2013
U.S. CLEAN TECH LEADERSHIP INDEX

State & Metro / June 2013

CLEAN EDGE

THE CLEAN-TECH MARKET AUTHORITY

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PRODUCT DESCRIPTION

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

This **U.S. CLEAN TECH LEADERSHIP INDEX** report contains findings from the 2013 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 nearly 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 25; Metro Index methodology on page 46).

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. While this is the fourth edition of the State Index and the second annual Metro Index, this is the first 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 52.**

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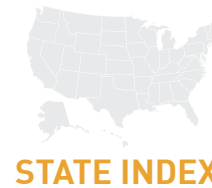
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THE U.S. CLEAN TECH MARKET

From an overall national perspective, 2012 was a decidedly mixed year for clean tech in the United States. A gridlocked Congress, presidential election-year politics, panic over the so-called fiscal cliff, and continued fallout from high-profile bankruptcies like Solyndra and A123 Systems resulted in yet another year of little significant progress on federal clean-energy policy. At the same time, private-sector investors pulled back from clean tech in a substantial way, with U.S. venture capital investment in clean energy down 26 percent to its lowest level ($5 billion) since 2009.

Yet despite these negative factors, clean-tech deployment in the U.S. showed notable, and even historic, market momentum during the year. Wind power, spurred in part by the then-looming expiration of the federal production tax credit, grew by 28 percent with 13.1 gigawatts of new capacity installed in 2012, bringing the U.S. past the 60 GW milestone in total wind power capacity for the first time. That made wind energy the nation's largest source of new generation capacity for the year, contributing 41 percent of the total – even more than the 33 percent share of new generation capacity from natural gas. Overall, renewable energy (wind, solar, geothermal, biomass, and others) accounted for 49 percent of the nation's added electricity capacity, its largest share ever.

Solar PV in the U.S., spurred by continued price drops and ever-more-innovative financing options, had its second straight banner growth year. Installed PV capacity grew by 3,313 MW or 76 percent, with California becoming the first state to install

2013 STATE INDEX TOP 10		
STATE	RANK	SCORE
CALIFORNIA	1	91.7
MASSACHUSETTS	2	77.8
OREGON	3	72.8
NEW YORK	4	63.3
COLORADO	5	63.0
WASHINGTON	6	62.3
NEW MEXICO	7	60.8
ILLINOIS	8	58.5
MINNESOTA	9	56.1
HAWAII	10	52.2

Source: Clean Edge, Inc.

2013 METRO INDEX TOP 10		
METRO AREA	RANK	SCORE
SAN FRANCISCO, CA	1	89.2
SAN JOSE, CA	2	80.3
PORTLAND, OR	3	62.8
LOS ANGELES, CA	4	56.1
WASHINGTON, DC	5	55.7
SACRAMENTO, CA	6	55.6
SAN DIEGO, CA	7	54.7
DENVER, CO	8	51.5
SEATTLE, WA	9	51.2
BOSTON, MA	10	50.5

Source: Clean Edge, Inc.

more than 1,000 MW in a single year. The geothermal power industry bounced back from recent doldrums, adding more than three times as much new capacity in 2012 as the two previous years combined.

This growth in clean energy occurred with little significant new federal legislation or Congressional leadership. But clean-tech leadership at the state and metro level tells a different, and much better, story. As we detail in the State Index, U.S. states – often politically conservative ones – are now rivaling the world's leading clean-

tech nations for preeminence in many areas. Take Iowa and South Dakota. With each state generating 24 percent of its utility-scale electricity from wind power in 2012, they trail only the country of Denmark (at 30 percent) for world leadership in this critical clean-tech metric. And Iowa wind farms actually generate more power than those in Denmark – 13,945 GWh in 2012, as compared to 11,637 GWh in Denmark (much less populous South Dakota generated 2,914 GWh from wind).

An April 2013 report from the Union of Concerned Scientists, "Ramping Up Renewables: Energy You Can Count On", presented this type of "if states were countries" analysis. North Dakota (with 15 percent of generation from wind) and Minnesota (14 percent) would also make this global top 10, just below Portugal's 17 percent and Spain's 16 percent. Global clean-tech powerhouse Germany generated 11 percent of its electricity from wind last year, but so did Kansas, Idaho, Colorado, and Oklahoma. Germany, with a much larger population than most U.S. states, has much larger total power from wind – 61,204 GWh in 2012. The leading U.S. state in total wind generation, Texas, reached 31,860 GWh.

On peak wind days during the year, wind farms supplied 25 percent of the juice to the grid in the Midwest, 30 percent to the Southwest Power Pool (Kansas, Oklahoma, and the Texas Panhandle), and 32 percent in the rest of Texas. The nationwide generation percentage for the U.S., by contrast, was just three percent, although wind was the largest contributor of new capacity as noted above.

The emergence of states as key global markets for clean-tech products and services has not been lost on the industry, particularly with some states' renewable portfolio standard (RPS) mandates, net-metering laws, and other supportive policies under attack from fossil-fuel backed lobbyists and legislators. "The federal PTC is hugely important, but it is state policies that drive our markets," says Susan Innis, senior manager of public affairs for leading wind turbine maker Vestas North America.

On the metro front, U.S. cities have long been out in front of the federal government on climate action and CO2 reduction. The U.S. Conference of Mayors' Climate Protection Agreement, created in 2005, has been signed by more than 1,000 mayors nationwide pledging to meet or exceed Kyoto Protocol emissions-reduction goals. More recently, 11 large U.S. cities, including five of the top 10 metro areas in our 2013 Metro Index, have become members of the global C40 Cities Climate Leadership Group. In C40, more than 60 large metro areas around the world collaborate and share best practices in expanding clean tech and advancing policies to reduce emissions and use energy and other resources more efficiently.

Such collaborations show that cities (and states), frustrated with the clean-tech progress of gridlocked national governments, can exhibit leadership of their own. "You don't have to get Los Angeles to agree with Montana," says C40 executive director and former L.A. deputy mayor Jay Carson. C40's member cities, if their populations were combined, would comprise the world's third most populous country.

In the U.S., we believe that quantitative, comprehensive benchmarking of states and the largest metro areas delivers the best snapshot of where the nation is on clean-tech progress each year. As U.S. states and metro areas increasingly exert themselves as global leaders, the U.S. Clean Tech Leadership Index serves as a highly useful resource for policymakers, companies, financiers, NGOs, and others leading the clean-tech sector forward.
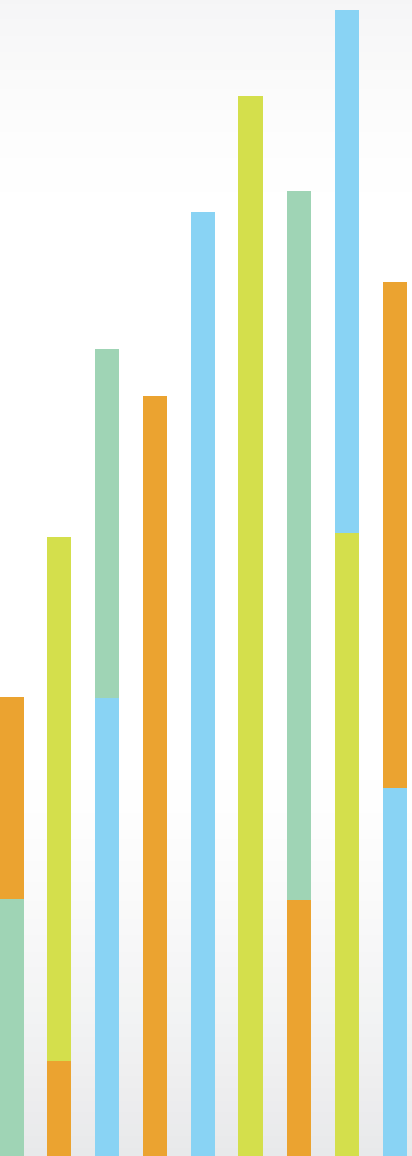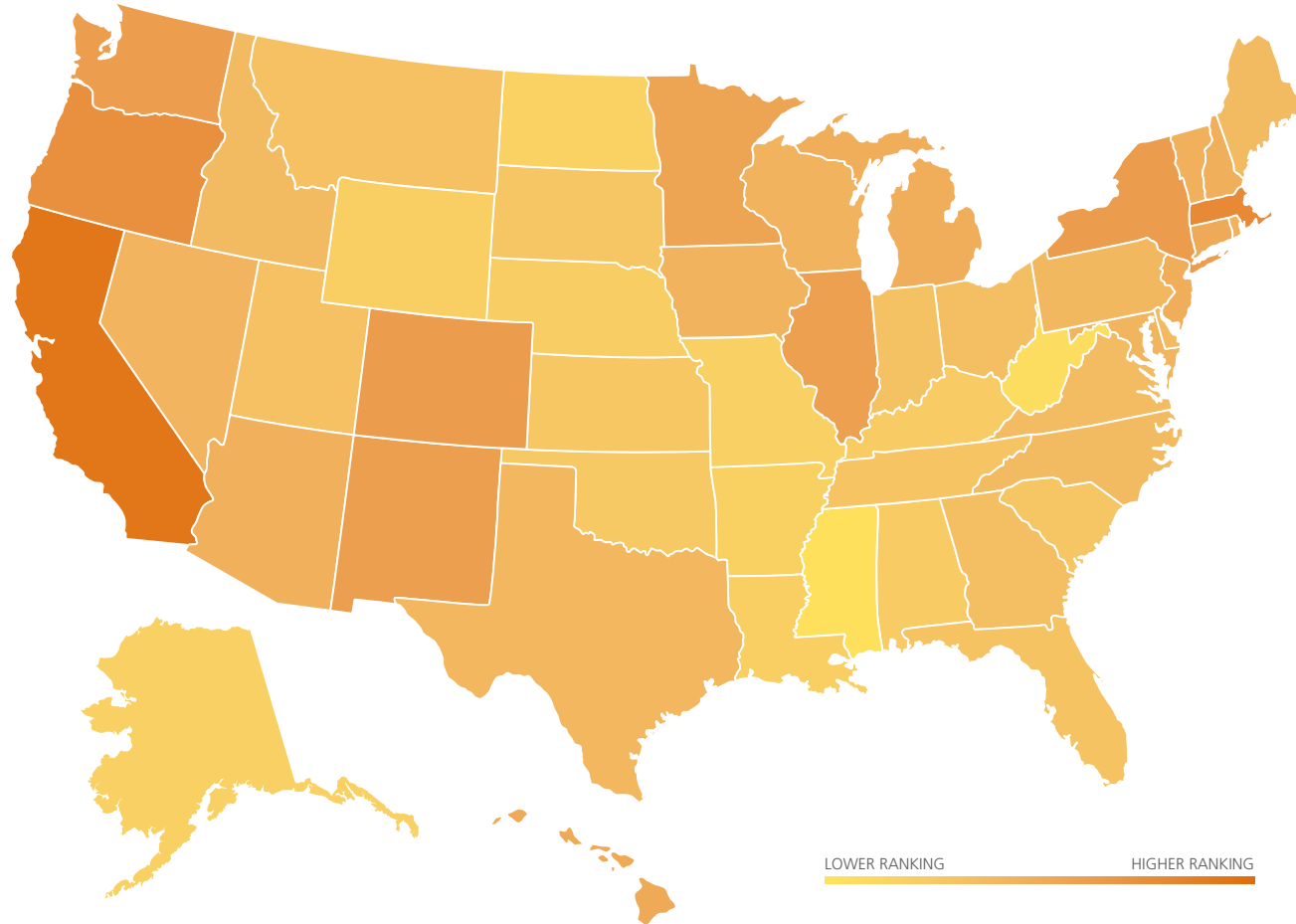
STATE INDEX

2013 U.S. Clean Tech Leadership Index

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 52.**

STATE INDEX

LOWER RANKING   HIGHER RANKING

RANK	STATE	LEADERSHIP SCORE	
1	California	91.7	
2	Massachusetts	77.8	
3	Oregon	72.8	
4	New York	63.3	
5	Colorado	63.0	
6	Washington	62.3	
7	New Mexico	60.8	
8	Illinois	58.5	
9	Minnesota	56.1	
10	Hawaii	52.2	
11	Connecticut	52.2	
12	Michigan	48.5	
13	New Jersey	48.2	
14	New Hampshire	46.5	
15	Vermont	46.4	
16	Arizona	45.6	
17	Rhode Island	44.5	
18	Iowa	43.8	
19	Wisconsin	43.7	
20	Nevada	43.4	
21	Maryland	41.6	
22	Texas	40.9	
23	Pennsylvania	39.6	
24	North Carolina	37.1	
25	Delaware	36.9	
26	Maine	36.8	
27	Idaho	36.8	
28	Virginia	35.7	
29	Georgia	33.7	
30	Ohio	33.6	
31	Montana	32.0	
32	Utah	31.5	
33	Indiana	31.1	
34	Florida	30.1	
35	Tennessee	28.6	
36	South Dakota	28.1	
37	South Carolina	27.9	
38	Kansas	27.0	
39	Oklahoma	24.6	
40	Kentucky	22.6	
41	Alabama	22.5	
42	Nebraska	21.0	
43	Wyoming	20.0	
44	Louisiana	19.6	
45	Missouri	19.4	
46	Alaska	18.5	
47	Arkansas	17.5	
48	North Dakota	16.5	
49	West Virginia	7.3	
50	Mississippi	4.2	

2013 STATE INDEX RESULTS

The Top 10 States

As the top-ranked state for the fourth consecutive year, **CALIFORNIA** (scoring 91.7 overall) continues to serve as the epicenter of the U.S. clean-tech market, maintaining a broad leadership role spanning clean electricity deployment, energy efficiency, policy innovation, and investment attraction. In addition to the state's top-tier position in almost every measure of sector activity, dominance in high-profile areas like electric/hybrid vehicle adoption, smart meter installations, solar power capacity, and venture capital makes California the unrivaled leader in the continuing advancement of clean technology. It's also home to no less than five of the top seven U.S. metro areas for clean-tech leadership, as tracked by our accompanying Metro Index: San Francisco, San Jose, Los Angeles, Sacramento, and San Diego.

A score of 77.8 was good enough to position **MASSACHUSETTS** in second place, overtaking Oregon for the first time since we started benchmarking state activity four years ago. Commitment to energy efficiency, strong industry policy, and continued leadership in early-stage technology development and capital attraction has made it one of only a few states to consistently compete with California for the U.S. clean-tech crown. Massachusetts-based venture capital investments in 2012 were enough to edge out California in per capita terms, and continued industry interest from the state's numerous prestigious universities is a sign that the state should remain an integral clean-tech innovation hub for years to come.

OREGON achieved a third-place ranking with a score of 72.8. Unlike many states which perform well in one or two categories, Oregon exhibits diverse success in all three State Index categories: technology deployment, policy structure, and capital attraction. The state's strongest areas of activity continue to be consumer-driven indicators like hybrid vehicle registrations and green building development, but leadership also extends to economy-wide measures. In the latest government green jobs survey, for example, Oregon ranks highest for green jobs as a percentage of total employment.

NEW YORK jumped from sixth to fourth place, scoring 63.3, a result of its exceedingly energy-efficient economy and supportive policy structure. The state is second only to California for least electricity consumed per person and is also a clear leader in economic output ($GDP) per kWh consumed – it's no surprise, then, to find that New York's utility energy efficiency budget ranks among the best in the nation. Not to be overlooked, Governor Andrew Cuomo's refocused commitment to the Empire State's clean-tech industry is likely to improve the already favorable legislative environment, which includes a strong RPS, active greenhouse gas reduction efforts, and a broad set of technology deployment incentives.

COLORADO's 63.0 score keeps it in fifth place for the fourth straight year, once again the best-performing state not located on either the West or East coast. While a strong performer in several areas, Colorado's clearest area of leadership is in green building infrastructure. For the two major green building programs –

LEED and Energy Star – the state ranks near the top for both total projects and square footage per capita. Another asset is Colorado's role as home to the DOE's National Renewable Energy Laboratory (NREL), a world-class hub for clean-tech expertise.

