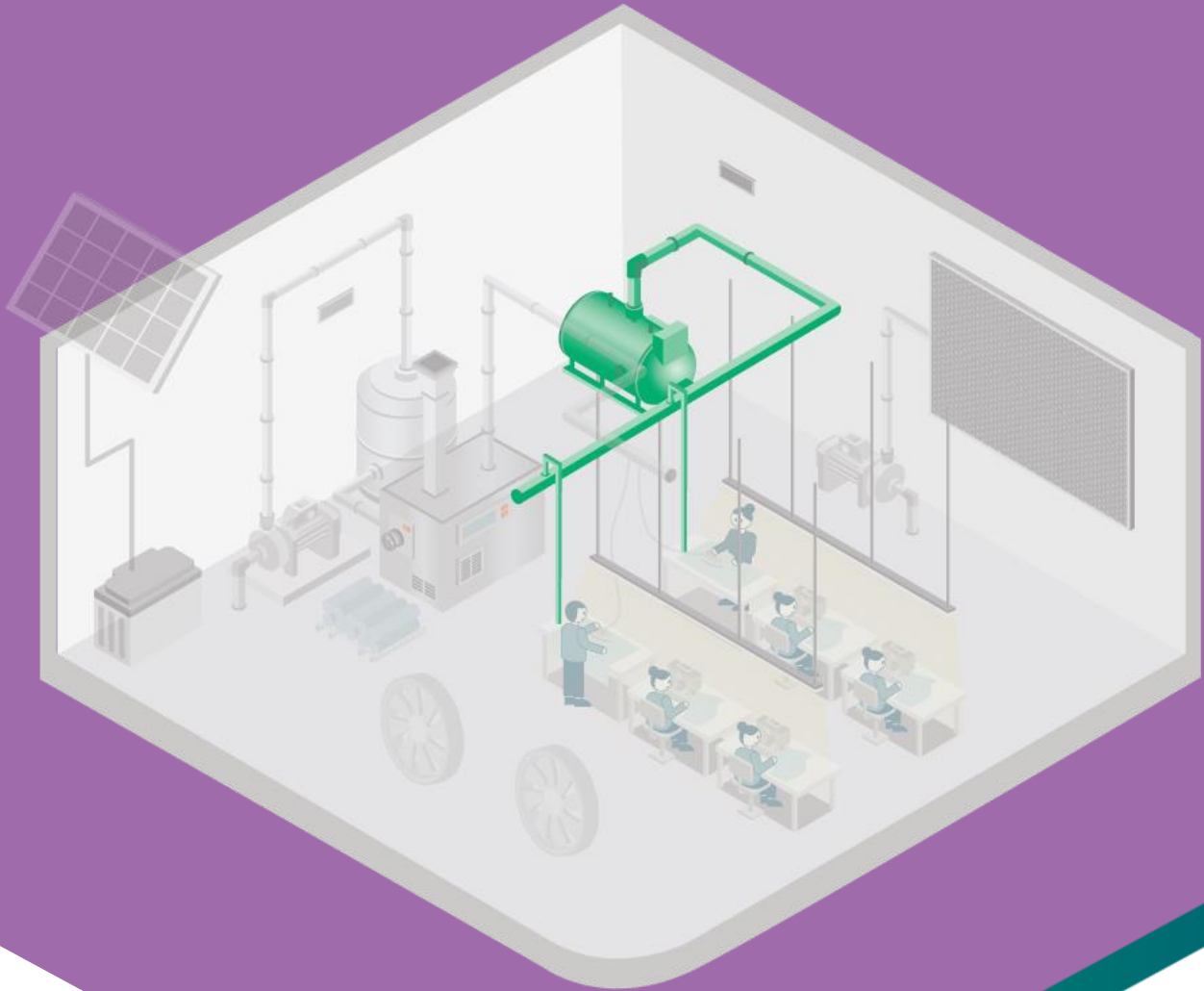




Case study on sustainable energy **COMPRESSED AIR SYSTEMS**

Compressor replacement

Wan He Da Manufacturing Limited



**SWITCH
GARMENT**
PROMOTION OF SUSTAINABLE ENERGY
PRACTICES IN THE GARMENT SECTOR
IN CAMBODIA



switchasia



Funded by
the European Union



1. Factory Information

Wan He Da Manufacturing Co., Ltd. is a sewing garment company that aims to pursue energy efficiency opportunities. Below is the profile of the factory:

Industry name	Wan He Da Manufacturing Co., Ltd
Address	Phnom Penh, Cambodia
Year of establishment	2018
No. Employees	1687 in 2020

Wan He Da Manufacturing Co., Ltd. joined the project on January 14th, 2021. The project aims to increase competitiveness and decrease the environmental impact of the Cambodian garment industry through sustainable production.

