

Electrification of compression system improves reliability, contributes to company's sustainability vision

Introduction

Eni S.p.A. is an Italian multinational oil and gas company headquartered in Rome. It has operations in 66 countries with a market capitalization of US\$55.61 billion (as of 31 December 2019).

An energy audit of an upstream gas plant in Fano, Italy was conducted in 2019. The audit highlighted the opportunity to electrify the compressor driver instead of using the gas turbine. Electrification of the compression system would shift the main energy consumption of the plant from natural gas to electrical energy.

However, the project proposal including the economics were not favorable until multiple benefits were considered.



“The pilot project increased the relevance of energy efficiency measures and could improve the process and the decision making for the implementation of energy efficiency projects in our company.”

Ing. Domenico D'Acierno – Energy Efficiency Manager

Company overview

Firm name

ENI S.p.A

Site location

FANO, Italy

Sector

Energy Company
(Natural Resource – Upstream)

Size (turnover)

Large enterprise

Customers

Upstream gas plant

Value proposition

Reduction of GHG emissions and the safeguard of the environment, ensuring operational continuity, asset valorization, OPEX reduction



Impacts on operations

Security

- Reliability of electricity network has been evaluated, to minimize the risk of compressor shut-down.

Quality

- Increase production reliability. Reduce down-time for maintenance. Avoid loss of production.

Costs

- Lower maintenance costs. Electric motors have lower maintenance costs compared to a gas turbine.

Time

- Health, Safety, and Environmental (HSE) procedures are simplified. Integrated Environmental Authorization no longer needed.

Project summary

- **Sector:** Oil and gas
- **Energy carrier impacted:** Natural gas and electricity
- **Energy services impacted:** Compression unit
- **Scope:** Replace natural gas turbines in compressor unit with electric motors
- **Accepted/implemented?** Under consideration



“The Multiple Benefits methodology allows us to approach energy efficiency projects with an holistic view. We are able to consider key operational aspects from an early project development phase and improve the sustainability of our company.”

Ing. Marco Ferrari
(Energy Senior Specialist - Company representative)

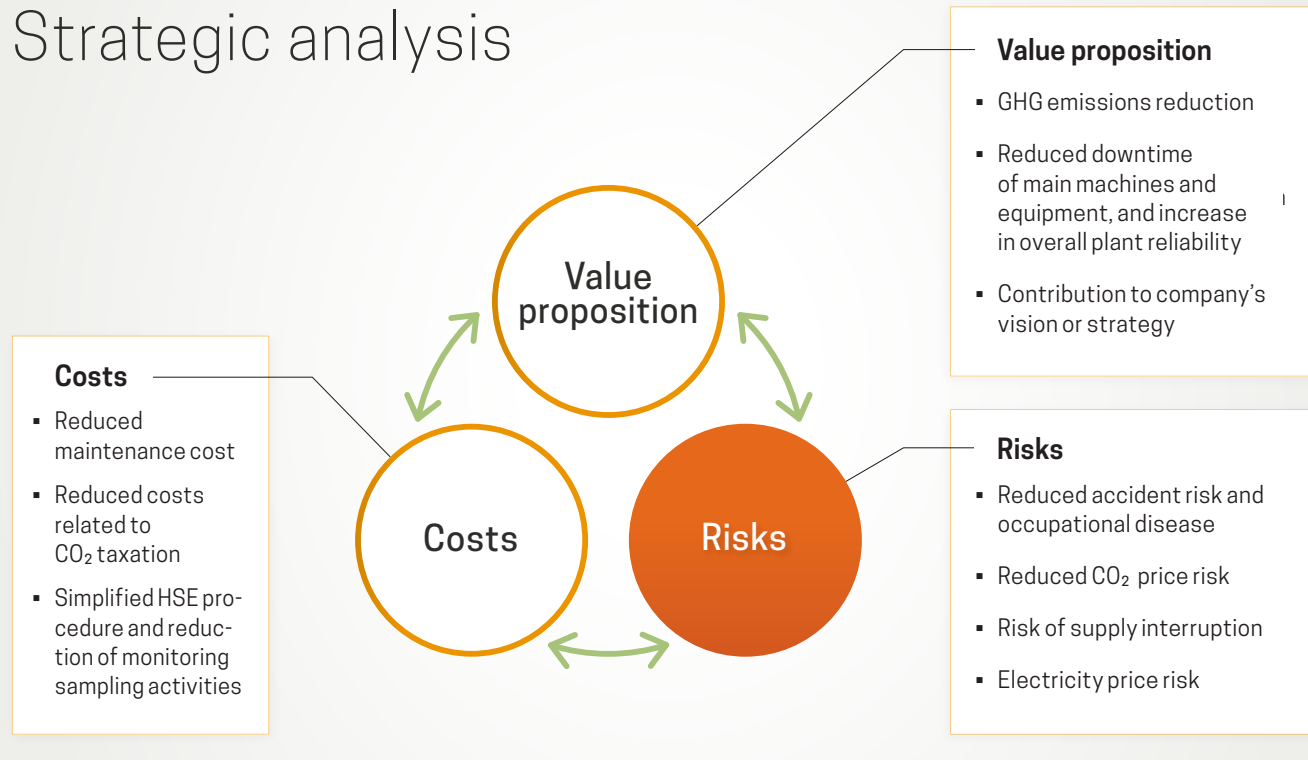
Energy insights – 69% savings

Replacing natural gas turbines in the compressor unit with electric motors would save 14 500 TOE/year or around 69%

14 500 TOE/year



Strategic analysis



Financial analysis

Discount rate: 6.4 %.

Investment duration for NPV, IRR calculation 20 years.

Note: The multiple benefits quantified include: reduced downtime of machines/equipment, reduced maintenance costs, reduced costs of CO₂ taxes, and simplified HSE procedures including reduction of monitoring sampling activities.

	All benefits	Energy-only benefits
Net present value (NPV)	23 000 k€	9 000 k€
Internal rate of return (IRR)	15 %	6%
Simple payback	6 years	11 years



Lessons learned

Key challenges?

The initial project proposal, which accounted only for energy cost savings, was not enticing.

In addition, Eni has to manage a security risk associated with switching to electrical motors to ensure high reliability of the electrical network.

Strategic benefits?

The project proposal clearly links energy efficiency with company's value proposition.

The Multiple Benefits approach also improved the relationships and interactions among various departments, enhancing synergies between field and HQ.

Does the company plan to change its investment behaviour?

Yes, we will promote identification of non-energy benefits, and share lessons learned, knowledge, and critical thinking based on this pilot project.

Contact information

FIRE - Federazione Italiana per l'uso Razionale dell'Energia

Ing. Livio De Chicchis, c/o Centro ENEA
Casaccia, dechicchis@fire-italia.org

ENI

Ing. Marco Ferrari
Marco.Ferrari1@eni.com

Ing. Domenico D'Acerno
Domenico.D'Acerno@eni.com

