switchmed

Funded by the European Union

MED TEST III in *Palestine*

Progressing resource-efficient and competitive industries

Project summary and achievements

Implemented by:

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

SwitchMed is co-funded by:

Generalitat de Catalunya Departament d'Acció Climàtica, Alimentació i Agenda Rural

Agència de Residus de Catalunya

Italian Development Cooperation Ministry of Foreign Affairs and International Cooperation

Funded by the European Union, with co-funding from the Government of Italy and the Government of Catalonia, the SwitchMed Programme is implemented under the lead of the United Nations Industrial Development Organization (UNIDO) in partnership with the United Nations Environment Programme (UNEP) Economy Division and MedWaves, the United Nations Environment Programme Mediterranean Action Plan (UNEP/MAP) regional activity centre for Sustainable Consumption and Production (formerly known as SCP/RAC). The initiative is carried out closely with the European Commission's Directorate-General for Neighbourhood and Enlargement (DG NEAR).

Each implementing organisation contributes specialised experience and tools to partner with the eight beneficiary countries on policy development, capacity building, business support services, demonstration activities and networking.

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For more information on the UNIDO activities within the SwitchMed initiative, please get in touch with us at: u.dolun@unido.org

The SwitchMed Programme

Launched by the European Union (EU) in 2014, the regional SwitchMed programme has demonstrated the potential for a green and circular economy in Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Palestine, and Tunisia. To upscale the transition to Sustainable Consumption and Production (SCP) practices in the Southern Mediterranean region, SwitchMed has demonstrated business models that can reduce the inefficient use of resources and the environmental footprint of existing economic activities. It has done so through industry demonstrations, policy development, networking opportunities, and support for start-ups and green entrepreneurs.

Under the lead of the United Nations Industrial Development Organization (UNIDO), the SwitchMed industry component has, during the MED TEST II (2014-2018) and MED TEST III (2020-2023) projects, realized over 165 industry pilots demonstrating pathways for more resource-efficient and circular production models in the southern Mediterranean industry.

SwitchMed has become one of the region's most relevant resource efficiency initiatives, building local capacities and demonstrating the industry's potential for resource-efficient and circular business models.

Through successfully demonstrating circular business and production models, the pilots have inspired industry actors with innovative production models that involve reusing, refurbishing, re-manufacturing, and recycling products to optimise productivity and recirculation. By embracing these resource-efficient practices, businesses in the region can effectively adapt to the ever-changing global market and environmental conditions. These practices are essential for achieving sustainability and economic objectives in the regional industry and building resilient supply chains.

The MED TEST III project in Palestine

Palestine has been grappling with persistent economic difficulties, including high unemployment rates, limited resource access, and restricted trade opportunities. These challenges have hindered the growth and development of the industrial sector and posed barriers to sustainable economic progress.
Recognising the urgent need for transformative solutions, the SwitchMed/MED TEST III project has focused on promoting resource efficiency to support economic development in Palestine.

By implementing sustainable production and consumption practices, the MED TEST III project encourages industries in Palestine to optimize resource usage, minimize waste generation, and improve operational efficiency. Adopting resource-efficient technologies and processes enables businesses to reduce costs, enhance productivity, and strengthen their competitiveness in local and global markets.

The previous MED TEST II project (2015-2018) emphasized the economic and environmental benefits of resource-efficient production in the Palestinian industry. Utilizing the UNIDO TEST methodology, ten industry demonstrations were conducted in Palestinian food and beverage companies, showcasing the practical application of resource efficiency measures. Industry demonstrations from the MED TEST II project were highly impactful, identifying 92 improvement measures for the participating companies. Implementing these measures could yield significant cost savings in energy, water, and raw material consumption, estimated at €2.5 million annually for the companies involved.

Building on the success of the MED TEST II demonstrations, the Government of Palestine, UNIDO, and local stakeholders developed a national roadmap to promote resource efficiency across other sectors and a second phase was launched in 2020 under the MED TEST III project.

In cooperation with the Ministry of National Economy (MoNE), the Environmental Quality Authority (EQA), the Palestinian Federation of Industry (PFI) and the Palestinian Food Industries Union (PFIU), the MED TEST III project targeted seven companies from Palestine's food and beverage, plastic, pharmaceutical, and paper sectors. Through training programs, workshops, and technical assistance, local service providers have been empowered to implement resource-efficient technologies and processes in the seven demonstration companies.

