

Latin America makes greatest strides in first quarter installations

Latest forecast installed and operating wind power capacity around the world (MW)* from January 2016 to April 2016, plus our unique Feelgood Factor

Compiled by **WINDPOWER** Feelgood Factor in association with **大成 DENTONS**

Where does wind power have the brightest future? It is a question that those working in this global environment seek to understand. And this guide aims to give a sense of market potential. Alongside our regular figures for cumulative and recent wind power installations in all countries with significant wind energy, we have added a five-star Feelgood Factor indicating prospects for near-term growth.

Using our expertise in each region, data from Windpower Intelligence, and with contributions from law firms in each country, arranged by Dentons — which has offices in more than 50 countries and a strong focus on energy — we have looked at political support, investor confidence, structural preparedness, and projects in the current pipeline.

The final rating is an amalgam of all these factors. Further details on the key markets are published in the annual Market Status Report, starting on page 19.

We would like to thank and acknowledge all those involved in the enormous task of gathering the information for this table. As well as the Windpower Intelligence and Windpower Monthly correspondents, the following have contributed expertise:

Dentons: Adam Brown, Agathe Martin, Andrew D Schifrin, Arkadiusz Krasnodobski, Ata Dinlenc, Balázs Várszeghi, Claudiu Munteanu-Jipescu, Cristina Mata Garay, Dani Hofmeyr, Diana Poputoaia, Edwin Li, Emőke Kovács, Ian McGrath, Islam Maklad, James Hogan, Javier Lasa, John Lu, Joseph Palin, Ladislav Štorek, Laurens Engelen, Louis Dubois, Maksym Sysoiev, Marc Fornacciarì, Matteo Falcone, Miletto Giuliani, Mylany David, Nadir Gilani, Noor Kapdi, Patrick Larrivé, Petr Slach, Sona Taghiyeva, Thomas Schubert, Toga Turan, Tomasz Janas, Vivek Bakshi, Yolande Meyyis, Arteaga Gorziglia & Cia: Luciano Cruz, Bahr: Rune Svoren; Bär & Karrer: Phyllis Scholtz; Bech-Bruun: Jakob Østervang; Bell Gully: Andrew Beatson; BLP Abogados: Julio Castellanos, Ernesto Riso, Karla Aguilar; Castrén & Snellman: Miika Pinomaa; Clerides Anastassiou Neophytou: Stephanos Evangelides; Cobalt: Cobalt Lithuania: Simona Oiskeviciute-Ciceniene; Consortium Legal: Alvaro Castellanos; Eisenberger & Herzog: Ulrike Sehrschn; Frasers Law: Mark Fraser; Gadens: Kym Livesley; Galindo Arias & López: Salomon Behar; Gernandt & Danielsson: Joakim Brännström; Guyer & Regules: Federico Susena; Hart Muirhead Fatta: Donovan C Walker; Headrick Ritzik Alvarez and Fernández: Marisol Vicens Bello; Karanovic & Nikolic: Josip Marohnic; Kim & Chang: John Park, Junhee Choi; Lopez, Velarde, Hefftye & Soria: Amanda Valdez; Marval O'Farrell and Mairal: Francisco A Marias and Gonzalo Santamaría; Matheson: Garret Farrelly; Nagashima Ohno & Tsunematsu: Ryo Okubo; Potamitisvekris: Euripides Ioannou, Dimitra Rachouti; Puyat Jacinto and Santos: Monalisa Dimalanta; Santiañez Abogados: Paul Sumar; Spasov & Bratanov: Vassil Hadjov; SRS Legal: Gonçalo Anastacio; Stek: Martha Brinkman; Tilleke & Gribbins: Cynthia Parnavaiva; Trilegal: Neeraj Menon; Veirano: Tiago Kummel Figueiro.

