

Countries, States, Districts, Counties, Cities, Towns, and International Businesses That Have Reached or Committed to 100 Percent Renewable Energy in One or More Energy Sectors Plus Eight Proposed U.S. Laws/Resolutions to go to 100 Percent

In

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Summary

This document contains three tables. The first lists countries; U.S. states, districts, and territories; U.S. counties; and U.S. towns and cities that have either reached or committed to 100 percent renewable electricity.

The second table lists proposed U.S. resolutions or laws for the United States to go to 100 percent clean, renewable energy in one or more energy sector.

The third table lists international businesses that have committed to 100 percent clean, renewable wind-water-solar (WWS) electricity, in the annual average, to run their global operations.

Table 9.1. List of countries and U.S. states, districts, territories, counties, cities, and towns that have committed to or reached 100 or near 100 percent clean, renewable electricity or all energy as of January 16, 2020. The country, state, and district commitments are just in the electricity sector. The county, town, and city commitments are either in the electricity sector (in most cases) or in all sectors, and they are beyond just town/city/country operations. Cities in blue have a population of at least 190,000 as of January 1, 2020. Countries having reached 95 to 100 percent WWS are primarily from Table 8.1. REN21 (2019b) lists 250 cities internationally that had committed to 100 percent renewables in the electric power sector by the end of 2018. 50 of these cities had committed to 100 percent renewables in multiple sectors (e.g., electricity, transport, and building heating/cooling). Country commitments are from Table R6 of REN21 (2019a) (whose data are for 2018 end) for all countries except Spain and Portugal, which committed during 2018. County, town, and city commitments are from Sierra Club (2019).

10 Countries that have reached 95 to more than 100 percent WWS electricity					
Albania	Costa Rica	Kenya ¹	Paraguay	Tajikistan	
Bhutan	Iceland	Norway	Scotland ²	Uruguay	
61 Countries that have laws requiring 100 percent renewable electricity					
Afghanistan	Cook Islands ³	Guatemala	Morocco	Senegal	Tunisia
Aruba ³	Costa Rica ⁵	Haiti	Nepal	Solomon Islands ⁵	Tuvalu ³
Bangladesh	Denmark ⁷	Honduras	Niger	South Sudan	Scotland ³
Barbados	Djibouti ³	Kenya	Niue ³	Spain	Vanuatu ⁵
Bhutan	Dominica	Kirbati	Palau	Sri Lanka	Vietnam
Burkina Faso	Dominican Rep.	Lebanon	Palestine	St. Lucia	Yemen
Cabo Verde ⁴	Ethiopia	Madagascar	Papua N. Guinea ⁵	Sudan	
Cambodia ⁴	Fiji ⁵	Malawi	Philippines	Sweden ⁶	
Colombia	Gambia	Maldives	Portugal	Tanzania	
Comoros	Ghana	Marshall Islands	Rwanda	Timor-Leste	
Congo, DR	Grenada	Mongolia	Samoa ⁵	Tokelau	