Joining the project involves energy audit assessment in the factory. Following a recommendation from this audit, the factory has expressed its intention to substitute one of their air compressors with a more energy-efficient alternative to save energy, also to increase compressed air flow in their facility. Furthermore, they have expressed their desire to incorporate a new technology that includes a variable-frequency drive (VFD) in the compressor to adjust the consumption to the use.

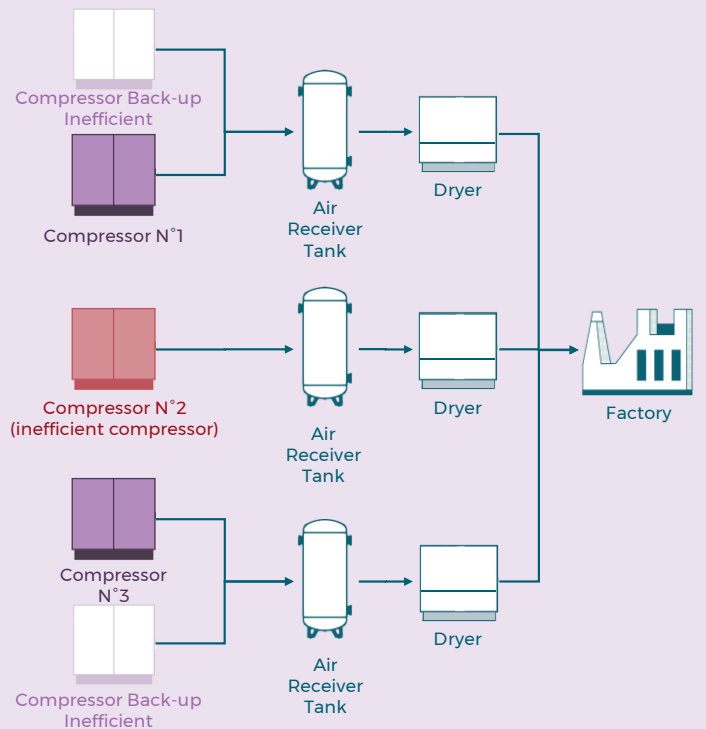
The air compressor was included in our plan for replacement. We made it a top priority due to its significant potential for reducing energy consumption replacement. Additionally, we have plans to incorporate lighting upgrades and install solar rooftop systems.

Mr. Oeung Seng
Assistant HR and Compliance Manager

2. About the compressed air system

The Wan Ha De Manufacturing Co., Ltd compressed air installation includes four screw-type compressors, and one reciprocating type compressor to meet the compressed air requirements of their process and instrumentation.

During the audit assessment, three compressors were in operation, while the other two were kept as backups.



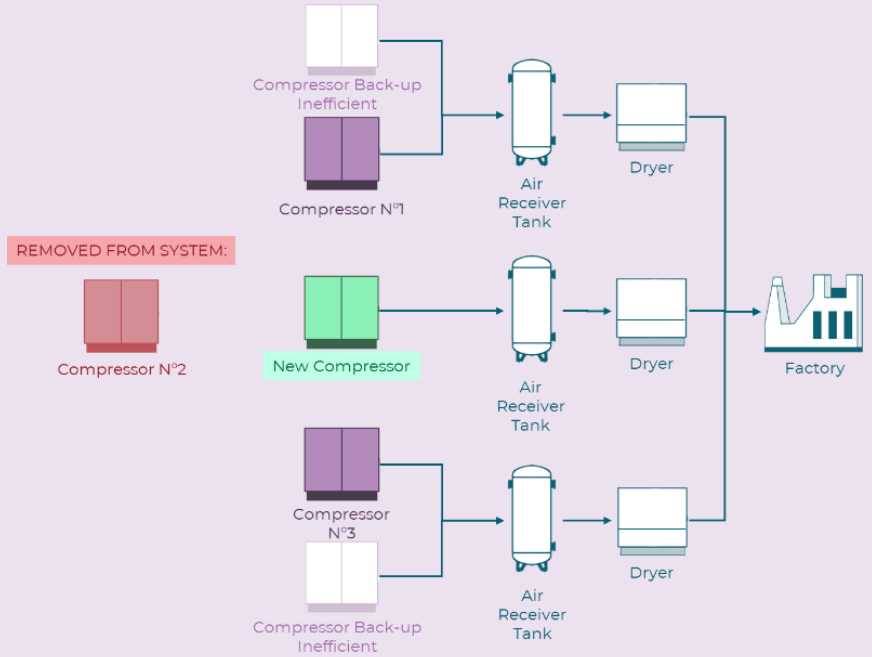
The performance of air compressor No. 2 was noted to be very poor in terms of energy efficiency. The average free air delivery rate of the compressor is only 2.98 m³/min, with an average specific power consumption of 7.48 kW/m³/min. This is higher than the recommended value of 5.21 kW/m³/min.

Therefore, it has been recommended to replace the existing non-efficient air compressor No.2 with a more efficient model with a higher free air delivery rate.

