

Energizing a Greener World: A Bangchak Group Perspective

2023 Thailand -Taiwan Industrial

Collaboration Summit (TTICoS)

12 September 2023

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Executive Vice President Corporate Branding, Communication and Sustainability Activation Bangchak Corporation Public Company Limited

Energy Consumption

C bangchak

World Primary energy consumption

Exajoules (10¹⁸)

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per day

(624 EJ per Year)

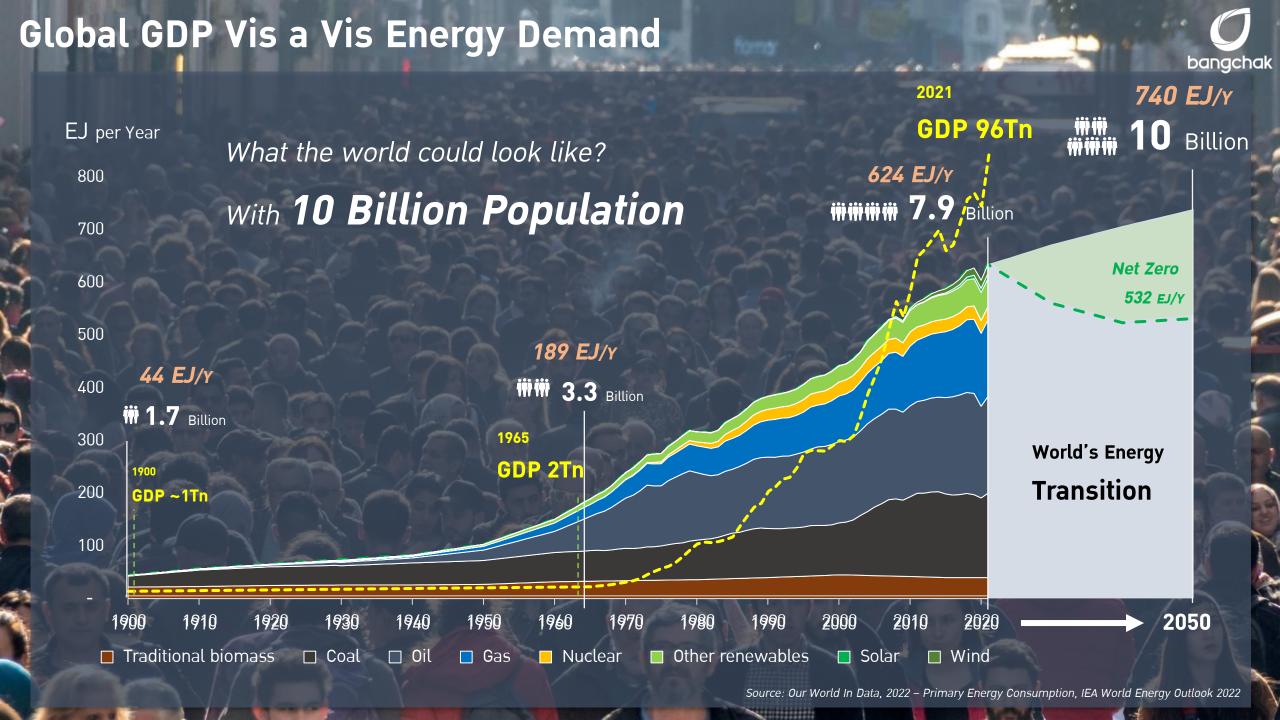
~100,000 Rounds

Of Boeing 747 travels around the earth

 $0r \sim 5,000$ Rounds



from Earth to the Moon



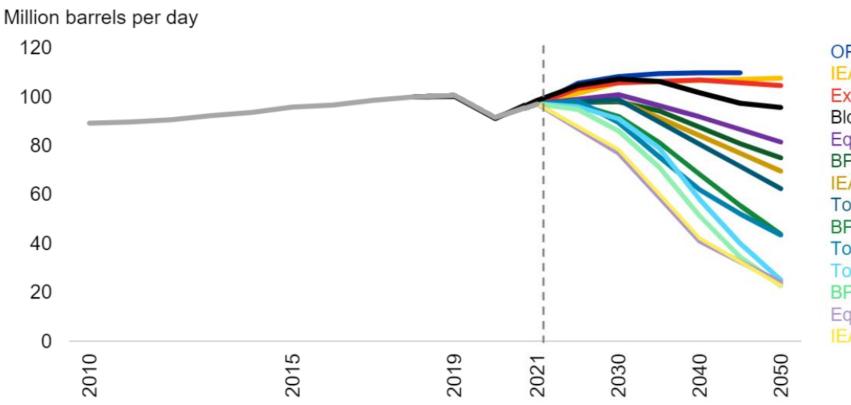


An Uncertain World We Live in...



The role of oil in the energy mix will likely change dramatically

Oil demand outlooks



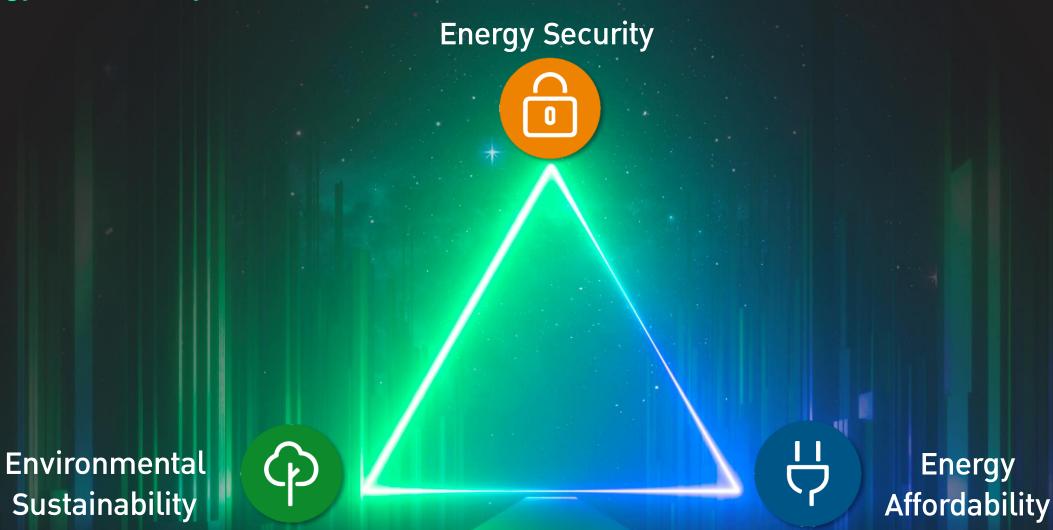
OPEC WOO
IEA Stated Policies
ExxonMobil
BloombergNEF
Equinor Walls
BP New Momentum
IEA Announced Pledges
Total Momentum
BP Accelerated
Total Rupture
Total Rupture
Total Rupture +
BP Net Zero
Equinor Bridges
IEA Net Zero

Source: OPEC 2022, IEA 2022, BP 2023, TotalEnergies 2022, Equinor 2022, ExxonMobil 2022, BloombergNEF Economic Transition Scenario 2022.

Balancing the Energy Trilemma

Energy in Harmony with Nature







