2015

U.S. CLEAN TECH LEADERSHIP INDEX

State & Metro / June 2015

CLEAN EDGE

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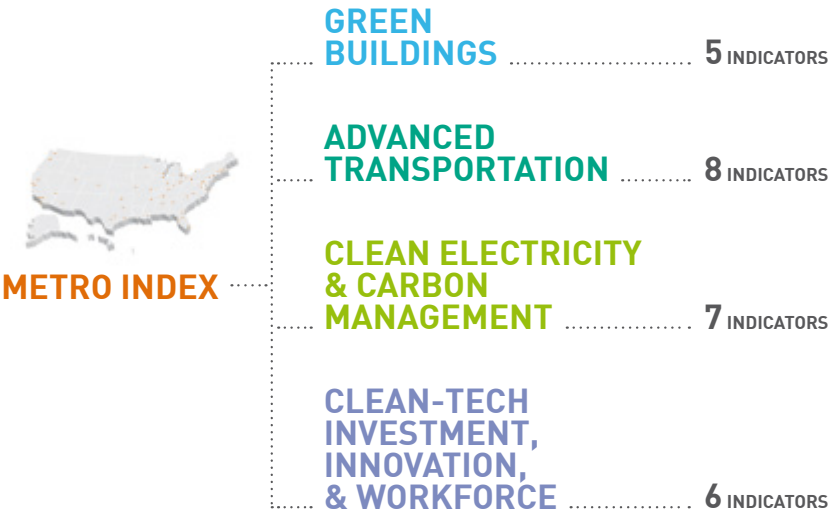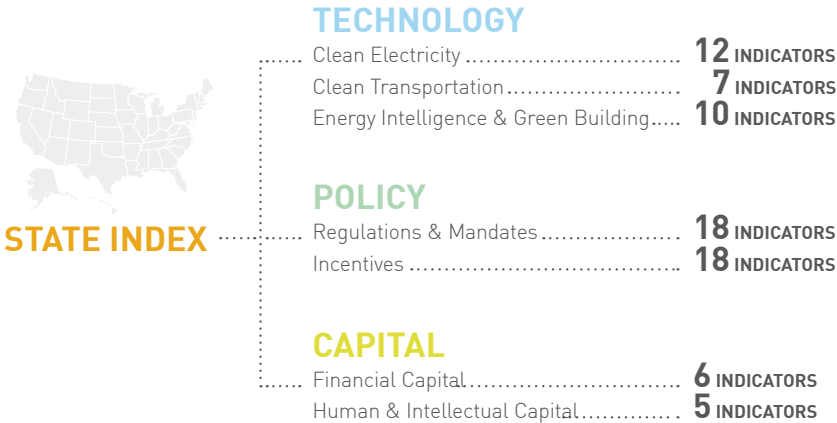**CLEAN EDGE**

PRODUCT DESCRIPTION

What is the U.S. Clean Tech Leadership Index?

This **U.S. CLEAN TECH LEADERSHIP INDEX** report contains findings from the 2015 editions of Clean Edge's State and Metro Indexes, which track activity in the U.S. based on a diverse set of underlying industry indicators at state and metro levels. Indicator performances are grouped into separate categories (for index weighting purposes) and ultimately used to calculate regional leadership scores. The **STATE INDEX** offers scores for all 50 states, derived from more than 70 state-based indicators. The **METRO INDEX** uses more than 20 metro-based indicators to calculate scores for the 50 largest U.S. metropolitan statistical areas. Organizational structures of both indexes are shown at the right, and more information can be found later in the report (State Index methodology on page 24; Metro Index methodology on page 43).

The objective of the Leadership Index is to serve as a tool for regional comparative research, a source for aggregated industry data, and a jumping-off point for deep, data-driven analysis of the U.S. clean-energy market. This is the sixth edition of the State Index, the fourth annual Metro Index, and the third year that topline index rankings and scores have been released as a public report.

Full Data Subscription Packages Available

Private subscription options, which provide access to all of the underlying datasets, are available for economic development agencies, policymakers, NGOs, investors, corporations, and other stakeholders. **For more information please see page 49.**

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THE U.S. CLEAN TECH MARKET

The United States has seen a significant shift in its energy landscape since Clean Edge began publishing its clean-tech leadership index five years ago. The transition to a clean tech and energy efficiency-based economy, based on the many indicators we track, is well underway. Solar and wind power, along with natural gas and energy efficiency, are now the mainstream choices for meeting the nation's electricity needs; coal-fired and nuclear power, the dominant choices of the 20th century, have become the marginalized "alternatives."

In 2014, utility-scale wind energy (27%) and solar power (20%) combined for 47% of U.S. generation capacity additions (this figure does not include distributed solar and wind installations less than 1 MW in size), according to the Federal Energy Regulatory Commission. Add in natural gas plants' share of 49% and these three sources were responsible for 96% of the nation's new utility-scale generation capacity. The clean-energy trend became even more dramatic in the first quarter of 2015, with non-hydro renewables contributing 70% of the new added capacity in the U.S. (wind 49%, solar 17%, and geothermal 4%).

Against this national backdrop, the top states and metro areas tracked by our 2015 U.S. Clean Tech Leadership Index are accelerating their clean-energy goals to levels once believed unthinkable. In California, the #1 state in the Index for six consecutive years, Governor Jerry Brown set a target of 50% generation from renewables by 2030 in his January 2015 State of the State address. The California cities of San Fran-

2015 TOP 10 STATES (INCLUDING HISTORICAL RANKINGS)
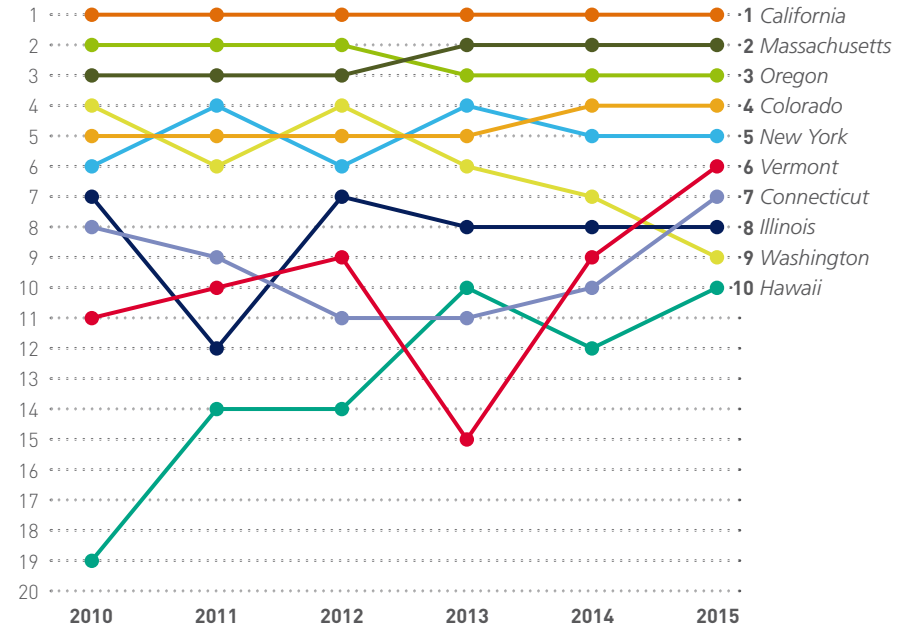
Source: U.S. Clean Tech Leadership Index, Clean Edge. Inc.

cisco, San Jose, and San Diego (along with much smaller cities like Burlington, Vt., Georgetown, Tex., and Greensburg, Kans.) have renewable energy goals of 100%.
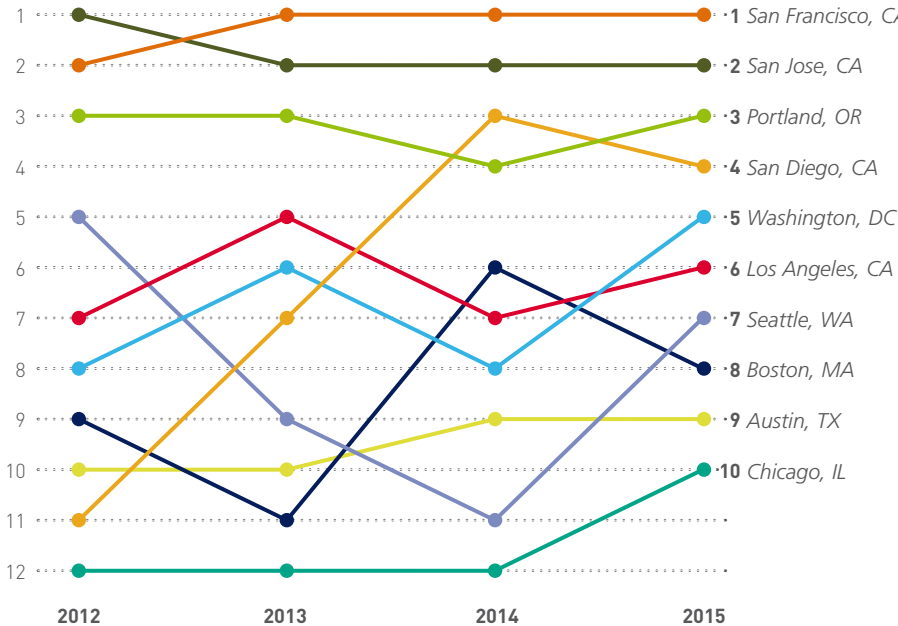
And lawmakers in Hawaii, a state that's back in the top 10 in this year's Index, made the biggest splash of all in May, establishing the nation's first statewide 100% renewables target (by 2045). That audacious goal passed the two houses of Hawaii's state legislature by a combined vote of 74-2 and was awaiting Governor

David Ige's expected signature as this report went to press; the Aloha State is currently at about 20% renewables.

Making these goals possible, in addition to the significant expansion of wind power over the past decade, is the recent surge in the growth of solar energy. The U.S. added more than 6 GW of new solar capacity in 2014, a 30% growth rate. California became the first state to exceed 5% generation from utility-scale solar, and that doesn't even include the state's hundreds of megawatts of rooftop solar working behind the residential and commercial customer meter. Utility-scale solar also contributed more than 2.5% of total generation in Nevada and Arizona.

Our tracking of states' clean-tech performance since our first Index in 2010 puts this momentum in perspective. Last year, 11 states generated at least 10% of their electricity from clean sources (excluding hydro and biomass); in 2009, it was just three. And in 2014, three states exceeded 20% for the first time, led by Iowa at 28.5%. Add in hydro and biomass, and five states exceeded 60% clean electricity in 2014. As the EPA's Clean Power Plan rolls out in the months and years ahead – and 100% clean-energy targets move from pipe dream to achievable goal – such state-by-state tracking of clean electricity sources, energy efficiency measures such as green buildings, and the move toward the electrification of transportation will be increasingly important.

2015 TOP 10 METRO AREAS (INCLUDING HISTORICAL RANKINGS)

1 San Francisco, CA
2 San Jose, CA
3 Portland, OR
4 San Diego, CA
5 Washington, DC
6 Los Angeles, CA
7 Seattle, WA
8 Boston, MA
9 Austin, TX
10 Chicago, IL

Source: U.S. Clean Tech Leadership Index, Clean Edge. Inc.

STATE INDEX

2015 U.S. Clean Tech Leadership Index

Full State Index Datasets Available

Clean Edge offers subscription access to the full State and Metro Index datasets. These include data for all 50 states on clean-energy generation, energy storage installations, green building deployment, energy efficiency expenditures, VC investments, clean-energy patents, and much more. **For more information on subscriptions, please see page 49.**

STATE INDEX

LOWER RANKING — HIGHER RANKING

CLEAN EDGE
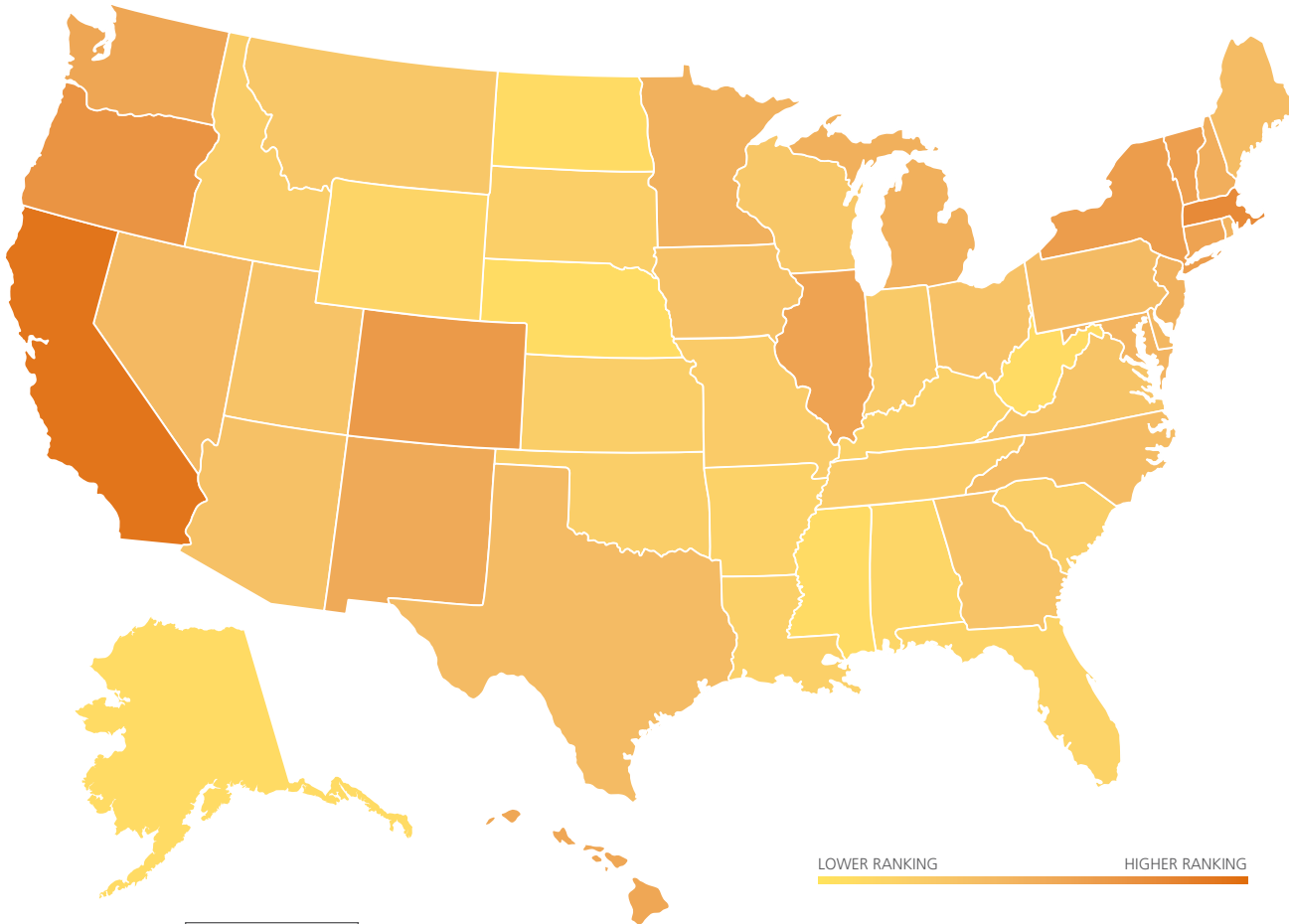
RANK	+/-	STATE	LEADERSHIP SCORE
1	0	California	94.0
2	0	Massachusetts	78.8
3	0	Oregon	72.0
4	0	Colorado	67.1
5	0	New York	65.1
6	3	Vermont	62.9
7	3	Connecticut	59.9
8	0	Illinois	59.6
9	-2	Washington	57.5
10	2	Hawaii	56.5
11	-5	New Mexico	54.5
12	4	New Hampshire	50.6
13	1	Michigan	50.3
14	-3	New Jersey	49.3
15	0	Minnesota	49.0
16	4	Maryland	46.3
17	-4	Rhode Island	45.7
18	3	Delaware	44.2
19	-2	Nevada	41.6
20	-2	Texas	40.1
21	5	Pennsylvania	39.7
22	7	Maine	38.7
23	1	North Carolina	38.5
24	-1	Iowa	35.1
25	-3	Arizona	34.9
26	2	Ohio	34.4
27	4	Utah	33.3
28	-3	Georgia	33.1
29	-2	Virginia	32.0
30	-11	Wisconsin	29.4
31	2	Montana	28.8
32	0	Indiana	25.8
33	8	Missouri	25.4
34	4	Tennessee	25.2
35	1	Idaho	23.7
36	-2	Kansas	23.3
37	-2	South Carolina	22.8
38	-1	Oklahoma	22.7
39	0	South Dakota	22.0
40	2	Louisiana	20.5
41	-1	Kentucky	19.5
42	2	Arkansas	19.0
43	-13	Florida	18.2
44	1	Wyoming	15.8
45	-2	Alabama	15.3
46	3	West Virginia	10.2
47	0	North Dakota	10.1
48	0	Alaska	10.0
49	1	Mississippi	9.7
50	-4	Nebraska	8.6

2015 STATE INDEX RESULTS

California leads all states by a wide margin for the sixth consecutive year, its overall Index score of 94 holding steady with its prior year score of 93.7. The Golden State, #1 in the Technology and Capital categories and #2 in Policy, slightly upped its overall score lead over second-place Massachusetts to 15.2 points from 14.3 last year. The rest of the top five states in last year's Index – Oregon, Colorado, and New York – repeated their respective rankings from 2014. All of the top five states have been ranked #6 or higher every year since the inaugural Index in 2010.

