YOUR TOPIC | GROUP 2 | TEGH

Waste to Energy

Slide | Editable PowerPoint | Slide PDF | Script and Q&A PDF | Cheat card | Cheat PDF | Two-page workshop PDF | Plain script | Rehearsal audio

412 spoken words. 3:00 measured synthetic rehearsal (180.114 seconds). Timing marks are targets. Rehearse your own voice; do not race to match the synthesiser.

0:00 / 3:00

0:00-0:35 | One example

I'm Tarn from Group Two. Our topic is waste to energy, using Thai Eastern Group Holdings, or TEGH. What stood out in Khun Nuch's deck was the connection between organic waste, biogas and the factories using that energy. I checked this against the TEGH study she co-authored with Sasin researchers, including Professor Nophea Sasaki. The example I want to focus on is simple: waste from production becomes fuel for production, instead of remaining only a disposal problem.

0:35-1:20 | Risk and resilience

For risk, this tackles two problems together. The business has organic waste and wastewater to manage, and it also needs energy. Capturing biogas can reduce unmanaged methane and replace some purchased energy. That reduces exposure to fossil-fuel prices, but it doesn't remove operating risk. The plant still needs reliable feedstock, maintenance and safe gas handling. For resilience, the paper reports

that biogas supplied roughly thirty-five to forty percent of total energy demand across rubber and palm operations in twenty twenty-four. That's a meaningful internal energy source, not complete energy independence. The remaining digestate and biosludge are reused as soil conditioners for farmers, so the system also has an outlet for what's left after digestion.

1:20-2:05 | Revenue, without overclaiming

For revenue, I'd start with the cost we don't have to pay. In twenty twenty-four, TEGH generated forty-three gigawatt-hours of electricity. The paper values that at more than one hundred and eighty million baht in avoided electricity costs, using prevailing industrial tariffs. That's avoided power purchases, not net profit, and not a claim that all that electricity was sold. The study also reports an estimated renewable-energy investment payback of about four point eight years. Fertiliser provides another useful outlet, but the paper doesn't give us a separate fertiliser sales figure. I wouldn't invent one or attribute the group's entire profit increase to biogas.

2:05-3:00 | Our decision and key lesson

My key lesson is: use waste to replace a real cost before chasing new income. In my own business, I'd first measure the waste stream, match it to an energy need, and test the economics under lower feedstock and different electricity prices. I'd want an owner for the operating data and an outlet for the residue before approving investment. This is one company case, partly based on company-reported data, not a guaranteed result elsewhere. The paper also notes that absolute

emissions rose after capacity expansion in the later reporting period. So I'd track both emissions per unit and total emissions. For me, the value is making waste part of the operating plan, with savings we can actually check.

Spoken-number source map

35-40%: study p. 9, Section 4.2.3. 43 GWh and more than THB 180m: p. 7, Table 1 and Section 4.1. About 4.8 years: p. 7, Section 4.1. Later absolute-emission increase: p. 9. Number words are expanded for natural delivery.

2-minute feedback preparation

Choose the question asked; give the short answer, then stop. These are prepared prompts, not a prediction of faculty comments.

Is the saving from waste or just electricity prices?

The electricity comes from the biogas system, but its monetary value uses prevailing industrial tariffs. The paper does not isolate a price effect. Treat THB 180m+ as avoided purchase cost, not audited net saving. Study p. 7, Table 1 and text.

What is the payback?

About 4.8 years for renewable-energy investments, estimated from company-reported performance. The paper does not publish a full project cash-flow model or capex breakdown. Tariffs, feedstock and regulation can change payback. Study pp. 7, 14, Table 5.

What if feedstock falls?

The model depends on available organic residues and wastewater. Less or poorer feedstock can reduce gas output and utilisation. Before investing, I would stress-test supply and retain backup energy. That recommendation is our analysis, not a measured scenario. Study pp. 13-14, 18.

Does this work outside palm and rubber?

The paper proposes cautious transfer to comparable agro-industrial and food-processing clusters. Check waste quality, energy demand, proximity, infrastructure, governance and regulation. It does not prove that every business needs its own digester. Study pp. 13, 17-18.

What happened to absolute emissions after expansion?

Study-period inventory totals fell from 84,478 to 75,851 tCO2e in 2022-2024. The paper says supplementary 2025 disclosure shows absolute emissions rising with capacity expansion. Track totals alongside intensity; do not claim emissions always fall. Study pp. 8-9, Table 2.

How reliable are company-reported numbers?

Selected indicators were cross-checked or independently verified, but that does not assure every economic claim. Two authors work for TEGH and disclose the potential conflict. It remains a single case without strong causal inference. Study pp. 5, 13, 19.

Where is the new income?

The strongest quantified evidence here is avoided power purchases. Digestate-based fertiliser creates a residual-biomass outlet and supports farmers; the study gives no separate fertiliser sales or profit figure. Do not call THB 180m+ sales revenue. Study pp. 3-4, 7, 9.

Is biogas the same as burning mixed rubbish?

No. This example is anaerobic digestion of palm oil mill effluent, rubber sludge and organic residues. Gas is used for drying and electricity; digestate is reused. It is not evidence about municipal mixed-waste incineration. Study pp. 3-4.