39 YEARS OF SUSTAINABLE GROWTH





Established "Bangchak" on 8th November



1994

Listed "BCP" in SET

2004

Launched Biofuel Products (Biodiesel & Gasohol)



2011

Commercial operation of the first solar power plant



2009

Established Biodiesel



2016

Established Oil

Trading Business "DCDE"



Established Bangchak Retail "BCR"

Acquired Solar Power Plants in Japan

Listed "BCPG" on SET

2017

BCPG expanded to wind power plant business in the Philippines

2020

Launched the "Winnonie" startup, electric motorcycle rental business with the first battery swapping model in Thailand



BBGI partnership with Manus Bio Inc., a Synbio technology leader

2019

Listed "OKEA ASA" on **OSLO Stock Exchange**



BCPG acquired the first hydropower plant in Laos

2021

BCPG expanded to solar farm business in Taiwan

2022

OKEA ASA acquired material portfolio







Ivar Aasen

Established "bSgf" to produce & distribute Sustainable Aviation Fuel (SAF)



Acquired right over the pipeline network capacity and terminal systems through

bfp



Listed "BBGI" on SET

2023



Acquired 65.99% shares of

ESSO Thailand





Sriracha Refinery 832 Service stations

OKEA OSA acquired additional assets











Unit Nord

BCPG acquired natural gas power plants in U.S.A.



