

# **A EURO-MEDITERRANEAN GREEN DEAL? TOWARDS A GREEN ECONOMY IN THE SOUTHERN MEDITERRANEAN**

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**EuroMeSCo** is the main network of research centres and think tanks in the Euro-Mediterranean area. Founded in 1996, in the aftermath of the Barcelona Declaration, the network currently comprises 104 institutes from 29 European and Southern Mediterranean countries. In addition to fostering evidence-based and policy-oriented analysis on Euro-Mediterranean politics and policies through joint research programmes, its mission is to boost the role of think tanks and research institutes in policy-making and strengthening Euro-Mediterranean relations by providing a platform for dialogue between researchers from both shores of the Mediterranean, as well as between the members of the network and key stakeholders.

**EuroMesCo: Connecting the Dots** is a project co-funded by the European Union (EU) and the European Institute of the Mediterranean (IEMed) that is implemented in the framework of the EuroMeSCo network. It contributes to inclusive and evidence-based policy-making by fostering research and recommendations in relation with the European Neighbourhood Policy (ENP) South priorities, with focus on economic development, migration and security. The project develops a wide range of research, dialogue and dissemination activities.

As part of the project, five Joint Study Groups are assembled each year to carry out evidence-based and policy-oriented research. The topics of the study groups are defined through a process of policy consultations designed to identify policy-relevant themes related to the three priorities of the project. Each study group involves a Coordinator and a team of authors who work towards the publication of a Policy Study which is printed, disseminated through different channels and events, and accompanied by audio-visual materials.

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The **European Institute of the Mediterranean** (IEMed), founded in 1989, is a consortium comprising the Catalan Government, the Spanish Ministry of Foreign Affairs and Cooperation and Barcelona City Council. It incorporates civil society through its Board of Trustees and its Advisory Council formed by Mediterranean universities, companies, organisations and personalities of renowned prestige.

In accordance with the principles of the Euro-Mediterranean Partnership Process, and today with the objectives of the Union for the Mediterranean, the aim of the IEMed is to foster actions and projects which contribute to mutual understanding, exchange and cooperation between the different Mediterranean countries, societies and cultures as well as to promote the progressive construction of a space of peace and stability, shared prosperity and dialogue between cultures and civilisations in the Mediterranean.

Adopting a clear role as a think tank specialised in Mediterranean relations based on a multidisciplinary and networking approach, the IEMed encourages analysis, understanding and cooperation through the organisation of seminars, research projects, debates, conferences and publications, in addition to a broad cultural programme.



The **Arab Reform Initiative** (ARI) is an independent Arab think tank working with expert partners in the Middle East and North Africa and beyond to articulate a home-grown agenda for democratic change. It conducts research and policy analysis and provides a platform for inspirational voices based on the principles of diversity, impartiality, gender equality and social justice.

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- It empowers individuals and institutions to develop their own concept of policy solutions.
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ARI's aim is to see vibrant democratic societies emerge and grow in the region.



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# Executive Summary

The transition to a green economy requires nothing short of a major, structural transformation of economic models, domestic and global. The scale and pace of the change needed and the high level of uncertainty require bold commitments, cooperation, innovation and experimentation across sectors, stakeholders and countries – a fierce challenge for the globe, well beyond the shores of the Mediterranean. Each chapter in this study includes domain-specific and country-specific findings and proposes recommendations on how to accelerate the green economy in the particular context. Due to the social, economic and political heterogeneity in the region, it is obvious that a “one size fits all” solution is not suitable. Nonetheless, common findings and recommendations do emerge across the case studies.

## **General assessment of Southern Mediterranean transitions to the green economy**

Like their neighbours to the north, Southern Mediterranean Countries (SMC) are far from mainstreaming green and sustainable development principles into their economies, despite the progress made. In terms of planning, almost all SMC have developed national strategies and priorities regarding green growth, driven both by their comparative advantage in certain sectors, such as renewable energy (RE) production, but also by resource scarcity that is already tangible, specifically water stress in most countries and high dependence on energy imports. Yet even those countries that have made the greatest strides in planning – Jordan, Morocco and Tunisia – struggle acutely with implementation and evaluation, due to problems of governance (lack of buy-in, coordination and communication among stakeholders), as well as more technical obstacles (such as underperforming quality infrastructure systems and underdeveloped skills in the labour market).

More critically, environmental policy remains siloed from core economic and social policy at the national, regional and international levels. For too many in the region, the link between environmental protection and key social and economic goals – addressing high unemployment, reducing poverty and regional and social inequalities and managing rapid urbanisation – is not yet clear. Given that most efforts towards greening the economy are led by foreign donors,



such programmes do not receive sufficient buy-in from the Southern Mediterranean partners to ensure continuity and scaling-up once international technical cooperation programmes come to an end. The weak regional integration and high level of policy fragmentation across the Southern Mediterranean region also hinders the transition to green economies as potential partners fail to identify synergies and co-benefits associated with greening. For the European Union (EU), the green economy as a new developmental paradigm has not been incorporated into its core economic and diplomatic relations across the Mediterranean, and the EU has not yet capitalised on the opportunities that the green economy provides to focus on collective and shared challenges and rethink key cooperation frameworks.

The following general recommendations – pitched to the primary stakeholders of this Joint Study Group, the European Commission (EC)'s Directorate-General for Neighbourhood and Enlargement Negotiations (DG Near) and specifically its Regional Programmes Neighbourhood South – are intended to highlight the points of tension we observed throughout the research and opportunities to forge environmental and climate partnerships that are more equal, inclusive and productive.

## **Recommendations to accelerate green economy transitions**

The EU's stated commitment to green diplomacy is an opportunity to invigorate cross-Mediterranean relations at the core. If the green economy is indeed a new developmental paradigm, we need a holistic and critical understanding of how it intersects with existing frameworks, what the plans are to transform them, and how progress will be measured and evaluated.

- **Measure and avoid spillover environmental effects** of the European Green Deal: Green economy strategies within the EU must be implemented without generating negative environmental externalities in the Southern Mediterranean. EU-wide indicators, which provide a useful and evolving tool to keep track of the EU's green economy developments, must be adapted to capture the external environmental effects of the EU's shift and to reduce the incentive to simply displace environmental externalities across borders.
- **Mainstream green economy concepts:** The concept of green economy must be etched into existing frameworks more clearly in all policy documents and statements, and crucially into trade agreements. The push for European trade agreements to include compliance with the Paris Agreement as an "essential

clause”, which is gaining in support in Europe, must be encouraged, as must the push for environmental and climate-related tariff conditionality on predefined objectives with Southern Mediterranean partners, especially around waste management and circular economy (CE) production.

- **Communicate domestic benefits of greening more clearly:** Communication with stakeholders in the areas of RE, energy efficiency and CE should focus on the short- and medium-term outcomes of domestic value creation, as well as on the co-benefits to diverse national stakeholders, especially in terms of job creation and export opportunities.
- **Place inclusion at the centre of greening transitions:** Local communities, municipalities and civil society must be part of the conversation from the start, and citizen engagement should be encouraged throughout. Inclusivity not only facilitates implementation and sustainability but also births innovative solutions to specific local needs in urban planning, RE projects, and circular economies.
- **Shift the focus from large-scale projects to decentralised greening,** especially in RE transitions: Large-scale centralised projects have not been fully effective or successful at attracting sustainable investment; support should move to micro, small and medium enterprises (MSMEs), which perform better in terms of job creation and technology transfer, and can reach marginalised areas reducing energy dependence and insecurity.
- **Integrate improvements in quality infrastructure (QI) systems** into development cooperation programmes and **align skill development and training assistance programmes with greening strategies.**
- **Rethink green finance:** Public funding of the green economy must: (1) shift from large-scale projects that mostly benefit large firms to smaller-scale projects that involve MSMEs and address their needs (such as encouraging and expanding the recent Green Value Chain programme); (2) target incentives to polluters such as by offering concessional credit to polluting firms for fuel switching, energy efficiency and end-of-pipe projects; (3) expand the portfolio of de-risking instruments, including loan guarantees, public-equity co-investments and political risk insurance; and, critically, (4) ensure that green financing is linked with and streamlined across other regional programmes aiming to reduce poverty and inequality.
- **Support measures to offset the social costs of greening:** Certain measures, such as the elimination of energy subsidies must be accompanied by measures that mitigate the adverse impacts on the most vulnerable. These measures may comprise social safety nets, adapted financing allocations, improvement of consumers’ purchase power, a widespread energy price-optimised access, and a price diversification strategy.



# Introduction

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The Mediterranean region is widely recognised to be particularly vulnerable to environmental degradation and climate change. Its current ecological footprint is higher than the global average, and its ecological deficit is twice as high (Global Footprint Network, 2018), with the region consuming around 40% more renewable natural resources and other ecosystem services than it provides (Galli et al., 2017). The Mediterranean is also considered a hotspot for climate change, due to more rapid warming in both the air and the sea than the global average, as well as an unequivocal trend towards drier conditions in this water-scarce region. While the global mean surface temperature is now about 1.1°C above pre-industrial values (IPCC, 2019), the Mediterranean region approaches 1.54°C (Cramer et al., 2018), and its global warming trend is about 0.03°C per year compared to 0.02°C globally. The implication of this trend is that when the world passes the 1.5°C threshold identified in the Paris Agreement, around the year 2040, the Mediterranean will already have warmed by 2.2°C (UNEP/MAP & Plan Bleu, 2020). The region is also particularly vulnerable to the impacts of sea level rise, given the proximity of dense human settlements, infrastructure and heritage sites close to the shore, as well as the large proportion of economic activities (agriculture, fisheries, tourism) and supporting infrastructure (cities, ports, agriculture in low-lying river deltas) that are tightly tuned to the current level of the sea surface. For the countries on the Southern and Eastern shores of the Mediterranean, these environmental challenges are compounded by the absence of the necessary economic resources for adaptation (Fosse et al., 2016).

In its Communication released in December 2019 on the European Green

Deal, the European Commission (EC) commits not only to mainstreaming sustainability and decarbonisation in all its internal policies but also to developing a stronger “green deal diplomacy” and specially to placing “emphasis on supporting its immediate neighbours” through “strong environment, energy and climate partnerships with the Southern Neighbourhood” (EC, 2019). Among the pathways to advancing sustainability and decarbonisation, the Green Economy concept has gained popularity as an attempt to create more inclusive and environmentally-friendly economic development. Coined at the 2012 United Nations Conference on Sustainable Development in Rio de Janeiro (known as the Rio+20 Summit), the Green Economy is seen as a path to improving human wellbeing and social equity, while significantly reducing environmental risks and ecological scarcities (UNEP, 2011).

This study takes stock of how Southern Mediterranean Countries (SMC) are moving towards green economy models in strategy and implementation. What are the context-specific opportunities, challenges, risks and tradeoffs involved in green economy transitions in the region – and what role can the European Union (EU) play in managing them? How palpable is the promise of economic development that is socially inclusive and environmentally sustainable – and how can the EU’s “green deal diplomacy” itself be equal, inclusive and productive?

The policy study addresses these questions through four individual contributions, each on a specific domain related to the green economy. The first chapter explores **green industrial development**, a multi-sectoral strategy for achieving more energy and material-efficient production and consumption processes that has been recognised as

a key element of sustainable development. The second chapter turns to the **circular economy (CE)**, a concept that is attracting increasing attention in the EU as a purported model for a sustainable and resilient economic system, where economic growth is decoupled from use of resources through the reduction and recirculation of natural resources. Third, we turn to **renewable energy (RE)**, a sector where the region's comparative advantage is driving many governments' national strategies and priorities regarding green growth. The final chapter explores **urban eco-innovation** practices, in recognition of the fact that around 70% of the Mediterranean population lives in urban areas and that 86% of new population growth is predicted to occur in cities of the developing world.

To explore progress and obstacles in these domains, each chapter focuses

on one or a small number of country cases. Given the nature of the questions guiding this study, the timespan of the research and writing process – four months – and the existence of recent multi-country surveys (e.g. Fosse et al., 2016; UNEP/MAP & Plan Bleu, 2020), the authors opted for case studies as the most practical way to assess and evaluate transitions to green economies. Together, the chapters focus primarily on the cases of Jordan, Morocco, Tunisia, with lesser attention to Egypt and Lebanon. All chapters follow a similar mix of analysis of primary and secondary documents (international and national policy reports and assessments, national planning documents, programmatic material, legislation, media sources and academic literature), as well as semi-structured interviews with key stakeholders, including policy-makers, diplomats, civil society, researchers, and the private sector.

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# **Green Industrial Development in the Southern Mediterranean: Harnessing Opportunities**

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## Introduction

The transition to greener economies has become irreversible. Given existing planetary boundaries, industrial transformation in the coming decades will have to rely on sustainable solutions for production and consumption of goods and services. Such a process has to be driven by a close interaction between technological innovation, sustainable infrastructure investment, and increased resource productivity (New Climate Economy, 2018). In fact, by 2030, a wide variety of green technologies are expected to be extensively deployed not only in developed countries but also across developing countries (Vidican Auktor, Altenburg, & Stamm, 2020), opening new markets and creating opportunities for domestic value creation and learning.

For the transition to a green economy to be embraced by developing countries, it should, however, deliver socioeconomic co-benefits, such as jobs, export opportunities, and knowledge spillovers. To this end, state intervention in close cooperation with the private sector and civil society is essential for “tipping energy and industrial systems towards newer, cleaner, and ultimately cheaper modes of production” (Hepburn, O’Callaghan, Stern, Stiglitz, & Zenghelis, 2020, p. 4). While extant literature increasingly points to employment gains and competitive advantages associated with investments in green technologies, how to harness such opportunities varies widely not only from one country to another, but also by sector. Specifically, interventions are highly dependent on the pattern of specialisation and trade, available technological capabilities and natural resources.

Building on both the scientific and political consensus that public-private partnerships and close cooperation with civil society are central to the transition to a green economy, and that industrial development guided by a policy process based on a long-term vision, collaboration and dialogue is essential for long-term growth (Rodrik, 2014; Altenburg & Rodrik, 2017), this chapter examines opportunities and challenges for greening the industry in the Southern Mediterranean region. The analysis focuses specifically on Jordan and Morocco, two upper-middle income countries, highly resource constrained, but which have remained relatively stable in political and economic terms despite having to absorb negative shocks from the region (i.e. regional instability, large waves of refugees in the case of Jordan). With similar sustainability challenges (i.e. high dependence on imported fossil-fuels, water scarcity) and priority given to energy efficiency and renewable energy (RE), their growth trajectories differ. Morocco has succeeded in maintaining the momentum created by large investments in RE to become a hub for clean energy in the region, and to diversify its economy while becoming more export-oriented. Jordan has also taken important steps towards greening its electricity generation sector; however, its RE sector has reached a standstill and its current focus has shifted to increasing energy efficiency in both production and consumption. In both countries, competitiveness in the private sector remains low as does its participation in national greening initiatives. Yet, greening the economy has been increasingly seen as an opportunity to develop new competitive advantages while also addressing resource scarcity and contributing to mitigation efforts.

To reflect on different pathways for greening, essential for structurally changing economies towards sustainability, this chapter critically reflects on: greening electricity generation (in Morocco) to support sustainable development; and promoting energy efficiency in production and consumption (in Jordan), essential for setting the foundation for a greener industrial sector and for a circular economy (CE) model.

Relying on semi-structured interviews with national experts in the public, private and research sectors in Morocco and Jordan and on secondary sources of data – specifically, policy and academic literature, conferences and workshops – this chapter reflects on initiatives taken to develop markets for green technologies and the challenges associated with increasing the environmental sustainability of industrial development. It also discusses how policy-makers could best address these challenges and in particular how, in light of the European Green Deal, cross-Mediterranean interventions could support the transition to a green economy in the Southern Mediterranean.

## **Demonstrating commitment to greening the economy**

Jordan and Morocco are similar in terms of resource base, but differ in terms of development pathways and progress towards greening. Highly constrained in terms of conventional

energy and water resources, both countries have been under extreme pressure to diversify their energy supply and to find ways to reduce the water stress. Specifically, Jordan and Morocco import more than 90% of their energy sources (IEA, n.d.) – thus being highly vulnerable to developments in international energy markets – and face high (in Morocco) to extremely high (in Jordan) water risk (Hofste et al., 2019). With energy demand expected to more than triple by 2030 (MEMEE, 2011; Berdikeeva, 2018) the urgency of finding more sustainable alternatives to fossil fuels and of improving water management to enable green and inclusive growth has been widely recognised by the policy-makers of the two countries. This commitment has been shown by the extensive national and sectoral level strategies developed to respond to challenges posed by climate change and resource scarcity. Morocco's mitigation targets as part of the Paris Agreement are the most ambitious, aiming to unconditionally reduce emissions by 17% by 2030, or even by 42% given external technical and financial support (UNFCCC, n.d.). Jordan, by comparison, aims for a 1.5% and 14% reduction, respectively. Even if in Jordan the dynamism that was seen a few years ago has diminished, the government remains committed to greening the economy.<sup>1</sup> In spite of the early steps and large investments that have been made in both countries, the efforts on the ground still lag behind the vast potential that exists.

In spite of the early steps and large investments that have been made in Jordan and Morocco, the efforts on the ground still lag behind the vast potential that exists

<sup>1</sup> Currently, without opportunities for energy exports and storage, Jordan faces overcapacity in RE generation putting limits on clean energy deployment because of grid capacity. This is primarily the result of focusing on large-scale RE generation projects (to the detriment of small- and medium-scale installations) in light of already long-term (20-30 years) binding contracts for imports of oil and gas resources.

## Greening the energy mix in Morocco

With an economy facing an ever-increasing energy demand driven by economic development and growing household consumption, as well as more negative signs of environmental degradation, Morocco has been under severe pressure to diversify its energy mix towards cleaner forms of electricity generation. As such, since 2009, the government's commitment to greening the energy mix and reducing its strong dependence on fossil fuel imports has been demonstrated through ambitious targets for solar and wind energy generation, as well as regulatory and institutional changes followed by large public investments. As explained in the chapter by Behnassi in this study, the National Energy Strategy initially set a target of 42% of total installed capacity to be provided by RE (solar, wind, hydropower) until 2020; later increased to 52% by 2030. To meet the target, 10 GW of RE capacity is expected to be added between 2018 and 2030 – 4,560 MW of solar, 4,200 MW of wind, and 1,330 MW of hydropower (IEA, 2019). These targets were soon followed by major energy reforms and initiatives meant to not only diversify the energy mix but to also make clean energy and resource efficiency an integral part of Morocco's growth pathway.<sup>2</sup> Like Jordan, Morocco has also phased out fossil fuel subsidies since 2014, reducing the initial cost disadvantage for renewables and resulting in more efficient energy use. These developments have rapidly contributed to positioning Morocco as the most promising destination for solar and wind

energy investments in the Middle East and North Africa (MENA) region and in Africa.

