

# Global Carbon Credits & Teak Project in Thailand of PM Group

August 23, 2023





# Climate Change & Global Warming

- Changes to Earth's climate driven by increased human emissions of heat-trapping greenhouse gases are already having widespread effects on the environment : glaciers and ice sheets are shrinking, river and lake ice is breaking up earlier, plant and animal geographic ranges are shifting, and plants and trees are blooming sooner . There is an entire shift in the climate due to the rising temperatures .
- We are seeing higher water levels that are causing floods in areas that had never seen them before .
- The weather is getting more tumultuous, and we are seeing tropical storms, hurricanes and more so forest fires due to the rising temperatures that are causing lots of destruction . (Maui, Hawaii forest fires that burnt down an entire part of the town Lahaina)
- **Higher levels of CO<sub>2</sub> emissions are the key cause of this .**

<https://climate.nasa.gov/effects/#:~:text=Changes%20to%20Earth's%20climate%20driven,plants%20and%20trees%20are%20blooming>  
<https://greenship.org/about/emission-wiki/green-house-gasses/>

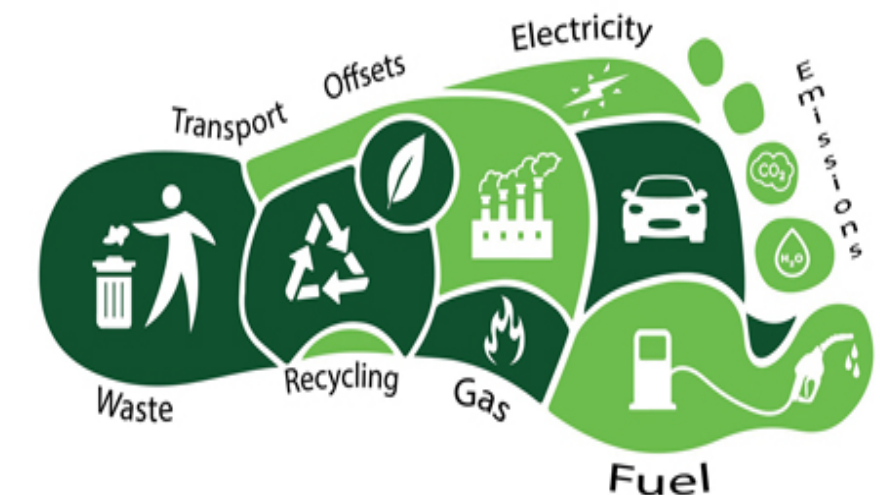
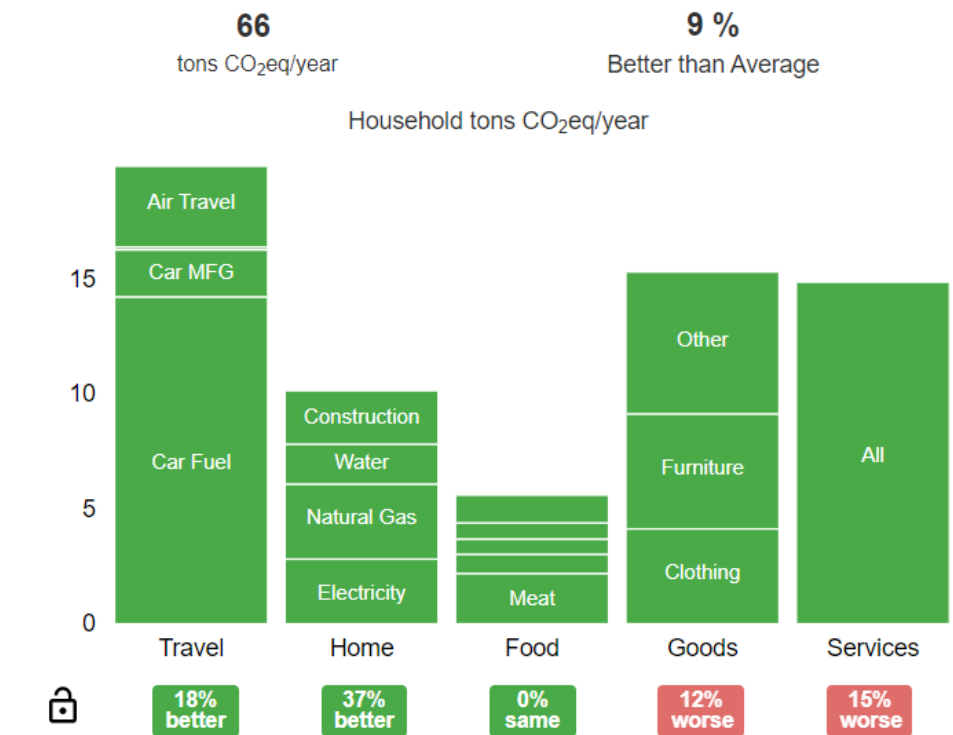




# Controlling our Carbon Footprint

- A carbon footprint represents the total greenhouse gases, like carbon dioxide and methane, produced by our activities. The global average carbon footprint is about 4 tons, but to avoid a 2 °C temperature rise, it needs to drop under 2 tons by 2050.
- Individual carbon footprints must decrease from 16 to 2 tons, requiring gradual changes like consuming less meat, using fewer flights, and air-drying clothes. Greta Thunberg, a Swedish activist, exemplifies this effort by urging leaders to reduce CO2 emissions. She turned vegan, avoided flying, and founded 'Fridays for Future' (aka School Strike for Climate).
- Calculating carbon footprints is easier now, e.g., via [www.nature.org](https://www.nature.org/en-us/get-involved/how-to-help/carbon-footprint-calculator/#:~:text=What%20is%20a%20carbon%20footprint,highest%20rates%20in%20the%20world). Our daily choices directly impact climate change, necessitating active changes in consumption and lifestyle.