Listing activity

New business

2018

Invested in OKEA ASA

in Norway to expand E&P **business**

BANGCHAK GROUP BUSINESS PORTFOLIO





Refinery and Oil Trading Business

Complex refinery with capacity of ~300 KBD Seamlessly integrates with supply chain.



"Greenovative Experience" through service stations, with non-oil businesses through Inthanin Coffee, Furio lubricants, EV charging stations, etc.





Natural Resources



45.46% shares

Norway-based company engaged in oil & gas exploration and production





Asia Pacific's leading power generation company & service provider of smart energy system





No.1 fully integrated biofuel producer, with expansion into bio-based High Value Products (HVPs)













"WORLD CLASS"

First Thai Organization from the Industrial Sector &

World's First and Only Refinery to Receive GPEA World Class Quality Award







REFINERY AND OIL TRADING BUSINESS GROUP



Bangchak Refinery Phra Khanong

Complex refinery with capacity of 120 KBD

Producing high value specialty products

Bangchak Refinery Sriracha

- Complex refinery with capacity of 174 KBD
- Located near Laem Chabang deep sea port



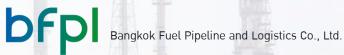
Trading Business



BCP Trading, one of leading independent oil trader in Singapore

- **Over 20 countries** for trading network
- More than 100 counterparties worldwide
- Expand into Biofuel trade

Logistic Business



- Logistic network by pipeline, terminal, truck and vessel
- Expansion of terminal hub and fuel transportation to cover all over in Thailand



FLYING SUSTAINABLY WITH DSGF





"Fry to Fly"







- **Production Capacity 1 ML/D**
- **Construction 2023 2024**
- Commissioning End of 2024
- Total Investment 10,000 MB







bangchak

BUSINESS GROUP

Main distribution channel of oil and lubricant products through more than 2,200 service stations nationwide, and directly sell to industrial sectors, as well as providing supplementary non-oil businesses





bcpg

bangchak

BUSINESS GROUP

Bangchak invests in the green power business through BCPG PLC. with 57.19% shareholding portion. BCPG, established in 2015 and listed in 2016, is among Asia-Pacific's leading companies in renewable energy with solar power, hydropower, wind power and combined cycle gas turbine businesses in Thailand, Japan, Taiwan, Laos, Vietnam the Philippines and USA.





BCPG Portfolio















Current Footprint:



577 mw

Operating



THAILAND



1.2 mw



9.0 MW

Operating

Developing

LAOS TO VIETNAM







800 mw

Transmission capacity



290.0 MW

Operating

Developing

Contracted Capacity:

