Net Metering
A Compendium

Net-Metering is facilitated or greatly benefits from each the recommendations described herein. To fully appreciate these recommendations and their relationship to net-metering, l**ook** for the keyword "net-metering" highlighted in RED in each section.

1. **Analysis of New Orleans's Net Metering Ordinance**

2. **The price paid for energy produced from PV at a residence in New Orleans is half what is paid in New Jersey.**

3. **Avoided Cost**

4. **Remote/Displaced Generation**

5. **Abolish the Minimum Usage & Connection Fee**

6. **Inclining Block Rates**

Title: Analysis of New Orleans's Net Metering Ordinance

Abstract: Establishes a consumer-friendly way purchasers of clean, on-site distributed energy systems (advanced batteries and controls, combined heat and power (CHP), fuel cells, heat engines, mini-generation (natural gas), micro-hydropower, modular biomass, photovoltaics, and small wind), can be connected to the electric grid (at sizes typically under 2 MW) and be credited on their electric bill at retail rates for energy generated as long as the amount generated is not in excess of consumption.

Issue the recommendation addresses:
The installation of on-site distributed energy systems.
Following the Federal Energy Regulatory Commission (FERC) NOPR guidelines for interconnection and successful programs such as in the State of Texas.

Basic of the recommendation: Base interconnection rules on that recommended by the Federal Energy Regulatory Commission FERC, and net-metering rules by State of TX. These rules are user-friendly, overseen by Public Service Commission, and reliable. New Jersey and Colorado have similar rules.

Which elements of city government have decision-making and implementation roles? What will it take to implement this recommendation? New Orleans City Council acting as utility regulator.

What are the expected benefits? Provides incentives for large building-based or site-based, clean energy systems to provide incremental electric power to the electric grid. This should stabilize supply and minimize swings in electric rates or electricity shortfalls.

What are the costs (or cost elements)? On-site distributed energy systems will generate costs for the utility, as well as increasing oversight costs of the utility's regulators , because they must establish systems, track 'netting' of power and insure the customer is credited appropriately — while insuring that the electricity grid is functioning smoothly.

What are the metrics? The number and the rate of the building/facility interconnected systems installed each month.

What is the role of the market? To offer customers certified clean energy systems and interconnection equipment under appropriate UL (Underwriters Laboratory) and IEEE (Institute of Electrical Engineers) requirements.

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The price paid for energy produced from PV at a residence in New Orleans is half what is paid in New Jersey.

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Cc: Dennis G. Lambert
Subject: RE: RE Committee - Formatted Final Report

To All:
I may be late on this suggestion; I understand the State of New Jersey's Net Metering Statute allows almost double the buy-back amount of the power than the Net-Metering program adopted by the City Council in March 2007. I think it would be worth looking into the New Jersey program.
Regards
Donald

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Christophor's research on Donald Lambert's note:

The New Jersey Renewable Energy Program incentives fall into two principal areas:

1. **Initial Purchase Rebate (i.e. for small producer (<10kW))**
   http://www.njcep.com/html/2_incent.html
   a. $ 5.00/Watt Wind & Biomass,
   b. $ 4.40/Watt Solar Electric
2. **Excess Production Credits**
   http://www.njcep.com/srec/index-primary.html
   a. 20 cents to a max of 30 cents/kW-hr

From The Desire Database:
http://www.dsireusa.org/library/includes/incentivesearch.cfm?Incentive_Code=NJ07F&Search=Type&type=Production&CurrentPageID=2&EE=1&RE=1

"Solar Renewable Energy Certificates (SRECs) represent the renewable attributes of solar generation, bundled in minimum denominations of one megawatt-hour (MWh) of production. New Jersey's SREC program provides a means for solar certificates to be created and verified, and allows electric suppliers to buy these certificates in order to meet their solar [Renewable Portfolio Standard] RPS requirements. All electric suppliers must use the Solar REC program to demonstrate compliance with the RPS. New Jersey's on-line marketplace for trading SRECs, launched in June 2004, is the first such operation in the world.