Following the training, these service providers have actively participated in the seven demonstration projects, gaining practical experience while assisting local businesses in implementing resource efficiency programs under the guidance of international sector experts.

The TEST training has been extended to selected staff members from the seven participating companies, enabling them to implement the technical measures and management solutions identified by the service providers. This approach ensures the sustainability of the identified actions at the company level, as it actively involves company staff in the process and transfers ownership of resource efficiency improvements within the company, fostering continuous improvement.

UNIDO has compiled a list of proficient service providers and industry experts knowledgeable in the TEST methodology to create a qualified pool of RECP service providers for industries in Palestine. This list can be accessed on the online version of the UNIDO TEST toolkit and will soon be available on the MoNE website under the Directorate of Industry.

The MED TEST III project in Palestine also raised awareness of RECP among academic and financial institutions. The concept of RECP was included to equip young engineers in education with the needed basics that can later be applied in their work in the industry. This approach also responds to the need for vocational training as requested by the industry. Two universities, the An-Najah National University and the Al-Quds University, have already integrated RECP into their curricula.

Finishing RECP investments requires the cooperation of banks, who must understand the RECP concept's benefits. In partnership with the Association of Banks in Palestine, the project initiated training on RECP for banks. Financial institutions have welcomed RECP as it allows clients to optimise their investment projects while minimising fixed costs, thus improving their financial risk profile.

The TEST approach

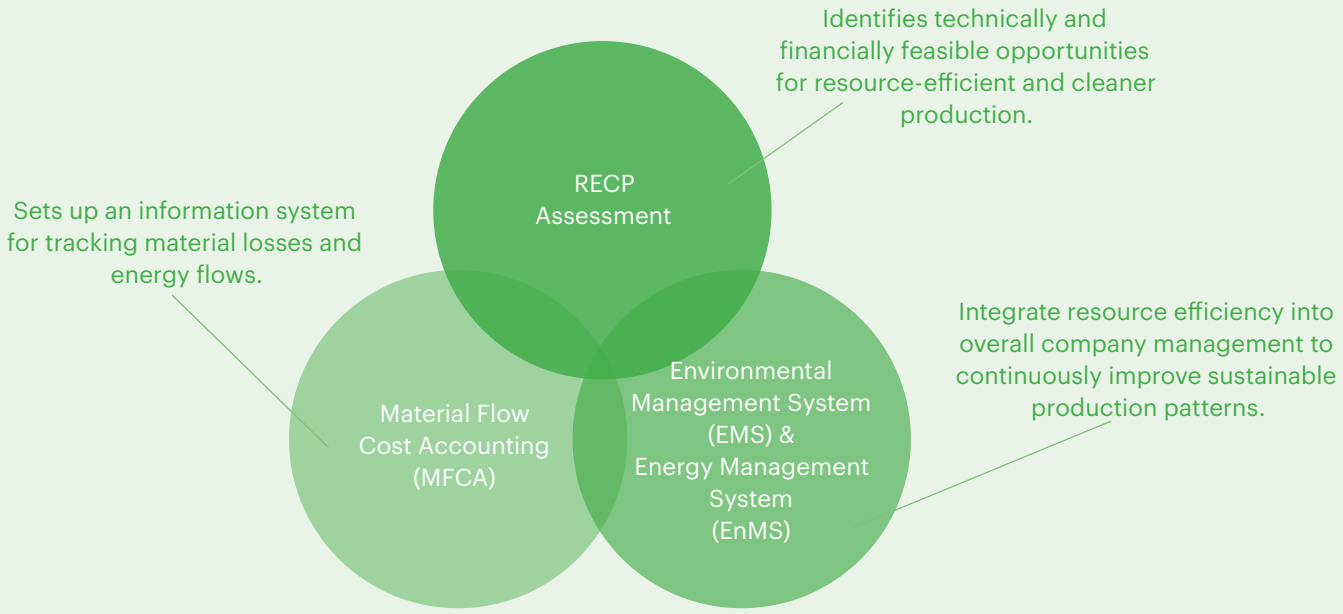
The TEST methodology, developed by UNIDO, offers a systematic approach to identifying and exploiting the most feasible opportunities for resource efficiency and continuous improvement in using materials, water and energy within a company. This methodology combines essential tools for sustainable production, namely, Resource-efficient and Cleaner Production Assessment (RECPA), Material Flow Cost Accounting (MFCA) and Environmental and Energy Management Systems (EMS/ EnMS). As a result of these tools' customised integration and implementation, best practices, new skills and an innovative management culture are adopted. The TEST methodology supports any company in transitioning towards more sustainable production business models.

