

Analysis Report for the State of the Art of NEEAP-NREAP Development in the Arab Region



The league of Arab States (LAS)

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List of Abbreviations

BAU	Business as usual
CO₂	Carbon Dioxide
EE	Energy Efficiency
ESCO	Energy Service Companies
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GWh	Gega-Giga Watt Hour
HDVs	Heavy-Heavy -duty vehicles
KFUPM	King Fahd University of. Petroleum & Minerals
LAS	League of Arab States
LDVs	Light-Light -duty vehicles
MMboe	Million Barrels of Oil Equivalent
MTOE	Million Tone Oil Equivalent
MW	Mega Watt
NEEAP	National Energy Efficiency Action Plan
NREAP	National Renewable Energy Action Plan
RCREEE	Regional Center for Renewable Energy and Energy Efficiency
RE	Renewable Energy
SAR	Saudi riyal
SBC	Saudi building code
SEEC	Saudi energy efficiency center
SEEP	Saudi energy efficiency Program
DZD	Algerian Dinar
EWA	Electric and Water Authority in Bahrain
ADME	Djiboutian Energy Management Agency
JD	Jordanian dinar
EBRD	European Bank for Reconstruction and Development
WB	World Bank
KAPSARC	King Abdullah Petroleum Studies and Research Center

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1 Executive summary

The MENA region has the world's highest solar irradiance (the sun's brightness and concentration) and enormous wind potential, both of which may be used to generate power from renewable sources. In addition, a massive energy efficiency potential is existing in the region. With the objective of transitioning towards a more green and sustainable economy, most of the Arab countries have developed their national strategies in different sectors with more reliance on renewable energy (RE) and energy efficiency (EE) solutions.

Arab countries have responded well to the regionally endorsed guidelines and templates for developing national action plans for RE and EE through the wide adoption and preparation of their own-plans including measures programs and projects to be implemented over specific timeframes, with specific mandates to different stakeholders. These plans mostly include ambitious targets for the integration of renewable energy into power or the overall energy mix, along with achieving energy savings on the demand side. This report shows that the planning and the implementation of RE and EE action plans in most of the Arab countries have resulted in significant progress.

In response to the COVID-19 crisis, governments around the world announced more than USD 12 trillion in financial-fiscal stimulus, including USD 470 billion in energy-related support. In the power sector, governments provided around USD 95 billion in response to COVID-19. This was largely to ensure the continuation of services and to reduce consumers' bill burdens rather than to incentivise-incentivize renewables, although several countries provided funds for new renewable power capacity.

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Arab governments have taken measures to develop the regulatory and legislative frameworks favorable for RE and EE, including the-the issuance of several laws and legislations promoting RE and EE, setting incentives schemes and tax exemptions for RE and EE systems and equipment, adopting procedures and means of conserving energy and improving its efficiency in different sectors, implementing energy tariff reform programs, etc.

In addition, Arab governments are exerting efforts to secure a-sustainable funding for sustainable solutions in their countries in-order-to facilitate the implementation of different measures and programs. Some countries have established dedicated funds on the national levels. Several financing mechanisms that are built on soft loans and grants are in-place. In addition, few countries are trying to boost EE and decentralized renewable energy deployment through the establishment of new investment schemes and business models via creating markets and modus-operandi for energy service companies (ESCOs) and Super ESCOs.

Together with-enforcing energy conservation laws, regulations and codes, many Arab countries have special programs for EE in different consuming sectors through labeling programs and mandatory energy performance standards for enhancing the efficiency of energy-consuming equipment, as well through providing incentives and financing mechanisms for solutions resorting to EE. These are accompanied by conducting awareness campaigns and capacity development programs.

The residential sector is considered the highest energy consumer in all Arab countries with a percentage almost exceeds 40% as an average of the total energy consumption, accordingly it is among the common priority sectors for the implementation of EE measures and programs. Efficient lighting, thermal insulation, MEPS and labelling, smart and new technologies, ~~small~~ ~~small~~-scale rooftop PV units are among the main applications for this sector.

Consequently, most Arab countries have scaled-up their interest in renewable energy sources, especially in wind and solar power generation, which offer the highest technological and market maturity. Most Arab countries have, or are in the process of creating, a viable market for renewable energy investments. This is accomplished through the creation of an enabling environment (~~legislations~~, institutions, feed-in-tariffs, net metering, auctions, etc.) and incentives schemes for different market segments to encourage private investors' contribution and integration of renewable energy in the power grids.

Nowadays, the total generation capacity of renewable power (including hydro) reached about 22.8 GW¹. Yet commitment from the region is set to spur unprecedented growth, increasing new renewables. The growth of the renewable energy market and the falling costs for renewable energy technologies over the past few years are positive signs. Policy makers are looking more seriously than ever into the potential of clean and sustainable energy sources.

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¹ Mahmoud M., 2021, "Impacts of COVID-19 Pandemic on Renewable Energy Sector in the Arab Region", a presentation to the Africa Renewable Energy Initiative (AREI) webinar on the impacts of COVID-19 Pandemic on renewable energy sector in Africa, 29 April 2021.

2 Introduction

The RE and EE Governance Framework, through its main elements, namely the Arab Sustainable Energy Strategy, and the tools for planning, execution and monitoring, is the product of the hard work of the Department of Energy in the League of Arab States (LAS) and the Arab States, in collaboration and alignment with the Regional Center for Renewable Energy and Energy Efficiency (RCREEE), the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH as well as various partners at the national, regional and international levels. It represents the umbrella that helps Arab countries to prepare optimally for the incorporation of renewable energy and energy efficiency into the future energy mix, and to boost energy security, affordability and preservation of the atmosphere.

In line with an integrated perspective, the 2030 Arab Sustainable Energy Strategy was conceived based on the idea of 'Sustainable Energy Development' as part of the 2030 Roadmap for Sustainable ~~Development, the~~ **Development, the** SDGs and taking into account what has been announced in the Arab countries' energy policies. The strategy included an overview of the realities of the Arab countries' energy systems and an evaluation of the opportunities and challenges facing the Arab region, at which energy systems would play a key role in the efforts of these countries to achieve holistic and sustainable economic, social and environmental growth. It should be remembered that this strategy has a driving characteristic aimed at helping Arab countries draw up their national sustainable energy policies ~~in accordance with~~ **following** the development policies implemented in those countries.

Energy efficiency enhancement is a crucial factor of sustainable energy development and offers the best ways to tackle the increasing demand for energy in general and ~~for~~ electricity in particular, and to tackle climate change in the Arab region. Arab countries have shown a strong response to the modalities proposed by the Arab **Guideline** on Energy Efficiency in the Electricity Sector issued by LAS through the national **development** and implementation of national EE Action Plans, including initiatives and projects to be introduced over specific timeframes.

In this respect, and ~~in order~~ to determine the relevance and feasibility of the implementation of the Arab countries' national EE action plans, it was important to track and review what has already been done in recent years and to move on to more efficient phases.

This report describes the conclusions of the progress achieved. It focuses on the analysis of the current strategic targets of EE measures and projects ~~with respect to~~ **for** the saving in primary energy consumption; existing EE policies, including legal frameworks and regulations, released or published; goals set; quantitative measures and timeframes required; institutional framework and dedicated EE entities; and, finally, the status of energy awareness campaigns and dissemination plans.

There is a great abundance of RE resources in Arab countries, especially solar and wind energy. Most Arab countries have therefore announced ambitious energy transition strategies, which are primarily focused on diversifying energy supplies ~~in order~~ to secure and maintain the supply of energy and increasing the share of renewable energy production. Furthermore, the policies implemented take economic, social and environmental issues into account, as the

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renewable energy market is becoming more labor intensive and can lead to growing local benefits and generating new and creative employment opportunities.

The Secretariat of the Arab Ministerial Council for Electricity, in collaboration with the Regional Center for Renewable Energy and Energy Efficiency, has released a Pan-Arab Strategy for Renewable Energies, ~~with the goal of developing~~intending to develop a shared and harmonized Arab structure to encourage the development of energy from renewable sources. This was followed by the issuance of the Arab Renewable Energy Framework, which includes guidance and templates for developing— the national objectives of the contribution of renewable energy sources to the production of electricity, heating and cooling such as the “National Renewable Energy Action Plan (NREAP) Template” and the “Monitoring and Reporting Protocol”.

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In order to assess the relevance, feasibility and efficiency of the Arab countries’ adoption- of the Arab Renewable Energy Framework including its instruments—, and if the country adopts a broad national renewable energy plan or focuses only on particular sectors, it was important to track and analyze what was achieved. The present assessment is carried out by evaluating the progress of national strategies and the costs of implementation; existing policies, regulations, financial and tax incentives; and sources of financing. It highlights the types of renewable energy technology introduced in the country and the national regulatory bodies involved, as well as the approvals necessary for the implementation of specific technologies, in particular their compliance with national and international standards.

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3 Objectives

This analysis report for the state of the art of NEEAP-NREAP development in the Arab Region aims to present the current strategies, programs- and measures stipulated in ~~the~~ the national RE&EE action plans and follow up its implementation in order to evaluate achieved progress.

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4 National Energy Efficiency Action Plan Progress

Remains an action priority, the governments of the Arab countries plans to rationalize the consumption of energy through various actions and measures which are collected and added in national energy efficiency action plans (NEEAP). These measures are ~~classified~~classified into different categories according to each country's potential. Some ~~arab~~Arab governments have taken several measures to develop the regulatory and legislative framework for energy efficiency through the issuance of several laws and legislations including renewable energy and energy efficiency, tax exemptions for RE and EE systems and equipment, regulating procedures and means of conserving energy and improving its efficiency, laws for street lightings and advertisement, regulations for energy ~~tariff~~tariff reform programs.

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In addition, some Arab governments intended to secure ~~a~~-sustainable funding mechanisms for energy efficiency in their countries so that they could facilitate the implementation of different measures. Some countries plans to establish energy efficiency fund (EEF) on the national levels. Several financing mechanisms were adopted by ~~arab~~Arab governments. In

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addition to boosting EE deployment through the establishment of new and innovative investment schemes and business development models as ESCOs and Super ESCOs.

In all sectors; Arab countries have special programs for EE in different consuming sectors through enhancing the efficiency of energy-consuming equipment, imposing incentives and financing mechanisms, conducting awareness campaigns and capacity development programs, promoting energy services companies and enforcing energy conservation law.

As they consider the highest consumer of energy in all countries, the residential sector considers an important focus for EE measures. In this sector, there are some programs including thermal insulation for buildings, using smart meters, replacing old bulbs with efficient LED, special programs for home appliances, using small scale rooftop PV units.

However, it was difficult to assess the progress and **achievements** of NEEAPs or to monitor EE progress in the Arab countries due to the absence of evaluation tools to measure updated achievements in most countries. A proper MRV system has to be implemented to follow up EE targets which are scattered among different sectors including transport, building, industry, etc. while the monitoring process is a very challenging process that involves several stakeholders and is linked to data availability, consolidation process and national coordination through integrated cross-sectoral management.

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In the following tables, a brief idea about the NEEAP target in each country has been introduced. It includes the priority targets in different countries, the expected results, as well as the main actions that have been achieved and in progress during this phase.

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4.1 Algeria:

Algeria	
Energy profile	<ul style="list-style-type: none"> Electricity consumption growth has been almost two times slower since 2015 (5%/year over 2015-2019 against 9.5%/year between 2010 and 2015); it reached 70 TWh in 2019. The electrification rate is close to 100%. In 2019, the residential sector consumed about for 33% of electricity consumption, followed by industry with 32%; the tertiary sector has a share of 19%. CO2 emissions from energy use have increased by 5%/year since 2015, reaching 147 Mt in 2019.
Development of EE policies, laws and regulations	<ul style="list-style-type: none"> A draft for First NEEAP for the period 2011-2013 was finalized including different EE measures and targeting <u>targeting</u> sectors (Residential – Industrial – services). In February 2015, The national program for RE&EE during the period 2015-2030 <u>was</u> approved and adopted by the government adopted a series of energy efficiency measures and energy-saving plans.
Target by 2030	<ul style="list-style-type: none"> Save the equivalent of more than 63 M tons of oil.

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<p>The priority target segments</p>	<ul style="list-style-type: none"> local authorities, which consume 80% of the energy produced in Algeria (public lighting, administrative buildings, schools, social housing, mosques...). It also covers the transport, industrial, health and housing sectors. Through the following measures "Thermal insulation, Solar water heater, Low consumption lamp, Public lighting.
<p>The expected results</p>	<p>An energy saving deposit of around 63 million toe (or: nearly 38 billion of \$ valued at export) through:</p> <ul style="list-style-type: none"> An avoided power of more than 1500 MW (or nearly \$ 2 billion); A reduction of greenhouse gas emissions by more than 193 million tons of CO2 equivalent to \$ 1.1 billion; Creation of almost 500,000 new jobs and employment opportunities.
<p>Actions achieved and in progress</p>	<ul style="list-style-type: none"> Contracts have already been signed with 33 local authorities to replace 1.1 million mercury vapour bulbs with LEDs. a 40M-Dinar investment programme was signed at the end of 2018. Due to run until 2020, the programme aims to supply 1541 schools and 148 mosques with solar power and to put in place 100,000 street lights fitted with solar panels. Algeria has a law on energy-saving and thermal efficiency in buildings (RTB), revised in 2016. It determines whether or not a project conforms to the RTB specifications. The law will be extended to individual homes and older buildings in 2020. The law on energy-saving is to be revised in 2021 include: <ul style="list-style-type: none"> using solar energy in public lighting in all the Republic's towns and villages. Convert all public transport vehicles to LPG and encouragement, facilitating of purchasing of electric vehicles. For the building sector, more than 30 MTOE million toe will be saved by 2030 distributed through the following actions: <ol style="list-style-type: none"> Thermal insulation: the objective is to reach a cumulative gain estimated at more than 7 MTOE million toe; Solar water heater: the objective is to achieve energy savings of more than 2 MTOE million toe; Low consumption lamp (LBC): the expected energy savings, on the horizon 2030 are estimated at nearly 20 MTOE million toe;

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	4- Public lighting: the objective is to achieve energy savings of almost one MTOE million toe , by 2030 and to reduce the energy bill of communities.
Additional measures	<ul style="list-style-type: none"> On In December 2020, The Ministry of the Interior, Local Government and Spatial Planning (MICLAT) and the German Cooperation Agency (GIZ) signed the contract for the implementation of the “green municipalities” project. This project will result in a sustainable reduction in energy consumption in the pilot municipalities, improved energy management at the municipal level, the extension of the results to the other municipalities in the country (nearly 1,500) and the creation of an incentive framework for the promotion of renewable energy and energy efficiency at the municipal level.

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4.2 Bahrain:

Bahrain	
Energy profile	<ul style="list-style-type: none"> In 2018, primary energy consumption for Bahrain was 0.72 quadrillion btuBTU. PrimaryThe primary energy consumption of Bahrain increased from 0.36 quadrillion btuBTU in 1999 to 0.72 quadrillion btuBTU in 2018 growing at an average annual rate of 3.79%. After rapid growth over 2012-2014 (4.7%/year), the growth of CO2 emissions from energy use slowed down between 2015 and 2018 to 0.6%/year with the slowdown in power generation. In 2018, CO2 emissions from energy use reached 33 MtCO2, almost 3 times the level of 1990 (12 MtCO2 in 1990).
Development of EE policies, laws and regulations	<ul style="list-style-type: none"> In October 2016, Sustainable Energy Authority (SUE) finalized the preparation of Bahrain’s first National Energy Efficiency Action Plan (NEEAP). The Plan was endorsed by the Cabinet of Bahrain in January 2017. NEEAP sets the target, and proposes a comprehensive set of initiatives to achieve the target and unlock energy efficiency potential in the Kingdom. NEEAP represents the Kingdom’s efforts to deliver the sustainable energy transition envisioned in the Economic Vision 2030. The Plan also represents the implementation of the Kingdom’s international commitments under the Paris Agreement, the

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	United Nations Sustainable Development Goals, and the League of Arab States Renewable Energy Framework.
Target by 2025	<ul style="list-style-type: none"> The Plan sets a national energy efficiency target of 6% by 2025. The target is expressed as a percentage of the average final energy consumption during the baseline period (2009-2013).
The priority target segments	Residential & Commercial sector - Electricity sector - Government sector - Industry sector - Transport sector
The expected results	<ul style="list-style-type: none"> Saving overall primary energy equivalent basis about 16,669 GWh during the period 2016-2025 distrubted distributed among different sectors as the following percentages: <ul style="list-style-type: none"> Residential & Commercial sector=51.3% Electricity sector = 19.24% Government sector = 5.7% Industry sector = 11.79% Transport sector= 3.85% Cross cutting sectors percentagepercentage = 8%
Actions achieved and in progress	<ul style="list-style-type: none"> 22 initiatives and measures were fixed and endorsed in the plan to support the achievement of the national energy efficiency target and are expected to collectively produce energy savings of 5,800 GWh on a primary energy equivalent basis in the year 2025, which is considered prudent given realized outcomes in other jurisdictions (including rebound effects). After the great success of the first campaign which targeted 5 stars hotels, a new phase of the campaign has been started aiming to reduce electricity and water consumption for four-star hotels by 3% for a period of one year. The five-star category of 17 hotels managed to save about 530 thousand dinars in just one year. A new pilot project aimed at improving energy efficiency in four government buildings has been launched in Bahrain. The 1,970,000 US \$ project involves providing energy from using electricity and water in the four facilities by using the latest technologies and energy-saving equipment. The project will achieve an annual savings of nearly 23% of the amount of electricity and water consumed. EWA chief executive Shaikh Nawaf bin Ebrahim Al Khalifa signed the agreement with Siemens International, Tatweer Petroleum Company and the four government agencies – the ministries of

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	<p>Youth and Sports Affairs, Education and Health, and the Real Estate Regulatory Authority (RERA).</p> <ul style="list-style-type: none"> by using the latest technologies and energy saving equipment the cost of the project could be recovered within less than four years through annual savings in the electricity and water bills. A public tender has been launched for the installation of solar panels on rooftops of eight government schools on a trial basis without any investment cost or expenses borne by the Education Ministry. The tender represents a pilot project which will be followed by installations on other government ministries and institutions. The authority received applications from 21 government bodies proposing to include their buildings and areas available in public bids for the installation of solar energy systems, he added. The cost of electricity for schools is expected to drop by around 30pc. Successful bidders will have to finance and manage the system and ensure maintenance works for 20 years.
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4.3 Djibouti:

Djibouti	
Energy profile	<ul style="list-style-type: none"> Energy efficiency (<u>1 MJ per \$1 of GDP</u>) The electrification rate is close to 60.2% CO₂ emissions in Electricity & heat generation in 2019 reaches 0.2 Mt
Development of EE policies, laws and regulations	<ul style="list-style-type: none"> Djibouti has not achieved work or national plans in the energy efficiency field yet. The Republic of Djibouti's Vision 2035 was launched in 2014. Djiboutian Energy Management Agency (ADME) has set a strategy for energy efficiency up to 2035.
Target by 2035	<ul style="list-style-type: none"> Reduce primary energy consumption by 17% by 2035 and by 13% by 2025 compared to the baseline scenario (trend). Reduce electricity consumption by at least 35% by 2035 and 26% by 2025 compared to the baseline scenario (trend).
The priority target segments	Key sectors include government buildings with approximately 80% of national electricity consumption, the electrical power sector where distribution and transmission losses are extremely high and the residential sector.

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<p>The expected results</p>	<p>The strategy is defined under three main pillars:</p> <p>Pillars 1:</p> <ul style="list-style-type: none"> Improving energy efficiency in the building sector: Thermal regulation for new buildings, through the definition of minimum energy performance. Promotion of thermal rehabilitation of existing buildings through incentive measures. <p>Pillars 2:</p> <ul style="list-style-type: none"> Improving the performance of household appliances: The establishment of minimum energy performance standards for household appliances. Promoting the accelerated renewal of the fleet, especially for air conditioners, to replace them with more efficient and less energy-consuming equipment through economic incentive measures. <p>Pillars 3:</p> <ul style="list-style-type: none"> Develop<u>To develop</u> the required tools for efficient lighting in the medium and long term, it would be desirable to introduce more energy-efficient and economically efficient lighting technologies to the market, more particularly LED lighting, particularly through the establishment of incentive regulations.
<p>Actions achieved and in progress</p>	<ul style="list-style-type: none"> In 2019 Djibouti became the first country with 100 percent sustainable energy provided in all refugee camps. The World Food Program country office collaborated with key humanitarian and host government partners to first assess energy requirements and then assist over the course of three years to have diesel generators replaced with solar photovoltaic systems. This transition sets an encouraging precedent and shows the expanding potential of renewable energy to reduce the humanitarian energy costs and lessen the related adverse environmental impacts of greenhouse gas emissions and pollution from fossil fuel combustion. Going forward, this project is expected to allow refugees to set up revenue generating ventures such as mobile phone charging shops, refrigeration services, sewing, etc.

