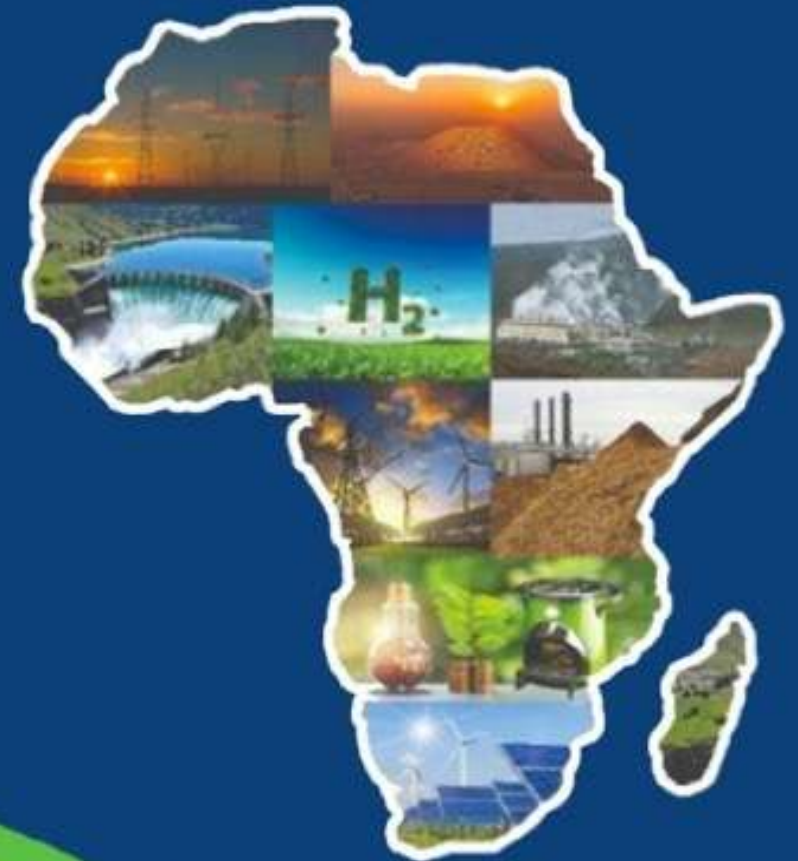


2030 - 300GW



## Renewable Energy Employment – Trends and Analysis from MENA Region

Eng. Maha Mostafa - (Chairwoman)

**RCREEE**

Regional Center for Renewable Energy and Energy Efficiency  
المركز الإقليمي للطاقة المتجددة وكفاءة الطاقة

# RCREEE – Who we are



**Intergovernmental Organization with 17 Member States**



**The technical arm of the League of Arab States**



**Leader in clean energy policy dialogues, strategies, technologies, capacity development, and investment and project support**



**The first regional renewable energy and energy efficiency centers across the world**



**Secretariat in Cairo, Egypt with regional antennas and a pool of short-term experts**

# Work in the **Pan-Arab Region**... know how to navigate your way



# RCREEE's Mission & Success Factors

*“We, the Regional Center for Renewable Energy and Energy Efficiency, are the strategic partner for the Arab countries driving energy transition for the prosperity of all our people.”*



## **Growth**

We grow with our assignments.



## **(Re)Active**

We are connected, accessible and responsive.



## **Variety**

Our organizational structure is flexible, multinational and attractive for our stakeholders.



## **Trust**

Our partners trust us to contribute to their competitive advantage.



## **Sustainability**

Our business is sustainable.

# Beneficiaries

**Member States**

**Financing Institutions**

**Regional Entities**

**Academia and  
Universities**

**Private Sector**

**International Organizations**

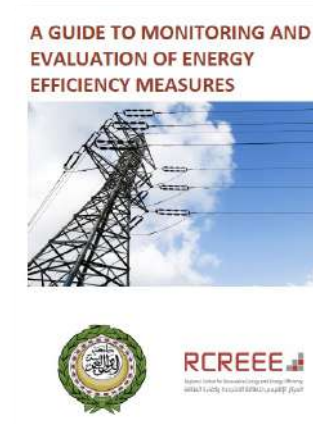
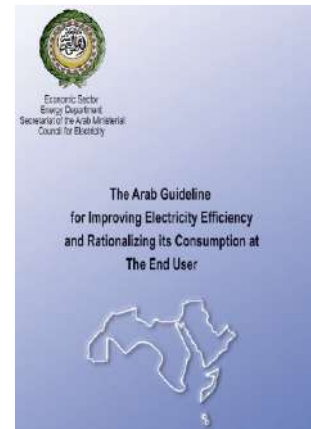
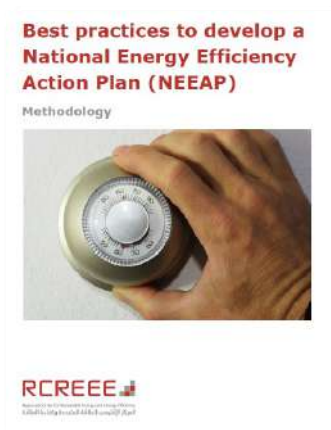
**NGOs and Civil Society  
Orgs**

**Industry and Trade  
Associations**



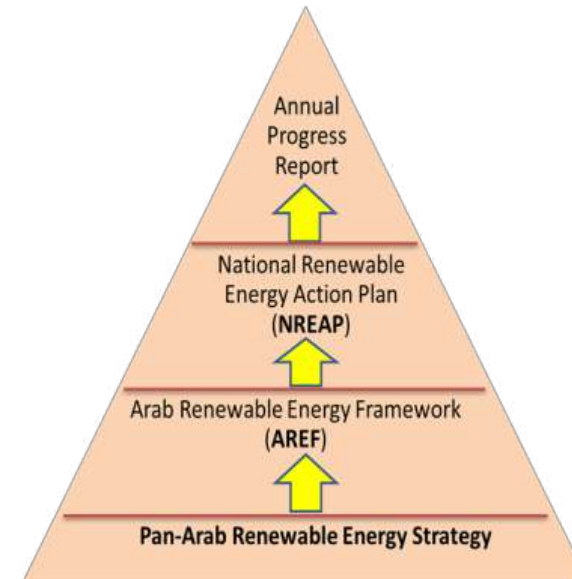
## National Energy Efficiency Action Plans (NEEAPs)

- **Supporting MS** in the **drafting and implementation** of their NEEAPs
- Introducing a **NEEAP template** for MS
- **Training MS officials** on EE planning, monitoring and evaluation of EE measures
- RCREEE Monitoring and reporting on **NEEAP's progress** in the region



## National Renewable Energy Action Plans (NREAPs)

- Supporting Arab Countries in developing their **national RE planning, reporting and evaluation in line with the Arab Renewable Energy Strategy**
- Introducing a **NREAP template**
- Providing **local and regional training** to MS





- Contribute to **enhancing energy security** of beneficiary countries while fostering their **transition to low carbon economy**, thereby contributing to more stable, **efficient, competitive and climate-resilient** socioeconomic contexts.



• The massive deployment of renewable energy and energy efficiency measures in building and appliances' sectors in the Southern Neighbourhood region accelerates the clean energy transition.



• Public awareness on energy's major stakes and challenges increases, thereby fostering public and private sectors' involvement towards more energy efficient buildings and appliances sectors



Algeria



Egypt



Jordan



Lebanon



Libya



Morocco



Palestine

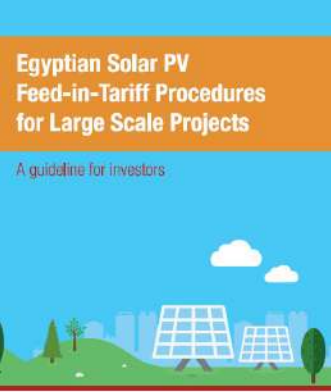
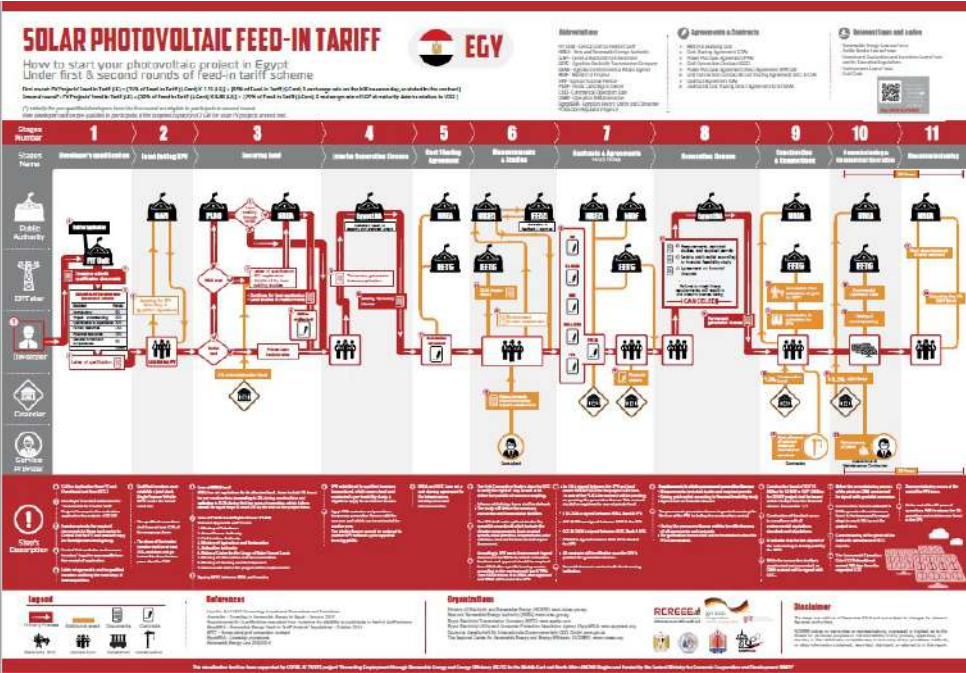


