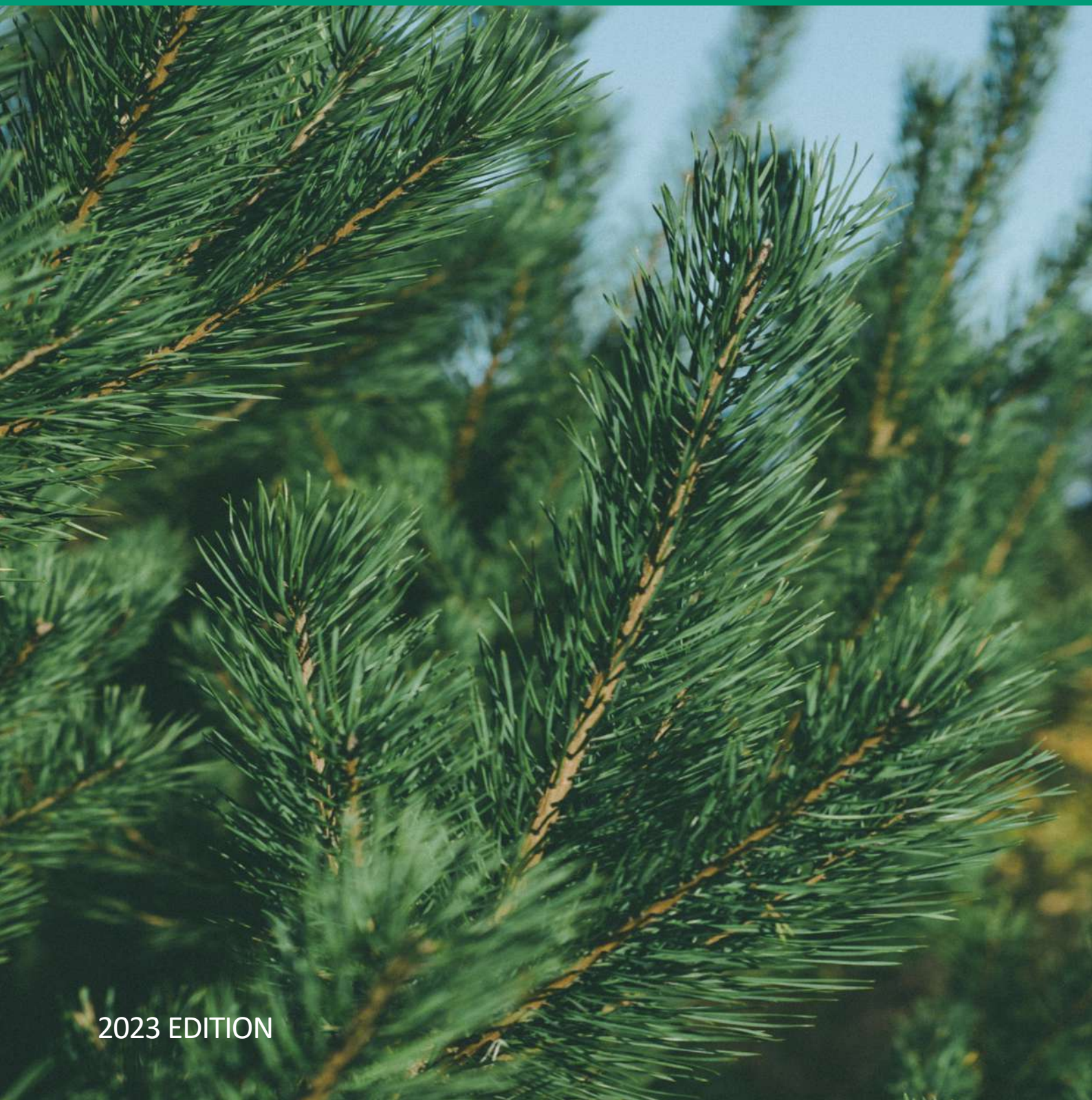


REPORT:

# Green, Circular Economy at the Mediterranean Level Including Green Skills and Jobs.

2023 EDITION





Union for the Mediterranean  
 Union pour la Méditerranée  
 الاتحاد من أجل المتوسط

This report has been edited by  
 WE&B – Water, Environment and Beyond  
[www.weandb.org](http://www.weandb.org)

Oversight by	Almotaz Abadi UfM Deputy Secretary General Water, Environment and Blue Economy
Publication coordinator and supervisor	Alessandra Sensi, Head of sector, Environment and Blue Economy, UfM
Study Coordinator	Dr. David Smith (WE&B)
Study Team	Karine Causse (WE&B) Amine Kabbaj María Pascual (WE&B)
Consultation Team / Expert Team	Water and Environment Support (WES) in the ENI Southern Neighbourhood region.  Interreg Euro-MED Innovative Sustainable Economy Mission  UNEP- MedWaves (Switch MED)  ENI-EU  Global CAD  CT BETA (UVIC-UCC)
Preferred Citation	Union for the Mediterranean (UfM), 2023. Green, circular economy at the Mediterranean level including green skills and jobs.
Publication Date	December 2023

### Disclaimer

Neither the Union for the Mediterranean nor any person acting on behalf of the Union is responsible for the use which might be made of the following information. The information and views set out in this document do not reflect the official opinion of the Union for the Mediterranean. Responsibility for the information and views expressed therein lies entirely with the author(s).

All care has been taken by the authors to ensure that, where necessary, they have obtained permission to use any parts of manuscripts including illustrations, maps, and graphs on which intellectual property rights already exist from the titular holder(s) of such rights or from her/his or their legal representative.

### Copyright

© Union for the Mediterranean, 2023

Reproduction is authorised provided the source is acknowledged.

More information on the Union for the Mediterranean is available on the website [www.ufmsecretariat.org](http://www.ufmsecretariat.org)





## Foreward

The Euro-Mediterranean region stands at a pivotal juncture, where the conventional linear production models clash with the imperative for sustainable practices amidst the changing climate. The region faces significant challenges, such as a projected tripling of electricity usage by 2025 and a notable increase in waste production, exacerbating environmental concerns.

Within the Mediterranean context, characterised by escalating resource consumption, urgent action is required to transition towards a green circular economy. This paradigm shift resonates with the region's youthful population and offers an opportunity to cultivate a resilient, environmentally conscious community. However, persistent challenges including environmental degradation, climate change, gender disparities, migration, and conflicts underscore the complexity of the landscape.

Efforts such as the UfM's Ministerial Declaration on Environment and Climate Action and COP28 highlight the pressing need for immediate action. Building upon existing commitments, the report "Green, Circular Economy at the Mediterranean Level Including Green Skills and Jobs" provides a detailed examination of the region's current state and advances the UfM's 2030GreenerMed Agenda.

The report delves into practical implementation strategies, emphasising stakeholder engagement, policy frameworks, financial mechanisms, and capacity building initiatives. It showcases successful endeavors and sector-specific examples, underscoring the importance of innovation, financing, and entrepreneurship in driving the transition.

Furthermore, the report sheds light on the concept of green jobs, stressing the necessity for capacity development to ensure a fair and equitable transition towards environmental sustainability. Its comprehensive analysis aims to serve as a valuable resource for policymakers, funding agencies, businesses, researchers, and civil society organisations advocating for green policies in the Mediterranean.

Despite the formidable challenges, the UfM remains steadfast in its commitment to fostering a green circular economy and green jobs in the region. It actively promotes collaborative efforts and seeks to forge new partnerships to realize a sustainable future where the potential of green and circular practices is fully realized.

H.E. Nasser Kamel, Secretary General, UfM

## TABLE OF CONTENTS

<b>CHAPTER 1</b>	
<b>INTRODUCTION &amp; CONTEXT</b>	<b>14</b>
Definition of a Green Circular Economy	20
Towards a Just, Green and Circular Economy	22
A Green and Circular Economy in the Mediterranean	24
Challenges in the Region Preventing the Transformation	31
<b>CHAPTER 2</b>	
<b>WHO'S WHO: WHAT ARE THE STAKEHOLDERS' ROLES IN SHIFTING TOWARDS A GREEN CIRCULAR ECONOMY IN THE MEDITERRANEAN?</b>	<b>38</b>
Public Sector	41
Private Sector	44
Academic Sector	49
Civil Society	52
The Role of Youth	55
The Role of Women	58
Consumers	60
<b>CHAPTER 3</b>	
<b>KEY PATHWAYS TO "GREEN" THE MEDITERRANEAN ECONOMY</b>	<b>62</b>
Pathways Towards Green Policies in the Mediterranean	64
Green Finance	72
Green Circular Capacity Development	79
<b>CHAPTER 4</b>	
<b>GREEN SKILLS AND JOBS FOR THE TRANSITION TOWARDS GREEN CIRCULAR ECONOMY.</b>	<b>85</b>
Green Skills	88

Green Jobs	94
------------	----

<b>CHAPTER 5</b> <b>EXAMPLES OF PRIORITY ACTION AREAS AND MEDITERRANEAN AMBITIONS FOR</b> <b>2030 AND 2050.</b>	<b>103</b>
---	------------

Sustainable Food Systems	105
--------------------------	-----

Green Circular Economy in Tourism	108
-----------------------------------	-----

Green Cities and Green Islands	114
--------------------------------	-----

Green and Circular Manufacturing	116
----------------------------------	-----

Sustainable and Smart Mobility	119
--------------------------------	-----

Zero Pollution: A Positive Path Forward	125
---	-----

Clean, Affordable, and Green Energy Transition	133
--	-----

<b>CHAPTER 6</b> <b>KEY HIGHLIGHTS ASSOCIATED WITH THE IMPLEMENTATION OF CIRCULAR</b> <b>ECONOMY IN THE MEDITERRANEAN</b>	<b>136</b>
---	------------

References	140
------------	-----

## TABLE OF FIGURES

Figure 1 Axis 1 and the key action areas of the UfM 2030GreenerMed Agenda driving the report	18
Figure 2 Timeline of the key policy instruments designed to promote green circular economy in the Mediterranean	71
Figure 3 The NEET rate for the 15-24 age group in selected Southern Med countries (own elaboration, data from (Albinyana & Martinez, 2022))	93
Figure 4 The fastest growing greening job types Source: Global Green Skills Report	95
Figure 5 Number of green jobs in the Mediterranean by 2030 per country compared to EU 27 Source: Own elaboration from various peer reviewed, grey literature and national database sources. The Mediterranean countries not listed in the graph are not reported due to the absence of data.	99
Figure 6 Percentage green jobs by total jobs available (2030).	101
Figure 7 Waste Generation by economic activities and households in the EU in 2020. Source: Eurostat (online data code: env_wasgen)	125

## TABLE OF TABLES

Table 1 Summary of the key challenges per category	32
Table 2 Key stakeholders' roles and contributions towards a green circular economy in the Mediterranean	40
Table 3 Skill Levels, Nature of change and examples of the occupational change Source: European Training Foundation. 2023	89

## TABLE OF BOXES

Box 1 This report aligns to the following SDGs	16
Box 2 The 5 key principles of a green and circular economy according to the Green Economy Coalition (The 5 Principles of Green Economy, Green Economy Coalition , June 2020)	21
Box 3 Mapped Projects, Programs, Initiatives: Axis 1 of the 2030 GreenerMed Agenda (UfM, 2023)	25
Box 4 The Interreg EuroMed Governance projects, labelled by the UfM	26
Box 5 Policy Recommendations: A Euro-Mediterranean Green Deal? Towards A Green Economy In The Southern Mediterranean (Vizoso, 2021)	27
Box 6 A selection of recommendations put forward for the consideration of the ESCWA members on SCP in the Arab region.	28
Box 7 The Mediterranean Accession Agenda to the Aarhus Convention: A guide to achieving effective environmental governance in the Mediterranean.	30
Box 8 Environmental challenges in the Mediterranean region in 2023	33
Box 9 National ban on plastic bags in Tunisia	42
Box 10 Further examples of Public Sector Initiatives in the Mediterranean Towards a Green and Circular Economy	44
Box 11 Resource Efficient Cleaner Production (MEDTEST II)	46

Box 12 Examples of Private Sector Initiatives in the Mediterranean that are driving the shift towards a Green Circular Economy	48
Box 13 Further examples of Academic initiatives in the Mediterranean working towards a Green Circular Economy	51
Box 14 National examples of Civil Society Initiatives in the Mediterranean Towards a Green Circular Economy	54
Box 15 Further examples of youth initiatives in the Mediterranean region working towards a Green Circular Economy	57
Box 16 Further examples of women initiatives in the Mediterranean region with a role in the transition	60
Box 17 Extended Producer Responsibility (EPR) developments in the MENA Region	66
Box 18 The Sustainable Food Systems in the Mediterranean (SFS-MED) Platform	68
Box 19 A Just Transition to Circular Economy (Just2CE Horizon 2020 project)	69
Box 20 Regional Financial Measures adopted by the Contracting Parties to the Barcelona Convention	74
Box 21 UfM Grant Scheme to Promote Employment and Entrepreneurship in the Green Economy	76
Box 22 The Mediterranean Strategy on Education for Sustainable Development (ESD)	81
Box 23 Regional Summary of Policy Recommendations to Support the Development of Green and Circular Businesses in the Mediterranean as provided by MedWaves/ SCP/RAC. (2021)	82
Box 24 The Interreg MED Green Growth Community and its successor the Interreg Euro-MED Innovative Sustainable Economy Mission	84
Box 25 Green jobs, green economy, just transition and related concepts (ILO,2023)	86
Box 26 An inclusive green transition for comprehensive societal change in the southern and eastern Mediterranean (SEMED) region	91
Box 27 Jordans potential for green jobs in 2030	102
Box 28 Mediterranean Food: Our legacy, our future. A Resource Handbook	106
Box 29 Social and economic regeneration of the Mediterranean after the crisis: Shared methods and tools for relaunching a sustainable post COVID-19 tourism model (UfM Publication)	113
Box 30 The Regional Transport Action Plan (RTAP) for the Mediterranean	122
Box 31 Plastic Busters Initiative	129
Box 32 Initiative Restore our Oceans and Waters by 2030	130
Box 33 Mediterranean Dialogue for Waste Management Governance (MED4WASTE)	131



## GLOSSARY LIST

ACR+	Association of Cities and Regions
AECID	Agencia Española de Cooperación Internacional para el Desarrollo
AFD	Agence Française de Développement
AfDB	African Development Bank
BMP	Blue Mediterranean Partnership
BMZ	Federal Ministry for Economic Cooperation and Development of Germany
BSOs	Business Support Organizations
CCRI	Circular Cities and Regions Initiative
CdS	Comité de Suivi
CDW	Construction and Demolition Waste
CEAP	Circular Economy Action Plans
COP	Conference of the Parties
CPA	Cleaner Production Assessment
CPMR-IMC	The CPMR Intermediterranean Commission
CSCP	Collaborating Centre on Sustainable Consumption and Production
CSRD	Coorporate sustainability reporting
CSS	Circular Systemic Solutions
DG IntPa	European Commission Directorate-General International Partnerships
DG NEAR	European Commission Directorate-General for Neighbourhood and Enlargement Negotiations
EBRD	European Bank for Reconstruction and Development
ECA	Emission Control Area
EEB	European Environmental Bureau
EFB	End Fossil Fuels Barcelona
EIB	European Investment Bank
EMIC	Euro-Mediterranean Innovation Camp
EMP	Euro-Mediterranean Partnership
EMS	Environmental Management System
EMV	Economic Modernisation Vision
EnMS	Energy Management System
EPLO	European Public Law Organization
EPR	Extended Producer Responsibility
ESCWA	Economic and Social Commission for Western Asia
ESD	Education for Sustainable Development
ESG	Environmental, Social, and Governance
EV	Electric Vehicle
FAO	Food and Agriculture Organization of the United Nations
GBRF	EU Green Budgeting Reference Framework
GEF	Global Environment Facility
GHG	Greenhouse Gas
GNSS	Global Navigation Satellite System

ICT	Information and Communication Technology
ICZM	Integrated Coastal Zone Management
IEMed	The European Institute of the Mediterranean
ILO	International Labour Organization
IOE	International Organization of Employers
ISWM	Integrated Solid Waste Management
ITUC	International Trade Union Confederation
JCI	Jordan Chamber of Industry
KfW	Kreditanstalt für Wiederaufbau
MAAAC	Mediterranean Accession Agenda to the Aarhus Convention
MCYN	Mediterranean Youth Climate Network
MEdIES	Mediterranean Education Initiative on Environment and Sustainability
MedSNAIL	Sustainable Networks for Agro-food Innovation Leading in the Mediterranean
MENA	Middle East and North Africa region
MFCA	Material Flow Cost Accounting
MIO-ECSDE	Mediterranean Information Office for Environment, Culture and Sustainable Development
MoE	Ministry of Environment
MPA	Marine Protected Area
MSEDS	Mediterranean Strategy on Education for Sustainable Development
MSMEs	Micro, Small, and Medium Enterprises
MSSD	Mediterranean Strategy for Sustainable Development
MYC	The Mediterranean Youth Council
MYN	Mediterranean Youth Network
NAP	National Action Plan
NEET	Not in Education, Employment, nor Training
NGO	Non-governmental organization
PAMEx	Plan of Action for a Model Mediterranean Sea
Plan	Regional Plan on Marine Litter Management in the Mediterranean
PLIFF	Local Investment Finance Facility
PRIMA	Partnership for Research and Innovation in the Mediterranean Area
PRO	Producer Responsibility Organization
RAED	Arab Network for Environment and Development
RECP	Resource Efficient and Cleaner Production
RTAP	Regional Transport Action Plan
SCP	Sustainable Consumption and Production
SDGs	Sustainable Development Goals
SEMCs	Southern and Eastern Mediterranean Countries
SFS-MED	Platform for Sustainable Food Systems in the Mediterranean
SMEs	Small Medium Enterprises
STEG	Société Tunisienne de l'Electricité et du Gaz
TEST	Transfer of Environmentally Sound Technology
TVET	Technical Vocational Education and Training

UB	University of Barcelona
UfM	Union for the Mediterranean
UNEA	UN Environment Assembly
UNEP	United Nations Environment Programme
UNEP-MAP	UNEP Mediterranean Action Plan
UNFSS	United Nations Food Systems Summit
VET	Vocational Education and Training
WEFE	Water–Energy–Food–Ecosystems
WES	Water and Environment Support (WES) in the ENI Southern Neighbourhood region.
WMRA	Waste Management Authority
WWF/MEDPO	World Wildlife Fund for Nature, Mediterranean Programme Office
YLP MED	Young Leadership Programme - Mediterranean
YMD	Youth Mediterranean Dialogue
YMV	Young Mediterranean Voices

## EXECUTIVE SUMMARY

The Mediterranean, a region of immense cultural and ecological significance, faces escalating challenges related to environmental degradation, biodiversity loss, pollution, overpopulation and water scarcity, which is compounded by heatwaves, droughts, and coastal vulnerabilities. In such, there is a critical need for an immediate transition to a green, circular economy in the Euro-Mediterranean region, as underscored during the COP28 (held in 2023) and reinforced by the Union for the Mediterranean's (UfM) Ministerial Declaration on Environment and Climate Action made in October 2021.

This report guided by Thematic Axis 1 of the UfM's 2030GreenerMed Agenda, examines the current state of green circular economy in the region, outlining challenges, stakeholder roles, and contributions, with a focus on supporting the transition to a sustainable and socially inclusive economy. It builds on and complements the report on sustainable blue economy 'Towards a Sustainable Blue Economy' published by the UfM<sup>1</sup>. It concentrates on the overarching theme of transitioning to a green and circular economy, impacting all sectors and segments of society. It serves as a valuable resource for policymakers to align decisions and strategies for sustainable economic development, as well as providing up-to-date information for funding agencies to align programs, and offers essential insights for businesses, researchers, academics, and civil society organizations advocating for green and fair policies in the Mediterranean region.

Chapter 2 underscores the critical roles of various stakeholders, including the public sector, civil society, youth, women, and consumers, in transitioning to a green circular economy in the Mediterranean. The chapter details the importance of engaging multiple stakeholders, fostering multi-scale dialogues, and implementing inclusive policies to drive the transition, with particular attention to the influential roles played by all the stakeholders in shaping sustainable practices and policies.

Chapter 3 focuses on key pathways for transitioning the Mediterranean economy to a "green" circular model, highlighting the crucial roles of green policies, finance, and circular capacity development to enhance resource efficiency, mitigate pollution, and preserve ecosystems. The chapter highlights the successful initiatives such as the Horizon 2020 Initiative addressing marine pollution, UfM Ministerial Declarations reinforcing commitment to environmental goals, European Circular Economy Action Plans guiding comprehensive green policies, the importance of innovation and institutional frameworks for upscaling, legal instruments fostering sustainable product policies in the EU, and sector-specific examples like the agri-food sector requiring a policy overhaul. Additionally, the chapter emphasises the significance of green finance, showcasing measures adopted in 2021, and highlights the importance of capacity development in driving the green circular transition.

Chapter 4 explores the concept of green jobs as professions contributing to environmental well-being, emphasising a just transition away from traditional jobs in harmony with the environment. Key points include the integration of sustainable practices into traditional sectors, the need for new skills in low-carbon sectors due to economic restructuring, the importance of aligning environmental policies with employment and skills development, and the challenge of addressing

---

<sup>1</sup> <https://ufmsecretariat.org/wp-content/uploads/2021/07/21.7.19-2021UfM.studydefEN-web.pdf>

youth unemployment in the Mediterranean region through education, training, and awareness for green skills. The chapter acknowledges the scarcity of data on green jobs in the Mediterranean but forecasts that South Mediterranean countries can benefit from the shift to green jobs by creating an enabling environment through appropriate policies, legislation, and upskilling initiatives. Significant predictions show that the transition to a green circular economy can generate around 10 million jobs in the EU by 2030. Across the Mediterranean, from the available modelled data, a total of 4.6 million jobs are expected to be created.

Chapter 5 explores the Primary Action Areas in the Mediterranean region for 2030 and 2050, focusing on transitioning to a green and circular economy across key sectors. The key messages from the chapter include the potential benefits of circular economy implementation in the agri-food sector, environmental challenges faced by the tourism industry and its sustainable recovery post-COVID-19, the pivotal role of cities and islands in promoting green circular practices, challenges and initiatives in green and circular manufacturing, the importance of sustainable mobility solutions, comprehensive waste management strategies to combat rising pollution, and the challenges and opportunities in achieving clean, affordable, and secure energy for a green transition in the Mediterranean.

Despite substantial challenges spanning environmental, technological, economic, societal, regulatory, and governance domains, this report highlights the comprehensive, multi-stakeholder mobilisation to accelerate the transition to a green, circular economy. The Mediterranean's path to a green circular economy centres on key sectors as hubs for innovation, characterized by challenges, successes, and a shared commitment to sustainability. Guided by a comprehensive approach addressing economic, social, and environmental dimensions, collaborative efforts position stakeholders to surmount obstacles and realize an equitable, sustainable green circular transition. The region's diverse cultures, landscapes, heritages, food, and people exemplify the strength of collaboration in fostering innovative progress while addressing the shared challenges.



## CHAPTER 1

# Introduction & Context





The vast and culturally rich Mediterranean with its diverse landscapes, historical significance, and varied mix of coastal countries is facing significant challenges exacerbated by human activities. Environmental degradation is accelerating and in turn is impacting on the socio-ecological systems through biodiversity loss; increased pollution; overpopulation - coupled with migration and displacement - water scarcity; coastal degradation; food insecurity and the accelerated impacts of climate change (Papamichael et al., 2022). The region is further characterised by prolonged and intensified heat waves that is heightened by droughts - within an already arid climate – with a constant threat of increased violent storms and coastal flooding. The Mediterranean region experiences the highest erosion rates and maintains the lowest levels of soil organic matter compared to the rest of Europe whereas coastal areas are also vulnerable to seawater intrusion and erosion. The consequences are creating a multiplier effect on the impacts (Pörtner et al., 2022).

Addressing these various challenges, the Sustainable Development Goals (SDGs) of the 2030 Agenda offer a common focus and specific targets for long-term sustainability in key areas of intervention to tackle the mentioned challenges. The implementation of the SDGs is crucial in the Mediterranean region due to prevalent economic, social, and environmental challenges, that lead to increasing disparities in development both among and within countries (Pörtner et al., 2022). The progress towards sustainable development is a unique opportunity to improve the well-being, inclusiveness and security of the Mediterranean communities and territories.

The adoption of green and circular economy principles contributes to achieving the SDGs by promoting resource efficiency, reducing environmental impact, and fostering sustainable production and consumption practices. Although the transition to a green and circular economy can impact on all the SDG targets and while the interconnection between green and blue economies is prominent, the focus of this report is narrowed to land and green circular economy, complementing the recently published UfM report 'Towards Sustainable Blue Economy in the Mediterranean'<sup>2</sup>.

Thus, this report specially responds to the SDGs included in the box below.

---

<sup>2</sup> <https://ufmsecretariat.org/wp-content/uploads/2021/07/21.7.19-2021UfM.studydefEN-web.pdf>

A new revised version of the Blue Economy report will be published in 2024.



**Zero Hunger:** SDG 2 aims to end hunger, achieve food security, improve nutrition, and promote sustainable agriculture. It seeks to ensure that all people have access to sufficient, safe, and nutritious food, while also promoting sustainable farming practices



**Clean Water and Sanitation:** SDG 6 focuses on ensuring access to clean water and adequate sanitation for all. It addresses the importance of efficient water use, wastewater treatment, and protection of water ecosystems



**Affordable and Clean Energy:** SDG 7 strives to ensure access to affordable, reliable, sustainable, and modern energy for all. It encourages the use of renewable energy sources and improved energy efficiency to reduce greenhouse gas emissions



**Sustainable Cities and Communities:** SDG 11 aims to create inclusive, safe, resilient, and sustainable cities and communities. It promotes urban planning, affordable housing, and improved public transportation to make cities more livable and environmentally friendly.



**Responsible Consumption and Production:** SDG 12 promotes sustainable consumption and production patterns. It encourages efficient resource use, waste reduction, and environmentally friendly practices in manufacturing and consumption



**Climate Action:** SDG 13 addresses urgent action to combat climate change and its impacts. It emphasizes mitigation efforts to reduce greenhouse gas emissions and adaptation strategies to cope with the consequences of climate change



**Life on Land:** SDG 15 focuses on the protection, restoration, and sustainable management of terrestrial ecosystems, forests, and biodiversity. It aims to combat desertification, halt land degradation, and protect endangered species.

Box 1: This report aligns to the following SDGs

The complex environmental challenges in the Mediterranean are coupled with escalating resource consumption, characterised by a projected tripling of electricity usage by 2025, and a significant increase in waste production (de Villamore Martín, 2016). The anticipated industrial growth, population expansion and improved living standards further increase pollution risks across the region<sup>3</sup>. To counter these challenges, a transition to a green circular economy is imperative for the Mediterranean, offering a holistic strategy to curtail waste generation,

<sup>3</sup> UNEP/MAP and Plan Bleu, 2020

mitigate pollution, optimise resource use, stimulate economic growth, create green jobs, and foster a just and sustainable future for the region.

There are clear pressing needs for an urgent shift towards a green, circular economy in the Euro-Mediterranean region. Indeed, the UNFCCC COP28 (held in 2023), emphasised the crucial transition to circular economy systems which was underscored by the historic inclusion in the negotiated outcomes text, explicitly recognising the significance of shifting to sustainable lifestyles and consumption patterns, particularly through circular economy approaches, in addressing climate change. Before this, the 2014 Ministerial Declaration of the 4<sup>th</sup> of October 2021, the 43 member countries of the Union for the Mediterranean (UfM) renewed their political commitment by adopting the 2<sup>nd</sup> Ministerial Declaration on Environment and Climate Action. Through the declaration, the ministers agreed on a common agenda – *Towards 2030: Agenda for a Greener Med* - contributing to achieving the Environmental SDGs in the Mediterranean – including the strengthening of the efforts in the Euro-Mediterranean region to urgently tackle the multiple climate, environmental and associated economic challenges<sup>4</sup>. Of its three thematic axes of focus, the first is on supporting the transition towards a green, circular and socially inclusive economy based on sustainable consumption and production practices and nature-based solutions, which is the focus of this report.

## The conceptualisation of this report

*“Green, Circular Economy at the Mediterranean Level Including Green Skills and Jobs”* provides an updated and fresh look at the just transition to green and circular economy in the region. It is a regional report that takes stock of the current state of play of green circular economy in the Mediterranean, presenting the challenges in advancing the transformation, while addressing the main stakeholders and their contributions and roles in the transition. The report has compiled and analysed national-level publications that document the transition to a Circular Economy, providing a comprehensive overview of how Mediterranean countries are implementing initiatives, policies, and programs related to Green and Circular Economy<sup>5</sup>.

This report is guided by Thematic Axis 1 of the UfM's 2030GreenerMed Agenda and its key action areas. The figure below provides a visual representation of the three thematic axes of the 2030GreenerMed Agenda and the key action areas related to Thematic Axis 1.

---

<sup>4</sup> On 4 October 2021, the 42 Member countries of the Union for the Mediterranean (UfM) adopted the 2nd Ministerial Declaration on Environment and Climate Action. Through the declaration, the ministers agreed on a common agenda to strengthen efforts in the Euro-Mediterranean region to urgently tackle the multiple climate and environmental challenges it faces. The Agenda was named “Towards 2030: Agenda for a Greener Med - Contributing to Achieving the Environmental SDGs in the Mediterranean” (2030GreenerMed)

<sup>5</sup> <https://wedocs.unep.org/handle/20.500.11822/42557>




THEMATIC AXIS 1	THEMATIC AXIS 2	THEMATIC AXIS 3
<p>Support the transition towards a Green, Circular and Socially Inclusive Economy, based on sustainable consumption and production practices and nature-based solutions.</p> <p><b>KA1.1.</b> Support Sustainable Consumption and Production</p> <p><b>KA1.2.</b> Increase Resource Efficiency</p> <p><b>KA1.3.</b> Adopt innovative solutions along the entire value chain</p> <p><b>KA1.4.</b> Promote changes in business practices, trade, public policy</p> <p><b>KA1.5.</b> Promote changes in education, behaviour and lifestyles</p> <p><b>KA1.6.</b> Engage all stakeholders (private, public and society/consumer level) and raise awareness</p>	<p>Prevent and reduce pollution on land, air, and sea.</p>	<p>Protect, preserve, manage, and restore natural resources in the Mediterranean region within an integrated ecosystem approach, including terrestrial, marine, and coastal dimensions.</p>
		

Figure 1 Thematic Axis 1 and the key action areas of the UfM 2030GreenerMed Agenda are the focus of this report.

Guided by the 2030GreenerMed Agenda and taking inspiration from other relevant international reports and initiatives, this report addresses the key aspects related to transitioning to a green and circular economy in the Mediterranean. It begins with an overview of the current state and challenges in the region (Chapter 1), followed by an exploration of stakeholders' roles in this transformation (Chapter 2). The report then delves into pathways for implementing green policies, financing, and capacity development (Chapter 3), emphasising the importance of green skills and jobs (Chapter 4). Priority action areas and ambitions for 2030 and 2050 are presented, covering sustainable food systems, tourism, cities, manufacturing, mobility, pollution reduction, and renewable energy (Chapter 5). Finally, the document highlights key considerations related to the implementation of circular economy practices in the Mediterranean (Chapter 6).

In obtaining the information for this report, grey and peer reviewed literature was analysed with data extracted to uncover some of the latest trends, and knowledge on green and circular economy initiatives in the Mediterranean region. Through a UfM endeavour of monitoring the progress of the 2030GreenerMed Agenda, all the programs, projects and initiatives that respond to its three axes have been mapped (starting from 2020). From this on-going exercise, key highlights have been extracted and included within this report. Several project coordinators have been interviewed to delve deeper into each initiative, with some of their reflections included in the report. Furthermore, an advisory group of partner organisations<sup>6</sup> with extensive experience

<sup>6</sup> Water and Environment Support (WES) in the ENI Southern Neighbourhood region; Interreg Euro-MED Innovative Sustainable Economy Mission; UNEP- MedWaves (Switch MED); ENI-EU; Global CAD; CT BETA (UVIC-UCC)

in the Mediterranean in the transition towards a green and circular economy was formed to guide the report, validate the information and review its contents.

### Who is this report for?

This report focuses on the key cross-cutting theme of transitioning to a green and circular economy which affects every sector and section of society. The information captured within could enable policy makers to align their decisions and strategies for sustainable economic development in the region. It also allows funding agencies to align their programs with some of the latest information. It is also highly relevant for businesses and industries looking to adapt to circular practices and capitalise on the emerging green job market, as well as for researchers and academics as a useful resource to further provide understanding of the region's environmental and economic dynamics. Furthermore, civil society organisations can use the information to enrich their narrative when advocating for green and fair policies and practices in the Mediterranean region.

## Definition of a Green Circular Economy

Circular economy, as defined by the Ellen MacArthur Foundation, aims to eliminate waste and pollution, circulate products and regenerate nature, with the focus on two material flows: biological nutrients re-entering the biosphere safely, and technical aspects circulated within the production system. This approach minimises resource consumption and maximises efficiency. By closing resource loops and reducing reliance on natural resources, it seeks to create a restorative and regenerative system (Ellen McArthur Foundation, 2013).

Green growth is integral to a green circular economy, promoting economic growth while preserving natural assets. It seeks to disconnect economic growth from resource use and environmental degradation through sustainable practices and eco-friendly technologies (Dogaru, 2021). Transitioning to this model requires significant changes in production, consumption, and resource management, aligning with goals such as those defined in the European Green Deal's ambition to achieve no net emissions of greenhouse gases by 2050 (European Commission, 2021). A green circular economy strives for shared prosperity while respecting the planet's limits, combining economic activities with the ecological system to transform processes across various scales (Figge et al., 2023).

The main areas of current work on green growth and green economy encompass the dimensions of sustainable development relating to economic activities, investment, infrastructure, employment, skills and associated socio-environmental friendly impacts. Green economy is currently seen as a macro-economic approach to sustainable economic growth that is conveyed through regional, sub-regional and national fora. In particular, this approach acknowledges that green finance, technology and investments play concomitantly a critical role. To facilitate its implementation, UNEP, for instance, is striving towards supporting countries in mainstreaming macro-economic policies that create favourable conditions for the transition to a green economy (UNEP, 2018). In current efforts to bring about this change in economic model, the emphasis is increasingly placed on promoting an economy that fosters social equity. The Green Economy Coalition, for example, advocates for an inclusive green economy based on 5 key principles that enshrine the economic, social, and environmental achievements/benefits while advancing the SDGs and the 2030 Agenda (See Box 2)



**Principle 1: Well-being principle**

A green economy centred on people, enabling everyone to contribute to and benefit from shared prosperity where wealth is understood as not merely financial but as including all human, social, physical and natural vectors of well-being.

**Principle 2: Justice principle**

A non-discriminatory economy where decision making, opportunities, benefits and costs are equitably distributed. It supports simultaneously gender equality, the reduction of disparities, the alleviation of multidimensional poverty and avoids encroachment on wildlife.

**Principle 3: Planetary boundaries principle**

An economy safeguarding the ecosystems's diverse values, from its functional value of providing goods and services, to its cultural values underpinning societies and ecological values which are the basis of all life. The green economy acknowledges the limited substitutability of natural resources and does not infringe ecological limits and climate stability.

**Principle 4: The efficiency and sufficiency principle**

A decarbonised economy striving for substantial global shift to lessen consumption of natural resources to ecologically sustainable levels.

**Principle 5: Good governance principle**

An evidence-based green and circular economy which is genuinely based on public participation and social dialogue while fuelling a financial system that safely serves the interests of society and of local economies.

Box 2: The 5 key principles of a green and circular economy according to the Green Economy Coalition (The 5 Principles of Green Economy, Green Economy Coalition , June 2020)

A **green circular economy** thus signifies a shift towards sustainability and regeneration by reducing waste, optimising resources, and decoupling economic growth from resource consumption. As the Mediterranean begins to embrace, adopt and accept the green and circular economy principles it aids societies in pursuing a just and shared prosperity, environmental sustainability, and the conservation of natural resources for future generations.

## Towards a Just, Green and Circular Economy



The concept of "just transition" has evolved since the 1980s, initially aimed at protecting workers from environmental regulations. Today, it's gaining importance in the context of climate goals, ensuring a fair and inclusive shift to a net-zero future (UNDP, 2022). It's defined by the International Labour Organization as greening the economy while creating decent job opportunities and leaving no one behind. The urgency to address climate change has propelled just transition into the spotlight, with governments increasingly integrating it into their climate plans. A just transition offers benefits such as building public support, creating quality green jobs, fostering resilience, driving local solutions, and reinforcing the urgency of climate action.

The concept of a just transition has gradually taken root in international policy agendas. This global process reflects a growing recognition of the need to align economic activities with environmental sustainability and social equity as indicated by the International Labour Organisation's Just Transition Policy Brief which states: *greening the economy in a way that is as fair and inclusive as possible to everyone concerned creating decent work opportunities and leaving no one behind. Thus, embracing the three dimensions of sustainable development: social solidarity, environmental responsibility, and economic efficiency.*<sup>7</sup>

The idea of a green economy was introduced as a central theme for the United Nations Conference on Sustainable Development (Rio+20) in 2012, where – against a linear approach – the “greening” of the economy through circular practices was promoted as a novel approach to achieving sustainable development, eradicating poverty, and creating employment opportunities.