Feelgood Factor in association with **大成 DENTONS**

	April 2016 Total MW	Jan 2016 Total MW**	Additions Jan-April	% change	Feelgood Factor	
MIDDLE EAST / AFRICA						
South Africa	1,053	1,053	0	0	★★★★★	Supportive legislation, investor confidence, slow grid upgrades
Morocco	787	787	0	0	★★★★★	Support for foreign private investment, complex permitting
Egypt	610	610	0	0	★★★★★	FIT scheme, investment, new grid rules, currency and delay concerns
Ethiopia	324	324	0	0	★★★★★	Anticipating positive legislation and investment support
Tunisia	245	245	0	0	★★★★★	New energy plan supportive of wind but power sale restrictions
Jordan	119	119	0	0	★★★★★	Good incentives, unstable politics deter investors, grid needs work
Iran	117	117	0	0	★★★★★	Legislative support, grid upgrades, but political/fiscal uncertainty
Others***	115	115	0	0		
TOTAL	3,370	3,370	0	0		
NORTH AMERICA						
Texas	17,713	17,713	0	0	★★★★★	Policy support, investor confidence, grid improvements planned
Iowa	6,365	6,212	153	2	★★★★★	Renewables support, incentives for utility-scale generation
California	6,108	6,108	0	0	★★★★★	Renewables requirement to 50%, ongoing growth and repowering
Oklahoma	5,482	5,184	298	6	★★★★★	Broad state support, but tax benefits for zero emissions expired
Illinois	3,842	3,842	0	0	★★★★★	State policy requires utilities deliver 25% renewables
Kansas	4,115	3,766	349	9	★★★★★	Renewables support, utilities that must deliver 20% prefer wind
Minnesota	3,235	3,235	0	0	★★★★★	Strong renewables support, strong wind contracting industry
Oregon	3,153	3,153	0	0	★★★★★	Renewables requirement of 25% for large utilities
Washington	3,075	3,075	0	0	★★★★★	Renewables requirement of 15% by 2020 for utilities, growth slowed
Colorado	2,992	2,992	0	0		
North Dakota	2,143	2,143	0	0		
Indiana	2,045	1,895	150	8		
New York	1,749	1,749	0	0		
Michigan	1,531	1,531	0	0		
Wyoming	1,410	1,410	0	0		
Pennsylvania	1,340	1,340	0	0		
New Mexico	1,130	1,080	50	5		
South Dakota	977	977	0	0		
Idaho	973	973	0	0		
Nebraska	890	890	0	0		
Montana	665	665	0	0		
Wisconsin	648	648	0	0		
Maine	613	613	0	0		
West Virginia	583	583	0	0		
Missouri	459	459	0	0		
Ohio	443	443	0	0		
Utah	327	327	0	0		
Arizona	268	268	0	0		
Hawaii	203	203	0	0		
Maryland	190	190	0	0		
New Hampshire	185	185	0	0		
Nevada	152	152	0	0		
Puerto Rico	125	125	0	0		
Vermont	119	119	0	0		
Massachusetts	107	107	0	0		
US others***	116	116	0	0		
TOTAL US	75,471	74,471	1,000	1	★★★★★	Reducing support to 2020, great stability, election uncertainty
Ontario	4,387	4,387	0	0	★★★★★	Subsidy changed to auctions, 300MW planned, nothing more
Quebec	3,261	3,261	0	0	★★★★★	Awaiting energy policy, grid limitations, but investor interest
Alberta	1,503	1,503	0	0	★★★★★	Plans to increase renewables but no details, grid upgrade needed
Nova Scotia	555	555	0	0		
British Columbia	490	490	0	0		
New Brunswick	294	294	0	0		
Manitoba	259	259	0	0		
Saskatchewan	221	221	0	0		
Prince Edward Is	204	204	0	0		
Canada others***	65	65	0	0		
TOTAL CANADA	11,239	11,239	0	0	★★★★★	As yet no federal involvement, key activity limited to three provinces
TOTAL NA	86,710	85,710	1,000	1		

