

# Building Science Innovator's Recommendations to Improve Entergy New Orleans's 2015 Integrated Resource Plan and Planning Process

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## Executive Summary

Building Science Innovators [BSI] is submitting, for review by the New Orleans City Council [NOCC], both a critique of Entergy New Orleans' [ENO] 2015 Draft Integrated Resource Plan [IRP] and recommendations designed to enhance both the result and process used to get that result. This document contains the recommendations and follows logically and complements the content of *BSI's Critique of the Core Assertions of ENO and Intervenors within the 2015 IRP* [BSI's Critique].

### ***Recommendations to Make Supply Cost-effectively Match Demand***

1. Incentivize robust demand-side management [DSM] by utilizing the means briefly described in the critique of the 3<sup>rd</sup> assertion within BSI's Critique.
2. Incentivize and provide legislative support for Community Solar in two ways:
  - promote a system of small, 50 to 100 KW solar farms with 150 to 300 kWh of integral battery storage on most "key lots" of the city.
  - promote much larger Solar Farms at distressed property found all around the city.
3. Incentivize the installation of battery energy storage systems [BESS] in every building.
4. ENO should continue to satisfy unmet peaking energy needs with power from MISO.
5. Stop adding generation resources to the rate-base now and for the foreseeable future.
6. Break this chain of logic at every link: ENO makes more profit only by building more generators; DSM cannot displace the need for new generation; DSM is under ENO's control.

### ***Recommendations to Improve the Integrated Resource Planning Process***

- Improve public confidence, input, input effectiveness, collaborative process and result finding.
- Publicize how, when and where key assumptions are made and how they can be changed.
- Publicize examples of effective input by the public and, thereby, facilitate it happening again.
- Pay intervenors when they effectively contribute to a regulatory decision that saves money.
- Fund the Center for Excellence in the Built Environment by paying intervenors.
- Pay a third-party consultant to choose and implement the IRP modelling software employed.
- Select from among pre-certified IRP modelling software to confirm its competence to:
  - Fully handle demand, supply and storage options located on either side of the meter,
  - Perform automated, what-if analyses on the broadest range of issues — including risk,
  - Warn against classes of input errors and inappropriate interpretation of results.
- Vet third-party consultants to assure that motivations are not compromised by self-interest or on-going relationships with any utility, business, industry, or government policy purveyor.

## Elaboration of Recommendations

### Part 1: Recommendations to Make Supply Cost-effectively Match Demand

How should CCNO engage City of New Orleans [CNO] ratepayers and the construction industry to rapidly and economically reduce peak demand in sufficient size and speed? BSI believes that any one of the first three methods (listed above) CAN displace 300 MW of peak demand in less than 5 years. But, BSI does not think the CCNO should pick the winner, allocate or segregate resources among these ways to reduce peak demand, but instead, create the following mechanisms. Here is a *carrot and stick* approach that utilizes graduated charge increases and rebates to engage and transform the marketplace.

