

# CONNECTING TO THE GRID

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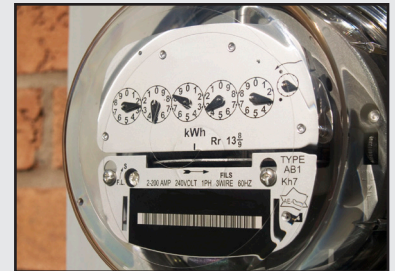
**Connecting to the Grid will be taking a break during the month of August but we'll see you again in September.**

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### ABOUT THIS NEWSLETTER

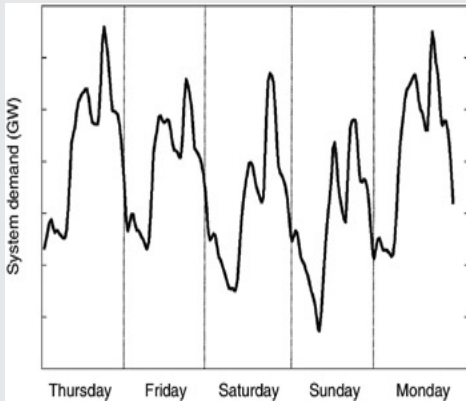
While customer-sited net metering and interconnection policies are primarily addressed at the state level, they are also becoming important on a regional basis. This newsletter has been designed to provide state-level policy updates and capture emerging regional trends. *Connecting to the Grid* is a free, electronic newsletter published each month by the Interstate Renewable Energy Council (IREC) and the North Carolina Solar Center at North Carolina State University. [Click here to subscribe.](#)

Please direct comments and questions about the newsletter to Laurel Varnado at [lvarnad@ncsu.edu](mailto:lvarnad@ncsu.edu).





## IN SEARCH OF HIGH PENETRATION PV POLICIES



In some areas of the country, states are beginning to experience higher levels of PV grid penetration than have ever been seen before. While this is essentially good news, it also presents several challenges for policymakers going forward. A 2008 NREL report titled [High-Penetration, Grid-Connected Photovoltaic Technology Codes and Standards](#), noted that, “Primarily, the bulk-level connection concerns relate to the need for better understanding how to plan and operate the transmission grid and other generation resources based on renewable energy operating characteristics.” The report also highlighted the following grid impacts that could be affected by high penetration PV: voltage and reactive power regulation; power quality (harmonics, flicker, DC injection); protection design and coordination (e.g., short circuits, re-closers, fuses); unintentional islanding; equipment grounding; load and generation imbalance (e.g., generation interaction with controllable loads—demand-side management); and storage and storage controls. That’s a lot to think about when designing policies.

The FERC Small Generator Interconnection Procedures (SGIP) and many state policies include a screen that prevents renewable systems from becoming too concentrated in any one area. Usually this means that the total output of DG on a utility line section cannot exceed 15% of that line section’s peak load. This is not to say that higher levels of penetration on a particular line would be harmful, just that they should be studied. Penetration-based screens have generally been calculated as a percentage of peak load because peak load data has been more available, not because this is a preferred approach from an engineering standpoint. To the contrary, the probability of generation exceeding load is greatest at times of minimum load, not peak load.

In order to meet several aggressive state targets for PV deployment, not to mention future targets, we will most likely need to re-examine this 15% approach for interconnection technical screens. Over the past year we’ve seen several dockets open up to address this issue, notably in states like [California](#) and [Hawaii](#), that already have a high volume of PV traffic. To help states meet their PV targets, IREC has proposed a different approach, one that bases engineering technical screens on minimum, rather than peak, load data. Setting a PV penetration ceiling at 50% of minimum load, measured between the hours of 10 a.m. and 3 p.m., would be a more appropriate screening tool to fast track interconnection requests. For most distribution systems, a line section minimum load is in the range of 30% of the peak load. This proposal simply eliminates the assumption that minimum load is likely to be 30 percent of peak load and instead sets allowable penetration levels that can be accommodated without additional study based on actual data instead of assumptions.

