

INTRODUCTION TO THE GLOBAL WIND ATLAS

CLEAN ENERGY SOLUTIONS CENTER WEBINAR

NOVEMBER 20, 2018

Oliver Knight
Senior Energy Specialist



A unique 'public-private partnership'



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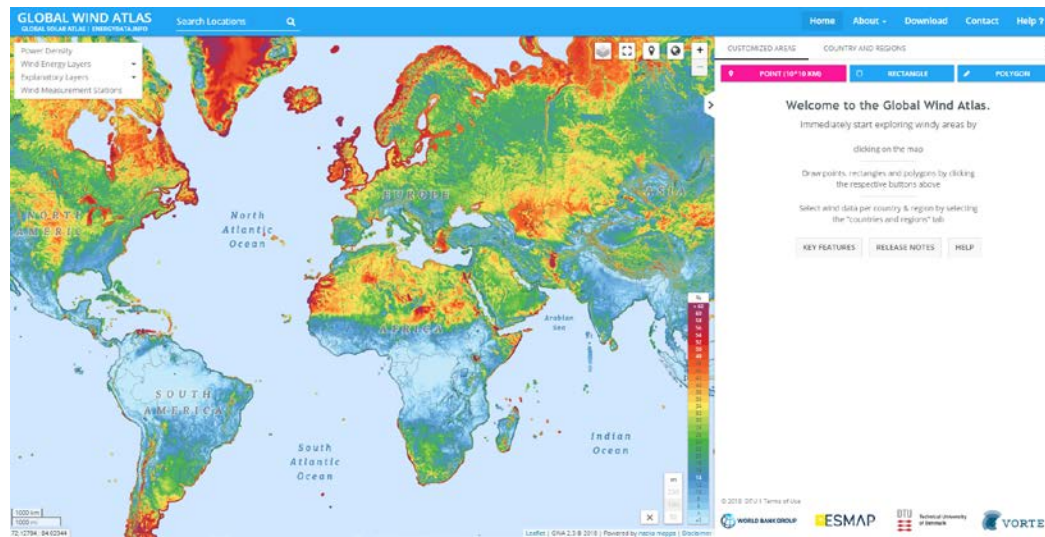
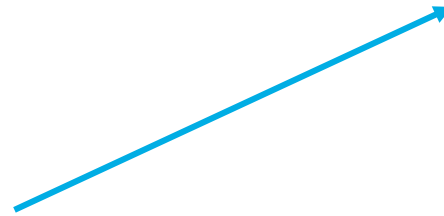
DTU Wind Energy
Department of Wind Energy



NAZKA



VORTEX



What is the Global Wind Atlas?

GLOBAL WIND ATLAS
GLOBAL SOLAR ATLAS | ENERGYDATA.INFO

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Power Density **i**
Explanatory Layers
Wind Measurement Stations

CUSTOMIZED AREAS COUNTRY AND REGIONS

POINT (10*10 KM) RECTANGLE POLYGON

Welcome to the Global Wind Atlas.
Immediately start exploring windy areas by
clicking on the map
Draw points, rectangles and polygons by clicking
the respective buttons above
Select wind data per country & region by selecting
the "countries and regions" tab

KEY FEATURES RELEASE NOTES HELP

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WORLD BANK GROUP ESMAP DTU Technical University of Denmark VORTEX

1000 km
1000 mi
65.51296 : 60.46875

Leaflet | GWA 2.0 © 2017 | Powered by nazka mapps | Disclaimer

W/m²
> 1300
1300
1100
900
850
800
750
700
650
600
550
500
450
400
375
350
325
300
275
250
225
200
175
150
125
100
75
50
<25

m
200
100
50

North Atlantic Ocean
EUROPE
AFRICA
Arabian Sea
South Atlantic Ocean
SOUTH AMERICA

