PROJECT CASE STUDY — PROCESS OPTIMISATION

Process Optimisation

Three engagements that demonstrate a consistent approach to process optimisation: diagnose the real driver of inefficiency, intervene with targeted engineering rather than wholesale replacement, and validate the result under the hardest operating condition. Across a petroleum terminal in Lebanon, a steel plant in France, and a gasoline terminal in Lebanon, the same method delivered measurable gains in energy, quality, and product-loss reduction.

1. Gravity-Assisted Truck Loading System

Location	Amchit, Lebanon
End Client	IPT Terminal
Role	Detailed Design, Construction Supervision
Focus	Energy & maintenance optimisation of road tanker loading

~70% reduction in power consumption • ~70% reduction in maintenance cost

BACKGROUND

Conventional road tanker loading at the IPT Terminal relied on active pumping for every dispatch operation, driving high power consumption, high maintenance overhead, and continuous safety exposure during transfer. The objective was to optimise the loading operation rather than simply maintain the existing pump-driven approach.

APPROACH

A custom loading system was engineered around gravity flow wherever operationally feasible, reducing reliance on active pumping during dispatch. The design addressed all three persistent pain points of conventional tanker loading simultaneously — energy, maintenance, and safety — rather than optimising one at the expense of the others.

OUTCOMES

- Approximately 70% reduction in overall operations power consumption.
- Approximately 70% reduction in maintenance cost.
- Improved operations safety through reduced active mechanical handling during transfer.

2. Steel Drying Oven Optimization

Location	Maubeuge, France
End Client	Fabrique de Fer de Maubeuge (FFM)
While At	Stein Heurtey
Role	Detailed Engineering Design, Process Automation

90% reduction in disqualified products • +5% yearly production • energy use reduced

BACKGROUND

FFM operates a painted-steel-plate manufacturing plant in northern France where a continuous drying oven is a critical finishing step. During transitory operating periods — start-up, throughput changes, recipe transitions — thermal conditions inside the drying unit drift, and product can fall outside quality specification. The objective was to optimise and automate the oven through these transient regimes, minimising out-of-specification plate, stabilising energy consumption, and controlling the thermal exchanges into the drying unit.

APPROACH

The solution closed the control loop around the oven's thermal exchanges during transient regimes. A thermal balance and transient analysis of the drying unit derived the control philosophy; process sensing was reorganised to capture the variables that actually drive plate quality; and automation logic was specified to actively manage heat input against measured product conditions — so the oven self-stabilises through start-up, throughput changes, and recipe transitions rather than relying on operator adjustments that lag the process. The approach was applied at the FFM installations.

OUTCOMES

- **90% reduction in disqualified products** — the share of out-of-specification painted plates produced during transitory periods was cut by 90% through controlled thermal exchanges.
- **+5% increase in yearly production** — the recovered output translated directly into a 5% increase in annual production from the same installation.
- **Energy optimisation** — lower energy consumption while holding consistent product quality across operating regimes.
- **Operator-light operation** — automation absorbs transient management; operators focus on supervision rather than constant manual correction.

3. Evaporation Losses Control

Location	Jieh, Lebanon
End Client	Cogico
Role	Inspection, Root-Cause Analysis, Calibration & Modifications
Focus	Vapour-loss control for gasoline storage tanks

Monthly losses cut from 0.8% to 0.05% • 94% reduction, validated at peak summer

BACKGROUND

Evaporation losses are among the costliest invisible problems in a gasoline storage terminal: product disappears, revenue with it, and emissions rise in parallel. Cogico's terminal at Jieh was experiencing losses of approximately 0.8% per month — a level effectively accepted as a cost of doing business, especially through the summer heat. The objective was to diagnose the actual root causes rather than treat the symptom, and to deliver corrective actions that would hold up under the worst-case condition: peak summer ambient temperatures.

APPROACH

The programme refused to treat the 0.8% loss as a single problem. Each loss path was diagnosed separately — seal condition, breathing valve setpoints, fitting integrity — distinguishing tank-fabric leaks from breathing-loss mechanisms, and each was addressed with the appropriate calibration or physical modification to tank bodies, accessories, and breathing equipment. Validation was deliberately scheduled for the hottest months of the year, so the corrective measures had to perform under the toughest thermal conditions before sign-off. The 94% improvement is therefore a peak-summer figure,

not a benign-season average.

OUTCOMES

- **94% loss reduction** — monthly gasoline losses cut from 0.8% to 0.05%, sustained under peak summer ambient conditions.
- **Direct cost recovery** — loss prevention translated directly into recovered revenue and reduced make-up purchases.
- **Environmental compliance** — lower hydrocarbon emissions from the tank farm, improving environmental performance alongside the commercial gain.