Places six through 10, however, showed some notable movement from last year. Fellow New England states Vermont and Connecticut each jumped three places to #6 and #7, respectively. Illinois held steady at #8 for the third straight year, but Washington fell two spots to ninth, its third consecutive yearly drop since ranking #4 in 2012. Hawaii moved up two places to rejoin the top 10. The Aloha State has climbed in the ranks significantly since ranking just 19th back in 2010.

The Top 10 States

1 The Technology category leader for six years running, **CALIFORNIA** tops the field in all three subcategories of clean-technology deployment: electricity; transportation; and energy intelligence/green buildings. The Golden State also captured the #1 spot in Capital this year after trailing Massachusetts in the previous five years of the Index, while finishing second to Massachusetts in Policy. With 55,000 people employed in its booming solar industry alone, a carbon market in place with its AB32 trading scheme, and a 50% renewables goal by 2030 set by Governor Jerry Brown, California sets the pace for what a clean-energy economy looks like. Showing the correlation between the State and Metro Indexes, California is home to three of the top four metro areas.

2 **MASSACHUSETTS** remains #2 for the third straight year, after swapping places with #3 Oregon in the 2013 Index. Its overall score dropped slightly this year to 78.8 from last year's 79.4. Although losing its top spot in Capital to California, Massachusetts jumped up four spots into the Top 10 in Technology at #8, reflecting a major policy and industry push to deploy more clean energy under the administration of former Governor Deval Patrick. Massachusetts repeats as the #1 state in Policy, boasting 31 of the 35 possible policies tracked by the Index.

3 **OREGON** retained its #3 rank for the third straight year, but enjoyed the highest score increase of any top 10 state, up to 72 points from 67 last year when it barely edged out Colorado. Oregon trails only California in the Technology category, with perennial strength in hybrid vehicles, electric vehicles, plug-in hybrids, charging infrastructure, and green buildings. But the Beaver State was most improved in Policy and Capital, jumping to sixth place in both categories after placing 11th in both a year ago. Oregon was #2 in the Regulations and Mandates portion of Policy, trailing only Massachusetts.

4 **COLORADO** moved up to fourth place in the 2014 Index and stayed there this year, with a virtually identical score of 67, after ranking #5 in the first four years of the Index. The home state of the National Renewable Energy Laboratory ranks #4 in Capital and #6 in Technology. Colorado is particularly strong in the Energy Intelligence & Green Buildings subcategory of Technology, placing #2 behind California. The state ranks 10th in Policy, with particular strength in Incentives at #5.

5 Despite placing just 19th in Technology, **NEW YORK** repeats its #5 overall ranking from a year ago with a score of 65. The Empire State shows clear policy leadership with a fourth-place rank in that category. Among its credentials are a Green Bank and one of the nation's most comprehensive utility regulatory overhauls called Reforming the Energy Vision (REV), which emphasizes distributed assets and demand side management.

6 **VERMONT** jumped three places from ninth in 2014, upping its score from 58.6 to 63, continuing its impressive climb from just 15th in the overall Index two years ago. The tiny state (ranking 49th in population with less than a million people) is the highest-placing eastern state in Technology at #5. Always a pacesetter in efficiency and its financing, Vermont lands at #3 in the Energy Intelligence & Green Buildings subcategory of Technology.

7 Fellow New England state **CONNECTICUT** (with a 59.9 score) also moved up three places from last year, when it entered the top 10 for the first time since 2011. The state is something of a study in contrasts, ranking 26th in Technology but #3 in Policy. Having established the nation's first full-scale Green Bank in 2011, Connecticut has continued that policy leadership, and ties Massachusetts for the most Incentives policies (15) tracked by the Index.

8 **ILLINOIS** saw its score drop slightly from 61.5 to 59.6, but continued its steady track record with a third consecutive #8 ranking (and a #7 in 2012). Like Connecticut and New York, Illinois overcomes a low rank in Technology (21st) with a strong showing in Policy (#8) and is also #8 in Capital. The only Midwestern state in the top 10, Illinois is one of just four states that's home to a DOE Lab, clean-energy incubator or accelerator, and a top-ranked green Master's program.

9 **WASHINGTON** fell two places from last year's Index, its score dropping from 61.6 to 57.5. Placing #4 or #6 in the first three years of our Index, Washington's rank has dropped each year since 2013. With one of the nation's lowest-carbon energy mixes, as well as high clean-powered vehicle ownership, Washington excels in the Technology category at fourth place. But the state is just 15th in both the Policy (down from #7 last year) and Capital categories.

10 **HAWAII** rejoins the top 10 in 2015 after dropping to 12th last year. The Aloha State improved its score by nearly five points in this year's Index to 56.5. Other than last year, Hawaii has climbed steadily up the ranks since placing 19th in our inaugural Index in 2010. Hawaii is an impressive #3 in Technology this year, trailing only California and Oregon. Its small island geography makes it ideal for electric vehicles. And with its legislature passing the nation's first statewide 100% renewable energy mandate (by 2045) in May of this year, Hawaii signaled its desire to be a leading clean-tech state for many years to come.

TECHNOLOGY
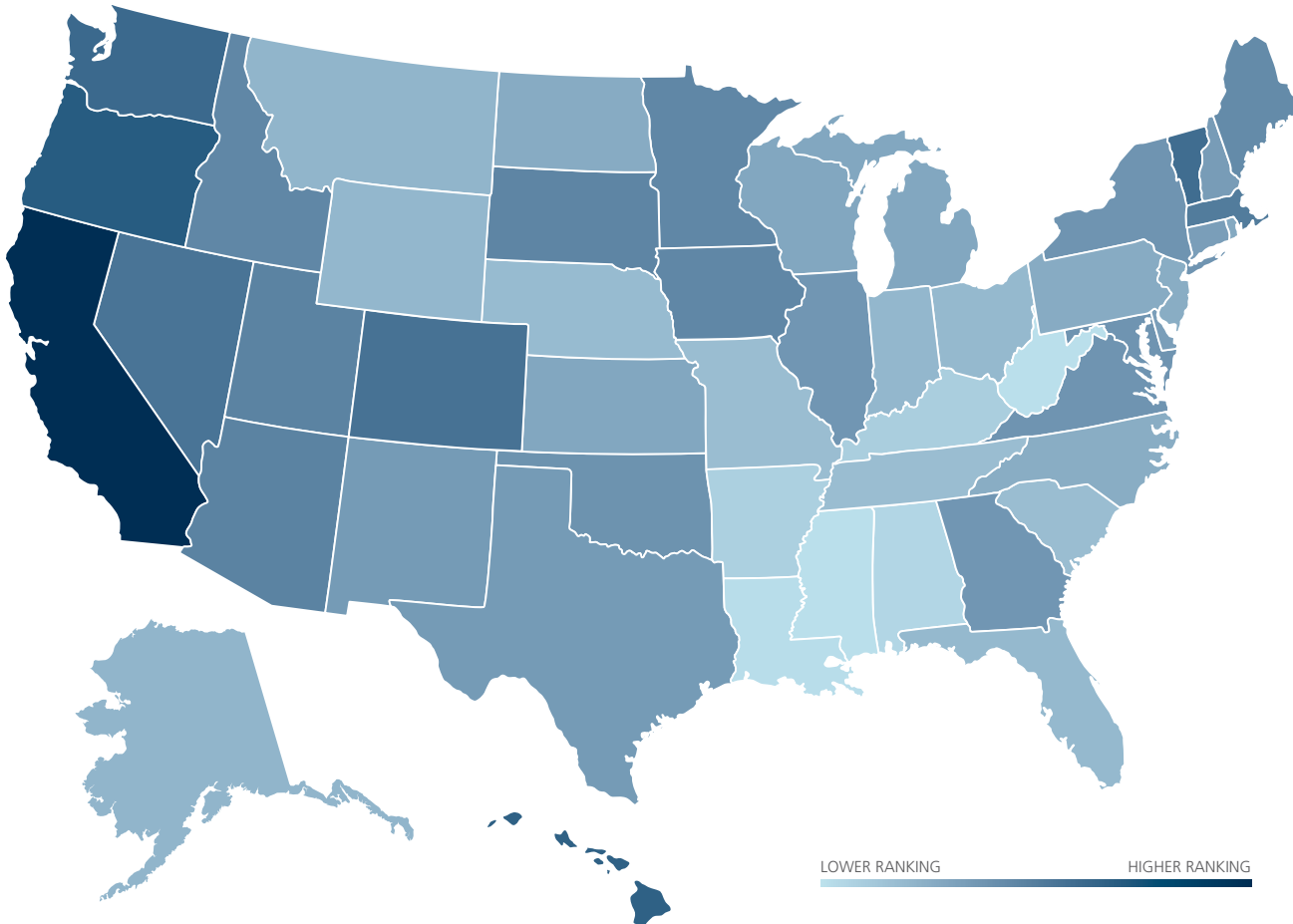
LOWER RANKING   HIGHER RANKING

RANK	STATE	LEADERSHIP SCORE
1	California	100.0
2	Oregon	69.0
3	Hawaii	66.0
4	Washington	61.2
5	Vermont	58.7
6	Colorado	56.3
7	Nevada	55.3
8	Massachusetts	51.3
9	Utah	47.2
10	Arizona	46.5
11	South Dakota	46.2
12	Iowa	45.0
13	Minnesota	44.8
14	Idaho	44.5
15	Maine	42.5
16	Oklahoma	38.9
17	Virginia	38.1
18	Maryland	38.0
19	New York	37.8
20	Georgia	37.3
21	Illinois	36.5
22	New Mexico	35.2
23	Texas	34.5
24	New Hampshire	33.5
25	Delaware	32.5
26	Connecticut	32.5
27	Kansas	29.2
28	Wisconsin	29.1
29	Michigan	28.4
30	Rhode Island	27.9
31	North Dakota	27.4
32	Pennsylvania	26.7
33	North Carolina	25.7
34	New Jersey	25.5
35	Montana	21.9
36	Alaska	21.7
37	Indiana	21.2
38	Wyoming	21.1
39	Florida	20.3
40	Ohio	19.9
41	Nebraska	19.4
42	Missouri	18.4
43	Tennessee	17.9
44	South Carolina	17.9
45	Kentucky	10.2
46	Arkansas	9.1
47	Alabama	6.6
48	Louisiana	2.9
49	West Virginia	2.4
50	Mississippi	1.5

CLEAN EDGE

TECHNOLOGY OVERVIEW

The Technology category tracks the progress of states' deployment across three subcategories:

- Clean Electricity (renewable energy generation, energy storage, and fuel cell deployment)

- Clean Transportation (use of electric vehicles, hybrids, plug-in hybrids, biofuels, natural gas vehicles, and charging/fueling infrastructure)

- Energy Intelligence & Green Building (green building projects, smart grid deployment, grid modernization, and efficient energy use)

The three subcategories are weighted equally.

The 2015 State Index marks the fourth straight year in which California has led the nation in all three Technology subcategories, resulting in a dominating performance with its top score of 100 eclipsing the rest of the pack by more than 30 points (#2 Oregon came in at 69 in Technology this year). After California and Oregon, five other states among the overall top 10 – Colorado, Washington, Vermont, Massachusetts, and Hawaii – make the top 10 in Technology.

But Technology leadership also includes states that that don't necessarily score highly in other areas or in the overall Index – thanks to an abundance and exploitation of clean-energy resources. Nevada and Arizona, #2 and #3 in the U.S. in utility-scale solar power as a percentage of total generation, crack the Technology

UTILITY-SCALE CLEAN ELECTRICITY GENERATION: WIND, SOLAR, GEOTHERMAL, HYDRO, BIOMASS (2014)

STATE	RANK	% OF TOTAL GENERATION	THOUSAND MWH
IDAHO	1	82.94%	12,587
WASHINGTON	2	76.05%	87,729
OREGON	3	73.37%	43,813
SOUTH DAKOTA	4	72.99%	8,416
MAINE	5	60.25%	7,925
MONTANA	6	43.58%	13,181
CALIFORNIA	7	30.16%	59,633
IOWA	8	30.06%	17,172
ALASKA	9	28.25%	1,737
VERMONT	10	27.48%	1,923

Source: EIA with Clean Edge analysis. Clean electricity sources include wind, solar PV and thermal, geothermal, hydro, and biomass. EIA electricity generation data is gathered from monthly surveys of power plants with peak capacity of at least 1 MW, meaning sub-1 MW solar installations do not count toward generation totals.
Full dataset available to subscription clients.

top 10 despite respective overall rankings of 19th and 25th. The top two wind power states (on a percentage basis), Iowa and South Dakota, reach the top 12 in Technology; overall, they rank 24th and 39th respectively.

The top four Technology states either border the Pacific Ocean or are surrounded by it, and four others in the top 10 are also west of the Great Plains. But Vermont achieved the highest Technology category ranking by an eastern state in the Index's six years, at #5, and Massachusetts also made the top 10 for the first time at #8.

UTILITY-SCALE WIND ELECTRICITY GENERATION (2014)

STATE	RANK	% OF TOTAL GENERATION	THOUSAND MWH
IOWA	1	28.53%	16,295
SOUTH DAKOTA	2	25.29%	2,916
KANSAS	3	21.67%	10,844
IDAHO	4	18.31%	2,778
NORTH DAKOTA	5	17.58%	6,349
OKLAHOMA	6	16.87%	11,862
MINNESOTA	7	15.94%	9,060
COLORADO	8	13.61%	7,351
OREGON	9	12.69%	7,580
TEXAS	10	9.00%	39,371

Source: EIA data with Clean Edge analysis. EIA electricity generation data is gathered from monthly surveys of power plants with peak capacity of at least 1 MW, meaning sub-1 MW solar installations do not count toward generation totals.
Full dataset available to subscription clients.

UTILITY-SCALE SOLAR ELECTRICITY GENERATION (2014)

STATE	RANK	% OF TOTAL GENERATION	THOUSAND MWH
CALIFORNIA	1	5.00%	9,891
NEVADA	2	2.84%	1,028
ARIZONA	3	2.76%	3,101
NEW MEXICO	4	1.69%	543
MASSACHUSETTS	5	1.35%	419
NEW JERSEY	6	1.00%	677
DELAWARE	7	0.77%	59
NORTH CAROLINA	8	0.72%	922
COLORADO	9	0.50%	268
HAWAII	10	0.48%	48

Source: EIA data with Clean Edge analysis. EIA electricity generation data is gathered from monthly surveys of power plants with peak capacity of at least 1 MW, meaning sub-1 MW solar installations do not count toward generation totals.
Full dataset available to subscription clients.

The next-highest ranking eastern state, Maine, comes in at 15th. By contrast, the remaining two Northeast states in the overall top 10, New York and Connecticut, are respectively 19th and 24th in Technology.

Clean Electricity

The top five states in the Clean Electricity subcategory – California, Idaho, South Dakota, Nevada, and Oregon – were also the top five in last year's Index, though in slightly different order. California's #1 spot includes use of wind, geothermal, and hydro resources, but it's in solar power where the state wears the undisputed crown. In 2014, California became the first state to see utility-scale solar reach 5% of total generation, cranking out nearly 10 GWh. Nevada and Arizona each

exceeded 2.5%, and Massachusetts ranked #5 in the solar generation indicator, surpassing former northeast leader New Jersey, now at #6.

Idaho, ranked just 35th in the overall Index, claims the #2 spot in Clean Electricity. Nearly 83% of the state's generation came from clean sources (including hydro and biomass) in 2014, making Idaho #1 in that indicator. Three other states – Washington, Oregon, and South Dakota – exceeded 70% clean electricity generation, and Maine topped 60%.

Idaho ranks fourth in wind generation, with turbines producing more than 18% of the state's output. Iowa continues to lead in the wind generation indicator as it has for several years, with wind producing 28.5% of the state's generation in 2014.

HYBRID ELECTRIC VEHICLES (REGISTERED VEHICLES, 2014)

STATE	RANK	HEVS PER 1M PEOPLE	TOTAL HEVS
CALIFORNIA	1	20,379.3	790,769
WASHINGTON	2	17,039.2	120,323
OREGON	3	16,998.7	67,489
VERMONT	4	16,016.0	10,035
VIRGINIA	5	13,811.8	115,001
HAWAII	6	13,675.4	19,413
NEW HAMPSHIRE	7	13,347.8	17,710
MASSACHUSETTS	8	13,146.3	88,677
MARYLAND	9	12,700.9	75,906
COLORADO	10	11,971.2	64,116

Source: IHS Automotive data with Clean Edge analysis. IHS Automotive data is a snapshot of every vehicle in operation as of January 1, 2015.
Full dataset available to subscription clients.

ELECTRIC VEHICLES (REGISTERED VEHICLES, 2014)

STATE	RANK	EVS PER 1M PEOPLE	TOTAL EVS
CALIFORNIA	1	1,812.3	70,322
HAWAII	2	1,708.3	2,425
GEORGIA	3	1,342.9	13,560
WASHINGTON	4	1,282.3	9,055
OREGON	5	882.3	3,503
ARIZONA	6	649.3	4,371
VERMONT	7	416.6	261
COLORADO	8	390.0	2,089
FLORIDA	9	341.7	6,798
UTAH	10	339.1	998

Source: IHS Automotive data with Clean Edge analysis. IHS Automotive data is a snapshot of every vehicle in operation as of January 1, 2015. In prior years, this indicator included plug-in hybrid electric vehicles like the Chevy Volt. However, plug-in vehicles are now tracked in a separate indicator.
Full dataset available to subscription clients.

Both South Dakota and Kansas exceed 20%; overall, nine states received more than 12% of their in-state power from the wind. Texas is the leader in total wind generation; its nearly 40 GWh in 2014 was 9% of its total generation.