Tunisia



# Private Investments' Promotion

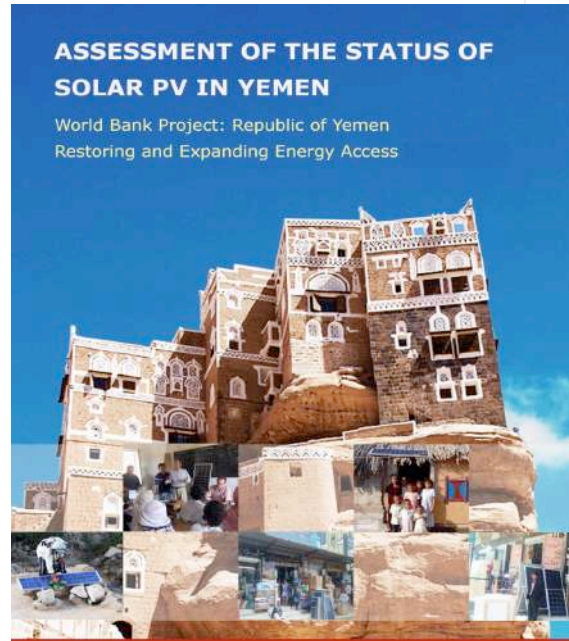
## Example: Investor's Toolkits- Egypt





# Private Investments' Promotion

## Market Assessment Studies



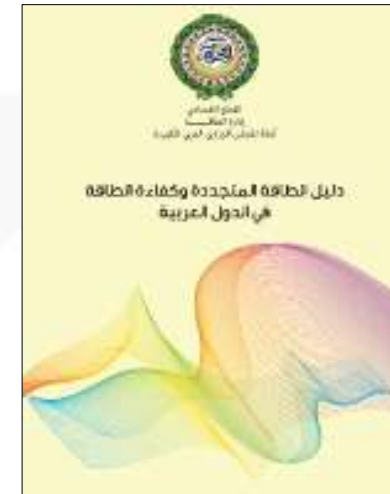
## Research & Analysis



MORE THAN  
**30,000**  
STATISTICS

**100's** OF  
DOCUMENTS  
& PROJECTS

Verified and Regularly  
**UPDATED**

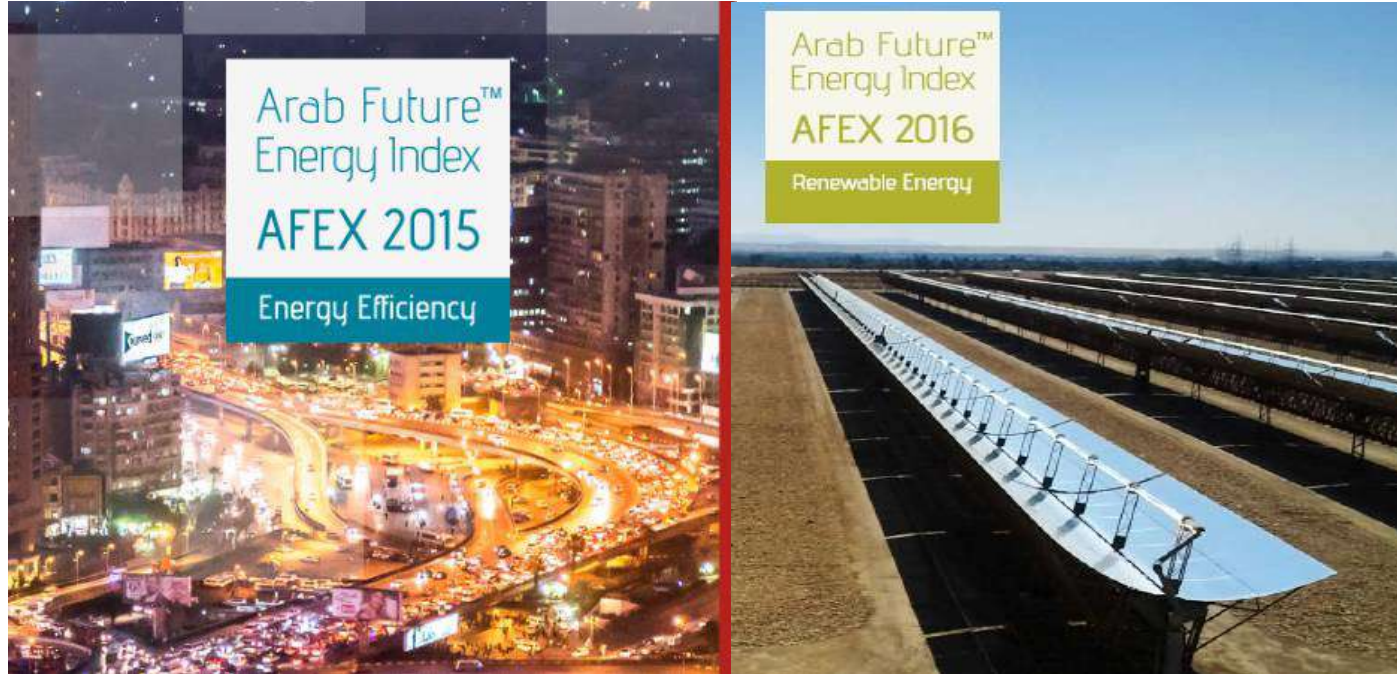


# TaqaWay.net





# Research & Analysis

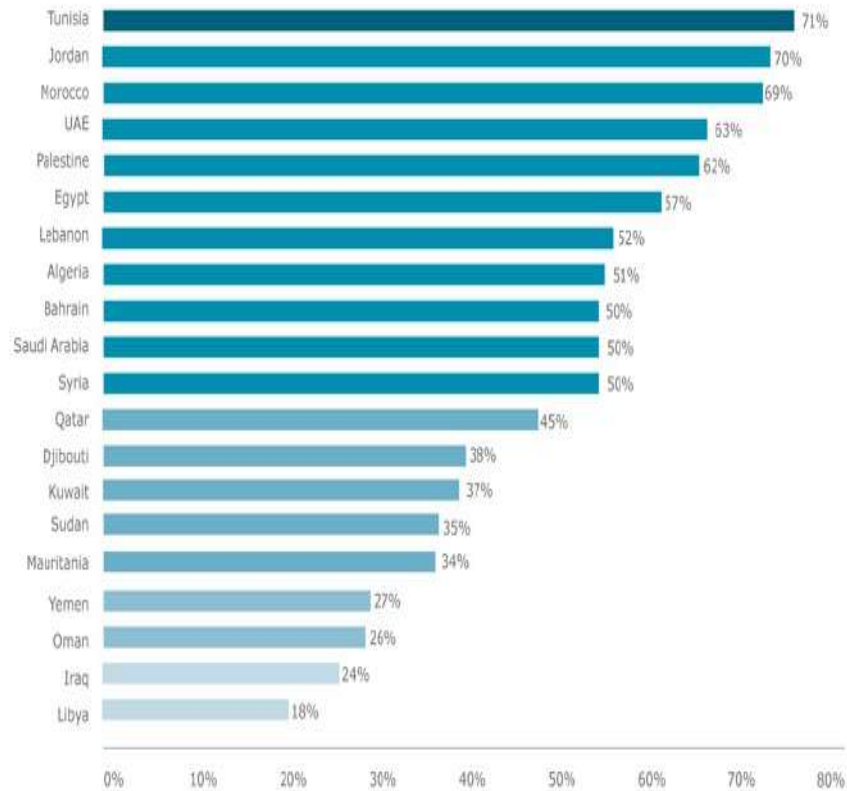


## Progress Towards Sustainable Energy Development

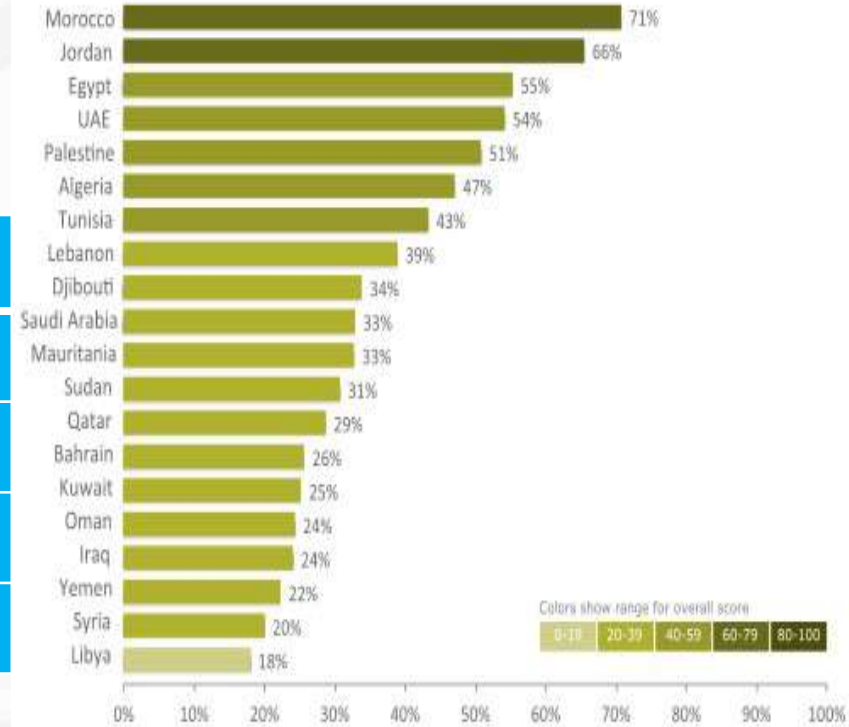




## Arab Future Energy Index EE



## Arab Future Energy Index RE



- AFEX – EE
- Energy Pricing
- Policy Framework
- Institutional Capacity
- Utility

- AFEX – RE
- Market Structure
- Policy Framework
- Institutional Capacity
- Finance and Investment Climate



## Intended Nationally Determined Contributions Comprehensive Analysis on the Energy Sector for Arab Countries

Country	Unconditional mitigation target	Conditional mitigation target	Total target
Algeria	7%	15%	22%
Djibouti	40%	20%	60%
Iraq	1%	14%	15%
Jordan	1.50%	12.50%	14%
Lebanon	15%	15%	30%
Mauritania	2.70%	19.60%	22.30%
Morocco	17%	25%	42%
Oman	0%	2%	2%
Tunisia	8.80%	29%	37.80%
Union of Comoros	0%	84%	84%
Yemen	1%	13%	14%

# Certification & Training for Energy Professionals

## Pan Arab Certified Energy Management Professional (PA-CEMP) ©

First standardized training program to equip the Arab energy professionals with the appropriate qualifications to reduce energy consumption in a cost-effective approach. Endorsed by the AMEC to support the implementation of NEEAPs and achievements of the EE targets..

### ■ Background:

Successful execution of energy efficiency plans rely on a highly skilled and well-trained workforce and experts. Arab Countries expressed their interest to conceive and implement a certification program for energy professionals in the Arab region.

### ■ Objectives:

Raise the professional standards of the Arab energy managers, and help to identify individuals with the required acceptable knowledge of the principles and practices of energy management related disciplines

### ■ Outcomes:

- ≡ Since November 2017, PA-CEMP program was implemented in 4 countries.
- ≡ **1200 applications received from all over the Arab region.**
- ≡ 46 PA-CEMP certification rounds held across different Arab cities.
- ≡ 14 PA-CEMP certification rounds organized in online basis during the COVID-19 pandemic.
- ≡ 426 PA-CEMP certificates awarded to the successful participants from 18 Arab nationalities.