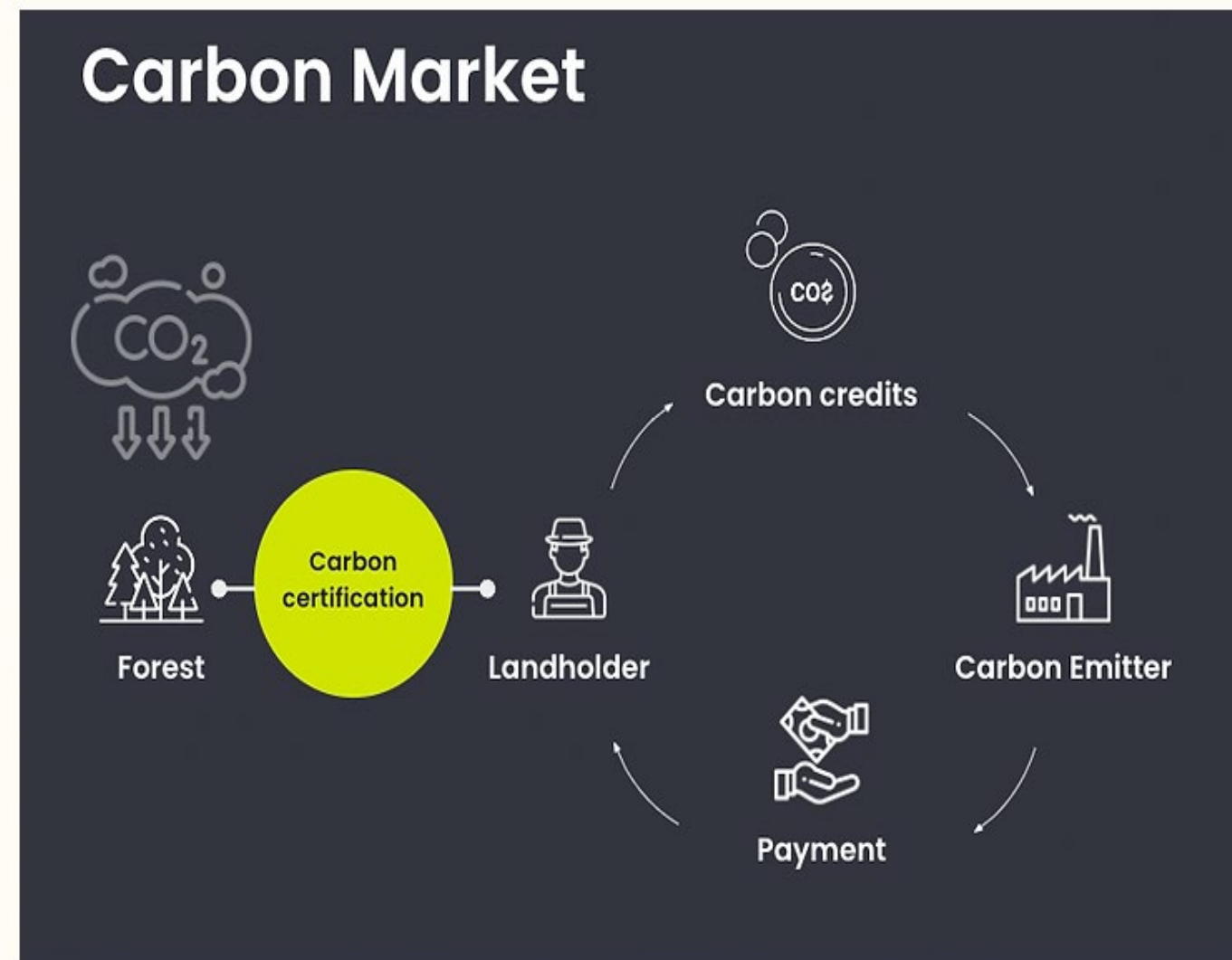
<https://www.nature.org/en-us/get-involved/how-to-help/carbon-footprint-calculator/#:~:text=What%20is%20a%20carbon%20footprint,highest%20rates%20in%20the%20world>.  
<https://www.britannica.com/biography/Greta-Thunberg>





# Controlling CO2 emissions: Carbon Credits

What are carbon credits?



- Carbon credits are quantifiable emission reductions from certified climate projects. They're tradeable due to global market mechanisms. This concept originated to lower greenhouse gas emissions. Firms receive credits that decrease over time; extra credits can be sold. This financial incentive drives emission reduction.
- Thailand also recognizes greenhouse gas impacts, establishing institutions like TGO (Thailand Greenhouse Gas Management Organization, a public limited company) and renamed the "Department of Environmental Quality Promotion" to the "Department of Climate Change and Environment Transformation" effective from August 18, 2023. This decision is vital due to the pressing global issue of climate change and global warming.

<https://www.southpole.com/sustainability-solutions/carbon-credits-frequently-asked-questions>

<https://www.carboncrop.nz/post/carbon-credits-what-are-they-and-how-do-they-work>

<http://www.tgo.or.th/2020/index.php/en/page/carbon-credit-carbon-market>



# Controlling CO2 emissions: Carbon Credits (cont.)

Carbon credit trading occurs in two main markets: 1) the compliance market and 2) the voluntary market.

## 1. Compliance Market (Mandatory/Regulated):

In line with the Kyoto Protocol's standards, various methods are used to achieve emissions reduction targets:

**1.1 Joint Implementation (JI):** Developed countries invest in projects in certain economies in transition (Annex B countries) to meet their Kyoto targets. Emission Reduction Units (ERUs) are earned by host countries that reduce emissions below their baselines.

**1.2 Clean Development Mechanism (CDM):** Like JI, but projects occur in developing countries. They must specify GHG reductions, resulting in Certified Emission Reductions (CERs).

These mechanisms allow for emissions reduction while generating tradable carbon credits .



# Controlling CO2 emissions: Carbon Credits (cont.)

**1.3 The Emissions Trading (ET):** mechanism facilitates the buying and selling of greenhouse gas (GHG) emissions among Annex I countries. These countries, each with varying emission reduction commitments, utilize Assigned Amount Units (AAUs) from 2008 to 2012. For those unable to meet commitments, they can buy credits (CERs or ERUs) through ET, often by investing in local emission -reduction projects. The European Union Emission Trading Scheme (EU ETS), launched in 2005, exemplifies this system. EU Member States were assigned emission "caps," with penalties for exceeding them and allowances for selling unused quotas. The EU ETS covers sectors like oil, electricity, paper, cement, and steel. This mechanism is a "cap and trade" system, one of the Kyoto Protocol's flexible mechanisms for GHG emission trading.

**2. Voluntary Market:** The voluntary carbon market involves selling Verified Emission Reductions (VERs) generated from CDM/JI projects. These projects don't always require approval from the Host Country DNA and aren't mandatory to be registered under UNFCCC. As a result, VERs are usually priced lower than Certified Emission Reductions (CERs).

This market can be categorized into two segments: the Chicago Climate Exchange (CCX) and Over -the -Counter (OTC).



# Controlling CO2 emissions: Carbon Credits (cont.)



**3. Location of carbon markets (especially CERs):** The selling and buying of CERs normally takes place over -the-counter (OTC), and the remaining 25 percent takes place in compliance markets, such as NordPool , ECX,BlueNext and Climex .

NordPool is a trading platform where CERs have been traded since 2007. This market is situated in the Nordic countries (Finland, Sweden, Denmark, and Norway).

European Climate Exchange (ECX) is a trading platform situated in the UK. It started buying Futures CERs in May 2008.

BlueNext market, situated in France, opened in 2007. It started trading CER Futures in 2008.

Climex market, located in the Netherlands, opened in 2003 but started trading CER spot contracts in 2008.

**Carbon market in Thailand:** In Thailand, there is still developing a carbon market that is related to the selling and buying of carbon credits. TGO and FTIX are an online web trade platform. And OTC trades taking place, in which developers of CDM projects and countries within the Annex I are trading credits through delegates, financial funds, and brokers.

# The Global Carbon Zero Objective

Due to damaging effects of Carbon Dioxide emissions on the environment the Carbon Zero objective has been set and governments are pledging to achieve net zero emissions. :

- It is international scientific consensus that, in order to prevent the worst climate damages, global net human -caused emissions of carbon dioxide (CO<sub>2</sub>) need to fall by about 45 percent from 2010 levels by 2030, reaching net zero around 2050.