Yet, reducing the energy intensity of Morocco's economy has been more difficult to achieve, especially because of the increase in demand. Moreover, set targets are to be covered primarily by large RE generation power plants; the use of renewables in residential, transport and industrial sector – which could contribute significantly to reducing the environmental footprint and to employment – remains limited (see Behnassi in this report, for a more detailed discussion). Regulatory and market hurdles also persist with regards to decentralised clean energy generation, which would allow micro, small and medium enterprises (MSMEs) to generate electricity from solar or wind sources for own use, feeding the surplus into the grid (Redouane, Masaki, Meijer, & Essakati, 2018). Lack of appropriate regulations limit RE generation to large-scale projects that can ultimately overburden the electricity grid (as we already see in Jordan's case). Nevertheless, large energy-intensive companies, such as cement producers, the phosphates sector and large retailers, have increasingly invested in building their own RE generation plants, reducing their dependency on the grid.

Despite these regulatory and market challenges, what distinguishes Morocco from its peers is its determination to link RE investments to industrial development, employment creation and competitiveness gains (Vidican Auktor,

<sup>2</sup> While this section focuses specifically on RE initiatives, it is important to mention that Morocco has also taken important steps towards increasing energy efficiency in buildings and in industrial processes.

2017).<sup>3</sup> While until now local value creation, in terms of jobs and local manufacturing, has remained limited, this trend is likely to change as Morocco becomes an increasingly prominent RE player on the African continent.<sup>4</sup> Although still at a low scale, the manufacturing of parts and components for solar photovoltaic (PV) systems and the presence of local service providers have been expanded as well. This is the result of both a decade of experience with RE project development and awareness-building initiatives, and of the continuous effort of the *Institut de Recherche en Énergie Solaire et en Énergies Nouvelles* (IRESEN) to build technological capabilities (and know-how) and develop a national innovation system for these technologies.

IRESEN has played a critical role in strengthening the weak links between the private sector and academic and research institutions. Through systematic efforts, it has contributed to not only increasing awareness of the opportunities offered by renewables for the private sector but has also played a critical role in fostering partnerships with experts abroad and developing domestic capabilities in applied re-

search. Moreover, IRESEN's Green Energy Park and the Green & Smart Building Park are unique in Africa and the MENA region, offering research and education platforms for testing and developing RE technologies not only for electricity generation but also for use in other sectors, such as agriculture, manufacturing and transportation. Its focus has also more recently expanded to bioenergy and storage, water-energy nexus, and green synthetic fuels (such as hydrogen, methane and ammonia).<sup>5</sup> As such, Morocco's commitment to transitioning to a green economy and its policy coordination across stakeholders are well reflected in its efforts to expand green technology supply chains especially in sectors with comparative advantage. Specifically, the export-oriented automotive sector is attracting investment and building capabilities in electric cars and battery technologies.<sup>6</sup> Similarly, cooperation with the European Union (EU) (led by Germany) in (green) hydrogen technology builds on its success with greening electricity generation. Building upon these early national initiatives is likely to offer win-win opportunities for cross-Mediterranean energy and industrial development cooperation programmes.

<sup>3</sup> Studies estimate that an investment of €20 billion in RE, energy efficiency and waste management is likely to generate 90,000 new jobs by 2020 (CESE, 2012).

<sup>4</sup> In 2019, the Moroccan Agency for Sustainable Energy (MASEN), the agency responsible for managing Morocco's RE projects, and the African Development Bank signed the "Desert to Power" partnership by which Morocco has committed to share its know-how, capacity-building and experience, and technical assistance to support African countries to realise their RE potential (Naji, 2019).

<sup>5</sup> The process of using (green) electricity to produce synthetic fuels such as hydrogen, methane and ammonia is called Power-to-X. More recently, Morocco has been identified as offering great potential in this area both in terms of satisfying its domestic needs of its large fertiliser sector and exporting green hydrogen to Europe (Fraunhofer ISI, 2019). Currently, Morocco imports large quantities of fossil fuel-based ammonia. To capitalise on these opportunities, a partnership was signed in 2019 between Germany and Morocco to invest in the development of such fuels (PAREMA, 2019).

<sup>6</sup> For instance, France's PSA Group and Morocco's postal service signed an agreement to develop in Kenitra an adapted version of the 225 Citroen Ami, a 100% electric car (Kasraoui, 2020). China's BYD also signed an agreement in 2017 to produce in Tangier electric cars, buses and trucks (Middle East Eye, 2017).

Decoupling economic growth from environmental degradation has become a core element of Jordan's development strategy

To foster a stronger participation of the Moroccan private sector in these (national and international) RE initiatives, the industry federation *Confédération Générale des Entreprises du Maroc* (CGEM) has only more recently been engaged in systematically integrating and coordinating initiatives across sectors, through its green economy permanent committee (CGEM, n.d.). Aside from coordination, the goal of this committee is to raise awareness within the Moroccan private sector on the vast opportunities that RE (and energy efficiency) offers in terms of increasing the sustainability of production and consumption, reducing costs and improving competitiveness. Moreover, through the sectoral industry associations, it aims to support MSMEs to adopt and use green technologies and to shift towards CE models of production. As discussed by Boussen and Choucair Vizoso in this report through the lens of Tunisia, such a transition is novel for the region and remains challenging also in the EU.

### Promoting energy efficiency in Jordan

Jordan is located in one of the most volatile world regions and faces major limits to its growth due to its strong dependence on imports of conventional energy fuels, severe water scarcity, and high inflow of refugees from war-torn neighbouring countries.<sup>7</sup> Therefore,

sustainability and resource efficiency have increasingly been core elements of Jordan's development strategy. The 2025 National Vision and Strategy launched in 2015, known as Jordan Vision 2025, focuses on accelerating growth and improving welfare and basic services for its citizens. Recognising that to achieve these development goals substantial changes in production and consumption patterns are needed,<sup>8</sup> the Ministry of Environment developed the National Strategy and Action Plan for Sustainable Consumption and Production 2016-2025. This action plan for supporting Jordan's transition to a green economy is part of the SwitchMed Programme<sup>9</sup> financed by the EU to support common sustainable consumption and production objectives in the Southern Mediterranean region. In Jordan, the programme, implemented over two phases, focuses on the three strategic sectors that are also central to achieving the Jordan Vision 2025: agriculture and food industry, transport sector and waste management sector. As such, the action plan for sustainable consumption and production complements the Jordan Vision 2025 and sets performance indicators to measure progress towards achieving the green economy objectives (Ministry of Environment, 2016). These strategic goals are also in line with the Mediterranean Strategy for Sustainable Development 2016-2025 (UNEP/MAP, 2016). More im-

<sup>7</sup> Prior to 2009, Jordan experienced high rates of growth, allowing it to triple its exports and increase income per capita by 38% (Hausmann et al., 2019). The large and persistent external shocks that followed (i.e. global economic crisis, Arab Spring, Syrian Civil War) significantly undermined its growth prospects.

<sup>8</sup> The two largest energy consumers in Jordan are the household sector (42%) and the industrial sector (26%) (GFA Consulting Group, 2017).

<sup>9</sup> The SwitchMed Programme focuses on supporting industry, green entrepreneurs, civil society, and policy-makers to change "the way goods and services are produced and consumed, so that human development and satisfaction of human needs is decoupled from environmental degradation" (Ministry of Environment, 2016, p. 4).

portantly, the sustainable consumption and production agenda aims for transversal actions with a focus on energy efficiency, water efficiency, resource efficiency, pollution reduction, sustainable transportation and mobility (Ministry of Environment, 2016). Thus, decoupling economic growth from environmental degradation has become a core element of Jordan's development strategy.

To further operationalise these objectives, Jordan's government launched in July 2020 the Green Growth National Action Plan 2021-2025 (GG-NAP), a multi-sectoral implementation plan to support Jordan's sustainable growth goals while also taking into account climate change targets. The GG-NAP is promising since it takes a cross-sectoral approach focusing on five objectives related to the transition to a green economy, applied to the most strategic sectors (energy, water, agriculture, waste, tourism, and transport): enhanced natural capital, sustainable economic growth, social development and poverty reduction, resource efficiency, and climate change adaptation and mitigation. While the strategy is very comprehensive and it recognises the importance of building on sectoral inter-dependencies for successfully transitioning to a green economy, it is too early to specifically assess its effectiveness. Interviews with experts in Jordan argue that, currently, the main shortcomings are limited implementation capacities within the responsible organisations, and the lack of a coordination mechanism/platform for the identified policy measures.

Interest from the public and private sector in reducing energy and resource consumption has intensified after the reduction of fossil fuel subsidies since 2012. Like other countries in the MENA region, with the EU's support Jordan has also set energy efficiency targets and embedded them in National Energy Efficiency Action Plans (NEEAPs),<sup>10</sup> aiming to reduce energy consumption by 2,000 GWh per year from 2018 to 2020 to achieve a 20% target for energy savings (JREEEF, 2017). For the industrial sector, for instance, targets are to be achieved through energy audits – mandatory for energy-intensive companies – and energy management systems, carried out through so-called "Mobile Energy and Environmental Clinics" (RCREEE, 2014). While most targets for energy efficiency lag behind in the public and residential sector, as well as in the agricultural sector, measures for improving energy (and material) efficiency in the industrial sector are also not sufficiently ambitious. Moreover, while the CE has been articulated to be an important means for greening the economy, action in this regard remains limited – similar to the case of Tunisia, discussed by Boussen and Choucair Vizoso in this report.

The Cleaner Production Unit at the Royal Scientific Society established in 2004 and recognised by the United Nations Industrial Development Organisation (UNIDO) and the Arab League Programme on Environment has been increasingly active in conducting environmental audits, cleaner production in-plant assessments and

<sup>10</sup> The first NEEAP was developed in 2011 for the period of 2012-2014. The second NEEAP was developed for the period of 2017-2020, more ambitious than the earlier one as it covered more sectors and expanded the energy efficiency measures.



life cycle assessments, but also training programmes and workshops. Sectors where their services have been demanded are: fertiliser producers, paint producers, electroplating, textiles, hospitals, hotels and restaurants. The Cleaner Production Unit has also been involved with developing a Master Programme in Environmental Technology and Management at Princess Sumaya University for Technology, contributing to green skills development. Furthermore, the first phase of the SwitchMED project, MED-TEST II, has focused on improving energy and resource efficiency in 12 companies in the food and beverage sector. With green finance support from the Jordan Renewable Energy and Energy Efficiency Fund, the project also demonstrated that such measures can have a strong impact on reducing production costs<sup>11</sup> related to raw materials, energy and water savings, and can contribute to increasing awareness of cleaner production and consumption. The extension of this project, MED-TEST III, from 2019 to 2023, aims to expand this approach to the chemicals and plastics sectors, to scale-up resource efficiency outcomes, and develop a policy framework to establish resource efficiency as a common practice for Jordanian companies.

## **Facing challenges in harnessing the opportunities**

Both Morocco and Jordan have made important steps towards greening the economy and have developed comprehensive national and sector-level strategies. Yet, given the vast oppor-

tunities, progress remains slow in terms of scaling-up these initiatives and fully integrating these approaches in the growth model. This is not surprising given that the green transformation is a novel pathway globally, defined by a high level of uncertainty regarding how markets and green technologies will develop. In addition, the experience of the last two decades shows how difficult it is to transfer best practices from abroad, calling for national innovations in policy and technologies to customise greening solution to the domestic framework conditions.

Reflecting on the experience of these two countries, several areas of interventions emerged as critical for tackling existing challenges related to scaling up and advancing the transition to a green economy. To deliver socioeconomic objectives (i.e. employment, localisation of value chains, and export opportunities), strengthening the participation of MSMEs and of other key stakeholders in the greening initiatives is essential. While pro-environment regulations may be considered (to a certain degree) satisfactory in both countries, the main challenge relates to compliance and implementation of those policies and regulations.

To this end, our assessment shows that several areas need to be strengthened to enable MSMEs to engage with greening production (of goods and services), increase compliance and make implementation more effective: (1) awareness, communication and multi-stakeholder engagement; (2) green skills

<sup>11</sup> In the 12 demonstration companies, a potential saving of over €2.1 million annually was identified, resulting in energy savings of 22,181 MWh/year, water savings of 63,844 m<sup>3</sup>/year, 404 tons of raw material savings, and the avoidance of 83 tons of landfill solid waste (SwitchMed, n.d.).

development programmes; (3) quality infrastructure; (4) research and innovation capabilities; and (5) policy coherence, monitoring and evaluation. Each of these aspects is discussed below with reference to the two specific intervention areas: RE in Morocco and energy efficiency in Jordan.

### **Awareness, communication, and multi-stakeholder engagement**

In both countries, private sector participation remains low, thus reducing the demand for “greening” solutions. Additionally, compliance to regulations remains problematic. Many donor-led projects, especially in the area of energy efficiency, tend to end once funding is over, showing poor ownership from domestic users/recipients. Important reasons for these shortcomings are the low level of awareness of the benefits associated with clean energy and energy efficiency (both in the public and private sectors), insufficient communication of facts and rationale, as well as lack of catalysts to mobilise the entire ecosystem necessary to advance the transition to a green economy. These hurdles are seen in both countries.

However, Morocco has recently made important progress to improve awareness within the private sector by mobilising the industry associations to play a more active role in the RE sector (i.e. to provide RE solutions for other sectors). The role of IRESEN as a catalyst for the clean innovation ecosystem in Morocco has also contributed to improving the cooperation between the public and private sector and with academic and research communities. In Jordan, implementation of national plans for resource efficiency in the industrial sector

is significantly hampered by the lack of both awareness and multi-stakeholder engagement. Low awareness of the benefits that energy efficiency can offer to enterprises, insufficient communication of positive examples, and limited capabilities to adequately translate technical know-how across stakeholders – from policy-makers to academia and research, financial sector, and civil society – have resulted in a narrow energy efficiency market focused on firm-level audits that are not sufficiently customised to firms’ needs. To overcome this blockage, awareness and communication campaigns can play a role in catalysing critical stakeholders – such as industry associations, civil society and the banking sector – to play a more active role in stimulating demand for resource efficiency solutions. Especially given the large share of the youth population in the Southern Mediterranean region, the active participation of civil society can play a critical role in advancing the transition towards sustainable modes of production and consumption. Environmental non-governmental organizations (NGOs) have been particularly active in Jordan in promoting civil society participation and collaborative governance. More could be learned, however, from EU-funded projects such as Accelerating and Rescaling Transitions to Sustainability (ARTS) when it comes to fully capitalising on the various ways in which civil society can advance the transition to a green economy in the urban environment (Frantzeskaki et al., 2016) but also in the rural space.

### **Green skill development**

Skill development programmes are critical for enabling the transition to a green economy. In fact, empirical evidence shows that gaps exist when it comes to supply and demand of green

While pro-environment regulations may be considered (to a certain degree) satisfactory in both Jordan and Morocco, the main challenge relates to compliance and implementation of those policies and regulations



skills, hindering the transition to a green economy (Vidican Auktor, 2020). Morocco and Jordan are no exception in this regard. Companies frequently report difficulties in finding adequate green skills in the labour market, both when it comes to technicians for RE technologies, as well as for resource management occupations. This is primarily the result of green skills development programmes not being closely aligned to the national strategies for greening. In Morocco, green skills development initiatives are more fragmented, offered partially by the public training agency or through technical cooperation. In contrast, Jordan has followed a more strategic approach by developing a Skills Development Centre in the Industrial Park of Ma'an, which focuses specifically on vocational training for clean energy (along with welding, electricity and car maintenance). Yet, skills necessary to implement the green growth strategies remain in high demand and the training programmes are still targeted at a very narrow (and non-diversified) set of skills. To better tailor the training programmes to the skills needed to advance the transition, green skill development programmes need to be not only scaled up at all education levels (to also improve awareness), they also need to be designed in close cooperation with the private sector and civil society to reduce the skill mismatch.

### Quality infrastructure

Quality infrastructure (QI) comprising standards, conformity assessment (testing, certification, and inspection), me-

trology and accreditation play a determining role in increasing competitiveness, enabling innovation, and securing health and environmental safety (Kellermann, 2019). The national QI still remains weak in both countries with respect to enabling firms to effectively respond to international competition and diversify their products based on environmental quality (Vidican Auktor, Altenburg, & Stamm, 2020; ITC & PTB, 2015; Bizri, 2018). In particular, awareness within the private sector with respect to the importance of quality, cost competitiveness for higher quality products and lack of adequate QI-related technical know-how and equipment slow down the adoption and use of green technologies. IRESEN, for example, has been a catalyst for developing the national QI for RE technologies, particularly solar, in Morocco. Certification and labelling of products – for appliances and green buildings, or organic food, for instance – can signal a higher environmental quality of products (Ambec, 2017). In Jordan, the Energy Label and Standards Programme for home appliances, the Thermal Insulation Code, the Energy Efficient Building Codes, and the Green Building Guide have been developed to improve energy use in buildings (Zawaydeh, 2018).<sup>12</sup> Yet, implementation lags both in terms of compliance and adoption of these standards. Compliance and demand for certification and labelling for green technologies and processes but also certification for energy management standards remain an issue in Morocco as well (UNECA, n.d.).

<sup>12</sup> Additionally, other energy efficiency sectoral measures were part of the NEEAP between 2017 and 2020: the SHAMCI Quality Mark, Energy Efficiency Audit Standards, Energy Management System Standard (ISO 50001), and several other RE and energy efficiency standards (GFA Consulting Group, 2017).

Thus, building up the national QI system for greening production and consumption should be a priority to enable the transition in both countries. Morocco, for instance, already has some accredited private test laboratories able to provide certifications in accordance with European standards, such as Solar Keymark, a voluntary third-party certification scheme for solar thermal products. Expanding such capabilities<sup>13</sup> in line with relevant sustainability-related European standards and the cross-country recognition of standards through trade agreements and accreditation systems could significantly contribute to enhancing green trade across the Mediterranean.

### Research and innovation capabilities

Scaling up the transition towards a green economy and developing domestic technological capabilities in green technologies require strong research and innovation capabilities. Morocco and Jordan, like other countries in the MENA region, perform poorly in this regard (Bizri, 2018), reducing the effectiveness of technology transfer and technology adoption initiatives. In Morocco, IRESEN has started to fill the existing gap in research capabilities related to greening the economy by raising and allocating research funding for public-private research projects. In Jordan, while the innovation system is more versatile/dynamic, such activities are mostly coordinated by the Royal Scientific Society and the Higher Coun-

cil for Science and Technology (through the National Centre for Innovation), which is often underfunded and focuses on too specific issues rather than cross-cutting ones.

In both countries, however, a major shortcoming comes from the lack of a performing innovation strategy and in particular the weak alignment of the national innovation and science and technology strategies with the national goals for greening. In Morocco, for instance, the Ministry of Higher Education and Scientific Research is rarely present in policy discussions related to the green industrial policy (Hahn & Vidican Auktor, 2018). In Jordan, while research funding for energy and water security has increased over the years, private sector participation in research projects remains limited (Mahroum, Al-Bdour, Scott, Shouqar, & Arafat, 2013), impeding the transfer of technologies from laboratories into the marketplace.