IREC also believes that it is possible to achieve penetrations greater than 50% of minimum load with appropriate supplemental screens in place. To illustrate this point, Kauai Island Utility Cooperative (KIUC) has recently been experimenting with a 1.2 MW [pilot project](#), which, on sunny days, supplies 100% of the demand required by the adjoining distribution circuit. Preliminary results from the project look promising - suggesting that utilities could achieve high levels of PV penetration in localized areas without causing problems for the grid.

As the price of PV declines, these issues will quickly rise to the forefront of state interconnection discussions. As we’ve seen with other policy development trends, if renewable energy frontier states like California and Massachusetts are looking into this issue now, it won’t be long before other states follow their lead.

Regards,  
Laurel Varnado

# STATE NEWS IN DETAIL

## NORTHEAST STATES

### NEW HAMPSHIRE

On June 14, New Hampshire enacted [H.B. 381](#), which includes combined heat and power (CHP) as an eligible technology for net metering. A CHP system sized 1 - 30 kW must have a fuel system efficiency of at least 80%. Systems sized 30 kW - 1 MW (the state net metering limit) must have a fuel system efficiency of at least 65%. In addition, net metered CHP systems can only contribute up to 2 MW under the state's aggregate capacity limit of 50 MW. Eligible fuels for CHP include natural gas, propane, wood pellets, hydrogen, or heating oil.

## MID-ATLANTIC STATES

### DELAWARE

On June 7, 2011, the Delaware Public Service Commission adopted revised net metering rules in [PSC Order No. 7984](#), as a result of 2010's S.B. 267. Delaware enacted S.B. 267 in July

2010, which expanded the state's net-metering policy by: (1) allowing a customer to aggregate individual meters; (2) allowing customers to participate in net metering via a community-owned system; (3) allowing net-metered systems to provide up to 110% of a host customer's expected aggregate electrical consumption; (4) extending net metering to leased systems and systems owned by third parties; and (5) extending net metering to fuel cells using non-renewable fuels.

As S.B. 267 required, the rule revisions expand the opportunities for net metering from the original single customer/single account scenario (Condition 1) to single customers with multiple accounts (Condition 2) and multiple customers and multiple accounts served by community energy generation facilities (Condition 3).

The revised rules also answer the new statutory requirement that calls for the Commission to provide, for optional use by the net metering supplier or utility, a direct payment alternative for dealing with net excess generation produced by a community generating facility during a billing period.

IREC submitted written comments in response to the PSC's second set of proposed revisions. In those comments IREC asserted that certain provisions in the proposed revised rules deviate from the governing statutory directives:

a. by limiting the value of monthly carry-over excess generation credits available to residential customers to the volumetric components of delivery and supply charges rather than the full sum of delivery and supply service charges;

b. by creating a distinction in the single customer contexts (Conditions 1 & 2)

between meters on the same distribution feeder as the customer's generator and those on a different feeder and, in the latter scenario, allowing carry-over net excess generation to be credited only against volumetric supply charges on the "other-feeder" accounts; and

c. by allowing the net metering supplier or utility to impose customer charges and other non-volumetric charges which might recover otherwise applicable supply, transmission, and distribution delivery costs on "stand-alone" community generation facilities.

IREC also urged other changes. In particular, IREC asked:

a. that, in the context of the alternative direct payment scheme for community generation (Condition 3), the monthly payment to the host should encompass only the retail supply charge amount for the net excess kWh (as a proxy for the utility's avoided costs) plus a value for the REC generated (as determined by Commission); and

b. that the notice times for alerting the net metering supplier or utility that the customer wished to net meter several aggregated accounts or that customers wished to institute community generation aggregation be shortened from 90 to 60 days.

After the submission of the IREC comments, Staff prepared a third set of revised rules and circulated them to the identified participants. This "third" revision accepted IREC's challenge to the on-the-same feeder/off-feeder distinction for net excess generation crediting in Conditions 1 and 2 and deleted that provision.

The rules take effect July 10, 2011.

