



## KHALLADI WIND FARM

# SOUTHERN AND EASTERN MEDITERRANEAN PRIVATE RENEWABLE ENERGY FRAMEWORK (SPREF)

*Co-delivering Policy and Investment Solutions to Drive  
Morocco's Energy Market Liberalization*

// May 2025

## CLIMATE DELIVERY INITIATIVE SERIES //

### Case Study

CIF Program: CTF

### TOPICS

- Renewable Energy Sources
- Liberalized Energy Markets
- Private Sector

# ACKNOWLEDGMENTS

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# PROJECT DATA

<b>PROJECT TITLE</b>	Khalladi Wind Farm Project sub-project of CTF DPSP II: <sup>1</sup> SEMed Private Renewable Energy Framework (SPREF)
<b>PARTNER ORGANIZATION/S</b>	CIF's Clean Technology Fund (CTF) and the European Bank for Reconstruction and Development (EBRD).
<b>COUNTRY</b>	Morocco
<b>SECTOR/S</b>	Renewable Energy Sources; Industrial Decarbonization; Energy Policy and Regulation.
<b>TOTAL PROJECT COST</b>	USD 182.99 million <sup>2</sup> including USD 16.75 million (CIF CTF, Concessional Loan); USD 58.16 million (EBRD, Senior Loan) <sup>3</sup> ; and USD 74.80 million (Bank of Africa, BMCE, Loan).
<b>PROJECT DURATION</b>	Nov 2015 –December 2038 (23 years)
<b>DEVELOPMENT CHALLENGE(S)</b>	<ul style="list-style-type: none"> <li>• Localized greenhouse gas (GHG) concentrations exacerbated by the dominance of hydrocarbon-based production systems.</li> <li>• Over-reliance on expensive, imported hydrocarbon energy sources.</li> <li>• Policy and financing conditions that hinder a liberalized and tariff-competitive energy market.</li> </ul>
<b>DELIVERY CHALLENGES</b>	<ul style="list-style-type: none"> <li>• <b>Challenge 1: Policy, Legislation, and Regulation Weaknesses:</b> Operationalization of Law 13-09 curtailed by the absence of cost-reflective rev-enue accommodations.</li> <li>• <b>Challenge 2: Lack of Consensus:</b> Energy market liberalization curtailed by grid operator concerns about system stability.</li> <li>• <b>Challenge 3: Weaknesses in Risk &amp; Reward Perception:</b> Private developers' and commercial financiers' hesitancy vis-à-vis a nascent and evolving market context.</li> </ul>
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## KEY MESSAGES

In-built mechanisms for iteratively adaptive and quantitatively founded policy and regulatory refinements can yield policy and regulatory arrangements that, while requiring longer gestation periods, are more inclusive and impactful in delivering long term energy transitions.

Ambition, effort, and risk-appetite in delivering right-sized concessional financing packages –marked by market responsive terms and tenors, and bespoke structuring modalities— can allow for innovative capitalization of market opportunities, and buttress entrant private sector investment models with exponential replication effects.

Good-faith and data-driven policy dialogues and due diligence, oriented explicitly toward realizing mutually beneficial policy and investment arrangements, are crucial for actualizing a robust enabling environment for public and private coaction on clean energy transitions and energy market liberalization.

# EXECUTIVE SUMMARY

Marked by windswept deserts, semi-arid steppes, rugged mountain ranges, and vast fertile plains, the Southern and Eastern Mediterranean (SEMed)<sup>4</sup> region is, by nature of its topography, at the frontline of vulnerability to shifting climactic conditions. The region stands acutely and disproportionately exposed to the heightening impacts of global warming, with temperatures in the wider MENA region expected to rise twice as fast as the global average.<sup>5</sup> This exacerbates an already critical water crisis in the region, and the related fragility of its water-energy-food nexus. Curtailing localized atmospheric concentrations of heat-trapping greenhouse gases (GHGs), while developing efficient industrial and production systems in step with burgeoning demand, has therefore become increasingly crucial.

In 2015, the majority of emissions were produced by the region's power sector, characterized by a dependence on conventional thermal generation systems that were both water- and emissions-intensive. Source fuels were largely imported, exposing national trade accounts to the often-extreme price volatilities of the global hydrocarbon market. This in turn deepened end-user dependencies on entrenched and potentially inefficient oil and gas subsidy regimes, bearing significant fiscal pressures on national budgets.

In support of the region's ambition to transform its energy architecture, in November 2015, the European Bank for Reconstruction and Development (EBRD) launched the SEMed Private Renewable Energy Framework (SPREF)—a multi-country investment program aimed at catalyzing private-to-private supply of renewable energy (RE) in high-emitting industrial sectors. Supported by concessional financing from CIF and the Global Environment Facility (GEF), SPREF sought to address, in tandem, two primary constraints to a private-sector entry into RE asset development in the SEMed: (1) policy and regulatory gaps and volatilities that raised the risks of longer-term viability; and (2) a nascent and/or unproven market for independent power generation, and for local, commercial financing, that raised the borrowing costs for first-mover or early-entrant investors.

To address policy misalignments or inadequacies, the technical advisory apparatus of SPREF's programming would partner with each government and its energy agencies, supporting the enactment, reform or operationalization of critical policy and regulatory measures. To address the hesitance of private development and financiers to participate in the market, the investment arm of SPREF—via the delivery of right-sized, risk-tolerant, and concessional local-currency financing—would support the actualization of pilot private sector project(s) that could test and demonstrate the economic viability of the aforementioned policy provisions. The development and operationalization processes of these pilots would, in turn, be utilized to further fine-tune policy arrangements.

Even when undergirded by resolute sovereign convictions and sound policy commitments, countries' transitions away from long-established and highly predictable thermal generation systems toward the more elaborate and dynamic gossamer of renewable-integrated architectures remain a demanding and gradual process. Conventional-dominant generation systems consist of portfolios of low risk, unintermittent supply, and baseload assets that require significantly less system stabilization. On the other hand, integrated systems, needing to modulate their absorption of power based on the weather-dependent intermittent supply from varied RE assets, require advanced supply- and demand-side management, real-time system responsiveness capacities, and commensurate technological and human capital investments in step with expanding RE connections. Within this frame, if a national energy policy enactment triggers the rapid and confluent addition of weather-dependent generation capacities, particularly at commercial volumes, the physical and operational demands on energy system operators, and the multitude of variables and actors for consideration, significantly raise the costs and consequentiality of the related risks.

In an effort to map and analyze such a transition process, potential impediments, and the underlying economics (e.g., market fundamentals, costs, trade-offs, risks, and responsibilities), this case study examines one of the projects within SPREF's investment portfolio, namely the "Khalladi Wind Farm in Morocco" (hereafter, Khalladi), and dissects the barriers encountered and solutions realized via SPREF's two-pronged upstream/policy and downstream/piloting approach to establishing a working model for private sector driven RE expansion. For Khalladi, policy-related challenges included a lack of consensus among state agencies on the operationalization of legislations, driven by prohibitive cost-to-revenue arrangements and insufficient provisions for grid-readiness. Market-related challenges included weaknesses in the real and perceived risk-to-reward calculus, driven by the potential oversaturation of particular market segments and the still-nascent development of others. By delineating the granularities and causal factors of each of these, and of the subsequent intervention strategies, this case study aims to raise key considerations and suggest potential solutions for delivering ambitious market-level change in national and regional energy ecosystems.

This report is one of a cohort of delivery-challenge case studies deployed annually by CIF's [Climate Delivery Initiative](#), a research base dissecting the operational conditions barring the entry, uptake, and actualization of frontier climate solutions. Each cohort is compiled to draw evidence from across the breadth of CIF's portfolio, ensuring coverage across regions, sectors, [investment programs](#), and modalities of delivery. Causal drivers of barriers are classified based on CDI's taxonomy, a live document that allows for inventory, aggregation, and comparative analyses, which are thereafter constituted into operations via Climate Delivery Labs co-led by CIF's implementing partners and sector leaders.