However, the circular economy as a concept, gained applicable consistency when the Ellen McArthur Foundation was founded in 2012. Their definition states that the circular economy is a system where materials never become waste and nature is regenerated. In a circular economy,

---

<sup>7</sup> [https://www.ilo.org/wcmsp5/groups/public/---ed\\_emp/--emp\\_ent/documents/publication/wcms\\_858855.pdf](https://www.ilo.org/wcmsp5/groups/public/---ed_emp/--emp_ent/documents/publication/wcms_858855.pdf)

products and materials are kept in circulation through processes like maintenance, reuse, refurbishment, remanufacture, recycling, and composting. The circular economy tackles climate change and other global challenges, like biodiversity loss, waste, and pollution, by decoupling economic activity from the consumption of finite resources.

Differently from the current linear economy which continually increases its demands of scarce natural resources, in a circular economy, the value of products, materials and resources is maintained in the economy for as long as possible, and the generation of waste is minimised.

Building on the Rio+20 conference and the integration of SDG 12 on sustainable consumption and production within the broader SDG framework, the fourth session of the UN Environment Assembly (UNEA-4) convened from March 11 to 15, 2019, in Nairobi, Kenya. The assembly centered around the overarching theme of 'Innovative Solutions for Environmental Challenges and Sustainable Consumption and Production.' UNEA-4 focused on addressing environmental challenges tied to poverty and natural resources management, including sustainable food systems, food security, and the imperative to halt biodiversity loss. Additionally, discussions delved into life-cycle approaches related to resource efficiency, energy, chemicals, and waste management, while also exploring innovative sustainable business development amidst the backdrop of rapid technological change.

Efforts are actively underway to facilitate the successful adoption of circular economy principles by coordinating actions across diverse stakeholders and sectors, with the goal of achieving systemic transformation. This initiative involves collaboration among public authorities, the private sector, research, and civil society in various areas, including financing, policy incentives, investment, capacity-building, knowledge sharing, traceability, and education on circular economy principles. How does this initiative relate to the Mediterranean and its transition towards a green and circular economy?

## A Green and Circular Economy in the Mediterranean

There is a widespread recognition of the pressing need to transition towards a green circular economy in the Mediterranean, which has been underpinned by a range of policy frameworks and declarations. Adopted in 2013, the Regional Plan on Marine Litter Management in the Mediterranean (the Plan), the UNEP Mediterranean Action Plan (MAP), was the first Regional Seas Programme and Convention to develop legally binding measures to prevent and reduce the adverse effects of marine litter on marine and coastal environments. The entry into force of the Plan coincided with the update of national action plans of the Mediterranean countries to combat pollution from land-based sources and activities<sup>8</sup>. In 2014, the 1<sup>st</sup> UfM Ministerial Meeting on Environment and Climate Change set the basis for the shift towards green, circular economy in the Mediterranean region, while the 2nd UfM Ministerial Conference on Environment and Climate Action (October 2021) stands as a pivotal milestone in renewing and strengthening the political commitment of 43 UfM/Euro-Mediterranean countries towards its coordinated and multi-stakeholder implementation through the Greener Med Agenda.

In tandem, the Mediterranean Strategy for Sustainable Development and the Regional Action Plan on Sustainable Consumption and Production in the Mediterranean, ratified in 2016 by the Contracting Parties of the Barcelona Convention, provide a foundational blueprint for sustainability in the region. A set of regional measures to support the development of green and circular businesses was also proposed. The 23<sup>rd</sup> Meeting of the Conference of the Parties of the Barcelona Convention (COP23), held in Slovenia in December 2023, was held under the main theme of 'Green Transition in the Mediterranean'.

The Mediterranean experience is currently recognised as a leading and global model for the transition towards a green and circular economy. International cooperation and regional collaboration leading to joint commitments attest to the region's dedication to sustainable practices and nurturing the growth of green and circular businesses. Sharing best practices, exchanging knowledge, and fostering partnerships among Mediterranean countries and stakeholders is accelerating the progress towards a sustainable and circular future. Regional platforms for collaboration and coordination on green circular economy policies and actions, are currently in place (e.g. UfM Working Group on Environment and Climate Change) and play a pivotal role in this endeavour.

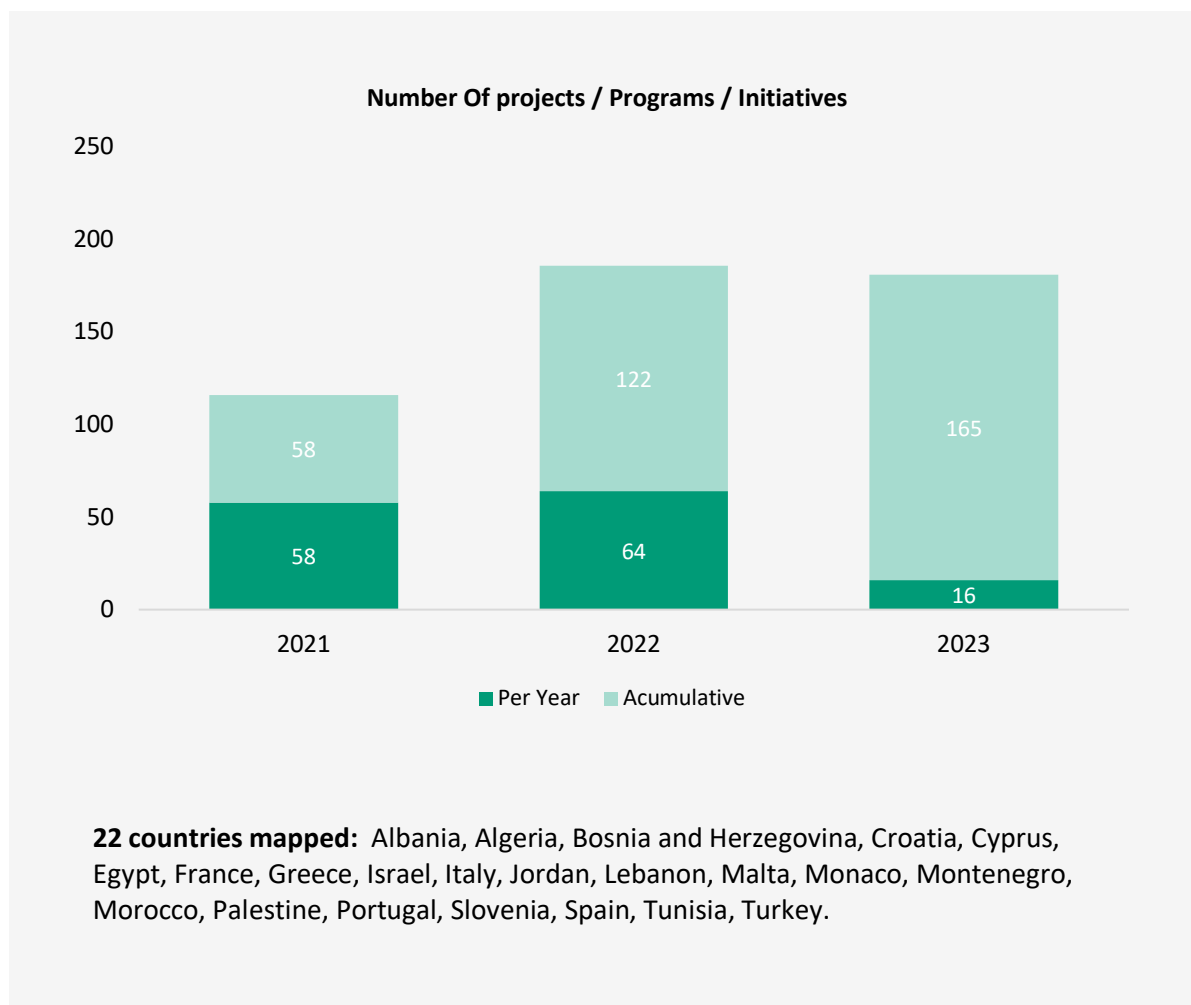
### The current state of play of Green Circular Economy

Over the past three years (2021 – 2023), the UfM has undertaken a comprehensive and deep mapping of the initiatives, programs and projects that support the priorities of the three Thematic Axes of the "2030 GreenerMed Agenda". The comprehensive analysis encompasses 22 countries, from both the North and South Mediterranean providing a systematic overview across the region. The mapping shows that the number of regional projects related to Axis 1 – Green, Circular Economy - has significantly increased, by more than 50% from the baseline figure (currently 156 projects and initiatives mapped in 2023). This figure could be even higher as there may be other initiatives at local, national or regional level that are not easily identifiable. The mapping highlights that key actions promoting sustainable consumption and production, and increasing resource efficiency have received the most attention across the region. Agriculture is the most

---

<sup>8</sup> <https://leap.unep.org/en/countries/al/case-studies/regional-plan-marine-litter-management-mediterranean#:~:text=With%20the%20Regional%20Plan%20on,on%20marine%20and%20coastal%20environments.>

frequently addressed sector, followed by tourism, food and beverage, and other sectors such as fisheries, waste management, ICT, forestry, textile, trade, and culture and creative industries (see Box 3).<sup>9</sup>



Box 3 Mapped Projects, Programs, Initiatives: Axis 1 of the 2030 GreenerMed Agenda (UfM, 2023)

Current initiatives across the Mediterranean have shown that there is no “one size fits all” solution that is suitable to implement a green circular economy that works throughout the region. The heterogeneity of social, economic, and political landscapes across the region poses challenges for implementing holistic coordinated changes that drive a green and circular economy. However, certain examples show how a transition across the Mediterranean towards a green and circular economy can be possible. Throughout this report we have listed these examples and highlighted several projects, programs and initiatives in boxes that showcase how the transition to a green circular economy is achievable.

<sup>9</sup> [https://ufmsecretariat.org/wp-content/uploads/2023/12/20231107\\_First-Monitoring-Report-2030GreenerMed\\_final-draft.pdf](https://ufmsecretariat.org/wp-content/uploads/2023/12/20231107_First-Monitoring-Report-2030GreenerMed_final-draft.pdf)

Over the years, funding for projects and programs crucial to steering the shift towards a green and circular economy, while supporting the key priorities outlined in the "2030 GreenerMed Agenda," has demonstrated sustained progress. This ongoing success underscores the tangible impact generated by these initiatives and emphasises a compelling rationale for the continued allocation of funding to sustain and amplify their positive effects. For example, Interreg MED (2013-2020) has evolved into Interreg Euro-MED (2020-2027), while ENI CBC Med (2014 – 2020) has transitioned into Interreg NEXT MED (2021 – 2027). The continuity of the Interreg EuroMed Program, maintaining the same name across two funding periods, is highlighted herewithin, with its current phase spanning from 2021 to 2027. Box 4 offers an in-depth exploration of this program, including the governance projects labelled by the UfM.

Further to the projects and programs, at national level, Mediterranean countries are taking

The Interreg Euro-MED programme considers capitalisation and governance as two inseparable processes to promote the transfer and integration of project results into practices and policymaking at European, national, regional and local levels. This is the overall approach in the Results Amplification Strategy (RAS) of the Programme, which focuses on multiplying the effect of project results, to increase their reach beyond the geographical area of the Programme.

Increased coordination between actors on the Mediterranean is the overall objective of the RAS. Specific RAS objectives point to increased visibility and dissemination of Euro-MED knowledge, increased outreach of results (by consolidating or creating networks, or by disseminating consolidated knowledge), facilitating the identification of coordination opportunities between Euro-MED and non-Euro-MED national policies, and promoting coordination between Euro-MED and non-Euro MED actors (non-EU partners from Eastern and Southern shores).

To address these ambitions, the Euro-MED programme has defined one governance priority, labelled by the UfM. The priority is composed of Thematic Community Projects and Institutional Dialogue Projects. Both types of projects cover each of the four programme Missions:

- **Mission Strengthening an innovative sustainable economy:** <https://innovative-sustainable-economy.interreg-euro-med.eu/>, which builds on the 2030 Sustainable Development Goals, the UfM Ministerial Declaration on Environment and Climate Action, and the Greener Med Agenda
- **Mission Protecting, restoring and valorising the natural environment and heritage:** <https://natural-heritage.interreg-euro-med.eu/>
- **Mission Promoting green living areas:** <https://green-living-areas.interreg-euro-med.eu/>
- **Mission Enhancing sustainable tourism:** <https://sustainable-tourism.interreg-euro-med.eu/>

Box 4: The Interreg EuroMed Governance projects, labelled by the UfM

significant steps to align with the UfM declaration's ambition of accelerating the transition to sustainable, climate-neutral, green, fair, circular, and resilient economies. Recognising the importance of protecting nature as an investment for the future, Mediterranean cities are



focusing on water and energy conservation, greening initiatives, waste recovery, sustainable mobility, and local commerce promotion. In the industrial sector, there's a growing emphasis on resource efficiency, waste recycling, and human capital development for enhanced competitiveness. Governments are increasingly considering green taxation, promoting participatory democracy, transparency, and the integration of youth and women into the economy and politics. However, policy fragmentation and limited regional integration in the Mediterranean region poses challenges to a full transition to green economies and the realisation of socioeconomic goals.

To address these issues, EuroMeSCo, The European Institute of the Mediterranean (IEMed), and the Arab Reform Initiative (ARI) developed policy recommendations in 2021 to foster equal, inclusive, and productive environmental and climate partnerships. These recommendations are presented in Box 5.

1	Measure and avoid spillover environmental effects of the European Green Deal
2	Mainstream green economy concepts
3	Communicate domestic benefits of greening more clearly
4	Place inclusion at the centre of greening transitions
5	Shift the focus from large-scale projects to decentralized greening
6	Integrate improvements in quality infrastructure (QI) systems into development cooperation programmes
7	Rethink green finance
8	Support measures to offset the social costs of greening

Box 5 Policy Recommendations: A Euro-Mediterranean Green Deal? Towards A Green Economy in the Southern Mediterranean (Vizoso, 2021)

Further to these recommendations, the Economic and Social Commission for Western Asia (ESCWA) plays a crucial role in promoting regional norms and balancing development dimensions across Western Asia. During the 31st ESCWA ministerial session, significant attention is directed towards regional integration and sustainability. A dedicated session addresses the "Governance of natural resources: extractive industries as an engine for sustainable development," with recommendations underscoring both the challenges and opportunities for sustainable development within the context of energy transition. Box 6 provides a short summary of these recommendations that have been put forward for consideration by the ESCWA members in the ministerial sessions that follows a comprehensive overview of the Arab region's extractive industries and the challenges it is addressing and opportunities it has for sustainable development.

<b>Circular Carbon Economy Framework</b>	To implement the circular carbon economy framework within the extractive and mining sectors, based on the 4Rs (reduce, reuse, recycle, and remove), to drive the transition to sustainable resource management.
<b>Promoting Green Jobs and Inclusive Economy:</b>	Encourage Arab Governments to work with regional organisations to shape national strategies, industrial policies, and financing strategies for a just energy transition, creating new decent job opportunities in the green economy and attaining a circular and inclusive economy aimed at achieving the SDGs.
<b>Global Partnerships for Critical Mineral Supply Chains</b>	Forge global partnerships for reliable, secure, and sustainable critical mineral supply chains to mitigate supply chain risks, promote economic benefits, and contribute to achieving the SDGs.
<b>Coordination in the Global Mineral Market</b>	Improved coordination and coherence in the global mineral market are vital for a clean and just energy transition, addressing environmental, social, and governance risks, and promoting sustainable and equitable economic growth.
<b>Adopting Taxonomies and Ethical Business Practices</b>	Encourage Arab Governments to adopt taxonomies aligned with their circumstances, integrating credible international environmental, social, and corporate governance criteria to ensure transparency, encourage accountability, and address the Arab region's specific circumstances.

Box 6 A selection of recommendations put forward for the consideration of the ESCWA members on SCP in the Arab region.

The Arab Vision 2045 is further promoting regional integration and sustainability. Launched during an expert group meeting in Cairo in 2022, ESCWA in collaboration with the League of Arab States are moving along with the Arab Vision 2045<sup>10</sup>. The vision holds significant importance in the region as it envisions a safe, just, prosperous, and culturally renewed Arab world. The vision focuses on pillars such as security, justice, innovation, prosperity, diversity, and cultural and civilisational renewal. One of the key pillars of the vision is sustainable and progressive economic growth that involves achieving significant progress in the movement and transfer of goods,

<sup>10</sup> <https://www.unescwa.org/events/arab-vision-2045>

services, people, knowledge and capital through linking networks of transportation, energy, communications, information and other dimensions of enhancing Arab cooperation. The anticipated deliverables include a comprehensive document defining the vision's pillars, background papers, an interactive electronic platform, and media materials, contributing to a roadmap for transformative social and economic development in the Arab region<sup>10</sup>.

In this context, embracing multilateral environmental conventions and national legislation is crucial for transitioning toward circular practices in the region. Yet, their successful implementation greatly relies on evidence-based, easily accessible information, effective public participation and access of all interested stakeholders. These three essential components are furthered by the Aarhus Convention<sup>11</sup>. Currently, 12 Mediterranean countries and the European Union are Parties to the Aarhus Convention. By securing effective access to information and justice, as well as engaging the public, accession to the Convention by the rest of the Mediterranean countries can advance the implementation of Principle 10 of the Rio Declaration. This, in turn, facilitates the smooth rollout of green and fair economy programs, the 2030 Agenda for Sustainable Development including the SDGs, and other relevant strategies and policies, including: the Union for the Mediterranean's 2030GreenerMed Agenda, the Mediterranean Strategy for Sustainable Development (MSSD) of the UNEP/MAP-Barcelona Convention system, the Mediterranean Strategy on Education for Sustainable Development, the compliance with, and enforcement of, the Barcelona Convention and its Protocols, and a series of national strategies and policies.

Being a Party to the Convention significantly contributes to countries' efforts to promote citizen-centric environmental governance and environmentally sound policies. It also encourages investments, particularly "green" ones, by ensuring: (i) an attractive and clear legal framework to encourage investments, capacity building support and bi- and multilateral cooperation and (ii) measures that promote social acceptance and conflict prevention, especially with regard to large infrastructure projects.

A Mediterranean Accession Agenda to the Aarhus Convention (MAAAC) has been elaborated in 2023 via a multi-stakeholder effort to guide the region in a harmonised approach. It provides all the information needed for a country to prepare and eventually put in motion the mechanisms required to accede to the Aarhus Convention and achieve effective Environmental Governance and a green and fair economy.

---

<sup>11</sup> Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Protecting your environment: [The power is in your hands – Quick guide to the Aarhus Convention](#) | UNECE – available in Arabic)

The Mediterranean Accession Agenda to the Aarhus Convention (MAAAC) serves as a comprehensive guide for Mediterranean countries that are not yet Parties to the Aarhus Convention, offering the necessary information for their accession. Developed through a multi-stakeholder effort with EU support, including contributions from various organisations, the MAAAC aims to facilitate the accession process and enhance environmental governance. With the engagement of the public and effective access to information and justice, the MAAAC seeks to advance the implementation of Principle 10 of the Rio Declaration and to support the rollout of green and fair economy programs. The initiative builds on previous efforts and aligns with the agenda of the Mediterranean Commission on Sustainable Development, emphasizing the importance of environmental governance.

The MAAAC is currently available in [English](#) and [French](#).

Box 7 The Mediterranean Accession Agenda to the Aarhus Convention: A guide to achieving effective environmental governance in the Mediterranean.

As much as policies align, the region is integrated and initiatives are upscaled, the region faces environmental, technological, economic, societal, regulatory and governance challenges that hinders the transition to a green circular economy. In the following section we dive into these challenges and how they are inhibiting a potential transition.

## Challenges in the region preventing the transition.

Although there are concerted efforts, key initiatives and examples of how the region is transitioning to a green and circular economy, some persistent challenges remain that require attention. While the specific challenges can vary from country to country, within the region, there are common obstacles that are shared. These challenges can be classified into environmental, technological, economic, societal, and regulatory, governance and strategic challenges.

Categories of Challenges	Key Challenges
Environmental	<ul style="list-style-type: none"> <li>• The Mediterranean faces environmental challenges and opportunities for a green economy amid frequent natural disasters. Widespread floods, droughts, wildfires, and other natural disasters underscore the region's environmental challenges and hinder the transition to a green circular economy.</li> </ul>
Technological	<ul style="list-style-type: none"> <li>• There is inadequate circular infrastructure across the region to foster technological circular advances.</li> <li>• Concerns for circularity in businesses, particularly in Southern Mediterranean countries, is driven by lagging markets and limited government support.</li> <li>• Cross-border collaboration and data sharing face technological obstacles, requiring better national innovation support infrastructures.</li> </ul>
Economic	<ul style="list-style-type: none"> <li>• Macroeconomic disparities in the Mediterranean hinder investments in green initiatives, worsened by a post-COVID-19 recovery coupled with global geo-political tensions.</li> <li>• Economic incentives that promote resource extraction can discourage investments into circular solutions.</li> <li>• SMEs have limited resources, short-term profit mindsets, and consumer preferences that favour traditional linear models.</li> </ul>
Societal	<ul style="list-style-type: none"> <li>• A just, socially inclusive transition faces challenges due to a lack of knowledge and capacity.</li> <li>• Limited awareness and understanding of circular economy concepts across the Mediterranean society hinder the adoption of day-to-day circular practices and the creation of a critical mass of citizens as agents of change.</li> <li>• Access to information and just transition, present challenges in the Mediterranean's transition to a green and circular economy.</li> <li>• The lack of green skills is a further societal challenge that is slowing the green and circular transition.</li> </ul>

### Regulatory, governance and strategic

- Fragmented policies and monitoring challenges persist in certain countries, indicating a need for detailed policy guidelines.
- The absence of cross-border coordination adds to implementation challenges.
- Citizen-centric governance is in general is lacking in the Mediterranean.

Table 1 Summary of the key challenges preventing the transition in each category of Environmental, Technological, Economic, Societal Regulatory, Governance and Strategic.

## Environmental challenges

The environmental challenges the Mediterranean faces are at somewhat of a juxtaposition. On the one hand mitigation and adaptation to climate change offers significant opportunities to transition towards a green and circular economy introducing innovative practices and processes that can provide new prospects while protecting the environment. Meanwhile on the other hand, governments and society put their efforts, resources, financing and time into recovering as quickly as possible from one natural disaster after another, which in turn burdens the transition towards a green and circular economy that requires more long-term planning. Disaster risk reduction systems, prevention and mitigation legislation, adopting new scientific knowledge of trends and future scenarios and climate adaptation policies that focus on the implementation of green and circular economy principles would be essential to try and overcome the current and future environmental challenges in the region (de Felipe Lehtonen et al., 2020).

The number of environmental disasters the Mediterranean faced in 2023 alone, indicate a worrying trend for the future in the region and show the sheer scale of the challenges that the changing climate is presenting to governments and society.

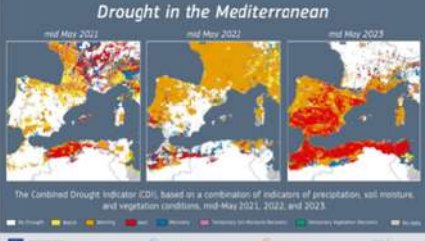


### Floods

Floods in 2023 have decimated many parts of Italy, Spain, Greece, Bosnia and Herzegovina, Croatia and Slovenia. The accumulated rainfall amounts, in some places reaching historical levels, which were responsible for widespread floods, damage to infrastructure, resulting in many landslides across large areas and the loss of life<sup>12</sup>



Floods in Ennio Romagna, Italy, 18 May 2023. Photo: Civil Protection Ennio Romagna

<sup>12</sup> <https://www.eumetsat.int/floods-around-central-mediterranean-region>

Droughts	Droughts in Morocco, Algeria, Spain, southern France and northern Italy where and continue to be severe-to-extreme which have affected water resources, agriculture and energy production. Most of the western Mediterranean is now under warning and alert conditions (the two most severe levels) according to the combined drought indicator, which integrates data on rainfall, soil moisture and vegetation stress anomalies to map drought hazards <sup>13</sup> .	 <p>The Combined Drought Indicator (CDI), based on precipitation, soil moisture and vegetation conditions, mid-May 2021, 2022, and 2023.</p> <p>The combined drought indicator (CDI), based on precipitation, soil moisture and vegetation conditions, mid-May 2023, 2022 and 2023.</p> <p>© EU 2023</p>
Wildfires	Wildfires in 2023 spread in Italy, Algeria, Tunisia and Greece, causing human casualties and massive environmental and economic damage <sup>14</sup> .	
Pollution Events	The 2021 Oil spill off the Mediterranean coast of Israel was seen as the worst ever ecological and environmental disaster in the Mediterranean <sup>15</sup> .	

Box 8 Environmental challenges in the Mediterranean region in 2023

## Technological Challenges

A diverse array of initiatives, programs, and projects, along with innovative entrepreneurs, are actively showcasing technologies that drive the transition towards a green and circular economy in the Mediterranean. While there's notable progress, one key area for improvement involves the gradual implementation of infrastructure that supports circular technologies. For instance, the inclusion of a municipal waste management systems in many countries in the Mediterranean underscores continuous efforts and potential areas for improvement in addressing this challenge. Despite substantial investments in advanced mechanical-biological treatment plants for mixed waste over the past decades, improvement in performance is still being worked on. This endeavour primarily involves refining waste management approaches, with a focus on

<sup>13</sup> [https://joint-research-centre.ec.europa.eu/jrc-news-and-updates/severe-drought-western-mediterranean-faces-low-river-flows-and-crop-yields-earlier-ever-2023-06-13\\_en#:~:text=The%20conditions%20in%20late%20spring,by%20the%20lack%20of%20rainfall.](https://joint-research-centre.ec.europa.eu/jrc-news-and-updates/severe-drought-western-mediterranean-faces-low-river-flows-and-crop-yields-earlier-ever-2023-06-13_en#:~:text=The%20conditions%20in%20late%20spring,by%20the%20lack%20of%20rainfall.)

<sup>14</sup> [https://joint-research-centre.ec.europa.eu/jrc-news-and-updates/wildfires-mediterranean-monitoring-impact-helping-response-2023-07-28\\_en](https://joint-research-centre.ec.europa.eu/jrc-news-and-updates/wildfires-mediterranean-monitoring-impact-helping-response-2023-07-28_en)

<sup>15</sup> <https://webgate.ec.europa.eu/life/publicWebsite/project/details/1548>



implementing a circular waste hierarchy system. Overcoming this hurdle requires infrastructure supporting the circularity of the sector and to thus reduce the emphasis on residual waste treatment and thereby foster the development of circularity within municipal waste (Luttenberger, 2020).

Circular economy technological innovations often go hand in hand with new circular business models that focus on extending product lifecycles, repairing products, and using resources more efficiently. Many Mediterranean businesses may be hesitant to launch new technologies or products targeting circular solutions over concerns of immature local markets, which slow the demand for sustainable products or constraints on the supply and demand of sustainable materials. Further, and particularly related to the Southern Mediterranean countries, there is limited support from governments for the creation of circular businesses with insufficient incentives, financial aids, and license requirements for launching green businesses and technologies<sup>16</sup>.

Collaboration across borders is further exemplified through the collection, management, storage and sharing of data and the use of real-time big data across borders which has shown, however, to be a further technological challenge to the transition to a green and circular economy. The lack of data, standardisation or indeed open data management processes across the Mediterranean impedes innovation and specifically the tracking of materials and circular economy indicators and roadmaps, subsequently creating a further obstacle to this transition (de Felipe Lehtonen et al., 2020).

Despite the presence of successful technological innovations in certain Mediterranean countries, there exists a deficiency in processes facilitating the internationalisation and widespread adoption of these technological successes toward achieving a green and circular economy. *THE NEXT SOCIETY* (an open multi-stakeholder community from Europe and 7 Mediterranean countries of Algeria, Egypt, Jordan, Lebanon, Morocco, Palestine and Tunisia) indicates that the role of a national technology innovation ecosystem is essential to create a framework that is capable of supporting its innovators<sup>17</sup>. Without a well-functioning national innovation support infrastructure, investments in innovation and large-scale technological projects become a challenge especially related to the upscaling and internationalisation of technological innovations to other countries in the region.

## Economic Challenges

The Mediterranean region is characterised by high macroeconomic disparity (European Commission, 2018). Several Mediterranean countries specifically in the Southern Mediterranean face economic instability, high unemployment rates, and social inequalities. These economic disparities can affect the capacity of countries to invest in and implement circular economy initiatives by diverting resources away from sustainability efforts (European Commission, 2018). The region, however, does have significant potential to transition to a green and circular economy. Nevertheless, the economic crisis of the previous decade coupled with the recovery post-COVID, which has been further complicated by wars, limits the capacity of many Mediterranean countries to invest in green and circular initiatives. The economic challenges are further exacerbated by individual country incentives and regulatory frameworks across many

---

<sup>16</sup> [https://www.enicbcmec.eu/sites/default/files/2023-06/CE%20and%20Sustainability%20Textiles%20Module\\_0.pdf](https://www.enicbcmec.eu/sites/default/files/2023-06/CE%20and%20Sustainability%20Textiles%20Module_0.pdf)

<sup>17</sup> [https://anima.coop/uploads/publications/TNS\\_FinalReport\\_Final-Innovation%20challenges%20in%20the%20MENA%20region.pdf](https://anima.coop/uploads/publications/TNS_FinalReport_Final-Innovation%20challenges%20in%20the%20MENA%20region.pdf)

Mediterranean countries that do not favour circular economy practices. Subsidies, tax structures, and pricing mechanisms that promote resource extraction and waste disposal can discourage investments into circular solutions. Additionally, governments of Mediterranean countries face significant budget constraints that limits their ability to fund circular economy initiatives, research, and pilot projects. This further hinders the scaling up of successful circular initiatives. Businesses face challenges in accessing financing and funding for circular economy projects, particularly in countries with less developed financial markets. Financial institutions can further be hesitant to provide loans for circular initiatives due to perceived risks or for a lack of familiarity.

Mediterranean countries additionally have economies that are heavily reliant on specific sectors, such as tourism or agriculture. Transitioning to circular economy practices may require a diversification or at least a renovation of these sectors, which can be challenging if the dominant industries are resistant to change. Indeed, older infrastructure and industrial setups might not be conducive to circular practices. Retrofitting or upgrading existing facilities to align with circular principles can be costly and disruptive to current outputs. Mediterranean economies are often interconnected through trade relationships and circular practices could impact these trade dynamics, especially if they involve reduced raw material extraction or changes in consumption and production patterns. For instance, there could potentially be significant costs to using new sustainable and circular supply chains, however very little is currently known of the processes that conceptualise a supply chain in a circular business model, which further creates uncertainty for businesses to transform or to use circular supply chains (Vegter et al., 2020).

The economic challenges across the region are further heightened by the large number of small and very small enterprises, cottage industries and family businesses with traditional organisational structures, operational schemes and activities that form the backbone of local economies in the Mediterranean (European Commission, 2018). This structure represents businesses that may lack the resources and capacity to invest in new technologies and processes required to transition to circular practices. Further, many businesses operate with a short-term profit mindset. A transition to circular economy practices may involve longer payback periods or delayed returns, which can be paradoxical to the immediate focus and economic returns of many businesses. Even if businesses are able to invest in creating circular products or services they may initially face market barriers due to consumer preferences that favour products produced from traditional linear models.

## Societal Challenges



The green and circular economy coupled with sustainable development are recognised as priorities in many Mediterranean countries (Union for the Mediterranean, 2021). However, knowledge and capacity to enable the practical implementation is a challenge where greater effort is required to enhance an integrated societal approach. The current lack of awareness and understanding of the circular economy concepts among the different sectors of society in the Mediterranean is hindering this integrated approach and thus the adoption of circular practices. Public awareness and engagement play a crucial role to drive the integration and the adoption of circular practices, however educating and involving citizens in sustainable practices can be a challenge, particularly in Mediterranean regions where environmental concerns might not be given a high priority (Union for the Mediterranean, 2021).

Fundamental societal issues such as limited access to information, barriers to participatory processes, and challenges related to achieving a just transition are prevalent. The SwitchMed project “Stand-Up!”, for instance, has been communicating through participatory processes the value and benefits of slow fashion, circular design and circular practices and inputs since 2020. The program, however, has found that communication and awareness raising of new circular business models has been one of the principal barriers that is to be overcome to ensure the textile and fashion sector uses green and circular production practices<sup>18</sup>.

The lack of skills is a further societal challenge that is slowing the green and circular transition. For instance, within the textile and fashion industry there is a lack of human resources with specific skills/expertise that are required for the eco-design, manufacturing, research and development and innovation<sup>19</sup>.

---

<sup>18</sup> <https://switchmed.eu/news/switchmed-circular-business-opportunities-in-the-south-mediterranean-how-can-businesses-lead-the-way-to-sustainable-fashion-publication-now-available/>

<sup>19</sup> [https://www.medwaves-centre.org/wp-content/uploads/2022/05/Circular-business-opportunities-in-SouthMed\\_Fashion.pdf](https://www.medwaves-centre.org/wp-content/uploads/2022/05/Circular-business-opportunities-in-SouthMed_Fashion.pdf)

## Regulatory, Governance and Strategy Challenges

Although significant work has taken place to provide comprehensive and harmonised policies and regulations that promote circular economy practices in the Mediterranean, further work is still required to enhance integrated rather than sectoral policies within the region (de Felipe Lehtonen et al., 2020). Refined regulations across the Mediterranean region could further encourage investments in circular solutions and innovations and create market openings towards a green and circular economy (EU Commission, 2020). The continued unified voice on policy with enhanced cross-border coordination together with a large number of initiatives and platforms of similar focus within the region will create a coordinated implementation of green and circular economy practices.

Further, many countries in the Mediterranean have limited natural resources and are heavily dependent on imports, which further hinders the development of a circular economy that relies on recycling and reusing resources within the region. National strategies are thus driven by resource scarcity and a high dependence on energy imports (Vizoso, 2021) that are stifling the development of policies that move towards a green and circular economy. The insufficient transposition of regional (Med) policy to national level across various sectors throughout the Mediterranean is evident in the absence of appropriate legislative and regulatory frameworks supporting a transition towards sustainable patterns of production and consumption (UNEP MAP, 2017).

Addressing the many challenges requires a multi-faceted approach that involves collaboration between all stakeholders at regional and national levels. Developing tailored strategies that consider the unique circumstances of each Mediterranean country while fostering regional cooperation is essential for a successful transition to a green circular economy. Thus, it is paramount that each stakeholder knows the role they should have in the transition process, while the enabling environment for these roles to be fulfilled, needs to be in place.

## CHAPTER 2

# Who's who: What are the stakeholders' roles in shifting towards a green circular economy in the Mediterranean?





The transition towards a green circular economy in the Mediterranean is a multifaceted process, deeply rooted in the unique ecological, economic, and cultural landscape of the region, which requires the concerted efforts of all stakeholders. Inclusivity is paramount, encompassing various stakeholders to transition towards a green circular economy, characterised by equitable participation in its development and implementation. Indeed, this concept of inclusiveness for sustainable development, underscores the importance of active involvement and collaboration of the so-called “quadruple helix” stakeholders (Carayannis & Campbell, 2009) which includes: (i) the public sector; (ii) the private sector; (iii) academia; and (iv) civil society actors to advance the transition to a green circular economy, thereby contributing to the comprehensive transformation of the region's economy and environment (World Economic Forum, 2018). The table below provides a general overview of the key stakeholders’ roles and their contributions in the transition towards a green circular economy.

The chapter then dives into each of these stakeholder categories providing some examples of their contributions in fostering a green circular economy in the Mediterranean.

Stakeholder Category	Role in Green Circular Economy	Key Contribution in the Mediterranean Region
<b>PUBLIC SECTOR</b>		
Local Authorities / Local Governments	Local policy development and implementation	Developing local policies for green job creation, skill development, creating fiscal incentives, facilitating access to funding and financing, and incentivising local sustainable practices
National Governments and Policymakers	National development and implementation. policy and	Developing national policies for green job creation, skill development, and incentivising sustainable practices.
Intragovernmental Organisations	Providing a regional perspective, exchange of experiences and guidance to national governments	Fostering cooperation, collaboration, and agreements on initiatives and policies to upscale green and circular economy across the Mediterranean.
<b>PRIVATE SECTOR</b>		
All	Implementation of sustainable practices	Investing in green technologies and creating green jobs and implementing circular solutions across all sectors.



ACADEMIC SECTOR		
Academic and Research Institutions	Education and research	Providing educational programs focused on green skills; conducting sustainability research and developing innovative regional solutions.
CIVIL SOCIETY AND NGOs		
All	Advocacy, education, and community engagement	Raising awareness about the circular economy and operationalising change, promoting education for sustainable development, leading sustainability initiatives including at community level.
Youth	Innovation and advocacy	Driving eco-innovation, advocating for sustainable development and leading grassroots sustainability movements.
Women	Leadership in sustainability	Leading change in agriculture and water conservation, championing local sustainable practices and engaging in eco-entrepreneurship.
Consumers	Behaviour change and trend setting	Shifting consumption patterns to circular consumption models through product choices and responsible decisions.

