

FLOATNRG

DESCRIPTION

Offshore Wind installation is needed for higher availability of wind and wave energies due to high wind speeds and high waves.

Floating Installation is also needed due to high cost of mono-pile wind turbine supports beyond 30meter sea bed depths.

FloatNRG Developed a floating platform (*) to support wind turbines and marine energy extraction equipment, offshore at high sea bed depths.

Space Between (WT) is utilized to extract additional wind and marine energies from sea waves and tidal energies.

Existing Installation easily accept development of space between installed wind turbines.

EXTRACTION EQUIPMENT

- **Wind Energy** is provided by conventional horizontal axis (WT).
 - **Vertical Axis** (WT)s are installed in the space between the main (WT) extracting additional 47% wind energy. (1).
- **Wave Energy**,
 - **Marine Turbines (VAXMT)** per (TLP) to extract front and lee sides of waves. (1).
 - **Rack and Pinion design (*)** acting as point absorber and marine water turbine (HAXMT) directly driving generators to extract; potential, kinetic and horizontal wave energies. Three (3) sets installed per (FCU) unit (1).
- **Tidal Energy** using the same (HAXMT) as for the (R&P) turbine.

ADDITIONAL FACILITIES

- **Marine Laboratory**, off shore floating for monitoring sea and wind states.
- **Test Tank**, full scale installed to monitor actual sea and wind states for
- **Open System** for installing extraction different equipment.
- **Energy Storage (*)** in the (TLP) in the form of compressed air up to 60,000 cubic meters for 60MW wind farms.

FABRICATION and ASSEMBLY complete with all equipment installed at the shore line, floated and towed for installation at final location without marine cranes.

LEBANON POWER SHORTAGE

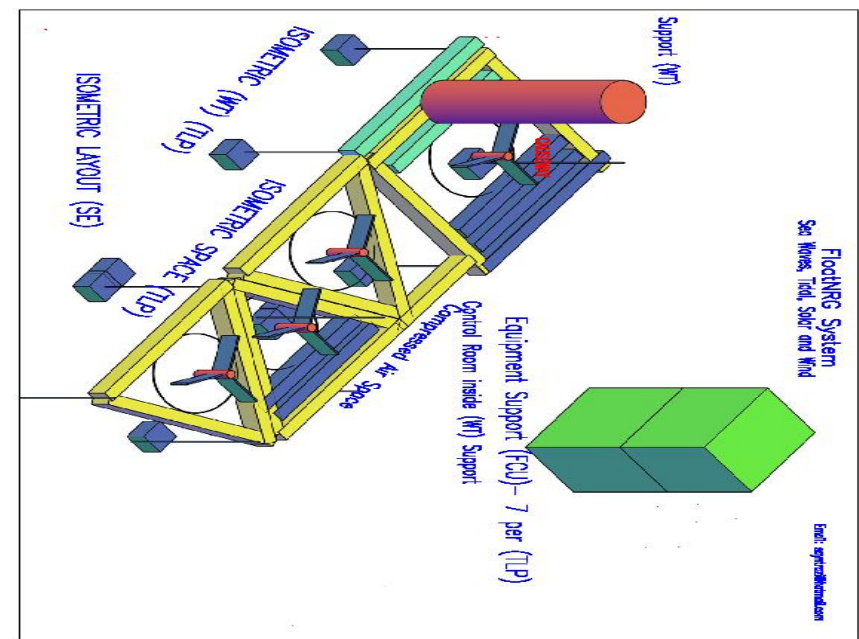
- **SOLVED** by providing 60 to 150MW offshore FloatNRG system at each of; Akkar, Batroun, Beirut, Sidon and South Lebanon.
- **“Electricite de France” (EDF)** are encouraged to implement their plans to develop (MENA) area power network.
- **“Electricite de Liban” (EDL)/ (MoEW)** are urged to:
 - a. **Review** these proposals and enter into a Sovereign (PPA) with FloatNRG and/or other contractors to develop one or a combination of these projects.
 - b. **Import 2,000MW** of electric power directly from Egypt and/or Turkey via marine and underground 650KV (HVDC) cables. Plans, approvals and funding are available including (PPA) Agreement.
 - c. **4,00MW** would be available in less than two years without (EDL) investment.
 - d. **400KV (AC) (EDL)** plans to upgrade existing 220KV network would not be required. Refurbishing existing networks would be sufficient as these proposals provide distributed power plants.
- **Lebanon Becomes** a Hub for control of (MENA) area power and (Pan Arab) networks and a fabrication/assembly center for floating wind turbine farms for (MENA) area.

