systems and by displacing non-renewable biomass and fossil fuels for cooking or displaces grid electricity in the case large biodigesters.

15. Life on Land	The reduction in wood used for cooking reduces pressure on the forests for firewood and the use of bio-slurry as fertilizer improves soil health (including soil microbial health).
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2 Vision

“Farmers, rural communities and agribusinesses improve their livelihoods and business profitability in a good and sustainable environment by increasing their business profitability through the use of biodigesters in efficient, safe and sustainable manner”

3 Goal and Objectives

3.1 Goal

“Promote efficient and sustainable use of biodigesters, aiming to supply renewable energy in rural and improve agricultural productivity as well as contributing to improve livelihoods of farmers, rural communities and agribusinesses and implementation of Sustainable Development Goals in Cambodia”

3.2 Objectives

1. Transform/strengthen animal and crop waste management practices by treating waste in quality biodigesters aiming to produce biogas and bio-slurry, towards increase construction of quality biodigesters.
2. Extend research and development in biodigesters technologies, including biogas utilization equipment and bio-slurry application to maximize the biodigester benefits.
3. Create an attractive enabling regulatory environment for the private sector, allowing banks, biogas companies and other private actor parties to invest in biodigesters.
4. Increase biogas sector development financing by capitalizing on various climate benefits and increase national budget allocation for biodigester development.

Table 4: Key performance indicators to be achieved by 2025 and 2030.

#	Indicators	2020 ²⁵	2025 ²⁶	2030 ²⁷
1	Greenhouse gas reduction (1000 tCO ₂ e)	824	1,689	2,554
2	Amount of firewood has been reduced (thousand tons)	273	489	705

²⁵ Accumulated number accounted in 2006-2020 based on NBP carbon reports.

²⁶ Biodigester policy 2016-2025 forecast

²⁷ Forecast based on 2020 and 2025 figures.

3	Amount of bio-slurry utilized (thousand tons)	7760	13888	20016
4	Cumulative biodigester power capacity (MW) ²⁸	8	52	105
5	Cumulative number of DSB constructed (thousand) since 2016	31 ²⁹	43	65
6	Cumulative number of small and medium scale biodigester constructed at livestock farms	43 ³⁰	250	500
7	Cumulative number of large-scale biodigester constructed at livestock farms		10	20
8	Cumulative number of medium and largescale biodigesters in the agro-food processing industry	4	10	20
9	Cumulative number of slaughterhouses having biodigesters (biodigester)	1 ³¹	50	76
10	Cumulative number of biodigester user communities established (Association)	1 ³²	5	10

4 Strategies to achieve objectives.

This policy will adopt a five-pronged approach, focusing on improving sector governance (strategy 1), promoting biodigester construction and utilization (strategy 2), improving biodigester quality and maximize benefits (strategy 3), promoting subsidies and incentives (strategy 4) and increasing marketing of carbon credits (strategy 5)

4.1 Improve sector governance

Cambodia's biogas landscape experienced various phases, a pilot stage characterized by the dissemination of low-cost low quality biodigesters in the period 1986 to 2005, consolidation in 2006-2013 with the establishment of NBP and the promotion of one proven technology with strong quality control to a period in which the market is diversifying with new companies promoting biogas of various scales and new biogas technology types. A diversity in technologies provides choice to farmers and businesses, and competition can result in better services and/or prices. However, competition is not always occurring at a level playing field and without regulation some companies may reduce quality in favor of a larger market share.

²⁸ C.P. contract farms are excluded due to lack of capacity data. 2025 and 2030 calculated with biogas capacity assumption medium farm 100 kVA, large farm 250 kVA and agribusiness 500 kVA on average

²⁹ Sum of NBP (28,863) and ATEC (1,800)

³⁰ Estimated based on table 2 - figures are not reported by farm size and of the CP farms only those are included with biogas generation equipment.

³¹ A small-scale slaughterhouse in Chhuck commune in Kampot

³² ATEC Smart Farmer Facebook page

MAFF will therefore promote NBP to become the biodigester apex body under GDAHP to coordinate, regulate and facilitate sector development for the agriculture sector. This includes setting up a framework for equal market opportunities such as addressing the varying and unregulated level of incentives, unequal taxation etc. MAFF will also work towards one unified quality norm or standard in close collaboration with all stakeholders ensuring competition does not result in the dissemination of low(er) quality digesters or services. Such a technical norm or standard will provide guidelines to harmonize requirements to protect the interest of end-user and technology providers, the environment, and the rural economy. The apex body shall implement the technical norm or standard in an impartial and anti-competitive manner.

4.2 Promote biodigester construction and utilization

There are still a large number of households, farms, slaughterhouses, and agro-processing factories without biodigesters. MAFF will coordinate the promotion of biodigesters as a solution to manage animal and other agricultural waste and the advantages it creates including additional income, access to clean energy and bio-slurry.

Awareness on the various benefits will be created, specified to the needs and requirements of the type of actor. In the case of household farms, emphasis will be put on improving agricultural production, closing nutrient cycles, avoiding indoor air pollution, time and fuel expenditure savings and convenience. For SMLSB the emphasis will be on improving the overall farm/agribusiness economy by generating energy for captive power and bio-slurry utilization.

Emphasis will also be put on the issues that good quality biodigesters can avoid, such as pollution of local water bodies leading to eutrophication and odor pollution and deforestation. In addition, the potential of bio-slurry to reduce soil erosion and improve soil health will be emphasized. Moreover, biodigesters will be promoted as 'state-of-the-art' method to meet the animal waste/bioslurry management regulation stipulated in Prakas 549.

4.3 Improve biodigester quality and maximize benefits of biodigester

Research and development into improving biodigester technologies is necessary to ensure the technology continues to meet the expectations in the market, but also to advance technologies in response to the developments in the sector. In addition, capacity building at all levels, from masons, to technicians to biogas engineers, to end users are necessary to maximize the performance of the technologies and stimulate the research and development (R&D) process.

MAFF will therefore continue to allocate the necessary funding for R&D, cooperate with existing expertise centers, such as NBP and BTIC, and develop a research agenda for key challenges faced in the market. In the case SMLSB this entails improving H₂S gas scrubbers, both in terms of efficacy and affordability, offering choices of suitable biodigester size and type based on real assessment, enabling suitable genset size and type, water pumping engine, gas recording mechanism, flare operation in case of excess gas, effective storage, and usage of bio-slurry and R&D on improved digester design with full hydrological isolation to maximize biogas production and to prevent ground water pollution. In the case of DSB, R&D should support the gradual transition away from fixed dome

digesters towards prefabricated digesters which would address issues faced related to mason shortages and low profit margins on fixed dome digesters.

R&D will also be allocated to support emerging opportunities in the mid to long term, such as upgrading and compressing biogas for vehicular fuel or other purposes (i.e. as boiler fuel for garment factories).

Capacity building remains required at all levels. MAFF will continue to work with Technical and Vocational Education and Training (TVET) institutes and cooperate with the agricultural, environmental, and engineering academic institutes together with BTIC on biogas curriculum development.

4.4 Promote incentives and subsidies

The development of the sector, the trainings, the subsidies, the quality control, technical regulation, technical assistance, and implementation require financing. MAFF will carry out resource mobilization and continue to provide in-kind assistance to the sector development. MAFF will also advocate to increase funding for biogas from the national budget. MAFF will also coordinate with development partners to continue financing various biodigester activities.

End-user subsidy or result based financing for companies remains necessary in the short term and requires the support both technical and financial terms from government, development partners and private sectors. However, subsidies to end-users will be gradually phased out in favor of market-oriented instruments such lease to own, Energy Service Company (ESCO) models, Pay-as-you-go (PayGo) or only made available to households against strict and transparent criteria, such as insufficient income, widows or registered in the Ministry of Planning's national poverty registry system (IDPoor). Other market-oriented measures will be considered related to (import) tax exemption on biodigester technologies, equipment (biogas-based generator, water pumping engine biogas-based equipment, flow meters, desulfurization (H₂S removal) system and its consumables) and materials and VAT exemption.

MAFF will also work with MME on developing regulation for biogas electricity sales to the grid against attractive tariffs and conditions.

4.5 Increase marketing of carbon credits to reduce greenhouse gas emission

Biodigesters are recognized as climate friendly technologies and both contribute to climate change mitigation and improve climate change adaptation capacity of farms, i.e., through the application of digester effluents and thereby improving soil health. However, biogas is not always managed properly leading to methane leakage/emissions to the atmosphere nor is bio-slurry always safely stored and utilized resulting in secondary pollution and methane emissions.

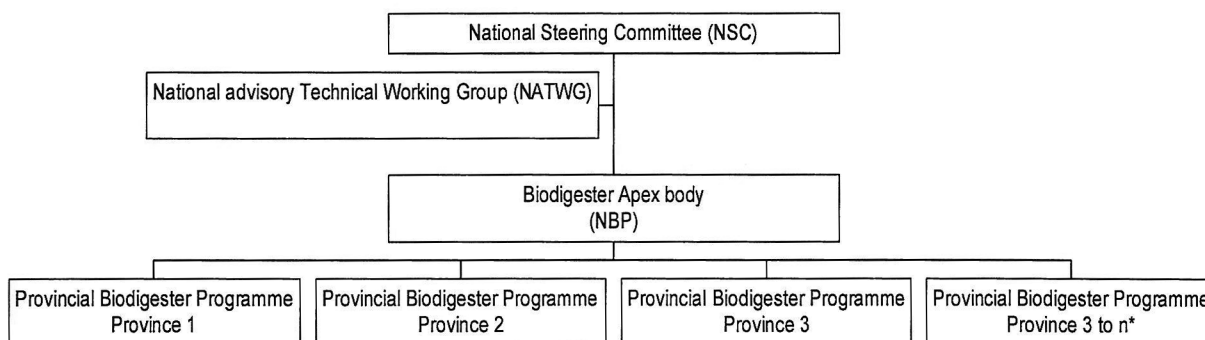
The climate action strategy will therefore focus on improving the positive climate impact of biodigesters, address biogas venting, improve bio-slurry handling and capitalizing on the climate benefits through carbon market mechanisms or other climate finance and implementation of Cambodia's NDC for sector financing.

5 Activity plan

5.1 Establishment of the implementation mechanism

To effectively implement this policy, the sector governance structure is required to run, facilitate, and manage diverse and complex interactions among stakeholders to address shortcomings and develop the sector in a sustainable manner. Existing bodies/institutions/agencies are assigned to be responsible for relevant duties within their mandates, and human resources are appointed as deemed appropriate and essential to perform tasks

To implement this policy successfully, mechanisms shall be established as follows:



Where the National Steering Committee (NSC) coordinates and guide the implementation of the biodigester policy and strategic plan, the National Advisory Technical Working Group (NATWG) supports the committee on technical matters and budget preparation, the biodigester apex body (National Biodigester Programme) implements the policy and strategic plan at national level and at provincial level, in each province a Provincial Biodigester Programme is established at the Provincial Department of Agriculture Forestry and Fisheries at the various provinces to implement the policy and activity plan at provincial³³ level.

In line with MAFF's Gender Mainstreaming Policy, the setting up of the committees and working groups shall strive to be gender balanced with at least 30% of the members being female.