"SRECs will accrue from participating solar-electric facilities beginning March 1, 2004. Generators must register with the BPU **[Board of Public Utilities (= New Jersey's PSC)]** in order to participate in this program. An annual engineering estimate will be used to calculate the monthly SREC generation for systems with a capacity less than 10 kilowatts (kW). The program web site allows owners of systems 10 kW and larger to upload monthly meter readings and/or production information. When a generator has at least one SREC in an account, the generator can use the electronic bulletin board on the SREC web site to announce a sale offering. Interested buyers can also use the web site to request an SREC purchase. Buyers and sellers contact each other offline and execute a sale. After the sale is executed, the seller uses the web site to transfer SRECs to the buyer. Electricity suppliers will also use the web site to retire SRECs that have been used to meet their RPS requirements. The BPU has noted that generators also have the option of recording and retiring SRECs as a personal statement regarding the need for more clean energy.

"As noted above, SRECs are bundled and traded in minimum denominations of one MWh (1,000 kWh). If a generator has accumulated a fraction of an MWh by the end of a reporting year (May 31), the fraction may be carried over and combined with energy generated in one or more

subsequent reporting years in order to make a full MWh that is eligible for sale. One or more full MWh may not be carried over to subsequent years.

"The maximum price for an SREC is forecast to be approximately $300 per MWh ($0.30 per kWh). In recent months, the SREC program has compensated system owners an average rate of about $200 per MWh ($0.20 per kWh) generated. The estimated rate impact of the program on all customers is $0.00002 per kWh."

Christophor Note:

In practice, the small New Jersey Renewable Energy Generator, i.e., net-metering customer, is being compensated with a larger rebate on his initial capital purchases (+18%), and, in addition, also receives cash-flow from generation in excess of consumption of more than five times the avoided cost currently stipulated in the New Orleans' Net-Metering ordinance. Additionally, the size limits of RE systems covered under their net-metering plan are forty times larger for residential customers (1000 kW vs. 25kW) and twenty times larger for commercial customers (2000kW vs. 100kW).

Christophor Faust's Recommendations on Net Metering Tariff's:

1. Expand current max limits to match those allowed in New Jersey (i.e., 1000 kW for residential and 2000 kW for commercial)
2. Have ENO pay retail rates (~ $12 MW-hr) for excess electricity generation until RPS targets are met. Although these rates are only about half of what the small-scale New Jersey customer receives, it is a low-cost — yet powerful incentive for the New Orleans' rate-base to become actively involved in pursuing a Sustainable Energy Future as defined by the New Orleans' Energy Policy Task Force's Mission Statement.

Basic of the recommendation: See Abstract.

Which elements of city government have decision-making and implementation roles? What will it take to implement this recommendation? ACTION BY CITY COUNCIL AS UTILITY REGULATOR.

What are the expected benefits? See above

What are the costs (or cost elements)? See above

What are the metrics? See above.

What is the role of the market? Helps to encourage PV sales and Energy Efficiency.

Avoided Cost

The current rate at which Entergy pays for energy generated in excess of consumption in the Net-Metering Ordinance is priced at avoided cost.

"Avoided Costs" is defined as the incremental costs to an Electric Utility of electric energy or capacity or both that, but for the purchase from the Net Energy Metering Facility, such utility would generate itself or purchase from another source." (as defined in "**NEW ORLEANS NET ENERGY METERING RULES")**

Insert language from the Net-Metering Ordinance here.
"VI. **BILLING FOR NET METERING**

"A. On a monthly basis, the net metering customer shall be billed the charges applicable under the currently effective standard rate schedule and any appropriate rider schedules. Under net metering, only the kilowatt-hour (kWh) units of a customer's bill are affected.

"B. If the kWhs supplied by the Electric Utility exceeds the kWhs generated by the Net Energy Metering Facility and are fed back to the Electric Utility during the billing period, the net metering customer shall be billed for the net kWhs supplied by the Electric Utility in accordance with the rates and charges under the customer's standard rate schedule.

"C. Where the electricity generated by the net metering customer exceeds the electricity supplied by the Electric Utility, the net metering customer shall be credited, during the next billing period, for the excess kilowatt hours generated in the same manner as Section VI(B) above. For the final month in which the net metering customer takes service from the Electric Utility, the Electric Utility shall issue a check to the net metering customer for the balance of any credit due in excess of amounts owed by the customer to the Electric Utility. The payment for any remaining credits shall be at the Electric Utility's avoided cost. That avoided cost shall be clearly identified in the Electric Utility's net metering tariff, as set out below in Section IX, below."