Clean Transportation

The top five states in the Clean Transportation subcategory have remained unchanged for the past three years – California, Utah, Hawaii, Washington, and Oregon – although Washington and Oregon swapped fourth and fifth places in 2014. California, with a 100 score, has a substantial lead over Utah (81.8) and Hawaii (81.1). California leads in hybrid, plug-in hybrid, and all-electric vehicles per million people. Hawaii, Oregon, and Vermont lead in EV charging infrastructure, and Utah's #2 rank in the subcategory stems from its leadership in natural gas vehicles and compressed natural gas fueling stations. Utah has more than 1,250 NGVs per million people; #2 Oklahoma has less than 800.

Four states – California, Hawaii, Georgia, and Washington – now have more than 1,000 EVs per million people, and two, California and Vermont, have more than 1,000 plug-in hybrids. California, where Tesla Motors is the state's largest auto industry employer, has nearly 950,000 clean-powered cars (including NGVs) on the road and should pass the 1 million-vehicle milestone this year.

Energy Intelligence and Green Building

California's leadership margin in this subcategory is akin to that of Clean Transportation, roughly 20 points over #2 Colorado (82.06); rounding out the top five are Vermont, Massachusetts, and Maryland. The top 10 states in the subcategory include three from outside the overall Index top 10 – Maryland, #7 Nevada, and #9 Arizona – for different reasons.

Maryland is fifth in LEED-certified projects per million people, many of them federal government buildings on or near the Capital Beltway; federal green building mandates also help Virginia earn seventh place in that indicator. Nevada, as in past years, benefits from its very large green building projects in Las Vegas, leading all states in the LEED-certified square feet per capita indicator. Nevada is also #2 in the nation in smart-meter market penetration at 94.8%; Maine leads with 97.5%. Arizona, where utilities have come under fire from the rooftop solar industry for new fees and other actions, is a leader in smart meter deployment as well; the state placed sixth in that indicator with 72.2% market penetration.

Nevada and Arizona both make the top 10 in the 2014 Gridwise Modernization Index (GMI), a new indicator reflecting the importance of grid infrastructure upgrade and reform in enabling a state's leadership in clean tech. The GMI is a state benchmarking index from the Gridwise Alliance, a consortium of leading utilities, grid operators, smart grid technology providers, and other key stakeholders. The GMI top 10 includes energy-efficiency leaders like California and Illinois, but also efficiency laggards Texas (which ties California for the top score), Idaho, and Virginia – showing the multi-faceted nature of Technology leadership for states in clean tech.

LEED BUILDING DEPLOYMENT (2014)

STATE	RANK	PROJECTS PER 1M PEOPLE	TOTAL PROJECTS	PLATINUM PROJECTS	GOLD PROJECTS	SILVER PROJECTS
COLORADO	1	129.7	695	48	309	216
VERMONT	2	128.6	81	7	31	25
WASHINGTON	3	114.3	807	40	343	295
OREGON	4	113.6	451	58	229	107
MARYLAND	5	112.5	673	27	292	240
NEW MEXICO	6	110.0	230	7	100	99
VIRGINIA	7	104.1	867	32	311	346
MASSACHUSETTS	8	100.4	678	48	317	189
HAWAII	9	88.0	125	13	57	37
CALIFORNIA	10	85.4	3315	312	1422	1038

Source: USGBC data with Clean Edge analysis. USGBC data is gathered from the LEED project registration database and includes all projects certified through 12/31/2014. This does not include LEED for Homes projects.
***Full dataset available to subscription clients.***

SMART METER MARKET PENETRATION (2013)

STATE	RANK	% OF SMART METERS	TOTAL SMART METERS
MAINE	1	97.52%	739,583
NEVADA	2	94.83%	1,125,193
GEORGIA	3	84.61%	3,771,777
CALIFORNIA	4	83.82%	12,427,747
VERMONT	5	80.37%	271,526
ARIZONA	6	72.19%	2,091,766
DELAWARE	7	71.83%	307,904
TEXAS	8	69.07%	7,840,588
IDAHO	9	68.57%	548,969
NEW HAMPSHIRE	10	66.63%	156,960

Source: EIA data with Clean Edge analysis.
Full dataset available to subscription clients.

POLICY
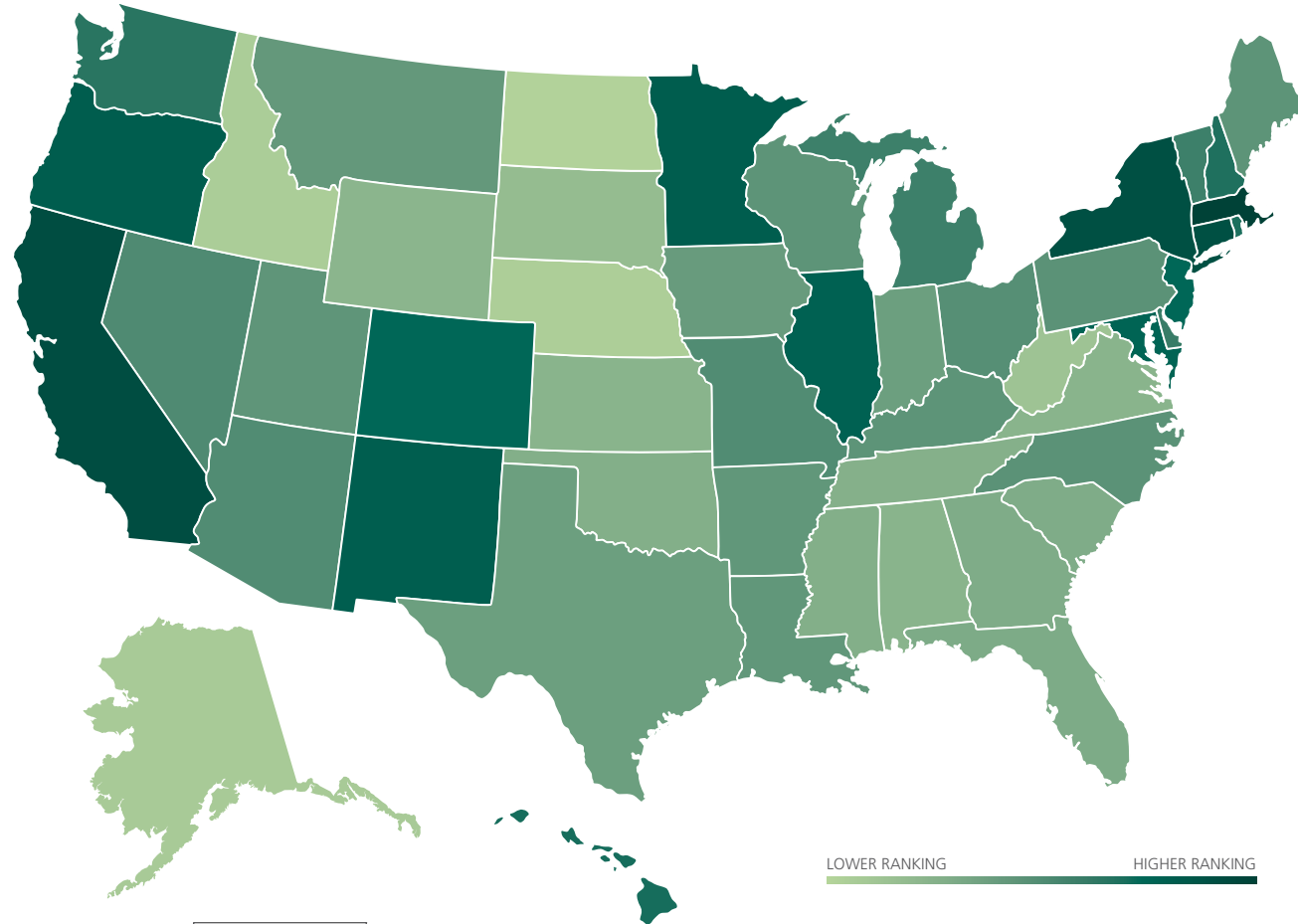
RANK	STATE	LEADERSHIP SCORE	
1	Massachusetts	100.0	
2	California	91.9	
3	Connecticut	90.2	
4	New York	90.1	
5	Minnesota	81.1	
6	Oregon	80.9	
7	New Mexico	80.1	
8	Illinois	78.4	
9	Maryland	75.6	
10	Colorado	73.9	
11	New Jersey	73.9	
12	Hawaii	70.3	
13	Rhode Island	69.3	
14	New Hampshire	67.6	
15	Washington	64.8	
16	Delaware	60.1	
17	Vermont	57.7	
18	Michigan	57.7	
19	Nevada	51.2	
20	Missouri	49.6	
21	Arizona	49.5	
22	Ohio	47.9	
23	Pennsylvania	45.9	
24	North Carolina	45.9	
25	Kentucky	45.2	
26	Wisconsin	45.1	
27	Maine	44.8	
28	Utah	44.2	
29	Louisiana	43.4	
30	Arkansas	42.5	
31	Montana	42.2	
32	Iowa	39.4	
33	Indiana	38.0	
34	Texas	37.8	
35	Florida	29.7	
36	Georgia	29.1	
37	South Carolina	29.0	
38	Oklahoma	27.3	
39	Mississippi	27.2	
40	Tennessee	26.3	
41	Virginia	24.3	
42	Kansas	24.3	
43	Alabama	23.5	
44	Wyoming	22.6	
45	South Dakota	18.2	
46	West Virginia	12.6	
47	Alaska	8.1	
48	Idaho	6.3	
49	Nebraska	4.5	
50	North Dakota	1.8	

LOWER RANKING   HIGHER RANKING

CLEAN EDGE

POLICY OVERVIEW

The Policy category of the State Index is slightly different from the Technology and Capital categories in that it is not based on quantitative industry metrics, but rather on each state's implementation of important clean-tech policies. The category includes two subcategories. Regulations & Mandates covers renewable portfolio standards (RPS), transportation policies, building codes, and climate change targets, representing the metaphorical "sticks." Incentives are the figurative "carrots," including state-level loans and rebates for renewable energy and energy efficiency, vehicle purchasing rebates, and utility performance incentives. Most policy indicators are scored on a yes or no basis – either a given policy exists in a state or it doesn't.

Massachusetts leads all other states in this year's Policy category for the third year running, with 31 of 35 possible policies in place. The state shares the top spot in Regulations & Mandates (16) with Oregon, and ties with neighboring Connecticut for the top spot in Incentives (15). Rounding out the top five states for policy are California, Connecticut, New York, and Minnesota, which rejoins the top five after a one-year absence. The top five Regulations rankings also include California, New York, and New Mexico, while California and New York tied for third in Incentives, with Minnesota, Illinois, Colorado, and New Jersey all tied for fifth.
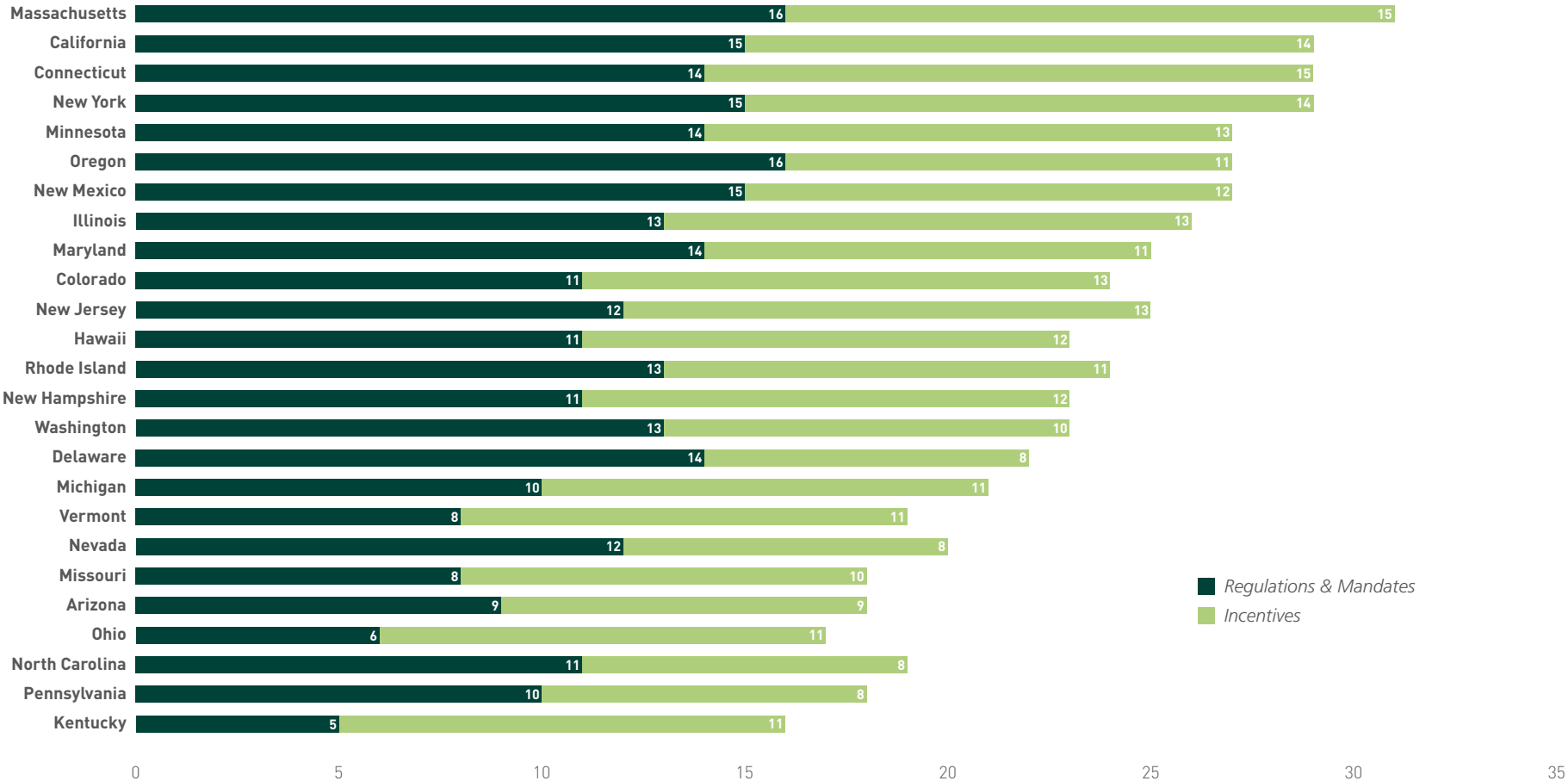
Not surprisingly, many of the top 10 states in the two subcategories are the same: seven states that are ranked in the top 10 in Regulations & Mandates (which has a three-way tie for 10th) are also in the top 10 in Incentives. There are differences in the two lists, though. Oregon, Maryland, Delaware, Rhode Island, and Washington are top 10 Regulations & Mandates states that fall outside the top 10 for Incentives;

Delaware (#7 in Regulations & Mandates) in particular suffers from a low Incentives score (just 32nd). On the other hand, Incentives top 10 states New Jersey, Colorado, Hawaii, and New Hampshire all rank in the teens in Regulations & Mandates.

Although it can be tricky to make a direct correlation between a state's policy choices and its clean-tech deployment, we can see some connections between the two. As the top-ranked Policy state for the sixth straight year, Massachusetts receives credit for most of the policy indicators tracked in the Index. And it's perhaps no coincidence that it also scores well in Energy Intelligence & Green Building, and has seen an increase in solar deployment numbers. At the other end of the spectrum are states like Oklahoma and Utah, which fare poorly overall in Policy (#28 and #38, respectively), but have enacted specific policies such as tax credits and rebates to encourage deployment in natural gas vehicles (NGVs). And it shows: Utah and Oklahoma are #1 and #2 respectively in both NGVs and NGV fueling stations.

