

Promoting Locally-Owned Renewable Electricity for Households: The Case For Feed-In Tariffs

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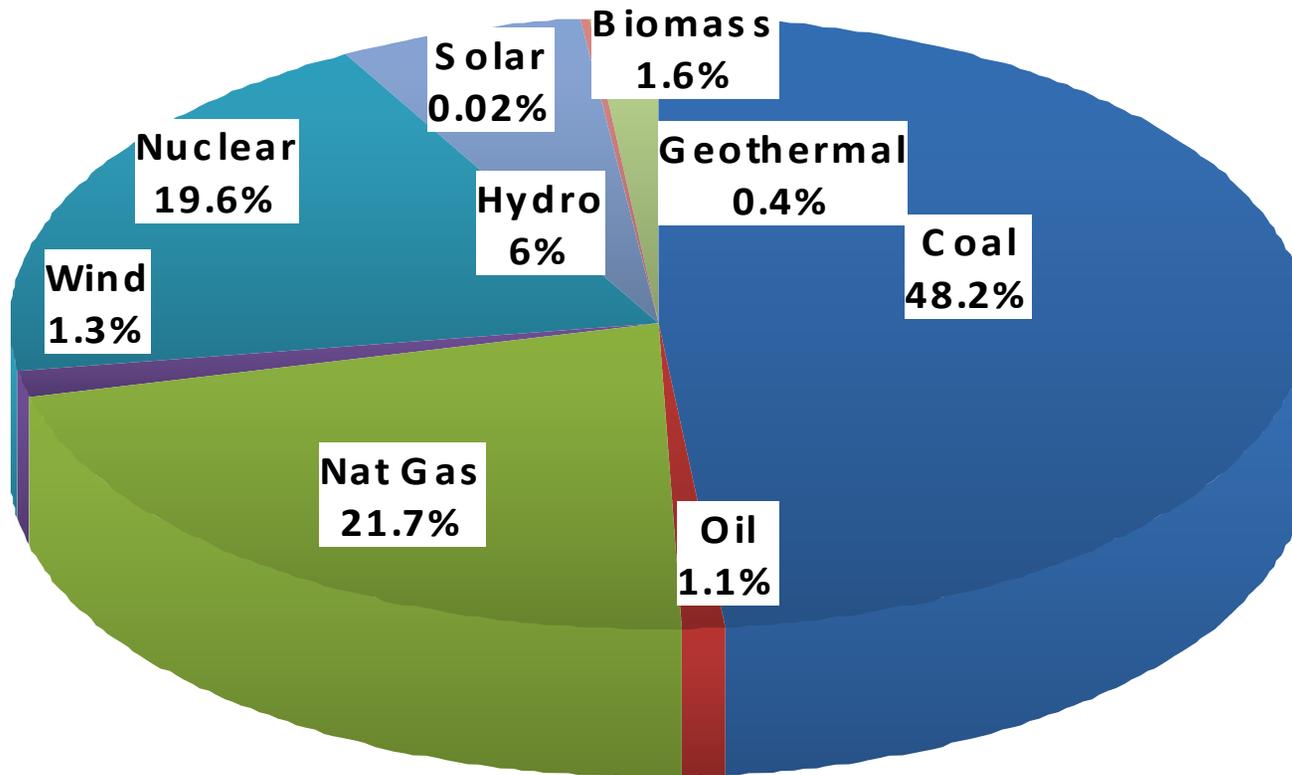
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January 29th, 2010

William & Mary School of Law, Environmental Law & Policy
Review

U.S. Net Generation by Energy Source, 2008





- Climate Change Demands That We Decarbonize Our Economy
 - But Wind+Solar+Geothermal = <2%
 - Why?
 - Inadequate Federal Incentives
 - The Renewable Production Tax Credit (2.1 ¢/kwh in '08) provided \$1.2 billion in 2009 – with 2/3 to wind, most of the rest to biomass, Sec. 45 was 1st enacted in '92
www.jct.gov/publications.html?func=startdown&iid=3555
 - Compare this to oil industry receiving \$9 billion/year in tax breaks + royalty relief



- Levelized costs for solar PV range between \$109-\$154/MWh, Solar thin film estimated from \$79-\$124/MWh, while IGCC coal registers at \$104-\$134/MWh, coal with 90% CCS clocks in at \$74-\$135/MWH and nuclear at \$98-\$126/MWH – when transmission and other costs are included

