



ENERGY EFFICIENCY PROJECT DEVELOPMENT VAS/DEPP3 Programme

UPGRADING THE EXISTING RECIPROCATING REFRIGERANT COMPRESSOR SYSTEM TO SCREW REFRIGERANT COMPRESSORS

Sector: Seafood Processing
Energy focus: Refrigeration compressor system

At this seafood processing facility, the refrigeration system was a major driver of operational costs and inefficiencies. The plant relied on aging reciprocating refrigeration compressors to operate its Individual Quick Freezing (IQF) lines and supply flake ice. These outdated units operated at a low average Coefficient of Performance (COP) of just 1.00, consuming excessive electricity while suffering from poor cooling efficiency and requiring frequent maintenance.

Guided by the feasibility study, the enterprise has planned the near-term implementation of a high-impact upgrade: **gradually replacing 25 existing reciprocating compressors with 4 modern, high-efficiency screw refrigeration compressors.**

Once this planned upgrade is complete, the project will:

- Increase the refrigeration system's average COP to **1.4**;
- Save **853,796 kWh of electricity annually**;
- Cut operational energy costs by approximately **1,700 million VND per year**;
- Reduce greenhouse gas emissions by **563 tons of CO₂e per year**.

FINANCIAL PERFORMANCE SUMMARY



NET PRESENT
VALUE*

417
MILLION VND



SIMPLE PAYBACK
PERIOD

~8.7
YEARS



INTERNAL RATE
OF RETURN (IRR)*

11.5%

*= baseline scenario

ENERGY BENEFITS



ANNUAL ENERGY
SAVINGS

853,8
KWH/YEAR



ANNUAL CO₂
REDUCTIONS

563
tCO₂e/YEAR

NON-ENERGY BENEFITS

- **Maximized Uptime:** Stabilizes freezing lines and minimizes unplanned downtime.
- **Slashed Maintenance Costs:** Cuts repair spending and optimizes spare parts inventory.
- **Enhanced Competitiveness:** Leverages a low-carbon, green image for global export markets.



WHY THIS CASE MATTERS?

In the seafood processing industry, refrigeration systems - powering IQF freezing, cold storage, and ice production - account for the vast majority of a facility's electricity consumption. As processors face rising energy costs and increasingly strict sustainability requirements from global export markets, optimizing these intensive cooling systems has become a critical priority.

This energy audit demonstrates the massive savings potential locked within aging refrigeration infrastructure. By transitioning from legacy reciprocating technology to advanced screw compressors, seafood enterprises can drastically reduce their electricity load and maintenance burdens while enhancing their production reliability.

EXPLORE SIMILAR OPPORTUNITIES

For more information and additional case studies, please visit:



**Vietnam – Denmark
Energy Partnership Programme
2020-2025**



**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.