Several indicators in the Policy category judge states for how well they encourage distributed generation (DG). For the first time, this year's Index rates states on the strength of their interconnection policies (the rules by which customers can connect DG systems to the electric grid) and net metering rules (the arrangements by which customers sell self-generated power back to the grid). A strong rating is considered an A or B grade in the "Freeing the Grid" report from the Interstate Renewable Energy Council (IREC) and Vote Solar. Just over half (26) of all states received the highest or second-highest ratings on interconnection, while 35 states received one of the two top ratings for their net metering programs.
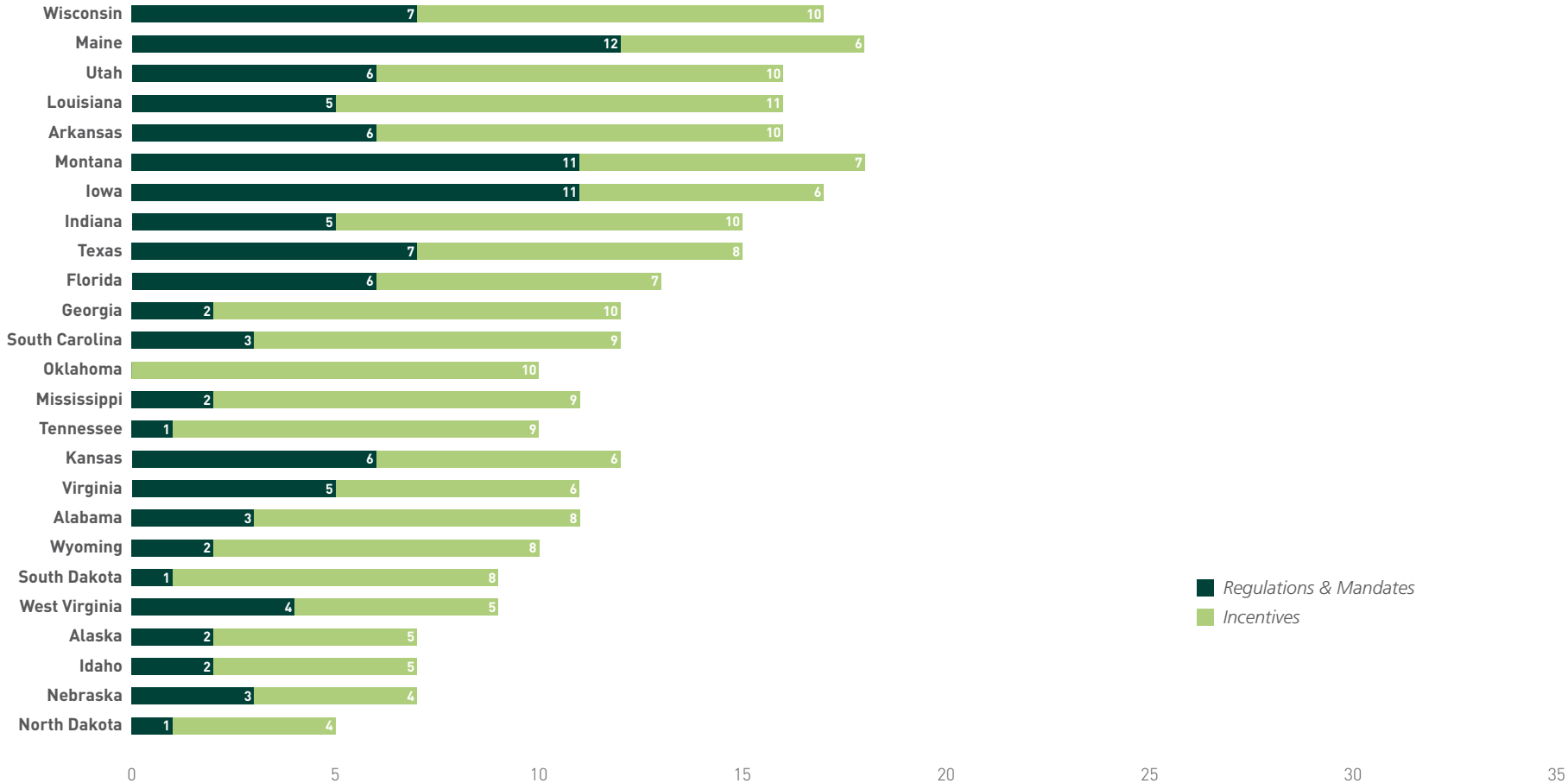
NUMBER OF CLEAN TECH POLICIES ENACTED BY STATE (TOP 25)

| State	Regulations & Mandates	Incentives
Massachusetts	16	15
California	15	14
Connecticut	14	15
New York	15	14
Minnesota	14	13
Oregon	16	11
New Mexico	15	12
Illinois	13	13
Maryland	14	11
Colorado	11	13
New Jersey	12	13
Hawaii	11	12
Rhode Island	13	11
New Hampshire	11	12
Washington	13	10
Delaware	14	8
Michigan	10	11
Vermont	8	11
Nevada	12	8
Missouri	8	10
Arizona	9	9
Ohio	6	11
North Carolina	11	8
Pennsylvania	10	8
Kentucky	5	11

Legend: ■ Regulations & Mandates   ■ Incentives

Note: The above table and rankings are based on the "Regulations & Mandates" and "Incentives" subcategories of the U.S. Clean Tech Leadership Index, which include indicators such as renewable portfolio standards (RPS), utility on-bill financing, net metering, energy efficiency budgets, and building codes. See pages 25-26 for the full list of indicators. Sources include ACEEE, the Building Codes Assistance Project, C2ES, the Coalition for Green Capital, DSIRE, the DOE, EQ Research, IREC, and Vote Solar. For Interconnection Law/Policy, Net Metering Law/Policy, Commercial Building Energy Policy, and Residential Building Energy Policy, credit is given to states scoring "2" or higher on 0-4 scale. Subscribers to Clean Edge's Leadership Index have access to the full dataset and policy checklist.

NUMBER OF CLEAN TECH POLICIES ENACTED BY STATE (BOTTOM 25)

State	Regulations & Mandates	Incentives
Wisconsin	7	10
Maine	12	6
Utah	6	10
Louisiana	5	11
Arkansas	6	10
Montana	11	7
Iowa	11	6
Indiana	5	10
Texas	7	8
Florida	6	7
Georgia	2	10
South Carolina	3	9
Oklahoma		10
Mississippi	2	9
Tennessee	1	9
Kansas	6	6
Virginia	5	6
Alabama	3	8
Wyoming	2	8
South Dakota	1	8
West Virginia	4	5
Alaska	2	5
Idaho	2	5
Nebraska	3	4
North Dakota	1	4

■ Regulations & Mandates
■ Incentives

Note: The above table and rankings are based on the "Regulations & Mandates" and "Incentives" subcategories of the U.S. Clean Tech Leadership Index, which include indicators such as renewable portfolio standards (RPS), utility on-bill financing, net metering, energy efficiency budgets, and building codes. See pages 25-26 for the full list of indicators. Sources include ACEEE, the Building Codes Assistance Project, C2ES, the Coalition for Green Capital, DSIRE, the DOE, EQ Research, IREC, and Vote Solar. For Interconnection Law/Policy, Net Metering Law/Policy, Commercial Building Energy Policy, and Residential Building Energy Policy, credit is given to states scoring "2" or higher on 0-4 scale. Subscribers to Clean Edge's Leadership Index have access to the full dataset and policy checklist.

CAPITAL
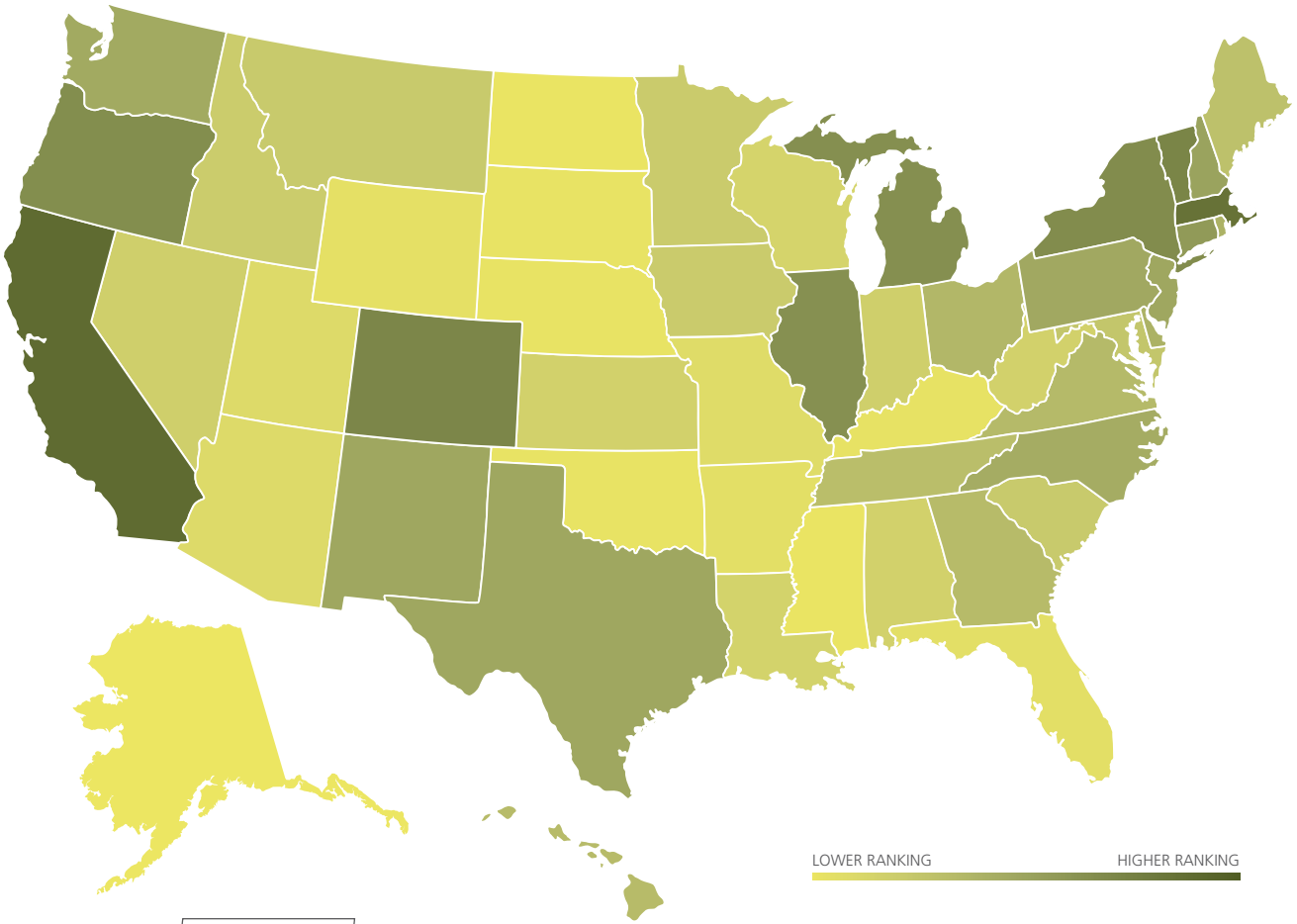
LOWER RANKING   HIGHER RANKING

RANK	STATE	LEADERSHIP SCORE
1	California	90.2
2	Massachusetts	85.2
3	Vermont	72.3
4	Colorado	71.0
5	New York	67.4
6	Oregon	66.1
7	Michigan	64.7
8	Illinois	63.8
9	Connecticut	57.1
10	New Hampshire	50.8
11	New Jersey	48.3
12	New Mexico	48.3
13	Texas	48.0
14	Pennsylvania	46.7
15	Washington	46.4
16	North Carolina	43.9
17	Delaware	40.0
18	Rhode Island	39.8
19	Ohio	35.5
20	Virginia	33.6
21	Hawaii	33.3
22	Georgia	32.9
23	Tennessee	31.4
24	Maine	28.8
25	Maryland	25.2
26	Montana	22.4
27	South Carolina	21.6
28	Minnesota	21.1
29	Iowa	20.8
30	Idaho	20.3
31	Indiana	18.3
32	Nevada	18.2
33	Kansas	16.3
34	Alabama	15.8
35	West Virginia	15.8
36	Louisiana	15.1
37	Wisconsin	13.9
38	Arizona	8.8
39	Utah	8.5
40	Missouri	8.2
41	Arkansas	5.3
42	Florida	4.5
43	Wyoming	3.7
44	Kentucky	3.1
45	Nebraska	2.1
46	Oklahoma	2.0
47	South Dakota	1.8
48	North Dakota	1.3
49	Mississippi	0.5
50	Alaska	0.2

CLEAN EDGE

CAPITAL OVERVIEW

The Capital category consists of two subcategories: Financial Capital, which measures clean-tech investment activity; and Human and Intellectual Capital, which gauges patent activity and the presence of top-rated educational and research institutions and industry incubators. In the 2015 Index, for the first time in the Index's six years, Massachusetts was dethroned as the #1 Capital state, with California moving up from #2 in 2014 to take its place. Massachusetts, the biggest hub of clean-tech venture capital outside of California, retained its spot atop the Financial Capital subcategory, while the Golden State supplanted New York (#2 in this year's Index) as the #1 state in the Human and Intellectual Capital subcategory.

The rest of the top 10 Capital states remained largely unchanged: only Oregon (up five spots to #6) and New Hampshire (up eight to #10) are newcomers to the top 10, replacing New Mexico and New Jersey. The two subcategories each saw three new entrants to their top 10 rankings: Montana (#6), Illinois (#9), and New York (#10) in Financial Capital; and Oregon (#6), Massachusetts (#9), and New Hampshire (#10) in Human & Intellectual Capital.

In the Financial Capital subcategory, overall VC investment in clean tech in the U.S. saw an uptick in 2014. Approximately $5.5 billion in VC dollars were invested in clean-tech companies in 2014 (a figure that includes companies in renewables, storage, efficiency, smart grid, recycling, and advanced transportation technology), a 28% jump from $4.3 billion in 2013. This increase came despite 55 fewer deals being completed in 2014. In 2013, 71% of all deals went to the top 10 states in

CLEAN ENERGY VENTURE CAPITAL INVESTMENT (DOLLARS PER CAPITA, 2014)

STATE	RANK	DOLLARS INVESTED PER CAPITA	TOTAL DOLLARS ($, MILLIONS)	TOTAL DEALS
CALIFORNIA	1	$72.13	$2,798.9	219
MASSACHUSETTS	2	$55.11	$371.7	56
VERMONT	3	$50.31	$31.5	4
COLORADO	4	$32.11	$172.0	36
MONTANA	5	$29.77	$30.5	3
TEXAS	6	$25.12	$677.2	36
WASHINGTON	7	$24.85	$175.5	18
MISSOURI	8	$20.38	$123.6	12
ILLINOIS	9	$15.35	$197.7	20
NORTH CAROLINA	10	$14.22	$141.4	11

Source: Cleantech Group data with Clean Edge analysis. Cleantech Group investment data used includes venture and growth financing rounds in the following sectors: Advanced Materials, Agriculture & Food, Air, Biofuels & Biomaterials, Biomass Generation, Energy Efficiency, Energy Storage, Fuel Cells & Hydrogen, Geothermal, Hydro & Marine Power, Recycling & Waste, Smart Grid, Solar, Transportation, Water & Wastewater, Wind, and Other Cleantech.
Full dataset available to subscription clients.

total deals; in 2014, that number increased to 79%. California alone contributed half of all total VC dollars and more than one-third of total deals.
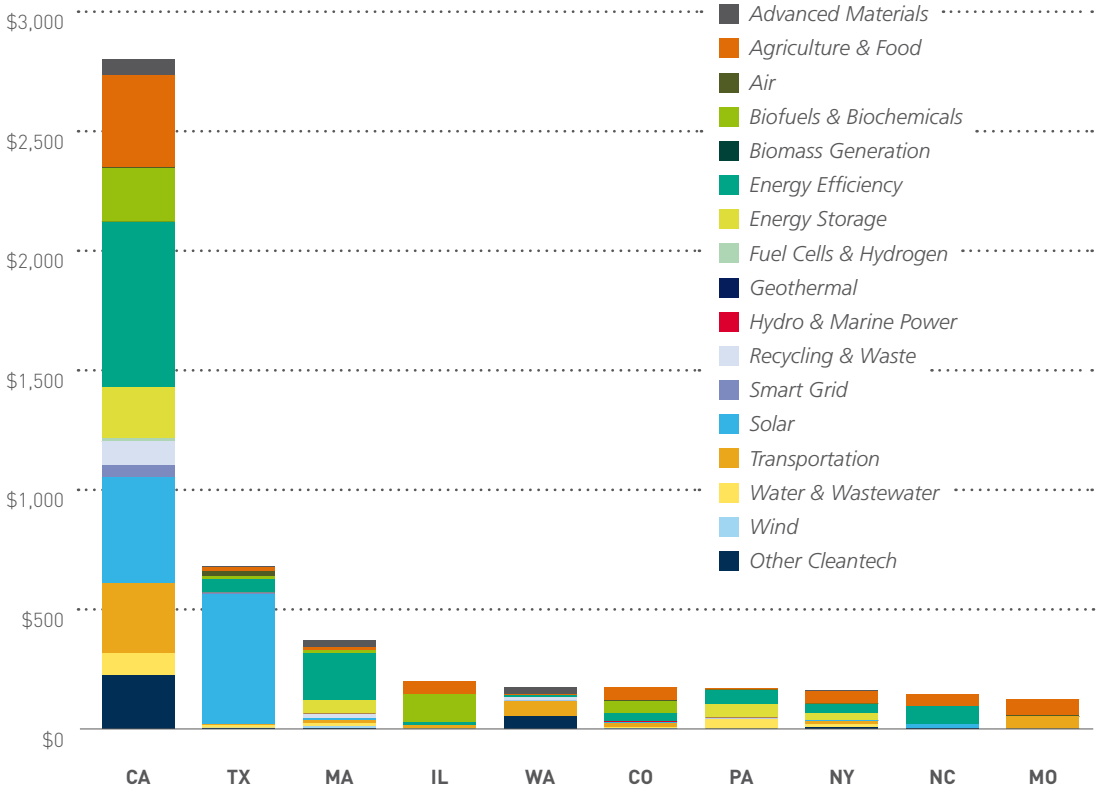
In contrast to the rise in VC investments, the number of total clean-energy patents (part of the Human and Intellectual Capital subcategory) barely budged in 2014. On a per-capita basis, the top 10 states in clean-energy patents granted in 2014

remained almost entirely intact from 2013, with the only new entrant being Arizona (which nudged neighboring New Mexico out of the top 10). Delaware, despite being awarded only 43 patents in 2014, continued to punch far above its weight on a per-capita basis. It leads the pack in this measure for the third consecutive year by a wide margin. The Index separately tracks patents awarded over a longer timeframe (2002-2014), and here, too, Delaware is #1, wresting the top spot from Michigan. Much of Delaware's success in clean energy patent activity can be traced to DuPont, which is headquartered in the state and has a long research and development tradition in solar PV and fuel cells.