### PENNSYLVANIA

On June 30, the Pennsylvania Public Utility Commission (PUC) issued for comment proposed clarifications on the owner/operator requirements of net metering systems. The PUC proposes that customers who contract with a solar developer who owns the facility on the customer's property and leases it back to the customer, and where the customer further contracts with the solar developer to operate the system, will still be entitled to net meter the facility, if the facility is designed to meet only the energy requirements of that customer.

The Commission voted 5-0 to approve a [motion](#) by Chairman Robert F. Powelson to allow customers who purchase power through a power purchaser the opportunity to net meter. The business model includes an alternative energy system developer installing a system for a customer while still maintaining ownership and performing the maintenance operations functions of the system.

"I believe that it should be the policy of the Commission to support access to alternative energy systems to as broad an array of consumers possible," said Powelson in his motion.

The Commission's net metering requirements set a standard for how electric generation suppliers and electric distribution companies (EDC) meter and compensate residential or small commercial customers who generate electricity using alternative energy sources as defined in the Alternative Energy Portfolio Standards (AEPS) Act of 2004.

An alternative energy credit (AEC) is created each time a qualified alternative energy facility produces 1,000 kWh of electricity. The AEC is then

sold or traded separately from the power. This makes it easier for individuals and businesses to finance and invest in alternative energy.

The AEPS Act of 2004 required that a certain percentage of all electric energy sold to retail customers within the Commonwealth be derived from alternative energy sources. By 2021, electric distribution companies (EDCs) and electric generation suppliers (EGSs) must supply 18 percent of electricity using alternative energy resources, which were divided into two tiers. The percentage of Tier I, Tier II and solar photovoltaic resources gradually increases over this period.

[Editor's note: for more information on this topic, see IREC's recent report titled [The Intersection of Net Metering and Retail Choice](#).]

Source: [PA PUC Press release](#)

### MIDWESTERN STATES

#### WISCONSIN

The Public Service Commission of Wisconsin (PSC) announced in June that all 118 Wisconsin electric providers have met their renewable portfolio standards (RPS) for 2010. Wisconsin utilities are well on their way to meeting the increase in renewable energy that will be required by 2015, and five electric providers achieved their 2015 renewable energy percentage in 2010.

The current RPS law requires Wisconsin retail electric providers to produce 10 percent of the state's electric-

ity from renewable resources by the year 2015. For the years leading up to 2015, Wisconsin utilities are required to report their progress in meeting the renewable milestones to the PSC. Wisconsin electric providers continue to take steps towards achieving their renewable energy goals.

Renewable sales have increased 92.5% from 2006- 2010. In 2010, 7.37 percent of electricity sold by the state's utilities and cooperatives was generated from renewable resources eligible for the RPS, up from 6.29 percent in 2009.

Source: [Wisconsin PSC press release](#)

### SOUTHERN STATES

#### FLORIDA

Florida homeowners and businesses using renewables to generate electricity grew by 75 percent last year, according to electric utility reports filed with the Florida Public Service Commission (PSC).

To promote customer-owned renewable generation, in 2007 the PSC established rules making it easier to interconnect a customer's system with the utility's grid. The net-metering rules are making a difference. Last year, 2,833 customer-owned renewable energy systems with a capacity of approximately 20,403 kilowatts were interconnected statewide. This is a significant jump from 2009, when only 1,625 customer-owned renewable systems with 13,236 kilowatts of electric capacity were interconnected.

"When developing this rule, our goal was to encourage customer devel-

opment of renewable generation to assist grid reliability, and also protect the environment and stimulate the economy,” said Chairman Art Graham. “I’m pleased to see that we’ve accomplished our goal, with the number of customers using the rule increasing each year.”

Solar photovoltaic panels are the most popular renewable choice with 2,809 customer-owned systems; however, 23 customers have wind turbines and one has an anaerobic digester.

Since customers with a renewable system sometimes generate more energy than they use in a billing cycle, PSC rules require any excess energy delivered to the utility be credited on the customers’ next bill. Investor-owned utilities (IOU) subject to the rule—Florida Power & Light Company, Progress Energy Florida, Inc., Tampa Electric Company, and Gulf Power Company—are also required to offer an expedited interconnection agreement process for homeowners and businesses that want to connect a renewable system to their grid.