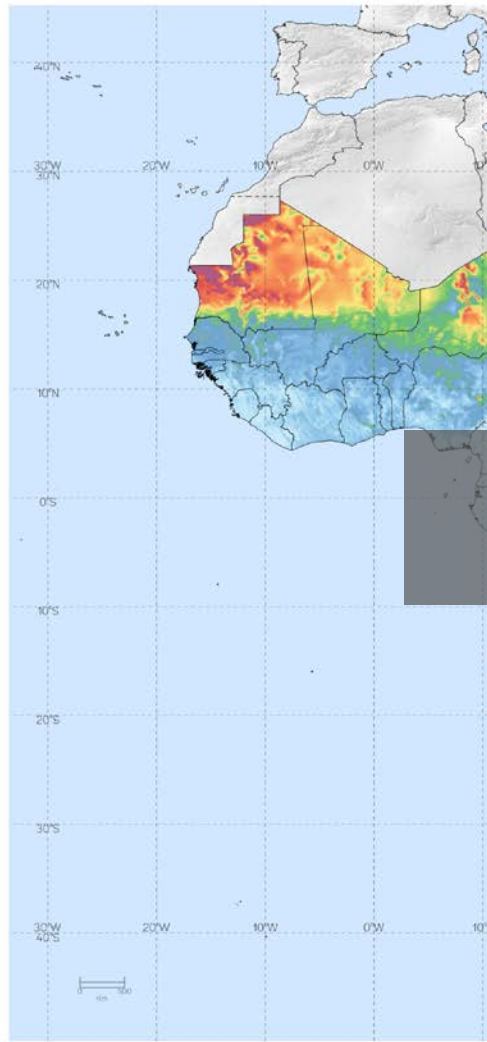
Web-based calculations

What is the Global Wind Atlas?