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	<ul style="list-style-type: none"> The project will also help foster the integration of renewable energy in other humanitarian and development operations in Djibouti such as office buildings and logistic centres<u>centers</u>, for which WFP is currently assessing feasibility. In addition, World Food Program built 15 shelters and 30 energy-efficient stoves in 15 different schools to address environmental challenges – including energy conservation.
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4.4 Egypt:

Egypt	
Energy profile	<ul style="list-style-type: none"> Energy consumption per capita stands at 0.93 toe, including 190 billion kWh<u>600 kWh of electricity</u> (2019). The country's overall consumption increased by 1% in 2018 and 2019. Households consumes 43% of that consumption, followed by industry (28%) and the tertiary sector (24%). CO₂ emissions from fuel combustion declined by 1.4% in 2019, to 215 MtCO₂. Previously, they increased by 2.2%/year over 2014-2018.
Development of EE policies, laws and regulations	<ul style="list-style-type: none"> On<u>In</u> November 2012, The Egyptian National Energy Efficiency Action Plan NEEAP I in the electricity sector has been officially launched for the period 2012-2015. NEEAP I is considered to be an electrical energy efficiency roadmap in the residential, public and tourist sectors in Egypt. It includes energy conservation measures in the public and tourist sectors. As for the residential sector, it includes measures of using efficient lighting systems, establishing and activating solar water heaters financing mechanisms. Electricity Law (No. 87/2015), which includes a chapter on improving energy efficiency in different sectors. In 2016, <u>the</u> Adoption of the Integrated and Sustainable Energy Strategy for Egypt, this strategy includes a definite target for EE by reducing the consumption of energy in different sectors by 18% in 2035.
	<ul style="list-style-type: none"> The Egyptian Cabinet also approved a sustainable electric energy plan for the period from 2019-2022, which includes the second action plan for National for National Energy Efficiency Action Plan NEEAP II to be implemented in a number of several energy-consuming sectors.

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Target by 2035	<ul style="list-style-type: none"> 18% of energy saving according to the energy strategy selected scenario in 2035, which is equivalent to 20 million tons of fuel Oil equivalent. A yearly saving of about 12.9 MTOE during the period 2018-2022.
The priority target segments	<p>The plan was concerned with:</p> <ul style="list-style-type: none"> Completing the institutional framework for the activity of improving energy efficiency by completing and activating energy efficiency units in various economic sectors. Reducing electrical losses in transmission and distribution networks. Distributing high-efficiency LED lamps to consumers. Completing the preparation of energy efficiency cards and specifications for devices Household electrical appliances. Activating energy efficiency codes in residential, commercial and public buildings, which represents the starting point towards green buildings. Providing financial tools for EE activities. Providing Energy efficiency technologies on the supply side.
The expected results	<ul style="list-style-type: none"> Save energy consumed by 20 million tons of fuel-Oil equivalent Which are defined as following: To decrease the energy consumption by 18% in industry sector, 16% in building sector and 23% in transportation sector.
Actions achieved and in progress	<ul style="list-style-type: none"> A decision was issued by the Prime Minister to form the Advisory Committee for following up Sustainable Energy Action Plan, with the membership of the first undersecretaries of the ministries of sustainable care, the committee's mandate and follow-up implementation activities of NEEAP II at the national level between line ministers. On the supply side, a major reduction in fuel consumption has been achieved after operating the Mega project power plant, the fuel rate reaches from 210 gm/k-w.hkWh in 2016 to 185.5 gm/k-w.hkWh in 2020. Issuing a law for street lightings and advertisements. This law ensures using efficient technologies in the streets facilities. A memorandum of understanding has been issued between the Egyptian Ministry of Electricity and Renewable Energy and the Egyptian Ministry of Transport to change the old lamps in

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	different buildings related to the ministry of- transport with LED mechanisms.
	<ul style="list-style-type: none"> ▪ In order to complete the institutional setup of EE units in different ministries, the ministry of education established a special unit for EE activities, many projects has have been implemented in different governmental buildings through changing old bulbs to <u>a</u> more efficient one, in addition to implementing PV rooftop over schools.
	<ul style="list-style-type: none"> ▪ A full program for replacing the mechanical meters with smart ones has been implemented. Till now more than 9 million pre-paid meters <u>have</u> already <u>been</u> installed.
	<ul style="list-style-type: none"> ▪ A pilot project has been implemented for 250 thousand smart meters to improve the grid capabilities by managing the demand side.
Additional measures	<ul style="list-style-type: none"> ▪ EgyptERA <u>submits</u> the tariff for charging of electric vehicles for the cabinet for final approval.
	<ul style="list-style-type: none"> ▪ The current phase of <u>the energy</u> tariff-tariff reform program has been extended until 2025.
	<ul style="list-style-type: none"> ▪ A market study with <u>an</u> international consultant is being prepared for the establishment of <u>the</u> first Super ESCO in Egypt.

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4.5 Iraq:

Iraq	
Energy profile	<ul style="list-style-type: none"> ▪ The residential sector is the major consumer of electricity which represents 48.3 percent of the total number of consumers. ▪ The increase in supplied electricity to the provinces except <u>the Kurdistan Region (KRI)</u> has gone up from 38.62 TWh in 2010 to 105.8 TWh in 2019. ▪ The demand has kept staggering at the rate of 7 – 9 percent per annual.
Development of EE policies, laws and regulations	<ul style="list-style-type: none"> ▪ Iraq made significant progress in EE during the past years, where: <ul style="list-style-type: none"> ○ The country adopted its first long term energy strategy “Electricity Master Plan 2030” with plans to improve efficiency in its refineries and utility sectors ○ The country announced the first national energy efficiency action plan (NEEAP).

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	<ul style="list-style-type: none"> ▪ The NEEAP goals included targets towards <u>the</u> governmental sector as following: <ul style="list-style-type: none"> ○ To Save 5% of the total consumed energy in the governmental sector during the period 2013-2015. ○ Saving 604 GWh of the total consumed energy in the governmental sector during the period 2015- 2016. ○ Saving 377 GWh of the total consumed energy in the governmental sector during the period 2016-2017.
Target by 2025	<ul style="list-style-type: none"> ▪ The potential for EE in Iraq might reach 18,070 ktoe (210.15 GWh) per annum by 2025. * <u>An energy saving will be reached about in 2035</u>
The priority target segments	<ul style="list-style-type: none"> ▪ The national RE&EE policy were-was included in the energy sector strategy of 2007-2020, as well as in the Vision 2025, which comprises several promising measures to tackle both: <ul style="list-style-type: none"> ○ The demand side (e.g. energy labels, lighting, reduction of energy consumption of public buildings by 10 percent, buildings code, development of minimum standards/specifications for appliances). ○ The supply side (e.g. solar water heaters, PV, capacity building in wind energy and concentrating solar power, solar energy code).
The expected results	<p>An energy saving per sector will be reached until 2035 as following:</p> <ul style="list-style-type: none"> ▪ Electricity sector about 153.95 TWh/year. ▪ Residential-Residential sector about 24.27 TWh/year. ▪ Industrial sector about 15.96 TWh/year. ▪ Transport sector about 11.77 TWh/year.
Actions achieved and in progress	<ul style="list-style-type: none"> ▪ The <u>Ministry</u> of Electricity has initiated some actions among which were: <ul style="list-style-type: none"> ○ Installation of a new billing system. ○ Outsourcing of revenue management services (also known as Collection and Service Contracts for meter reading and electricity sales revenue collection. ○ The installation of smart meters at selective consumer premises. ▪ A directive (Order No. 12 of 2018) has <u>been</u> issued by the Council of Ministers (CoM) which aimed to improve revenue collection of supplied energy to about 80 percent of consumers. ▪ The European Union and World Bank have joined forces for the implementation of a project (worth EUR 12.9 million) to support

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	<p>the Government of Iraq in achieving its objective of modernising <u>modernizing</u> the energy sector.</p> <ul style="list-style-type: none"> ▪ Iraq’s economic White Paper issued on <u>in</u> October 2020 included a defined actions in the field of energy efficiency to "increase the effectiveness of the collection system within the power sector in order to increase revenues and encouraging individuals and institutions to rationalize consumption to strengthen the capacity to meet the increasing demand for power <u>power demand</u>". ▪ The objective of this initiative is through: <ul style="list-style-type: none"> ○ Establishing an approach to deal with the transgressors in areas where there is no electrical network, including collection of a lump sum. ○ Forming a specialized team in the Ministry of Electricity to follow up with the industrial subscribers to install smart meters, take inventory of the network materials and equipment, numbering the transformers and entering their details in the GIS system, set up circuit breakers, install smart energy meters in the fields of generation, transmission and distribution, and automating the readings of the meters. ○ Adopting the use of advanced smart meters that work with all payment options, designing mechanisms to correct the names of the subscribers, considering a specific number of units free for the household covered by the social protection (safety) system, exempting debts accrued within a <u>a</u> specific timeframe prior to <u>before</u> installation of the meters, and granting investment licenses to collection companies in non-covered areas, and granting an opportunity to the contracting companies to develop their operation. ○ Ministry of Electricity to study the possibility of using alternative energy systems and mechanisms to ensure the rationalization of power consumption within the public institutions and facilities, in addition to designing specifications and conditions to be adopted in public and private buildings, and importing air-conditioning equipment, in order to <u>to</u> achieve the goal of rationalization, and provide the necessary facilities for electricity production projects through the alternative energy systems. ○ Reducing electricity charges by a specified percentage for the committed subscribers within a <u>a</u> certain consumption
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	<p>threshold, and establishing procedures to prosecute the non-committed subscribers.</p> <ul style="list-style-type: none"> o Allocating a percentage of the revenues as incentives for the collectors, provided that the loss is below 30% in the regulatory unit, within the governorates in which MoE is collecting revenues.
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4.6 Jordan:

Jordan	
Energy profile	<ul style="list-style-type: none"> ▪ The primary energy sources for Jordan in 2018 as following: Imported oil and natural gas comprise the largest share at 87% of the total energy need (9,712 ktoe), while domestic resources account for 7.8% of energy supply, including the 7% obtained from renewable energy. ▪ Projected annual growth rates for energy demand for 2015-2025 (~5%) are some of the highest in the world. ▪ The shares of energy consumption by major sectors are classified among different sectors: Transportation consumed 49% of the national energy demands, followed by residential needs at 21.5% (lighting, cooling, and heating), the industrial sector consumed 14%, and the remaining 15.5%, which includes agriculture and forestry. ▪ CO₂ emissions by sector for <u>the</u> electricity sector reaches 47% in 2019.
Development of EE policies, laws and regulations	<ul style="list-style-type: none"> ▪ The first Jordan NEEAP (2012-2014) has included 11 main measures and has set out the target of a 7.1% reduction in energy consumption by 2014, which equals to around 806 GWh. ▪ Jordan has updated its action plan by developing a new NEEAP for 2018-2020. With an ambitious target to save 17.5% (1975 GWh) of electricity by 2020. The NEEAP includes 26 measures including residential, tertiary, industrial, water pumping sectors, street lighting sector, municipal level, transport sector, and eight cross cutting measures. ▪ <u>On In</u> July 2020-, <u>the</u> Jordanian Minister of Energy released the Comprehensive Strategy for Jordan's Energy Sector (2020-2030), The core principles of Jordan's energy development are sustainability and self-sufficiency.

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	<ul style="list-style-type: none"> The four key areas are security of energy supply, reduction of energy costs, sustainability of energy development and increased dependence on local resources.
Target of EE by 2030 included in strategies/ NEEAP	<ul style="list-style-type: none"> As per energy strategy 2030, The energy efficiency rates of all sectors will increase by 9 percent in compared to 2018. Jordan has updated its action plan by developing a new NEEAP for 2018-2020. With an ambitious target to save 17.5% (1975 GWh) of electricity by 2020.
The priority target segments	<ul style="list-style-type: none"> The NEEAP includes 26 measures including residential, tertiary, industrial, water pumping sectors, street lighting sector, municipal level, transport sector, and eight cross cutting measures.
The expected results	<p>Saving according to NEEAP 2017- 2020 (GWh) with <u>a</u> total investment-investment cost of about 696 (MJD):</p> <ul style="list-style-type: none"> Residential sector by 998 GWh Industrial sector by 383 GWh Commercial & services sector by 376 GWh Water Pumping sector by 163 GWh Street Lighting sector by 55 GWh
EE Actions "achieved and in progress"	<p>Jordan Ministry of Energy and Mineral Resources (MEMR) is:</p> <ul style="list-style-type: none"> Updating the energy efficiency By-Law and Energy Efficiency Road Map in Jordan. Issued the Jordan Energy Strategy 2020-2030 with <u>a</u> vision towards 2050. Finalising the third National Energy Efficiency Action Plan (NEEAP) for 2021-2024.

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4.7 Kuwait:

Kuwait	
Energy profile	<ul style="list-style-type: none"> <u>The</u> total final energy consumption was 18.4 Mtoe in 2015. Industrial energy demand accounted for the largest percentage about 31%. Final demand in the transport sector was accounted for 25% of the total demand. The residential and services sectors accounted for 21% of total final energy consumption. CO₂ emissions per capita were 21.1 tonnes of CO₂ per capita.

<p>Development of EE policies, laws and regulations</p>	<ul style="list-style-type: none"> ▪ In 2010, a revised version of the building code was developed with more stringent requirements for energy efficiency measures in new buildings. ▪ In 2014, more rigorous standards for the minimum requirements for the energy-efficient design of new buildings in Kuwait were implemented. ▪ A new 2017 code for government and commercial buildings, which sets minimum requirements in terms of power densities, material properties and the use of efficient air-conditioning systems, is under final approval. ▪ Kuwait released the White Paper on a Sustainable National Energy Strategy in 2017, which recommended the establishment of a national champion to implement the strategy and coordinate its multiple dimensions.
<p>The target of EE by 2030 included in strategies/ NEEAP</p>	<ul style="list-style-type: none"> ▪ The Ministry of Electricity and Water is planning to develop its first NEEAP and launched an awareness plan and campaigns to promote EE actions in the residential sector.
<p>The priority target segments</p>	<ul style="list-style-type: none"> ▪ There is enormous potential in Kuwait to increase the energy efficiency of its buildings and transport sectors. ▪ EE measures includes: <ul style="list-style-type: none"> ○ Enforce and update building regulations and codes to reduce permissible power for air-conditioning. ○ Enhance the arrangement of windows in buildings to increase efficiency and install photovoltaic buildings. ○ Integrated systems Invest in building retrofits. ○ District cooling ○ Implement a standardized labelling program for appliances and equipment. ○ Promote energy service companies to work within the sector to market energy efficiency programs to consumers and support consumers in estimating energy savings
<p>The expected results</p>	<p>Improvement in energy efficiency would require additional investment in a combined strategy of:</p> <ul style="list-style-type: none"> ▪ Actionable national energy efficiency plans. ▪ An incentive and cleaner energy sensitization programme. ▪ Subsidy reduction.
	<ul style="list-style-type: none"> ▪ In 2018, The Kuwait Council of Ministers set up the Higher Energy Committee to improve coordination between ministries,

EE Actions "achieved and in progress"	<p>regulatory agencies and infrastructure operators and service providers.</p> <ul style="list-style-type: none"> Energy efficiency measures offer the least-cost pathway to energy and greenhouse gas emission reductions and to an increase in energy supply security. The effectiveness of energy efficiency measures and price adjustments should be underpinned with measurable targets and objectives, which could be selected and monitored by the Higher Energy Committee.
	<ul style="list-style-type: none"> On the supply side, The Ministry of Electricity and Water will depend on combined-cycle plants <u>to</u> make up the lion's share of capacity expansions over the projection period to 2035, resulting in a more efficient and flexible fleet of power plants compared to today.
	<ul style="list-style-type: none"> In the residential sector, Stricter enforcement of regulations and codes in the buildings sector <u>are-is</u> expected to play a major role in the significant deceleration in energy demand growth over the projection period. Kuwait has plans to construct 128,000 new houses over the Outlook period, all subject to the more rigorous standards of the recent energy conservation codes and regulations. Three government entities will be responsible for enforcing the building codes.

4.8 Lebanon:

Lebanon	
Energy profile	<ul style="list-style-type: none"> Electricity consumption reached about 19 TWh by 2018. In 2018, Total energy supply (TES) per capita reached 1.3 toe/capita. Total final consumption (TFC) by sector, Transport about 2750 ktoe, residential 1030 ktoe, Industry 750 ktoe, commercial and public 290 ktoe. Electricity consumption per capita 2.8 Mwh/ capita.
Development of EE policies, laws and regulations	<ul style="list-style-type: none"> First NEEAP during the period 2011-2015 focused on both promoting EE and RE applications and was not targeting a specific sector. It included 14 crosscutting measures covering residential, industrial, commercial, etc. The program implementation saved 304 GWh of electricity consumption.

	<ul style="list-style-type: none"> In March 2016, The second national EE plan targeted the period 2016-2020 and covered the primary energy sector, industry and agriculture sectors, as well as the building and public sector, with 26 sectoral measures and a bottom-up approach. The savings resulted from this action plan are still under calculation. However, the implementation of these measures is expected to save 1514 GWh that corresponds to around 1221.5 to 1316.5 MUSD and approximately 4.83 % of the total electricity demand in 2020 (31344 GWh in 2020 (BAU)), in addition to decreasing the demand growth rate from 7% to 5.81%. The third national plan for 2021-2025 is still under development.
The target of EE by 2030 included in strategies/ NEEAP	<ul style="list-style-type: none"> Satisfy 12% of primary energy consumption for both electricity generation and heating purposes by 2020.
The priority target segments	<ul style="list-style-type: none"> Industrial sector Residential-Residential sector Transport sector
The expected results	<ul style="list-style-type: none"> Total final energy consumption by <u>the</u> end-use sector is reduced from 477 PJ in the reference case to 450 PJ due to synergies between renewable energy, electrification, and energy efficiency. PV distrubted-distributed generation will reach 150 MW by 2030. Solar water heaters (SWH) will cover 1 716 835 m² in 2030.
EE Actions "achieved and in progress"	<ul style="list-style-type: none"> The Minimum Energy Performance Standards (MEPS) that include an energy saving program for 4 appliances (split AC units, refrigerators, televisions, washing machines). NEEREA financing mechanism. ESCO's business development. Adopting the Energy Conservation Law. Testing Facility for Buildings Components (With the Lebanese University). Green Building Code (with LIBNOR), SEAPs for municipalities, Memo M17-1-V1 was launched in January 2018 entitled "Mandatory Energy Audits for PV projects with an installed capacity greater or equal to 60kWp – for existing facilities only". National workshops, leveraging funds to promote the use of energy efficient equipment, market surveys (retailers and importers), the proposal of a list of equipment to be exempted

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	<p>from taxes (Decree 167-2017), home appliances committee at LIBNOR (safety and performance) and lastly Grant Program with IMELS for Italian appliances.</p> <ul style="list-style-type: none"> ▪ Moreover, several financing mechanisms were adopted such as NEEREA, LEEREFFF and GEF. In addition to the implementation of business development models of ESCOs (four rounds of ESCO's qualifications), along with awareness campaigns and continuous academic and professional capacity development activities.
	<ul style="list-style-type: none"> ▪ The BIM for Energy Efficiency in the Public sector (BEEP) project aims at strengthening the use of Building Information Modeling (BIM) - a process supported by various tools and technologies involving the generation and management of digital representations of physical and functional characteristics of places - to enhance energy efficiency in buildings. ▪ The project will provide public administrations with a powerful method for the energy rehabilitation of public buildings to be supported with private funds through the Energy Performance Contracting. ▪ The project's main outcome will be an innovative methodology based on the integration of emerging technologies tested on heritage public buildings. ▪ The results will streamline the sustainable rehabilitation process and start a virtuous circle where the money saved by public administrations in managing public assets will be used to multiply the interventions on the existing building stock. ▪ Duration: 3 years (from September 2019 to August 2022) ▪ The total budget of € 1,934,184.51, of which € 1,740,766.06 (90%) is funded by the EU under the ENI CBC Med Programme.
	<ul style="list-style-type: none"> ▪ The Energy Smart Mediterranean Schools Network (ESMES) project focuses on the optimization of energy consumption in public schools through innovative, monitoring-based renewable energy and energy efficiency (REEE) pilot actions. ▪ Some of the expected achievements are listed below: <ul style="list-style-type: none"> ○ Set-up strategies to support efficient and cost-effective energy mix in public schools. ○ Set-up national energy efficiency hubs among relevant stakeholders to enhance national cooperation on REEE.