Customers who receive their electricity from a municipal electric utility or a rural electric cooperative also have incentives to generate their own renewable electricity. Every Florida municipal and cooperative utility that sells electricity at retail is required, by statute, to provide a standardized interconnection agreement and net metering program for customer-owned renewable generation systems.

Source: [Florida PSC news release](#)

### TEXAS

Taking a cue from the Legislature, the Public Utility Commission of Texas has dropped a proposal that would have mandated that electricity generators buy renewable energy other than wind.

The three-member state commission in December published a proposal to require that generators get 500 megawatts, or about 2 percent of all the electricity generated in the state, from a renewable source other than wind.

July 8, 2011 is the deadline to act on that proposal, but it is not included on the commission’s agenda. The 500-megawatt renewable energy target has been on the books since 2005, but there has been a dispute about whether the Legislature intended for it to be a mandate or just a goal. Last December, the state commission published the proposal, and it held public hearings during the spring, but always with an eye toward the Legislature.

Commissioners Barry Smitherman and Ken Anderson talked of the need to have a diversified portfolio of generating fuels while expressing concerns about the price of renewable energy in a world of low natural gas prices. “I am cautious,” Smitherman said. “It’s impossible to predict commodity prices.”

Commissioner Donna L. Nelson said she didn’t think the PUC had the authority to adopt a mandate. “If we don’t have the authority, we should just wait and see what the Legislature does,” she said at that December hearing. “Just publishing (the rule) sends the impression we are moving forward.”

Texas adopted a renewable energy target for electric utilities in 1999, but wind has dominated the renewable sector because of its lower price and earlier start in the market. This year the Legislature did not mandate the non-wind renewable energy target because

some lawmakers feared it would increase electricity bills. A 500-megawatt mandate, echoing the PUC proposal, never cleared a House committee.

Source: [Austin Statesman](#)

## WESTERN STATES

### CALIFORNIA

On June 14, the California PUC issued a [proposed decision](#) on the California Solar Initiative (CSI) phase one modification, which includes expanding virtual net metering to all customers and a bill credit transfer option.

Under this proposed decision, all multi-tenant buildings may be eligible for Virtual Net Metering (VNM), which was first established as part of the Multifamily Affordable Solar Housing (MASH) Program. VNM currently allows customers to allocate electricity generated from a single solar energy system as kilowatt hour credits to other accounts on the affordable housing property. These housing complexes are often served by multiple utility “service delivery points” (SDPs). The SDP is defined in utility practice as the demarcation between the customer-owned electrical system and the utility distribution system. Typically, each multitenant building has one SDP that then serves multiple tenants or utility accounts. Some developers of MASH/VNM projects argue that this tariff provision has limited the viability of VNM for many potential affordable housing sites that have multiple SDPs. They have questioned whether “affordable housing property” should more properly be defined as “all units in a single af-

fordable housing development” so that tenants served by different SDPs within a single development can benefit from VNM bill credits. The Staff Proposal recommended that the SDP should not be considered the proper boundary for VNM tariffs for affordable housing projects. Instead, the Staff Proposal recommends the Commission clarify that VNM should be available to the entire affordable housing development, not just the units behind a single SDP. The commission agreed with this assessment in their proposed decision.

Furthermore, the PUC staff recommended that the Commission expand VNM to all multitenant customers, not just those that qualify for the MASH program, as long as the customers who receive the credits are all behind the same utility SDP. Staff suggests that as long as VNM credits are transferred between the accounts served by a single SDP, there should be no significant cost-shifting between customer classes.

The Commission agreed with staff’s suggestion and clarified that VNM should not be limited to those who receive CSI incentives. The Commission also added that VNM should not be limited to photovoltaic (PV) systems. The expanded VNM concept can apply to any DG technology that is allowed under net energy metering.

