

EThree Fund (E³)

Poor Farmers Getting Poorer, in Thailand and Across the Developing World.

While Thai agriculture exports are very successful internationally, Thai farmers remain the poorest members of society, a situation which characterizes farmers across the region, and across the developing world. From a recent study¹, about 7 million farmers earn less than US \$30 per month, and 80% of farmers are in debt. Factors that affect income are the degraded land, significant investment and expenses in irrigation, seedlings, fertilizers, pesticides, and manpower.

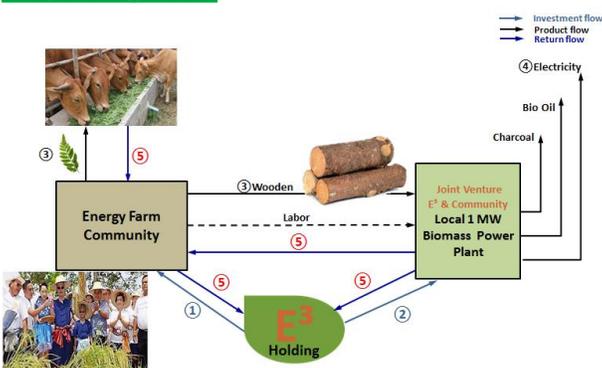
How Can E³ Help?

EThree Fund (E³) provides the necessary financial support so that farmers may switch to growing crops of a *Leucaena Leucocephala* (LAM), a tree found throughout Southeast Asia and other tropical regions. Growing LAM generates several major advantages:

- **Economic:** Farmers gain from a fixed price guaranteed by the E³ fund, removing their susceptibility to fluctuating commodity cash crops. E³ can provide the price guarantee because of three major factors:
 - Continued, increasing energy demand in Thailand and throughout Asia.
 - A Thai government goal of 25% energy supplied by renewable sources by 2021, leading to expected biomass-generated energy of 3,630 MW by 2021 (versus 1,751MW today).
 - Biomass has the lowest cost for power production in renewable energies, US \$0.04/kWh, compared to solar, US \$0.28/kWh and hydro power US \$0.06/kWh, respectively.
- **Environment:** LAM can be grown in poor, degraded soil, with nitrogen fixing properties that improve soil quality over time. This leads to eventual production of higher value crops on currently unused land.
- **Social:** E³ employs a business model that utilizes distributed power generation near the communities where LAM is grown. This not only lowers transportation costs, but actually allows local communities to take control of their economic future, guaranteeing their social well-being.

The benefits of E³ drive each other: environmental benefits drive economic benefits, and vice-versa, leading to stronger communities and their related social benefits.

E³ operating Model



- ① E³ invests in community to grow energy farm.
- ② E³ invests in power plant.
- ③ Community sells leaves to an animal feed and delivers wood to power plant.
- ④ Power plant sells electricity and by-products.
- ⑤ Power plant pays back to community and E³ Holding. Community pays back to E³ holding.

Ms. Toom, a 53-year-old farmer in Lopburi, Thailand, started off with 50 acres of sugarcane in 1981, making significant investments in pesticide, chemical fertilizer and labor every year. A severe drought in 2005 killed Ms. Toom's entire crop, and excessive use of pesticides degraded the soil. Ms. Toom was forced to mortgage her land to repay her debt.



In 2006, Ms. Toom received funds from local foundation and decided to grow a biomass-fuel called *Leucaena Leucocephala* (LAM) - Tarramba species. LAM is a fast-growing tree even where no irrigation system exists and can grow in degraded land. Thus, farmers can harvest and supply wood for biomass every year without re-planting in the next 25 years. Moreover, farmers like Ms. Toom received an additional income from the high proteinic LAM leaves which are an excellent animal feed. LAM is of the Nitrogen fixing type. It improves soil fertility so other plants are encouraged to grow between rows of LAM to achieve bio-diversification. With no expenses in fertilizers and pesticides, her 50 acres of LAM could earn US \$32,000 per year. In a few years, she could pay off all debts.

E³ is based on a pilot project in Lopburi Province in Thailand, comprising 2,400 acres and generating 1.5 MW of power, and US \$500,000 of income per year. From this success, E³ is being launched to expand the benefits throughout Thailand, Southeast Asia, and eventually other regions of the developing world.

First Phase: More than one third of Thailand, or 52 million acres of agriculture land, is degraded to an extent that does not support efficient agricultural cultivation.² Planting LAM transforms useless or lower-yield land into commercially valuable land, while improving soil quality in the long run.

To ensure that farmers retain the value of the crops they grow (which are often taken over by middlemen) a major part of the E³ solution includes establishing a very small power producer (VSPP), 1 MW gasification plant, matches to 800 acres of cultivated LAM (approximately the size of Central Park in NY). This allows villagers to grow biomass fuel, generate electricity, and sell commercially to the Thailand power grid. As E³ expands to other developing countries, the model is also viable for bring the benefits of distributed power to off-grid communities (Myanmar, for example, as 95% of its population living off-grid). (See page 2 for other Asia and Central American areas that E³ can serve.)

¹ Office of Agricultural Economics (2012), The study of farmers' poverty

² Land Development Department (2008), Degraded land in Thailand

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Financial Summary and Target

A good return, while providing excellent economic, environmental, and social benefits: If E³'s projects meet their assumptions; **the fund will return an annual average return (IRR) of 13.7% per gasification plant**, and dividends from operating income over the next 15 years period of the Power Purchasing Agreement.