The adoption of sustainable production strategies is rooted in the concept of the "learning organization", which requires the commitment and engagement of the various stakeholders who influence resource efficiency (customers, suppliers, production managers, workers, etc.) in line with the internal management processes of a business.

At the core of the TEST methodology lies the RECP tool, a step-by-step assessment for improving production systems' resource efficiency and environmental performance. The core output of this tool is a portfolio of financially feasible solutions, including good housekeeping, operational control improvements, process and product modifications, and eco-innovative technologies.

Within the TEST methodology, elements of MFCA are employed to strengthen priority-setting based on non-product output costs and to establish ad hoc information systems for critical material and energy flows, as well as key processes. This step is essential for monitoring significant resource losses and consumption. An MFCA-based information system is also crucial for calculating economic improvements resulting from implemented RECP measures and programmes, thereby evidencing their impact on medium to long-term decisions. It also enables enterprise staff accountability and the reporting of demonstrated company performance against baselines and targets.

The core elements of the Environmental Management System (EMS) and Energy Management System (EnMS) are used in TEST to integrate resource efficiency into the company's overall management systems. This provides operating criteria, Standard Operational Procedures (SOPs) and the internal resource structure for ensuring that resource efficiency programmes are implemented, sustained and further developed.



Results from the MED TEST III demonstration projects

Under the MED TEST III project, the industry demonstrations for resource-efficient production targeted companies from Palestine's food and beverage, plastic, pharmaceutical, and paper sectors. Following a call for participants, 50 companies applied for demonstration projects, of which seven were selected based on the published criteria for implementation of the demonstration projects and on-the-job training of the national service providers.

The industry demonstrations in Palestine identified a total of 119 resource efficiency measures. Among these, 107 measures, corresponding to approximately 90% of the total, were approved by the management of the demonstration companies and incorporated into their action plans for implementation. The resource efficiency measures identified for the seven participating demonstration companies could potentially save 6,558 m³ of water, 11,207 MWh of energy, 792 tons of materials, and 7,913 tons of CO_2 equivalent annually. As for economic savings, the identified measures have an average Payback Period (PBP) of two years and could potentially save the participating companies €2.5 million in annual production costs.

The table below summarises some of the financial aspects of the identified resource efficiency measures:

Name	Employees (full-time)	Investment Euro*	Savings Euro* per year	Average pay-back-period years	% of water savings per year	% of energy savings per year	% of material savings per year
Food and beverage sector							
Arab Development Society (ADS)	17	328,916	227,037	1.5	45%	50%	16%
Al-Rawafed food company	85	207,291	283,507	0.7	8%	48.2%	1.2%
Al'Ard Palestinian Agri-Products Ltd.	35	4,493	48,310	0.1	-	13%	1.4%
The Palestinian-Turkish Company for Food Manufacturing Zeta	35	314,250	119,874	2.6	61%	54%	1.3%
Pharmaceutical sector							
Beit Jala Pharmaceutical Company BJP	250	1,576,336	767,900	2	-	23.7%	0.7%
Plastic sector							
Al-Wafa Plastic Industries (WPI)	211	2,366,529	880,596	2.7	-	73%	3.5%
Paper sector							
The National Carton Industry Company NCI	54	105,131	139,065	0.7	-	25%	8.2%
Total	**687**	**4,902,946**	**2,466,289**	**2**			

*Exchange rate as 1 Euro = 3.69 NIS (New Israeli Shekel)

The MED TEST III project in Palestine also helped companies set up management accounting systems to get production costs under control. As a result, three demonstration companies have optimized their internal product pricing strategies. In particular, the National Carton Industry Company collaborated with its customers to engage them in a project to optimise the product design. The outcomes of this transformative re-design bolstered productivity and reduced production costs. In a mutually beneficial arrangement, the company customers could take advantage of the cost-saving measures through lower prices.

The initial outcomes of the MED TEST III project in various companies have generated notable interest from multiple industries, particularly from players in the food and beverage and plastics sectors. One striking example comes from a small dairy company based in Jericho, operating under the Arab Development Society (ADS). Through the insights from the project, this company has successfully introduced an innovative product crafted from waste material (Whey), known as "Palestine's Areesh Whey Cheese."