ONSHORE WIND RESOURCE MAP

WIND POWER DENSITY POTENTIAL

AFRICA

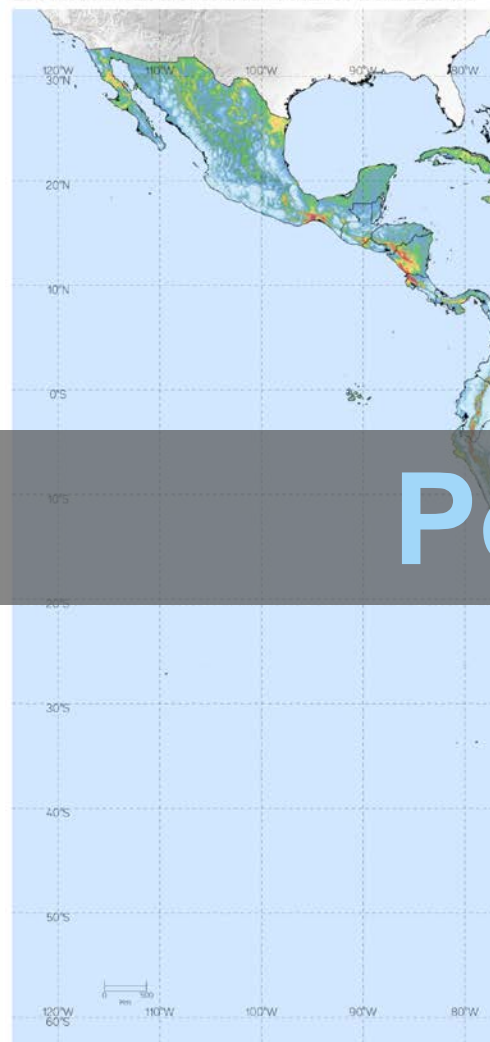


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ONSHORE WIND RESOURCE MAP

WIND SPEED

LATIN AMERICA AND THE CARIBBEAN

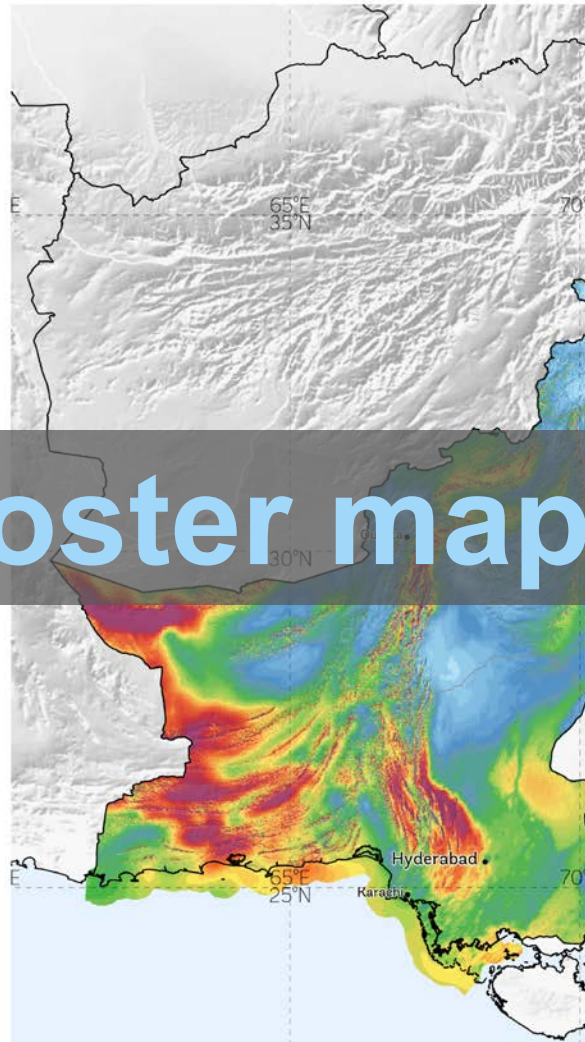


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ONSHORE & OFFSHORE WIND RESOURCE MAP

WIND POWER DENSITY POTENTIAL

PAKISTAN

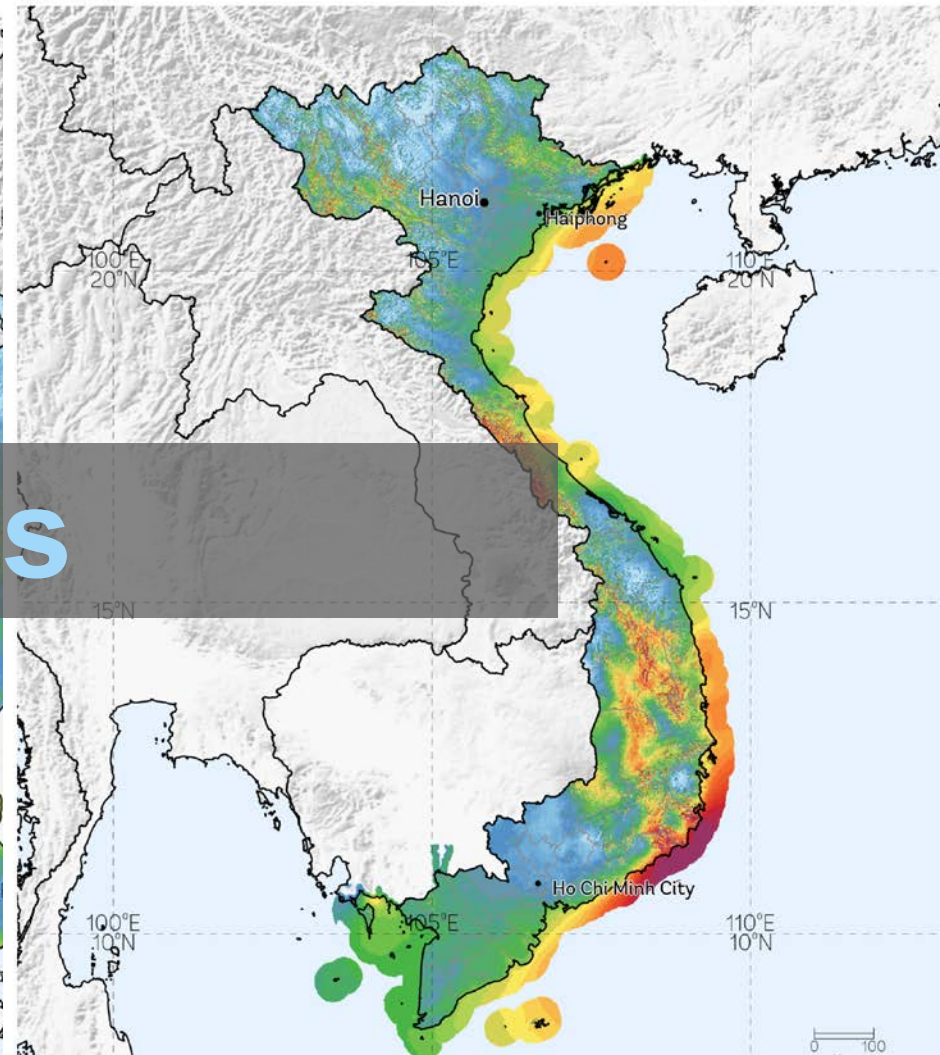


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ONSHORE & OFFSHORE WIND RESOURCE MAP

WIND SPEED

VIETNAM



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Poster maps

What is the Global Wind Atlas?