# LIST OF ABBREVIATIONS

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<b>ANRE</b>	National Electricity Regulation Authority
<b>ARIF</b>	Argan Infrastructure Fund
<b>BOA</b>	Bank of Africa, previously Banque Marocaine du Commerce Extérieur or BMCE
<b>BOA</b>	Bank of Africa
<b>CDER</b>	Centre de Développement des Energies Renouvelables au Maroc
<b>CDI</b>	Climate Delivery Initiative
<b>CIF</b>	Climate Investment Funds
<b>CTF</b>	Clean Technology Fund
<b>CTF - DPSP</b>	Clean Technology Fund - Dedicated Private Sector Program
<b>DPSP</b>	Dedicated Private Sector Program
<b>EBRD</b>	European Bank for Reconstruction and Development
<b>EPC</b>	Engineering, Procurement and Construction
<b>GEF</b>	Global Environment Facility
<b>GHG</b>	Greenhouse Gases
<b>GoM</b>	Government of Morocco
<b>HV</b>	High Voltage
<b>IFI</b>	International Financial Institution
<b>IPP</b>	Independent Power Producer
<b>kV</b>	Kilovolt
<b>MAD</b>	Moroccan Dirham
<b>MASEN</b>	Morocco Agency for Sustainable Energy
<b>MENA</b>	Middle East and North Africa
<b>MV</b>	Medium Voltage
<b>MW</b>	Mega Watt
<b>MWh</b>	Mega Watt Hours

<b>MTCO<sub>2</sub>Eq</b>	Metric Tons of Carbon Dioxide Equivalent
<b>ONEE</b>	National Office of Electricity and Drinking Water (Office National de l'Électricité et de l'Eau Potable)
<b>PPA</b>	Power Purchase Agreement
<b>RE</b>	Renewable Energy
<b>SEMed</b>	Southern and Eastern Mediterranean
<b>SOE</b>	State Owned Enterprise
<b>SPREF</b>	SEMed Private Renewable Energy Framework
<b>STATCOM</b>	Static Synchronous Compensator
<b>USD</b>	United States Dollar
<b>VHV</b>	Very High Voltage

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# 1. INTRODUCTION: SPREF AND ENERGY MARKET LIBERALIZATION IN THE SOUTHERN AND EASTERN MEDITERRANEAN (SEMed)

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In 2015, in Egypt, Jordan, Morocco, and Tunisia, the four countries targeted by the European Bank for Reconstruction and Development's (EBRD) SEMed Private Renewable Energy Framework (SPREF), the greatest share of greenhouse gas (GHG) emissions was notched by the energy sector, discharged by emissions-intensive thermal assets fueled by imported, price-volatile hydrocarbons. The sector was responsible for 71 percent of GHG output in the four countries collectively, followed by 11 percent from agriculture, and ten percent from industry.<sup>6</sup>

Fortuitously, the same countries also have high concentrations of domestic renewable energy (RE) resources. Heavy coastal and desert wind systems provide ample capacity for both onshore and offshore generation, and per-unit ground irradiation rates are among the highest and most consistent globally (refer to images 1 and 2).

Resource-commensurate additions of RE assets, however, have been stymied by complex policy and financing environments that discourage the entry of private developers with the appetite, capital, and experience to deploy tariff-competitive sustainable energy generation at scale and speed. As of 2015, Egypt, Jordan, Morocco, and Tunisia only housed 750 MWp, 772 MWp, 206 MWp, and 47 MWp of installed solar capacities respectively,<sup>7</sup> representing a mere 0.8%, 10.2%, 0.02%, and 0.6% of total generation.<sup>8</sup> Combined, solar (0.1%) and wind (2.0%), the two most water-efficient generation technologies, only represented 2.1 percent of the aggregate energy mix, versus a global average of 25 percent.<sup>9</sup>

In remedy, well formulated policy architectures and financial market interventions, leading to dynamic and liberalized RE markets, present a host of economic benefits, including:

- **Reductions in public expenditure:** Via the (1) displacement of electricity subsidies linked to the importation of non-sustainable hydrocarbons; (2) reduction of operating pressures and management costs borne by the public ledger when state owned enterprises (SOEs) carry the full weight of national energy supply; and (3) redistribution of the capital costs and risks associated with expanding into new energy technologies so as to meet national climate targets.<sup>10</sup>
- **Technological transfers:** Via entrance of established global energy developers, drawn by the profitability of newly liberalized markets, bringing new technologies and know-how, and laying the groundwork for “demonstration effects” and replication by entrant and expanding local actors.
- **End-user tariffs:** Via increased competition between energy suppliers, driving innovation and cost effectiveness, eventually translating to lower end-user energy costs. The resulting knock-on effects include industrial growth and competitiveness, spurred by reduced production costs, and increased human capital and household income gains, spurred by cost-savings—each with further induced economic impacts.

## 1.1. The Centrality of Responsive Policy and Regulatory Ecosystems

Entry into emerging markets often carries a host of risks for private sector energy operators, raising the costs of investment. Chief among them are (1) policy/regulatory inadequacies and variability and (2) financing/currency volatilities. To allay the former, several factors remain fundamental for shoring up policy efficacy and reliability, including those highlighted by SPREF:

- **Authorization:** Via policies that are adequate, appropriate, and non-restrictive for the entry, development, operation, and expansion of competitive independent power producers (IPPs) harnessing RE sources. Table 2.1 summarizes the status of various energy policy spheres at SPREF's inception in 2015.
- **Predictability:** By demonstration of a reasonable degree of policy stability, consistency with long-

term national/energy strategies, transparency and judiciousness in reform processes and timelines; and built-in clauses and safeguards that cushion the transfer of risks to existing operators in the event of future reforms.

- **Relevance and Responsiveness:** By including feedback loops and fine-tuning mechanisms which facilitate robust pulse-taking, broad-spectrum (re)negotiations, and timely reforms that ensure policies remain aligned with gazetted national objectives and are responsive to evolving market dynamics.

The resulting policy frameworks, conducive to market liberalization, would be marked by both constancy at the macro-level (non-reversal of key policy or regulatory permissions, appreciable progress toward five and ten-year goalposts, etc.), and adaptiveness at the micro-level (cost reflective tariff agreements, reform of inefficient or restrictive subsidy regimes, etc.).

**TABLE 1. SEMed Market Liberalization Policy Status and Regulatory Status, 2015**

COUNTRY	SPHERE			
	<i>Public to Public</i>	<i>Independent Power Producers (IPPs)</i>	<i>Auto Generation</i>	<i>Private to Private</i>
Egypt	Proven for conventional and RE	Authorized but not proven for RE	Authorized but not proven for RE	Authorized but not proven for RE
Jordan	Proven only for conventional	Proven for conventional and RE	Authorized but not proven for RE	Not authorized, except for net metering; not fully proven for RE
Morocco	Proven for conventional and RE	Proven for conventional and RE	Authorized but not fully proven for RE	Authorized for High Voltage; not proven for RE
Tunisia	Proven for conventional and RE	Authorized for conventional but not RE	Authorized but not proven for RE	Not authorized

Source: EBRD SPREF Approval Documents

## 1.2. The Instrumentality of Market-Creating Concessional Financing Arrangements

In light of the discussed policy risks, and given that technologies, regulatory/operating arrangements, and financing arrangements may often be largely unproven in emerging energy markets, the risk premia of private, fully commercial financiers often take the form of higher interest rates, shorter tenors, or more stringent security and guarantee terms, all of which raise the costs of investment.

Capital constraints and lower-risk tolerances, paradigmatic of local financial markets in emerging economies, may also necessitate the sourcing of funds from international capital markets, especially given the scale of investments required in the energy sector. In such cases, a fair stock of liabilities may be denominated in hard currencies, versus all future electricity revenues denominated in local currency, with exchange rate risks further raising the costs of investment.

Where policies or tendering arrangements are new or nascent, they often carry significant upfront costs. Market and technical assessments, as well as due diligence, are often borne by first movers, and the processes for negotiating and establishing wholly new financial structures, agreements, and documents can be onerous and protracted.

Aptly formulated concessional finance, guarantees, financing arrangements, and technical assistance, as provided by SPREF and sourced from multilateral development financiers, who have the capacity to weather more lenient terms and tenors, can be strategically delivered to hedge inherent risks, allow a buffer against exogenous shocks, and/or serve as catalysts to crowd in both private developers and finance.

