ENERGY MANAGEMENT & ENERGY EFFICIENCY

# A Competitive Advantage for T&T Manufacturers

*Turning a rising input cost into a source of margin, resilience, and market access*

**Andre Escalante** | Founder & Managing Director, Energy Dynamics Limited (EDL)

THE T&T ENERGY LANDSCAPE IS CHANGING

# The era of flat, deeply subsidized power is ending

## 17+ yrs

T&TEC's electricity rates stood still before the current price review — that era of a frozen tariff is now over.

## 58–72%

Proposed increase range for industrial customers under the RIC's determination; high-consumption users face significantly more.

## ~99.9%

Share of T&T's electricity still generated from fossil fuels, so fuel-price and supply risk passes straight through to the tariff.

*Sources: Regulated Industries Commission (RIC) Final Determination on T&TEC's Price Review; U.S. EIA generation-mix data.*

DRIVERS

# Four forces putting energy on the boardroom agenda

## Rising & less predictable tariffs

Industrial rates are moving upward after nearly two decades flat — energy is shifting from a fixed cost to a variable one.

**Natural gas for manufacturers (LICs): NGC proposed +76%, US$3.00 → US$5.30/MMBtu for 2026**

## Export market requirements

Overseas buyers and markets like the EU increasingly price carbon and ask for energy/emissions data as a condition of doing business.

## Grid reliability pressure

An aging, gas-dependent grid means outages and voltage issues carry a real production-downtime cost for manufacturers.

## ESG expectations from buyers & lenders

Regional and international financiers and supply-chain partners are factoring efficiency and emissions into terms.

*Source: National Gas Company of T&T (NGC) LIC price notice, Dec 2025; TTMA correspondence, Jan 2026. Proposal was still under negotiation as of the latest reporting.*

BENEFIT 1 OF 4

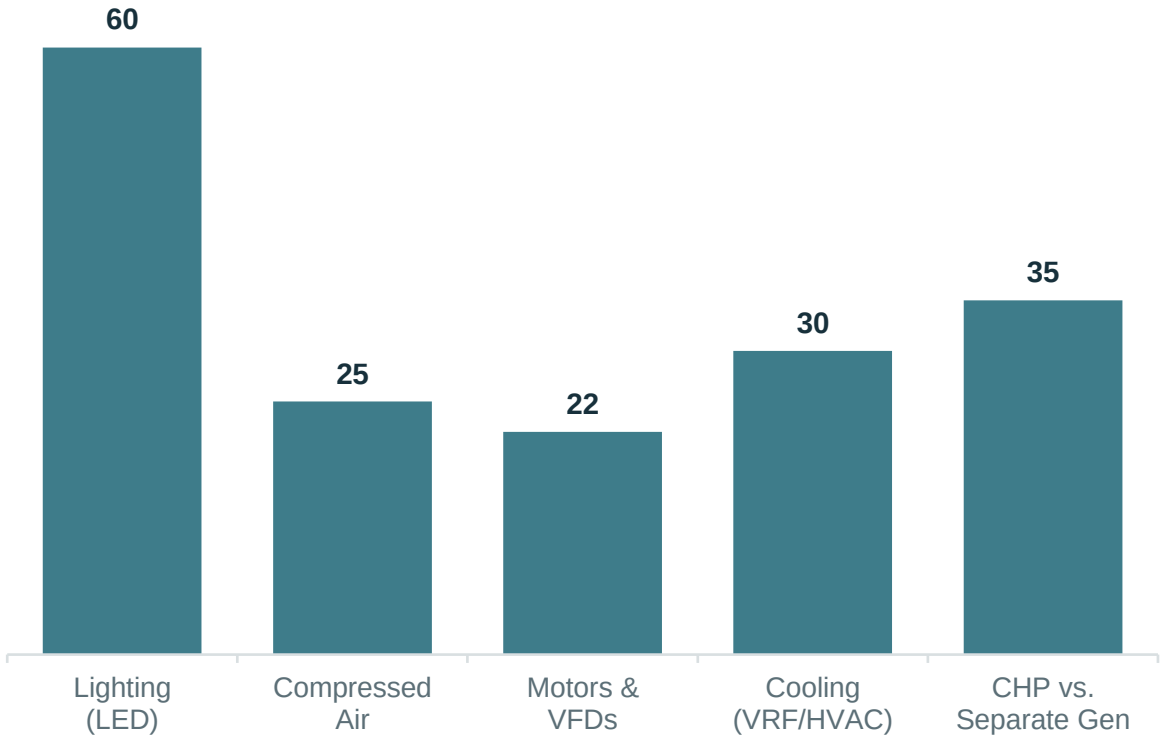
# Direct, bankable cost savings

**10–40%**

typical reduction in facility energy spend achievable through a structured efficiency program — often self-funding through the savings it creates.