A) National Steering Committee (NSC)

The NSC is an effective coordination mechanism for the implementation of biodigester development policy, 2021-2030. The committee will be established by the decision of the Minister of Agriculture, Forestry and Fisheries. The committee has the following composition:

- Secretary of State of the Ministry of Agriculture, Forestry and Fisheries Chair

³³ n is a provincial biodigester programme

- Undersecretary of the Ministry of Agriculture, Forestry and Fisheries Vice-Chair
- Director General of the General Directorate of Animal Health and Production of the Ministry of Agriculture, Forestry and Fisheries Permanent Member
- Secretary General / Deputy Secretary General of the Ministry of Agriculture, Forestry and Fisheries Member
- Director of National Biodigester Programme of the General Directorate of Animal Health and Production of the Ministry of Agriculture, Forestry and Fisheries Member
- Head of the relevant institutions of the Ministry of Agriculture, Forestry and Fisheries Member
- Representatives of private sectors (DSB and SMLSB) member
- Representative of Agriculture and Rural Development Bank (ARDB) and Small and Medium Enterprise Bank of Cambodia (SME) Bank member
- Representatives of MoE Member

NSC will be implementing key prioritized tasks as follows:

- Coordinate and guide the implementation of biodigester development policy, 2021-2030 to achieve the goals and objectives as stated in this policy.
- Coordinate with the government and development partner to ensure a uniform and coordinated implementation of the policy.
- Review and approve on annual, three years and five years activities and budget plans proposed by the technical working groups at national and provincial level to ensure that the proposed activities in response to this policy.
- Coordinate with development partners, NGOs, the private sector, and stakeholders under the mechanism of Technical Working Group on Agriculture and Water and other mechanisms to enhance cooperation and promote the development of biodigester in Cambodia effectively and sustainably.
- Monitor and evaluate the implementation of the action plan to ensure the effective implementation of the relevant entities.

B) National Advisory Technical Working Group (NATWG)

The NATWG is a mechanism to support the biodigester development policy implementation, 2021-2030. Technical Working Group will be established by the decision of the Minister of Agriculture, Forestry and Fisheries and has the following composition:

- Secretary of State of the Ministry of Agriculture, Forestry and Fisheries Chair
- Undersecretary of the Ministry of Agriculture, Forestry and Fisheries Vice-Chair

- Director General of the General Directorate of Animal Health and Production of the Ministry of Agriculture, Forestry and Fisheries	Vice Chair
- Secretary General /Deputy Secretary General of the Ministry of Agriculture, Forestry and Fisheries	Member
- Director of National Biodigester Programme of the General Directorate of Animal Health and Production of the Ministry of Agriculture, Forestry and Fisheries	Member
- The active member of Gender Mainstreaming Action Group of the Ministry of Agriculture, Forestry and Fisheries	Member
- The relevant Director of the Department and Institute of the General Directorate of Animal Health and Production	
- The relevant head office or representative of the Department and institute of the General Directorate of Animal Health and Production	Member
- Manager of the National Biodigester Programme	Member
- Representatives of the Ministry of Mines and Energy (MME)	Member
- Representatives of the Ministry of Industry, Science, Technology and Innovation (MISTI)	Member
- Representatives of the Ministry of Environment (MoE)	Member
- Chief office of Animal Waste Management	Permanent Member
- Representative of NBP's marketing team	Member
- Representative of NBP's technical team	Secretary
- Representatives of biodigester private companies	Member
- Representatives of BTIC/RUA	Member
- Advisors of the National Biodigester Programme	Observer
- Representatives of the General Department of Taxation	Member

NATWG implements the following key tasks:

- Prepare policy proposals, technical regulations and other regulations related to the development of the sector, feed-in-tariffs, tax exemption and other fiscal and non-fiscal support mechanism in close collaboration with the apex body
- Coordinate the implementation of the National Biodigester Programme, the apex body and other biogas stakeholders for better progress, transparency, and high efficiency.
- Monitor and evaluate on the implementation of the action plan implemented by the Provincial Biodigester Programme to ensure that the implementation of the relevant provincial institutions effectively.

C. Biodigester sector apex body (National Biodigester Programme)

The Ministry of Agriculture, Forestry and Fisheries will promote NBP to become the **apex biodigester** body in the General Directorate of Animal Health and Production for a direct liaison to the National Technical Working Group. The apex body is hosted by GDAHP and established by MAFF. The apex body is the implementing agency of the biodigester policy and will operate on behalf of all biogas actors in an impartial, supporting and facilitating role ensuring quality of biodigester construction, quality of information and after sale services and will carry out regular inspections. The apex body will also:

- Prepare activities and budget for annual, three years and 5 years planning in order to implement biodigester development policy, 2021-2030 successfully.
- Implement the approved action plan, manage, and use biodigester fund transparency by enhancing cooperation with development partners, NGOs, private sectors, and other stakeholders to spread out the use of Biodigesters in Cambodia.
- Carbon credit management of digesters constructed with donor and development partner support to NBP

D) Provincial Biodigester Programme

Director of Provincial Department of Agriculture forestry and fisheries is the Chair of the **Provincial Biodigester Programme**, the chief of animal production and health office is the deputy chair/coordinator, members of this working group include officials from relevant PDAFF offices, officials of the local/district agricultural offices and local biodigester companies.

Provincial Biodigester Programme will implement priority activities as follows:

- Prepare an annual action plan and budget in accordance with the instructions of the apex body (National Biodigester Programme) to jointly implement biodigester development policy, 2021-2030
- Implement the action plan which has been approved by closely cooperating with the apex body and other private sector parties and coordinate technical implementation from the Advisors of the National Biodigester Programme.
- Monitor and evaluate on the implementation of activities of biodigester construction and operation at the district level.
- Cooperate with the Commune Councils to include budget for biodigester construction in the commune-sangkat investment plan and provide technical construction and operation of biodigester at commune-sangkat level.
- Assist biodigester companies, BCA's, masons, including the private sector, in identified areas with potential for biogas

D) Coordination mechanism with development partners

Donor support is preferably channeled through the Ministry of Agriculture Forestry and Fisheries to the apex body for biodigester sector financing. Both bilateral and multilateral assistance can be incorporated in the implementation of this policy.

This biodigester policy was developed under financial assistance provided by UNIDO Cambodia and, expects to cooperate with and looking for the support from development partners such as, GCF, NAMA facility, GEF, IFAD, and others funding countries to execute this this policy effectively for the benefit of clean energy security and safety at national, provincial and the agricultural sector. Currently funding sources of projects provided are public and private funding sources. MAFF will continue to coordinate and liaise with various donors on sector financing, sector development and other support such as technical assistance.

5.2 Legal framework

The policy implementation shall comply with the laws and legal frameworks which are available and in place. Ministries/agencies of the Royal Government of Cambodia can create new laws and regulations for biogas as deemed necessary and needed.

In order to effectively implement this biodigester development policy, the Ministry of Agriculture, Forestry and Fisheries (MAFF) will develop legal framework for the coordination of work implementation and management as follows:

- Decision paper on establishment of National Steering Committee for the coordination in implementation of biodigester development policy, 2021-2030
- Decision paper on establishment of NATWG to support the implementation of biodigester development policy, 2021-2030
- Decision paper on establishing an apex body to regulate and coordinate the sector
- Decision paper on the establishment of provincial biogas program (PBP) at the provincial and city level in the office of animal health and production for managing and coordinating and implementing activities at local areas as too contribute to implementation of the biogas development policy 2021-2030.
- Decision paper on establishment of Biodigester Fund to support the biogas sector (NBP and other program/companies)

5.3 Finance

The Royal Government of Cambodia's national budget will be the main source of financing for the implementation of concrete actions detailed as stated in the action plan via the budget mechanism of the MAFF's programs. The MAFF shall be responsible for addressing issues related to financing according to the vision of this policy document. Simultaneously, finance will also be mobilized from development partners, private sector, and other legal sources.

Furthermore, MAFF will set-up a biodigester Fund to support the biogas sector for the implementation of the annual action plan within the framework of the biogas apex body. The Ministry of Agriculture, Forestry and Fisheries encourages related development partners and the private sector involved to contribute budget for Biodigester Fund and to actively participate in implementation effectively.

At local level, the Provincial Department of Agriculture, Forestry and Fisheries has to increase the extension to the commune council about the benefits of the use of biodigester and to advocate to

allocate annual commune investment budget by setting targets to build at least one biodigester per year per commune.

Furthermore, the apex body will liaise with banks, micro-finance institutions and (impact) investors to raise capital for the construction of biodigesters at farms, agribusinesses, and slaughterhouses.

In the medium-term sustainability of biodigester development, carbon finance is the main source of sector finance. However, and in particular after the period 2025 when NBP's carbon project expires, additional sources of carbon or climate finance are required. The apex body, in cooperation with relevant development partner's and the Ministry of Environment (MoE) will explore the various carbon and/or climate finance options.

5.4 Human resource development

Human resources are a key asset to achieve the policy vision and its successful implementation. The NBP, TVETs (Technical and Vocational Education and Training), BTICs and Universities will conduct training, practical, technical, and academic courses to improve the skills and productivity of masons, technicians, and engineers, create product technical standards as needed, and enable access to new knowledge through study tours, conferences, internships, applied and academic research and field work. In addition, the apex body will, on behalf of MAFF:

- Conduct a training capacity need assessment for technical experts, farm owners and biodigester clients and other stakeholders.
- Coordinate and facilitate an annual recurring internship program in cooperation with development partners the private sector for university and vocational students and increase female student participation to 30%.
- Mobilize and arrange the financial resource for training programs related to biodigester development.
- Arrange and implement a training plan to strengthen the capacity of technical officials and relevant stakeholders on the DSB technical aspects, particularly on the training program set out in the National Biodigester Programme.
- Coordinate and collaborate to develop curriculum and courses on biodigesters for education institutes and agricultural training institutions (Royal University of Agriculture, Prek Leap National College of Agriculture and Kampong Cham National Agriculture College etc.), in close cooperation with BTIC.
- Establish the extension programs to build the capacity of Biodigester Construction Agents, and to arrange study tour to exchange experiences between Biodigester Construction Agents (BCA) and also offer this program to non-NBP actors.
- Train biogas companies, BCAs on business skills and facilitate the promising ones to become registered companies.

5.5 Policy implementation

The biodigester sector development is linked to the whole agricultural sector, this policy will therefore align with national strategies and related sectoral policies to complement each other for development effectiveness.

5.5.1 Biogas promotion

1. Promote construction and utilization of DSB.

MAFF, through the apex body, will continue to promote, in close collaboration with development partners and private sector parties, biodigesters for households, irrespective of the implementers, in an impartial manner. In order to increase the construction of biodigester in rural areas the MAFF will focus on the following elements:

- 1) Promote construction of household biodigesters to reduce pandemic diseases from animal crops and zoonosis.
- 2) Promote construction and utilization of household biodigesters to reduce dependence on unsustainable forest resources, reduce expenditure on LPG and improve indoor air quality for all biogas implementers.
- 3) Allow BCAs to install different types of technologies other than those promoted by NBP provided the technology meets technical norms approved by MAFF/apex body.
- 4) Enhance the biodigester extension to farmers on creating awareness on benefits and technology of biodigesters through MAFF's provincial offices.
- 5) Ensure the promotion and awareness creation is implemented at all levels, such as inclusion of biodigesters in the commune development plans.
- 6) Ensure continued use of biodigesters by improving after sales services, setting up a communication mean for providing information about biodigesters.
- 7) Utilize the nationwide biogas infrastructure of NBP for biogas promotion and dissemination of technologies.