- A. Install smart meters throughout the ENO building stock. These meters should have the ability to report consumption every 5 minutes. Residential customers can be the last to get them.
- B. Increase the *demand charge* found for all but residential customers to a *utility peak demand charge* from what the customer had been paying as a demand charge by equal steps each year for five years until it reaches \$20/KW/month. *Utility Peak Demand* for a building is the maximum measured KW consumption rate during any consecutive 15-minute period within the utility's 3 to 6 hour peak demand time of any day for a month of readings.
- C. Customers will get a 50% demand charge reduction if they buy into a solar farm or install a rooftop system sufficiently large to displace at least 30% of their annual consumption.
- D. kWh's generated at a solar farm cannot be banked for future use; energy not consumed within a five-minute generation window goes into a pool to discount bills for low-income ratepayers.
- E. Facilitate solar farms on key lots and economically distressed real estate.
- F. Rule: "peak watt for ten years" = 10-year average demand reduction over all utility peak hours.
- G. Provide a \$1.5/"peak watt for ten years" rebate for any energy efficiency retrofit that saves 10% of the annual bills; the CNO retains ownership of the associated White Certificates [WC].<sup>1</sup>
- H. Provide a \$0.75/"peak watt for ten years" rebate for any purchase of part of a PV system whether at the building's site or through a Solar Farm; the CNO retains ownership of the associated Renewable Energy Credits [REC].<sup>2</sup>
- I. Provide a \$0.50/"peak watt for ten years" rebate for any purchase of part of a BESS.
- J. Provide a \$0.20/"peak watt for ten years" rebate for any other kind of retrofit.
- K. Provide a mechanism whereby any ENO customer can sell electricity power quality services, i.e., spinning reserve and/or frequency regulation, to ENO or MISO at competitive rates.
- L. Customers eligible for rebates, discounts or power quality sales must have smart meters.
- M. Accept RESNET Home Energy Raters as certified 3<sup>rd</sup> party verifiers.
- N. Pay intervenors in a manner similar to the program that works in California.
- O. Mandate that Real Estate Multi-listing services publicize energy ratings if available.
- P. Set up a website that advertises and explains these measures and successful client examples.
- Q. Hire a third party expert to choose IRP software, input data, model issues and present results.

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<sup>1</sup> [https://en.wikipedia.org/wiki/White\\_certificates](https://en.wikipedia.org/wiki/White_certificates)

<sup>2</sup> <http://www.epa.gov/greenpower/gpmarket/rec.htm>

**Incentivize robust demand-side management by utilizing all of the means briefly described in the critique to the 3<sup>rd</sup> assertion within BSI's Critique of the Core Assertions of ENO and Intervenors within the 2015 IRP.**

The following includes an example to help explain each of the deficiency categories of ENO's DSM.

**1) ENO's DSM underpays for energy-efficiency.**

The current average price ENO pays is \$1/"peak demand W" even though it considers a solar system that costs \$5/"peak demand W" a good candidate for an alternative to a combustion turbine. This means that ENO should at least be paying \$2/"peak demand W" on average for its DSM program.

**2) Fully exploit a broader range of cost-effective, energy-efficiency retrofit options.**

- a) The Geysier heat pump water heater made by Nyle industries, is more efficient, less expensive and cheaper to install than those on the short list of approved water heaters.
- b) Almost all ductless AC's save more energy by each of: a) avoided distribution energy losses, b) zoning, and c) dehumidification and cost much less to a) purchase, b) install or c) test than almost all ducted systems even though some ductless AC are nominally rated to have lower energy efficiency than some ducted systems.
- c) Converting an open to a closed crawl space saves a considerable amount of energy, is an inexpensive retrofit and avoids expensive, serious and very common moisture problems.

**3) The DSM plan should reward performance-assured savings.**

Reducing infiltration and duct leakage are highly cost-effective retrofits but cannot be adequately appraised with deemed savings because from home to home and contractor to contractor there are gross differences in the extent of the previous conditions of the home and the quality of the retrofits. A highly skilled and experienced, 3<sup>rd</sup> party, home performance expert will easily find more cost-effective retrofits than can be found on ENO's DSM list but the success must be verified with a before and after energy audit — nothing else can confirm energy savings. This strong opinion is an embodiment of the *modus operandi* of Louisiana's highly successful HERO program which operated for almost 20 years.

The performance of some equipment is highly dependent upon how and where it is installed: e.g., duct testing must be done to assure ducted AC performance, and the placement of a heat pump water heater can easily change its efficiency by 50%.

**4) Allow market transformations and indirect or unshared investment in each building.**

Indirect investments can save energy at low \$ / "peak demand W"; for example, education.

By using an approved list of retrofits, manufacturers will raise their prices to match the subsidy and thereby undermine the economic potential for future retrofits; it is better to approve a generic list instead and if necessary, reject bad models; even better is let installer claim benefit after installation.