E³ will raise capital from three main sources:

- Development bank funds and climate investment funds (approx. 10-15% of the funding requirements)
- Bank for Agricultural and Agricultural Cooperatives of Thailand, Export-Import Bank of Thailand (approx. 40%)
- Institutional and impact investor equity (approx. 40-50%).

To maximize social impact directly to farmers, E³ has developed a pricing plan which allows farming communities to sell biomass at a discounted price to the generating plant, in return for equity ownership in that plant. Farmers may discount their supplies by 20%, 50% or 100% for the term of the contract of wood supply, in return for up to 40% of shares of the plant (the remaining 60% will remain in E³).

Based on financial assumptions, E³ expects to pay dividends within year 1, a benefit that also accrues to farmers and communities who have ownership in the power plant. The large amount of degraded land present in Thailand allows E³ to expand to electricity generating capacity of 20 MW in the first five years by building and operating twenty plants over that period. At the beginning, E³ plans to focus on 5 provinces which are Chai Nat, Nakhon Ratchasima, Khon Kaen, Sakon Nakorn and Roi Et. These areas contain some of the largest degraded lands accounted for 6 million acres. For the second five-year period a more aggressive expansion is projected by reaching a total of 70 MW generating capacity by year ten. To realize these goals, E³ assumes an investment of US \$55 million is needed during the first five-year period, and a total capital outlay of US \$200 million by the tenth year.

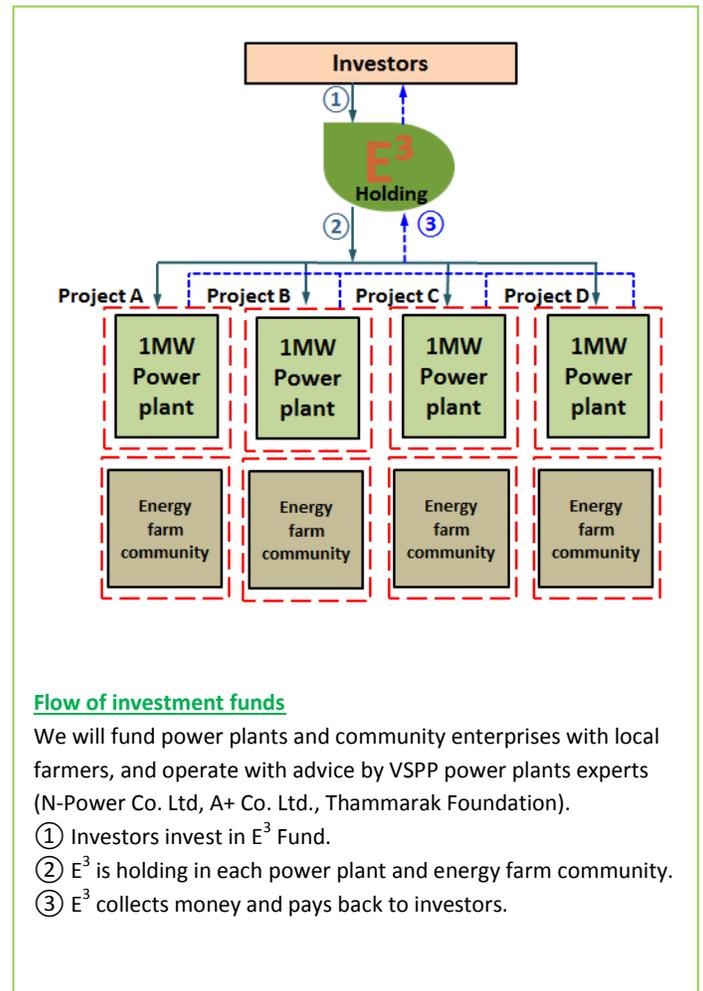
International expansion

The second phase of E³ expansion points to Myanmar, and the many problems that this developing country is facing, as first international objective. In rural Myanmar 95% of the population is not connected to the grid and a majority sustain themselves on seasonal crops leaving them with no revenue during a part of the year. These plants will be based on the system developed in Thailand, which will increase the revenue of the farmers and help to improve the soil of some of the more than 5 million acres of land in high risk of desertification. Further on other countries as Cambodia in SEA, or Central-American countries that are facing soil degradation from extensive cultivation of sugarcane as Nicaragua and El Salvador can be pointed as possible objectives of expansion.

	% of total area degraded by agricultural activities	Severe degradation (Acres)	Very severe degradation (Acres)	GDP per capita* (USD)
Myanmar	19	31.1 M	-	1,300
Cambodia	4	-	1.9 M	897
El Salvador	95	4.9 M	-	3,702
Nicaragua	65	22.5 M	0.7 M	1,587

Info: Land resource potential and constraints at regional and country levels, A.J.Bot, FAO, 2000

*The world bank (2011), GDP per capita



Risks

Energy farm community

- Variations in wood and other crop prices
- Difficulties to convince farmer to grow LAM

E³ mitigates risks by giving forward contract to farmers with best price guarantee.

Power plant

- Planning Phases: Political risk, Tariff Adder uncertainty
- Construction Phases: Default risk, Cost Overrun, Delay risk
- Operation Phases: Operation and maintenance risk

E³ mitigates risks, through co-partner with reliable expertise, conservative price estimation, Contract insurance, Letter of Guarantee, Total Productive Maintenance (TPM) plan.

Others risks

- Over/under supply of LAM

E³ mitigates risks by outsourcing to buy/sell LAM in order to maintain supply of LAM

We are seeking US \$200 million investment for 70 plants in 10 years. Please join us.