

# MED TEST II


*Transfer of Environmentally  
Sound Technology in the  
Southern Mediterranean Region*

Lebanon

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the European Union



Regional Activity Centre  
for Sustainable Consumption  
and Production



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# Switching to a sustainable consumption and production

**T**he EU funded SwitchMed Program is about changing the way goods and services are produced and consumed, so that human development is decoupled from environmental degradation. SwitchMed strives to assist the Southern Mediterranean Region to switch to more Sustainable Consumption and Production (SCP) patterns, enabling the actors in this region to realize their full economic potential. It supports industries, emerging green entrepreneurs, service providers, civil society, and policy makers through demonstration activities, policy development, and networking of incubators for eco innovation in order to catalyze progress towards low carbon and climate resilient societies, and gives rise to new economic opportunities.

**T**urning challenges into opportunities is at the core of the MED TEST II component, a unique and innovative part of the SwitchMed program. The Transfer of Environmentally Sound Technology (TEST) methodology from UNIDO addresses rising energy and raw material costs by demonstrating how best practices in Resource Efficient and Cleaner Production (RECP), with an attractive return on investment, can be integrated into current business operations.

**E**nhancing productivity by integrating practices and technology that lead to greater efficiency in the use of natural resources, to a reduction of waste and energy consumption, and to opportunities for innovation and value creation, is central to the UNIDO TEST approach.

**A**dopting a resource efficient and cleaner production (RECP) not only leads to better environmental performance for the industry, it also enables businesses to operate more competitively while at the same time saving money, and also providing businesses with the scope to invest and grow sustainably. But efficiency in production also contributes to saving valuable resources, such as energy and water, for the national economy. Hence, the economic benefits of RECP extend far beyond lowering production costs for businesses as it also contributes to additional growth, a sustained job creation, and supports the long-term resource resilience of Lebanon.



# Partnering for a competitive industry in Lebanon

The prevailing economic and social instability in the neighboring region to Lebanon (loss of markets due to closure of borders with contiguous countries, increased pressure on infrastructures, increased informal competition) is a setback for Lebanon's own development and constrains the competitiveness of Lebanese businesses. Power supply interruptions and dependency on expensive and carbon-intensive fossil fuels for energy are among the reasons why energy efficiency and switching to renewable sources are top priorities for the national industry. In common with the energy situation, water also continues to face distribution problems in Lebanon. Although water is considered an almost free resource for most businesses, many companies must drill their own wells or purchase water to meet their water consumption needs. Moreover, national businesses must also now cope with rising transportation costs for delivering their goods to nearby markets, which coupled with increasing prices for raw materials and the aforementioned socio-economic challenges, underpin the message that resource savings would not only improve the economic situation for the industry, but also contribute to ensure resource availability to other parts of the society.

The MED TEST II Program, implemented in Lebanon from 2015 to 2017, addresses the challenges and the barriers national industries are facing in becoming more resource and energy efficient, non-polluting and safe, and assists in producing goods that are responsibly managed throughout their life cycle, while also increasing productivity and maintaining access to international markets with good quality products that comply with international standards.

Under the patronage of the Ministry of Industry (MoI) and the Ministry of Environment (MoE), the MED TEST II Project in Lebanon has been led by the Industrial Research Institute (IRI), in collaboration with the Association of the Lebanese Industrialists (ALI), the Chamber of Commerce, Industry and Agriculture of Beirut and Mount Lebanon (CCIA-BML), and Banque du Liban (BDL) to mobilize funding and support for a sustained application and scaling-up of RECP in Lebanon.



in collaboration with



# The TEST approach for Lebanon

Through creative thinking and effective collaboration, the UNIDO TEST integrated approach targets all management levels of a company, involving people with different professional backgrounds and operational responsibilities, in order to enhance and sustain the efficient use of production inputs and environmental performance, encouraging a business culture where eco-innovative business solutions can thrive.