# Renewable Energy & Energy Efficiency Investments Promotion



## Green Economy Financing Facility

- Provides finance and advice for private sector businesses
- Supports Egypt's green economy transition with €140 million of financing for energy efficiency and small-scale renewable energy investments
- Technical support to develop a green investment project
- Businesses receive a partial grant



## Energy Management Services

- Provides capacity building to the Banque du Caire on energy assessment procedures and classifications
- Provides energy assessments to industries
- Provides help-desk support to interested parties



## Support for the establishment of Industrial Energy Efficiency (IEE) Fund

- Setting up the fund
- Actively engage in identifying interested project proponents
- Administering the procedures for project finance
- Monitoring, measurement and verification of energy savings





## Bird migration protection and management through active turbine management

- Aiming to determine the optimum wind turbines operations periods during the heavy bird migratory seasons.
- An innovative coordinating and executing strategic framework



## Environmental and social impact assessment and management of large-scale PVs

- Ensure application with monthly report of issues raised and actions taken or planned:
  - Child labor
  - Forced labor
  - Payroll
  - Accommodation
  - Working Conditions

# Evolution of global renewable energy employment by technology, 2012-2021



Source: Renewable Energy and Jobs Annual Review 2022

# Fact Figures & Analysis

**12.7**  
million



**Worldwide employment** in renewable energy in 2021, up from 12 million in 2020. Close to two-thirds of all jobs are in Asia, and China alone accounts for 42% of the global total. It is followed by the European Union and Brazil with 10% each, and the United States and India with 7% each.

**4.3**  
million



**Jobs in solar photovoltaic (PV)** in 2021, the fastest-growing sector, accounting for more than a third of the total renewable energy workforce.

**1.3**  
million



**Jobs in wind power** in 2021. Countries are building the industrial base and infrastructure needed to support growing offshore installations.

**2.4**  
million



**Direct jobs in hydropower** in 2021. Two-thirds of these jobs were in manufacturing, 30% related to construction and installation and about 6% to operation and maintenance.

**2.4**  
million



**Jobs in biofuels** in 2021, with the vast majority in feedstock operations. Biodiesel output and employment are rising while ethanol is ebbing.

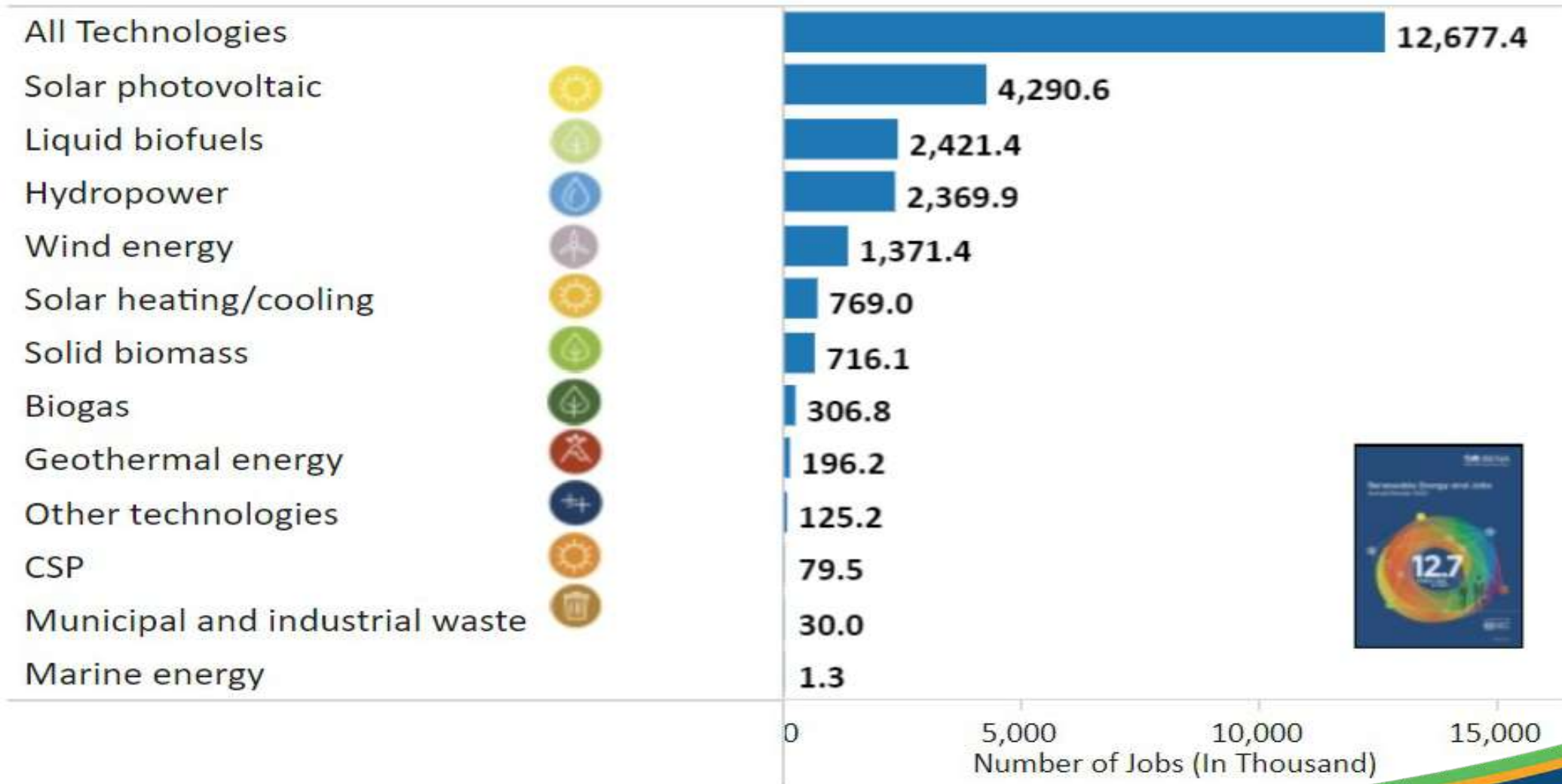
**38.2**  
million



**Worldwide employment in renewable energy in 2030** under an ambitious energy transition scenario with front-loaded investments. The number of jobs in the energy sector could rise to 139 million, including more than 74 million in energy efficiency, electric vehicles, power systems/flexibility and hydrogen.