## 1.3. SPREF: A Composite Policy-and-Market Interventions Approach

Supported by CIF's Clean Technology Funds' Dedicated Private Sector Window (CTF – DPSP II), the EBRD's SPREF was designed as a regional umbrella intervention, under which country-specific sub-projects would address, in tandem, the policy inadequacies and the market failures currently barring the establishment of robust private sector, RE markets. Investment models would be deployed in Morocco, Tunisia, Egypt, Jordan, and Lebanon—countries with significant untapped energy potential and latent private sector appetite, but with nascent and uncondusive investment ecosystems.

Building on the EBRD's established policy and investment presence in the target countries, each SPREF sub-project would work with the government to dissect, design, and deploy the regulatory and legal frameworks necessary for liberalized and competitive energy markets. In tandem or in sequence, it would also provide catalytic financing for competitively tendered private investments that utilize these policy accommodations. Each investment model, to concurrently and cohesively address both the upstream (enabling environment) and downstream (demonstrated viability) requirements for expansive RE deployment would include two tiers:

- 1 | **Policy ecosystem: Establishing an enabling investment environment** by supporting the government's reform of legal and regulatory architectures and ensuring coherence and buy-in across key national, ministerial, and regulatory arms.
- 2 | **Market ecosystem: Actualizing uptake and catalyzing investments** by supporting pilot project(s) via the provision of technical assistance, and of right-sized financing packages that carry terms, tenor, and concessionality required to buffer risks and weather shocks.

The two tiers are intended to be iterative and reinforcing. Incremental improvements in the legal

and regulatory frameworks were to be validated by pilot investments, which would in turn road-test the policies' robustness and applicability, thereby providing crucial optics and data for further reforms, tariff-amendments, and fine-tuning.

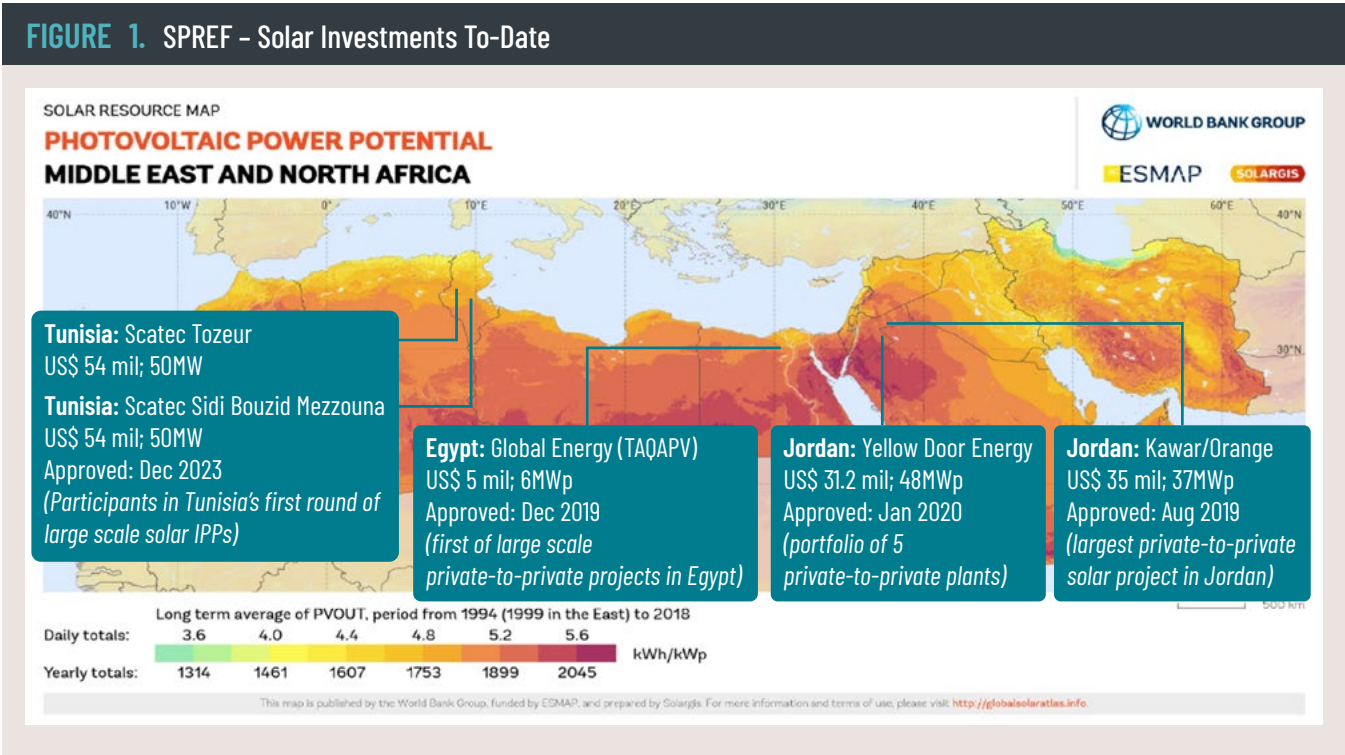
The private sector financing operations were also specifically designed to reinforce and capitalize on incentive structures that engendered multiplier effects. For example, where a regulatory reform was validated by a highly replicable pilot project, it would build market confidence, triggering increased appetite and momentum for other investors to capture the same first-mover gains; and where pilots demonstrated economic and climate gains for a country and its peoples, they would increase the impetus and demand for further policy and regulatory responsiveness and fine-tuning. The EBRD, by co-deploying both its policy and technical advisory teams and its investment and commercial finance teams, sought to respond to both spheres when encountering policy, legal, regulatory, or pricing frictions within each investment lifecycle.

The SPREF represents an expected total investment volume of USD 900 million, with contributions from:

SOURCE	VOLUME (USD MIL)	SHARE (%)	FINANCIAL PRODUCT/ MODALITY
EBRD	250	28%	(senior secured debt, alongside some equity/quasi equity)
CIF	35	4%	(senior secured debt, alongside some equity/quasi equity)
GEF	15	2%	(concessional co-finance)
Mobilization	600	67%	(private and public co-finance)

To-date, SPREF's portfolio of six investments is expected to add 261 MW of RE generation capacity in the region, via USD 216 million (refer to images 1 and 2). It has also provided policy support for the Wheeling Regulations in Jordan; Law 13-09 for private-to-private RE supply in Morocco; and private-to-private regulations in Tunisia.