*Control* is a means of energy conservation that is purposely ignored in homes by RESNET; but this need not be the case in ENO's DSM by design.

Mandate that energy ratings of homes to be posted in all local listings by the real estate industry whenever they are available and publicize the improvement in selling price caused by an energy rating.

## 5) Forthrightly ameliorate the 3, major, split-incentive problems of the utility and utility consumer.

Solve the tenant-landlord, split-incentive problem with third-party financed, EE retrofits that provide payback sufficient to pay all of the following four cash flows

- i) the investment's capital cost via small monthly payments over 5 years,
- ii) substantial net discount on tenants' monthly energy bills and, as well,
- iii) a smaller but non-trivial monthly payment to the landlord;
- iv) a much smaller income for the 3<sup>rd</sup> party investor and/or administrator of the program

after 5 years, all energy retrofit capital costs are paid and three of these cash flows are eliminated; thereafter all kWh savings from this retrofit will go exclusively to lower tenants' bills.<sup>3</sup>

The other two major split-incentive problems are:

- the problem of the new homeowner who only plans to live in the home for 5 years or less.
- the problem of the coupled incentive of the utility who only makes a profit by owning capital investments and makes no profit by lowering its consumer's bills.

## 6) More fully exploit the gold mine of retrofits of existing buildings that solve much more economically significant problems like moisture control or worker productivity which create prodigious energy-efficiency and decreased demand as minor ancillary by-products, and conversely.

Insulating a building shell by placing pre-cast foam boards onto the exterior side of stud walls can solve two major moisture problems: stopping rain intrusion as well as controlling vapor flows — neither of these are positively affected by putting any kind of insulation between studs; moreover, this system is far and away better than any alternative to retard heat flows; a homeowner would not tend to choose this if the benefit is measured in energy savings alone because of its installation cost, but when durability and health are considered, this retrofit is an easy sell.

Because worker productivity easily has 50 times the economic value compared to utility bill savings to a commercial building's tenant, a lighting retrofit that allows individualized control of lighting levels or prodigious natural lighting can be sold based upon improved productivity — the same retrofit will likely not meet have the cost / benefit ratio if only energy savings is considered.

However, the converse problem also exists: some energy retrofits can actually create much more economically significant moisture problems or degrade worker productivity.

Well known examples are:

- Vinyl wallpaper placed on the interior side of exterior walls.
- Installing over-sized AC equipment or equipment with poor dehumidification ability.
- Over-lighting offices or hallways or providing limited control of location or level.

Less well known examples are:

- Using exhaust fans to dry or cool a crawl space or attic.
- Place a radiant barrier in a vented attic that contains a ducted AC system.
- Putting fiber or foam insulation between studs behind a stucco-coated exterior.
- Cooling a home below the monthly average outside dew point.

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<sup>3</sup> [www.academia.edu/2900824/Policy\\_Options\\_for\\_the\\_Split\\_Incentive\\_Increasing\\_Energy\\_Efficiency\\_for\\_Low-Income\\_Renters](http://www.academia.edu/2900824/Policy_Options_for_the_Split_Incentive_Increasing_Energy_Efficiency_for_Low-Income_Renters)

**7) Engage in efforts with others to fix broken building codes, reverse faulty EPA decisions, reform manufacturers' activities that impede energy-efficiency and redirect the energy design industry.**

During the last few decades the building codes have changed regarding where and how to insulate the top of a residential attic, crawl space, as well as on the floor of a drop-ceiling of a one-story commercial building. Some of these moved in the wrong direction and some of these changes took far too long to happen. For example: cathedralized or unvented attics took too long to become code-compliant and insulation over drop ceilings has recently become non-compliant; both of these are wrong and have wasted or will waste retrofit opportunities, raise energy consumption, and increase demand that will happen whether or not ENO gets involved.