In addition to patents, the Human and Intellectual sub-category tracks the presence of clean-energy incubators, top-ranked green MBA and Master's programs, and Department of Energy research labs in each state. The lists of states receiving credit under these indicators are remarkably similar. States on the West Coast and in the Northeast (particularly New England) have several of each type of institution, with smaller concentrations seen in the Rust Belt and mid-Atlantic states. DOE labs, however, are more geographically dispersed. In all, five states – California, Colorado, Oregon, Illinois, and New York – receive credit for having an incubator, top green Master's program, and Department of Energy research facility, while 15 additional states receive credit on two out of those three indicators.

2014 CLEAN ENERGY VENTURE CAPITAL – TOP 10 STATES BY TOTAL INVESTMENT ($US MILLIONS)

Legend:
- Advanced Materials
- Agriculture & Food
- Air
- Biofuels & Biochemicals
- Biomass Generation
- Energy Efficiency
- Energy Storage
- Fuel Cells & Hydrogen
- Geothermal
- Hydro & Marine Power
- Recycling & Waste
- Smart Grid
- Solar
- Transportation
- Water & Wastewater
- Wind
- Other Cleantech

Source: Cleantech Group data with Clean Edge analysis.
Full dataset available to subscription clients.

CLEAN ENERGY PATENTS GRANTED (2014)

STATE	RANK	PATENTS PER 1 MILLION PEOPLE	TOTAL PATENTS
DELAWARE	1	45.7	43
MICHIGAN	2	22.9	227
NEW HAMPSHIRE	3	13.5	18
VERMONT	4	11.1	7
CALIFORNIA	5	9.9	385
CONNECTICUT	6	8.3	30
MASSACHUSETTS	7	8.1	55
COLORADO	8	7.1	38
NEW YORK	9	6.7	132
ARIZONA	10	5.9	40

Source: Data from Heslin Rothenberg Farley & Mesiti P.C. with Clean Edge analysis.
Full dataset available to subscription clients.

2014 TOTAL CLEAN-ENERGY PATENTS GRANTED TOP 10 STATES
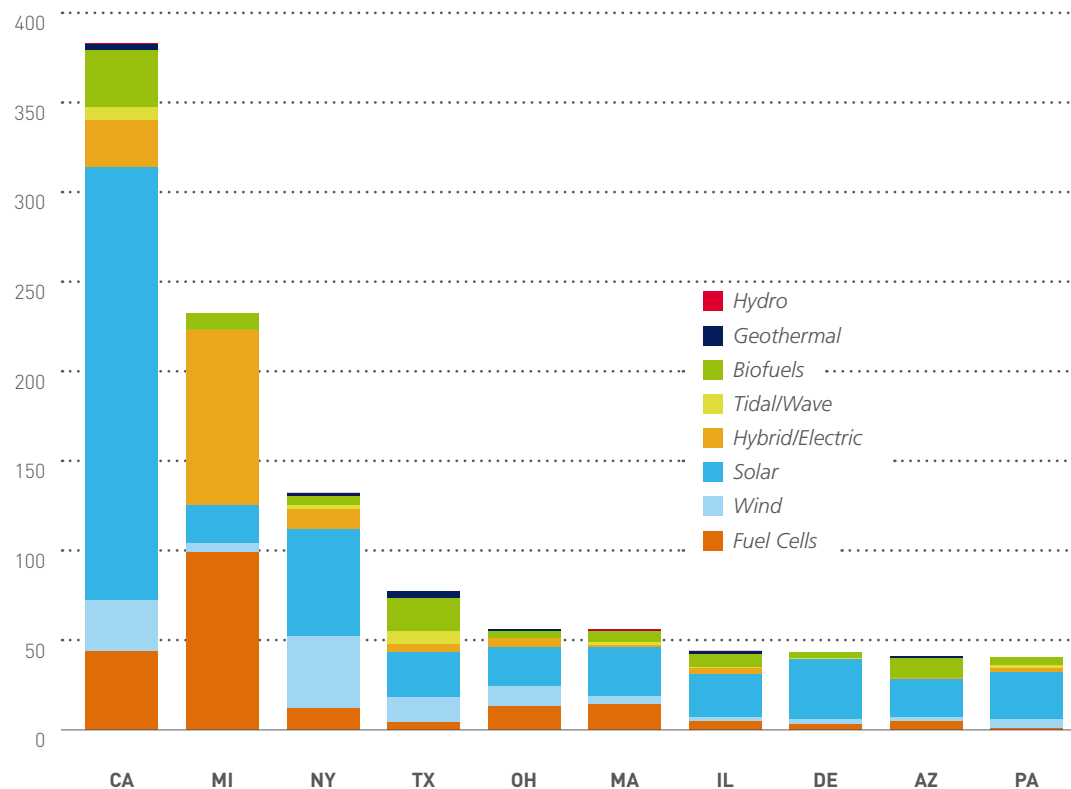
Source: Data from Heslin Rothenberg Farley & Mesiti P.C. with Clean Edge analysis.
Full dataset available to subscription clients.

STATE INDEX METHODOLOGY

How is the State Index constructed?

The structure of the State Index includes four distinct layers. The top layer, the State Index itself, is a set of 50 state scores which evaluates each state based on involvement and leadership in clean technology. Results of the top layer are derived from performance in three equally weighted categories – technology, policy, and capital – that each play an important role in a state's positioning in the clean-tech industry. Each of these categories is composed of two or three subcategories, which themselves include a set of individual indicators. Some minor methodology changes were made in this edition of the State Index, but generally the structure remains the same as in previous years.

How is the State Index calculated?

The overall State Index measures each state on a 100-point scale and is the result of many calculations made at the indicator, subcategory, and category levels.

First, **INDICATOR SCORES** are calculated on a scale of 0 to 100. The best-performing state in an individual indicator receives a score of 100; the worst-performing state gets a 0. All other states receive scores based on where they fall between the best and worst-performing states.

To put states on an even playing field, all quantitative indicators are adjusted for state size using metrics such as state population, state GDP, electricity generation capacity, etc. By reporting in terms of per capita or percent of state totals, smaller states are not punished for having relatively smaller economies.

Several indicators, like those related to policy, are qualitative rather than quantitative. In this case, qualifying states receive indicator scores of 100 and non-qualifying states get 0.

SUBCATEGORY SCORES range from 0 to 100 and are calculated in the same fashion as individual indicators, with a score of 100 given to the state with the best average indicator score in each subcategory, and the state with the lowest average indicator score receiving a 0. All other states receive scores between 0 and 100 based on performance relative to the best and worst-performing states.

CATEGORY SCORES are calculated from a simple averaging of underlying subcategory scores; and the ultimate **STATE CLEAN ENERGY INDEX SCORES** are calculated from averaging the three equally weighted category scores

Data Sources

Along with an extensive level of clean-energy data mining from sources in the public domain, Clean Edge has also teamed up with private data providers to offer the highest level of industry intelligence. Private data partners include Cleantech Group, EQ Research LLC, Heslin Rothenberg Farley & Mesiti P.C., and IHS Automotive.

The following is a list of indicators used to calculate the State Index. Indicators are grouped by subcategory and are shaded according to which category they are included in.

TECHNOLOGY

CLEAN ELECTRICITY

Utility-Scale Clean Electricity Generation (2014, MWh % of Total)

Utility-Scale Clean Electricity Generation incl. Hydro & Biomass (2014, MWh % of Total)

Utility-Scale Wind Electricity Generation (2014, % of Total)

Utility-Scale Solar Electricity Generation (2014, % of Total)

Utility-Scale Geothermal Electricity Generation (2014, % of Total)

Utility-Scale Hydro Electricity Generation (2014, % of Total)

Utility-Scale Biomass Electricity Generation (2014, MWh % of Total)

Installed Wind Capacity (2014, % of Total)

Installed Solar Capacity (2013, % of Total)

Installed Geothermal Capacity (2014, % of Total)

Installed Fuel Cell Capacity (2014, % of Total)

Installed Energy Storage Capacity (2014, % of Total)

CLEAN TRANSPORTATION

Hybrid Electric Vehicles Per 1M People (as of 1/1/15)

Electric Vehicles Per 1M People (as of 1/1/15)

Plug-In Hybrid Electric Vehicles Per 1M People (as of 1/1/15)

Natural Gas Vehicles Per 1M People (as of 1/1/15)

Electric Vehicle Charging Stations Per 1M People (as of 12/31/14)

E85 & B20 Fueling Stations Per 1M People (as of 12/31/14)

CNG Fueling Stations Per 1M People (as of 12/31/14)

ENERGY INTELLIGENCE & GREEN BUILDING

Electricity Consumption Per Capita (2014, Annual kWh)

Electric Productivity (2013, State GDP Dollars Per kWh Consumed)

LEED-Certified Projects Per 1M People (as of 12/31/14)

LEED-Certified Square Feet Per Capita (as of 12/31/14)

Energy Star Buildings & Plants Per 1M People (as of 12/31/14)

Energy Star Buildings & Plants Square Feet Per Capita (as of 12/31/14)

Energy Star Homes Per 1K People (as of 12/31/14)

Smart Meter Market Penetration (2013, % of Total Meters)

ACEEE 2014 State Energy Efficiency Scorecard Performance

Gridwise Alliance 2014 Grid Modernization Index Performance

POLICY

REGULATIONS & MANDATES

Renewable Portfolio Standard

Strong RPS: At least 20% by 2020 or 25% by 2025

Smart RPS: No Clean Coal

Smart RPS: No Nuclear

Smart RPS: Solar/DG Provision

Energy Efficiency Resource Standard

State Renewable Fuel Standard

Climate Action Plan

GHG Reduction Target

Membership in Active Cap-and-Trade Market

Low Carbon Fuel Standard

State Fleet High Efficiency Vehicle Requirement

Zero-Emissions Vehicle (ZEV) Requirement

Mandated Green Power Purchasing Option

Interconnection Law/Policy

Net Metering Law/Policy

Commercial Building Energy Policy

Residential Building Energy Policy

POLICY (CONT.)

INCENTIVES

Grants - Renewable Energy

Grants - Energy Efficiency

Loans - Renewable Energy

Loans - Energy Efficiency

Rebates - Renewable Energy

Rebates - Energy Efficiency

Bonds - Renewable Energy

Bonds - Energy Efficiency

Clean-Tech Vehicle Purchasing Incentive

Utility Revenue Decoupling - Electricity

Utility Revenue Decoupling - Natural Gas

Utility Performance Incentives - Electricity

Utility Performance Incentives - Natural Gas

Utility On-Bill Financing

Green Bank

PACE Legislation

Third Party Ownership

Community Renewables

CAPITAL

FINANCIAL CAPITAL

Venture Capital Investment ($ Per Capita, 2012-2014)

Venture Capital Investment (Deals Per 1 M People, 2012-2014)

Venture Capital Investment ($ Per Capita, 2014)

Venture Capital Investment (Deals Per 1M People, 2014)

Utility Energy Efficiency Program Budget ($ Per Capita, 2013)

State Clean Energy Fund or Public Benefit Fund

HUMAN & INTELLECTUAL CAPITAL

Clean Energy Patents (Patents Per 1M People, 2014)

Clean Energy Patents (Patents Per 1M People, 2002-2014)

Presence of DOE Lab

Presence of Clean Energy Incubator and/or Accelerator

Presence of Top-Ranked Green Master's Program
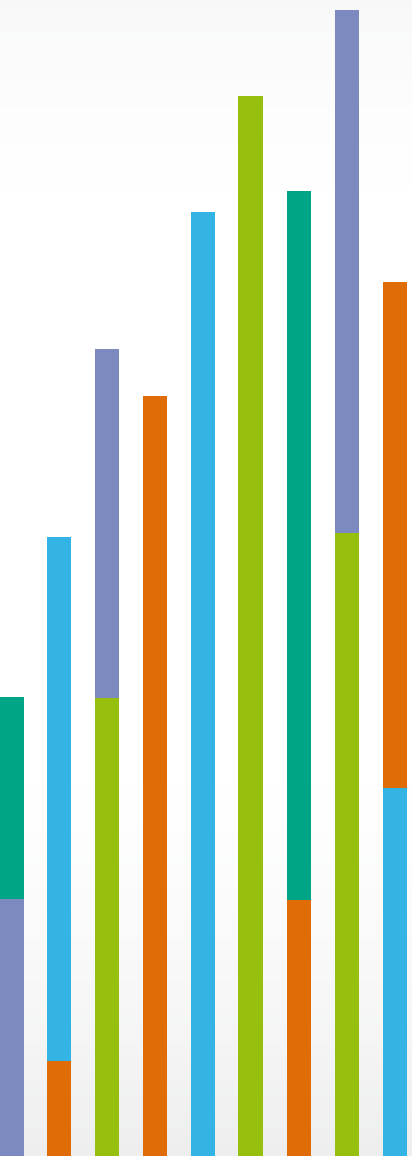
METRO INDEX

2015 U.S. Clean Tech Leadership Index

Full Metro Index Datasets Available

Clean Edge offers subscription access to the full State and Metro Index datasets.
These include data for the top 50 Metro Area regions on green building deployment, electric
and hybrid vehicles, large facility carbon emissions, VC investments, clean-energy patents,
and much more. **For more information on subscriptions, please see page 49.**

METRO INDEX

LOWER RANKING — HIGHER RANKING

RANK	+/-	METRO AREA	LEADERSHIP SCORE
1	0	San Francisco, CA	86.5
2	0	San Jose, CA	80.6
3	1	Portland, OR	59.7
4	-1	San Diego, CA	55.5
5	3	Washington, DC	55.2
6	1	Los Angeles, CA	53.8
7	4	Seattle, WA	52.2
8	-2	Boston, MA	49.2
9	0	Austin, TX	46.4
10	2	Chicago, IL	45.8
11	-1	Denver, CO	43.5
12	-7	Sacramento, CA	42.7
13	2	Minneapolis, MN	37.8
14	9	New York, NY	36.4
15	1	Atlanta, GA	36.4
16	6	Riverside, CA	34.8
17	4	Philadelphia, PA	32.5
18	-1	Salt Lake City, UT	28.9
19	-6	Dallas, TX	28.9
20	-1	Detroit, MI	28.4
21	11	Columbus, OH	27.5
22	-8	Houston, TX	27.3
23	3	Phoenix, AZ	27.0
24	-6	Oklahoma City, OK	25.2
25	3	Pittsburgh, PA	24.4
26	10	Baltimore, MD	24.2
27	2	Charlotte, NC	23.7
28	-1	Nashville, TN	22.7
29	2	Kansas City, MO	21.7
30	-6	Raleigh, NC	21.7
31	3	Las Vegas, NV	21.6
32	-12	Hartford, CT	20.6
33	-8	Milwaukee, WI	20.6
34	-4	Indianapolis, IN	20.5
35	5	Cleveland, OH	19.6
36	-3	Providence, RI	19.4
37	1	Virginia Beach, VA	18.5
38	-3	Buffalo, NY	18.4
39	5	St. Louis, MO	17.4
40	-3	San Antonio, TX	17.2
41	1	Cincinnati, OH	15.6
42	1	Richmond, VA	14.5
43	-2	Louisville, KY	13.3
44	2	Miami, FL	12.3
45	-6	Orlando, FL	11.9
46	-1	Tampa, FL	10.0
47	1	Jacksonville, FL	7.3
48	-1	Memphis, TN	6.2
49	0	New Orleans, LA	5.0
50	0	Birmingham, AL	2.5

CLEAN EDGE

2014 METRO
INDEX RESULTS

As has been the case since our first Metro Index in 2012, the San Francisco Bay Area remains the nexus of top clean-tech leadership in the U.S. The San Francisco metro area is #1 in the Index for the third straight year with southern neighbor San Jose in second place, although the rankings grew tighter this year. San Francisco's nearly 15-point lead a year ago shrunk to about six points, with an overall score of 86.5 to San Jose's 80.6. But both remained well ahead of #3 Portland at 59.7.

As in the past two years, four metros in the #1 state of California dominate the top of the Metro Index; San Diego dropped from third to fourth this year while Los Angeles rose from #7 to #6. But Sacramento, ranking #5 in 2014, dropped out of the top 10 to #12 this year due mainly to a big drop in the Clean Electricity and Carbon Management category from #1 last year to #18. Denver (10th last year) also fell off the leaderboard to 11th. Seattle, out of the top 10 last year for the first time, rebounded to place seventh. Tenth-place Chicago joins the top 10 for the first time after placing 12th in each of the first three years of the Index.

The Top 10 Metro Areas

1 **SAN FRANCISCO, CA** – Although its score fell from 94.4 to 86.5, San Francisco continued as the leading clean-tech metro with high rankings in the four Metro Index categories. Across the categories, the City by the Bay notches a #1 placement (in Advanced Transportation), two seconds, and a third. The undisputed hub of the U.S. clean-tech industry along with San Jose, San Francisco excels in public

and private-sector leadership, as well as green consumer choices such as electric and hybrid vehicle ownership.

2 **SAN JOSE, CA** – San Jose holds down the #2 spot among metros for the third straight year, improving its 2014 score of 79.7 to 80.6. The core of its leadership is the Clean-Tech Investment, Innovation & Workforce category, where its top score of 100 outpaces #2 San Francisco by nearly 30 points. First in VC dollars and deals and second in patents, the Silicon Valley metro continues to epitomize the innovation/finance ecosystem driving clean-tech lab breakthroughs to commercialization.

3 **PORTLAND, OR** – Portland places #3 for the third time in four years, nudging ahead of 2014 third-place finisher San Diego. The Rose City leads all metros in Clean Electricity & Carbon Management, thanks to strong hydroelectric power resources, low carbon emissions from large facilities, and a strong commitment to climate protection and reporting. Portland also ranks #3 in the Green Buildings category, a sector where the metro area has traditionally led in design services as well as deployment.