With a score of 62.3, **WASHINGTON**'s sixth-place ranking rounds out another strong performance for West Coast states. Abundant natural resources allow the state to generate more than 80 percent of in-state electricity from low-carbon sources, making it home to arguably the greenest grid in the nation. Through aggressive policies and an eager public, Washington has also become an early leader in electric vehicle activity – both for EV sales and the build out of a reliable charging infrastructure network.

NEW MEXICO earns seventh place, scoring 60.8. The sunny southwestern state achieved top-10 placement through its robust policy framework and local concentration of human and intellectual capital. New Mexico has done well to implement almost all of the policy regulations and mandates tracked in this Index including a strong RPS (with a specific carve-out for solar), an energy efficiency resource standard, and relatively strict building energy codes. As home to a top-ranked green MBA program, a clean energy incubator, and a DOE lab, the state also performs strongly in patents granted and university-licensed technologies.

ILLINOIS, with a score of 58.5, comes in at eighth place. The state stands out from a policy perspective, having implemented some of the strongest building energy codes in the country, and as a result is also a leading market for LEED and Energy Star square footage (especially for commercial properties). Like New Mexico, Illinois is home to a top-ranked green MBA program, a clean energy incubator, and a DOE laboratory – an achievement that only eight states can claim.

MINNESOTA's 56.1 score earns ninth place, buoyed by an incentive-driven policy structure and several areas of technology leadership. As a top market for wind energy, more than 14 percent of the state's electricity generation during 2012 came from utility-scale wind projects. A leader in biofuels, Minnesota is a top-tier producer of ethanol and is home to the most biofuel fueling stations in the country. And in the area of green building, the state has registered more Energy Star-qualified square footage per capita over the last decade than any other state.

Led by an exceedingly strong display of technology deployment, **HAWAII**'s 52.2 score allowed the state to break into the top 10 for the first time. As a sunny island state, it seems logical that Hawaii leads the U.S. in solar power as a share of total peak capacity (just over seven percent) and electric vehicle charging stations per capita. With the nation's highest electricity rates, the state has been forced to focus on energy efficiency, resulting in lower electricity consumption capacity per person than any state other than California.

TECHNOLOGY
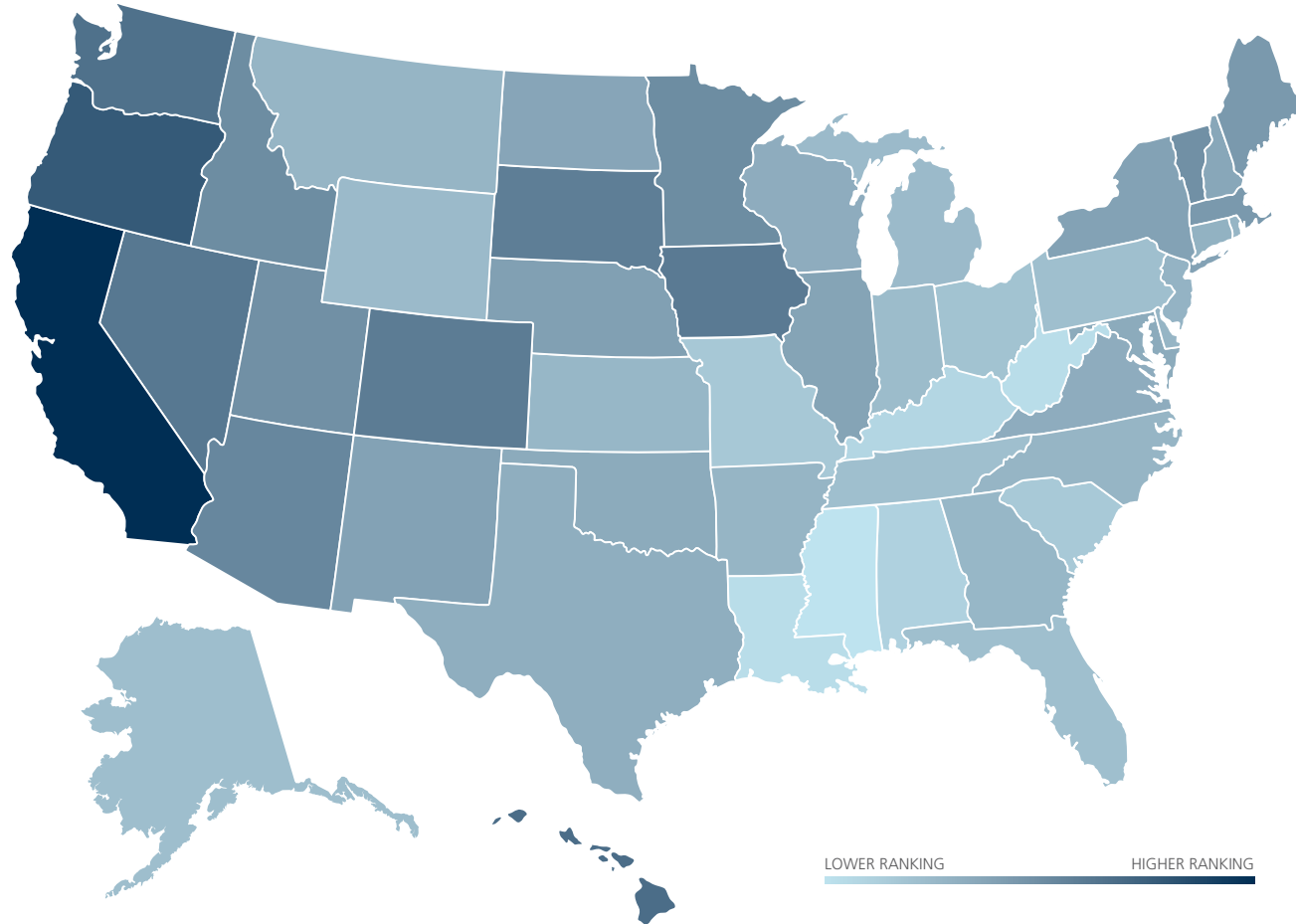
LOWER RANKING — HIGHER RANKING

RANK	STATE	LEADERSHIP SCORE
1	California	100.0
2	Oregon	78.3
3	Hawaii	67.9
4	Washington	66.1
5	Nevada	61.6
6	Iowa	61.2
7	Colorado	59.6
8	South Dakota	58.8
9	Arizona	53.7
10	Minnesota	50.9
11	Idaho	50.5
12	Utah	49.4
13	Vermont	48.5
14	Massachusetts	44.2
15	Maine	44.1
16	New York	39.1
17	New Mexico	39.0
18	Illinois	37.6
19	North Dakota	37.1
20	New Hampshire	35.7
21	Maryland	34.3
22	Oklahoma	34.3
23	Virginia	33.2
24	Wisconsin	33.0
25	Texas	31.5
26	Connecticut	30.1
27	New Jersey	29.3
28	Rhode Island	28.1
29	Delaware	28.1
30	Montana	27.8
31	North Carolina	27.5
32	Kansas	27.3
33	Georgia	26.8
34	Wyoming	25.1
35	Michigan	24.5
36	Indiana	23.6
37	Nebraska	23.4
38	Alaska	23.2
39	Pennsylvania	22.2
40	Florida	22.0
41	Tennessee	21.5
42	Ohio	19.6
43	Missouri	16.6
44	South Carolina	15.5
45	Alabama	10.6
46	Kentucky	8.4
47	Arkansas	7.5
48	Louisiana	4.1
49	West Virginia	3.9
50	Mississippi	0.0

TECHNOLOGY OVERVIEW

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

- Clean Electricity (renewable electricity generation)
- Clean Transportation (use of electric vehicles, hybrids, biofuels, natural gas vehicles, and charging/fueling infrastructure)
- Energy Intelligence & Green Building (green building projects, smart grid deployment, and efficient energy use)

The three subcategories are weighted equally.

For the second year in a row, overall State Index leader California led the nation in all three Technology subcategories. Its top score of 100 was well ahead of #2 Oregon's 78.3. Oregon, Washington, Colorado, and Hawaii, fellow members of the overall State Index top 10, also reach the top tier in Technology. Hawaii, #10 overall, jumps to #3 in Technology with strong marks for solar power and clean transportation. But as in previous years, Technology is the category in which "outliers" – states with relatively low overall Index rankings – most consistently break into the top 10.

Most notable are Great Plains wind power all-stars Iowa (18th in the overall Index) and South Dakota (36th), which place sixth and eighth respectively in Technology. Nevada, with leadership in solar and geothermal deployment, is #5 in Technology while just 20th overall. Arizona, the nation's third-best performer in installed solar PV capacity as a percentage of its total, comes in at #9 in Technology but 16th

2012 UTILITY-SCALE CLEAN ELECTRICITY GENERATION: WIND, SOLAR, GEOTHERMAL			
STATE	RANK	% OF TOTAL GENERATION, 2012	THOUSAND MWH, 2012
IOWA	1	24.50%	13,945
SOUTH DAKOTA	2	23.95%	2,914
NORTH DAKOTA	3	14.69%	5,316
MINNESOTA	4	14.32%	7,529
CALIFORNIA	5	12.26%	24,682
IDAHO	6	11.77%	1,904
COLORADO	7	11.59%	6,213
KANSAS	8	11.43%	5,119
OKLAHOMA	9	10.52%	8,234
OREGON	10	10.11%	6,103

Source: EIA with Clean Edge analysis. Clean electricity sources include wind, solar PV and thermal, and geothermal. 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.

overall. Further down the list, wind-rich North Dakota, near the bottom overall at 48th, cracks the top 20 in Technology at #19.

Conversely, Technology is the weakest category for top overall states from the Northeast, which lack the renewable generation resources of their Great Plains and Western counterparts. Massachusetts and New York, #2 and #4 overall, are 14th and 16th respectively in Technology. No. 8 Illinois is just 18th in the category;

STATE	RANK	% OF PEAK CAPACITY, 2012	CUMULATIVE CAPACITY (MW)
IOWA	1	31.19%	5,137
NORTH DAKOTA	2	25.76%	1,679
IDAHO	3	22.74%	973
OREGON	4	21.00%	3,153
SOUTH DAKOTA	5	19.79%	784
KANSAS	6	19.62%	2,712
MINNESOTA	7	17.39%	2,986
WYOMING	8	15.97%	1,410
COLORADO	9	14.49%	2,301
OKLAHOMA	10	13.03%	3,134

Source: AWEA and EIA data with Clean Edge analysis. Capacity factor - which for wind energy averages about 25-40% - has a large impact on how productively installed capacity translates to electricity generation.
Full dataset available to subscription clients.

STATE	RANK	% OF PEAK CAPACITY, 2012	CUMULATIVE CAPACITY (MW)
HAWAII	1	7.10%	199.50
NEW JERSEY	2	4.85%	955.70
ARIZONA	3	3.63%	1,105.40
CALIFORNIA	4	3.48%	2,555.70
NEVADA	5	2.59%	349.60
VERMONT	6	2.43%	28.00
NEW MEXICO	7	2.19%	200.40
COLORADO	8	1.88%	299.20
MASSACHUSETTS	9	1.35%	206.30
DELAWARE	10	1.25%	44.20

Source: Preliminary IREC and EIA data with Clean Edge analysis. Solar PV capacity factor varies by location and climate and has a large effect on how productively installed capacity translates to electricity generation.
Full dataset available to subscription clients.

despite solid growth in wind power (823 new MW in 2012), the Land of Lincoln still relies heavily on coal and nuclear power.

Clean Electricity

In Clean Electricity, #1 California is unique in having wide-scale deployment of all three leading renewable-energy power sources (wind, solar, and geothermal). In 2012, California became the first state to install more than a gigawatt of new solar PV in one year, and was second in the U.S. in new wind energy deployment with 1.65 GW. These three clean energy sources contributed more than 12 percent to California's overall electricity mix. (It should be noted that our Clean Electricity indicators track the amount of clean electricity generated within a state; most states'

RPS mandate the percentage of clean electricity in their investor-owned utilities' total energy mix, which often includes clean power purchased from other states.)

But California is just fifth in the U.S. in percentage of generation from wind, solar, and geothermal, trailing four states from the far less populous, wind power-driven Upper Midwest: Iowa, South Dakota, North Dakota, and Minnesota. As noted in our introduction "The U.S. Clean-Tech Market" on page 5, wind's contribution of 24 percent of generation in Iowa and South Dakota makes those states national leaders (and arguably in Iowa's case, world leaders) in clean electricity. Iowa has also gone beyond deployment to make the wind industry's supply chain a significant part of the state's economy and job base. When presidential hopeful Mitt Romney opposed the renewal of the federal PTC for wind last summer, lead-

STATE	RANK	HEVS PER 1M PEOPLE	TOTAL HEVS
CALIFORNIA	1	15,337.8	583,473
WASHINGTON	2	13,050.1	90,007
VERMONT	3	12,988.6	8,131
OREGON	4	12,866.0	50,169
VIRGINIA	5	11,400.3	93,321
NEW HAMPSHIRE	6	10,797.9	14,261
MASSACHUSETTS	7	10,773.9	71,605
MARYLAND	8	10,322.3	60,742
HAWAII	9	10,017.1	13,947
COLORADO	10	9,274.3	48,111

Source: R.L. Polk data with Clean Edge analysis. R.L. Polk data is a snapshot of every vehicle in operation as of October 1, 2012.
Full dataset available to subscription clients.

STATE	RANK	EVS PER 1M PEOPLE	TOTAL EVS
CALIFORNIA	1	674.9	25,676
ARIZONA	2	556.4	3,646
HAWAII	3	546.6	761
WASHINGTON	4	333.0	2,297
OREGON	5	249.3	972
TENNESSEE	6	183.1	1,182
OKLAHOMA	7	183.0	698
NEW YORK	8	174.0	3,406
VERMONT	9	169.3	106
FLORIDA	10	164.3	3,173

Source: R.L. Polk data with Clean Edge analysis. R.L. Polk data is a snapshot of every vehicle in operation as of October 1, 2012.
Full dataset available to subscription clients.

ing Iowa Republicans like Gov. Terry Branstad and U.S. Rep. Steve King strongly disagreed with their party's standard-bearer.

Iowa also tops the nation in percentage of peak generation capacity from wind, passing the 30 percent milestone in 2012 to 31.19 percent. North Dakota, Idaho, and Oregon passed the 20 percent mark.

In the U.S., wind clearly remains a far larger contributor of utility-scale megawatts than solar power, a fact that comes through loud and clear by comparing the tables on the previous page. Nine of the top 10 states in installed wind capacity are also in the top 10 for total clean-energy generation. Of the top 10 in solar PV capacity, however, only two, California and Colorado, can make that claim, and both have significant wind and/or geothermal generation resources as well.

In terms of total capacity, only California and Arizona had more than 1 GW of solar PV installed by the end of 2012 (New Jersey was close with 955 MW, and has since cleared the GW hurdle in 2013). By contrast, 15 states had more than 1 GW in wind power capacity by year's end, according to the American Wind Energy Association.

Clean Transportation

California continued its dominance of the Clean Transportation subcategory in 2012 with the top score of 100, being particularly strong in its drivers' adoption of hybrids and electric vehicles. With the Tesla Model S sedan, Nissan LEAF, and Chevy Volt starting to appear on a regular basis on the freeways of the Bay Area and Los Angeles, for example, California's nearly 675 registered EVs per million people leads by a wide margin over Arizona's 556.4 and Hawaii's 546.6.

