

# MED TEST III Lebanon

Transfer of Environmentally Sound Technologies

Food and beverage sector

*Marina Frozen Fries s.a.l*

## Company overview

Number of employees:

50 Full-time employees

**Key products:** Semi-fried french fries

**Main markets:** Local restaurant and household sectors (80%), International (20%)

**Standards & certifications before MED TEST III:**

ISO 22000, FSSC, YUM! APPROVED, FDA Approved

Marina Frozen Fries s.a.l. is a family-owned business and the frozen fries division was established in 2014. This unit specializes in semi-fried frozen fries of different sizes, with an annual production of around 3,800 tons. Marina's main customers are mostly local households and restaurants. The company includes also a raw potato storage division, which was established in 1977.

Marina's mission is to provide the best quality product to its customers, with food safety at the core of its practices, as demonstrated through its ISO 22000 certification. Although a comprehensive environmental system is not in place, Marina does place environmental and health aspects as relevant, not only for the production of added-value products from potatoes but also from the agricultural side of its production. Among the environmental commitments, Marina Frozen Fries activities are managed by the Global Gap system (Good Agricultural Practices), which controls the level of insecticides and the quality of water and also manages the treatment of pests and diseases to provide a first-class quality raw material.

## Benefits

The MED TEST III project identified total annual savings of 281,548 Euro\* related to energy with an estimated investment of 187,195 Euro\*. The average payback period is about eight months. The top management accepted to implement 93% of the 14 identified measures. Of the approved measures, 92% have been implemented or are under implantation, while the remaining are to be implemented at a later stage due to the needed investments.

The identified measures have the potential to reduce Green House Gas emissions by 1,021 tons of CO<sub>2</sub>-eq per year.

## Identified annual savings



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Our motivation is to become more resource-efficient and to reduce our environmental footprint, integrating the manufacturing area to our environmental management that starts from our agricultural division. Through the MED TEST III project, we started a path to understand better the way we use our resources in our production plant, which is the first step to control and reduce impacts.

Mohamad Tarchichi  
Owner and General Manager

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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	6,316	32,817	0.2	-	185	Total: 1,021 tons CO <sub>2</sub> -eq
Improving electrical network power factor	11,771	11,293	1.0	-	24.6	
Optimizing thermal oil system performance	2,488	22,682	0.1	-	316	
Improving steam system performance	48,426	125,849	0.4	-	1,621	
Improving refrigeration system performance	118,193	88,908	1.3	-	317	
<b>TOTAL</b>	<b>187,195</b>	<b>281,548</b>	<b>0.66</b>	<b>-</b>	<b>2,464</b>	

\* Using average exchange rate February 2022-February 2023 1 USD=0.957 Euro

\*\*Based on the production value: December 2021 to October 2022

### Good housekeeping measures

A number of good housekeeping measures were identified, enabling the company to achieve good savings (32,817 Euro\*) at an exceptionally low cost (6,316 Euro\*), resulting in a payback period of just 2.3 months. The identified measures comprise improving the combustion efficiency of generators, installing Plastic Vinyl Curtains and air curtains at freezers entrances, replacing and cleaning air compressors filters periodically, checking compressed air lines for leaks, combing condensers fins, cleaning cooling towers condensers coils, etc. The upgrade of the monitoring and control systems will contribute to minimizing losses and implementing an ongoing improvement strategy.

### Improving electrical network power factor

The actual power factor at Marina is relatively low (below 0.8), which induces increased operating currents in the electrical system. The company installed power factor correction capacitors, which will reduce the operating currents sensibly. This change increases the service entrance voltage, further reducing the operating currents and may avoid the need to operate the 500 kVA generator when EDZ (Electricité De Zahlé) utility or the 1000 kVA generator are ON.

### Optimizing thermal oil system performance

The performance of the thermal oil system will be improved by insulating key elements such as the thermal oil boiler and its supports, the accessory piping and the valves. Materials such as fiberglass and aluminum jacketing are recommended for an efficient insulation, with removable jackets in valves with clips for easy removal to facilitate maintenance and operation.

### Improving steam system performance

Undetected energy losses were identified during the measuring campaign. The steam boiler, boiler supports, boiler accessory piping, steam pipes, valves and condensate tanks all require additional insulation measures.

### For more information contact:



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The steam burner's air-to-fuel ratio is optimized through periodic boiler exhaust checks using a gas analyzer. Furthermore, replacing the 3-tonne steam boiler with a smaller-sized oil-fired boiler unit can potentially adjust steam production to real production needs, with a payback period of 1.3 years. In the future, the company is planning to upgrade its boiler system to better respond to increased production demand as well as improving the energy performance.

### Improving refrigeration system performance

The purpose of these measures is, on one side, to improve the coefficient of performance (COP) of the ammonia system and, on the other side, increase the cooling capacity of the pre-cooler of fried potatoes before entering the freezer. This measure will reduce the compression ratio from 12 to 6, thus considerably improving the COP of the system and lowering the electricity consumption of the ammonia system by nearly half and also sensibly decreasing the load on the cooling tower.

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The technical assistance from UNIDO revealed the potential to improve our energy consumption as one of our priority resource flows. We are keen on becoming more energy-efficient and upgrading our performance to reduce emissions. Saving energy-related costs in the difficult time we face here in Lebanon while improving our environmental footprint motivates us to continue working on our resource efficiency action plan.

Mohamad Tarchichi  
Owner and General Manager

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