2030 - 300GW



Africa Renewable Energy Initiative Initiative Africaine pour les Énergies Renouvelables

How to present a project and obtain financing: Successful Financing of RE Project in Africa





Transition to Renewable Energy





Challenges lead to the Importance of setting a new strategy of electricity Sector



During Year 2014





Political Leadership Support



Energy is considered a matter of national security.



The political leadership has placed the issue of electric energy within its main agenda as it is the main pillar for development in various fields of economic and social life.



Installed Capacities Added from the

End of 2014 till the End of 2021







Generation Power Plant (Investment Cost)





During the last 7 years total investment cost of the Generation Power Plants over national Grid exceeds : 22 billion \$







Upgrading Transmission Grid







Upgrading the extra high voltage main transmission network.

- Investigate the impact of the growing demand on the transmission system infrastructure by 2025 and define the corresponding grid development measures.
- Set a target network topology as a guideline for the short term transmission planning phase.

Situation for 500KV Transmission Network By End of 2021





ELECTRICITY GRID BY END 2021



7203 km Total Length of 500 KV Grid

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National Grid Upgrading (Investment Cost)





During 7 years total investment cost of the Transmission network over

national Grid exceeds : **4.6 billion \$**





Transition to Renewable Energy



Potentials from Wind & Solar Based on (Wind & Solar Atlas)



Available Areas				
Zone		Areas (km2)	Capacity MW	
Suez Gulf (wind)		80	400	
Wind		645	3225	
East Nile	Solar	981	49050	
West Nile	Wind	1807	9035	
	Solar	66	5800	
Benban (Solar)		5.5	270	
Fares 1, 2		11	550	
Kom Ombo (Solar)		32	1600	
Zafrana (Solar)		6.5	300	
TOTAL		3634	≈70230	





(Solar Atlas)

(Wind Atlas)





Considering the Renewable Energy in our Energy Strategy until year 2035 to encourage private investments:

Incentives For Investments In Renewable Energy

Availability of information concerning Solar Atlas and Wind (Available for all investors).

Environmental Impact Assessment Studies.

Long Term bankable PPAs.

Custom duties for all imported materials and equipment do not exceed 5%.

Sovereign Guarantees issued by Ministry of Finance.

Renewable Energy Projects qualify developers to the Golden License permission from Ministry of Investment



Framework for Renewable Energy Development Mechanisms



Private sector investments will play major role in achieving the target through a framework mechanisms .





Integrated Sustainable Energy Strategy to 2035



A transformative shift from gas to renewables

- Targeting : 20 % Renewable Energy from Peak load by year 2022.
- Targeting by year 2035 :
 - 42 % Renewable Energy from total Installed Capacity .
 - **18%** Improvement in Energy Efficiency.





Egypt's Energy Mix by 2035





• 2035 Strategy has Been Revised and Excluding COAL option from the Energy Mix and replaced it by Renewable Energy using (BOO) Scheme "will be shown later"



Updated Results Renewable Energy Situation



Update of the Integrated Sustainable Energy Strategy to 2040 (ISES40)

ELECTRICITY DATA / INFORMATION REQUEST

1. Expansion plan by EEHC

2. Future Demand projection made by the planning department at EEHC(if it is available till 2040, it will be better). It is preferable to provide the study for this projection.

3. Status of the Nuclear plants and execution program (planned schedule for the commissioning dates of the four plants) and if there are plans for more Nuclear plants in future till 2040.

4. Status for the pumping and storage project at Attaqah and its implementation program

Status of the planned additional pumping and storage program and the expect introduction data of these plants.

Projected reduction in the Hydro power from the high dam and other hydro plants due to the renaissance dam (available studies).