# World Economic Forum - Paris Agreement

- In the [Paris Agreement](#) – emissions need to be reduced by 45% by 2030 and reach net zero by 2050.
- By the year 2020, more than 110 nations had committed to reaching a state of net zero emissions by 2050, while additional countries are gradually undergoing transitions which might extend beyond the year 2050.
- The primary goal of the Paris Agreement is to ensure that the increase in global temperatures is kept well below 2 degrees Celsius by the year 2100, with a preference for an even more ambitious target of 1.5 degrees Celsius.

<https://www.un.org/en/climatechange/net-zero-coalition>

<https://net0.com/blog/net-zero-countries#:~:text=By%202020%20more%20than%20110,the%20largest%20emitter%20by%202060.>

# Carbon Credit Evaluation

- Carbon credits play a crucial role in sustainable development and decarbonization efforts .
- In Thailand, carbon credits are traded at around THB 100 per unit, while in Europe, the price is about THB 3,000 per unit. The value of carbon credits is expected to rise, making investment in projects more attractive .
- The project includes planting new saplings to replace felled trees, promoting environmental sustainability and societal benefits . This approach aims to contribute positively to both the environment and society .

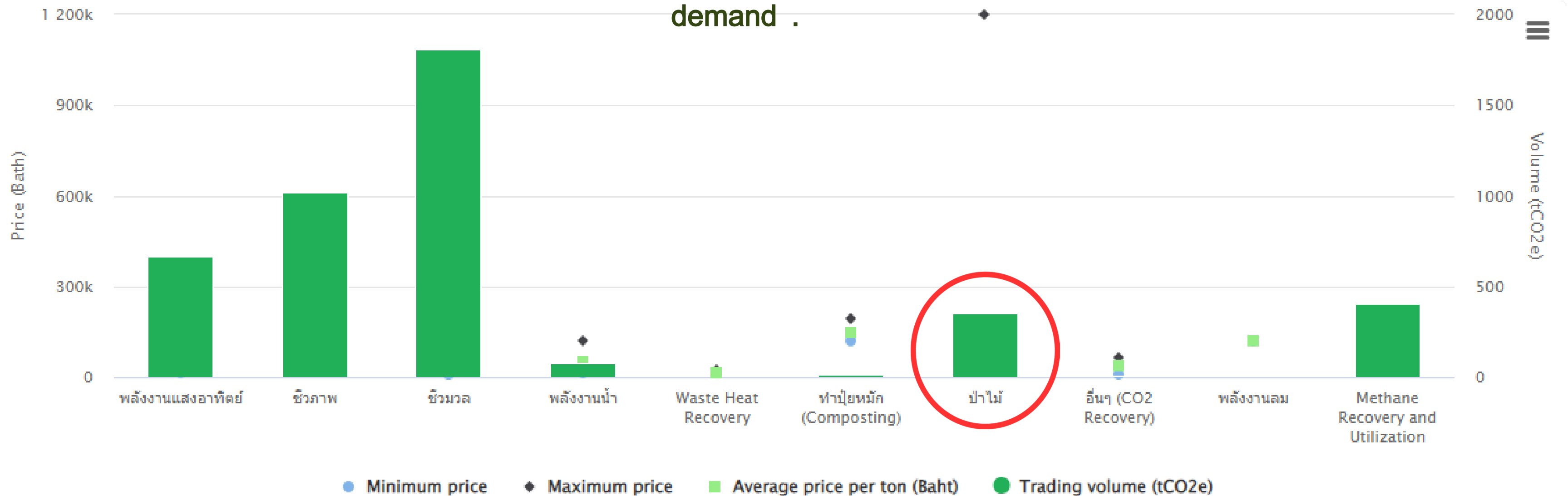




# Carbon Credit Evaluation (cont.)

## TVERs purchase price by project type

- In Nov 2022, Carbon Credit trading price in Thailand for the Forestry Sector was at 1,937.46 THB/tCO<sub>2</sub>e This price could be even higher in the future due to stronger demand .



# Carbon Credit Evaluation (cont.)




Source: Thailand Greenhouse Gas Management Organization (TGO); Thailand Government Unit

- Carbon Credit price in EU has been soaring 5 folds in 3 years from 2020 at 20 EU/tCO<sub>2</sub>e to 109.12 tCO<sub>2</sub>e in 2022.
- According to Mc Kinsey, the global Carbon credit market would expand to 15x and 30x in 2030 and 2050 .
- With natural gas shortage in Europe and switching to coal as main fuel, the Carbon Credit gaining in Europe should decline and the Carbon Credit price could be driven up even more and possible to reach 1,000 EU/tCO<sub>2</sub>e.



# Carbon Credit Pricing Chart

Carbon Credit Pricing by Type				
Project Type:	Volume Sold (MtCO <sub>2</sub> e):	Average Price:	Price Range:	
Wind	12.8	\$1.9	\$0.3 - \$18	
REDD+	11	\$3.3	\$0.8 - \$20+	
Landfill methane	7.9	\$2	\$0.2 - \$19	
Tree planting	3	\$7.5	\$2.2 - \$20+	
Clean cookstoves	3	\$4.9	\$2 - \$20+	
Run-of-river hydro	1.5	\$1.4	\$0.2 - \$8	
Water/purification	1.2	\$3.8	\$1.7 - \$9	
Improved forest management	0.8	\$9.6	\$2 - \$17.5	
Biomass/biochar	0.7	\$3	\$0.9 - \$20+	
Energy efficiency - industrial-focused	0.7	\$4.1	\$0.1 - \$20	
Biogas	0.6	\$5.9	\$1 - \$20+	
Energy efficiency - community-focused	0.6	\$9.4	\$3.3 - \$20+	
Transportation	0.5	\$2.9	\$2.2 - \$6.8	
Fuel switching	0.5	\$11.4	\$3.5 - \$20+	
Solar	0.3	\$4.1	\$1 - \$9.8	
Livestock methane	0.2	\$7	\$4 - \$20+	
Geothermal	0.1	\$4	\$2.5 - \$8	
Agro-forestry	0.1	\$9.9	\$9 - \$11	