The PUC also noted that utilities may propose a one-time account set up fee and a monthly administrative fee for VNM service. In addition, the utilities may seek recovery of implementation and set up costs for VNM in their future general rate cases.

Staff also recommended that solar energy system owners can transfer bill credits across multiple service delivery points, similar to the “Renewable Energy Self-Generation Bill Credit Transfer”

(RES-BCT) option currently available only to local governments. However, the commission decided to adopt an expanded RES-BCT tariff on a pilot basis only. The commission applied a statewide 250 MW cap to the expanded program, in addition to the 250 MW cap that applies to the current local government RESBCT tariff. The PUC further specified in their proposed decision that the generation credit should be the same generation rate now credited under the current RESBCT tariff.

For more information see [CPUC Proceeding R1005004](#).

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Under prior law, any net excess generation (NEG) remaining at the end of a 12-month period was granted to the customer’s utility. [AB 920](#) of 2009 gave customers who are net metering solar and wind systems two additional options for the NEG remaining after a 12 month period. Customers have the option of rolling over any remaining NEG from month-to-month indefinitely, or they can receive financial compensation from their utility for the remaining NEG.

On June 9, 2011, the CPUC approved the original [Proposed Decision](#) that established a rate for payment of excess kWh generated by distributed wind and solar systems, as required by [AB 920](#). The Decision sets the rate equal to the 12-month average spot market price for the hours of 7 am to 5 pm for the year in which the customer generated surplus power. See the [CPUC webpage on net surplus compensation](#) to read more about net surplus compensation. The rate making authorities of municipal utilities must develop their own compensation method for the remaining NEG through a public proceeding. By January 31, 2010, utilities must notify all of their net metering

customers of these new options. If the customer makes no affirmative election for either option, the utility will be granted their NEG at the end of the 12 month period with no compensation to the customer.

### COLORADO

Two new groups have formed in the last week to evaluate Boulder’s options for its energy future and, eventually, to recommend a path forward to voters.

Members of both groups say they plan to dig through the hundreds, if not thousands, of pages of consultants’ reports, memos and proposals generated by the city and Xcel Energy to determine the best option for the city.

Last year, the city’s 20-year franchise agreement with Xcel Energy expired. Now, the City Council is considering whether to renew its partnership with Xcel or start a municipal electric utility instead.

In either case, the city is looking to add more renewable energy into its power mix. Both options would require voter approval.

“What Boulder is doing is precedent-setting in terms of a community saying, ‘We really want to move into this new energy economy in a big way,’” said former Boulder Mayor Shaun McGrath, co-chairman of the newly formed Boulder Clean Energy Business Coalition. “There’s not a whole lot of communities in the world that are having this conversation. Whether we municipalize, or whether Xcel comes through with a proposal that gets us to this goal, it’s really exciting to be having this conversation.”

The Boulder Clean Energy Business Coalition is made up of companies

that have the energy-industry knowledge necessary to provide relevant feedback on the city's choices, McGrath said.

"The point of our group is to really focus on businesses that have expertise in the field," he said. "We want to weigh in on this with expertise and credibility to help people understand the different proposals. We want to do that in-depth analysis."

Source: [Boulder Daily Camera](#)

## IDAHO

Solar power, business growth and the lingering effects of the recession have all factored into Idaho Power Co.'s latest growth plan.

The Integrated Resource Plan explains the utility's business plan, growth predictions and future projects it hopes to spearhead within the next 20 years.

Among the highlights: The company has seen a drop in energy use for the first time since 2001, according to the document. In 2009, energy use contracted by 3.5 percent, followed by another decline of 1.2 percent in 2010. Idaho Power believes the decline is related to the stalled customer growth the company experienced during the peak of the recession. The report estimates Idaho Power will regain the amount of customers it had before the economy soured by 2015.

Renewable energy has been in the utility's plan for some time, and Idaho Power is again looking to renewable energy with the expectation of growing customers and, eventually, more energy use. A series of renewable energy projects is scheduled to begin within the next 10 years. Unlike in previous plans, this one includes a solar demonstration project.