14 U.S. states, districts, and territories that have laws or executive orders requiring 100 or up to 100 percent electric power from renewables					
California Connecticut Hawaii	Maine Nevada New Jersey	New Mexico New York Puerto Rico	Rhode Island Virginia Washington D.C.	Washington State Wisconsin	
13 U.S. counties that have committed to 100 percent renewables					
Buncombe, NC Floyd, VA Grand, UT	Multnomah, OR Orange, NC Pueblo, CO	Salt Lake, UT Summit, CO Summit, UT	Taos, NM Ventura, CA Wake, NC	Whatcom, WA	
6 U.S. towns and cities that have reached 100 percent renewable electricity					
Aspen, CO	Burlington, VT	Georgetown, TX	Greensburg, KS	Kodiak Island, AK	Rock Port, MO
157 additional U.S. towns and cities that have committed to 100 percent renewable electricity					
Abita Springs, LA Alta, UT Ambler, PA Amherst, MA Angel Fire, NM Apex, NC Arlington, VA Athens, GA Atlanta, GA Augusta, GA Berkeley, CA Blacksburg, VA Bluffdale, UT Boise, ID Boulder, CO Breckenridge, CO Cambridge, MA Castle Valley, UT Chapel Hill, NC Cheltenham, PA Chicago, IL Chula Vista, CA Cincinnati, OH Clarkston, GA Cleveland, OH Coalville, UT Columbia, SC	Concord, NH Conshohocken, PA Cornish, NH Cottonwood Hts UT Culver City, CA Del Mar, CA Denton, TX Denver, CO Downington, PA Dunedin, FL Durango, CO Eagle Nest, NM East Bradford, PA East Hampton, NY East Pikeland, PA Eau Claire, WI Edmonds, WA Emig. Canyon, UT Encinitas, CA Eureka, CA Evanston, IL Fayetteville, AR Fort Collins, CO Francis, UT Fredericksburg, VA Frisco, CO Gainseville, FL	Golden, CO Goleta, CA Hanover, NH Haverford, PA Helena, MT Hillsborough, NC Holladay, UT Ivins, UT Kamas, UT Kansas City, MO Kearns, UT Keene, NH Kennett, PA La Crosse, WI La Mesa, CA Lafayette, CO Lakewood, OH Largo, FL Longmont, CO Los Angeles, CA Louisville, KY Lowell, MA Madison, WI Menlo Park, CA Middleton, WI Millcreek, UT Milwaukie, OR	Minneapolis, MN Missoula, MT Moab, UT Monona, WI Monterey, CA Narberth, PA Nederland, CO Nevada City, CA New Brunswick, NJ Norman, OK Norristown, PA Northampton, MA Oakley, UT Ogden, UT Ojai, CA Orem, UT Orlando, FL Oxnard, CA Palo Alto, CA Park City, UT Petoskey, MI Philadelphia, PA Phoenixville, PA Plainfield, NH Plymouth, PA Portland, OR Portola Valley, CA	Pueblo, CO Questa, NM Radnor, PA Reading, PA Red River, NM Rolling Hills Est., CA Safety Harbor, FL Salt Lake City, UT San Diego, CA San Francisco, CA San Jose, CA San Luis Obispo, CA Santa Barbara, CA Santa Monica, CA Sarasota, FL Satellite Beach, FL Savannah, GA Schuylkill, PA Silverthorne, CO Solana Beach, CA South Lake Tahoe, CA South Miami, FL South Pasadena, CA Southampton, NY Spokane, WA Springdale, UT Springfield, PA	St. Louis, MO St. Louis Park, MN St. Paul, MN St. Petersburg, FL State College, PA Tallahassee, FL Taos, NM Taos, Ski Valley, NM Thousand Oaks, CA Traverse City, MI Tredyffrin, PA Truckee, CA Upper Merion, PA Uwchlan, PA Ventura, CA West Chester, PA West Hollywood, CA West Jordan, UT West Valley City, UT West Vincent, PA Whitemarsh, PA Windsor, MA

¹Kenya's nameplate capacity in mid-2019 was 88.7 percent WWS, sufficient to produce 90 to 100 percent of its annual average electricity from WWS (Section 8.1). ²Scotland is included based on a preliminary estimate that it can produce 100 percent of its annual average power consumption from WWS by 2020, which is its commitment. Country commitments are all for 2050, except ³2020; ⁴2025; ⁵2030, ⁶2030. ⁷Denmark's law is for all energy.

Table 9.3. Proposed United States House of Representatives and Senate resolutions and bills between 2015 and 2019 for the U.S. to go to 100 percent WWS in one or more energy sectors. None has been voted on as of August 2019.

