NolaSolar-NOCX-GreenTariff-Proposal.doc Presented Thurs, February 28th, 2008

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NOLA Solar and the New Orleans Carbon Exchange think that better things can be done with the $0.02 / kwh collected.

I. ENO's Green Power Program or Green Tariff proposal [1]... Pros and Cons:

A. Proposed by ENO: sign contract. $0.02 / kwh collected. Buy Green Power i.e., purchase Renewable Energy. e.g. produced by Windmills of Wyoming.. WoW!

B. However, the price of energy purchased this way will always be $0.02 / kwh above the price paid by other customers. This is apparently less than the national average. [2] But it more than five times the price used in Austin. [3]

C. Unclear whether this program allows the customer to buy a discrete amount of energy per month or instead, the customer must buy all the energy the customer consumes via this tariff to use it at all. [2]

D. If the customer agrees to buy all of its energy this way, the projected average cost per customer comes to about $200 / yr or $17/mo. In 2001, this cost generated just under a 20% participation rate in similar programs around the country. [4] However, for programs priced like Austin's the participation rate can be expected to reach 50% or more.

D. Unlike Austin's Green Tariff system, ENO's proposal does not include the idea of a long-term purchase-power contract... which has the possibility that with sufficient fossil fuel increases, the future price per kwh purchased with their Green Tariff can actually be lower than merely staying with normally priced electricity. [5]

E. ENO's proposal mentions Carbon Credits but only provides virtual certificates to the ultimate purchaser of the green energy. NOLA SOLAR and the NO Carbon Exchange believe this provision to be may be an unfair allocation of value and reduces the financing possibilities of locally installed PV systems.

F. There is no mention or prospect that the green tariff will be used to purchase ***local*** renewable energy -- despite the availability of large State and Federal solar tax credits.

G. There is no mention of, or a proposal to, buy energy conservation instead of green energy. Energy Conservation is much more cost-effective than any supply-side energy even operating windmills.

II WHERE's the MONEY?

A. **$25 M / yr from shutting down Michoud. [6]** The Michoud power plant can be shut down: That action would be expected to save over $25 million per year.

B. **$300 M financeable at 3% backed by the state of Louisiana. [7]** ENO as well as any private utility in Louisiana that suffered extensive damage from Katrina or Rita can access 3% financing secured by the State of Louisiana to facilitate reconstruction.

1. ENO claims that it had over $500 million in damages that were not covered by insurance or any other contingency fund.

2. ENO received just under $200 million from the LRA and other sources to help correct this deficiency.

C. **$10 million per year from the direct income from Green Tariffs.** A high percentage of the ratepayers in New Orleans are projected to choose to buy green power. (The success in Austin is over 50%. [8]). This option could easily generate over $5 million a year among residences. Assume that the average residential customer uses 10,000 kwh/yr, then a $0.02 increase generates $200/yr per green tariff ratepayer. If the number of customers subscribing is 25% of 100,000 customers, the 25,000 residential customers each pay an additional $200/yr or a total of $5 million / yr. Moreover, commercial customers who represent a larger share of the energy consumption in New Orleans, and are more interested in stable prices for economic reasons, are very likely to soundly participate. Hence, this number should be expected to be more than twice as high.

D. **$17 million per year from Carbon Credits.** If 50%, of the customers, as in Austin, choose this option, we avoid ½ of fossil fuel consumption via renewables. Consider the economic value: Note that production of a kwh of natural gas-powered electricity generation produces 1.32 pounds of CO_2. ENO sells over 5.2 billion kwh/yr. This becomes 5.2 * 10^9 * 1.3 /2000 tons or 3.4 million tons/yr. Carbon credits currently sell between $4 and $45 / ton, where the lowest price is for the lowest quality carbon credit, while programs that are city-wide programs with quality control get the highest prices. Under a conservative value of $10/ton, the income from carbon credits that could easily be derived from ½ of current production of CO2, i.e., 1.7 million tons a year would be $17 million / yr.

E. **Tax-Free Municipal Bonds can finance at 3% and guarantee payment through real-estate taxes. [9], [10]**

III. **The Demand & Supply Utility (D&SU).** Put both sides of the meter into the discussion. Redefine the notion of an energy utility to be one that operates on both sides. Let's call it a D&SU for a Demand and Supply Utility.

A. To value the capital investment on the demand side we propose:

The "RATE-BASE" of the new utility will include demand side investments. A demand side investment in a home is defined to be the lowest, amortized first cost of the set of investments that lower a home's energy use below that required to be building-code-compliant. How is this done? Via Energy Ratings that are more automated.

B. The (effective) price per kwh paid by a ratepayer is adjusted to make this work:

1. Energy Bill & Payments accrue from Energy Rating.
   a. Owner of Demand Side Rate Base is paid an annual, in lieu of interest or profit, payment equal to 0.5% to 5%.
   b. We propose that the supply-side utility gets a return on the same investment equal to1/4 of what the building owner gets.

