

MED TEST III Lebanon

Transfer of Environmentally Sound Technologies

Food and beverage sector *Tayyebat*

Company overview

Number of employees:
61 Full-time employees

Key products:
Semi-fried frozen French Fries

Main markets:
Local restaurant and household sectors (40%)
International (60%)

Standards & certifications before MED TEST III:
FSSC 22000

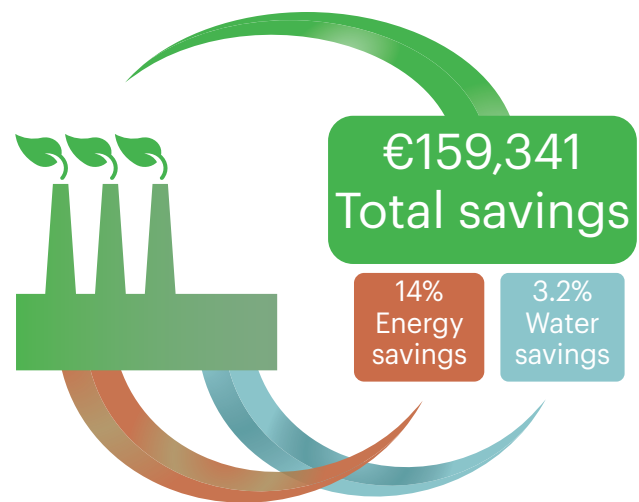
Established in 2011, Tayyebat is a Limited Liability Company that produces semi-fried frozen fries of various sizes. In 2023, the company had an annual production of around 12,000 tons of frozen French fries. Tayyebat is recognized as one of the leading companies in this type of production, supplying local households and restaurants, which represent 40% of the market in 2023. The remaining 60% of its production is destined for export. Tayyebat is committed to provide the best quality products to its customers, by ensuring compliance with food safety practices and equipping its production lines with modern industrial technologies.

Benefits

The MED TEST III project identified total annual savings of €159,341* related to energy and water with an estimated investment of €340,103*. The average payback period is about two years. The top management accepted to implement 10 of the 12 identified measures, out of which one is already implemented.

The identified measures have the potential to reduce annual conventional electricity consumption by 19.3% and thermal energy consumption by 6%, for a combined total energy saving of 14% and an equivalent reduction of Green House Gas emission of 454 tons of CO₂-eq per year. The annual potential for saving water consumption is 3.2%.

Identified annual savings



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Before joining in the MED TEST III project, we had embarked on a project to upgrade our steam system for a more efficient potato peeling method and we also implemented a SCADA system to monitor our energy consumption. Recognizing the relevance of resource efficiency for our company's growth, we joined the MEDTEST III project to seek qualified technical assistance for resource efficient and cleaner production processes.

Mr. Mohamad Baqer Gharawi
Owner and General Manager, Tayyebat

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As part of the EU-funded SwitchMed programme, UNIDO demonstrates in the MED TEST III project pathways for industries in the Southern Mediterranean to become more resource efficient and to generate savings for improved competitiveness and environmental performance.

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Saving opportunities**

Actions	Economic key figures			Resource savings & Environmental impacts		
	Investment Euro*	Savings Euro* per year	Payback period years	Water & Materials per year	Energy MWh per year	Environmental impact per year
Good housekeeping measures	933	1,398	0.7	311 m ³ water	6	Total: 454 tons CO ₂ -eq
Optimize boiler operation	4,664	15,785	0.3	-	282	
Improve the combustion efficiency and load factor of generators	32,649	25,763	1.3	-	345	
Process water recovery	1,866	905	2.1	1,763 m ³ water	-	
Heat recovery from blanchers and preheaters overflows	5,597	3,377	1.7	-	60	
Improve the efficiency of electric systems	14,543	7,840	1.9	-	37	
Install a PV system	279,851	104,273	2.7	-	279	
TOTAL	340,103	159,341	2.1	2.074 m³ water	1,010	

* Using average exchange rate October 2022-October 2023 1 USD=0.932836 Euro
**Numbers based on the production value: 2022

Good housekeeping measures

A number of good housekeeping measures were identified, such as removing scale from shock freeze evaporating fins as well as cleaning and combing cooling tower condenser coils in order to improve heat transfer. Among good practices, it is also suggested to adjust the level of the primary conveyer at the washing and destoning stage which will reduce water consumption by 311 m³/year.

Optimize boiler operations

This measure combines several boiler optimization interventions including, daily boiler blowdown to avoid scaling and cleaning of boiler firetubes, every six months remove soot, which inhibits proper heat transfer between the hot gases and the water in the boiler. Furthermore, the measure suggests heat recovery on the boiler exhaust to heat the diesel as well as the combustion air entering the boiler.

Improve the combustion efficiency and load factors of generators

This measure includes improving the combustion efficiency of the on-site generators by properly tuning the engine to reduce excess air. Furthermore, the measure consist of reducing idle operations of existing generators during non-production hours to achieve a higher load factor and thus high efficiency. Both practices will reduce fuel consumption significantly.

Process water recovery

This intervention involves two different water savings measures. The first suggest to recover and reuse the water resulting from the defrosting of the pre-cooler and shock freeze. The second one proposes to increase the size of the funnels, used to discharge rejects from different process stages, where water is unnecessarily accumulated causing overflows that become water losses.

For more information contact:



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

United Nations Industrial Development Organization
Ms. Ulvinur Müge Dolun
Division of Circular Economy and Environmental Protection
Circular Economy and Resource Efficiency Unit
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
E-mail: u.dolun@unido.org Web: www.unido.org

Heat recovery from blanchers and preheater overflows

Currently, water overflows from pre-heating and blanching processes are sent to drain at a temperature of around 60°C which wastes thermal energy. Through this measure, heat will be recovered from the overflow water to preheat the fresh water entering the pre-heater and the blanchers.

Improve the efficiency of electric systems

The power factor at Tayyebat will be improved by installing capacitors, which will reduce the operating currents sensibly and corresponding ohmic losses. On the other hand, cooling tower fans of the ammonia system can be optimized by installing variable speed drives which will modulate the fans' speed according to load.

Install a Photo Voltaic (PV) system

This measure suggests the installation of a 300 kWp on-grid PV system without battery storage. The PV system is estimated to supply around 279 MWh of electricity per year representing around 16% of Tayyebat annual electricity consumption.

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The MED TEST III project was a very fruitful and enriching experience. We are planning to implement most of the measures proposed by the project, as they align with our ambition to make our company's operation more sustainable.

Mr. Mohamad Baqer Gharawi
Owner and General Manager, Tayyebat

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