Levelized Cost of Energy Analysis-Version 2.0,

[www.narucmeetings.org/Presentations/2008%20EMP%20Levelized%20Cost%20of%20Energy%20-%20Master%20June%202008%20\(2\).pdf](http://www.narucmeetings.org/Presentations/2008%20EMP%20Levelized%20Cost%20of%20Energy%20-%20Master%20June%202008%20(2).pdf)

And cost estimates for solar continue to fall while projected costs for new nuclear and CCS continue to rise



- PTC Functioned as a Wall Street Giveaway
 - Solar developers typically did not have enough taxable income—so they sold their credits to *tax equity investors*: AIG, Goldman Sachs, Lehman Brothers, Wells Fargo-Wachovia, JP Morgan Chase-Bear Stearns, Morgan Stanley, BoA-Merrill Lynch. These banks use the credits to shelter unrelated income from taxation. Now there are ~5 tax equity investors in the U.S. renewable market.
www.bizjournals.com/sanfrancisco/stories/2008/10/06/story11.html
 - Excluded schools, government, churches
 - RPS+PTC has greatly helped renewables – but namely large-scale, centralized, utility-driven projects
 - **Stimulus (American Recovery & Reinvestment Tax Act Of 2009) changed this by expanding the PTC to include an investment tax credit and an additional ITC cash grant—while this stopped the bleeding, it's not enough of an injection the industry needs**



- State RPS Mandates Would Be Aided By Federal Standard
- 29 states + DC have a mandatory RPS

Mandatory Renewable Portfolio Standards

| | | |
|----------------|--------------------|--------------------|
| AZ 15% by 2025 | MD 20% by 2022 | NV 25% by 2025 |
| CA 20% by 2010 | ME 40% by 2017 | NY 25% by 2013 |
| CO 20% by 2020 | MI 1,100 MW by '15 | OH 12.5% by 2025 |
| CT 27% by 2020 | MN 25% by 2025 | OR 25% by 2025 |
| DC 20% by 2020 | MO 15% by 2021 | PA 18% by 2020 |
| DE 20% by 2020 | MT 15% by 2015 | RI 16% by 2019 |
| HI 40% by 2030 | NC 12.5% by 2021 | TX 5,880 MW by '15 |
| IL 25% by 2025 | NH 23.8% by 2025 | VT 20% by 2017 |
| KS 20% by 2020 | NJ 22.5% by 2020 | WA 15% by 2020 |
| MA 15% by 2020 | NM 20% by 2020 | WI 10% by 2015 |

www.ferc.gov/market-oversight/other-mkts/renew/other-rnw-rps.pdf



19 States + DC Have Solar DG Set-Asides Or Credit Multipliers

RPS for Solar & DG

| | | | |
|----|-------------------------|----|------------------------------|
| AZ | 4.5% DG by 2025 | NH | 0.3% solar by 2014 |
| CO | 0.8% solar by 2020 | NJ | 2.12% solar by 2021 |
| DC | 0.4% solar by 2021 | NM | 4% solar by 2020 |
| DE | 2% solar by 2021 | NV | 1.5% solar by 2025 |
| IL | 1.5% solar by 2025 | NY | 0.1312% on-site solar by '21 |
| MA | 250 MW by 2017 | OH | 0.5% solar by 2025 |
| MD | 2% solar by 2022 | OR | 20 mw PV by 2020 |
| MI | x3 RPS credit for solar | PA | 0.5% solar by 2020 |
| MO | 0.3% solar by 2021 | TX | double credit for non-wind |
| NC | 0.2% solar by 2018 | WA | double credit for DG |

www.ferc.gov/market-oversight/other-mkts/renew/other-rnw-rps-solar-DG.pdf



The EPA's modeling of the Waxman-Markey climate bill, which requires a federal RPS of only 8%-11.5% by 2020 (due to all the exemptions), projects only a business as usual growth of new renewable generating capacity by 2020 (page 27, http://energycommerce.house.gov/Press_111/20090623/hr2454_epaanalysis2.pdf)

This prompted the Southern Alliance for Clean Energy to conclude that the Waxman-Markey RPS would have "effectively zero" impact on renewable energy generation.