2. Promote investments in reliable SMLSB biogas plants for livestock farms and agro-processing industry.

SMLSB can become a solution to a number of issues these companies face, such as the need to environmentally treat wastewater in order to prevent eutrophication³⁴, foul odor emission as per Prakas 549 and address high operation costs. In order to promote construction and utilization of biogas for those companies, the apex body will focus on the following elements:

- 1) Create awareness on the benefits of biodigester to improve business performance, environmental and other benefits amongst banks, MFIs, investors, and farmers.
- 2) Promote biogas as a sustainable agricultural waste management (animal and crop) solution and opportunity to lower operation cost in the expanding livestock and agro-processing industry aligned with sectoral policies, plans and targets.
- 3) Promote the SMLSB biodigesters by developing a "white paper" introducing the technology and inform the financial institutions and donors about the substantive economic return possible for commercial pig farms using biogas.
- 4) Promote commercialization of bio-slurry as another income stream for the SMLSB investors
- 5) Inspire and encourage biodigester farmers to develop communities that practices an integrated pest management and organic agriculture by linking the biodigester with growing crops.

³⁴ *Eutrophication is an enrichment of water by nutrients that causes structural changes to the ecosystem such as: increased production of algae and aquatic plants, depletion of fish species, general deterioration of water quality and other effects that reduce and preclude use.*

3. Promote construction and utilization of biodigesters at slaughterhouses

The rapid growth of the livestock sector will result in more slaughterhouse waste. Most slaughterhouse waste is currently not effectively managed resulting in environmental and odor pollution. Addressing this situation is a key priority in this policy. To overcome this, apex body will:

- 1) Develop minimum regulation on slaughterhouse waste management in line with Sub-decree 108 and 225 and consider mandating the construction of a biodigester to treat waste and recover energy.
- 2) Create awareness on biodigesters as waste management solution for slaughterhouse waste, including the benefits of utilizing biogas.
- 3) Develop biodigester technologies suitable for various slaughterhouse sizes in cooperation with NBP and BTIC and private sector parties, including provision to utilize all biogas and proper storage and utilization of the biodigester effluent.

5.5.2 Improve sector governance, coordination, and reporting.

The biodigester market is developing rapidly in Cambodia through various projects and programs with each their implementation mechanism, subsidy, quality control mechanism and varying levels of after construction services. To promote sector development at a desirable speed, responsible ministries, in cooperation with development partners, MAFF will implement to following strategic measures:

- 1) Promote NBP to become the sector governance apex body overseen by the National Steering Committee - the apex body would be responsible for:
 - a. Formulation and promotion the implementation of supportive policies for biogas, including norms and technical regulation for all stakeholders, standard conformity checks and inspections.
 - b. Coordination of involved government and donor agencies and private sector.
 - c. Monitoring and reporting the progress of the biogas program and other parties.
 - d. Coordinate tax exemptions for biogas appliances and other biogas equipment.
 - e. Subsidy management and administration for a number of biogas sector.
 - f. Coordinate with MME, MISTI and MoE on biogas, renewable energy, climate change etc.
- 2) Ensure competition occurs in a regulated market where conditions are similar for all construction companies in terms of subsidy regime and taxation.
- 3) Improve coordination and dialogue between the various stakeholders by initiating setting up a biodigester company community/ association.
- 4) Collaborate with the locally available specialized center, BTIC to carry out research and development activities as well as consulting services that are aimed to promote the development of biogas industry in the country.
- 5) Inform, connect and train biodigester companies on relevant policies and regulations.
- 6) Establish an information system on technical construction and operation of biodigester and promote to relevant stakeholders in countrywide in cooperation with BTIC on SMLSBS.
- 7) Establish a national database covering all biogas activities to track policy implementation and for reporting purposes.

5.5.3 Improve the biodigester quality infrastructure.

A characteristic of a functioning market is competition between companies. However, regulation and technical norm are necessary to ensure betterment. In this direction, the apex body will focus mainly on implementation of five strategic measures are.

- 1) Prepare and effectively implement the technical norms of biodigester with clear technical provisions, construction condition, biogas quality and utilization, quality management with warranty, and training to the users for all biodigester types.
- 2) Prepare an implementation strategy for the norms currently under development with the aim to develop a unified norm for the whole sector.
- 3) The apex body will become the independent quality inspection body in order to assure the quality (of biodigesters) against technical norms with applicability to the whole sector and set-up a certification scheme for BCA's transitioning to becoming an enterprise.
- 4) Encourage the use of technical norms for commercial development of the biogas sector.
- 5) Train and strengthen the capacity of technical and inspection teams for monitoring and evaluation on implementation of biodigester technical norms.

5.5.4 Fiscal and non-fiscal support mechanism

5.5.4.1 Domestic scale biodigesters

MAFF will continue to support the sector with the following strategic measures:

- 1) Re-assess the need and extent of subsidies required for DSB based on financial indicators³⁵ and develop guidelines for the sector on subsidy levels and possible exceptions for vulnerable groups.
- 2) Utilize carbon rebates for short or medium term to fund subsidies in case development partner support is inadequate. Facilitate the request for VAT exemption on sales for companies installing biodigesters at household level and import duty exemption for construction materials, stoves, generators, PayGo instrumentation to reduce project cost.
- 3) Increase cooperation with banks, MFI's, and impact investors for financing of DSB especially on loans with reasonable interest acceptable by farmer and - utilize the biodigester fund to create new loan products for biogas, such as lease to own financing, PayGo and other innovative financing models.

5.5.4.2 Medium and large-scale biogas

The following support mechanisms will be implemented to support SMLSB biodigester uptake.

- 1) MAFF will liaise with the Ministry of Mines and Energy (MME), especially Electricité Du Cambodge (EDC) on the development of a feed-in tariff policy enabling the sale of biogas-electricity to the grid against attractive rates or allowing its sale directly to nearby households at the same rates as local private and/or state suppliers.

³⁵ Such as achieving a reasonable financial internal rate of return and pay-back period

- 2) MAFF will liaise with the Ministry of Environment (MoE) and related ministries to promote and facilitate the process of social and environmental impact assessments for medium and large-scale livestock farms and agro-processing facilities to ensure the challenge of waste and pollution management and impacts on health and welfare of people residing in processing sites or downstream areas.
- 3) Facilitate the request for import tax exemption on materials (i.e., HDPE, geotextile) and equipment (stoves, biogas generators, water pumping engine, PayGo instrumentation, H₂S filters and consumables etc.) in order to reduce biodigester costs.
- 4) Coordinating with donors and financial institutions in providing concessional interest rates.

5.5.5 Establish and Promote DSB Biodigester User Community

SSC biodigester user communities are the foundation for information access, knowledge of technology and other experiences related to biodigester development. ATEC for example connects users through Smart Farmer communities, allowing them to share information, knowledge and obtain instant feedback if there are issues. Organizing biodigester owners at the grassroots through these networks will also improve their negotiation position with private companies. The apex body of MAFF will therefore:

- 1) Set-up user networks for biodigesters owners.
- 2) Support both technical and financial in the establishment of biodigester user community.
- 3) Increase support by linking user networks to trained masons or companies serving a particular area.
- 4) Promote the application of integrated farming system within the community in order to increase the animal production and organic/safe agricultural production.

5.5.6 Promote research and development and the use of biodigester.

The research and development for biodigester construction and operation is a key element to improve the quality of biodigester, its cost-effectiveness and to maximize the benefits of biodigester. To achieve this the apex body of MAFF will focus on the implementation of four strategic measures as follows:

- 1) Cooperate with BTIC on research and development of medium and large-scale digester technologies including appropriate and affordable H₂S gas scrubbers, gen-sets, water pumping engine, digester designs and bio-slurry application.
- 2) Promote R&D and establish digestate/bio-slurry value chains, in particular for SMLS farms and agro-processing industries, to reduce the reliance on imported fertilizers, close nutrient loops³⁶, improve soil health and fertility and improve soil resilience to climate change with potential biodigester fund.
- 3) Promote research and development on uses of biogas, such as biogas upgrading to vehicular fuels, boiler fuels, bottled as cooking fuel.

³⁶ Closed loop agriculture is farming practice that recycles all nutrients and organic matter material back to the soil that it grew in. This forms part of an agricultural practice that preserves the nutrient and carbon levels within the soil and allows farming to be carried out on a sustainable basis

5.5.7 Increase budget allocation to GDAHP for biogas development

The MAFF will continue to carry out resource mobilization for the development of biodigester in Cambodia and aim to increase financial resource and allocate national budget increase from 4% to 10% of the national budget for animal health and production sub-sector by 2030. MAFF will also encourage development partners to actively participate in the development of biodigesters in Cambodia, both financially and technically.

5.5.8 Attract climate finance.

Mobilizing carbon/climate finance is an important strategic measure in resource mobilization for the development of biodigesters. More biodigester construction will result in more greenhouse gas emission reductions and therewith a higher opportunity to tap in various climate finance. However, not all biogas plants are managed and used properly, and, in some cases, biogas is vented to the atmosphere resulting in a negative climate impact. The following policy measures will therefore be imposed:

- 1) Promote and consider biodigester construction as a cost-effective method to reduce GHG emission and improve climate resilience aligned with the NDC.
- 2) Promote biogas flares for unused biogas to prevent release of methane gas to the atmosphere and increase safety to human being and animals.
- 3) Promote optimal biogas use in order to avoid release of unused biogas to the atmosphere by developing and dissemination biogas technologies other than stoves and/or encourage biogas sharing with neighbors or sell electricity to agro-processing facilities or electricity operators.
- 4) Manage the treated effluent or manure in a biogas plant properly without causing environmental pollution. Apex body of GDAHP will develop guidelines on effluent management.
- 5) Farmers who own the digestors shall be provided extension or training on the use and maintenance by the apex body of GDAHP by using the carbon finance and carbon credit (in case the carbon right is transferred from the families, farms and slaughterhouses to NBP and at the permission of the donors).
- 6) NBP shall inform DSB users on the use of carbon finance for trainings and to maintain digesters.
- 7) Improve marketing of carbon credits and explore different markets for the value/credits, including the domestic market and collaborate with NCSD/MoE on a NDC biogas implementation plan to attract climate finance.

6 Policy Monitoring and Evaluation

To implement the policy effectively, a monitoring system will be established to monitor, track, and assess ongoing progress and results as follows:

- Policy goal and objectives
- Indicators against the action plan
- Policy progress reports
- Report against development outcomes (baseline/end line targets)
- Policy mid-term review
- Policy evaluation

The National Advisory Technical Working Group (NATWG) shall be responsible for monitoring, evaluation, and coordination at the policy level to ensure the consistency and alignment of this policy with other policies and strategies implemented by provincial biodigester programme. All the collected data for the reports shall be sex-disaggregated aligned with MoWA (2015) Project Gender Mainstreaming guidance for Gender Responsive Sector Policy.

Monitoring officers of the NATWG will be senior and/or monitoring and evaluation (M&E) experts or those who can participate in all activities, have expertise, and can provide critically constructive comments/insight as well as inputs to the strategy and action plan.

NATWG shall formulate a M&E plan which defines SMART³⁷ indicators including the KPI in table 4 and the performance indicators in Annex A and B, methodologies, data collection, means of verification, and report which can provide updates to the Chairman of the National Steering Committee (NSC), and/or line ministries/agencies. The National Technical Advisory Working Group is able to recruit M&E consultants/experts to craft a M&E plan and facilitate monitoring activities.

Reporting system on the effectiveness and efficiency of the use of biodigester will be clearly defined to guide the implementation in line with the progress of the global biodigester development. Progress report will be prepared on an annual basis, and every 5 year a mid-term review will be prepared by the apex body. Provincial Department of Agriculture, Forestry and Fisheries will have to cooperate as necessary in the evaluation of the implementation of this policy. The apex body will also explore utilizing the reporting mechanism of the ODA database administered by CDC for enhanced transparency³⁸.