From Entergy's Website

http://www.entergy-neworleans.com/content/price/tariffs/enoi_nm.pdf

"Table 2
Entergy Avoided Costs (ENO and ELL)

2008	*¢/kWh*	*Summer*	*Winter*	**2011**	*¢/kWh*	*Summer*	*Winter*
On-Peak		6.479	5.626	On-Peak		4.781	4.444
Off-Peak		4.393	4.211	Off-Peak		3.969	4.111"

Table #2 clearly shows that ENO has established a rate structure where avoided cost does not include anything but the very least cost source associated with generating capacity.

While this rate structure is a standard method supported by most utilities, it is not very representative of the cost the consumer actually pays ENO for energy services.

However, as it turns out, the price paid at "Avoided Cost" at this time happens to be less than 50% of the average retail price. This is too low.

Christophor's Recommendation:

1. ENO pays retail rates (~ $12 MW-hr) for any excess generation on an annual basis until the RPS is fulfilled. Payment shall be in the form of a check to the customer.
2. Customers that generate excess production in any calendar month shall not be charged a service charge for that month until the RPS is fulfilled.

Basics of the recommendation: See Abstract.

Which elements of city government have decision-making and implementation roles? What will it take to implement this recommendation? ACTION BY CITY COUNCIL AS UTILITY REGULATOR.

What are the expected benefits? See above

What are the costs (or cost elements)? See above

What are the metrics? See above.

What is the role of the market? Helps to encourage PV sales and Energy Efficiency.

Remote/Displaced Generation

Title Remote/Displaced Generation

Abstract Net-Metering Customers may install / sell and rent generation equipment anywhere in the parish.

Issues the recommendation addresses.

I. PV equipment works better when facing the south or even better if tracking. Unfortunately, in New Orleans, few roof hips face south or allow for tracking at low cost.

II. Historic homes are less appropriate for PV systems. In many cases, such a system would violate the requirements of the historic standard.

III. PV equipment, if improperly installed, can threaten the durability of a roof.

IV. A PV system can be purchased too big. With the current net-metering law, substantial economic value is lost if the PV system generates more energy than the home it is associated with consumes. If the PV system associated to a home is not tied to the same piece of real-estate, the homeowner can independently sell or rent the excess generation to a neighbor to insure that the equipment always receives the maximum return on investment.

V. Without the provision to sell or rent excess capacity to a neighbor, the homeowner has no incentive to conserve energy in the home. Since such steps usually cost much less than PV equipment's cost to generate energy, fixing a system on a home dis-incentivizes conservation.

VI. With this provision, it is possible for a landlord owning a duplex or a multi-family complex to also install a single, PV array large enough to accommodate all of the apartments and change the percentage of that array rented by each tenant on a monthly basis. The landlord can rent to a particular tenant a percentage of the array at a rental cost equal to a fraction (say 90%) of the retail value of the electricity generated by that part of the array, but not to exceed the annual consumption of that apartment. This allows the landlord to amortize the debt associated with the PV purchase and the tenant to effectively receive electricity at a price discounted to just below retail. When coupled with Louisiana's recently enacted SB90 and the Federal Energy Policy Acts of 2005 and 2007, which allow the Landlord to buy-down the amortized cost per kWh to less than 90% of the current retail price, both the Landlord and tenant enjoy positive cash flows.

VII. Many critical buildings like hospitals and schools could greatly benefit from having more than adequate PV equipment to run them in a crisis, but the economics of such purchases are not currently justifiable. This can happen if, for example, the landlord, as in the previous example, installs the PV equipment on the hospital or school.

Basics of the recommendation: Allow a net-metering customer to install, sell or rent PV equipment on real-estate discontinuous with the home or building "served" by that energy generator. The energy-generating equipment need not be installed on real-estate owned by the same owner as the building it "serves". Neither must the energy generation associated with an array of panels have independent inverters or meters to be deemed by the utility to be separate PV arrays for accounting purposes.

For example: A home at 123 First Street can install a 3 kW PV system on the roof of a building at 456 Main Street. The owner of the home and building need not be the same person. Under current interpretation of the net-metering law, this action would be prohibited from obtaining the credit. Under this proposal, it would be acceptable.

Moreover, at any time, the owner of the PV system can sell or rent any part of the equipment to any entity. If that new owner or renter of part of the PV system has a building in New Orleans, then he will become a net-metering customer by simple application to Entergy and get the benefit of the energy generated just as if that equipment were installed on his building. Because of the last sentence in the proposal, the array does not need to be rewired with a different set of connections, inverters or meters. The only effect will be accounting within the records of the utility company.