Table 2 Key stakeholders' roles and contributions towards a green circular economy in the Mediterranean

## Public Sector

The public sector plays a crucial role in driving the transition towards a green circular economy. Governments and organisations at various levels, from local, sub-national, national to inter-regional have the responsibility to shape and implement policies, regulations, and frameworks that promote sustainable practices and incentivise circularity. Their involvement in transitioning to a green circular economy aligns with the principles of good governance, which underscores their role in serving the interests of society and promoting sustainable development (World Bank, 2009). By creating an enabling environment, the public sector can support the adoption of circular economy principles across different sectors. The guidelines, frameworks and standards that are developed by international organisations such as UN agencies, the European Union and Development Banks amongst others, can be adopted to create a favourable environment for circularity in the Mediterranean. By following these guidelines, governments can establish a solid foundation for the circular economy and ensure that their policies and initiatives align with international standards. Financial and technical support are also vital contributions provided by international/regional organisations, offering funding opportunities, grants, and loans to countries and regions that aim to embrace the circular economy model. This financial support helps governments to invest in the necessary infrastructure, research and development, and capacity building initiatives to facilitate the transition. International organisations also provide technical assistance, expertise, and training to governments, helping them build the necessary capabilities to implement circular economy practices effectively.

The transition to circularity is also driven at the local level; local authorities can take the lead in implementing circular economy initiatives. They can promote waste prevention, reduction and resource recovery, establish recycling programs and support local businesses that adopt circular practices. Through zoning regulations and urban planning, local governments can also encourage sustainable design and construction practices, such as using recycled materials and promoting energy efficiency (UN-Habitat, 2016). For instance, the project “High Energy efficiency for the public stock buildings in the Mediterranean” (SOLE, ENI CBC Med<sup>20</sup>) has showcased how joint strategies from local level governments can support cost-effective and innovative energy rehabilitations of public buildings across several Mediterranean countries. The MedCities<sup>21</sup> network focuses on cities across the Mediterranean (refer to section 5.3), managing urban projects with a keen focus on green circular solutions through strategic planning, decentralisation and promoting representative and participatory democracy. Similarly, the Association of Cities and Regions (ACR+)<sup>22</sup> facilitates capacity building and the exchange of experiences between members (i.e. European and Mediterranean cities and regions), by sharing technical and policy knowhow on sustainable resource management.

At national level, governments can develop comprehensive strategies and action plans to promote the transition towards a green circular economy. They can provide financial incentives, such as grants and subsidies, to businesses that adopt circular practices and invest in sustainable technologies. The strategies may also include setting targets for waste reduction, promoting the use of renewable energy sources, and implementing extended producer responsibility schemes

---

<sup>20</sup> <https://www.enicbcmed.eu/projects/sole>

<sup>21</sup> <https://medcities.org>

<sup>22</sup> <https://acrplus.org/en/about-acr/about-us>

(OECD, 2016). Box 9 provides an example of how at national level, the government of Tunisia is implementing an initiative to shift towards circularity.

The Ministry of Environment of the government of Tunisia, through collaborative efforts with MedWaves and the EU/SWIM-H2020 SM project<sup>23</sup> has enabled an implementation of a national ban on plastic bags, effective since January 2021, backed by essential bylaws. This endeavour involved building trust and collaboration between the public and private sectors, culminating in a clear framework for the ban's enforcement. Moreover, it introduced criteria for the reform of industrial norms related to reusable plastic bags, fostering industry engagement in the transition.

The EU Water and Environment Support (WES) project also extended this assistance and provided in 2023 advice to the Ministry of the Environment of the government of Tunisia to identify and address technical, legislative, financial and communication bottlenecks in the implementation of the plastic bag ban regulation. The WES project also contributed to the development of a roadmap to reduce or ban other single-use plastic items. Other policy initiatives, like the "Let's be Responsible" communication campaign, launched in May 2022, have empowered individuals to make environmentally responsible choices.

#### Box 9 National ban on plastic bags in Tunisia

Intergovernmental organisations at the regional level facilitate cooperation between different Mediterranean countries and play a significant role in supporting the public sector's efforts to foster the transition towards a green circular economy. One way they support the public sector is through enabling knowledge exchange. They serve as platforms for sharing information, experiences, and best practices related to the circular economy. For example, the Union for the Mediterranean (UfM) and UNEP's Mediterranean Action Plan (MAP) are regional frameworks that promote sustainable development and environmental protection in the Mediterranean region. The UfM, as an intergovernmental organisation made up of the 43 Euro-Mediterranean countries, promotes political and strategic convergence around common priorities on a consensual basis through Ministerial Declarations, such as the 2014<sup>24</sup> and 2021<sup>25</sup> UfM Ministerial Declarations on Environment and Climate Action or the 2015<sup>26</sup> and 2021<sup>27</sup> UfM Ministerial Declarations on Sustainable Blue Economy. The UfM organises a stable dialogue around policy and technical issues through regular working groups and task forces, accompanied by structured participatory practices. On the latter, the UfM sets in place mechanisms to foster knowledge transfer, exchange of best practices and collaborative strategies on key environmental and economic issues through

<sup>23</sup> <https://www.swim-h2020.eu>

<sup>24</sup> [https://ufmsecretariat.org/wp-content/uploads/2014/05/20140515\\_UfM\\_declaration\\_FINAL\\_compromiseeditorial-changes.pdf](https://ufmsecretariat.org/wp-content/uploads/2014/05/20140515_UfM_declaration_FINAL_compromiseeditorial-changes.pdf)

<sup>25</sup> [https://ufmsecretariat.org/wp-content/uploads/2021/10/UfM-ministerial-declaration-ENV-CA\\_final-1-1.pdf](https://ufmsecretariat.org/wp-content/uploads/2021/10/UfM-ministerial-declaration-ENV-CA_final-1-1.pdf)

<sup>26</sup> [https://ufmsecretariat.org/wp-content/uploads/2015/11/2015-11-17-declaration-on-blue-economy\\_en.pdf](https://ufmsecretariat.org/wp-content/uploads/2015/11/2015-11-17-declaration-on-blue-economy_en.pdf)

<sup>27</sup> <https://ufmsecretariat.org/wp-content/uploads/2021/02/Declaration-UfM-Blue-Economy-EN-1.pdf>

multi-stakeholder consultations, processes and networking mechanisms and various tools such as the GreenerMed Agenda and its implementation plan, the Mediterranean Blue Economy Platform and the UfM Regional Stakeholder Conference on the Blue Economy, among others.

Similarly, UNEP/MAP, established in 1975 as the inaugural regional action plan within the UNEP Regional Seas Programme, which includes the Barcelona Convention and its Protocols, serves as a pioneering and comprehensive institutional, legal, and implementation framework for 21 Mediterranean countries and the European Union, aiming to protect the marine and coastal environment, to ensure sustainable resource use, and foster regional cooperation for the Mediterranean's ecological health and sustainable development. The key specific work programmes and initiatives include the "Mediterranean Strategy for Sustainable Development (MSSD) 2016-2025" that guides and supports sustainable practices in the region, providing commonly agreed policy targets, initiatives and indicators to monitor progress. The Policy Hub<sup>28</sup> is another initiative, led by MedWaves, UNEP/MAP's Regional Activity Center for Sustainable Consumption and Production, as part of the EU-funded SwitchMed Programme. It aims to support Mediterranean countries to have in place legal and policy frameworks enabling the switch to an inclusive circular economy. It contributes to information exchange and peer learning on policy instruments to foster the development of green and circular businesses as key drivers for the green and circular economy in the Mediterranean region.

Apart from the few examples mentioned in the text, there are various other key public sector initiatives that are driving the green and circular economy movement in the Mediterranean. The box below highlights a few of these examples.

### EU Switch to Green Initiative

The European Commission Directorate International Partnerships (DG IntPa former DG DEVCO) launched the SWITCH to Green Flagship Initiative that aims at facilitating the transition to an inclusive green economy that generates growth, creates decent jobs, and helps reduce poverty.

It combines policy level cooperation to contribute to the establishment of the right incentive structures and instruments, with support to private sector initiatives to promote sustainable consumption and production (SCP) practices and the development of green business. It supports EU international partnerships of DG NEAR, DG Int. Pa. and EU Delegations by providing technical assistance (<https://www.switchtogreen.eu/home/>).

### The "SwitchMed" Initiative

Funded by the European Union and implemented by UNIDO, UNEP, UNEP/MAP, SCPRAC/MedWaves and in close collaboration with DG NEAR, aims at achieving a circular economy in the southern Mediterranean by changing the way goods and services are produced and consumed.

<sup>28</sup> <https://www.theswitchers.org/en/policy>

In order to achieve this, the initiative provides tools and services directly to the private sector, supports an enabling policy environment, and facilitates exchange of information among partners and key stakeholders (<https://switchmed.eu>)

### Turning SCP Into National Strategy in Egypt

Egypt transformed its Sustainable Consumption and Production (SCP) National Action Plan into a comprehensive strategy called Egypt 2030, with a focus on integrated solid waste management, renewable energy, and policy instruments. The strategy aims to prioritize natural resource management, promote sustainable tourism and industry, and implement a coordinated approach across sectors for a shift to a more sustainable, circular economy (UNEP, 2023b).

### Green Public Procurement in Israel

Israel recognises the significance of public procurement, constituting 10.24% of the GDP, in driving demand for green products and services. The Ministry of Environmental Protection, in collaboration with the Ministry of Finance, successfully achieved government-set targets for green procurement, leading to the establishment of environmental criteria in tenders, product factsheets for government officials, and a Green Procurement Forum to promote a transition to a low-carbon, resource-efficient society (UNEP, 2023c).

### The Moroccan Solar Plan

Morocco has significantly invested in solar energy, with the Ouarzazate Solar Power Station being one of the world's largest solar thermal plants. This initiative not only diversifies the country's energy mix but also positions Morocco as a leader in renewable energy in the Mediterranean, aligning with green circular economy principles (Belkhir, M., & El Fadili, A., 2022).

### Extended Producer Responsibility (EPR) in France

France has been one of the pioneering European countries in adopting EPR, which requires manufacturers to be responsible for the end-of-life management of their products. This approach has led to significant waste reductions and has promoted eco-design and recycling (French Ministry of Environment, 2014).

Box 10 Further examples of Public Sector Initiatives in the Mediterranean Towards a Green and Circular Economy

## Private Sector

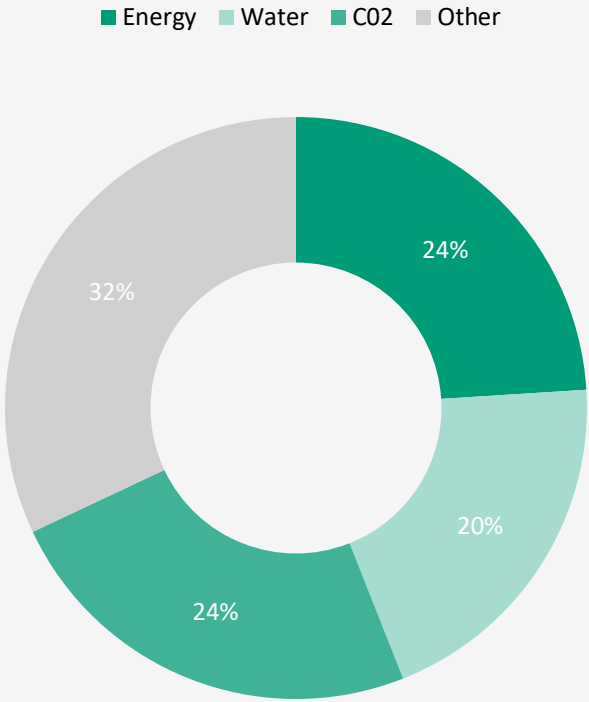
The private sector encompasses both established companies and startups, each playing unique roles in fostering sustainable consumption and production and transforming linear into circular

economy models. Industries in the Mediterranean region are crucial for championing transformative business models centered around circular economy principles. By embracing circularity, industries can drive the development and implementation of innovative solutions, such as product-service systems, sharing platforms, and resource recovery initiatives (Tukker, 2015). This requires a shift from traditional linear value chains to circular value chains, where products are designed for durability, repairability, and recyclability (Bocken et al., 2016). Industry leaders can drive this transformation by adopting circular principles, investing in research and development, and collaborating with stakeholders along the value chain.

The transition to a green and circular economy has gradually come to be perceived as a means to achieve SDG 12 on sustainable consumption and production. With this in mind, UNIDO has developed the Transfer of Environmentally Sound Technology (TEST) methodology, which aims to precisely address the challenges of achieving SDG12 specifically with rising energy and raw material costs. The TEST methodology demonstrates how best practices in Resource Efficient and Cleaner Production (RECP) can be effectively integrated into the existing business operations of the Southern Mediterranean industry. This methodology serves as a pivotal component of the MED TEST I, II and III initiatives, which form part of the SwitchMed Program (UNIDO, 2018). By facilitating demonstration activities, policy development, and the networking of eco-innovation incubators, the program supports various stakeholders such as industries, green entrepreneurs, service providers, civil society organizations, and policymakers in countries including Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Palestine, and Tunisia. Through these efforts, the program empowers these actors to unlock their economic potential and promote SCP practices. Box 11 provides a summary of the results achieved from the participating demonstration companies as they show the effectiveness of the TEST methodology as an instrument for industries that wish to overcome challenges related to a sustainable consumption and production.



MED TEST II projects achieved an average resource saving of 24% for energy, 20% for water, and 24% for Carbon Dioxide to the overall industrial manufacturing sector in the Southern Mediterranean region.



125 participating demonstration companies in Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Palestine, and Tunisia

**707 GWh**  
per year saving

**197,525 tons**  
Of Co2 avoided

**33,623 tons**  
of raw material saved

**41.7 million Euro**  
in savings

**3.5 million m3**  
of water saved

[MED TEST II Projects](#)

Box 11 Resource Efficient Cleaner Production (MEDTEST II)

A further key role of the private sector is in financing the circular transition. Financial actors and investors are important stakeholders in driving the adoption of circular practices. An example of such is the Italian multi-utility, *Hera*, serving 265 municipalities which launched the first green bond in Italy in July 2014, raising €500 million. The funds, redeemable in 10 years, are dedicated to environmentally focused investments, with transparent oversight to ensure responsible use across four identified areas of intervention: (i) Fighting climate change; (ii) Improved air quality; (iii) Improving the quality of water purification and (iv) Waste cycle management<sup>29</sup>. Public-private partnerships can also play a significant role in mobilizing private sector investments for circular economy initiatives<sup>30</sup>. These partnerships facilitate collaboration between the public and private sectors, leveraging resources and expertise to support the development and implementation of circular business models and projects.

When contemplating the shift towards a circular economy, it is crucial to take into account the distinctive features of the private sector in the Mediterranean region. This encompasses the region's unique economic challenges, the influence of cultural factors on business practices, diverse regulatory frameworks, and the effects of geopolitical factors on trade and investment, among other considerations. Further, multiple prominent sectors in the region including tourism, retail and consumer goods, agriculture and food sectors were significantly impacted by the COVID-19 pandemic. (Union for the Mediterranean, 2021). Understanding the unique challenges and opportunities within these sectors is crucial for developing tailored strategies and interventions that promote circular practices and resilience.

Another essential function undertaken by the private sector involves Business Support Organizations (BSOs), including chambers of commerce, business incubators, innovation hubs, technology transfer offices, and more. These entities play a crucial role in offering vital support to businesses, ranging from well-established companies to startups, by providing guidance, resources, training, and networking opportunities. They are key in raising awareness about the circular economy, facilitating knowledge sharing, and fostering collaboration among businesses. BSOs also assist in identifying funding opportunities and connecting businesses with relevant stakeholders, enabling the development and scaling-up of innovative circular business models.

Box 12 below provides further examples of private sector initiatives that are shifting to a Green Circular Economy.

### Ecoalf (Spain)

Founded in Madrid, Ecoalf is a sustainable fashion brand that creates garments, sneakers, and accessories from upcycled marine waste from the Mediterranean and other oceans. Their initiative showcases the potential of transforming waste into high-quality sought-after fashion products (Ecoalf, 2021).

<sup>29</sup> <https://www.iemed.org/publication/green-finance-in-the-mediterranean/#section-good-practices-in-mediterranean-countries-BQ28j>

<sup>30</sup> [https://unece.org/sites/default/files/2023-04/CIRCULAR-STEP%20Mobilizing%20Financing-%204.28.2023\\_0.pdf](https://unece.org/sites/default/files/2023-04/CIRCULAR-STEP%20Mobilizing%20Financing-%204.28.2023_0.pdf)

**SEKEM (Egypt)**

SEKEM is a renowned company in Egypt focusing on sustainable agriculture and holistic development. It integrates circular principles by recycling organic waste into compost, promoting biodynamic agriculture, and supporting ecological and social initiatives (SEKEM, 2019).

**EcoWavePower (Israel):**

Harnessing wave energy, EcoWavePower, produces clean electricity. Using uniquely designed floaters attached to existing structures (like piers and breakwaters), they convert wave motion into green energy. This initiative not only generates renewable energy but also reduces the carbon footprint associated with traditional energy sources (EcoWavePower, 2022).

**FaterSMART (Italy):**

A joint venture between Procter & Gamble and Angelini, FaterSMART has developed an innovative technology to recycle used diapers, adult incontinence, and feminine hygiene products. Through their process, these products are transformed into secondary raw materials (i.e. high-quality cellulose and specialty plastics), showcasing a pioneering approach to waste reduction in personal care items (Interreg Europe, 2018).

Box 12 Examples of Private Sector Initiatives in the Mediterranean that are driving the shift towards a Green Circular Economy

## Academic Sector



The academic sector plays a multifaceted and pivotal role in driving the green and circular economy in the Mediterranean region. Not only does it serve as a foundational pillar for educating the youth, providing them with the knowledge and skills necessary to navigate the complexities of sustainability, but it also contributes significantly to scientific research aimed at understanding and addressing environmental challenges unique to the region. The academic sector further serves as an information hub, actively informing public policy by providing evidence-based insights and recommendations. The academic sector also acts as a catalyst for innovation and collaboration. Through research initiatives, academic institutions drive the development of eco-friendly technologies, sustainable practices, and circular business models. This innovation not only benefits the academic community but also has a broader impact on businesses and industries seeking to adopt more environmentally conscious practices. In recent years, there has been a notable shift within the academic sector in the Mediterranean towards better integration with society. By promoting collaboration and knowledge exchange, academic institutions enhance their ability to address real-world sustainability challenges and contribute to the effective implementation of green and circular initiatives in the Mediterranean region.

### Educating Youth:

Academic institutions in the Mediterranean are instrumental in shaping the future workforce by instilling a circular economic mindset in upcoming leaders, professionals, and entrepreneurs, crucial for the region's sustainable development (Jancar-Webster, 2015). By integrating circular economy principles into curricula and programs, academic institutions can raise awareness about the importance of sustainability, resource efficiency, and circularity (Tiippana-Usvasalo et al., 2023). This education can span across various disciplines, including economics, engineering, design, environmental sciences, and business management. By equipping students with the knowledge and skills to embrace circular thinking, academia fosters a future workforce that can

contribute to the implementation and advancement of circular economy practices in the Mediterranean region (see Box 22)

### Scientific Research:

The academic sector generates scientific knowledge and conducts research that helps to understand the complexities and requirements of successful sociotechnical transitions towards a circular economy (Geissdoerfer et al., 2017). Researchers explore topics such as sustainable production and consumption patterns, resource management, waste reduction, eco-design, and circular business models. Through empirical studies and methodologies, academia contributes to the growing body of knowledge on circular economy principles, strategies, and best practices (Vasileios Rizos et al., 2017). Indeed, the green and circular economy has been a growing field of scientific interest with an 83% increase in circular economy publications in Mediterranean region from 2000 to 2016. Advances in research and scientific production provides valuable insights for policymakers, businesses, and other stakeholders to continue the transition towards a green and circular economy.

### Contribution to Public Policy:

The academic sector takes part in informing and shaping public policy related to the circular economy (Bocken et al., 2016). Researchers collaborate with policymakers to provide evidence-based insights and recommendations. By engaging with academia, policymakers can access expert knowledge and guidance to develop effective regulations and strategies for circularity (D'Amato et al., 2019).

### Innovation and Collaboration:

Academic institutions act as hubs of innovation and collaboration, bridging the gap between theory and practice (Murray et al., 2017). They foster partnerships between various stakeholders to drive circular transition, involving research projects, innovation labs, and technology transfer programs (Antikainen et al., 2018). For instance, the Euro-Mediterranean Innovation Camp (EMIC) in 2023 is providing a distinctive innovation competition and boot camp designed for youth (aged 18 – 35) in the Med region. EMIC invites the residents of the Euro-Mediterranean within the specified age group to apply with novel ideas or inventions that can be commercialized and prototyped within three months. The competition focuses on three thematic areas: health, renewable energy, and the environment, including climate change.

Box 13 explores further examples of academic initiatives in the Mediterranean.

#### Mediterranean Universities Union (UNIMED)

It is a network of Higher Education and Research Institutions, active in promoting academic cooperation in the Euro-Mediterranean region and in Sub-Saharan Africa, in Middle East and in Western Balkans. UNIMEDs mission is to facilitate international academic and research cooperation in order to enhance the scientific, cultural, social, and economic development of the region. <https://www.uni-med.net/>

### Euro-Mediterranean University (EMUNI)

Established in 2008 in Portorož with the objective of becoming an international, post-graduate, higher-education and research institution, fully integrated in the Euro-Mediterranean area, is serving the aims of the Union for the Mediterranean. One of the main features of EMUNI is its diverse network of Higher Education and Research institutions across the two shores of the Mediterranean. <https://emuni.si>

### Mediterranean Education Initiative on Environment and Sustainability (MEdIES):

Launched in 2002 during the Johannesburg Summit for Sustainable Development, has been a long-standing initiative of MIO-ECSDE. MEdIES focuses on Education for Sustainable Development (ESD), addressing economic, ecological, and social dimensions, and apart from a network of more than 6000 educators, supports a network of 20 universities from across the region, working on sustainable development (MedUnNet). The implementation of the Mediterranean Strategy on Education for Sustainable Development is at the heart of the initiative's work. <https://medies.net>

### MoU between EPLO and University Ca' Foscari of Venice

The European Public Law Organization (EPLO) and the University Ca' Foscari of Venice have strengthened collaboration through educational and academic exchanges with the signing of an MoU in 2023. This agreement emphasizes cooperation in public law, European Union law, sustainability, environmental protection, and sustainable water management. The partnership aims to develop joint programs, facilitate knowledge exchange, share academic staff, and conduct collaborative research activities, reflecting a commitment to advancing education and research in support of a sustainable and circular economy. <https://www1.eplo.int/newsitem/1520/mou-with-the-university-ca%27-foscari-of-venice>

Box 13 Further examples of Academic initiatives in the Mediterranean working towards a Green Circular Economy



## Civil Society

In the Mediterranean context, civil society is another key driver in the transition to a green circular economy. Engaged citizens, local community groups, non-governmental organizations (NGOs), and grassroots movements, are all actively involved in influencing policy decisions and executing initiatives that are crucial for sustainable development across the region.

One crucial aspect of civil society's involvement in the transition to a green circular economy is the recognition and utilisation of communities' knowledge and ownership of circular solutions. Local communities often possess valuable traditional knowledge, practices, and innovations that can contribute to the development and implementation of sustainable circular economy models (Scoones, 1999). By engaging with civil society organizations and citizens, policymakers can tap into this knowledge and ensure that circular solutions are context-specific and responsive to the needs and aspirations of the Mediterranean communities (van Langen et al., 2021).



Democratic governance is another key principle that is closely tied to civil society engagement in the transition towards sustainable policies and development (Diamond, 1999), including green circular economy. It emphasizes the importance of transparent, accountable, and participatory decision-making processes (see Box 7 – The Mediterranean Accession Agenda to the Aarhus Convention). Civil society organisations play a crucial role in advocating for democratic governance in policy formulation, implementation, and evaluation. They can act as overseers, promoting transparency and accountability in the public sector's efforts to advance the circular economy agenda (Fonteneau et al., 2010).

Moreover, civil society organizations often act as facilitators, mobilising communities and fostering collaboration among different stakeholders (Ho et al., 2022). They can raise awareness, provide education, and promote behavioural changes towards more sustainable consumption and production patterns. Through their grassroots initiatives and projects, civil society organisations contribute to the dissemination of best practices, knowledge-sharing, and capacity-building, enabling communities to actively participate in and benefit from the transition towards a green circular economy (Lyth et al., 2017).

Cedare (Centre for Environment and Development for the Arab Region and Europe), established in 1992, is an international inter-governmental not-for-profit organisation with diplomatic status that stands out as an illustration of the advancement of citizen centred circular economy in the Mediterranean. It was formed in response to a call by Arab Ministers of Environment, supported by the United Nations Development Programme, and the Arab Fund for Economic and Social Development. It has its headquarters in Cairo, Egypt, with regional offices in Jeddah, Kingdom of Saudi Arabia, and the University of Malta, Valetta, Malta. The organisation embeds environmental concerns in national development policies, aiming to support sensible decision-making and foster a sustainable future. Cedare envisions becoming a recognised international Centre of Excellence for environment and development, focusing on sustainability, leadership, and innovation to address real-life challenges and opportunities. Their mission involves partnering with countries and institutions to balance economic, environmental, and social priorities for a more innovative, people-centered, inclusive, and sustainable future, with a central principle of environment and development for human well-being<sup>31</sup>.

Indeed, the Mediterranean has had a long-standing tradition in the participation of regional networks of NGOs and international organisations in the formulation of environmental policies and advocacy for the region's transition to a green and fair economy. In 1995 when the Barcelona Process (Euro-Mediterranean Partnership - EMP) was launched, the concept of sustainable development was not included. Seven regional environmental NGOs of the European Union and the Mediterranean, with the encouragement of the European Commission, joined together and formed a steering committee known as the Comité de Suivi (CdS) to monitor the environmental component of the process as well as the integration of environmental concerns into other policy areas of the EMP. Most of these organisations continued to be key stakeholders of the UfM process when it was created in 2008. Today, the Arab Network for Environment and Development (RAED), the European Environmental Bureau (EEB), the Mediterranean Information Office for Environment, Culture and Sustainable Development (MIO-ECSDE) and the World Wild Fund for Nature, Mediterranean Programme Office (WWF/MEDPO) continue to work very closely with the UfM, UNEP/MAP, and other regional and sub-regional political bodies contributing in expert groups and high level meetings, influencing final formulations of the regional commitments of the governments.

At national level there are further examples identified of civil society initiatives that are driving the transition towards green circular economy which are included in the box below.

### Community-based Recycling in Egypt

Grassroots initiatives such as the "Zabaleen" community in Cairo have been recycling urban waste for decades, demonstrating the power of community-driven circular practices. <https://zabbaleenproducts.com>

<sup>31</sup> <https://web.cedare.org>

### Save Posidonia Project (Spain)

On the island of Formentera, a civil society initiative known as the Save Posidonia Project, launched in 2023 and funded by donations, is dedicated to conserving the crucial Oceanic Posidonia marine plant, a vital species in the ecosystem of the Balearic Islands with a significant role in carbon sequestration. This pioneering project, born from the collaboration with the Consell Insular of Formentera, aims to promote sustainable tourism and raise funds exclusively for the conservation of the Posidonia Meadows, recognized as a World Heritage Site by UNESCO. Formentera, with its turquoise blue sea, white sand banks, and the dark green of the Posidonia Meadows, offers visitors unique Mediterranean beaches, emphasizing the purity and clarity of its waters filtered by the largest and oldest living being in the world, the Oceanic Posidonia. <https://www.saveposidoniaproject.org/en/>

### Lebanon Eco Movement

Founded in 2012 by multiple local NGOs, the Lebanon Eco Movement envisions safeguarding Lebanon's natural and cultural heritage. Evolving into a network of over 60 environmental organizations, the movement collaborates to address environmental challenges, preserve the nation's natural and cultural assets, and foster a healthy and sustainable environment. Their vision involves integrating natural, economic, social, and cultural resources for the sustainable development of ecosystems and biodiversity, while their mission centers on leadership, solidarity, and participatory efforts to combat climate change, reduce pollution, advocate for harmonized national laws in line with international agreements and eradicate environmental illiteracy. <http://www.lem-lb.org/en/about>

### Eco-Villages in Turkey

Established by local communities, these villages follow circular principles in agriculture, waste management, and energy production, demonstrating an integrated approach to sustainability. [https://ecovillage.org/gen\\_country/turkey/](https://ecovillage.org/gen_country/turkey/)

Box 14 National examples of Civil Society Initiatives in the Mediterranean Towards a Green Circular Economy

## The Role of Youth

The role of youth in shifting towards a green circular economy in the Mediterranean is increasingly recognised as crucial (van Langen et al., 2021). Young people are at the forefront of driving change, advocating for sustainability, and pushing for innovative solutions to address environmental challenges (UNESCO, 2019). Their engagement and active participation in the transition towards a green circular economy are vital for creating a sustainable future in the Mediterranean region.

### **Agents of Innovation and Entrepreneurship:**

Young people bring fresh perspectives, creativity, and innovation to the table (Kirkwood, 2009). They are often early adopters of sustainable practices and technologies (Nikolaeva & Bicho, 2011), and they have a strong drive to address environmental issues. In the Mediterranean context, youth-led startups, social enterprises, and initiatives are emerging, focusing on circular economy principles. These young entrepreneurs are developing sustainable business models, products, and services that promote resource efficiency, waste reduction, and circularity. Their ventures contribute to job creation, economic growth, and sustainable development in the region.

### **Advocates for Sustainability:**

Youth activists and advocates play a significant role in raising awareness about the importance of a green circular economy (O'Brien & Sygna, 2013). They organize protests, campaigns, and educational initiatives to mobilize their peers and the wider society. Through social media, youth-led movements can quickly reach a large audience, generating momentum and inspiring action (Loader et al., 2014). By actively engaging in discussions, participating in policy dialogues, and lobbying for change, young people influence decision-making processes at various levels, from local to international. Their voices amplify the urgency of transitioning to a sustainable and circular economy in the Mediterranean (UNECE, 2022). This was no more evident than a recent occupation of the University of Barcelona (UB) by activists from End Fossil Barcelona (EFB). The young student activists occupied UB for seven-days to eventually come to an agreement with the University to introduce a mandatory course on the climate crisis for all 14,000 undergraduate and postgraduate students starting from the 2024 academic year. This move, considered a world first, also includes a climate training program for its 6,000 academic staff. There was a further significant victory for EFB as the university met the activists' demands to reject funding from fossil fuel-related businesses. Additionally, the success of this initiative has garnered international attention, with the Paris Institute of Political Studies launching a compulsory course on ecological culture in response. Students and professors globally have reached out to EFB to learn from their achievements, as their struggle and results have become a source of inspiration, setting a precedent for similar movements worldwide. The media attention has propelled the message beyond the Mediterranean, resonating with people everywhere and revitalising parts of the climate justice movement.

### **Drivers of Behavior Change:**

Young people have the potential to influence consumption patterns and lifestyle choices. They embrace sustainable practices such as recycling, upcycling, and sharing economy models (Thompson & Coskuner-Balli, 2007). By adopting environmentally friendly behaviors, youth inspire their communities and encourage others to follow suit. They promote sustainable fashion,

minimalism, and conscious consumerism, contributing to the reduction of waste and the demand for unsustainable products (Joy et al., 2012). Through peer-to-peer education and outreach programs, young people actively engage their peers and encourage them to make sustainable choices, fostering a culture of circularity in the Mediterranean (Pike, 2008).

#### **Collaborators and Network Builders:**

Youth networks and organizations provide platforms for collaboration, knowledge-sharing, and collective action (Serrat, 2017). They facilitate the exchange of ideas, experiences, and best practices related to the green circular economy. These networks enable young people to connect with like-minded individuals, experts, and professionals across different sectors and countries in the Mediterranean. Collaborative efforts among youth organisations lead to joint initiatives, projects, and campaigns that amplify their impact and drive systemic change (Matarasso, 2001). For instance, on 9 November 2023, the Union for the Mediterranean (UfM) hosted the Youth Engagement for a Sustainable Mediterranean event in Barcelona, co-organised with Egypt's Mediterranean Youth Foundation. The gathering, part of the Mediterranean Youth Academy, involved 100 young participants from 20 Euro-Mediterranean countries discussing youth involvement in green and digital transitions, employment, and social inclusion. The participants endorsed the UfM Youth Agenda: Call for Action, proposing measures for governments and organizations to empower youth in addressing global challenges by 2030. The event emphasised the importance of youth empowerment on the green transition, active involvement in society, and bridging the skill gap for youth employability and entrepreneurship.

#### **Agents of Policy Influence:**

Youth involvement in policy-making processes is essential for shaping sustainable development agendas and strategies. Through youth councils, youth representatives in decision-making bodies, and engagement with policymakers, young people advocate for policies and regulations that support the transition to a green circular economy (UNDP, 2016). They provide input based on their experiences, needs, and aspirations, ensuring that policies are inclusive, future-oriented, and responsive to the challenges faced by the younger generation.

#### **Mediterranean Youth Climate Network (MYCN)<sup>32</sup>:**

A regional network that aims to amplify the voice of Mediterranean youth in climate change discussions and initiatives. They work on various projects related to sustainability and circular economy in the Mediterranean region.

Young Mediterranean Voices (YMV) <sup>33</sup> :	This is a program aimed at amplifying the voice of Mediterranean youth in policy and decision-making processes. They engage young people in dialogues and projects related to social and environmental issues, including the circular economy.
The Youth Mediterranean Dialogue (YMD) <sup>34</sup> :	A conference that brings together young leaders from around the Mediterranean to discuss various topics, including sustainable development and the circular economy.
The Young Leadership Programme - Mediterranean (YLPMED) <sup>35</sup> :	A program organised by the European Forest Institute (EFI) that aims to develop the skills and knowledge of young professionals working in the forest sector in the Mediterranean region.
The Mediterranean Youth Council (MYC) <sup>36</sup>	Comprises young, dynamic individuals from across the Mediterranean, including countries like Kosovo, Cyprus, Lebanon, Palestine, Algeria, Tunisia, Morocco, Egypt, Spain, Italy, and France. The Council serves as a platform for these youths to voice their ideas, engage in collaborative actions, and dialogue with local, regional, and national authorities. The MYC was officially launched during the Forum for the Mediterranean Worlds in Marseille on February 7, 2022.
Mediterranean Youth Network (MYN) <sup>37</sup> :	MYN is sub network of the SDSN Youth is a program of the UN Sustainable Development Solutions Network - an initiative launched by UN Secretary General, Ban Ki-moon, in 2012 to mobilize global expertise around the Sustainable Development Goals.

Box 15 Further examples of youth initiatives in the Mediterranean region working towards a Green Circular Economy

33

<https://www.youngmedvoices.org/#:~:text=Young%20Mediterranean%20Voices%20is%20the,and%20the%20Southern%20Mediterranean%20region.>

34 <https://www.coaje.es/ynd>

35 <https://efi.int/ylp-med-2023>

36 <https://www.medyouthcouncil.com>

37

<https://www.unsdsn.org/youth#:~:text=SDSN%20Youth%20educates%20young%20people,address%20the%20world%27s%20biggest%20challenges.>



## The Role of Women

The indispensable role of women in the transition to a green circular economy, especially in the Mediterranean context, is deeply rooted in both historical practices and modern endeavors. Their contributions span across various sectors and dimensions of the circular movement.

### **Traditional Knowledge Holders:**

Women in many Mediterranean communities have been the main custodians of traditional ecological knowledge. Their expertise, especially in sectors like agriculture and natural conservation, has been central to sustainability practices in the region (IUCN, 2020).



### **Economic Contributors:**

In the Mediterranean context, women play a significant role in sectors like textiles, handicrafts, and food processing. Their involvement can pivot these sectors towards more sustainable and circular practices (CIHEAM, 2022). In this regard the project STAND Up! (funded by ENI CBC Med) for Sustainable Textile Action for Networking and Development of circular economy business ventures in the Mediterranean, showcases the strong role of woman to enhance scalable, replicable and inclusive circular economy ventures in the Mediterranean. By developing an ecosystem of business support, innovation, and technology transfer it leads to sustainable and green job creation for youth and women in the Mediterranean textile sector.

### **Change Agents for Sustainability:**

Women are key actors in managing household resources, influencing waste reduction, and molding consumption patterns towards sustainable behaviors (OECD, 2020). They are often at the forefront of local sustainability and environmental protection initiatives. Their grassroots campaigns and actions bring community-specific solutions to the fore.

### **Fostering sustainability through women empowerment:**



Women's networks in the Mediterranean region are playing a vital role in promoting sustainable practices and the circular economy. These networks facilitate knowledge sharing and collaboration, fostering innovation and driving change. For instance, the Mediterranean Women Mediators Network (MWMN)<sup>38</sup> addresses the critical need for increased female participation in peacemaking endeavors, striving to facilitate the appointment of high-level women mediators locally and internationally, including the mediation of climate action and circular business in the Mediterranean. Through such initiatives, despite being traditionally underrepresented in decision-making roles, women are increasingly assuming leadership positions in policymaking and advocacy related to the green circular economy (OECD, 2022)

Understanding the multifaceted roles and contributions of Mediterranean women is pivotal for a successful transition to a green circular economy in the region. Amplifying their voices and acknowledging their contributions can catalyze more sustainable and holistic outcomes. Further examples of woman initiatives driving the green circular economy transition are included in Box 16.