Summarized reports will be published on the MAFF website and the information will be shared with the MoE for tracking of the NDC implementation, Ministry of Planning for tracking of the CSDG implementation, e.g., CSDG 7.1.2 Proportion of population with primary reliance on clean fuels and technology and other SDGs.

The Department of Planning and Statistics of MAFF will have an important role in the coordination, collection sex-aggregated data, and implementation of monitoring and evaluation work closely in collaboration with the General Directorate of Animal Production and Health and/or the apex body.

7 Conclusion

This policy is an update of the biodigester policy 2016-2025 and is developed in response to the rapid development in the agricultural sector, both livestock and the agro-processing industry. The revised biodigester development policy, 2021-2030 in Cambodia is prepared with clearly defined vision and goal of actual strategic policies within the medium and long term mission of the Ministry of Agriculture Forestry and Fisheries, including many measures policies are devised and involved implementation of the various sections in all sub-sectors under the management of the Ministry, and requires the collaborated implementation from public sector, development partners, national and international organizations and private sectors to implement policies have been set forward to boost agriculture sector efficiently.

³⁷ SMART quality indicators stands for Specific, Measurable, Achievable, Relevant and Time-bound.

³⁸ <http://odacambodia.com/>

The Ministry of Agriculture, Forestry and Fisheries hopes and believes that the Royal Government of Cambodia will deem the Policy on Biodigester development, 2021-2030 as high priority. MAFF continues to strongly support the implementation of this policy, reducing negative impacts to ensure the growth of the agriculture sector, both to improve the lives of small farmers but also to improve the overall economic and environmental performance of household, small, medium and large farms, slaughterhouses, and agribusinesses.

By creating an enabling environment for the private sector, such as a level playing field, the sector will continue to develop and attract investment from various sources.

The Ministry of Agriculture, Forestry and Fisheries strongly commits in the implementation of this Policy on Biodigester development, 2021-2030, aiming to improve the animal and agricultural waste management in compliance with the proper technical provision, good sanitation, and hopes that the achievement under this policy framework will yield positive results from now on.

Acronyms

BCA	Biodigester Construction Agent
BTIC	Biogas and Technology Information Center
COVID-19	Worldwide pandemic of coronavirus disease 2019
CSDG	Cambodian Sustainable Development Goals
DSB	Domestic Scale Biodigester
EdC	Electricité du Cambodge
ESCO	Energy Service company
EVAP	Evaporative cooling system
GDAHPP	General Directorate of Animal Health and Production
GDP	Gross domestic product
GHG	Greenhouse gas
H ₂ S	Hydrogen sulfide gas
IPCC	Intergovernmental Panel on Climate change
kVA	Kilovolt ampere
KPI	Key performance indicator
NATWG	National Technical Advisory Working Group
NSC	National Steering Committee
MAFF	Ministry of Agriculture, Forestry and Fisheries
MAFF	Ministry of Agriculture Forestry and Fisheries
MISTI	Ministry of Industry, Science and Technology and Innovation
SMLSB	Small, Medium and large scale biodigester
MME	Ministry of Mines and Energy
NBP	National Biodigester Program
NDC	Nationally Determined Contribution
ODA	Official Development Aid
R&D	Research and development
UNIDO	United Nations Industrial Development Organization

Annex A: Matrix of Legal Framework implementation

Legal framework	year	Lead/responsible Institution
Decision paper on establishment of National Steering Committee for the coordination in implementation of biodigester development policy, 2021-2030	2021	- MAFF - GDAPH
Decision paper on establishment of NATWG for the preparation of biodigester development policy, 2021-2030	2021	- MAFF - GDAPH
Decision paper on promoting NBP to become the apex body to regulate and coordinate the sector	2021	- MAFF - GDAPH
Decision paper for the establishment of provincial biogas program (PBP) at the provincial and city level for managing and coordinating and implementing activities at local areas as too contribute to implementation of the biogas development policy 2021-2030.	2021	- MAFF - GDAPH
Decision paper on establishment of Biodigester Fund to support the biogas sector (NBP and other program/companies)	2021	- MAFF - GDAPH

Annex B: Matrix of Policy measures and Action plan

Practical measure	Policy actions	Performance indicator	Target year	Lead/responsible Institution
<p>1. Biogas promotion:</p> <p>1.1 Promote construction and utilization of DSB.</p>	<p>1) Promote construction of household biogas to reduce pandemic diseases from animal and crops.</p> <p>2) Promote construction and utilization of household biogas to reduce dependence on unsustainable forest resources, reduce expenditure on LPG and improve indoor air quality for all biogas implementers.</p> <p>3) Allow BCAs to install different types of technologies other than those promoted by NBP provided the technology meets technical norms approved by MAFF/apex body.</p> <p>4) Enhance the biogas extension to farmers on creating awareness on benefits and technology of biogas through MAFF's provincial offices.</p> <p>5) Ensure the promotion and awareness creation is implemented at all levels, such as inclusion of biogas in the commune development plans.</p> <p>6) Ensure continued use of biogas by improving after sales services, setting up a communication mean for providing information about biogas.</p>	<p>Table 4 KPI 2, 3 and 5</p> <p>Cumulative number of biogas constructed: 65,000 by 2030</p> <p>Amount of firewood reduced: 705 thousand ton by 2030</p> <p>Amount of bio-slurry utilized: 20,016 thousand ton by 2030</p>	<p>Continues</p> <p>SMART indicators/ annual targets to be defined in M&E plan</p>	<p>apex body</p> <p>NBP/GDAHP</p> <p>PBP/PDAFF</p>

Practical measure	Policy actions	Performance indicator	Target year	Lead/responsible Institution
1.2 Promote investments in reliable SMLSB for livestock farms and agro-processing industry.	<p>7) Utilize the nationwide biogas infrastructure of NBP for biogas promotion and dissemination of technologies.</p> <p>1) Create awareness on the benefits of biogas to improve business performance, environmental and other benefits amongst banks, MFIs, investors, and farmers.</p> <p>2) Promote biogas as a sustainable agricultural waste management (animal and crop) solution and opportunity to lower operation cost in the expanding livestock and agro-processing industry aligned with sectoral policies, plans and targets.</p> <p>3) Promote the SMLSB biogas by developing a “white paper” introducing the technology and inform the financial institutions and donors about the substantive economic return possible for commercial pig farms using biogas.</p> <p>4) Promote commercialization of bio-slurry as another income stream for the SMLSB investors</p> <p>5) Inspire and encourage biogas farmers to develop an integrated farming system and organic agriculture by linking the biogas with growing crops.</p>	<p>Table 4 KPI 4,6,7 and 8</p> <p>Number of biogas plants constructed</p> <p>(Farms: 500 small and medium-scale, and 20 large scale by 2030.</p> <p>Agribusinesses 20 medium and large scale plants by 2030)</p> <p>Total installed capacity: 105 MW by 2030</p>	Continues SMART indicators/ annual targets to be defined in M&E plan	apex body NBP/GDAH
1.3 Promote construction and utilization of biogas plants	<p>1) Develop minimum regulation on slaughterhouse waste management in line with Sub-decree 108 and 225 and consider</p>	Table 4 KPI 9	Continues SMART indicators/ annual targets to be defined in M&E plan	Apex body NBP/GDAH BTIC/RUA Private sector

Practical measure	Policy actions	Performance indicator	Target year	Lead/responsible Institution
at slaughterhouses	<p>mandating the construction of a biodigester to treat waste and recover energy.</p> <p>2) Create awareness on biodigesters as waste management solution for slaughterhouse waste, including the benefits of utilizing biogas.</p> <p>3) Develop biodigester technologies suitable for various slaughterhouse sizes in cooperation with NBP and BTIC and private sector parties, including provision to utilize all biogas and proper storage and utilization of the biodigester effluent.</p>	Number of biodigesters constructed: 76 by 2030		
2. Improve sector governance, coordination, and reporting.	1) Promote NBP to become the sector governance apex overseen by the NSC	Legal decision paper on apex body set-up	2022	MAFF NSC
	2) Ensure competition occurs in a regulated market where conditions are similar for all construction companies in terms of subsidy regime and taxation.	Decision paper on national subsidy regulation biogas industry	2022	NSC Apex body GDAH/ NBP
	3) Improve coordination and dialogue between the various stakeholders by initiating setting up a biodigester company community/ association.	Biodigester company association established	2022	Apex body/NBP BTIC/RUA Private sector
	4) Collaborate with the locally available specialized center, BTIC to carry out research and development activities as well as consulting services that are aimed to promote the development of biogas industry in the country.	Biogas R&D plan with annual update	Annual SMART indicators/ annual targets to be defined in M&E plan	Apex body/NBP BTIC/RUA

Practical measure	Policy actions	Performance indicator	Target year	Lead/responsible Institution
3. Improve the biodigester quality infrastructure.	5) Inform, connect and train biodigester companies on relevant policies and regulations.	Annual implementation plan of apex body	Continues SMART indicators/annual targets to be defined in M&E plan	Apex body/NBP BTIC/RUA
	6) Establish an information system on technical construction and operation of biodigester and promote to relevant stakeholders in countrywide in cooperation with BTIC on SMLSB.	Technology white paper with annual update	Annual	NBP/GDAHP Private sector BTIC/RUA
	7) Establish a national database covering all biogas activities to track policy implementation and for reporting purposes.	National biodigester database	2022 with annual updates	Apex body/NBP
	1) Prepare and effectively implement the technical norms of biodigester with clear technical provisions, construction condition, biogas quality and utilization, quality management with warranty, and training to the users for all biodigester types.	Technical norm	DSB sector wide norm: 2022 with annual review SMLSB technical norm 2023 with annual review	MAFF Apex body NBP/GDAHP Private sector
	2) DSB: Prepare an implementation strategy for the norms currently under development with the aim to develop a unified norm for the whole sector.			Apex body NBP/GDAHP
	3) The apex body will become the independent quality inspection body in order to assure the quality (of biodigesters) against technical norms with applicability to the whole sector and set-up a certification scheme for BCA's transitioning to becoming an enterprise	Quality inspection procedure designed and implemented	2022 onwards SMART indicators/annual targets to be defined in M&E plan	Apex body NBP/GDAHP
	4) Encourage the use of technical norms for commercial development of the biogas sector			

Practical measure	Policy actions	Performance indicator	Target year	Lead/responsible Institution
	5) Train and strengthen the capacity of technical and inspection teams for monitoring and evaluation on implementation of biogas digester technical norms	Training and capacity evaluation report	Annual SMART indicators/ annual targets to be defined in M&E plan	Apex body NBP/GDAH
4. Fiscal and non-fiscal support mechanism 4.1 Fiscal and non-fiscal support mechanism for DSB	1) Re-assess the need and extent of subsidies required for DSB based on financial indicators and develop guidelines for the sector on subsidy levels and possible exceptions for vulnerable groups.	Apex implementation plan M&E report	Annual	NSC NATWG Apex body NBP/GDAH
	2) Utilize carbon rebates for short or medium term to fund subsidies in case development partner support is inadequate.			
	3) Facilitate the request for VAT exemption on sales for companies installing biogas digesters at household level and import duty exemption for construction materials, stoves, generators, PayGo instrumentation to reduce project cost	Sales VAT exemption regulation Import duty exemption regulation	2022	NSC NATWG Apex body NBP/GDAH
4.2 Fiscal and non-fiscal support	4) Increase cooperation with banks, MFI's, and impact investors for financing of DSB especially on loans with reasonable interest acceptable by farmer and - utilize the biogas digester fund to create new loan products for biogas, such as lease to own financing, PayGo and other innovative financing models.	New loan products	2022 onwards SMART indicators/ annual targets to be defined in M&E plan	NSC NATWG Apex body NBP/GDAH Banks
	1) MAFF will liaise with the Ministry of Mines and Energy (MME), especially Electricité Du Cambodge (EDC) on the development of a feed-in tariff policy enabling the sale of biogas-	Electricity sale regulation (feed-	2022	NATWG Apex body NBP/GDAH