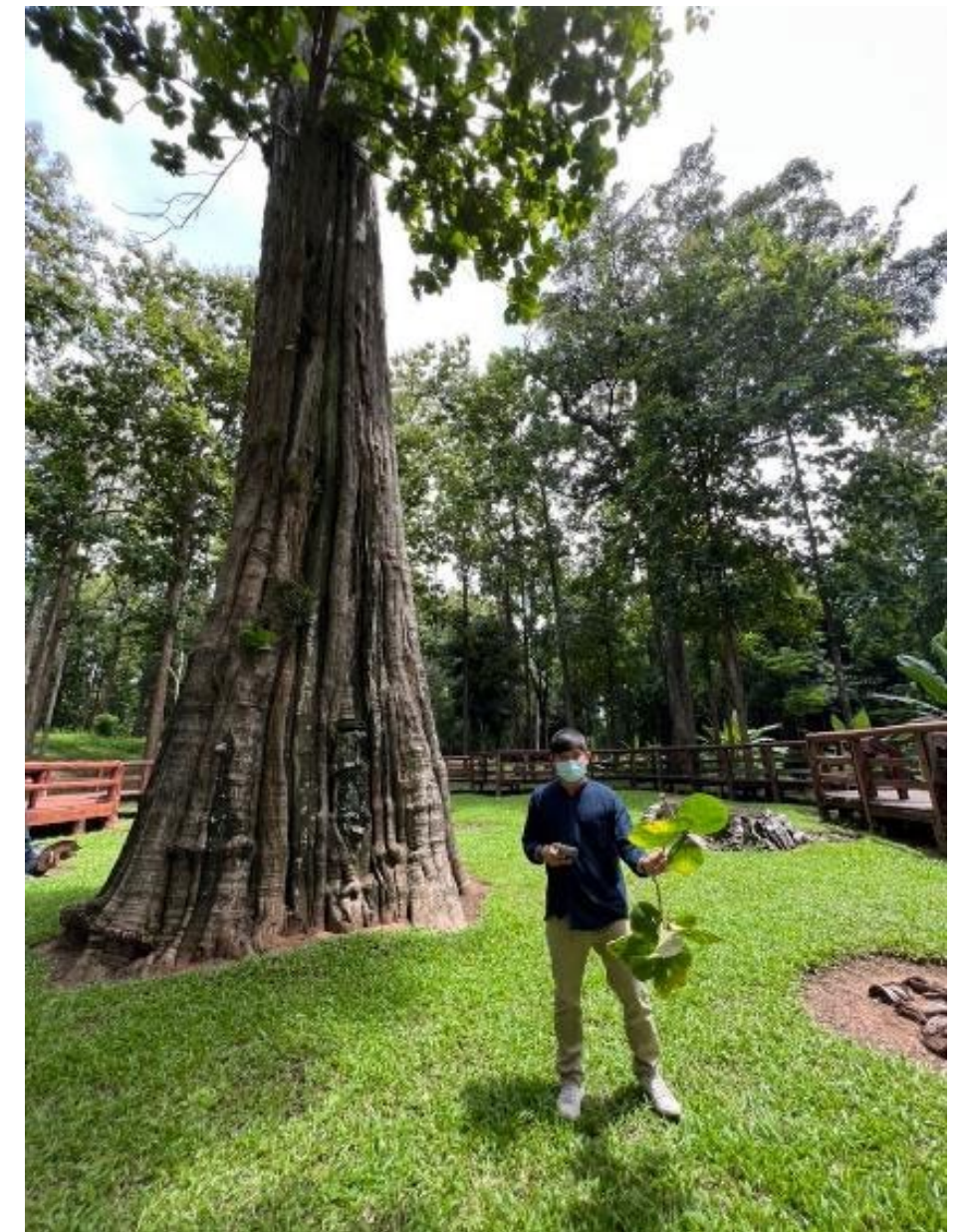




# The World's Oldest & Largest Teak Tree is located in Uttaradit province.

Pictures below taken from the largest teak tree in the world.

- The largest teak tree is located in Uttaradit Province, northern part of Thailand.
- It is over 1,525 years old its name is 'Mahesak' that translates to be "The Giant Teak tree"





# Teak Tree Applications and Benefits

- Teak is a hardwood tree, native to south and southeast Asia, mainly India, Sri Lanka, Indonesia, Malaysia, Thailand and Myanmar .
- Thailand has the most teak trees, second to Myanmar, and the quality of the teak is very good - teak trees are quite rare around the world .
- Teak wood spots pale green color and turns brown at maturity .
- Common teak is a large, long, tropical, deciduous, hardwood tree reaching about 40–50 meter tall . Its leave is in elliptic or obovate at 20 to 30 centimeters long .
- Teak is one of the fast-growing tropical hardwoods, growing at a rate of about half an inch per day. It takes at least 25-30 years to grow into a mature tree ready to be harvested .



# Teak Tree Application

There are 2 major applications made from teak:  
Furniture and decoration  
Health: Medical & Herb



Uses of Teak



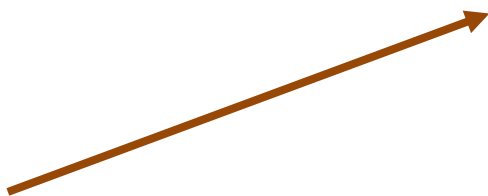
**Wood**



**Furniture**



**Decoration**



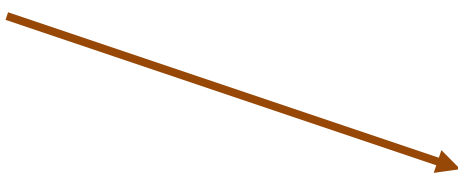
**Flower**



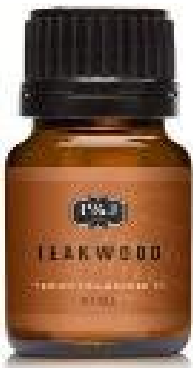
**Herb**



**Medical**



**Leaf and Bark**



**Cosmetic**



**Beverage**



# Teak for Furniture and Decoration

- Teak is considered to be one of the highest qualities of wood that exists in the world today .
- Teak possesses many amazing qualities, such as being sturdy wood, very workable, resistant to rot, fungus, termites and even fire due to the wood's high oil content . For these reasons it has been the pillar of the shipbuilding industry for centuries . It's the best material for ship and yacht decks.
- Along with its rarity, honey-hue, teak wood is used to create a prestigious, privileged and luxurious feel.
- Teak products are used in ship building, luxury furniture, home decoration, and the interior decoration of automobiles, airplanes, yachts and luxury cruise ships.





# Teak Wood Is High -Quality, Prestigious and Expensive

## Advantages of Teak Wood

- **High Aesthetic Appeal** : Teak wood has great aesthetic appeal. Its rich golden brown resonates with gold and the color darkens over time.
- **Waterproof** : Due to its high oil content and extremely tight grains, it has a very low moisture permeable rate and is suited for ships, pools, and seaside areas or any water resistance required areas. It is rarely affected by plant fungi and therefore resistance to surface damage. As teak wood reacts minimally to moisture in environment it is not prone to much swelling.
- **Durability** : Teak wood furniture can last very long time.
- **Workability** : With its durability, it can be crafted to fit different places, shapes and usages.
- **High price** : With both look and functionality, teak is highly sought after and thus commands a high price.
- **Cost Effective** : Many hotel also adopts teak usage since it matches with luxurious feel, long life expectancy, ease of maintenance therefore reducing the overall replacement cost.