### The UfM Regional Dialogue on Women Empowerment<sup>39</sup>

UfM Member States and key stakeholders in the Euro-Mediterranean region are engaged to assess progress in implementing commitments outlined in the third UfM Ministerial Declaration on Strengthening the Role of Women in Society. Aligned with the UfM's objectives, four working groups address priorities, including enhancing women's participation in economic life, improving access to leadership roles, combating violence against women, and transforming stereotypes through education and culture.

### Association Sidi Bouzitoun<sup>40</sup>

In Tunisia this woman-led project has had a significant impact on shepherd women and the community by promoting traditional grazing practices and providing alternative income sources, such as honey and pottery production (BirdLife, 2022).

### Cooperatives for Rural Women in Algeria

In collaboration with GIZ, and the Ministry of the Environment and Renewable Energies an experimental program was initiated in El Kala National Park and the Edough mountains to harness the traditional knowledge of rural women and develop local biodiversity resources. Through three pilot projects focused on beekeeping, lentisk oil, and aromatic/medicinal plants, approximately 90 women were organized into cooperatives, showcasing their products at national and international events after receiving technical training and support (UNEP, 2023a).

<sup>38</sup> <https://womenmediators.net/the-network/>

<sup>39</sup> <https://ufmsecretariat.org/ufm-regional-dialogue-on-women-empowerment/>

<sup>40</sup> <https://www.birdlife.org/news/2022/03/08/women-in-the-mediterranean-share-stories-of-empowerment-through-nature-conservation/>

### Une Gruaja ("I am a Woman")<sup>41</sup>

The Albanian organisation empowers women and youth by providing psychological and legal support, as well as promoting environmental conservation in the Ohrid-Prespa Transboundary Biosphere Reserve (BirdLife, 2022).

### UN Women eco-friendly fishing<sup>42</sup>:

In collaboration with local Moroccan partners, UN Women supported a project towards adopting sustainable and eco-friendly fishing practices, while also improving their lives and resilience through the provision of modern equipment, training in fish processing techniques, and promoting gender equality in the fisheries sector. This initiative aims to mitigate the impacts of climate change on the marine ecosystem and support the livelihoods of these women who rely on shellfish collection as their main source of income.

Box 16 Further examples of women initiatives in the Mediterranean region with a role in the transition

## Consumers

Consumer behaviours and choices have a significant impact on resource consumption, waste generation, and the overall sustainability of the economy (OECD, 2002). It is important to consider the unique characteristics and challenges faced by consumers in the Mediterranean region.

### Human Behaviour and Circular Economy:

Consumer behaviour is a crucial lever in promoting and supporting circularity. By adopting sustainable consumption patterns, consumers can reduce their ecological footprint and contribute to the efficient use of resources. This includes practices such as purchasing durable and repairable products, opting for second-hand or refurbished items, practicing sharing and collaborative consumption, and recycling or upcycling products at the end of their life. By embracing these behaviours, consumers can drive the demand for circular products and services, influencing businesses to adopt more sustainable practices and business models. For instance, *Dabchy*<sup>43</sup>, an online platform in Tunisia, facilitates the buying and selling of second-hand clothes with a door-to-door delivery system, addressing the growing demand for sustainable fashion and eco-innovative ventures in the region.

In recognising that the Mediterranean region is characterised by diverse cultural backgrounds and consumption patterns, it is important to understand the cultural values, lifestyle choices, and consumer preferences in designing effective circular economy strategies. Traditional practices in some Mediterranean cultures can be seen as part of the circular economy (Ghisellini et al., 2016).

<sup>41</sup> <https://www.birdlife.org/news/2022/03/08/women-in-the-mediterranean-share-stories-of-empowerment-through-nature-conservation/>

<sup>42</sup> <https://www.unwomen.org/en/news-stories/feature-story/2022/03/in-morocco-fisherwomen-adopt-new-climate-resilient-practices>

<sup>43</sup> <https://www.dabchy.com>

For example, repairing and reusing goods, common in some Mediterranean cultures, can be leveraged and promoted as part of the circular economy, as the *Dabchy* example showcases.

### **Holistic Approach and Consumer Responsibility:**

While consumer behaviour is essential, it is important to avoid placing the sole focus on individual citizens' responsibility. This means recognising that consumers' choices are influenced by various factors, including product availability, affordability, accessibility, and the overall market and policy environment (Cohen & Vandenberg, 2012). Transitioning to a green circular economy requires a holistic approach that considers systemic changes and collective action. Therefore, alongside encouraging responsible consumption, it is crucial to address structural barriers and provide consumers with viable alternatives that are affordable, convenient, and sustainable.

### **Understanding Consumer Barriers:**

Consumers in the Mediterranean region, like elsewhere, face various barriers that can hinder the transition towards a green economy and shape their choices. These barriers may include limited awareness and understanding of circular economy concepts, limited availability and accessibility of sustainable products and services, affordability concerns, and ingrained consumption habits (Lieder & Rashid, 2016). Overcoming these barriers requires a multi-dimensional approach that involves education and awareness campaigns, collaboration between businesses and governments to provide sustainable options, and policies and incentives that make circular choices more affordable and convenient.

### **Consumer Insights and Collaboration:**

Consumer insights play a crucial role in shaping the design and implementation of circular economy strategies and initiatives. Organizations like the Consumer Insight Action Panel, led by the Collaborating Centre on Sustainable Consumption and Production (CSCP), gather data and conduct research to understand consumer attitudes, preferences, and barriers related to sustainable consumption (CIAP). These insights can inform the development of targeted interventions and communication strategies to promote circular behaviours among consumers. Collaboration between businesses, policymakers, and consumer organizations is essential to co-create solutions that align with consumer needs and aspirations, fostering a sense of ownership and participation in the circular economy transition. (Prieto-Sandoval et al., 2018)

Engaging consumers (in the Mediterranean region) requires collaboration among various stakeholders, including businesses, governments, civil society organisations, and academia. Collaborative efforts can help address consumer barriers and promote circular consumption through awareness campaigns, education programs, and the development of circular infrastructure and services.

## CHAPTER 3

# Key Pathways to “Green” the Mediterranean Economy



The successful integration of a green circular economy in the Mediterranean relies on a robust enabling environment, underscored by the interplay of sound green policies, green finance, and comprehensive circular capacity development. These interconnected elements, spanning research, eco-innovation for sustainable economies, education, and training on green skills, along with the transformative greening of jobs, serve as foundational pillars promoting resource efficiency, mitigating pollution, and fostering the preservation and restoration of ecosystems and biodiversity.

All these aspects are related to the key pathways to the green circular transition in the Mediterranean region. The dynamics of these pathways are explored in the first section of this chapter dives into the green policies in the Mediterranean followed by the section on the aspects related to Green Finance that holds the potential to facilitate the implementation of comprehensive solutions for addressing circular economy challenges in the Mediterranean region. The final section of the chapter relates to the capacity development required to take advantage of the green circular economy in the Mediterranean.

## Pathways Towards Green Policies in the Mediterranean

Launched in 2006, the flagship Horizon 2020 initiative for the De-pollution of the Mediterranean Sea was a regional effort aimed at tackling marine pollution, promoting sustainable development, and preserving the ecological health of the Mediterranean Sea. It has been widely regarded as a successful effort, having effectively met its mandate and work program, making a significant impact by reinforcing regional cooperation and partnership<sup>44</sup>. Engaging all Mediterranean countries and a diverse range of stakeholders, it has fostered a sense of ownership, collegiality, and solidarity, indicating its relevance and the need for continuity.

However, with the recognition that efforts needed to be intensified, the 2014 UfM Ministerial Declaration on Environment and Climate Change reaffirmed that coherent and efficient regional cooperation was necessary to deal with the environmental challenges facing the Mediterranean. The Declaration has played a leading role in forging a pathway towards green policies in the Mediterranean. It underscored the commitment of member states to address the pressing environmental and climate challenges in the Euro-Mediterranean region. Emphasising the importance of sustainable development, the Declaration outlined a comprehensive approach to protect the environment, promote biodiversity, and mitigate climate change impacts. It highlighted the need for cooperation among member countries to address pollution prevention by fostering green economy. The declaration also acknowledged the significance of engaging stakeholders, including civil society and the private sector, to collectively work towards environmental sustainability and climate resilience in the Mediterranean.

The UfM 2021 Ministerial Declaration on Environment and Climate Change builds upon the 2014 Declaration, reiterating member states' dedication to enhancing regional cooperation in tackling pressing environmental and climate challenges in the Euro-Mediterranean region. It outlines specific actions through initiatives such as the UfM Environment Agenda, the UfM 2030 GreenerMed, and the Climate Change Action Plan.

In parallel, the 2015 and 2020 Circular Economy Action Plans, the main cornerstones of the European Green Deal (launched in 2019)<sup>45</sup> have helped to lay the foundations for further anchoring of green policies in the Euro-Mediterranean region. The first Circular Economy Action Plan<sup>46</sup> (2015) set the basis for a systemic approach relating to circular design and production processes, turning waste into resources and closing loops of recovered materials. Five years later, the new Circular Economy Action Plan<sup>47</sup> (2020) has further refined its approach to circular economy by emphasising waste prevention measures as a top priority. It encompasses measures to reduce the use of raw materials, minimise waste, and encourage eco-design and recycling practices, aiming to accelerate the transition toward a more resource-efficient and circular economic model in the European Union. This policy framework aims to further foster the deployment of sustainable product policies as well as their translation into specific legislation to make progress on circularity. It sets new targets for waste reduction; the circularity of products;

---

<sup>44</sup> <https://mio-ecsde.org/final-report-on-the-14-year-long-h2020-initiative-for-a-cleaner-mediterranean-is-out/>

<sup>45</sup> [https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal\\_en](https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en)

<sup>46</sup> [https://environment.ec.europa.eu/topics/circular-economy/first-circular-economy-action-plan\\_en#:~:text=In%202015%2C%20the%20European%20Commission,growth%20and%20generate%20new%20jobs.](https://environment.ec.europa.eu/topics/circular-economy/first-circular-economy-action-plan_en#:~:text=In%202015%2C%20the%20European%20Commission,growth%20and%20generate%20new%20jobs.)

<sup>47</sup> <https://www.europarl.europa.eu/legislative-train/theme-a-european-green-deal/file-new-circular-economy-action-plan>

for single-use plastics; circular public procurement; e-waste management; textiles and SCP. Following on from this text, specific targets for decreasing food waste and residual waste streams are also set. More broadly, the 2020 Circular Economy Action Plan places strong emphasis on the conditions for implementing cross-cutting actions to foster greater synthesis across sectors (Maleš, 2020).

Within the realm of sustainable product policy, a multitude of initiatives and a broad spectrum of legal and technical instruments have been set in place. A policy framework that empowers both consumers and public buyers while fostering circularity in production processes across the EU is seen within the EU Eco Design Directive and the ongoing review of the Industrial Emissions Directive. The commitment to ensuring circularity in European production extends further through initiatives such as the development of an industry-led reporting and certification system. Additionally, emphasis is placed on renewed efforts directed at establishing a sustainable and circular bio-based sector.

In the landscape of production processes driving the green economy, digital technologies play a crucial role, offering capabilities for tracking, tracing, and mapping resources. Further reinforcing this commitment is the registration of the EU Environmental Technology Verification Scheme, which contributes to a holistic approach towards sustainable and circular practices (EU Commission, 2020).

Within the Mediterranean region, the approach to “creating an enabling framework for sustainable and inclusive businesses” (MedWaves, 2022) is pivotal as it provides key regional measures to support the development of green and circular businesses and to strengthen the demand for more sustainable products across the Mediterranean. In this regard, the Extended Producer Responsibility (EPR) is a policy approach designed to promote environmental sustainability and waste management by placing the responsibility for the entire life cycle of a product on the producer. Box 17 details the significant developments of the EPR that have taken place in the MENA region.



Extended Producer Responsibility (EPR) developments in the MENA Region have been limited, but promising lessons for replicability are evident in countries like Morocco, Tunisia, Egypt, Jordan and Lebanon.

The WES project in Morocco has supported from April 2021 to February 2023 the design of an EPR scheme for PET bottles. A proposed framework agreement outlines continued collaboration, and the Ministry of Energy Transition and Sustainable Development aims to expand EPR to cover all packaging. Recognizing benefits for both government and the private sector, ongoing revisions to Law 28-00 aim to incorporate the EPR principle for future implementation. Agri-food companies have initiated voluntary EPR initiatives, potentially paving the way for mandatory implementation. Overall, these developments reflect a positive trajectory in the integration of EPR principles within the region's waste management strategies.

Tunisia's Eco-Lef, established in 2001, sets an example for successful EPR implementation. Eco-Lef's collaboration with the private sector, financed through an eco-tax, showcases effective waste recovery, job creation, and state resource allocation

Egypt's Law No. 202 of 2020 has paved the way for EPR, with the Waste Management Authority (WMRA) and the private sector expressing strong interest. Ongoing efforts, including a recommended pilot study and participation in the TouMaLi (UfM labelled project), highlight progress in EPR implementation.

Jordan is laying the foundation for an EPR system, focusing on long-term financing through a legal framework supervised by the Ministry of Environment and the Jordan Chamber of Industry (JCI). The private sector will organise and finance the scheme, with a proposed Producer Responsibility Organization (PRO) overseeing registrations, fees, and funding for recycling industries.

In Lebanon, despite legislative challenges, ongoing projects and reports highlight EPR's potential as a waste management solution, particularly due to the private sector's significant role and the conducive environment for a voluntary EPR scheme. The Ministry of Environment (MoE) actively supports EPR, recognising its capacity to offset Solid Waste Management costs. The Integrated Solid Waste Management (ISWM) Law No. 80, enacted in 2018, provides a legal framework for potential EPR integration.

#### Box 17 Extended Producer Responsibility (EPR) developments in the MENA Region

Even with improved approaches, such as EPR, the sustainability of products cannot be separated from the strengthening of waste policy in support of waste prevention and circularity. This approach has been further developed through the revision of EU legislation on batteries,

packaging, end-of-life vehicles, and hazardous substances in electronic equipment (EU Commission, 2020).

The agri-food sector is another sector that requires a policy-making overhaul where policy makers acting in different areas (health, agriculture, fisheries etc.) need to adopt a holistic approach to activate a range of potential policy levers in a concerted manner. Greening food systems policy entails addressing the trade-offs between food security and environmental sustainability, nutrition and livelihoods (OECD, 2021). Situated at the crossroads of different levels, the effective application of green policy in this sector faces several obstacles, such as the limited capacity of municipalities to ensure effective policy implementation due to insufficient financial and human resources. In addition to the evolution of the framing of food issues, another key element to enhance policies in this sector concerns innovative governance models for sustainable agri-food systems based on participation, inclusiveness, accountability and transparency, with a particular focus on enabling local communities to have greater control over their own food systems (Bilali et al., 2021). With a view to transforming agri-food policies in the Mediterranean area, FAO, CIHEAM and UfM are pooling their technical, scientific and political expertise to support the platform for Sustainable Food Systems in the Mediterranean (SFS-MED Platform) which aims, through a 10-year transitional work plan, to inform policy developments and breakthrough decision-making in the region (FAO, 2021). Box 18 dives deeper into the SFS-MED platform showcasing the benefit of collaboration in the Mediterranean agri-food sector.

As a collaborative initiative of the Food and Agriculture Organization (FAO), the International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM), the Secretariat of the Union for the Mediterranean (UfM), and the Partnership for Research and Innovation in the Mediterranean Area (PRIMA), the SFS-MED Platform stands as an affiliated project of the One Planet Network's Sustainable Food Systems Programme. With the financial support of the Ministry of Foreign Affairs and International Cooperation of Italy, the SFS-MED Platform connects stakeholders, fosters collaboration and coordination at various levels (regional, national, sub-national, municipal) and across diverse sectors (public/government, private, academia and research, farmers, consumers, civil society, etc.) to overcome the fragmentation of agri-food interventions. Its overarching goal is to accelerate progress on the 2030 Agenda at Mediterranean level, facilitating the transformation towards more sustainable, efficient, nutritious, inclusive, and resilient agri-food systems.

### Entry points to tackle common challenges

The stocktaking exercise<sup>48</sup> conducted by the SFS-MED Platform indicated that the transformation levers presented in this interactive report responds to the trends, priorities and challenges identified in most Mediterranean countries that have developed pathways towards agri-food systems transformation as part of their engagement in the United Nations Food Systems Summit (UNFSS) process<sup>49</sup>. The core themes identified through the UNFSS process have inspired the series of SFS-MED technical webinars initiated in 2022, which provided a rich repository of information presented in this digital tool. The UN

<sup>48</sup> <https://www.fao.org/documents/card/en/c/cb7978en>

<sup>49</sup> <https://www.un.org/en/food-systems-summit>

Food Systems Summit + 2 Stocktaking Moment (UNFSS+2, 2023) played a pivotal role in underscoring the need for enhanced regional cooperation around key levers to address common challenges through shared solutions.

The interactive tool “Sustainable agri-food systems in the Mediterranean - Levers for transformation<sup>50</sup>”.

The SFS-MED Platform proudly launched a digital tool that showcases catalytic levers for transforming agri-food systems in the Mediterranean. It serves as a dynamic resource compiling a wealth of expert knowledge, while weaving in inspiring narratives from organizations working tirelessly to reshape the region’s agri-food systems through collaborative efforts and innovative ideas.

#### Box 18 The Sustainable Food Systems in the Mediterranean (SFS-MED) Platform

In the quest for a green, circular transition, innovation policy emerges as further crucial focus area, encompassing, among other aspects, legal frameworks that facilitate the scalability of technological and digital solutions in the Mediterranean region. Green policies in the Mediterranean have garnered recent attention regarding the critical role they play in increasing the capacity to finance technological and digital solutions and to enable their appropriation to ensure a green circular transition (UNECE, 2013; ANIMA, 2023; Coalition for Digital Environmental Sustainability 2022). Within this scope, UNIDO's approach in implementing resource efficiency in the Mediterranean region moves from a regional to a national level and from demonstration sites to upscaling, together with a focus on transforming business models and value chains (UNIDO, 2022; UNIDO, MED TEST I, II and III projects).

Technology upscaling in the Mediterranean region should go together with policy innovation. Green and circular policy innovation can be explored in experimentation spaces such as Living Labs, case studies, test beds, legislative sandboxes or lighthouse initiatives that can support regulatory decision-making so that policies are better tailored to facilitate innovation developments and to accelerate them further to ensure uptake across the Med region. To this end, it is crucial to consider another element underpinning the success of green policies, namely the improved governance of (open) innovation based on social engagement processes, which can be achieved through regulatory learning in Mediterranean testing grounds. The Just2CE project

---

<sup>50</sup> <https://www.fao.org/3/cc8220en/online/cc8220en.html>

has used 10 case studies to analyse the conditions that can drive green circular policy formulations while ensuring a just transition (see Box 19).

**The Just2CE project**<sup>45</sup> aims at understanding, the conditions of a responsible, inclusive and socially just transition to a circular economy including the technical, geopolitical and social factors that can enable or hamper such a transformation and how these aspects can contribute to the development of transitional policy measures. The project identifies the enablers and barriers to Circular Economy in key strategic sectors of food production and waste, water management, critical raw materials and production in complex global supply chains. The project has shown through 10 diverse case studies spanning various countries and industries, that the implementation of a circular economy has a predominant technocentric approach, prioritising economic gains over social and environmental considerations, potentially reinforcing existing patterns of inequality. The project has also emphasised the need for a more inclusive and socially just circular economy that incorporates considerations of social justice, democratic participation, and embraces diverse cultural and philosophical approaches, particularly in the Global South. It advocates for a degrowth-oriented circularity, focusing on sustainable strategies like sufficiency, redistribution, localisation, and regenerative practices, with a call for increased support and research on bottom-up circularity approaches, especially in regions with limited resources.

Box 19 A Just Transition to Circular Economy (Just2CE Horizon 2020 project)

To secure a just transition towards a green circular economy, it is crucial to consider the internal dynamics within countries. This involves fostering enabling environments supported by robust institutional and legal frameworks in each country, complemented by strong economic institutions to sustain the actions. This foundation safeguards the continuity of progress in sustainable development, shielding it from any compromises along the way (Akinyemi et al., 2021).

Further to the consideration of internal country dynamics, the implementation of action plans at national level could be mainstreamed as a priority in national policies specifically in relation to sustainable consumption and production (SCP)<sup>52</sup> practices. To that end, a key example of producing sustainable consumption and production national action plans is showcased from SwitchMed where Egypt, Israel, Jordan and Palestine developed through nationally owned and nationally driven multi-stakeholder processes eight SCP-NAPs. Part of the success of these SCP-NAPs lies in their cross sectoral nature, and the fact that they emphasise resource efficiency, enhance coherence and inter-ministerial cooperation while engaging the private sector and

<sup>51</sup> <https://just2ce.eu>

<sup>52</sup> <https://www.unido.org/sites/default/files/files/2020-01/SwitchMed-newspaper-Third%20edition.pdf>

consumers (SwitchMed, 2018). Further, countries in the SwitchMed initiative, including Egypt, Israel, Jordan, Lebanon, Morocco, Palestine, and Tunisia, have produced a series of short documents providing an overview of their implementation of activities, policies, and programs in Sustainable Consumption and Production (SCP) and Circular Economy, demonstrating concrete examples of how the UNEP-coordinated SwitchMed policy work since 2015 has supported, inspired, and directly implemented Circular Economy and SCP initiatives at the national level<sup>53</sup>.

Monitoring the progress towards the efficient implementation of circular economy that include the above-mentioned initiatives, is critical across the Mediterranean region (EU Commission, 2020). Indeed, the European Commission places substantial efforts to strengthen the monitoring of national plans and measures to accelerate the transition, and to update the monitoring framework for the circular economy. Monitoring progress towards circular economy entails building new indicators associated with the focus areas of the national action plan, based on national as well as regional statistics, while considering the relationship between circularity, climate neutrality and the zero-pollution objective, a perspective relevant in the Mediterranean context. Established under the SwitchMed program, the Euro-Mediterranean Policy Hub, described in chapter 2, also facilitates access to the exhaustive collection of green growth instruments at EU and Mediterranean levels, providing a resource for navigating the landscape of sustainable policies in the region.

The various policies and instruments that have been introduced in the Mediterranean with regards to promoting green circular economy, alongside global initiatives, are presented in a timeline in Figure 2.

---

<sup>53</sup> <https://wedocs.unep.org/handle/20.500.11822/42557>

2006	UfM Flagship: H2020 Initiative to Depollute the Mediterranean.
2014	1st UfM Ministerial Declaration on Environment and Climate Change. Mediterranean Strategy on Education for Sustainable Development.
2015	Mediterranean Strategy for Sustainable Development 2016-2025. SDGs and Paris Agreement Adopted. EU Circular Economy Action Plan adopted. UfM Ministerial on Blue Economy.
2016	Regional Action Plan on Sustainable Consumption and Production. Action Plan of the Mediterranean Strategy on Education for Sustainable Development.
2019	EU Green Deal.
2020	14 years of regional cooperation on environment the H2020 Initiative for a Cleaner Mediterranean. UfM Stakeholder Consultation on post-2020 Environment and Climate Action priorities. First Assessment Report (MAR1) on the current state of play and risks of climate and environmental change in the Mediterranean.
2021	EU renewed partnership with the Southern Neighbourhood - A new agenda for the Mediterranean. Towards 2030: UfM Agenda for a Greener Med - Contributing to Achieving the Environmental SDGs in the Mediterranean. 2nd UfM Ministerial Declaration on Environment and Climate Action. UfM Ministerial on Sustainable Blue Economy. UfM Ministerial on Energy.
2022	Revised Action plan till 2030 of the Mediterranean Strategy on Education for Sustainable Development.
2023	Mediterranean Initiative under Horizon Europe (research and innovation for Mediterranean resilience).

Figure 2 Timeline of the key policy and other instruments designed to promote green circular economy in the Mediterranean.

## Green Finance

Placing sustainability at the heart of global, regional and local economic mechanisms and responding to the current need to implement green policies calls for public and private investment supporting a just transition to a green and circular economy. Green finance involves all forms of financing of the green economy that has the potential to enable the realisation of integrated responses to circular economy challenges in the Mediterranean.

Green finance relates to a set of financial mechanisms and programmes that aim to transition towards a decarbonised green economy to minimise environmental pollution and limit greenhouse gas emissions of the economy through minimising waste and improving natural resource use efficiency. It notably encompasses funding for both public and private investments in environmental goods and services, as well as the financing of policies that promote environmental protection and mitigation efforts as well the implementation of components of the financial system focused on green investments (Fosse et al., 2017).



Green climate finance inflows to the South-eastern Mediterranean, in 2018, reached a total of 6.95 billion Euros. The majority of this amount, 58%, was provided by multilateral development banks and funds, which included key entities like GEF and FAO. A significant portion of the funding, 41%, was attributed to bilateral contributions, primarily originating from EU financing institutions. The remaining 1%, amounting for 69 million Euros, was drawn from international climate finance sources<sup>54</sup>.

The multilateral climate funds in the MENA region have provided resources primarily allocated to support large projects with a strong focus on mitigation, while less attention has been paid to addressing the region's specific requirements for adaptation. Indeed, in the Southern and Eastern Mediterranean region, there is a pronounced preference for climate finance towards mitigation activities, receiving nearly four times more funding than adaptation measures. Adaptation

---

<sup>54</sup> <https://ufmsecretariat.org/wp-content/uploads/2021/01/Climate-Finance-Flows-in-SEMed-Region-2018.pdf>



initiatives received a funding of 1.09 billion Euros, whereas mitigation activities attracted 4.25 billion Euros. Additionally, a commitment of 563 million Euros was allocated for endeavours with dual benefits in both adaptation and mitigation (Union for the Mediterranean, 2018). On the other hand, in the context of bilateral aid, most EU funding has been directed to the Mediterranean area via bilateral agreements, such as the European Neighbourhood Policy.

In 2021, the EU has renewed its partnership with the Southern Neighbourhood partners with a new Economic and Investment Agenda for the Mediterranean in a post-COVID scenario focusing on various policy areas including human development, good governance and the rule of law, strengthening resilience, building prosperity and seizing the digital transition, migration and mobility and green transition: climate resilience, energy, environment.

Nevertheless, green finance within the Mediterranean region is essentially propelled by the public sector, led by multilateral development banks and national development agencies. There is a crucial need to stimulate private sector participation in green financing, in particular in the Southern and Eastern Mediterranean countries where there is a notable lack of financial tools for encouraging private investments. As an example, only Egypt has issued green bonds thus far.

Significant disparities are apparent in the Mediterranean concerning the types of entities benefitting from green finance. Currently, green finance primarily supports large-scale infrastructure projects, particularly in the energy and transportation sectors, with a predominant focus on mitigation efforts. However, it is crucial to ensure that both public and private finance becomes accessible to small and medium-sized enterprises, which play a pivotal role in Mediterranean economies. Rooted in local environments and challenges, SMEs may therefore lead the way in extending efforts to carry out adaptation actions and scale them up.

The obstacles to fostering a resilient green financial market in the region include the absence of a unified definition or categorisation for what qualifies as green investments, coupled with a lack of standardisation measures. The further lack of data adds to this obstacle, implying a deficiency of green finance traceability and hindering the credibility of investments for potential investors (Eco-Union and IEMed, 2022). Supranational public institutions, multilateral development banks, the European Union and multilateral climate funds provide various forms of green financing, contributing to leverage private investment. A salient challenge in the Mediterranean context is to enable orchestrated actions between actors sharing similar concerns on green circular economy issues, while focusing on ensuring the sustainability of Southern countries' development.

On the one hand, numerous national institutions of European countries provide, in collaboration with international bodies such as development agencies, financial support for environmental projects in developing countries, notably in the southern Mediterranean. On the other hand, private green finance is also an essential element for the future of the green economy in the Mediterranean, especially as forecasts indicate that private green financial flows should expand rapidly. The strength of market-based financing provides the capital needed to overcome the financial hurdles faced by green endeavours, avoiding the constraints which tend to be associated with the release of public funds.

In 2021, recognising the advantages of market-based financing, the Contracting Parties to the Barcelona Convention (i.e. the 21 countries surrounding the Med and the EU) adopted two notable regional measures as part of the "Regional Measures to Support the Development of Green and Circular Businesses and to Strengthen the Demand for more Sustainable Products". The two measures harness the interest and power of impact investing and the sustainability of

capacity development of financial institutions. See Box 20 that describes the two regional measures.

#### REGIONAL MEASURE F1: Sustainable Finance MED Observatory<sup>55</sup>

The Sustainable Finance MED Observatory aims to enhance the capacity of financial institutions and investors in the Mediterranean to invest in circular economy business models. Conducting annual research on finance opportunities, including blending finance, impact investing, ESG funds, micro-credit, and Venture Philanthropy, the Observatory seeks to attract sustainable finance solutions for the benefit of social and green economies. By fostering collaboration between European investors and local financiers, the Observatory aims to create a network facilitating the development of a common agenda on sustainable finance, contributing to the transition to a Circular Economy.

#### REGIONAL MEASURE F2: Public-Private Fund Facility for Eco-Innovative Ventures

Addressing the key barrier of access to finance for Green Entrepreneurs in the Mediterranean, this measure proposes the establishment of a public-private fund facility. This facility aims to provide diverse financing tools, including blended finance, to support Green and Circular Economy entrepreneurship. Focused on inclusivity, the fund will engage investors matching the funding needs of eco-entrepreneurs, particularly start-ups and SMEs facing challenges in accessing traditional financing. The initiative, exemplified by the Mediterranean Green Impact Investing Network, not only provides funding but also offers technical assistance, creating a supportive framework for circular businesses, removing obstacles, and fostering policy shifts in the region.

Box 20 Regional Financial Measures adopted by the Contracting Parties to the Barcelona Convention

The UfM Financial Strategy for Water is another notable public and private funding facility in the Mediterranean region. The objective is not only to increase the allocation of public budgetary resources for water-related activities but also to mobilise additional funding from domestic private entities. The specificity of the UfM Financial Strategy for Water is to provide a framework which establishes an enabling ecosystem for sustainable funding models, fostering their adoption throughout the UfM region, while drawing in additional financial support from both domestic and international sources (Union for the Mediterranean, 2020).

The various forms of green financing include two types of traditional instruments, namely grants and loans. Mainly directed to developing countries, grants are characterised by the non-refundable and interest-free nature of the financial aid provided by international or regional institutions to implement green economy projects. This type of financing enables the countries most severely impacted by the effects of climate change and with low financial capacity to obtain the resources required to implement a green transition, thus promoting equal access to

<sup>55</sup> [https://wedocs.unep.org/bitstream/handle/20.500.11822/37140/21ig25\\_27\\_2518\\_eng.pdf](https://wedocs.unep.org/bitstream/handle/20.500.11822/37140/21ig25_27_2518_eng.pdf)

"greening". However, international cooperation in the field of green finance through grants remains low compared to less direct financial aid such as debt (Oxfam International, 2021). Another type of traditional green finance instrument are loans which rely on debt and can be delivered by multilateral development banks active in the Mediterranean such as the World Bank, the European Bank for Reconstruction and Development (EBRD), the European Investment Bank (EIB) and the African Development Bank (AfDB), as well as other multilateral institutions including the EU and specialised climate funds.

Beyond traditional financial products such as grants and loans, various innovative instruments such as green bonds and guarantees are increasingly leveraged to fund the green economy that can be considered in the context of the Mediterranean (IEMed, 2017). The recent regulation adopted in October 2023 by the European Council concerning environmentally sustainable bonds serves as a pivotal instrument for financing investments aimed at transitioning to a resource efficient economy. Its main objective is to align European green bonds with the EU taxonomy for sustainable activities and to facilitate comparability in the green bond market by implementing a registration system and supervisory framework. This measure holds promise for the Mediterranean region as it offers a globally accessible reference taxonomy for investors, facilitating sustainable investment opportunities (European Council, 2023). Indeed, the UfM grant scheme (Box 21) launched in 2020 showcases the use of these types of financial mechanisms that are in use in the Mediterranean.

With the financial support of GIZ, on behalf of the Federal Ministry for Economic Cooperation and Development of Germany (BMZ) and the Agencia Española de Cooperación Internacional para el Desarrollo (AECID), the Union for the Mediterranean (UfM) has launched the UfM Grant Scheme to Promote Employment and Entrepreneurship in the Green Economy. It focuses on fostering dialogue, knowledge exchange, and creating job opportunities through trade and investment. In response to the COVID-19 pandemic, the grant scheme emphasises the role of the green economy, green skills, and green jobs in the sustainable recovery of the Southern Mediterranean region.

This grant scheme particularly targets vulnerable groups affected by climate change. The call for proposals (which was launched in May 2023, with the first contracts to be signed in December 2023) has three specific objectives: (i) fostering green skills development in the Southern Mediterranean (especially for young people and women, in order to enhance their chances to find employment in sectors related to the green economy transition), (ii) supporting entrepreneurial activities and micro, small, and medium enterprises (MSMEs) in the green economy (with a view to enabling income generation and job creation in green and sustainable sectors), and (iii) empowering women as drivers of the green economy (through skills training, awareness raising or capacity building initiatives).

Applicants, specifically non-governmental organizations, would need to be based in UfM Member States, namely Algeria, Egypt, Jordan, Lebanon, Mauritania, Morocco, Palestine, and Tunisia. The proposed actions would look to last between 6 to 12 months and may involve regional collaboration. Grants fall within the range of €150,000 to €300,000, covering 50% to 80% of total eligible costs, with the remainder sourced externally.

<https://ufmsecretariat.org/grant-scheme-2023/>

Box 21 UfM Grant Scheme to Promote Employment and Entrepreneurship in the Green Economy

The Blue Mediterranean Partnership (BMP), endorsed at COP27 in Sharm el-Sheikh (2022), is a blue economy financing mechanism which has synergies with green circular economy activities. Spearheaded by the European Commission through DG MARE and DG NEAR, and initially championed by partners such as the Agence Française de Développement (AFD), the European Bank for Reconstruction and Development, the European Investment Bank (EIB), the Kreditanstalt für Wiederaufbau (KfW), the Union for the Mediterranean (UfM) and the countries of Sweden, Spain, Jordan, Egypt, and Morocco, BMP aims to catalyse blue economy investments in non-EU countries of the Mediterranean and Red Sea region, with an initial focus on Egypt, Jordan, and Morocco. The BMP is a collaborative platform setup to combat the environmental threats to the Mediterranean by coordinating bankable blue economy projects, uniting sovereign donors through the multi-donor fund dedicated to upstream technical assistance and project preparation. The priority areas include plastic waste reduction, marine food systems, coastal resilience, sustainable tourism, marine mobility, renewable energy, wastewater treatment, solid waste management, and research and innovation for marine environments. The BMP partnership strives to bolster the impact and visibility of sustainable blue economy investments, aligning with existing regional initiatives and international frameworks.

Among notable new instruments of green finance, the Local Investment Finance Facility (PLIFF) of the the PAMEx (the Plan of Action for a Model Mediterranean Sea) is an important enabler for the transition towards a green circular economy. Launched on the 6<sup>th</sup> of December 2022, PLIFF builds on an innovative approach directing funding towards projects aligned with PAMEx's goals in the Mediterranean. These objectives revolve around preserving marine biodiversity, eliminating plastic discharge by 2030, and advocating for environmentally friendly maritime transport practices to combat climate change. The creation of PLIFF addresses the need for a financial mechanism to facilitate the mobilisation of the necessary financial resources. With an ambitious target of 1 billion Euros, PLIFF aims to combine both public and private funding through various financial instruments, such as equity, debt, bonds, and guarantees.

Driving green and circular practices at national level in Mediterranean countries requires the integration of environmental considerations into national budgets. An interesting example that has the potential to be implemented across the Mediterranean is the EU Green Budgeting Reference Framework (GBRF), which provides a set of guidelines to EU Member States, enabling them to adopt green budgeting practices. This framework serves as a guiding resource for the development of national green budgeting frameworks (European Commission, 2023). Besides, greening national budgets it goes hand-in-hand with the imperative for implementing green financial sector regulations and assisting policymakers in boosting the incorporation of the financial sector in the transition towards a green circular economy, in the Mediterranean region and beyond<sup>56</sup>. Within the toolkit of strategies for promoting decarbonisation and bolstering resilience against climate-related shocks, a well-defined tax policy is of paramount importance. Specifically, carbon pricing is among the most critical tools for incentivising investments and consumption decisions that favour low-carbon practices.

Further priority pathways for unleashing the potential of green finance include securing strong leadership to drive the financial sector's commitment to sustainability, increasing and scaling up green finance while significantly improving the transparency of private investments, as well as mainstreaming the sustainable economy approach into financial systems (IEMed, 2017). In this regard, the EU Sustainable Finance Package (European Commission, 2023) supports the financial sector and companies by encouraging private funding for transition projects and facilitating

---

<sup>56</sup> <https://www.unep.org/regions/asia-and-pacific/regional-initiatives/supporting-resource-efficiency/green-economy>

financial flows to sustainable investments. This involves additions to the EU Taxonomy and new rules for Environmental, Social, and Governance (ESG) rating providers, with a view to enhancing transparency in the market for sustainable investments. The EU Directive on corporate sustainability reporting (CSRD), which entered into force on the 5<sup>th</sup> of January 2023, also serves as a powerful instrument for enhancing transparency, with the potential to significantly influence future investments<sup>57</sup>. This directive mandates organisations to publicly disclose their sustainability risks and impacts, contributing to a heightened level of transparency in the business landscape.