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	<ul style="list-style-type: none"> o Prepare REEE rehabilitation plans for public schools based on monitoring data and energy audit o Implement pilot REEE solutions in public schools with energy performance certification. o Run schools contests and increase awareness and better energy habits in schools through trainings and awareness activities <ul style="list-style-type: none"> ▪ Duration:3 years (from September 2019 to August 2022) ▪ The total budget of € 3.3 million, of which € 2.9 million is co-funded by the EU under the ENI CBC Med Programme.
	<ul style="list-style-type: none"> ▪ In 2019, EDL Electricité du Liban (national power utility) began installing smart electricity meters as part of its advanced metering infrastructure project to add more than one million meters across Lebanon by 2022.
	<ul style="list-style-type: none"> ▪ On the supply side, increasing generation capacity, improving efficiency and reducing costs by switching to natural gas ▪ The plan proposed to increase the generation capacity of EDL by combining both short term temporary solutions with long term permanent solutions – installing 1450 MW of temporary generation combined with around 3 100 MW of permanent generation.

4.9 Libya

Libya	
Energy profile	<ul style="list-style-type: none"> ▪ Total energy supply (TES) per capita in Libya reached 2.7 toe/capita, 2018. ▪ Electricity consumption reached 27.7 TWh. ▪ Electricity consumption per capita: Libya reached 4.2 Mwh <u>MWh</u> per capita. ▪ Electricity final consumption by sector: residential sector 763 ktoe, commercial and public sector 167 ktoe, Industrial sector 105 ktoe, and not specified 375 ktoe.
Development of EE policies, laws and regulations	<ul style="list-style-type: none"> ▪ Renewable Energy Authority of Libya (REAOL) developed <u>NEEAP</u> as a draft for the period 2014-2016-NEEAP. ▪ The NEEAP stressed that the largest potential for energy savings lies in buildings. Unfortunately, this NEEAP has not been approved because due to the of political instability. Currently, Libya does not have any EE targets or plans.

	<ul style="list-style-type: none"> The majority of energy development in the country is focused on re-establishing normal, pre-conflict grid operation. However, RCREEE supports LAS to develop a NEEAP for Libya.
Target of EE by 2030 included in strategies/ NEEAP	<ul style="list-style-type: none"> Not defined
The priority target segments	<ul style="list-style-type: none"> The domestic sector in the Libya accounts for almost 40% of final energy consumption <ul style="list-style-type: none"> The majority of energy consumed is for space and water heating, not electricity in most buildings. There is significant scope for energy efficiency improvements with savings in space heating of up to 90% achievable.
EE Actions "achieved and in progress"	<ul style="list-style-type: none"> Currently, NEEAP of Libya is being prepared by RCREEE. Installation of 25 SWHs on the university of Sabha and currently 75 more SWH are being installed. Issuing a decision to approve the Energy Research Center to approve the standards and evaluate the conformity of solar energy and solar thermal systems Resolution No. 881 of 2019 was issued to exempt solar energy systems and solar thermal energy from customs duties.
	<ul style="list-style-type: none"> Resolution No. 55 of 2019 was issued by the minister of economic<u>s</u> to prevent the import of old lamps, this action opens the market for LED lighting systems.
Additional measures	<p>There are some private sector activities in the filed field of EE:</p> <ul style="list-style-type: none"> Electricity generation by solar power: <ul style="list-style-type: none"> Part of fossil fuel-based energy production will be replaced with renewable, clean energy solutions that can meet increasing energy demand. Petrol station convert to solar energy for supply electrical to petrol pumps and lights A project for energy efficiency improvements in buildings is introduced in. For the residential sector aiming to implement, a project for energy efficiency improvements in buildings through the introduction of solar energy systems for buildings and state institutions to generate electricity. <ul style="list-style-type: none"> Accredited Entity:- EBRD, WB. These projects have different financial instruments, either through subsidies (Thermal audit of the building and work program); LT subsidized loans whose monthly payments are

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	<p>determined on the basis of based on energy savings" or ; through Guarantees / insurance on the energy savings achieved.</p> <ul style="list-style-type: none"> ▪ For the Agruicultural Agricultural sector, A project for solar driving pumping systems. ▪ The project would propose solar pumping systems with optimized irrigation solutions to reduce water consumption on the one hand and the carbon footprint of water pumping (1 TCO2eq avoided per solar pumping station). ▪ Project of waste heat recovery improvements: The energy-intensive electricity and fossil fuel sectors as industrial sector cause a significant amount of waste in energy in the form of heat at the end of the burning process and would benefit from being recovered to be either: <ul style="list-style-type: none"> ○ Reintegrated into the burning process (preheating) used in an electricity production circuit for export or for self-consumption. ○ other local uses
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4.10 Morocco:

Morocco	
Energy profile	<ul style="list-style-type: none"> ▪ Total energy supply (TES) by source: Coal 4939 ktoe, Natural gas 924 ktoe, hydro 146 ktoe, biofuel and waste 1311 ktoe, oil 12397 ktoe. ▪ Electricity consumption reached 34.6 TWh in 2019. ▪ Electricity consumption per capita, in 2018, 0.9 Mwh/ capita. ▪ Electricity final consumption by sector, Morocco in 2018, Industry 1039 ktoe, residential 956 ktoe, commercial and public service 485 ktoe, agriculture and forestry 289 ktoe, transport 32 ktoe.
Development of EE policies, laws and regulations	<ul style="list-style-type: none"> ▪ In March 2014, Morocco published its national energy efficiency strategy until 2030 prepared by the Ministry of energy and the national agency of energy efficiency. ▪ The Ministry of Energy, Mines, Water and Environment has put in place programs and legislative and regulatory reforms to introduce energy efficiency to the key sectors, including buildings, of the national economy. ▪ Different laws and decrees were issued to support EE measures in the building. Those measures are: <ul style="list-style-type: none"> ○ Global energy performance of the building

	<ul style="list-style-type: none"> o Energy performance requirements for materials o Thermal insulation to exterior walls and roofs o Passive heating and cooling requirements in building design like orientation o Promotion of RES (solar water heaters, PV...) o Energy performance labelling for building
Target of EE by 2030 included in strategies/ NEEAP	<ul style="list-style-type: none"> ▪ The objective is to reduce the final energy consumption by 12% by 2020 and 15% by 2030.
The priority target segments	<ul style="list-style-type: none"> ▪ Controlling energy consumption in the building sector is therefore a key factor in Morocco’s energy strategy as it is the second-largest consumer after transportation. ▪ The building sector accounts for 25% of the final consumption. ▪ heating and air conditioning in residential buildings
The expected results	<ul style="list-style-type: none"> ▪ EE measures will also help Morocco to meet its target of cutting by 32% greenhouse gas emissions to which the country committed to under the Paris Agreement.
EE Actions “achieved and in progress”	<ul style="list-style-type: none"> ▪ The government launched also a program to install energy-efficient light bulbs, which led to 700 GWh of energy savings. ▪ Moroccan Authorities are committed to boosting EE deployment through the establishment of new and innovative investment schemes to catalyze sustainable energies to reduce the country’s dependency on imported energy and reduce potential energy trade deficits, EE measures will also help Morocco to meet its target of cutting by 32% greenhouse gas emissions to which the country committed to under the Paris Agreement. ▪ Morocco is meanwhile putting the final touches to-on an energy efficiency label, Eco-Binayate, with the aim of improving <u>intending to improve</u> buildings’ quality in terms of energy -efficiency and the environment. ▪ Eco-Binayate will be rolled out progressively, providing visibility for the more virtuous operators. The first phase of deployment will cover only new homes. Its objective is to showcase best practices in order to elicit change in the construction sector towards building sustainable buildings that are more comfortable and more energy-efficient. ▪ Morocco is also investigating other promising avenues, such as promoting solar water heaters, the renovation of public buildings and aid measures for the replacement of older air conditioners

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	and refrigerators. Refrigerators represent 45% of all household electricity consumption and lighting 20%.
	<ul style="list-style-type: none"> ▪ The efforts being made by Morocco have recently been rewarded, with €20M of funding received from the NAMA Facility, a programme financed by Germany, Denmark, the United Kingdom and the European Commission aimed at supporting projects to combat climate change. Due to come online in 2021, the Moroccan project involves, among other things, integrating energy efficiency measures into 12,000 homes being built across the country.
	<ul style="list-style-type: none"> ▪ Morocco's ports authority (ANP) and the Moroccan Agency for sustainable energy (MASEN) signed a cooperation agreement to promote the use of renewable energies in Morocco's ports. ▪ The agreement would help the ANP tap into MASEN's experience to facilitate the transition of Morocco's ports to renewable energies and energy efficiency.

4.11 Palestine

Palestine	
Energy profile	<ul style="list-style-type: none"> ▪ Electricity consumption reached 5,915,758 Mwh in 2018. ▪ Annual Electricity Consumption Per Capita = 1,148.7KWh/Capita ▪ The Energy consumption distributed among different sectors as following (Transport 45.4%, household 38%, service 9.8%, Industrial sector 6.1%).
Development of EE policies, laws and regulations	<ul style="list-style-type: none"> ▪ The Palestinian Energy Authority prepared the National Energy Efficiency Action Plan (NEEAP) from 2012 to 2020. ▪ Palestine was one of the 13 countries that having <u>have</u> participated to in these benchmarks on EEIs. It is noticeable that, in both projects, PEC was the focal point selected for Palestine. ▪ It also demonstrates the willingness of the Palestinian government to participate in <u>the</u> international benchmark on energy efficiency performances. However, in both projects, the number of EEIs was very limited: primary and final intensities, sectoral intensities (industry, services and transport and unit consumption for dwellings). ▪ NEEAP II (that has not been ratified yet) was prepared by PENRA in partnership with the World Bank and the Agence Française de

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	<p>Développement (AFD) as a prolongation of the NEEAP 2012-2020.</p> <ul style="list-style-type: none"> ▪ The NEEAP II plan focuses on electricity since this form of energy has the largest share in the Palestinian final energy mix. ▪ The proposed NEEAP II plan is built on three layers or phases
Target of EE by 2030 included in strategies/ NEEAP	<ul style="list-style-type: none"> ▪ Reaching 9880 GWh of saved Energy by Year 2030.
The priority target segments	<p>To reduce energy consumption in the main sectors of consumption: Agriculture, Residential, Industry and Services through the following programs:</p> <ul style="list-style-type: none"> ▪ LightingLighting. ▪ More efficient fridges. ▪ Switch to gas for room heating ▪ Labelling systems ▪ Repairing of SWH. ▪ Smart meters. ▪ Thermal insulation.
The expected results	<p>To achieve the indicative target of saving of electricity consumption:</p> <ul style="list-style-type: none"> ▪ Phase I (2020-2030) is a follow up of the previous plan ▪ Phase II (2024-2030) focuses on energy market structuring ▪ Phase III (2027-2030) is dedicated to the use of new technologies.
EE Actions “achieved and in progress”	<ul style="list-style-type: none"> ▪ In Palestine, the recent development and management of a database on energy audits at the EE Unit of the Palestinian Energy authorityAuthority. ▪ The basis of this database is a €2 Million energy efficiency fund supported by the French development bank (AFD) on energy audits. ▪ Until now, 250 energy audits have been performed and monitored for several sectors, such as public buildings, schools, hotels, hospitals etc. All information provided during the audits including energy efficiency performances are-is stored in this database. In that respect, this is an obvious and important source of data for energy efficiency monitoring.

4.12 Qatar:

Qatar	
Energy profile	<ul style="list-style-type: none"> Total energy supply (TES) by source in 2018, Oil 4971 ktoe, Natural gas 38437 ktoe. Electricity consumption reached 46.1 TWh in 2018. Annual Electricity Consumption Per Capita = 16.6 MWh/Capita The Electricity consumption distrubted distributed among different sectors as following: Resedential Residential 1741 ktoe, Industry 1049 ktoe, Commercial and public services 720 ktoe, Non specified 356 ktoe.
Development of EE policies, laws and regulations	<ul style="list-style-type: none"> Since 2012, through its National Program for Conservation and Energy Efficiency (Tarsheed) and other efficiency measures, the Qatar General Electricity and Water Corporation (Kahramaa) has been attempting to reduce the consumption of both desalinated water and electricity. During the period 2018 to 2022, the second phase of <u>the</u> Tarsheed program is running to implement actions in energy saving. According to Kahramaa’s sustainability report published in 2016, consumption of water and electricity per capita had fallen by 20% and 18%, respectively, since the implementation of Tarsheed in 2012.
Target of EE by 2022 included in strategies/ NEEAP	<ul style="list-style-type: none"> Kahramaa aims to reduce per capita consumption of electricity and water by 8% and 15%, respectively, in line with the National Development Strategy 2018-2022.
The priority target segments	Resedential The residential sector, Hotels, Energy performance indicators.
The expected results	As per the third outcome of Qatar national strategy 2018-2022-: Im Improve and implement energy efficiency by 10% by 2022.
EE Actions “achieved and in progress”	<ul style="list-style-type: none"> + Kahramaa is launching an energy efficiency certification program for hotels and prepare a comprehensive strategy to encourage the use of solar energy in households. The certification will be yearly for hotels with a high rate of efficiency. Regular audits will also be planned according to Tarsheed standards in electricity and water consumption. Qatar has so far introduced Minimum Energy Performance Standards (MEPS), labelling and set up awareness campaigns, experience exchange, and capacity development activities to

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	spread energy conservation culture and promote practices of optimal use of water and electricity.
	<ul style="list-style-type: none"> The achievements of Tarsheed program in 2019 include success in reducing electricity consumption by about 7,654,489 MWh, reducing water consumption by about 33.781 million cubic metres, and reducing gas consumption by about 73602 million cubic feet. Tarsheed PV electric vehicles charging and energy storage station project. This station is the first of its kind in the State of Qatar and it charges vehicles with electricity produced from solar energy through 216 photovoltaic panels, divided into two areas with a total area of 270sqm equal to a row of 24 cars, and the total energy produced by the panels is 72kW.

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4.13 Saudi Arabia:

Saudi Arabia	
Energy profile	<ul style="list-style-type: none"> Total energy supply (TES) by source in 2018, Oil 134509 ktoe, Natural gas 79108 ktoe. Electricity consumption reached 345.1 TWh in 2018. Annual Electricity Consumption Per Capita = 10.2 MWh/Capita The Electricity consumption is distributed among different sectors as following: Residential 11215 ktoe, Industry 3850 ktoe, Commercial and public services 10973 ktoe, Non specified 419 ktoe.
Development of EE policies, laws and regulations	<ul style="list-style-type: none"> Saudi energy efficiency center (SEEC) was established through a Council of Ministers resolution in 2010. Since 2012, Saudi Arabia has launched the Saudi energy efficiency program (SEEP), to ensure that the country becomes highly energy efficient. In 2013, SEEP has a full-fledged program with 12 teams, with 80 initiatives at different stages ranging from feasibility, design and execution. Following that, a new mandate for SEEC has been approved in 2018, and the scope of works has expanded to cover power generation including electricity transmission and distribution, water desalination and feedstock used in the industry.
Target of EE by 2030 included in strategies/ NEEAP	<ul style="list-style-type: none"> Enhancing energy efficiency in the economy by up to 4 percent per annum could avoid the consumption of as much as 1 MBOED by 2030.

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The priority target segments	SEEP has focused on three sectors that consume more than 90% of the energy consumption; industry, buildings and transport.
The expected results	<ul style="list-style-type: none"> ▪ KAPSARC estimates the avoided energy consumption from a 4 percent-% improvement in energy efficiency per annum could be worth between approximately Saudi riyal (SAR) 50 billion and SAR 100 billion per annum in extra revenue to the government by 2030, depending on international oil market conditions.
EE Actions "achieved and in progress"	<p>Saudi has achieved success in six enablers:</p> <ul style="list-style-type: none"> ▪ Testing; inspection and certification team (TIC) which included product monitoring namely refrigerator, AC, washing machines, lighting, thermal insulation materials, electric motors and cars. ▪ Human capacity development (HCD) by offering EE courses for 12 universities where 460 students enrolled, certifying three programs (CEA, CEM and CMVP) where 268 individuals were certified, and 15 students enrolled in the Center of Excellence in Energy Efficiency at KFUPM. ▪ Awareness; by conducting 14 kingdom-wide mass media campaigns using both traditional and social media, having 661 M appearances on digital and mobile media, 3.2B appearances on social media and 300 k followers on social media. ▪ District cooling; by designating the Electricity and Cogeneration Regulatory Authority (ECRA) as the District Cooling Regulator, licensing and technical regulations for district cooling which resulted in a developed economy, issuing a decree from Council of Ministries for mandating district cooling in government projects when meeting the set criteria, and developing an enforcement mechanism with Ministry of Finance to enable the execution of the decree. ▪ Urban planning through; developing energy efficiency-efficient urban planning guidelines for new developments (covering urban form, public transport and district cooling) and signing MOU with the related government entities to integrate the EE urban planning guidelines into existing regulations. ▪ ESCO market development through identifying key barriers to industry development, including technical, financial, and legislative issues, developing licensing schemes to certify Energy Services Companies (ESCOs), developing the national guide for Measurement and Verification (M&V). All of these resulted in licensing 45 Energy services companies.

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	<ul style="list-style-type: none"> ▪ More than 180 industrial plants are covered with the energy efficiency framework resulting in an improvement in the energy intensity level from 2011 to 2016 at the key process industries (phase I). ▪ Then the energy efficiency standards for electrical motors were updated and allowed for implementing MEPS in 2018, followed by establishing the energy management system infrastructure (e.g. ISO 50,001).
	<ul style="list-style-type: none"> ▪ There are as well ongoing efforts regarding: extending the existing industrial efficiency framework to Aluminum (phase II), expanding the scope of the industry to cover additional sectors (phase III), completing the design and implementation of the feedstock utilization efficiency regulation.
	<ul style="list-style-type: none"> ▪ The buildings sector represents about 28% of the primary energy consumed in the Kingdom. The sector's consumption of the total electric energy produced in the Kingdom has reached more than 75%, with an annual growth rate of about 7%. ▪ This-These increase rates are due to two main reasons; firstly, the low energy consumption efficiency in the electrical appliances used; and secondly, most buildings lack thermal insulation. ▪ Therefore, the Saudi Energy Efficiency Program (SEEP), to be prepared by SEEC, has implemented a series of secondary programs to rationalize electricity consumption in buildings including updating the standard specification for air conditioners and other household appliances, as well as standard specifications for lighting and air conditioning with large capacities. ▪ In the building sector, 26 energy efficiency standards and regulations were developed to improve the energy efficiency of buildings. Eight of these measures are mandatory labels which include; 15 insulation materials, small AC, large AC, 4 white goods (refrigerators & freezers, washing machines, clothes dryers and water heaters), 3 lighting products and 2 Saudi building code (SBC) regulation. ▪ In addition to increasing the energy efficiency rating (EER) requirements for split ACs. There are ongoing efforts as well in this sector regarding developing and launching the Energy Use

	<p>Intensity (EUI) Ecosystem targeting residential, commercial and government buildings to determine overall building efficiency.</p> <ul style="list-style-type: none"> ▪ These programs also included addressing the fact of more than 70% of existing residential buildings are lacking thermal insulation, as well as this fact, led to increase-increasing the consumption of energy used in refrigeration equipment by about (250) million equivalent barrels approximately during the past five years. ▪ As the thermal insulation contributes to reduce-reducing energy consumption in buildings by a rate ranging between 30 - 40%, SEEP has accelerated the implementation of the Royal Order, issued in 1431H, to oblige all new buildings to apply the thermal insulation. <p>This is carried out by updating the standard specifications for thermal insulation materials, determining the values of the thermal transfer coefficient of the buildings and monitoring their implementation as follow:</p> <ul style="list-style-type: none"> ○ Update (15) standard specifications for (10) new thermal insulation materials. ○ Apply the thermal insulation in a compulsory manner<u>Compulsorily apply the thermal insulation</u> in (24) cities in the Kingdom, as a first phase. It has started to apply the thermal insulation throughout the Kingdom of Saudi Arabia on 01/01/2019. ○ SEEC, in cooperation with the Saudi Building Code National Committee (SBCNC), has updated the Saudi code for energy rationalization 601 and 602 that contains the values of the thermal transfer coefficient of buildings, determining the thermal transfer coefficient of ceilings, floors, walls, windows, and glass doors, by dividing the kingdom into three climatic zones. ○ SEEP has developed a sustainable mechanism to monitor the application of thermal insulation and to ensure the compliance with the application of thermal insulation requirements. ○ After the application of all the previous procedures in the buildings, the energy consumption per building is expected to be reduced up to 50%.
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	<ul style="list-style-type: none"> ▪ The data of energy consumption in the industrial sector for the year 2018 was collected and audited from all iron, cement and petrochemical factories (176 factories). ▪ A comprehensive study was conducted to identify the opportunities and challenges that other industrial sectors face to improve their energy efficiency, as well as reviewing the final results of the 2020 -2024 stage. For the initiative to efficiently use feedstock, compare it with international standards, and present it to all factories covered under the scope.
	<ul style="list-style-type: none"> ▪ Key performance indicators (KPIs) in the utility sector were defined to calculate energy efficiency for each sector, and to develop models, Collect data, and provide a user guide, with setting a baseline for energy efficiency levels in electricity generation, Water desalination and co-production and issuance of reports.
	<ul style="list-style-type: none"> ▪ An updated version of the online portal was launched in the buildings sector to collect energy consumption data for entities With the issuance of the guideline for the Energy Management Program (for government buildings) in line with the standards of ISO50001, and its circulation to four government agencies in coordination with the Expenditure Efficiency Center, specialists also began preparing a specification for the seasonal energy efficiency factor (SEER)
	<ul style="list-style-type: none"> ▪ In the road transport sector, the second phase of the fuel economy standard (Phase CAFE Saudi II) was issued, which includes the fuel economy targets for the years 2021-2023, and the electronic portal for energy efficiency cards (sa.gov.sls) has been updated to include the new design of the electric card. Also, the "Center" specialists have completed a study of alternatives to preventing the import of used vehicles that do not align with energy efficiency standards.
	<ul style="list-style-type: none"> ▪ The obligatory-obligatory application of new cards in customs outlets and markets for household appliances has started with regard to inspection, control and certification. ▪ The second part of the lighting control has been applied in factories and outlets by customs, and the re-exportation (945064) of the products of the customs ports, and conducting 18 control visits on factories, warehouses and outlets.