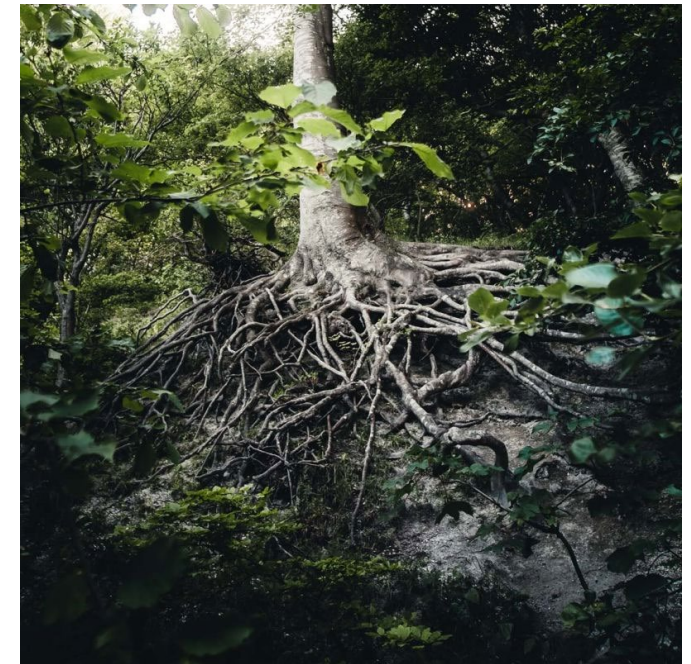




# Health Benefits of Teak

Listed below are some of the popular health benefits of consuming common teak, the different parts have :

1. Teak leaves are cooling in nature thus can act as an anti-inflammatory agent for reducing the inflammation of the skin.
2. Frontal leaves of teak can be prepared as herb and used for treating and healing wounds especially scald or burn wound.
3. Teak wood can be decocted and used for treating gastrointestinal disorders such as dysentery, stomachache, piles and constipation.
4. Roots of the teak plant can be decocted and used for treating anuria. Anuria is a health condition marked by the failure of the kidneys to produce urine.
5. Teak flowers are useful for curing bronchitis. Bronchitis is the inflammation of the mucous membrane in the bronchial tubes in the respiratory system.
6. The oil extracted from teak flowers can be applied on hair for promoting hair growth.
7. The bark of the teak wood can be decocted and used for curing diabetes due to its antidiabetic properties.





# Teak Tea

As we know that coffee and tea are consumed globally as a breakfast and after dinner beverage and both drinks contain caffeine. Most people would order a decaffeinated coffee for dinner as it would affect their sleep. That is why Teak Tea is a better alternative and healthier as well.

As we have seen the benefits of the teak tea leaf, therefore PM Group has entered a partnership with a company called Amazing Tea Limited Partnership and have developed a new Teak Tea product.

The Chinese people drink tea daily and we are sure that this product would become popular as well. Furthermore, we also believe that it would become a product consumed globally.



Teak Tea 5 Herbal Alternative<sup>20</sup>  
for Good Health and Well Being

*White Mulberry*  
*Asiatic Pennywort*  
*Pandan*  
*Mint*  
*Kaffir Lime*

Drink Teak Tea 5 Herbal 1-2 sachets  
per day for people with the following :

- obesity
- excess food consumption
- risk of diseases
- high fats
- high blood pressure
- diabetes
- heart disease
- cancer
- amnesia







**Prayudh Mahagitsiri** , a visionary leader, had planted many teak trees for over 30 years and he now owns in total of over 500,000 teak trees in Thailand. He was concerned about the global emissions & sustainability and knew that these trees would be part of the reduction of global warming. These trees would be the lungs of Thailand and the world as they would provide oxygen and greenery to the environment

Because Prayudh wanted to also use these teak plantations professionally, the first project that has been registered under the Thai carbon credits scheme is Carbon Teak Co., Ltd in Phetchabun.



# Carbon Teak Company Limited and Carbon Credits Market (Cont.)

Teak Plantation in Wichianburi, Phetchabun has been registered under TGO

- The project activities are conducted in accordance with relevant laws or regulations and are carried out in alignment with the development guidelines for greenhouse gas reduction projects, as per the standards of Thailand (T-VER)
- The project falls within the scope of greenhouse gas reduction projects that do not require additional verification (Positive List) or involves additional activities beyond normal operations (Additionally) as defined by the committee under TGO.
- It conforms to the Voluntary Emission Reduction (T-VER)Methodology as stipulated by the committee under TGO.
- The potential for greenhouse gas reduction or sequestration of the project is assessed in accordance with the Voluntary Emission Reduction (T-VER)Methodology .
- It must undergo Validation by external assessors for voluntary emission reduction projects that have been registered by the committee under TGO.
- Monitoring and reporting of greenhouse gas reduction progress are carried out using the Voluntary Emission Reduction (T-VER)Methodology .



# Carbon Teak Company Limited and Carbon Credits Market (Cont.)

## Details of the Carbon Teak plantation



Forest Plantation located in Wichianburi, Phetchabun-Northeast of Thailand



600,000 teak trees, many which are over 30 years old.



Many of the trees have a circumference of around 100 centimeters



# Carbon Teak Company Limited and Carbon Credits Market (Cont.)

For Carbon Teak Company limited the estimation of the carbon credits are 72,000 tons of Carbon Dioxide equivalent. (ton CO<sub>2</sub> ). On average this amount increases by 3,500 tons because of the growth of the trees .

RANKING	Code	NORTHING	EASTING	COMMON NAME	HEIGHT (M.)	CIRCUMFERENCE (M.)
1	T5193	1,735,228.47	730,712.97	TEAK	10.00	2.02
2	T43510	1,736,621.60	731,726.01	TEAK	14.00	1.96
3	29733	1,735,961.10	731,554.13	TEAK	15.00	1.95
4	30242	1,735,981.89	731,618.48	TEAK	15.00	1.92
5	T 10317	1,735,026.69	730,493.19	TEAK	12.00	1.92
6	30243	1,735,987.20	731,624.49	TEAK	15.00	1.89
7	T 12569	1,735,359.08	730,290.97	TEAK	12.00	1.81
8	T43581	1,736,636.31	731,746.03	TEAK	20.00	1.80
9	T38214	1,736,015.75	731,670.58	TEAK	20.00	1.78
10	T29520	1,735,938.14	731,625.06	TEAK	15.00	1.74

Sample of actual teak trees measurement taken by the surveyors at Wichianburi, Phetchabun.