This noteworthy achievement, coupled with the regional online whey seminar organised by colleagues from the SwitchMed/MED TEST III project in Lebanon, has significantly piqued the interest of other dairy companies operating in Palestine. The spotlight is now on the potential for whey valorisation, marking an exciting development in the local dairy industry and opening doors to more sustainable, value-added products.

The MED TEST III project has revealed that whey previously discarded as waste from dairy production can be transformed into high-quality products for sale. To promote the wider implementation of this process in the Palestinian dairy industry, UNIDO has provided technical support to Al Pinar, a dairy company looking to incorporate whey valorisation into its production methods. The findings from this effort have been truly promising, particularly in the realm of utilizing whey in the creation of new products.

In this case, technical assistance from UNIDO in manufacturing whey-based drinks focused on developing new products from high-quality acid whey, which was costly and treated as waste before. In close cooperation with the company, laboratory tests and experiments were conducted using various drink samples. Some samples delivered excellent results and a good shelf life, providing a basis for Al Pinar's new whey-based products.

10 service providers qualified on the UNIDO TEST methodology through on-the-job training

26 industry professionals trained on the TEST methodology.

7 industry demonstrations completed during the MED TEST III project...

...impacting **687** full-time jobs in the 7 demonstration companies.

119 resource efficiency measures identified.

...with the potential to save the 7 companies **€2,466,289 (ILS 9,100,606*)** in annual production costs.

24 academics from **12** local universities were trained on the TEST methodology and provided with educational material and case studies.

2 Universities have incorporated the concept of resource-efficient production into their curricula.

Enhancing resource efficiency in the food and beverage sector

A case study from the Al-Rawafed Company for Food Industries and Juice

Al-Rawafed is a well-known Palestinian food manufacturer in business since 1960. The company has 85 full-time employees and is based in Nablus. They produce over 30 popular food products using state-of-the-art machinery and packing technology.

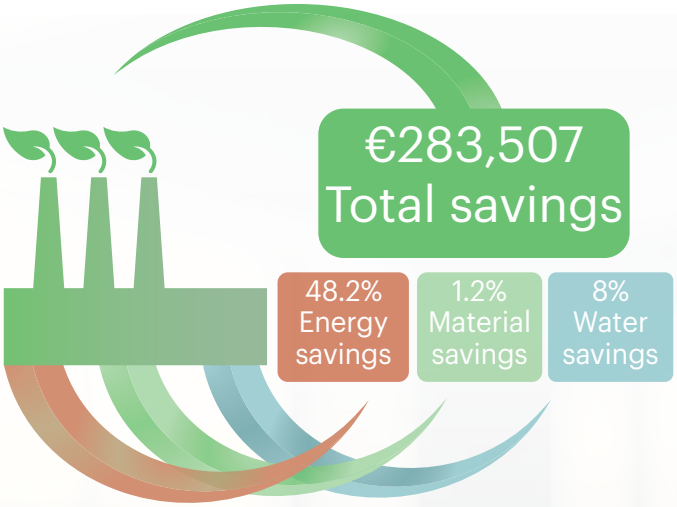
As part of their efforts to become more cost-effective and resource-efficient, Al-Rawafed joined the MED TEST III project. The project helped the company identify areas to improve its operations and reduce costs. One of the measures they identified was the automation of their concentrated syrup line, saving the company €90,000 annually while costing approximately €63,000 to implement. This measure would save 414 m3 of water and 58 MWh of energy annually.

Another area where the company could improve was in their production line for dry powders. By optimising the filling line and introducing vacuum pipes, the company could save approximately €157,000 annually.

Overall, the resource-efficiency measures identified during the MED TEST III project would cost €207,291* (NIS 764,904) to implement but would save the company €283,507* (NIS 1,046,141) in energy, water, and raw materials each year. The average payback period for this investment is approximately eight months. Additionally, implementing these measures would help the company reduce their CO_2-eq—emissions by 115 tons per year.

The resource efficiency measures identified during the MED TEST III project will also help Al-Rawafed improve the quality of its products and ensure consistency in its production processes. This will help the company enhance their reputation and increase customer satisfaction.