1,744.2 MW

968.7	775.5
Operating	Developing





10.0 mw

Operating

Developing





469.0 MW

Operating

Developing



THE PHILIPPINES



14.4 MW

5.3 MW

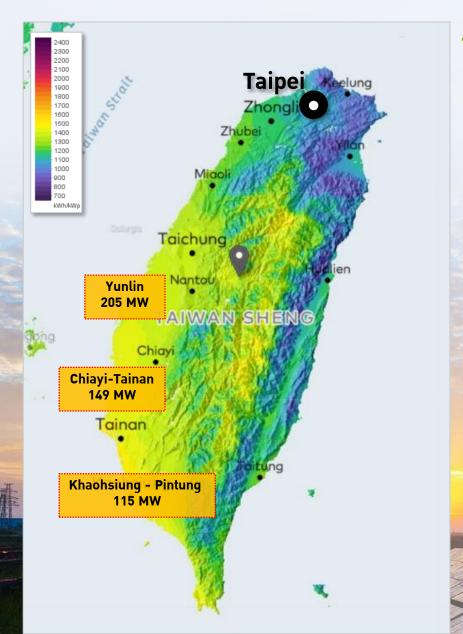
Operating

Developing



bcpg Investment in Taiwan





Taiwan : Solar Farms

Investment Highlight

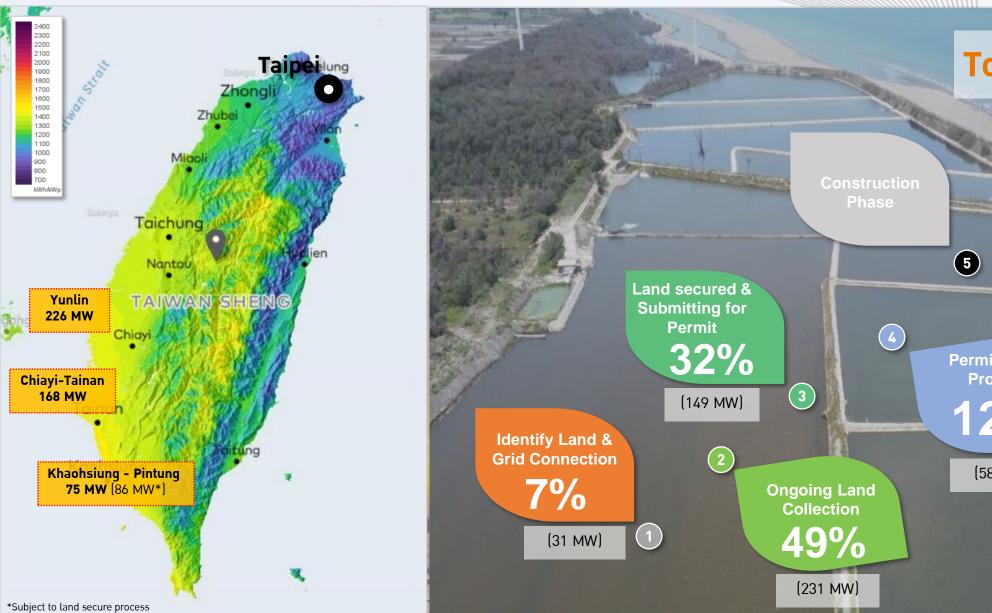
- With a very aggressive RE target, and strong government support incentivizing private sector to develop green energy project, Taiwan has been viewed as a growth engine for BCPG.
- BCPG Formosa, with an HQ in Taipei, is developing solar farms in Taiwan with target capacity of 469 MW. BCPG aims to expand to 1 – 2 GW in near future
- BCPG involves since early development stage of the projects up until operations
- BCPG is also considering other RE projects such as Offshore wind, BESS projects