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*The project is one of the best projects we have ever implemented. It improved company financial and managerial situation and introduced good practices at operational and maintenance levels. Thanks to the resource monitoring system installed at the onset of the project, the culture of performance monitoring is now ingrained in the company.*

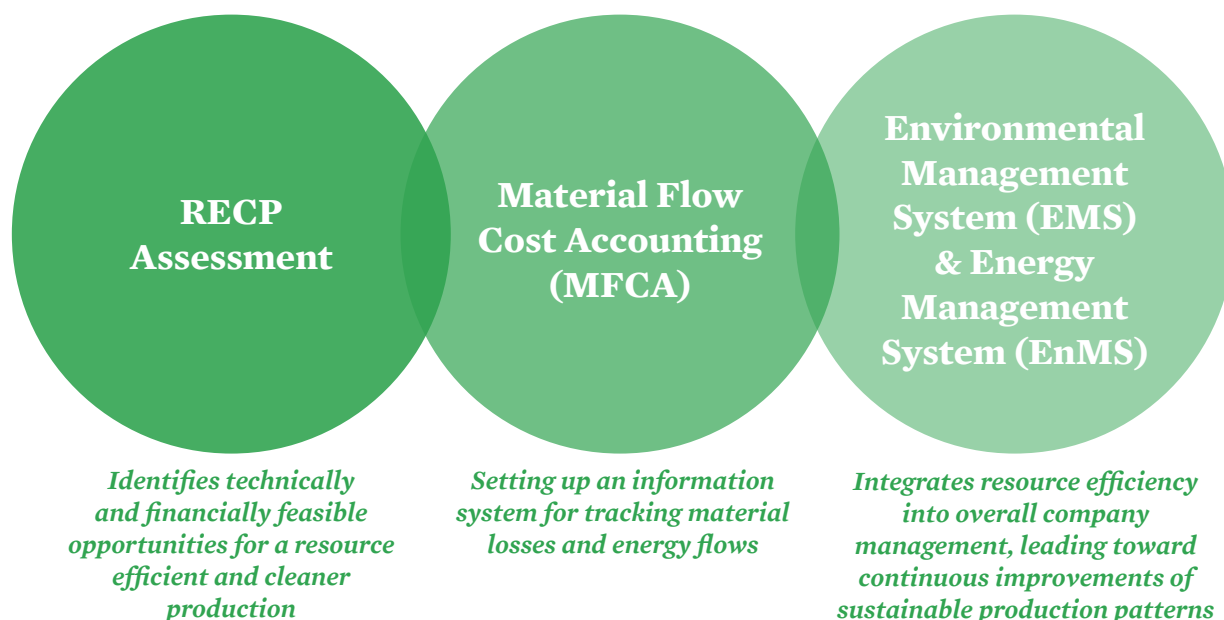
Camille Skaff  
Owner,  
Skaff Dairy Farm

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Identifying each and every business potential for resource efficiency requires a systematic assessment of the company production and the set-up of an information and management system that can monitor resource use in production for the continuous improvement of the performance of the business. The MED TEST II project in Lebanon supported most of the demonstration companies by guiding them in taking the necessary steps to introduce effective monitoring systems and get prepared to obtain ISO certifications.

Connecting RECP assessments with present-day standards in environmental and energy management systems, together with the material flow cost accounting standard ISO14051, enables businesses to establish an integrated system to identify and track losses in energy, water, and raw material inputs. The TEST methodology builds across-the-board understanding and capacities within various management areas of a company enabling a holistic understanding and support for RECP within the business.

*The TEST methodology builds on the following tools:*



# Stepping up Lebanon's capacities for a green growth



*professionals from business consultancies, government institutions and industries received training on the TEST tools during the demonstration phase of MED TEST II in Lebanon.*

One of the core objectives of the MED TEST II Program is to reinforce the local capacities of service providers in resource efficiency tools and to develop local markets for sustainable production services. By the end of the project, 8 Lebanese professionals from 8 consultancy firms were qualified on the UNIDO TEST approach, and will now be able to continue to provide integrated resource efficiency services to the local industries. The extensive on-the-job training, combined with an evidence based best-practice methodology and a technical assistance program, has been effective in bringing the industry closer to innovative knowledge networks and practitioners with hands on experience in resource efficient and cleaner production. This will enable the MED TEST II initiative to be scaled up beyond the duration of the project to the wider benefit of the industries in the food and beverage sector, and other sectors in Lebanon, leveraging on the local capacities and expertise gained and adapted to guide the national diffusion of sustainable production solutions.