	<ul style="list-style-type: none"> ▪ The number of companies licensed to provide energy efficiency services has reached more than (45) companies, and the Center has reviewed more than (34) projects received from the National Company for Energy Efficiency Services (rationalizing the electronic portal, approving and evaluating projects, and evaluating them). Through which requests for approval of projects in the governmental and private sectors will be received and studied.
	<ul style="list-style-type: none"> ▪ The initiative of high-efficiency air-conditioning devices. The number of citizens benefiting from the initiative in the year of the report reached more than 30 thousand citizens, whereby an electronic platform was established to connect the national factories and stores participating in the initiative, and follow up the workflow, audit and disbursement of sums. (A shop, with activating the sale through the electronic platforms of the participating stores.
	<ul style="list-style-type: none"> ▪ The Center developed a plan to spread awareness among the employees of government agencies and began to implement it. ▪ Saudi universities have started to study the Energy Efficiency Curriculum.
	<ul style="list-style-type: none"> ▪ The transport sector, where multiple initiatives were developed to improve the energy efficiency of the Light Duty Vehicles (LDVs) and Heavy Duty Vehicles (HDVs) in the country. ▪ The fuel economy label for light duty vehicles was implemented in 2014 and has been updated regularly. Secondly, the Tires Rolling Resistance and Wet Grip Standards were implemented in 2015. In addition to implementing the Saudi Corporate Average Fuel Economy Standards for light duty vehicles in 2016, which consequently led to significant improvements in the new fleet's fuel economy. ▪ The ongoing efforts in this sector are: launching the second phase of the Saudi Corporate Average Fuel Economy (CAFE) standard targeting new Light Duty Vehicles (LDVs), targeting on the road LDVs to improve the existing fleet's fuel economy by multiple initiatives, lastly implementing aerodynamic devices regulation for the Heavy Duty Vehicles (HDV).

4.14 Somalia:

Somalia	
Energy profile	<ul style="list-style-type: none"> ▪ The total installed capacity in Somalia is around 106 MW and power generation is entirely secured by diesel engines. ▪ Energy intensity is 3.1 GJ/capita. ▪ The total primary energy supply per capita equals 10.19 GJ (TPES/Capita).
Development of EE policies, laws and regulations	<ul style="list-style-type: none"> ▪ The target declared in the National Development plan (NDB) 2020-2024 is to increase the energy supply from both renewable and fossil fuel sources, and as a result increase access to energy from 15% to 45% of the population by 2024; or 6% growth in access per year.
Target of EE included in strategies/ NEEAP	<ul style="list-style-type: none"> ▪ Somalia neither has a NEEAP nor energy efficiency target. In addition, no energy efficiency entities exist.
Major Challenges facing EE sector	<ul style="list-style-type: none"> ▪ Most <u>The most</u> prominent barriers are technical, regulatory, policy, institutional, capacity, financial and economic barriers. Some of the barriers are listed below: <ul style="list-style-type: none"> ○ Lack of information, well-structured databases and planning tools for the energy sector; ○ Lack of dedicated EE policies and strategies with clear targets; ○ Lack of institutional backbone to adopt EE policies and spread out EE best practices; ○ Wide usage of charcoal, fuelwood, and agriculture residual wastes as it is available everywhere; ○ Efficient technologies are not cheap and need financing to be available to all income levels; ○ Inadequate capacity human capacity across all sectors (policy, regulatory, technology, project development) which hinder the development of the whole electricity sector; ○ Lack of communication and information channels to raise awareness of policy makers, investors, developers, contractors, and the public about the benefits of energy efficiency and potential savings with other positive impacts.

EE Actions "achieved and in progress"	<ul style="list-style-type: none"> Currently, RCREEE supports LAS to develop the National Energy Efficiency Action Plan (NEEAP) for Somalia. The Somalia's National Energy Efficiency Action Plan (NEEAP) is designed to support the Ministry of Energy & Water in promoting energy efficiency development. The plan provides a detailed road map, strategies, measures, and reforms that the country should undertake to overcome challenges hindering affordable and clean energy deployment.
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4.15 Sudan:

Sudan	
Energy profile	<ul style="list-style-type: none"> Total energy supply (TES) by source in 2018, Oil 6015 ktoe, Hydro 830 ktoe and Biofuels and waste 11779 ktoe. Electricity consumption reached 11.8 TWh in 2018. Annual Electricity Consumption Per Capita = 0.3 MWh/Capita The Electricity consumption is distributed distributed among different sectors as following: Residential Residential 690 ktoe, Industry 154 ktoe, Commercial and public services 219 ktoe, Agricultural and forestry 114 ktoe.
Development of EE policies, laws and regulations	<ul style="list-style-type: none"> In October 2012, Sudan adopted the National Energy Efficiency Action Plan (NEEAP) for 2013-2016, setting cumulative EE targets of 11.8% (32% by 2020). The electricity law 2019 includes four proposed measures for electrical energy efficiency: electrical energy efficiency card, electrical appliance and equipment, energy classification of electrical appliance and equipment and electro-energy audit. A higher committee chaired by a State Minister is following up on the implementation of the NEEAP, the direct follow-up is the responsibility of the Electricity Regulatory Authority (ERA) of Sudan. However, Sudan is facing challenges regarding: legislation and policies, comprehensive independent entity, energy data collection, funding and continuity. Especially that the electricity department has been under different authorities including the Ministry of Energy, Ministry of Water Dams and others. This continuous change of head authorities made it difficult to continue any previous plans. Unfortunately, this has been the case for the last few years.

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Target of EE by 2020 included in strategies/ NEEAP	<ul style="list-style-type: none"> ▪ The annual savings is about 4.21% from the total demand for electricity between 2017 and 2020.
The priority target segments	<ul style="list-style-type: none"> ▪ Sudan's energy efficiency objective is integrated into its national plan, which consists of energy saving in the generation (thermal, hydro), transmission and distribution procedures. ▪ Energy efficiency measures are also integrated at end-user level by decreasing the consumption of lighting in the residential sector through: <ul style="list-style-type: none"> ○ Replacing the tungsten lamps with LED. ○ Using of high efficiency appliances. ○ Decreasing the consumption in governmental buildings.
The expected results	<ul style="list-style-type: none"> ▪ EE programs in the residential sector is <u>is-are</u> expected to save about 876 GWh in 2020. ▪ EE programs in in the public sector is <u>is-are</u> expected to save about 658 GWh in 2020.
EE Actions "achieved and in progress"	<ul style="list-style-type: none"> ▪ EE programs in the residential sector concern: reducing the consumption of lighting, replacing one million tungsten lamps with (CFL & LED) lamps and increase this number by 2020 to reach 3 million thus correspondingly save about 876 GWh. ▪ In the public sector, the EE program includes the reduction of annual governmental buildings consumption of electricity by 193 GWh (15%) in 2016 and by 658 GWh in 2020. ▪ In the industrial sector, the actions are improving the power factor from 0.6-0.8 to 0.95 to reduce the monthly bill for the factories' owners and imposing a penalty on power factor less than 0.95. ▪ Sudan has a project of transforming the market to energy efficient lighting and air conditioners, this will be achieved by the following planned steps: <ul style="list-style-type: none"> ○ Development of a national strategy to advance energy efficiency in lighting and air conditioners as part of the National Energy Efficiency Action plan (NEEAP). ○ Adoption of regulatory mechanisms directing the market towards energy efficient lighting products and air conditioners, including minimum energy performance standards (MEPS), labelling scheme, testing and importing procedure.

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	<ul style="list-style-type: none"> o Adoption of monitoring, verification, and enforcement (MVE) system, to ensure that products in the market comply with the established MEPS. o Awareness-building of the new MEPS and regulatory mechanism. o Enhancing environmentally sound management of lighting products and air conditioners.
Additional measures	<ul style="list-style-type: none"> ▪ In Sep. 2020, the world bank announced a Sudan Energy Transition and Access Project, The project is designed to include four components. ▪ Component 1 will support short-terms measures to mitigate the ongoing power shortage through the use of decentralized solar PV generation and energy efficiency appliances. ▪ Component 2 will address electricity access deficits for households and public facilities through the use of solar PV systems. ▪ Component 3 will support the development of grid-scale solar and wind projects, including a—transaction support. It will contribute to reduce the sector dependency on costly thermal generation and address the supply deficit. ▪ Component 4 will support overall project management as well as the sector’s reforms and capacity building.

4.16 Syria:

Syria	
Energy profile	<ul style="list-style-type: none"> ▪ Total energy supply (TES) by source in 2018, Oil 7372 ktoe, Natural gas 2982 ktoe and hydro 65 ktoe. ▪ Electricity consumption reached 15.3 TWh in 2018. ▪ Annual Electricity Consumption Per Capita = 0.9 MWh/Capita ▪ The Electricity consumption distributed distributed among different sectors as following: Residential is 519 ktoe, Industry is 382 ktoe, Commercial and public services are 118 ktoe, not specified is 116 ktoe.
Development of EE policies, laws and regulations	<ul style="list-style-type: none"> ▪ In 2010, the first draft NEEAP has been prepared, covering four major sectors; industry, buildings, agriculture and transport. ▪ The draft NEEAP included measures to be implemented in the electricity sector and 4 other complementary measures that address the topic of media and private sector promotion to create energy services companies.

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	<ul style="list-style-type: none"> The NEEAP was halted due to the political situation in Syria.
Target of EE by 2030 included in strategies/ NEEAP	<ul style="list-style-type: none"> The overall target of the Syrian Arab Republic's energy policy aims at ensuring supply security by providing energy services to all segments of society at effective and affordable prices appropriate to Syrian economic conditions. The draft NEEAP also set a target for 2020 equal to <u>a_10%</u> reduction in energy consumption.
The priority target segments	<ul style="list-style-type: none"> Enhancing <u>Enhancing</u> energy efficiency on both the supply side through improving <u>the</u> efficiency of old power stations, depend on new technologies and the demand side with the concentration <u>concentration</u> on the residential sector.
The expected results	<ul style="list-style-type: none"> In accomplishing this goal, Syrian energy policy is faced with three main challenges: <ul style="list-style-type: none"> Expanding the gas market Sustaining oil production Developing the country's power capacity To overcome these challenges, the following general implementation measures are considered: <ul style="list-style-type: none"> Reconstructing damaged infrastructure Reducing technical losses and illegal consumption Improving energy efficiency Encouraging the use of renewables and nuclear options Establishing a cost oriented price policy Conserving oil and substituting it with gas;
EE Actions "achieved and in progress"	<ul style="list-style-type: none"> National Center for Energy Research is implementing many projects in the field of energy efficiency and renewable energies as labelling systems, PV for municipals, Insulation for buildings.

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Tunisia:

Tunisia	
Energy profile	<ul style="list-style-type: none"> Total energy supply (TES) by source in 2018, Oil <u>is_4664</u> ktoe, Natural gas <u>is_-5498</u> ktoe, Biofuel and waste <u>is_1090</u>, wind and solar <u>is_112</u> ktoe and hydro <u>is_1</u> ktoe. Electricity consumption-: reached 17 TWh in 2018. Annual Electricity Consumption Per Capita = 1.5 MWh/Capita The Electricity consumption <u>is_distrubted</u> distributed among different sectors as following: Resedential <u>Residential</u> 430 ktoe,

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	Industry 493 ktoe, Commercial and public services 387 ktoe, Agricultural and forestry 100 ktoe, Transport 9 ktoe.
Development of EE policies, laws and regulations	<ul style="list-style-type: none"> Tunisia's EE success hinges on effective EE planning and policy set forthoutlined in the country's long term national energy strategy "Energy 2030" and its current "New Program 2013 – 2020" that establishes the regulatory framework, implementation strategies, and financial incentives to increase the deployment of EE measures and technologies. The energy-saving action plan for 2017-2030 was developed in the context of the EE energy strategy horizon 2050. The energy-saving action plan represents a total investment of 27.1 billion dinars, equivalent to 11.3 billion US dollars.
Target of EE by 2030 included in strategies/ NEEAP	<ul style="list-style-type: none"> Tunisia has an action plan to accelerate Energy Efficiency Program–Under the final stage of approval-to reduce primary energy consumption by 17% in 2020 and 34% in 2030.
The priority target segments	<ul style="list-style-type: none"> Industries, tertiary and residential buildings, transportation, public lighting, agriculture and fisheries.
The expected results	<ul style="list-style-type: none"> The energy efficiency mitigation goal was based on a bottom-up approach by aggregating the CO2 reductions expected by different measures, which would represent an emission reduction of around 11.2 MtCO2 by 2030 according to the baseline scenario (BaU). These reductions would come from the energy efficiency in buildings including the tertiary sector, residential and public lighting (56%), industry (32 %) and transportation (11 %).
EE Actions "achieved and in progress"	<p>Main ongoing and planned EE measures and programs are summarized below:</p> <ul style="list-style-type: none"> Launch the "Alliance of Municipalities for Energy Transition" ACTE program: This program was designed to help municipalities control and implement local strategies for achieving energy and climate goals. Three hundred and fifty municipalities will be audited in this context. Increase the installed capacity of cogeneration to 730 MW in 2030 compared to 100 MW in 2017. Increase the number of program contracts to 2,500 in the three sectors of industry, services and transportation compared to 1,400 in 2017. Implement a smart grid development program by STEG. A pilot phase will be launched in Sfax's city with the installation of 400 smart meters.

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	<ul style="list-style-type: none"> • Launch a program to reduce the energy bill for low-income households: This program will concern nearly one million families whose consumption is less than 100 KWh per month. • Gradually scale up the approach that is based on the Energy Management System (ISO 50001) to all companies subject to periodic energy audit requirements. • Ban the use of incandescent light bulbs from 2018 and replace half of the bulb stock in residential and commercial buildings with LEDs by 2030. • Scale-up efficient public lighting. • Increase energy efficiency for household appliances, mainly by banning the marketing of those with poor energy performance and rapidly replacing the inefficient stock of refrigerators and air conditioners with energy efficient ones. • Reinforce the current thermal regulation for collective residential buildings and commercial buildings. • Release the "PROMO-ISOL programme" aimed at insulating 1.85 million existing buildings. • Establish and implement the Urban Mobility Plan (PDU) in 15 Tunisian cities of more than 100,000 inhabitants. • Introduce and promote the widespread use of hybrid and electric vehicles. • Improve the efficiency of agricultural machinery and fishing units. • Development of technical skills and national expertise for all the stakeholders involved in the sustainable energy deployment and launching awareness and dissemination campaigns to promote EE programs and initiatives. • Promote research and innovation capacity in the sector.
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4.17 Yemen:

Yemen	
Energy profile	<ul style="list-style-type: none"> ▪ Total energy supply (TES) by source in 2018, Oil 2972 ktoe, Natural gas 86 ktoe, Biofuel and waste 127, wind and solar 39 ktoe and coal 76 ktoe. ▪ Electricity consumption reached 2.8 TWh in 2018. ▪ Annual Electricity Consumption Per Capita = 0.1 MWh/Capita ▪ The Electricity consumption is distributed distributed among different sectors as following: Residential Residential 152 ktoe, Industry 6 ktoe, Commercial and public services 17 ktoe, non not specified 14 ktoe.

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Development of EE policies, laws and regulations	<ul style="list-style-type: none"> ▪ In 2009, the Ministry of Electricity and Energy prepared and published the National Strategy for Renewable Energy and Energy Efficiency. ▪ Baseline scenario aims to increase 15% of the power sector by 2025. While high and low scenarios aim to increase by 20% and 10% respectively. ▪ Although this strategy is not ratified, it is considered as-official in Yemen and national authorities are planning and budgeting based on announced targets.
Target of EE by 2025 included in strategies/ NEEAP	<ul style="list-style-type: none"> ▪ To decrease the energy consumption by 15% by 2025.
The priority target segments	<ul style="list-style-type: none"> ▪ Install solar water heaters and maintain old units. ▪ Encourage using efficient lamps. ▪ Enhance power factor in governmental buildings. ▪ Promote Energy audits in industrial facilities. ▪ Using Labelling system for appliances.
The expected results	<ul style="list-style-type: none"> ▪ The potential of energy saving according to the strategy of renewable energy and energy efficiency which is in the ratification phase reaches about 650 Gwh-GWh by 2025. ▪ For solar water heaters (SWH): is-are expected to install about 200,000 units to save about 457 GWh yearly from 2025.
EE Actions "achieved and in progress"	<ul style="list-style-type: none"> ▪ On May 3, 2020, the de facto authorities issued Laws No. 5 to No. 8 (2020), ratifying amendments to the Customs Tariff Laws, General Sales Tax Law and Income Tax Law. ▪ The legislative revisions are part of the economic measures under the Economic Revival and Recovery Strategy 2019-20, announced in January 2020. The amendments provide tax exemptions to support small businesses, strengthen local production of medicine, and facilitate renewable energy investment to reduce reliance on imported fuel products.

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5 Progress and Achievements in Energy Efficiency

One of the key factors for the success in implementing action plans related to EE in the Arab countries is to design a monitoring mechanism to facilitate following up the progress of actions in different countries. In addition, to determine the gaps in executing the plans which need immediate actions to complete the progress. EE targets are scattered among different sectors including transport, building, industry, etc. while the monitoring process is a very challenging process that involves several stakeholders and is linked to data availability, consolidation process and national coordination through integrated cross-sectoral management.

Due to the absence of evaluation tools to measure updated achievements in most of countries, many efforts are done in this field to reach an adequate framework to tackle the progress of EE in different countries. Nevertheless, we could take four main indicators to measure the progress of EE in the region as they reflect the regulations and policies infrastructure for EE in each country. The figures used below are ~~represents~~ Regulatory Indicators for Sustainable Energy (RISE website 2020) Which is produced by the Global Energy and Extractives Practice of the World Bank Group.

The methodology is to give a score for each indicator per each country according to the actions achieved regarding this indicator, there are four selected indicators as measures to check the progress which are financing mechanisms for energy efficiency, national energy efficiency planning, energy efficiency entities and minimum energy efficiency performance standards.

The following radar chart indicates the progress between the year 2010 and 2019 among the four pillars, where the first two indicators which are the national energy efficiency planning and energy efficiency entities have a massive development during the last decade. In addition, minimum energy efficiency performance standards have ~~raised~~ with reasonable steps towards achieving EE progress in different Arab countries throughout the same period. On the other hand, targeting different financing mechanisms for energy efficiency in Arab countries need to exert more efforts to facilitate achieving different EE targets.

The countries are classified into two regions, group I ~~are~~ the Arab countries in ASIA (Bahrain -Jordan-Kuwait-Lebanon-Qatar-Saudi Arabia-Yemen), and group II ~~are~~ for the Arab countries in Africa (Morocco- Algeria- Tunisia - Egypt- Sudan - Somalia). All the Arab countries in the report are tracked in the scoring system except (Djibouti -Iraq- Libya- Palestine-Syria) due to the lack of data in the RISE report and current circumstances.



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Progress for the main EE indicators between 2010 – 2019 in the Middle East countries –
Source-: RISE Report ~~2021~~2020

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A- National energy efficiency planning

This section shows the greatest improvement since 2010 for different countries in each group, as most of countries in the region have national energy efficiency action plans (NEEAP) and special programs for EE activities.

In group I countries, Saudi Arabia and Lebanon lead countries in planning different EE methodologies. In 2016, Bahrain has a turning point from the lowest score to the top as a result of the endorsement of their first NEEAP which includes 22 initiatives and measures that were fixed and endorsed in the plan to support the achievement of the national energy efficiency target and are expected to collectively produce energy savings of 5,800 GWh on a primary energy equivalent basis in the year 2025. Kuwait, Qatar and Yemen are on their way towards national energy efficiency planning as they update their progress in the last years.