Why does the deck say 76.1%, not 35-40%?

Deck p. 9 reports LPG-to-bio-energy substitution of 76.1%. Study p. 9 reports biogas supplying 35-40% of total energy demand across rubber and palm in 2024. Different denominators and reporting contexts; neither should replace the other.

Why does the deck show 321,452 tCO2e, not 19,271?

Deck p. 9 shows 321,452 tonCO2e reduction, without a directly comparable period and boundary established here. Study pp. 1, 4 report estimated 19,271 tCO2e reduction in

2024. Present separately; do not add or equate them.

Does 43 GWh mean all the biogas became electricity?

No. The system uses biogas for thermal drying as well as electricity. The study reports roughly 23 million Nm3 annual biogas alongside 43 GWh electricity, without allocating the whole gas volume to power. Study pp. 3, 7-8, Table 1.

What should we measure before approving it?

My proposed checks are feedstock volume and quality, usable energy, avoided purchases, operating and maintenance costs, methane leakage and residue outlets. Track absolute and per-unit emissions. The paper supports integrated monitoring, but does not publish a complete investment checklist. Study pp. 8, 13, 17-18.

If I do not know

I don't have a verified figure for that. The study doesn't break it out, so I wouldn't guess. I'd check the underlying operating records or ask Khun Nuch before making that claim.

Honest limits

- Single company case; associations are not proof that symbiosis caused all financial improvement (pp. 7, 13).
- Partly company-reported data. Selected third-party checks do not assure every number (p. 5). Two authors are TEGH employees and disclose a potential conflict (p. 19).
- Cradle-to-gate boundary excludes downstream logistics, product use and some Scope 3 categories (pp. 6, 13).
- Supplementary 2025 reporting says absolute emissions rose with capacity expansion. It is not part of the formal 2022-2024 dataset (pp. 5, 9, 13).
- Payback depends on tariffs, feedstock, infrastructure and regulation. THB 180m+ is avoided power cost, not net profit (pp. 7, 14).
- Deck 76.1% LPG substitution is not the same metric as study 35-40% total-energy share. Deck 321,452 tCO2e and study 19,271 tCO2e lack matched boundaries here (deck p. 9; study pp. 4, 9).
- Table 5 reports about 350 kg CO2e avoided per tonne waste, but its relationship to the 19,271 tCO2e annual reduction and waste totals is not reconciled in the paper.

Do not combine or extrapolate those figures (pp. 4, 9, 14).

- Study p. 9 mentions 100% renewable energy by 2030 and renewable electricity by 2040; Table 4 specifies carbon neutrality for Scopes 1-2 in 2030 and renewable electricity in 2040. Clarify the target definitions before quoting them.

Which source supports what?

Khun Nuch's 11-page class deck, pp. 7-8, supplies the single organic-waste-to-biogas example; p. 9 reports 76.1% LPG-to-bio-energy substitution. The TEGH research paper supplies the 2024 power, avoided-cost and estimated-payback figures on p. 7, and the total-energy share on p. 9. These numbers are not all in the talk deck. No recording is available here, so this is not a verbatim transcript or a claim about what was spoken.

Kokanutaporn, S.; Rachuratchata, L.; Aung, E.D.; Sasaki, N. (2026). Industrial Symbiosis as a Carbon-Centered Operational Strategy: Evidence from Thailand's Eastern Economic Corridor. *Sustainability* 18, 5547. doi:10.3390/su18115547. Sasin affiliations are on paper p. 1. PDF page numbers are printed paper pages.

Measure	Exact value	PDF page	Location
Direct organic waste	More than 420,000 t/year	4, 9	Sections 2.3, 4.2.2
Waste including upstream residues	Approximately 628,000 t/year; p. 4 says more than 600,000	4, 9	Sections 2.3, 4.2.2
Biogas	23.0 million Nm3 in 2024	7	Table 1
Electricity generated	43.0 GWh in 2024	7	Table 1
Avoided electricity cost	More than THB 180 million in 2024	7	Table 1 and Section 4.1
Renewable-energy asset payback	Estimated about 4.8 years	7, 14	Section 4.1; Table 5
Biogas share of total energy demand	Roughly 35-40% across rubber and palm in 2024	9	Section 4.2.3
Estimated avoided GHG emissions	19,271 tCO2e in 2024	1, 4	Abstract; Section 2.3

Measure	Exact value	PDF page	Location
Biogas utilisation	About 98%	9, 14	Section 4.2.4; Table 5
GHG intensity	0.285 in 2022; 0.2471 tCO2e/t output in 2024	8	Table 2
Inventory total	84,478 in 2022; 75,851 tCO2e in 2024	8	Table 2
Group revenue / net profit	THB 10,227m / 206m in 2022; THB 16,552m / 818m in 2024	7	Table 1; association only
LPG-to-bio-energy substitution	76.1%	Deck 9	Class deck, renewable-energy panel
Deck carbon-emission reduction	321,452 tonCO2e; unmatched period/boundary	Deck 9	Class deck, decarbonisation panel

Previous version

Original deck-only notes | Original slide PPTX. Kept for comparison, not the current assigned presentation.