## To achieve carbon credit recognition there are several steps and processes as follows:



องค์การบริหารจัดการก๊าซเรือนกระจก (องค์การมหาชน)  
Thailand Greenhouse Gas Management Organization  
(Public Organization)

### 1. Hire Consultant

They will create  
PDD Report &  
Co-benefits  
Report

### 2. Hire External Validator (VVB)

They will review and  
validate the PDD  
Report &  
Co-benefits Report

### 3. Submission of Reports

Submit both  
reports & validated  
reports to the TGO

### 4. Monitoring

Reevaluation by  
the Consultant &  
Validator before  
registering T-VER

### 5. Register T-VER Carbon Credits

For trading on FTIX  
web platform

# Carbon Teak Company Limited

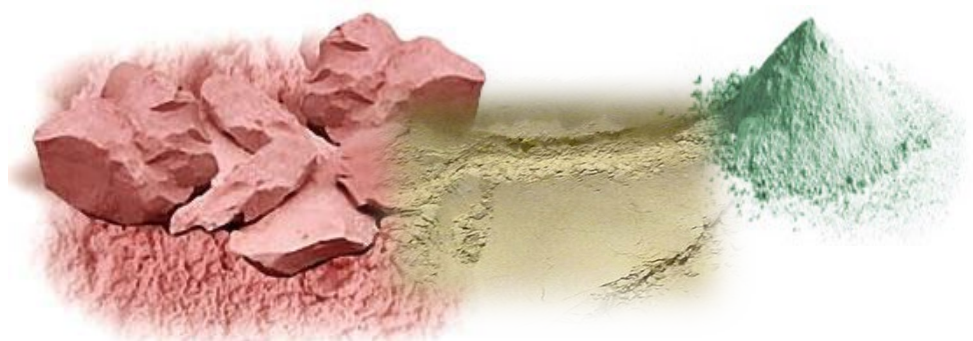
## Discovery of Montmorillonite

Montmorillonite – Reserves in Hand 100 rais (160,000 sqm)  
9 million tons of MMT

Montmorillonite – Property and Usage

### Superior Clay Property with 3 Nano-Layers

- Montmorillonite (MMT) is a natural clay mineral belonging to the smectite group. It is a product of volcanism and hydrothermal activity.
- MMT color can range from white, yellow, green, pink and red.
- Due to its 3 Nano-layers structure, MMT takes up water between their layers and can exchange organic liquids.
- MMT Nano Clays has superior overall properties compared to traditional additives and fillers, for example, strength, stiffness, optical clarity and permeability.



### Usage

- **Cattle feed and pet food:** MMT clay is used as an anti-caking agent.
- **Bleaching Agent:** For vegetable oil and biodiesel oil.
- **Alcohol Beverage:** In powder form, it can be used as flocculant by tossing into the pond or pools of water. Same method could be used to purify organic matter in water.
- **Cosmetic:** MMT is used to absorb excess water and oil, reduce too high cosmetic density, stabilize ingredient formula, extend shelf life, adjust cosmetic viscosity and used in deep cleansing agent.

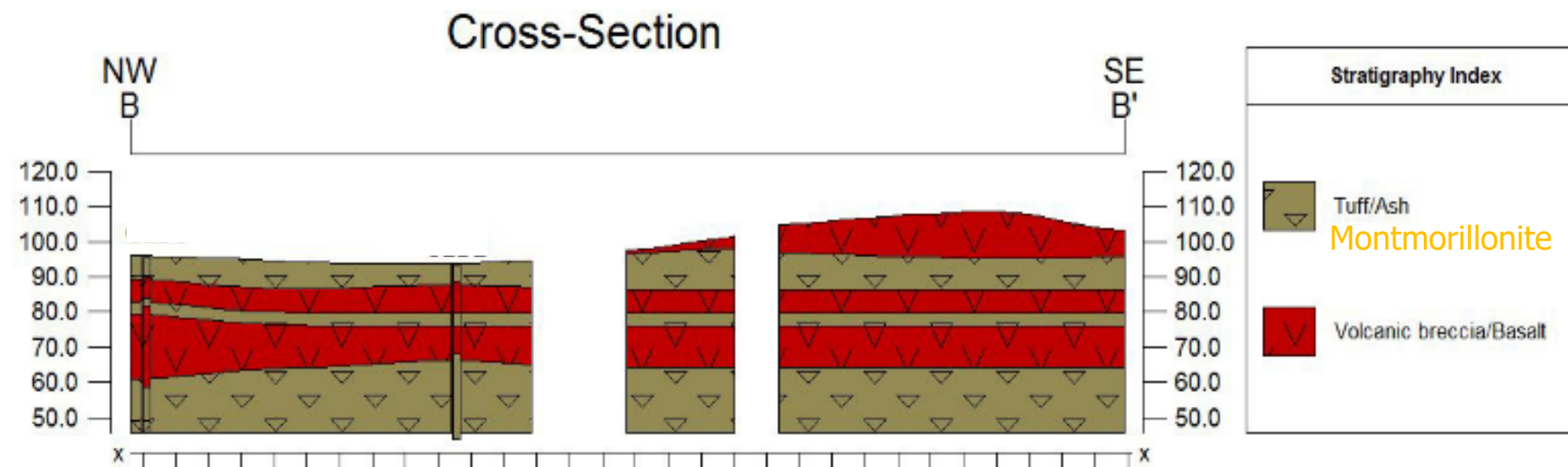
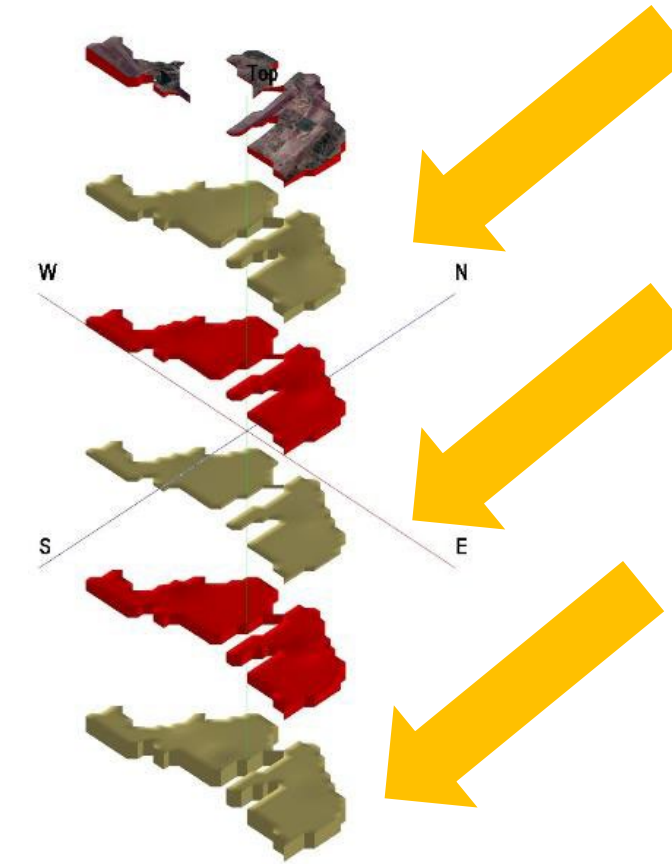
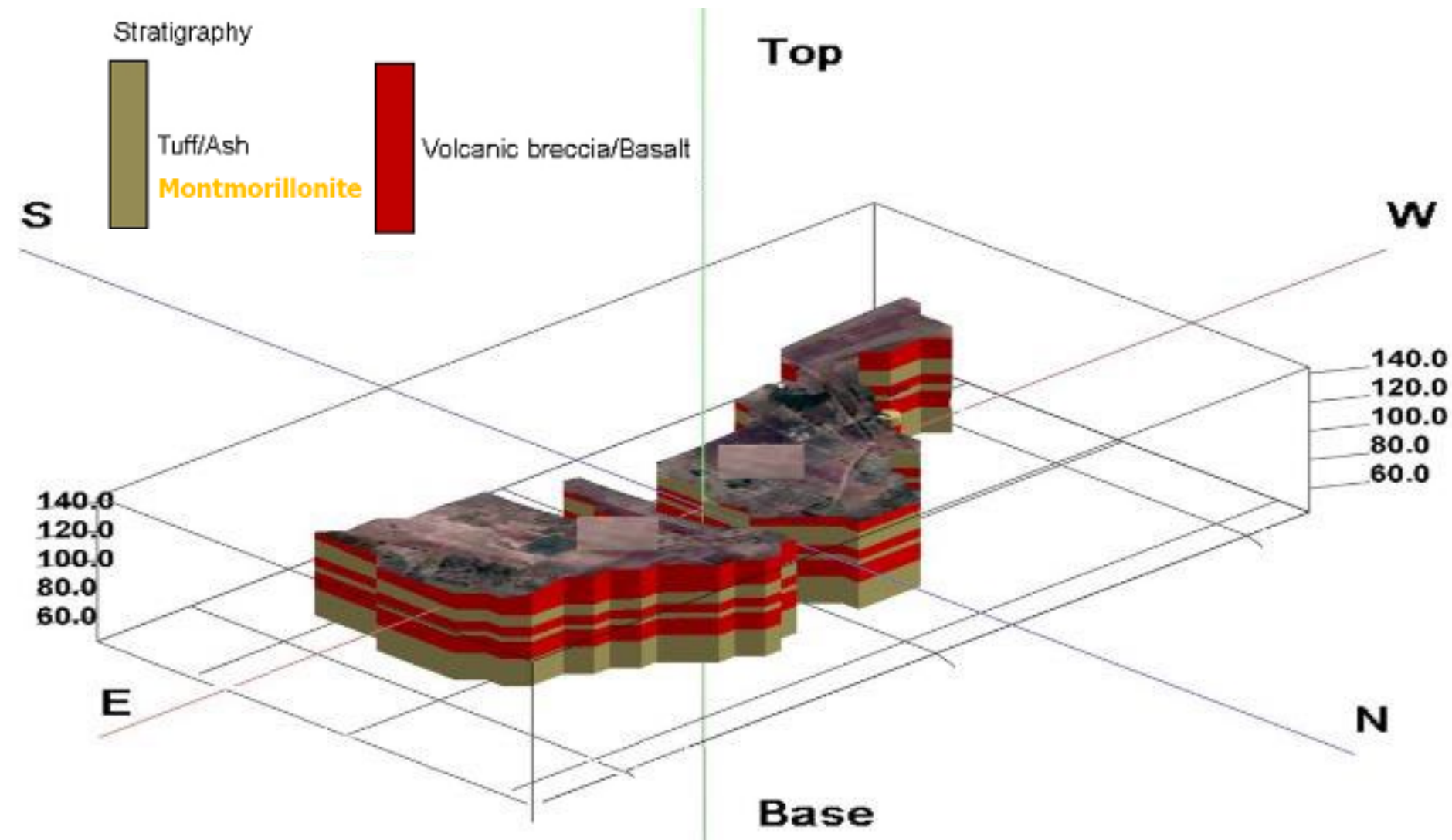