"Solar energy is really unlike wind or natural gas," said Mark Stokes, the company's manager of power supply planning. "Unlike wind, our peak energy-use days are on our hottest days when the wind isn't blowing. Solar panels could be critical for adding energy when the wind can't."

While the state does not regulate how much of a utility's energy must come from renewable sources, the cost of solar panels has been trending down, Stokes said. The lower costs sparked an interest among company stakeholders to begin testing solar energy use.

"We know the technology is out there, this will be a time for us to learn how it can sync up with our load and integrate the energy into our system," Stokes said.

Source: [Magic Valley Times News](#)

## NEVADA

On June 13, 2011 Nevada governor Brian Sandoval signed [AB 359](#) into law, which makes several changes to the state's net metering statute. The bill allows certain renewable facilities (University-based research and demonstration wind facilities and hydropower facilities up to 1 MW), to aggregate meters for the purposes of net metering. The bill also clarifies that owners and operators of the research and demonstration wind-based net metering systems are not included in the definition of a public utility. Other net metering systems were excluded from the definition of a public utility through SB 186 of 2009 and PUC Orders 07-06024 and 07-06027.

Notably, the bill also lowered the size limit threshold for which utilities must

## UPCOMING EVENTS

### [Intersolar](#)

July 12-14  
San Francisco, CA

### [Utility Solar Conference](#)

July 26 – 27  
San Diego, CA

### [Sunshine State Renewable Energy Expo and Symposium](#)

July 27-29  
Captive Island, Florida

### [AWEA Small & Community WIND-POWER 2011 \(with DWEA\)](#)

September 15-17  
Des Moines, IA

### [Solar Power International 2011](#)

October 17 - 20  
Dallas, TX

Visit [IREC's online calendar](#) for more details and events. If you have events you'd like to include in this newsletter, [contact us](#).

provide customers with a bi-directional meter and for which they are not allowed to charge any additional fees. Previously this limit was set at 100 kW and this law lowers the limit to 25 kW. For systems over 25 kW, the utility may require the customer to install extra meters or pay for required upgrades to the grid.

## IREC NEWS

Thanks to strong consumer demand and financial incentives at the federal and local levels, the U.S. solar market is booming. The Interstate Renewable Energy Council recently released its Solar Market Trends report for 2010. The report includes 2010 installation data for solar electric (photovoltaic), solar heating and cooling, and concentrating solar technologies.

“The capacity of photovoltaic systems installed in 2010 is double what it was in 2009,” said Larry Sherwood, chief author of the annual report. According to Sherwood, 2010 saw more than 124,000 new solar heating, cooling and solar electric installations, the majority of which were concentrated in a few states.

Growth in the photovoltaic utility sector was the most dramatic— the capacity of systems installed by utilities quadrupled in 2010. In addition, photovoltaic installations in both residential and commercial sectors grew by more than 60%. “State renewable portfolio standards are a big reason for that huge growth in the utility sector,” said Sherwood, “and other state and federal incentives helped fuel the dramatic growth of solar installations on homes and businesses.”

California still ranks as the largest U.S. market, with some 28% of installed capacity completed in 2010, but faces some competition as other states embrace renewables. Arizona, Colorado,

Massachusetts, Nevada, New Jersey, New Mexico, Pennsylvania and Texas made huge strides, at least doubling their installed photovoltaic capacity since 2009.

The number of solar heating and cooling installations also increased for 2010. “Solar water heating installations were up by 6% in 2010, with 84% in the residential sector,” said Sherwood.

And despite being below the peak achieved in 2006, the capacity of solar pool heating installations increased by 13% in 2010, compared to 2009.

Two new concentrating solar power (CSP) plants were connected to the grid in 2010, with a combined capacity of 76 MW. Most of this capacity was at a 75 MW Florida plant, the largest U.S. CSP installation since 1991.

Given the long-term extension of the federal solar investment tax credit (ITC), Sherwood is optimistic about solar’s continued growth.

“Besides the ITC,” he said, “a deadline to start construction in 2011 to participate in the federal cash grant program will continue to spur market growth in 2011.”