PERFORMANCE

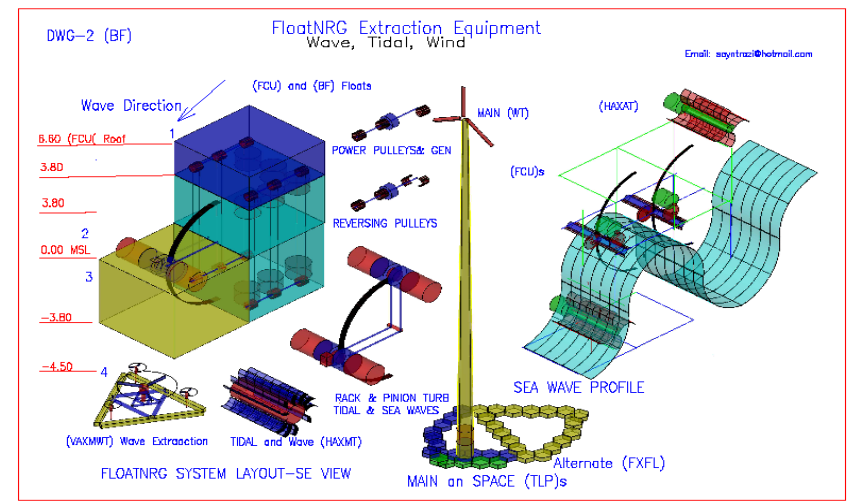
Additional Output, 40% energy extraction from the spaces between the main (WT).

				Resisting Moment Ton-m		6,346		Duration Wind/Wave Hours.Yr		3,000		Tidal		7,000			
						Data per (TLP) per (TLP)				60MW Wind Farm		10		150MW Wind Farm		25	
PERFORMANCE	TYPE	Unit	Quantity	Weight Ton	Uplift Ton	Rating KW	Energy KWh/Year	Compr'd Air Cum	Rating KW	Energy KWh/Year	'd Air Cum	Rating KW	Energy KWh/Year	Compr'd Air Cum	Rating KW	Energy KWh/Year	Compr'd Air Cum
Equipment Main (WT)	(HAXWT)	No	1	400	0.00	6,000	18,000,000		60,000	180,000,000	N/A	150,000	450,000,000	N/A			
Equipment Space Sub Total (TLP)	Steel	N/A	47	6.45	0.00	441	1,322,710	0.00	23,809	71,426,323	N/A	63,490	190,470,194	N/A			
GRAND TOTAL-Equipment				406	0	6,441	19,322,710	0	83,809	251,426,323		213,490	640,470,194				
Floats Main (WT) (TLP)		No	8	418	1,241	N/A	0.00	1,091	N/A	N/A	10,911	N/A	N/A	27,277			
FLOATS SPACE (TLP)		No	4	308	704	N/A	0.00	898	N/A	N/A	48,510	N/A	N/A	129,359			
TOTALS											59,421			156,637			
ANCHORS - Main (WT) (TLP)																	
NET Uplift Floats (WT) per Corner				106					NET Uplift Floats Space per Corner		101						
NET ANCHOR Main (WT) (TLP)					24				ANCHOR at Space (TLP)					124			