	April 2016 Total MW	Jan 2016 Total MW**	Additions Jan-April	% change	Total MW April 2016 Onshore/Off	Additions Jan to April Onshore/Off	Feelgood Factor	
EUROPE								
Germany	45,005	44,947	58	0	41,722 / 3,283	58 / 0	★★★★★	New auction system, slight investment uncertainty but still positive market
Spain	23,025	23,025	0	0	23,020 / 5	0 / 0	★★★★★	Unclear government policy and auction system, yet some investor optimism
UK	13,654	13,603	51	0	8,526 / 5,128	51 / 0	★★★★★	Government anti-onshore wind, better prospects for offshore, mature grid
France	10,435	10,358	77	1	10,435 / 0	77 / 0	★★★★★	Support system changed, permitting simplified, slight investor concern
Italy	8,958	8,958	0	0	8,958 / 0	0 / 0	★★★★★	New medium-low support expected, some investor interest, grid upgrades needed
Sweden	6,157	6,025	132	2	5,946 / 211	132 / 0	★★★★★	Reducing support, low electricity prices, investor interest only in existing projects
Poland	5,100	5,100	0	0	5,100 / 0	0 / 0	★★★★★	New government changing positive approach to wind, investor concern
Portugal	5,079	5,079	0	0	5,077 / 2	0 / 0	★★★★★	Strong support, foreign investment interest, EU grid connections may help growth
Denmark	5,063	5,063	0	0	3,771 / 1,292	0 / 0	★★★★★	Already high wind capacity, reducing onshore interest, high activity offshore
Turkey	4,728	4,694	34	1	4,728 / 0	34 / 0	★★★★★	Dollar feed-in-tariff support, confident investors
Netherlands	3,520	3,431	89	3	3,144 / 376	89 / 0	★★★★★	Government subsidies, imminent approval of high wind targets, offshore interest
Romania	2,976	2,976	0	0	2,976 / 0	0 / 0	★★★★★	Support system being reduced and changed, little development interest
Ireland	2,486	2,486	0	0	2,461 / 25	0 / 0	★★★★★	New support expected, government and investors positive, grid upgrade plans
Austria	2,436	2,411	25	1	2,436 / 0	25 / 0	★★★★★	Supportive framework, but allocations taken to 2019, varied province enthusiasm
Belgium	2,229	2,229	0	0	1,523 / 706	0 / 0	★★★★★	Complex regulations, but good support particularly offshore, plenty of investment
Greece	2,128	2,128	0	0	2,128 / 0	0 / 0	★★★★★	Government support, local investor interest, but low foreign confidence
Finland	867	867	0	0	835 / 32	0 / 0	★★★★★	Legislation change due May, investor confidence hoped to return
Norway	819	819	0	0	817 / 2	0 / 0	★★★★★	15-year certificates, positive approach, but better export grids needed
Bulgaria	691	691	0	0	691 / 0	0 / 0	★★★★★	No government support, merchant project interest
Ukraine	498	498	0	0	498 / 0	0 / 0	★★★★★	Government support, but political instability and financial uncertainty
Croatia	425	381	44	12	425 / 0	44 / 0	★★★★★	Support quotas full, permitting unfavourable, low investor confidence
Hungary	329	329	0	0	329 / 0	0 / 0	★★★★★	Grid issues, unsupportive regime for non-balancing power source
Estonia	303	303	0	0	303 / 0	0 / 0	★★★★★	Limited subsidies under review, development delays discourage investors
Czech Republic	282	282	0	0	282 / 0	0 / 0	★★★★★	Poor political climate and public attitude, but 2020 goal to add projects
Lithuania	279	279	0	0	279 / 0	0 / 0	★★★★★	Planned government support, EU funds and interconnectors
Cyprus	147	147	0	0	147 / 0	0 / 0	★★★★★	Government incentives, and targets to 2020, but little activity