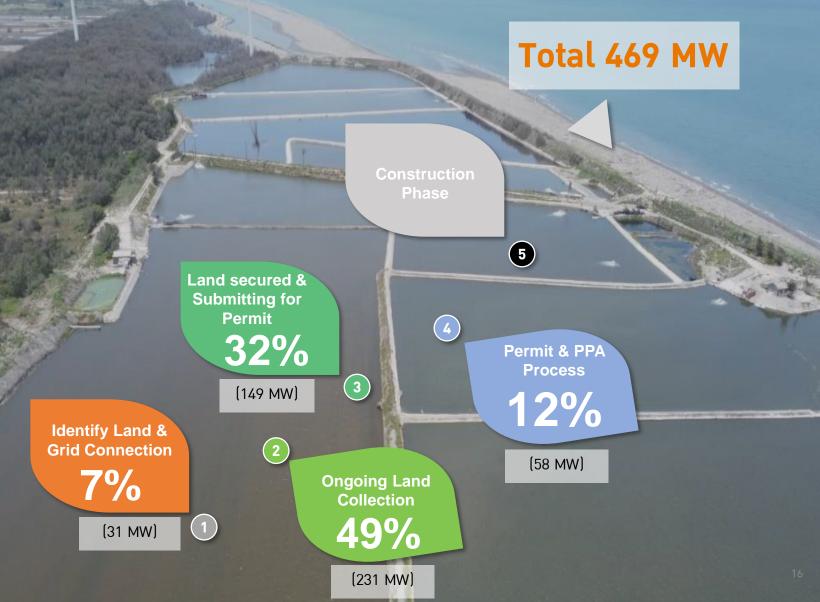
Expected Project Timeline



Taiwan Solar Farm Development Progress









BIO-BASED PRODUCTS

BUSINESS GROUP



Listed in SET since March 2022

No.1 Fully Integrated Biofuel Producer in Thailand

Biodiesel Business

Bioethanol Business





High Value Bio-Based Products

Partner









Product



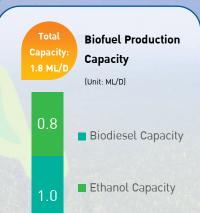












Biodiesel Business

Ayutthaya - CPO 1,000,000 L/D

Operates under BBGI Biofuel Co.

Biodiesel Products





bangchak

Ethanol Business

Kanchanaburi - Molasses

300,000 L/D

Operates under BBGI Bioethanol Plc.

Khonkaen - Molasses

350,000 L/D

Operates under BBGI Bioethanol Plc.

Chachoengsao - Cassava

150,000 L/D

Operates under BBGI Bioethanol (Chachoengsao)

Ethanol Products







NATURAL RESOURCES



and NEW BUSINESSES GROUP

Bangchak invests in upstream petroleum exploration and production (E&P) business through OKEA ASA, and involves in the lithium business and innovation businesses all over the world.

Current Asset in Production



44.56% Draugen Operator: OKEA



12% Gjoa



15% Yme



9.24%





6% Nova



35.2% Brage

STRENGTHENING A MORE ROBUST AND DIVERSE PRODUCTION PORTFOLIO IN **NORWEGIAN CONTINENTAL SHELF**







14% Statfjord



15.4% Sygna Unit



28% Statfjord nord



23.9% **Statfjord Unit**

Expected completion in Q4/2023



BANGCHAK INITIATIVE AND INNOVATION CENTER (BiiC)

BiiC explores opportunities for collaboration with various partners to develop business innovation that will generate new income and profit. BiiC is divided into groups, as follows



Corporate Venture Capital (CVC)

Invest in global innovative and disruptive startups to create new strategic partnerships and business opportunities for Bangchak Group. Its investments has extended from green energy and bio-based businesses to hydrogen economy and carbon capture & utilization.



Research and Development (R&D)

Collaborate and fund research institutes and universities for joint research and development of innovative products in the field of green and bio-based technology, as well as intellectual property protection.



Ecosystem and Incubation (E&I)

Create an ecosystem to support innovation through collaboration and incubate the growth of internal and external startups to create new customer experiences, increase revenue and efficiency for Bangchak businesses.



bangchak

Winnonie

Commercial startup from BiiC

An electric motorcycle rental platform for professional purpose that help cut the conventional costs of motorcycle payments, fuel, and maintenance into a singular all-inclusive rental service.

successfully raised 80 MB for a Series A early 2022





PATHWAY to NET ZERO in 2050





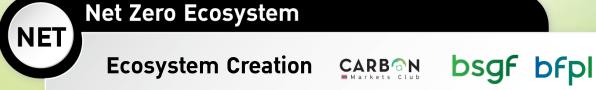


Conserving Nature and Society

Green and Blue Carbon = 10%







- 3

Conserving Nature and Society

1

Proactive Business Growth and Transition

6

Emphasize high quality production processes, efficiency enhancements for low-carbon emissions and environmental friendliness.

Promote ecological balance and linkage towards a low-carbon society (Green Carbon, Blue Carbon).

Transition business towards clean energy through technology for sustainable growth, increase revenue from Green Businesses, emphasize new investments that reduce GHG emissions.

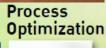
Efficiency Improvement







Battery Storage at Sites





Green Carbon





Blue Carbon



Transitioning business towards sustainable growth

Green Energy Technology





Contracted capacity

of

1,744.2 MW





Biodiesel

1 Million L/D

Bioethanol

0.6 Million L/D

High Value Bio-Based Products





Net Zero Ecosystem (NET)







Winnonie





ข้อมูล ณ วันที่ 30 มิถุนายน 2566

1.550.145 MWh





bfpl



Winnonie



Creating Largest Impact on Residual CO, emission, driving overall reduction ~80,000 tons CO,eq/y









Energy Transition is critical for our future...