Practical measure	Policy actions	Performance indicator	Target year	Lead/responsible Institution
mechanism for SMLSB	electricity to the grid against attractive rates or allowing its sale directly to nearby households at the same rates as local private and/or state suppliers.	in-tariff and local sales)		
	2) MAFF will liaise with the Ministry of Environment (MoE) and related ministries to promote and facilitate the process of social and environmental impact assessments for medium and large-scale livestock farms and agro-processing facilities to ensure the challenge of waste and pollution management and impacts on health and welfare of people residing in processing sites or downstream areas.	Streamlined and social and environmental impact regulation for SMLSB	2022	NATWG Apex body NBP/GDAHP
	3) Facilitate the request for import tax exemption on materials (i.e., HDPE, geotextile) and equipment (stoves, biogas generators, water pumping engine, PayGo instrumentation etc.) in order to reduce biodigester costs.	Import duty exemption regulation	2022	Apex body NATWG NBP/GDAHP
	4) Coordinating with donors and financial institutions in providing concessional interest rates	Loans available with reasonable interest	2022 with annual updates SMART indicators/ annual targets to be defined in M&E plan	Apex body NATWG NBP/GDAHP Banks
5. Establish and Promote Biodigester User Community	1) Set-up user networks for biodigesters owners.	Table 4, KPI 10	2022 with annual update	Apex body NBP/GDAHP PBP/PDAFF
	2) Support both technical and financial in the establishment of biodigester user community.	15 biodigester user networks by 2030		

Practical measure	Policy actions	Performance indicator	Target year	Lead/responsible Institution
	<p>3) Increase support by linking user networks to trained masons or companies serving a particular area.</p> <p>4) Promote the application of integrated farming system within the community in order to increase the animal production and organic/safe agricultural production</p>		SMART indicators/ annual targets to be defined in M&E plan	
6. Promote research and development and the use of biogas.	1) Cooperate with BTIC on research and development of medium and large-scale digester technologies including appropriate and affordable H2S gas scrubbers, gen-sets, water pumping engines, digester designs and bio-slurry application	Annual R&D activity plan	2022 with annual updates SMART indicators/ annual targets to be defined in M&E plan	Apex body NBP/GDAH BTIC/RUA
	2) Applied research on alternative uses of biogas, such as biogas upgrading to vehicular fuels, boiler fuels, bottled as cooking fuel.			
	3) Disseminate new and improved technologies to private sector parties.			
7. Increase budget allocation to GDAH for biogas development	The MAFF will continue to carry out resource mobilization for the development of biogas in Cambodia and aim to increase financial resource and allocate national budget increase from 4% to 10% of the national budget for animal health and production sub-sector by 2030. MAFF will also encourage development partners to actively participate in the development of biogas in Cambodia, both financially and technically.	Annual technology white papers on best practices and new technologies 10% by 2030	Annual 2022-2030	Apex body NBP/GDAH BTIC/RUA MAFF NSC GDAH

Practical measure	Policy actions	Performance indicator	Target year	Lead/responsible Institution
8. Attract climate finance.	1) Promote biodigester construction as a cost-effective method to reduce GHG emission and improve climate resilience aligned with the NDC.	Table 4 KPI 1 2,554 GgCO ₂ e reduced by 2030	2022 with annual updates SMART indicators/annual targets to be defined in M&E plan	Apex body NATWG NBP/GDAH
	2) Promote biogas flares for unused biogas to prevent release of methane gas to the atmosphere and increase safety to human being and animals			
	3) Promote optimal biogas use in order to avoid release of unused biogas to the atmosphere by developing and dissemination biogas technologies other than stoves and/or encourage biogas sharing with neighbors or sell electricity to agro-processing facilities or electricity operators			
	4) Manage the treated effluent or manure in a biogas plant properly without causing environmental pollution. Apex body of GDAH will develop guidelines on effluent management			
	5) Famers who own the digestors shall be provided extension or training on the use and maintenance by the apex body of GDAH by using the carbon finance and carbon credit (in case the carbon right is transferred from the families, farms and slaughterhouses to NBP and at the permission of the doners).	Annual carbon utilization budget plan	2022	MAFF NSC Apex body NBP/GDAH
	6) NBP shall inform DSB users on the use of carbon finance for trainings and digesters maintenance services	Training reports	2021 with annual updates SMART indicators/annual targets to be defined in M&E plan	Apex body

Practical measure	Policy actions	Performance indicator	Target year	Lead/responsible Institution
	7) Improve marketing of carbon credits and explore different markets for the value/credits, including the domestic market and collaborate with NCSD/MoE on a NDC biogas implementation plan to attract climate finance	Annual carbon marketing plan NDC implementation plan	2022	NATWG NSC Apex body NBP/GDAHPP

Glossary

Apex body	An organization having the most important position in the sector. In the context of this policy, the apex body is the top implementing body responsible for regulating, coordinating, and facilitating biodigester sector development for all biogas actors in an impartial manner
Bio-slurry	Effluent from the biodigester, also referred to as digestate
CO ₂ e	Carbon dioxide equivalent is a metric used to compare the emissions from various greenhouse gases on the basis of their global-warming potential (GWP), by converting amounts of other gases to the equivalent amount of carbon dioxide with the same global warming potential.
Eutrophication	Eutrophication is a limnological term for the process by which a body of water becomes progressively enriched with minerals and nutrients. Eutrophication is characterized by excessive plant and algal growth due to the increased availability of one or more limiting growth factors needed for photosynthesis resulting tainted drinking water supplies, degradation of recreational opportunities, and hypoxia (resulting in fish death)
Good Animal Husbandry Practice (GAHP)	Good husbandry practices at farm level form an essential component of the production of quality and safe food. It encompasses all the measures adopted at the farm, from procuring and rearing healthy animals, their welfare, to final slaughter or milking.
PayGo	PAYGO (Pay As You GO) is the practice of financing expenditures with funds that are currently available rather than borrowed.
Leasing	A contract for the use of land or buildings, but not for their ownership.
Zoonotic disease	Diseases that spread between animals and people.



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ជាតិ សាសនា ព្រះមហាក្សត្រ

ក្រសួងកសិកម្ម រុក្ខាប្រមាញ់ និងនេសាទ

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- បានឃើញរដ្ឋធម្មនុញ្ញនៃព្រះរាជាណាចក្រកម្ពុជា
- បានឃើញព្រះរាជក្រឹត្យលេខ នស/រកត/០៩១៨/៩២៥ ចុះថ្ងៃទី៦ ខែកញ្ញា ឆ្នាំ២០១៤ ស្តីពីការតែងតាំង រាជរដ្ឋាភិបាលនៃព្រះរាជាណាចក្រកម្ពុជា
- បានឃើញព្រះរាជក្រមលេខ នស/រកម/០៦១៨/០១២ ចុះថ្ងៃទី២៨ ខែមិថុនា ឆ្នាំ២០១៨ ដែលប្រកាសឱ្យ ប្រើច្បាប់ស្តីពីការរៀបចំ និងការប្រព្រឹត្តទៅនៃគណៈរដ្ឋមន្ត្រី
- បានឃើញព្រះរាជក្រមលេខ នស/រកត/០១៩៦/១៣ ចុះថ្ងៃទី២៤ ខែមករា ឆ្នាំ១៩៩៦ ដែលប្រកាសឱ្យប្រើ ច្បាប់ស្តីពីការបង្កើតក្រសួងកសិកម្ម រុក្ខាប្រមាញ់ និងនេសាទ
- បានឃើញអនុក្រឹត្យលេខ១៧ អនក្រ.បក ចុះថ្ងៃទី០៧ ខែមេសា ឆ្នាំ២០០០ ស្តីពីការរៀបចំ និងការប្រព្រឹត្តទៅ របស់ក្រសួងកសិកម្ម រុក្ខាប្រមាញ់ និងនេសាទ
- បានឃើញអនុក្រឹត្យលេខ១០៥ អនក្រ.បក ចុះថ្ងៃទី២២ ខែសីហា ឆ្នាំ២០០៥ ស្តីពីការបន្ថែមមុខងារភារកិច្ច ឱ្យក្រសួងកសិកម្ម រុក្ខាប្រមាញ់ និងនេសាទ និងការបង្កើតនាយកដ្ឋានសវនកម្មផ្ទៃក្នុង នាយកដ្ឋានផែនការ និងស្ថិតិ នាយកដ្ឋានសហប្រតិបត្តិការអន្តរជាតិ និងមជ្ឈមណ្ឌលព័ត៌មាន និងឯកសារកសិកម្ម ចំណុះក្រសួង កសិកម្ម រុក្ខាប្រមាញ់ និងនេសាទ
- បានឃើញអនុក្រឹត្យលេខ១៤៨ អនក្រ.បក ចុះថ្ងៃទី១៤ ខែវិច្ឆិកា ឆ្នាំ២០០៨ ស្តីពីការកែសម្រួលអគ្គនាយកដ្ឋាន នៃក្រសួងទៅជាអគ្គលេខាធិការដ្ឋាន ការដំឡើងរដ្ឋបាលព្រៃឈើ រដ្ឋបាលជលផលឱ្យមានថ្នាក់ស្នើអគ្គនាយកដ្ឋាន ការដំឡើងនាយកដ្ឋានក្សេត្រសាស្ត្រនិងកែលម្អដីកសិកម្មឱ្យទៅជាអគ្គនាយកដ្ឋានកសិកម្ម និងការកែសម្រួល អគ្គនាយកដ្ឋានចម្ការកៅស៊ូទៅជាអគ្គនាយកដ្ឋានកៅស៊ូ ស្ថិតក្រោមការគ្រប់គ្រងរបស់ក្រសួងកសិកម្ម រុក្ខាប្រមាញ់ និងនេសាទ
- បានឃើញអនុក្រឹត្យលេខ២២៤ អនក្រ.បក ចុះថ្ងៃទី២៨ ខែតុលា ឆ្នាំ២០១៦ ស្តីពីការដំឡើងនាយកដ្ឋាន ផលិតកម្ម និងបសុព្យាបាល ទៅជាអគ្គនាយកដ្ឋានសុខភាពសត្វ និងផលិតកម្មសត្វ
- បានឃើញអនុក្រឹត្យលេខ៨១ អនក្រ.បក ចុះថ្ងៃទី២១ ខែមិថុនា ឆ្នាំ២០១៩ ស្តីពីការកែសម្រួលមាត្រា២ មាត្រា២៥ មាត្រា២៦ និងមាត្រា៣៥ នៃអនុក្រឹត្យលេខ១៨៨ អនក្រ.បក ចុះថ្ងៃទី១៤ ខែវិច្ឆិកា ឆ្នាំ២០០៨ និងមាត្រា២៧ថ្មី នៃអនុក្រឹត្យលេខ១១៤ អនក្រ.បក ចុះថ្ងៃទី២៦ ខែកក្កដា ឆ្នាំ២០១៧
- យោងតាមសំណើរបស់ប្រតិភូរាជរដ្ឋាភិបាលកម្ពុជាទទួលបន្ទុកជាអគ្គនាយកនៃអគ្គនាយកដ្ឋានសុខភាពសត្វ និងផលិតកម្មសត្វ