### Policy coordination, monitoring and evaluation

Given the cross-cutting nature of interventions to green the economy, coordination across policies is essential. Policy coordination also contributes to coherence of national targets and strategies and ensures the scale-up of initiatives aimed at greening production and consumption. At the same time, monitoring and evaluation of outcomes should be considered an important element of policy design to ensure that policies are effective, i.e. they are likely to achieve the set targets. In Jor-

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<sup>13</sup> As discussed in greater detail by Vidican Auktor, Altenburg, and Stamm (2020), the accreditation system in Morocco suffers from several shortcomings and therefore receives relatively low international recognition. For national standards to be more closely aligned with European ones across a wider range of green technologies and processes, such gaps in the national QI system have to be addressed.

dan, for instance, policy monitoring and evaluation remains weak, undermining the effectiveness of several energy efficiency measures (GFA Consulting Group, 2017). Yet, given the dynamic nature of the transition, as technologies evolve and the domestic (and global) framework conditions change, the reassessment of goals and alignment of long-term goals across sectors are essential for transitioning to a green economy.

Not surprisingly, given the unprecedented nature of this transition process, both countries experience shortcomings in terms of policy design, but have also seen improvements. As awareness of the co-benefits across sectors has increased, policy coordination has also intensified in both countries. For example, solar based solutions for water pumping in agriculture has been a central focus to reduce fuel dependence in Morocco's agricultural sector. Improved coordination across stakeholders led to the integration of these solutions in the new greening strategy for the agricultural sector. In Jordan, the GG-NAP clearly identifies the lack of coordination across ministries as an important shortcoming, and aims to address it by 2025 through the Higher Green Economy Steering Committee (Ministry of Environment, 2017). In both countries, however, as the private sector becomes more aware of the benefits of clean and efficient use of energy, demand for policy coordination may also increase. Moreover, a closer integration of civil society in the policy-making process can also contribute to improving monitoring and evaluation of outcomes. In particular, given its role in servicing

under-represented communities, civil society can play a crucial role in safeguarding social needs (Frantzeskaki et al., 2016) and monitoring outcomes for green and inclusive development. To this end, it may be desirable to support regional initiatives of (or similar to) the International Institute for Environment and Development's Green Economy Coalition,<sup>14</sup> which brings together businesses and governments with civil society in dialogue to deliver socially accountable solutions.

## Conclusions and recommendations

The transition to a green economy requires major transformations in the way goods and services are produced and consumed, which is nothing short of a major transformation of the economic model. This process is challenging not only for MENA countries; its scale and novelty, as well as the high level of uncertainty related to markets and technology development call for experimentation, policy innovation, and partnerships across sectors, stakeholders and countries. As exemplified by the cases of Morocco and Jordan, the MENA region has been actively engaged with the transition to a green economy, driven both by its comparative advantage – in terms of favourable conditions for RE generation – and by persistent risks in terms of resource scarcity, specifically water stress in most countries and high dependence on energy imports in some countries. By now, with very few exceptions, all MENA countries have developed national strategies and set targets for RE and energy efficiency, and many – Mo-

<sup>14</sup> National hubs of the Green Economy Coalition exist in several countries, such as in Senegal, South Africa, or India but not in the MENA region.

rocco and Jordan included – have detailed comprehensive cross-sectoral plans for greening the economy. While these action plans do clearly articulate national priorities regarding green growth, all countries struggle with implementation.

Drawing on the experience of Morocco and Jordan (as well as of the larger region), we discuss below a few areas that emerge to be important for deepening the EU's cooperation with its Southern Mediterranean partners. The ambitious European Green Deal agenda is likely to not only provide a reference point for greening the Southern Mediterranean Countries (SMC) (through its strong focus on promoting the CE model as part of its industrial development strategy), it is also likely to instil new impetus for cross-Mediterranean cooperation, especially in the post-COVID-19 recovery efforts to "build back better". More generally, however, it is increasingly recognised that the transition to a green economy in Europe, and in the MENA region, depends on a close policy consistency and coherence and on collaboration in the Euro-Mediterranean area (Escribano & Lazaro, 2020).

Yet, as most efforts towards greening the economy are led by foreign donors, there is a risk that such programmes do not receive sufficient buy-in from the Southern Mediterranean partners to ensure the continuation and scale-up of projects. Indeed, as experts argue in the case of Jordan, the momentum for energy efficiency projects in the industrial sector has significantly subsided once technical cooperation programmes ended.

To overcome these general challenges, we discuss below several guidelines for

policy-makers, which may contribute to greening industrial development in the MENA region and to stimulate foreign direct investment, thus reducing dependence on donor funds in the long run. It first refers to two strategic objectives that should be more strongly embedded in cooperation programmes with the SMC, followed by four more targeted areas of intervention. Increasing and better targeting green finance to achieve the transformation of these economies is critical and cuts across all these intervention areas.

### **Strengthen regional integration, policy coherence and learning**

One overall objective that should be part of any Euro-Mediterranean cooperation programme, especially when it comes to green industrial development, relates to both promoting regional market integration and to policy coherence within the Mediterranean region. Weak regional integration is likely to hinder the transition to a green economy and in particular the localisation of co-benefits associated with greening (Escribano & Lazaro, 2020); it is also likely to lead to further polarisation in the MENA region. In addition, coherence across green industrial policies ensures that investment in green technologies – be it in renewables in Morocco or in energy and resource efficiency in Jordan – follows specialisation patterns based on dynamic comparative advantages. Morocco's recent efforts to become a technology hub in RE technologies for the larger African region and the new green hydrogen partnership with Germany are examples on which the EU could capitalise, further develop and promote across the MENA region through Euro-Mediterranean partners-

Policy coherence across goals – while recognising the regional disparities, complexities and existing synergies – should be a core objective for any cross-Mediterranean partnership aimed towards green industrial development

hips. Jordan could similarly capitalise on its position as an important centre of education and research and investor in clean energy in the Middle East.

The high level of policy fragmentation across the MENA region poses, however, an obstacle in this regard. Moreover, the social, economic and political heterogeneity in the region certainly places constraints on policy coherence – seen even in energy importing countries such as Morocco and Jordan or Tunisia. Thus, it is obvious that a “one-size-fits-all” solution is not suitable given the complexity of the region (Tagliapietra & Zachmann, 2016). Policy coherence across goals – while recognising the regional disparities, complexities and existing synergies – should be a core objective for any cross-Mediterranean partnership aimed towards green industrial development. The EU-funded SwitchMed project advancing sustainable production and consumption across the region is one such example that aims for policy coherence both at national level (across sectors) as well as at regional level.<sup>15</sup> To this end, it would be desirable to channel more (green) funds for regional technical cooperation programmes that aim to achieve policy coherence in line with national framework conditions and accompanied by solid mechanisms for monitoring and evaluation.

Needless to say, the EU has already played a critical role in advancing the sustainability agenda in the Southern Mediterranean region through, for example, its External Investment Plan and the Neighbourhood Programme. Other cross-Mediterranean platforms,

such as the Barcelona Process and the Union for the Mediterranean (UfM), have also contributed to catalysing the transition to a green economy in the region. Their outcomes have not always fully reached objectives, mostly due to challenging cross-regional cooperation processes and, to a certain extent, to grand (normative) strategies that may not reflect regional dynamics (Escribano, 2018; Escribano & Lazaro, 2020). Therefore, driven also by the opportunities created by the European Green Deal, it is of utmost importance for EU policy-makers to critically reflect on both success and failure, improve coordination across EU initiatives related to sustainable industrial development and with other donors, and draw lessons learned for “a new wave” of cross-Mediterranean engagement to accelerate and deepen the green transformation.

### **Concentrate on demonstrating domestic value creation**

The transition to a green economy in the MENA region must be closely aligned with its social and economic development goals. In particular, investments in greening the industry have to demonstrate not only economic/profit prospects but also job creation and export opportunities. Therefore, cooperation in the area of RE, energy efficiency, or the CE areas should focus on the short- and medium-term outcomes of domestic value creation, and on better communicating co-benefits to diverse national stakeholders. Reducing energy consump-

<sup>15</sup> To be able to assess whether such efforts have been successful to date, more extensive and systematic evaluation of these programmes across sectors and countries is needed, which, while extremely important, is beyond the scope of this study.

tion, and thus emissions through energy efficiency measures, as seen in Jordan – and increasingly in Morocco – is one such low-hanging fruit intervention area, which suffers, however, from insufficient buy-in from the private sector due to poor communication and awareness.

At the same time, while MSMEs are the largest employers in the MENA region but perform worse in terms of competitiveness, targeted measures to upgrade the MSMEs sector and increase their access to finance are essential to support them to both adopt green technologies and processes and to participate in global value chains. The domestic value creation potential associated with, for instance, large-scale clean energy generation projects as seen in Morocco, offers little in terms of jobs and technological know-how. By contrast, decentralised clean energy solutions (a later focus in Morocco) or resource efficiency in production in Jordan perform much better in this regard.

### **Improve the national quality infrastructure system for green technologies**

National QI systems are critical for boosting competitiveness, fostering innovation, and ensuring health and environmental protection. Under-performing national QI systems are core barriers to green industrial development in developing countries (Vidican Auktor et al., 2020). Yet, they are too often neglected in development cooperation programmes. Improving awareness and technical know-how related to QI (e.g. regarding standards for clean technology, metrology, and testing), as well as enforcement of standards, sup-

porting certification programmes, and surveillance can contribute significantly to greening industrial development. Yet, both in Morocco and Jordan, national QI systems for green technologies remain underdeveloped and the private sector (especially MSMEs) has little awareness regarding the importance of quality assurance. The EU's Twinning instruments could be further improved and extended to offer support for national QI systems to green the industry in the SMC. Moreover, as fostering trade and promotion of European standards are key elements of the European Green Deal, strengthening national QI systems related to greening can contribute to intensifying trade flows in green goods and services across the Mediterranean.

### **Align skill development programmes with national greening strategies**

It has become increasingly evident that the transition to a green economy requires major re-skilling and up-skilling of the workforce. Yet, most countries experience not only a gap between the demand and supply of green skills (ILO, 2019) but also a poor alignment between skill development programmes and environmental regulation (Vidican Auktor, 2020). EU cooperation programmes, in cooperation with other partners, such as UNIDO and the International Labour Organization (ILO), must also target public-private partnerships for green skills development. Moreover, the EU's 2020 industrial strategy recognises the need to address the twin challenge of the green and the digital transformation.

Cross-Mediterranean cooperation programmes focused on greening should also centre on developing both green



Cross-Mediterranean cooperation programmes focused on greening should also centre on developing both green and digital skills, including research and innovation skills, in close cooperation with the private sector

and digital skills, including research and innovation skills, in close cooperation with the private sector. A strong engagement of the private sector (especially the MSMEs) in the area of training to align skilling with the national greening strategies – following the example of successful cases from France, Germany or the United Kingdom – could also contribute to developing closer multi-stakeholder partnerships (a major challenge, as discussed above). These successful examples make use of systemic coordination mechanisms for green skills development, with the private sector playing a critical role in early identification and forecasting of skill needs – based on quantitative forecasting, qualitative needs assessments, institutional social dialogue mechanisms and information flows to education and training systems (van der Ree, 2017). Developing and institutionalising such skill development programmes is essential, especially since the transition to a green economy calls for new modes of production based on the CE model, new business models (based on new standards for consumption and the increasing role of services in the economy), and growing inter-dependencies between the green and digital transformation.

### **Enhance technology transfer and knowledge development**

Moving beyond green/low-carbon technology adoption and diffusion – phase in which most SMC have been to different degrees already actively engaged with – effective technology transfer requires complex capabilities to partake in technology imitation, collaborative innovation and indigenous invention (Cicera & Maloney, 2017). Yet, the (public and private) research and innovation ecosystem is underperforming across the region. Successful

initiatives as seen in Morocco and Jordan should be scaled up both at national and regional levels. Aside from financing (discussed below), building capabilities necessary to enhance transfer of technology and know-how is essential. This transfer must be, however, needs-based and impact-oriented. For instance, the EU-Jordan Partnership Priorities and Compact signed in 2016 emphasises the importance of sustainable and knowledge-based growth. However, partnerships should envision more ambitious goals in terms of building up research capabilities, fostering entrepreneurship and green technology innovation.

Transfer of technology and know-how is important not only for improving research capabilities. Improving technical and analytical skills to demonstrate impacts of greening (e.g. in terms of emissions reduction, water conservation, and energy costs) could create an incentive for firms to invest in greening. Communicating this knowledge across diverse stakeholders is also an important know-how intervention area that could be better integrated in development cooperation programmes. This could be achieved through expanding cross-Mediterranean innovation and research platforms between academia and the private sector.

Moreover, given the increasingly complex system of capabilities required to climb the technology ladder (Pigato et al., 2020), systematic interventions are necessary to improve the institutional and administrative framework, including public investment in education and physical capital. Pigato et al. (2020) find, in fact, that improving educational outcomes, increasing infrastructure stock, and building

institutional capacity may be more effective in accelerating green technology transfer than increasing financing. For countries with small markets – which is the case for most of the SMC – these aspects, especially related to technology-push/supply-side policies that encourage technology innovation, production, and export, may be even more important if coupled with efforts to increase regional integration and long-term strategic planning.

To overcome such challenges and avoid a “technology trap”,<sup>16</sup> cross-Mediterranean development programmes to accelerate green technology transfer should consider interventions such as integrating environmental provisions into multilateral trade and investment initiatives; supporting the creation of patent pools to facilitate cost-efficient transfer of technologies; supporting high-tech clusters, early-stage accelerators and innovators, technology centres and transfer offices, and endorsing entrepreneurship and technological training.

### Increase green finance

Improving the access of SMC to green finance is critical for their ability to transition towards a green economy. Financing is necessary in the form of financial cooperation programmes (e.g. financing the deployment of green technologies) and especially in the form of technical cooperation to strengthen the capacity of the private sector, civil society and public actors engaged in strategy develop-

ment and implementation. EU institutions have played a growing role in energy-related green finance in the SMC via, for instance, the EU External Investment Plan. Examples are the Morocco Green Economy Financing Facility (GEFF) initiated in 2018 to finance sustainable energy projects and raise awareness of green technologies with market potential, or the SEMED Green Economy Financial Facility launched in 2019 to scale up green economy investment in Jordan, Lebanon and Tunisia. Yet, even greater investment – and better targeted to the needs of firms – would be needed for these countries to reach their Nationally Determined Contributions<sup>17</sup> (Tagliapietra, 2018). Additionally, it would be important to ensure that green finance is linked to energy reforms and goals for greening the economy (such as energy efficiency in the industrial sector). Also, while most green finance has been channelled to large-scale projects, therefore mostly benefiting large firms, smaller-scale projects with a strong involvement of MSMEs should be considered, aiming to upgrade the MSMEs sector. This is important because a major barrier to scaling up the transition to a green economy – in Morocco and Jordan, but not only – is the low competitiveness of the private sector, in particular of the MSMEs. Improving the availability of green finance and reducing structural problems in the financial sector when it comes to supporting green investments by MSMEs could positively contribute to accelerating the transition to a green economy in the MENA region.

Improving the availability of green finance and reducing structural problems in the financial sector when it comes to supporting green investments by micro, small and medium enterprises could positively contribute to accelerating the transition to a green economy in the MENA region

<sup>16</sup> The term has been used by Fofack (2008) to refer to countries with low scientific infrastructure and widening education and skills gaps that continue to operate in the lowest technology ladder, far from the global technology frontier.

<sup>17</sup> The World Bank estimates that Egypt, Jordan and Morocco alone would need about \$100 billion in investment in renewable energy generation between 2016 and 2030 to meet their New Distribution Capability (NDC) targets (Tagliapietra, 2018).



This need is recognised by the EU institutions, as reflected by the new Neighbourhood, Development and International Cooperation Instrument (NDICI) proposed for 2021-2027, in which an increase in funds – in the form of grants, budgetary guarantees and financial instruments – has been planned for achieving climate and environmental objectives (European Parliament, 2020). The European Investment Bank's (EIB) participation in the Green for Growth Fund targeting energy efficiency and RE investments in the Southern Mediterranean region – specifically in the electricity, gas, steam and air conditioning supply – or the Climate Action in the Middle East and North Africa (CA-MENA), a climate action envelope for the Mediterranean partner countries, are additional examples.

Targeting such funds to reducing pollution and environmental degradation is key (for example by offering concessional credit to polluting firms for fuel switching, energy efficiency and end-of-pipe projects). Additionally, expanding the portfolio of de-risking instruments, including loan guarantees, public-equity co-investments and political risk insurance could accelerate private investment and green technology transfer. More importantly, ensuring that green financing instruments specifically address the needs of the MSMEs sector<sup>18</sup> and are linked to (and streamlined across) other regional programmes aiming to reduce poverty, inequality and stimulate employment, is key for achieving inclusive green growth in the MENA region.

<sup>18</sup> The newly-launched Green Value Chain programme of the European Bank for Reconstruction and Development (EBRD), EU, and the Green Climate Fund in Egypt are exemplary in this regard. The financing programme targets small and medium-sized enterprises (SMEs), supporting them to invest in advanced technologies and climate mitigation and adaptation solutions (Zgheib, 2020). A similar programme also has been supported in Tunisia and Morocco.

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# Circular Economy in EU-Tunisia Relations: Closing the Loop in Theory and Practice

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## Introduction

This chapter turns to the European Union (EU)'s "green deal diplomacy" in the Southern Mediterranean through the "circular economy" – a concept that is attracting increasing attention as a purported model for a sustainable and resilient economic system, where economic growth is decoupled from use of resources through the reduction and recirculation of natural resources. While there is no standardised definition of the circular economy (CE), visions rest primarily on a systemic approach to resource efficiency, in which products and materials at the end of their original service lifespan are not discarded but are instead recycled, repaired or reused through circular value chains that transform waste from one industrial process into valued input for another. Critically, discussions of the CE are increasingly emphasising full-economy transformations, rather than the reform of specific supply chains. Although over the past decade the CE has been primarily associated with the strategies and marketing of high-profile transnational corporations in consumer industries in China and the EU (the global front-runners on the CE), attention is shifting to thinking more holistically about the particular form of industrial organisation that has come to underpin the contemporary global economy – one organised around global value chains and production networks. CE practices are now believed to potentially contribute directly to achieving a significant number of the United Nations' (UN) Sustainable Development Goals (SDGs) (Schroeder, Anggraeni, &

Weber, 2019),<sup>1</sup> and the CE agenda is pitched as complementary and mutually supportive of the low-carbon agenda.

Yet as the CE concept gains popularity in domestic and international policy agendas, the world in 2020 is only 8.6% circular and is in fact becoming less circular every year. In the last 40 years, global materials use has tripled (Schandl et al., 2018) and the modest improvement in recovery rates and yield of secondary materials pales in comparison with the volume of virgin materials being extracted and stocked (PACE, 2020). In just two years, between 2015 and 2017, total resources entering the global economy increased by 8.4%, to 100.6 billion tons, and total extracted resources increased by 9%, to 92 billion tons – while reused materials grew by only 2%, to 8.65 billion tons, and fell as a proportion of overall material use (PACE, 2020, p. 21-22). The culprits in this negative trend in circularity are three interrelated dynamics that are hardwired into our "take-make-waste" linear economic models: high rates of extraction, ongoing stock build-up, and low levels of end-of-use processing and cycling (PACE, 2020, p. 15). The level of "decoupling" that would be needed to effectively and equitably mitigate climate change and address other environmental crises is nowhere to be seen (Parrique et al., 2019).