Following an extensive marketing campaign entailing workshops and one-to-one company visits, 13 companies were selected for an initial assessment, out of which 8 demonstration companies from the food and beverage sector signed up for the MED TEST II project. The Lebanese demonstration companies range from SME's with 6 full time em-

ployees to large companies with 382 employees located in several areas of Lebanon and covering different industrial zones in Mount-Lebanon and the Bekaa Valley. The food sector was selected because of the high "replicability" potential of the results to other similar production sites, and with the aim of producing ripple effects from the TEST project in Lebanon.

*“The TEST approach presented in the MED TEST II project constitutes a win-win solution for industry: by cutting losses in resources, industrial companies can reduce their production costs and at the same time lower their environmental footprint, which will lead to enhanced competitiveness.*

*Ramzi Shasha,  
SwitchMed Focal Point,  
Ministry of Industry*

*”*

Companies were initially motivated by the expectation that the project could help them reduce energy related production costs and also enhance the awareness of their staff about RECP. A few companies were also motivated by the need to receive technical support to comply with the environmental national regulations.

## Service Providers

Apave Liban

MORES s.a.r.l

ECODIT Liban

Rafik El Khoury & Partners Consulting Engineers

ELARD s.a.r.l

S.E.S s.a.l

Kabbara & Partners

SGS Liban s.a.l

# Results of the *TEST* demonstration projects

Initial assessments in the 8 MED TEST II demonstration companies in Lebanon showed clear potentials for reducing consumption of raw materials, water and/or energy.

The TEST methodology introduced the Material Flow Cost Accounting tool (MFCA) as one of the major innovations. The MFCA analysis revealed to the company the real cost of raw material losses and inefficiencies. Through the TEST approach, both monetary and volume data related to production losses have been compiled leading to the “finance” and “technical” company staff working together.

This results in putting a price tag on the losses and shedding light on the savings potential in monetary terms. Analysis of the data showed that in some cases the annual cost of water and energy usage were lower than the costs resulting from raw material losses. This helps the plant to choose the critical areas in which to focus its efforts to identify sources of inefficiency and improvement measures.

“*Thanks to the MFCA tool, we were able to attribute costs to our losses, identify important materials savings and acknowledge the importance of increasing information exchange between the production, sales and accounting departments*”

Marwan El Koussa,  
Chairman of the Board of Directors and Owner,  
HMBR Manufacturing and Trading Co.

The table below summarizes the financial and environmental indicators of the total identified approved measures in the 8 demonstration companies.

Company	No. of employees <sup>1</sup>	Investment Euro	Savings Euro / yr.	Avg. PbP yr.	Water % / yr. <sup>2</sup>	Material % / yr. <sup>2</sup>	Energy % / yr. <sup>3</sup>
<b>Food and beverage sector</b>							
HMBR Manufacturing and Trading co s.a.l	382	1,002,441	1,211,561	0.8	21	4.7	13.4
Skaft Dairy Farm	11	19,315	38,859	0.5	15	2.8	44
A-Z Manufacturing & Trading	40	154,340	124,052	1.2	12	3.3	36
Bach Snacks	140	22,008	79,502	0.3	85 <sup>3</sup>	-	5
Chamssine Bakeries	150	73,438	93,890	0.8	8	-	5.7
Manara Dairy	6	16,000	7,200	2.2	-	-	8
Dirani Group	350	157,500	65,310	2.4	-	-	8
B. Ghrawi for chocolate	118	2,200	9,545	0.2	-	-	5
<b>TOTAL</b>	<b>1,197</b>	<b>1,447,242</b>	<b>1,629,919</b>	<b>0.9</b>			