PRO: Encourages conservation.

PRO: Encourages PV installation without regard to PV sizing.

PRO: Improves the economics of the installation as it enables a customer to secure a location that will accommodate large PV' arrays thereby obtaining discounts on purchases and installation, while enabling him/her to profit while helping his/her neighbors at the same time.

PRO: Increases the number of buildings that are Passively Survivable. Such systems could be installed on hospitals or schools to enable them to serve as emergency shelters. Such buildings would therefore be inclined to provide free space on the roof as a mutual benefit to the net-metering neighbor and to the community in time of power-outages.

PRO: Helps move the community at large to sustainable.

PRO: Helps solve the Landlord – Tenant problem and makes economical the purchase of a large PV array by a landlord of a duplex or even a large multi-family apartment complex. This benefits both landlord and tenants.

PRO: If incorporated with a policy used in New Jersey, larger and larger PV arrays will be built and a more and more aggressive RPS can be attained.

Which elements of city government have decision-making and implementation roles? What will it take to implement this recommendation? ACTION BY THE CITY COUNCIL AS THE UTILITY REGULATOR.

What are the expected benefits? See above

What are the costs (or cost elements)? See above

What are the metrics? See above.

What is the role of the market? Helps to encourage PV sales and Energy Efficiency.

Abolish the Minimum Usage & Connection Fee

Title Abolish Minimum Usage & Connection Fee

Abstract Connection fees should be included in the base rate for energy.

Issues the recommendation addresses.

I. When a customer makes a major effort to lower his consumption (whether *actual consumption* via Conservation & Energy-efficiency alone or *net consumption* via Conservation, Energy-Efficiency and On-Site Electricity Generation, i.e., via Net-Metering), as the net consumption gets closer to zero, the residual bill arising from the connection fee can become a major percentage of the remaining bill. ***If this part of the bill does not decrease proportionally with consumption, the rate-payer has less economical incentive to save the last few kWh per month, in fact, the disincentive increases the closer the actual bill gets to zero.***

For example: In the current situation, with a fixed connection fee — Let's assume that a code-compliant home uses 1000 kWh per month, that electricity costs $0.10 / kWh and the connection fee is $10 per month. Then the bill for the code-compliant home will be $110 plus various taxes & fees, most of which are generally proportional to $110. In this case, the price per kWh is effectively $0.11.

If the connection fee is proportional to the usage, as it would be if it were already in the rates, the consumer who reduces his usage by 50% from 1000 kWh / month will receive a $55 plus tax savings. The result is a 50% savings on the energy bill. And the price per kWh purchased or saved stays at $0.11.

For the rest of the discussion we'll assume that the connection fee is fixed at $10 / month; i.e., that that fee is not included in the rates.

If the customer reduces his use by 50%, his bill drops to $60 plus various taxes — only a $50 plus tax savings. The net savings on the bill is only 50/110 = 45.5%. *With a fixed connection fee, small consumers of electricity are subsidizing large consumers*. In this case, the price per kWh purchased becomes $60/500 kWh = $0.12 / kWh. However, the price per kWh **saved** stays $50/500 kWh = $0.10 / kWh

However, suppose the ratepayer takes more steps to reduce the actual consumption — let's say by another 50% of what remains. Then, in this case, the bill goes from $60 plus taxes to $35 plus taxes (= $10 connection + $25 in consumption). Thus the consumer's usage drops by 50% but his bill drops by 25/60 = 41.7%. Then the price per kWh purchased increases to $35/250 kWh = $0.14 / kWh.

Another 50% drop in consumption decreases the bill by $12. Again this is not a 50% decrease in the actual bill but in fact 12.5/35 = 35.7% decrease. Then the price per kWh **purchased** increases to $22.5/125 kWh = $0.18 / kWh.

Another 50% drop in consumption decreases the bill by only $6. Again this is not a 50% decrease in the actual bill but in fact a 6.25/22.5 = 27.7% decrease. Then the price per kWh **purchased** increases to $16.25/62.5 kWh = $0.26 / kWh.

As long as the consumer never generates electricity, the economic value for the kWh **saved** stays the same, but the residual cost of electricity **purchased** per kWh increases!