Name	Resolution or bill?	Date introduced	Scope of proposed resolution or law
^a H.Res. 540	Resolution	Nov. 30, 2015	100 percent clean, renewable energy for all purposes by 2050
^b S.Res. 632	Resolution	Dec. 7, 2016	100 percent clean, renewable electricity for all purposes by 2050
^c S. 987	Bill	Apr. 27, 2017	100 percent clean and renewable electricity and public transport by 2050
^d H.R. 3314	Bill	Jul. 19, 2017	100 percent clean and renewable electricity by 2050
^e H.R. 3671	Bill	Sep. 8, 2017	100 percent clean (only renewable) electricity by 2035
^f H.R. 330	Bill	Jan. 8, 2019	100 percent renewable electricity by 2035
^g H.Res. 109	Resolution	Feb. 7, 2019	100 percent clean, renewable, 0-emission energy for all purposes by 2030
^h S.Res. 59	Resolution	Feb. 7, 2019	100 percent clean, renewable, 0-emission energy for all purposes by 2030

Sources: ^aHouse (2015); ^bSenate (2016); ^cSenate (2017); ^dHouse (2017a); ^eHouse (2017b); ^fHouse (2019a); ^gHouse (2019b); ^hSenate (2019).

By January 16, 2020, 221 international companies had committed to provide 100 percent of their electricity for global operations, in the annual average, from renewables (Table 9.4). The first company to reach 100 percent WWS in the annual average was Google, who reached it during 2017. Apple met the 100 percent goal for its global operations during April 2018.

Table 9.4. International businesses (230, in alphabetical order) that have committed to transition their global operations to 100 percent renewable electricity in the annual average, as of March 28 2020. The businesses may either produce the electricity themselves or source it from the market. Renewables include wind, solar, geothermal, hydroelectric, or biogas. Companies in blue are among the top 10 biggest companies in the world in terms of total value of a company's shares of stock. From RE100 (2019).

3M	Bozzuto	Dell Techs.	Hazama Ando	Logitech	Proximus	Tata Motors
ABInBev	British Land	Dentsu Aegis	Heathrow Airport	Longi	PVH	TCI Co.
Adobe	Broad Group	Derwent London	Helvetia	Lululemon	PwC	TD Bank Group
Accenture	BT	Deutsche Tel.	HP Enterprise	Lyft	QBE	Telefonica
AEO, Inc.	Burberry	Dexus	HP Inc.	Mace	QTS	Tesco
AEON	CaixaBank	Diageo	HSBC	M&G	Rackspace	Tetra Pak
AkzoNobel	Califia Farms	DNB	Hudson Pacific	Mahindra	Radio Flyer	T-Mobile
Allianz	Canary Wharf	Ebay	Hulic Co., Ltd.	M&S	Rakuten	Toda Corp.
Alstria	Capital One	Elion	IFF	Macquarie	Ralph Lauren	Tokyu Corp.
Amalgamated Bk	Carlsberg Group	Elopak	IHS Markit	Mars	RB	Tokyu Land
Amazon	Chanel	Envipro	Ikea	Marui Group	Roy. Bank Scot.	Trane
Anthem	Citi	Envision	Infosys	McKinsey & Co.	RELX Group	TRIDL
ANZ	City of London	Equinix	ING	Microsoft	Royal DSM	UBS
Apple	Clif Bar	Estee Lauder	Interface	Mirvac	Royal Philips	Unilever
Asahi Kasei	Coca Cola	Etsy	Iron Mountain	Mitsubishi Estate	Ricoh	Vail Resorts
Askul	Colruyt Group	Facebook	JC Decaux	Mitsui Fudosan	Salesforce	Vaisala
Asset Man. One	Commerzbank	Formula-E	JD Sports Fashion	Morgan Stanley	SAP	Vestas
Astra Zeneca	Commonwealth Bk	Fifth Third Bank	Jinko Solar	Nat Austral Bank	Schneider Elec.	VF Corp.
Atlassian	Coop Sapporo	Firmenich	Johnson & Johnson	Nestle	Schroders	Virgin Media
Aurora	Corbion	Fujifilm	Johnan Shinkin Bank	Next	Sekisui House	Visa
Autodesk	Credit Agricole	Fujikura	JPMorgan Chase	New Balance	SGS	VM Ware
Aviva	Credit Suisse	Fujitsu	Jupiter	Nike	Signify	Vodafone
Axa	Crown Estate	Fuyo Lease	Kellogg's	Nordea	Sky	Voya
B of A	Crown Holdings	Gatwick Airport	Keurig Dr. Pepper	Novo Nordisk	Slaughter & May	Walmart
Bank Australia	Dai-ichi Life Group	General Motors	Kingspan	NREP	Sony	Watami
Bankia	Daito Trust	Givaudan	Konica Minolta	NRI	Starbucks	Westpac
Barclays	Daiwa House	Goldman Sachs	KPN	O'right, Hair	Steelcase	WeWork
BayWa	Dalmia	Google	L'Occitane Group	Organic Valley	Swisscom	Wells Fargo
BBVA	Danfoss	Grape King Bio	La Poste	Panasonic	Swiss Post	Wonderful Co.
Bestseller	Danone	Grupo Bimbo	Landsec	Pearson	Swiss Re	Workday
Biogen	Danske Bank	Gurmengroup	Lego Group	Pernod Ricard	Symrise	Yoox
Bloomberg	DBS	H&M	Lixil Group	P&G	Takashimaya	Zurich Insurance
BMW Group	Decathlon	HAP	Lloyds Banking	PNC	Target	

