



ENERGY EFFICIENCY PROJECT DEVELOPMENT VAS/DEPP3 Programme

ENERGY EFFICIENCY IMPROVEMENT PROJECT FOR LPG VAPORIZATION SYSTEM

Sector: Ceramics

Energy focus: Heat recovery for LPG vaporization

At this ceramic manufacturing facility, supplying liquefied petroleum gas (LPG) to the kilns required an energy-intensive vaporization process. The plant relied on high-capacity electric resistance heaters to vaporize the LPG, driving up electricity costs. Simultaneously, high-temperature exhaust gas (around 200°C) from Kiln #1 and Kiln #2 was being discharged directly into the environment, completely unutilized.

Through the feasibility study, the enterprise identified a strategic solution to **install a waste heat recovery system for LPG vaporization**. By placing heat exchangers at the kiln exhaust outlets, the plant can capture this waste heat to produce hot water, which is then pumped to the LPG station to vaporize the gas indirectly.

Once implemented, the proposed solution will:

- Fully replace the 240 kW electric heating system with recovered waste heat;
- Save approximately **627 kWh of electricity annually**;
- Cut operational energy costs by **over VND 1.13 billion per year**;
- Maintain the electric heaters solely as a safety backup, ensuring uninterrupted LPG supply.

FINANCIAL PERFORMANCE SUMMARY



NET PRESENT
VALUE*

~3.67
BILLION VND



SIMPLE PAYBACK
PERIOD

~2.5
YEAR



INTERNAL RATE
OF RETURN (IRR)*

37.36%

**= baseline scenario*

ENERGY BENEFITS



ANNUAL ENERGY
SAVINGS

~627,8
KWH/YEAR



ANNUAL CO₂
REDUCTIONS

~395
tCO₂e/YEAR

NON-ENERGY BENEFITS

- **Reduced unexpected downtime:** Reduced unplanned production interruptions and improved operational stability.
- **Stabilised LPG supply to the furnace:** Ensured a stable and continuous supply of vaporized LPG to the furnace.
- **Improved competitiveness:** Strengthened the company's competitiveness and green business image.



WHY THIS CASE MATTERS?

The Vietnamese ceramics industry is highly energy-intensive and is currently undergoing a massive transition from traditional coal to cleaner LPG fuel. While LPG significantly improves product quality and reduces direct emissions, the required electric vaporization process often creates a new burden of high electricity costs for manufacturers.

This feasibility study proves that by installing a waste heat recovery system - specifically, capturing existing kiln exhaust heat to vaporize LPG - ceramic enterprises can significantly reduce energy cost without altering their core firing processes. This highly replicable heat recovery model offers manufacturers a practical pathway to optimize fuel transition costs, improve overall resource efficiency, and meet the strict low-carbon standards of global supply chains.

EXPLORE SIMILAR OPPORTUNITIES

For more information and additional case studies, please visit:



**Vietnam – Denmark
Energy Partnership Programme
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**Energy Efficiency
Center of Excellence**



This case was developed under the Voluntary Agreement Scheme (VAS) for the Vietnamese Industrial Sector, part of the DEPP3 Programme (Vietnam – Denmark Energy Partnership Programme Phase III).

VAS supports industrial enterprises in identifying, preparing, and implementing bankable energy efficiency investments through structured audit, pre-feasibility and feasibility assessment processes.