*For an energy-intensive manufacturer, that is margin recovered every month — not a one-time rebate.*

**Typical Efficiency Gains by Measure (%)**




*Illustrative industry benchmark ranges; actual results depend on baseline equipment condition and operating profile.*

BENEFIT 2 OF 4

# Fewer breakdowns, longer equipment life

- **Energy waste is usually a symptom, not the disease**

  An oversized, poorly maintained motor or a leaking compressed-air line wastes power AND runs hotter, wears faster, and fails sooner.

- **Metering surfaces problems before they cause downtime**

  A sudden rise in a line's energy draw is often the earliest warning sign of bearing wear, refrigerant loss, or fouled heat exchangers.

- **Right-sized, well-maintained systems run cooler and steadier**

  VFDs on motors and modern VRF/CHP systems reduce mechanical stress from constant on/off cycling and voltage strain.



## Uptime is revenue

*For most manufacturers, an hour of unplanned downtime costs far more than an hour of electricity — reliability gains often outweigh the energy savings themselves.*

BENEFIT 3 OF 4

# Stronger footing in export & regional markets



## CARICOM & extra-regional buyers

Procurement teams increasingly screen suppliers on energy and emissions performance, not price alone.



## Carbon-linked trade requirements

Mechanisms like the EU's carbon border adjustment put a price on the carbon embedded in imported goods — efficiency lowers that exposure.



## A differentiator versus regional peers

Few T&T manufacturers can point to a documented energy program — it's a credible edge in RFPs and buyer audits.

BENEFIT 4 OF 4

# Sustainability credentials that mean something

T&T's grid is almost entirely gas-fired, so a plant's own efficiency and on-site generation choices are, in practice, the main lever it controls over its carbon footprint.

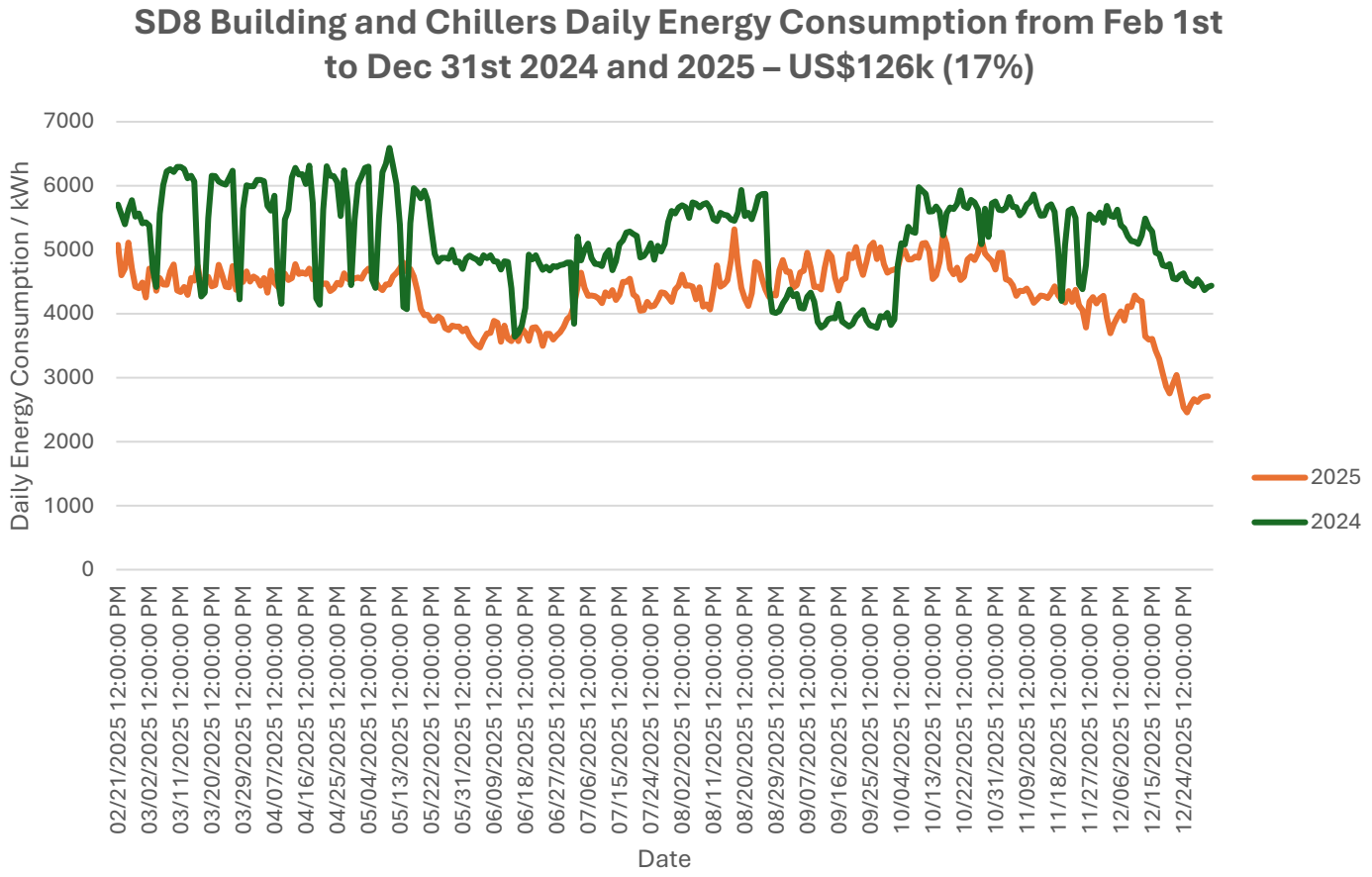
- ✓ Lower Scope 1 & 2 emissions without cutting output
- ✓ Verifiable data for ESG disclosures & lender covenants
- ✓ A genuine story for buyers, insurers, and investors
- ✓ Attractive to a workforce that values employer responsibility