4 **SAN DIEGO, CA** – San Diego's goal to establish a thriving clean-tech ecosystem took it from a #11 ranking in 2012 to the top tier of metros. Clean Tech San Diego is arguably the sector's preeminent regional industry association, with nearly 900 member companies. Although down one place from last year, San Diego (with a 55.5 score) is a top 10 metro in three of four Index categories; its best showing is #4 in Clean Electricity and Carbon Management.

5 **WASHINGTON, DC** – The nation's capital metro jumped three places to its best-ever finish in the Index, improving its 53.6 score last year to 55.2, just barely behind San Diego. Washington's only top 10 category is Green Buildings, but it's #1 in that category (as in all four years of the Index) by nearly 20 points over #2 San Francisco. The metro places in the top 15 in the three other categories, and is the highest-ranking metro in the East.

6 **LOS ANGELES, CA** – The most populous top 10 metro with 13.3 million people (second in size to New York), Los Angeles continued its consistency with a #6 ranking; it has placed between fifth and seventh in every year of the Index. Los Angeles places second behind Portland in Clean Electricity and Carbon Management, in a region without major hydroelectric resources. Its #3 rank in Advanced Transportation includes a tie for the eighth best score in the public transportation ridership indicator – an encouraging sign in the iconic land of freeways.

7 **SEATTLE, WA** – Seattle leapt four places to #7, adding four points to last year's score of 48.2 for its highest ranking since placing fifth in the Index's inaugural year of 2012. A #4 ranking in Green Buildings and top 10 placement in two other categories offset a #19 rank in Clean-Tech Investment, Innovation & Workforce. Symbolizing Seattle's green building leadership is the Bullitt Center in the city's Central District, the net-zero energy structure considered by many to be the nation's greenest commercial building.

8 **BOSTON, MA** – Boston dropped two spots from last year, its score falling from 58.3 to 49.2, but still posted its second-highest ranking in the four years of the Index. Boston held the #3 rank in Clean-Tech Investment, Innovation and Workforce from last year and also posted a #5 placement in Green Buildings. The Boston metro is home to MIT's myriad clean-tech breakthroughs and business spinoffs, and innovators like Greentown Labs, an incubator/accelerator with more than 40 member companies.

9 **AUSTIN, TX** – The only Top 10 metro (besides Washington, DC) not located in a Top 10 state, Austin has consistently ranked ninth or 10th in the Index's four years. Like San Jose with a similar metro population under two million, Austin has developed a strong clean-tech ecosystem among government, industry, finance, academia, and its progressive municipal utility, Austin Energy. Austin repeats its #5 rank from last year in Clean-Tech Investment, Innovation & Workforce, and improved from ninth to sixth in Clean Electricity and Carbon Management.

10 **CHICAGO, IL** – After three years at #12, the Windy City makes the top 10 for the first time, upping its 41.1 score last year to 45.8. Chicago earns a top 10 spot in three of the four Index categories, its highest rank a #7 in Clean-Tech Investment, Innovation & Workforce. In a city considered the birthplace of the modern skyscraper, Mayor Rahm Emanuel has made clean tech a priority with programs such as the Chicago Infrastructure Trust, a green bank for energy efficiency improvements now looking to finance solar power projects as well.

GREEN BUILDINGS
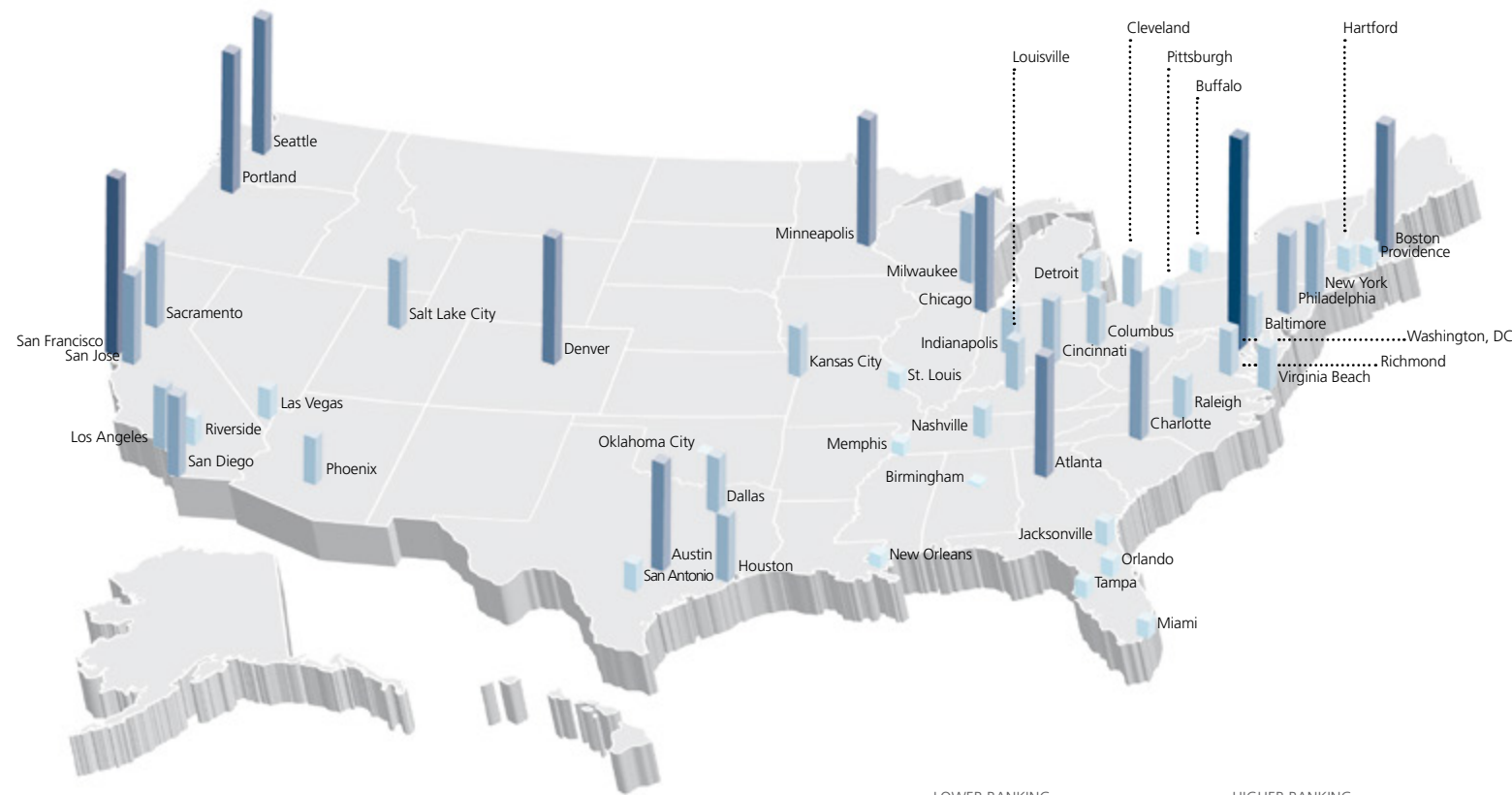
LOWER RANKING   HIGHER RANKING

RANK	METRO AREA	LEADERSHIP SCORE
1	Washington, DC	100.0
2	San Francisco, CA	83.5
3	Portland, OR	65.5
4	Seattle, WA	63.6
5	Boston, MA	61.3
6	Minneapolis, MN	60.2
7	Denver, CO	59.5
8	Atlanta, GA	56.8
9	Chicago, IL	55.2
10	Austin, TX	50.6
11	Charlotte, NC	42.3
12	San Jose, CA	41.5
13	Sacramento, CA	38.7
14	San Diego, CA	38.2
15	Philadelphia, PA	36.9
16	New York, NY	35.2
17	Milwaukee, WI	32.9
18	Salt Lake City, UT	32.3
19	Houston, TX	30.9
20	Cincinnati, OH	29.5
21	Los Angeles, CA	29.2
22	Dallas, TX	26.2
23	Kansas City, MO	23.4
24	Columbus, OH	23.1
25	Cleveland, OH	23.1
26	Louisville, KY	22.8
27	Phoenix, AZ	21.7
28	Richmond, VA	21.3
29	Indianapolis, IN	20.7
30	Baltimore, MD	20.4
31	Virginia Beach, VA	19.8
32	Raleigh, NC	19.0
33	Pittsburgh, PA	18.3
34	Detroit, MI	15.6
35	Las Vegas, NV	14.3
36	Nashville, TN	14.0
37	Riverside, CA	13.2
38	San Antonio, TX	12.6
39	Hartford, CT	10.9
40	Jacksonville, FL	10.6
41	Buffalo, NY	9.5
42	Providence, RI	8.9
43	Orlando, FL	8.4
44	Tampa, FL	8.4
45	St. Louis, MO	7.5
46	Miami, FL	7.4
47	New Orleans, LA	5.9
48	Memphis, TN	5.6
49	Birmingham, AL	1.5
50	Oklahoma City, OK	0.0

GREEN BUILDINGS OVERVIEW

The Green Buildings category of the Metro Clean Tech Index uses five equally weighted indicators to evaluate leadership in each metro area. Two of these indicators come from the U.S. Green Building Council (USGBC). Using the USGBC's Leadership in Energy and Environmental Design (LEED) project database, the Index calculates the number of projects and square feet per capita for each of the 50 largest metro areas. Cities and urban areas are a key part of the LEED market in the U.S., with more than half of all certified projects and two-thirds of all square footage located in the 50 metropolitan statistical areas covered in the Metro Index. Two other indicators track the U.S. Environmental Protection Agency's standard registry of Energy Star-qualified buildings – the EPA's rating system for energy efficiency – by the number of projects and square feet per capita in each metro area. A fifth indicator, added in this year's Index, is a policy metric tracking whether a metro's principal city requires energy use disclosure for its buildings.

This category shows strong correlation with overall metro leadership, with seven of the top 10 metros in Green Buildings also ranking in the top 10 in the overall Index. The exceptions are Denver (#11 overall), Minneapolis (#13), and Atlanta (#15). Eight of the top 10 Green Buildings metros return from last year, although only the top two, Washington, DC and San Francisco, repeat the same ranking.

Both Denver (#3) and Boston (#5) jumped four places from the 2014 Index. Joining the top 10 this year are #9 Chicago and #10 Austin, while San Diego and Sacramento, ranking sixth and seventh last year, dropped into the teens. The top

LEED CERTIFIED PROJECTS (2014)

METRO AREA	RANK	PROJECTS PER 1M PEOPLE	TOTAL PROJECTS
WASHINGTON, DC	1	219.9	1,327
SAN FRANCISCO, CA	2	170.2	782
SAN JOSE, CA	3	164.4	321
PORTLAND, OR	4	149.0	350
SEATTLE, WA	5	148.7	546
DENVER, CO	6	132.5	365
SAN DIEGO, CA	7	125.9	411
BOSTON, MA	8	122.1	578
BALTIMORE, MD	9	119.2	332
SALT LAKE CITY, UT	10	110.1	127

Source: USGBC data with Clean Edge analysis. USGBC data is gathered from the LEED project registration database and includes all projects certified through 12/31/2014. This does not include LEED for Homes projects.
Full dataset available to subscription clients.

10 shows good regional diversity, with metros from the East and West Coasts, South, Midwest, and Rocky Mountains. Public-sector buildings generally lead the way in this sector, and five of the top 10 metros include state capitals, with the nation's capital topping the field.

Perennial category leader Washington, DC increased its lead over #2 San Francisco from last year's Index, to nearly 17 points. The nation's capital metro added nearly 500 new LEED-certified projects in 2014 for a total of 1,327, or nearly 220 projects

ENERGY STAR BUILDINGS AND PLANTS (2014)

METRO AREA	RANK	PROJECTS PER 1M PEOPLE	TOTAL PROJECTS
CHARLOTTE, NC	1	188.2	448
DENVER, CO	2	181.5	500
SACRAMENTO, CA	3	174.7	392
WASHINGTON, DC	4	171.5	1035
SAN FRANCISCO, CA	5	160.9	739
SAN DIEGO, CA	6	150.5	491
LOUISVILLE, KY	7	143.3	182
MILWAUKEE, WI	8	138.0	217
MINNEAPOLIS, MN	9	137.3	480
PORTLAND, OR	10	135.8	319

Source: Energy Star with Clean Edge analysis. Energy Star Buildings and Plants includes all projects that have qualified for Energy Star accreditation through 2014. This does not include Energy Star certification for new homes.
Full dataset available to subscription clients.

BUILDING ENERGY USE DISCLOSURE REQUIREMENT

METRO AREA	YEAR ENACTED
AUSTIN, TX	2008
WASHINGTON, DC	2008
NEW YORK, NY	2009
SAN FRANCISCO, CA	2011
PHILADELPHIA, PA	2012
SEATTLE, WA	2012
BOSTON, MA	2013
CHICAGO, IL	2013
MINNEAPOLIS, MN	2013
ATLANTA, GA	2015
PORTLAND, OR	2015

Source: Institute for Market Transformation. This table lists all of the primary cities in the Metro Index that have enacted a benchmarking and disclosure ordinance. Berkeley, CA (part of the San Francisco MSA) and Cambridge, MA (part of the Boston MSA) are the two other U.S. cities with building energy use disclosure requirements.
Full dataset available to subscription clients.

per million people. Washington's raw total actually leads the U.S, topping that of the three most populous metros – New York, Los Angeles, and Chicago. Of the top 10 in this indicator, six other metros – San Francisco, Seattle, Denver, San Diego, Boston, and Baltimore – each added more than 100 LEED-certified projects during the year.

Energy Star's energy-specific requirements differ from LEED's broader overall green building criteria, and track only commercial and multi-unit residential projects, resulting in a different metro area leadership mix. Charlotte takes the top spot here, moving up from #4 last year with 188.2 projects per million people. Denver remained at #2 while Sacramento dropped from first to third. All of last year's top 10 metros made the leaderboard again in 2015, in a slightly different order. Leaders in this indicator include manufacturing centers such as Milwaukee (just 17th in the overall Index) and Louisville (26th).

To reflect the importance of transparency in a building's energy performance over its lifespan, not just when it's constructed, the 2015 Index added the building energy-use disclosure requirement indicator. Tracked by the non-profit Institute for Market Transformation in Washington, DC, this metric credits metros whose principal city has adopted a mandate that large buildings publicly disclose their energy-use data. Austin and Washington DC were the first to do so in 2008 and nine others have followed, including Atlanta and Portland earlier this year. Not surprisingly, this indicator is a strong proxy for overall Green Buildings leadership. Nine of the 11 metros receiving credit are in the category top 10; New York and Philadelphia are the others.

