switchmed

Financé par l'Union européenne

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

MED TEST III Lebanon

Transfer of Environmentally Sound Technologies

Food and beverage sector

Junet

Company overview

Number of employees: 52 Full-time employees

Key products:
Concentrate-based juices and nectars, milkshakes, and iced coffee.

Main markets: 50% local and 50% international

Standards & certifications before MED TEST III: ISO 22000

Junet is a family business and a leading manufacturer of soft beverage products in Lebanon. Since 1978, Junet has grown steadily into a renowned brand with a wide variety of products, including juices of different flavors based on concentrates and nectars, as well as milkshakes and iced coffee. Junet produces approximately 4,388,000 liters per year, and its products are available through more than 5,000 points of sale in Lebanon. They are also exported to more than 35 countries across Middle East, North and West coast Africa, America, and Europe.

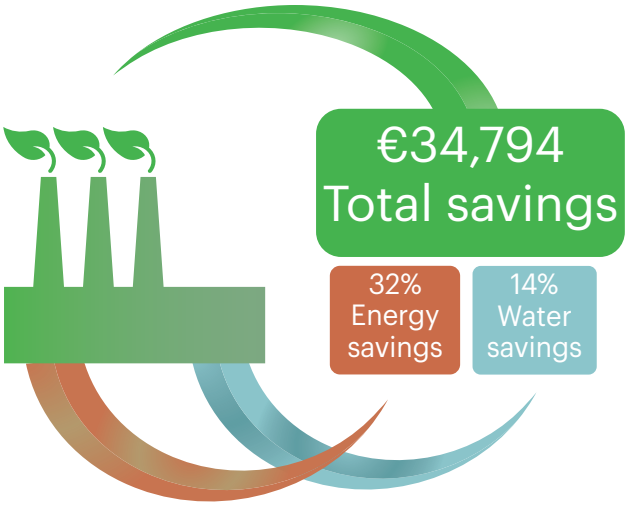
Junet's mission is to provide the best quality products to its customers, with food safety at the core of its practices. The company is committed to improving its environmental performance by using resources more efficiently and through circular economy practices.

Benefits

The MED TEST III project identified total annual savings of €34,794* related to energy with an estimated investment of €61,347*. The average payback period is about 1.7 years. Eleven measures were identified, out of which three are selected for short-term implementation.

The identified measures have the potential to reduce electricity consumption by 16% and thermal energy consumption by 41%, for a combined total energy savings of 32% and a Green House Gas emissions reduction of 122 tons of CO_2-eq per year. The resource efficiency measures in the saving catalogue will contribute to a water saving of 3%. Additionally, five recommendations were identified, which increase the water saving potential to 14% of the baseline consumption. However, due to the negligible cost of water, these measures do not generate economic savings.

Identified annual savings



"We joined the MED TEST III project to explore opportunities that could improve our energy and water consumption and our environmental footprint. We were also interested for options that would allow us to incorporate dairy whey in our beverages, an innovative approach that was promoted by the project."

Mr. Jean Estephan
Owner and General Manager, Junet

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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
Optimizing pasteurization operating temperatures	-	6,687	0.0	26 m³ water	71	Total: 166 tons CO_2-eq.
Improving the efficiency of the steam network	10,041	14,054	0.7	193 m³ water	204	
Optimization of steam boiler operations	4,664	1,611	2.9	-	21	
Improving the heat recovery ratio of pasteurizers	46,642	12,442	3.7	87 m³ water	104	
TOTAL	**61,347**	**34,794**	**1.7**	**306 m³ water**	**400**	

* Using average exchange rate October 2022-October 2023 1 USD=1.072 Euro
**Numbers based on the production value 2022

Optimizing pasteurization operating temperatures

The concentrate-based juices and nectars are currently pasteurized at 95-98°C. This measure suggests gradually reducing the pasteurization temperature of these products until reaching a stable 85°C, which will reduce both heating and cooling loads on the pasteurizers without affecting the product quality. This is possible, in line with international best practices, due to the high acidity (pH<4.2) of the products which inhibits pathogens growth. This measure will enable the company to achieve savings of €6,168 at no cost.

Improve the efficiency of the steam network

Most of the steam network including the steam boiler, supports, accessory piping, steam pipes, pasteurization holding cell pipes, condensate pipes, valves, and condensate tanks lack any kind of thermal insulation leading to very high thermal losses. Furthermore, excess hot water from the thermal expansion tanks as well as some condensates are sent to the drain. Proper thermal insulation and jacketing of all the mentioned items in the steam network, fixing steam leaks in pipes and valves, and the recovery of hot water currently sent to the drain will enable Junet to achieve savings of €14,054 at an investment cost of €10,041, resulting in just nine months of payback period.

Optimization of steam boiler operations

This measure combines several boiler optimization interventions that should be implemented as one package to maximize the potential benefits. These measures include the daily boiler blowdown to avoid scaling as well as the cleaning of boiler firetubes every six months to remove soot, which inhibits proper heat transfer. Furthermore, the measure suggests heat recovery on the boiler exhaust to heat the diesel and the combustion air entering the boiler. This intervention will reduce boiler fuel consumption and should drastically reduce the need for excess air entering the boiler and soot formation.

Improve the heat recovery ratio of pasteurizers

The average heat recovery ratio of the existing heat exchangers is around 60-70% which is relatively low. This measure suggests increasing the regenerative surface by increasing the number of plates in the heat exchanger leading to less energy consumption and lower thermal losses. This intervention will increase heat recovery by around 20% which will enable Junet to achieve savings of €10,604 at an investment cost of €46,642, resulting in a 3.7 years of payback period. The payback period can be significantly reduced if the plates are sourced locally.

A Circular Economy initiative: Valorization of dairy whey in the juice production

Additional to the resource efficiency assessment, Junet has undertaken a technical assistance from the MED TEST III project to introduce whey in the formulation of concentrate-based juice production. After testing seven flavors such as orange, lemon, guava, apple, pineapple, strawberry and banana with whey concentration ranging among 20 – 30%, three flavors resulted with positive quality results and will be tested further for industrial production. This initiative opens a new ground for Junet to introduce a more nutritious product and promote a circular economy solution by closing a material loop between the dairy and juice production sectors.

> “We greatly appreciate the interventions carried out by the MED TEST III team; the ideas and analysis conducted by national and international team members have been valuable and we are confident that we will obtain great benefits by implementing the resource efficiency measures in the best of our capacities.”
>
> Mr. Jean Estephan
> Owner and General Manager, Junet

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