But other states are catching up. Utah repeated its #2 Clean Transportation ranking from last year's Index, but upped its score from 76.3 to 87.1. Riding the shale-gas boom, Utah is by far the leading state in natural gas vehicles and compressed natural gas (CNG) filling stations per million people. Hawaii surged from a sixth-place ranking with a 50.1 score last year to #3, with a strong score of 82.8. With gasoline prices among the nation's highest and comparatively short distances to drive, Hawaiians have strongly embraced EVs. The Aloha State is the runaway leader in EV charging stations per million people, with more than 100, and ranks third in registered EVs and ninth in hybrids. Hawaii's surge dropped Oregon from #3 to #4, despite the Beaver State's slight score improvement from 67.7 to 74.6. Oregonians rank #4 in hybrid use, #5 in EVs, and #2 in EV charging stations.

Energy Intelligence & Green Building

Consistency is the name of the game in this wide-ranging subcategory. The top four states – California, Colorado, Oregon, and Massachusetts – maintained their same rankings as last year, and all four are among the top five performers in the overall Index. California, with a score of 100, actually increased its lead over Colorado, which led this subcategory two years ago; Colorado's score dropped from 97.9 in the 2012 Index to 89.8. All four of the top states (plus #6 Washington) are also in the top 10 in the key indicator of LEED Building Deployment, which specifically measures a state's total number of LEED-certified projects per million people. Vermont, showing that a small state can have a big impact, completed 16 new LEED-certified projects in 2012 (a 27 percent increase) to jump to #1 in this indicator.

The deployment of smart-grid technologies is an increasingly critical factor in state leadership in energy efficiency. Nevada's impressive jump from 13th last year to #5

2012 LEED BUILDING DEPLOYMENT						
STATE	RANK	LEED CERTIFIED PROJECTS PER 1M PEOPLE	TOTAL LEED	PLATINUM PROJECTS	GOLD PROJECTS	SILVER PROJECTS
VERMONT	1	95.8	60	4	24	19
OREGON	2	91.8	358	48	189	77
COLORADO	3	91.0	472	30	211	138
WASHINGTON	4	87.7	605	27	272	213
NEW MEXICO	5	72.4	151	4	75	54
MASSACHUSETTS	6	72.2	480	33	202	142
MARYLAND	7	72.1	424	15	187	151
VIRGINIA	8	68.2	558	19	202	211
MAINE	9	59.4	79	4	21	29
CALIFORNIA	10	57.6	2,193	177	967	687

Source: USGBC data with Clean Edge analysis. USGBC data is gathered from the Public LEED Project Directory and includes all projects certified through 12/31/2012.
Full dataset available to subscription clients.

in this subcategory was mainly due to a huge increase in smart meter installations. Nevada went from a paltry 1.94 percent smart meter market penetration in last year's Index (based on the Federal Energy Regulatory Commission's biannual survey in 2010) to 55.2 percent, fifth highest in the U.S. California leads in this indicator at 70.1 percent (with nearly 10.5 million smart meters installed), while Georgia and Idaho each boast more than 65 percent market penetration.

POLICY

LOWER RANKING   HIGHER RANKING
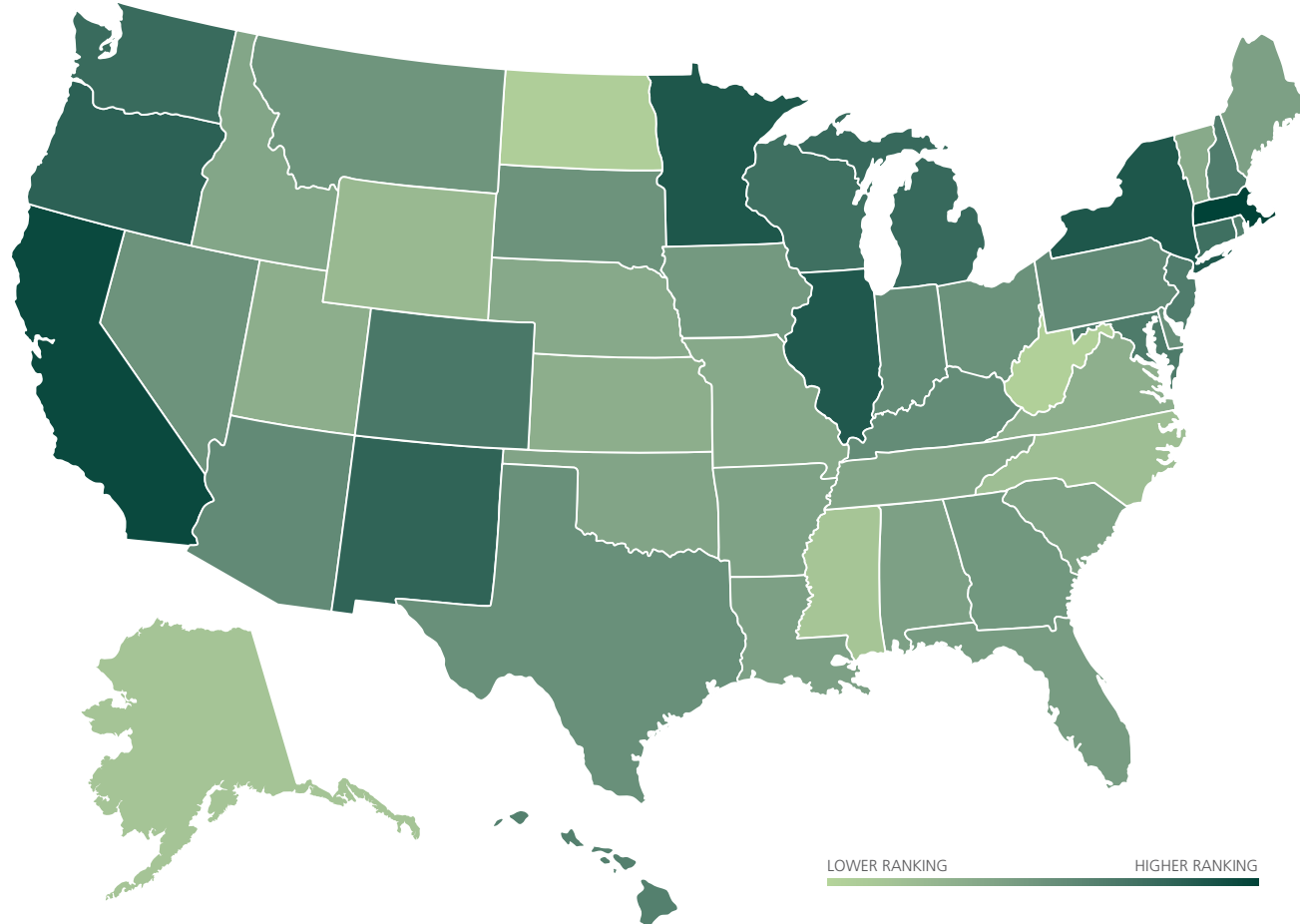
RANK	STATE	LEADERSHIP SCORE
1	Massachusetts	100.0
2	California	95.9
3	New York	88.3
4	Minnesota	87.8
5	Illinois	87.0
6	Oregon	82.1
7	New Mexico	79.9
8	Michigan	77.0
9	Washington	75.8
10	Connecticut	73.1
11	Wisconsin	73.0
12	Colorado	67.7
13	Maryland	65.5
14	New Hampshire	65.0
15	New Jersey	65.0
16	North Carolina	65.0
17	Hawaii	62.8
18	Rhode Island	62.8
19	Arizona	56.1
20	Pennsylvania	56.1
21	Indiana	55.1
22	Kentucky	55.1
23	Delaware	52.2
24	Texas	52.0
25	Ohio	50.7
26	Nevada	50.3
27	Montana	48.5
28	Georgia	47.0
29	Iowa	46.3
30	Florida	44.4
31	Maine	41.4
32	Louisiana	41.2
33	Alabama	40.7
34	Arkansas	39.9
35	South Carolina	38.5
36	Oklahoma	38.0
37	Tennessee	38.0
38	Idaho	36.7
39	Missouri	34.6
40	Nebraska	34.5
41	Vermont	34.1
42	Kansas	31.4
43	Utah	30.9
44	Virginia	30.1
45	Wyoming	22.8
46	South Dakota	18.8
47	Alaska	14.4
48	Mississippi	12.5
49	North Dakota	6.3
50	West Virginia	4.1

POLICY OVERVIEW

The Policy category of the State Index is slightly different than the Technology and Capital categories in that it is based not on quantitative industry metrics, but rather on each state's implementation of important policies. The category has been separated into two subcategories: Regulations & Mandates represent the metaphorical "sticks" and Incentives are the figurative "carrots." Policy indicators are mostly scored on a yes or no basis – either a given policy exists in a state or it doesn't. While the yes/no evaluation may not capture the strength of individual policies, it does allow for evaluation of the comprehensiveness of clean-tech policy in each state.

Massachusetts leads all other states in this year's policy category, a result of its first place performances in both the Regulations & Mandates and Incentives subcategories. Rounding out the top five states for policy are California, New York, Minnesota, and Illinois, each with its own broad policy toolkit aimed at industry support. This is a slight change from last year, which saw Massachusetts joined in the top five by New York and the West Coast states of California, Washington, and Oregon. In the Regulations & Mandates subcategory, trailing Massachusetts are New Mexico in second, California and Delaware in a tie for third, and New York and Oregon tied for fifth place. In somewhat of a gridlock at the top in Incentives, Massachusetts shares first place with California, Minnesota, Michigan, and Wisconsin.

The Regulations & Mandates subcategory covers transportation policies, building codes, and climate change targets, but the renewable portfolio standard (RPS) is argu-

ably the most impactful legislative tool in a state's arsenal and so several indicators are used to assess the strength and scope of these policies. First, the existence of such a policy is tracked (29 states qualify) and credit is next given to states that have instituted more aggressive RPS targets, defined as at least 20 percent from renewables by 2020, or 25 percent by 2025 – 15 states receive credit here. Because RPS policies vary, further indicators take note of states where large hydro, nuclear, and "clean" coal qualify as energy sources to meet RPS mandates, resulting in less effective legislation that does little to drive-clean energy deployment. Through these screens, the more ambitious RPS targets begin to stand out, such as California's 33 percent by 2020, Colorado's 30 percent by 2020, and Maine's 40 percent by 2017 – with 10 percent from new capacity.

Evaluating state-level efforts to combat climate change, the subcategory also tracks states that have established climate action plans, greenhouse gas reduction targets, and are participating in an active regional climate initiative. Completing a climate action plan is the least intensive of these three climate-related indicators. To date, 36 states have established climate action plans which identify the most impactful and cost-effective strategies to reduce local greenhouse gas (GHG) emissions and how best to adapt to a changing climate. Taking the next step, 19 states have actually established a specific GHG reduction target, requiring either electric utilities or the entire state to reduce emissions a certain amount by an explicit target date (Arizona, for example, is targeting 2000 emission levels by 2020, and 50 percent below 2000

by 2040). The Regional Greenhouse Gas Initiative (RGGI), which includes nine north-eastern states, was the first active cap-and-trade program of its kind in the U.S.; California's recently launched emissions trading program brings the number of states active in regional climate initiatives to 10.

Building energy codes are another essential set of indicators in the Regulations & Mandates subcategory. Using research compiled by the Building Code Assistance Project (BCAP), commercial and residential building energy code indicators monitor the strictness of standards in each state. According to BCAP, only two states, Illinois and Maryland, have implemented building codes equivalent to the latest, strongest industry standards. Many states qualify for the second tier of energy code strength, but there are still several states with either no building energy codes or codes that are weaker than the oldest standards tracked by BCAP (from 2004 and 2006). A dozen states are at this lowest level of energy code strength for residential buildings, 11 states for commercial buildings (not surprisingly, the list of those with the lowest codes for both residential and commercial buildings includes includes weak-performing policy states like Alaska, the Dakotas, and Wyoming).

In the Incentives subcategory, availability of state-level loans and rebates, vehicle purchasing rebates, and utility performance incentives are tracked. One of the most effective incentives is utility revenue decoupling – the separating of a utility's profit from the amount of electricity generated. States implementing this strategy have found it to be an effective way to drive utility investment in energy efficiency (as opposed to utilities simply expanding capacity). Decoupling has not caught on extensively, however, and ACEEE's most recent *State Energy Efficiency Scorecard* shows only 14 states having implemented explicit decoupling programs for electricity and only 16 having done so for natural gas.

The following two pages contain a policy checklist – an overview of state performances in the State Index's Policy category, with states listed in the order of their policy rank. The most striking feature of the checklist is the starkness of the divide between states with established clean-tech policies and states that have basically ignored the industry altogether.

		MA	CA	NY	MN	IL	OR	NM	MI	WA	CT	WI	CO	MD	NH	NJ	NC	HI	RI	AZ	PA	IN	KY	DE	TX	OH
Quali-fying States	**POLICY CATEGORY RANK**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
29	Renewable Portfolio Standard	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			●	●	●
15	Strong RPS: At least 20% by 2020 or 25% by 2025	●	●	●	●	●	●	●			●		●		●		●							●		
26	Smart RPS: No Clean Coal	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			●	●	
28	Smart RPS: No Nuclear	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			●	●	●
14	Smart RPS: No Large Hydro	●	●							●				●	●	●	●	●	●					●		
19	Smart RPS: Solar/DG Provision	●		●		●		●						●	●	●	●	●		●	●			●		●
24	Energy Efficiency Resource Standard	●	●	●	●	●		●	●	●	●	●	●	●			●	●	●	●		●		●		
11	State Renewable Fuel Standard	●			●		●	●		●			●						●	●				●		
36	Climate Action Plan	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●		
19	GHG Reduction Target	●	●	●	●	●	●	●		●	●		●	●	●	●	●	●	●		●			●		
10	Membership in Active Regional Climate Initiative	●	●	●	●						●			●	●	●			●					●		
1	Low Carbon Fuel Standard		●																							
30	State Fleet High Efficiency Vehicle Requirement	●	●	●	●	●	●	●	●	●	●	●	●			●	●	●	●	●	●	●		●	●	●
8	Mandated Green Power Purchasing Option						●	●		●		●														
44	Interconnection Law/Policy	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
46	Net Metering Law/Policy	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
n/a	Commercial Building Energy Policy	◕	◕	◕	◔		◕	◕	◕	◕	◕	◕	◯	●		◕	◕	◕	◕	◔	◕		◕	◕	◕	◕
n/a	Residential Building Energy Policy	◕	◕	◕	◔		◕	◕	◕	◕	◕	◕	◯	●		◕	◕	◕	◔	◯	◕		◕	◕	◔	◕
21	Grants - Renewable Energy	●			●		●		●						●			●		●	●		●			
21	Grants - Energy Efficiency	●	●		●		●		●			●	●				●						●			
46	Loans - Renewable Energy	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
47	Loans - Energy Efficiency	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
47	Rebates - Renewable Energy	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
50	Rebates - Energy Efficiency	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
3	Bonds - Renewable Energy						●		●																	
2	Bonds - Energy Efficiency						●		●																	
19	Clean-Tech Vehicle Purchasing Incentive		●		●				●				●	●	●				●	●		●		●		●
14	Utility Revenue Decoupling - Electricity		●	●	●		●		●				●	●					●	●				●		●
16	Utility Revenue Decoupling - Natural Gas	●	●	●	●		●		●			●	●	●			●		●	●				●		●
26	Utility Performance Incentives - Electricity	●	●	●	●					●	●	●	●		●						●		●		●	●
16	Utility Performance Incentives - Natural Gas	●	●	●	●			●			●	●	●		●								●			●
31	Utility On-Bill Financing	●	●	●	●	●	●	●	●	●	●	●		●	●	●			●			●	●		●	●

Commercial and Residential Building Energy Policies are scored based on their relation to ASHRAE and IECC standards. Scores are broken into four tiers and represented by circles: fully shaded (strongest); 2/3 shaded (2nd tier); 1/3 shaded (3rd tier); unshaded (weakest or no codes).