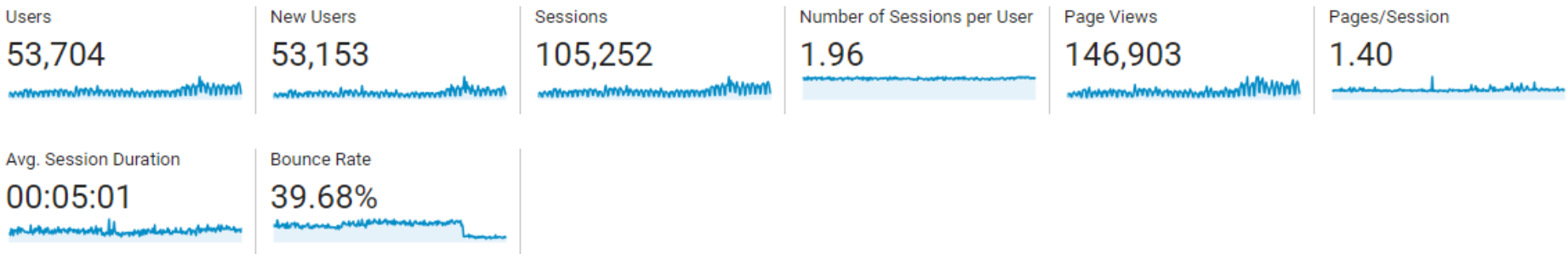
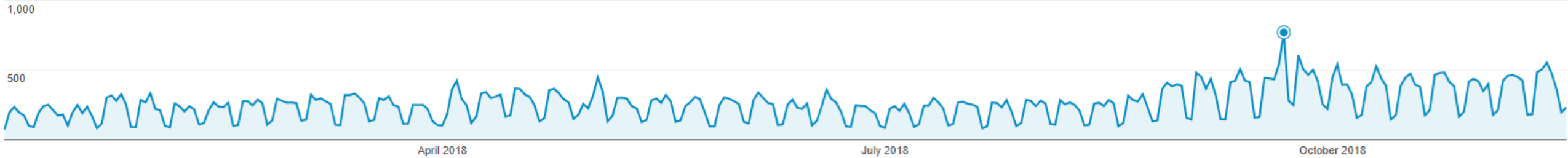
Global Wind Atlas 2.0 (WRF 9-km) ix: 2896, iy: 1171 <coordinates>61.333,32.417,0.0</coordinates>