SYATEM Layout



EQUIPMENT Layout



CALCULATION

CALCULATIONS									
		Density Kg per Cum							
FRP	M. Steel	Concrete	Sand	WET	AIR	g m/Sec ²		KW = Kg-m/Sec	
1.8	6.7	2.7	2	1.22	9.8	102.2			
Space between (WT)		191.52		No. of Main (WT)		10		(TLP) Spaces Between (WT)	
								6	
								Length m (TLP)	
								30	
Data and Characteristic per (TLP)									
EQUIPMENT per Main (TLP)	TYPE	Unit	Quantity	Rating KW	Total KW	Material	Height or Length m	Blade or R m	Swept Area Sqm
Equipment Main (WT)	(HAXWT)	No	1	6,000	6,000	M. Steel	82.00	104	16,000
Space Equipment per (TLP)	(HAXWT)	No	1	6,000	6,000	M. Steel	82.00	104	16,000
Space Eght Wind Turbine (WT)	(VAXWT)	No	4	53	213	M. Steel	30	5.5	165
Space Eght Wave Marine Turbine	(VAXWT)	No	1	123	123	M. Steel	N/A	9	254
Space Eght Wave Rack & Pinion	(R&PN)	No	21	4	84	M. Steel	4	0.3	N/A
Space Eght Tidal Marine Turbine	(R&PN)	No	21	1	21	M. Steel	N/A	9	254
Space Eght Wave Energy	(BFLT)	No	21	4	84	FRP	0.50	0.75	0.88
Equipment Space Sub Total (TLP)	(TLP)	N/A	47		441				N/A
									0.600
									6.450
FLOATS Main (WT) (TLP)									
		Data		Dimensions m		Volume Cum		Weight Ton	
TYPE	Unit	Quantity	Rating KW	Material	Height or	Width	Height	Thick or R	Out
Floats Main (WT) (TLP)	Rectr	No	4	N/A	M. Com	30	1.92	1.92	0.07
Additional Floats Main (WT) (TLP)	Rectr	No	2	N/A	M. Com	32	3.00	3.00	0.07
Equipment Floats Support	Rectr	No	2	N/A	M. Com	28	2	2.00	0.07
Equipment Support (FCU)	Rectr	Lm	68	8	M. Steel	0.050	3.00	2.5	0.91
Tether Line	Rope	Lm	4	N/A	M. Steel	0.015	30		0.0212
Sub Total Floats Main (WT)	(TLP)	No	8	N/A					510
Total Floats Main (WT)	(TLP)								510
									451
									59
									165
									418
									510
									1,241
									1,091
									6,346
FLOATS SPACE (TLP)									
		Data		Dimensions m		Volume Cum		Weight Ton	
TYPE	Unit	Quantity	Rating KW	Material	Height or	Width	Height	Thick or R	Out
Space Floats (TLP)	Rectr	No	4	N/A	M. Com	30	2.00	2.00	0.07
Space Floats Equipment	Rectr	No	2	N/A	M. Com	28	2.00	2.00	0.07
Equipment Support (FCU)	Rectr	Lm	68	8	M. Steel	0	2	3	0
Tether Line	Rope	Lm	4	N/A	M. Steel	0.0150	0.0000	30	0.0000
Sub Total Floats Sub Total	Rectr	No	6	N/A					233
Total Floats Space (TLP)	(TLP)	No							233
									200
									33
									90
									308
									232
									704
									898
									711
ANCHORS - Main (WT) (TLP)									
TYPE	Unit	Quantity	0	0	0	Height or	Width	Height	Thick or R
NET Uplift Floats (WT) per Corner	TYPE								Out
ANCHORS at (WT) (TLP)	(TLP)	0	4		M. Com	4.65	4.65	4.65	0.30
NET ANCHOR Main (WT) (TLP)	(TLP)								101
									96
									34
									225
									900
									106
									402
									-124
ANCHORS - SPACE (TLP)									
TYPE	Unit	Quantity							
NET Uplift Floats Space per Corner	Rectr				M. Com				101
ANCHOR at Space (TLP)	Rectr	No	4		M. Com	4.65	4.65	4.65	0.30
NET ANCHOR Space (TLP)	(TLP)								101
									96
									34
									225
									900
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									402
									-124