REGULATIONS & MANDATES

INCENTIVES

CLEAN EDGE

POLICY CATEGORY RANK	NV	MT	GA	IA	FL	ME	LA	AL	AR	SC	OK	TN	ID	MO	NE	VT	KS	UT	VA	WY	SD	AK	MS	ND	WV
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50

REGULATIONS & MANDATES

Policy	NV	MT	GA	IA	FL	ME	LA	AL	AR	SC	OK	TN	ID	MO	NE	VT	KS	UT	VA	WY	SD	AK	MS	ND	WV
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: No Large Hydro	•	•		•																					
Smart RPS: Solar/DG Provision	•																								
Energy Efficiency Resource Standard	•			•					•																
State Renewable Fuel Standard			•			•		•						•											
Climate Action Plan	•	•		•	•	•		•	•	•		•				•			•	•			•		
GHG Reduction Target					•	•										•									
Membership in Active Regional Climate Initiative						•										•									
Low Carbon Fuel Standard																									
State Fleet High Efficiency Vehicle Requirement	•			•				•									•						•		
Mandated Green Power Purchasing Option			•																•						
Interconnection Law/Policy	•	•	•	•	•	•	•	•		•				•	•	•	•	•	•	•	•	•			•
Net Metering Law/Policy	•	•	•	•	•	•	•		•	•	•			•	•	•	•	•	•	•	•		•	•	
Commercial Building Energy Policy	◐	◐	◐	◐	○	•	◐	◐	◐	◐	◐	◐	○	◐	○	◐	◐	◐	○	○	○	○	○	○	○
Residential Building Energy Policy	◐	◐	◐	◐	◐	○	○	◐	○	◐	○	◐	○	◐	○	◐	○	◐	○	○	○	○	○	○	○

INCENTIVES

Policy	NV	MT	GA	IA	FL	ME	LA	AL	AR	SC	OK	TN	ID	MO	NE	VT	KS	UT	VA	WY	SD	AK	MS	ND	WV
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				•		•		•	•	•	•	•		•		•		•			•				

Commercial and Residential Building Energy Policies are scored based on their relation to ASHRAE and IECC standards. Scores are broken into four tiers and represented by circles: fully shaded (strongest); 2/3 shaded (2nd tier); 1/3 shaded (3rd tier); unshaded (weakest or no codes).

CAPITAL
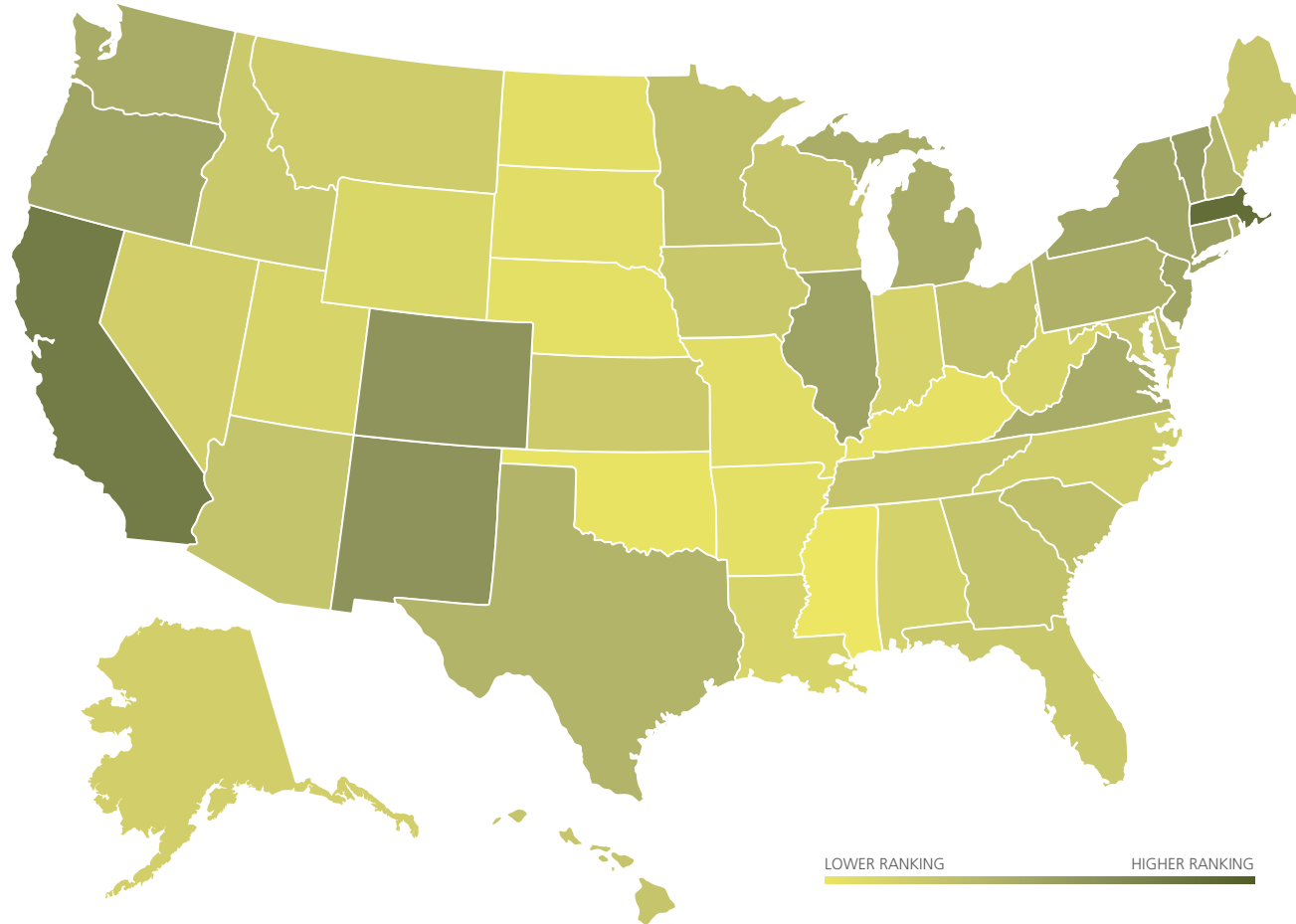
LOWER RANKING — HIGHER RANKING

RANK	STATE	LEADERSHIP SCORE
1	Massachusetts	89.3
2	California	79.1
3	New Mexico	63.4
4	New York	62.5
5	Colorado	61.6
6	Oregon	57.9
7	Vermont	56.6
8	Connecticut	53.2
9	Illinois	51.1
10	New Jersey	50.2
11	Washington	44.9
12	Michigan	44.1
13	Virginia	43.8
14	Rhode Island	42.5
15	Pennsylvania	40.5
16	Texas	39.0
17	New Hampshire	38.8
18	Delaware	30.5
19	Ohio	30.4
20	South Carolina	29.6
21	Minnesota	29.5
22	Georgia	27.3
23	Arizona	27.0
24	Tennessee	26.4
25	Hawaii	26.0
26	Wisconsin	25.1
27	Maine	25.0
28	Maryland	24.9
29	Iowa	23.9
30	Florida	23.8
31	Idaho	23.2
32	Kansas	22.3
33	Montana	19.8
34	North Carolina	18.7
35	Nevada	18.3
36	Alaska	18.0
37	Alabama	16.0
38	Indiana	14.6
39	Utah	14.3
40	West Virginia	14.0
41	Louisiana	13.6
42	Wyoming	12.1
43	Missouri	7.0
44	South Dakota	6.9
45	North Dakota	6.1
46	Arkansas	5.2
47	Nebraska	5.0
48	Kentucky	4.3
49	Oklahoma	1.5
50	Mississippi	0.2

CAPITAL OVERVIEW

The two-pronged Capital category measures the latest state-level investment activity, as well as the presence, concentration, and vibrancy of human and intellectual capital in each state. This analysis provides insight into each state's ability to attract not only clean-tech dollars, but also the minds and ideas that translate into long-lasting regional leadership, tracking areas such as venture capital, patent registrations, and the presence of relevant higher education and research institutions.

Massachusetts leads this category for the fourth consecutive year with a score of 89.3, outpacing California's 79.1. Those two states essentially battle it out for Capital leadership, with the rest of the pack (led by #3 New Mexico's 63.4) well behind. All of the top 10 Capital states in 2013 also made the top 10 in Capital in last year's Index, with some movement; New York jumped from seventh place to fourth, swapping places with Vermont. Capital is a strong category for the Northeast, with Connecticut, Massachusetts, New Jersey, New York, and Vermont all in the top 10.

2012 was a rough year for clean-energy venture capital, with funding down 26 percent nationwide from the prior year, but Massachusetts weathered the storm better than most states to notch the first-place score of 100 in the Financial Capital subcategory. Even though the state's VC dollars per capita fell to $75.94 from $81.36 in 2011, that was modest compared to California's plunge from a nation-leading $98.76 in 2011 to $58.51, a 41 percent drop. Colorado's level fell by more than half, from $69.91 to $32.40, but the state still held its #3 ranking in the U.S. in that indicator. California, of course, remains the nation's leader in total (non-levelized)

CLEAN ENERGY VENTURE CAPITAL INVESTMENT – TOP 10 STATES BY DOLLARS PER CAPITA (2012)

STATE	RANK	DOLLARS INVESTED PER CAPITA	TOTAL DOLLARS ($, MILLIONS)	TOTAL DEALS
MASSACHUSETTS	1	$75.94	$504.7	40
CALIFORNIA	2	$58.51	$2,225.8	143
COLORADO	3	$32.40	$168.1	17
VIRGINIA	4	$21.67	$177.4	7
ARIZONA	5	$16.72	$109.5	12
MINNESOTA	6	$15.68	$84.4	10
ILLINOIS	7	$14.82	$190.8	7
MICHIGAN	8	$14.09	$139.2	8
NEW HAMPSHIRE	9	$13.86	$18.3	3
VERMONT	10	$12.78	$8.0	1

Source: Cleantech Group data with Clean Edge analysis. Cleantech Group investment data used includes venture and growth financing rounds in the following sectors: Air & Environment; Biofuels & Biomaterials; Energy Efficiency; Energy Storage; Materials; Recycling & Waste; Smart Grid; Solar; Transportation; and Wind.
Full dataset available to subscription clients.

clean-energy VC investments, with the transportation sector displacing solar power as the top technology area receiving VC dollars in 2012.

Although the overall Capital top 10 states remain relatively consistent from year to year, there's a notable contrast between the leaders of the two subcategories, Financial and Human & Intellectual Capital. Rhode Island is third in Financial and
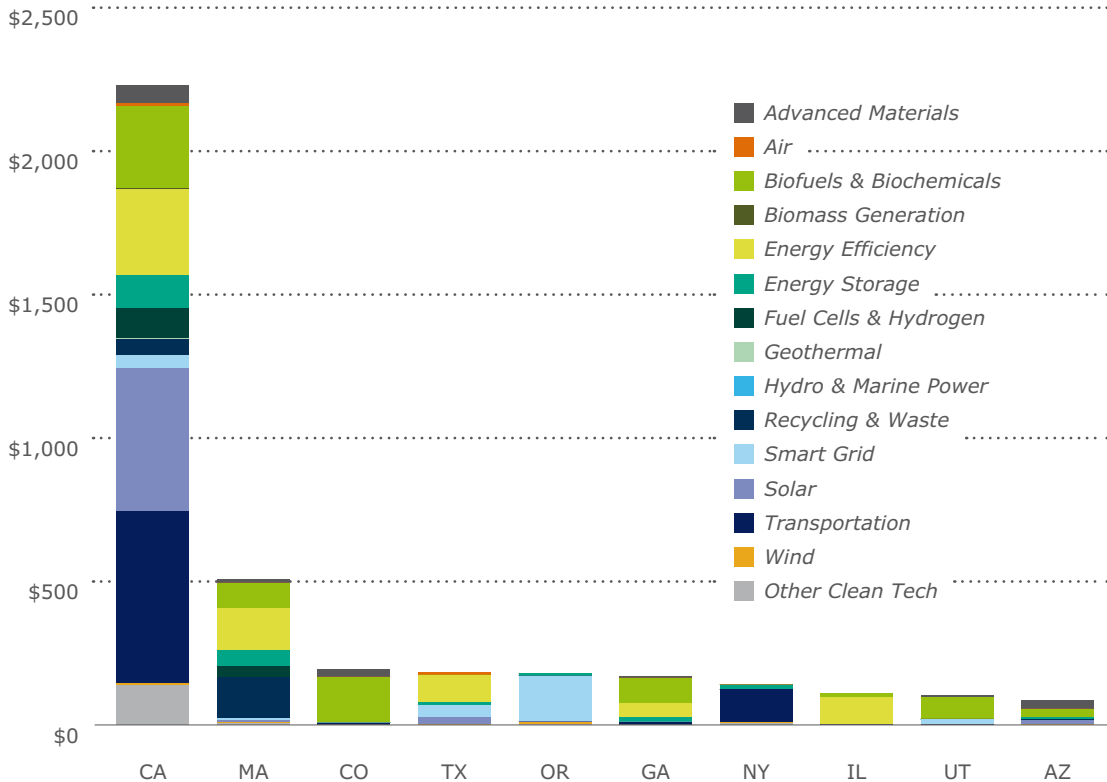
31st in Human & Intellectual; New Hampshire, sixth and 27th; Minnesota, seventh and 39th; and Hawaii, eighth and 41st. On the flip side, New Mexico, #1 in Human & Intellectual Capital with a 100 score on the strength of its national energy labs and other factors, ranks just 18th in the Financial subcategory.

In Human & Intellectual Capital, clean-energy patent activity continues to grow, with nearly all of the leading states showing growth in patents granted in 2012. The top four states in patents per million people – Delaware, Michigan, Connecticut, and New York – retained the same rankings from 2011. Fifth-ranked New Mexico and #8 Massachusetts swapped places from last year's Index, while Arizona moved into the top 10 in ninth place.

In total clean-energy patents granted in 2012, New York edged ahead of last year's runner-up, Michigan, to take second place behind California. These three lead all other states by a wide margin, but patent activity is dominated by a different clean-energy sector in each one: solar power in California, wind energy components in New York, and fuel cells in Michigan.

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

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

CLEAN ENERGY PATENTS GRANTED (2012)

STATE	RANK	PATENTS PER 1 MILLION PEOPLE	TOTAL PATENTS
DELAWARE	1	29.4	27
MICHIGAN	2	20.4	202
CONNECTICUT	3	11.4	41
NEW YORK	4	11.1	217
NEW MEXICO	5	10.5	22
CALIFORNIA	6	9.1	345
COLORADO	7	8.3	43
MASSACHUSETTS	8	6.9	46
ARIZONA	9	6.0	39
OREGON	10	5.6	22

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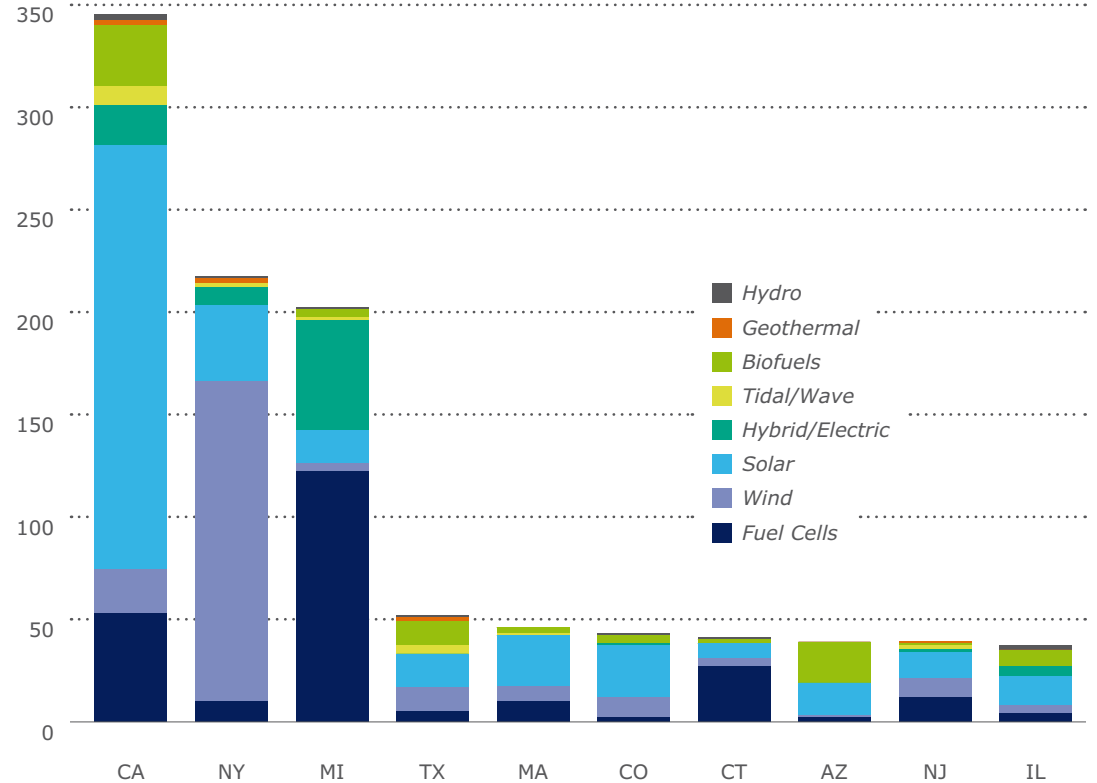
Source: Data from Heslin Rothenberg Farley & Mesiti P.C. with Clean Edge analysis.
Full dataset available to subscription clients.