The EU has positioned itself at the helm of discourse and planning around circularity, making CE a core component of its commitment to achieving climate neutrality by 2050. The Circular

<sup>1</sup> Especially SDG 6 (Clean Water and Sanitation), SDG 7 (Affordable and Clean Energy), SDG 8 (Decent Work and Economic Growth), SDG 12 (Responsible Consumption and Production), and SDG 15 (Life on Land).

Economy Action Plan presented by the European Commission (EC) on 11 March 2020 is a main pillar of the European Green Deal.<sup>2</sup> Beyond its borders, and in recognition that CE has profound cross-border effects, the EU sees itself as leading the “global transition to a just, climate-neutral, resource-efficient and circular economy,” through, among other things, reaching an international agreement on plastics, ensuring that Free Trade Agreements reflect the enhanced objectives of the CE, and stepping up outreach activities through “green deal diplomacy” and “the Circular Economy missions.” What does this vision of circularity mean in theory and practice for EU relations with Southern Mediterranean states? What would it take to witness the emergence of a model of cooperation that could support circularity at the scale deemed necessary for critical action on the climate emergency?

Using the EU-Tunisia relationship as a case study, this chapter adopts circularity as a framework to question and rethink the broader relationship; it documents, analyses and assesses recent and emergent CE initiatives, highlights the points of tension and inconsistencies with extant ways of thinking, and identifies opportunities for a more productive and sustainable political and economic cooperation. We also feature the views of Tunisian policy-makers, local officials, the private sector – how they currently understand, interpret and strategise

around the concept of CE. After all, if the EU intends to forge “strong environment, energy and climate partnerships,” it must begin with how its potential partners, at different levels, articulate and act on concepts such as the CE.

The chapter is structured as follows. We begin by motivating our case selection, highlighting the reasons that make the EU-Tunisia relationship a fruitful case through which to explore the emergent issue of circularity in international cooperation, and explaining our methodology. We then situate circularity in existing high-level EU foreign policy, development, and trade paradigms, before moving to the local level to discuss how decentralisation is interacting with environmental action in Tunisia. The final section presents conclusions and recommendations, pitched primarily to the primary stakeholders of this Joint Study Group, the EC’s Directorate-General for Neighbourhood and Enlargement Negotiations (DG Near) and specifically its Regional Programmes Neighbourhood South.

## **Why a circular Tunisia: case selection and method**

We select Tunisia as our case for several reasons. First, since its political transition, the country has expressed strong discursive commitments to environmental action. The 2014 constitution includes provisions on climate

<sup>2</sup> From the EC’s perspective, applying CE principles across the EU economy will increase the EU Gross Domestic Product (GDP) by an additional 0.5% by 2030, create around 700,000 new jobs, increase the profitability of manufacturing firms while sheltering them from resource price fluctuations, strengthen the EU’s industrial base, foster business creation and entrepreneurship among small and medium-sized enterprises (SMEs), and provide citizens with high-quality, functional, affordable products that last longer and are designed for reuse, repair, and recycling.

In a region of limited decentralisation, Tunisia's decentralisation process since regime change in 2011 stands out, as do its implications for who has the authority and capabilities for environmental action

change, one of the only constitutions in the world to do so.<sup>3</sup> In the 2016 Paris Agreement on Climate Action, Tunisia made the second most ambitious emission and renewable energy (RE) commitments of any state in the region, after Morocco (see the chapter by Behnassi in this volume), setting a RE target at 30% of power generation and committing to unconditionally reduce its emissions by 2030 by 13%, and up to 42% if it has external technical and financial support. As the only country to have experienced a democratisation process in the so-called Arab Spring, Tunisia also holds symbolic stature for the region and for relations with the EU. The socioeconomic origins of the Tunisian revolution, tied as it was to social exclusion and dispossession (Ayeb, 2017), shine the light on developmental models tied to EU-Tunisia economic relations, and especially trade. If circularity is to be integrated into trade relations, it will have profound reverberations due to both the magnitude of Tunisia's trade with Europe – almost 80% of exports and 50% of imports – as well as the nature of its exports, dominated by textiles, electrical goods, and agricultural products. For the EU, although trade with Tunisia is marginal – less than 1% of its global trade – Brussels approaches trade agreements through the lens of stabilising the only country to have transitioned to democracy and through the securitised lens of migration and counter-terrorism.

Tunisia also exemplifies a recent confluence of factors related to ideas and processes of decentralisation that hold profound implications for environmental action. In a region of limited decentralisation, Tunisia's decentralisation process since regime change in 2011 stands out, as do its implications for who has the authority and capabilities for environmental action. New powers and worsening effects of environmental problems experienced at the local level, and environmental activists invigorated by the pluralisation of the terrain of politics – all are mapping onto pre-existing regional and geographical social and economic inequalities. These domestic developments are occurring amid what we can describe as a “local turn” by international development agencies and programmes that increasingly look to local governments, especially municipalities, as sites for new regulatory powers, tools and capabilities for environmental action – and which see in the local the hope to have more fruitful engagements than the ones achieved at the national level thus far.

Our focus on Tunisia is also practical. Given the nature of the research questions this study sets to answer, the dearth of existing secondary source material, and the travel restrictions and limitations on research due to COVID-19, it was critical that we guarantee access to primary source material as the backbone to our qualitative case study. As author Boussen is based in Tunis,

<sup>3</sup> The preamble of the Tunisian constitution states: “The necessity of contributing to the preservation of a healthy environment that guarantees the sustainability of our natural resources and bequeathing a secure life to future generations.” Article 12 of the text states: “The state shall seek to achieve social justice, sustainable development and balance between regions based on development indicators and the principle of positive discrimination. The state shall seek to exploit natural resources in the most efficient way.” Article 45 obliges the state to guarantee “the right to a healthy and balanced environment and the right to participate in the protection of the climate” and to “provide the necessary means to eradicate pollution of the environment.” Translated by UNDP and reviewed by International IDEA. Available at: [https://www.constituteproject.org/constitution/Tunisia\\_2014.pdf](https://www.constituteproject.org/constitution/Tunisia_2014.pdf)

we could conduct the necessary interviews and original fieldwork upon which this study is built. Over four months, Boussen conducted semi-structured and unstructured interviews with representatives at the Ministry of Environment, the *Centre International des Technologies de l'Environnement de Tunis* (CITET), the EU delegation in Tunis, the SwitchMed and ClimaMed initiatives, environmental activists, and researchers working on environmental policies at the local level. We complement the interviews with analysis of international and national policy reports and assessments, national planning documents, and programmatic material from EU initiatives.

A final word on our approach: We study the CE in Mediterranean relations through an international political economy lens. As such, we are interested in the governance and power dimensions inherent in this new developmental paradigm, and what it entails for Euro-Med cooperation. We lack the necessary expertise to contribute to the technical but critical discussion about the potential tradeoffs involved in specific value chains and the unintended environmental and health risks (especially as relating to recycling of municipal waste, e-waste, and wastewater).

## **Circularity and international cooperation: lost in translation or at the source?**

When EU representatives and Tunisian officials are asked about their experiences of CE at the national level, the frus-

tration and lack of enthusiasm is palpable. Actors within the EC and the member states complain of a lack of efficiency, coordination and communication in both government and administration in Tunisia. One interlocutor characterised cooperation with Tunisian central authorities over the past decade – mainly within the Ministry of International Cooperation and Development – as disappointing on all levels. Among the limitations our respondents cited was the absence of a real and serious environmental vision that would be propelled by national authorities and implemented with rigour by technical agencies on the ground. They assess that CE is poorly incorporated into public policies at the ministerial level, even within the Ministry of Environment, and that it does not feature in internal decision-making or regulations, or even make an appearance in discourse.<sup>4</sup>

From our own observations, CE has certainly not penetrated as a concept among political or bureaucratic staff in Tunisian ministries, neither in discourse nor practice. There is no articulated sense of the desired outcomes CE is supposed to deliver on definitions of success or failure, standards or measurements for what constitutes success, or balancing of the tradeoffs that tend to accompany discussions about green economy models: What will it mean for job loss? What unintended environmental issues might arise? What are the possible environmental and health risks of CE waste-to-energy activities? Nor could we observe that resources are being devoted to national-level long-term strategising around CE.

Local observers attribute the absence of a strategy to coordination problems and low synergy between different ministries and public agencies, especially given their proliferation in recent years

<sup>4</sup> This characterisation matches how EU officials discuss other policy areas of cooperation with Tunisia; they are perplexed by the fact that Tunisian agencies often take months or even years to respond to EU proposals and requests for data and statistics in the DCFTA process (Rudloff & Werenfels, 2018).

Local observers attribute the absence of a strategy to coordination problems and low synergy between different ministries and public agencies, especially given their proliferation in recent years. An often-used term is “dissolution of responsibility” (تتازع الاختصاص السلبي), meant to capture a dynamic whereby two or more public authorities refuse to exercise certain powers or deliver a particular service on the basis that it falls outside their jurisdiction or competencies. As one local researcher put it, “nobody knows what they’re supposed to be doing, who else is doing what, and who they are accountable to.” The lack of coordination was extended in some settings to intra-institution dynamics, with departments and directorates also not being aware of each other’s responsibilities. Although specialised agencies such as the CITET are more comfortable with the concept of CE, their work is often disconnected from high-level strategising, planning and implementation.

Given the frequency of political and administrative turnover since 2011, this state of affairs is unsurprising. In under 10 years, the Ministry of Environment and CITET have had 10 ministers and 10 general directors, respectively. In addition, the absence of centralised or distributed coordination across multiple ministries is a common challenge for countries whose governments are still organised along sector lines, where ministries focus on specific areas, and where environment ministries are often among the weakest departments in government, with limited influence over the industrial and innovation strategies needed to succeed in a CE (Preston, Lehne, & Wellesley, 2019, p. 19). To Tunisia’s credit, the 2014 Sustainable Consumption and Production National Action Plan (SCP-NAP) – de-

veloped under the coordination of the Ministry of Environment and Sustainable Development, and funded by the EU with advisory services and technical support from the United Nations Environment Programme (UNEP) – already recognised the transversality of the concept of green economy and why it could not reside solely in the Ministry of Environment (S. Bouzgarou, CITET, personal communication, September 2020). The SCP-NAP does not mention the CE by name but refers to the appropriate management of industrial and domestic wastewaters, the preservation of air quality and the development of sustainable cities. Although the SCP-NAP raised hopes when it was launched, six years later it is not clear if any parts have been implemented and no assessment has been done (N. Attia, O. Chebaane, HBS, personal communication, September 2020).

More importantly, however, the ambiguity and absence of metrics linked to the CE points to an issue far beyond the confines of Tunisian ministries. The lack of international definitions and standards linked to circularity – even on issues critical to health such as waste quality and hazardous substances – are significantly hindering the promotion of the benefits of the CE globally. As one interlocutor put it, the concept is already a “*fourretout*” – everything and nothing at the same time. The absence of global metrics is also reflected in how specific programmes are organised. The SwitchMed programme, which since 2015 has supported the adoption of circularity practices in Tunisia’s private sector (and in seven other Mediterranean countries), has focused on awareness-building, training, sharing lessons, and networking among individual entrepreneurs. They have also showca-

sed best practices and stories of specific initiatives or companies.<sup>5</sup> Yet, as we know from research on the private sector and the CE in other contexts, these types of activities can have limited or even negative effects if not accompanied by a broader structural effort with clear metrics, goals, and incentive structures to attain them. As one recent comparative study of the CE in several developing countries warns: "In the absence of a coordinated and strategic approach to the CE at national or international level, there is the risk that companies will adopt tokenistic – or, at worst, harmful – activities under the umbrella of the CE which preclude more sustainable or higher-value material use" (Preston, Lehne, & Wellesley, 2019, p. 2).

The absence of a strategy and compelling narrative for the CE among Tunisian policy-makers also reflects a global situation. As the study cited above concludes: "There has yet to emerge a compelling narrative on the CE as a strategy for delivering on developing-country policy priorities such as economic diversification, job creation, agricultural development or energy security" (Preston et al., 2019, p. 26). Tunisian decision-makers are the norm among policy-makers who are not articulating the connections between the CE and tangible socio-economic benefits in terms of jobs, food security or public health. Likewise, the scepticism of the powerful Tunisian General Labour Union (UGTT) reflects the position of many labour unions in the developing world who are worried about the immediate job losses of green economy transitions.

## Circularity as a new type of economic development

The EU-Tunisia relationship encapsulates one of the most intriguing aspects of circularity when viewed from a global developmental perspective: the fact that the CE complicates the distinction between developed and developing countries. If we map countries not on standard measures of economic growth, such as Gross Domestic Product (GDP) per capita, but instead on how well they operate within the ecological boundaries of our planet while also satisfying certain basic social needs, a different developmental picture emerges than the one we are used to. One such alternative image appears from the *Circularity Gap Report*, a new annual report that scores 176 countries based on their score along two axes: the United Nations Human Development Index (HDI), which measures achievement in key dimensions of human development, such as a long and healthy life, being knowledgeable and having a decent standard of living; and performance on its Ecological Footprint (EF), an indicator that accounts for human demand of global biological resources. This approach then positions countries relative to the "socially just and ecologically safe space", a space that includes countries with an EF score per person of less than the world's biocapacity available for each global citizen and an HDI above 0.8 out of 1. As Figure 1 demonstrates, no country resides within the safe and just space today, all have a distance to go. As the authors of the report put it, "all countries are developing now."

Figure 1 also demonstrates that Tunisia – through the combination of having a

The circular challenge for Tunisia is to design a pathway for inclusive growth that enables progress on human and social development metrics, while staying within the planet's ecological limits

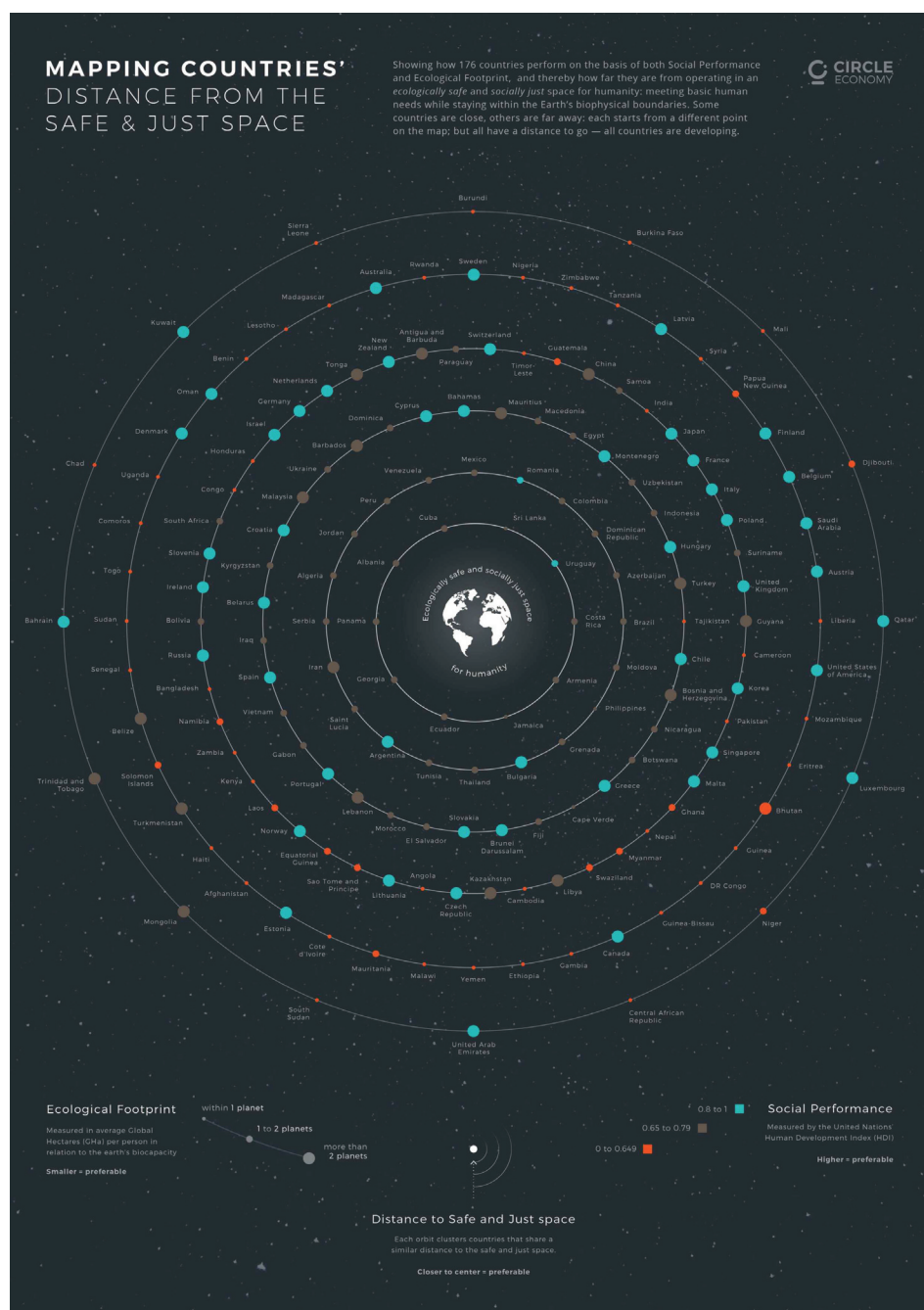
<sup>5</sup> See Vidican Auktor's chapter in this study for more details on the SwitchMed programme.



medium ecological footprint and an HDI value of 0.739 – is closer to the just and safe space than almost all EU member

states, and on par with Bulgaria and Romania. The European Environment Agency (EEA) has observed that if ever-

Figure 1. Mapping countries' distance from the safe and just space



Source: Circle Economy (2020)

yone on the planet consumed like the average European, we would need almost three Earths to sustain the global economy (EEA, 2020). Moreover, Europe is, to an increasing degree, externalising its pressures on key environmental issues onto other parts of the world. Between 30% and 60% of the environmental pressures associated with European consumption are on countries abroad where many goods are produced (Pantzar & Suljada, 2020). For its part, Tunisia has the fourth lowest per capita levels of plastic good consumption in the Mediterranean, and contributed to less than 1% of oil energy consumption for plastic across the region, and, having no incineration facilities, less than 1% of carbon emissions (WWF, 2019).

These different positions imply different needs for a CE transition. The circular challenge for Tunisia is to design a pathway for inclusive growth that enables progress on human and social development metrics, while staying within the planet's ecological limits. By contrast, for most of the EU countries that are already achieving high human development but doing so at a high ecological cost, the immediate challenge is to decarbonise their economies, reduce pollution of soil and water, consume resources more efficiently, reconsider their consumption habits altogether, and recognise their global carbon footprint.

This framework and the combination of facts – that all countries are underperforming, that Tunisia is relatively closer to the ecologically safe and socially just space, and that different types of CE transitions are needed – offers three opportunities. First, it complicates our familiar narratives about what development entails, and undermines the distinction between developed and

developing that characterises the EU-Tunisia economic relationship and the dominant Euro-Mediterranean script. Recognising these nuances may help avert the risk that circularity is seen as yet another term designed in western countries and exported to southern neighbouring countries without prior needs assessment.