In group II countries, Morocco, Tunisia, Egypt and Sudan have tangible progress in the planning process for EE. All of these countries have NEEAP with different phases as well as full strategies for energy include long term targets for EE. Somalia is expecting to hit a high

record this year as their first National Energy Efficiency Action Plan (NEEAP) has been developed by LAS and RCREEE.

B- Energy efficiency entities

One of the most effective pillars in implementing EE actions among different countries is to have a specialized entity for EE in the country. Mandates of EE entities are extended to follow up the progress of EE activities, put executing schedules, select proper financing mechanisms as long as collecting required data for benchmarking EE measures.

In group I countries, most of the countries have very good EE infrastructures either with an entity or a national committee to follow up EE progress among national stakeholders. Lebanon, Saudi Arabia and Bahrain are on the top of the figure as they have entities for monitoring EE initiatives and measures.

In group II countries and since for more than five years, countries as Morocco, Tunisia, Egypt, Algeria have definite entities to implement EE progress in their countries. In formulating their NEEAPs, Sudan and Somalia have to define a national committee or entity for keeping the progress of EE among countries.

C- Minimum energy efficiency performance standards

A minimum energy performance standard (MEPS) is a specification, containing a number of performance requirements for an energy-using device, that effectively limits the maximum amount of energy that may be consumed by a product in performing a specified task. Followed by energy efficiency entities and incentives. Meanwhile, the indicator on MEPS for energy efficiency showed the least improvement, as countries appear to have been slow to adopt definite indicators for EE.

In group I countries, Saudi Arabia and Jordan have definite standards for different consuming activities. On the other side, Yemen, Lebanon, Bahrain and Kuwait have to define EE indicators for appliances, buildings and different categories among their countries.

In group II countries and except Algeria, most of the countries have low rating scores below 50% as they cannot define a special standard for their consuming facilities. A massive effort is needed in updating their NEEAPs to pave the way for completing their MEPS.

D- Financing mechanisms for energy efficiency

All NEEAP for different countries lightened the diversity of obstacles preventing energy efficiency investments across national markets. Lack of available and sustainable funding mechanisms is the major and common obstacle in different cases. In this section, the following figures illustrate the improvement of financing mechanisms among different countries.

In group I countries, Jordan has a great record as there are definite facilities for funding energy efficiency activities. In addition, Lebanon is on track for providing different funding mechanisms for energy efficiency activities, especially for the residential sector.

In group II countries, Morocco and Tunisia are made a lot of procedures in the same context, While Algeria and Egypt have recent regulations to encourage investments in the field of EE.

On the other hand, Sudan and Somalia need more improvement to adopt different funding mechanisms for implementing EE actions.

6 National Renewable Energy Action Plan Progress

The current crisis has huge consequences for global economies, energy use and CO₂ pollution, beyond the direct effects on health. Countries in full lockdown are experiencing an average drop in energy demand each week of 25 percent and countries in partial lockdown are experiencing an average decrease of 18 percent.

As a consequence of lockout measures, electricity demand has been drastically decreased. During times of complete lockout in many nations, electricity demand has been reduced by 20 percent or more. Demand reductions have increased the share of renewables in the supply of electricity, as demand is essentially unaffected by their production. Demand for all other electricity sources, including coal, gas and nuclear power, dropped.

Oil demand was also severely affected, down nearly 5%, largely due to a decline in mobility and aviation, accounting for nearly 60% of global oil demand. The only cause of growth in demand, driven by larger installed capacity and priority dispatch, was renewables. Because of low operating costs and preferential access to many power systems, renewable energy demand is projected to grow. Recent capacity expansion, with some new projects coming online in 2020, would also boost output.

In 2020, the overall worldwide usage of renewable energy should be increased by around 1%. The expansion of solar, wind and hydro power is expected to enable renewable electricity production to increase by almost 5 percent in 2020, despite supply chain disruptions ~~which~~ that have paused or postponed operation in many main regions.

Renewables account for nearly 30 percent of the world's energy production, according to the IEA, halving the coal deficit (from 10 percentage points in 2019). As supply chain delays and labor constraints slow construction, the rate of renewable power capacity additions could decline in 2020. In reaction to the economic crisis, the length and scale of lockdowns and social distancing measures in various countries, along with the nature and timing of economic stimulus packages, would affect the total for the year.

In the Arab regions, Service-oriented, oil export-dependent economies are particularly vulnerable to COVID-19. A predominantly young population faces the risk of pronounced unemployment, but may also constitute a potential resource for effective national mobilization in recovery. The Arab region is expected to lose \$35 billion out of \$1 trillion in exports because of the COVID-19 crisis, minus oil revenue losses. In addition, considering that much of the region's exports are energy-related, the global drop in oil prices and steep cuts in demand means s that the region will see its oil and gas revenues drop from \$329 billion in 2019 to \$197 billion in 2020 (equivalent to ~~40 % per cent~~ 40 % loss).

Renewables are one option and there is an abundance of solar capacity in the region that is being installed in a range of countries, including, among others, Saudi Arabia, the UAE, Oman and Qatar. The dilemma we are now facing is to ensure that declining oil and gas export

revenues do not derail attempts to diversify the economies of the country and prepare their energy systems to absorb a broader range of energy sources, including wind, solar and nuclear power.

In the following tables, the renewable energy targets included in different energy strategies will be highlighted. In addition, the progress for RE institutional framework and regulations in the past period will be mentioned. Afterwards, Current RE capacities and projects ~~as well as future RE projects among projects in pipeline, as well as future RE projects among projects in the pipeline,~~ will be illustrated for different countries.

6.1 Algeria:

Algeria																																	
Renewable Energy Targets Strategies	<ul style="list-style-type: none"> ▪ The Algerian National Program for Renewable Energy and Energy Efficiency 2030 consists of installing renewable energy capacities of around 22,000 MW by 2030 for the national market. ▪ This means that around 37% of installed capacities by 2030 will be from renewable and this will be translated to 27 % target for RE share in electricity generation by 2030. ▪ Renewable electricity production projects dedicated to the national market will be carried out in two steps: <ul style="list-style-type: none"> ○ First phase 2015 - 2020: The RE capacities foreseen are 4010 MW including photovoltaic and wind energy, as well as 515 MW, between biomass, cogeneration and geothermal energy. ○ Second phase 2021 - 2030: The development of the electrical interconnection between the north of Algeria and the Sahara (Adrar), will allow the installation of large renewable energy plants in the regions of In Salah, Adrar, Timimoune and Bechar and their integration into the system national energy. 																																
% of RE by 2030: 27% (22 GW)	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr style="background-color: #4a7ebb; color: white;"> <th style="font-weight: normal;">Unit: MW</th> <th style="font-weight: normal;">1st Phase 2015- 2020</th> <th style="font-weight: normal;">2nd Phase 2021-2030</th> <th style="font-weight: normal;">Total</th> </tr> </thead> <tbody> <tr> <td style="font-weight: bold;">Photovoltaic</td> <td>3000</td> <td>10575</td> <td style="font-weight: bold;">13575</td> </tr> <tr> <td style="font-weight: bold;">Wind</td> <td>1010</td> <td>4000</td> <td style="font-weight: bold;">5010</td> </tr> <tr> <td style="font-weight: bold;">CSP</td> <td>-</td> <td>2000</td> <td style="font-weight: bold;">2000</td> </tr> <tr> <td style="font-weight: bold;">Cogeneration</td> <td>150</td> <td>250</td> <td style="font-weight: bold;">400</td> </tr> <tr> <td style="font-weight: bold;">Biomass</td> <td>360</td> <td>640</td> <td style="font-weight: bold;">1000</td> </tr> <tr> <td style="font-weight: bold;">Geothermal</td> <td>5</td> <td>10</td> <td style="font-weight: bold;">15</td> </tr> <tr style="font-weight: bold;"> <td style="font-weight: normal;">Total</td> <td>4525</td> <td>16475</td> <td>22000</td> </tr> </tbody> </table>	Unit: MW	1 st Phase 2015- 2020	2 nd Phase 2021-2030	Total	Photovoltaic	3000	10575	13575	Wind	1010	4000	5010	CSP	-	2000	2000	Cogeneration	150	250	400	Biomass	360	640	1000	Geothermal	5	10	15	Total	4525	16475	22000
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Progress for RE institutional framework Regulations	<ul style="list-style-type: none"> ▪ Algeria has made many institutions arrangements to integrate renewable energies and thus diversify its energy resources in order to initiate its energy transition. ▪ To this end, several public institutions were created to support this target, including: 																																

	<ul style="list-style-type: none"> ○ Department of New and Renewable Energies and Energy Efficiency under the supervision of the Ministry of Energy. ○ Department of Development, Promotion, and the Valorization of Renewable Energies under supervision of Ministry of the Environment and Renewable Energies. ○ The Renewable Energies Commission and Energy Efficiency (CEREFÉ) is an entity to support the implementation and evaluation of national policy, in the field of energy renewables and energy efficiency which Created with the Premier Minister executive decree no. 19-280 of 20 October 2019. ○ Ministry of Energy Transition and Renewable Energies is created following the reshuffle Ministerial of June 23, 2020.
<p>Current RE capacities and projects</p>	<ul style="list-style-type: none"> ▪ Algeria’s current installed solar power capacity is 389.3 MW includes the following: <ul style="list-style-type: none"> ○ The solar PV plants were initially launched <u>in</u> 2014 and enter into service by SKTM (22 in number) with a total- of 343 MW. ○ A pilot CSP project with a capacity <u>of</u> 25 MW. ○ Some different small PV projects with capacities <u>of</u> 21.3 MW. ▪ In addition, there are about 21,375 KW <u>off-off</u>-grid Solar PV applications, 9146 KW by the Ministry of Interior and Local Authorities and Regional Planning (MICLAT) and 4197 KW by the Ministry of Agriculture and Rural Development (MADR).
<p>Future RE projects and Projects in Pipeline</p>	<ul style="list-style-type: none"> ▪ “Tafouk1” This is the name of the mega solar project that will soon be launched in Algeria. <ul style="list-style-type: none"> ○ The project provides for the construction of several photovoltaic solar power plants. These will have a cumulative capacity of 4,000 MW. ○ The work will be carried out over the period from 2020 to 2024. ○ They will cost up to 3.6 billion dollars to the State, the equivalent of nearly 390 billion Algerian dinars. ○ The power plants will be spread over a dozen <u>wilayas</u> districts in Algeria and will mobilize a total area of about 6400 hectares. Their construction should create 56,000 jobs during the construction phase and 2,000 jobs during the operation phase. ▪ Ministry of Energy <u>are-is</u> going to propose to financial partners, two projects of 500 megawatts each, made up of small plants of 50 MW, 100 MW or 150 MW.

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	<ul style="list-style-type: none"> ▪ The two new programmes to produce electricity from solar power plants, with a cumulative capacity of 1000 MWp.
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6.2 Bahrain:

Bahrain	
Renewable Energy Targets Strategies	<ul style="list-style-type: none"> ▪ The sustainable energy unit with the support of UNDP Bahrain prepared the first NREAP for the kingdom of Bahrain that was adopted in 2017. ▪ Based on a broad survey of Bahrain’s resource potential, the economic viability of various renewable energy technologies, the current energy situation, and the country’s unique geographical conditions, the plan sets a national renewable energy target of: <ul style="list-style-type: none"> ○ 5% by 2025 ○ 10% by 2035 ▪ Achieving 5% by 2025 will have the following impact: <ul style="list-style-type: none"> ○ Clean energy generation of approximately 480 GWh per year. ○ Annual savings of 5,700,000 MMBTU of natural gas. ○ Annual financial savings of Bahraini Dinar 1.6 million. ○ Reduction in greenhouse gas emissions by 392,000 tons of CO2 per year. ○ The attraction of more than Bahraini Dinar 140 million of investment. ▪ The targets are based on the projected peak load electricity capacities, excluding the industry’s generation, and equate to 255 MW of installed capacity by 2025 and 710 MW by 2035. ▪ The targets will be met by a proposed renewable energy mix consisting of solar, wind, and waste to energy technologies. ▪ Decentralized generation is targeting 100-150 MW, Large scale generation target is between 50-100 MW, and the offshore generation target is 50 MW.
Progress for RE institutional framework and Regulations	<ul style="list-style-type: none"> ▪ Established in late 2014, it is the designated agency for promoting sustainable energy policies and practices in the Kingdom of Bahrain. As such, the SEU is leading the coordination efforts in implementing the NEEAP and NREAP and will provide technical assistance in the design and implementation of specific initiatives. ▪ In February 2018, the Minister of Electricity and water affairs announced the net metering in Bahrain to encourage the

	<p>integration of the renewable energy into Bahrain's power system.</p> <ul style="list-style-type: none"> For the preparation of the launching of the Net Metering, the SEU has delivered a training course, awarding 33 installers a Solar PV Installers Certification.
	<p>feed-in tariff-:</p> <ul style="list-style-type: none"> Attract private investors to develop renewable energy projects through a competitive procurement process.
	<p>Renewable energy mandate for new buildings-:</p> <ul style="list-style-type: none"> Require new buildings and real estate developers to integrate renewable energy technologies in the building design.
<p>Current capacities and projects</p>	<p>RE and</p> <ul style="list-style-type: none"> Bahrain World Centre has integrated three wind turbines projected to be providing a total of between 1,100 and 1,300 MWh per year which represents 11% to 15% of the office towers electrical energy consumption. Bahrain first grid-connected renewable energy pilot project is the 5 (MW) PV project owned by Bahrain Petroleum Company (Bapco). Dar Al Nakheel Green Building was a project initiated by Bapco, demonstrating the use of 4 kW Solar (PV) and 5.1 kW Wind Power. Tatweer Petroleum commissioned its own ground-installed 1 (MW) PV project at one location in a Southern part of Bahrain. Solar PV irrigation units were installed in different areas across the governorates, providing about 200 W to the units which each equipped with an automatic irrigation system. Gulf Petrochemical Industries Company (GPIC) installed 5 kW solar thermal system with a total capacity of 1600 litre/hour with a saving of 14181 kW/year power consumption. In addition to different projects in Solar Powered Bus, Shelters Street Lighting and Solar Powered Mosques.
<p>Future RE projects and Projects in Pipeline</p>	<ul style="list-style-type: none"> A project owned by the Electricity and Water authority of a five MW wind and solar power plant, EWA built 2 MW wind power and 3 MW solar power as a poth-pilot plant. The project which cost USD 17.1 million is still under construction.

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	<ul style="list-style-type: none"> ▪ Considered the country’s first large-scale PV power plant, the project was commissioned to generate 100 MW through solar power, Al Askar PV IPP is an independent power plant being constructed on a build, own, operate model at the Askar landfill site, in Bahrain’s southern governorate. ▪ A consortium led by ACWA Power, Mitsui and Almoayyed Contracting Group WLL submitted the lowest bid of 14.668 Bahraini Dinar /MWh (\$39.1) for electricity to be generated by the project to the Electricity and Water authority Authority as an off-taker.
	<ul style="list-style-type: none"> ▪ Sustainable Energy Authority (SEA), Bahrain announces the bid results for the project” Installation of Cumulative 3MWp (AC) Grid Tied Solar PV Rooftop Power Plants.

6.3 Djibouti:

Djibouti	
Renewable Energy Targets	-
Strategies	<ul style="list-style-type: none"> ▪ Djibouti has set goals to use energy resources that are safe and countable. The goal set by 2035 is to have 100% generated energy from renewable sources, also, to lower the electricity purchase tariff from 30 cents to 17-20 cents.
% of RE by 2035: 100% (1 GW)	
Progress for RE institutional framework Regulations	-
	<ul style="list-style-type: none"> ▪ Djibouti authorities are taking major measures to improve the regulatory framework of the sector. A nNew legislation, adopted in 2015, would allow private operators to produce energy from renewable sources and supply the national grid. ▪ In addition, a law allowing for a tax exemption for all clean energy equipment was enacted in May 2015. ▪ currently, the Ministry of Energy and Natural Resources is developing its first National Renewable Energy Action Plan NREAP in cooperation with LAS and RCREEE.
Current capacities and projects	RE and
	<ul style="list-style-type: none"> ▪ Currently, Djibouti imports 80% of its electrical energy from Ethiopia (from RE sources) and locally produces 120 MW. ▪ Djibouti has an abundant RE source which is geothermal, currently, there are high efforts to utilize this source efficiently and effectively. However, there is a high effort to have policies, plans and strategies to address renewable energy.

Future RE projects and Projects in Pipeline	<ul style="list-style-type: none"> ▪ The construction of the first ever Djibouti green renewable project has recently been announced. ▪ The 59 MW wind farm will be situated in the Gulf of Tadjour near the Goubet cove and is expected to be operational by mid-2021. ▪ The consortium has already signed a power supply agreement for a term of 25 years with Djibouti's national electricity firm, Electricité de Djibouti.
	<ul style="list-style-type: none"> ▪ The Djibouti government has approved a 30 MWp solar power plant in Grand Bara. ▪ The solar power plant will be built as part of a public-private partnership (PPP).
	<ul style="list-style-type: none"> ▪ In a three-phase program, the African Development Bank's board of directors accepted an additional \$3.22 million in financing for geothermal exploitation programs, taking the overall investment to \$24.73 million. ▪ First, the discovery of the area in question will be carried out to validate the characteristics of the geothermal resource; Then, the development of the geothermal field and the installation of a 20 MW power plant; and finally, the expansion of the 50 MW power plant capacity.

6.4 Egypt:

Egypt	
Renewable Energy Targets Strategies	<ul style="list-style-type: none"> ▪ In October 2016, the National Sustainable and Integrated Energy Strategy 2035 has been ratified. Egypt has a target to produce 20% of its energy from renewable energy sources in 2022. For the long-term projection, Egypt fixed an ambitious RE goal of 42% in 2035. ▪ Currently, the Integrated Energy Strategy 2035 is under revision and the share of RE into the grid will be updated.
% of RE by 2035: 42% (54 GW)	
Progress for RE institutional framework Regulations	<p>Egypt has successfully created a conducive business environment for private investments through:</p> <ul style="list-style-type: none"> ▪ Tariff reform program: which <u>was</u> announced in July 2014 for five years up to 2019. According to the new variables such as fuel prices, floating exchange rate, the government has decided to extend the plan for tariff reform to three years ended by 2021/2022.

	<ul style="list-style-type: none"> ▪ Electricity market reform: A new electricity law has been issued in July 2015, which has been designed to reflect the ongoing market reform and will establish a gradually liberalized electricity market, encouraging the renewable energies and the energy efficiency. ▪ The Executive Regulation for implementing the law was issued. ▪ The electricity sector is working towards liberalizing the electricity market and enhancing competition in the field of electricity production and restructuring the Egyptian Electricity Transmission Company to be an independent company. It will be a Transmission system operator (TSO) after converting the electricity market into a free market and converting the company to be with a huge investments by liberalizing the price of electricity according to the supply and demand mechanisms. <hr/> <ul style="list-style-type: none"> ▪ A presidential decree has <u>been</u> issued to modify <u>the</u> New & Renewable Energy Authority establishment law to allow it to establish companies by itself or in partnership with the Private sector. <hr/> <ul style="list-style-type: none"> ▪ Issuing Renewable Energy Law in December 2014, to encourage generating the electricity from RE sources through 4 development schemes as follows: <ul style="list-style-type: none"> ○ Governmental Projects scheme: by NREA via EPC contracts. ○ The competitive bids scheme: "Build, Own and Operate" (BOO). ○ Independent Power Producer (IPP) scheme: This mechanism allows the investor to sell the electricity generated from his project directly to the end user through using the national grid with a wheeling charge. ○ Feed-Feed-in Tariff scheme (FIT): In 2014 Government of Egypt has announced <u>a</u> target of 4300 MW of both solar and wind energy with attractive prices. The second phase of FIT was announced in 2016. <hr/> <ul style="list-style-type: none"> ▪ The Egyptian Government role in supporting the renewable energy includes: <ul style="list-style-type: none"> ○ About 7650 Km² have been allocated for Implementing RE projects with <u>an</u> expected potential of 35 GW from wind energy and 55 GW from Solar. ○ Availability of the related information ○ Long-term PPA
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	<ul style="list-style-type: none"> o Governmental guarantees o Customs are is 2% o The investors will enjoy benefiting from carbon credits o Environmental Impact Assessment studies and others o The governmental Guarantee of financial obligations has been issued
<p>Current capacities and projects</p>	<p>RE and</p> <ul style="list-style-type: none"> ▪ During the past two years, the private sector investments exceeded USD 3 billion, with the contribution of USD 2 billion allocated for Benban complex. ▪ A total of 1375 MW of Wind power classified-classified as following: <ul style="list-style-type: none"> o 545 MW in Zaafarana and 580 MW in Gulf Suez, in cooperation with (Denmark-, Germany-, Japan, EU-, Spain) o 250 MW as the first IPP wind power project is constructed under the Build-Own-Operate (BOO) scheme in the Gulf of Suez, close to Gabal El Zayt from Consortium (Engie-Toyota-Orascom). ▪ A total of 1665 MW of solar power classified-classified as following: <ul style="list-style-type: none"> o 140 MW Concentrated Solar Power CSP Kurymat (20 MW Solar + 120 MW Thermal). o 40 MW Remote areas not connected to Grid. o 120 MW (Net Metering – Roof top) o 1465 MW in Benban solar park, 32 international and local investors were involved to implement Benban Solar Park project, the largest one in the Medial East and Africa located in one place in Aswan. ▪ A total of 2832 MW of hydropower
<p>Future RE projects and Projects in Pipeline</p>	<p>750 MW under implementation wind power projects:</p> <ul style="list-style-type: none"> ▪ PPA was signed for a 250 MW from Lekela Power in Suez Gulf under the BOO scheme. ▪ 500 MW from Consortium “Engie-Toyota-Orascom” under BOO scheme. ▪ The global dynamics of the Egyptian energy markets have contributed to providing a competitive and transparent environment leading to a new record in the field; less than cent US\$ 2.5 /kWh for solar energy projects and Cent US\$ 3 /kWh for wind energy projects.