ICATT – IFRS S1 and S2

- IFRS S1 - Sustainability Disclosure Standards
- IFRS S2 – Climate Related Disclosures
- ICATT - Decision at end of 2026

# CASE STUDY - EFFECTIVE MAINTENANCE : SGU, GRENADA – US$500k Energy Savings in 2025 vs 2024





BENCHMARKING

# The cost of energy ladder: all T&T fuels compared

*Every fuel and energy carrier, converted to a common basis — US$ per MMBtu of purchased energy*

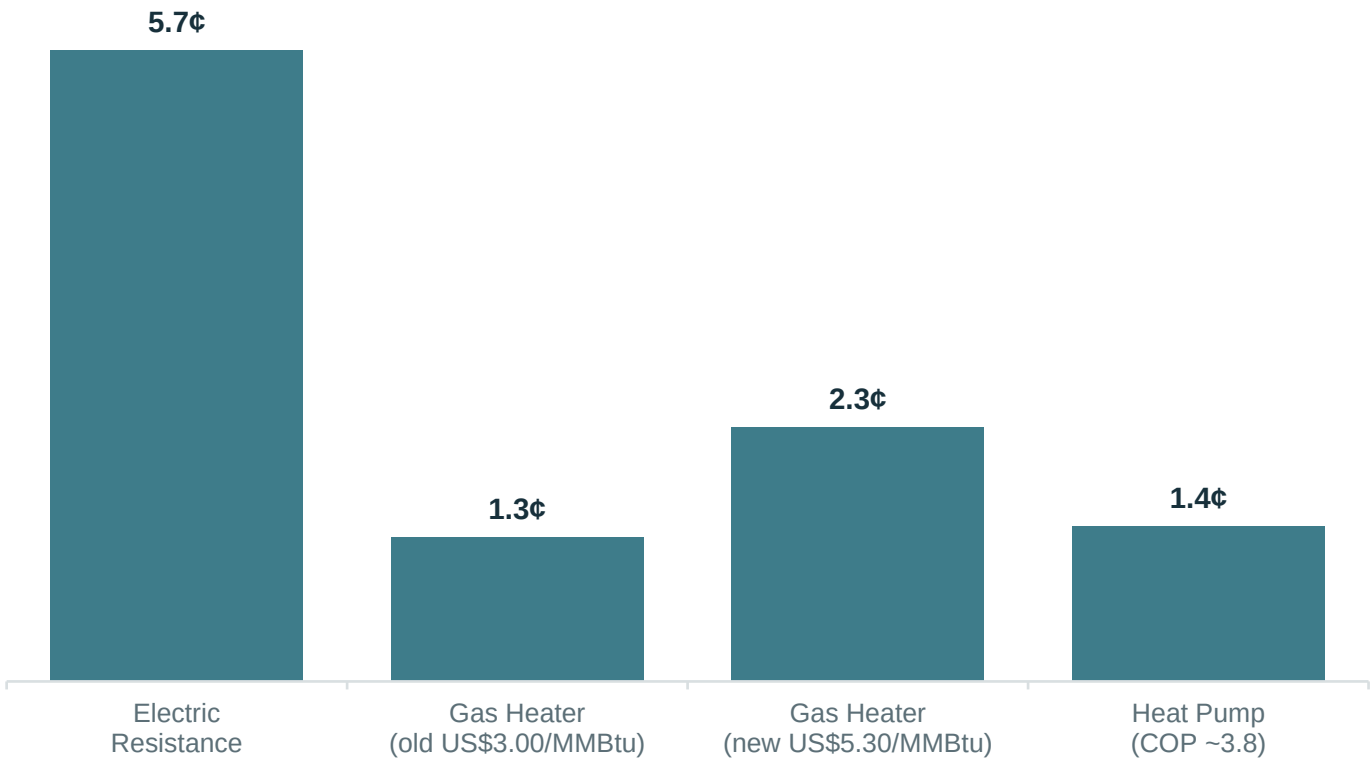



*Even after the 2026 increase, natural gas remains the cheapest energy source in T&T by a wide margin — roughly 3x cheaper than electricity and diesel per unit of raw energy.*

*Purchased-energy cost only — excludes conversion efficiency (boiler, generator, heat pump COP). Diesel: pump price. LPG: 100lb cylinder, propane HHV ~21,550 Btu/lb. Electricity: commercial average, US$0.053/kWh. FX: TT$6.78 = US$1.*

# The gas price hike just flipped water-heating economics

**Cost per kWh of Delivered Hot Water Heat**




*Illustrative: US$0.05–0.06/kWh electricity; gas heater at ~80% thermal efficiency. Actual figures vary by tariff class and equipment.*

## Why Trinidad favors heat pumps

A heat pump moves heat instead of generating it. Warm, frost-free ambient air year-round (~24–32°C) means T&T avoids the efficiency losses temperate climates suffer — COP typically 3–4.5.

vs. gas at the new rate:
**~35–50% cheaper to run**
vs. electric resistance:
**~3.5–5x cheaper to run**

*Caveats: higher upfront capital cost than gas/electric; COP falls for higher process-water setpoints; best suited to plants with adequate storage rather than instantaneous high demand.*

CASE STUDY – ELECTRIC HYDROFOIL BOATS: Electric Energy Lower Specific Cost vs Diesel





WHERE TO LOOK

# Six practical levers, most manufacturing plants

### HVAC & VRF cooling

Right-size and modernize cooling — often the single largest load in T&T's climate.

### CHP (combined heat & power – 40% Energy Savings)

Capture waste heat on-site instead of buying gas and grid power separately.