(1) Full time employees in production departments only

(2) Cost savings compared to the production year 2015

(3) Cost savings compared to the production year 2016

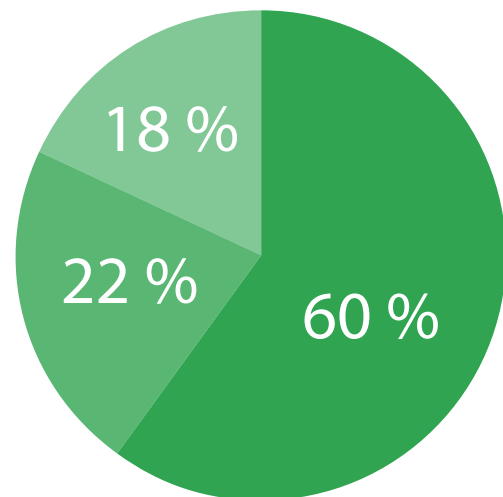
# TEST a vantage point for Lebanon's industry

A total of 111 resource efficiency measures were identified by the TEST team in the 8 demonstration companies. Of these 101 measures, corresponding to approximately 91% of the total measures, were approved by management in these companies and included in the action plan for implementation in 2017.

In the 8 plants a potential saving of over 1.6 million euros annually was identified, resulting in energy savings of 14,376 MWh/year; water savings of 53,412 m<sup>3</sup>/yr.; 544 t of raw material savings, and 523 t of landfilled solid waste avoided.

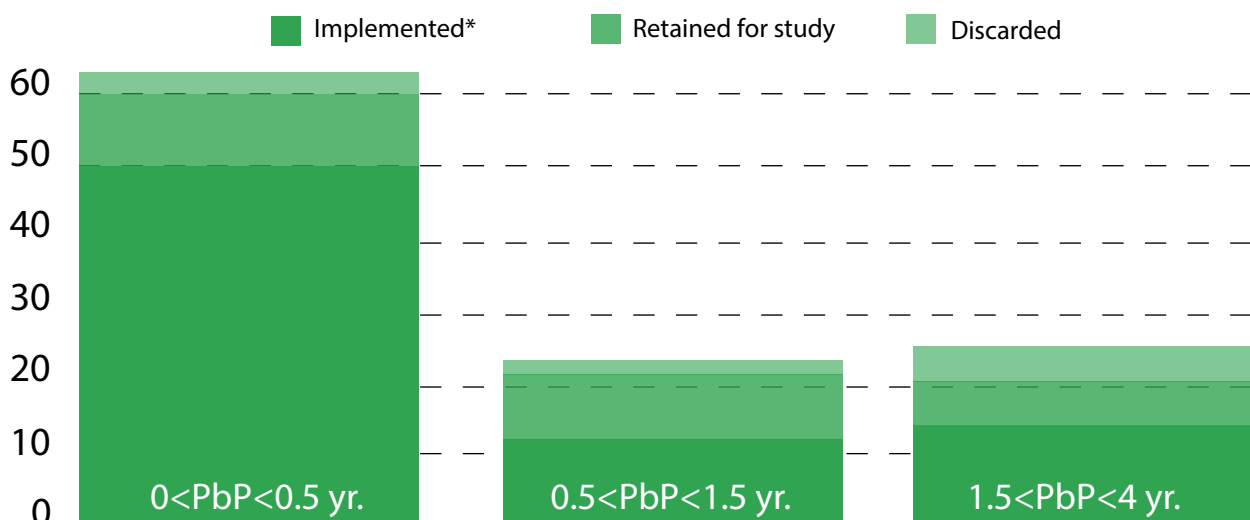
While substantial savings were identified, the majority of the identified measures had a payback period (PBP) of less than half a year (60%), showing the high profitability of resource efficiency.