**FIGURE 1. SPREF – Solar Investments To-Date**

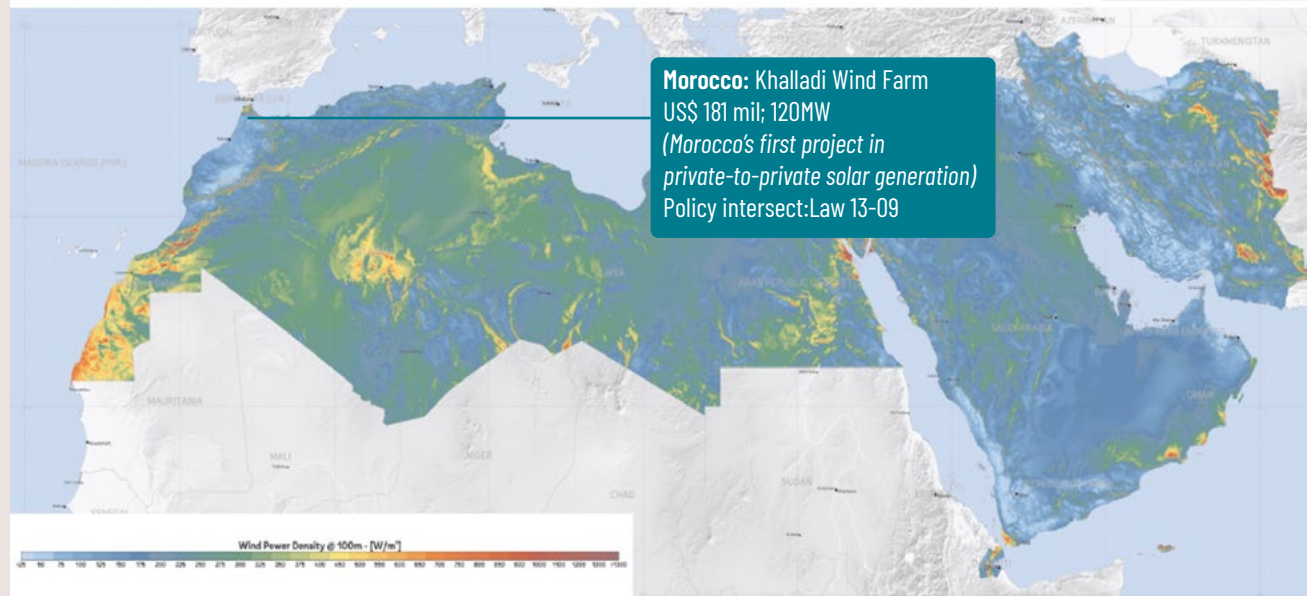


**FIGURE 2.** SPREF – Wind Investments To-Date

WIND RESOURCE MAP

## WIND POWER DENSITY POTENTIAL

### MIDDLE EAST AND NORTH AFRICA



Data: EBRD<sup>11</sup>

Source: The Global Wind Atlas, <https://globalwindatlas.info>



## 2. CONTEXT: RENEWABLE ENERGY CAPACITY ADDITIONS VIA PRIVATE-TO-PRIVATE ARRANGEMENTS IN MOROCCO

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### 2.1. Development Challenge: Overdependence on Emission-Intensive, Expensive, Imported Fuels

**At project approval, 99 percent of Morocco's energy was supplied by hydrocarbon-based generation** (67.6% oil, 16.1%, coal, 7.4% biofuels and waste, 5.7% natural gas, and 2.2% net electricity import), despite the region's acute vulnerability to the climate impacts from rising atmospheric GHG concentrations.<sup>12</sup> Wind generation accounted for only eight percent of total supply, while solar for a mere 0.02 percent. The energy sector accounted for 70 percent of gross GHG emissions in 2015, equaling 56.18 MtCO<sub>2</sub>e, which represented a 40 percent increase in total volume of emissions over the decade from 2005.<sup>13</sup>

**Ninety-two percent of Morocco's hydrocarbon-based supply was solely reliant on imported sources,**<sup>14</sup> weighing on the nation's balance of payments. Exposure to rising hydrocarbon costs, and to fluctuations in price and supply, periled national energy security. As of 2014, Morocco's energy import bill (~MAD 100 billion, or US\$12 billion) amounted to two-third of the annual budget deficit.<sup>15</sup>

Policy and market barriers to private sector entry had stifled Morocco's capitalization of independent power producers (IPPs) to drive advancements, efficiencies, and the establishment of a liberalized energy market

that could deliver cost-effective power at scale. Law 13-09, passed in 2010 and amended in 2015, provided authorization for the private commissioning of RE assets designed to solely serve singular or a consortium of high-voltage (HV) and very high voltage (VHV) industrial consumers. Within such frame, IPPs would no longer be obligated to sell electricity to the previously singular, state-owned off-taker ONEE (National Office of Electricity and Drinking Water, or Office National de l'Électricité et de l'Eau Potable) but could instead enter power purchase agreements (PPAs) directly with commercial off-takers, without government arbitration on terms or tariffs.

To incentivize uptake, the law allowed use of the national transmission grid, at no cost, for IPPs' transmission of electricity to their commercial off-takers; and included an accommodation to sell at minimal cost up to 20 percent of unsold residual generation to ONEE, serving as the default off-taker, and with provisions to sell further residual supply at a further discounted rate of 40 percent.

As of 2015, however, the law had generated only 500 MW of RE capacity, and with all investments backed by financial support from sovereign entities (i.e., government or monarch agencies). As such, the benefits of a fully independent investment environment, where knife's-edge competition incentivizes frontier efficiency gains and technological advancements, and thereby drives down costs and end-user tariffs, remain untapped.



# 2.2. Development Intervention: The Khalladi Wind Farm Project

Initiated in 2015, Khalladi comprised a 120 MW wind farm and 225 kV transmission line. It was specifically designed to pilot and prove Law 13-09’s private-to-private RE generation model, thereby supporting the Government of Morocco’s (GoM) “*Programme National de Développement des Énergies Renouvelables et de l’Efficacité Énergétique*” commitment to generate ten percent of power from wind by 2030. By demonstrating the viability of commercially financed and fully independent sustainable energy investments in the Moroccan energy market, the project sought to catalyze further private entry, increasing the share of sustainable energy penetration and displacing dependencies on costly, import-reliant, thermal generation.

**Market ecosystem:** To trigger private sector entry, CIF and the EBRD provisioned a funding package consisting of concessional, commercially priced, and local currency financing, thereby incentivizing first-mover establishment of an IPP that would:

- demonstrate the effectiveness and replicability of a business model that utilized Law 13-09;
- increase the private sector’s optics and appetite for participation in the Moroccan RE market; and
- strengthen competition by opening the market to fully private projects.

**Policy ecosystem:** To ensure that the policy framework remained adaptive and fit for purpose, the EBRD leveraged and expanded its ongoing advisory support for the GoM’s energy regulation reform to:

- support further operationalization and testing of Law 13-09 (and its auxiliary regulations) for fully independent investments; and
- utilize the Khalladi Wind Farm as a learning environment for further regulatory fine-tuning and reforms that would induce replicant investments.