ADVANCED TRANSPORTATION
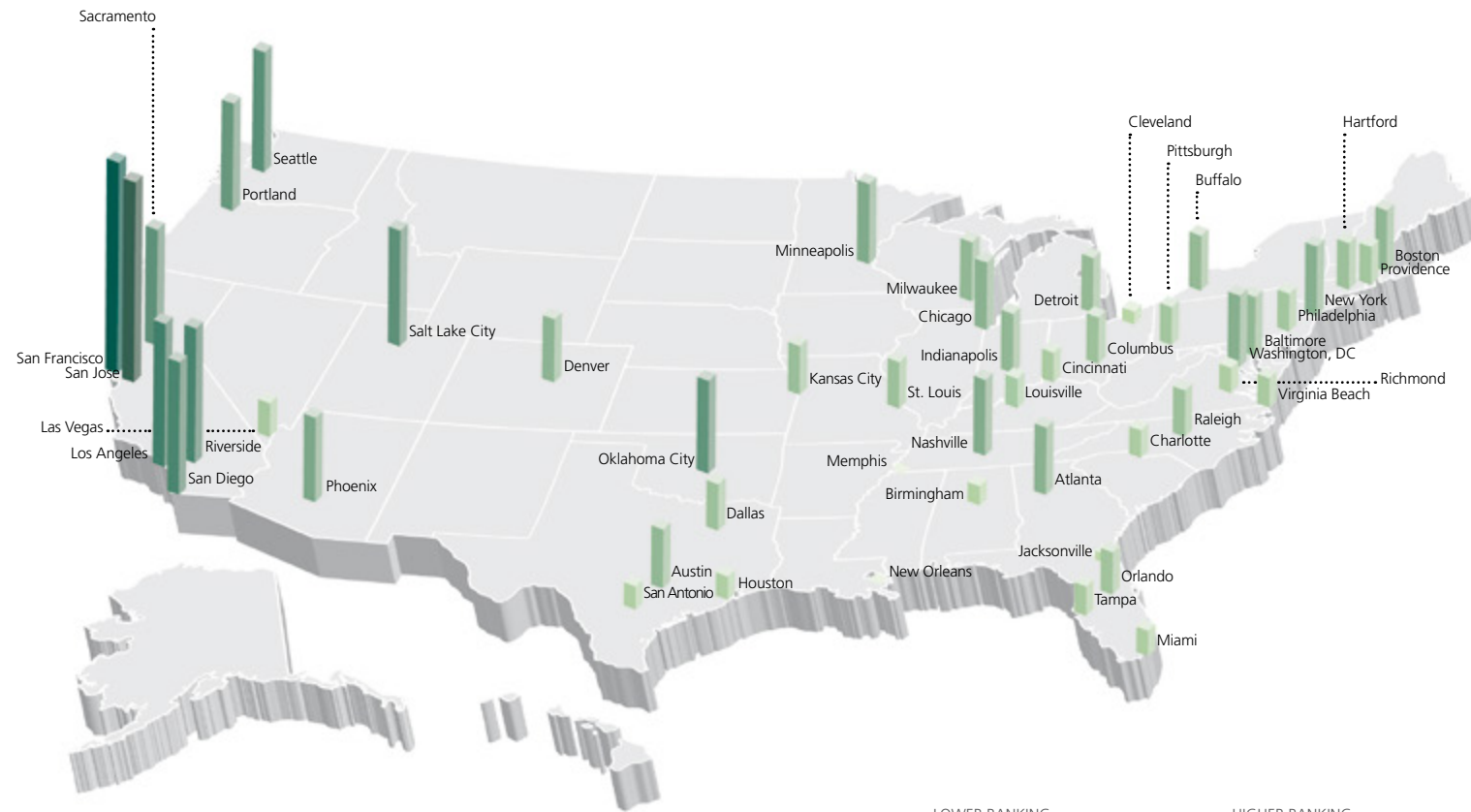
LOWER RANKING — HIGHER RANKING

RANK	METRO AREA	LEADERSHIP SCORE
1	San Francisco, CA	100.0
2	San Jose, CA	94.7
3	Los Angeles, CA	68.2
4	Riverside, CA	64.4
5	San Diego, CA	63.0
6	Seattle, WA	57.3
7	Sacramento, CA	55.4
8	Salt Lake City, UT	54.6
9	Portland, OR	51.4
10	Oklahoma City, OK	44.4
11	Phoenix, AZ	39.7
12	Minneapolis, MN	37.8
13	Nashville, TN	36.0
14	Washington, DC	34.4
15	New York, NY	32.9
16	Chicago, IL	32.2
17	Atlanta, GA	31.7
18	Denver, CO	30.0
19	Boston, MA	29.3
20	Indianapolis, IN	27.9
21	Austin, TX	27.6
22	Milwaukee, WI	27.5
23	Baltimore, MD	27.5
24	Detroit, MI	26.4
25	Buffalo, NY	25.7
26	Kansas City, MO	23.4
27	Hartford, CT	22.4
28	St. Louis, MO	22.4
29	Raleigh, NC	22.3
30	Columbus, OH	21.7
31	Dallas, TX	21.7
32	Orlando, FL	20.3
33	Philadelphia, PA	18.2
34	Providence, RI	18.0
35	Pittsburgh, PA	17.5
36	Las Vegas, NV	16.2
37	Louisville, KY	15.2
38	Tampa, FL	14.3
39	Cincinnati, OH	13.9
40	Virginia Beach, VA	13.6
41	Charlotte, NC	12.9
42	Miami, FL	12.4
43	Richmond, VA	11.6
44	San Antonio, TX	11.4
45	Houston, TX	11.1
46	Birmingham, AL	8.5
47	Cleveland, OH	6.3
48	Jacksonville, FL	4.1
49	Memphis, TN	0.4
50	New Orleans, LA	0.0

CLEAN EDGE

ADVANCED TRANSPORTATION OVERVIEW

The Advanced Transportation category combines eight indicators to benchmark U.S. metro areas in the transportation sector, which in many cities is a leading source of CO2 emissions. Advanced Transportation indicators cover four types of advanced vehicles, their related charging or fueling infrastructure, and public transportation ridership. For the 2015 Index, we have begun tracking plug-in electric hybrids such as the Chevy Volt, which had previously been included in the electric vehicles indicator, in their own indicator.

West Coast metro areas once again dominate the top of this category. Coming in first and second, just as in last year's Index, are the neighboring metros of San Francisco and San Jose. These two areas increased their lead over the rest of the field this year, though San Francisco's lead over San Jose has narrowed by eight points. Three other California metros – Los Angeles (up five places from 2014), Riverside (rising six spots), and San Diego (down one position) – take the next three slots, while Sacramento holds steady at #7. The Pacific Northwest's Seattle (#6, down one) and Portland (#9, down three) also make an appearance. The only two top-10 metros not located on the Pacific Coast are Salt Lake City (which tumbled five spots this year to eighth, due largely to a poor showing in the new indicator of plug-in electric hybrid registrations) and Oklahoma City (down one to 10th).

Readers should note that the vehicle registration data has one methodological anomaly. The data is reported by Designated Market Area (DMA), and these geo-

HYBRID ELECTRIC VEHICLES IN USE (2014)

METRO AREA	RANK	HEVS PER 1K PEOPLE	TOTAL HEVS
SAN FRANCISCO, CA	1	30.70	223,331
SAN JOSE, CA	2	30.70	223,331
SAN DIEGO, CA	3	21.37	69,469
LOS ANGELES, CA	4	20.35	331,211
RIVERSIDE, CA	5	20.35	331,211
SEATTLE, WA	6	19.85	100,538
WASHINGTON, DC	7	17.62	120,535
PORTLAND, OR	8	17.29	56,419
SACRAMENTO, CA	9	16.40	71,601
BOSTON, MA	10	13.84	90,391

Source: IHS Automotive data with Clean Edge analysis. IHS Automotive data is a snapshot of every vehicle in operation as of January 1, 2015. For this indicator the San Francisco and San Jose metro areas are combined, as are the Los Angeles and Riverside areas.
Full dataset available to subscription clients.

graphic areas do not exactly align with the Metropolitan Statistical Area (MSA) designations used in the other parts of the Metro Index. Practically speaking, this affects only San Francisco/San Jose and Los Angeles/Riverside, which are respectively combined into one DMA; they are separate and distinct MSAs throughout the rest of the Index. Between them, these two DMAs combine for more than 650,000 advanced transportation vehicles on the road.

Registration numbers for the advanced vehicles (per thousand people) indicators reflect the geographical make-up of the overall category rankings. The six California metros each show up in the top-10 lists for electric vehicles (EVs), plug-in electric vehicles (PHEVs), and hybrid electric vehicles (HEVs), as do Seattle and Portland. No other metros can make this claim; in fact, only six other metros (Atlanta, Baltimore, Boston, Detroit, Phoenix, and Washington DC) appear even once in the top-10 rankings for any of these three vehicle types. The San Francisco/San Jose DMA leads all three indicators by healthy margins.

The list of metros hosting the most EV charging stations (per million people), however, does not show the same geographic homogeneity. Many of the usual suspects – including indicator leader Portland, San Jose, San Francisco, Seattle, Sacramento, and San Diego – are there, but they are joined by Nashville (#5), Orlando (#8), Hartford (#9), and Austin (#10). None of these metros seems poised to make a leap up the vehicle rankings, but having the infrastructure in place could promote growth in vehicle registrations.

The natural gas vehicle (NGV) numbers paint a different picture. As it did last year, Salt Lake City leads the country in NGVs. It is once again followed by Oklahoma City, though the gap between the two has narrowed significantly. These are the only two metros with at least one NGV per thousand people. The remainder of the top 10 in this indicator is rounded out by the six California cities, along with St. Louis and Dallas. Utah, Oklahoma, Missouri, and Texas all have incentives to purchase or convert vehicles to natural gas, which could help explain NGVs' prominence there, as could the oil and gas extraction industries in Texas and Oklahoma. Salt Lake City and Oklahoma City lead the nation in NGV stations per million, but here again cities such as Birmingham, Buffalo, Kansas City, Milwaukee, and Pittsburgh show up as top-10 NGV station metros despite having weak NGV vehicle registration numbers.

ELECTRIC VEHICLES IN USE (2014)

METRO AREA	RANK	EVS PER 1K PEOPLE	TOTAL EVS
SAN FRANCISCO, CA	1	3.77	27,417
SAN JOSE, CA	2	3.77	27,417
SAN DIEGO, CA	3	1.95	6,329
ATLANTA, GA	4	1.94	13,017
SEATTLE, WA	5	1.63	8,234
LOS ANGELES, CA	6	1.55	25,156
RIVERSIDE, CA	7	1.55	25,156
SACRAMENTO, CA	8	1.18	5,146
PORTLAND, OR	9	1.04	3,396
PHOENIX, AZ	10	0.72	3,825

Source: IHS Automotive data with Clean Edge analysis. IHS Automotive data is a snapshot of every vehicle in operation as of January 1, 2015. For this indicator the San Francisco and San Jose metro areas are combined, as are the Los Angeles and Riverside areas. In prior years, this indicator included plug-in hybrid electric vehicles like the Chevy Volt. However, plug-in vehicles are now tracked in a separate indicator.
Full dataset available to subscription clients.

ELECTRIC VEHICLE CHARGING STATIONS (2014)

METRO AREA	RANK	EV CHARGING STATIONS PER 1M PEOPLE	TOTAL EV CHARGING STATIONS
PORTLAND, OR	1	112.9	265
SAN JOSE, CA	2	105.0	205
SAN FRANCISCO, CA	3	103.6	476
SEATTLE, WA	4	100.5	369
NASHVILLE, TN	5	86.5	155
SACRAMENTO, CA	6	76.2	171
SAN DIEGO, CA	7	71.7	234
ORLANDO, FL	8	65.5	152
HARTFORD, CT	9	61.8	75
AUSTIN, TX	10	58.7	114

Source: Clean Edge analysis of data gathered from the U.S. DOE Alternative Fuels & Advanced Vehicles Data Center. As of 12/31/2014.
Full dataset available to subscription clients.

CLEAN ELECTRICITY & CARBON MANAGEMENT

LOWER RANKING   HIGHER RANKING

CLEAN EDGE

RANK	METRO AREA	LEADERSHIP SCORE
1	Portland, OR	100.0
2	Los Angeles, CA	94.0
3	San Francisco, CA	91.8
4	San Diego, CA	86.6
5	San Jose, CA	86.2
6	Austin, TX	73.1
7	Seattle, WA	70.2
8	Boston, MA	66.1
9	Dallas, TX	65.4
10	Chicago, IL	63.6
11	Columbus, OH	63.0
12	Washington, DC	62.8
13	Philadelphia, PA	61.2
14	Riverside, CA	61.0
15	Oklahoma City, OK	56.2
16	Denver, CO	56.0
17	Las Vegas, NV	54.7
18	Sacramento, CA	54.3
19	Houston, TX	52.2
20	New York, NY	46.8
21	Minneapolis, MN	46.1
22	Phoenix, AZ	42.5
23	Pittsburgh, PA	39.0
24	Baltimore, MD	38.2
25	St. Louis, MO	37.7
26	Buffalo, NY	37.6
27	Atlanta, GA	35.4
28	San Antonio, TX	35.3
29	Cleveland, OH	35.3
30	Detroit, MI	32.8
31	Raleigh, NC	32.4
32	Indianapolis, IN	31.2
33	Nashville, TN	30.3
34	Charlotte, NC	29.9
35	Providence, RI	28.5
36	Miami, FL	28.0
37	Kansas City, MO	26.9
38	Richmond, VA	23.3
39	Salt Lake City, UT	23.1
40	Virginia Beach, VA	21.8
41	Milwaukee, WI	21.5
42	Hartford, CT	21.0
43	Memphis, TN	18.6
44	Cincinnati, OH	17.4
45	Orlando, FL	16.7
46	Tampa, FL	16.6
47	Louisville, KY	15.2
48	New Orleans, LA	14.3
49	Jacksonville, FL	14.2
50	Birmingham, AL	0.0

CLEAN ELECTRICITY & CARBON MANAGEMENT OVERVIEW

The top 10 metro areas in the Clean Electricity & Carbon Management category remain quite similar from the 2014 Index, with eight of last year's top 10 showing up again this year. The top-ranked metro, Portland, jumped five spots into the pole position, with four California metros – Los Angeles, San Francisco, San Diego, and San Jose – rounding out the top five. The two new entrants into the top 10 are Seattle (#7) and Chicago (#10), which displace Sacramento (last year's #1) and Oklahoma City.

The Clean Electricity & Carbon Management category has undergone several changes since last year's Index. In an effort to better measure a metro region's clean electricity mix, the former Regional Electricity Mix indicator and methodology has been replaced with two indicators that use state-level data as a proxy for local clean energy generation. In addition, there is a new indicator that rewards cities' commitments to combatting climate change by measuring and reducing their carbon emissions, as assessed by whether they participate in any of three different national or global reporting and reduction commitments.

The two Regional Electricity Mix indicators are akin to those in the Clean Electricity subcategory of the State Index. One indicator includes solar, wind, and geothermal generation; metros with high penetrations of solar and wind, such as the six California metros and Oklahoma City, dominate here. The second indicator adds biomass and hydro to the mix; metros with large amounts of hydro – such as Seattle, Portland,

REGIONAL ELECTRICITY MIX (2014)

METRO AREA	RANK	PERCENT OF TOTAL GENERATION FROM SOLAR, WIND, GEOTHERMAL, HYDRO, & BIOMASS
SEATTLE, WA	1	76.0%
PORTLAND, OR	2	73.9%
LOS ANGELES, CA	3	30.2%
RIVERSIDE, CA	3	30.2%
SACRAMENTO, CA	3	30.2%
SAN DIEGO, CA	3	30.2%
SAN FRANCISCO, CA	3	30.2%
SAN JOSE, CA	3	30.2%
BUFFALO, NY	9	23.5%
NEW YORK, NY	10	21.8%
OKLAHOMA CITY, OK	11	19.5%
LAS VEGAS, NV	12	18.7%
DENVER, CO	13	17.5%
MINNEAPOLIS, MN	14	16.8%
NASHVILLE, TN	15	13.3%

Source: EIA and U.S. Census with Clean Edge analysis. This indicator uses state-level electricity data reported to the EIA as a proxy for the electricity fuel mix of each metropolitan statistical area. For MSAs that cross state boundaries, this indicator is calculated based on the percentage of each state's residents that reside in the MSA.
Full dataset available to subscription clients.

Buffalo, and New York – reign in this category. Six metros with high percentages of renewable generation can be found in the top 10 overall Index rankings.

Another indicator in this category measures the amount of per-capita carbon emissions from large emitters in 2013 (the last year for which data is available). Raleigh takes the top spot this year, as it did last year; nine of this year's top 10 metro areas with the lowest emissions are the same as in last year's Index (the exception being Charlotte, which has been replaced by Hartford). The lowest-ranked performers in this indicator, such as Birmingham and New Orleans, are home to large fossil fuel-generation power plants and/or oil and natural gas production, transmission, and refining facilities.

Three new indicators in this category reward cities for their leadership in combatting climate change. They include signing the U.S. Conference of Mayors' Climate Protection Agreement (which most major cities have done); measuring and reporting greenhouse gases through the CDP or carbonn Climate Registry; and membership in the C40 or the STAR Community Rating System. In all, 19 cities received credit for all three criteria, while 19 more were credited for meeting two out of three.

The final Clean Electricity indicator awards credit to any metro area that has a top-30-ranked local government green power purchaser in the EPA's Green Power Partnership program. The list of metros receiving credit under this indicator is identical to last year, with exception of Sacramento, which has been supplanted by Columbus. The City of Houston, as in last year's Index, purchased the most green power, which is interesting given that its total carbon emissions from large facilities far outweigh any other metro area in the Index. (As in last year's Index,

CARBON EMISSIONS FROM LARGE FACILITIES (2013)

METRO AREA	RANK (LOW TO HIGH)	METRIC TONS CO2E PER CAPITA	METRIC TONS CO2E*
RALEIGH, NC	1	0.23	290,238
SEATTLE, WA	2	0.67	2,442,519
COLUMBUS, OH	3	0.68	1,352,711
SACRAMENTO, CA	4	1.42	3,191,702
SAN DIEGO, CA	5	1.49	4,849,601
PORTLAND, OR	6	1.55	3,643,821
HARTFORD, CT	7	1.90	2,304,787
SAN JOSE, CA	8	1.93	3,763,437
NEW YORK, NY	9	1.94	39,024,592
VIRGINIA BEACH, VA	10	2.05	3,523,070
RICHMOND, VA	41	9.83	12,380,126
SAN ANTONIO, TX	42	10.93	25,450,558
OKLAHOMA CITY, OK	43	11.82	15,795,503
KANSAS CITY, MO	44	14.26	29,532,074
CINCINNATI, OH	45	16.46	35,382,824
HOUSTON, TX	46	19.66	127,583,727
LOUISVILLE, KY	47	19.85	25,202,341
PITTSBURGH, PA	48	21.50	50,659,760
BIRMINGHAM, AL	49	28.54	32,642,295
NEW ORLEANS, LA	50	28.77	36,016,095

*Least Emissions* (rows 1–10)
Most Emissions (rows 41–50)

Source: EPA with Clean Edge analysis. *CO2e = carbon dioxide equivalent
Full dataset available to subscription clients.

San Francisco receives credit here due to its use of on-site green power generation. The city is not a part of the Green Power Partnership, but Clean Edge credited the city for indexing purposes.)