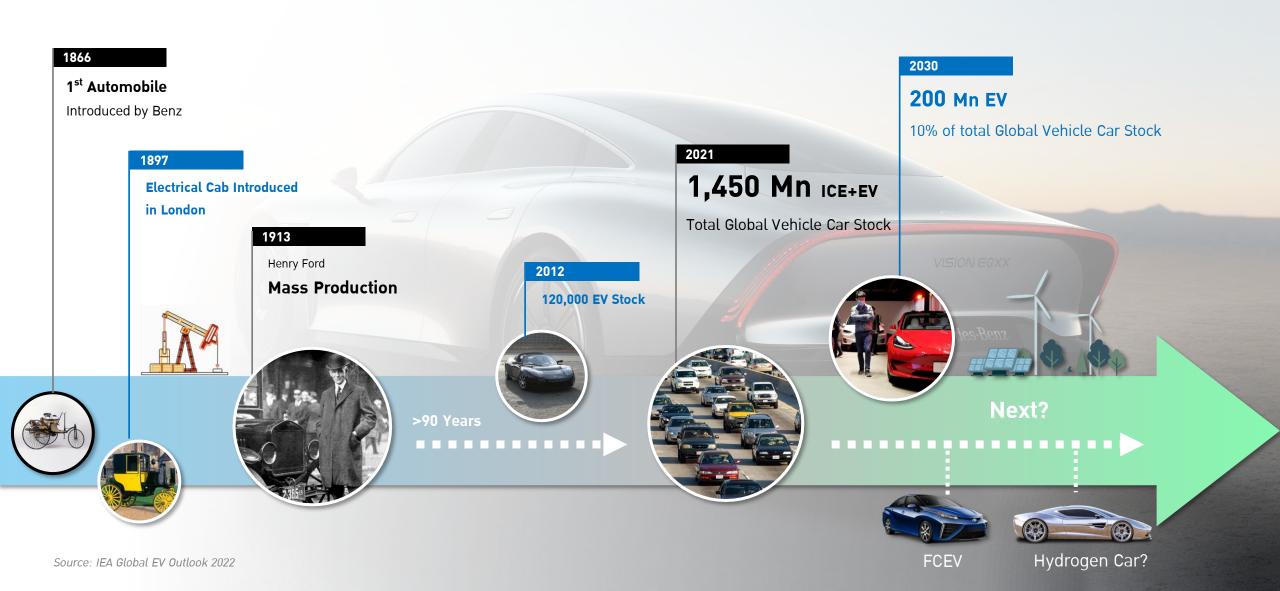




World is Moving To Cleaner Technologies

However, Time is Needed





First in Thailand, established in June 2021 11 Founding Members



























A "not-for-profit" community of entities and individuals...





A network to support carbon credits trading and certificates for the rights to become a digital power producer from renewable energy for greenhouse gas emission reduction in Thailand.

- Create awareness about global warming and adaptation, as well as providing solutions to the public.
- 2. Supporting carbon credit trading
 - to mitigate the impact of greenhouse gas emissions from conducting business or daily activities.
 - to create an ecosystem for transitioning to clean energy.

NEW MEMBERS are welcome...

A legal entity; business, government body, department, charity, institution.

or

An individual

who are concerned about global warming and ambitiously strive to make commitment to tackle climate change by *employing circular economy concept /supporting renewable energy / engaging with carbon trading as a mean for offsetting, etc.*



Communication Activities



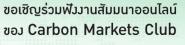








ธนาคารแท่งประเทศไทย



DID YOU KNOW? The Webinar Series

ในหัวข้อ **มาตรฐานการจัดกลุ่มกิจกรรม**

สำหรับการประเมินการดำเนินธุรกิจ ที่คำนึงถึงสิ่งแวดล้อม (Thailand Taxonomy)



บรรยายโดย **คุณเปรมาิต** สมรัตนซัย

CARBON

รอมผู้อำนวยการ ฝ่ายกลยทธ์สถาบันการมิน ธนาคารแห่วประเทศไทย

วันพุธที่ 27 กันยายน 2566 เวลา 10.00-12.00 น.