# Showcases employment for renewable energy sector worldwide by technology



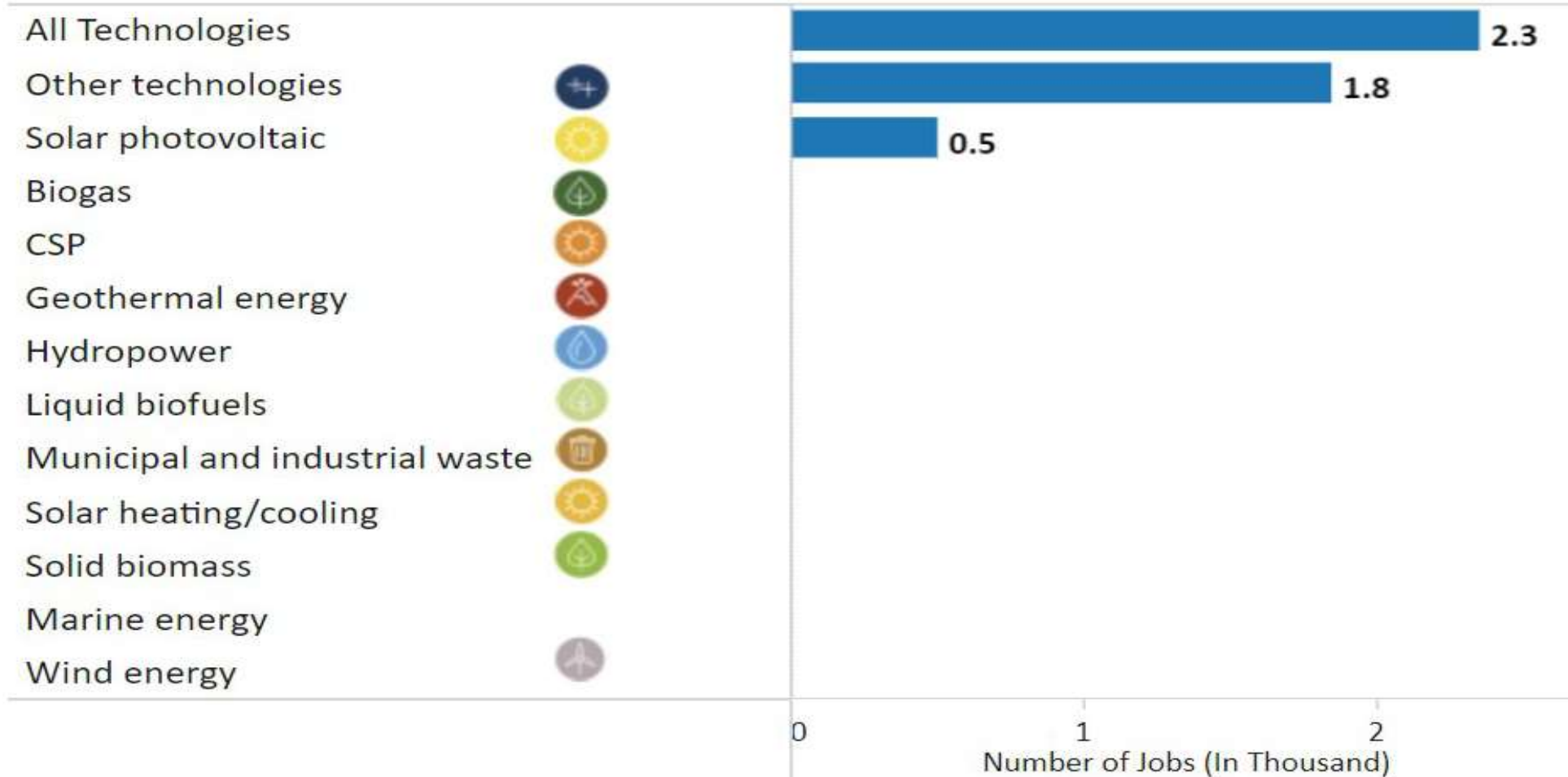




**RENEWABLE ENERGY EMPLOYMENT  
– INSIGHTS FROM MENA REGION**

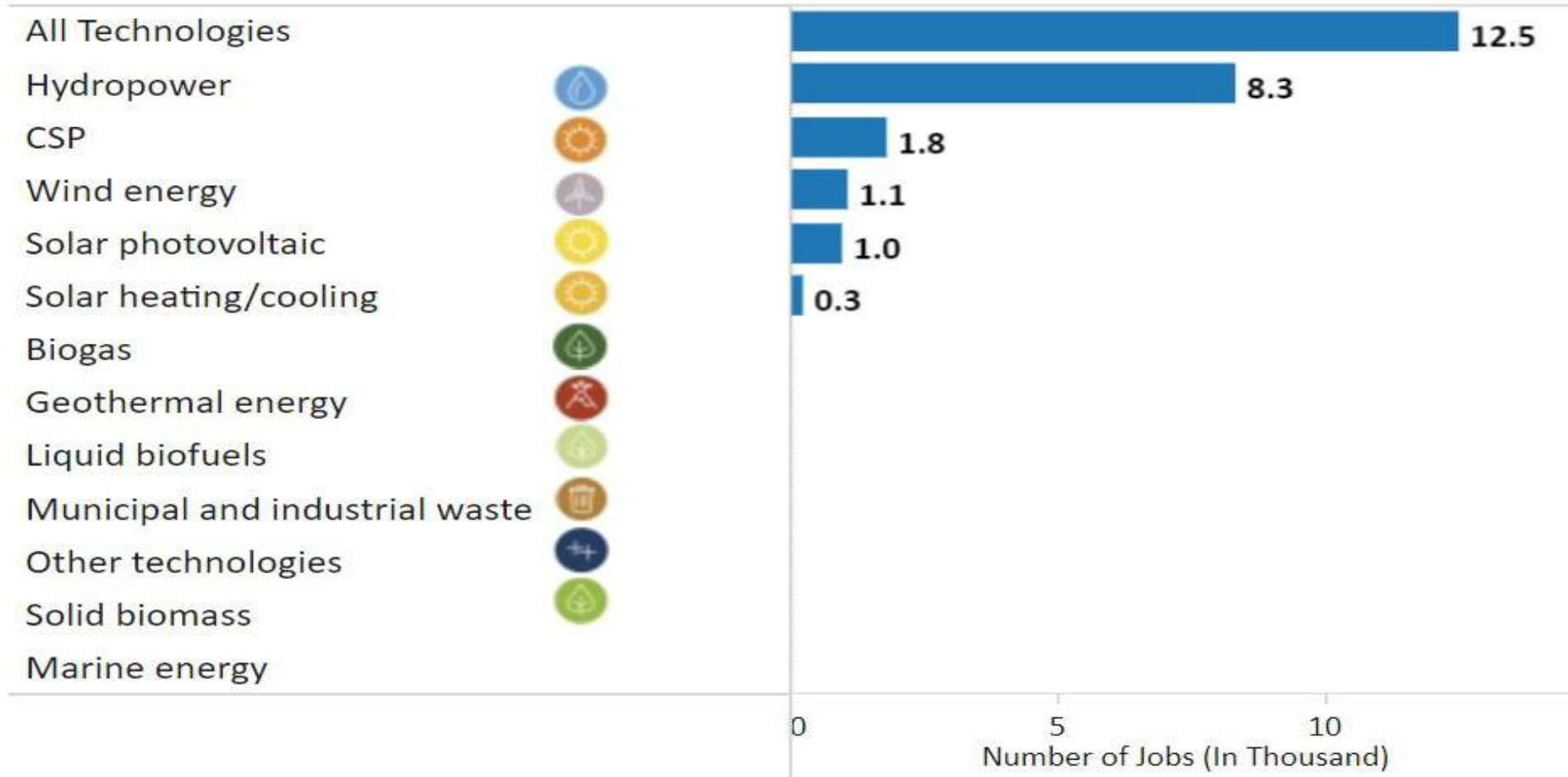
- ❑ The experience of the Middle East and North Africa (MENA) countries provides insights into deployment strategies for renewable energy capacity and their potential links with employment policies.
- ❑ While these countries are endowed with young, growing and increasingly well-educated populations, constraints in their respective labor markets have limited job opportunities for their national labor forces.

# Showcases employment for renewable energy sector by technology - Algeria



Source: IRENA Jobs Annual Review 2022 Platform

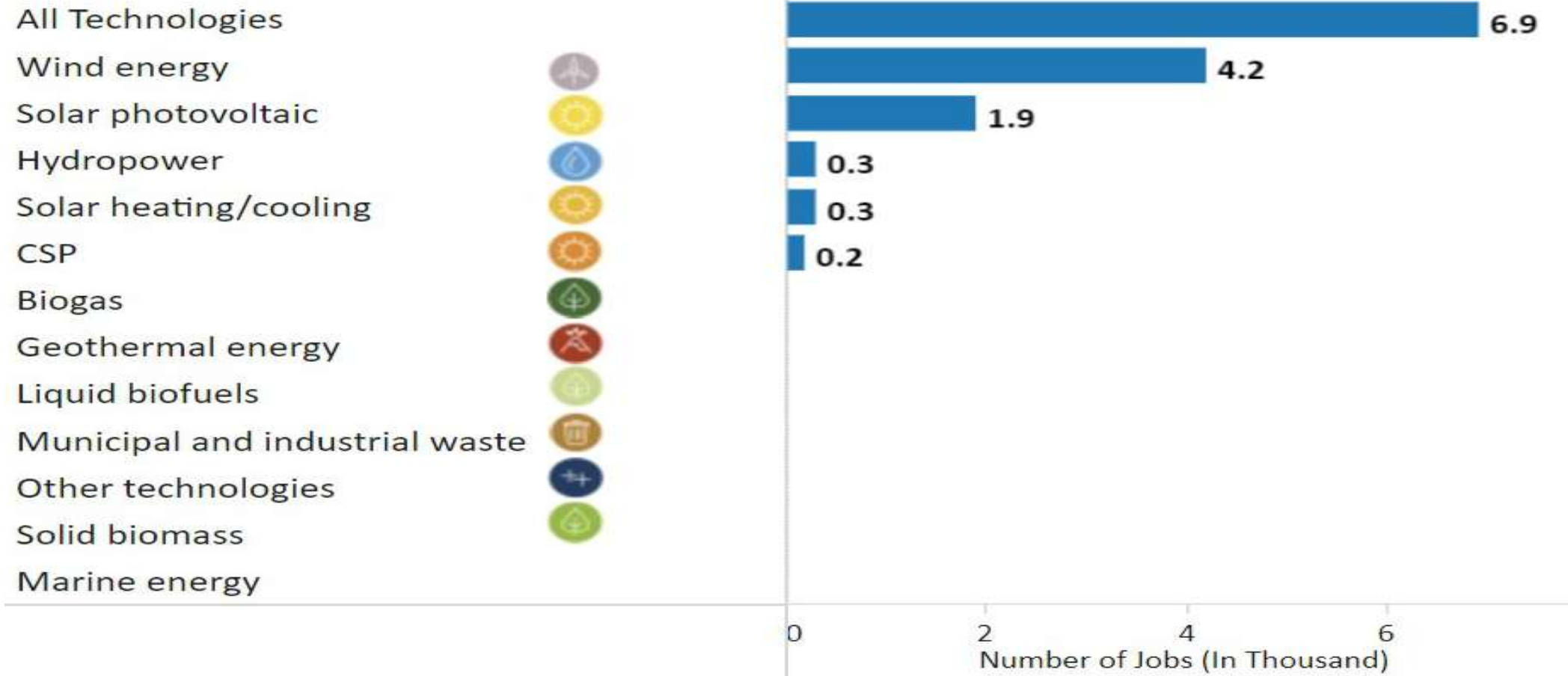
# Showcases employment for renewable energy sector by technology - Morocco



Source: IRENA Jobs Annual Review 2022 Platform

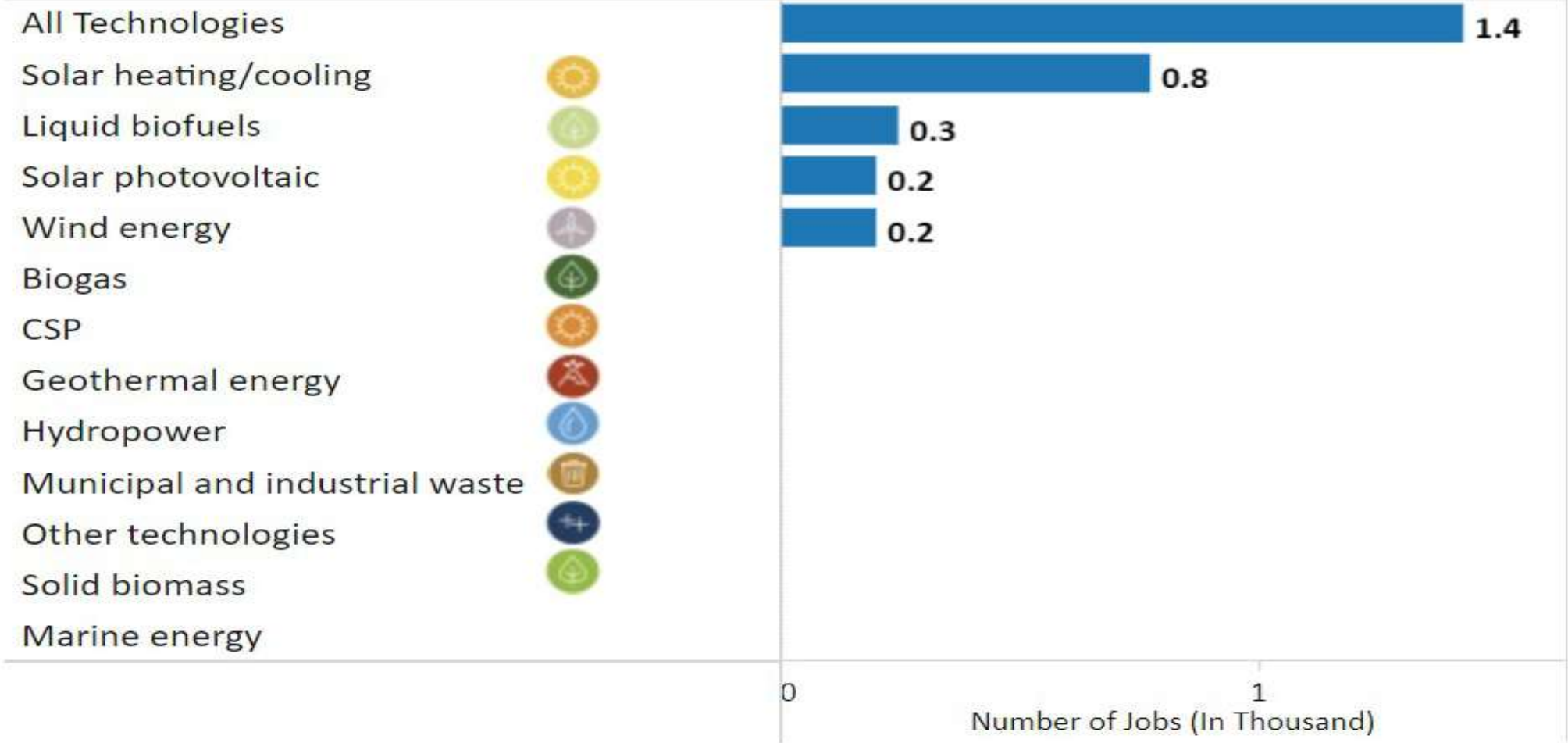


# Showcases employment for renewable energy sector by technology - Egypt



Source: IRENA Jobs Annual Review 2022 Platform

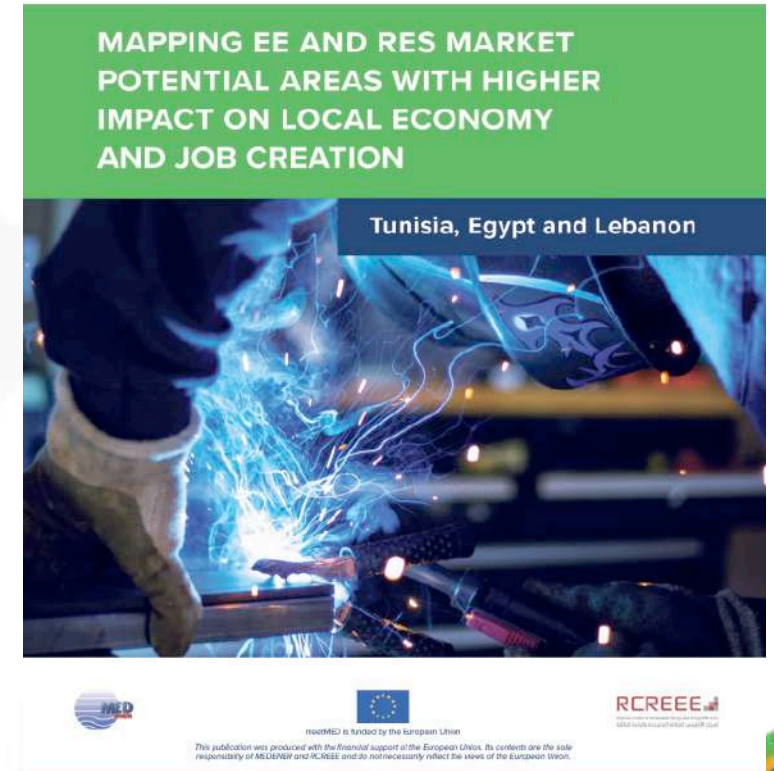
# Showcases employment for renewable energy sector by technology - Tunisia