The EPA has rated many appliances with a national perspective without getting into the granularity of climate-zone specific considerations. For this reason, heat pump water heaters can be more than twice as efficient when installed in a southern basement than a northern basement, nevertheless gets only one efficiency rating. Similarly, FEMA has insisted that homes in flood plains, must have vented crawl spaces — big mistake.

Manufacturers of fiberglass batts clearly state that the paper backing should be down when installed in an attic — which may be a good recommendation for homes north of Missouri, but in our climate, such insulation should be installed with the paper backing above. In fact, the best choice would be fully air-tight, thin-plastic encased insulation, without which both the energy and moisture flows are grossly adversely affected.

The home energy design industry has purposely ignored control in the design of new homes or retrofits of existing homes. For this reason, homes are frequently fitted with single-hung windows which cannot accept full height screens and cannot be opened at the top. This is a gross design error.

**8) Utilize highly cost-effective retrofits that lower peak demand and also RAISE kWh use.**

A timer connected to an electric water heater that keeps the device off and thus the electricity consumption zero between 6 AM and midnight can be expected to increase kWh use but decrease the wholesale cost of energy needed to heat water. At the same time, the KW consumption at peak times goes to zero for this appliance.

An AC that makes ice at night may raise kWh use, but it can drastically lower peak demand.

**9) Fully exploit time-of-use pricing, interruptible rates, or any other kind of Demand Response means of having retail rates better reflect wholesale prices.**

The ComEd example shows that people will pay to get access to real time pricing. This example may be showing that a drop in demand need not have any cost to the utility.

**10) Allow customers to participate in selling the *spinning reserve* service to ENO or MISO.**

Estimates of the cost-effectiveness of selling spinning reserve<sup>4</sup>, show that it has about the same value to a utility as Frequency Regulation, i.e., around \$5/month per residential-sized battery backup power supply (as explained in number 11), moreover, it can be simple and even less expensive to implement by simply requiring solar inverters to provide reactive power.<sup>5</sup> *Although the direct effect of selling spinning reserve has little effect on the cost of peak power, this step can have major consequences on reducing peak demand because it helps finance battery installations which actually do the heavy lifting. This same statement applies to selling frequency regulation described just below.*

**11) Allow customers to participate in selling the *frequency regulation* [FR] service to ENO or MISO.**

In the IDCC talk referenced earlier, the V2G experiment showed that the FR cash-flow provided by a home-sized battery back-up power supply can be expected to generate about \$5 a day. Note that \$5/day is about \$1500 a month and more than 50% greater than the average residential energy bill.

**12) Allow customers to sell electricity at near wholesale prices to the utility during peak times.**

Moving low priced energy purchased in the early AM for delivery to the grid in the late afternoon can change the value of that energy by a factor of 2 to 20. For confirmation, see MISO graphics within the IDCC document.

**13) Raise demand charges on commercial and industrial customer to around \$15 /kW-month.**

Commercial Demand rates within ENO and Entergy Louisiana in general are currently around \$3 / kW-month. This is less than 1/8 of the fair price and 1/5 of the average rates found in Ca, FL and NY. This depressed price may help encourage the relocation of businesses to our region but at a price which unduly burdens residential customers. Switching to this higher figure has multiple benefits:

- a) Stops the unfair situation where residential customers are subsidizing commercial.
- b) Creates, in the short term, a cash flow which can be used to support new rebates, and
- c) Provides a normal marketplace sufficient to invite national companies like Solar City.

**14) Facilitate the purchasing of battery back-up power supplies in all buildings.**

Moving toward such a situation will lower the need for larger utility reserve margins and help place more batteries in the system to facilitate all of the above means of lowering demand and the costs of the utility.