### Motors & VFDs – Bottle Plant (30% Energy Savings)

Variable-frequency drives match motor output to actual demand instead of running flat-out.

### Compressed air

Leak surveys and right-sized compressors — one of the fastest-payback fixes on any floor.

### Lighting

LED retrofits with occupancy and daylight controls in warehouse and production areas.

### Metering & controls

Sub-metering by line or department turns "we think" into "we know," and keeps gains from drifting back.

GETTING STARTED

# A practical roadmap, not a leap of faith



STEP 1

## Energy Audit

Walk the plant, meter key loads, and baseline where energy and money are actually going.

*Weeks 1–3*



STEP 2

## Opportunity Ranking

Rank measures by payback, capital need, and disruption to production.

*Weeks 3–4*



STEP 3

## Implementation

Execute quick wins first; phase larger retrofits (HVAC/VRF, CHP) around production schedules.

*Months 2–9*



STEP 4

## Measurement & Verification

Track performance against baseline so savings are proven, not assumed.

*Ongoing*

THE CASE, IN SUMMARY

# Energy management pays back on four fronts at once



## Cost

10–50% typical reduction in energy spend



## Reliability

Fewer breakdowns, longer asset life, more uptime



## Market Access

Meets buyer & export sustainability expectations



## Reputation

A credible, verifiable sustainability story

*The plants that start now set the efficiency baseline everyone else in their sector will eventually be compared against.*

NEXT STEP

# Start with a walk-through energy audit

Energy Dynamics Limited works with commercial and industrial clients across the English-speaking Caribbean on efficiency audits, VRF and HVAC retrofits, and CHP — happy to scope a no-obligation walk-through for any TTMA member plant.

**Andre Escalante**
Founder & Managing Director, Energy Dynamics Limited
Port of Spain, Trinidad and Tobago
andre@energydynamics-lac.com