Identified annual savings in Al-Rawafed



Grahpic: UNIDO

> Looking back on the project, we take pride in its achievements and benefits to our business. By implementing cleaner production methods, we have successfully reduced waste, improved resource efficiency, and reinforced our reputation as a responsible Palestinian company. We firmly believe that investing in sustainability is not only an ethical but also a wise business choice. The MED TEST III project has played a crucial role in shaping our approach to resource conservation and has provided new insights to our team.
>
> Nidal Zaatr
> CEO, Al-Rawafed company

*Exchange rate as 1 Euro = 3.69 NIS (New Israeli Shekel)

Improving resource efficiency in the plastics industry

A case study from the Al-Wafa Plastic Industries

Al-Wafa Plastic Industries (WPI) was established in Palestine in 2004 to provide packaging solutions for several products and meet customer needs. It started on an area of eight hundred square meters, then was enlarged in 2016 to an area of 10,000 m² by introducing several Swiss and Japanese production lines, the first of their kind in the Middle East with the latest international standards.

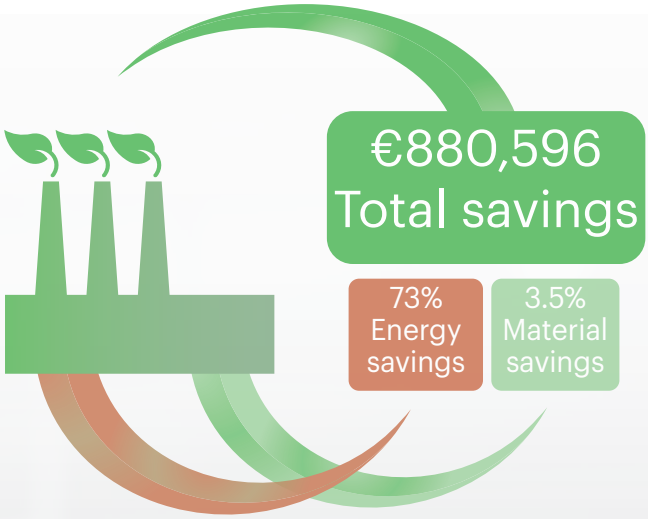
The company manufactures different items, including plastic containers, caps and gallons for mineral oil and detergents. Al-Wafa's production capacity is about 350 tons per month. Products are marketed locally and internationally. The company has 211 Full-time employees based in Hebron. Before the TEST project, WPI operated in a newly constructed facility with modern equipment and ISO 22000 and ISO 9001 in place.

As part of the MED TEST III project, WPI took on the challenge of identifying the most critical material and energy flows while closely monitoring resource efficiency. To achieve this, the project began by monitoring resource efficiency and incorporating information systems into the existing quality control system, which provided valuable insight into areas that could be improved. Consequently, optimised resource efficiency measures were established, including conserving raw materials, waste prevention at the source, recycling, conserving electricity and LPG, and expanding the company's photo-voltaic power station.

Implementing these measures will result in total annual savings of €880,596 (3,249,398 NIS) for WPI, with an estimated investment of €2,366,529 (8,732,400 NIS). The average payback period is 2.7 years. Over 80% of the 16 measures identified were accepted by the company's top management, and half were implemented, or are in the process of being implemented, at the end of the MED TEST III project.

The MED TEST III project also facilitated the establishment of the main elements of an environmental management system, which enabled the company to obtain ISO 14001 certification within a few months of completing the MED TEST III project.

Identified annual savings in WPI



Grahpic: UNIDO

> Initially, we were hesitant to join, but after completing MED TEST III, we now see the benefits of using a scientific methodology to help us identify losses and achieve savings. I advise all Palestinian industrial companies to cooperate with your project to achieve the benefit and encourage any company to engage in this important activity.
>
> Tariq Abu Alfelat
> Public Relations Manager
> Al-Wafa Plastics Industries

MED TEST in Palestine

Since 2015, UNIDO has demonstrated resource-efficient production in Palestine, showcasing its advantages for companies, industries, and society. Through the two successive MED TEST projects, it has become evident that this approach is relevant for businesses and Palestine's long-term goal of reducing reliance on imported resources and promoting a national green growth pathway. The figures below provide evidence of the success of this initiative.