**Pay-back period of identified measures at the demo companies**



■ 0 < PBP < 0.5 yr. ■ 0.5 < PBP < 1.5 yr. ■ 1.5 < PBP < 4 yr.

**Distribution of identified measures by pay-back period and implementation rate in the Lebanese demo companies**



**€ 1,629,919**  
Annual savings

\*Implemented, under implementation or planned at the time of this publication



# A profitable solution for industry and environment in *Lebanon*

**A**s recommended by the Med TEST II project team, at project's start, each company installed a set of meters to monitor energy and water use at key consumers. A total of 475 meters were installed in the 8 companies with an investment of 120,108 euros, showing the high commitment of top management and a raised awareness on the importance of resource efficiency. The installation of this resource monitoring system, together with the formulation of an RECP policy, and the recommendation to improve accounting systems (MFCA) for material losses, will facilitate companies' adoption of environmental and energy management standards and also enable them to have continuous improvements in resource efficiency as a routine practice in future.

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*Thanks to the project, we achieved in 2 years energy efficiency improvements that would have taken us 10 years to accomplish without project intervention.*

Ahmad Dirani,  
General Manager  
Dirani Group

”

“

*The TEST methodology constitutes an environmental added value for industrial companies as it helps them lower their environmental foot print on one hand and decrease the cost of their environmental compliance on the other*

Bassam Sabbagh  
SwitchMed Focal point,  
Ministry of Environment

”

**I**n order to respond to high investment requirements, companies were assisted by the MED TEST II project to access the existing green financial incentives that have been developed by Banque du Liban as part of its strategic policies to support the Lebanese economy. In addition, initiatives were conducted within the scope of the project to develop integrated RECP loans for industry in the future.

**O**n the other hand, all the companies prepared their EMS policy statements and were provided with specific guidelines to integrate RECP in their management system and towards the end of the Project, one of the companies decided to start ISO 14001 certification. During the Project implementation, one of the companies conducted an assessment for its water footprint and is now able to manage and monitor its water consumption more efficiently.

## *Estimated environmental benefits\**

Water savings	Energy savings	CO <sub>2</sub> reductions	Waste reductions	COD reductions	BOD <sub>5</sub> reductions
53,412 (m <sup>3</sup> /yr.)	14,376 (MWh/yr.)	3,567 (t/yr.)	523 (t/yr.)	7.3 (t/yr.)	6.3 (t/yr.)

\*Of approved measures

# Partners for RECP in Lebanon

To share our vision of a system wide change towards sustainable consumption and production in the Southern Mediterranean requires the efforts of all society actors. The MED TEST II demonstration project in Lebanon has revealed how additional economic or environmental benefits can be gained from the RECP methodology, by using the integrated approach of TEST and

without interfering in the business operations of the industries.

Moreover, the MED TEST II Project has reinforced the capacities of the local service providers offering RECP competence, to help develop solutions for Lebanon that increasingly decouple production from the consumption of finite resources.

## National team

### Core TEST Team:

Mohamed Haidar/ Project Manager and Coordinator, Naji Tannous/Senior Energy Efficiency Expert, Adnan Jouni/ Energy Efficiency Expert, Hanan Khanafer/ RECP & MFCA Expert, Maya Trad/ MFCA Expert, Ali Ismail/ Food Processing Expert, Ali Yaacoub/ RECP Expert, Joseph Matta/ EMS Expert.

### Supporting Technical Team:

Nada Sabra/ Regional Monitoring Expert, Hicham Abou Jaoudeh and Abdallah Ahmad/ Policy Experts, Salim Kfoury (IRI Financial and Administrative Director).

## International Team

Carolina Gonzalez-Mueller (Project Manager), Roberta De Palma (Chief Technical Advisor), Vladimir Dobes (Senior TEST Expert), Christine Jasch (MFCA Expert), Mohamed Ghoul (International Food & RECP Expert), Michael Barla/ Communication Specialist, Vladimir Anastasov/ Headquarters Project Coordinator.

## Acknowledgment

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## Implementing partners



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