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.

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, R.L. Polk & Co., Heslin Rothenberg Farley & Mesiti P.C., InnovateTech Ventures, and the Interstate Renewable Energy Council.

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 (2012, MWh % of Total)

Utility-Scale Clean Electricity Generation incl. Hydro & Biomass (2012, MWh % of Total)

Utility-Scale Wind Electricity Generation (2012, % of Total)

Utility-Scale Solar Electricity Generation (2012, % of Total)

Utility-Scale Geothermal Electricity Generation (2012, % of Total)

Utility-Scale Hydro Electricity Generation (2012, % of Total)

Utility-Scale Biomass Electricity Generation (2012, MWh % of Total)

Installed Wind Capacity (2012, % of Total)

Installed Solar Capacity (2012, % of Total)

Installed Geothermal Capacity (2012, % of Total)

CLEAN TRANSPORTATION

Hybrid Electric Vehicles Per 1M People (as of 10/1/12)

Electric Vehicles Per 1M People (as of 10/1/12)

Natural Gas Vehicles Per 1M People (as of 10/1/12)

Electric Vehicle Charging Stations Per 1M People (as of 4/15/13)

E85 & B20 Fueling Stations Per 1M People (as of 4/15/13)

CNG Fueling Stations Per 1M People (as of 4/15/13)

Ethanol Operating Capacity Per Sq Mi Land (2012, Thousand Gallons)

ENERGY INTELLIGENCE & GREEN BUILDING

Electricity Consumption Per Capita (2012, Annual kWh)

Electric Productivity (2011, State GDP Dollars Per kWh Consumed)

LEED-Certified Projects Per 1M People

LEED-Certified Square Feet Per Capita

Energy Star Buildings & Plants Per 1M People

Energy Star Buildings & Plants Square Feet Per Capita

Energy Star Homes Per 1K People

Smart Meter Market Penetration (2012, % of Total Meters)

ACEEE 2012 State Energy Efficiency Scorecard 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: No Large Hydro

Smart RPS: Solar/DG Provision

Energy Efficiency Resource Standard

State Renewable Fuel Standard

Climate Action Plan

GHG Reduction Target

Membership in Active Regional Climate Initiative

Low Carbon Fuel Standard

State Fleet High Efficiency Vehicle 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

CAPITAL

FINANCIAL CAPITAL

Venture Capital Investment ($ Per Capita, 2010-2012)

Venture Capital Investment (Deals Per 1 M People, 2010-2012)

Venture Capital Investment ($ Per Capita, 2012)

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

Utility Energy Efficiency Program Budget ($ Per Capita, 2011)

State Clean Energy Fund or Public Benefit Fund

HUMAN & INTELLECTUAL CAPITAL

Clean Energy Patents (Patents Per 1M People, 2012)

Clean Energy Patents (Patents Per 1M People, 2002-2012)

Green Jobs (as % of total employment)

Licensable University Clean Technologies (Per 1M People)

Presence of DOE Lab

Presence of Clean Energy Alliance Incubator

Presence of Top-Ranked Green MBA Program
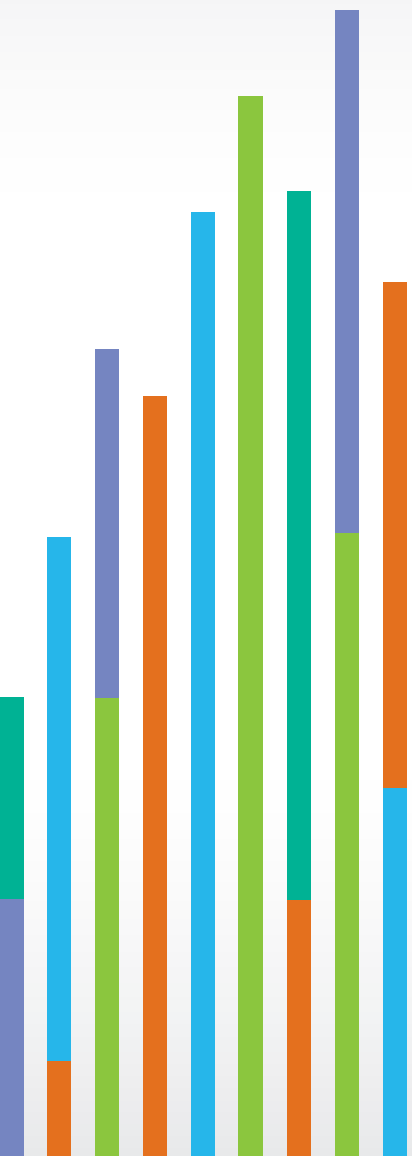
METRO INDEX

2013 U.S. Clean Tech Leadership Index

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 52.**

METRO INDEX

LOWER RANKING — HIGHER RANKING

RANK	METRO AREA	LEADERSHIP SCORE
1	San Francisco, CA	89.2
2	San Jose, CA	80.3
3	Portland, OR	62.8
4	Los Angeles, CA	56.1
5	Washington, DC	55.7
6	Sacramento, CA	55.6
7	San Diego, CA	54.7
8	Denver, CO	51.5
9	Seattle, WA	51.2
10	Boston, MA	50.5
11	Austin, TX	48.8
12	Chicago, IL	41.7
13	Salt Lake City, UT	38.5
14	Minneapolis, MN	36.5
15	Dallas, TX	35.8
16	Houston, TX	34.4
17	Hartford, CT	33.5
18	Riverside, CA	33.1
19	Philadelphia, PA	31.6
20	Phoenix, AZ	31.3
21	New York, NY	30.7
22	Oklahoma City, OK	30.7
23	Raleigh, NC	30.4
24	Atlanta, GA	30.3
25	Milwaukee, WI	29.1
26	Detroit, MI	28.2
27	Kansas City, MO	26.3
28	Nashville, TN	26.1
29	Charlotte, NC	24.6
30	Las Vegas, NV	24.3
31	Buffalo, NY	23.7
32	Indianapolis, IN	23.5
33	Baltimore, MD	21.7
34	Providence, RI	21.5
35	Columbus, OH	21.0
36	Cleveland, OH	19.5
37	Orlando, FL	19.4
38	Richmond, VA	18.7
39	Pittsburgh, PA	18.7
40	Cincinnati, OH	18.0
41	Virginia Beach, VA	17.9
42	San Antonio, TX	17.1
43	Louisville, KY	16.5
44	St. Louis, MO	15.8
45	Tampa, FL	15.1
46	Miami, FL	13.1
47	Jacksonville, FL	11.0
48	Memphis, TN	9.7
49	New Orleans, LA	7.3
50	Birmingham, AL	4.2
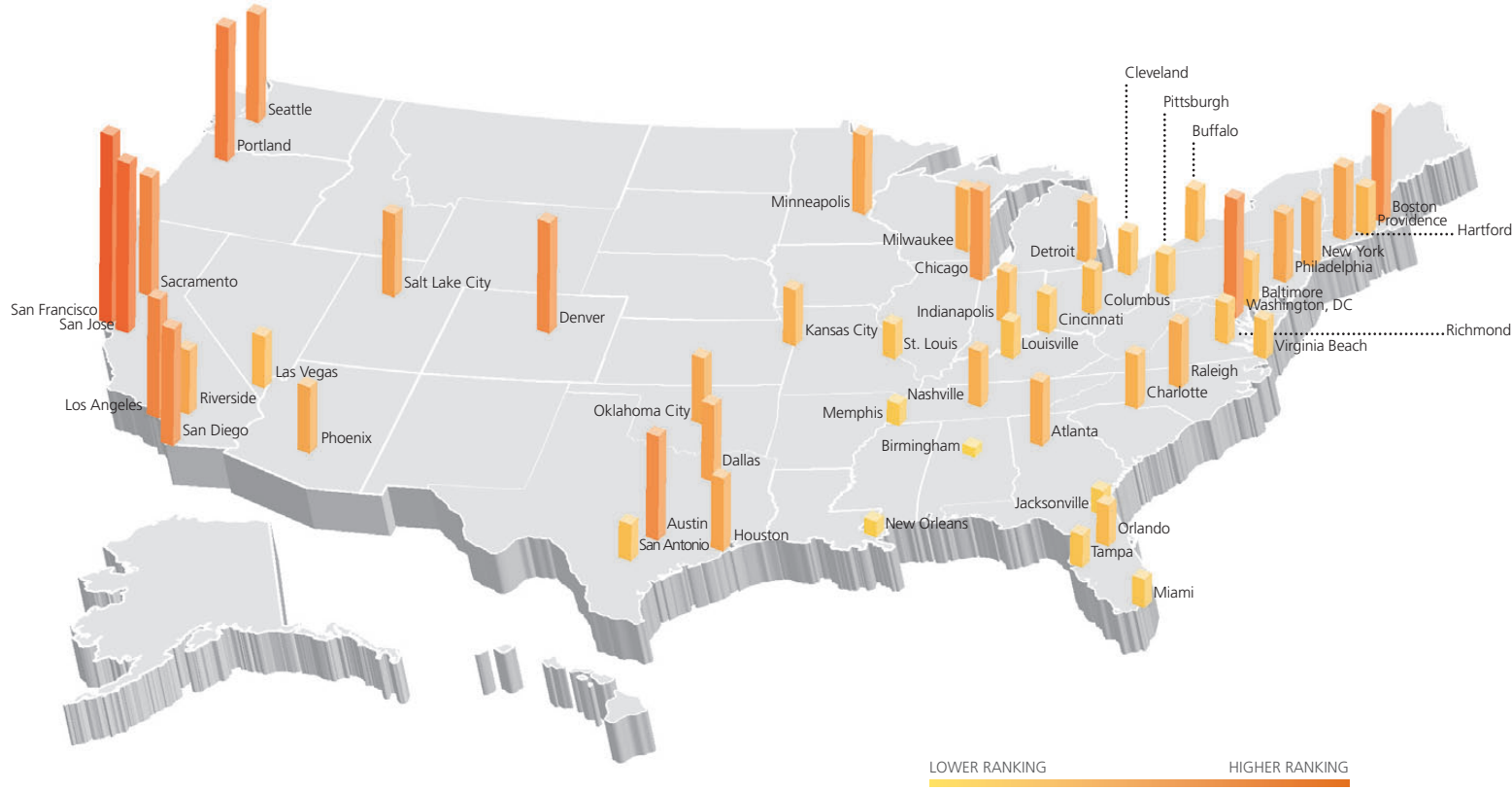
2013 METRO INDEX RESULTS

In analyzing the clean-tech landscape of the U.S., it's quite clear that leadership at the state and city level is inextricably linked. Although our Metro Index categories, indicators, and methodology vary from those of the State Index, the results of Clean Edge's second annual Metro Index dramatically show this linkage.

No less than half of the top 10 metro areas (in fact, five of the top seven) are located in the leader of the State Index for the past four years running, California. Four other metro areas are in top 10 states Oregon, Colorado, Washington, and Massachusetts, while another top 10 state, Illinois, has the metro area of Chicago checking in at #12. Even though some metro areas include suburbs and outlying cities in neighboring states, the correlation remains striking. The only exception among the top 10 metro areas is America's unique "city without a state," the nation's capital of Washington, D.C., which ranks fifth in our 2013 Metro Index.

The Top 10 Metro Areas

1. SAN FRANCISCO, CA – Like its world champion Giants in baseball, San Francisco takes the crown for U.S. Metro clean-tech leadership in calendar year 2012. The City by the Bay captures the crown from its southern neighbor San Jose, #1 in our inaugural Metro Index last year. Ranking #1 in Advanced Transportation and second or third in the three other categories, San Francisco raised its score from 81.4 to 89.2 to take the top spot in the Index.

2. SAN JOSE, CA – San Jose's overall score dropped slightly from 82.2 to 80.3, but it's still nearly 20 points higher than #3 metro area Portland. San Francisco and San Jose combine for a formidable 1-2 duo that we see leading the U.S. for some time to come. San Jose's first-place score in Investment, Innovation & Workforce affirms Silicon Valley's position as the nation's (and world's) preeminent nexus of R&D, venture capital, and entrepreneurship, and along with a #1 ranking in Clean Electricity & Carbon Management, is more than enough to offset a 21st-place finish in Green Buildings. San Jose is the smallest metro area in the top 10, just 34th in the U.S. with less than two million people in an area that also includes Sunnyvale, Santa Clara, and Palo Alto.

3. PORTLAND, OR – Portland's green ethos is often spoofed on the hit TV series *Portlandia*, but it's helped the Rose City lead the rest of the nation, excluding California, with the Metro Index's #3 ranking for the second straight year. Portland boosted its 2012 score more than 10 points from 52.2 to 62.8. Long a center of green design expertise and deployment, Portland ranks fourth in Green Buildings as well as Clean Electricity.

4. LOS ANGELES, CA – After Portland, the metros are very tightly bunched, with less than six points separating the #4 and #10 metro areas. Los Angeles, the nation's second largest metro area, jumped three places from seventh last year, boosting its 52.2 score to 56.1. Thanks in large part to its municipal utility's clean

energy mix, L.A. ranks #2 in the Clean Electricity category; L.A. Mayor Antonio Villaraigosa has pledged to remove all coal-fired power from the mix by 2025.

5. WASHINGTON, DC – The nation's capital also vaulted three places, from its #8 Index ranking last year. Washington's leadership is a bit one-dimensional: it's #1 in the Green Buildings category with a 100 score for the second straight year, but doesn't make the top 10 in any other category.

6. SACRAMENTO, CA – Sacramento's score dropped slightly from 59.4 to 55.6, costing California's state capital two places after last year's #4 ranking. It's in the top 10 in all four categories, placing highest in Investment, Innovation, and Workforce at #4.

7. SAN DIEGO, CA – San Diego showed the best improvement of any top city over the 2012 Index. The metro area added 10 points to a 44.7 score to leap four places from 11th to seventh, giving California its fifth entrant in the top seven. San Diego has an aggressive focus from both the public and private sectors to expand its clean-tech economy, and it has paid off with a solid all-around performance of 11th place or better in all four categories.

8. DENVER, CO – Denver's overall score fell three points from the 2012 Index, costing it two places from last year's sixth. But with Austin dropping from 10th to 11th this year, Denver is the only non-coastal metro area in the top 10. Denver particularly shines in Green Buildings with a #3 ranking, paralleling Colorado's leadership; the state has been second in the nation in the State Index's Technology subcategory for the past two years.