7. Plans for the expansion in small hydro plants

8. Plans for market reform and unbundling of EETC from EEHC.

9. Electric mobility projection and expected demand (any approved studies)

10. Water strategy and its energy demand (water strategy report for both irrigation and municipal water including both pumping needs and desalination)

11. Expected demand increase due to the on going projects (Haya karma, new delta, 1.5million Fiddan program, Development of Sinai,...etc)

12. Hydrogen strategy (the report developed by the national committee on Hydrogen strategy which is formed by the prime minister)

 Recent Updata for the Study of Euro-Africa project and project program (feasibility study, expected changed energy, execution program, status of the implementation and trading agreements,...etc)

14. Recent Update on Egypt Saudi interconnection and the execution program

15. Recent update of Egypt Sudan Interconnection and future plans for expansion

16. Recent Update on Egypt Jordan interconnection expansion plan and expected traded energy (feasibility study for the project expansion). Plan for the expansion of Egypt/Lybia interconnection and study for the expected energy exchange.

There is an urgent need to update the strategy to determine the possibility of increasing the participation of renewable energy in the Egyptian energy mix through excluding COAL option from the Energy Mix and replaced it by Renewable Energy

- In coordination with the European Union Commission in Cairo, it was agreed to provide technical support to update the scenarios of the integrated and sustainable energy strategy until 2035.
- A contract was made through the Commission with an international advisory office, which includes the same consultants who previously worked in preparing the original strategy in 2016.







Project	Capacity	Commercial Operation	
Current Renewable Energy Installed Capacities (Hydro – Wind – Solar)	6096 MW	In Operation	
Solar Project - PV (Under Construction)	770 MW	2024 (2025	
Wind Projects (Under Construction)	3050 MW	2024 / 2025	
Total	Approx	. 10 GW	

- Installed Capacities of renewables (Hydro Solar Wind) : 6096 MW (Approx. 20% of peak load)
- By End 2023 installed Capacities of Renewables reach approximately 10000 MW





Preliminary Study for Additional Areas for wind and Solar power





Study for Additional Areas for wind power





- Total Potential Area (km²) : 173 thousand Km²
- Total of Min. expected Wind Capacity (GW) : 347 GW

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Study for Additional Areas for SOLAR power



Site	Area number	Proposed area (KM ²)	Available areas (KM ²)	Radiation GHI kwh/m ²	Capacity (GW)
Fayoum	8	202	35	2504.11	1.75
West Sohag	10	7679	4040	2610.38	200
Total			4075		202

There are other spaces that produces

up to **445 GW** additional capacity.

Total spaces produces up to 647 GW Solar

Note: Every 1 KM² produces about 50 MW solar









- Preparing The National Hydrogen Strategy
- Cooperation with International Companies





Preparing The National Hydrogen Strategy



 5th March 2022 : MOU has been signed between EBRD, Ministry of Electricity and Renewable Energy, Ministry of Petroleum & Mineral resources to establish a national low-carbon hydrogen strategy, The strategy is expected to be completed before COP27 in November 2022.





Proposed Capacities & Capacities of MOU

Renewable Energy - Electrolyser





16 Standard MOU'S were signed to establish green hydrogen production projects and its

derivatives from green ammonia and green fuels:

- Renewable Energy = 12.4 GW
- Electrolyzer = 5.5 GW





Proposed Capacities & Capacities of MOU



	Capacities of MOU							
Company	Pilot Project			1st Phase Project			Total { P.P + 1st Phase}	
	Electrolyser	R. E	Electr	olyser	R	. E	Electrolyser	R. E
	G.W	G.W	G	W	G	.W	G.W	G.W
💿 ΤΟΤΑL	0.8	1.2	4	ł.		6	4.8	7.2
🔀 MAERSK	0.32	0.8	1.27		3		1.6	3.8
S edf	0.2	0.63	0.3		0.95		0.5	1.6
	0.3	0.8	0	.2	0	.6	0.5	1.4
Masdar S Ain Sokhna	0.2	0.3	1	.8	3.	.17	2	3.5
Masdar S Damietta	0.2	0.3	1	.8	3.	.17	2	3.5
Scatec	1.5	4	2	.7	6	.5	4.2	10.5
ReNew	0.15	0.57	1	.5	5.	68	1.65	6.25
	0.28	0.3	1.8	3.4	3.1	5.8	5.5	9.2