	<ul style="list-style-type: none"> ▪ Egypt is also working on creating create new business opportunities with a focus on electric-vehicle, waste to energy, and water desalination.
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6.5 Iraq:

Iraq	
Renewable Energy Targets Strategies -	<ul style="list-style-type: none"> ▪ Iraq is one of the world's top five oil producers and holds the fifth-largest proven oil reserves in the world with around 140 billion barrels. ▪ Despite the abundance of fossil resources, the electricity sector in Iraq faces significant challenges as a result of the political instability over the past years. ▪ To overcome existing electricity challenges characterized by a high share of diesel power generation and the lack of reliability and capacity of Iraq's electricity supply, the government of Iraq plans to promote renewable energy deployment considered among the most suitable solutions to guarantee the security and stability of the grid. ▪ According to the 2017's solar Plan Iraq has a national PV target of 2695 MW.
% of RE by 2025: 20% (2.24 GW)	
Progress for RE institutional framework Regulations -	<ul style="list-style-type: none"> ▪ Iraq has laws and legislations for renewable energy under validation by the government, in addition to several incentives and initiatives for renewable energy that are currently being shaped, in collaboration with local banks. ▪ A dedicated RE entity, derisking investments and securing finance are the main challenges facing the implementation of the RE national plan and programs. To achieve planned targets, Iraq launched public awareness campaigns through TV, radio, newspaper, social media, posters, exhibitions, lectures and workshops, in addition to the implementation of capacity development activities and experience exchange related to renewable energy technologies. ▪ Steps <u>were</u> undertaken by the government to promote renewable energy. <ul style="list-style-type: none"> ○ In addition to arranging an open, transparent and fair reverse auction, the government has declared the cancellation of a

	<p>previously identified impractical FIT of 3.5 US cents dollar/kWh USc/KWh.</p> <ul style="list-style-type: none"> ○ The Electricity Law No. (53) Of 2017 regulates “supporting and encouraging the adoption of renewable energy, its activities and nationalization” under the Ministry of Electricity. ○ The Ministry of Electricity has passed a proposed Renewable Energy law. With the assistance of the UNDP Regional Center for Renewable Power and in collaboration with the High Central Commission for Sustainable Energy in Iraq, the Law was drawn up with the goal of: Enabling and utilizing to enable and utilize renewable energy in Iraq, achieving sustainable energy development, increasing the addition of renewable energy to the energy mix and contributing to energy security, and protecting the environment and mitigating climate change. 																								
<p>Current capacities and projects</p>	<p>RE and</p> <ul style="list-style-type: none"> ▪ The national RE plan for 2019-2022 contains 7 new projects using PV-these projects that have different ranges for the project capacity (with a minimum of 30 MW to a max of 300 MW). ▪ This indicates the country’s political commitment toward RE deployment. The ministry of electricity in Iraq launched in-2019 a tender for the construction of 775MW solar projects. This project will be enough to power 250,000 houses and create 1300 Jobs. ▪ A first in the history of Iraq's electricity sector. These projects are supposed to be finished within 12 months from the stage at which the Independent Power Producer (IPP) model allocates projects to developers. ▪ These projects are set to become operational by the end of 2021. They include: <table border="1" data-bbox="440 1360 1021 1581"> <thead> <tr> <th>Project</th> <th>Capacity (MWp)</th> <th>Province</th> </tr> </thead> <tbody> <tr> <td>Sawa-1</td> <td>30</td> <td>Muthana</td> </tr> <tr> <td>Sawa-2</td> <td>50</td> <td>Muthana</td> </tr> <tr> <td>Khidhir</td> <td>50</td> <td>Muthana</td> </tr> <tr> <td>Iskandariya</td> <td>225</td> <td>Babil</td> </tr> <tr> <td>Jissan</td> <td>50</td> <td>Wassit</td> </tr> <tr> <td>Karbala</td> <td>300</td> <td>Karbala</td> </tr> <tr> <td>Diwania</td> <td>50</td> <td>Diwania</td> </tr> </tbody> </table>	Project	Capacity (MWp)	Province	Sawa-1	30	Muthana	Sawa-2	50	Muthana	Khidhir	50	Muthana	Iskandariya	225	Babil	Jissan	50	Wassit	Karbala	300	Karbala	Diwania	50	Diwania
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<p>Future RE projects and Projects in Pipeline</p>	<ul style="list-style-type: none"> ▪ The Ministry of Finance and the Central Bank of Iraq have finalized a simple loan scheme (with a maximum interest rate of 4 percent) via public and private banks to finance capital 																								

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	<p>investment and installation costs for roof-top solar households (3 kW, 5 kW, 10 kW and more).</p> <ul style="list-style-type: none"> ▪ Iraq follows a free-free market approach by encouraging developers to bid various rates on the basis of <u>based on</u> Build-Own-Operate (BOO) and IPP (Independent Power Producer) projects with the least ones being awarded. ▪ Iraq is also able to offer protection (without charge) to suppliers of electricity on a utility-utility scale to reduce risks. ▪ A wind energy project with 100 MW targeted capacity is in the tendering phase, in addition to a new hydropower project with a targeted capacity of 25 MW to be contracted as well.
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6.6 Jordan

Jordan	
<p>Renewable Energy Targets -</p> <p>Strategies</p> <p>% of RE by 2025: 15% (3.22 GW)</p>	<ul style="list-style-type: none"> ▪ Jordan is acknowledged as one of the leading countries in promoting renewable energy in the Arab region where RE contributes to about 23% of the installed capacity and about 10.8% of the generated electricity. ▪ The Kingdom of Jordan committed itself to a clear and sustainable energy policy path by promoting renewable energy projects. Jordan has set up the "Master Strategy for Energy Sector 2015-2025" with an ambitious target for renewable energy (RE) to reach 15% of generated electricity by 2025. ▪ The energy sector strategy has been recently updated to cover the period (2020-2030) whereby <u>in</u> 2030, around 48.5% of the country's electricity generation would come from local energy sources. Currently, it stands at only 15%. ▪ Jordan's government aims to expand power generating capacity to 3.22 GW by 2025 from renewable sources. ▪ The kingdom would gradually reduce dependence on imported natural gas for its power plants by expanding oil shale production, alongside renewable power generation capacity connected to the grid. ▪ The renewable energy sector saw a significant boom after 2015 with the implementation of solar and wind utility-utility scale projects. Under the 2015-2025 strategy, the Government of Jordan, in cooperation with the technical assistance of the EU funded project "Renewable Energy & Energy Efficiency Programme II (REEE II – TA)" updated its National Renewable

	<p>Energy Action Plan (NREAP) for the coming 5 years in cooperation with RCREEE expertise.</p> <ul style="list-style-type: none"> ▪ The updated NREAP proposed 14 measures targeting some additional areas such as information and indicators, policies and support schemes, grid integration, awareness raising & capacity development, geopolitics and others. ▪ Jordan depends on its projected 40 billion tons of oil shale deposits to increase the market for energy supplies. ▪ The nuclear energy strategy of Jordan aims to produce electricity through nuclear reactors for electrical loading and desalination of water.
<p>Progress for RE institutional framework Regulations</p>	<ul style="list-style-type: none"> ▪ Jordan follows a policy of 4-tracks-approach to develop renewables: Direct Proposal scheme, competitive bidding, EPC turnkey projects and small scale RE schemes (Net Metering). ▪ Similarly, the regulatory framework had different adjustments which included renewable energy and energy efficiency law No. (13) of 2012 that has been amended in 2014, this law allows investors to identify and develop grid-connected electricity production projects through the direct proposal submission, in addition to bylaw No. (50) of 2015 of direct proposal submission for renewable energy projects that governs the process of direct proposal submission renewable grid-connected electricity production projects. ▪ Moreover, Jordan set a directive on the reference price list record for the calculation of electrical energy purchase prices (ceiling prices) from different RE technologies. ▪ Another important directive is the one governing the sales of electrical energy generated from small RE systems (rooftop) with fixed purchase prices (Net-Metering), and another directive governing the electric power wheeling for self-consumption, as well as a directive on the costs of connecting RE facility to the electrical system. ▪ There were several bylaws; bylaw No. (10) of 2013 which is amended in 2015, 2017 and 2018, on tax exemptions for RE and EE systems and equipment, bylaw No. (73) of 2012 on regulating procedures & means of conserving energy & improving its efficiency, bylaw No. (49) of 2015 on establishing the Jordan Renewable Energy and Energy Efficiency Fund (JREEEF).

Current capacities and projects	<ul style="list-style-type: none"> ▪ At present, 716 megawatts of solar photovoltaic (PV) capacity are in use and a further 636 megawatts of solar PV are being installed. Jordan is on track to surpass 20% of renewable energy produced by 2020. ▪ In 2015, a 117-megawatt wind farm in Tafleeh was introduced. There are currently 279 megawatts of wind power in service. ▪ The private sector has invested hundreds of millions in solar and wind renewable projects in recent years with a total of 2,400 megawatts (MW) by the end of 2020. This is expected to rise to 3,200 megawatts (MW) in 2030.
Future RE projects and Projects in Pipeline	<ul style="list-style-type: none"> ▪ An additional 334 megawatts of being installed wind power. ▪ Transmission and distribution companies work to upgrade their networks. NEPCO is also looking at ways to expand its grid capacity to meet the additional power generated by installation traditional and renewable energy projects.

6.7 Kuwait

Kuwait	
Renewable Energy Targets – Strategies	<ul style="list-style-type: none"> ▪ Kuwait has no dedicated entity in charge of renewable energy and is completely dependent on conventional fuel to generate electricity (18723 MW in 2018). ▪ The contribution of renewable energy in its electricity mix is limited to some small installations of PV, CSP and wind energy (50 MW, 10 MW, 10 MW respectively in 2018).
% of RE by 2030: 15% (4.2 GW)	<ul style="list-style-type: none"> ▪ Kuwait has a national plan for renewable energy for 2030, targeted electricity production is 800,000 MWh with a share of 15% from renewable energy. ▪ Accordingly, three planned projects are using PV that have capacities ranging from 10 MW to 1700 MW. ▪ In addition to, two other projects using CSP where one is under operation with a capacity of 50 MW, and the other is in the contractual stage with a capacity of more than 200 MW. ▪ Along with two projects using wind energy onshore with a capacity of 10 MW and 100 MW. Furthermore, there is an initiative of renewable energy pilot study of 100 households using solar panels.
Progress for RE institutional	<ul style="list-style-type: none"> ▪ Regarding laws and legislation, Kuwait has one ministerial decision (NO.126/2018) about energy conservation in buildings

framework Regulations	-	<p>that stipulates "Production of at least 10% of the maximum load of electricity required by renewable energy".</p> <ul style="list-style-type: none"> In addition to the existence of MEW & CAPT responsible for the certification and license for renewable energy infrastructures. In an encouraging first step, the Higher Energy Committee was formed by the Kuwait Council of Ministers in 2018 to enhance cooperation between ministries, regulatory agencies, infrastructure operators and service providers and to improve Kuwaiti involvement in international decision-making forums.
Current capacities and projects	RE and	<ul style="list-style-type: none"> In three phases, the 4 gigawatt Shegaya Park is being developed. In December 2018, the first 70 MW, comprising 50 MW of Concentrated Solar Power, 10 MW of PV and 10 MW of wind power, began commercial operation. A 1500 MWac photovoltaic (PV) project built under a 25 year PPA will be phase two, called Al Dibdiba.
Future RE projects and Projects in Pipeline		<ul style="list-style-type: none"> A mixed technology project containing a minimum of 200 megawatts (MW) of concentrated solar power (CSP), 1200 MW_{wac} PV and 100 MW of wind power (CSP), will be tendered for Phase 3, called Al Abrag, in several packages. The completion of the 1-GW Al Dibdibah solar power station is expected to produce half of the country's projected renewable output, in line with the government's renewable energy targets. The demand for 5.2 million barrels of oil per year is projected to be offset by the project, thus reducing annual carbon emissions by 1.3 million tonnes. The completion date is scheduled for 2020. In addition, Kuwait has plans to meet at least 10 percent of the peak demand for all government buildings with solar power.

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6.8 Lebanon

Lebanon	
Renewable Energy Targets Strategies	- <ul style="list-style-type: none"> The Lebanese Center for Energy Conservation leads to the renewable energy promotion and deployment in Lebanon. Lebanon developed its first National Renewable Energy Action Plan according to the template adopted by the Energy Department at the League of Arab States (LAS) and in
% of RE by 2030: 30%	

	<p>cooperation with the Regional Center for Renewable Energy and Energy Efficiency (RCREEE) in 2015.</p> <ul style="list-style-type: none"> ▪ NREAP 2016 - 2020 defines the country's target to implement RE projects equivalent to 12% of the projected total electricity and heating demand. ▪ In addition, Lebanon has recently extended these projections to allow the country to meet 30% of the total electricity and heat from renewables by 2030 and a new RE national plan (2021-2025) is under development. ▪ NREAP 2016-2020 fixed a target capacity of 832.8 MW: 331 MW from hydropower, 50 MW from CSP, 250 MW from PV, 200 MW from wind energy and 1.3 MW from geothermal energy.
<p>Progress for RE institutional framework Regulations</p>	<ul style="list-style-type: none"> ▪ Lebanon implemented a dedicated regulatory framework for distributed renewable energy. The existing law lays the main principles for small scale projects using net metering in all its forms, it defines RE exchange through direct energy purchase agreements and/or leasing renewable energy equipment ▪ Lebanon set up a mandatory solar energy decree that states that it is mandatory to have solar water heaters, and in the lack of adequate space it is mandatory to have heat pumps for hot water production. ▪ In partnership with the Ministry of Energy and Water (MEW) and with the help of the European Bank for Reconstruction and Development (EBRD), the Lebanese Centre for Energy Conservation (LCEC) is drafting a law enabling collective net metering and power wheeling to be adopted to assist the development of renewables in Lebanon. ▪ In a recently published declaration, the Government of Lebanon announced that Law 288 will be extended to maintain current synergies, especially in the renewable energy sector, and given an opportunity allowed to conclude a wind PPA contract.
	<ul style="list-style-type: none"> ▪ The LCEC developed also an affordable funding mechanism for clean energy projects in collaboration with the Banque du Liban (BDL), the "National Energy Efficiency and Renewable Energy Action" (NEEREA) that represents a financial platform that aims to support and boost the development of sustainable energy.
<p>Current RE capacities and projects</p>	<ul style="list-style-type: none"> ▪ Lebanon adopted the first solar PV auction in early 2017. It involves 12 PV farms in the four major regions of Lebanon, each with a capacity of 10 to 15 MW.

	<ul style="list-style-type: none"> The electricity production in 2018 is based mainly on conventional fuel and totaled 15,083 GWh; renewable energy sources contribute with 891.56 GWh including hydropower generation with almost 345.34 GWh, PV with 83.5 GWh, biomass with 22.34 GWh, in addition to 435.3 GWh from other renewable energy sources.
Future RE projects and Projects in Pipeline	<ul style="list-style-type: none"> For the launch of the second round of PV auctions, the MEW and the LCEC are planning to install 24 farms with a combined capacity of 240-360 MW_p by the end of 2020. Around 4000 PVs of public street lighting systems with an installed total capacity of around 1.2 MW_p have already been installed by the MEW. Moreover, by constructing 113 PV stations that provide battery storage, the Ministry of Education and Higher Education is also participating in the development of distributed PV systems. For large scale PV, there is a PV capacity in the pipeline that reached about 1050 MW. For distrubted-distributed PV capacities there are 12 MW for the public sector and 56 MW for the private sector in the pipeline. In addition, 500 MW wind capacities are in the pipeline.

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6.9 Libya

Libya	
Renewable Energy Targets - Strategies	<ul style="list-style-type: none"> In 2013, the Libyan government launched the Renewable Energy Strategic plan 2013-2025, which aims to achieve 7% of renewable energy contribution to the electric energy mix before the end of 2020 and 10% by 2025. This will come from wind, Concentrated Solar Power, solar PV and solar heat. The breakdown by technologies will be as follows: <ul style="list-style-type: none"> By 2020: 600 MW wind, 150 MW CSP, 300 MW solar PV, 250 MW solar water heating. By 2025: 1000 MW wind, 400 MW CSP, 800 MW solar PV, 450 MW solar water heating. The strategic plan has been revised and a new target was set. The revised plan 2018-2030 has a target of 22% in 2030. In 2030, 4600 MW of renewable energy will be installed as follow 850 MW from wind resources, 3350 PV, and 400 MW from CSP.
% of RE by 2030: 22% (4.6 GW)	

<p>Progress for RE institutional framework Regulations</p>	<ul style="list-style-type: none"> ▪ The Libyan government formed Libya's Renewable Energy Authority in 2007 (REAOL). ▪ REAOL's main objective is to introduce appropriate policies to achieve the government's goal of a 10% share of the overall energy mix coming from renewable sources by 2020. ▪ So far there is no regulatory framework or supporting policies for RE in Libya for both small-small-scale and large-scale projects as well as for the participation of private capital in the power sector. Regarding finance and investments, Libya does not have a dedicated RE fund and a specific incentive mechanism for RE projects. ▪ The challenges linked to the lack of the legislative and financial infrastructure in addition to the current political challenges have slowed down the achievement of the planned RE objectives. ▪ Resolution No. 881 of 2019 was issued to exempt solar energy systems and solar thermal energy from customs duties.
<p>Current capacities and projects</p>	<ul style="list-style-type: none"> ▪ The Libyan government recently launched the construction of a solar photovoltaic power plant in the town of Kufra in south-eastern Libya. The plant will have a 100 MWp capacity. ▪ A photovoltaic solar power plant is under construction in Kufra, Libya. The facility which will occupy an area of 200 hectares. Its construction has been entrusted to a Chinese company. ▪ About 2 MW of solar PV panels have been installed from private sector companies around the country.
<p>Future RE projects and Projects in Pipeline</p>	<ul style="list-style-type: none"> ▪ The Italian multinational Eni met with Libya's National Oil Company as recently as July 2020 to discuss plans for the country's power sector. ▪ The organization is also conducting studies to build a new gas power plant and is funding the national start-up of renewable pilot projects.

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Commented [NA41]: This is not true. There are no any utility-scale projects under construction in Libya.

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6.10 Morocco

<p style="text-align: center;">Morocco</p>	
<p>Renewable Energy Targets Strategies</p>	<ul style="list-style-type: none"> ▪ Morocco is leading RE deployment in the Arab region, in fact, the 2009 National Energy Strategy set out an ambition target for 42% of the total installed power capacity to come from renewable energy in 2020.
<p>% of RE by 2030: 52% (10 GW)</p>	<ul style="list-style-type: none"> ▪ By: optimizing Morocco's energy mix, accelerating renewable energy growth, improving energy efficiency, fostering foreign

	<p>direct investment in the discovery of oil and gas, and promoting more regional integration.</p> <ul style="list-style-type: none"> ▪ This was expected to require the commissioning of new plants to bring the total capacity to 2000 MW of solar, 2000 MW of wind and 2000 MW of hydro by 2020. ▪ In 2015, during the 21st session of the UNFCCC’s Conference of the Parties (COP21), Morocco announced a further planned increase in the renewables capacity to reach 52% of the total by 2030 (20% solar, 20% wind, 12% hydro). ▪ To meet the 2030 target, the country aims to add around 10 GW of RE capacities between 2018 and 2030, consisting of 4560 MW of solar, 4200 MW of wind, and 1330 MW of hydropower capacity.
<p>Progress for RE institutional framework Regulations –</p>	<ul style="list-style-type: none"> ▪ To accomplish these goals, the Moroccan authorities have enacted law 13-09, which establishes the legal framework for the development of renewable energy sources and partially opens the electricity sector to competition for the production and sale of renewable energy sources. ▪ The law allows private companies to build projects for the production of renewable energy and to sell power directly to large customers, while providing guaranteed access to the electricity grid for the purpose of transporting to transport electricity. ▪ The purpose of Law No. 48-15 is to set up a new independent regulatory body known as the National Electricity Regulation Authority, whose mandate will be to clarify the roles and responsibilities of all actors involved in the transmission and distribution of electricity networks, as well as the management of the medium-voltage electricity system. Simultaneously, authorities established the Moroccan Agency for Solar Energy (MASEN), which has a the mandate to foster the development of solar in the country. ▪ The current regulatory framework promulgated as part of the national strategy offers several opportunities to promote and structure RE projects. It consists of a set of laws for the liberalization of the electricity market, the establishment of new institutions, and the regulation of power production from renewable sources.