Source: IRENA Jobs Annual Review 2022 Platform

# RCREEE Analysis: Approach

- The basic idea is as follows:
  - The value chain of RE contains (i) Product development and manufacturing (ii) Planning, design, construction and installation, and (iii) Operation and maintenance
  - Each phase leads to direct employment, calculated in a multiplication of employment factors with the respective physical quantities or monetary units
  - Each phase also leads to indirect employment along the value chain

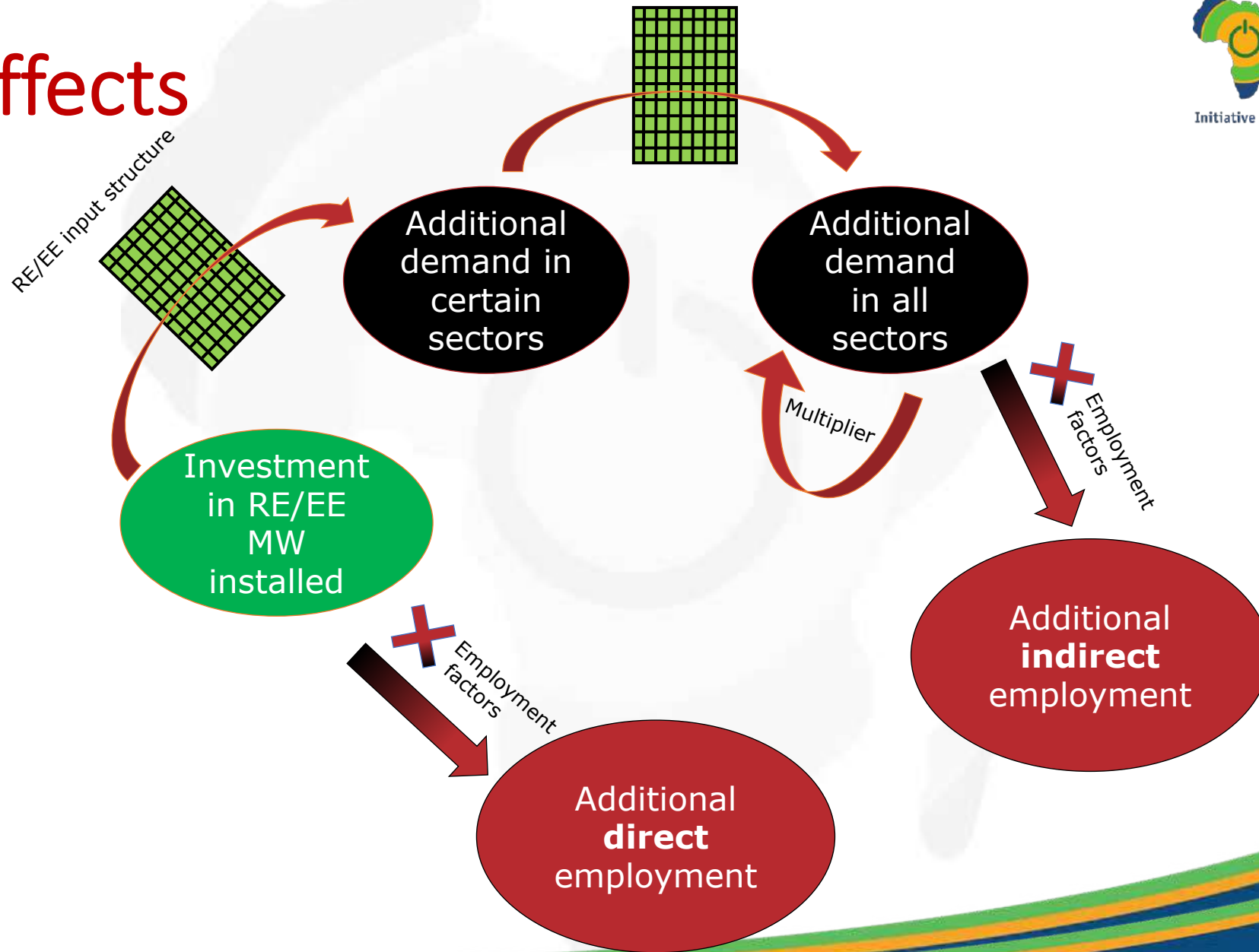


# RE Jobs: Value Chain, Direct and Indirect Jobs

	Direct	Indirect
Product development and manufacturing	Jobs in the production of electricity or heat generating system itself be it turbines, PV modules, solar water heaters, etc.	connected to all intermediate goods used in the production of the RE systems
Planning, design, construction and installation	Jobs in planning and design of the wind farm, the solar field, etc., the construction works, such as digging, installation and assembly of components, concrete works, pipes, electrical works, buildings for the operation, storage etc.	production of building material and building machinery, cables, etc.
Operation and maintenance	in controlling the performance, bookkeeping, accounting, cleaning, repairs, replacements, greasing, etc.	production of spare parts, greasing material, computers etc.



# Chain of effects





# RE Jobs: Introductory Thoughts!

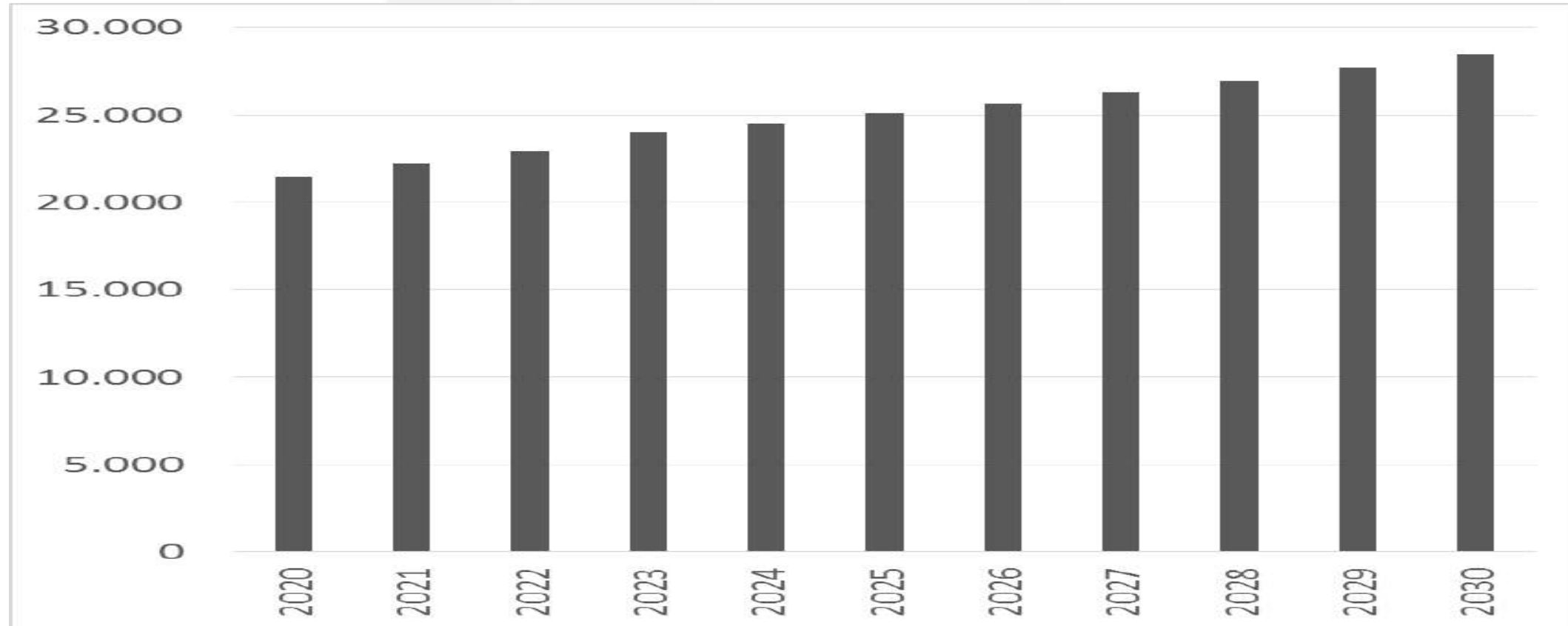
- RE energy business is gaining traction throughout MENA and jobs creation is a very important impact ...
- RCREEE has decided to learn how this is being done and to tell the true story about the green jobs in MENA and the region! Backing the decision-making process !