- Need for massive transmission expansion to meet next round of RPS targets—Population density, United States, 2000: 79.6 people/sq mi, 87% increase from 1950 (42.6 people/sq mi)—China doesn't have 5th Amendment private property rights, can evict 1.3 million people for the Three Gorges Dam project, no problem!
- "...an RPS is not a stand-alone policy. State experience indicates that results depend on complementary policies, especially those relating to transmission...simply having an RPS is no guarantee of more renewable capacity." - *State Clean Energy Practices: Renewable Portfolio Standards*, www.nrel.gov/analysis/pdfs/43512.pdf
- States allow utilities to purchase Renewable Energy Certificates (RECs) in lieu of actually producing the renewable energy themselves—states' place few, if any, restrictions on out-of-state supply
- RPS advantage – setting a goal for industry and planners to shoot for



The Feed-In-Tariff as the next generation of Renewable Energy Incentive to Encourage Household Distributed Generation

- Households need energy independence and more local control over energy production to break from the centralized utility model and looming transmission bottlenecks
- FITs are production-based incentives, with the most effective based on the levelized cost of renewable energy generation, ensuring a payment to cover costs.
- The subsidy is funded through ratepayers, rather than taxpayers. Ratepayers can be reimbursed through policies that place a price on carbon (Obama's 100% auction or a carbon tax).
- High up-front costs are addressed through debt-financing paid through the long-term guaranteed payments made through the rate subsidy. This can allow for the creation of FIT share-based financing vehicles, whereby investors can provide up-front capital in exchange for a portion of the long-term rate subsidy payment.
- Ratepayers can be protected from escalating retail rate increases with the imposition of a subsidy "cap" that, say, can be designed to keep electric retail rates from rising more than x%/year.



“Well-designed FIT policies have several advantages over other RE policies such as upfront rebates, net metering, and quota-based policies like renewable portfolio standards...FIT policies have on average fostered more rapid RE project development than these other policy mechanisms. Additionally, they have been found to be more cost-effective...than policies like RPSs that make use of competitive solicitations.” – *An Analysis of Renewable Energy Feed-in Tariffs in the United States*, NREL, www.nrel.gov/docs/fy09osti/45551.pdf

The feed-in tariff relies on *debt financing*—rather than the *equity financing* which has characterized the large financial institution involvement in RPS-PTC markets. In most situations, debt financing will be cheaper.

FIT financing is tied to costs, generally allowing full recovery—making it a safer investment, putting downward pressure on returns, keeping program costs lower.



- Germany & Spain are the two countries in Europe with advanced FITs
 - As a direct result of FIT financing, Germany generates 4.5x more electricity from the sun than the U.S, and Spain 2.8x more (2008)
www.eia.doe.gov/emeu/international/contents.html
 - The City Commission representing the municipal utility in Gainesville, FL approved a FIT in February 2009. Gainesville pays 32¢/kWh for PV < 25kW, and 26¢/kWh for those > 25kW. FIT payments are authorized for 20 years, with the subsidy payment decreasing by 5%/year, and providing an annual cap of 5MW of solar capacity installation/year.



This underscores the problem: Investor-Owned Utilities have largely opposed FIT programs in the US out of self-interest: the last thing an IOU wants is for their customers to turn into independent power producers.

There are IOU programs in California, Washington, Wisconsin & Vermont that are extremely limited in size and scope.

One key may be promoting a federal FIT financed through climate legislation that raises money by placing a price on carbon. On August 25, 2009 – two months *after* the House passed Waxman-Markey, President Obama submitted to Congress his Mid-Session Review Budget of the U.S. Government his 100% auction, 80% dividend climate plan that would raise \$80 billion/year, with \$15 billion/year dedicated to clean energy financing www.whitehouse.gov/omb/budget/MSR/

U.S. Rep. Jay Inslee introduced HR 6401 in 2008 that would establish a federal feed-in tariff financed by a federal system benefits charge and providing 20-year contract financing for all renewable energy technologies.



- Conclusion – state RPSs helped get us to where we are today, and FITs can run us through the final leg
 - With investments in energy efficiency and demand reduction (we use double the energy per person compared to our competitors in Western Europe and Japan), distributed generation can meet our energy needs. But don't take Public Citizen's word for it:

"We may not need any [nuclear or coal plants], ever... I think baseload capacity is going to become an anachronism. Baseload capacity really used to only mean in an economic dispatch, which you dispatch first, what would be the cheapest thing to do. Well, ultimately wind's going to be the cheapest thing to do, so you'll dispatch that first. People talk about, 'Oh, we need baseload.' It's like people saying we need more computing power, we need mainframes. We don't need mainframes, we have distributed computing...So if you can shape your renewables, you don't need fossil fuel or nuclear plants to run all the time. And, in fact, most plants running all the time in your system are an impediment because they're very inflexible. You can't ramp up and ramp down a nuclear plant. And if you have instead the ability to ramp up and ramp down loads in ways that can shape the entire system, then the old concept of baseload becomes an anachronism." – Jon Wellinghoff, Chairman of the Federal Energy Regulatory Commission, April 2009



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bring solar panels to William
& Mary's classroom and dorm
rooftops