Capacity development is a critical process in the green circular economy transition not only for securing strong leadership within the sector but to provide the various institutions with the capacity necessary to secure financing from the various schemes available. In such the following section on green circular capacity development dives into the mechanisms that are facilitating this process.

---

<sup>57</sup> [https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting\\_en](https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en)

## Green Circular Capacity Development

To propel the transition toward a green, circular economy, a comprehensive capacity-building effort should encompass a diverse array of subjects from the aforementioned financing mechanisms to aspects related to sustainable resource management, eco-design, circular business models, reuse systems, repair skills, recycling technologies etc. In particular, the development and sharing of new knowledge, competencies, and skills for implementing circular practices from the grassroots level to regional level would need to go beyond the traditional research and capacity development organisations to harness the power of networked knowledge holders. It is essential to recognise that capacity building in this regard extends far beyond education institutions to include - but not limited to – on the job training, network building, the establishment of collaborative frameworks for greening skills as well as the development of decision market-oriented information systems. Several initiatives to develop green circular capacity across the Mediterranean have been launched, specifically the Mediterranean Strategy on Education for Sustainable Development (ESD) stands as a key initiative in this regard as well as other specific initiatives that can drive the capacity development in this subject in the Mediterranean (Box 22).



The Mediterranean Strategy on Education for Sustainable Development (MSESD) promotes the integration of the principles, values and practices of sustainable development into all aspects of education and learning. The MSESD was endorsed in 2014 by the Ministers for Environment and Climate Change of the Union for the Mediterranean (UfM)<sup>58</sup>. It was further included in the Athens Declaration of the Contracting Parties to the Barcelona Convention at COP 19.

### Aim

<sup>58</sup> <https://ufmsecretariat.org/wp-content/uploads/2014/05/Mediterranean-Strategy-on-Education-for-sustainable-development-.pdf>



The Strategy aims to ensure that national frameworks support ESD, promote sustainability through all levels and types of education, develop educators' competencies, and promote materials, research and cooperation on ESD. Thus, the Strategy encourages the countries of the region to develop and incorporate ESD into all relevant subjects of their formal educational systems, as well as in formal and informal educational initiatives.

## Implementation and Activities

The Strategy was designed so that its implementation is driven by the countries' priorities and initiatives addressing their specific needs and circumstances, serving as a flexible framework for the fulfilment of their regional/global but also national agendas. An Action Plan was adopted by the Nicosia ESD Ministerial Conference in 2016, providing the following guiding strategic elements:

1. Priority areas for institutional and operational interventions, with recommended activities and an indicative roadmap.
2. A set of identified common regional programmes and projects of institutional and non-thematic nature.
3. Priority thematic areas for region-wide programmes.
4. Proposed indicators for monitoring progress.

During 2022, the Action Plan was updated through a participatory process and exchange among competent stakeholders and actors. Consequently, the MSES "Action Plan towards 2030"<sup>59</sup> was adopted by the High-Level Meeting of Education and Environment Ministers of the Mediterranean (in the framework of the 9<sup>th</sup> Conference of the Environment for Europe, Nicosia, 5-7 October 2022). The "Action Plan towards 2030" aspires to develop the necessary knowledge, attitudes and competences - cognitive, socio-emotional and behavioural - of the people of the region, to learn, live and work in a just, creative, healthy and sustainable way for a green society and economy.

## Members

In the Bureau of the Mediterranean Committee on ESD that guides the implementation of the MSES and its "Action Plan towards 2030" at the regional level, the following International Organizations participate: the UfM, UNEP/MAP, UNESCO, UNECE, the League of Arab States, together with Cyprus (chair), Greece, Lebanon, Morocco and Palestine. The Secretariat is jointly handled by MEdIES / MIO-ECSDE and the UNESCO Chair on Management and Education for Sustainable Development in the Mediterranean. All these partners collaborate to advance ESD in the Mediterranean region.

<sup>59</sup> [https://medies.net/wp-content/uploads/2022/11/MSES\\_Action\\_Plan-towards-2030-EN.pdf](https://medies.net/wp-content/uploads/2022/11/MSES_Action_Plan-towards-2030-EN.pdf)

### Achievements of the MSES Action Plan (2016 - 2021)

5 national ESD policy frameworks were formulated.

11 national and regional physical and online training sessions took place.

19 countries were technically supported in promoting ESD in their national contexts.

1.700 educational administrators and educators were engaged in interactive trainings and dialogue.

1 Flagship Project of UNESCO/GAP was dedicated to the Action Plan of MSES.

#### Box 22 The Mediterranean Strategy on Education for Sustainable Development (ESD)

MedWaves (previous SCP/RAC), the UNEP/MAP Regional Activity Centre for Sustainable Consumption and Production, emphasizes the need for green and circular capacity development. It has provided a set of policy recommendations (Box 23) that can establish an enabling environment, leveraging a supportive system that:



Promotes the development of sustainable, circular business models by supporting **incubation and acceleration programs**. These programs should focus on fostering youth and women's participation (Mediterranean Strategy for Sustainable Development. 2016-2025) and include components for circular design and business plan development. To maximise their effectiveness, they should provide access to business mentors, investors, and partnerships to engage with well-established organizations. Learning from the Switchers Support Programme's success in creating an enabling ecosystem for Mediterranean green and circular entrepreneurship, it is essential to adopt a methodology that trains entrepreneurs in creating green and circular businesses of the region. These incubation and acceleration programs should take into consideration that the shift towards green and circular economy requires the adoption of eco-innovation, life cycle-assessment and eco-design approaches by entrepreneurs, start-ups, SMEs, big companies, etc., as well as experts and Business Support Organizations.

✓	Integrates <b>circular economy modules in education</b> , fostering a diverse generation of circular professionals with equal access to training in various fields, including circular business models and renewable energy.
✓	Provides <b>gender-specific training and support in circular entrepreneurship</b> for youth and women to stimulate women-led startups and SMEs. This requires ensuring that women and men have equal access to business advice, training, mentoring, market insights, and networking opportunities.
✓	<p>Establishes <b>national or regional specialized knowledge centres or networks dedicated to Circular Economy</b>. Indeed, the support needed from entrepreneurs, start-ups and companies should also be expanded not only to capacity development but also to areas such as technical assistance, mentoring/coaching, networking, impact assessment, etc. These centres aim to disseminate circular economy strategies and practices, encouraging their adoption among both existing and new businesses. Implementation can be facilitated through an online platform aggregating comprehensive information on green and circular economy (i.e. relevant policies, best practices, funding opportunities), as well as via national partnerships, such as the Switchers Support National Partnership. A national or regional centre of knowledge might involve the following activities:</p> <ul style="list-style-type: none"> <li>• To provide professional training, tools, and services for circular practices, tailored to local economic sectors.</li> <li>• To facilitate collaboration among stakeholders to jointly address circular challenges.</li> <li>• To collaborate with international organizations for knowledge sharing.</li> <li>• To develop an information system for informed, sustainable decision-making based on Life Cycle Analysis and Costing. (SCP/RAC. 2021)</li> </ul>
✓	Assists financial actors and investors in acquiring knowledge about impact investment and understanding the specific needs and potentials within the green economy sectors.

Box 23 Regional Summary of Policy Recommendations to Support the Development of Green and Circular Businesses in the Mediterranean as provided by MedWaves/ SCP/RAC. (2021)

Recognising the multifaceted nature of capacity building in the Mediterranean's shift towards a green and circular economy is crucial. This extends beyond education and encompasses various dimensions, including network building, the establishment of collaborative frameworks for greening skills, and the development of decision-maker oriented information systems. As Green Growth and the circular economy have gained momentum in the Mediterranean, additional networking partnerships have emerged, exemplified by the Interreg MED Green Growth Community and its subsequent iteration, the Interreg Euro-MED Innovative Sustainable Economy Mission.



#### Interreg MED Green Growth Community

The Interreg MED Green Growth Community (GGC)<sup>60</sup> was established within the framework of the Interreg-MED programme during the period 2016-2022, with the aim of addressing the main challenges in the Mediterranean area related to Green Growth and Circular Economy. The GGC promoted sustainable development and the sound management of natural resources by enhancing cross-sectoral innovation practices through an integrated and territorially-based cooperation approach. The Thematic Community gathered 17 projects connecting 165 partners from 13 countries in the Mediterranean. The projects were organised in 4 focus areas tackling topics from food systems (ARISTOIL, ARISTOIL PLUS, CAMARG, EMBRACE, MADRE, PEFMED, PEFMED Plus and MED Greenhouses projects), eco-innovation (Creainnovation, GRASPINNO, GRASPINNO Plus, GREENOMED, finMED), smart cities (ESMARTCITY and GREENMIND), to waste management (REINWASTE and RE-LIVE WASTE). The GGC supported these projects by enhancing the visibility of their results increasing their impact at policy level and ensuring their replication in other territories. The community produced unified results and knowledge that was capitalised and transferred to key stakeholders in the Mediterranean region and beyond, contributing towards the targets of the EU Green Deal and the EU Circular Economy Action Plan. The UfM labelled the GGC in October 2019, thereby acknowledging its potential to advance cooperation in transitioning to a green and circular economy and delivering concrete benefits to citizens of the Mediterranean region. The UfM supported the development and implementation of this project within the 2030 GreenerMed Agenda.

<sup>60</sup> <https://interregmedgreengrowth.eu>



### Interreg Euro-MED Innovative Sustainable Economy Mission

The new Innovative Sustainable Economy (ISE) Mission (2023-2029) of the Interreg Euro-MED Programme aims to promote a just transition to a circular economy<sup>61</sup>. This is achieved through the implementation of two governance projects that advance innovative technical knowledge and facilitate the integration of these novel solutions into public policies. Building upon the achievements of the Interreg MED 2014-2020 Programme, the governance projects expand the legacy established by the earlier Thematic Communities focused on Green Growth, Blue Growth, and Cultural Social and Creative areas. The present mission has a wider focus, encompassing innovation capacities in technological, social, and institutional realms, aiming to foster sustainable production and consumption practices within the region. This aligns with the priorities of European Cohesion Policy and its specific objectives. It covers 14 countries in the Mediterranean with a focus on the whole Mediterranean Sea basin. The mission governance mechanism of the Interreg Euro-MED Programme has been labelled by the UfM. These projects are in line with the 2030 GreenerMed Agenda supporting the transition of the Mediterranean region towards a green, blue, circular and inclusive economy.

Box 24 The Interreg MED Green Growth Community and its successor the Interreg Euro-MED Innovative Sustainable Economy Mission

As capacity is developed, it is essential that there is a focus on green skills that can respond to the “new” green jobs that will become available as the region transitions to a green circular economy. In the following chapter we dive into the green skills and jobs that are generated as the region transitions.

---

<sup>61</sup> <https://innovative-sustainable-economy.interreg-euro-med.eu>



## CHAPTER 4

# Green Skills and Jobs for the transition towards green circular economy.



Green jobs encompass professions that include measuring, preventing, controlling, and rectifying adverse environmental impacts, as defined by Stanef-Puică et al. (2022). These roles actively contribute to reducing energy and raw material consumption, curbing greenhouse gas emissions, minimising waste and pollution, and safeguarding and restoring ecosystems (International Labour Office, 2018). Furthermore, green jobs play a crucial role in enabling both enterprises and communities to adapt to climate change. Green jobs are the antithesis of “brown jobs” which concern highly polluting activities (e.g. in mining, manufacturing, etc.). Neutral in their environmental impact, 'white jobs' make up the majority share of jobs in the EU, and are characterised by a neutral carbon footprint (office jobs, health workers etc.) (Bluedorn et al., 2023).

In 2008, the *Green Jobs Initiative*<sup>62</sup> was collaboratively initiated by the International Labour Organization (ILO), the United Nations Environment Programme (UNEP), the International Organization of Employers (IOE), and the International Trade Union Confederation (ITUC). This joint effort aimed to assist governments and social partners in translating the prospect of meaningful employment into tangible reality by harmonising environmental and employment goals and policies (Strietska-Ilina et al., 2012). Green jobs are thus directly linked to the environment and a sustainable economy. Box 25 provides a definition of green jobs provided by the International Labour Organisation.

The ILO define green jobs as positions in agriculture, manufacturing, construction, installation, and maintenance, as well as scientific and technical, administrative, and service-related activities, that contribute substantially to preserving or restoring environmental quality. Specifically, but not exclusively, this includes jobs that help to protect and restore ecosystems and biodiversity; reduce energy, materials, and water consumption through high-efficiency and avoidance strategies; de-carbonise the economy; and minimise or altogether avoid generation of all forms of waste and pollution. Green jobs, also need to be good jobs that meet longstanding demands and goals of the labour movement, i.e., adequate wages, safe working conditions, and worker rights, including the right to organize labor unions. (ILO and UNEP 2008, pp. 35–36<sup>64</sup>)

Box 25 Green jobs, green economy, just transition and related concepts (ILO,2023)

Critical to unlocking the potential of green jobs is skills development, which is indispensable for successful transformations that boost productivity, foster employment growth, and contribute to overall development. Greening jobs involve incorporating this new "skills block" to address the environmental dimension in practices, even when the primary focus is non-environmental. These roles necessitate integrating sustainable practices and considerations into conventional sectors

<sup>62</sup> [https://www.ilo.org/beijing/what-we-do/projects/WCMS\\_182418/lang--en/index.htm](https://www.ilo.org/beijing/what-we-do/projects/WCMS_182418/lang--en/index.htm)

<sup>63</sup> [https://www.ilo.org/wcmsp5/groups/public/---ed\\_emp/---emp\\_ent/documents/publication/wcms\\_883704.pdf](https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/documents/publication/wcms_883704.pdf)



such as waste management, water management, renewable energies, pollution prevention, and energy-saving amongst others (ILO, 2011).

The transition towards greener economies affects the required skills in three essential aspects. Firstly, green restructuring involves shifting economic activities from polluting sectors to low-carbon emission sectors. This requires workers to acquire new skills to adapt to the changing demands of these sectors. Secondly, the development of new technologies generates entirely new professions that revolve around renewable energy, energy efficiency, and other green technologies. These new professions require specialised knowledge and expertise. Lastly, the greening of existing jobs involves adapting traditional roles and sectors to incorporate sustainability practices and comply with changing environmental regulations. For instance, waste management professionals are more and more required to possess skills in recycling technology and sustainable waste reduction strategies. Similarly, energy professionals are increasingly expected to be proficient in renewable energy technologies and energy-efficient solutions (ILO, 2011).

The greening of jobs requires an alignment with environmental policies, employment and skill efforts. This involves ensuring that skills development initiatives and educational programs address the changing needs of the labour market in the transition to a green circular economy. By providing relevant training and education, individuals can acquire the necessary skills to thrive in green jobs and contribute to sustainable economic growth. Local actions are also essential in creating green jobs and developing green skills. Local contexts often present unique opportunities and challenges that require tailored approaches. Local governments, businesses, and community organisations play a significant role in identifying and capitalising on these opportunities to stimulate green job creation and skill development.

With this background in mind, this chapter dives further into the Euro-Mediterranean labour forces' capacity to shift towards green skills in terms of the types and levels of green skills required and related opportunities and challenges, which in turn leads to the subsequent section on job development, the monitoring and forecasting of green jobs across the Mediterranean towards 2030, which has a specific focus on youth and women, before closing with a section on the potential for green jobs in the Euro-Med region.

## Green Skills

The demand for green skills in the Euro-Mediterranean region is a crucial component for transitioning to a sustainable and resource-efficient society. Structural changes, involving economic activities, and the shift towards green necessitates the adaptation of skills and job profiles. Despite economic disparities and challenges in the region, the young population emerges as a significant resource for shaping a sustainable future. To empower the youth, the focus should be on education, training, and awareness of green skills, considering the diverse challenges faced by young people. Sustainability issues should be integrated into formal and non-formal education, and to establish a Youth Green Skills Agreement<sup>64</sup> to foster cooperation and joint action among Mediterranean countries. Recognising the potential of the younger generation and providing them with the necessary skills is deemed essential for steering the Mediterranean region towards a more sustainable economy and development (Elmasllari, 2022).

The European Union (EU) has prioritised the transition to digital and green economies through initiatives such as the European Skills Agenda, a 12-point action plan introduced in July 2020<sup>65</sup>. Complementing this, the Osnabrück Declaration on vocational education and training (VET) was signed in November 2020, contributing to the broader development of the European Education and Training Area. With a focus on the EU Green Deal, which requires €1 trillion for economic transition, including €100 billion for retraining and upskilling, efforts are directed toward mobilising private funding and defining the just transition fund, particularly for coal mining regions. The internationalisation of training is emphasised, promoting cooperation with countries beyond the EU to facilitate mutual learning and skill improvement. Initiatives like the Green Skills Award recognise and promote best practices in teaching and learning green skills, showcasing diverse projects from around the world. Calls for incorporating awareness of ecosystem cycles into educational and workplace settings highlight the importance of sustainable practices in broader education and professional contexts.

While there is no specific methodology designated for the identification of skills pertaining to green jobs, there does exist general skills anticipation schemes that systematically incorporate green considerations (El-Sherif, 2023). These skills anticipation initiatives entail a comprehensive institutional framework, bringing together authorities in employment and education, alongside social partners and other relevant stakeholders. The skills identified play a pivotal role in delineating the training provisions offered through Technical Vocational Education and Training (TVET) programs for both employed and unemployed individuals. In such the types and levels of skills pertaining to green jobs that can be identified are detailed below.

---

<sup>64</sup> <https://sdgs.un.org/partnerships/green-skills-agreement>

<sup>65</sup> <https://ec.europa.eu/social/main.jsp?catId=1223&langId=en>



### Types and Levels of Green Skills

In the Mediterranean region, the evolving green economy has created a rising demand for a diverse range of green skills. These skills can be broadly categorised based on their level and the nature of changes required for the green transition: Low-skilled, Medium-skilled and High-skilled level occupations (European Training Foundation, 2023). Understanding these distinct skill sets is crucial in recognising the varied roles and competencies needed to propel environmental sustainability efforts in the Mediterranean.

Table 3 outlines the skill levels required for various green jobs and the nature of these roles and their evolution due to environmental changes. In each of these scenarios, examples are provided below the table from different countries illustrating the demand for these skilled workers within the green economy transition.

Skill Levels of Occupations	Nature of Change
Low	Generic change, including environmental awareness, adaptations to work procedures, use of new materials and compliance with environmental regulations
Medium	Emergence of new green jobs, substantial changes to existing technical skills and knowledge.
High	High focus on new green jobs. Significant changes to existing jobs in terms of skills and knowledge.

Table 3 Skill Levels, Nature of change and examples of the occupational change  
Source: European Training Foundation. 2023

**Low-skilled level jobs:** Example jobs in this category include refuse/waste collectors and dumpers. In Morocco, the movement towards a sustainable economy through increased green jobs in sectors such as agriculture and fisheries primarily affects workers with low skill levels.

**Medium-skilled level jobs:** New occupations include wind-turbine operators and solar-panel installers. Meanwhile, existing roles like roofers and HVAC technicians must adapt. For instance, Bosnia and Herzegovina is currently in need to retrain workers from fossil fuel sectors to meet the demand in renewable energy sectors.

**High-skilled level jobs:** New roles include agricultural meteorologists, climate-change scientists, energy auditors, and carbon traders. Countries like Israel need more high-skilled workers in sectors such as agriculture and ICT to maintain global competitiveness.

The transition to a green economy will create new job roles and transform existing ones across all skill levels. However, this shift requires tailored educational and training initiatives to equip the workforce with the necessary skills to thrive in a green economy.

### **Green Skill Opportunities and Challenges in the Mediterranean**

The Mediterranean region is currently undergoing a dynamic transition, with a growing emphasis on cultivating green skills and fostering careers in growing sectors like renewable energy, sustainable agriculture, and eco-tourism (UNEP/MAP, 2016). This shift is poised to unlock a multitude of opportunities that could stimulate rural employment, propel sustainable development forward, and aid in environmental conservation efforts. Such progress, however, comes with its unique set of challenges. The need for specialised training, the integration of sustainable practices into the diverse cultural and economic fabric of the Mediterranean, and the balancing act between economic growth and ecological preservation are notable obstacles.

There is another layer of complexity added to this by identifying potential difficulties in ensuring inclusivity within these emerging green sectors. As the green economy expands, it is crucial to address disparities in access to education and training programs, especially for the youth and other disadvantaged groups, to prevent the perpetuation of existing inequalities. This includes the risk of low-skilled workers being left behind as industries transition away from traditional energy sources like coal. To mitigate these challenges, proactive measures must be taken to facilitate the upskilling and reskilling of the current Mediterranean workforce to meet the evolving demands of the green economy (European Training Foundation, 2023).

The integration of green jobs and skills into the labor market is pivotal for the Mediterranean's sustainable future. It requires a concerted effort from policymakers, educational institutions, and industry stakeholders to create a labour market that not only thrives on innovation and sustainability but also remains accessible and equitable for all societal groups. By carefully examining and responding to the Mediterranean unique cultural and economic landscape, the region can ensure that its transition to a sustainable economy is both successful and just, providing a roadmap for other regions to follow (European Training Foundation, 2023). In this regard, Egypt and Tunisia are showcasing how the skills evolution can take place from the traditional linear economy energy sector as it transitions to a green circular economy (see Box 26).

Leveraging the abundant natural resources for renewable energy presents economic advantages, requiring increased government investment in essential infrastructure such as battery storage, grid enhancements, water supply, bunkering, and hydrogen transport.

Addressing workforce challenges is crucial, involving the identification of skill gaps and the cultivation of green skills, along with retraining and redeploying workers affected by changes in brown sectors. Egypt's NWFE-EP initiative<sup>66</sup> exemplifies this approach, involving the decommissioning of fossil fuel power plants, scaling up the electricity grid, and supporting affected workers, accompanied by educational programs promoting renewable energy skills. Similarly, Tunisia's national electricity and gas company, Société Tunisienne de l'Electricité et du Gaz (STEG)<sup>67</sup>, is actively promoting green skills for young individuals in the energy sector through three key initiatives, supported by the European Bank for Reconstruction and Development (EBRD).

Firstly, they have introduced national occupational skills standards for crucial energy-sector positions, ensuring transparent criteria for recruitment and aligning educational curricula with industry demands. Secondly, in collaboration with local technical universities, STEG has initiated an innovative training program that combines internationally accredited master's programs for young engineers with practical on-the-job learning. Thirdly, STEG has adopted a comprehensive gender action plan aimed at enhancing women's access to technical and STEM roles, contributing to a more inclusive workforce in the energy sector (European Bank for Reconstruction and Development, 2023).

Box 26 An inclusive green transition for comprehensive societal change in the southern and eastern Mediterranean (SEMED) region

### **Gender and Youth Focus on Green Skills Development**

The Mediterranean regions' approach to developing green skills among women and youth is a multifaceted endeavor, crucial for steering the green economic transformation. Despite the lingering gender disparity in green employment, there is a growing opportunity to involve the youth. In Europe, women still effectively work 59 days 'for free,' as the gender pay gap persists at 16.4%, denoting ongoing inequalities within the labour market, according to the European Commission (2014). In the South and East Mediterranean regions, land rights are held by only 10% to 20% of women, despite being the majority of small-hold farmers. Paradoxically, women

<sup>66</sup> <https://moic.gov.eg/page/nwfe>

<sup>67</sup> <https://www.ebrd.com/news/2023/ebd-celebrates-international-youth-skills-day-.html>

play a crucial role in facilitating <sup>68</sup>the transition to sustainable agricultural practices. They also hold fewer assets and face more challenges attaining credit (FAO, 2011).

Further to this, in many instances, women face limitations in their employment choices, often finding themselves confined to vulnerable and insecure occupations (International Labour Office, 2012). Women are disproportionately represented in low-paying, insecure jobs with limited social mobility, and they frequently populate the informal economy, where they are more susceptible to exploitation without adequate formal protection.

The advent of green jobs within the green economy holds promise for transforming the current labour market dynamics. It serves as a conceptual foundation for recognising and revaluing women's contributions to society and the economy. However, realising this potential necessitates a reevaluation of the green economy through a gender lens. Failing to do so risks perpetuating existing gender inequalities across various economic sectors, hindering the attainment of sustainable development goals and impeding poverty eradication efforts (International Labour Organization, 2022). It underscores the importance of ensuring that the transition to a green economy is inclusive and addresses gender disparities to achieve truly sustainable and equitable outcomes.

The youth also hold a key opportunity as the green skilling of a new generation of workers can capitalise on the dynamism and invoke the allure of working in sustainable industries. However, to do so requires a need to dismantle the barriers they face including educational and training disparities, societal biases, and entrenched economic hurdles. Such challenges call for a suite of solutions that transcend conventional approaches. Targeted educational pathways, heightened awareness through strategic campaigns, and robust policy frameworks are key to cultivating a landscape where opportunities in green sectors are accessible to all, irrespective of gender or socioeconomic status or age. Moreover, the aspirations and insights of young people are not just valuable; they are indispensable for crafting future-oriented policies that pivot towards an inclusive green and digital recovery. Services aimed at reaching out to those not in education, employment, or training (NEETs) must be amplified and tailored to meet the unique needs of this group. Enhancing employability and green skills among the youth is not merely an investment in individual futures; it is a strategic move to harness their potential for innovation, propelling digitalization, economic growth, decent work, and broad-based social inclusion (Youssef, 2023). Indeed, in the South Mediterranean countries, there is an opportunity to skill the youth that are currently not in work and to reverse the worrying trend of NEETs. Jordan has the highest number of young people that are neither in work, education or training (32%) of the 15 to 24 age group, this is followed by Egypt (28%), Tunisia (25%), Morocco (22%) and Algeria (21%), compared to EUs (13%).

---

68

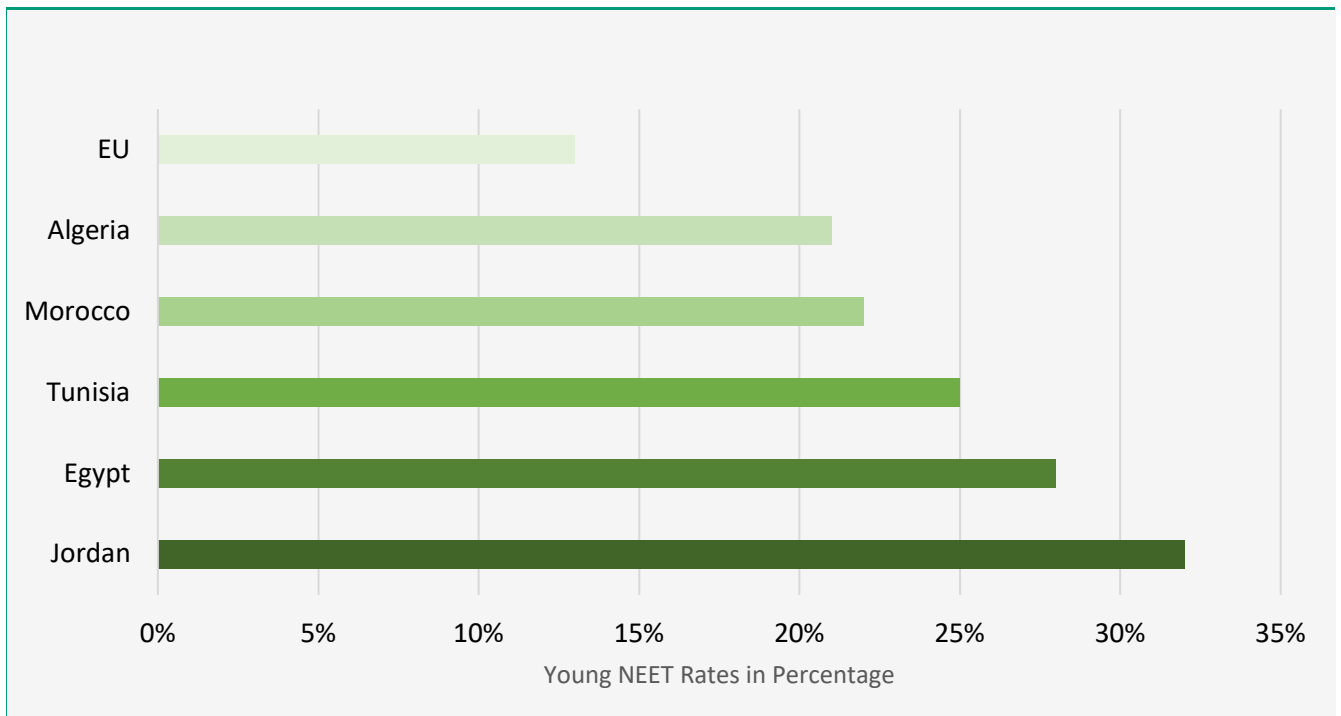


Figure 3 The NEET rate for the 15-24 age group in selected Southern Med countries (own elaboration, data from (Albinyana & Martinez, 2022))

The green transition therefore presents unique opportunities and challenges within the Mediterranean region, particularly concerning gender and youth. Women are notably underrepresented in science and technology sectors pertinent to green jobs, often occupying lower-skilled jobs. Yet, the emergence of green jobs offers a chance to dismantle traditional gender barriers, as these new fields are not yet entrenched in gender segregation. Concurrently, the transition poses risks of unequal benefits, with disadvantaged youth potentially missing out on green job opportunities. These challenges are currently being addressed in the Mediterranean, for instance through the UfM Grant Scheme to Promote Employment and Entrepreneurship in the Green Economy, funded by GIZ (Chapter 3: Pathways Towards Green Policies in the Mediterranean) is addressing the disparities in age and gender to foster an inclusive green circular economy in the Mediterranean. By proactively tackling these gender and age-related challenges, the Mediterranean can leverage its demographic diversity to build a sustainable and equitable future, fostering a skilled workforce ready to thrive in the green economy.



## Green Jobs

In the transition towards green jobs, brown jobs are set to face a contraction in labour demand (and in some cases, such as coal and lignite mining, even a full phase-out), or significant structural change related to the greening of these sectors (Youssef, 2023). At present, these jobs are estimated to cover around 5% of employment in the EU. Simulations for decarbonization policies indicate a temporary decline of up to 0.5% of job losses relative to the current baseline, with employment returning to baseline levels by 2050 (Vandeplas et al., 2022). Significantly, green jobs will serve as a catalyst for the transition to a green economy (International Labour Office, 2018).

In essence, while certain industries or sectors may increase in the number of green jobs available, others will contract, disappear, or undergo transformative changes in their practices (brown), the majority of jobs are in fact expected to remain relatively unchanged, falling into the category of white jobs. Indeed, most jobs across the EU fall into the category of “white jobs”. These jobs are anticipated to undergo only modest shifts in task content, aligning with the overall trend towards environmental sustainability. Some among these 'white jobs' might also witness increased labour demand due to the green transition, even though they may not directly involve 'green tasks' (Vandeplas et al., 2022). Workers in white jobs have a slightly higher probability to switch to a green job (9-11%) when they change jobs. Nevertheless, after controlling for individual worker characteristics, there are no differences in the transition probability to a green job from a brown or a white job (Vandeplas et al., 2022).

Green jobs, however, in the Mediterranean will be vast and multifaceted. These jobs currently range from solar and wind energy technicians to environmental conservation and restoration specialists. The regions abundant solar and wind resources make it prime for renewable energy projects, requiring engineers, installers, and maintenance workers. Additionally, the Mediterranean's rich biodiversity and coastal environments present opportunities in marine conservation, restoration, and sustainable tourism, potentially offering roles in habitat restoration, eco-tourism guides, and environmental education.

In terms of the types of green jobs that are growing Figure 4 showcases the fastest-growing green jobs globally, plotting the medium-term and short-term job growth rates against the prevalence of these jobs in various countries from 2016 to 2021.

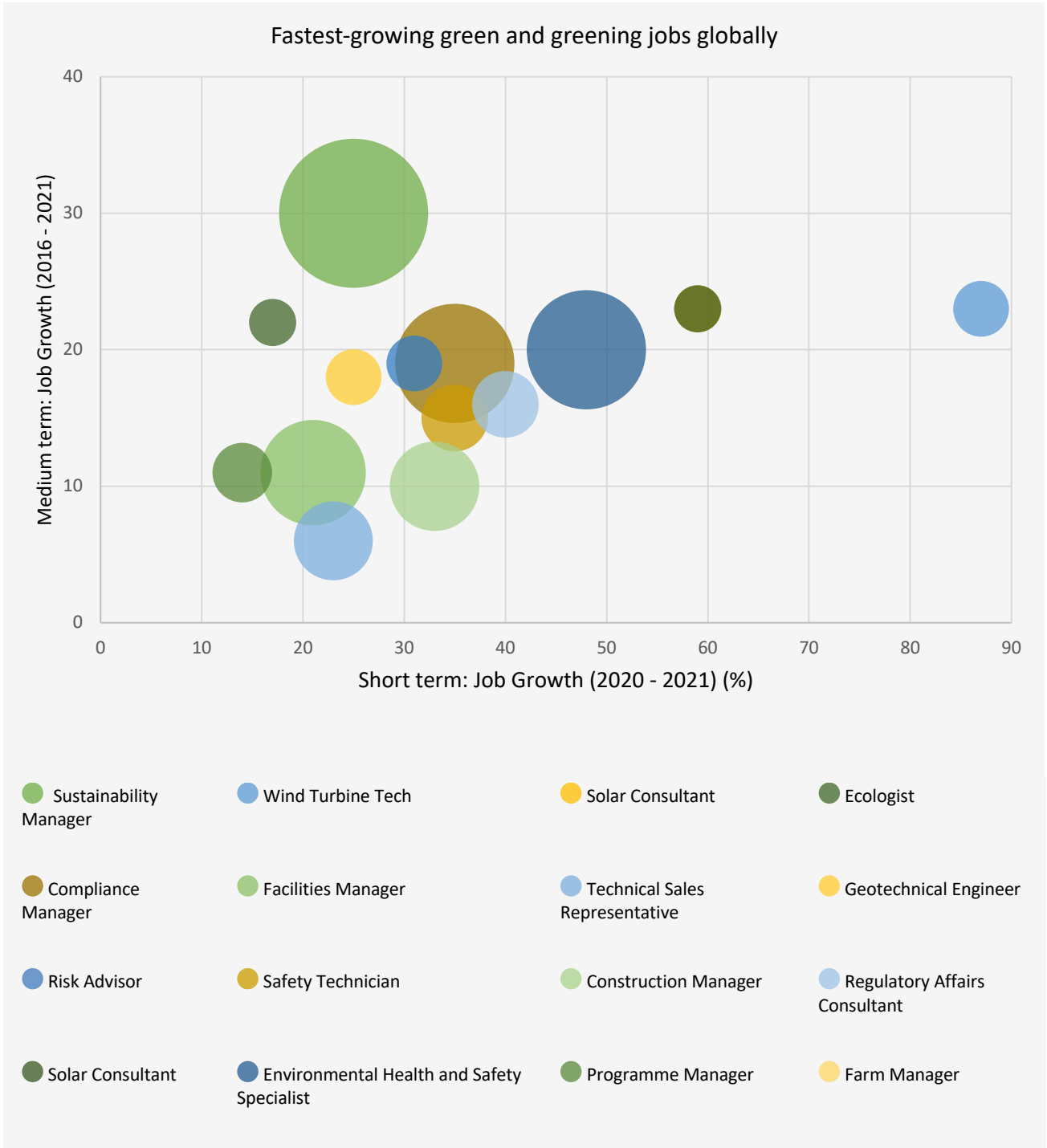


Figure 4 The fastest growing greening job types  
Source: Global Green Skills Report<sup>69</sup>

<sup>69</sup> <https://economicgraph.linkedin.com/research/global-green-skills-report>

Analysing the data of the graph, we notice that due to the Mediterranean geographical and climatic conditions, certain green jobs are particularly relevant.

**Wind Turbine Technician:** Almost 90% of the world's marine renewable energy is generated in Europe, however the contribution of the Mediterranean Sea within this energy mix is practically negligible (Abanades, 2019). This presents a significant opportunity as the region transitions towards green energy sources.

**Solar Consultant:** Generally, solar is underexploited in the southern regions of the Mediterranean, with only 2.7%<sup>70</sup> of the total capacity in solar energy used, providing significant opportunities for future growth.

**Farm Manager:** Sustainable agriculture is key in this region known for its agricultural output, and farm managers who can implement and oversee sustainable practices are in demand.

**Sustainability Manager:** Many Mediterranean countries are tourism hotspots, and sustainability managers can play a crucial role in balancing tourism with environmental conservation.

**Ecologist and Environmental Health Safety Specialist:** The rich biodiversity of the Mediterranean basin makes the role of ecologists and environmental specialists crucial for conservation efforts.

These roles support the region's transition to a sustainable economy, with a focus on the abundant natural resources and the need for conservation and sustainable management. The shift toward green energy presents a substantial opportunity for job creation, notably in medium-skilled roles.

Figure 5 illustrates the top 25 countries leading in the number of sectors that exhibit above-average green skill intensity, showcasing the global landscape of green skills distribution across industries in 2021. At a global level, as shown in the Figure 5 Mediterranean countries are amongst the top 25 global countries in terms of green skill intensity.

---

<sup>70</sup> <https://stories.ecmwf.int/paving-the-way-for-a-renewable-energy-transition-in-the-mediterranean/index.html>



Figure 5 Top 25 countries with the higher number of sectors with green skills (2021)

The graph indicates how the following Mediterranean countries are fairing:

**France:** Shows a high concentration of green skills across many sectors, particularly strong in areas like Energy and Mining, Finance, Hardware/Networking, Media and Comms, Non-profit, and Software and IT Services.