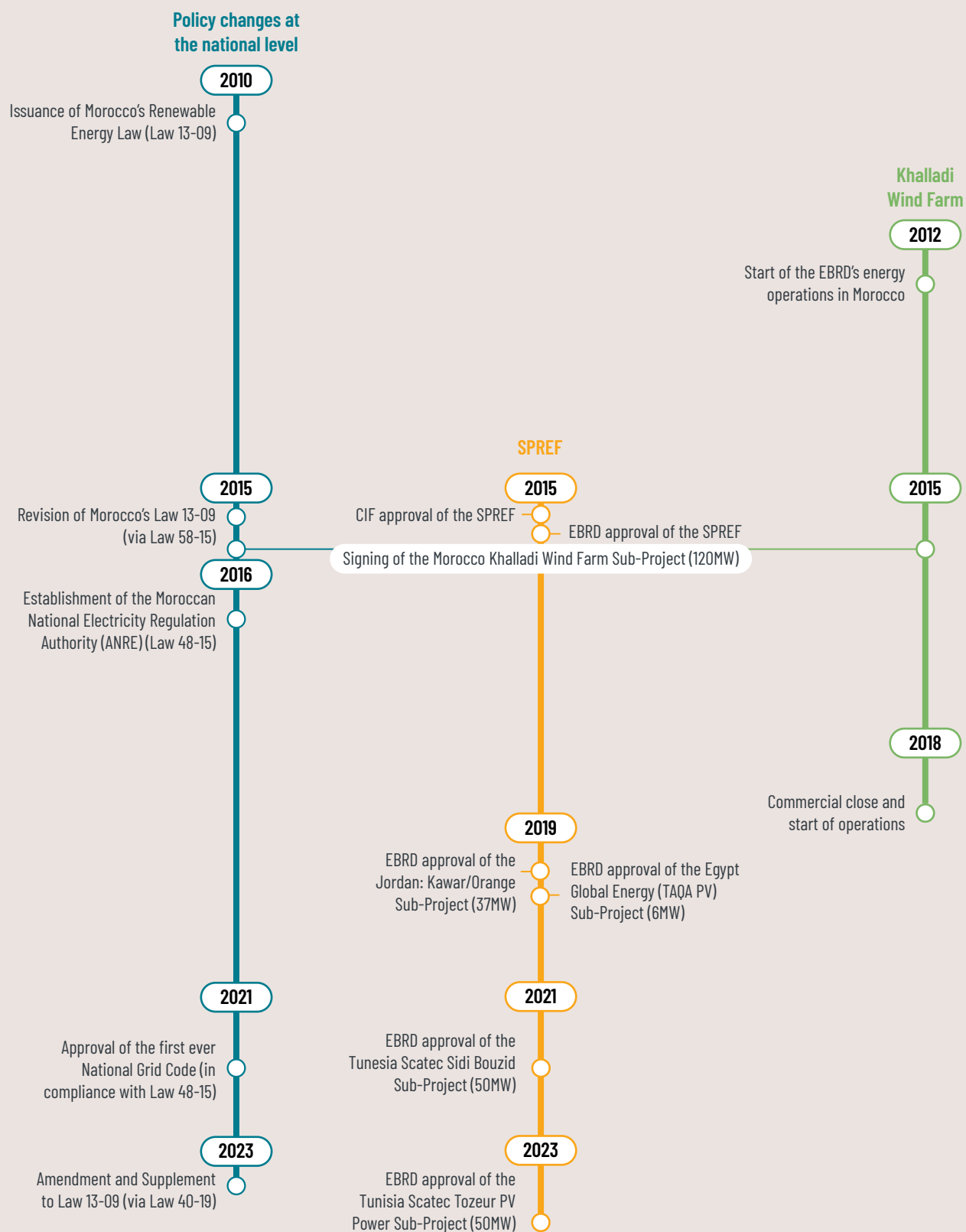


# 2.3. Results

Khalladi Wind Farm began full operations in 2018, serving three long-term PPAs with three large, commercial cement producers, with agreements secured well ahead of commissioning, ensuring the sale of 80 percent of total supply. The competitive pricing of its RE supply allowed it to also secure short-term PPAs to absorb surplus generation, responding to short-term exigencies and dispatched at more advantageous tariffs. This positioned Khalladi as a merchant power producer able to capitalize on, and meet, dynamic market demands. The resulting higher-than-target revenues provided significant demonstration of (1) the viability of sustainable energy in Morocco; (2) Law 13-09’s private-to-private business model; and (3) market and regulatory conduciveness for merchant energy supply.

POWER GENERATED	Target = 390 MWh/yr;	Result to-Date: 397 MWh (2021)
GHG EMISSIONS AVOIDED	Target = 177,060 MTCO <sub>2</sub> eq/yr;	Result to-Date: 180,238 MTCO <sub>2</sub> eq (2021)

**FIGURE 3. Key Milestones**



### 3. DELIVERY CHALLENGES

This case differentiates *development* challenges, referring to the core objectives defined at, and driving, project conception (outlined in section 3), from delivery challenges, referring to the non-technical barriers that, upon project deployment, hinder the translation of the project concept into project results. For Khalladi, results on the market side of the intervention were over-delivered (i.e., actualization of a pilot private-to-private sustainable energy IPP; demonstrated profitability/efficacy of a fully private business model under Law 13-09), and interactions and results on the policy side (e.g., negotiations and modulations for confirmation of its operating license under Law 13-09; and the full operationalization and catalyzing of uptake of the law, exhibited by the proliferation of replicant, stand-alone investments) were constrained by three delivery challenges:

1 | **Policy, Legislation, and Regulation Weaknesses: Operationalization of Law 13-09 Curtailed by the Absence of Cost-Reflective Revenue Accommodations.** Law 13-09, per its initial design, did not adequately account for expenditure that would be borne by the grid operator, as relate to (1) increased operating costs from IPPs using the national grid to transmit high-voltage, commercial-scale loads at peak hours; (2) upgrade and maintenance costs required to ensure system stability in the face of exponential and rapid integrations of new variable generation capacities; and (3) duplicate and redundant payment obligations, which occurred if the volume of surplus intermittent energy generation from the new IPPs—guaranteed for purchase via provisions of law 13-09—curtailed the grid’s ability to absorb the full volume of purchasing commitments from existing thermal assets, which were guaranteed for payment under long-term take-or-pay agreements necessary to secure base-load supply.

2 | **Lack of Consensus: Energy Market Liberalization Curtailed by Grid Operator Concerns About System Stability.** Per provisions of Law 13-09, the resultant IPPs would be allowed to utilize the national grid to dispatch high or very high voltage loads to commercial users. As such, significant grid integration capacities and flexibility measures were required for the absorption of RE at the pace and volumes sought under Law 13-09. The national grid operator was hesitant to authorize, via signing of the prerequisite Grid Access Agreements, the operationalization of the law’s RE licenses, given that any shortfall in grid readiness and responsiveness could, in the event of either over- or under-supply, trigger devastating infrastructure damages and/or system-wide outages.

3 | **Weaknesses in Risk & Reward Perception: Private Developer and Commercial Financier Hesitancy Vis-à-Vis the Nascent and Evolving Market Context.** At the time of Khalladi’s inception, local currency financing for large-scale infrastructure developments, particularly when not supported by sovereign co-investments, was neither readily available nor established. IPPs would need to borrow in hard currencies, while earning revenues only in local currency, with balance sheets facing significant forex risks. Furthermore, for both developers and financiers, the reconsideration of Law 13-09’s zero-fee grid-usage provisions (Challenge 1) and the cessation of sustainable energy license issuances (Challenge 2), signaled the potential for further mid-course deviations in plans and policy assurances, thereby raising the financial risks of entry.

The following sections dissect these challenges, drilling down to the fundamental drivers of each scenario, and the ways in which the project teams and their counterparts worked to address them, with causal linkages regarding solution strategies worked and why.

## 4. TRACING THE IMPLEMENTATION PROCESS

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### 4.1. 2012–2015: The EBRD’s Engagement Prior to the Project

The EBRD began operations in Morocco’s energy sector in 2012, and in the three years leading up to the 2015 investment in Khalladi, its policy advisory team had worked closely with the GoM on reforms aimed at a gradual and robust liberalization of the energy market. Policy dialogues, technical due diligence, and methodological refinements undertaken by the teams had already included support for Morocco’s Law 13-09, promulgated in 2010 but pending full operationalization, and through which Khalladi had been granted license for development. The EBRD’s utilization of the SPREF model for the investment was therefore opportune, able to leverage robust technical familiarity with the policy architecture and trusted partnerships with state energy actors.

### 4.2. 2007–2018: Development of the Khalladi Wind Farm and Start of Operations

The Khalladi project was initiated in 2007 by the Hong Kong-based UPC Renewables, with development subsequently led by the Saudi-based ACWA Power (acquiring a 70% controlling stake in 2014) and the Argan Infrastructure Fund (or ARIF, acquiring a 20% ownership stake). The project reached financial close in 2015, securing investments from the EBRD, CIF, and the Bank of Africa (or BOA, previously Banque Marocaine du Commerce Extérieur or BMCE). Construction comprised 40 wind turbines of 3 MW nameplate capacity each, situated 30 km east of Tangiers, and a 225 kV power line connecting the farm with the Tétouan Substation, 24 km to the south-east.



When Law 13-09 was enacted in 2010, the Ministry issued *provisional* licenses to prospective applicants to commence development of RE assets—the provisional license for Khalladi was secured in 2013. Final *operating* licenses were to be issued upon achievement of predefined milestones, including the mandatory signing of a Grid Access Agreement with ONEE. Prohibitive cost burdens, however, resulted in ONEE’s hesitance to authorize Grid Access Agreements, stalling the operationalization of existing licenses. In tandem, concerns about maintaining grid stability in the face of rapid sustainable energy integrations, while well founded, resulted in a suspension of the Ministry’s issuance of new licenses, curtailing the Law’s aims for exponential RE capacity developments. The resulting policy reassessments had onward market affects, dampening appetite for IPPs to participate in and utilize Law 13-09’s provisions for energy market liberalization.