9. SEATTLE, WA – Seattle dropped four spots from fifth last year, its score down more than five points from 56.5 to 51.2. A strong #5 in both Green Buildings and Advanced Transportation, the Emerald City is 14th in Clean Electricity and just 19th in Investment, Innovation & Workforce.

10. BOSTON, MA – The lone top 10 metro area from the Northeast for the second straight year, Boston essentially stayed even, slightly improving its score from 49.4 to 50.5 and dropping one place. The Hub is indeed a hub for Investment, Innovation & Workforce, trailing only the Bay Area's two metro areas in that category. Thanks to its world-class research bona fides from MIT and many other universities, and a strong VC-fueled technology culture, Boston remains the East Coast capital of clean-tech entrepreneurship.

GREEN BUILDINGS

LOWER RANKING   HIGHER RANKING
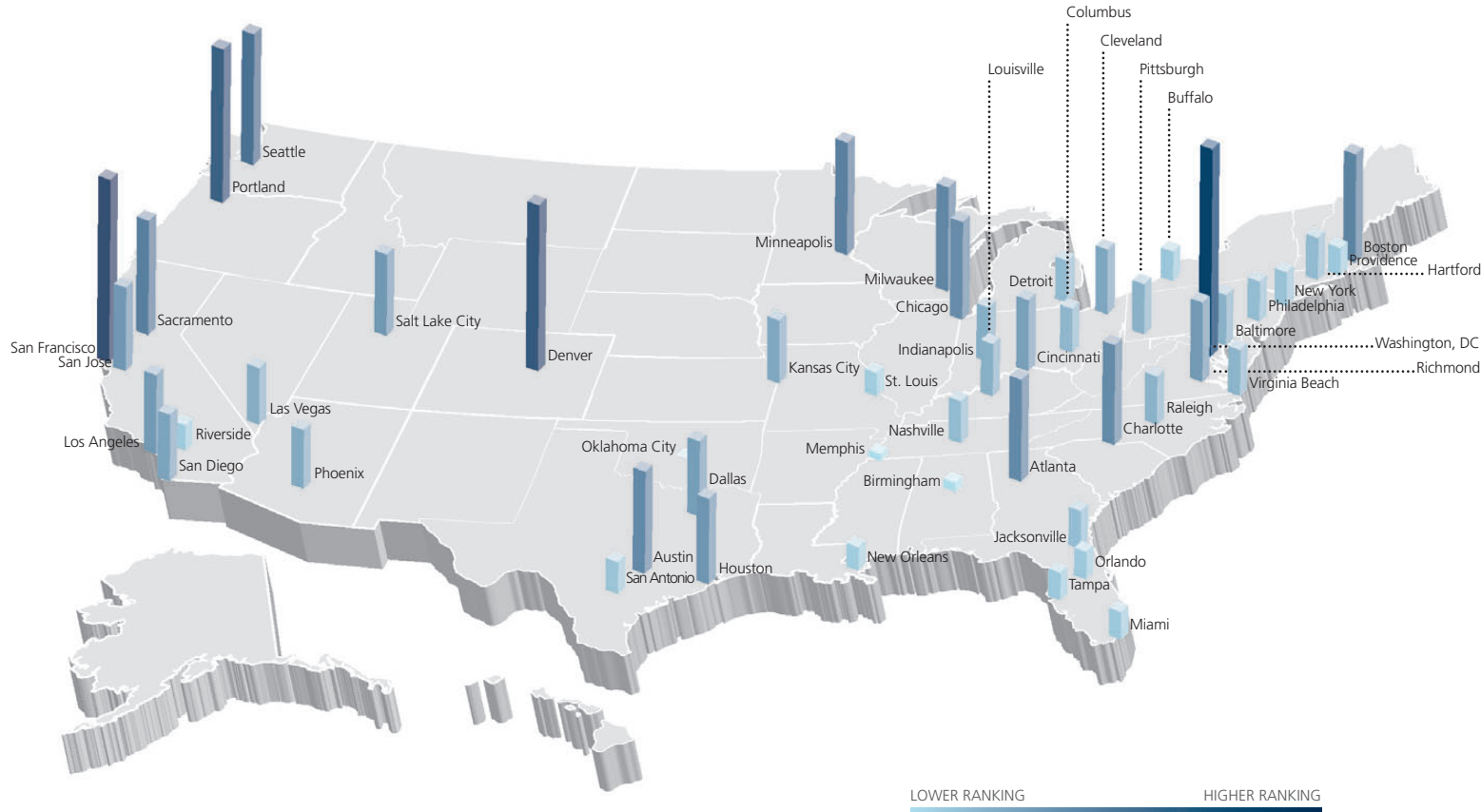
RANK	METRO AREA	LEADERSHIP SCORE
1	Washington, DC	100.0
2	San Francisco, CA	88.1
3	Denver, CO	80.2
4	Portland, OR	73.9
5	Seattle, WA	63.4
6	San Diego, CA	56.5
7	Sacramento, CA	54.8
8	Minneapolis, MN	53.9
9	Boston, MA	52.0
10	Milwaukee, WI	49.6
11	Austin, TX	48.7
12	Atlanta, GA	48.6
13	Charlotte, NC	47.6
14	Chicago, IL	46.6
15	Houston, TX	41.3
16	Salt Lake City, UT	38.8
17	Los Angeles, CA	38.2
18	Richmond, VA	37.9
19	Dallas, TX	36.1
20	Cincinnati, OH	34.3
21	San Jose, CA	31.8
22	Cleveland, OH	31.1
23	Kansas City, MO	30.2
24	Phoenix, AZ	27.9
25	Las Vegas, NV	27.3
26	Indianapolis, IN	25.5
27	Louisville, KY	24.5
28	Baltimore, MD	23.9
29	Pittsburgh, PA	23.6
30	Raleigh, NC	23.1
31	Virginia Beach, VA	21.7
32	Columbus, OH	21.1
33	Detroit, MI	20.2
34	Hartford, CT	19.8
35	Nashville, TN	19.5
36	Philadelphia, PA	19.4
37	Jacksonville, FL	17.7
38	New York, NY	16.1
39	San Antonio, TX	14.6
40	Buffalo, NY	13.6
41	Orlando, FL	12.9
42	Providence, RI	12.9
43	Miami, FL	12.7
44	Tampa, FL	12.6
45	Riverside, CA	12.4
46	St. Louis, MO	11.1
47	New Orleans, LA	10.8
48	Birmingham, AL	4.1
49	Memphis, TN	2.9
50	Oklahoma City, OK	0.0

GREEN BUILDINGS OVERVIEW

With buildings responsible for roughly one-third of all greenhouse gas emissions in the U.S., tracking the rapidly expanding green building sector is an integral part of understanding how clean technologies are being deployed to fight climate change. And in urban areas where buildings are responsible for a higher than average share of local emissions – up to 75 percent in some cities – developing a sustainable and energy-efficient built environment is critical.

In the Green Buildings category of the Metro Clean Tech Index, four equally weighted indicators are used to evaluate the advancement of sustainable building infrastructure 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 number of projects and square feet per capita is calculated for each of the 50 largest metro areas. In similar fashion, the remaining two indicators track the number of projects and square feet per capita of Energy Star qualified buildings – the U.S. Environmental Protection Agency's standard registry of energy-efficient buildings.

The rankings for the Green Buildings category this year look very similar to the 2012 edition of the Metro Index. Washington, D.C. tops the list – a clear consequence of the federal government leading by example in building efficiency efforts. Following D.C. in the top five are San Francisco, Denver, Portland, and Seattle. The West

Coast handily outperforms all other regions in Green Buildings, with five of the region's major metro areas ranking in the top seven.

The USGBC's green building program, LEED, provides third-party verification of green building projects based on a wide variety of criteria. The program evaluates commercial buildings, neighborhood developments, and homes – although homes are excluded from our measure for this indicator. 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.

Through the end of 2012, the Washington, D.C. metro area was home to more LEED projects per capita than any other metro area in the country. Its 653 projects represents a more than 200-project jump from the 2011 total, allowing D.C. to move from fourth to first place in the LEED projects per capita indicator. As mentioned previously, the main driver of Washington, D.C.'s LEED success is the federal government, which has made an extensive effort to certify government-owned buildings. Arlington, Virginia is included in the broader D.C. metro area, meaning the many government agencies headquartered in this city across the Potomac River – and their many LEED buildings – count towards D.C.'s total. Other top performers in LEED projects per capita include the West Coast sustainability powerhouses

of Portland, San Francisco, and Seattle, each closely trailing the nation's capital for the highest concentration of LEED-certified buildings. And while the New York City area does rank second for total number of LEED projects, the sheer size of the metro area (the nation's largest) means it underperforms in per capita terms.

Results change slightly when evaluating LEED deployment by square feet, favoring places that are home to larger LEED projects. Washington, D.C. again places first, but is joined by a few players that aren't standouts in the projects per capita indicator. Las Vegas, last year's LEED square feet per capita leader, places second this year thanks to its many major LEED developments on the Las Vegas strip and facilities at nearby UNLV; Chicago, seventh in square feet per capita, performs stronger here due to the city's efforts to green its downtown high-rises; and Austin, thanks to its many University of Texas and state government green buildings, ranks eighth for LEED square feet per capita.

In addition to LEED-related indicators, the Green Buildings category also looks at Energy Star building certification. Launched by the EPA in 1992, the Energy Star program has accredited more than 20,000 commercial buildings across the U.S., granting Energy Star certification for commercial buildings and industrial plants that achieve a score of 75 or higher on Energy Star's 100-point evaluation model. While there are more than 20 different types of qualified Energy Star facilities, the majority consist of commercial offices (7,000+ projects), K-12 schools (6,000+), and supermarket/grocery stores (2,000+). Of the buildings labeled Energy Star through 2012, nearly two-thirds are located in the 50 metro areas covered in the Metro Index and nearly 80 percent of all reported Energy Star square footage is located in this scope.

LEED CERTIFIED PROJECTS			
METRO AREA	RANK	PROJECTS PER 1M PEOPLE	TOTAL PROJECTS
WASHINGTON, D.C.	1	111.4	653
PORTLAND, OR	2	109.2	250
SAN FRANCISCO, CA	3	104.1	464
SEATTLE, WA	4	95.4	339
DENVER, CO	5	76.0	201
BOSTON, MA	6	68.7	319
SAN DIEGO, CA	7	68.6	218
SALT LAKE CITY, UT	8	64.1	72
BALTIMORE, MD	9	60.3	166
PITTSBURGH, PA	10	57.2	135

Source: USGBC with Clean Edge analysis. LEED Certified Projects includes all buildings awarded LEED certification through 12/31/2012. This does not include LEED for Homes projects.
**Full dataset available to subscription clients.**

Energy Star's energy-specific requirements differ from LEED criteria, resulting in a different metro area leadership mix. Sacramento leads all areas in terms of Energy Star projects per capita, edging out the other leading markets of Denver, Washington, D.C., San Diego, and Charlotte. The Los Angeles area is home to more Energy Star projects than any other metro area and is the only location with more than 1,000 qualified facilities, but as with New York City in the LEED indicator, LA's large population hinders its per capita performance. Leading the Energy Star indicator measuring square feet per capita is Washington, D.C., followed by San Francisco, Minneapolis, Denver, and Atlanta. In total, eight metro areas are home to more than 100 million Energy Star-certified square feet.

LEED CERTIFIED SQUARE FEET

METRO AREA	RANK	SQUARE FEET PER CAPITA	TOTAL SQUARE FEET (THOUSANDS)
WASHINGTON, D.C.	1	27.7	162,274
LAS VEGAS, NV	2	23.5	47,096
SAN FRANCISCO, CA	3	22.1	98,314
DENVER, CO	4	21.8	57,626
SEATTLE, WA	5	20.2	71,804
PORTLAND, OR	6	18.7	42,762
CHICAGO, IL	7	16.2	154,017
AUSTIN, TX	8	13.9	25,513
HOUSTON, TX	9	12.0	73,960
DALLAS, TX	10	11.6	77,514

Source: USGBC with Clean Edge analysis. LEED Certified Square Feet includes all buildings awarded LEED certification through 12/31/2012. This does not include LEED for Homes projects.
Full dataset available to subscription clients.

ENERGY STAR BUILDINGS AND PLANTS

METRO AREA	RANK	PROJECTS PER 1M PEOPLE	TOTAL PROJECTS
SACRAMENTO, CA	1	155.7	342
DENVER, CO	2	146.3	387
WASHINGTON, D.C.	3	141.8	831
SAN DIEGO, CA	4	139.4	443
CHARLOTTE, NC	5	138.0	317
SAN FRANCISCO, CA	6	136.0	606
MILWAUKEE, WI	7	132.1	207
PORTLAND, OR	8	121.4	278
MINNEAPOLIS, MN	9	118.6	406
RICHMOND, VA	10	112.0	138

Source: Energy Star with Clean Edge analysis. Energy Star Buildings and Plants includes all projects that have qualified for Energy Star accreditation through 2012. This does not include Energy Star certification for new homes.
Full dataset available to subscription clients.