Second, this framework illuminates the path for a more convincing narrative on the CE in the Southern Mediterranean. Recognising how the CE transition in a country like Tunisia necessarily differs from that in European countries reveals potential benefits that are not generally at the centre of the CE discourse – such as, for example, the public health benefits associated with better waste management. Tunisia has high levels of unsanitary waste dumping, including what is known as open burning – defined by the World Wide Fund for Nature (WWF) as a “widespread practice to manage waste” that creates “potentially toxic emissions” – as well as “uncontrolled landfill sites [that] can release leachate and toxins, decompose, create spontaneous fires, and contaminate water supplies with harmful substances, affecting the surrounding environment and communities” (WWF, 2019, p. 9). The public health consequences of inefficient waste management chains are already a subject of massive controversy in Tunisia, especially after the disruption they suffered when most local councils were dissolved. Pitching the CE through the angle of improved waste management, reduced waste generation, and the resultant health benefits – such as the fact that it can help to lower the number of premature deaths associated with the open burning of waste – would make the benefits of the CE tangible. We are already seeing how the CE is more po-



From an environmental point of view, a change in the demand for textiles in the EU, especially the decrease in demand for those not produced following certain environmental standards, could have positive effects

pular when its benefits are linked to issues of public health and access, rather than “environmental” considerations in the traditional sense. The state agencies keener to incorporate the CE have been those that oversee waste management – *Agence Nationale de Gestion des Déchets* (ANGeD) – and water management – *Société Nationale d’Exploitation et de Distribution des Eaux* (SONEDE) and the National Office of Sanitation (ONAS). A water management plan that aims to reuse 50% of Tunisian greywater by 2050 has been drafted, out of a concern for water scarcity rather than traditional environmental considerations.

The third opportunity provided by a circularity framework is in rethinking the EU-Tunisia trade relationship.

## Circularity and trade

While the CE is gaining a lot of attention domestically in European countries, the impacts of the EU’s shift to a CE on the rest of the world through international trade remain understudied. In fact, there are very few studies dedicated to investigating the interface of international trade and the transition to a CE generally (OECD, 2018). Yet such transition is unlikely to leave global trade flows unaffected, including those in the Mediterranean. The linkages between circularity and trade can occur at various levels along the product value chain such as trade in second-hand goods, end-of-life products, secondary materials and waste, as well as trade in related services. Based on some of the structural changes that economies transitioning to the CE would require, we can anticipate some potential points of tension for trade with Tunisia.

One trade effect of a CE transition is the transformation of recyclable waste into a tradable good. Waste recycling targets in the EU aimed at promoting circularity and increasing more sustainable resources can also incentivise member states to export waste to be recycled outside the EU. Depending on their implementation and in the absence of additional control mechanisms, these exports can lead to adverse impacts outside the EU, including negative environmental and social impacts on developing countries (for example, Kettunen, Gionfra, & Monteville, 2019). In principle, secondary raw materials recovered from waste have the potential to become a valuable resource for third country economies, but only when supplied by waste streams of an appropriate quality and supported by the capacity to process the recyclable material.

Another trade effect of circularity, given that a CE means both keeping the value of products in the economy for longer and increasing the use of secondary raw materials, may be the EU’s change in import demand for one of Tunisia’s major export industries: textiles. Currently, over 90% of Tunisia’s total textile and garment export is destined for the European market. Exploiting lower wage costs, a division of labour between Tunisia and the EU emerged in the 1970s: European fabrics are finished in Tunisia and re-imported to the EU under European preferential tariffs. The proximity to the EU gives Tunisia a competitive advantage when it comes to producing fashion goods for global brands and in quickly responding to changing fashion trends. As circularity increases the demand in Europe for clothing with a green label, and shifts consumption towards green/eco-fashion, the effects should be felt in Tunisia.

From an environmental point of view, a change in the demand for textiles in the EU, especially the decrease in demand for those not produced following certain environmental standards, could have positive effects. Textile and ready-made garment manufacturing demands significant amounts of resources and generates unprecedented amounts of waste. In 2015, the global textile and clothing industry consumed 79 billion m<sup>3</sup> of water, generated 1,715 million tons of CO<sub>2</sub> and 92 million tons of waste (SwitchMed, 2019). More than 8,000 chemicals are needed in the various processes of the textile value chain, and the World Bank estimates that between 17% and 20% of industrial water pollution comes from dyeing and treatments given to fabrics. In Tunisia, textile manufacturers have been known to pollute water, dumping waste directly into the bay with health repercussions and secondary effects on other production systems industries such as fisheries (Ajl, 2018).

The economic impact of a reduction of the demand for textiles would be multifaceted. On the one hand, textiles are a pillar of the Tunisian economy, comprising more than 20% of GDP, 160,000 jobs (80% of which are filled by women younger than 35), 34% of the country's manufacturing sector, and €2.2 billion in export sales. Yet the textile industry is riddled with issues that undermine its contribution to sustainable development in Tunisia. Beyond the environmental issues discussed above, it is characterised by increasing job insecurity (only 13% of workers have a permanent contract), and a downward pressure on wages (ILO, 2011). Most firms pay few taxes because they fall under the "offshore" legal classification.

The limitations of Tunisia's textile industry in distributing the benefits of trade raises a broader, critical point: on the 25th anniversary of the 1995 EU-Tunisia Association Agreement, there is no evidence that the trade agreement has boosted economic and social wealth in Tunisia, or that it has had a positive impact on productivity, employment or manufacturing growth. Many in Tunisia perceive access to the EU market and to its financial assistance as an opportunity that is captured by a few with privileged access, as another form of rentier capitalism (Haddouk, 2016). Like other citizens of the region, Tunisians widely perceive the EU as seeking to connive with elites for mutual gain, from trade to energy to environmental actions in the Mediterranean (Escribano & Lazaro, 2020). Negotiations since 2016 of a new free trade agreement – the Deep and Comprehensive Free Trade Agreement (DCFTA, better known in North Africa by its French acronym ALECA) – have been stalled by overall resistance within Tunisian civil society, business and politics, for whom there is no consensus over whether this agreement would bring more benefits than costs (Rudloff & Werenfels, 2018). The EU has been unable to offer sufficient, credible and consistent incentives to counteract that growing scepticism towards more free trade agreements (Escribano, 2016 & 2017). Unless the economic and trade implications of circularity are spelled out, overhauling the trade relationship in the process, it is unlikely that circularity will be understood by anyone on either side of the Mediterranean as an economic, industrial and social opportunity.

## Looping in the local

As discussed above, many of our respondents expressed a sense of disappointment with the progress that has

been made (or lack thereof) in incorporating circularity into policy-making at the national level, as well as pessimism about future potential. In contrast, we noted much greater enthusiasm and hope for engaging more closely with municipalities on CE issues. Interviewees across different EU-funded programmes described the decentralisation process as a great opportunity, and referenced municipalities explicitly in opposition to the central government as being more reliable and more stable, and offering more diverse tools to induce a change in strategies and practices. As one respondent put it, *“on s’est cassé les dents sur le national, allons vers le local.”* In practice, the shift to the local is apparent in one of the EU-funded programmes most relevant for circularity: ClimaMed, a Union for the Mediterranean (UfM) programme that works in Tunisia and seven other countries in the region. ClimaMed provides technical and investment assistance to policy-makers at both the national and local level, but has been placing increased attention on engaging mayors and supporting the implementation of local Sustainable Energy Access and Climate Action Plans (A. Makhoul, ClimaMed, personal communication, 23 September 2020). Programmes like ClimaMed increasingly interact with municipalities as sites for new regulatory powers, tools and capabilities for environmental action.

In part, this turn to the local reflects a broader development in international cooperation and aid programmes, where it is increasingly popular to imagine and articulate a particular version of how decentralisation can further developmental goals (Salman, 2017). Yet it also reflects domestic pressures specific to Tunisia, where regime change and the new constitution placed decentralisation at the core of the general political narra-

tive – and by extension, environmental politics. The 2018 Code on Local Authorities reframes the logic around what municipalities should and can do in terms of environmental protection. It encourages local councils, with the support of local administration, technical agencies, ministries and civil society organizations (CSOs) to adopt urban plans and local development plans that include aspects of environmental protection, as well as Local Climate Plans designed to tackle the effects of climate change on municipal areas. Another clear example of the way environmental issues are conceptualised as local issues in Tunisia is the fact that environmental affairs and local affairs were housed in the same ministry between 2018 and February 2020, and again in September 2020 following the government change.

The turn to the local when it comes to environmental issues is a realistic needs-based development, as discussed by Zubel’s chapter in this study. Problems such as the deterioration of water resources, waste management, air pollution, desert encroachment, soil and coastal environment degradation, and loss of biodiversity are of primary concern to municipalities around the world, whose responsibility is to ensure an efficient and sustainable delivery of public services relating to water management, waste collection and transport, intra-urban mobility, land use, as well as electricity access and energy standards (Appleman & Leidreiter, 2018). Moreover, these problems have only worsened in recent years. With solid waste management, for example, the coverage of collection services has become more uneven and the number of uncontrolled and unsanitary landfills has risen, thereby worsening air and soil pollution.

Yet international cooperation on circularity at the local level faces additional challenges. For one, the specificities of the CE across locales are naturally not homogeneous across locals. The challenges faced by communities living on the coast, such as rising sea levels and soil salinisation, differ significantly from those living near areas threatened by desertification. Water and wind erosion will be a much larger concern in local communities which rely on tourism or agriculture than those relying on textiles. Because of this differentiation, local circularity measures will necessarily be different, in some prioritising circular tourism, circular agriculture, as well as circular industrial product use.

In addition, the daunting environmental challenges are further exacerbated by existing regional economic imbalances: for example, the interior of the country not only lags behind the coastal regions in economic terms but also suffers disproportionately from the effects of environmental change. These imbalances add a clear political dimension and raise the stakes to demands at the local level. Relatedly, with the liberalisation of civic space over the past decade, many civil society actors have pushed for new concepts about sustainability at the local level tied explicitly to pressures to pluralise the terrain of politics generally. Consequently, and as we have seen elsewhere in the Southern Mediterranean and in other locales of the Global South, we are witnessing “environmental” issues being conceived in broader terms and explicitly linked to redistribution, public health justice, and development strategies (Sowers, 2012).

In Tunisia, one way this may be expressed is the way local demands often make no distinction between environ-

mental policies and public health and sanitation – such as street cleaning and waste collection. These overlaps were described by some of the representatives and environmental experts of international and national agencies we interviewed as demonstrations of local actors’ “confusion” or “lack of awareness”, an erroneous conflation of issues. The notion that “municipalities only perceive environmentalism through clean streets” came up several times. Our research is too preliminary to understand all the ways local actors are articulating demands, let alone to surmise the diverse motivations. Yet, it is worth pausing at the differences and tensions in the language and frameworks through which local councils articulate environmental issues vis-à-vis EU programmes or experts at specialised agencies. For they may reflect a broader recent trend: as decentralisation has gained popularity among international development agencies and financial institutions in Tunisia, these programmes have encountered alternative and competing models of development, articulated by local constituents and civil society actors, especially in how the problems and solutions are characterised (Salman, 2017). It would not be surprising if circularity and the green economy, as development paradigms, are in a similar dynamic.

## Conclusions and recommendations

How circularity intersects with the existing EU-Southern Mediterranean relationship is an incipient research and policy agenda. To our knowledge no research has been published on the EU-Tunisia relationship from a CE perspective, and relevant literature on the

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implications of circularity for global trade, and for policy in middle- and lower-income countries is burgeoning but underdeveloped. As such, our study is exploratory and our conclusions are suggestive and preliminary. The following recommendations, pitched primarily to European stakeholders, are intended to highlight the points of tension we observed throughout our research and opportunities to forge environment and climate partnerships that are more equal, inclusive, and productive.

### **Measure spillover effects of the European Green Deal**

Circularity is a powerful framework precisely because it allows us to conceptualise a global development approach that focuses on collective and shared challenges, with attention to their uneven nature and impacts. Currently, Mediterranean high-income countries generate significant socioeconomic and environmental spillover effects by exporting a large amount of pollution, waste and other negative externalities, which then limit the ability of other countries to achieve sustainable development (Sachs, Schmidt-Traub, Kroll, Lafortune, & Fuller, 2019). One of the missed opportunities of the European Green Deal would be to allow the pattern of international spillovers – whereby high-income countries' sustainability measures generate negative impacts on other countries – to continue unabated, or even to be exacerbated. Critical issues that especially affect lower-income countries in and outside of the Mediterranean region include: international demand for palm oil and other commodities that fuel tropical deforestation, tax havens leading to difficulties raising public revenue to finance the SDGs, tolerance for poor

labour and environmental standards in international supply chains, and so on. Strategies to achieve circularity within the EU need to be implemented domestically without generating negative impacts on the Southern Mediterranean. The 2030 Agenda and the SDGs recognise the importance of international spillovers – SDG 12, Responsible Consumption and Production – and require developed countries to take the lead in tackling spillovers. Circularity agendas must be no different.

To ensure that the European Green Deal does not incentivise additional spillover, the EU's CE policy should support the harmonisation of waste standards and treatment practices not only within the EU but also at the international level. It could build on the Basel Convention's ban on plastic waste exports from Organisation for Economic Co-operation and Development (OECD) to non-OECD countries, with the exception for material that is "non-hazardous, clean, unmixed and uncontaminated" and strictly purposed for recycling and not energy recovery. Robust regulations will also be needed to avoid the exploitation of hubs in the Southern Mediterranean for waste dumping by the EU. As long as there are issues with the quality of the EU's waste exports and uncertainty about whether the exported waste is really recycled, and if so, in what conditions, focusing on improving waste recycling within the EU should remain the priority.

### **Incorporate circularity into trade agreements**

If circularity is indeed a new developmental paradigm, we need a holistic and critical understanding of how it intersects with existing international eco-

conomic relations, especially with international trade. A 2019 review of EU free trade agreements reveals that to date only two agreements explicitly mention the CE, and furthermore, that circularity is integrated in the agreements as pertaining to the environmental safeguards to trade only (Kettunen et al., 2019). To our knowledge, circularity is not a component of the latest ALECA negotiations with Tunisia. Circularity, as a development paradigm that supports inclusive, sustainable growth, must be incorporated into trade frameworks between the EU and the Southern Mediterranean in a manner that allows for the global upgrading of standards for the environment and human development. For example, the EU monitoring framework for the CE and existing indicators, which provides a useful and evolving tool to keep track of the EU's developments on the CE, can be adapted to capture the external effects of the EU's circular shift, primarily as it relates to trade policy.

### **Integrate local priorities into bilateral CE relations**

The nature of environmental challenges related to circularity necessarily require agency and action at the local level, and the EU should continue to invest in identifying local priorities in the crafting of comprehensive bilateral relations that include a strong CE component. Tunisia's decentralisation process has paved the way for more flexible direct cooperation between sub-national governments and the EU on environmental action, and existing EU programmes in Tunisia already allow direct engagement with local policy-makers. The main challenges ahead are not in finding additional avenues of direct engagement in spe-

cific localities around best practices but rather in crafting a comprehensive plan of differentiated response options at the local level. Such a plan must recognise the heterogeneity of localities not simply in terms of their needs – based on the heterogeneity of environmental problems affecting specific geographies – but also in terms of the resources at their disposal and existing imbalances and inequalities across regions.

### **Prioritise inclusion and multi-directional learning**

EU programmes can assist in identifying synergies between the CE and the existing Tunisian Sustainable Consumption and Production National Action Plan (SCP-NAP), developed under the coordination of the Ministry of Environment and Sustainable Development, as well as with relevant ministries such as industry, transportation and health. Identifying the ways that CE policies can accelerate existing goals and objectives is a more fruitful avenue than encouraging or incentivising the Tunisian government to mark a separate CE strategy that would exist as a separate stand-alone framework. As has been suggested by studies in other countries (e.g. Preston, Lehne, & Wellesley, 2019, p. 70), establishing a cross-ministerial working group dedicated to circularity could contribute to mainstreaming the CE across different ministries and policy domains. In Tunisia, and given the recent frequency in cabinet turnovers, the group could include mid-level officials at ministries for a closer field of collaboration.

At the local level, if the EU seeks to engage local councils as partners and

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support the development of environmental plans, it should start by allowing for the possibility that divergent interpretations may be alternative solutions, and possibly competing models of development – rather than assume they necessarily reflect mistaken or misunderstood notions about environmental issues. Relatedly, EU-funded programmes in Tunisia must be more transparent publicly and more inclusive in terms of design, implementation and assessment. While conducting this research, interlocutors expressed it was difficult to ascertain how programmes such as SwitchMed or ClimaMed had been designed, who was involved, and to what extent stakeholders in Tunisia had been included from the start.



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# Questioning the Transition to Green Energy in Morocco from a Sustainability and Inclusivity Approach

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## Introduction

Environmental and climate risks have the potential to undermine development and human security and worsen inequalities. How are these risks and associated vulnerabilities best addressed, particularly in countries where the implications are already tangible? The green economy is increasingly considered as a pathway since it carries the promise of promoting sustainability and decarbonisation with the potential to enable structural change. However, such a process may entail both opportunities and risks, hence the need to manage it carefully.

In Morocco, the transition to a green economy is embedded in its perception of “sustainable development”. Attuned to local realities, this principle highlights six goals: territorial, economic and social attractiveness; optimal utilisation of natural resources; societal resilience to climate, energy, technology, and economic shocks; natural resource protection and mitigation of environmental externalities; social cohesion; and citizen well-being (Bouhia, 2020).

This chapter focuses on the transition to renewable energy (RE) from a sustainability and inclusive perspective. The rationale behind this approach is that the transition process may either contribute in fostering environmental and social sustainability inclusively or reinforcing the dynamic risks which deepen vulnerability and exclusion. The multifaceted and complex issues raised here are the following:

- Is the transition to RE linked to the societal context of Morocco?
- What are the key social and ecological implications of such a transition?

- What are the stakeholders’ perceptions of such a process and what is their level of convergence?
- Who are the intended beneficiaries, winners and losers and is there any mismatch on the ground?
- Who is involved or excluded from relevant decision-making processes and are these processes legitimate and inclusive for all stakeholders?
- What are the main governance challenges related to the transition?
- What are the prospects of such a transition within the perspective of the European Green Deal?

In addition to answering such questions, policy-oriented recommendations will be formulated to guide future actions.

## Societal context of the transition to RE in Morocco

The transition to RE is an option often subscribed to an existing societal setting. This section provides a background for the subsequent parts, and unpacks potential linkages and challenges.

### Economic dynamics as a key driver of the transition to RE

Morocco has the most competitive economy in North Africa according to the World Economic Forum’s 2015-2016 Global Competitive Index. Pinto Moreira (2019) attributes this to the country’s growth model, based on the sustained expansion of domestic de-

mand supported by strong public investments. Such a model was undoubtedly useful since it allowed a series of external shocks to be faced and prudent macroeconomic policies to be implemented, thus maintaining a macroeconomic stability that benefited private investment.