## 4.3. Challenge 1: Policy, Legislation, and Regulation Weaknesses

### OPERATIONALIZATION OF LAW 13-09 CURTAILED BY THE ABSENCE OF COST-REFLECTIVE REVENUE ACCOMMODATIONS

While aptly designed to trigger private entry and increase the share of RE supply, upon execution, Law 13-09 was deemed prohibitively costly to ONEE, without measures for commensurate remuneration or recourse, and at a stage when the utility was already weathering significant financial pressures. In particular, the legislation lacked provisions related to the:

- 1 | **Absence of a cost-reflective system service fee:** Law 13-09 allowed the charge-free use of the national HV and VHV grid for the transmission of energy from the resulting IPPs to their industrial off-takers. However, conveying substantial, commercial scale loads significantly raised ONEE's system operation and maintenance costs, absent of the conventional system service fees (i.e., usage levies) accommodated for in similar arrangements.
- 2 | **Duplicate tariffs in the event of over-supply:** The law guaranteed that ONEE, as the default off-taker, would absorb up to 20 percent of the residual generation from participant IPPs at minimal cost. ONEE, however, was already party to long-term take-or-pay agreements with the country's existing fleet of baseload, thermal-generation plants. Without system upgrades to predict and control supply and demand in real-time, in periods when high irradiation or wind densities caused the combined supply of both intermittent and thermal energy to exceed the volume the grid could absorb, ONEE would need to facilitate the powering down of thermal plants while still honoring its take-or-pay agreements with them. In such cases, ONEE would be legally bound to pay for energy it was not using or monetizing.

- 3 | **Loss of revenue streams:** HV and VHV industrial consumers represent a non-negligible share of ONEE's revenue base. Law 13-09 would facilitate the transfer of a share of such consumers to the new IPPs, as the incentives and arrangements defined by the law would allow IPPs to dispatch electricity at lower tariffs than ONEE, thereby further cutting into ONEE's bottom line.

**For Khalladi specifically,** this resulted in delays and protracted negotiations related to securing its Grid Access Agreement, with ONEE appending the project's prerequisites to include investment costs for a static synchronous compensator (STATCOM)—a device able to instantaneously absorb or generate power to stabilize the grid connection.

**For the wider market and prospective developers in queue for licenses,** the barriers were twofold. First, as a delay to entry, with ONEE's request for a revision of the law's fee structure resulting in a cessation of license issuances. Second, as an ambiguity regarding future bankability wherein a system service fee, although standard and reasonable, if set too high, would require IPPs to increase consumer tariffs to remain economically viable. This, in turn could dampen consumer appetite, distorting the underlying risk-to revenue assumptions for investment.

### 4.3.1. SOLUTION: Exhaustive Negotiations and Policy Reform Toward New Grid Access Fee Arrangements

**For a resolution on Khalladi,** the EBRD and AWCA engaged directly with ONEE, with exhaustive negotiations focused on the interpretation of technical aspects of the Grid Connection Agreement and aimed at dissecting the various cost constraints in order to formulate a mutually viable solution. To accommodate the process, Khalladi's provisional license was initially extended by two years, through 2018, with a final resolution, which included investment costs of a STATCOM, resulting in full authorization in 2021.

**For a resolution on wider market expansion,** the EBRD partnered with the GoM on a suite of technical assistance and policy negotiation actions aimed at a reform of Law 13-09, including provisions for a system service fee that was amenable to all parties. This included work with the National Electricity Regulation Authority (ANRE) to define the methodology to calculate the fee such that it balanced (1) adequate compensation for the grid operator to ensure the law, in composite, was executable at the current time, sustainable over the long term, delivered on targets, and was economically viable for state energy agencies; and (2) reasonable pricing for operators vis-à-vis risk-reward profiles and financing plausibility to incentivize the entry of private developers and provide assurance of project bankability.

For the former, to ensure that the proposed service fee would provide fair compensation for the operator (i.e., ONEE), work by the EBRD ANRE included an exhaustive appraisal of the maintenance workload across both the transmission and distribution systems, thereby providing a forecast of ONEE's annual investment burden. It also included a retrospective unbundling of the entirety of ONEE's historical ledger expenditures, providing differentiated accounting of the generation, transmission, and distribution systems so as to allow a more accurate attribution of the cost implications across each business unit.

For the latter, to ensure the fee structure was reasonable and, therefore, commercial investments were viable, the team facilitated processes for investors and operators to weigh in on the methodological assumptions related to market fundamentals, ensuring they accurately reflected operational realities and were durable amid the evolving market and technological dynamics.

After extensive rounds of reviews and renegotiations, the amendment and supplement to Law 13-09, titled Law 40-19, was successfully adopted in February 2023, reframing Morocco's energy sector liberalization—see Box 1 for full detail on Law 40-19.

## 4.4. Challenge 2: Lack of Consensus

### **ENERGY MARKET LIBERALIZATION CURTAILED BY GRID OPERATOR CONCERNS ABOUT SYSTEM STABILITY.**

As the sole proprietor of the national transmission grid, ONEE was also the sole custodian of its security. Maintaining constant system stability, and thereby preventing the catastrophic effects of under- or over-supply, included balancing the power absorbed from generation assets (supply) with the electricity dispensed to end users (demand).

Law 13-09, if fully operationalized, would actuate rapid and exponential RE integrations to the national transmission grid. Given the intermittency of solar and wind supply, the resultant parameters for grid readiness included substantial infrastructure and human capital enhancements to establish robust supply-side forecasting and real-time demand-side management capabilities. This included, for example, the shoring up of engineering and IT personnel, and the securing and operationalization of technological imports and upgrades for real-time system responsiveness (e.g., for predicting wind and radiation patterns, enabling system responsiveness to fluctuations in supply, energy storage and dispatch solutions, enhanced grid interconnectedness, and balancing fluctuations in solar and wind supply with real-time demand responsive hydro and thermal generation).

Implementing such changes across a national grid is inherently a highly precise and stepwise process, requiring sufficient latitude for testing and refinements, and for due process, prudence and adaptive modulations when committing public funds to infrastructure and personnel expansions. Within such context, ONEE's appraisal that the current runway was inadequate for such processes, alongside an exacerbation of the cost-burdens outlined under Challenge 1, contributed to ONEE's forestalling the issuance of new RE licenses under Law 13-09.



#### 4.4.1. SOLUTION: Technical Assistance for Grid Readiness and Establishment of ANRE

To advance grid readiness at the institutional level, technical assistance arrangements between the GoM and the EBRD were expanded to include the buttressing of state agencies' mandates and mechanisms for judicious oversight of sustainable energy capacity additions and integrations. The subsequent Energy Regulation Law, issued in 2015, and the inception of a National Electricity Regulation Authority (ANRE), established in 2016, were aimed at providing a structured and independent architecture for regulatory operations. At present, alongside proposing draft laws or regulations for the energy sector, ANRE bears responsibility for the approval of the (1) the scope, allocation rules, and principles determining the financial relationships between ONEE's separate activities; (2) the national electricity transmission grid code; (3) the rules and tariffs for access to electricity interconnections; and (4) the setting of quality indicators to be met by the national electricity transportation grid.<sup>16</sup>

To advance grid-readiness at the operational level, and to undergird the ambitions of ANRE and the objectives of the Ministry of Energy, Mines and Environment, the EBRD-GoM advisory partnerships expanded to cover instrumental gaps and value-additions in technical research and due diligence. For example, a comprehensive assessment of the grid's capacity for RE absorption was geared for the issuance of Morocco's first ever National Grid Code (in compliance with Law 48-15), approved and published in December 2021, and has since informed the 2023 promulgation of Law 40-19, decreeing the annual issuance of comprehensive national grid carrying capacities by ANRE.

#### BOX 1. Law 40-19 Provisions Relevant to Khalladi and SPREF

##### **Vis-à-vis Challenge 1: Introduction of a System Service Fee for Use of the National Grid**

All RE IPPs utilizing the national electricity grid are required to pay a tariff to use the electricity grid are subject to a tariff, as determined by ANRE, and wherein the fee for system services includes all actions required on part of ONEE to balance the intermittency of RE within the system, and to maintain the frequency, voltage and exchanges in cross-countries transmission arrangements.

##### **Vis-à-vis Challenge 2: Regular Disclosures of Grid Carrying Capacities**

ANRE will publish, by 31st January every year, the national grid carrying capacity (capacité d'accueil), defined as the maximum RE capacity that can be accommodated by the national grid without system management constraints, thereby allowing greater transparency for prospective IPPs seeking to submit authorizations for new capacity developments.