CLEAN-TECH INVESTMENT, INNOVATION & WORKFORCE

LOWER RANKING   HIGHER RANKING

RANK	METRO AREA	LEADERSHIP SCORE
1	San Jose, CA	100.0
2	San Francisco, CA	70.7
3	Boston, MA	40.0
4	Detroit, MI	38.9
5	Austin, TX	34.3
6	San Diego, CA	34.1
7	Chicago, IL	32.2
8	New York, NY	30.7
9	Denver, CO	28.4
10	Hartford, CT	28.2
11	Los Angeles, CA	23.6
12	Washington, DC	23.6
13	Pittsburgh, PA	22.8
14	Sacramento, CA	22.6
15	Providence, RI	22.3
16	Portland, OR	22.1
17	Atlanta, GA	21.6
18	Virginia Beach, VA	18.7
19	Seattle, WA	18.0
20	Houston, TX	15.1
21	Cleveland, OH	13.8
22	Philadelphia, PA	13.6
23	Kansas City, MO	13.1
24	Raleigh, NC	13.0
25	Baltimore, MD	10.9
26	Nashville, TN	10.6
27	Charlotte, NC	9.8
28	San Antonio, TX	9.3
29	Minneapolis, MN	6.8
30	Salt Lake City, UT	5.5
31	Phoenix, AZ	3.9
32	Columbus, OH	2.3
33	Indianapolis, IN	2.3
34	Dallas, TX	2.1
35	Orlando, FL	2.1
36	St. Louis, MO	1.9
37	Richmond, VA	1.8
38	Cincinnati, OH	1.5
39	Las Vegas, NV	1.4
40	Miami, FL	1.2
41	Buffalo, NY	0.9
42	Tampa, FL	0.7
43	Milwaukee, WI	0.5
44	Riverside, CA	0.5
45	Jacksonville, FL	0.3
46	Oklahoma City, OK	0.3
47	Memphis, TN	0.3
48	Louisville, KY	0.1
49	Birmingham, AL	0.1
50	New Orleans, LA	0.0
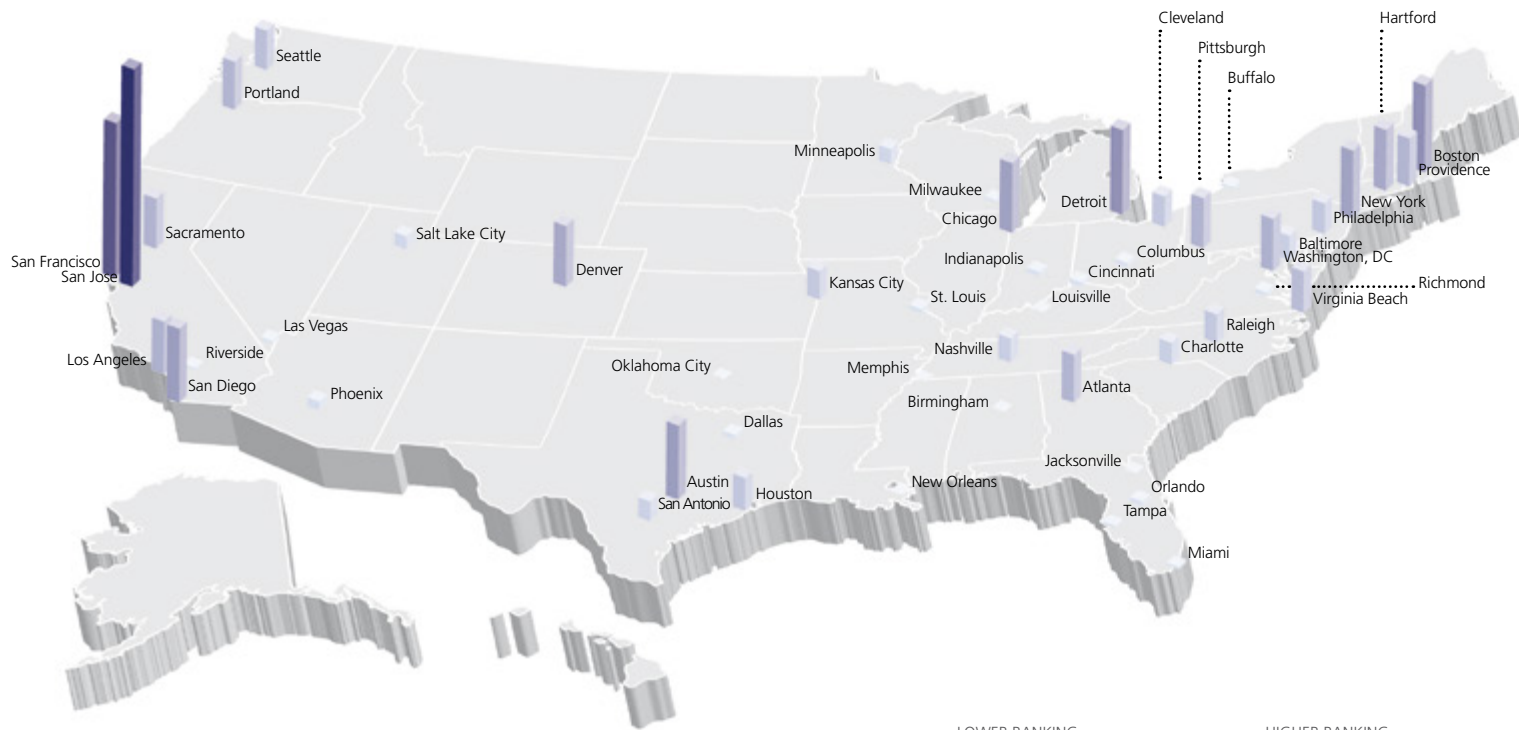
CLEAN-TECH INVESTMENT, INNOVATION, & WORKFORCE OVERVIEW

The Clean-Tech Investment, Innovation, and Workforce category measures a metro area's financial, human, and intellectual capital. It tracks indicators such as venture capital investments in clean tech, clean-energy patent activity, and the presence of U.S. Department of Energy labs, clean-energy incubators, and top-rated green Master's programs. It mirrors the Capital category in the State Index fairly closely, and eight of the top 10 metro areas are located in top 10 Capital states.

A top story of this year's Investment, Innovation, and Workforce category is the dominance of one particular metro area: San Jose. The area known as Silicon Valley retains its #1 category ranking from last year, but the distance between it and #2 San Francisco has grown to nearly 30 points. San Jose leads the pack in venture capital dollars and deals per capita, and jumps to second in patents per capita. It is also home to a clean-tech incubator, as well as a university (Stanford) that places on two of the three lists used to compile the top green Master's programs indicator.

The remaining top 10 metro areas in the category are Boston in third, with Detroit, Austin, San Diego, Chicago, New York, Denver, and Hartford rounding out the list. The top 10 is identical to last year's, with the exception that New York and Denver have switched spots at eighth and ninth. The distance between #2 San Francisco and #3 Boston has dwindled some, but remains large at just over 30 points. All of the top 10 metros except San Jose have seen their scores decline, a testament to San Jose's growing leadership in the category.

Take venture capital, where San Jose remains the #1 metro. Three-year VC investment trends for the 50 metro areas are a mixed bag: total dollars invested in the 2012-2014 period declined by about 11% (nearly $1.7 billion) from the 2011-2013 period, yet total deals increased by more than 100. San Jose increased

CLEAN TECH VENTURE CAPITAL (2012 – 2014)

METRO AREA	RANK	DOLLARS PER CAPITA	TOTAL DOLLARS (MILLIONS)	TOTAL DEALS
SAN JOSE, CA	1	$1,281.10	$2,501.83	169
SAN FRANCISCO, CA	2	$575.83	$2,645.39	317
BOSTON, MA	3	$282.46	$1,336.64	173
SAN DIEGO, CA	4	$271.71	$886.71	76
AUSTIN, TX	5	$242.42	$471.09	57
HOUSTON, TX	6	$104.79	$680.10	35
DENVER, CO	7	$103.03	$283.78	44
WASHINGTON, DC	8	$80.01	$482.78	26
SEATTLE, WA	9	$78.82	$289.39	59
LOS ANGELES, CA	10	$71.80	$952.24	94

Source: Cleantech Group data with Clean Edge analysis.
Full dataset available to subscription clients.

its lead over second-place San Francisco by greater than $250 per capita, while San Francisco's edge over third-place Boston shrunk but remains healthy. Those three were the only metros that received more than $1 billion in total clean-tech VC dollars during the three-year period. In last year's Index, Los Angeles also had a three-year investment total exceeding $1 billion, but this year's Index shows VC activity in the City of Angels dropped by more than $600 million; thus L.A. fell from #7 in dollars per capita in the 2014 Index to #10 this year.

VC deals per capita rankings mirrors the VC dollars rankings: San Jose increased its lead over the field, while third-place Boston fell further behind #2 San Francisco. One San Jose-based company, energy-efficient data center solutions provider Nutanix, accounted for two of the nation's largest clean-tech VC deals in 2014, with a combined $241 million. The top five metros in this category (with Austin and San Diego rounding out the top five) remained the same from last year. While there was some switching of places in the #6-9 slots, the only new metro in the top 10 is Portland, which displaced Providence for 10th. But this was due more to a drop in VC deals in Providence than increased activity in Portland.

The clean-tech patents indicator measures patent activity from 2002 through 2014. But leadership in intellectual capital does not necessarily yield financial capital, as several leading patent activity metros are not hotbeds of VC investment. Among those is Detroit, the #1 patents-per-capita metro. The bulk of Detroit's clean-tech patents have gone to big auto companies such as Ford and General Motors. Hartford, the #3 patents-per-capita metro, has seen a great deal of activity in fuel cells and advanced aerospace technologies, while the #6 entry, Cleveland, is home to patent holders in energy-efficient technology manufacturing. San Jose,

CLEAN ENERGY PATENTS GRANTED (2002 – 2014)

METRO AREA	RANK	PATENTS PER 1M PEOPLE	TOTAL PATENTS
DETROIT, MI	1	424.8	1,825
SAN JOSE, CA	2	407.1	795
HARTFORD, CT	3	257.8	313
SAN FRANCISCO, CA	4	135.2	621
BOSTON, MA	5	61.7	292
CLEVELAND, OH	6	51.4	106
PHILADELPHIA, PA	7	45.8	277
DENVER, CO	8	43.9	121
MINNEAPOLIS, MN	9	42.6	149
SAN DIEGO, CA	10	40.1	131

Source: Data from Heslin Rothenberg Farley & Mesiti P.C. with Clean Edge analysis.
Full dataset available to subscription clients.

on the other hand, proves the success of the clean-tech nexus between Silicon Valley technology and Sand Hill Road financing.

As was the case last year, only three metro areas – San Francisco, Chicago, and New York – can lay claim to all three institutions tracked by the final indicator: a DOE lab, a clean-energy incubator, and a top-ranked green Master's program. Of the 13 additional metros receiving credit for two out of three, 10 of them qualify with an incubator and a green Master's program, while three (Denver, Pittsburgh, and Virginia Beach) have a DoE lab and a green Master's program. Twelve metro areas receive credit for one of the three, while 22 metros have none.

METRO INDEX METHODOLOGY

How is the Metro Index constructed?

The Metro Index consists of three layers. The top layer, the Metro Index itself, is a set of 50 metro area scores which evaluates each MSA based on involvement and leadership in clean tech. Results of the top layer are derived from performance in four equally weighted categories – green buildings; advanced transportation; clean electricity & carbon management; and clean-tech investment, innovation, & workforce – with each category composed of a set of individual indicators.

How is the Metro Index calculated?

The overall Metro Index evaluates the 50 largest metro areas on a 100-point scale, deriving each score from category and individual indicator performance. The score calculation process works as follows:

INDICATOR SCORES are given on a scale of 0 to 100. The best-performing metro area in an individual indicator receives a score of 100; the worst-performing metro area gets a 0. All other metro areas receive scores based on where they fall between the best and worst-performing regions. To put each metro area on an even playing field, all quantitative indicators are adjusted for region size. By reporting in terms of per capita or percent of metro totals, smaller regions are not punished for having relatively smaller economies.

Several indicators, like the presence of a top-ranked green MBA program, are qualitative rather than quantitative. In this case, qualifying states receive indicator scores of 100 and non-qualifying states get 0.

CATEGORY SCORES are calculated in a similar fashion as individual indicators. Based on metro areas' average indicator scores within each corresponding category, category scores of 100 are given to the metro area with the best average indicator score; the metro area with the lowest average indicator score in a category receives a 0.

Finally, the **METRO CLEAN TECH INDEX SCORE** is calculated by averaging the four equally-weighted category scores.

Data Sources

Along with an extensive level of data mining from clean-energy sources in the public domain, Clean Edge has also teamed up with private data providers to offer U.S. Metro Index subscribers the highest level of industry intelligence. Private data partners include Cleantech Group, EQ Research LLC, Heslin Rothenberg Farley & Mesiti P.C., and IHS Automotive.

The following is a list of all indicators used to calculate the Metro Index. Indicators are grouped by category.

GREEN BUILDINGS

GREEN BUILDINGS
LEED Certified Projects Per 1M People (as of 12/31/14)
LEED Certified Square Feet Per Capita (as of 12/31/14)
Energy Star Buildings & Plants Per 1M People (2014)
Energy Star Buildings & Plants Square Feet Per Capita (2014)
Building Energy Use Benchmarking Policy

ADVANCED TRANSPORTATION

ADVANCED TRANSPORTATION
Electric Vehicles Per 1K People (as of 1/1/15)
Hybrid Electric Vehicles Per 1K People (as of 1/1/15)
Plug-In Hybrid Electric Vehicles Per 1K People (as of 1/1/15)
Natural Gas Vehicles Per 1K People (as of 1/1/15)
Electric Vehicle Charging Stations Per 1M People (as of 12/31/14)
CNG Fueling Stations Per 1M People (as of 12/31/14)
E85 & B20 Fueling Stations Per 1M People (as of 12/31/14)
Public Transit: Avg Weekday Trips (Per Capita, 2014)

CLEAN ELECTRICITY & CARBON MANAGEMENT

CLEAN ELECTRICITY & CARBON MANAGEMENT
Regional Electricity Mix (2014, MWh % of Total)
Regional Electricity Mix incl. Hydro & Biomass (2014, MWh % of Total)
Presence of Top Local Government Green Power Purchaser
GHG Emissions from Large Facilities (Per Capita, CO2e MT)
Mayor's Climate Protection Agreement Signatory
Reporting to CDP (Carbon Disclosure Project) or carbon *Climate Registry*
Member of C40 or STAR Community Rating System

CLEAN-TECH INVESTMENT, INNOVATION, & WORKFORCE

CLEAN-TECH INVESTMENT, INNOVATION, & WORKFORCE
Venture Capital Investment ($ Per Capita, 2012-2014)
Venture Capital Investment (Deals Per 1M People, 2012-2014)
Clean Energy Patents (Per 1M people, 2002-2014)
Presence of DOE Lab
Presence of Clean Energy Incubator and/or Accelerator
Presence of Top-Ranked Green Master's Program

CLEAN EDGE

DATA SOURCES

Along with an extensive level of data mining from clean-tech sources in the public domain, Clean Edge has also teamed up with private data providers to offer Index subscribers the highest level of industry intelligence.

DATA PARTNERS
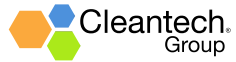
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OTHER INDEX DATA SOURCES

AMERICAN COUNCIL FOR AN ENERGY–EFFICIENT ECONOMY (ACEEE)

AMERICAN PUBLIC TRANSPORTATION ASSOCIATION (APTA)

AMERICAN WIND ENERGY ASSOCIATION (AWEA)

BUILDING CODES ASSISTANCE PROJECT

C40

CDP (CARBON DISCLOSURE PROJECT)

CARBONN CLIMATE REGISTRY

THE CENTER FOR CLIMATE AND ENERGY SERVICES

THE COALITION FOR GREEN CAPITAL

DATABASE OF STATE INCENTIVES FOR RENEWABLE ENERGY (DSIRE)

ENERGY STAR

FUEL CELLS 2000

GEOTHERMAL ENERGY ASSOCIATION (GEA)

GRIDWISE ALLIANCE

INSTITUTE FOR MARKET TRANSFORMATION

INTERSTATE RENEWABLE ENERGY COUNCIL, INC.

KANTAR MEDIA

MAYOR'S CLIMATE PROTECTION CENTER

NATIONAL RENEWABLE ENERGY LABORATORY (NREL)

NET IMPACT

THE PRINCETON REVIEW

STAR COMMUNITIES

U.S. BUREAU OF ECONOMIC ANALYSIS (BEA)

U.S. BUREAU OF LABOR STATISTICS (BLS)

U.S. CENSUS BUREAU

U.S. DEPARTMENT OF ENERGY (DOE)

U.S. ENERGY INFORMATION ADMINISTRATION (EIA)

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

U.S. GREEN BUILDING COUNCIL (USGBC)

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yonker@cleanedge.com

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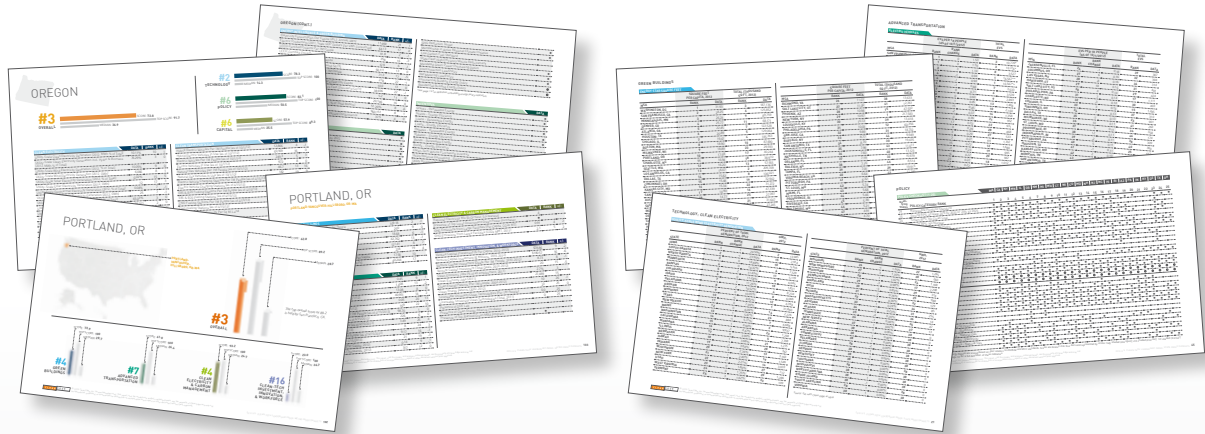
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