សម្រេច

ប្រការ ១ .-

ត្រូវបានបង្កើតក្រុមការងារបច្ចេកទេសរៀបចំកសាង គោលនយោបាយអភិវឌ្ឍន៍ឡធីវឌ្ឍន៍នៅកម្ពុជា ឆ្នាំ២០២១-២០៣០ ដែលមានសហសភាពដូចខាងក្រោម៖

១-ឯកឧត្តម	ធីត គឹមសា	រដ្ឋលេខាធិការក្រសួងកសិកម្ម រុក្ខាប្រមាញ់ និងនេសាទ និងជាប្រធានគណៈកម្មាធិការប្រឆាំងសកម្មវិធីឡធីវឌ្ឍន៍ជាតិ	ប្រធាន
២-ឯកឧត្តម	កៅ ផល	អនុរដ្ឋលេខាធិការក្រសួងកសិកម្ម រុក្ខាប្រមាញ់ និងនេសាទ និងជាអនុប្រធានគណៈកម្មាធិការប្រឆាំងសកម្មវិធីឡធីវឌ្ឍន៍ជាតិ	អនុប្រធាន
៣-ឯកឧត្តម	កាន់ ផាន់ណារ៉ា	ប្រតិភូរាជរដ្ឋាភិបាលកម្ពុជាទទួលបន្ទុកជំនាញនាយក នៃអគ្គនាយកដ្ឋានសុខភាពសត្វ និងផលិតកម្មសត្វ	អនុប្រធាន
៤-លោក	ឃី វិបុលបុត្រា	អគ្គលេខាធិការរងក្រសួងកសិកម្ម រុក្ខាប្រមាញ់ និងនេសាទ	សមាជិក
៥-លោក	គឹម សារឿន	អគ្គនាយករងនៃអគ្គនាយកដ្ឋានសុខភាពសត្វ និងផលិតកម្មសត្វ និងជានាយកកម្មវិធីឡធីវឌ្ឍន៍ជាតិ	សមាជិក
៦-លោក	អ៊ឹង ថ្រី	អនុប្រធានរដ្ឋបាលជលផល	សមាជិក
៧-លោក	យួន កក្កដា	អគ្គនាយករងនៃអគ្គនាយកដ្ឋានកៅស៊ូ	សមាជិក
៨-លោក	ម៉ាក់ សៀន	អគ្គនាយករងនៃអគ្គនាយកដ្ឋានកសិកម្ម	សមាជិក
៩-លោក	សៀ វ៉ា	អនុប្រធានរដ្ឋបាលព្រៃឈើ	សមាជិក
១០-លោក	ជា ច័ន្ទវាសនា	ប្រធាននាយកដ្ឋានកិច្ចការរដ្ឋបាល	សមាជិក
១១-លោក	ម៉ក់ ម៉ុនី	ប្រធាននាយកដ្ឋានផែនការ និងស្ថិតិ	សមាជិក
១២-លោក	ម៉ៅ មិនា	ប្រធាននាយកដ្ឋានផ្សព្វផ្សាយកសិកម្ម រុក្ខាប្រមាញ់ និងនេសាទ	សមាជិក
១៣-លោក	ស៊ាង សុខលីម	ប្រធាននាយកដ្ឋានផលិតកម្មសត្វ នៃអគ្គនាយកដ្ឋានសុខភាពសត្វ និងផលិតកម្មសត្វ និងជាប្រធានកម្មវិធីឡធីវឌ្ឍន៍ជាតិ	សមាជិក
១៤-លោក	នូ វិនិតា	ប្រធាននាយកដ្ឋានសុខភាពសត្វ និងសុខភាពសាធារណៈ បសុព្យាបាល នៃអគ្គនាយកដ្ឋានសុខភាពសត្វ និងផលិតកម្មសត្វ	សមាជិក
១៥-លោក	ថោង សំណាង	ប្រធាននាយកដ្ឋានផ្សព្វផ្សាយបច្ចេកទេស និងនីតិកម្ម នៃអគ្គនាយកដ្ឋានសុខភាពសត្វ និងផលិតកម្មសត្វ	សមាជិក
១៦-លោក	សូ វិទូ	អនុប្រធាននាយកដ្ឋានផលិតកម្មសត្វ នៃអគ្គនាយកដ្ឋានសុខភាពសត្វ និងផលិតកម្មសត្វ	សមាជិក
១៧-លោក	ស៊ា វិសាលរដ្ឋ	អនុប្រធាននាយកដ្ឋានរដ្ឋបាល ផែនការ គណនេយ្យ និងសហប្រតិបត្តិការ នៃអគ្គនាយកដ្ឋានសុខភាពសត្វ និងផលិតកម្មសត្វ	សមាជិក
១៨-លោក	ឃ្លាំង សុប៊ុណ្ណា	ប្រធានការិយាល័យគ្រប់គ្រងកាកសំណល់ នៃនាយកដ្ឋានផលិតកម្មសត្វ នៃអគ្គនាយកដ្ឋានសុខភាពសត្វ និងផលិតកម្មសត្វ	សមាជិក
១៩-លោក	ហ៊ុន លីហ្សូ	អ្នកបច្ចេកទេសឡធីវឌ្ឍន៍របស់មជ្ឈមណ្ឌលបច្ចេកវិទ្យា និងព័ត៌មានវិទ្យាឡធីវឌ្ឍន៍ នៃសាកលវិទ្យាល័យភូមិន្ទកសិកម្ម	សមាជិក
២០-លោក	ឆេង រតនៈ	ប្រធានផ្នែករដ្ឋបាល និងគណនេយ្យ នៃកម្មវិធីឡធីវឌ្ឍន៍ជាតិ នៃអគ្គនាយកដ្ឋានសុខភាពសត្វ និងផលិតកម្មសត្វ	សមាជិក
២១-លោក	ហ៊ុម សម្បត្តិ	ប្រធានផ្នែកបច្ចេកទេសឡធីវឌ្ឍន៍ នៃកម្មវិធីឡធីវឌ្ឍន៍ជាតិ នៃអគ្គនាយកដ្ឋានសុខភាពសត្វ និងផលិតកម្មសត្វ	សមាជិក
២២-លោក	Eric Buysman	ប្រធានក្រុមការងារតែសម្រួលគោលនយោបាយឡធីវឌ្ឍន៍ តំណាងអង្គការ UNIDO	សមាជិក
២៣-លោក	ឆេង ផ្លូវផង	ជំនាញការវិឌ្ឍន៍ តំណាងអង្គការ UNIDO	សមាជិក

- ២៤-លោក លោកស្រី តំណាងដៃគូអភិវឌ្ឍ និងវិស័យឯកជន សមាជិក
- ២៥-លោកស្រី គង់ រចនា មន្ត្រីតម្រោងកាត់បន្ថយការបញ្ចេញឧស្ម័នផ្ទះកញ្ចក់ដោយជំរុញ
- ការវិនិយោគលើជីវឧស្ម័នឆ្នាតធំ តំណាងអង្គការ UNIDO លេខាធិការ
- ២៦-លោក សេង សុភាព ប្រធានផ្នែកអភិវឌ្ឍន៍វិស័យឯកជន និងដឹកនាំកម្មវិធីវិនិយោគ
- ឧស្ម័នជាតិ នៃអគ្គនាយកដ្ឋានសុខភាពសត្វ និងផលិតកម្មសត្វ លេខាធិការ។

ប្រការ២ ..

ក្រុមការងារបច្ចេកទេសរៀបចំកសាង ។ គោលនយោបាយអភិវឌ្ឍន៍ឧស្ម័ននៅកម្ពុជា ឆ្នាំ២០២១-២០៣០- មានភារកិច្ចដូចខាងក្រោម៖

- ប្រមូលទិន្នន័យ ព័ត៌មាន និងឯកសារសំខាន់ៗពីគ្រប់អង្គការក្រោមឱវាទក្រសួងកសិកម្ម រុក្ខាប្រមាញ់ និងនេសាទ និងមន្ទីរកសិកម្ម រុក្ខាប្រមាញ់ និងនេសាទរាជធានី-ខេត្ត ដើម្បីរៀបចំជាធាតុចូលសម្រាប់ធ្វើការរៀបចំកសាងគោលនយោបាយអភិវឌ្ឍន៍ឧស្ម័ននៅកម្ពុជាឆ្នាំ២០២១-២០៣០ របស់ក្រសួងកសិកម្ម រុក្ខាប្រមាញ់ និងនេសាទ
- រៀបចំដំណើរការសិក្ខាសាលា ឬកិច្ចប្រជុំពិគ្រោះយោបល់ផ្សេងៗ ដើម្បីរៀបចំកសាងគោលនយោបាយអភិវឌ្ឍន៍ឧស្ម័ននៅកម្ពុជាឆ្នាំ២០២១-២០៣០ ជាមួយអង្គការ និងស្ថាប័នពាក់ព័ន្ធផ្សេងៗ
- រៀបចំបុកសរុបមតិយោបល់ដែលប្រមូលបានពីសិក្ខាសាលា ឬកិច្ចប្រជុំពិគ្រោះយោបល់ផ្សេងៗ ឬទទួលបានពីអង្គការជំនាញក្រោមឱវាទក្រសួងកសិកម្ម រុក្ខាប្រមាញ់ និងនេសាទ មន្ទីរកសិកម្ម រុក្ខាប្រមាញ់ និងនេសាទរាជធានី-ខេត្ត និងអ្នកពាក់ព័ន្ធផ្សេងទៀត ដើម្បីកែសម្រួលសំដៅធ្វើយ៉ាងណាឱ្យខ្លឹមសារនៃឯកសារគោលនយោបាយអភិវឌ្ឍន៍ឧស្ម័ននៅកម្ពុជាឆ្នាំ២០២១-២០៣០ ស្របតាមគោលនយោបាយ និងយុទ្ធសាស្ត្ររបស់រាជរដ្ឋាភិបាលកម្ពុជានាពេលបច្ចុប្បន្ន និងឆ្លើយតបបានទៅនឹងតម្រូវការអភិវឌ្ឍន៍ឧស្ម័នក្នុងវិស័យកសិកម្មនៅកម្ពុជា។

ប្រការ៣ ..

អនុប្រធាន សមាជិក និងលេខាធិការនៃក្រុមការងារខាងលើ ត្រូវអញ្ជើញចូលរួមប្រជុំតាមការអញ្ជើញរបស់ប្រធាន។ ក្នុងករណីប្រធានអវត្តមាន ឬមានភារកិច្ចផ្សេងៗ អនុប្រធានត្រូវដឹកនាំប្រជុំជំនួសតាមការប្រគល់ភារកិច្ចពីប្រធាន។

ប្រការ៤ ..


បទប្បញ្ញត្តិទាំងឡាយណាដែលផ្ទុយនឹងសេចក្តីសម្រេចនេះ ត្រូវទុកជានិរាករណ៍។

ប្រការ៥ ..