**Greece:** Demonstrates above-global-average green skills in sectors such as Energy and Mining and Software and IT Services.

**Italy:** Exhibits a broad distribution of green skills, with strengths in Agriculture, Arts, Corporate Services, Design, Energy and Mining, Finance, and more.

**Portugal:** Has a few sectors with green skills above the global average, notably in Energy and Mining and Software and IT Services.

**Spain:** Shows an extensive spread of green skills, similar to Italy, with multiple sectors above the global average.

**Turkey:** Has green skills above the global average in sectors like Manufacturing and Software and IT Services.

The chart suggests that these Mediterranean countries are integrating green skills into their workforces at varying levels, with Italy and Spain the most diverse in their green skill distribution across sectors. France has a high concentration in high-tech and finance sectors suggesting a focus on green skills in advanced areas of the economy. Greece, Portugal, and Turkey have fewer sectors above the global average, indicating potential areas for growth in green skill development. The situation in other Mediterranean countries is addressed below.

### **Green jobs monitoring and forecasting**

There is an apparent gap in data on green jobs in the Mediterranean that is following a global trend in the scarceness of data for the measurement of the number of current or forecasted green jobs (ILO, 2018). While some efforts have been made in the EU (Eurostat, 2017), the United States (Elliott and Lindley, 2017), and the United Kingdom (ONS, 2017), these measurements are hindered by variations in definitions and may lack comparability. Typically focusing solely on environmental goods and services, these efforts often fail to encompass all categories of green jobs, neglecting roles that contribute to improving the environmental impact of production processes across diverse industries. Moreover, national definitions of green jobs frequently overlook the crucial aspect of decent work, creating challenges in making meaningful comparisons across different estimates.

Measuring the number of green jobs within a country becomes an important metric in evaluating the progress towards a green economy. The limited measurements hinder a comprehensive understanding of the global landscape of green employment. Indicators, including the share of green sectors in total output, green investment, and environmental employment, offer valuable insights into the extent of the green transformation. The focus extends to key green industries, and detailed employment data is imperative, covering aspects such as total employment, employment by economic activity, environmental domains, occupation, and the types of green technology used. The disaggregation of data plays a vital role in identifying core industries, monitoring progress, and assessing the impact on labor markets transitioning toward greener activities. Furthermore, the evaluation of wages, working hours, and the consideration of specific vulnerable groups, such as age, education levels, and gender, are crucial for gauging the quality and inclusivity of employment in the different sectors. This comprehensive approach would then enable policymakers to tailor strategies that not only measure progress accurately but also address potential disparities and ensure the equitable distribution of opportunities in advancing the green circular economy (Rayan et al., 2020).

Against this backdrop, an attempt has been made in this report to gather projections of green jobs in the Mediterranean extracting data from various presumptive models across diverse resources and databases. Figure 6 provides the projected number of green jobs in the Mediterranean by 2030 per country and is compared to the European Union as a whole.

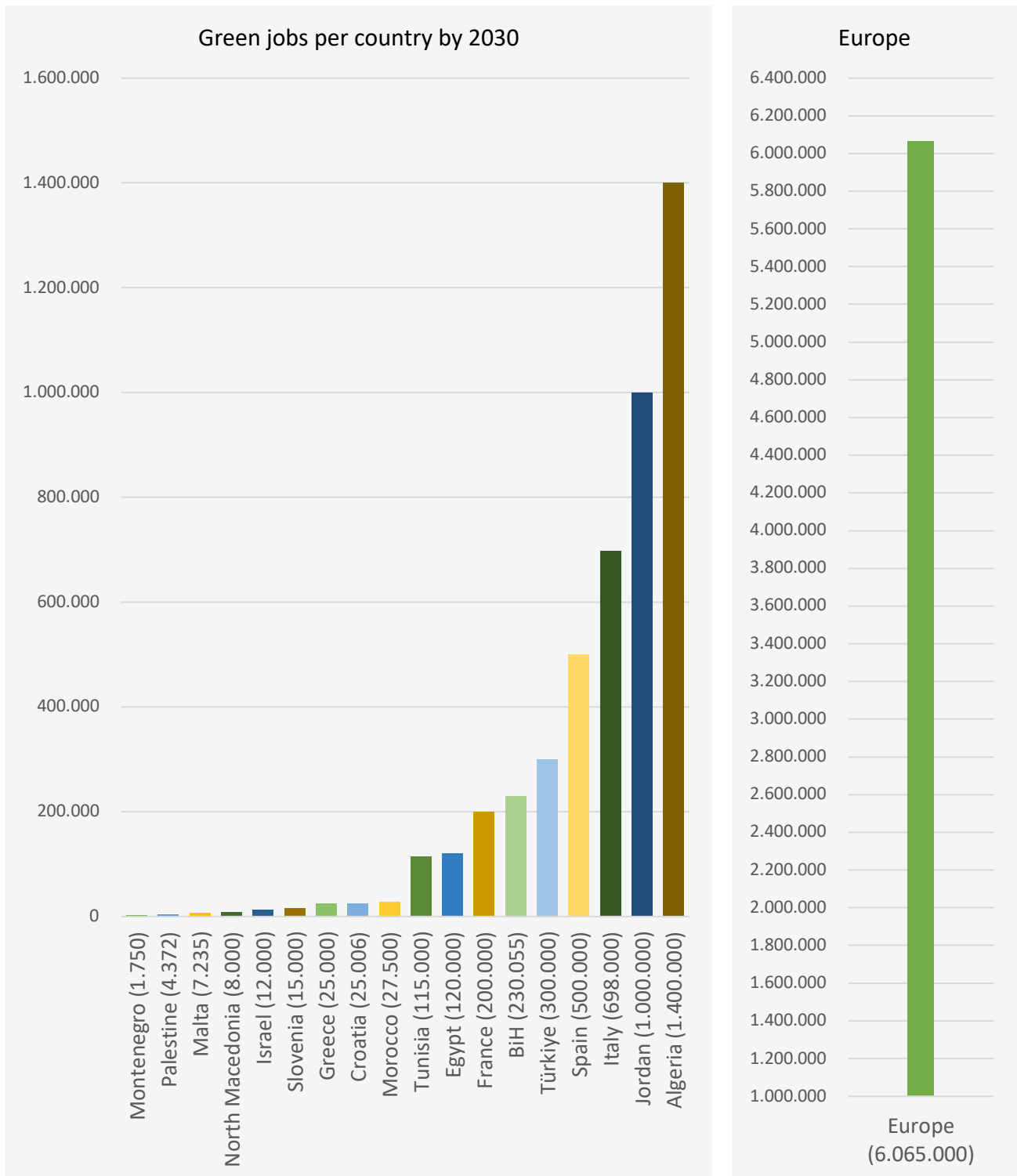


Figure 6 Number of green jobs in the Mediterranean by 2030 per country compared to EU 27.

Source: Own elaboration from various peer reviewed, grey literature and national database sources. The Mediterranean countries not listed in the graph are not reported due to the absence of data<sup>71</sup>.

<sup>71</sup> Information sources per country

<a href="#">Algeria</a>	<a href="#">Croatia</a>	<a href="#">Egypt</a>	<a href="#">European Union</a>	<a href="#">France</a>	<a href="#">Greece</a>	<a href="#">Israel</a>	<a href="#">Italy</a>	<a href="#">Jordan</a>	<a href="#">Malta</a>
<a href="#">Bosnia and Herzegovina</a>	<a href="#">Montenegro</a>	<a href="#">Morocco</a>	<a href="#">North Macedonia</a>	<a href="#">Palestine</a>	<a href="#">Slovenia</a>	<a href="#">Spain</a>	<a href="#">Tunisia</a>	<a href="#">Türkiye</a>	

These forecasted figures suggest that across the EU and the Mediterranean a total of around 10 million green jobs could be generated by 2030. Across the Mediterranean, from the available modelled data, a total of 4.6 million are expected to be created. The graph indicates that there is a high potential for growth in green jobs in the Southern Mediterranean region and the Balkans. As an example, Algeria showcases significant potential of growth in this regard with an estimated 1.4 million jobs by 2030 according to a study by the United Nations Economic Commission for Africa Office for North Africa<sup>72</sup>. This growth is expected specifically in five main sectors of: renewable energy, energy efficiency, water management, waste treatment and recycling, environment-related services and management of green zones. A recent GIZ study (2023)<sup>73</sup> in Jordan estimates that there could be a total of 1 million green jobs by 2030 in the diverse sectors of agriculture; manufacturing; energy; 'sustainable' water supply and the water and wastewater sectors; transport and tourism.

This data showcases that developing and transition nations are sitting with a unique potential to transition towards green and circular economy while creating a significant number of job opportunities as different economic sectors transition to a green circular economy.

However, the absolute number of green jobs that are forecasted should be considered together with the total number of employable people within each country. Considered in this manner, the Southern Mediterranean countries continue to show the high potential of job transition. The modelled data shows that Tunisia could potentially transition to have the highest percentage of green jobs per total jobs, followed by the EU, Italy and Jordan.

---

<sup>72</sup> [https://archive.uneca.org/sites/default/files/uploaded-documents/SROs/NA/AHEGM-ISDGE/egm\\_ge\\_algeria.pdf](https://archive.uneca.org/sites/default/files/uploaded-documents/SROs/NA/AHEGM-ISDGE/egm_ge_algeria.pdf)

<sup>73</sup> <https://www.giz.de/en/downloads/giz2023-en-jordan-selected-green-job-assessment.pdf>



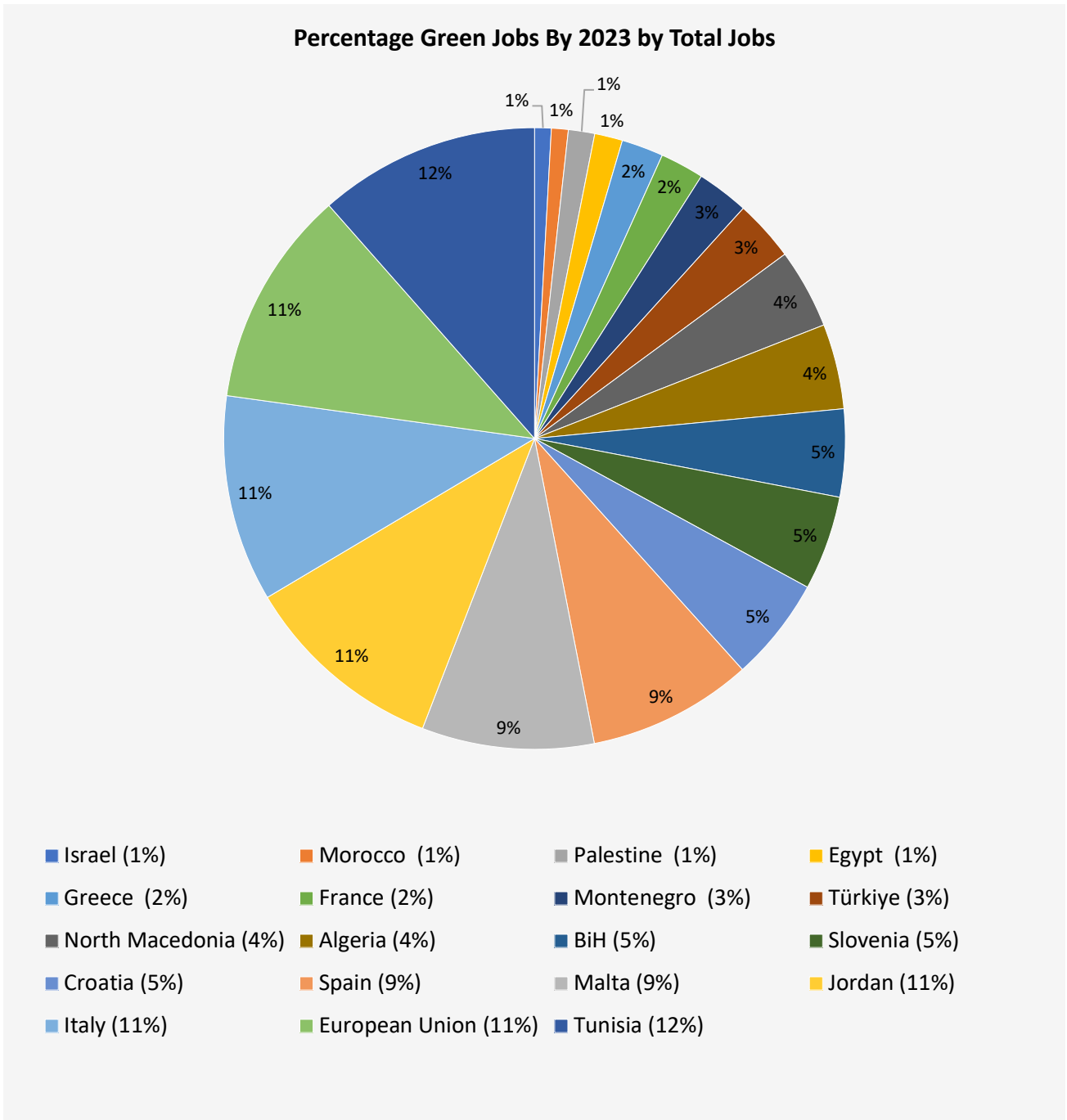


Figure 7 Percentage green jobs by total jobs available (2030).

Nevertheless, Jordan prominently stands out in both scenarios, demonstrating a substantial prospect for creating green jobs, both in absolute numbers and as a percentage of total employment. This underscores Jordan's significant potential to transition to a green circular economy. Given that Jordan sits with the highest percentage of NEETS in the 15 to 25 year old category, the potential to shift to a green circular economy creating new green jobs provides a clear path for Jordan that is further justified in Box 27.

The potential for greening the Jordanian economy in key sectors, including water and waste, energy, transport, agriculture, manufacturing, and tourism, could benefit from increased capital investments in green technologies. Green investment promotion is identified as pivotal for creating and sustaining green jobs, facilitating a broader transition to a green economy in Jordan. The current level of green employment in these sectors ranges from 74,135 to 95,060 jobs, with transport and agriculture leading in green job numbers.

A recent GIZ report (2023) <sup>73</sup> suggests that national strategies and sector-specific green initiatives can boost employment beyond the business-as-usual scenario. Simulated scenarios with a macroeconomic model reveal that direct investments in the green economy can yield economic benefits and contribute to environmental preservation and restoration. This study, aligned with Jordan's Economic Modernisation Vision (EMV) 2023-33 and utilising the International Labour Organisation *GAIN* methodology, marks the inaugural assessment of the potential for green job development in the country. The EMV aspires for Jordan to become a "low-carbon, resource-efficient, and socially inclusive nation," targeting the creation of one million green jobs by 2033. To realise this vision, the establishment of a conducive business environment for green economic growth and strategic policy interventions prioritising employment effects are deemed crucial. Jordan, with political commitment and comprehensive policy reforms, is therefore well-positioned to leverage the green economy for employment opportunities.

#### Box 27 Jordans potential for green jobs in 2030

The European Union (EU) is prioritising the transition to digital and green economies, mobilising funds for economic transition and retraining and reskilling in green skills, with an emphasis on international collaboration to promote mutual learning and skill improvement. The Euro-Med region necessitates a shift to a green economy by adapting skills and job profiles, with a rising demand for low, medium, and high-skilled occupations. There are challenges to achieve this transition from specialised training, integrating sustainability into diverse cultures, and addressing disparities in access to education and training programs. Recognising the potential of woman and the younger generation is essential for steering the Mediterranean region towards a more sustainable economy, emphasizing the importance of inclusivity and tailored educational initiatives for the workforce to thrive in a green economy. Taking advantage of the new jobs that will be created through this transition, the prediction is that the Southern Mediterranean countries are well positioned to be at the forefront of the green job evolution with prominent examples of initiatives already taking place. Chapter 5 dives into examples of priority action areas and the Mediterranean ambitions for 2030 and 2050 providing up-to-date examples that showcase inclusivity with the potential for women and the younger generation to make this shift.

## CHAPTER 5

# Examples of priority action areas and Mediterranean ambitions for 2030 and 2050.



A key to guiding the present actions in the transition towards a green and circular economy in the Mediterranean is through the foresights and ambitions that are laid out in the long-term horizons of 2030 and 2050. This chapter explores the priority action areas of sustainable food systems; circular economy in tourism; green cities and green islands; green and circular manufacturing; sustainable and smart mobility; zero pollution and the clean, affordable, green energy transition.

In each section we provide the Euro-Mediterranean challenges that each sector is currently facing before providing prominent examples of local, national or regional projects and initiatives that are overcoming the challenges and showcasing the way forward in transitioning each of these sectors towards a green circular economy that can provide the required change within these long-term horizons.



## Sustainable Food Systems

SDG 12.3 sets out the goal to “halve per capita the global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses” by 2030 (United Nations, n.d.). Achieving this target would bring significant reductions in greenhouse gas emissions, as using food more efficiently would decrease land conversion for extra food production, reduce fertilizer use and methane emissions coming from food in landfills (Searchinger et al., 2019; Willett et al., 2019). Additionally, meeting SDG 12.3 has been identified as a critical action to achieve a sustainable food future, which would also contribute to reaching SDGs 1 – no poverty, 2 – zero hunger, and 3 – good health and well-being (Flanagan et al., 2019).

However, current food systems (both from land and sea) are not on track to deliver the target of SDG12.3 on time. Food systems are currently unsustainable and not resilient to crises. They use up great quantities of natural resources, are drivers of environmental degradation and biodiversity loss, and do not ensure food security and adequate nutrition. Furthermore, they do not provide fair economic returns for all stakeholders, and they are failing to ensure decent livelihoods to most part of the global population in the face of a climate crisis that brings increasing disparities (European Commission, n.d.; Food System Summit Dialogues, 2021).



Food loss and waste has a greater impact on Southern and Eastern Mediterranean countries (SEMCs) due to the scarcity of natural resources, especially of water, and the pressing demand for agriculture production (FAO & CIHEAM, 2016). The agricultural intensification, together with the effects of a changing climate, is bringing an increased use of irrigation and nitrogen fertilization, which causes soil degradation, water scarcity, and increase in GHGs emissions, among others (Papamichael et al., 2022). Thus, minimising food waste in the Mediterranean region would enhance food nutrition and security, alleviate the strain on water and other natural resources, and increase food availability (FAO & CIHEAM, 2016).

To achieve the food system SDGs and tackle the issue of food loss and waste, the EU Farm to Fork strategy aims to redesign the current food systems into healthier, more environmentally friendly, and just systems. With circularity in mind, this strategy proposes both regulatory and non-regulatory initiatives to accelerate the transition into a robust and Mediterranean sustainable food system (European Commission, 2020a).

In the Southern and Eastern Mediterranean, circular economy has been identified as both necessary and an opportunity for sustainable development. Applying it to the agri-food sector has the potential to reduce food losses, improve livelihoods by reducing costs of goods and services, to decreasing environmental pressures, and enhancing resilience. In the Mediterranean region, the food consumption and production patterns are changing alongside demographic changes, increased urbanization, and globalization. This is causing the region to face exceptional and interrelated environmental, economic, and social challenges that directly affect the livelihoods of the Mediterranean people (Food System Summit Dialogues, 2021). The region is witnessing shifts in diet and nutrition, with the traditional Mediterranean dietary pattern gradually declining over the past five decades (Berry, 2019). The Mediterranean Diet is still dominant but the adoption of a western-style diet is causing significant environmental repercussions in the area. These recent environmental changes could potentially undermine the capacity of the local food system to ensure food and nutrition security (Verger et al., 2018). A recent publication is tackling this challenge head-on, entitled the Mediterranean Food: Our legacy, our future. A Resource Handbook (see Box 28)

This publication was co-created by Mediterranean NGOs from Greece, Egypt, Morocco, Italy and Palestine in the context of a project awarded by the Anna Lindh Foundation to contribute to a continuous intercultural dialogue for sustainability through fostering the understanding and competences related to the various aspects and dimensions of the Mediterranean food and diet. The handbook is addressed to people aged from 15 years old, and it can be used in a wide spectrum of audiences and in formal as well as informal learning settings and awareness raising initiatives. It describes the evolution of Mediterranean cuisines and the characteristic food products of the region, the current dietary trends, the challenges related to food consumption (i.e. food waste & loss) and production (i.e. biodiversity risks, pollution, resource depletion, etc.) as well as the sustainable options (tools, management approaches, policies, practices, etc.) to address these challenges. The handbook is available in several languages.

Box 28 Mediterranean Food: Our legacy, our future. A Resource Handbook<sup>74</sup>

Furthermore, the Mediterranean agro-food sector is suffering from significant sectorial fragmentation, rural poverty, limited investment capacity for rural entrepreneurship, and barriers regarding EU food security regulations for non-EU countries. The ENI CBC Med Project "Sustainable Networks for Agro-food Innovation Leading in the Mediterranean" (MedSNAIL) formed by 7 partner countries (Spain, Lebanon, Palestine, Tunisia, Malta, Jordan, and Italy), is a key example how these matters can be addressed by promoting small-scale traditional agro-food value chains with the aim of providing greater business prospects and advancing socio-environmental sustainability (MedSNAIL, 2023).

---

<sup>74</sup> <https://medies.net/mediterranean-food-our-legacy-our-future/>

The heritage of the Mediterranean diet, shared by the countries of the region, has the potential to maintain and transform the food systems into more sustainable ones through bridging the gap between food consumption and production (Food System Summit Dialogues, 2021). The current partnership between FAO-UfM-CIHEAM-PRIMA-One Planet, united together at the 2021 UN Food Systems Summit, is an innovative initiative showcasing the importance of “creating collaborative and science-based pathways that lead to transformative food systems in the Mediterranean”. The dialogues held at the Summit set the stage for the development of the *Platform for Sustainable Food Systems in the Mediterranean* (SFS-MED), a multi-stakeholder initiative that promotes collaborative action among different actors (FAO, 2021). This network focuses on strengthening knowledge and building capacity on sustainable food consumption and production in Mediterranean countries, as well as promoting regional cooperation and dialogue (One Planet Network, 2022). An interactive tool launched in 2023 compiles expert knowledge about a series of catalytic levers for agrifood systems transformation<sup>75</sup>. These levers include: (i) Urban Food Waste Management and Circular Economy; (ii) Increasing Resilience through the Water–Energy–Food–Ecosystems (WEFE) Nexus; (iii) Linking innovation and SMEs; (iv) The Mediterranean diet for more sustainable consumption; (v) Women as Key Players in the Green Transition; (vi) Green Growth; (vii) Blue Transformation and (viii) Integrated Land Use Planning. Through the interactive tool, stories from the ground are shared about the people working to transform the region's agrifood systems, serving as inspiration for change. The majority of the information was gathered during a series of technical webinars curated by the SFS-MED Platform between 2022 and 2023<sup>76</sup>.

These initiatives are transforming the Mediterranean food systems to recover the uniqueness of the Mediterranean diet while transforming the sector towards sustainability and circularity.

---

<sup>75</sup> <https://www.fao.org/documents/card/en/c/CC8220EN>

<sup>76</sup> <https://9zciu.r.a.d.sendibm1.com/mk/cl/f/sh/OycZvHuFo1kTbkO3DB6UCTW1/TmWYVUIpE9jl>



## Green Circular Economy in Tourism

Tourism plays a vital role in boosting employment and GDP which further assists less developed regions to advance. Tourism in the Mediterranean Basin is integral to the coastal economies, contributing to over 70% to Production Value and Gross Value Added (UNEP/MAP, 2017). However, it comes with substantial environmental consequences and strains on the local resources, resulting in some detrimental consequences. This includes land use, water, energy, and food consumption, along with significant waste production and environmental issues such as traffic congestion, noise, air pollution, and CO<sub>2</sub> emissions. These issues are exacerbated by our current linear economic model, which calls for the need to shift to a green circular economy model in the tourism sector (Rodríguez et al., 2020).



Apart from these already existing challenges to the tourism sector, the COVID-19 pandemic severely impacted global tourism, resulting in a 74% drop in international tourist arrivals in 2020. The Mediterranean region was particularly affected where 400 million arrivals in 2019 reduced to 88 million in 2020, resulting in a 78% decrease (Plan Bleu, 2022). Despite this, industry experts predict a recovery, with international passenger numbers expected to surpass pre-pandemic levels by the end of 2023 (Petrick et al., 2021). However, the industry must undergo a sustainable and equitable recovery post-COVID-19. In such, in 2021, within the context of the global tourism sector recovering from the COVID-19 crisis, a group of leading tourism organisations called for the commitment of a decade of climate action in tourism during the Glasgow Declaration. Through specific climate action plans, the signatories are aiming to cut global tourism emissions by at least half over the next decade and to achieve zero emissions by 2050 (UNWTO, n.d.-b, 2021). The declaration states that “A just transition to Net Zero before 2050 will only be possible if tourism’s recovery accelerates the adoption of sustainable consumption and production and redefines our future success to consider not only economic value but rather the regeneration of ecosystems, biodiversity and communities.” (Glasgow Declaration, 2021).

The objective of this declaration is to guide and coordinate efforts to address climate change within the tourism industry, involving various parties such as government and institutional

bodies, donors and financial institutions, international organisations, civil society, the private sector, and academia (Glasgow Declaration, 2021).

In the Mediterranean, post COVID-19, the tourism sector stands at a crossroads, with a choice between sustainable and inclusive practices or a return to unsustainable mass tourism. The pre-pandemic model was seen as unsustainable which was contributing to environmental degradation. The pandemic has necessitated a digital and sustainable transformation, emphasising skills development and a green and blue recovery (UNWTO, 2021).

Circularity plays a pivotal role within the context of sustainable and inclusive practices and indeed aligns to the Glasgow Declaration on Climate Action in Tourism, facilitating the enhancement of both mitigation and adaptation initiatives among tourism stakeholders. The circular economy provides a chance to amplify the positive sustainable development impacts of tourism. This involves creating well-being for the local population by generating new employment opportunities and fostering more inclusive local value chains. As a result, a symbiotic relationship is established between businesses and the communities they operate in (UNWTO, n.d.-a).

Plan Bleu's "State of Play of Tourism in the Mediterranean," aids in this process by guiding policymakers toward an intelligent, environmentally conscious, and inclusive model (Plan Bleu, 2022). One of the key strategic directions of the roadmap is to ensure resilient infrastructure and connectivity. This points towards infrastructure (such as hotels, airports, resorts, ports, etc.) developed by or for tourism activities as critical assets with large environmental impacts and high vulnerability to climate events. Therefore, greening, retrofitting, or repurposing existing infrastructure are seen as essential actions as part of the roadmap to reduce the tourism climate footprint and to improve environmental ecosystems. Connectivity (digital, ecological, social, etc.) also contributes to resilience and future-proofing the industry and the communities.

The shift towards green circular tourism in the Euro Med can take many forms, from policies that encourage skills development, financing research and innovation, involving local communities in planning, promoting ecological and social certifications, and investment in ecosystem restoration (High Level Panel for a Sustainable Ocean Economy, 2020). Directed investments in the tourism sector can be strategically guided through the implementation for example of Nature-based Solutions (NbS) and eco-designed infrastructure, favouring the re-naturalization of coastal areas over urbanization, such as dunes replacing buildings along coasts (Plan Bleu, 2022). Revenue generated from tourism, encompassing a tourist tax, holds the potential to contribute to the preservation, safeguarding, and promotion of cultural and natural resources. This not only amplifies the allure of destinations but also acts as a buffer against the adverse impacts of tourism. Crucial for establishing resilient investments in tourism infrastructure, self-sustaining structures that autonomously manage energy and water needs will be imperative for future-proofing the industry. The insurance and finance sectors can also play a key role by promoting the investment in blue bonds for ecosystem restoration, finance the retrofitting of facilities, and supporting green infrastructures.

Simultaneously, the maritime industry has been encouraged by the European Commission to retrofit vessels, invest in smart monitoring, and advocate for an Emission Control Area (ECA) in the Mediterranean (European Commission, 2021). In parallel, tour operators, hotels, and resorts are recommended to implement circular waste management systems, develop organic and local food systems, and educate visitors and staff on sustainable practices (High Level Panel for a Sustainable Ocean Economy, 2020). These comprehensive policies, coupled with the integrated approach, collectively pave the way for a more sustainable and resilient green and circular Mediterranean tourism sector.

For the Mediterranean tourism sector to stay competitive and align with these sustainable practices, there is a need for the integration of digital, cultural, and social practices across the entire tourism value chain and ecosystems. Achieving this necessitates collaborative efforts, involving education and cooperation with both tourism and non-tourism entities, including those overseeing critical infrastructure and resources such as transportation, water, energy, information technology, education, and waste management. Active participation of local stakeholders, who are the primary users of these resources, in all planning and management decisions becomes paramount. This inclusive approach ensures shared advantages and fosters governance that is participatory and embraces diverse perspectives. A prime example of engaging with tourists in the need to change to circularity models in the tourist sector is seen in the project WAT'SAVEREUSE<sup>77</sup>. The project is led by Euroregion Pyrenees Mediterranean and funded by the EU LIFE program, focusing on raising awareness in the tourism sector regarding water-saving and reuse legislation in the Mediterranean. Through various communication campaigns across 3 Mediterranean regions (Catalonia, Balearic Islands, Occitania), the project reached around 14 million tourists, 15 municipalities, 810 water suppliers and 31 institutions. Through these communication campaigns and further actions of promoting water reuse in the tourism industry, implementing water reuse solutions and enhancing water governance has resulted in a reduction of water usage of around 30% in these 3 regions. Cooperation between public administrations and tourists has also been enhanced through the creation of “community water action groups” by the municipalities in order to mitigate the environmental impact of tourism on the Mediterranean Coast.

Further sustainable tourism initiatives such as the Interreg-Med funded DESTIMED PLUS<sup>78</sup> project building on from the Mediterranean Eco-tourism Network (MEET)<sup>79</sup> is improving the levels of integration between regional tourism and conservation policies in Mediterranean protected areas through the creation of ecotourism itineraries which are developed using a collaborative approach, both locally and regionally. In the framework of the DESTIMED PLUS project, the Catalan tourist company, Trescàlia, recently earned the EUROPARC STAR Award in the Contribution to Conservation category for its ecotourism initiative, "Walking on the Landscape," a 7-day itinerary developed in collaboration with La Garrotxa Volcanic Zone Natural Park and Turisme Garrotxa, promoting sustainable exploration of Catalonia's natural wonders while minimising the ecological impact.

The InCircle project<sup>80</sup> stands out as a further noteworthy sustainable tourism initiative in the Mediterranean, championing circular economy tourism principles in the city of Himara, Albania. The Himara Municipality showcased that through investments in circular mobility, such as mountain bike lanes, and inclusive decision-making that involved all relevant stakeholders, has led to a 15% increase in bike usage and a 5-10% reduction in traffic congestion illustrating a win-win proposition for both tourists and locals. For its part, the REBOOT MED<sup>81</sup> project has aligned to these sustainability goals by promoting blue economy tourism in six WestMed countries (France, Italy, Spain, Tunisia, Morocco and Mauritania), aiming to foster partnerships, recommend policy pathways, and to create eco-friendly tourism packages for the benefit of Mediterranean populations and tourism ecosystems. The project launched a call for disruptive proposals in the field of eco-tourism and blue economy receiving 39 proposals and funding 19

---

<sup>77</sup> <https://lifewatsavereuse.eu>

<sup>78</sup> <https://destimed-plus.interreg-med.eu>

<sup>79</sup> <https://www.meetnetwork.org>

<sup>80</sup> <https://incircle.interreg-med.eu>

<sup>81</sup> <https://www.reboot-med.eu/en/home/>

projects across the Mediterranean, that focus on increased awareness, cross-border cooperation, digitalisation, and a responsible circular economy in the maritime and coastal tourism sector.

The commitment to green circular tourism resonates not only through overarching initiatives like the European Green Deal and coastal policies but it is also driven by regional Mediterranean efforts such as WestMed and the UfM's Blue Economy platform (European Commission, 2021). The CPMR Intermediterranean Commission (CPMR-IMC) further advances this commitment, particularly through its "Culture & Sustainable Tourism Task Force," highlighting regional involvement in initiatives like the EU Transition Pathway for Tourism and its newly established expert group. Additionally, the CPMR-IMC tracks progress on the Glasgow Declaration and the formulation of climate action strategies for the tourism sector (CPMR Intermediterranean Commission, 2023). Further to the commitment in transforming the tourism sector, the UfM published an operational handbook in 2022 on recovering and regenerating the tourism sector following the COVID-19 pandemic (See Box 29).



The COVID-19 pandemic has severely slowed development dynamics in the Mediterranean, especially in the tourism sector. Governments in the region have implemented measures to support the tourism industry and are preparing recovery plans, emphasising the need for more resilient and sustainable coastal and maritime tourism in the face of the ongoing crisis. The themes for the improvement of the capacity development highlight in the report include:

## Governance

Strengthening a multilevel approach through the involvement of key players at international and national/local levels.

## Improvement/Building Capacity/Diversification of Skills

Focusing on digital skills to diversify ways territories are visited and enable alternative forms of travel.

Public-Private Partnership

Impressing a long-term vision on initiatives and facilitating the identification of common territorial needs for sustainable tourism.

### Development of Synergies and Complementarities

Understanding tourism's relations with other sectors and mobilizing them to contribute to its long-term sustainability.

### Involvement of Territories and Local Communities

Emphasizing the inclusion of young people and women to enhance employability and benefit countries and the entire region.

### Support for Collection, Sharing, and Updating of Tourism-Related Data:

Essential for assessing strengths and weaknesses in local offers and informing development strategies.

### Support for Acceleration of Innovation:

Aiming to redefine sustainable business models, products, and services for local businesses and socio-economic actors in the tourism sector.

Box 29 Social and economic regeneration of the Mediterranean after the crisis: Shared methods and tools for relaunching a sustainable post COVID-19 tourism model (UfM Publication)<sup>82</sup>

Overall, green circular economy is crucial for fostering a more sustainable tourism sector. The tourism industry holds a substantial role within the global economy and has the potential to contribute to all 17 SDGs, particularly goals 8,12 and 14 – inclusive and sustainable economic growth; sustainable consumption and production; and sustainable use of oceans and marine resources - where tourism has been included as a key target (Rodríguez et al., 2020).

<sup>82</sup> [https://ufmsecretariat.org/wp-content/uploads/2022/03/PRESENTAZIONE\\_low.pdf](https://ufmsecretariat.org/wp-content/uploads/2022/03/PRESENTAZIONE_low.pdf)



## Green Cities and Green Islands

Currently, cities account for nearly two-thirds of the global energy consumption, 80% of GHG emissions, and 50% of global waste generation (OECD, 2020). According to the OECD, by 2050 cities will accommodate 70% of the global population. Cities and regions are central places of decision-making with regards to economic growth, social welfare and environmental benefits (AIT et al., 2022). Hence, they represent an opportunity to change the production and consumption paradigm into a green circular one that promotes environmental and social sustainability (OECD, 2020). Moreover, cities are fertile grounds for innovation with regards to consumption and production patterns, holding the potential to host initiatives such as urban living labs or urban farming, amongst others (AIT et al., 2022).

The Circular Cities and Regions Initiative (CCRI)<sup>83</sup> was launched in 2020 as part of the EU Circular Economy Action Plan to implement the circular economy in Europe. The initiative aims to support Europe's green transition by enhancing collaboration between various projects and initiatives, promoting knowledge exchange and dissemination, and overall supporting stakeholders throughout Europe's cities and regions. By accompanying circular economy at a local and regional level, the CCRI contributes locally to the European Green Deal (European Commission, 2019). Numerous European cities and regions have established their distinct Circular Economy Action Plans (CEAP) to establish the groundwork for sustainable circular systems and to develop collaborative, community-driven innovation initiatives within their respective areas (AIT et al., 2022).

Furthermore, the European Green Deal introduced the concept of Circular Systemic Solutions (CSS) as a cross-sectoral demonstration project focused on implementing a circular and climate neutral economy within a geographically cohesive area, involving pertinent stakeholders. The CCRI aims to offer customised assistance to cities and regions committed to execute their respective CSSs (AIT et al., 2022).

Within the spirit of the Circular Systemic Solutions in the Mediterranean region, the ENI CBC Med project SOLE (High Energy efficiency for the public stock buildings in Mediterranean)<sup>84</sup> (2020 – 2023) addressed the significant energy consumption of the building sector in the Mediterranean. The project focusses on energy-efficient rehabilitation of public buildings in seven Mediterranean countries. The project has increased renewable energy use, reduced CO<sub>2</sub> emissions, and achieved economic savings through behavioural change initiatives and pilot actions. According to Lebanon's Ministry of Environment, SOLE's broader objectives provided recommendations for Mediterranean-level policies, where results were integrated into existing policies, while delivering cross-border recommendations for strategic green building rehabilitation. The project provided results to public authorities, energy agencies, construction sector businesses, and the scientific community, ultimately contributing to sustainable energy policies and practices in the Mediterranean region.