3. Energy efficient equipment

Based on the recommendation, the factory purchased a high-efficiency VFD new air compressor to replace the inefficient air compressor (Compressor No. 2). After installation, an expert consultant assessed the new air compressor and compared it to the inefficient air compressor, with the following results:

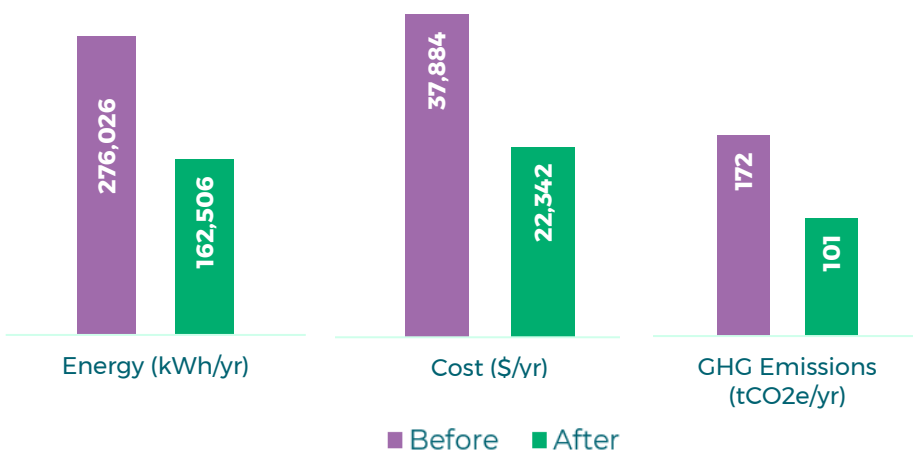
Compressor	Unit	Old	New
Free air Delivery	m ³ /min	2.98	12.75
Specific Energy Consumption	kWh/m ³ /min	7.48	4.44
Specific Cost of Compressed Air	USD/m ³	0.0172	0.0101
Control Type		Fixed Speed	Auto load



4. Savings Opportunity

Following the replacement of an inefficient air compressor with a high-efficiency model, the factory experienced a notable reduction in energy consumption. The comparative results showcasing this improvement before and after the replacement are outlined below:

Annual Consumption of Compressed Air System



After analyzing the consumption, we were pleased to see that the results were exceptionally positive compared to the previous data. We are delighted with the outcome and remain committed to monitor electricity consumption in the future.

Mrs. Kim Thavy
Compliance Supervisor

Upon analyzing the post-replacement results, a remarkable efficiency enhancement of 41% was identified. This clear outcome underscores the tangible advantage derived from the implementation of energy-efficient measures within the factory.



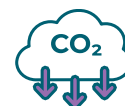
Investment Cost
10,120 USD



Payback Period
8 Months



Annual Saving Cost
15,542 USD/Year



Annual Saving GHG
71 tCO₂e/Year

**Edition:**

January 2024

Developed by:

Geres

With the contributions of:

This Case Study has been made possible thanks to the Switch Garment and VETHIC projects. They aim at providing hand-holding support to garment manufacturing units in the country to identify and adopt sustainable energy practices.

Switch Garment, a project funded by the European Union SWITCH-Asia Grants Programme and jointly implemented by Global Green Growth Institute (GGGI) Cambodia, Textile, Apparel, Footwear & Travel Goods Association in Cambodia (TAFTAC) and Geres aims at 'Promotion of sustainable energy practices in the garment sector in Cambodia' ("Switch Garment"). The objective of this project is to increase the competitiveness and decrease the environmental impact of the Cambodian garment industry through sustainable production.

The VETHIC project (2022-2024), funded by Agence française de développement (AFD), aims to improve the environmental performance of the Cambodian textile sector by activating the levers of energy transition. The project is jointly implemented by Geres, TAFTAC, Cambodia Women for Peace and Development (CWPD), and Live and Learn Cambodia (LLC).

Contacts

**E-mail:** switchgarment@gggi.org**Website:** <http://www.taftac-cambodia.org/partners/switch-garment>**Follow us on social media:** @switchgarment

TAFTAC | Textile, Apparel, Footwear & Travel goods Association in Cambodia

Royal Group Phnom Penh Special Economic Zone, Phum Trapeang Kul, Sangkat Kantaok, Khan Kamboul, Phnom Penh. Cambodia. 120906

+855 622 8888

www.taftac-cambodia.org
info@taftac-cambodia.org

GERES | Cambodia Office, Phnom Penh

Building #7B (3rd floor), St 81 corner St 109, Phnom Penh

+855 (0) 16 600 617 /

+855 (0) 78 767 499

www.geres.eu
cambodia@geres.eu

GGGI | Global Green Growth Institute

Ministry of Environment, Techo Heritage Building, No 503, Road along Tonle Bassac, Sangkat Tonle Bassac, Khan Chamkarmon, Phnom Penh, Cambodia

www.gggi.org
cambodia@gggi.org