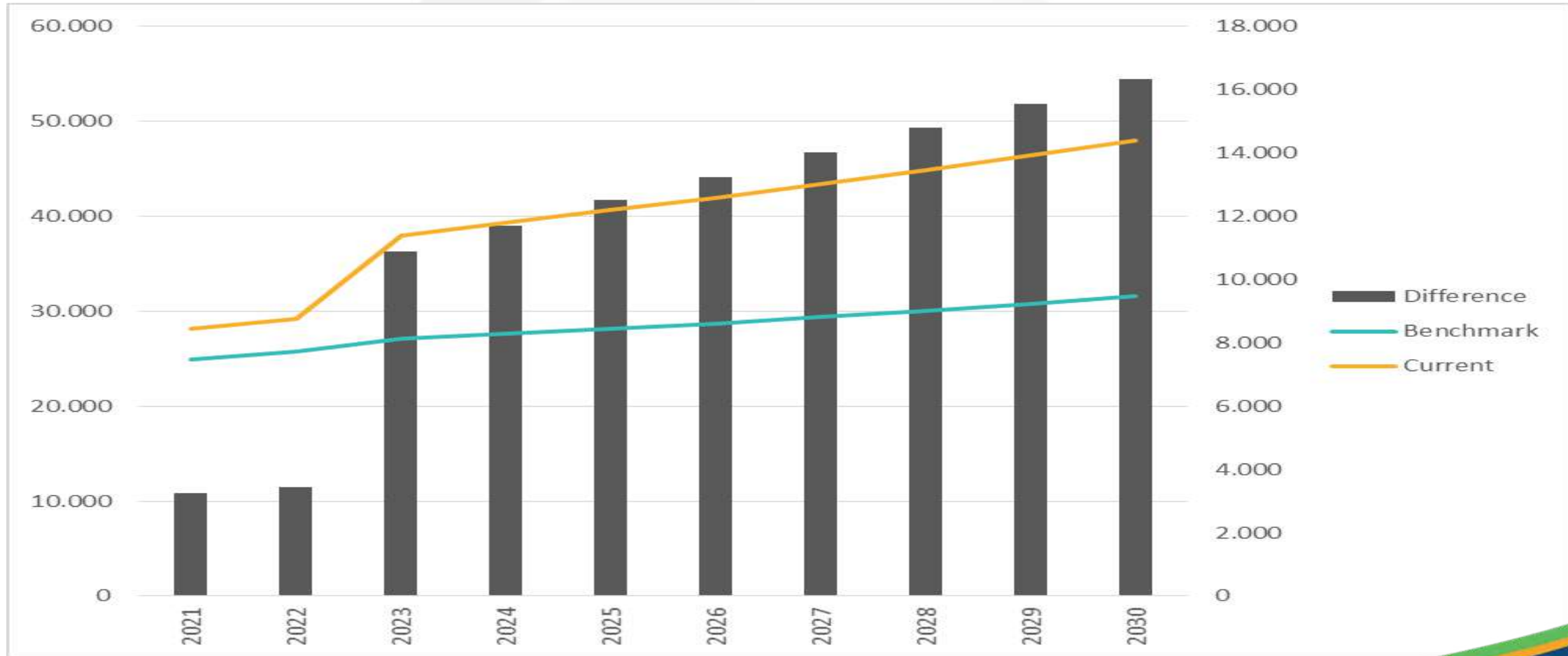
Country	Capacity (MW)		Potential Direct Jobs Created by 2030	
	Solar	Wind	Solar	Wind
Palestine	300	200	1,102	263
Lebanon	900	600	3,305	790
Jordan*	1,932	1,288	7,095	1,696
Tunisia	2,289	1,526	8,406	2,009
Libya	2,76	1,84	10,135	2,423
Morocco	6	4	22,033	5,267
Algeria	13,2	8,8	48,473	11,587
Egypt**	32,4	21,6	118,978	28,44

# Example of Results – Benchmark scenario

- Employment rises to more than 28,000 jobs



## Example of Results – Different future scenarios



# **RENEWABLE ENERGY EMPLOYMENT - WORLDWIDE**



# RCREEE's Role in Promoting Green Jobs

Introduce and mainstream green jobs in the national and regional energy frameworks (NEEAPs, NREAPs, Arab RE Strategy, etc.)

Market assessments showcasing the high/untapped potentials

Institutional support through dedicated assessment tools and capacity building

Participate in and organize partnerships on national and regional levels that facilitate dialogue among & engage all relevant stakeholders

Develop harmonized/replicable quality for training frameworks, models and programs  
Implement pilot/exemplary training and workforce development programs

Support identify proper channels to get information, training, and available resources to those who need it most

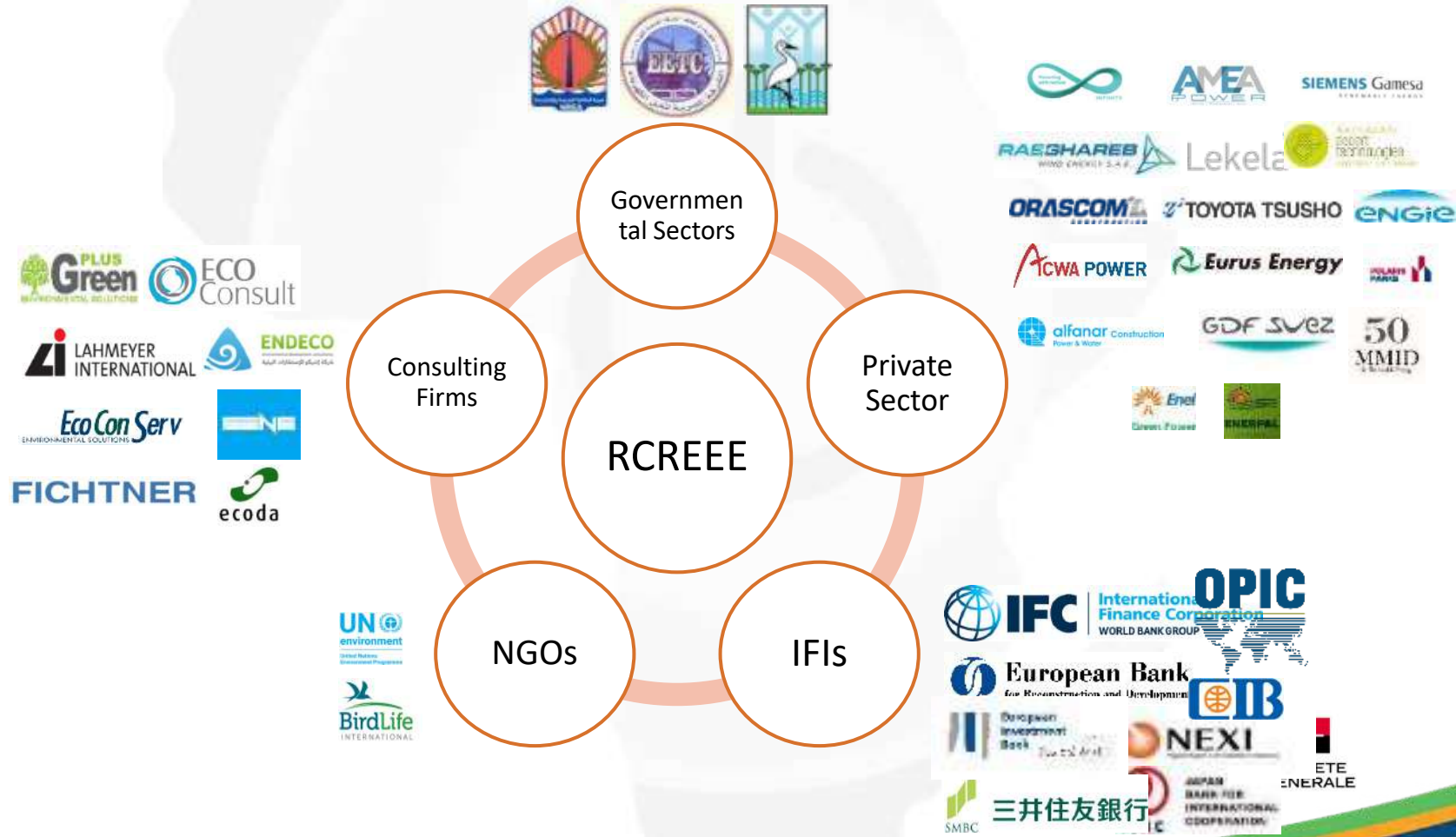
# **Active Turbine Management Program – Success story from Egypt**

# ATMP

The Regional Center for Renewable Energy and Energy Efficiency (RCREEE), Egyptian Electricity Transmission Company (EETC), Egyptian Environmental Affairs Agency (EEAA) and New and Renewable Energy Authority (NREA) have signed on 15<sup>th</sup> of December 2015 a Protocol titled “Executive Framework for Strategic Cumulative Environmental and Social Impact Assessment (SESA) & Program of Ornithological Monitoring and Active Turbine Management Program (ATMP) for Wind Energy Developments in the Gulf of Suez.