# Montmorillonite – Reserves in Hand 100rais(160,000 sqm) area



PM GROUP



# Montmorillonite Project Benefit

## Expect market for 150,000 tons capacity

Bleaching Clay for cooking oil Industry 75,000 Ton/year  
Antitoxin Clay for Animal Feed Industry 75,000 Ton/year

## Expect Market Price

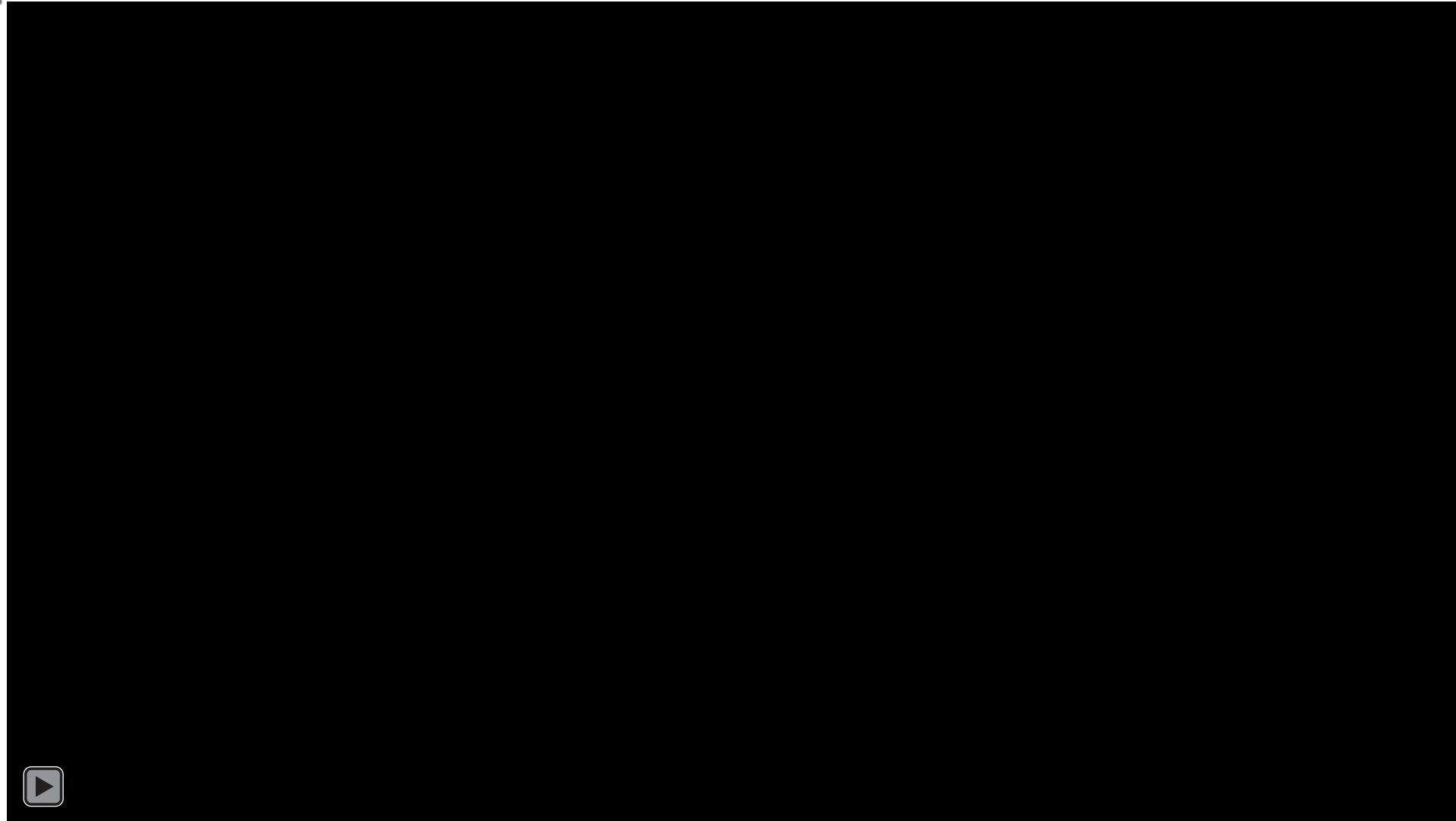
Bleaching Clay for cooking oil Industry 442 USD/Ton  
Antitoxin Clay for Animal Feed Industry 882 USD/Ton