5 5 12

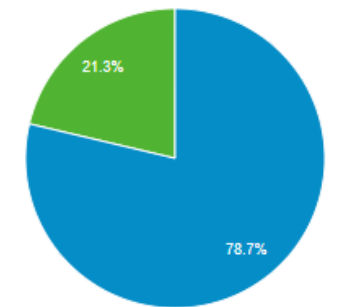
0.000	0.030	0.100	0.400	1.500							
15.0	50.0	80.0	100.0	200.0							
48.92	4.03	3.61	8.20	8.10	2.86	0.58	0.27	0.31	0.21	0.48	26.52
14.53	4.84	5.50	4.70	5.37	5.99	4.44	5.65	6.16	2.59	3.55	16.79
2.631	2.451	3.221	2.338	2.467	2.037	1.287	1.342	1.596	1.002	1.416	3.377
15.88	4.91	5.30	5.13	5.09	5.71	4.32	6.09	5.98	2.30	3.43	18.31
2.752	1.779	2.600	2.311	2.096	1.775	1.186	1.264	1.252	0.830	1.189	3.541
16.98	4.87	4.63	5.27	5.19	5.51	4.24	5.80	7.02	1.69	3.03	19.66
2.889	1.361	1.877	2.252	1.975	1.658	1.096	1.104	1.264	0.666	0.986	3.943
17.55	4.94	3.97	5.24	5.42	5.37	4.35	5.90	7.47	1.69	2.81	20.21
2.920	1.295	1.498	2.186	2.088	1.658	1.131	1.119	1.307	0.646	0.936	3.971
19.25	5.05	2.53	3.25	5.63	5.33	3.29	3.70	7.13	1.46	2.13	19.65
3.029	1.170	1.061	1.205	1.623	1.701	0.852	0.818	1.175	0.588	0.795	3.033
18.39	3.35	4.91	5.5	6.4	1.62	1.38	1.31	1.2	0.73	0.73	56.16
7.89	3.90	4.19	3.5	4.0	3.7	6.0	5.4	1.2	4.17	4.17	12.66
1.529	2.584	2.568	2.072	2.002	1.408	1.221	1.451	1.123	1.002	1.721	3.080
9.60	3.83	4.64	4.21	4.68	4.22	4.29	6.26	4.41	1.86	4.06	14.48
1.709	1.877	2.662	2.244	2.029	1.479	1.221	1.557	1.189	0.877	1.404	3.295
11.17	3.97	4.68	4.77	4.94	4.58	4.34	7.11	4.36	1.88	3.80	15.97
1.932	1.553	2.439	2.322	2.107	1.561	1.201	1.568	1.018	0.807	1.318	3.588
11.97	3.96	4.44	5.09	5.25	4.73	4.30	7.19	4.39	1.70	3.37	16.71
2.057	1.389	2.064	2.396	2.205	1.592	1.182	1.467	0.975	0.756	1.186	3.729
15.51	4.45	3.08	4.75	6.87	5.18	3.96	6.35	5.62	1.49	3.15	18.58
2.510	1.240	1.377	1.639	2.135	1.670	1.115	1.123	1.029	0.697	1.072	3.592
18.39	3.35	4.91	9.05	6.41	1.62	0.38	0.31	0.27	0.23	0.73	56.16
7.09	3.51	3.77	3.19	3.98	3.45	3.54	4.61	3.05	1.64	3.75	11.36
1.525	2.568	2.561	2.064	1.990	1.400	1.213	1.443	1.115	0.994	1.713	3.080

GWC and GIS files

A growing user base



■ New Visitor ■ Returning Visitor



Demographics

Language

Country ▶

City

System

Browser

Operating System

Service Provider

Mobile

Operating System

Service Provider

Country

	Country	Users	% Users
1.	United States	5,853	10.65%
2.	United Kingdom	3,879	7.06%
3.	Germany	3,265	5.94%
4.	Brazil	2,334	4.25%
5.	France	1,992	3.63%
6.	Spain	1,958	3.56%
7.	Denmark	1,898	3.45%
8.	India	1,898	3.45%
9.	Belgium	1,697	3.09%
10.	Netherlands	1,406	2.56%