Significant efforts to modernise the economy and encourage efficiency and innovation have been made. This has resulted in sectoral strategies, reforms of the business climate, signing of free trade agreements, modernisation of the governance of public enterprises, and the launching of flagship projects in partnership with foreign investors.

Despite such achievements, many barriers remain and the business climate is still unpredictable. Burdensome, complex and opaque administrative formalities and procedures, corruption, legal uncertainty, lack of transparency, obsolete nontariff barriers, competition from the informal sector, and difficulties in accessing financing – especially for small and medium-sized enterprises (SMEs) – are regularly confirmed in surveys of businesses as persistent constraints (World Bank, 2018). This has resulted in a decline in national private investment from 2008, a slowdown in average growth, low job creation, insufficient labour quality and growing skills mismatches, insufficient innovation capacity, concentration of product and geographical trade, loss of competitiveness of the industrial sector, and insufficient adaptation of productive sectors.

This situation suggests that Morocco's growth model has reached its limits. Therefore, without a fundamental change, the country may fall into a middle-income trap, from which it may

be difficult to escape (Pinto Moreira, 2019). The investment in a green economy, including RE, may be a window of opportunity to avoid such a trap.

### **Human development: increased efforts, modest achievements**

Morocco is gradually achieving an acceptable rate of growth and is progressing in reducing poverty while closing the gap with some improving trends (i.e. changes of consumption patterns). The reduction of poverty has been associated with migration of rural poor to urban areas; thus, areas with high poverty rates tend to be less populated (World Bank, 2018). At the territorial level, the poorest regions saw higher poverty reduction and higher income growth. Such dynamics reveal the existence of a convergence process between the 12 regions, even if it is evolving at an asymmetric and slow pace (Pinto Moreira, 2019).

Despite this slight progress, Morocco continues to lag behind on human development (UNDP, 2019). The poverty rate is twice that of Tunisia and four times higher than that of Turkey. Moreover, poverty is only one aspect of inequality. The GINI index shows that regional and gender inequalities are high in Morocco relative to some North African countries. Disparities in access to social services are the most crucial issues. The inefficiencies and inequity of service delivery can, to a large extent, be traced back to governance challenges at the local level, whereby mutual accountability between service providers and citizens breaks down (World Bank, 2018).

The need for inclusive development, particularly in lagging regions, is still a

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key social demand. It was also at the heart of the 2011 protests, to which the Moroccan state swiftly responded with promises of reform and redistribution. Yet, citizens' persistent feeling of relative deprivation and the lack of trust in certain institutions have led to new protests. The recent multifaceted crises in certain regions point to the challenge of consolidating citizens' trust in the policy process and providing equitable delivery of services – two prerequisites for social stability (World Bank, 2018).

The role played by Morocco so far in reducing poverty and inequality seems modest compared to many Mediterranean countries (Dadush & Saoudi, 2019). This situation often affects the attractiveness of backward regions to investors, thus reinforcing a vicious circle. Therefore, any transition to RE which is not part of an inclusive development may be seen as illegitimate and will have more chance to deepen or generate new negative externalities.

### **Managing environmental and climate risks to trigger a transition to RE**

The sustainability and resilience of ecosystems and natural resources in Morocco are increasingly undermined due to the economic and demographic growth, land-use change, and environmental and climate risks. In 2015, the costs of environmental degradation were estimated at 3.52% of the Gross Domestic Product (GDP) (Croitoru & Sarraf, 2017 & 2018). Moreover, the country with the richest biodiversity in the Mediterranean is increasingly at risk due to natural and anthropogenic factors (Bouhia, 2020). Many Intergovernmental Panel on Climate Change (IPCC)

reports consider the country a climate change hotspot with increased negative impacts on its social-ecological systems – vulnerable rural and urban poor are adversely impacted given their substantial dependency on natural resources and limited adaptive capacity (World Bank, 2018). Water availability per capita has substantially declined from 2,600 m<sup>3</sup> in 1960 to about 700 m<sup>3</sup> in 2016 and projected to reach 500 m<sup>3</sup> by 2030 (UNFCCC, 2016). This will, in turn, negatively affect food and health security and threaten the sustainability of ecosystems.

Due to these ongoing and projected dynamics, Morocco's current vision is to make its social-ecological systems sustainable and climate-resilient while ensuring a rapid transition to a low-carbon economy.

### **Transition to RE: social and ecological implications**

This section depicts the energy status of Morocco and implemented reforms while assessing their social, ecological and climate implications.

#### **Energy status and the move towards RE**

Morocco, which has no conventional energy resources, depends entirely on the foreign primary energy market to satisfy its growing domestic demand (Choukri, Naddami, & Hayani, 2017) due to demographic and economic growth, increasing rates of urbanisation, rural energy modernisation and expanding transport infrastructures. The country is considered a net fossil fuel importer in North Africa due to financial and econo-

mic barriers for developing local energy production facilities and the cheaper cost of imported energy (Chentouf & Allouch, 2018). Therefore, the country remains highly vulnerable to price volatility and its negative impacts. This situation engenders two risks: balance of payments risk, given the pressure exerted on foreign reserves to acquire foreign goods; and political risk, in light of the energy security concerns.

To simultaneously manage such risks and contribute to mitigation efforts, Morocco decided to move swiftly towards RE (Ayache et al., 2014) as an option inscribed in a broader green economy policy (World Bank, 2018). The RE target is set at 52% by 2030 in the Nationally Determined Contribution (NDC, 2016). A solar programme of at least \$8.3 billion and an integrated wind energy programme over a 10-year period have been launched. The country also intends to invest in the subsequent construction of hydroelectric plants, with an estimated investment of \$1.3 billion. Such a focus on electricity can be explained by the crucial role it plays in development and the decreasing costs of RE projects (Ayache et al., 2014). Similarly, the investment in green hydrogen, given the comparative advantage when it comes to the production costs, is underway. Cooperation with the EU – especially through the German-Moroccan Energy Partnership initiated in 2012 (GIZ-PAREMA) – is evolving. The *Institut de Recherche en Énergie Solaire et en Énergies Nouvelles* (IRESEN) succeeded in prioritising Power-to-X (PtX) on the agenda of the Ministry of Energy and in supporting domestic research efforts in this area. In 2018, IRESEN assessed that the country can take up to 2-4% of the global PtX market by 2030, given its exceptional renewable resources and its successful track re-

cord in deploying large-scale renewable plants (Eichhammer, 2019). The geographical proximity to Europe may facilitate exports of liquids as well, and reduce emissions related to transport in the long term. Therefore, Morocco's local market gives enough reasons for the development of "green ammonia" as it offers opportunities to meet the needs of its huge fertiliser industry and the international market in the longer term (IRESEN, 2019). Such early projections have led to the creation of a national committee on PtX in 2019, which is currently preparing a roadmap for hydrogen and PtX. Several Research and Development (R&D) pilot scale PtX projects are currently ongoing as well with scale-up possibilities. The objective is to develop commercial size plants capable of producing green molecules at a competitive price (van Wijk, Wouters, Rachidi, & Ikken, 2019).

Energy efficiency is a key pillar of energy transition, and related targets have been increased to 15% in 2030, with investments estimated at \$184 million. Many initiatives are being undertaken to provide financing incentives and to strengthen investment into energy efficiency measures for private companies as well as to support the banks in developing the needed expertise. There are also areas for improvement such as the implementation of energy audits, which should become mandatory, and the strengthening of cooperation among various stakeholders in energy efficiency measures (Jamea, Zejli, & Komendantova, 2019).

Beyond meeting energy demand and supply challenges, Morocco is acquiring an increased know-how and expertise through the transition to RE. In addition to its social and economic benefits, RE is also an opportunity of



Stakeholder inclusion is a prerequisite of a sustainable and inclusive energy transition and some recent developments in Morocco may portend changes in this direction

great interest for the southern provinces, where nearly 60% of solar and wind power production is concentrated, which would allow them to transfer the surplus to other regions (Vedie, 2020). The potential for RE exports to Europe, facilitated by Morocco's proximity to Spain, offers unique market opportunities that could be critical for the development of a domestic RE sector. The efforts made to maintain domestic political stability in times of major turmoil across the Middle East and North Africa (MENA) region reinforce Morocco as a potential upcoming market for RE. The high level of investment that has already materialised for the rollout of the first large-scale RE plants demonstrates this positive outlook. All these factors, if adequately channelled, could contribute to positioning the country as a regional and global player in the RE sector (Vidican Auktor et al., 2013). Moreover, shifting from a net energy importer to a potential RE exporter in the future may enable Morocco to transform its geopolitical relationships and enhance its regional leadership: i.e. the country is already undertaking an intelligent strategy within the West Africa's "Green Hub" by being the gateway to the African continent for Europeans. The country has thus started to sign partnerships while exporting its acquired know-how and expertise (Boisgibault, 2017).

To support the implementation of RE policies, Morocco has developed a regulatory framework and industrial, R&D and training ecosystems. Nevertheless, the pace of reforms should be accelerated in order to achieve a comprehensive transition, especially by boosting the decentralised RE generation and the development of a fabric of local production. There is an excessive reliance on international expertise, and

local companies – especially SMEs – still suffer from a technical knowledge gap (Ezouine & Bouaza, 2019) and lack the needed skills and conditions to respond to calls for tenders or efficiently develop, build, operate and maintain RE projects, therefore producing a marginal impact on local development (Jamea, Blanchet, & Herzberg, 2018). Moreover, the public funding through bilateral and multilateral mechanisms has been the least popular for most of the solar and wind project pipelines. All these limitations may affect the performance of RE projects or the full achievements of stated goals in this area.

It is true that the government and public institutions that were created to accompany the transition to RE have committed to drive the development of projects in the priority areas of RE and energy efficiency, but the country still needs to deal with many barriers related to the policy, financial and technical frameworks (Choukri et al., 2017).

### **Social implications of the transition to RE**

Many RE policies and projects are designed and implemented in an exclusive way without being sensitive to local specific needs (Haddad, 2016). In a research examining the genesis of the first solar project in Morocco, Rignall (2016) explored the "energy transition" as a political as well as a geographical project since colonial legal instruments had been used by the competent authorities to obtain the land necessary for RE development. Such land was constructed and perceived as marginal or "no man's land" (Ryser, 2019a). Also, bureaucratic processes for responding to local de-

mands effectively narrowed the local opposition to a set of technocratic problems – while excluding residents' broader political claims – to be solved by development interventions (Rignall, 2016). This process, for Ryser (2019a), acts as "an anti-politics machine to hide the loss of land and land-related common-pool resources, and thus an attack on resilience" – scientifically called a process of "resilience grabbing". In the same vein, Ryser (2019b) considers the Noor Ouarzazate solar project as an example showing how a large-scale land acquisition (LSLA) project for generating RE may alter the power and gender settings governing access to land and its resources. Therefore, LSLA "green grabbing" (Fairhead, Leach, & Scoones, 2012) examples must be contextualised and green energy infrastructure investments must be connected to all debates about climate adaptation and mitigation, sustainable energy, and Sustainable Development Goals (SDGs). In the Moroccan case, RE projects are framed and legitimised as "win-win" situations since they have the potential to make worthless territories valuable, foster a greener country and bring development (Ryser, 2019a).

Stakeholder inclusion is a prerequisite of a sustainable and inclusive energy transition and some recent developments in Morocco may portend changes in this direction. It seems that an effort, at least in official documents, is being made to consider local expectations when implementing RE projects. In the case of the Midelt wind and solar energy projects, a stakeholder engagement plan was put in place, offering the opportunity for stakeholders, including marginalised groups, to express their concerns (ONEE, 2013; MASEN, 2017). Regarding information and con-

sultation mechanisms, some innovative practices are emerging: in Chefchaouen, an energy information centre was set up in 2015 to inform and sensitise households and professionals on energy consumption issues, and a participatory council was also set up to discuss the energy transition. Concerning the participation of citizens in energy production, negotiations had been undertaken to implement the law on opening the low voltage market, which would allow individuals to produce solar energy and connect to the low voltage distribution network (Dref, 2017). Accordingly, the interests of SMEs are now increasingly considered through the active engagement with the Association of the Solar and Wind Industry (AMISOLE) and the creation of the Solar Cluster to support companies in innovation and technology, promote a more competitive and skilled industry, and develop synergies between actors from different sectors. Finally, significant efforts in terms of diversity management have been made, with the desire to take gender into account in climate and energy policies (Jamea et al., 2018).

Nevertheless, energy issues still fall under a technical register and related debates are still dominated by experts and males. Local institutions still lack specific knowledge about energy transition and the type of stakeholders to be involved. Citizens, whose level of awareness about energy transition as a process is still low, are indeed enthusiastic about participation in RE projects but they consider such participation as a kind of employment rather than an opportunity to shape decision-making processes (Jamea et al., 2019). Moreover, women still suffer, and especially in rural areas, from a high illiteracy rate (around 40%), which

is a significant barrier to their inclusion (Jamea et al., 2018). Therefore, the direct and systematic participation of citizens in energy transition is almost non-existent. A comparison with other countries having an experience of citizen participation in energy transition processes – design, implementation, monitoring and evaluation – may enlighten Morocco on its potential benefits. For instance, experience in several European countries, particularly with regard to the development of wind farms, has shown that informing and involving citizens encourage social acceptance and upstream engagement.

### Ecological implications of the transition to RE

The transition to RE is believed to produce positive environmental returns. This is among the key reasons why producing electricity at an affordable price while taking into account the sustainability and climate imperatives has become a major priority for Morocco. However, the technical and financial issues are still hindering the efficient integration of such imperatives in relevant RE policies and projects (Chentouf & Allouch, 2018). Similarly, the issue of energy efficiency, which is central to a sustainable energy transition, does not seem so far to have been addressed systematically by competent authorities, in particular with regard to energy conservation measures. The implementation of such measures seems to encounter barriers mainly linked to the lack of a clear regulatory framework compared to the RE sector (Jamea et al., 2018). The potential of RE in mobilising external funding and political support compared to energy efficiency, which remains a domestic and technical area of action, may explain such a gap.

Moreover, energy access is increasingly critical for the poor, and their use of wood for fuel often contributes to deforestation (Ayache et al., 2014). RE projects are also land-use intensive and may negatively impact biodiversity, thus compromising the goals of biodiversity conservation (Rehbein et al., 2020). Similarly, some solar projects, especially in desert areas, may be water-use intensive since their functioning needs considerable volumes of water. This, combined with the impacts of climate change on water availability, negatively affects the water security of host regions.

Using a system dynamics model to simulate different scenarios of mitigation policies up to 2030, Chentouf and Allouch (2018) show that the achievement of RE projects in Morocco could save 228,143 MtCO<sub>2</sub> between 2020 and 2030 and an additional 18,127 MtCO<sub>2</sub> could be avoided in the same period through energy efficiency. This carbon footprint reflects the magnitude of intensive CO<sub>2</sub> emitting sectors – mainly electricity, transportation, and agriculture – and the high reliance on fossil fuels for ensuring local energy needs. Therefore, Morocco was investing in RE while simultaneously promoting fossil fuel consumption (Souza, Fetz, & Cavalcante, 2020). In this perspective, viewed through the lens of environmental modernisation, Souza et al. (2020) interpret the Ouarzazate solar thermal complex as an indicator affirming environmental rationality, due to the mainstreaming of sustainability criteria. However, when screening this project in light of changes in the energy sector, such a process becomes paradoxical. In all cases, with an expanding economy and demography and raising living standards, Morocco has to provide increased and diversified

Energy issues still fall under a technical register and related debates are still dominated by experts and males

energy offer, so the use of a mix of fossil fuels and RE is legitimate. Moreover, this strategy of presenting investments in green energy as a sign that the environmental variable was being incorporated into energy planning is not limited to Morocco (Souza et al., 2020).

RE projects are commonly implemented following an impact assessment according to which the positive and negative social and environmental effects of the project, in addition to remediation measures, are identified and a monitoring programme is developed. However, despite using this systematic assessment, there is a lack of efficient monitoring and evaluation mechanisms which help ensure that the positive impacts are enhanced and the negative impacts are continuously assessed and mitigated. Also, such assessments are rarely undertaken during the implementation of RE projects compared to their economic and technical aspects.

## **Conclusions and recommendations**

To effectively achieve Morocco's ambitious RE policy, in line with the European Green Deal, while fostering its sustainability and inclusiveness, the following recommendations may be of assistance.

### **Reinforce the inclusive and participatory governance of the transition to RE**

The transition to RE in Morocco has been mostly undertaken through a model which associates the private sector as partner given its expertise and operational capacity. Such an approach was supported by the develop-

ment of a regulatory framework with the objective of fostering investment confidence, mobilising stakeholders and sharing resources (Choukri et al., 2017). In this setting, this transition remains a rather top-down process with support from the highest governance institutions, given that the different options of energy transition are not frequently discussed by all stakeholders. In that context, RE projects, especially large-scale ones, may generate misunderstandings, resistance and even conflicts. Therefore, planning RE projects by involving all stakeholders would make it possible to obtain greater social acceptance and a clear picture about the transition's outcomes. To do so, stakeholders should be systematically informed, starting from the project planning stage to be enlightened about site and technology choices, regulatory framework, and the concrete socioeconomic and environmental returns of the project. Organised civil society has a central role to play in this process by raising public awareness of energy issues and creating citizen engagement during the implementation phase. Multilevel coordination and consultation mechanisms may be set up to actively involve stakeholders in relevant decision-making processes. To reinforce participation of local communities, there is a need to strengthen the implementation of existing regulations because the Moroccan regulatory framework provides such communities with a mandate to act as a local development driver (Jamea et al., 2019).

Ultimately, a community of citizens committed and mobilised for the transition to RE could emerge, with the possibility to develop a common vision and influence energy policies at various scales. Therefore, new forms of sociability could materialise, especially

among women and young people, and a culture of debate and consultation between involved actors could emerge. Citizen commitment could also go beyond simple energy issues to support engagement in other underlying areas – i.e. mobility, water management, farming, tourism, education and health. This could even help transform other economic sectors and trigger the development of new forms of organisation to meet the needs of this emerging economy. Indeed, Morocco could develop a whole social and solidarity-based economy around energy such as the creation of energy cooperatives while encouraging young people to get involved in this niche through capacity-building and financial support (Jamea et al., 2018).

Promoting gender equality in the RE transition is also crucial. Giving women the opportunity to get involved in RE projects, therefore legitimising and strengthening their presence in this sector, may diversify the design and implementation of an inclusive transition to RE and help integrate their vision in the process. This could also initiate a shift in role distribution. Indeed, the role of women remains crucial if we consider their function within the household, which is an important place of energy consumption. Therefore, women could play a decisive intermediary role – between public authorities, non-governmental organizations (NGOs) and other household members – in questions of energy consumption and sobriety, including the use of energy-efficient technologies.

### **Promote decentralised RE production**

Morocco has initiated its transition to RE mainly through large power plants.