Additionally, several companies have already announced plans for many large solar electric projects, including both PV and CSP projects. According to Sherwood, some of these projects are under construction and will come on-line between 2011 and 2014.

You can read the [full report](#) on the IREC website.

## MISCELLANEOUS

## NEWS

### HOME DEPOT TO START SELLING SMALL WIND TURBINES

Home Depot will begin selling small wind turbines in select stores, a decision that reflects the growing popularity of the devices, which can provide homeowners in windy parts of the country with a steady supply of renewable power.

Arizona-based Southwest Windpower, a leading manufacturer of small-scale wind turbines, announced that its Skystream 3.7 turbine will be available at stores in Texas, Nevada, Idaho, Utah, Wyoming and California.

Southwest says the turbine is the first compact, all-inclusive grid-connected personal wind turbine with controls and inverter built in.

Designed for use on farms, homes and businesses, the wind turbine can produce up to 400 kWh of clean electricity per month depending on the wind resource and site location. The average US home uses about 930 kWh per month according to government figures.

The Skystream 3.7 will range in price based on location of the installation.

A survey of websites selling the turbine range in price from \$6,000 to \$9,000 before incentives. Customers may be eligible for a 30% federal tax credit and local incentives available through state governments and utilities.

Southwest Windpower plans to expand distribution to Home Depot stores in other windy locations across the United States.

In 2009, close to 10,000 small wind

turbines were sold in the US, according to the American Wind Energy Association - up from only 2,100 turbines in 2001.

However, because modern, residential wind power is relatively new in the US, permitting and zoning rules are an obstacle in many parts of the country, according to a recent story in USA Today.

Some cities, like Boston, are leading the way by adopting codes to clarify issues like installation height and noise requirements.

James Hunt, the city's chief of environmental and energy services, told USA Today the small scale wind is part of a broader vision the city has for renewable energy.

"We do envision the day when we will have houses that are super efficient, that are generating renewable energy through solar and building-integrated wind, and they are producing more energy than they consume and exporting energy into the grid," he says.

Source: [SustainableBusiness.com](http://SustainableBusiness.com)

## RENEWABLE ENERGY SURPASSES NUCLEAR IN U.S.

In the first quarter of 2011, renewable energy production in the United States surpassed nuclear production in overall quantity and percentage. Also, the percentage of natural gas is growing slowly, while coal is declining.

Entrenched energy industries like to say that renewable energy can never provide a significant amount of U.S. energy needs. And while it's true that some technologies still face barriers to widespread implementation and

others, while technically renewable, might not be very green, renewables as a percentage of U.S. energy generation are creeping up steadily — and not just in California, with its target of 33 percent renewables by 2020.

In the first three months of 2011, renewable energy — hydroelectric, geothermal, solar/PV, wind, and biomass — made up 11.7 percent of the U.S. energy production mix, surpassing nuclear at 11.1 percent. The same period last year, nuclear was 11.6 percent, and renewables 10.6, according to a June report from the U.S. Energy Information Administration (Table 1.2).

"The rise in conventional hydroelectric generation was by far the largest absolute "fuel-specific" increase as it was up 10,759 thousand megawatt-hours, or 52.2 percent," according to Electric Power Monthly. This was largely due to heavy spring rains in Washington, Oregon, and California, which accounted for 71.5 percent of the national rise.

However, environmentalists find objectionable the two biggest technologies that make up the renewables sector: hydroelectric power at 35 percent and biomass at 48 percent.

While large hydroelectric power doesn't emit emissions (at least not after accounting for the materials and energy expended in building it), it has harmful impacts on river ecosystems and has therefore fallen out of favor as a power source in the developed world.

As for biomass, there are many types of feedstocks, and each must be evaluated individually for its emissions profile, its water footprint, and other considerations, such as whether farm fields or forests need that material to

decompose in place to retain soil or ecosystem function.

Wind was next highest at 13 percent of renewables, or 1.5 percent of total U.S. energy production, up from 1.1 percent the same time last year.

Source: [Forbes Blog](http://Forbes Blog)

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