Proposed Capacities & Capacities of MOU



	Capacities of MOU							
Company	Pilot Project			1st Phase Project			Total { P.P + 1st Phase}	
	Electrolyser G.W	R. E G.W	Electr G	Electrolyser G.W		. E .W	Electrolyser G.W	R. E G.W
GLOBELEQ	0.1	0.25	1	2.5	2.5	6.25	3.6	9
الفينيار alfanar	0.5	1.1	0	.5	1	.1	1	2.2
	0.3	0.8		-		-	0.3	0.8
	0.13	0.49	1.3	1.3	3.3	3.3	2.73	6.93
ALCAZAR ENERGY	0.2	0.3	0.	46	0	.7	0.66	1
MEDITERRANEAN ENERGY PARTNERS	0.13	0.4		-		-	0.13	0.4
actis	0.15	0.2	0	.4	0	.5	0.55	0.7
Total Capacities	5.46	12.44	26	.23	55	.65	31.69	67.93



Roadmap for RES required for Green hydrogen Projects in Egypt











- A contract has been signed with the Legal Expert House "Shearman & Sterling" to:
 - Provide legal advice on licensing obligations and legal requirements related to projects with

implementation in accordance with the established time plans.

- Prepare Shareholder agreements and usufruct agreements for these projects
- Prepare the framework agreement.





EGYPT Green Energy Corridor

Due to expansion of Green Projects





EGYPT Green Energy Corridor aims to facilitate integration of large scale Renewables into the Grid to Supply:

- National Development projects.
- Green Hydrogen projects.
- Water Desalination Projects.
- Interconnection Projects.

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Energy Wealth Initiative: A COP27 initiative



• EBRD suggested (Energy Wealth Initiative: A COP27 initiative) of a green Energy Transition in regards of

retirement of low efficiency power plant units by decommissioning of 5GW from thermal power plant

units and implement 10 GW renewable energy with total investments of 10 Bn \$ (EBRD will provide 500

Mil \$ as grant and soft loan)







Existing RES Projects





Project	Location	Capacity
A- Existing RES projects		
Zafrana I, II	Zarana/ Gulf Suze	547
(Orascom I , Toyota)	Ras Ghareb/ Gulf Suze	250
KFW6	Gabl El Zait/ Gulf Suze	240
JICA	Gabl El Zait/ Gulf Suze	252
Spanish	Gabl El Zait/ Gulf Suze	120
LEKELA (West Bakr)	FIT/ Gulf Suze	250
Benban	Benban/ Upper Egypt	1465
Kurimatt	Kurimat/ Upper Egypt	140
Total Hydro	-	2832
Total Existing Wind	-	1659
Total Existing Solar		1605
Total Installed	6096	



RES Under Construction Projects



Recent Projects Contracts

Mediterranean Sea	Company	Capacity (MW)	Technology	Price (cent \$ / K.w.h)
Generation (Sour parVind) Voalitation Area Power and Area P	Masdar	200	Wind	3
Survey Barbar Alzait	Acwa Power	200	PV	2.47 (Competitive Tenders)
2800 TYW	Amea Power	500	PV	2
Benban Near Asswan Benban Near Red Sea	To replace Coal Fired Power plant	500	Wind	3
	ENGIE - Orascom- Toyota	500	Wind	3
Asswan 1465MW — Higb.Dam & Aswan	Siemens – Gamesa	500	Wind	3
Dam 2830 MW	ACWA Power	1100	Wind	2.85
	Benban	270	PV	2
Existing UC PLN	Total		3770	



RES Planned





Company	Capacity (MW)	Technology
Ras Ghareb	1500	Wind
Nile West	10800	PV
Nile West	4000	Wind
Total	16300	



The Plan includes 4 Phases (20 GW) with total estimated cost 4096 M\$



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Thank You