Between September 2017 and September 2019, the Climate Group went further, galvanizing 52 international companies to commit to transitioning their 2 million company vehicles to 100 percent electric by 2030 (Climate Group, 2019). Companies committed not only to changing their vehicle fleet, but also to installing charging stations. On September 19, 2019, an additional company, Amazon, committed to replacing 100,000 delivery trucks with electric trucks. Transitioning company vehicles is important given that up to half of all vehicles on the road in many countries are company owned.

References

- Climate Group, EV100 members, 2019, <https://www.theclimategroup.org/ev100-members> (accessed September 22, 2019).
- House (U.S. House of Representatives), H.Res.540, 2015, <https://www.congress.gov/bill/114th-congress/house-resolution/540/text> (accessed February 7, 2019).
- House (U.S. House of Representatives), H.R.3314 – 100 by '50 Act, 2017a, <https://www.congress.gov/bill/115th-congress/house-bill/3314> (accessed February 7, 2019).
- House (U.S. House of Representatives), H.R.3671 – Off Fossil Fuels For A Better Future Act, 2017b, <https://www.congress.gov/bill/115th-congress/house-bill/3671/text> (accessed February 7, 2019).
- House (U.S. House of Representatives), H.R. 330 – Climate Solutions Act of 2019, 2019a, <https://www.congress.gov/bill/116th-congress/house-bill/330/text> (accessed February 7, 2019).
- House (U.S. House of Representatives), Resolution recognizing the duty of the federal government to create a green new deal, 2019b, <https://apps.npr.org/documents/document.html?id=5729033-Green-New-Deal-FINAL>, <https://apps.npr.org/documents/document.html?id=5729035-Green-New-Deal-FAQ> (accessed February 7, 2019).
- RE100, The world's most influential companies committed to 100% renewable power, 2019, <http://there100.org> (accessed January 26, 2019).
- REN21 (Renewable Energy Policy Network for the 21st Century), Renewables 2019 global status report, 2019, <https://www.ren21.net/gsr-2019/>, https://www.ren21.net/gsr-2019/tables/table_06/table_06/ (accessed July 27, 2019).
- Senate (U.S. Senate), S.Res.632, 2016, <https://www.congress.gov/bill/114th-congress/senate-resolution/632> (accessed February 7, 2019).
- Senate (U.S. Senate), S.987 – 100 by '50 Act, 2017, ” <https://www.congress.gov/bill/115th-congress/senate-bill/987/text?r=1> (accessed February 7, 2019).
- Senate (U.S. Senate), S.Res.59 – A resolution recognizing the duty of the Federal Government to create a Green New Deal, 2019,” <https://www.congress.gov/bill/116th-congress/senate-resolution/59?q=%7B%22search%22%3A%5B%22green+new+deal%22%5D%7D&s=1&r=2> (accessed March 26, 2019).
- Sierra Club, 100% commitments in cities, counties, and states, 2019, <https://www.sierraclub.org/ready-for-100/commitments> (accessed January 26, 2019).