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Current RE capacities and projects	<ul style="list-style-type: none"> ▪ Morocco’s renewable energy capacity reached 3,685 MW by the end of 2019, including 700 MW of solar energy, 1,215 MW of wind power and 1,770 MW of hydropower. ▪ Four solar panels and 11 wind power plants are currently supplying the Kingdom's renewable energy. ▪ The proposed projects which have not yet been launched include the Noor Midelt I and Noor Midelt II solar power plants with a capacity of 800 and 230 MW respectively, along with other projects with a total capacity of 1,150 MW of solar power and 640 MW of wind.
Future RE projects and Projects in Pipeline	<ul style="list-style-type: none"> ▪ In several regions of Morocco, projects that are currently in the planning process include power stations. ▪ The total capacity of the projects will be 1,000 MW of solar energy and 570 MW of wind power.

6.11 Palestine

Palestine	
Renewable Energy Targets Strategies	<ul style="list-style-type: none"> ▪ Since Palestine is completely dependent on imported energy, increasing the use of local resources seems vital. ▪ Resolution No. 16-2012 on the utilization of renewable energy in Palestine was issued, defining the target for Renewable Energy Source (RES) in electricity generation in Palestinian territory for 2020 to reach 25% of the total electricity consumption in 2020. ▪ According to the strategy, 130 Mw of renewable resources projects are planned to be completed by the end of 2020. ▪ The expected local generation (all fuels) will be 50% of the demand and the RES production shall be 10% of the total new electricity generation in 2020. ▪ The PEC prepared its second national renewable energy action plan (NREAP) until 2030 with RCREEE support. ▪ The NREAP highlighted that by 2030, 300 to 500 MW, depending on scenarios, will be built. ▪ 80% of the 2030 targets shall be achieved with solar PV, 10% with wind and 10% with biogas/biomass. Palestine’s RE strategy emphasizes PV because it is a modular RE technology that allows for fast deployment, both for small rooftop systems as well as for large scale ground-based plants.
<p style="text-align: center; color: green; font-weight: bold;"> % of RE by 2020: 10% (0.5 GW) </p>	
Progress for RE institutional	<ul style="list-style-type: none"> ▪ In 2010, the Palestinian Energy Authority (PEA) with direct support from RCREEE had launched the sustainable energy

<p>framework Regulations</p>	<p>-</p> <p>policy road map targets, with the objectives to increase the operating/technical efficiency of the distribution utility companies through end-use energy efficiency, energy conservation and better load management and diversification of the regional electricity supply sources.</p> <ul style="list-style-type: none"> Two stages comprise the renewable strategy. The first step covers the execution of feasibility studies and the preparation of tenders for the Palestinian market, as well as the deployment of small-scale projects and the implementation of the Palestinian Solar Initiative. The Decree Law on renewable energy and energy efficiency, published in 2015, offers a response to the strategy. Its aim <u>aims</u> to promote the utilization and use of renewable energy sources in order to maximize their contribution to the overall energy balance and, in accordance with the renewable energy policy, to ensure <u>a</u> stable energy supply. The second related law is Electricity Decree Law No. 13, published in 2009 with the key goal of reforming and improving the electricity sector and of encouraging national and international investment in order to achieve an appropriate supply of electricity and services that are fairly priced The feed-in tariff (FIT) scheme, net metering scheme, licensing scheme, and tendering scheme were the main support schemes adopted in Palestine for the uptake of renewables.
<p>Current capacities and projects</p>	<p>RE and</p> <ul style="list-style-type: none"> Currently, about 1,604,870 MWh of solar energy are is produced among <u>the</u> country. Based on the sustainable energy target and in accordance with <u>following</u> the Palestinian energy strategy, the PEA had launched in 2013 the PV solar initiative that aims to build 5MW until the end of 2015, through installing 5kW solar systems on the rooftop of 1,000 Palestinian households. The output of these systems would be fed directly to the electricity grid, with an allocated tariff that must be subsidized from by the Palestinian Ministry of Finance.
<p>Future RE projects and Projects in Pipeline</p>	<ul style="list-style-type: none"> In order to encourage the idea of using renewable energy, a new UNDP initiative will be established to install solar systems for 4 schools, submersible pumps, two maternity health clinics and public awareness. The Renewable Energy Generation project will boost nearly 107,000 people's livelihoods.

	<ul style="list-style-type: none"> A new loan arrangement to fund the roof construction of approximately 500 public schools to power more than 16,000 houses across the West Bank has been signed. Solar projects on the rooftop would help prevent the release of 30,000 tonnes of greenhouse gas emissions annually.
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6.12 Qatar

Qatar	
Renewable Energy Targets - Strategies % of RE by 2030: 20% (1.8 GW)	<ul style="list-style-type: none"> Qatar has taken several initiatives towards diversifying its energy mix and encouraging the sustainable use of resources through renewables, along with improving energy efficiency. The country's recent visions and national strategies are centred on increasing its renewable energy investment and diversifying its national energy mix with a target of generating 20% of its electrical demand through solar by 2030, estimated infrastructure development plan is USD 30 Billion. Under this long-term target, Qatar plans up to 10 GW of solar power capacity by 2030. A series of public and private investments are driving new developments in Qatar's solar energy sector to meet the 2030 targets.
Progress for RE institutional framework Regulations -	<ul style="list-style-type: none"> Qatar has developed an Economic Infrastructure Strategy over the period 2018-2022, to Develop a sustainable and high-quality infrastructure that supports the national economy and is capable of keeping abreast of the latest smart technologies". To achieve <u>the</u> main outcomes, many intermediate outcomes and targets have been identified one of these outcomes is that Qatar's infrastructure has sources of energy and renewable energy.
Current capacities and projects RE and	<ul style="list-style-type: none"> Late January 2020, Qatar General Electricity & Water Corporation signed a 25-year contract to purchase 800 megawatts (MW) of solar power with a new record low price of \$15.69. Recent low bid prices have included 2019 contracts at \$16.44 for solar in Portugal and \$16.953 in Dubai. The proposed plant is estimated to decrease carbon emissions by 26 million tonnes over its lifespan.
Future RE projects and Projects in Pipeline	<ul style="list-style-type: none"> The Ministry of Energy and Industry (MoEI) is developing and implementing a renewable energy strategy along with its policy and legal umbrella.

	<ul style="list-style-type: none"> ▪ In addition, Kahramaa is developing a plan to generate 200 megawatt of solar energy by 2020, to be increased to 500 megawatt afterwards, due to the relevant projects of Qatar Petroleum (QP). ▪ Qatar Water and Electricity Company signed an agreement with the Emirati Masdar Company and the Qatari Nebras Company to establish a joint working relationship to develop renewable and sustainable energy projects.
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6.13 Saudi Arabia:

Saudi Arabia	
Renewable Energy Targets	<ul style="list-style-type: none"> ▪ The National renewable energy program in Saudi Arabia (NREP) has drawn the directive guidelines of RE programs at the ministry of energy in the kingdom; this includes the support of all the initiatives related to renewable energy and the implementation and review of dedicated regulatory and legal frameworks. ▪ The NREP developed a detailed road map to diversify national energy sources and support sustainable, clean and secure economic stability. ▪ The NREP will not only reduce the Kingdom's reliance on oil and its greenhouse gas emissions as part of the Paris Agreement by diversifying Saudi Arabia's energy mix, but will also enable job creation and catalyze economic development throughout the Kingdom, fostering long-term stability in line with the objectives of Vision 2030. ▪ The RE strategy aims to promote investment in the long term and to develop <u>the</u> renewable energy industry through encouraging the cooperation between public and private sectors, allowing the private sector to invest in the renewable energy field and localizing research. ▪ Saudi Arabia's RE target is to develop 27.3 GW and 58.7 GW of renewable energy capacity respectively by 2023 and 2030. The 2023 goal will include the development of 20 GW of PV capacity, 7 GW of wind capacity and 300 MW of CSP. While the 2030 target will involve the development of 40 GW of photovoltaic solar capacity, 16 GW of wind capacity and 2.7 GW of concentrated solar power capacity
Strategies	
% of RE by 2030: 30% (58.7 GW)	
Progress for RE institutional	<ul style="list-style-type: none"> ▪ The prices of petrol and electricity have increased by 2018 as part of the Saudi Arabian government's attempts to meet its

<p>framework Regulations</p>	<p>-</p>	<p>sustainable goals. By reducing petrol consumption by 8 % last year, this decision has a direct effect</p> <ul style="list-style-type: none"> ▪ Combined with the addition of more renewables, these price reforms should see domestic energy consumption of hydrocarbons decline by 1.5-2 million barrels of oil equivalent per day by 2030.
<p>Current capacities and projects</p>	<p>RE and</p>	<ul style="list-style-type: none"> ▪ Saudi Arabia has planned to launch 10 projects during 2019-2020 with a total capacity of 2670 MW. ▪ In 2019, 12 pre-developed projects with a total capacity of 3.1 GW has<u>have</u> been tendered for Mahad Dahab 20-, Saad 600-, Alras 300, Wadi Adwawser 70-, Qurrayat 40-, Yanbu 850-, Qurrayat 200-, Madinah 50, Rafha 45, Alfaisalia 600-, Rabigh 300, Jeddah 300. ▪ In 2017, the first bidding round announced by REPDO included two projects: the Sakaka 300-MW solar IPP and the Dumat Al Jandal 400-MW wind farm. The Skaka project will provide 45,000 households in Al Jouf with electricity from the national grid, helping to offset nearly 500 tonnes of CO annually. ▪ ▪ In September 2019, The Saudi Industrial Development Fund (SIDF) SR105bn (\$28bn) initiated the Mutjadeda program to help local companies involved in investing in and producing for the energy market. ▪ To fund component manufacturers or participation in independent power producer (IPPs) schemes, SIDF will provide loans of up to SR1.2bn (\$319.9m). ▪ Mutjadeda will offer companies intending to produce renewable energy components funding for up to 75 % of project expense with loan repayment periods of up to 20 years. ▪ The Renewable Energy Project Development Office (REPDO) of Saudi Arabia has opened a request-for-qualification process related to a 1.2 GW solar generation capacity tender. ▪ The third round of the Kingdom's National Renewable Energy Program will be used by REPDO to select developers to construct four solar power plants with 80, 120, 300 and a mammoth 700 MW generating capacity. ▪ The Saudi government has announced that projects selected must include at least 17% of local content.

Future RE projects and Projects in Pipeline	<ul style="list-style-type: none"> ▪ In the short term (currently); enhancing the local content through laying the price bases for the cost of electricity production, starting to develop the supply chain for the renewable energy sector (localizing solar and wind energy 17-19%). ▪ In the medium term (2024-2025); global competitiveness through balancing the cost of electricity production and local content and establishing industrial clusters for solar and wind energy equipment (localizing solar and wind energy 33-35%). ▪ In the long term (2028 and forward); to be a renewable energy manufacturing center by balancing the cost of electricity production and local content and developing a sustainable supply chain specializing in the export of renewable energy equipment (localizing solar and wind energy 40-45%).
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6.14 Somalia:

Somalia	
Renewable Energy Targets Strategies	<ul style="list-style-type: none"> ▪ Currently, Somalia does not have NREAP nor renewable energy targets in the generation mix. In addition, no renewable energy entities exist. ▪ However, the national development plan 2020-2024 includes the preparation of a-national legislation in-order-to: <ul style="list-style-type: none"> ○ Establish the national regulatory authority for the energy sector that will be operational by 2021, ○ Increase the energy supply from both renewable and fossil fuel sources, ○ Increase access to energy from 15% to 45% by 2024 or 6% growth in access per year.
Progress for RE institutional framework Regulations	<ul style="list-style-type: none"> ▪ Currently, RCREEE and LAS are developing a NREAP for Somalia.
Current RE capacities and projects	<ul style="list-style-type: none"> ▪ The power sector in Somalia is facing major challenges, including a lack of adequately trained labor, a weak regulatory environment, high investment costs, a shortage of electricity sources, and inadequate infrastructure. ▪ Somalia suffers from <u>a</u> lack of electricity in rural areas with 15 % access rate.

	<ul style="list-style-type: none"> There are 2.4 million households without power. In urban areas as Mogadishu, 60 % of the population is connected to electricity while, in smaller cities only 23 % are connected to electrical services. The total installed generation capacity at present is 106 MW, about 100 MW of diesel fuel and 6 MW of solar/wind power plants.
Future RE projects and Projects in Pipeline	<ul style="list-style-type: none"> No RE projects are announced in this period.

6.15 Sudan

Sudan	
Renewable Energy Targets Strategies	<ul style="list-style-type: none"> Sudan has no dedicated entity for RE deployment. Currently, the country produces electricity from conventional power plants and hydropower as renewable energy resources principally. The draft national renewable energy action plan (2015-2020) suggested targeting 18% of electricity generation from RE sources, however, it was not endorsed officially. The draft NREAP envisages implementing 680 MW from wind energy, 1000 MW from PV, 50 MW from CSP and 67 MW from Biomass energy.
% of RE by 2031: 50% (5.3 GW)	
Progress for RE institutional framework Regulations	<ul style="list-style-type: none"> RCREEE joined forces with UNDP in 2019 to help Sudan's efforts to facilitate its energy transition. The key goal of the project is to devise a long-term plan for renewable energy and to strengthen the role of the private sector in renewables. As part of the project, RCREEE is working very closely with the Ministry of Water Resources, Irrigation and Electricity (MWRIE) to devise Sudan's long-term policy and regulations on renewable energy. Main Outcomes: <ul style="list-style-type: none"> Formulation of Sudan's long-term policy and legislation for renewable energy. Creation of secondary wind energy regulations to catalyze projects in the private sector. Establishment of "one-stop shop" (OSS) for renewable energy investors and entrepreneurs. Three dissemination workshops.

<p>Current capacities and projects</p>	<p>RE and</p> <ul style="list-style-type: none"> ▪ At the end of 2019, Sudan had just 19 MW of installed solar capacity, according to the latest statistics from the International Renewable Energy Agency. ▪ By the end of the year, the Sudanese government plans to install 500 MW of solar power and 300 MW of wind power <hr/> <ul style="list-style-type: none"> ▪ There are several projects under construction using PV technology such as Fashir for solar energy (5 MW installed capacity). ▪ Another 5 MW project in Al-Daien city is currently under construction. ▪ Rooftop project 0.3 MW and solar energy pumping 14.78 MW. In addition to the wind energy pilot project in Dongola (contractual stage). <hr/> <ul style="list-style-type: none"> ▪ In a project implemented by the UNDP, the GoS committed US\$ 213.3 million together with a US\$ 3.5 million grant from the Global Environment Facility (GEF) to introduce utility-scale wind power in Sudan. The objective of the project is to install a 100 MW wind farm in Dongola in Northern State. ▪ A phased implementation approach has been adopted for the wind farm, with 5 MW to be built in 2014, 20 MW in 2015, and 25 MW to be built in each year between 2016-2018, to reach the 100 MW total. The project also aimed to put in place legislation and a framework to promote private sector involvement in renewable energy in Sudan. ▪ The intended outcome of the project is the development of standardized guidelines and procedures for future wind farms to facilitate future GoS efforts to tender wind farms as IPP projects. <hr/> <ul style="list-style-type: none"> ▪ UNDP and Global Environment Facility invested US\$5 million for 1,469 solar water pumps in Northern Sudan in 2016. Based on the success cases, the UNDP and KOICA invested an additional US\$7 million for 450 solar water pumps at River Nile State in 2020. ▪ Sudan recently received a grant from the African Development Bank (AfDB) to install nearly 1,200 solar pumps for irrigation on farms in the states of West Kordofan and North Kordofan, based in part on the success of the solar pumping earlier interventions. The grant of US\$ 21.7 million will help boost the productivity of plantations while facilitating the process of the-phasing out the use of diesel pumps.
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	<ul style="list-style-type: none"> This will benefit farmers who will no longer need to buy diesel to run pumps, which is traditionally scarce and relatively expensive in rural areas. About 75% of the cost of installing solar pumps on the plantations will be borne by the government, with the remaining 25% payable in installments over three years.
Future RE projects and Projects in Pipeline	<ul style="list-style-type: none"> An unidentified UAE solar firm has committed itself to building multiple large-scale PV plants across the country, according to the country's Ministry of Energy. A 20-year PPA will be granted to these new projects and will be Sudan's first solar parks with a combined 500 MW capacity.

6.16 Syria

Syria	
Renewable Energy Targets Strategies	<ul style="list-style-type: none"> According to the renewable energy strategy 2030 that was adopted in 2019. The contribution of renewable energies will be 30% of the total primary energy in 2030.
% of RE by 2030: 30% (4.55 GW)	
Progress for RE institutional framework Regulations	<ul style="list-style-type: none"> As the political situation in Syria is gradually improving, Syria has been working extensively lately on resuming its RE programs. Syria adopted progressive measures in 2011 to attract interests and activities in the renewable energy sector. It has opened its market for private developers, adopted feed-in-tariffs and a net metering policy, authorized private-to-private sale of renewable electricity and announced tenders for public competitive bidding to develop the first large-scale wind projects. These were all positive foundational activities. However, due to the deteriorating political situation, all activities were paused. Currently, a new strategy including updated measures is under consideration, with increased reliance on private investments. Furthermore extensive capacity building activities are taking place with the support of regional and international bodies.
	<ul style="list-style-type: none"> There are-is number of solar energy projects connected to the electricity grid, with a capacity of 11,522 megawatts.