ในรูปแบบออนไลน์ ผ่าน 💶 zoom

สามารถลมทะเบียน เพื่อเข้ารับฟัวสัมมนาได้ที่ หรือตาม LINK www.carbonmarketsclub.com



"DID YOU KNOW?

Info@carbonmarketsclub.com member@carbonmarketsclub.com



The Webinar Series 2023"

Articles on www.carbonmarketsclub.com





Road to Decarbonization the Series

By Dr. Thon Thamrongnawasawat



มกราคม *"4+1 สู่เส้นทางลดคาร์บอน 2566"*



กุมภาพันธ์ **"รถไฟไฮบริดกับเส้นทางสายน้ำแข็ง"**



มีนาคม "การท่องเที่ยวแบบคาร์บอนเป็นศูนย์"

Contribution from Members

"Thai Rice Nama"





Facebook

"Did you know?" the series







Did You Know?



Did You Know?



CARBON

CARBON

Exhibitions/Knowledge Sharing Sessions









Carbon Neutral Events/Individuals

Nan

5,208 persons
521 Tons Co2 Equivalent **Mukdahan**12,348 persons

4,954 Tons Co2 Equivalent



Bangchak Sponsors Athletes from
Banthongyord for the 9th Consecutive Year,
Committing Carbon Offsets for "Carbon-Free
Athletes", Representing Thailand in an
Environmentally Friendly Fashion







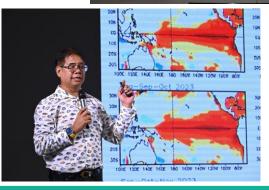


2nd Anniversary of Carbon Markets Club









- Reflecting the success in being a part of driving Thailand towards the Net Zero goal, stimulating the trading of carbon credits: TVERs, and RECs, totaling of app. 800,000 tons of carbon dioxide equivalent.
- Introducing the ECOLIFE for CMC application to encourage and invite both organizational and individual members to participate in various forms of environmental conservation missions."







Carbon Credit Trading





Members to date









Total 474 members (as of 8 September 2023)





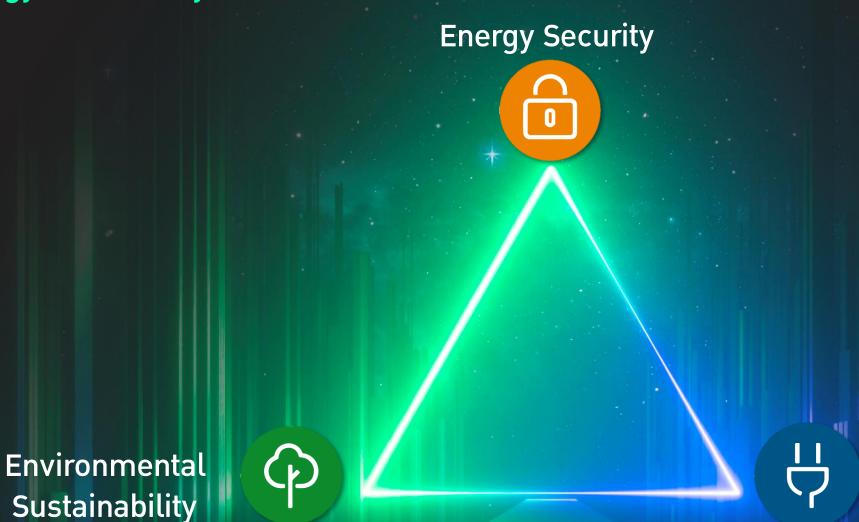
www.carbonmarketsclub.com



Balancing the Energy Trilemma

Energy in Harmony with Nature





Energy **Affordability**

Bangchak Group: Always Ahead of the Curve

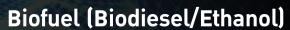






FOSSIL FUELS







Solar/Wind/Hydro Renewable Energy



EV Bike rental Platform



Net Zero



Carbon Markets Club



Sustainable Available Fuel