# Innovative Strategic Framework - Egypt



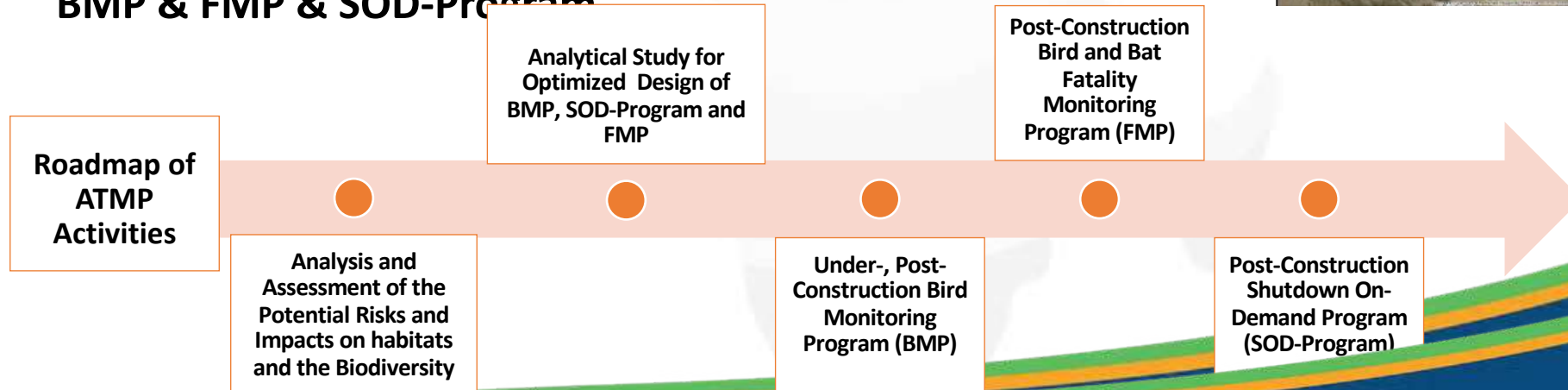


# RCREEE's Niche Expertise

SESA and Proposal for 5-yrS BMP

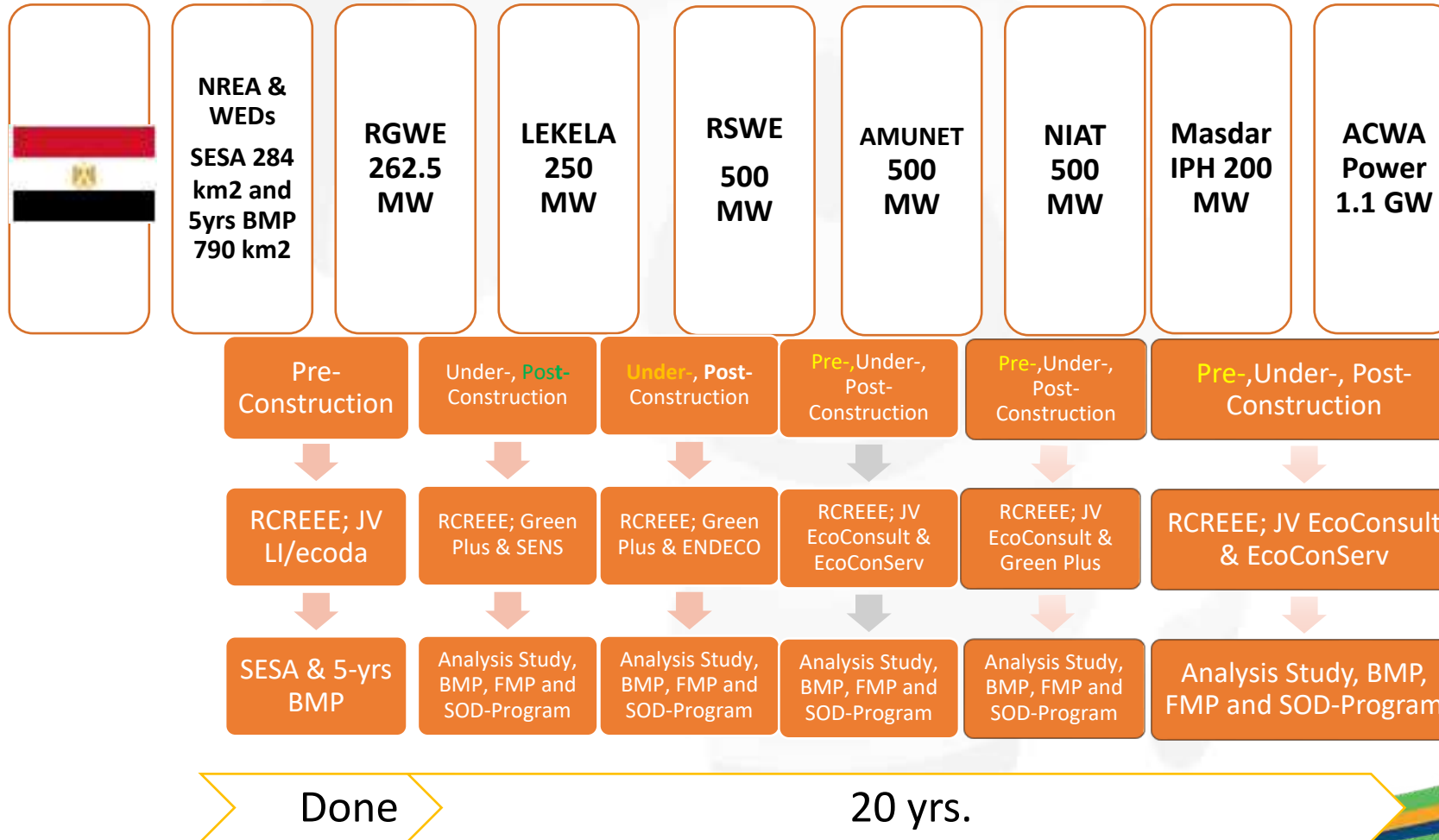
ESIAs, OTL, EIA, CEA, CHA, Bat Assessment.

Active Turbine Management Program (ATMP):  
BMP & FMP & SOD-Program

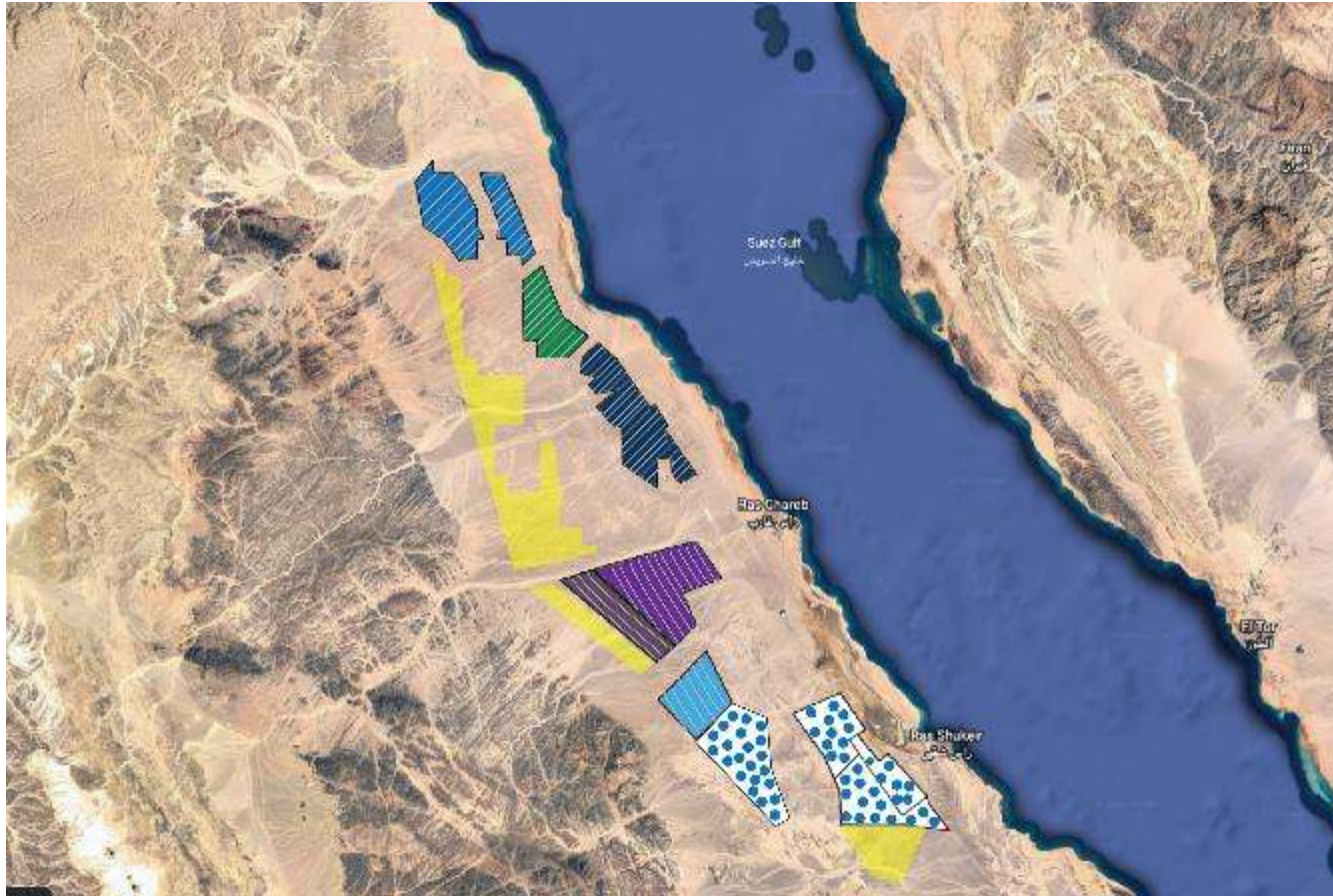
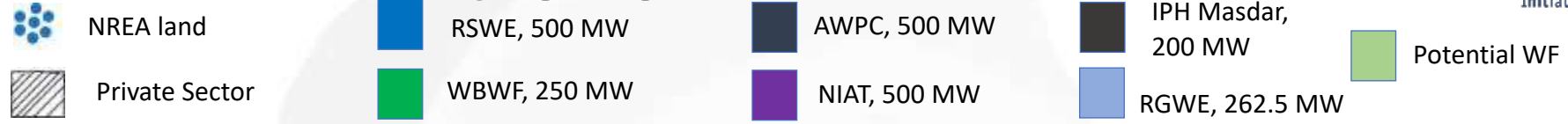


# ATMP Portfolio

Total of 3.3 GW of wind turbine Power



# ATMP Portfolio





# ATMP Components

## Environmental and Social Requirements

Landscape and Visual

Land Use

Geology, Hydrology, Hydrogeology

Biodiversity

Birds

Archaeology and Cultural Heritage

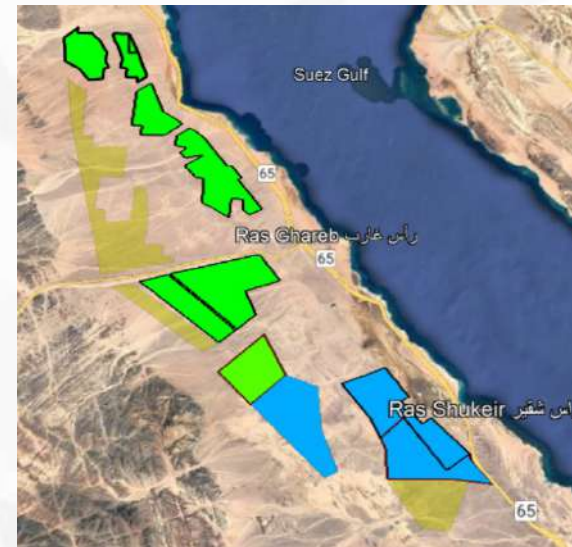
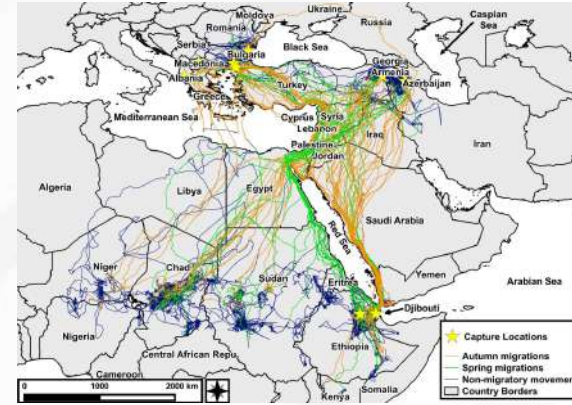
Air Quality and Noise