2. The non-Participant ratepayer is one who didn't get a rating or chooses to not have his energy rating affect his energy bill.

Sample calculation:

Assumptions:

100,000 homes
10,000 kwh/yr is average consumption per home.
$0.10/kwh
Total 1,000,000,000 kwh/yr or $100,000,000.

Suppose 20,000 homes have on average $8000 in Demand Side Rate Base (e.g., capital investment on energy conservation, energy efficiency and/or PV). Therefore there is $160,000,000 of demand side rate base.

A **2.5% return on investment** on $160,000,000 is $4,000,000 annually.
Therefore the total cost for electricity is $104,000,000 for 1,000,000,000 kwh's or
$0.104/kwh

If there is no subsidy for this $4 million, the Non-Participant sees 4% rate increase. However, as pointed out above in the source of funds discussion, there are many pots from which to take this money. **With the subsidy from the green tariff, the non-participant sees no rate increase.**

The participant gets a 2% return: on average $160 / yr. — which is more than 75% of the cost of an energy rating.

The **supply-side utility gets a 0.5% return on the $160,000,000 or $800,000 / yr —** hopefully this is much more than enough to get ENO's full cooperation!

IV **What Does It Cost?** to install PV or Energy Conservation?

A. Buy kwh from Entergy with no change in the status quo
1. Energy from Michoud = $0.125 / kwh
2. Purchased Energy from Entergy = $0.084 / kwh
3. From Marketplace suppliers = $0.0445 /kwh

B. PV (A 3.5 kW system @ $7.15 installed /W has a first cost of $25,000 and actually has a 40-year life expectancy. In New Orleans, it can be expected to generate 458 kwh/month. [11] The following calculations presume a 20-year useful life amortized at 6% annually.)
1. Unsubsidized costs = $0.391 / kwh.
2. With the 50% State tax credit, $12,500 -> $0.196 / kwh,
3. with 30% Federal tax credit in addition, $3750 -> $0.137 / kwh
4. with carbon credits $858 -> $0.124 / kwh
5. with subsidy from Green Tariff $0.02 / kwh -> goes to $0.104 / kwh

C. Energy Conservation (amortized over 20 years @ 6% annually)
1. **Light bulb change saving cost is -$0.01 / kwh**. Because the energy savings for an Incandescent to fluorescent lamp change (60w to 15w) calculated over 10,000 hr (the useful life two fluorescent lamps) 45w => 450 kwh. In addition, there is a bulbs savings of $2+ since 13 incandescent bulbs @ $.50 each costs $2 more than 2 fluorescent bulbs @ $2 each
2. **Shading windows savings cost is $0.013 / kwh** (In a typical home $250 spent on solar shades will save about $150 /yr in energy.)
3. **Fixing duct leakage saving cost is $0.013 / kwh** (In a typical home $500 spent on duct leakage saves about $300 /yr in energy**.)**
4. **Weather-stripping saving cost is $ 0.039/ kwh** (In a typical home, $250 spent on weather-stripping will save at least $50 / yr in energy.)
5. **For the average home where $10,000 is spent, the value is $0.086 / kwh** : (since this saves about 10,000 kwh/yr on average)

V. **The NOLA Solar / NO Carbon Exchange Green Pricing Program** (NSGPP) should focus upon local generation of electricity from renewable sources but preferably energy conservation.

A. What is Local Generation?

1. Is it a single, large PV array located in NO by owned by Entergy? Or

2. Is it a distributed PV array located on hundreds to thousands of homes in NO? We think it should be this one!

B. Better still is Energy Conservation.

C. Long term purchase power contracts.

1. Direct agreements between suppliers: homeowner who installs 3 to 25 kW at their homes and consumers: Commercial or Residential customers in the city. A small transaction fee and distribution cost could be collected by ENO and the City of NO. At $0.135/kwh, there is more than enough income for the supplier.

2. Direct agreements between suppliers of Energy Conservation: any building owner which sells the carbon credits to other building owners. The purchaser of the carbon credits pays $0.02 / kwh or $30 / ton of carbon.

REFERENCES:

[1] "Voluntary Green Power Program" ENO, Inc. Tracie L Boutte, VP – Regulatory & Governmental Affairs. January 17, 2008

[2] **Energy-based programs** — This type of program allows customers to choose a discrete amount of energy to be supplied from renewable sources, usually in 100-kWh "blocks" or as a fixed percentage of their monthly electric energy requirements. Many utilities with energy-based programs allow customers to obtain 100% of their electricity use from green power. With one exception, the green premiums charged in energy-based programs range from 1.0¢/kWh to as high as 17.6¢/kWh, with a median of 2.5¢/kWh (see Figure 2).
Utility Green Pricing Programs: What Defines Success? **Blair Swezey and Lori Bird NREL/TP.620.29831** September 2001 http://www.eere.energy.gov/greenpower/resources/pdfs/29831.pdf