អគ្គលេខាធិការ អគ្គាធិការ អគ្គនាយកនៃអគ្គនាយកដ្ឋានសុខភាពសត្វ និងផលិតកម្មសត្វ ប្រធាននាយកដ្ឋានកិច្ចការរដ្ឋបាល ប្រធាននាយកដ្ឋានបុគ្គលិក និងអភិវឌ្ឍន៍ធនធានមនុស្ស ប្រធាននាយកដ្ឋានផែនការ និងស្ថិតិ ប្រធានអង្គការដែលពាក់ព័ន្ធក្រោមឱវាទក្រសួងកសិកម្ម រុក្ខាប្រមាញ់ និងនេសាទ ប្រធានមន្ទីរកសិកម្ម រុក្ខាប្រមាញ់ និងនេសាទរាជធានី-ខេត្ត និងសាមីខ្លួន ត្រូវទទួលបន្ទុកអនុវត្តសេចក្តីសម្រេចនេះ តាមភារកិច្ចរៀងៗខ្លួន ចាប់ពីថ្ងៃចុះហត្ថលេខាតទៅ។

ថ្ងៃ ៥ ខែ ២០២១ ខែ ២០២១ ឆ្នាំ ២០២១ ទោស័ក ព.ស.២៥៦៤
ធ្វើនៅរាជធានីភ្នំពេញ ថ្ងៃទី ០១ ខែ កុម្ភៈ ឆ្នាំ២០២១

រដ្ឋមន្ត្រី
ប្រធានក្រុមការងាររៀបចំកសាង និងនេសាទ



កន្លែងទទួល៖
- ទីស្តីការគណៈរដ្ឋមន្ត្រី
- ក្រសួងសេដ្ឋកិច្ច និងហិរញ្ញវត្ថុ
- ដូចប្រការ៥
- ឯកសារ កាលប្បវត្តិ

ការប្រជុំលើកទី១ របស់ក្រុមការងារបច្ចេកទេសរៀបចំកសាង
 “គោលនយោបាយអភិវឌ្ឍន៍ឡឌីជីថលស្ទឹងនៅកម្ពុជាឆ្នាំ២០២១-២០៣០”
 ថ្ងៃទី០៩ ខែមេសា ឆ្នាំ២០២១ ម៉ោង៨.៣០ព្រឹក ដល់ម៉ោង១២.០០រសៀល
 តាមរយៈកម្មវិធីZoom

អ្នកចូលរួម៖

លរ.	ឈ្មោះ	តួនាទី	តួនាទីក្នុងក្រុមការងារបច្ចេកទេស	វត្តមាន
១	ឯកឧត្តម ឱម គឹមសា	រដ្ឋលេខាធិការក្រសួងកសិកម្ម រុក្ខាប្រមាញ់ និងនេសាទ និងជាប្រធានគណៈកម្មាធិការតម្រង់ទិសកម្មវិធីឡឌីជីថលស្ទឹងជាតិ	- ប្រធាន	អវត្តមាន (មានការកិច្ចជាមួយឯកឧត្តម រដ្ឋមន្ត្រី)
២	ឯកឧត្តម កៅ ផល	អនុរដ្ឋលេខាធិការក្រសួងកសិកម្ម រុក្ខាប្រមាញ់ និងនេសាទ និងជាអនុប្រធានគណៈកម្មាធិការតម្រង់ទិសកម្មវិធីឡឌីជីថលស្ទឹងជាតិ	- អនុប្រធាន	វត្តមាន
៣	ឯកឧត្តម ស្រី ខ្មៅ	អគ្គលេខាធិការក្រសួងកសិកម្ម រុក្ខាប្រមាញ់ និងនេសាទ	- អនុប្រធាន	វត្តមាន
៤	ឯកឧត្តម តាន់ ផាន់ណារ៉ា	ប្រតិភូរាជរដ្ឋាភិបាលកម្ពុជាទទួលបន្ទុកជាអគ្គនាយកនៃអគ្គនាយកដ្ឋានសុខភាពសត្វ និងផលិតកម្មសត្វ	អនុប្រធាន	វត្តមាន
៥	លោក យី វិបុលបុត្រា	អគ្គលេខាធិការរងក្រសួងកសិកម្ម រុក្ខាប្រមាញ់ និងនេសាទ	សមាជិក	
៦	លោក គឹម សារឿន	អគ្គនាយករងនៃអគ្គនាយកដ្ឋានសុខភាពសត្វ និងផលិតកម្មសត្វ និងជានាយកកម្មវិធីឡឌីជីថលស្ទឹងជាតិ	សមាជិក	វត្តមាន
៧	លោក ម៉ាក់ សឿន	អគ្គនាយករងនៃអគ្គនាយកដ្ឋានកសិកម្ម	សមាជិក	វត្តមាន
៨	លោក អ៊ុង ទ្រី	អនុប្រធានរដ្ឋបាលជលផល	សមាជិក	
៩	លោក សៀ វ៉ា	អនុប្រធានរដ្ឋបាលព្រៃឈើ	- សមាជិក	
១០	លោក យុន កក្កដា	អគ្គនាយករងនៃអគ្គនាយកដ្ឋានកៅស៊ូ	- សមាជិក	
១១	លោក ម៉ក់ ម៉ុនី	ប្រធាននាយកដ្ឋានផែនការ និងស្ថិតិ	- សមាជិក	វត្តមាន

១២	លោក ស៊ាង សុខលីម	ប្រធាននាយកដ្ឋានផលិតកម្មសត្វ នៃអគ្គនាយកដ្ឋានសុខភាពសត្វ និងផលិតកម្មសត្វ និងជាប្រធានកម្មវិធីឡដីវឌ្ឍន៍ជា តិ	- សមាជិក	វត្តមាន
១៣	លោក នូ វនិកា	ប្រធាននាយកដ្ឋានសុខភាពសត្វ និងសុខភាពសាធារណៈ បសុព្យាបាលសត្វ នៃ អ.ស.ជ.ស.	- សមាជិក	
១៤	លោក ថោង សំណាង	ប្រធាននាយកដ្ឋានផ្សព្វផ្សាយ បច្ចេកទេស និងនីតិកម្ម នៃ អ.ស.ជ.ស.	- សមាជិក	
១៥	លោក ម៉ៅ មិនា	ប្រធាននាយកដ្ឋានផ្សព្វផ្សាយកសិ កម្ម រុក្ខាប្រមាញ់ និងនេសាទ	- សមាជិក	
១៦	លោក ជា ច័ន្ទវាសនា	ប្រធាននាយកដ្ឋានកិច្ចការរដ្ឋបាល នៃក្រសួងកសិកម្ម រុក្ខាប្រមាញ់ និងនេសាទ	- សមាជិក	
១៧	លោក សូ វិទូ	អនុប្រធាននាយកដ្ឋានផលិតកម្មស ត្វ នៃ អ.ស.ជ.ស.	- សមាជិក	វត្តមាន
១៨	លោក ស៊ា វិសាលរដ្ឋ	អនុប្រធាននាយកដ្ឋានរដ្ឋបាល ផែនការ គណនេយ្យ និងសហប្រតិបត្តិការ នៃ អ.ស.ជ.ស.	- សមាជិក	
១៩	លោក ឃ្នាំង សុប៊ិណ្ណា	ប្រធានការិយាល័យគ្រប់គ្រងកាក សំណល់នៃនាយកដ្ឋានផលិតកម្ម សត្វ នៃ អ.ស.ជ.ស.	- សមាជិក	វត្តមាន
២០	លោក ហ៊ុន លីហួរ	អ្នកបច្ចេកទេសឡដីវឌ្ឍន៍របស់ម ជ្ឈមណ្ឌលបច្ចេកវិទ្យា និងព័ត៌មាន ដីវឌ្ឍន៍ខ្នាតធំ (BTIC) នៃសាកលវិទ្យាល័យភូមិន្ទកសិកម្ម	- សមាជិក	វត្តមាន
២១	លោក ឡោ លីត្ត	ប្រធាន មជ្ឈមណ្ឌលបច្ចេកវិទ្យា និងព័ត៌មានដីវឌ្ឍន៍ខ្នាតធំ (BTIC) នៃសាកលវិទ្យាល័យភូមិន្ទកសិកម្ម	- ភ្ញៀវ	វត្តមាន
២២	លោក ឆេង រតនៈ	ប្រធានផ្នែករដ្ឋបាល និងគណនេយ្យ នៃកម្មវិធីឡដីវឌ្ឍន៍ជាតិ នៃ អ.ស.ជ.ស.	- សមាជិក	វត្តមាន

២៣	លោក ហ៊ឹម សម្បត្តិ	ប្រធានផ្នែកបច្ចេកទេសឡដីវឌ្ឍន៍ នៃកម្មវិធីឡដីវឌ្ឍន៍ជាតិ នៃ អស.ផ.ស.	- សមាជិក	វត្តមាន
២៤	លោក Eric Buysman	ប្រធានក្រុមការងារកែសម្រួលគោ លនយោបាយឡដីវឌ្ឍន៍ តំណាងអង្គការ UNIDO	- សមាជិក	វត្តមាន
២៥	លោក ឆេង ផ្លូវវែង	ជំនាញការដីវឌ្ឍន៍ តំណាងអង្គការUNIDO	- សមាជិក	វត្តមាន
២៦	លោកស្រី គង់ ចេនា	មន្ត្រីគម្រោងកាត់បន្ថយការបញ្ចេញ ឧស្ម័នផ្ទះកញ្ចក់ដោយជម្រុញការ វិនិយោគលើដីវឌ្ឍន៍ខ្នាតធំ តំណាងអង្គការ UNIDO	- លេខាធិការ	វត្តមាន
២៧	លោក សេង សុភាព	ប្រធានផ្នែកអភិវឌ្ឍន៍វិស័យឯកជន និងដីកាកឡដីវឌ្ឍន៍ នៃកម្មវិធីឡដីវឌ្ឍន៍ជាតិ នៃ អ.ស.ផ.ស	- លេខាធិការ	វត្តមាន
២៨	លោកស្រី ប៉ាក សុហៀង	ជំនាញការយេនឌ័រ	ភ្ញៀវ	វត្តមាន
២៩	Dr S C Sangha	Deputy Secretary General, ADB Biodigester project	- ភ្ញៀវ	
៣០	Dr Sothoeun Suon	DDG of GDAHP for ADB Biodigester project	- ភ្ញៀវ	វត្តមាន
៣១	Mrs Heng Morany	DDG of GDAHP for Chinese Biodigester project and MAFF Gender focal point	- ភ្ញៀវ	វត្តមាន
ថ្នាក់ខេត្ត				
៤៤	PDAFF-NPB (14 provinces) 1. ខេត្តបាត់ដំបង 2. ខេត្តបន្ទាយមានជ័យ 3. ខេត្តកំពង់ចាម 4. ខេត្តកំពង់ឆ្នាំង 5. ខេត្តកណ្តាល 6. ខេត្តកំពត 7. ខេត្តកំពង់ស្ពឺ 8. ខេត្តកំពង់ធំ 9. ខេត្តពោធិសាត់ 10. ខេត្តព្រៃវែង 11. ខេត្តសៀមរាប		- ភ្ញៀវ	វត្តមាន

	12. ខេត្តស្វាយរៀង 13. ខេត្តត្បូងឃ្មុំ 14. ខេត្តតាកែវ។			
វិស័យឯកជន				
៤៥	លោក លី ឡាវីល	ប្រធានក្រុមប្រឹក្សាភិបាល សមាគមអ្នកចិញ្ចឹមសត្វកម្ពុជា	- ភ្ញៀវ	
៤៦	លោក អ៊ុក វ៉ាន់ជា	ប្រធាន ផ្នែកកម្ចី SMeS ធនាគារពាណិជ្ជកម្មក្រៅប្រទេស) នៃកម្ពុជាFTB)	- ភ្ញៀវ	វត្តមាន
៤៧	លោក Nikolai Schwarz	នាយកក្រុមហ៊ុនSATEC	- ភ្ញៀវ	វត្តមាន
៤៨	លោក វ៉ាត់ ប៊ុនថង	នាយកក្រុមហ៊ុន VW Gas	- ភ្ញៀវ	វត្តមាន