In a comparable context, the ENI CBC Med funded project Sustainable MED Cities<sup>85</sup> (2021 – 2023) was a capitalisation project involving different stakeholders from Spain, Italy, Tunisia, Lebanon,

---

<sup>83</sup> <https://circular-cities-and-regions.ec.europa.eu/#:~:text=The%20CCRI%20is%20a%20collaboration,Circular%20Economy%20Action%20Plan%202020.>

<sup>84</sup> <https://www.enicbcmed.eu/projects/sole>

<sup>85</sup> Co-funded by the European Union's ENI CBC MED Program



Jordan, and Greece that equipped municipalities in the Mediterranean region with a set of tools and approaches to transition to a green circular economy. The project produced the Sustainable MED Cities assessment system<sup>86</sup> that enhances urban sustainability through a collaborative open-source platform for stakeholder engagement, an assessment platform for sustainability evaluations at various scales, and a training system offering multilingual training materials and online courses, with pilot projects in Southern Mediterranean cities including Sousse (Tunisia), Moukhtara (Lebanon), and Irbid (Jordan) measuring the sustainability of specific buildings and neighbourhoods. These resources will continue to empower the cities to formulate impactful policies, strategies, and action plans aligned with the Mediterranean Strategy for Sustainable Development 2016-2025.

Mediterranean islands are some of the most at risk areas in the Mediterranean in terms of the impacts of climate change (Hilmi et al., 2022). In mitigating these risks and following the steps of El Hierro (Spain) – the first self-sustainable island, and Samsø (Denmark) – the world’s first renewable energy island, Tilos (Greece) is the first autonomous renewable energy green island in the Mediterranean (Notton et al., 2017; *The Sustainable Island*, n.d.; UNFCC, 2022). This was developed within the TILOS Horizon 2020 project<sup>87</sup> where it achieved several milestones, including the establishment of the first battery-based Hybrid Power Station, the deployment of a smart metering and Demand-Side Management (DSM) platform and the introduction of the first solar-based Electric Vehicle (EV) charging station. These innovations not only impacted the local energy market but also contributed to the evolution of Greek regulations and legislation on Hybrid Power Stations, demonstrating the potential for replicable solutions in island regions and serving as a model for community engagement and future advancements in the TILOS ecosystem (Notton et al., 2017).

Broader regional initiatives such as MedCities<sup>88</sup>, the network of 73 local authorities encompassing the Mediterranean region, strives to foster collaboration space among cities for undertaking meaningful urban projects and initiatives of green circular economy projects and promoting good practices, knowledge uptake and upscaling across the Mediterranean (MedCities, 2021).

These initiatives underscore the collective commitment to foster green cities and green islands within sustainable urban development, sharing best practices, and advancing green and circular economy initiatives throughout the Mediterranean region in alignment with the 2030 Agenda for Sustainable Development.

---

<sup>86</sup> [https://medurbantools.com/portfolio\\_page/sustainable-med-cities-decision-making-methodology/](https://medurbantools.com/portfolio_page/sustainable-med-cities-decision-making-methodology/)

<sup>87</sup> <https://cordis.europa.eu/project/id/646529>

<sup>88</sup> <https://medcities.org>

## Green and Circular Manufacturing

Across the Euro-Med region, it is evident that while green and circular manufacturing in the region is making considerable strides, challenges remain regarding the significant generation of CO<sub>2</sub> emissions, particularly as countries pursue increased industrialisation. About 80% of greenhouse gas emissions stemming from manufacturing processes manifest as CO<sub>2</sub> emissions (SWITCH-Med, 2017). Despite notable improvements, there is an urgent need to markedly decrease these emissions. Structural changes and product diversification within the manufacturing sector are crucial to achieve this goal. This highlights the urgency of transitioning towards green circular manufacturing and to establish a carbon-neutral economy in the Mediterranean region. Indeed, green manufacturing involves the adoption of innovative production methods, aligning with the imperative for sustainability and environmental responsibility. Green manufacturing is guided by the principles of the 5 R approach: "repair, reuse, refurbish, rebuild, and recycle." Based on a product life cycle thinking, this strategy seeks to minimise waste coupled with a smarter and more sustainable use of primary raw materials, water and energy (Haleem et al., 2023).



The Regional Summary of Policy Recommendations to Support the Development of Green and Circular Businesses in the Mediterranean, which forms part of the Implementation of the Barcelona Convention - COP21 Decision IG.24/13 on the "Development of a Set of Regional Measures to Support the Development of Green and Circular Businesses and to Strengthen the Demand for more Sustainable Products" provides recommendations on overcoming the manufacturing challenges (SCP/RAC, 2021). The recommendations highlight that on the one hand, direct challenges impede the growth of green and circular businesses, particularly during the start-up phase of circular projects where developing a robust economic business case proves to be particularly challenging. While on the other, it relates to the legislative framework that may not consistently support innovative business models incorporating new types of product-service systems. Moreover, entrepreneurs in the green and circular sector often struggle with a lack of strategic or technical knowledge, practical tools, methodologies and data to implement eco-innovative solutions such as eco-design. Obtaining finance for these innovative approaches can also be challenging as there is often a significant gap in knowledge and experience within the financial sector regarding the necessity and benefits of a circular economy. Inadequate collaboration within supply chains and between sectors, is often highlighted as limiting the demand for green and circular products and services.

In the realm of institutions and politics across the Mediterranean region, the main obstacles encompass challenges in optimising institutional structures that could benefit from enhanced coordination of circular economy initiatives. This highlights the opportunity for collaborative efforts across various ministries, policies, and sectors to overcome these challenges in optimisation. Complex administrative procedures for obtaining environmental permits, especially for waste-related installations, further add to these challenges. Moreover, existing taxation structures that favour linear practices hinder the widespread adoption of circular approaches. Lastly, the emigration of a skilled workforce creates a gap in technical and managerial human resources, which are crucial for the successful implementation of circular economy initiatives (SCP/RAC, 2021).

In its pursuit to mitigate the environmental footprint associated with production and consumption, there is a distinction on the work done in industries and manufacturing and that of green entrepreneurs. In this sense, green manufacturing intricately connects to eco-design, a holistic approach that encompasses the entire lifecycle of a product or service. This comprehensive perspective includes considerations for design, raw material procurement, production processes, packaging and distribution, sales and marketing, product use, and end-of-life management. (Mosangini & Tunçer, 2020)

The European Commission's New Circularity Action Plan (European Commission, 2020) emphasises that enhancing circularity in production processes also involves establishing a reporting and certification system led by industry. This is essential to boost environmental accountability throughout value chains and facilitate the assessment of circular economy performance. Another key strategy highlighted in this Action Plan to promote circularity in production processes involves fostering the development of a sustainable and circular bio-based sector. Indeed, circular bio-based industries play a crucial role in resource preservation by replacing non-renewable fossil resources with waste and responsibly sourced biomass for the manufacturing of industrial goods. Additionally, promoting the widespread adoption of digital technologies for tracking, tracing, and mapping resources is identified as another pivotal enabler advancing circularity in production schemes as it enables the monitoring of material flows. The New Circularity Action Plan underscores the critical need to encourage the integration of green technologies through a robust environmental technology verification system. This entails the implementation of evaluation processes by verification organisations employing internationally recognised certified methods to assess the performance of green technological solutions.

In addition to advancing circularity in production processes, it is essential to encourage consumer demand for green products and services. This can realistically be achieved through assisting green and circular businesses in expanding their presence in global markets, which happens to be crucial when local markets fall short of meeting domestic demand (SCP/RAC, 2021). A third pathway mentioned in the SCP/RAC policy recommendations refers to the introduction of VAT reductions or exemptions for second-hand goods and repair services. These types of products and services undeniably play a vital role in promoting the circular economy by preventing waste and generating extra value and economic opportunities.

In this regard, the SWITCH-Med program plays a vital role in supporting the development of green circular manufacturing and sustainable production in the Southern Mediterranean and undertakes ground-breaking work involving a wide range of stakeholders in target countries including Algeria, Egypt, Israel, Morocco, Palestine and Tunisia. SWITCH-Med leverages UNIDO's Transfer of Environmentally Sound Technology (TEST) integrated approach based on combining the Cleaner Production Assessment (CPA) methodology, the core elements of an Environmental Management System (EMS) and an Energy Management System (EnMS), which entails exploring

innovative eco-efficient technologies and implementing a supportive information system for effective material and energy flow management, based on Material Flow Cost Accounting (MFCA). In addition to building on the TEST approach, SWITCH-Med focuses on boosting the market of sustainable services and products by providing start-ups and entrepreneurs with training to build skills in design, business planning, marketing, and financing for sustainable products and services. The program also offers capacity-building to enhance resource efficiency in small and medium-sized enterprises within the industry, collaborates with policymakers to create a regulatory framework that supports the market for sustainable products and services, empowers civil society to drive innovative solutions addressing environmental challenges, and establishes an Action Network of stakeholders to connect with similar initiatives and networks in the region and scale-up current undertakings (SWITCH-Med, 2014-2019).

Green entrepreneurs play a significant role in driving the transition in green circular manufacturing. In this context, eco-innovation emerges as a powerful driver for industry transformation towards green circular manufacturing while addressing the challenges at the process, product and system levels.

In this regard, the ENI CBC MED project GREENinMED (2019 – 2023) seeks to develop new products and services for efficient use of water and energy and to reduce consumption by 10% in the hotel industry, based on eco-innovative products such as seawater air conditioning, water and energy-saving devices for spas, garden irrigations and industrial cold generation. Notably, the GREENinMED supports the eco-innovation capabilities of Mediterranean SMEs in the hotel sector by fostering innovate ecosystems, facilitating cross-border learning, and providing dedicated financial assistance (ENI CBC MED – GREENinMED, 2019).

Facilitating the upscaling of these initiatives or projects may involve employing tools such as certification/verification programmes or labels, encouraging strategic collaborations between Mediterranean businesses or trade agreements etc. Another key enabling factor tackling consumption patterns is the promotion of awareness-raising on circular practices among consumers, with the aim to boost sustainable consumption patterns and increase the demand for green and circular products or services that are based on waste prevention, reuse and repair. In this frame, the Interreg Green Growth Community provides a digital tool to enhance the sharing of project results and materials to foster the uptake of green growth practices. Its primary function is to facilitate the development of new partnerships and synergies among institutions and stakeholders, fostering collaboration among existing members and welcoming new participants to the Community.

There have been significant strides in green and circular manufacturing in the Euro-Med region, particularly in relation to the urgent need to reduce CO<sub>2</sub> emissions. The importance of structural changes, product diversification, and transitioning towards a carbon-neutral economy are very evident. The challenges of green and circular manufacturing include barriers in policy, financing, and knowledge, as well as the need to encourage consumer demand for green products. Initiatives and projects detailed above illustrate the practical solutions, while Interreg Green Growth Capitalisation Platform and SWITCH-Med stand out as comprehensive approaches to upscale and capitalise on sustainable production and green circular manufacturing in the Mediterranean.

## Sustainable and Smart Mobility

The challenge of mobility in the Mediterranean region is significant, as it constitutes a fundamental aspect in the evolution of human-made systems. The efficient implementation of new mobility systems is essential for enhancing the effectiveness of urban and metropolitan structures and ensuring the sustainability of transport services amidst increasing territorial load, environmental considerations, and climate change (Battarra & Mazzeo, 2022). Consequently, effective control and innovative management of various functional components within metropolitan systems, including mobility, dwellings, production, and tourism, become imperative, posing a technical and organisational challenge that both Northern and Southern coastal Mediterranean countries need to overcome.

The European Commission's Sustainable and Smart Mobility Strategy<sup>89</sup> is focused on precisely this point in redefining the transport sector to achieve a balance between economic benefits and environmental concerns. The strategy acknowledges the critical role of mobility in people's daily lives and its impact on both the economy and the environment. It aims to address the challenges posed by emissions, pollution, congestion, and safety in the transport sector. The primary goal is to significantly reduce emissions and to make the transport system more sustainable. To achieve this, the strategy emphasises the importance of digitalisation, automation, and transitioning to zero-emission vehicles and fuels. It also outlines specific targets for 2030 and 2050, including a substantial increase in zero-emission vehicles and the expansion of sustainable transport networks. The strategy aligns with the European Green Deal and places sustainability and smart mobility at the forefront of the EU's transport agenda<sup>90</sup>



The concept of sustainable consumption and production extends its influence to various sectors, and notably, it plays a crucial role in the transportation and mobility sector. This sector is intricately linked with essential areas such as agriculture, logistics, manufacturing, tourism, and

<sup>89</sup> [https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12438-Sustainable-and-Smart-Mobility-Strategy\\_en](https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12438-Sustainable-and-Smart-Mobility-Strategy_en)

<sup>90</sup> <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52020DC0789>



construction. Consequently, efforts to incorporate sustainable consumption and production practices impact the management of these cross-cutting issues, particularly within the transportation and mobility sphere.

The UfM has set its sights on advancing the development of an integrated, multimodal, efficient, sustainable, and resilient transport infrastructure network in the Euro-Med region. This objective builds on the goals initially outlined in the 2013 UfM Ministerial Conference and incorporated into the 2017 UfM Roadmap for Action. The most recent (February 2023) Transport Ministerial Conference, co-chaired by the EU and the Hashemite Kingdom of Jordan highlighted the progress made over the past decade in various transport modes, including maritime security, rail projects, and aviation. The focus at the conference was on extending the Trans-European Transport Network (TEN-T)<sup>91</sup> to the Euro-Mediterranean area and enhancing connectivity with adjacent strategic corridors which demonstrates the commitment to regional integration and cooperation in the Mediterranean region's transportation sector. This effort aligns with the European Green Deal and the Sustainable and Smart Mobility Strategy, contributing to a more sustainable and connected Mediterranean transport system.

To further this vision, the Ministerial Conference developed a new Regional Transport Action Plan (RTAP)<sup>92</sup> covering all transport subsectors (see Box 30). The new RTAP aims to enhance regional integration in the transport and mobility sector while embracing contemporary transitions like energy, digitalisation, climate resilience, and environmental protection.

The plan outlines a roadmap for achieving a sustainable, smart, resilient, and an inclusive future in the field of trans-Mediterranean transport, emphasising the importance of adapting to ongoing global trends and geo-economic changes. The COVID-19 pandemic highlighted the critical role of a well-connected and resilient transport system in overcoming crises and ensuring the region's stability. Digitalisation is identified as a key driver for modernising the transport system and enhancing efficiency and safety. In addition, the plan emphasises the need to make mobility accessible for all, focusing on social conditions and job opportunities.

The RTAP sets out 28 actions to guide UfM Member States' efforts in the transport sector, paving the way for a more sustainable and integrated regional transport system. This marks a significant milestone in enhancing the Mediterranean region's transportation system to be safe, secure, sustainable, and efficient, building upon harmonised transport standards and a multimodal integrated network. The new Declaration provides the political mandate for continued collaborative efforts until 2027, guided by the new RTAP, emphasising the importance of sustainable and resilient transport in the Southern Neighbourhood.

The RTAP is a comprehensive strategy aimed at fostering positive transformations in the Euro-Med transport sector, at an operational level. The plan strategically focuses on critical areas of the sector to enhance efficiency, sustainability, health and safety, intelligent transport systems, and collaborative efforts for improved transport solutions in the Mediterranean region. Specifically, the key areas of focus of the RTAP include:

<sup>91</sup> [https://transport.ec.europa.eu/transport-themes/infrastructure-and-investment/trans-european-transport-network-ten-t\\_en](https://transport.ec.europa.eu/transport-themes/infrastructure-and-investment/trans-european-transport-network-ten-t_en)

<sup>92</sup> [https://ufmsecretariat.org/wp-content/uploads/2023/02/RTAP-2021-2027\\_final\\_EN.pdf](https://ufmsecretariat.org/wp-content/uploads/2023/02/RTAP-2021-2027_final_EN.pdf)

## Strengthening Regional and International Collaboration

- Emphasis on regional and international dimensions.
- Promoting regulatory convergence.
- Alignment with EU agreements and regulations.
- Undertaking regional transport projects.
- Active participation in relevant international forums.
- Encouraging ratification of international agreements and conventions.

## Financial Autonomy

- Establishment of regulatory frameworks to facilitate transportation.
- Increased financial autonomy.
- Creation of sustainable sectoral financing frameworks.
- Ensuring effective implementation through sound financial mechanisms.
- Updating national plans and programs for enhanced and sustainable transport services.

## Sustainable Mobility

- Inclusion of emission reduction targets in national transport strategies.
- Promotion of eco-friendly vehicles, alternative fuels, and electric transport.
- Enhancing transport resilience to climate change.

## Health, Safety, Intelligent and inclusive Transport Systems and Post-COVID Adaptation

- Implementation of measures for the safety of all transport modes.
- Establishment of mechanisms for assessing transport systems.
- Promotion of gender equality in the transport sector and initiatives to empower women in planning, policy implementation, and operations.
- Focusing on traffic management, safety, and energy efficiency.
- Implementation of regulations and measures for passengers.
- Consideration for passengers with reduced mobility.
- Preparing for possible pandemics in future transport strategies.

## Global Navigation Satellite System (GNSS) Strategies

- Encourages the development of consolidated national GNSS strategies.
- Comprehensive data collection systems for monitoring.
- Emphasis on coordination among various cooperation tools.
- Fostering effective collaboration for sustainable and efficient transport solutions.



Box 30 The Regional Transport Action Plan (RTAP) for the Mediterranean

In alignment with the RTAP, there are several national initiatives that can be upscaled across the region. For instance, the *MobiliseYourCity*<sup>93</sup> Partnership in Tunisia has initiated a positive transformation in urban mobility planning and public transportation. Despite the challenges of rapid urbanisation and deteriorating public services, Tunisia embraced the opportunity to develop a National Urban Mobility Plan and Programme (NUMP). The Ministry of Transport, recognised the importance of inclusive planning and the adoption of emerging technologies, as well as ensuring holistic engagement. With the involvement of local and national authorities, transport experts, and enthusiasts they formulated concrete action plans to benefit public transportation users nationwide. A key success of the partnership lies in establishing a stable funding scheme in collaboration with private investors, alleviating the burden on public budgets. This endeavour highlighted the significance of stakeholder engagement, efficient information flow, and high-level political support in achieving common goals (Vizoso, 2021).

The Bus Map project in Lebanon<sup>94</sup> is working to make public transportation more accessible and to build a community of conscious bus riders advocating for passenger rights. In Morocco, Taxi Social is significantly improving mobility in an isolated community by providing adapted transportation, reducing travel time, and increasing social interaction while promoting the importance of sustainable transportation. The Leila Community Bike Centre in Israel empowers marginalized communities to use bicycles for transportation and reduces waste by refurbishing discarded bicycles. These initiatives exemplify the positive impact of sustainable transport solutions at national level throughout the region.

At a regional level, the transnational Interreg MED MOBILITAS<sup>95</sup> project, aimed at implementing Sustainable Urban Mobility Plans, policies, technologies, governance, innovative services, and other actions to reduce the environmental impact of traffic. A handbook, a key outcome of the MOBILITAS project, serves as a valuable resource for sustainable mobility projects throughout the Med area. It offers insights, methodologies, guidelines, solutions, and actionable measures for addressing traffic-related challenges in tourist destinations and similar contexts. This practical manual is designed to cater to a wide audience, including policymakers, technicians, professionals, experts, and anyone interested in sustainable mobility in the Med area.

Away from the Mediterranean streets, the 450 ports and terminals across the Mediterranean account for 30% of global maritime trade by volume. The sector, contributing to 23% of CO<sub>2</sub> emissions, is undergoing a shift towards greater efficiency and eco-sustainability in alignment with the 2030 Agenda. To transition towards green circular maritime transport, there is a need to support green shipping, with a transformation of regional vessels using sustainable fuel and the development of green ports as "circular hubs." This involves monitoring emerging technologies, addressing financing fragmentation, and focusing on key priorities like assessing innovative models, establishing maritime ports as energy communities, and promoting the adaptation of commercial vessels to sustainable energy sources (WestMed, 2023). The UfM Ministerial declaration on Blue Economy (2021) highlights the significant role of maritime transport in the Mediterranean for regional connectivity and its potential in addressing global greenhouse gas emissions. Specifically, the declaration encourages the use of clean energy, technology, and the implementation of sustainable transport projects, along with the development of a digital administrative environment for waterborne transport. Additionally, the declaration emphasizes

---

<sup>93</sup> <https://www.mobiliseyourcity.net/factsheet-tunisia>

<sup>94</sup> <http://busmap.me>

<sup>95</sup> <https://mobilitas.interreg-med.eu>

the need for environmentally sound practices in the dismantling of seagoing vessels, urging countries to ratify the Hong Kong International Convention for Safe Recycling of Ships.

Green circular and sustainable transport is emerging as a primary driver for economic recovery, and the post-COVID-19 adaptation which is attuned to the imperative of building a sustainable society. While the pandemic's lasting effects on public transport are yet uncertain, it is evident that the industry will transition towards eco-friendly mobility, serving people and goods more efficiently through non-polluting fuels and artificial intelligence-based digitalization processes.

## Zero Pollution: A Positive Path Forward

In 2020, the European Union generated 2,135 million tonnes of waste, averaging 4,815 kg per capita<sup>96</sup>. Construction, mining and quarrying waste accounted for the major contributors to waste generation in Europe (Figure 8). Across the Mediterranean region, municipal solid waste production per capita has risen by 15 % over the last 10 years with estimates of it quadrupling by 2050 (WWF Mediterranean Marine Initiative, 2019).

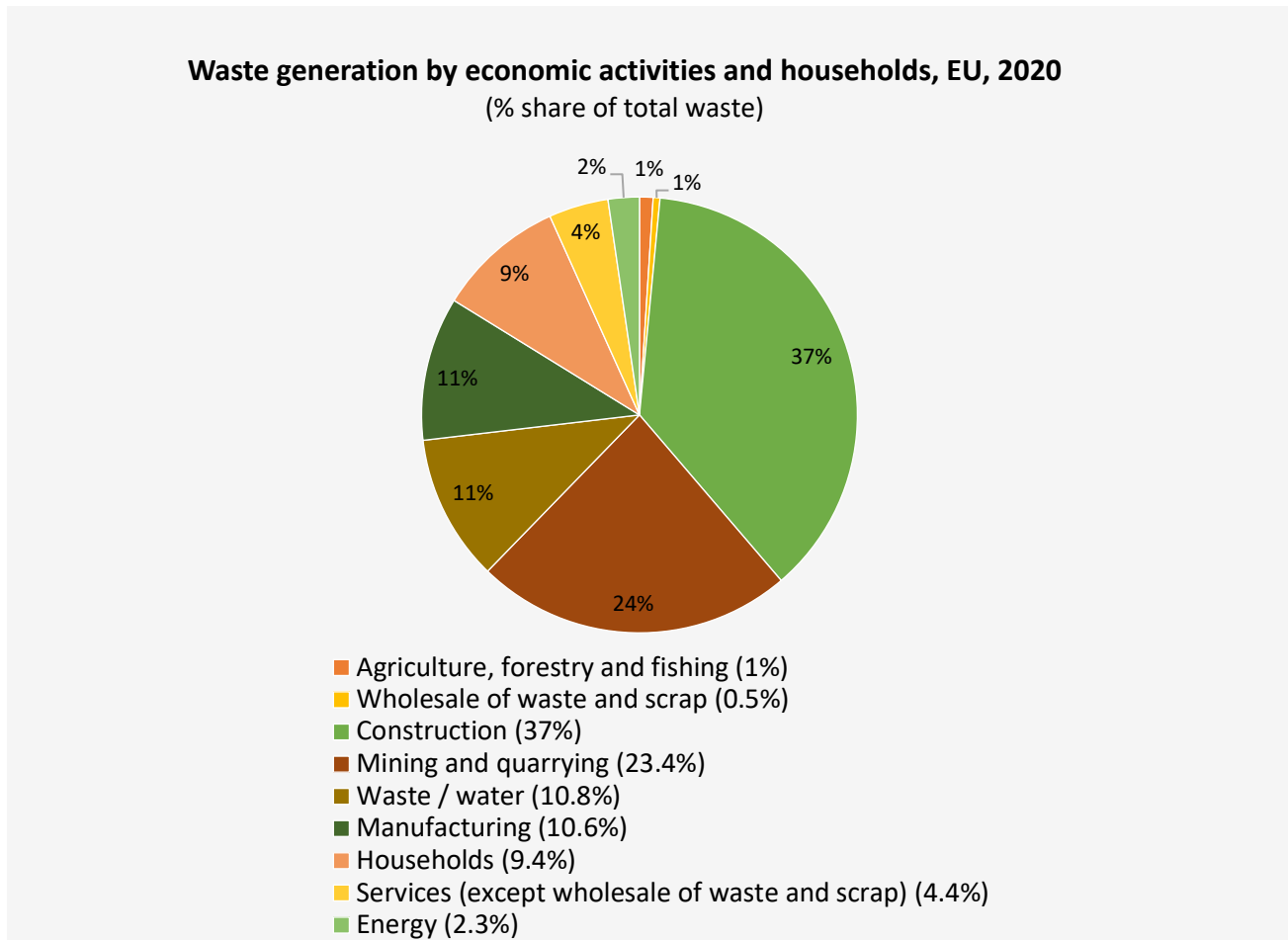


Figure 8 Waste Generation by economic activities and households in the EU in 2020.  
Source: Eurostat (online data code: env\_wasgen)

These challenges emphasise the need for comprehensive waste management strategies across sectors and scales.

At the local level, businesses and communities, across the Mediterranean, are embracing a zero pollution objective through green and circular economy principles. For instance, the Israeli start-up Home-Biogas<sup>97</sup>, founded in 2012, converts organic waste into biogas and fertilizer, reducing CO<sub>2</sub> emissions and providing sustainable energy solutions to households. Similarly, the Chennouf

<sup>96</sup> [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Waste\\_statistics](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Waste_statistics)

<sup>97</sup> <https://www.homebiogas.com>

Farm in Tunisia<sup>98</sup> developed an agroforestry waste recycling unit to produce organic charcoal and biomass energy out of pear and olive tree waste. The farm, which had been producing pears and olives since 1995, became the Chanouf Farm-Biofire company in 2015 to produce fuel briquettes, contributing to deforestation reduction and economic diversification. The local business example MetaForm<sup>99</sup> from Egypt is drawn from the African Circular Economy Network<sup>100</sup> where they revamp and reuse solid metal waste such as trash cans to create new furniture. They employ contemporary, practical, and cost-effective methods to upgrade public spaces like bus stops with their innovation call, "smart benches". The furniture is tech-enhanced and improved to meet contemporary standards.

At national level, in Morocco for instance, waste management is functioning adequately, however, it has a major constraint in terms of the informality of the sector, which is made up of a lot of intermediaries. This informality acts as a barrier to the sector's transition toward a circular economy, primarily due to the lack of professionalisation in the sorting process. Attempts are currently being made to improve the situation to move towards a green circular economy, mainly by making producers more responsible. The '*Programme de réduction et de valorisation des déchets au Maroc*' (Waste reduction and recovery programme in Morocco) is the leading initiative in this regard with success stories involving the creation of cooperatives that work alongside the ministry and local authorities, creating favourable environmental and health conditions while fostering a future of circularity in the waste sector (S. Ameziane, personal communication, 26 October 2023).

A further national example is taken from Turkey where in 2017 it took a stance and initiated a zero waste initiative. Turkey's policy priorities for addressing plastic pollution centers on eliminating open dumping, enhancing industry stewardship, and promoting recycling. To achieve its 'Zero Waste' program goals, Turkey is focussing on improving municipal-level waste management capacity, implementing upstream actions to reduce plastic production, and encouraging industry actors to reduce unnecessary plastic use while investing in recycling infrastructure.

These examples indicate that the Mediterranean is improving its capacity to deal with solid waste, but it remains far from sufficient to cope with the growing volume of waste generated and, in particular, the plastic fraction. Indeed, the generation of plastic pollution from land sources poses significant threats to the Mediterranean coastal ecosystem and forms part of the need to reimagine solid waste management towards green circular solutions. Projections indicate a potential annual plastic leakage into the Mediterranean Sea of 500,000 tonnes by 2040 without substantial interventions (Boucher & Billard, 2020). A prominent example of an impactful regional effort to prevent plastic waste from reaching the Mediterranean is the Plastic Busters initiative, which was labelled by the UfM in 2016 (see Box 31).

### Plastic Busters Initiative



<sup>98</sup> <https://www.un.org/sustainabledevelopment/blog/2018/07/chanouf-farm-biofire/>

<sup>99</sup> <https://nikhilrd18.wixsite.com/metaform>

<sup>100</sup> <https://www.acen.africa>

**Duration:** 2013 to 2020

**Total cost:** €8.8 million

**Funding:** EU Interreg Med Programme, ENI CBC Med Programme

**Demonstration projects facilitated:** 10+

The Plastic Busters Initiative was labelled by the UfM as early as 2016 ('Plastic Busters MPAs' project, tackling Marine Litter in Mediterranean Marine Protected Areas). With the endorsement and support of the UfM and following three successful financing rounds ('Plastic Busters MPAs; 'COMMON'; and 'PB CAP' on capitalization and amplification), Plastic Busters is now a Mediterranean initiative and a model of cross-border cooperation to tackle the Marine Litter crisis in the Med basin, addressing the entire management cycle of marine litter - both macro and micro plastics - from monitoring and assessment to prevention and mitigation.

Marine litter, including plastic bags and fishing gear, poses significant environmental, social, and economic risks. The Mediterranean Sea is one of the areas most affected by marine litter worldwide. The UfM-labelled Plastic Busters initiative, launched in 2013, aiming to bridge scientific and policy gaps in the Mediterranean region. Over time, it has enhanced the connection between science and policy, influencing and being influenced by regional policies. It therefore aims to monitor, assess, mitigate, and prevent marine litter through various actions. These actions include harmonized monitoring methods, demonstration projects for prevention and mitigation, governance support, and capacity-building initiatives. In 2016, the Plastic Busters project received the Union for the Mediterranean (UfM) label, signifying recognition and support. By 2017, it evolved into the Plastic Busters Initiative, with three leading projects (Plastic Busters MPAs, COMMON and Plastic Busters CAP) that enhance cooperation, and sustainable development in the Mediterranean region, serving as an umbrella for projects such as AdriCleanFish and Plastic Busters MPAs. The initiative involves a consortium of partners from around the Mediterranean and focuses on collaborative efforts to address the issue of marine litter in the region. The initiative had a particular emphasis on enhancing networking among pelagic and coastal marine protected areas in countries like Albania, Croatia, Greece, Italy, France, and Spain. Valuable actions included fishing for litter, removing derelict fishing gear, and establishing recycling mechanisms. The project, aligning with a circular economy approach, conducted systemic evaluations and involved key stakeholders such as port authorities, fishermen, and municipalities. The comprehensive results included a geographic information system database, hotspot analysis, policy recommendations, and awareness campaigns in 15 Mediterranean countries. With financing from the EU Interreg Med Programme and ENI CBC Med Programme, the project has facilitated more than 10 demonstration projects and aims to create future awareness, involving regional experts, and to implement measures to combat marine litter across the Mediterranean.

Plastic Buster MPAs

Plastic Busters MPAs is an Interreg Euro-Med funded project aiming to maintain biodiversity and preserve natural ecosystems in pelagic and coastal marine protected areas by consolidating Mediterranean efforts against marine litter. The project deploys the multidisciplinary strategy and common framework of action developed within the Plastic Busters initiative led by the University of Siena and the Mediterranean Sustainable Development Solutions Network. This initiative frames the priority actions needed to tackle marine litter in the Mediterranean. Plastic Busters MPAs brings together 15 implementing partners and 17 associated partners from 8 countries, namely Albania, Cyprus, Croatia, France, Italy, Greece, Slovenia and Spain. The scientific results of Plastic Busters MPAs are applicable well beyond Mediterranean MPAs.

### Plastic Busters “COMMON”

The main objective of COMMON is to combat Marine Litter in the Mediterranean Sea using the principles of Integrated Coastal Zone Management (ICZM) through a participatory approach, testing a model that is potentially transferable to the entire Mediterranean basin. Activities took place in five pilot areas: two in Italy (Maremma and Salento), two in Tunisia (Kuriate Islands and Monastir) and one in Lebanon (Tyre nature reserve). In addition to capacity-building workshops, engagement with key stakeholders through participatory methods, and awareness-raising campaigns, common monitoring protocols have been developed and applied to assess the impacts of marine litter in the five pilot areas, a key aspect in terms of replication potential and to define targeted and more effective mitigation actions. The project’s scientific monitoring/assessment activities focused on the analysis of macro litter and microplastics on the beaches, on the sea surface, and ingested by mussels, commercially important fish species, and sea turtles (*Caretta caretta*). Over 90,000 objects were collected and analyzed on the Mediterranean beaches, among these, 17,000 (around 20%) are cigarette butts, and 6,000 are cotton bud sticks. One out of three fish (the gastrointestinal tract of over 700 specimens of 6 commercially important fish species were analyzed during the project) and more than half of the analyzed sea turtles were found to have ingested plastic. In addition, project results demonstrated that the ingestion of plastic and microplastics can cause alterations to metabolic pathways and endocrine systems of marine wildlife due to the release of toxic substances contained or absorbed by plastics.

### Plastic Busters CAP



The Plastic Busters CAP is an ENI CBC MED funded project aiming to facilitate decision-makers and stakeholders in effectively tackling the problem of marine litter by integrating EbM (Ecosystem-Based Management Approach) into ICZM (Integrated Coastal Zone Management) planning towards good environmental status. The project entails actions that address the entire management cycle of marine litter, from monitoring and assessment to prevention and mitigation actions. Plastic Busters CAP is a 24 month -long project, with a total budget of €1.109.976,27 million and is co-funded by the European Union under the ENI CBC MED Programme 2014- 2020. It brings together partners from 7 countries of the Mediterranean region, namely Egypt, Greece, Italy, Jordan, Lebanon, Spain and Tunisia. The backbone of Plastic Busters CAP is the Interreg Med Plastic Busters MPAs; both projects deploy the multidisciplinary strategy and common framework of action developed within the Plastic Busters Initiative led by the University of Siena and the Sustainable Development Solutions Network Mediterranean. This initiative frames the priority actions needed to tackle marine litter in the Mediterranean and was labelled under the Union for the Mediterranean (UfM) in 2016, capturing the political support of 43 Euro-Mediterranean countries.

#### Box 31 Plastic Busters Initiative

The EU Mission on “Restore our Oceans and Waters” is aiming to harmonise the protection and restoration of marine and freshwater ecosystems. It is within this frame that the Horizon Europe funded project Blue Mission Med is a further example of an initiative that is taking place to eliminate land based plastic pollution impacting on the Mediterranean. The Mediterranean lighthouse from the project is showcased in Box 32.

The mission **"Restore our Oceans and Waters by 2030"** seeks to align the protection and restoration of marine and freshwater ecosystems with growing pressures on aquatic resources, positioning the EU as a leader in the shift to a sustainable and circular blue economy. This inclusive and transformative initiative consolidates existing efforts at EU, national, and regional levels by overcoming fragmented governance frameworks, establishing four Mission 'lighthouses' in major European sea and river basins to pilot scalable solutions.

With over 480 actions and EUR 3.72 billion in mobilized funds, endorsed by Member States and international partners, the Mission garners strong political support and concrete measures, creating key stakeholder communities. Operational in 2024, the European Digital Twin of the Ocean facilitates access to ocean knowledge for informed decision-making. Emphasizing participatory approaches, citizen science, ocean literacy, and community-led ventures, the Mission acts as a catalyst for synergies across EU programs and funds.

The Mediterranean Lighthouse, accounting for 7.5% of the world's marine biodiversity and facing risks to economic prosperity and political stability due to pollution, holds high priority on the political agenda of the EU, UN, and UfM. Addressing Objective 2 of the Mission, the Mediterranean Lighthouse aims to "prevent and eliminate pollution of our ocean, seas, and waters" by defining specific targets.



Reduce by at least 50%  
plastic litter at sea



Reduce by at least 30%  
microplastics released into  
the environment



Reduce by at least 50%  
nutrient losses, the use and  
risk of chemical pesticides

Box 32 Initiative Restore our Oceans and Waters by 2030

A shift in the production and consumption paradigm across the entire region, coupled with strategic investments in waste collection and the development of new value chains, alongside increased awareness and education, holds the potential not only to reduce waste generation but also to yield substantial economic benefits for society. At the regional level, the key project Med4Waste is addressing these challenges across the Mediterranean (See Box 33)

## MED4WASTE (ENI CBC MED) Mediterranean Dialogue for Waste Management Governance



The Med4Waste project addresses the environmental challenges arising from current production and consumption patterns in the Mediterranean. With a focus on waste management governance, the project aimed to establish new models for integrated and efficient urban waste management policies across the Mediterranean. Supported by a strong partnership involving seven organizations from six Mediterranean countries, Med4Waste aligned to the 2030 GreenerMed Agenda, receiving backing from the Union for the Mediterranean (UfM). Through activities such as building skills, planning, and decision-making capabilities, the project sought to promote better governance in the sustainable use of resources, waste reduction, and the transition to circular economy models. By implementing waste management plans and policies, Med4Waste contributed to environmental and socio-economic improvements, including the reduction of CO<sub>2</sub> emissions, job creation, and the advancement of circular economy practices.

The project has benefitted various stakeholders along the waste management chain within social cooperatives, the education sectors, and policymakers, with achievements that have included the establishment of a Mediterranean Business Platform, a Waste Management Policy toolkit, the creation of jobs, awareness campaigns, and initiatives to enhance skills and decision-making capabilities. The project, spanning from October 2021 to November 2023, demonstrated a comprehensive approach to addressing the waste management challenges in the Mediterranean region.