II. The situation is even more of a problem for a net-metering customer. During months when electricity consumed is less than the electricity generated, the net value of the electricity generated can be negative!

For example: If the consumption – production = - 50 kWh, then the net value of the electricity is 50 x $0.10 = $5.00 – the connection fee of $10 = -$5.00.

Photovoltaic systems are already challenged economically by the fact that without subsidies it generates electricity at about $0.40 / kWh. During the months when production is less than 100 kWh more than consumption, the PV is in fact providing NO NET ECONOMIC BENEFIT to allow the homeowner to pay off (amortize) the original capital investment.

III. The net-metering law requires that the consumer who participates in Net-metering receive the retail value for the electricity generated. By eliminating the connection fee, more value is available to pay for the PV system.

IV. A home that has a net-zero consumption in the current system will not have a zero annual bill. But if the connection fee is abolished and included in the base-rate, then a home with a net-zero consumption will have a zero annual energy bill!

Basics of the recommendation: See Abstract.

Which elements of city government have decision-making and implementation roles? What will it take to implement this recommendation? ACTION BY CITY COUNCIL AS UTILITY REGULATOR.

What are the expected benefits? See above

What are the costs (or cost elements)? See above

What are the metrics? See above.

What is the role of the market? Helps to encourage PV sales and Energy Efficiency.

Inclining Block Rates

Title Abolish Declining Block in Favor of Inclining Block Rates

Abstract Rates should be inclining as in Austin Energy.

Issues the recommendation addresses.

I. When a customer uses more energy than the smallest block in the rates, the remaining electricity is sold at a lower cost. This discourages conservation.

"Block rates for electric service are those in which the per unit price changes with increasing monthly usage. Usage levels are defined by blocks, or successive ranges of monthly consumption. In the most-common form of block rate, the declining block, the per-unit-price decreases with each successive block. The declining block rate traditionally has been used because, according to proponents, it effectively satisfied the need to recover fixed charges early in the rate. Thus, the high initial blocks recovered virtually all the fixed costs and the latter blocks primarily recovered variable costs. Further, the rate was administratively simple and required a minimum of metering equipment. Finally it was also considered advantageous to provide a lower rate to high-volume customers since it was presumed that these loads provided overall benefits to the system. Currently, however, the declining block is undergoing substantial criticism. The three major criticisms are: (1) there exists some question whether the decline in price with increasing use reflects commensurate decreases in utility costs; (2) it is claimed that the declining-block rate structure fosters unnecessary load growth, impeding conservation efforts; and (3) the rate is said to favor large users and discriminate against small users. "http://www.osti.gov/energycitations/product.biblio.jsp?osti_id=5161182

"Is there a clear cost basis for declining block generation rates?
No. The Company has offered no substantiation of any cost basis for a declining block generation rate. In response to AG DR 2-24 and AG DR 2- 25, the Company provided no cost-based information to support the contention that large users in either of these classes use less peak energy than smaller users.
In my analysis of a number of utilities, I have actually found contrary evidence - that smaller users and customers living in apartments often actually have less peaked load profiles than larger or single-family customers within the residential class."
PREPARED SUPPLEMENTAL TESTIMONY OF WILLIAM B. MARCUS on behalf of THE ARKANSAS ATTORNEY GENERAL October 31,2000
http://www.apscservices.info/PDF/99/99-249-u_58_1.pdf

Basic of the recommendation: Use inclining block rates.

Austin Energy provides a single increasing block rate where an approximately 50% discount from the standard rate is provided for the first 500 kWh of usage per month.

PRO: This really encourages conservation to just below 500 kWh / month

PRO: Provides tremendous rate-relief for the poor.

But

CON: Provides significantly lower incentive for conservation below this level!

However, compensation can be found if:

PRO: A net-metering customer can receive an extra incentive wherein electricity generated in excess of consumption is paid at the full rate, while in the months where consumption – production is less than 500 kWh / month the cost is charged at the ½ rate. This rate structure will further incentivize PV!

Which elements of city government have decision-making and implementation roles? What will it take to implement this recommendation? ACTION BY THE CITY COUNCIL AS THE UTILITY REGULATOR.

What are the expected benefits? See above

What are the costs (or cost elements)? See above

What are the metrics? See above.

What is the role of the market? Helps to encourage PV sales and Energy Efficiency.