<p>Current capacities and projects</p>	<p>RE and</p> <ul style="list-style-type: none"> ▪ At present, two tenders for the construction of solar power plants with a total generation capacity of 63 MW have been provided by the Syrian Ministry of Electricity Transmission Establishment. ▪ The Syria Solar Project intends to equip hospitals around the country with the energy needed to suppress the restricted availability of diesel by one of Syria's largest medical NGOs during periods of high demand. ▪ By 2020, in cooperation with the health authorities in northwestern Syria, more than 45 health facilities in northwestern Syria are planned to use solar energy as their primary source of electricity. ▪ Eight renewable energy plants were carried out in Sweida province recently in the villages of Najran, al-Qurayya, Habran, Qanawat, Orman and Rimah al-Lahaf. The plants are with a total capacity of 380 Kilowatt, and put into service and linked to the electricity network.
<p>Future RE projects and Projects in Pipeline</p>	<p>RCREEE in collaboration with UNDP Syria are is preparing Request For Proposals (RFP) documents for 50 MW wind project and 50 MW PV project as BOO projects.</p>

6.17 Tunisia

<p style="text-align: center;">Tunisia</p>	
<p>Renewable Energy Targets - Strategies</p>	<ul style="list-style-type: none"> ▪ The Tunisian government has announced in 2015 an energy transition strategy to diversify its energy resources and to increase the share of renewable energy resources in its national energy mix and set up its Intended Nationally Determined Contribution (INDC) that aims to decrease its carbon intensity by 41% by 2030 compared to the base year 2010. ▪ The program aims to increase the share of renewable energies in electricity production reaching 12% in 2022 and 30% in 2030 and to reduce energy intensity by 3% per year during 2016-2030. The strategy also aims to save energy by 17% during the period 2016-2020. ▪ In 2018, RCREEE supported Tunisia in designing its NREAP according to the Arab Renewable Energy Framework. NREAP Tunisia will cover the period 2016-2030.
<p>% of RE by 2030: 30% (3.8 GW)</p>	

	<ul style="list-style-type: none"> ▪ Moreover, the NREAP stated that the installed solar and wind capacity is 1360 MW by 2022 and 3815 MW by 2030 including 1755 MW of wind energy, 1510 MW of PV plants, 450 MW of CSP and 100 MW of bioenergy).
<p>Progress for RE institutional framework Regulations</p>	<ul style="list-style-type: none"> ▪ In order to achieve the planned target, the Tunisian state adopted regulatory reforms in 2015 through a new law relating to the production of electricity from renewable energy: Law No. 2015-12. ▪ The objective of this law is to establish a legal framework allowing private-sector investment in the production of electricity sourced from renewable energy sources through three new regulatory regimes: <ul style="list-style-type: none"> ○ Self-generation/consumption ○ Independent power production (IPP) for local consumption including the authorization and concession schemes ○ IPP for export ▪ Tunisia has undertaken huge efforts to promote sustainable energy deployment through the establishment of the adequate institutional, regulatory and financial framework, however still some improvement to better integrate private sector contribution including principally: <ul style="list-style-type: none"> ○ Develop a renewable energy planning and scheduling framework ○ Improve the assessment of renewable resources and the untapped resources ○ Simplify procurement procedures for power grid development ○ Clarify the roles of the intervening institutions and strengthen their human resources ○ Establish an independent electric power regulator ○ Restructure and operationalize the Energy Transition Fund ○ Create a dedicated financing mechanism for solar water pumping ○ Involve the contribution of local banks in the financing of renewable energy <p>Financing schemes</p> <ul style="list-style-type: none"> ▪ Energy Transition Fund (FTE):_Financing measures for RE, EE and fuel substitution ▪ SUNREF Tunisia: This green finance system has been an important part of the energy transition's environmental context, allowing local financial institutions to provide support for projects

	<p>in the Tunisian business sector aimed at saving the environment and improving EE.</p> <ul style="list-style-type: none"> ▪ Tunisian investment fund (FTI) <ul style="list-style-type: none"> a) Disbursing investment grants b) Subscription to pooled investments and development funds and the establishment in each area of start-up and development funds and priority sectors. ▪ ANME/KfW PV program linked to the grid program designed for public establishments (about 200 establishments) ▪ Tunisia Tax/Custom duty Exemption on all RE/EE imports Tax privilege for RE equipment not made locally for anything similar
<p>Current capacities and projects</p>	<p>RE and</p> <ul style="list-style-type: none"> ▪ Since 2017, 172 solar PV projects connected to the MV grid have been authorized by the Ministry, totalizing an installed capacity of 32 MWp. ▪ So far, the installed capacity is 4.5 MW and no wind project has yet been authorized under this scheme. ▪ Several calls for projects have been launched since 2017 for the development of solar PV and wind projects, with a total capacity of 324 MW for <u>the</u> Authorization scheme and 800 MW for <u>the</u> concession scheme (500 MW PV and 300 MW wind). ▪ A<u>The</u> fourth tender for solar photovoltaic (PV) projects has been issued by the government of Tunisia, again seeking to grant 70 MW of capacity. ▪ The tender covers the construction of six solar farms of 10 MW each and 10 smaller plants with individual capacities of up to 1 MW. ▪ Selected bidders will be granted long-term power purchase agreements, as in the previous rounds (PPAs). ▪ TUNIS - UPC Renewables (UPC) and Climate Fund Managers (CFM) have collaborated to build a 30-megawatt wind farm in Sidi Mansour, Tunisia, to help the country reach its % target for renewable energy by 2030. ▪ The first renewable energy IPPs were announced in the second half of 2017, and so far the GOT has awarded private companies 12, 10 MW solar projects, two 50 MW solar projects each, two 100 MW solar projects each, one 200 MW solar project and four 30 MW wind projects each.
<p>Future RE projects and Projects in Pipeline</p>	<ul style="list-style-type: none"> ▪ The GOT plans to launch tenders for about 3.5 gigawatts of renewable energy, worth roughly \$3.5 billion, by 2030, or approximately 350 MW per year over the next 10 years. One-

	third of the projects will be for wind farms and two-two thirds for solar photovoltaics.
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6.18 Yemen

Yemen	
Renewable Energy Targets Strategies	<ul style="list-style-type: none"> ▪ In 2009, the Ministry of Electricity and Energy prepared and published the National Strategy for Renewable Energy and Energy Efficiency. ▪ According to the baseline scenario, 15% of the electricity production should be generated by renewable resources in 2025, this corresponds to an annual production of 2600 GWh and is translated as follows: <ul style="list-style-type: none"> ○ 400 MW from wind farms ○ 160 MW from geothermal power stations ○ 100 MW from CSP ○ 9 MW from PV and ○ 6 MW from power stations using landfill gas
% of RE by 2025: 15% (0.714 GW)	
Progress for RE institutional framework Regulations	<ul style="list-style-type: none"> ▪ On May 3, 2020, the de facto authorities issued Laws No. 5 to No. 8 (2020), ratifying amendments to the Custom Tariff Laws, General Sales Tax Law and Income Tax Law. ▪ The legislative revisions are part of the economic measures under the Economic Revival and Recovery Strategy 2019-20, announced in January 2020. ▪ The amendments provide tax exemptions to support small businesses, strengthen local production of medicine, and facilitate renewable energy investment to reduce reliance on imported fuel products.
Current capacities and projects	<ul style="list-style-type: none"> ▪ Two wind projects 60 MW each in Taaz ▪ A-PV projects with total installed capacity reach 2 MW in Soqotri Island. ▪ A-PV projects with total installed capacity reach 10 MW in Tohama – ElHadedia. ▪ <u>A PV project with a total capacity of 29.2 GWh- in Erfaf.</u> ▪ A PV project with <u>a total capacity of 35 GWh- in Soqotri.</u>

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	<ul style="list-style-type: none"> A tender Station No. (1/2019) has been issued to install a PV With a BOOT system with a power of 30 MW.
<p>Future RE projects and Projects in Pipeline</p>	<ul style="list-style-type: none"> A wind project in MAKHAA by the government of Yemen with a total capacity of 178000 GWh is under implementation. A PV project in Kamran Island is under implementation with a total capacity of 2920 GWh. For the optimistic scenario, the generation mix percentage will be raised to 20% representing 3467 GWh of electricity production. For low-end scenario, 10% of the generation mix should be achieved in 2025, which is equal to 1733 GWh. There is a recommendation to install 100 MW of CSP if it gets economically viable due to increased accumulated generation capacity installed worldwide. It is worth noting that this strategy is not ratified but officials in Yemen are planning and budgeting based on this strategy. So, the political instability situation in Yemen triggered decentralized solutions. By 2025 approximately 20000 households will be electrified by solar PV off-grid installations

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7 Progress and achievement in RE action plan and adopted strategies

The potential for wide-scale deployment of renewable energy technologies in the Arab region is considerable. Rapid demographic growth and the rising need for economic development call for additional, stable energy sources that can satisfy demand while protecting the environment.

Most Arab countries have scaled-up their interest in renewable sources of energy, especially in wind and solar power generation, which offer the highest technological and market maturity. Most Arab countries have, or are in the process of creating, a viable market for renewable energy investments. This is accomplished through enabling conditions (feed-in-tariffs, net metering, auctions, etc) and attractive tariffs in different segments to encourage private investors to enter the market.

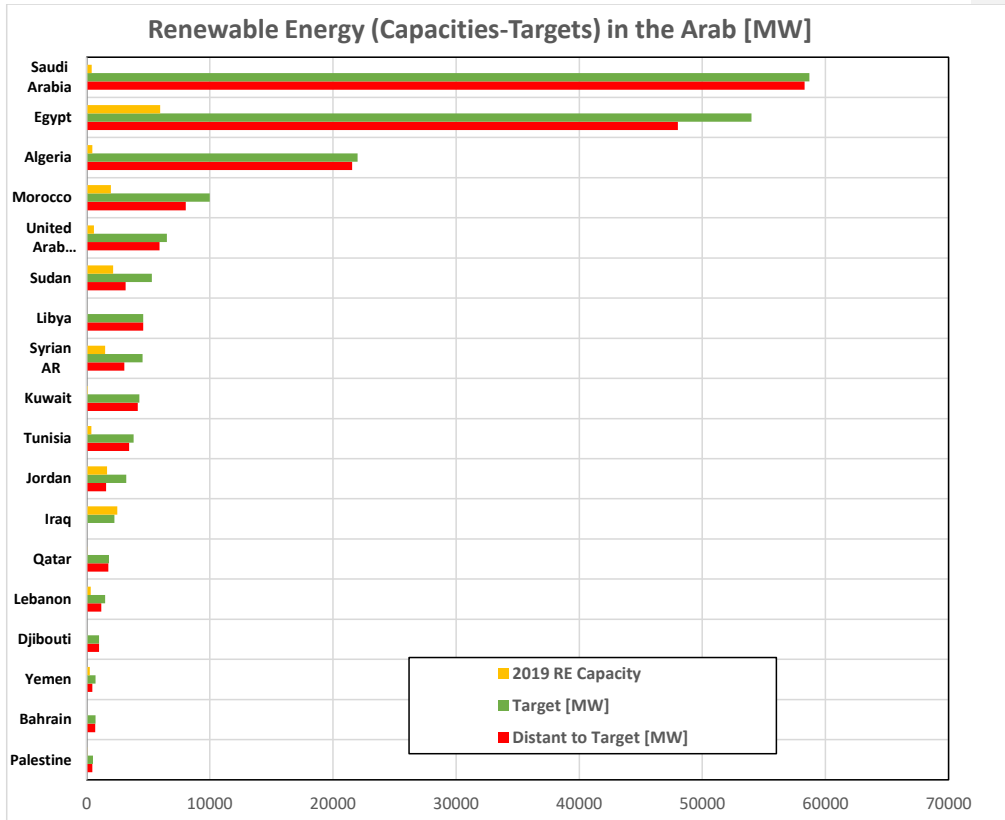
These enabling conditions are increasingly being supported by official, long-term renewable energy targets set by governments to ensure the tangible impact of scaled-up renewable energy investments in the Arab world.

Recently, the total generation capacity of renewable power production (including hydro) reaches about 19424.2 MW. Nevertheless, the region's commitment is set to spur unprecedented growth, increasing new renewables. The growth of the RE market this year and falling costs for their technologies are very ambitious signs. Policy-makers are looking more seriously than ever into the potential of clean and sustainable energy sources.

Some Arab countries have been more committed than others to facilitating the transition towards renewable energy. Despite difficulties faced by regional economies and energy sectors, the Arab world is taking bold steps to advance renewables and play a significant role in the global energy transition.

Most of the Arab countries have set their RE targets as mentioned above. Some of those targets are very challenging and ambitious. Continuous monitoring is required to assess the progress achieved in countries' RE national plans and strategies.

The following figure and table depict each country target in terms of percentage and target installed capacity. In addition, they show the actual installed RE capacity at the end of ~~the~~ the current year and the remaining capacity to achieve the declared target.



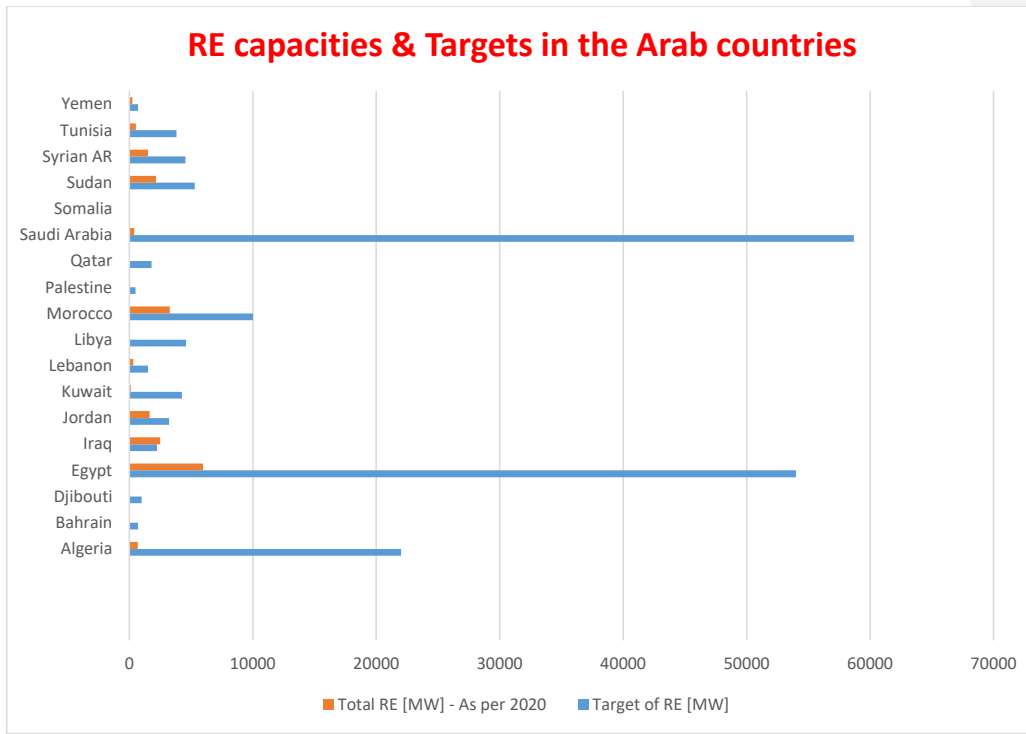


Table: Renewable Energy Targets in the Arab Countries

Country	Target [MW]	Target [%]	Year	RE-Renewable Energy Installed Capacities [MW] - 2019/2020						RE Total Installed Capacities [MW] - 2019
				Solar PV [MW]	CSP [MW]	Wind [MW]	Other Hydr [MW]	Other [MW]	Total As per 2020 [MW]	
Algeria	22000	37%	2030	410686	25	10	228	0	686	673
Bahrain	710	10%	2035	57	0	1	0	0	7	6
Djibouti	1000	100%	2035	0.1	0	0	0	0	1	1
Egypt	54000	42%	2035	7505972	20	1125	2851	67	5972	4813
Iraq	2240	-	2025	372490	0	0	2514	0	2490	2490
Jordan	3220	10%	2025	7721642	0	285	12	4	1642	1073
Kuwait	4266	15%	2030	31106	0	10	0	0	106	41
Lebanon	1500	12%	2030	42321	0	3	253	9	321	307
Libya	4600	22%	2030	551	0	0	0	0	51	5
Morocco	10000	52%	2030	2063267	530	1250	1770	1	3267	3267
Palestine	500	25%	2030	3648	0	1	0	0	48	37.2
Qatar	1800	20%	2030	5431	0	0	0	38	43.1	43
Saudi Arabia	58700	30%	2030	89397	50	3	0	0	397	142
Somalia	-	-	-	11	-	-	-	-	11	11
Sudan	5300	50%	2031	182146	0	0	1928	190	2146	2136
Syrian AR	4550	30%	2030	11504	0	1	1494	7	15043	1503
Tunisia	3815	30%	2030	47528	0	245	66	0	528	358
Yemen	715	15%	2025	150250	0	0	0	0	250	150
Total RE capacity (MW) include hydropower in Arab countries =19424.2 MW									19424.2	

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Country	Target [MW]	Target [%]	Year	Renewable Energy Installed [MW] - 2019	Renewable Energy Installed [MW] - 2020	% of change compared to 2019
Algeria	22000	37%	2030	673	686	+54%
Bahrain	710	10%	2035	6	7	
Djibouti	1000	100%	2035	1	1	
Egypt	54000	42%	2035	4813	5972	
Iraq	2240	-	2025	2490	2551	
Jordan	3220	10%	2025	1073	1642	
Kuwait	4266	15%	2030	41	106	
Lebanon	1500	12%	2030	307	321	
Lihya	4600	22%	2030	5	5.1	
Morocco	10000	52%	2030	3267	3757	
Palestine	500	25%	2030	37.2	48	
Qatar	1800	20%	2030	43	43.1	
Saudi Arabia	58700	30%	2030	142	397	
Somalia	-	-	-		11	
Sudan	5300	50%	2031	2136	2146	
Syrian AR	4550	30%	2030	1503	1504	
Tunisia	3815	30%	2030	358	528	
Yemen	715	15%	2025	150	250	

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~~8 NEEAP and NREAP Technical Support Provided by LAS and RCREEE~~

~~The following table shows the countries that have prepared their NEEAPs or NREAPs through technical support from LAS and RCREEE~~

~~**Table 8. NEEAP&NREAP Technical Support Provided by LAS and RCREEE**~~

Country	Type of Support	Outcome	Direct Beneficiary	Delivery Mechanism
Djibouti	Technical Assistance in the field of policy design	National Renewable Energy Action Plan	Ministry of Energy and Natural Resources	Ongoing support by LAS & RCREEE experts
Egypt	Promotion of the 2nd National Energy Efficiency Action Plan	National Energy Efficiency Action Plan endorsement by different stakeholders	Ministry of Electricity and Renewable Energy	Direct support by LAS & RCREEE experts

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Iraq	Technical Assistance in the field of policy design	Catalyzing the use of Solar PV Energy	Ministry of Electricity	Direct support by RCREEE experts
Jordan	Technical Assistance in the field of policy design	National Renewable Energy Action Plan	Ministry of Energy and Mineral Resources	Direct support by RCREEE experts
Libya	Technical Assistance in the field of policy design	National Energy Efficiency Action Plan	Renewable Energy Authority of Libya	Ongoing support by LAS & RCREEE experts
Mauritania	Design the National Renewable Energy Action Plan	Datasheet for RE-plan design	Ministry of Petroleum, Energy and Mines	Direct support by LAS & RCREEE experts
Palestine	Technical Assistance in the field of policy design	National Renewable Energy Action Plan	Palestinian Energy Center	Direct support by LAS & RCREEE experts
Somalia	Technical Assistance in the field of policy design	National Renewable Energy Action Plan	Ministry of Energy and Water Resources	Ongoing support by LAS & RCREEE experts
	Technical Assistance in the field of policy design	National Energy Efficiency Action Plan	Ministry of Energy and Water Resources	Ongoing support by LAS & RCREEE experts
Sudan	Update the National Renewable Energy Action Plan	National Renewable Energy Action Plan	Ministry of Water Resources, Irrigation and Electricity	Direct support by LAS & RCREEE experts
	Technical Assistance in the field of policy design	National Energy Efficiency Action Plan	Ministry of Water Resources, Irrigation and Electricity	Direct support by RCREEE experts
Syria	Technical Assistance in the field of policy design	First draft of National Energy Efficiency Action Plan	Ministry of Electricity	Direct Support by RCREEE experts
Tunisia	Technical Assistance in the field of policy design	National Renewable Energy Action Plan	Ministry of Energy, Mines and Renewable Energies	Direct Support by LAS & RCREEE experts

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98 Recommendations

Although the COVID-19 crisis was the central political focus of the last year, commitments to sustainable actions also were prominent during this crucial period. Overall, this phase was an important milestone for sustainable policies, with many countries' greenhouse gas targets for the year expiring, countries setting new targets, and numerous countries committing to carbon neutrality. ~~In Arab countries, recovery strategies which raised up after the COVID pandemic should be consistent with long-term national and global energy resilience and sustainable growth priorities and, if they are to be met, should concentrate on clean energy transitions.~~

In addition, ~~considering~~ reviewing the progress and ~~recently~~ updated situations for National Energy Efficiency Action Plans and National Renewable Energy Action Plans in the Arab region through this report, a group of recommendations have been raised, summarized below:

- ~~The renewable energy (RE) in the MENA region is becoming a mainstream, particularly in the power sector.~~
- ~~Investments in Arab MENA countries over the past decade in solar and wind projects alone exceeded 17 billion USD.~~
- ~~There is clear commitment to embrace strong forward-thinking policies and capture the immense value of the RE business and cross-border interconnections.~~
- ~~Several RE support policies and financial instruments have proven to be effective region. Examples are competitive bids and auctions for utility scale projects, resulting in a competitive RE electricity prices all over the region.~~
- ~~Such prices are possible because of the excellent solar and wind energy resources, backed by some concessional finance coupled with policy measures to reduce the various risks and encourage investment.~~
- It is highly recommended to enhance the energy information systems for the collection process of sustainable data, this could be done through the development of a dedicated energy observatory and center in the region.
- As a high priority, ~~it~~ is important to complete the institutional framework for implementation of different action plans by completing the establishment of dedicated energy efficiency units in relevant sectors, this will help in following up the implementation, assessment and monitoring of the national policies and plans.
- Arab countries have to set up sustainable energy efficiency and renewable energy national funds based on stable and sustainable financing sources. The availability of funding mechanisms is the common challenge facing Arab countries while implementing their RE & EE action plans.
- ~~Investments in renewable energy, energy efficiency, building retrofits and other labor-intensive, low carbon industries, for example, will improve economic recovery by generating for all Arab countries.~~
- For Arab governments, investments in the green, creative, circular, low-carbon sectors could advance sustainability to the head of decision-making process and pave the way for economic diversification, while reducing the influence of fossil fuel-related price fluctuations.
- Renewable energy technologies have a vital role in closing the gap in access to energy rates in ~~the~~ Arab region.

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- There is a crucial need for capacity development programs, technology transfer, sharing experience and knowledge between different parties to enhance competencies related to information management and innovative methods for data collection, verification and validation for different national programs. This will help to overcome the challenges facing the development, implementation and following up of the National Action Plans for RE and EE.

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