##### **Vis-à-vis Challenge 3: Expansion of Access from only High and Very High Voltage to Medium Voltage Consumers**

IPPs can now also access the medium voltage grid to sell and RE to consumers or groups of consumers, and to the electricity system operator.

##### **Vis-à-vis Challenge 3: Expansion of Authorized for Market for Sale of RE**

Distribution network operators authorized to purchase up to 40% of supply to customers from RE IPPs.

## 4.5. Challenge 3: Weaknesses in Risk & Reward Perception

### PRIVATE DEVELOPER AND COMMERCIAL FINANCIER HESITANCY VIS-À-VIS THE NASCENT AND EVOLVING MARKET CONTEXT

While Law 13-09 was designed to incentivize commercial-scale private sector entry into the energy market (via authorization of direct and exclusive off-take agreements with highly remunerative HV and VHV industrial off-takers; zero-cost use of national transmission infrastructure, etc.), the convergence of several market- and country-specific risk factors raised the risks of investment:

1 | **Oversaturation of HV and VHV off-take market:**

Per its statutes, Law 13-09 authorized IPPs to sell energy only to high-voltage and very high-voltage off-takers. However, with only a limited number of such commercial consumers operating in the Morocco market, and where a majority of them were already committed to long-term PPAs with the first tranche of the Law's IPPs, subsequent developers faced shortfall of potential off-takers to absorb supply. Expanding the law's provisions to include also the much larger base of medium-voltage (MV) customers had long been in negotiations. However, as such an inclusion would add yet larger volumes of RE grid integration and grid usage demands, it was seen to exacerbate existing concerns regarding service costs and grid stabilization.

2 | **Reliability and transparency of legislative arrangements and authorizations:**

a | **Volatility of provisions for grid access:**

Per Challenge 1, agencies' forestalling and/or renegotiations around Law 13-09's grid-usage arrangements rendered operators' prior cost-benefit and viability estimations unreliable, risking both potential investees' security of financial viability and potential financiers' confidence in project bankability. If risk-reward calculations were subjected to idiosyncratic, iterative, or protracted exogenous shocks, entrants could find themselves

holding unfavorable financial commitments, particularly vis-à-vis the rapid advancements and entry of new energy technologies that could swiftly outpace even the more durable revenue calculus.

b | **Insufficient transparency and timely disclosure of geography-based authorizations:**

Authorizations for provisional license holders to proceed toward project development hinged ONEE's approval of intermittent energy capacity additions in each target region. While founded on reasonable considerations of the regions' available grid capacities for intermittent energy absorption, the issuance of such clearances was seen to require more structured, transparent, and advanced disclosure processes that would provide developers the technical confidence to commit to investment plans, and the requisite lead-time to secure operational and financial allocations.

c | **Variability in license issuances and/or authorizations:**

The cessation of new license issuances to active prospectors, and the protracted or stalled processes for converting provisional to authorized licenses, dampened the initial optimism and appetite of opportunist and time-sensitive private investment and capital markets. As explained in Challenge 1, the transition from provisional to final authorizations depended on ONEE's consent to enter into Grid Service Agreements and the operator's well-founded concern regarding service costs and grid readiness. While some final authorizations were indeed secured, as with Khalladi, these were realized via bi-lateral, closed-door negotiations with ONEE, adding to concerns regarding the transparency, predictability, and actualization of otherwise-standard contractual processes.

d | **The Moroccan energy sector and the complex roles of ONEE.**

Morocco's primary energy actor is the electricity utility ONEE, a public utility holding multiple roles in the sector. Aside from being the primary implementing organ of the



Ministry of Energy, Mines and Environment, ONEE was also the sole owner and operator of the national transmission system, and therein the sole eventual buyer of electricity from all generators; and the sole seller and distributor of electricity to consumers, except in a subset of cases where final, end-of-line onward distribution was managed by the recipient municipality.

When the Morocco Agency for Sustainable Energy (MASEN) was established in 2010, and later expanded in 2016, to manage all intermittent energy-related generation in Morocco, its founding documents placed ONEE as a partial owner. Despite this arrangement however, MASEN is also a vendor of ONEE, selling to the agency the power it procures from intermittent energy assets, as ONEE remains the sole conduit for onward transmission and distribution. As such, ONEE's composite remit and weight of influence stretched across several competing functions, as: (1) an off-taker negotiating tariff arrangements; (2) the final licensor of grid usage; (3) a counselor on regional authorizations of capacity additions; and (4) a material adjudicator of regulatory actions writ-large. This overlap stood to preclude the independent arbitration potential of each of these roles, the contest and collaboration between which are meant to achieve a more unbiased and market-driven equilibrium in operational and financial arrangements.

#### 4.5.1. SOLUTION: Technical Assistance to Ensure Legislative Amendments Were Comprehensive and Durable

- 1 | **Oversaturation of HV and VHV off-take market:** Technical assistance partnerships between the EBRD and the GoM included lengthy policy dialogues and the laying of technical groundwork required for expanding Law 13-09's provisions to also allow off-take by MV users of the national MV grid, buttressed by commensurate systems service fee arrangements that adequately compensated ONEE for the related cost and capacity expenditures.
- 2 | **Reliability and transparency of legislative arrangements and authorizations:**
  - a | **Volatility of provisions for grid access:** By ensuring that the system service fee, as established by Law 40-19's amendment made to Law 13-09, was based on broad-spectrum negotiations and robust technical and financial analyses, the GoM has been able to secure a legislative remuneration arrangement that has much greater market-responsiveness, and universal application in lieu of individually negotiated application. Thus, it offers the much greater degrees of the stability and reliability required for private sector appetite and entry.
  - b | **Insufficient transparency and timely disclosures of geography-based authorizations:** As part of the provisions within Law 40-19, the national grid's region-specific hosting capacities will be issued by ANRE annually, with sufficient disclosure of technical underpinnings to allow prospective developers greater forecasting and discernment in decision making, and greater certainty in commitment when requesting authorization under Law 13-09.
  - c | **Variability in license issuances and/or authorizations:** The approach for license issuances and authorizations has since been streamlined and standardized, negating the



need for case-by-case bi-lateral negotiations that are costly both for the state and the private sector. The issuance of standardized and universally applicable fee structures, contractual arrangements, and expansion prospectives, alongside meaningful disclosure and dialogue on decisions' operational and financial drivers, have allowed for greater accountability, confidence, and coercion between agencies and actors and a more robust liberalized energy economy.

- d | **The Moroccan energy sector architecture, and the complex roles of ONEE.** The strengthening and operationalization of ANRE was pivotal to Morocco's energy market liberalization. By building technical capacity and legislative weight, ANRE freed ONEE from its regulatory responsibilities strengthening private sector confidence. While Morocco's Law 13-09 on RE and the establishment of a regulatory agency was enacted in 2016, full culmination of its role and authority required a reasonable gestation period and the development of significant institutional capacities. ANRE has since been instrumental in providing the technical underpinnings for subsequent legislative advancements, issuing technical directives and disclosures, and the independent assessment and arbitration of multi-party arrangements.

## 4.6. 2018 TO DATE: FULL OPERATIONALIZATION AND EVOLUTION OF KHALLADI

Khalladi was commissioned in October 2018. Prior to this, the project had already structured, negotiated, and entered into long-term PPAs with three private, industrial-scale cement manufacturers—namely, Holcim Morocco, Asment, and Cimat—securing the sale of 80 percent of its total output, wherein it provided renewable-only supply to its customers at prices lower than those offered by the mixed-supply national grid. Capitalizing on its price-competitiveness, and buttressed by ACWA's enterprising efforts and expertise, Khalladi subsequently designed and executed short-term PPAs for sale of its residual output. These short-term PPAs, while also partially indexed to ONEE tariffs, were positioned to cover the more dynamic and immediate supply shortfalls in the market, thereby capturing higher tariffs, and establishing Khalladi as the first private merchant power purveyor in Morocco (refer to section 6.2 for further details and Box 1, showing the summary of updates and provisions under Law 40-19).