ADVANCED TRANSPORTATION

LOWER RANKING — HIGHER RANKING
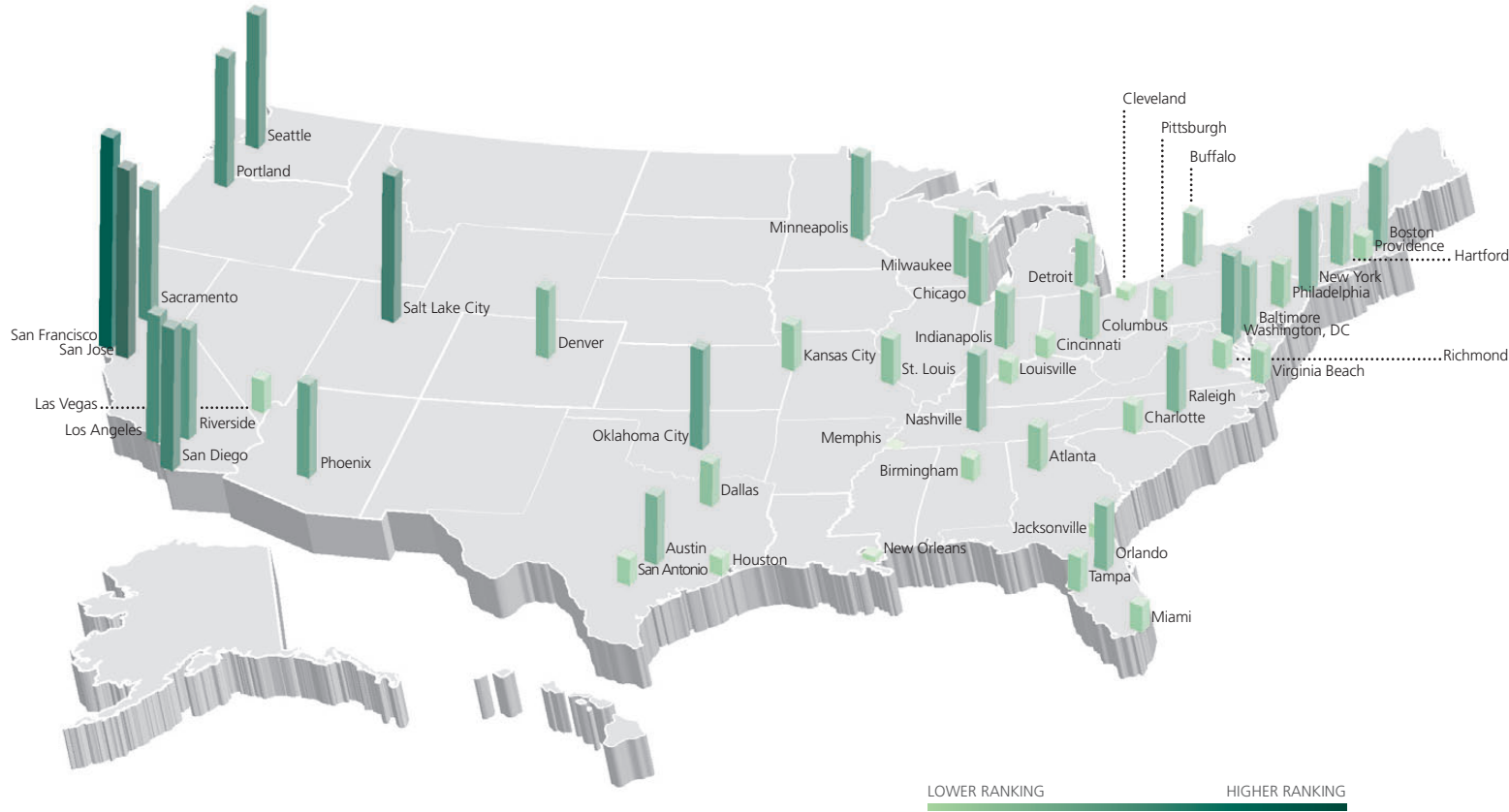
RANK	METRO AREA	LEADERSHIP SCORE
1	San Francisco, CA	100.0
2	San Jose, CA	89.3
3	Salt Lake City, UT	69.0
4	San Diego, CA	67.2
5	Seattle, WA	62.9
6	Sacramento, CA	62.3
7	Portland, OR	61.0
8	Los Angeles, CA	59.7
9	Riverside, CA	52.2
10	Oklahoma City, OK	47.0
11	Phoenix, AZ	44.4
12	Washington, DC	41.2
13	Minneapolis, MN	39.4
14	New York, NY	38.1
15	Boston, MA	37.9
16	Nashville, TN	36.4
17	Denver, CO	31.9
18	Austin, TX	31.7
19	Baltimore, MD	31.2
20	Orlando, FL	30.0
21	Chicago, IL	29.8
22	Raleigh, NC	29.6
23	Milwaukee, WI	27.8
24	Hartford, CT	27.6
25	Indianapolis, IN	25.5
26	Buffalo, NY	23.9
27	Detroit, MI	21.9
28	Columbus, OH	21.7
29	St. Louis, MO	21.2
30	Kansas City, MO	21.0
31	Dallas, TX	20.1
32	Philadelphia, PA	19.9
33	Atlanta, GA	19.8
34	Tampa, FL	15.7
35	Virginia Beach, VA	15.4
36	Las Vegas, NV	15.1
37	Pittsburgh, PA	14.3
38	Charlotte, NC	12.6
39	Miami, FL	12.3
40	Richmond, VA	11.7
41	San Antonio, TX	11.6
42	Providence, RI	11.4
43	Louisville, KY	10.2
44	Birmingham, AL	9.9
45	Cincinnati, OH	8.6
46	Houston, TX	8.0
47	Jacksonville, FL	5.6
48	Cleveland, OH	3.5
49	New Orleans, LA	2.1
50	Memphis, TN	0.0

ADVANCED TRANSPORTATION OVERVIEW

The Advanced Transportation category combines seven indicators to benchmark U.S. metro areas in the transportation sector, which in many cities is the leading source of CO2 emissions and environmental impacts. Advanced Transportation indicators cover metro areas' penetration of three types of advanced transportation vehicles; their related charging or fueling infrastructure; and public transportation ridership.

As in last year's Index, metro areas in the western U.S. dominate this category. The top 11 metros are all west of the Mississippi River, and all but two, #3 Salt Lake City and #10 Oklahoma City, are on the West Coast. San Francisco and San Jose rank #1 and #2 in Advanced Transportation, just as they do in the overall Index, and as they did in this category in the 2012 Index. But Salt Lake City places third (up from fourth last year), mainly from its nation-leading use of natural gas vehicles (NGVs). The Utah state capital has nearly one NGV registered for every thousand people; no other metro area even reaches 0.4 in that indicator.

Overall, the Advanced Transportation top 10 comprises the same metro areas as last year with one exception, Oklahoma City (#11 in 2012) swapping places with last year's 10th place finisher, Phoenix. As they did last year, all six of California's largest metro areas make the top 10 in this category: the five metros represented in the overall Metro Index top 10 plus Riverside, which is 18th in the overall Index but ninth in Advanced Transportation.

In terms of vehicle registration data, this category has one methodological anomaly. The data source for these three indicators, R.L. Polk, reports vehicle sales data by Designated Market Area (DMA), and these geographic areas do not exactly align with the Metropolitan Statistical Area (MSA) designations used throughout the Metro Index. Practically speaking, this only affects four metro areas in this index, all of them in California. San Francisco/San Jose and Los Angeles/Riverside are respectively combined into one DMA; they are separate and distinct MSAs throughout the rest of the Index.

But both these DMAs are at or very near the top in two key vehicles-related indicators, registered hybrids and electric vehicles (EVs). San Francisco/San Jose is #1 in both for the second straight year. With nearly 24 hybrids per thousand people, the Bay Area leads the pack by a wide margin. In the much more nascent EV indicator, the area's result of just 1.53 vehicles per thousand leads the way. (It should be noted that GM's Chevy Volt, even though it has a small backup gasoline engine, runs primarily on electricity and is classified as an EV.) Los Angeles/Riverside is fifth in hybrids and third in EVs, with neighboring San Diego claiming second place in both indicators. Washington, D.C. cracks the West Coast lineup of leading hybrid users at #4, although it's down from second place last year. Boston, Austin, and Denver also make the top 10 in hybrid usage.

HYBRID ELECTRIC VEHICLES IN USE

METRO AREA	RANK	HEVS PER 1K PEOPLE	TOTAL HEVS
SAN FRANCISCO/SAN JOSE, CA	1	23.91	168,193
SAN DIEGO, CA	2	15.79	48,873
SEATTLE, WA	3	15.46	74,165
WASHINGTON, D.C.	4	15.16	96,865
LOS ANGELES/ RIVERSIDE, CA	5	13.31	233,611
PORTLAND, OR	6	13.08	40,951
SACRAMENTO, CA	7	12.44	50,208
BOSTON, MA	8	11.44	72,350
AUSTIN, TX	9	10.78	20,033
DENVER, CO	10	10.13	40,830

ELECTRIC VEHICLES IN USE

METRO AREA	RANK	EVS PER 1K PEOPLE	TOTAL EVS
SAN FRANCISCO/SAN JOSE, CA	1	1.53	10,776
SAN DIEGO, CA	2	1.14	3,527
LOS ANGELES/ RIVERSIDE, CA	3	0.94	16,567
SACRAMENTO, CA	4	0.88	3,533
PHOENIX, AZ	5	0.71	3,539
SEATTLE, WA	6	0.60	2,893
PORTLAND, OR	7	0.45	1,408
DETROIT, MI	8	0.45	2,160
ORLANDO, FL	9	0.37	1358
NASHVILLE, TN	10	0.36	952

In EV usage, registrations of the Volt helped propel the U.S. auto capital of Detroit into the top 10 at #8, although the Motor City is just 27th in the Advanced Transportation category and 26th in the overall Index. Detroit is this year's only top 10 newcomer; Phoenix, Orlando, and Nashville are repeat leaders from last year, along with all six West Coast metro areas.

In the EV charging stations indicator, California metros do not have a leadership stranglehold. Portland and Seattle are the top two metro areas, as in last year's Index. Portland has a total of 226 stations, or nearly 100 (98.7) per million people. San Francisco, ranked fourth when levelized for population, has the most total stations with 309. Nashville, just 28th in the overall Index, does well in this indicator,

moving up a place this year to #3 with 70.7 stations per million people. The Music City is one of the key deployment metro areas for The EV Project by charging-station developer ECOtality and has a total of 122. It's also worth noting here that Honolulu is another EV infrastructure leader, with a similar number of charging stations per capita (70) as San Francisco and Nashville. Since Honolulu does not qualify as one of the nation's 50 largest metro regions, it's not included in the Metro Index, but there are nearly 70 charging stations in the Honolulu area. (In the State Index, Hawaii ranks third in EV registrations and first in EV charging stations.)

Public Transportation Ridership, measured by average weekly mass transit trips per capita, is a very different type of indicator. New York is the leader by far, joined by

ELECTRIC VEHICLE CHARGING STATIONS

METRO AREA	RANK	EV CHARGING STATIONS PER 1M PEOPLE	TOTAL EV CHARGING STATIONS
PORTLAND, OR	1	98.7	226
SEATTLE, WA	2	79.1	281
NASHVILLE, TN	3	70.7	122
SAN FRANCISCO, CA	4	69.4	309
ORLANDO, FL	5	68.4	152
SAN JOSE, CA	6	59.6	113
SACRAMENTO, CA	7	57.8	127
AUSTIN, TX	8	54.5	100
RALEIGH, NC	9	52.2	62
SAN DIEGO, CA	10	48.5	154

Source: Clean Edge analysis of data gathered from the U.S. DOE Alternative Fuels & Advanced Vehicles Data Center. As of 4/15/2013.
Full dataset available to subscription clients.

Boston, Washington, D.C., Chicago, and Philadelphia in taking five of the top six places. But San Francisco – California's most East Coast-like city – places third in Public Transportation, moving up one place from last year. San Jose, by contrast, is just 13th.

CLEAN ELECTRICITY & CARBON MANAGEMENT

RANK	METRO AREA	LEADERSHIP SCORE	
1	San Jose, CA	100.0	
2	Los Angeles, CA	99.3	
3	San Francisco, CA	97.5	
4	Portland, OR	93.2	
5	Dallas, TX	77.1	
6	Oklahoma City, OK	75.8	
7	Austin, TX	75.6	
8	Houston, TX	65.7	
9	Sacramento, CA	64.1	
10	San Diego, CA	64.1	
11	Riverside, CA	63.4	
12	Washington, DC	62.9	
13	Philadelphia, PA	62.4	
14	Seattle, WA	57.4	
15	Chicago, IL	56.6	
16	Denver, CO	55.5	
17	Hartford, CT	49.5	
18	Boston, MA	48.3	
19	Las Vegas, NV	46.9	
20	Providence, RI	46.8	
21	Buffalo, NY	46.3	
22	Indianapolis, IN	39.7	
23	New York, NY	38.2	
24	Minneapolis, MN	37.2	
25	Detroit, MI	37.0	
26	Milwaukee, WI	36.3	
27	Raleigh, NC	36.0	
28	Kansas City, MO	35.3	
29	Phoenix, AZ	34.4	
30	San Antonio, TX	34.3	
31	Charlotte, NC	33.4	
32	Nashville, TN	32.1	
33	Memphis, TN	31.3	
34	Atlanta, GA	30.2	
35	St. Louis, MO	28.6	
36	Columbus, OH	28.5	
37	Miami, FL	26.7	
38	Virginia Beach, VA	26.6	
39	Salt Lake City, UT	26.5	
40	Orlando, FL	25.8	
41	Baltimore, MD	25.3	
42	Cincinnati, OH	23.6	
43	Tampa, FL	23.3	
44	Cleveland, OH	23.3	
45	Richmond, VA	21.1	
46	Jacksonville, FL	20.2	
47	Louisville, KY	18.6	
48	New Orleans, LA	15.4	
49	Pittsburgh, PA	13.6	
50	Birmingham, AL	0.0	

LOWER RANKING   HIGHER RANKING

CLEAN ELECTRICITY & CARBON MANAGEMENT OVERVIEW

Three indicators make up the Clean Electricity & Carbon Management category, which tracks each metro area's electricity makeup, government participation in voluntary green power purchasing programs, and the carbon intensity of its local economy. Top performing metro areas are usually in a region with an abundance of non-hydro renewable resources, making for a clean electricity mix; are home to a forward-thinking government aggressively purchasing green power; or have a very efficient local economy that doesn't rely on energy-hungry facilities like aluminum smelters, chemical plants, and refineries; or, for the very best performers, all of the above.

Leading this category are three California metro regions, San Jose, Los Angeles, and San Francisco, each benefitting from the three aforementioned factors. Portland, coming in fourth, also fits this well-rounded profile. The next tier of metro areas – Dallas, Oklahoma City, and Austin – is clustered in the West South Central region of the country. These metros may not tap the cleanest electric grid, but each has a local government proactively purchasing green power and an economy driven by a relatively low-carbon infrastructure (two are state capitals), resulting in a strong category performance.

Looking more closely at what determines scores in this category, the Regional Electricity Mix indicator serves as a proxy for the advancement of clean electricity on the regional grid. In our State Index, we're able to leverage rich data from the Energy Information Administration (EIA) to track the amount of wind, solar, geo-thermal, and other types of energy that states feed into the grid. But the metro area perspective is not as clear. Because centralized power plants are usually located far from population centers, tracking generation facilities within cities doesn't provide much insight. And because metro areas consist of several individual cities, often served by a number of utilities, profiling comprehensive electricity consumption isn't a viable option either. Instead, we've gathered reports from a range of entities including independent system operators, regional transmission organizations, and state-reported utility consumption profiles, ultimately determining the approximate makeup of the regional electricity fuel mix. Electricity mixes are evaluated on a scale of 0 to 5 – high percentages of non-hydro renewables will mean a higher score, while heavy dependency on fossil fuels and nuclear will lead to lower scores. See the next page for a breakdown of regional electricity characteristics.

The Clean Electricity & Carbon Management category also includes an indicator tracking the concentration of greenhouse gas emissions emitted from large facilities (power plants, refineries, industrial plants, waste facilities, and other major emitters), as reported by the EPA. As results in the table show, there is a clear division between high-tech economies – like North Carolina's Research Triangle area, California's Silicon Valley, and New York City's finance hub – and more coal-fueled, energy-intensive regions like Birmingham, New Orleans, and Louisville. For metro areas underperforming in this indicator, retiring of inefficient coal plants and energy-hungry industrial infrastructure could go a long way. Much of the GHG emissions in Birmingham (the overall Metro Index's 50th-place finisher), for example, can be credited to one 1970's-era coal plant that alone emits 20 million metric tons of CO_2 each year.

The third indicator in this category is qualitative rather than quantitative, and credits metro areas that are home to top local government green power purchasers. The indicator is based on the EPA's Green Power Partnership program, which periodically reports which organizations – including Fortune 500 companies, local governments, and academic institutions – are the leading participants in voluntary green power markets. In the latest ranking, 11 metro areas had the presence of a top-20 local government green power purchaser. Among standouts in the top 20, the city governments of the District of Columbia and the city of Austin, plus the Port of Portland, each had green power purchasing totals that achieved 100 percent of organization-wide electricity use. While the other two indicators in this category give a good glimpse of broad metro area characteristics, this indicator specifically targets local government's commitment to advancing clean electricity and reducing carbon emissions.

REGIONAL ELECTRICITY MIX

REGION	INDICATOR SCORE	FOSSIL FUELS, NUCLEAR, & OTHER	LARGE HYDRO	NON-HYDRO RENEWABLES
CALIFORNIA	5	72.8%	13.0%	14.2%
OREGON	4	55.4%	38.7%	5.6%
COLORADO	4	81.3%	1.6%	17.1%
WASHINGTON STATE	4	25.8%	73.0%	2.1%
NEW ENGLAND ISO	3	75.2%	5.2%	6.2%
NEW YORK ISO	3	76.0%	20.0%	4.0%
ERCOT (TEXAS)	2	90.2%	0.1%	9.2%
MIDWEST ISO	2	91.0%	0.8%	8.4%
NEVADA	2	88.0%	6.0%	6.0%
SOUTHWEST POWER POOL	2	92.0%	1.0%	7.0%
ARIZONA	1	92.7%	7.3%	"all renewables"
SOUTHEAST RELIABILITY CORPORATION	1	94.0%	5.0%	<1%
FLORIDA RELIABILITY COORDINATING COUNCIL	0	99.0%	~1%	"all renewables"
PJM	0	98.0%	1.0%	1.0%
UTAH	0	97.8%	0.9%	1.3%

Source: Clean Edge research; this indicator uses the most recently reported fuel mixes of larger regional entities (like FERC ISO regions, regional transmission organizations, states, and major utilities) to the strength of clean electricity activity in the surrounding regional electric grid. Scoring for this indicator is on a scale from 0 to 5, with 0 representing heaviest reliance on dirty energy sources and 5 indicating the cleanest electricity mix..