Source: Google Analytics

Global Solar Atlas

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Map Info

Photovoltaic electricity output

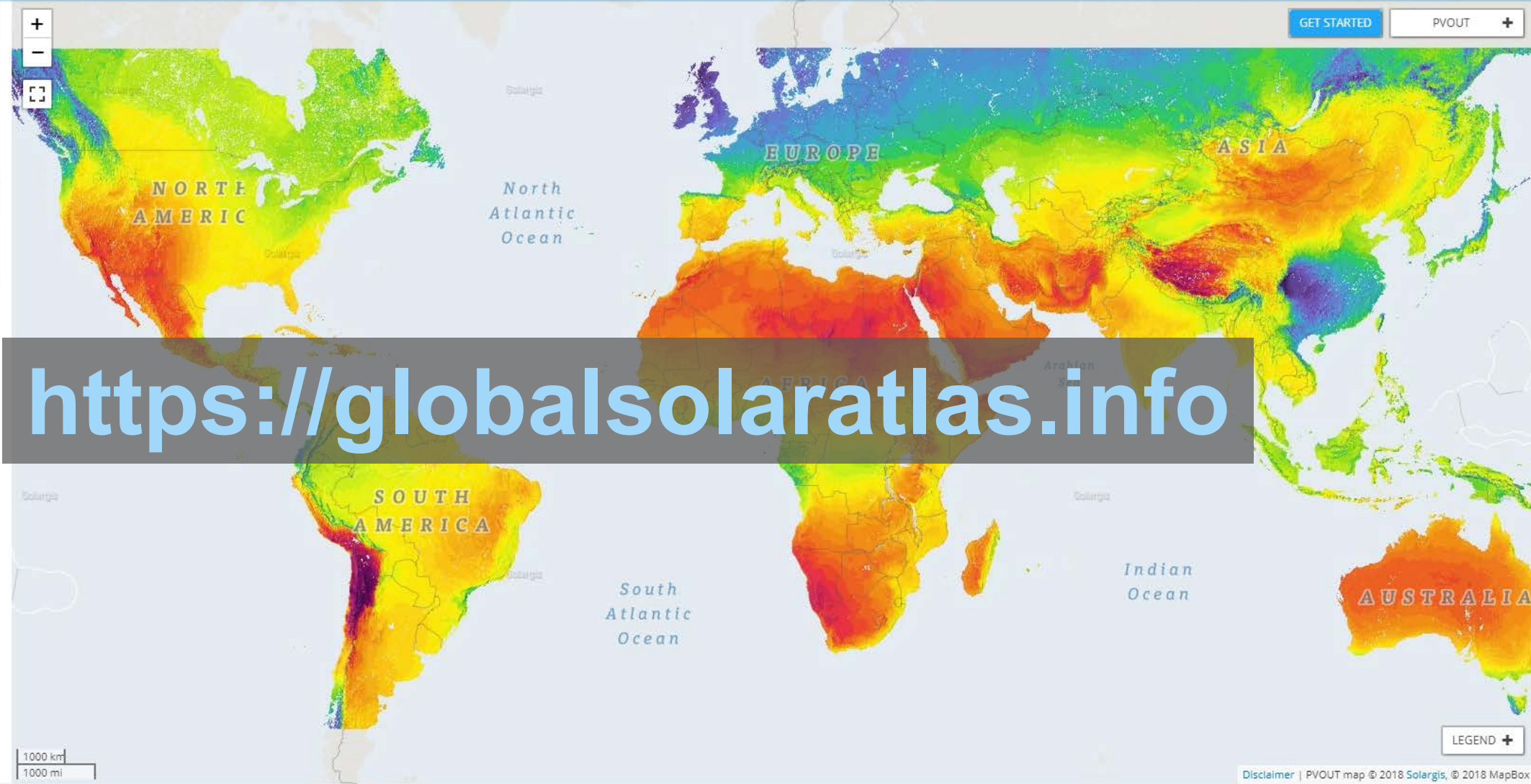
PVOUT map © 2018 Solargis

- Solar Measurement Sites
- Hydro-connected Solar PV potential

Site Info

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<https://globalsolaratlas.info>



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Pakistan - Solar Radiation Measurement Data (2014 - 2017)

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Dataset Groups Activity Stream Manage

Pakistan - Solar Radiation Measurement Data (2014 - 2017)

From 2018 onward, the measurement stations are being operated by the Government of Pakistan, together with NREL and USAID.

For more information and additional outputs, please visit: http://esmap.org/re_mapping_pakistan

For download access to GIS layers, please visit the Global Solar Atlas: <http://globalsolaratlas.info/>

Please cite as: [Data/Information/map obtained from the] "World Bank via ENERGYDATA.info, under a project funded by the Energy Sector Management Assistance Program (ESMAP). For more information: Pakistan-Solar Radiation Measurement Data, 2017, <https://energydata.info/dataset/pakistan-solar-measurement-wbg-esmap>"

Data and Resources

CSV Solar-Measurements_Pakistan_Bahawalpur_WB-ESMAP_QC Explore

Organization

WORLD BANK GROUP
THE WORLD BANK IFC International Finance Corporation

World Bank Group

The World Bank Group has set two goals for the world to achieve by 2030: (i) End extreme poverty by



<https://energydata.info>

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