## 5. NOTABLE SUCCESSES

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### 5.1. First Large-Scale, Fully Private Wind Farm in Morocco

Khalladi was the first fully private project to be structured under Law 13-09, bringing in commercial financiers and securing terms that were aligned with project characteristics and market conditions. It was also the first project in Morocco where the equity holders (i.e., private sector sponsor, funders, etc.), developers (i.e., contractors and subcontractors for engineering, procurement and construction, or EPC), and operators (i.e., operation and maintenance, or O&M), were not all part of a singular holding company, but were partnered via competitive bidding processes and/or under commercial agreements with clear division of roles and liabilities.

### 5.2. First Demonstration of a Merchant Scheme Business Model

Per the provisions of Law 13-09, the project was expected to dispatch unsold, surplus generation (of up to 20%) to the national grid at a minimal tariff. Khalladi's offer of lower-priced green-energy (set at a discounted rate vis-à-vis ONEE tariffs), however, proved highly attractive to commercial users, particularly vis-à-vis imminent European import regulations related to emissions intensities of production.<sup>17</sup> As a result, the project secured a range of competitively priced short-term PPAs to absorb any surplus generation in excess of its long-term PPA contracts. This transformed the nature of the asset from a conventional private-to-private power provider, providing fixed volumes at long-term negotiated tariffs, to a flexible power merchant, able to meet

immediate or short-term supply needs and capitalize on dynamic pricing. The shift was a significant milestone for the Moroccan sustainable energy market and its track toward liberalization.

### **5.3. Pioneering of Commercial Local Currency Financing for Utility-Scale Assets in Morocco**

Given the significant capital outlays and operational experience required when developing intermittent-supply RE assets, the efficient and accelerated establishment of such projects often benefits from the entry of international developers and financiers. The risk-profiles of nascent private energy markets, however, and the currency volatilities that are inherent to emerging economies, result in lenders often offering only hard-currency financing packages. At the time of Khalladi's inception, there were no local currency financing arrangements available in Morocco with the scale or tenor required for commercial scale, RE asset development. This meant developers had to repay debts in foreign currency, while earning revenue in local currency, with profit-and-loss calculations, thereby, being fully exposed to forex market volatilities. The EBRD's treasury offices' ability, leveraging prior experience in similar markets, to negotiate currency swaps with local commercial banks such that the funding package was issued in Moroccan Dirhams, set a monumental precedent for the issuance and viability of such packages for future investments.

### **5.4. Regional Demonstration Effects**

Khalladi's success sent strong signals regarding the profitability of private investment in sustainable energy in the region, and of the viability of Law 13-09 and SPREF's private-to-private model. In 2019, Tunisia adopted similar private-to-private legislation, and the EBRD has been working with Egypt on developing the same. Khalladi's experience in, and testing of, both the policy and market environments have provided lessons for regional counterparts with similar RE expansion objectives. The success of the project, in deployment of a lucrative and cost-effective investment model, and its ability to negotiate for necessary policy reform, has also increased the EBRD's credibility with regards to policy support for laws and decrees in the region, bolstering its ability to drive ambitious action via and beyond the SPREF.



# 6. LESSONS LEARNED & CONCLUSIONS

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The SPREF, in the nuance of its design and the resoluteness of its execution, offers encouragement and a proof-of-concept for the circular-reinforcing policy-to-pilot-to-policy approach. The case of Morocco, driven by its context and defined by its response to challenges, offers three primary replicable takeaways:

## 6.1. Value of Right-Sized, Concessional Financing Packages

The EBRD's provision of local currency lending, CTF inclusion of concessional financing, and commercial financiers' formulation of market-conducive leeway in loan terms and tenor, proved to be critical stimulants for localized private sector development. The financing package provided longer tenors with limited recourse; a 10-year grace period on the CTF tranche; accommodations for the inclusion of short-term PPA inflows in base-case revenue projections; and a fast-tracked financial close schedule.<sup>18</sup> The latitude of these arrangements was buffered by steadfast partnerships between financiers and project sponsors, negotiated and shared commitments, and precisely targeted technical cooperation strategies. Together, these structures enabled the project to execute key pivots and innovations, and weather a host of material challenges, such as COVID-19-related market downturns (including the insolvency of one of the three long-term PPA off-takers), cost overruns, procurement and development delays, and protracted negotiations for license authorizations.



## 6.2. Investee Commitment and Ambition

ACWA Power and its implementation teams set an example of private sector leadership in emerging environments. Despite facing a nascent and evolving policy architecture, the sponsor (1) pursued international commercial and concessional financing, backed by robust business fundamentals, to reignite sluggish project development; (2) secured lucrative long-term PPAs well in advance, structuring a suite of stringent, bankable, and market-responsive financial and security documents; (3) structured and signed short-term PPAs that captured higher-than-expected returns, and positioned Khalladi as Morocco's first merchant power purveyor; and (4) engaged in diligent negotiations with policy actors in pursuits of mutually beneficial long-term solutions. This underscores the role and responsibility of commercial and development actors in identifying, championing, and empowering innovative regional actors, paving the way for greater private sector growth and diversification.

## 6.3. Collaborative Mechanisms for Adaptive Policy Reform

Prevalent across interviews with the EBRD team was the underscoring of the GoM and private sector's clear recognition, understanding and dissection of the drivers and deterrents of Morocco's sustainable energy expansion and energy market liberalization. As a result, the technical advisory arrangements were driven by a common-denominator approach rather than one of prescriptive solutions. While policy negotiations were often lengthy, the pursuit of data-driven and long-term operational and financial agreements, rather than quick fixes, shows the commitment of all parties to find solutions that go beyond financial returns, focusing on sturdy, sustainable development objectives.

In sum, the commitment, and consistent efforts of various actors to pursue a pragmatic operationalization of Morocco's ambitious Law 13-09 framework, by staying true to their economic and operational fundamentals, while being receptive and tractable to counterparty concerns, provides a promising, if formidable, model for emerging economies that seek to transform entrenched hydrocarbon energy systems.

# ENDNOTES

CLICK ON ANY NOTE TO GO BACK TO THE REFERENCED PAGE

- 1 The Dedicated Private Sector Program (DPSP) is a financing mechanism within CIF's Clean Technology Fund (CTF), aimed at supporting inventions that deliver impacts at scale and speed by leveraging private sector participation.
- 2 EUR 162,135,897. <https://www.ebrd.com/home/work-with-us/projects/psd/47297.html#customtab-756cc89d3e-item-e9cb933dfa-tab>.
- 3 EUR 51,578,949. Ibid.
- 4 The Southern and Eastern Mediterranean (SEMed) is a regional demarcation of the EBRD, encompassing Egypt, Jordan, Lebanon, Morocco, Tunisia, and the West Bank and Gaza.
- 5 Zittis, G., Almazroui, M., Alpert, P., Ciais, P., Cramer, W., Dahdal, Y., et al. With oversight of the Cyprus Institute's Climate and Atmosphere Research Center and the Max Planck Institute for Chemistry (2022). Climate change and weather extremes in the Eastern Mediterranean and Middle East. *Reviews of Geophysics*, 60, e2021RG000762. <https://doi.org/10.1029/2021RG000762>.
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- 8 International Energy Agency (IEA), "Electricity Information," <https://www.iea.org/data-and-statistics/data-product/electricity-information>. Documented at IEA, *Database Documentation: Electricity Information 2021 Edition*, (2021), [https://iea.blob.core.windows.net/assets/910f28b7-5276-4599-a349-097ab58aeea8/IEA\\_documentation.pdf](https://iea.blob.core.windows.net/assets/910f28b7-5276-4599-a349-097ab58aeea8/IEA_documentation.pdf). Note: data for Morocco is as of 2020, as numbers are available only per five-year periods.
- 9 International Energy Agency (IEA), *Clean Energy Transitions in North Africa*, (2020), [https://iea.blob.core.windows.net/assets/b9c395df-97f1-4982-8839-79f0fdc8c1c3/Clean\\_Energy\\_Transitions\\_in\\_North\\_Africa.pdf](https://iea.blob.core.windows.net/assets/b9c395df-97f1-4982-8839-79f0fdc8c1c3/Clean_Energy_Transitions_in_North_Africa.pdf), pg 20.
- 10 At time of SPREF's inception, SOEs and sovereign-supported entities carried the bulk of energy provision.
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