CARBON EMISSIONS FROM LARGE FACILITIES

|	METRO AREA	RANK (LOW TO HIGH)	METRIC TONS CO2E PER CAPITA	METRIC TONS CO2E* (2011)
Least Emissions	RALEIGH, NC	1	0.28	325,144
	SEATTLE, WA	2	0.58	2,020,480
	COLUMBUS, OH	3	0.67	1,253,282
	PORTLAND, OR	4	0.91	2,067,221
	SACRAMENTO, CA	5	1.19	2,586,729
	SAN DIEGO, CA	6	1.26	3,962,898
	SAN JOSE, CA	7	1.42	2,648,323
	HARTFORD, CT	8	1.49	1,806,248
	NEW YORK, NY	9	2.02	38,344,504
	RIVERSIDE, CA	10	2.05	8,843,546
Most Emissions	KANSAS CITY, MO	41	9.90	20,323,872
	CHICAGO, IL	42	10.32	98,128,202
	JACKSONVILLE, FL	43	10.79	14,677,393
	SAN ANTONIO, TX	44	11.17	24,523,100
	HOUSTON, TX	45	16.79	102,189,805
	ST. LOUIS, MO	46	18.12	51,040,262
	PITTSBURGH, PA	47	18.76	44,267,645
	LOUISVILLE, KY	48	21.46	27,788,988
	NEW ORLEANS, LA	49	25.34	30,186,176
	BIRMINGHAM, AL	50	44.04	49,865,752

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

CLEAN-TECH INVESTMENT, INNOVATION & WORKFORCE

LOWER RANKING — HIGHER RANKING

RANK	METRO AREA	LEADERSHIP SCORE
1	San Jose, CA	100.0
2	San Francisco, CA	71.4
3	Boston, MA	63.6
4	Sacramento, CA	41.1
5	Austin, TX	39.3
6	Denver, CO	38.5
7	Hartford, CT	37.0
8	Chicago, IL	33.6
9	Detroit, MI	33.6
10	Raleigh, NC	32.7
11	San Diego, CA	31.1
12	New York, NY	30.5
13	Los Angeles, CA	27.3
14	Philadelphia, PA	24.7
15	Pittsburgh, PA	23.2
16	Portland, OR	23.0
17	Atlanta, GA	22.7
18	Houston, TX	22.4
19	Seattle, WA	21.0
20	Cleveland, OH	20.2
21	Salt Lake City, UT	19.7
22	Kansas City, MO	18.8
23	Phoenix, AZ	18.7
24	Washington, DC	18.6
25	Nashville, TN	16.3
26	Minneapolis, MN	15.6
27	Providence, RI	15.0
28	Louisville, KY	12.8
29	Columbus, OH	12.7
30	Buffalo, NY	10.8
31	Dallas, TX	10.0
32	Tampa, FL	9.0
33	Orlando, FL	8.8
34	Virginia Beach, VA	8.0
35	San Antonio, TX	7.8
36	Las Vegas, NV	7.7
37	Baltimore, MD	6.4
38	Cincinnati, OH	5.5
39	Charlotte, NC	4.8
40	Riverside, CA	4.5
41	Memphis, TN	4.5
42	Richmond, VA	3.9
43	Indianapolis, IN	3.4
44	Birmingham, AL	2.8
45	Milwaukee, WI	2.8
46	St. Louis, MO	2.1
47	New Orleans, LA	1.0
48	Miami, FL	0.8
49	Jacksonville, FL	0.7
50	Oklahoma City, OK	0.0
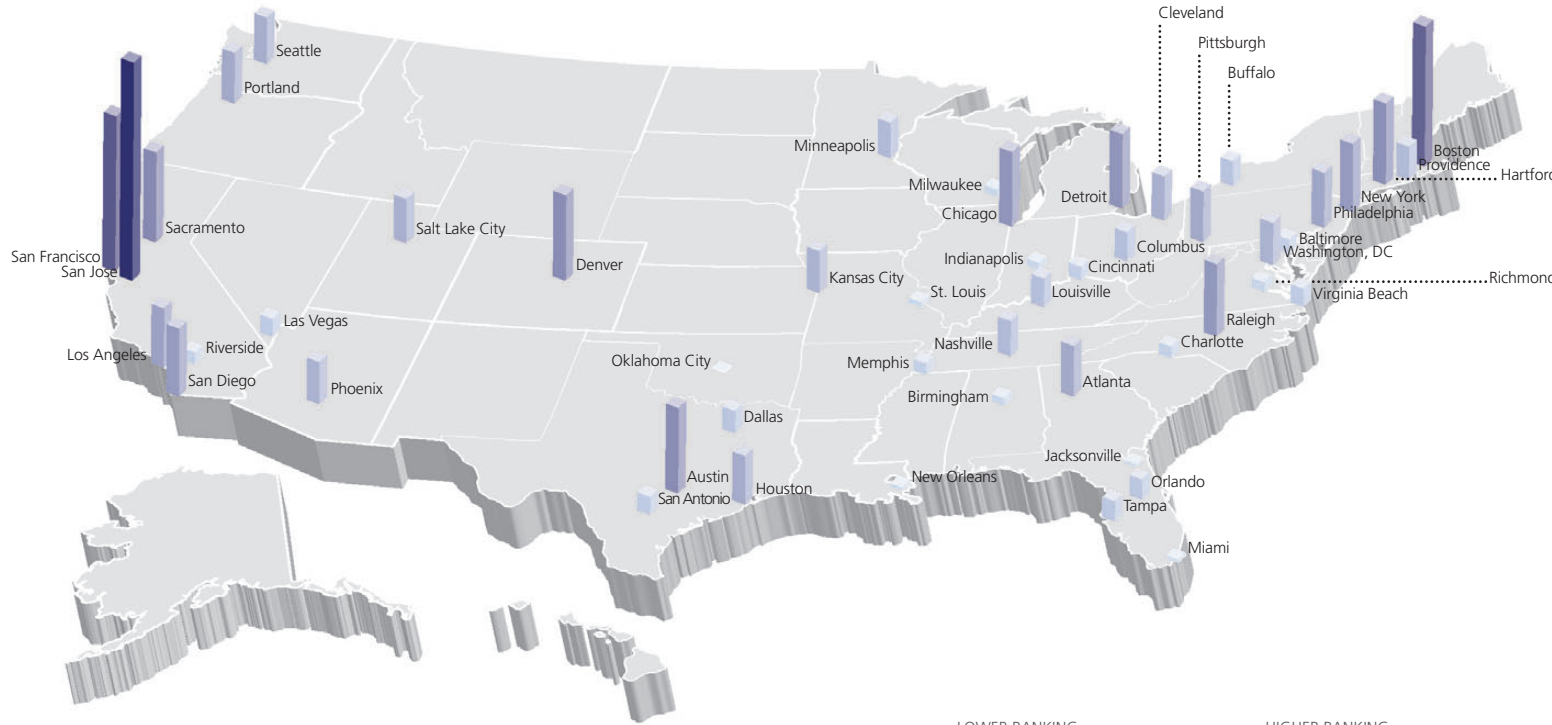
CLEAN-TECH INVESTMENT, INNOVATION, & WORKFORCE OVERVIEW

This category, somewhat akin to the Capital category in the State Index, measures a metro area's financial, human, and intellectual capital with indicators such as venture capital investments in clean tech, percentage of clean-economy jobs, clean-energy patent activity, and the presence (or lack thereof) of U.S. Department of Energy labs, incubators for clean-energy startups, and Green MBA programs.

Metro leadership in the category, for the second consecutive year, is really a tale of three cities: San Jose, San Francisco, and Boston. And San Jose's civic boosters might even claim it's a tale of one city. The San Jose metro area's first place ranking, also for the second straight year, outpolls #2 San Francisco's 71.4 by nearly 30 points, by far the largest margin by any Metro Index category leader. San Jose leads the financial (VC) metrics by a wide margin, is second in patents and licensable university technologies, and has both an incubator and a top-ranked Green MBA program (Stanford University's, rated the world's #1 Green MBA program by the Aspen Institute).

San Francisco and Boston retain their respective #2 and #3 ranks from last year's Index, and Boston's score of 63.6 is more than 20 points ahead of Sacramento (41.1), which also placed fourth in this category in the 2012 Metro Index. The rest of the top 10 is quite geographically diverse, reflecting different strengths in clean-tech leadership in different areas of the U.S., and also showcases leadership from three of the Index's smallest metro areas.

Fifth-ranked Austin, just 35th in population among U.S. metros, places fifth in VC dollars per capita; it moved up from #7 last year in the overall Investment, Innovation & Workforce category. Seventh-ranked Hartford and #10 Raleigh are just 46th and 47th respectively in population. Hartford, a key hub for fuel-cell technology, ranks #2 in clean-energy patents per million people, behind Detroit. The Raleigh metro area, home to top universities and the Research Triangle high-tech cluster, is an up-and-coming clean-tech leader with smart grid and efficiency as a key focus. Raleigh trails only Sacramento in percentage of clean-economy jobs at 3.3 percent. It jumped into the top 10 from #13 last year, boosting its score from 24.1 to 30.4.

Denver and Chicago, at #6 and #8, are the only metro areas (along with #12 New York) that can claim the presence of a DOE research lab, Clean Energy Alliance Incubator, and top-ranked Green MBA program. Detroit, as the runaway U.S. metro leader in clean-energy patents granted, earns a category rank of ninth, down one place from last year.

The clean-tech VC indicator showed little change in leadership from last year, perhaps not surprising as it tracks all investments in each metro area's clean-tech companies over a three-year period. The top five metros remained the same, with San Jose the runaway leader in dollars per capita, although more populous San Francisco (which includes the startup-heavy East Bay) had the most total dollars and total deals. Boston, San Diego, and Austin complete the top five. Of the

METRO AREA	RANK	DOLLARS PER CAPITA	TOTAL DOLLARS (MILLIONS)	TOTAL DEALS
SAN JOSE, CA	1	$1,148.44	$2,175.59	129
SAN FRANCISCO, CA	2	$704.72	$3,139.90	209
BOSTON, MA	3	$397.41	$1,844.30	141
SAN DIEGO, CA	4	$254.49	$808.52	47
AUSTIN, TX	5	$248.36	$455.56	48
LOS ANGELES, CA	6	$143.01	$1,866.65	77
SALT LAKE CITY, UT	7	$110.59	$124.28	7
DENVER, CO	8	$98.65	$260.95	29
PORTLAND, OR	9	$78.86	$180.57	20
KANSAS CITY, MO	10	$66.03	$134.63	5

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

METRO AREA	RANK	PATENTS PER 1M PEOPLE	TOTAL PATENTS
DETROIT, MI	1	318.0	1,365
SAN JOSE, CA	2	245.5	465
HARTFORD, CT	3	219.9	267
SAN FRANCISCO, CA	4	88.9	396
BOSTON, MA	5	39.2	182
CLEVELAND, OH	6	34.9	72
MINNEAPOLIS, MN	7	32.1	110
SAN DIEGO, CA	8	30.2	96
PHILADELPHIA, PA	9	29.9	180
DENVER, CO	10	29.1	77

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

metro areas ranked sixth through ninth – Los Angeles, Salt Lake City, Denver, and Portland – no rankings changed more than two places.

But there was one notable difference from last year's top 10: the presence of the Kansas City metro area, ranked just 27th in the overall Metro Index, at #10. Even though Kansas City tallied just five VC deals in the past three years, three of them – all to commercial all-electric truck manufacturer Smith Electric Vehicles – totaled nearly $100 million. The most recent, a $25 million round in February 2012, propelled the heartland metro area into the national top 10.

Rankings in the clean-energy patents indicator, tracking patents granted over the past decade, are also very consistent with last year's Index. Led by Detroit, the top eight metro areas in the 2013 Index were in the top nine last year. Philadelphia and Denver entered the top 10 this year, displacing Orlando and Houston.

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, R.L. Polk & Co., Heslin Rothernberg Farley & Mesiti P.C., InnovateTech Ventures, and Interstate Renewable Energy Council

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
LEED Certified Square Feet Per Capita
Energy Star Buildings & Plants Per 1M People
Energy Star Buildings & Plants Square Feet Per Capita

ADVANCED TRANSPORTATION

ADVANCED TRANSPORTATION
Electric Vehicles Per 1K People
Hybrid Electric Vehicles Per 1K People
Natural Gas Vehicles Per 1K People
Electric Vehicle Charging Stations Per 1M People (as of 4/15/2013)
CNG Fueling Stations Per 1M People (as of 4/15/2013)
E85 & B20 Fueling Stations Per 1M People (as of 4/15/2013)
Public Transit: Avg Weekly Trips (Per Capita, 2012)

CLEAN ELECTRICITY & CARBON MANAGEMENT

CLEAN ELECTRICITY & CARBON MANAGEMENT
Regional Electricity Mix (0=Dirtiest; 5=Cleanest)
Presence of Top Local Government Green Power Purchaser
GHG Emissions from Large Facilities (Per Capita, CO_2e MT)

CLEAN-TECH INVESTMENT, INNOVATION, & WORKFORCE

CLEAN-TECH INVESTMENT, INNOVATION, & WORKFORCE
Venture Capital Investment ($ Per Capita, 2010-2012)
Venture Capital Investment (Deals Per 1M People, 2010-2012)
Clean Economy Jobs (% of all employment, 2011)
Clean Energy Patents (Per 1M people, 2002-2012)
Licensable University Clean Technologies (Per 1M People)
Presence of DOE Lab
Presence of Clean Energy Alliance Incubator
Presence of Top-Ranked Green MBA Program

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
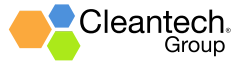
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INNOVATETECH VENTURES (INNOVATETECH) connects university inventions and the entrepreneurs, investors, and businesses interested in commercializing technologies through its publications and matching activities. For the State and Metro Indexes, Clean Edge is using InnovateTech's Investor's Guide to University Startups to track university startups and technologies. For information on InnovateTech services visit www.innovatetech.com.

R.L. POLK & CO. (POLK) is a globally recognized provider of automotive intelligence and marketing solutions to the automotive world and its related industries. For the State Index, Clean Edge is using R.L. Polk's hybrid, electric, and compressed natural gas vehicle registration data. For information on Polk research visit www.polk.com.

OTHER INDEX DATA SOURCES

AMERICAN COUNCIL FOR AN ENERGY–EFFICIENT ECONOMY (ACEEE)

AMERICAN PUBLIC TRANSPORTATION ASSOCIATION (APTA)

AMERICAN WIND ENERGY ASSOCIATION (AWEA)

THE ASPEN INSTITUTE

BROOKINGS INSTITUTION

BUILDING CODES ASSISTANCE PROJECT

THE CENTER FOR MEASURING UNIVERSITY PERFORMANCE

CLEAN ENERGY ALLIANCE (CEA)

DATABASE OF STATE INCENTIVES FOR RENEWABLE ENERGY (DSIRE)

ENERGY STAR

FEDERAL ENERGY REGULATORY COMMISSION (FERC)

GEOTHERMAL ENERGY ASSOCIATION (GEA)

INNOVATETECH VENTURES

NATIONAL RENEWABLE ENERGY LABORATORY (NREL)

RENEWABLE FUELS ASSOCIATION (RFA)

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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If you are interested in supporting the 2014 edition, please contact Bryce Yonker, **yonker@cleanedge.com**.

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- Smart meter installations
- Energy efficiency expenditures
- GHG emissions
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- Clean-tech patents
- Clean economy jobs
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