PERFORMANCE Summary

				Resisting Moment Ton-m		6,346		Duration Wind/Wave Hours		3,000		Tidal		7,000			
		Data per (TLP) per (TLP)															
PERFORMANCE		TYPE	Unit	Quantity	Weight Ton	Uplift Ton	Rating KW	Energy KWh/Year	Compr'd Air Cum	Rating KW	Energy KWh/Year	d Air Cum	Rating KW	Energy KWh/Year	Compr'd Air Cum		
Equipment Main (WT)		(HAXWT)	No	1	400	0.00	6,000	18,000,000		60,000	180,000,000	N/A	150,000	450,000,000	N/A		
Equipment Space Sub Total (TLP)		Steel	N/A	47	6.45	0.00	441	1,322,710	0.00	23,809	71,426,323	N/A	595,219	1,785,658,065	N/A		
GRAND TOTAL-Equipment					406	0	6,441	19,322,710	0	83,809	251,426,323						
Floats Main (WT) (TLP)			No	8	418	1,241	N/A	0.00	1,091	N/A	N/A	10,911	N/A	N/A	27,277		
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TOTALS												59,421			156,637		
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NET ANCHOR Main (WT) (TLP)										ANCHOR at Space (TLP)					124		

650KV (HVDC) (MENA) AREA RING MAIN NETWORK

DESCRIPTION

650KV (HVDC) NETWORK connects Southern European and Northern African countries in a “Ring Main Network” (RMN) with radial lines to neighboring countries and islands as (MENA) (RMN). **(MENA) Countries** are; Lebanon, Turkey, Greece, France, Spain, Portugal, Gibraltar, Morocco, Algeria, Tunisia, Libya, Egypt and back to Lebanon.

LENGTH of the (MENA) (RMN) is 5,000Km

2,000MW are provided by local power plants giving **4,000MW** at each local (DC).(AC) conversion station.

PAN ARAB Network is a result of this (MENA) (RMN) and covers; Ghaza, Palestine, Jordan and Iraq.

Total Length of the (RMN) is 5,000Km,

POWER LOSS is estimated at (2%) per 1,000 km for transmitting 5,000MW for 3,000 Kilometers and **(1.5%)** for both converter stations at the sending and receiving ends.

Higher Capacities for longer distances are presently in operation in Brazil and in China.

ADVANTAGES

(MENA) (RMN) Connects Europe, (MENA) Area, Pan Arab network and Africa to provide viable and dependable power supply.

FUTURE PROJECTS are planned for connecting power plants and load centers with (HVDC) transmission lines.

COMPETITORS

FRANCE (EDF) has power plans for (MENA) Area and may be associated with to develop this project.

LEBANON POWER SHORTAGE

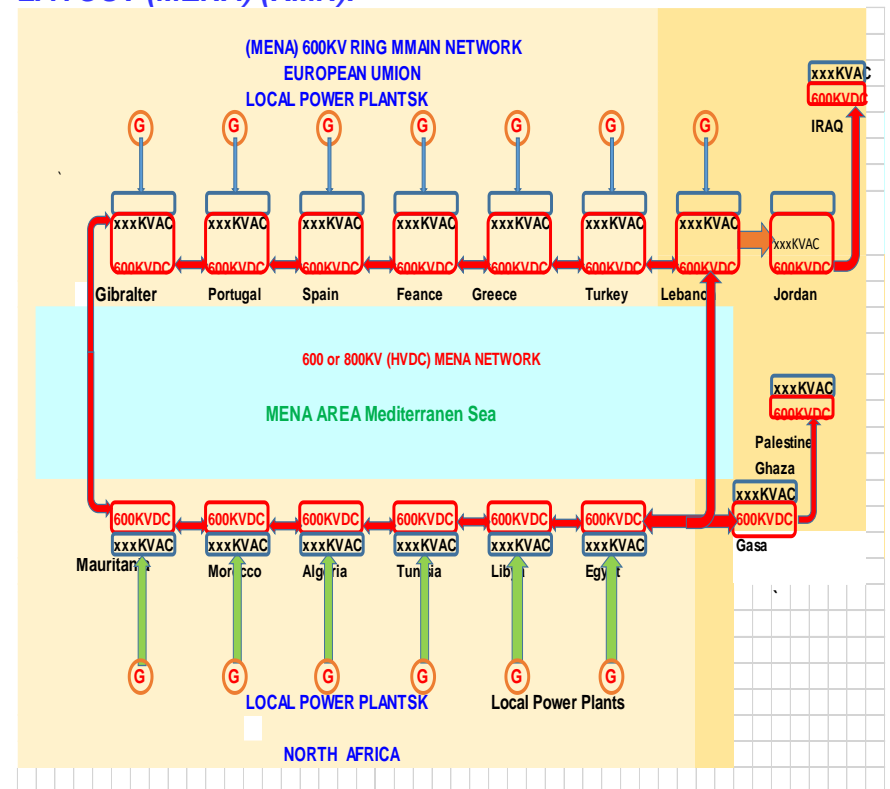
SOLVED by importing electric power from Egypt (Port Sa'eed) and from Turkey and act as a hub for the (MENA) (RMN) power network.