While this model relies on the public sector to take responsibility for site selection and land allocation, and subsequently retain the asset at the end of the contract period (very much like any similar infrastructure project across the MENA region and elsewhere), it also sees the government take on additional project development and delivery risks with the goal of driving down prices, accelerating capacity deployment, and achieving an economically optimal outcome (World Bank, 2018). However, the interventions in these areas have not been fully effective, especially with regard to attracting private investments. The deployment of decentralised energy generation projects frequently lacks financing, and further options to identify innovative financing solutions are required (Jamea et al., 2019). More concerted efforts are needed to offer the right incentives and strengthen associated social and physical infrastructure to maximise the potential of private sector financing (World Bank, 2018).

In this perspective, opportunities offered by new financing instruments – such as green bonds or a national RE development bank – may be assessed. The banking sector may be encouraged to introduce further RE credit lines and should be assisted in building up expertise in RE project financing in cooperation with foreign banks as well as technical assistance by multilateral/bilateral development banks (to improve projects' bankability). Cooperation with development banks to provide guarantees should be intensified and a domestic venture capital market may be created (Vidican Auktor et al., 2013). Mechanisms and national/ international micro-financing tools for small-scale RE projects should be developed as well to allow

Promoting, alongside mega-projects, decentralised renewable energy production will have the potential to create a demand for goods and services and dynamise the local production potential

adequate adaptation of vulnerable local populations (Choukri et al., 2017). In addition, since decentralised energy generation in Morocco is mainly connected with the deployment of the smart grids systems, access to the grids is currently the major barrier. Therefore, the current legal framework should be improved to facilitate the connections of RE systems to the national grids (Jamea et al., 2019).

Additionally, there is a need to empower local companies and prepare them to participate in RE programmes while establishing basic local production that can respond to the energy efficiency market while being accessible to customers. Promoting, alongside mega-projects, decentralised RE production will have the potential to create a demand for goods and services and dynamise the local production potential. Boosting local companies' activity through the establishment of an enabling environment would certainly generate significant economic benefits in concerned regions, thus supporting the creation of continuous and inclusive employment (World Bank, 2018).

Decentralised RE production may help reduce Morocco's energy dependence and insecurity. In addition, RE may be produced in marginal areas, therefore meeting the energy needs of communities on the sidelines of the grids and connecting the very last isolated areas of the territory. Beyond a mere energy aspect, supplying such areas could allow the development of farming, tourism and other income-generating activities, thus reducing disparities, inequalities and further migration to other regions, including the EU. For all this to happen, several barriers must be removed and incen-

tive mechanisms should be put in place to empower citizens as energy producers. In addition, a dialogue should be opened with the various actors responsible for production so that they can promote the development of decentralised energy production and increase the opening of the market to new investors (Jamea et al., 2018).

Cooperation between local governance institutions, project developers (such as MASEN) and the private sector requires further attention and improvement. To this end, an institutional mechanism is highly recommended since such cooperation might increase efficiency and sustainable implementation of RE projects (Jamea et al., 2019).

### **Enhance job creation and capacity-building**

The investment in an inclusive transition to RE may contribute to job creation during the planning and implementation processes. However, the regions where RE projects are carried out should be provided with adapted skills and expertise. Therefore, the development of training and capacity-building programmes will have the potential to fill existing gaps, benefit structurally vulnerable regions, allow the emergence of new professional perspectives and opportunities, and help develop local expertise in the energy sector.

An inclusive transition could also provide innovative solutions to the specific local needs by integrating local perspectives and experiences into RE projects, thus engaging the transformations in a comprehensive manner. This may also generate significant positive impacts on local communities that go beyond the framework of energy transition, such as the



use of solar pumping-based irrigation systems, mitigation of some conflicts over water points between users – i.e. farmers and nomad pastoralists – through solar pumping and reducing the suffering of nomads and especially their children who very often have to move to fetch water, thus encouraging nomads to settle in areas where access to social services, including education, is provided.

### **Accompanying measures to offset the social impacts of energy subsidy reduction**

Morocco has undertaken reforms to phase out fossil fuel subsidies due to rising fiscal pressures on the national budget (World Bank, 2018). Such reforms have caused adverse effects on the rural and urban poor households by compromising their financial ability to access energy services (Ezouine & Bouaza, 2019). Therefore, such reforms in addition to the investment in RE are generating many shifts which need to be handled carefully. Accompanying measures to mitigate such adverse impacts on the poor are needed. These measures may comprise a social safety net, adapted financing allocations, improvement of consumers' purchasing power, a widespread energy price-optimised access, and a price diversification strategy. Such measures have the potential to enhance the energy security of households and their access to affordable energy services, thus ensuring a basic standard of living, preventing energy poverty, and reducing deforestation.

### **Enhance an eco- and climate-smart transition to RE**

Morocco should ensure that the transition to RE is substantially contributing to

sustainability and climate mitigation and resilience. To do so, the country should engage in a robust mitigation strategy simultaneously with its transition to RE, thus fostering its contribution to the reduction of greenhouse gas emissions. Cutting fossil fuel consumption and increasing the use of RE in key emitting sectors are recommended measures. Coordinated planning of RE expansion and biodiversity conservation is also essential to avoid conflicts that compromise their respective objectives (Rehbein et al., 2020). Similarly, decoupling RE production and water use may help maintain water security in concerned regions. The same goes for the use of RE in irrigation systems, which should not increase the pumping of limited groundwater due to the decrease of pumping costs (Elame, Lionboui, & Doukkali, forthcoming). The biodiversity-water-energy nexus should be one of the key approaches guiding the energy transition process and technological developments and best practices should be fostered to mitigate potential negative externalities (Jamea et al., 2019).

Regarding the systematic environmental assessment prior to the establishment of RE projects, efficient monitoring and evaluation mechanisms, which help ensure that the positive impacts are enhanced and the negative ones are continuously assessed and mitigated, should be activated. Such assessments may also be undertaken during the implementation of RE projects.

### **Boost the transition to RE through cooperation and diplomacy**

The transition to decarbonised energy systems would have significant social,

The biodiversity-water-energy nexus should be one of the key approaches guiding the energy transition process

political, economic and geopolitical implications for all countries regardless of their energy status. In such a scenario, both multilateral and bilateral energy diplomacy have a key role to play. Multilateral diplomacy may help align the interests of multiple parties and shape the scale, extent and implications of such a transition for concerned countries and organisations (Griffiths, 2019), thereby ensuring a transition that serves the political interests of countries while fostering international development, cooperation and security. Bilateral diplomacy may help countries in implementing their relevant domestic policies and meeting their energy demand through a stable energy supply on foreign markets. Energy diplomacy is, therefore, an important tool of soft power which may help achieve countries' energy transition goals (Griffiths, 2019).

Southern Mediterranean Countries (SMC) are mostly perceived by European countries as a reservoir of resources useful for their security and development. Such a setting is behind many resource-related conflicts in this region. Within the European Green Deal, this perception is increasingly inappropriate due to shared risks and opportunities. Therefore, future diplomacy should allow the mutual transfer of knowledge, technology and resources, fostering shared stability and peace, and developing interconnectedness between the EU and Southern Mediterranean neighbours as key conditions for the implementation of the European Green Deal. The EU should decide whether future interactions with its neighbours, including in the area of RE, will be undertaken according to business as usual or different approaches should apply. In this regard, connecting the implementation of the European Green Deal to neighbours' specific needs is

highly recommended. To do so, appropriate mechanisms to jointly assess needs and tradeoffs and undertake actions should be developed. For instance, mitigation is a primary framework for the EU in its energy transition whereas adaptation is key for most SMC given their high vulnerability to climate-induced risks and limited adaptive capacities. Thus, achieving climate neutrality as an objective for the EU through RE should not lose sight of the importance of adaptation for SMC, especially that related challenges are increasingly transboundary. Moreover, there is a need to restructure the European strategy towards the neighbourhood in all energy-related areas to offset the negative impacts of the transition to a low-carbon economy. For instance, managing the green gas system reliability infrastructure and storage requires a different approach when it comes to managing the security of supply of imported gas. Such an approach should be increasingly localised and decentralised. Moreover, importing green hydrogen from MENA countries given their competitiveness in this area requires the upgrading of energy systems in these countries. Financial and technical assistance from the EU will be highly needed.

Developing robust energy diplomacy within the Mediterranean may contribute to the long-term peace in this region through advanced levels of integration among the concerned countries, thus fostering human security and a sustainable future. Such a diplomacy may boost the transition to RE in concerned countries by facilitating the sharing of science, technology and innovation, enhancing market opportunities through existing negotiation frameworks, mainstreaming RE in related policy agendas (trade, energy, transport, industry, agriculture, climate, security,



etc.), and creating governance mechanisms to ensure continuous progress. In addition, the EU may develop special bilateral relationships with countries that can provide strategic benefits during the decarbonisation process, foster and leverage soft power in bilateral energy relationships, stimulate bilateral collaborations to advance national science and technology capabilities, and engage in multilateral diplomacy to complement bilateral efforts.

A potential energy diplomacy between the EU and Morocco is a strategic trend. For instance, a joint hydrogen strategy can help build a faster and cheaper sustainable European energy system based on 50% renewable electricity and 50% green hydrogen by 2050,<sup>1</sup> thus meeting its obligations within the Paris Agreement (van Wijk et al., 2019). Such a win-win cooperation will also boost economic development, generate fu-

ture-oriented jobs and foster the social stability of Morocco, potentially reducing migrant flows from the country (van Wijk et al., 2019). Moreover, the EU may positively use the conditionality mechanism in enhancing a sustainable and inclusive transition to RE in Morocco since its political acceptance is generally established. To do so, existing cooperation frameworks may be shaped to serve such a goal. This mechanism may also be associated with many incentives (i.e. through trade mechanisms and financial and technology transfer) for more efficiency. Fostering Morocco's research, innovation and development capacities is also an area of action. Similarly, linking RE with human security, social-environmental vulnerabilities and inequalities is the best way to boost the progress towards SDGs in Morocco, thus preventing many externalities with national and transborder implications.

<sup>1</sup> Due to its limited size and population density, Europe will not be able to produce all its RE domestically and should rely on imports. Although hydrogen imports can come from many areas in the world with good solar and wind resources, an interesting possibility is the import from North Africa (van Wijk et al., 2019).

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# **MENA's Cities of the Future: Accelerating Urban Eco-Innovations by and for the People**

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## Introduction

Cities and urban areas occupy less than 3% of the world's terrestrial areas, yet they are home to 56% of the global population, generate around 80% of global Gross Domestic Product (GDP), and are responsible for 70-80% of carbon emissions (UN DESA, 2019). The Middle East and North African (MENA) region is no exception; in fact, the MENA region is an urbanisation hotspot with almost 66% of its population living in cities (World Bank, 2018). The coastal cities are expanding at the fastest pace, as is the mass tourism in those areas (UNWTO, 2019). Moreover, towns and metropolises of the region are particularly sensitive to climate-related shocks, other environmental externalities, and resource shortages (Abumoghli & Gonçalves, 2020). At the same time, rapid urbanisation of the region leads to congestion (Galal Shokeir & Ben Yahia, 2020), as well as housing shortages and increased crime (NSDS HUB, 2018). In addition, with greater integration into global markets, MENA urban centres are also "increasingly exposed to broader sets of adverse shocks beyond natural risks, which can also jeopardise hard-won gains and affect their stability" (CMI, 2014). Yet, the region presents favourable geographical conditions for the exploitation of renewable energy sources (RES) (Tagliapietra, 2018) and urban experimentation overall (Evans & Karvonen, 2016). The nature of these challenges and opportunities varies in each country, influenced by the pace of city growth and income level in each economy (Woertz, 2018).

The cleantech sector, despite being a new business area across the region, is gaining importance, as are the new urban eco-innovative ideas and processes. It is estimated that the introduction

of sustainable policies respecting Sustainable Development Goals (SDGs) across the MENA region can generate \$637 billion in economic value as well as some 12.4 million jobs by 2030. Around \$183 billion will come from foreign direct investments (FDIs) in holistic urban planning and improvement of inefficient cities' infrastructures (BSDC, 2017). Egypt and Morocco are believed to keep their leading position in attracting FDI in sectors related to sustainable growth (UN-Habitat & IHS-EUR, 2018, p. 15). To reflect on different pathways for greening of cities where a large majority of investments will take place – critical for structurally changing MENA economies towards sustainability (UNECA, 2020) – this chapter reflects on the urban eco-innovations and broader state of the cleantech sector at the local level across the region.

Relying on primary sources (in the form of urban strategy reports), 11 semi-structured interviews with cleantech entrepreneurs, policy-makers and representatives of foreign donors responsible for relevant projects' execution, Local and Regional Authorities (LRA) and Local Government Associations (LGAs) representatives from, among others, Dubai, Egypt, Jordan, Lebanon, Morocco and Tunisia – and on secondary sources of data (policy and academic literature, conferences and workshops) – this chapter reflects on initiatives to develop eco-friendly urban technologies and the challenges associated with increasing the environmental sustainability and self-sufficiency of urban development across the region. The chapter also discusses how policy-makers could best address these challenges and in particular how, in light of the currently developing Union for the Mediterranean (UfM)'s New Urban Agenda in the Mediterranean Region



and European Green Deal, cross-Mediterranean interventions could support the transition to a sustainable and inclusive urbanisation in the MENA region. Hence, the focus is not on pure high-tech developments – even if those newest urban technologies such as flying taxis in Dubai are fully electric and hence climate-friendly (Wray, 2020) – but on ongoing and currently developing participatory projects that will make the lives of urban dwellers safer and healthier while safeguarding the environment and ensuring longer-term sustainable growth (UN-Habitat, 2012).

The main objective of this chapter is to collect insights on major eco-innovations of diverse MENA cities – from the small Lebanese community Qabrikha of some 2,000 inhabitants to megapolises as big as Dubai or Cairo where challenges are entirely different and chosen in a way that pan-MENA regional coverage is ensured – as well as assess bottlenecks in their implementation and possible strategies to move forward, considering economic, legislative and other policy-oriented barriers. Urban eco-innovations as understood in this chapter will be chosen only when they tackle the problems mentioned above (climate change, resources scarcity, etc.) while ensuring growth, environmental sustainability, as well as inclusion and broad societal support without which no real transformation can be pursued (Szela-gowska & Bryx, 2015). The secondary objective is to create a catalogue of possible solutions for accelerating urban eco-innovations in particular regulatory contexts, which could serve as guidelines for

local authorities interested in replication with relation to new methods of: (1) financing such costly investments without burdening public budgets; and (2) engaging local community and private actors for the sake of participatory engagement and true social inclusion of citizens.<sup>1</sup>

## **Promoting organic urban agriculture while maintaining biodiversity and protecting ecological balance**

Innovative thinking does not always consist of creating or discovering something completely new, but it is based on a new use, combination or shaping of existing techniques or processes that offer new possibilities for the development of new practices. The idea of cooperation of three separate zones – economy, environment and social engagement – is not a unique theory when considering urban land, or even urban arable soils (Ryńska, 2012, p. 20). The analysis of innovative ecological and technological solutions integrated i.e. with buildings and the observed processes of changes in urban, social and environmental structures provided the basis for formulating conclusions and guidelines for the new function introduced in the urban tissue – the production of plants for the local community, referred to as urban agriculture, as in the urban structure it is equally doable (albeit on different scale) to enhance vegetation for nutritional purposes for the inhabitants of

With almost no room left for further spread of arable soils, the future of food production across the region depends purely on the preservation of fragile resources, which are already exposed to negative consequences of climate change and unsustainable exploitation

<sup>1</sup> Although countries of the Gulf Cooperation Council (GCC) are not relevant to the policy-making of the main EU stakeholders to which this study is being presented, particularly the European Commission's Directorate-General for Neighbourhood and Enlargement Negotiations (DG Near), the chapter draws on examples from the Gulf as many regional challenges concerning climate change are shared with countries of the Southern Mediterranean, which are under the purview of DG Near.

the city as it is in the rural environment. What is more, the implementation of environmentally- and climate-friendly solutions, which determine innovative thinking about the urban structure and construction integrating various functions, technologies and materials with the use of greenery as a compositional element of the facade and roofs, can also be beneficial for making citizens more engaged in their city transformation simply because we all need food to survive. In the end, urban interiors, public spaces and buildings need to be shaped in an integrated manner, in which vegetation, water and energy constitute core elements, and result in organic food production for the needs of the local community.

This is of the utmost importance as the MENA region can be defined by very limited arable land resources, 95% of which are already used for agricultural purposes (UfM, 2016). With almost no room left for further spread of arable soils, the future of food production across the region depends purely on the preservation of fragile resources, which are already exposed to negative consequences of climate change and unsustainable exploitation triggered by the continuously increasing needs of the rapidly growing population (MedECC, 2019). Moreover, unsustainable water use and lack of sufficient water management policies are serious issues across the whole region (MedECC, 2019). Yet, this unfavourable situation opens a new window of opportunity for targeted actions such as urban farming.

Overall, across the MENA region, management of land and water resources is fragmented with numerous ministries, agencies or LRA, among others, being responsible for different tasks

and policies. While water resources are oftentimes managed by local agencies, i.e. in Jordan and Egypt, land management and innovative approaches to agriculture are typically managed by central authorities, which creates unclear division of responsibilities (Zubel & Apprioual, 2020). With the exception of some projects implemented by foreign donors – such as the German Development Agency's "participatory development programme in urban areas" in Egypt (GIZ, n.d.) – participatory approaches are rare.

Yet, municipalities have a role to play in the process of launching urban agriculture projects even if only by enabling a regulatory framework which will allow for such experiments. For example, Palestinian *La Vie Café*, "with an edible urban garden in the centre of Ramallah that is not just a food production site with organically grown foods but is also a cultural spot for local communities interested in thematic events such as workshops and exhibits" (Zubel & Apprioual, 2020). Founders of *La Vie Café* are also responsible for conceptualisation of the Mashjar Juthour eco-park. This facility in the suburbs of Ramallah offers lectures on sustainable consumption patterns, the efficient management of resources and an eco-friendly lifestyle for urban dwellers presented by practitioners and city authorities. Hence, cooperation between private actors, LRA and citizens who are the "end concept users" is enhanced.

Increasing water efficiency in public buildings is another important step that LRA can take. It would also allow them to set a positive example, act as a catalyst for changing mindsets, and save costs. Multiple guidelines, such as the United States Agency for Interna-

tional Development (USAID) and Jordan's Ministry of Water and Irrigation "Office Buildings Water Efficiency Guide", provide great insights on the best practices and technology to support a considerable reduction in water wastage in office buildings that are typically dominating urban centres.