Infrastructure and Utilities

Occupational H&S

Public Health and Safety

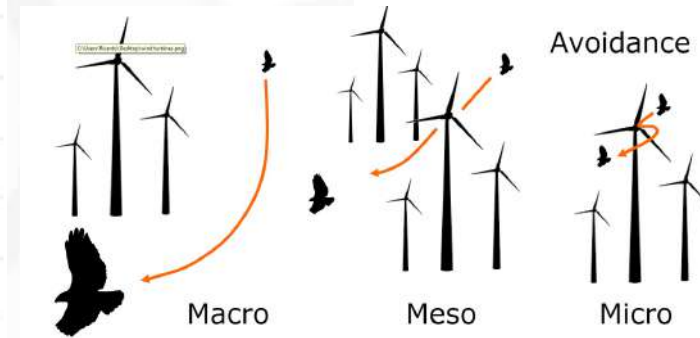
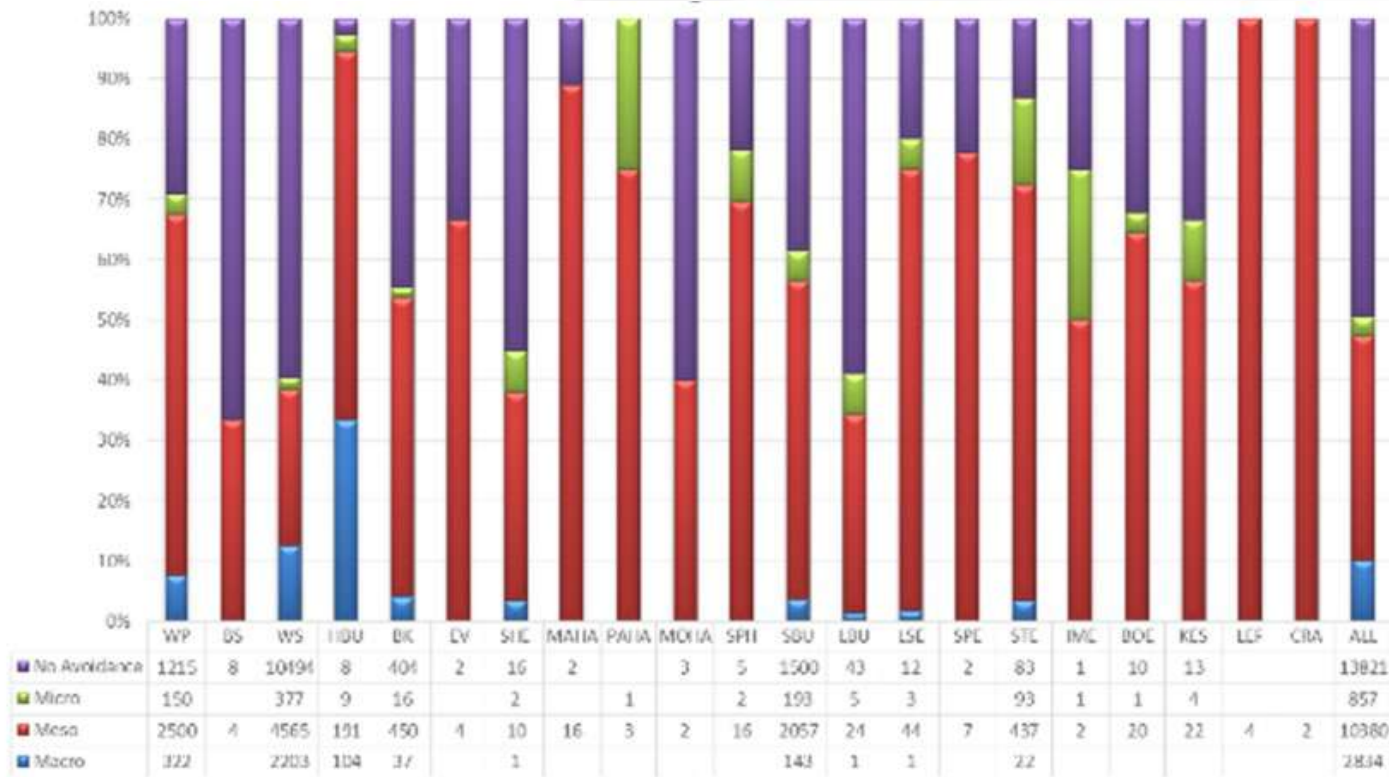
Socio-economics



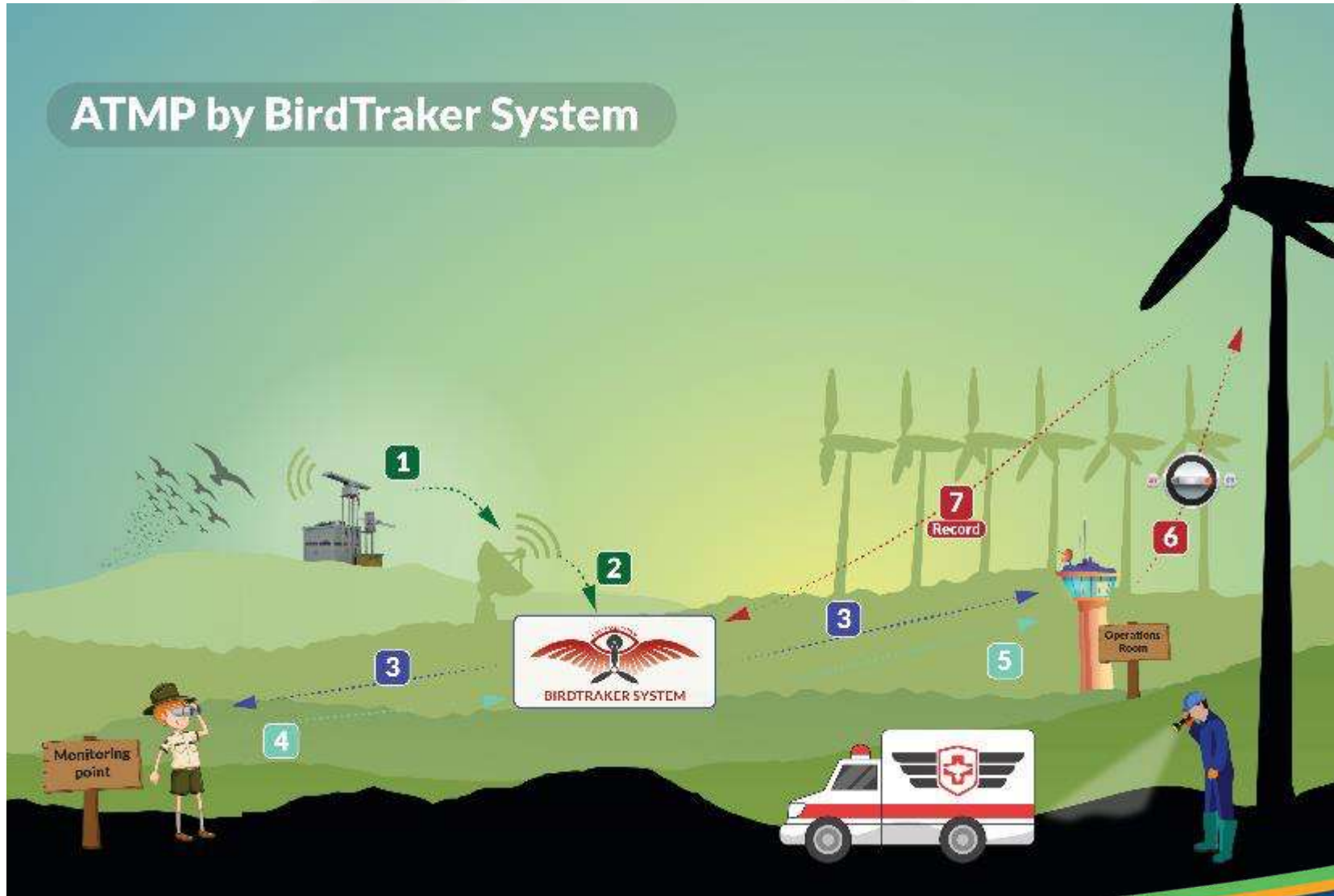


# ATMP Components

## BMP and SOD-Program

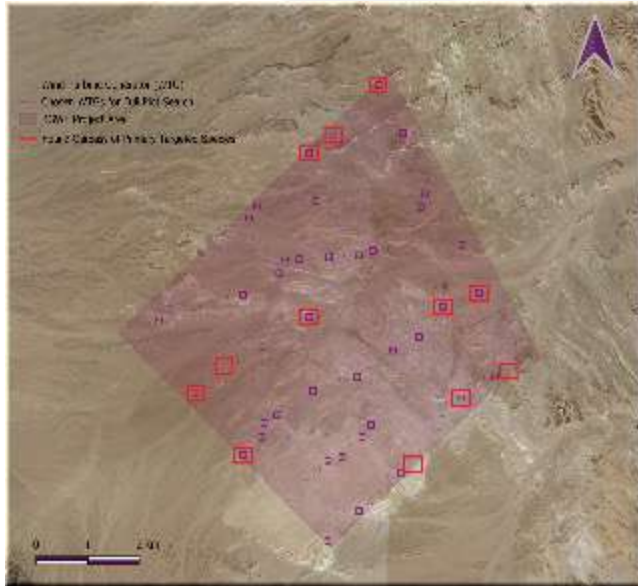


## ATMP by BirdTraker System





# Bird & Bat Fatality Monitoring Program



# ATMP Portfolio

## Bird & Bat Fatality Monitoring





# ATMP Training and Capacity Building Activities

throughout the application of ATMP program, RCREEE committed to train **200** young professionals on bird monitoring and observing in wind farms



**35%** of the trained observers are female



ATMP Management Team has both genders working together for the program success



**RCREEE Proud To Be The First Center in the Region to Train Women on Bird Observing in Wind Farms and to Be Core Part Of The Program Implementation**



# RECOMMENDATIONS

- ❑ There is still a **mismatch** between graduates and the labor market across the three countries reviewed. This extends to the renewables sectors, particularly in regions where most of the solar and wind farms are located.
- ❑ The combination of highly skilled unemployment and skills shortages indicates **an educational system** that trains individuals in unsuitable skills.
- ❑ The fact that the tertiary educational system is still geared towards the needs of the public sector adds to the **skills challenge**.



- ❑ The number of jobs in the MENA renewables sector **will likely remain small overall** and cannot be counted on to fully employ the growing number of young people entering the region's labor market.
- ❑ However, the green power sector's development can nonetheless become an **important motor of job creation** with spillovers from and to related subindustries, scientific research and new business opportunities.
- ❑ It is therefore important to have the right conditions in place to take advantage of any **future job opportunities** that the renewable energy sector may offer.

**In the energy sector, there is a need to prepare :**

- ❑ new workers for designing, installing, operating and maintaining wind farms.
- ❑ In the manufacturing sector there is a need to train engineers, technicians and supervisors in the manufacturing of different components of wind farms, such as wind blades.
- ❑ Within the construction sector, there is a need to prepare engineers in the design and construction of wind farms.
- ❑ Environmental Impact Assessment consultants

# **FUTURE PARTNERSHIPS**

# Our Partnerships - Examples





# RCREEE Work Areas

Policy Reform and Support	Action Plans for Sustainable Energy Legal, Regulatory and Contractual Frameworks Support
Knowledge Management	Online platform Capacity Building
Private Sector Promotion	Market Assessment Investment Promotion
Sustainable Energy Projects Assessment	Financial and Technical Assessment Social and Economic Impact Assessment
Environment and Climate Change	Climate Change Environmental and social Impact Assessment
Standardization and Certification	Products Certification Personnel Certification

***These work areas are being implemented through 40+ different projects with various partners and stakeholders***

# Conclusion

- ❑ RCREEE is supporting in the promotion and acceleration of sustainable energy policies, plans, strategies and technologies in all the region.
- ❑ RCREEE is officially requested from member state countries to satisfy the needs and gap the challenges in the sustainable energy field.
- ❑ For example, RCREEE is receiving requests to help North African countries in technical support regarding building energy models, expansion plans, enhancement grid systems and develop capacity building programs.
- ❑ RCREEE seeks International partnerships with financiers and enablers to satisfy the needs of African countries.

## **Thank You**

**Eng. Maha Mostafa - (Chairwoman)**

**Regional Center for Renewable Energy and Energy  
Efficiency (RCREEE)**

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