PHASING

Phasing Sequence

Phase I	Lebanon	→	Egypt								
Phase II	Lebanon	→	Jordan	→	IRAQ	Radial Line					
Phase III	Egypt	→	Libya	→	Tunisia	→	Algeria	→	Morocco	→	Mauritania
Phase IV	Lebanon	→	Turkey	→	Greece	→	Italy	→	Spain	→	Gibraltar
Phase V	Lebanon	→	Syria	Radial Line							
Phase VI	Lebanon	→	Cyprus	Radial Line							

LAYOUT (MENA) (RMN).



GREENING the DESERT

DESCRIPTION

Full Utilization of the open desert area allocated for a solar system is achieved using the (GTD) system.

Supporting Structure of (PV) Cells is raised 5-m above ground level.

Agricultural Area provided under the supporting structure is freely. .

Sunlight is provided by leaving (10%) of the solar area to allow infiltration of sun light to the Agricultural area below.

Wastewater Treatment is added to provide irrigation water.

Wind Turbines, are added above the solar system to provide additional energy.

EQUIPMENT

Solar Energy (PV) cells

Wind Energy (HAXWT) and (VAXWT)

Wastewater Tertiary Oxidation Lagoons

Pumping Station at the city for delivering wastewater to the (GTD) system.

DESIGN DATA

Output Solar (PV) cells per Sqm 250 Watts.

Electric Power per housing unit 5 KW

Block Area (PV) cells, Sgm; 40,000

Tertiary Lagoon 40 x60 meter

Waste Water 640 L/Day/housing unit

Capita per Housing Unit 4 members.

Diversity Factor 70 %

PERFORMANCE

Utility Scale Projects for (1) to (6) blocks.

Solar System 40,000 to 60,000 Sqm

Lagoons 40,000 to 120,000 Sgm

Output Solar 10 to 60MW

Output Wind	120MW	to 180MW
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Agricultural Area 40,000 to 240,000 Sqm,

Wastewater Treatment 6,603 to 22,857 LPDay

Total Area 240,000 to 320,000 Sqm

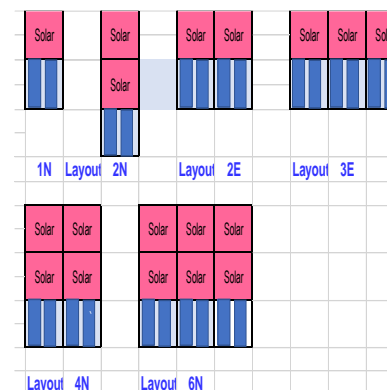
LEBANON POWER SHORTAGE

SOLVED by implementing the (GTD) system at; Hermel, Baalback, South Lebanon and Akkar and,

Converting Organic wastes to liquid and disposing into wastewater network.

PERFORMANCE Summary

		(WT)	Space	Compr'd	Power KW		Energy KW-hour per Year	
	Unit	(TLP)	No.	Air Cum	Main	FloatNRG	Main	FloatNRG
Wind Turbine Farmss, 6MW (WT)								
Main (TLP), with 6MW (WT)	No.	10	64	68,404	60,000	88,218	1,800,000,000	2,646,534,194
Space (TLP) with 6MW (WT)	No.	25	169	179,095	150,000	224,513	11,250,000,000	16,838,448,387

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LAYOUT