Greater mobilisation of non-conventional water resources is part of the recommended policy toolbox for local authorities and can considerably enrich the supply-side management of water resources. Most MENA countries are still lagging behind in terms of wastewater treatment, with the notable exceptions of Israel (93% of wastewater treated) and Jordan (88%) (Deboos, 2018). Compatible with the concepts of the circular economy (CE), reuse of treated wastewater has a significant potential to preserve resources in irrigation and can also serve to restore groundwater capacities and humid zones. However, intensifying the reuse of treated wastewater requires several constraints to be overcome: the high quality of treatment required, high costs, inadequate legislation, limited social acceptance and viability issues, among others. LRA can help to overcome these barriers by seeking financial support for wastewater treatment plants (WWTP) through public-private partnerships (PPPs), international cooperation and water non-governmental organizations (NGOs); launching awareness raising actions to enhance social acceptance of the practice by highlighting the quality of water and transparency of information; and, finally, by using treated wastewater for irrigation in urban landscapes (urban gardens in the future), recreational areas and in public cleaning services. The decentralisation of WWTP should also be promoted at the semi-urban (and rural)

municipal level where they can help to solve local shortages and restore degraded land. Several great examples exist in this regard, including the pilot projects implemented by the GIZ in the framework of the SWIM Sustain Water MED Project, in Ait-Idir (Morocco), Oueljet el-Khoder (Tunisia) and Al Goz-zayera (Egypt), which tackle local water-management related challenges and highlight the benefits, risks and lessons learned (Al Baz, Otterpohl, & Wendland, 2016). What is more, the Israeli cleantech startup – AgRobics – developed a new bio-stabiliser technology that improves urban and industrial wastewater treatment and collects biogas for energy production from the microorganism-rich waste. This means that they can turn a plant into a net energy producer just from the biogas produced. They can run entire operations off this biogas and sometimes have more than they need, and sell back to the grid. The company used not only private resources to develop this game-changing technology, they are also actively seeking international grants and were already successful in one of the European Union (EU)-funded H2020 projects.

Moreover, the co-creation of policies for urban agriculture can already take place in a participatory and multi-stakeholder manner and should be led by respective city authorities, as has been the case in Amman for some time (where participatory policy co-creation policies have been in place since 2009) (Tawk, Moussa, & Hamadeh, 2014). As one of the stakeholders representing the private sector mentioned, this is of special importance for innovative installations such as aquaponic systems, if the right legislation is in place. Although aquaponic and hydroponic systems will not ensure food security

for the growing populations in the MENA countries, especially in Egypt, they may significantly contribute to achieving food sovereignty and initiate some changes in diets across the region. Bustan Aquaponics – the first Egyptian fully commercial aquaponics farm created in 2011 on the outskirts of Cairo – already provides fresh and pesticide-free vegetables and fish to numerous stores and markets across the city. According to Faris Farrag, the founder of Bustan Aquaponics, the company has managed to create a natural system which uses around 90% less water than traditional farming practices and allows urban dwellers to have its local food supplies almost every day. Yet, lack of regulations on aquaponic-based food production remains a source of concern for ambitious urban foodtech entrepreneurs in Egypt.

In fact, not all endeavours need to be initiated by the authorities themselves. Private projects oftentimes prove to be equally beneficial for the local communities and they do not burden already limited municipal funds. As one of our interviewees mentioned, given their limited budgets, LRA should focus on creating a favourable regulatory environment, and if they are willing to execute at least a part of a project – they can always do it within a PPP model or in cooperation with international development funds to secure the necessary financial support. Ideally, they could also blend different sources in accordance with the new knowledge platform: “Financing the climate transition in the MENA” recommendations (UNEP FI, 2020).

## Producing and using renewable energy

The MENA region has undoubtedly an incredible green energy potential despite being exceptionally rich in oil and gas resources (especially GCC countries). Geographical and climate conditions enhance distributed RES developments, especially when it comes to solar and wind sources, and eventually urban prosumerism. The Middle East Solar Industry Association (MESIA) representatives estimate that, between 2019 and 2023, investments in sustainable energy technologies across the region might add up to \$1 trillion, as, with global drops in fossil fuel prices, innovators are more and more interested in investments, which are both efficient and environmentally conscious, especially in cities where demand is ever growing (El-Huni, 2020). For example, Saudi Arabia’s energy demand is expected to increase threefold within the next decade and hence, the Saudi authorities are investing in projects that help to make the country’s energy value chain more local and distributed.

Dubai also aims to focus on green cities, green technology, green energy and green investment, including by diversifying its electricity generation mix. It hopes to see clean energy consisting of at least one quarter of its energy mix by 2030 and three quarters by 2050. In fact, the results are already more than promising. A private initiative called “The Sustainable City” is presented as a first “operational net zero energy city in Dubai, modelled to become an international showcase for high quality sustainable living” (The Sustainable City, n.d.).

Similarly, Mohammed bin Rashid Al Maktoum Solar Park – a solar park situated around 50 kilometres from Dubai – is the largest single-site solar

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park in the world based on the Independent Power Producer model with a planned production capacity of 5,000 MW by 2030 (project's website). The solar park also houses an Innovation Centre, a Research and Development (R&D) Centre and a 3d-printed lab where other urban eco-innovations are about to be implemented as promised by the Dubai Electricity and Water Authority (DEWA) representatives who are in charge of the endeavour.

Another interesting example related to RES and prosumerism in a much smaller town can be found in Lebanon. Qabrikha, a small community of about 2,000 people in the Marjayoun district in Southern Lebanon, is the site of an EU-funded project in municipal-generated solar power "that experts hope to expand to other communities across the country, providing relief on high electricity bills and reducing reliance on polluting diesel-fuelled generators." The EU cooperated with the United Nations Development Programme (UNDP) CEDRO sustainable energy initiative in creating this 250kW solar farm with installation completed in the summer of 2018. Before the project's execution, citizens of Qabrikha oftentimes had to deal with long electricity cuts on the state-run power grid supplied by *Électricité du Liban* (EDL). However, unlike in many areas where generator subscriptions are sold by private operators, the municipality of Qabrikha currently owns three generators, ranging from 200kVA to 400kVA, which supply the village during EDL cuts, as one of our interviewees told us. That fact made the village an attractive site to pilot the concept of a community-scale solar farm in Lebanon where households are shareholders. In fact, the project proved to be such a success for the local communities that project initia-

tors are currently working on the preparation of legal acts that will enable replication of such a model to other parts of the country, including larger towns and cities.

### **Urban planning to preserve the environment and raise the efficiency of housing and buildings environmentally**

Inefficient urban planning across the MENA region is a well-known problem which limits the path towards becoming truly resilient (UNDP/RBAS, 2018). For example, in Lebanon, there is a disturbing tendency to view urban planning as an entirely separate process in urban governance, "equivalent to, and on a par with, environmental or transport planning and the like." A shift by urban authorities towards a more holistic and forward-looking approach to urban planning where all the sectors are interconnected is urgently required (Madbouly, 2009, p. 33-34).

Yet, the progress in such people-centric thinking is already visible in some of the cities across the region. When it comes to preserving the environment while experimenting with new building infrastructure, Morocco deserves to be mentioned. The country will soon become home to Africa's very first smart eco-city, which will be run only by nature-based solutions. Zenata Eco-City is therefore a sustainable urban development project aimed at "improving living conditions and economic opportunities, thereby cementing a sense of belonging to the city" (CMI, 2019, p. 53). Zenata, which is emerging on the outskirts of a less sustainable metropolis (Casablanca) and is supposed to be fully operational by 2023, will transform all the sectors considered as the biggest polluters thus

far. Among others, it will have a huge impact on the construction industry, which employs around a million people across the country. Construction workers will work only with sustainable materials and techniques as the building stock is supposed to be fully efficient. As the project is supported by multiple international institutions including the EU and the European Investment Bank (EIB), in line with the EIB's environmental and social standards, the project owner is "supposed to seek to mitigate the risk associated with involuntary resettlement by drawing up a Resettlement Policy Framework and Resettlement Action Plan" (EIB, 2017). In parallel, dialogue with other stakeholders affected by the project will be pursued.

The city will be planned in a truly resilient manner: "several measures in the urban design have resilience to climate change, and climate adaptation, in mind, notably incorporating the foundations of the rampart-like coastal line of 'cabanon' houses to form a flood defence; orientation of urban development to take account of natural geomorphology and use of extensive water retention areas which provide a reserve for storm-water drainage in extreme weather events" (EIB, 2017, p. 2). What is equally important is the fact that all this will be built while ensuring biodiversity and natural ecosystem protection so that no single species is put at risk.

Another interesting example comes from Tunisia and links urban planning with public transportation – yet another service considered problematic and highly ineffective, especially in larger cities across the region. Yet, the MobiliseYourCity Partnership facilitated conceptualisation and execution of four separate National Urban Mobility

Plans and Programmes (NUMP). In fact, Tunisia – a country where quick urbanisation leading to a larger transport demand as well as the deterioration of related public services are a daily routine – was among the world's pioneers in the process of development of such plans. The Tunisian Ministry of Transports – an institution well aware of those issues as well as of the challenges related to emerging technologies which will soon prove inevitable (such as public transportation electrification) – decided to join the MobiliseYourCity Partnership exactly to receive a quality technical assistance for its NUMP development.

With the world's best experts on board, the Ministry was willing to make the planning phase a truly inclusive one and invited, among others, stakeholders representing the local and national level authorities as well as transport experts and enthusiasts. With so many parties united, the result was impressive – creation of concrete action plans that will serve all those using public transportation across the country. Perhaps, the biggest success story related to implementation of these NUMP is related to securing a stable and well-designed funding scheme in partnership with private investors so that public budgets are not too burdened. Numerous actions were undertaken for the project's purposes. These, among others, included researching the local context – familiarising with infrastructure, technical and human capacities related to mobility services as well as regulatory environment. It turned out that the lack of integration between the different modes of transport at all government levels was one of the biggest surprises for the programme's executors.



Apparently numerous lessons can be drawn from the implementation of these NUMP. Firstly, the project allowed different stakeholders to feel engaged in the process of shaping the future framework of the city while using their skills and building on their previous experiences. Besides, efficient flow of information is indispensable in today's multilevel governance era. For example, apart from official city bulletins, the internet can be used by LRA to inform or explain their decisions to urban dwellers – in fact it is one of the most important obligations of all public authorities. Finally, high-level political support is no less important as it helps to make the project a reality while actively involving all interested parties to join forces and work for the common good. At the same time, no project can be realised without secured funding. The integrity of all these concepts ensured a successful NUMP launch in Tunisia.

## Conclusions and recommendations

As the MENA urban areas are growing rapidly, the importance of coming up with green technologies and sustainable processes in a participatory manner has begun to receive widespread recognition across the region, where resources are scarce, urbanisation growth high and the existing systems and infrastructure insufficient. Cities are now the main sources of global greenhouse gas emissions but are also the most vulnerable to climate change and other environmental externalities.

Yet urban areas, if designed in an efficient and sustainable manner, are well-positioned to answer the needs of citizens while protecting the local-spe-

cific resources (Habitat II, 2017). Every city is particular with its very own culture, traditions and knowledge, as well as infrastructure and human capital. Hence, it lays the ground for local experimentation, incubation and sometimes vertical and horizontal acceleration of new well-functioning eco-innovations and deployed socio-technical participatory projects (Smeds & Acuto, 2018).

However, designing sustainable urban spaces is a challenging and holistic task. Green and inclusive cities cannot be achieved by one particular authority as new forms of governance require comprehensive and integrated knowledge sharing between different stakeholders. Having this in mind, urban authorities need cooperation with other players such as local communities, private companies, national governments and research institutes to boost know-how exchange and promote integrated nexus approaches, especially in areas as crucial as water, food and energy. To overcome these general challenges, we define several guidelines for local, regional, UfM and EU policy-makers, which may contribute to making MENA cities more sustainable and inclusive.

## A new model of city governance

The main obstacle to urban climate and energy transition is not a lack of cleantech technologies and eco-friendly ideas but the capacity to implement them. The silo-based forms of governance which still dominate in the MENA cities were sufficient for conceptualising and implementing sectoral policies like public transportation in the past, yet, today, in a highly-interconnected world, they are not enough

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to drive ambitious large-scale transformations where expertise of stakeholders representing different fields is very much needed. Systems innovation, promoted by specialised EU bodies, for example Climate-KIC, which links different sectors while ensuring a new model of city governance for environmentally-friendly actions in a truly participatory model in which citizens are oftentimes initiators and executors, might be a solution. Such transformation could be implemented while ensuring three simple objectives: (1) a comprehensive approach in conceptualising eco-city innovation and its deployment; (2) a multi-level form of governance; and (3) an inclusive cooperation and collaboration between all interested stakeholders. Such *modus operandi* would require strong political will from local politicians and authorities and, in the case of projects funded by foreign donors, their strong encouragement or even requirement of enhancing multi-level governance.

### **Enable new business models**

Governments in MENA countries can help cleantech entrepreneurs pursue shared goals by creating a favourable environment that enables private sector sustainable growth. In the end, most of the eco-friendly urban initiatives are initiated by individuals or private entities, oftentimes in cooperation with international donors who are typically more active in countries and regions where the regulatory environment is safe. National governments should create transparent policy-making processes and LRA should execute them whenever needed. New cleantech start-ups in the region have to compete with bigger actors, and current procurement policies favour a few dominant market players – especially in

the monopolised energy production sector, i.e. in Lebanon – while limiting innovation and job creation. As one of the interviewees mentioned, there is a high degree of uncertainty around the regulatory environment for small and innovative cleantech initiatives, which creates a serious obstacle to their growth in the MENA region. This is particularly relevant in sectors considered heavily burdened, such as urban food production or net-metering. Simplifying regulations for local and distributed food or energy production across the region could be one of the driving forces of the currently developed UfM Urban Agenda.

### **Partner for sustainable city initiatives**

The network of twinning contacts between EU cities is ever growing. Collaboration continues to be one of the most important opportunities for the European LRA to meet face to face, share their everyday experiences and use their knowledge in a variety of areas – from education and culture to the economy. Most of all, collaboration has been crucial in building partnerships with private actors, i.e. in the form of PPPs. It also helps to create a sense of European unity. Moreover, enabling citizens to discuss important and often difficult topics in a friendly atmosphere is an expression of active European citizenship. Perhaps a similar initiative could be implemented across the MENA region. Partnering with other cities pursuing their own green transitions is crucial for the success of each initiative as only cooperation inspires plans to be adjusted whenever needed and involve stakeholders who were initially not relevant for the project's success. Other cities' experiences can help LRA to understand how municipalities



can overcome traditional barriers, for example related to the funding and financing of smart and sustainable city projects, by demonstrating the potential of joining PPPs and supporting private initiatives serving common goals (EBRD, n.d.). Such a network of eco-friendly MENA partner cities sharing experiences on becoming more resilient (UNDP/RBAS, 2018) could be supported by both the EU and UfM, especially in the context of the currently developing Urban Agenda and EU mission for “100 climate-neutral cities by 2030 – by and for the citizens”.

## Regional integration

Despite the fact that cities across the region differ from one another, the sharing of ideas related to urban eco-innovation as well as know-how on their execution should be treated as a priority, even if the purpose of such action would simply be “inspirational”. South-South and South-North urban networking could support LRA in scaling up green experiments (Smeds & Acuto, 2018). An initiative like the European Territorial Cooperation Programme for Sustainable Urban Development (URBACT) could be created. This programme emphasises the key role cities play in the face of increasingly complex social change. URBACT helps cities develop practical, innovative and sustainable methods that combine economic, social and environmental dimensions. It enables them to share good practices and lessons learned with all professionals involved in urban policy in Europe.

It could also work across the MENA region. It could be targeted to clean initiatives or address broader issues: strengthening research, technological

development and innovation; supporting the transition to a low-carbon economy in all sectors; preserving and protecting the environment and promoting resource efficiency at the local level; promoting sustainable and high-quality employment and labour mobility; and promoting social inclusion, combating poverty and any discrimination.

By organising themselves into more or less formal groups and associations, LRA have the chance to join forces in negotiations with other national and international actors. One instance of such a successful intervention by LRA was the coordinated participation in public consultations launched in 2010 in preparation for establishing the trans-European transport network (TEN-T). A similar approach to common projects could be taken when negotiating with donor countries providing technical assistance, for example, in the field of decentralised energy sources (currently, in the majority of MENA countries, the role of LRA in this field is purely declarative and they have no real ownership over the energy production facilities).

## Green finance

As the chapter by Vidican Auktor in this study states, EU institutions have played a growing role in sustainable energy- and climate-related finance across the MENA region, and the Southern Mediterranean Countries (SMC). At the urban level, greater investment, and one better targeted to the needs of respective cities and regions instead of national authorities, would be needed for these countries to reach their Nationally Determined Contributions, as well as to fulfil the

A network of eco-friendly MENA partner cities sharing experiences on becoming more resilient could be supported by both the EU and UfM

goals mentioned in various strategies on sustainable urban development (i.e. the Amman Climate Plan, a vision for 2050 Amman – Greater Amman Municipality, 2019). A critical component would be to link green finance to sustainable reforms (such as energy efficiency in the residential sector or integrated urban planning). Also, while most green finance has been channelled to large-scale projects (solar farms in Morocco), smaller-scale projects with a strong involvement of smaller municipalities and towns should be considered. Lebanese Qabrikha inhabited by some 2,000 citizens who became shareholders of their new energy infrastructure proves to be an exceptional example here. Improving the availability of green finance and reducing structural problems in the financial sector when it comes to supporting cleantech could positively contribute to accelerating the green and just transition of the MENA region. Finally, to

make the most of the European Green Deal, the Multiannual Financial Framework (MFF), the EU Recovery and Resilience Facility and Horizon Europe (MENA countries will be eligible for some instruments), all investments should have a multiplying effect on the urban growth, involve citizens in decision-making processes and have a reframing effect towards enhancing sustainability in accordance with the Integrated Product Policy objectives. This major EU initiative seeking to limit the environmental footprint of both products and services throughout their complete life cycles could indeed become a *sine qua non* condition for urban-specific funding. That is because potential beneficiaries would have to ensure sustainability of both the demand side (consumption) and the supply side (product development) to be eligible for any potential funds. Investment in inclusive city transition fulfils all those conditions.

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# List of acronyms and abbreviations





<b>CE</b>	circular economy
<b>CITET</b>	Centre International des Technologies de l'Environnement de Tunis
<b>DG Near</b>	Directorate-General for Neighbourhood and Enlargement Negotiations
<b>EIB</b>	European Investment Bank
<b>EU</b>	European Union
<b>GDP</b>	Gross Domestic Product
<b>GW</b>	Gigawatt
<b>GWh</b>	Gigawatt hour
<b>IRESSEN</b>	Institut de Recherche en Énergie Solaire et en Énergies Nouvelles
<b>kVA</b>	Kilovolt-ampere
<b>kW</b>	Kilowatt
<b>LRA</b>	Local and Regional Authorities
<b>m<sup>3</sup></b>	cubic metre
<b>MENA</b>	Middle East and North Africa
<b>MSMEs</b>	micro, small and medium-sized enterprises
<b>MtCO<sub>2</sub></b>	Metric tons of carbon dioxide
<b>MW</b>	Megawatt
<b>MWh</b>	Megawatt hour
<b>NGO</b>	non-governmental organization
<b>NUMP</b>	National Urban Mobility Plans and Programmes
<b>PPP</b>	public-private partnership
<b>PtX</b>	Power-to-X
<b>QI</b>	quality infrastructure
<b>R&amp;D</b>	Research and Development
<b>RE</b>	renewable energy
<b>RES</b>	renewable energy sources
<b>SCP-NAP</b>	Sustainable Consumption and Production National Action Plan
<b>SDGs</b>	Sustainable Development Goals
<b>SMC</b>	Southern Mediterranean Countries
<b>UfM</b>	Union for the Mediterranean