កិច្ចប្រជុំលើកទី២ របស់ក្រុមការងារបច្ចេកទេសរៀបចំកសាង
 “គោលនយោបាយអភិវឌ្ឍន៍ឡធីវិឌ្ឍន៍នៅកម្ពុជាឆ្នាំ២០២១-២០៣០”
 ថ្ងៃទី១១ ខែមិថុនា ឆ្នាំ២០២១ ម៉ោង៨.៣០ព្រឹក ដល់ម៉ោង១២.០០រសៀល
 តាមរយៈកម្មវិធីZoom

អ្នកចូលរួម៖

លរ.	ឈ្មោះ	តួនាទី	តួនាទីក្នុងក្រុមការងារបច្ចេកទេស	វត្តមាន
១	ឯកឧត្តម ឱម គឹមសិរី	រដ្ឋលេខាធិការក្រសួងកសិកម្ម រុក្ខាប្រមាញ់ និងនេសាទ និងជាប្រធានគណៈកម្មាធិការតម្រង់ទិសកម្មវិធីឡធីវិឌ្ឍន៍ជាតិ	- ប្រធាន	វត្តមាន
២	ឯកឧត្តម កៅ ផល	អនុរដ្ឋលេខាធិការក្រសួងកសិកម្ម រុក្ខាប្រមាញ់ និងនេសាទ និងជាអនុប្រធានគណៈកម្មាធិការតម្រង់ទិសកម្មវិធីឡធីវិឌ្ឍន៍ជាតិ	- អនុប្រធាន	វត្តមាន
៣	ឯកឧត្តម ស្រី វឌ្ឍី	អគ្គលេខាធិការក្រសួងកសិកម្ម រុក្ខាប្រមាញ់ និងនេសាទ	- អនុប្រធាន	វត្តមាន
៤	ឯកឧត្តម តាន់ ផាន់ណារ៉ា	ប្រតិភូរាជរដ្ឋាភិបាលកម្ពុជាទទួលបន្ទុកជាអគ្គនាយកនៃអគ្គនាយកដ្ឋានសុខភាពសត្វ និងផលិតកម្មសត្វ	អនុប្រធាន	វត្តមាន
៥	លោក យី វិបុលបុត្រា	អគ្គលេខាធិការរងក្រសួងកសិកម្ម រុក្ខាប្រមាញ់ និងនេសាទ	សមាជិក	វត្តមាន
៦	លោក គឹម សារ៉េន	អគ្គនាយករងនៃអគ្គនាយកដ្ឋានសុខភាពសត្វ និងផលិតកម្មសត្វ និងជានាយកកម្មវិធីឡធីវិឌ្ឍន៍ជាតិ	សមាជិក	វត្តមាន
៧	លោក ម៉ាក់ សៀន	អគ្គនាយករងនៃអគ្គនាយកដ្ឋានកសិកម្ម	សមាជិក	វត្តមាន
៨	លោក អ៊ុង ទ្រី	អនុប្រធានរដ្ឋបាលជលផល	សមាជិក	វត្តមាន
៩	លោក សៀ វ៉ា	អនុប្រធានរដ្ឋបាលព្រៃឈើ	- សមាជិក	អវត្តមាន
១០	លោក យុន កក្កដា	អគ្គនាយករងនៃអគ្គនាយកដ្ឋានកៅស៊ូ	- សមាជិក	អវត្តមាន
១១	លោក ម៉ក់ ម៉ុនី	ប្រធាននាយកដ្ឋានផែនការ និងស្ថិតិ	- សមាជិក	វត្តមាន

១២	លោក សាំង សុខលីម	ប្រធាននាយកដ្ឋានផលិតកម្មសត្វ នៃអគ្គនាយកដ្ឋានសុខភាពសត្វ និងផលិតកម្មសត្វ និងជាប្រធានកម្មវិធីឡដីវឌ្ឍន៍ជា តិ	- សមាជិក	វត្តមាន
១៣	លោក នូ និកា	ប្រធាននាយកដ្ឋានសុខភាពសត្វ និងសុខភាពសាធារណៈ បសុព្យាបាលសត្វ នៃ អ.ស.ផ.ស.	- សមាជិក	អវត្តមាន
១៤	លោក ហោង សំណាង	ប្រធាននាយកដ្ឋានផ្សព្វផ្សាយ បច្ចេកទេស និងនីតិកម្ម នៃ អ.ស.ផ.ស.	- សមាជិក	វត្តមាន
១៥	លោក ម៉ៅ មិនា	ប្រធាននាយកដ្ឋានផ្សព្វផ្សាយកសិ កម្ម រុក្ខាប្រមាញ់ និងនេសាទ	- សមាជិក	អវត្តមាន
១៦	លោក ជា ច័ន្ទវាសនា	ប្រធាននាយកដ្ឋានកិច្ចការរដ្ឋបាល នៃក្រសួងកសិកម្ម រុក្ខាប្រមាញ់ និងនេសាទ	- សមាជិក	អវត្តមាន
១៧	លោក សូ វិទូ	អនុប្រធាននាយកដ្ឋានផលិតកម្មស ត្វ នៃ អ.ស.ផ.ស.	- សមាជិក	វត្តមាន
១៨	លោក សិរី សាលរដ្ឋ	អនុប្រធាននាយកដ្ឋានរដ្ឋបាល ផែនការ គណនេយ្យ និងសហប្រតិបត្តិការ នៃ អ.ស.ផ.ស.	- សមាជិក	អវត្តមាន
១៩	លោក ឃ្លាំង សុប៊ុណ្ណា	ប្រធានការិយាល័យគ្រប់គ្រងកាក សំណល់នៃនាយកដ្ឋានផលិតកម្ម សត្វ នៃ អ.ស.ផ.ស.	- សមាជិក	វត្តមាន
២០	លោក ហ៊ុន លីហួរ	អ្នកបច្ចេកទេសឡដីវឌ្ឍន៍របស់ម ជ្ឈមណ្ឌលបច្ចេកវិទ្យា និងព័ត៌មាន ដីវឌ្ឍន៍ខ្នាតធំ(BTIC) នៃសាកលវិទ្យាល័យភូមិន្ទកសិកម្ម	- សមាជិក	វត្តមាន
២១	លោក ឡោ លីត្ត	ប្រធាន មជ្ឈមណ្ឌលបច្ចេកវិទ្យា និងព័ត៌មាន ដីវឌ្ឍន៍ខ្នាតធំ(BTIC) នៃសាកលវិទ្យាល័យភូមិន្ទកសិកម្ម	- ភ្ញៀវ	វត្តមាន
២២	លោក ឆេង រតនៈ	ប្រធានផ្នែករដ្ឋបាល និងគណនេយ្យ នៃកម្មវិធីឡដីវឌ្ឍន៍ជាតិ នៃ អ.ស.ផ.ស.	- សមាជិក	វត្តមាន

២៣	លោក ហ៊ឹម សម្បត្តិ	ប្រធានផ្នែកបច្ចេកទេសឡដីវឌ្ឍន៍ នៃកម្មវិធីឡដីវឌ្ឍន៍ជាតិ នៃ អ.ស.ផ.ស.	- សមាជិក	វត្តមាន
២៤	លោក Eric Buysman	ប្រធានក្រុមការងារកែសម្រួលគោល នយោបាយឡដីវឌ្ឍន៍ តំណាងអង្គការ UNIDO	- សមាជិក	អវត្តមាន
២៥	លោក ចេង ង៉ុវវែង	ជំនាញការដីវឌ្ឍន៍ តំណាងអង្គការ UNIDO	- សមាជិក	វត្តមាន
២៦	លោកស្រី គង់ រចនា	មន្ត្រីគម្រោងកាត់បន្ថយការបញ្ចេញ ឧស្ម័នផ្ទះកញ្ចក់ដោយជម្រុញការ វិនិយោគលើដីវឌ្ឍន៍ខ្នាតធំ តំណាងអង្គការ UNIDO	- លេខាធិការ	វត្តមាន
២៧	លោក សេង សុភាព	ប្រធានផ្នែកអភិវឌ្ឍន៍វិស័យឯកជន និងដីកាកឡដីវឌ្ឍន៍ នៃកម្មវិធីឡដីវឌ្ឍន៍ជាតិ នៃ អ.ស.ផ.ស	- លេខាធិការ	វត្តមាន
ថ្នាក់ខេត្ត				
	PDAFF-NPB (14 provinces) 1. ខេត្តបាត់ដំបង 2. ខេត្តបន្ទាយមានជ័យ 3. ខេត្តកំពង់ចាម 4. ខេត្តកំពង់ឆ្នាំង 5. ខេត្តកណ្តាល 6. ខេត្តកំពត 7. ខេត្តកំពង់ស្ពឺ 8. ខេត្តកំពង់ធំ 9. ខេត្តពោធិសាត់ 10. ខេត្តព្រៃវែង 11. ខេត្តសៀមរាប 12. ខេត្តស្វាយរៀង 13. ខេត្តត្បូងឃ្មុំ 14. ខេត្តតាកែវ។		- ភ្ញៀវ	វត្តមាន
វិស័យឯកជន				
៤២	លោក លី ឡាវីល	ប្រធានក្រុមប្រឹក្សាភិបាល សមាគមអ្នកចិញ្ចឹមសត្វកម្ពុជា	- ភ្ញៀវ	វត្តមាន
៤៣	លោក មាន ច័ន្ទណារិទ្ធ	ធនាគារពាណិជ្ជកម្មក្រៅប្រទេស (នៃកម្ពុជាFTB)	- ភ្ញៀវ	វត្តមាន

៤៤	លោក Nikolai Schwarz	នាយកក្រុមហ៊ុន SATEC	- ភ្ញៀវ	វត្តមាន
៤៥	លោក វ៉ាត់ ប៊ុនថង	នាយកក្រុមហ៊ុន VW Gas	- ភ្ញៀវ	វត្តមាន
៤៦	Mr. Wong Keet Loong	CEO, Credit Guarantee Corporation of Cambodia Plc.	- ភ្ញៀវ	វត្តមាន
៤៧	Mr Zola Taing	Public-Private Dialogue Officer, European Chamber of Commerce in Cambodia	- ភ្ញៀវ	វត្តមាន
៤៨	Mr. leuk Dana	Soma Energy	- ភ្ញៀវ	វត្តមាន
៤៩	BY SOKUNTHEA	Food Security Programme Officer at European Commission Cambodia	- ភ្ញៀវ	វត្តមាន
៥០	Mr. Lim Darun	Netherlands Development Organization (SNV) Cambodia	- ភ្ញៀវ	វត្តមាន
៥១	H.E. Tin Ponlok	Secretary of State, MoE	- ភ្ញៀវ	វត្តមាន
៥២	H.E. Chea Chantou	Deputy Secretary General, NCSD	- ភ្ញៀវ	វត្តមាន
៥៣	Mr. Men Seanchhun	MEF	- ភ្ញៀវ	វត្តមាន
៥៤	Sam Nang		- ភ្ញៀវ	វត្តមាន
៥៥	But Bunmakara		- ភ្ញៀវ	វត្តមាន
៥៦	By Sokunthea		- ភ្ញៀវ	វត្តមាន
៥៧	Sem Souphea		- ភ្ញៀវ	វត្តមាន