[3] In January 2000, Austin Energy announced a green power product, which was initially priced at 0.4¢/kWh above the cost of the traditional system power offering. Because the utility's *GreenChoice* subscribers are exempt from the utility's fuel charge, the green rate has fallen below that of system power as natural gas prices have risen. Because this first product offering, which is now fully subscribed, was partially subsidized, subsequent participants pay a premium of 0.17¢/kWh.
http://www.eere.energy.gov/greenpower/resources/pdfs/29831.pdf

[4] Figure 3. Aggregated willingness-to-pay curve for residential customers
http://www.eere.energy.gov/greenpower/resources/pdfs/29831.pdf page 6.

[5] ***Protection from fuel price increases*** — Because determination of an energy-based green power premium is, in part, tied to the utility's cost of other resources, it follows that if the costs of these other resources increase, the green power premium should decrease accordingly.
http://www.eere.energy.gov/greenpower/resources/pdfs/29831.pdf page 7.

[6] Sylvester et. al. Research on the economic consequences of shutting down the Michoud Electricity generation plant.

[7] "Attempting to assist electric utility companies still recovering from losses sustained as a result of hurricanes Katrina and Rita, **House Bill 887 by Representative Pinac and Senator Hollis (Act 64)** established the Louisiana Electric Utility Storm Recovery Securitization Act which will allow an electric utility to take advantage of certain IRS regulations by bonding out future "storm recovery charges" to be imposed on consumers and borrowing against such funds at a reduced rate. The Louisiana Public Service Commission will retain their ability to examine and approve any request from a utility to impose such "storm recovery charges" prior to obtaining such bonds. By utilizing this procedure, the consumer will benefit since the utility will have to borrow less money to make the necessary repairs."
http://senate.legis.state.la.us/SessionInfo/2006/RS/Highlights/LinkShell.asp?s=Commerce

[8] Address by Rodger Duncan at New Orleans City Council May of 2007.

[9] "Now the city of Berkeley has devised an innovative plan that could dramatically increase that number and turn the nascent solar industry into a mass market if replicated. Under a solar initiative to be considered by the city council on Tuesday, Nov. 6, Berkeley would finance the installation of solar arrays and solar hot water systems (more on that later) for any homeowner or commercial building owner. You choose an installer from a city-approved list and retain ownership of the solar system, paying back the cost over 20 years through an assessment on your annual property tax bill." October 31, 2007 http://blogs.business2.com/greenwombat/2007/10/berkeley-to-fin.html

[10] Feb 11, 2008 "**...** To cope with the problem, many Indian cities offer incentives such as property-tax rebates to get residents to install solar-water heaters. But Thane, an industrial city of about 1.5 million people, has been much more aggressive than other municipalities. Not only is it encouraging residents to take up solar power -- it is using the renewable energy extensively in its own buildings. … Beginning in May 2005, the administration made it mandatory for builders to fit all new buildings with solar water heaters. … Meanwhile, to encourage existing buildings owners to install solar water heaters, the city began offering a 10% discount on property tax every year for adding the hardware. … Since the program began, 16,300 families in the city have connected to solar water heaters, Mr. Pote says. With those efforts, the city today saves enough electricity to power more than 5,000 homes. "This is still a small fraction," Mr. Pote adds. "If we can get at least 25% of the families to start using solar water heaters, we can reduce the city's total electricity consumption by almost 15%."
http://online.wsj.com/public/article/SB120248655589254033-o_E8MSu_lUbSRP8Bp8Y_xHWoPVg_20090210.html?mod=rss_free

[11] The actual AC electricity produced by a 3.5 KW PV system over 20 years is not quite as much as its rating multiplied by the appropriate available sunlight. In fact the energy supplied is degraded by the efficiency of the inverter (that takes the DC energy and converts it to AC energy) which typically has efficiencies over 90%, but the newest inverters are more like 95% efficient. However, it is also true that the PV equipment degrades over time; in fact, standard PV equipment, made of crystalline silicon, degrades over time with an average effectiveness over the first 20 years guaranteed to be at least 88%. Therefore, the expected output is near 90%. To complete our calculation, we must multiply by the number of available hours / day of sunlight — about 5 hours a day on average for New Orleans. Thus the expected output of the PV system over 20 years is

(rated output) * (hours / day) * (days / year) * (number of years) * average expected effectiveness of the PV equipment over the time period) * (efficiency of inverter) =

3.5 KW * (5h/day)*(365.25 days/ year) (20 years) * 90% * 95% = 109301 kwh

While the average monthly output is

.5 KW * (5h/day)*(365.25 days/ year) * 90% * 95% /12 = 455 kwh

HOWEVER, if "PVwatts" is used, as required by state rules, the projected output decreases to 410 kwh/mo since in that case 90% * 95% is replaced by 77%.