## Expect Project Benefit per Year

Bleaching Clay for cooking oil Industry 22.74 M.USD/Ton  
Antitoxin Clay for Animal Feed Industry 55.82 M.USD/Ton  
TOTAL EXPECT BENEFIT 78.56 M.USD/Year



# Carbon Teak Company Limited and Carbon Credits Market (Cont.)

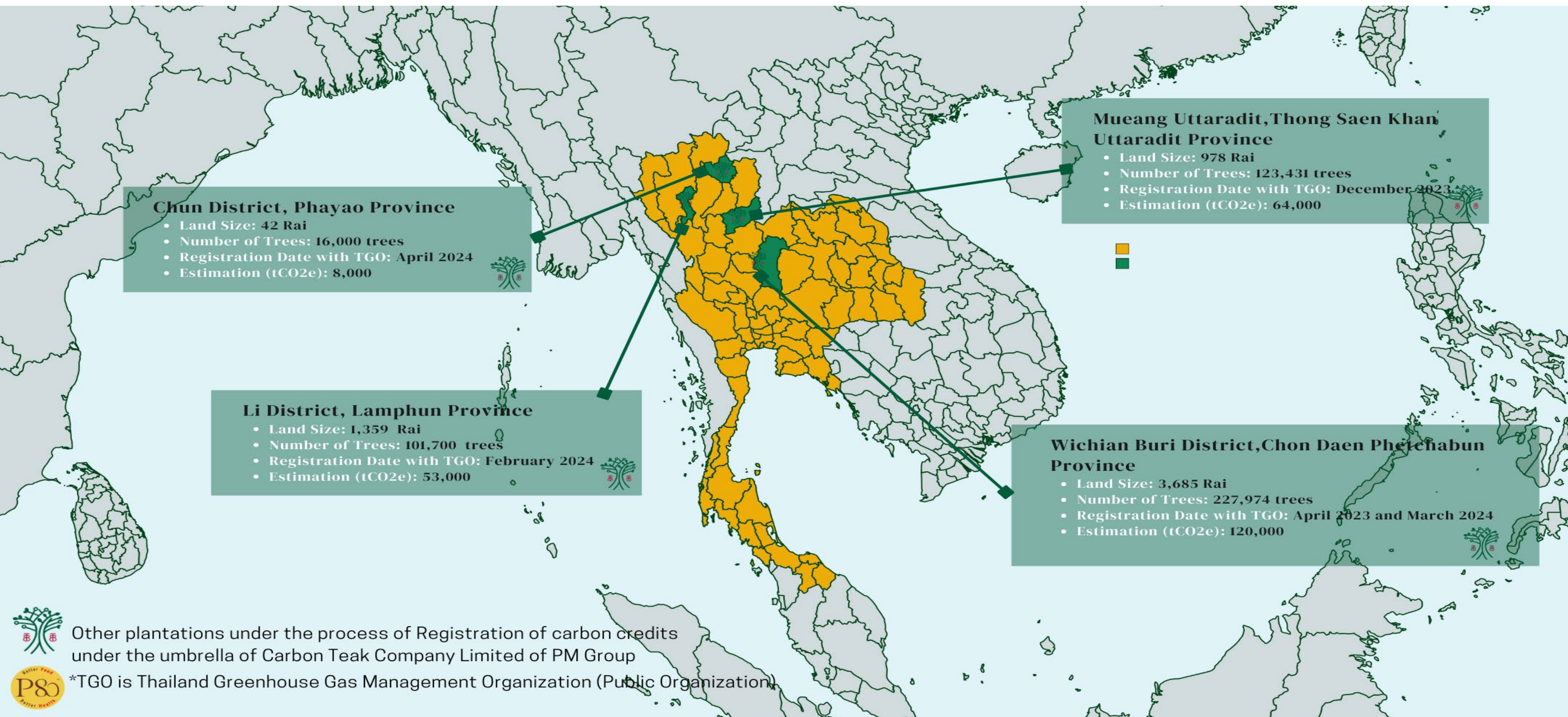


Actual Drone footage of Carbon Teak plantation in Wichianburi, Phetchabun



# Carbon Teak Company Limited and Carbon Credits Market (Cont.)

## Carbon Credit Registration Roadmap with TGO





# Other plantations under the process of Registration of carbon credits under the umbrella of Carbon Teak Company Limited of PM Group

For Carbon Teak Company limited the estimation of the carbon credits are 75,000 tons of Carbon Dioxide equivalent. (average this amount increases by 3,500 tons because of the growth of the trees)

Carbon Teak Co., Ltd.					
No.	Teak Tree Area	Total Area (Rai)	Number of Trees	T-VER Registration (Date)	Carbon Credits Estimation (tCO <sub>2</sub> e)
1	Phetchabun Province Wichianburi District	2,500	142,974	28-Apr-23	75,000
2	Uttaradit Province Thongsankhan District	662	111,431	Will be registered in December 2023	58,000
3	Uttaradit Province Muang Uttaradit District	316	12,000	Will be registered in December 2023	6,000
4	Lamphun Province Li District	1,359	101,700	Will be registered in February 2024	53,000
5	Phetchabun Province Chon Daen District	1,185	85,000	Will be registered in March 2024	45,000
6	Phayao Province Chun District	42	16,000	Will be registered in April 2024	8,000
		Total	469,105		245,000

(1 rai (land measurement) = 1600sqm (0.4 acres))

## Contact Carbon Teak Company Limited

Investors looking for opportunities to expand :

- ✓ Carbon credits we will have 500,000 tons of carbon dioxide equivalent (tCO<sub>2</sub>e) from 600,000 teak trees that are over 30 years old.
- ✓ Teak wood for luxurious furniture and interior decoration of automobiles, airplanes, yachts and luxury cruise ships.
- ✓ High quality MMT to be used as raw material for various usages.
- ✓ Health drinks; tea & beverages made from the teak tree.



# Contact for more information

Carbon Teak Company Limited

16 Village Number 17,

Tha-rong Subdistrict , Wichienburi District ,

Phetchabun , Thailand 67130

Email: [Atthaphon.k@pm-80.com](mailto:Atthaphon.k@pm-80.com) & [suchada.c@Thoresen.com](mailto:suchada.c@Thoresen.com)



**Carbon Teak  
Company Limited**

Welcome to Invest with us  
Thank You