Others***	291	291	0	0	291 / 0	0 / 0		
TOTAL	147,910	147,400	510	0	136,848 / 11,062	510 / 0		
LATIN AMERICA								
Brazil	9,341	8,300	1,041	13	9,341 / 0	1,041 / 0	★★★★★	Good support but economy hindering growth, auction bids low, grid work needed
Mexico	3,073	3,073	0	0	3,073 / 0	0 / 0	★★★★★	Confidence in new auction system, hope for grid and power sector upgrades
Chile	933	933	0	0	933 / 0	0 / 0	★★★★★	Government support, investor confidence, grid upgrades planned
Uruguay	845	845	0	0	845 / 0	0 / 0	★★★★★	Support via PPAs, investor confidence, grid upgrades needed
Argentina	279	279	0	0	279 / 0	0 / 0	★★★★★	New, positive fiscal support, good investor confidence, grid improvements needed
Panama	270	270	0	0	270 / 0	0 / 0	★★★★★	Low prices, no subsidies, grid issues, but merchant wind potential
Costa Rica	268	268	0	0	268 / 0	0 / 0	★★★★★	Incentives need updating, investors confident, grid upgrades critical
Nicaragua	186	186	0	0	186 / 0	0 / 0	★★★★★	Fiscal support needs to be renewed in 2018, investment and minor growth ongoing
Honduras	176	176	0	0	176 / 0	0 / 0	★★★★★	"Enough" wind projects, but new electricity market encouraging investment
Peru	148	148	0	0	148 / 0	0 / 0	★★★★★	Renewables auctions, positive legal framework
Others***	337	287	50	17	337 / 0	50 / 0		
TOTAL	15,856	14,765	1,091	7	15,856 / 0	1,091 / 0		
ASIA PACIFIC								
China	146,683	139,808	6,875	5	145,875 / 808	6,875 / 0	★★★★★	Major growth to slow, curtailment and poor grid concern investors
India	25,428	25,088	340	1	25,428 / 0	340 / 0	★★★★★	Government support, investor confidence, grid upgrade and offshore plans
Australia	4,187	4,187	0	0	4,187 / 0	0 / 0	★★★★★	No subsidies, but new government offers hope, offgrid potential
Japan	3,043	3,038	5	0	3,003 / 40	5 / 0	★★★★★	Government supports wind, investor interest, but coal and nuclear plans
South Korea	835	835	0	0	830 / 5	0 / 0	★★★★★	Solar preferred, wind costs nearing fossil, local supply chain interest
Taiwan	647	647	0	0	647 / 0	0 / 0	★★★★★	Renewables target, subsidies, offshore potential, but monopolistic industry
New Zealand	623	623	0	0	623 / 0	0 / 0	★★★★★	Grid and permitting ready, no subsidies, financial uncertainty
Pakistan	256	256	0	0	256 / 0	0 / 0	★★★★★	Reducing support, China investor interest only, new grid planned
Thailand	223	223	0	0	223 / 0	0 / 0	★★★★★	Wind less popular than solar and biomass, land rights obstacles
Philippines	216	216	0	0	216 / 0	0 / 0	★★★★★	Positive legislation expected, on and off grid investor confidence
Vietnam	151	151	0	0	52 / 99	0 / 0	★★★★★	Government investment incentives, but power prices dampen interest
Others***	114	114	0	0	114 / 0	0 / 0		
TOTAL	182,406	175,186	7,220	4	181,454 / 952	7,220 / 0		
WORLD TOTALS	436,251	426,431	9,820	2	424,237 / 12,014	9,820 / 0		

★ **Feelgood Factor** Rates countries above 100MW, and states/provinces/territories above 3000MW, for political support, investor confidence, structural readiness, and pipeline

* Includes only operational capacity delivering power to grid
** Official figures from GWEC, EWEA, AWEA and Windpower Intelligence

*** **Others** Includes countries/US states and Canadian provinces/territories with less than 100MW online individually