### Box 33 Mediterranean Dialogue for Waste Management Governance (MED4WASTE)

A further regional project, The ENI CBC MED project ReMed<sup>101</sup> (2020–2023) “Applying innovation to develop the circular economy for sustainable construction in the Mediterranean” involves the governments of France, Lebanon, Tunisia, and Italy, focusing on creating markets for construction

<sup>101</sup> <https://resilientmedia.eu>

and demolition waste (CDW). It is developing recycling plants and promoting the use of recycled aggregates into road construction materials, aiming to transform CDW into resources while fostering societal, environmental, and digital transitions in Mediterranean territories. The project includes building and evaluating a road section incorporating CDW, implementing a collaborative platform for knowledge sharing, structured training, dissemination activities, and advocating for regulatory changes to facilitate the use of recycled aggregates in road construction.

The Mediterranean region is witnessing a positive shift towards zero pollution ambition, driven by innovative businesses, committed communities, proactive governmental measures and regional initiatives. By replicating successful initiatives and fostering collaboration, the entire Mediterranean community can aspire to a sustainable, circular, and environmentally responsible and zero pollution future.

## Clean, Affordable, and Green Energy Transition

Amidst the global energy crisis intensified by current geopolitical tensions, the wider Mediterranean region emerges as a pivotal area for energy production and supply to Europe, offering opportunities for economic development and renewable energy scale-up. However, the crisis has also heightened the current demand for alternative sources of fossil fuels, impacting energy transition plans in the region and necessitating a recalibration of decarbonisation strategies with a focus on energy security, affordability, and sustainability<sup>102</sup>.

Funding emerges as a challenge in the region for crucial renewable energy projects in the Southern and Eastern Mediterranean (SEMCs) region. Amid challenges related to limited fiscal space, post-Covid economic conditions, and investor concerns about macro and political instability, necessitates effective private sector leadership, government policies encouraging private investment, and the development of transnational Mediterranean grids through regional collaboration<sup>103</sup>.

Overcoming these challenges and built upon the framework of the Paris Agreement and striving to reduce the climate change and environmental degradation risks, the European Green Deal is poised to deliver three things: “no net emissions of greenhouse gases by 2050; economic growth decoupled from resource use; and no person and no place left behind” (European Commission, 2021b). The deal is codified in the European Climate Law, enforced on the 29 July 2021, aiming to keep energy prices affordable and reduce vulnerability to climate change (European Commission, n.d.-b, 2020b)

“The challenge at the heart of Europe's green transition is to make sure the benefits and opportunities that come with it are available to all, as quickly and as fairly as possible.”

(European Commission, 2021a)

<sup>102</sup> [https://www.medecc.org/wp-content/uploads/2020/11/MedECC\\_MAR1\\_3\\_3\\_Energy\\_transition\\_in\\_the\\_Mediterranean.pdf](https://www.medecc.org/wp-content/uploads/2020/11/MedECC_MAR1_3_3_Energy_transition_in_the_Mediterranean.pdf)

<sup>103</sup> <https://www.iemed.org/publication/the-clean-energy-challenges-sustainability-decarbonization-and-security-of-supply-in-the-euro-mediterranean-region/>

Moreover, the updated Directive 2018/2001/EU establishes a goal of achieving a minimum of 32% of renewable energy in the overall portion of gross final energy consumption by 2030 (European Commission, n.d.-e). Nevertheless, the journey towards energy transition and decarbonisation is more challenging due to the recent energy price crisis in 2021 and the conflict in Ukraine (Moreno-Dodson et al., 2022).

The Mediterranean accounts for 7% of the total global energy demand. Currently, fossil fuels account for 65% of the energy mix in the Northern Med countries and 92% in the Southern Med. Achieving carbon neutrality by 2050 in the Northern Mediterranean necessitates an additional 41% reduction in energy demand, while the Southern Mediterranean should limit its demand increase to less than 2% from the current levels until 2050. Moreover, the energy mix needs to change, where the share of renewables will have to make up 57% of the total mix by 2050 (Observatoire Méditerranéen de l'Énergie, 2022). The Mediterranean Basin, particularly the SEMCs, holds significant potential for various renewable energy sources, both terrestrial and marine, such as wind, solar, hydro, geothermal, bioenergy, waves, and currents (Drobinski et al., 2020).

The significance of bioenergy in the Mediterranean area varies significantly among countries, dependent upon the accessibility of biomass derived from forests, agriculture, and organic waste. Biomass availability is the main limitation to bioenergy development and varies significantly between the Northern and Southern Mediterranean countries. Fragile forests, limited productivity, and challenges in agriculture due to regional climate conditions, exacerbate the region's bioenergy concerns. Algeria and Morocco are actively boosting bioenergy, while the other Mediterranean nations rely on non-forest biomass due to scarce forest biofuel resources. Importing biomass compensates for local shortages but requires careful evaluation of its impact on land resources. Agricultural and forestry sectors face constraints such as water scarcity, limited arable land, and soil degradation, hindering the growth of purpose-grown plants for bioenergy expansion. Agricultural emphasis remains on food production, limiting bioenergy development in the Southern and Eastern Mediterranean countries (Drobinski et al., 2020).

Transitioning to a net-zero carbon future would significantly reduce reliance on fossil fuels in the Mediterranean area, especially in the Northern region (Observatoire Méditerranéen de l'Énergie, 2022). Furthermore, renewable energy is pivotal in the transformation of the tourism sector into a sector that has circular economy at its core (Rodríguez et al., 2020).

For SEMCs, the energy transition might make them vulnerable to sudden disruptions in their primary sectors and labour markets. Thus, the energy transition can be an opportunity to create inclusive policies and initiatives for the labour market. SEMCs nations should consider and execute educational strategies that tackle skill deficiencies, gender disparities, and industry requirements for some interdisciplinary competencies. Collaboration between the North and South Mediterranean states will also be essential in attaining these objectives (Moreno-Dodson et al., 2022).

Ministers from 43 Union for the Mediterranean member countries signed a declaration in Lisbon, reaffirming their commitment to combat climate change by decarbonising the energy sector. The declaration emphasizes the establishment of a new clean energy transition pathway and priorities for enhanced regional cooperation. The urgency of energy efficiency and the expanded use of clean energy across various sectors was highlighted. The adopted declaration stresses the acceleration of energy efficiency measures, the promotion of sustainable gas solutions, and the encouragement of investment in renewable energy and energy projects. It also emphasizes the

importance of raising public awareness about energy, climate, and environmental issues, particularly among the younger generation (Union for the Mediterranean, 2021).

Initiatives from the local level can introduce changes that can have significant knock-on effects and changes to the green energy transition. For instance the company “Evaptainers<sup>104</sup>” from Morocco has developed a modular and mobile refrigeration unit that utilises evaporative cooling to preserve farm produce along the supply chain, providing low-cost, electricity-free cooling which significantly extends the shelf life of agricultural products. The company is moving into providing the same solution for medical supplies and other perishables as efficient, no energy, mobile cooling alternatives.

Overall, enhancing energy efficiency and implementing widespread renewable energy sources in the Mediterranean area would boost energy security for all nations, elevate export possibilities for exporting countries, reduce energy expenses, and minimise environmental degradation throughout the region. An energy transition would also advance social well-being, promote job generation, and yield other beneficial outcomes (Drobinski et al., 2020)

---

<sup>104</sup> <http://www.evaptainers.com>



## CHAPTER 6

# Key Highlights Associated with the Implementation of Circular Economy in the Mediterranean



This report is guided by Thematic Axis 1 of the UfM's 2030GreenerMed Agenda on Green, Circular Economy and its key actions<sup>105</sup>, as agreed by the 43 UfM Member States in 2021 within the frame of the UfM Ministerial Declaration on Environment and Climate Action<sup>106</sup>. It showcases that, through various success stories of cooperation at regional level around key initiatives, programs and projects, the significant pressing crises the Mediterranean region is going through, can actually be addressed and progressively overcome.

However, the journey is not without hurdles. The region must address substantial challenges spanning environmental, technological, economic, societal, regulatory, and governance domains, demanding coordinated efforts and a collaborative approach. This implies a comprehensive multi-stakeholder and multi-level mobilization of actors and human, technical and financial resources in order to accelerate a just transition from a linear to a green, circular economy, which can steer the Mediterranean region towards achieving the SDGs and long-term sustainability. This report focuses on land related sectors and activities, thus complementing the 2021 UfM publication '*Towards Sustainable Blue Economy*'<sup>107</sup>, covering the blue aspects of green economy.

The active involvement of stakeholders recognises their pivotal roles in driving this transformative shift. Multi-stakeholder dialogues, inclusive policies and the active contribution of the public sector at various levels provides the essential framework for collaborative decision-making, fostering a comprehensive and sustainable approach to transition to a green circular economy.

From local to national levels, the public sector plays a crucial role in shaping the context/framework/enabling environment/market for such a change through policy formulation and incentives that promote sustainability and circularity. The academic sector contributes significantly by steering green and circular economy initiatives through youth education, scientific research, evidence-based policy making, innovation, and increased societal integration. Civil society, including grassroots movements and NGOs, serves as a crucial agents of change, implementing partner, influencing policies across all governance levels, and contributing valuable traditional knowledge for sustainable practices. Notably, youth-led innovation and advocacy, coupled with the pivotal roles of women as knowledge holders, economic contributors, and sustainability advocates, play essential roles in fostering job creation and sustainable development.

Acknowledging that consumer behaviours impact resource consumption, market choices and sustainability, addressing barriers such as limited awareness, accessibility, affordability, and ingrained consumption habits is crucial for engaging Mediterranean consumers in the circular economy.

The private sector, encompassing established companies and startups, plays a pivotal role in driving the transition to a circular economy in the Mediterranean. Embracing circularity requires a shift to circular value chains and product design for durability, with industry leaders fostering this transformation through circular principles, research and development, and collaboration along the value chain. Additionally, financial actors and investors contribute to environmentally focused investments, while public-private partnerships facilitate collaboration to mobilise private sector investments for circular economy initiatives in the region. Understanding specific

---

<sup>105</sup> [https://ufmsecretariat.org/wp-content/uploads/2022/03/220304-Presentación\\_Final\\_Light.pdf](https://ufmsecretariat.org/wp-content/uploads/2022/03/220304-Presentación_Final_Light.pdf)

<sup>106</sup> [https://ufmsecretariat.org/wp-content/uploads/2021/10/UfM-ministerial-declaration-ENV-CA\\_final-1.pdf](https://ufmsecretariat.org/wp-content/uploads/2021/10/UfM-ministerial-declaration-ENV-CA_final-1.pdf)

<sup>107</sup> <https://ufmsecretariat.org/wp-content/uploads/2021/07/21.7.19-2021UfM.studydefEN-web.pdf>

challenges and opportunities within pandemic-impacted sectors is crucial for developing tailored strategies promoting circular practices and resilience.

Marked by the Horizon 2020 collaboration kicked off in 2006 and building a progressively solid, longer term collaboration, the 2014 UfM Ministerial Declaration and its 2021 counterpart affirmed and renewed the 43 Euro-Mediterranean member states' political and operational commitment to engage in the shift towards green, circular economy, emphasising specific priority actions through the UfM Environment Agenda, “UfM 2030GreenerMed”, aligning with the UfM Climate Change Action Plan. In parallel, the European Circular Economy Action Plans from 2015 and 2020, integral to the European Green Deal, helped to lay the groundwork and provide the technical and financial push and resources for such a change, focusing on comprehensive green policies, circular design, production processes, and waste prevention. The role of innovation in policy and technology upscaling, supported by robust institutional frameworks, is underscored as essential for upscaling the green circular economy. Legal and technical instruments, including Green Procurement and Extended Producer Responsibility, create an environment conducive to sustainable product policies and markets. Green finance, a vital component, demands public-private collaboration, incorporating innovative tools and EU frameworks for enhanced transparency.

Green jobs, contributing to good environmental status and a just transition, require new skills emphasising the crucial alignment of environmental policies with employment and skills development. The UN's International Labour Organisation has indicated that there is a scarceness of data globally to measure the number of green jobs, which applies also to the Mediterranean region. Forecasts suggest that approximately 10 million green jobs could be generated across the EU and the Mediterranean by 2030, with an expected creation of 4.6 million jobs in the Mediterranean alone. Notably, the Southern Mediterranean region and the Balkans, demonstrate significant growth potential, driven by sectors such as renewable energy, energy efficiency, water management, waste treatment and recycling, and environment-related services.

These green jobs will shape the Mediterranean's transition to a green, circular and just economy within key areas and sectors. For instance, the agri-food sector is cited as a pivotal example necessitating policy overhaul, addressing trade-offs between food security and environmental sustainability, while the tourism sector is called to promote digitalization, and to reduce its carbon emissions from the whole tourism industry, including tourism-related maritime transport; and address seasonality and over tourism by promoting the diversification of the tourism offer, encouraging experience-based and slow tourism as well as associating the hinterland. Green cities and islands, recognising their significance in global energy consumption, are fostering collaboration for Circular Economy Action Plans and showcasing innovative responses to climate change impacts. Green and circular manufacturing requires structural changes and product diversification, while sustainable and smart mobility is overcoming territorial load challenges with regional and local initiatives. Public and private sector initiatives are driving the zero pollution initiatives addressing the rising waste production, plastic leakage, and comprehensive waste management strategies. Finally, the transition to clean, affordable, and secure energy, as part of the European Green Deal, involves addressing challenges in achieving carbon neutrality and promoting inclusive policies for renewable energy use. These collective efforts across sectors underscores the Mediterranean's potential for sustainable development, economic growth, and environmental preservation and restoration.

Although the challenges are significant, there is a collaborative willingness to advance to a green circular economy. In the last decade, the Mediterranean region has been at the forefront of

developing strategies, approaches, and demonstration activities to progress towards a green, circular economy, establishing itself as a leader among global regions.

Indeed, the key sectors and areas that require attention to drive the green circular transition are hotbeds for green circular innovative solutions. The Mediterranean transition journey is marked by challenges, success stories, and a collective commitment to sustainability. These collaborative efforts from diverse stakeholders coupled with a holistic approach that addresses the economic, social, and environmental aspects and incorporates the sector-specific strategies will overcome the challenges and achieve a just sustainable green circular transition.

With the rich extensive mix of cultures, landscapes, heritages, food and people, the Mediterranean highlights how working together in overcoming common challenges can result in innovative advances.

## References

- Abanades, J. (2019). Wind Energy in the Mediterranean Spanish ARC: The Application of Gravity Based Solutions. *Frontiers in Energy Research*, 7. <https://doi.org/10.3389/fenrg.2019.00083>
- AIT, Directorate-General for Research and Innovation (European Commission), ECORYS, EGEN, Tecnalia, Menger, P., Etmnan, G., Rueda, F., Bianchi, M., Fernández Fernández, I., Fuster Figuerola, E., & Maleki, P. (2022). *Circular cities & regions initiative: Methodology for the implementation of a circular economy at the local and regional scale*. Publications Office of the European Union. <https://data.europa.eu/doi/10.2777/068045>
- Albinyana, R., & Martinez, E. R. (2022). *Youth, Women and Employment in the Mediterranean Region: Continuity and Change* [Year Report]. IEMed. <https://www.iemed.org/publication/youth-women-and-employment-in-the-mediterranean-region-continuity-and-change/>
- AMEZIANE, S. (2023, October 26). *Interview to the coordinators of key Mediterranean projects/initiatives* [Personal communication].
- Battarra, R., & Mazzeo, G. (2022). Challenges of Mediterranean metropolitan systems: Smart planning and mobility. *New Scenarios for Safe Mobility in Urban areas Proceedings of the XXV International Conference Living and Walking in Cities (LWC 2021), September 9-10, 2021, Brescia, Italy*, 60, 92–99. <https://doi.org/10.1016/j.trpro.2021.12.013>
- Berry, E. M. (2019). Sustainable food systems and the Mediterranean diet. *Nutrients*, 11(9), 2229.
- Bluedorn, J., Hansen, N.-J., Noureldin, D., Shibata, I., & Tavares, M. M. (2023). Transitioning to a greener labor market: Cross-country evidence from microdata. *Energy Economics*, 126, 106836.
- Bocken, N. M., De Pauw, I., Bakker, C., & Van Der Grinten, B. (2016). Product design and business model strategies for a circular economy. *Journal of Industrial and Production Engineering*, 33(5), 308–320.
- Boucher, J., & Billard, G. (2020). *The Mediterranean: Mare plasticum*.
- Burton, M., & Eike, R. (2023). The Sustainability-Conscious Consumer: An Exploration of the Motivations, Values, Beliefs, and Norms Guiding Garment Life Extension Practices. *Sustainability*, 15(15), 12033.
- Carayannis, E., & Campbell, D. (2009). ‘Mode 3’ and ‘Quadruple Helix’: Toward a 21st century fractal innovation ecosystem. *International Journal of Technology Management - INT J TECHNOL MANAGE*, 46. <https://doi.org/10.1504/IJTM.2009.023374>
- Chaplain, R., Petrick, K., & Fosse, J. (2017). *The implementation of the Sustainable Development Goals in the Mediterranean*. Eco-Union. <https://www.ecounion.eu/wp-content/uploads/2020/03/SDGs-in-the-MED-v18-10-17-2020.pdf>
- CPMR Intermediterranean Commission. (2023, September 7). INTERMEDITERRANEAN COMMISSION Task Force on Culture & Sustainable Tourism. *CPMR Intermediterranean Commission*. <https://cpmr-intermed.org/event/intermediterranean-commission-task-force-on-culture-sustainable-tourism/>
- D’Amato, D., Korhonen, J., & Toppinen, A. (2019). Circular, green, and bio economy: How do companies in land-use intensive sectors align with sustainability concepts? *Ecological Economics*, 158, 116–133.
- de Felipe Lehtonen, H., del Rio, C., Gajdosik, A., Gkofas, P., Henri, M., & Georgios, P. (2020). *Sustainable development in the Mediterranean region* (PRELIMINARY DRAFT INFORMATION REPORT REX/526 – EESC-



- 2020-01279-00-00-APRI-TRA; p. 12). European Economic and Social Committee. <https://www.eesc.europa.eu/sites/default/files/files/eesc-2020-01279-00-00-apri-tra-en.pdf>
- de Villamore Martín, E. (2016). Circular Economy: Rethinking the Way in which We Produce and Consume Is an Opportunity for a Smart Development in the Mediterranean. *IEMed: Mediterranean Yearbook, 2016*, 49.
- Dogaru, L. (2021). *Green economy and green growth—Opportunities for sustainable development. 63(1)*, 70.
- Drobinski, P., Azzopardi, B., Allal, H. B. J., Bouchet, V., Civel, E., Creti, A., Duic, N., Fylaktos, N., & Mutale, J. (2020). *Chapter 3 Resources | Subchapter 3.3 Energy transition in the Mediterranean*.
- El Bilali, H., Strassner, C., & Ben Hassen, T. (2021). Sustainable agri-food systems: Environment, economy, society, and policy. *Sustainability, 13(11)*, 6260.
- Ellen McArthur Foundation. (2013). *Towards the circular economy Vol. 2: Opportunities for the consumer goods sector*. <https://emf.thirdlight.com/link/coj8yt1jogq8-hkhkq2/@/preview/1?o>
- Elmasllari, D. (2022). *Youth Green Skills: Ensuring that Young People are Educated and Skilled Today for a Sustainable Future (Policy Brief 114)*. IEMED. <https://www.iemed.org/wp-content/uploads/2022/02/Policy-Brief-No114.pdf>
- El-Sherif, S. (2023). *GREEN JOBS AND GREEN ENTREPRENEURS IN THE MENA REGION: CHALLENGES AND OPPORTUNITIES (63; EUROMESCO PAPERS, p. 24)*. European Institute of the Mediterranean. <https://www.euromesco.net/wp-content/uploads/2023/06/EuroMeSCo-Paper-63.pdf>
- EU Commission. (2020). Circular Economy Action Plan, For a cleaner and more competitive Europe. *European Commission's Website*. [https://ec.europa.eu/environment/circular-economy/pdf/new\\_circular\\_economy\\_action\\_plan.pdf](https://ec.europa.eu/environment/circular-economy/pdf/new_circular_economy_action_plan.pdf)
- European Bank for Reconstruction and Development. (2023). *Chapter 3: LABOUR MARKETS IN THE GREEN ECONOMY (TRANSITION REPORT 2023-24 TRANSITIONS BIG AND SMALL, p. 108)*. [https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjJmqWKqJaDAXUthv0HHUKqD9AQFnoECBkQAQ&url=https%3A%2F%2Fwww.ebrd.com%2Fpublications%2Ftransition-report-202324&usg=AOvVaw2vByY4ISEWS\\_myozWkCGyz&opi=89978449](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjJmqWKqJaDAXUthv0HHUKqD9AQFnoECBkQAQ&url=https%3A%2F%2Fwww.ebrd.com%2Fpublications%2Ftransition-report-202324&usg=AOvVaw2vByY4ISEWS_myozWkCGyz&opi=89978449)
- European Commission. (n.d.). *Farm to Fork Strategy*. Retrieved 15 September 2023, from [https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy\\_en](https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en)
- European Commission. (2018). *Opinion of the European Economic and Social Committee on 'Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Initiative for the sustainable development of the blue economy in the western Mediterranean (Official Journal of the European Union COM(2017) 183; p. 3)*. <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52017AE3128&from=MT>
- European Commission. (n.d.-a). *Circular Cities and Regions Initiative*. Retrieved 27 September 2023, from <https://circular-cities-and-regions.ec.europa.eu/>
- European Commission. (n.d.-b). *European Climate Law*. Retrieved 27 October 2023, from [https://climate.ec.europa.eu/eu-action/european-climate-law\\_en](https://climate.ec.europa.eu/eu-action/european-climate-law_en)
- European Commission. (2020a). *Farm to Fork Strategy. For a fair, healthy and environmentally-friendly food system*.

- European Commission. (2020b). *Towards an inclusive energy transition in the European Union: Confronting energy poverty amidst a global crisis*. Publications Office. <https://data.europa.eu/doi/10.2833/103649>
- European Commission. (2021a). *EU economy and society to meet climate ambitions* [Text]. European Commission - European Commission. [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_21\\_3541](https://ec.europa.eu/commission/presscorner/detail/en/ip_21_3541)
- European Commission. (2021b, July 14). *The European Green Deal*. [https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal\\_en](https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en)
- FAO. (2021). *Pathways for the Future of Sustainable Food Systems in the Mediterranean*. <https://www.fao.org/food-systems/news-events/news-detail/en/c/1396388/>
- FAO, & CIHEAM. (2016). *MediTerra. Zero Waste in the Mediterranean. Natural Resources, Food and Knowledge*. <https://www.fao.org/3/bq976e/bq976e.pdf>
- Fien, J., Neil, C., & Bentley, M. (2008). Youth can lead the way to sustainable consumption. *Journal of Education for Sustainable Development*, 2(1), 51–60.
- Figge, F., Thorpe, A., & Gutberlet, M. (2023). Definitions of the Circular Economy-Circularity Matters. *Ecological Economics*, 208.
- Flanagan, K., Robertson, K., & Hanson, C. (2019). Reducing Food Loss and Waste: Setting a Global Action Agenda. *World Resources Institute*. <https://doi.org/10.46830/wriipt.18.00130>
- Fonteneau, B., Neamtam, N., Wanyama, F., Pereira Morais, L., & de Poorter, M. (2010). *Social and solidarity economy: Building a common understanding*.
- Food System Summit Dialogues, F. (2021). *Pathways for the future of sustainable food systems in the Mediterranean. Independent Food Systems Summit Dialogues. Concept Note*. <http://www.fao.org/3/cb4357en/cb4357en.pdf>
- Geissdoerfer, M., Savaget, P., Bocken, N. M. P., & Hultink, E. J. (2017). The Circular Economy – A new sustainability paradigm? *Journal of Cleaner Production*, 143, 757–768. <https://doi.org/10.1016/j.jclepro.2016.12.048>
- Glasgow Declaration. (2021). *The Glasgow Declaration: A Commitment to a Decade of Tourism Climate Action*.
- Hilder, C., & Collin, P. (2022). The role of youth-led activist organisations for contemporary climate activism: The case of the Australian Youth Climate Coalition. *Journal of Youth Studies*, 25(6), 793–811.
- Hilmi, N., Ali, E., Carnicer Cols, J., Cramer, W., Georgopoulou, E., Le Cozannet, G., & Tirado, C. (2022). *IPCC AR6 WGII cross-chapter paper 4: Mediterranean region*. EGU22-10590.
- Ho, C., Böhm, S., & Monciardini, D. (2022). The collaborative and contested interplay between business and civil society in circular economy transitions. *Business Strategy and the Environment*, 31(6), 2714–2727.
- ILO. (2018). *World Employment and Social Outlook 2018 – Greening with jobs*.
- International Labour Office. (2012). *ILO Global Estimate of Forced Labour*. [https://www.ilo.org/wcmsp5/groups/public/---ed\\_norm/---declaration/documents/publication/wcms\\_182004.pdf](https://www.ilo.org/wcmsp5/groups/public/---ed_norm/---declaration/documents/publication/wcms_182004.pdf)



- International Labour Office. (2018). *World Employment and Social Outlook 2018: Greening with jobs* (13.01.3; p. 190). [https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms\\_628654.pdf](https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_628654.pdf)
- International Labour Organization. (2022). *How to work in the green economy? Guide for young people, job seekers and those who support them*. [https://www.ilo.org/wcmsp5/groups/public/---ed\\_emp/documents/publication/wcms\\_856666.pdf](https://www.ilo.org/wcmsp5/groups/public/---ed_emp/documents/publication/wcms_856666.pdf)
- Jancar-Webster, B. (2015). Environmental movement and social change in the transition countries. In *Dilemmas of Transition* (pp. 69–90). Routledge.
- Kevin van Langen, S., Vassillo, C., Ghisellini, P., Restaino, D., Passaro, R., & Ulgiati, S. (2021). Promoting circular economy transition: A study about perceptions and awareness by different stakeholders groups. *Journal of Cleaner Production*, 316, 128166. <https://doi.org/10.1016/j.jclepro.2021.128166>
- Luttenberger, L. R. (2020). Waste management challenges in transition to circular economy – Case of Croatia. *Journal of Cleaner Production*, 256, 120495. <https://doi.org/10.1016/j.jclepro.2020.120495>
- Lyth, A., Baldwin, C., Davison, A., Fidelman, P., Booth, K., & Osborne, C. (2017). Valuing third sector sustainability organisations—qualitative contributions to systemic social transformation. *Local Environment*, 22(1), 1–21.
- Maleš, I. (2020). Guidelines on Circular Economy for the Countries of the Western Balkans and Turkey. *Brussels: European Environmental Bureau (EEB) and Institute for the Circular Economy (INCIEN)*. [https://eeb.org/wp-content/uploads/2021/01/guideline-WBT\\_INCIEN\\_final.pdf](https://eeb.org/wp-content/uploads/2021/01/guideline-WBT_INCIEN_final.pdf)
- Matarasso, F. (2007). Common ground: Cultural action as a route to community development. *Community Development Journal*, 42(4), 449–458.
- MedCities. (2021, April 21). About us—MEDCITIES. *MEDCITIES - Un Altre Lloc Gestionat Amb El WordPress*. <https://medcities.org/about-us/>
- MedSNAIL. (2019, September 1). ENI CBC Med. <https://www.enicbcmed.eu/projects/medsnail>
- Moreno-Dodson, B., Tsakas, C., & Pariente-David, S. (2022). *The Clean Energy Challenges: Sustainability, Decarbonization and Security of Supply in the Euro-Mediterranean Region*.
- Nikolaeva, R., & Bicho, M. (2011). The role of institutional and reputational factors in the voluntary adoption of corporate social responsibility reporting standards. *Journal of the Academy of Marketing Science*, 39, 136–157.
- Notton, G., Nivet, M.-L., Zafirakis, D., Motte, F., Voyant, C., & Fouilloy, A. (2017). Tilos, the first autonomous renewable green island in Mediterranean: A Horizon 2020 project. *2017 15th International Conference on Electrical Machines, Drives and Power Systems (ELMA)*, 102–105. <https://doi.org/10.1109/ELMA.2017.7955410>
- O'Brien, K., Selboe, E., & Hayward, B. M. (2018). Exploring youth activism on climate change. *Ecology and Society*, 23(3).
- Observatoire Méditerranéen de l'Énergie. (2022). *The Mediterranean Energy Perspectives 2022*.
- OECD. (2020). *The Circular Economy in Cities and Regions: Synthesis Report*. OECD. <https://doi.org/10.1787/10ac6ae4-en>

- One Planet Network. (2022, April 10). *SFS-MED Platform*. One Planet Network. <https://www.oneplanetnetwork.org/programmes/sustainable-food-systems/sfs-med-platform>
- Papamichael, I., Voukkali, I., & Zorpas, A. A. (2022). Mediterranean: Main environmental issues and concerns. *Euro-Mediterranean Journal for Environmental Integration*, 7(4), 477–481. <https://doi.org/10.1007/s41207-022-00336-0>
- Pörtner, H.-O., Roberts, D. C., Adams, H., Adler, C., Aldunce, P., Ali, E., Begum, R. A., Betts, R., Kerr, R. B., & Biesbroek, R. (2022). *Climate change 2022: Impacts, adaptation and vulnerability*. IPCC Geneva, Switzerland:
- Rayan, E. O., Ragab, A. M., & Anwar, A. S. (2020). Determinants of green job creation: An empirical investigation. *International Journal of Social Economics*, 47(7), 887–911.
- Rodríguez, C., Florido, C., & Jacob, M. (2020). Circular Economy Contributions to the Tourism Sector: A Critical Literature Review. *Sustainability*, 12(11), 4338. <https://doi.org/10.3390/su12114338>
- Searchinger, T., Waite, R., Hanson, C., Ranganathan, J., & Matthews, E. (2019). *Creating a Sustainable Food Future*. <https://www.wri.org/research/creating-sustainable-food-future>
- Serrat, R., Villar, F., Warburton, J., & Petriwskyj, A. (2017). Generativity and political participation in old age: A mixed method study of Spanish elders involved in political organisations. *Journal of Adult Development*, 24, 163–176.
- Strietska-Ilina, O., Hofmann, C., Haro, M. D., & Jeon, S. (2012). *Skills for green jobs: A global view*. International Labour Organisation Geneva.
- The Sustainable Island*. (n.d.). El Hierro. Retrieved 20 November 2023, from <https://elhierro.travel/en/discover/sustainable-island/>
- Tiippana-Usvasalo, M., Pajunen, N., & Maria, H. (2023). The role of education in promoting circular economy. *International Journal of Sustainable Engineering*, 16(1), 92–103.
- UNDP. (2022). *What is just transition? And why is it important?* <https://climatepromise.undp.org/news-and-stories/what-just-transition-and-why-it-important>
- UNEP. (2018, January 23). *Green Economy*. UNEP - UN Environment Programme. <http://www.unep.org/regions/asia-and-pacific/regional-initiatives/supporting-resource-efficiency/green-economy>
- UNEP MAP. (2017). *REGIONAL ACTION PLAN ON SUSTAINABLE CONSUMPTION AND PRODUCTION IN THE MEDITERRANEA*. [https://switchmed.eu/wp-content/uploads/2022/01/unepmap\\_SCPAP\\_eng\\_web.pdf](https://switchmed.eu/wp-content/uploads/2022/01/unepmap_SCPAP_eng_web.pdf)
- UNEP/MAP. (2016). *Mediterranean Strategy for Sustainable Development 2016-2025*. Plan Bleu, Regional Activity Centre. [https://wedocs.unep.org/bitstream/handle/20.500.11822/7700/-Mediterranean\\_strategy\\_for\\_sustainable\\_development\\_2016-2025\\_Investing\\_in\\_environmental\\_sustainability\\_to\\_achieve\\_social\\_and\\_economic\\_development-20.pdf?sequence=3](https://wedocs.unep.org/bitstream/handle/20.500.11822/7700/-Mediterranean_strategy_for_sustainable_development_2016-2025_Investing_in_environmental_sustainability_to_achieve_social_and_economic_development-20.pdf?sequence=3)
- UNEP/MAP and Plan Bleu. (2020). *State of the Environment State of the Environment and Development Development in the Mediterranean in the Mediterranean* (p. 341). <https://planbleu.org/wp-content/uploads/2020/11/SoED-Full-Report.pdf>
- UNFCCC. (2022, November 4). *Green Island*. <https://unfccc.int/news/green-island>

- UNIDO. (2018). *MED TEST II. Transfer of Environmentally Sound Technology*. <https://switchmed.eu/https://acrobat.adobe.com/link/review?uri=urn:aaid:scds:US:0fb81358-a035-3766-8483-f309a3148b9c>
- Union for the Mediterranean. (2021a). *TOWARDS 2030: AGENDA FOR A GREENER MED Contributing to Achieving the Environmental SDGs in the Mediterranean* (p. 42) [Agenda]. [https://ufmsecretariat.org/wp-content/uploads/2022/03/220304-Presentación\\_Final\\_Light.pdf](https://ufmsecretariat.org/wp-content/uploads/2022/03/220304-Presentación_Final_Light.pdf)
- Union for the Mediterranean. (2021b). *Union for the Mediterranean Ministers sign declaration on clean energy transition*. [https://commission.europa.eu/news/union-mediterranean-ministers-sign-declaration-clean-energy-transition-2021-06-14\\_en](https://commission.europa.eu/news/union-mediterranean-ministers-sign-declaration-clean-energy-transition-2021-06-14_en)
- United Nations. (n.d.). *Goal 12 | Department of Economic and Social Affairs*. Retrieved 15 September 2023, from <https://sdgs.un.org/goals/goal12>
- UNWTO. (n.d.-a). *Circular Economy: Integrating Circular Economy Principles in Tourism*. Retrieved 26 September 2023, from <https://www.unwto.org/sustainable-development/circular-economy>
- UNWTO. (n.d.-b). *The Glasgow Declaration on Climate Action in Tourism*. Retrieved 26 September 2023, from <https://www.unwto.org/the-glasgow-declaration-on-climate-action-in-tourism>
- UNWTO. (2021, September 21). *The Glasgow Declaration: An urgent global call for commitment to a decade of climate action in tourism*. <https://www.unwto.org/news/the-glasgow-declaration-an-urgent-global-call-for-commitment-to-a-decade-of-climate-action-in-tourism>
- Vandeplas, A., Vanyolos, I., Vigani, M., & Vogel, L. (2022). *The Possible Implications of the Green Transition for the EU Labour Market*. Directorate General Economic and Financial Affairs (DG ECFIN), European ...
- Vasileios Rizos, V. R., Katja Tuokko, K. T., & Arno Behrens, A. B. (2017). *The Circular Economy: A review of definitions, processes and impacts*. CEPS Research Report No 2017/8, April 2017.
- Vegter, D., van Hillegersberg, J., & Olthaar, M. (2020). Supply chains in circular business models: Processes and performance objectives. *Resources, Conservation and Recycling*, 162, 105046. <https://doi.org/10.1016/j.resconrec.2020.105046>
- Verger, E., Perignon, M., El Ati, J., Darmon, N., Dop, M., Drogué, S., Dury, S., Gaillard, C., Sinfort, C., & Amiot, M. J. (2018). A “Fork-to-Farm” Multi-Scale Approach to Promote Sustainable Food Systems for Nutrition and Health: A Perspective for the Mediterranean Region. *Frontiers in Nutrition*, 5. <https://doi.org/10.3389/fnut.2018.00030>
- Vizoso, J. (2021). A Euro-Mediterranean Green Deal. *Towards a Green Economy in the Southern*. <https://www.euromesco.net/wp-content/uploads/2021/03/A-Euro-Mediterranean-Green-Deal.pdf>
- Willett, W., Rockström, J., Loken, B., Springmann, M., Lang, T., Vermeulen, S., Garnett, T., Tilman, D., DeClerck, F., Wood, A., Jonell, M., Clark, M., Gordon, L. J., Fanzo, J., Hawkes, C., Zurayk, R., Rivera, J. A., Vries, W. D., Sibanda, L. M., ... Murray, C. J. L. (2019). Food in the Anthropocene: The EAT–Lancet Commission on healthy diets from sustainable food systems. *The Lancet*, 393(10170), 447–492. [https://doi.org/10.1016/S0140-6736\(18\)31788-4](https://doi.org/10.1016/S0140-6736(18)31788-4)
- WWF Mediterranean Marine Initiative. (2019). *Stop the Flood of Plastic: How Mediterranean countries can save their sea*. [https://awsassets.panda.org/downloads/a4\\_plastics\\_reg\\_low.pdf](https://awsassets.panda.org/downloads/a4_plastics_reg_low.pdf)
- Youssef, A. B. (2023). Digitalization for the Green Transition in the Mediterranean. *IEMed: Mediterranean Yearbook, 2023*, 56–61.



Union for the Mediterranean  
Union pour la Méditerranée  
الاتحاد من أجل المتوسط

Interreg  
Euro-MED



Co-funded by  
the European Union

Innovative  
sustainable economy



Water and  
Environment Support  
in the ENI Southern Neighbourhood region



Funded by the  
European Union



MedWaves  
the UNEP/MAP Regional  
Activity Centre for SCP



german  
cooperation  
DEUTSCHE ZUSAMMENARBEIT

Implemented by

**giz** Deutsche Gesellschaft  
für internationale  
Zusammenarbeit (GIZ) GmbH