12 Service Providers qualified on the UNIDO TEST Methodology

Total industry pilots undertaken

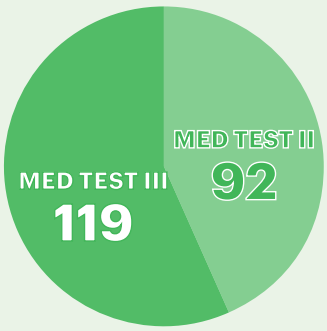
MED TEST II
10

MED TEST III
7

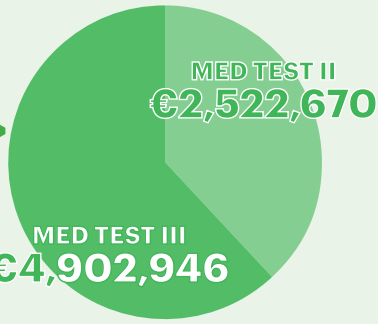
= 17

Impacting **1,817 jobs** (number of employees from the 17 demo companies)

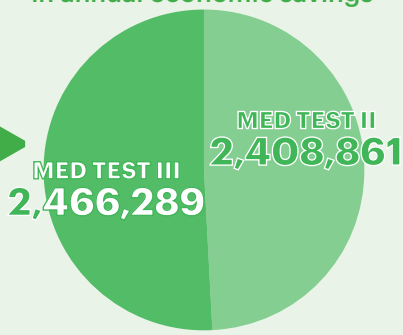
211
RECP measures identified



€7,425,616
private sector investment for RECP identified



That can generate
€4,875,150
in annual economic savings



The average payback period for the identified RECP measures

Identified water savings
252,211 m³ x year

Identified energy savings
16,519 MWh x year

Identified material savings
1,090 tons x year

Identified CO_2 savings
12,110 tons x year

The way forward for RECP in Palestine

Mainstreaming Resource Efficiency in Palestine

The effort to promote resource efficiency in Palestine has gained momentum with the successful demonstration projects from MED TEST III. This has led to increased communication and coordination with stakeholders, and discussions have begun to amend the Roadmap for Scaling Up Resource Efficiency in Palestine created during the previous MEd TEST II. The stakeholders are committed to building on the success achieved through the 17 demonstration companies and extending the benefits of RECP to more companies.

Expanding the pool of qualified service providers within the country is necessary to achieve this. Universities are already integrating RECP into their curricula for new engineers; however, there is still a need for more capacity building in academia and technical and vocational education and training. Additionally, there is growing interest in exploring opportunities for greater cooperation between academia and industry.

Meetings with donors and development agencies on potential support for follow-up activities related to MED TEST III also provided the parties with an update on the progress made on RECP in Palestine and information on the expertise and capabilities of national Service Providers trained under the SwitchMed initiative. These experts have know-how and experience on how to apply RECP in the context of Palestine that can be utilised in other technical assistance programs in Palestine. The expertise of the National Service Providers is also appealing to private banks in Palestine and members of the Bank Association, who support and finance projects related to resource efficiency, energy efficiency and renewable energy in the industry.

Recently, the Palestinian government joined forces with the Team Europe Initiative, which includes Germany, Italy, Sweden, and Belgium, to host an important event called "Go Green Palestine." During this event, Minister of National Economy Khaled Osaliy declared that the Palestinian government is fully committed to transitioning to a green economy. This transition will have two major benefits: safeguarding the environment and reducing costs while preserving the climate."

The MoNE has created the Green Industries Department (GID) that focuses on helping Palestinian industries transition to sustainable practices. The GID is crucial in promoting sustainable energy solutions and supporting the Ministry's commitment to green development and economic empowerment.

> “We strongly endorse the expansion of the UNIDO TEST methodology, with a particular emphasis on Resource Efficient and Cleaner Production, across all sectors in Palestine. The successful implementation of this methodology in our member’s industrial food firms has resulted in remarkable improvement and impactful transformations. It has addressed some of our most critical challenges, including scarcity of vital resources such as materials, energy, and water.”
>
> Bassam Abu Ghalyoun
> General Manager
> Palestinian Food and Agriculture Industries Union - PFAIU

The MoNE has also recommended regulatory and administrative reforms to improve the business environment. These reforms are designed to turn challenges into opportunities, creating a more conducive and enabling regional business atmosphere. The Ministry envisions a future marked by prosperity, driven by the transformative impact of these reforms. Such reforms include Promoting the adoption of renewable energy sources in industry, such as solar power, to reduce energy costs and dependence on fossil fuels.

In September 2023, President Mahmoud Abbas issued a presidential decree to create the "Supreme National Committee for Industrial Development." This committee will oversee industrial matters in the country and work to solve the challenges historically hindering the industrial sector.

All these recent green growth and resource efficiency initiatives in Palestine demonstrate the momentum for RECP in Palestine.

Scan the QR code to access the Industry Resource Efficiency Service Providers list in Palestine.

Find us on switchmed.eu

For more information contact:

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