Within the IDCC talk it was reported that Pepco found (before it went out of business) that the average cost of unreliable electricity to its residential and commercial customers exceeded \$500 / year and \$2000/ year, respectively. This cash flow is not a cost to be borne by the utility but provides an economic incentive for the average customer to purchase back-up power. Customers in the more

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<sup>4</sup> [http://www.science.smith.edu/~jcardell/Courses/EGR325/Readings/Ancillary\\_Services\\_Kirby.pdf](http://www.science.smith.edu/~jcardell/Courses/EGR325/Readings/Ancillary_Services_Kirby.pdf)

<sup>5</sup> It has been pointed out by Thomas Bialek, an electrical engineer and prominent employee of San Diego Gas and Electricity, that such a change is a relatively minor improvement in standard inverters but may require such inverters to be connected to a relatively small battery. Bialek, Thomas, ***Perspective on Solar and Energy Storage***, Presented at DOE's Sunshot Initiative: Integrated PV with Energy Storage Workshop, Jan 13, 2014.

affluent parts of this city are already investing in natural gas powered back-up systems for more capital cost but such equipment provides no ability to facilitate any of the above DSM benefits. Why not make a wedding with mutual benefits?

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**Incentivize and provide legislative support for Community Solar in two ways: i) promote a system of small, 50 to 100 KW solar farms with 150 to 300 kWh of integral battery storage on most “key lots” of the city.**

*The following (solar farms on key lots), is an important example of how to do solar farms and has the advantage that it garners the most subsidy: 30% from IRS and 50% from state, as well as an accelerated depreciation credit if privately owned. However, the next section on Solar Farms, a.k.a., Community Solar, works quite well without the state tax subsidy; we will see it explained in the next section.*

**Roll out a system of small, 50 to 100 KW solar farms with 150 to 300 kWh, ground-coupling and distributed battery storage at most “key lots” of the city.<sup>6</sup>**

Many to most “city blocks” have what is called a “key lot”. This lot is usually located near the center of the block and relatively far from any of the four bounding streets. This lot may be “L” shaped, longer than other lots or even have triangular regions. When it exists, it sits as the “odd-ball” lot within the block so that the other lots will have the more common dimensions like 30’ wide and 120’ long. This key lot is also distinguished in that it often has a boundary with most of the other lots. For these reasons, the key lot is a perfect place to put a variety of energy improvements that can enhance the energy services utilized for all of the homes on that block. Of course, at the time of this writing, the lot is privately owned and would not be automatically available for such improvements. To garner use to any part of the land, the owner should be paid the fair market value of the acquired land. The most expensive land in the city within residential neighborhoods probably costs around \$25 / sq ft, but much of the rest of the land is far cheaper.

Only a small portion within an area of the key lot is needed for this enterprise. Because solar PV is currently nearly 20% efficient and 1 sq meter normally receives 1000 Watts of sunshine at sea level, a minimum of 5 x 50 sq meters is needed for a 50 KW solar farm. Because a sq meter is very nearly 10 sq feet, the minimum amount of land is around 2500 sq ft.

What can be done with such land?

1. Site a Solar Farm
2. Site a Ground Coupling array for Heat Pumps.
3. Site a Battery Bank within each home on that block

Because the solar farm is close enough to the home, the solar equipment installed there may qualify for both the La and Federal solar tax credits. The solar system will be “AT” the home, even though the PV servicing that home is not on the same piece of real estate.

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<sup>6</sup> This idea need not utilize key lots, because there is much land in the city that can be otherwise made available, however, the use of land proximal to a home affords access to more and larger tax credits and allows fully, privately-funded solar farms to take full advantage of energy net metering—thereby providing more benefit for less net cost. However, the era of grossly subsidized PV is likely coming to an end because the price of installed solar has dropped by 80% since the Federal or State solar tax credits began. It is time to confect a tariff which correctly rewards owners of remotely placed solar farms without jeopardizing non-participating utility customers.



Because the solar system is at the home, , the energy flows to and from these homes would qualify for energy net metering and be logically entitled to completely avoid all of the costs associated with each kWh saved by the solar system.

The Ground Coupling Loop can facilitate ground-coupled heat pumps as needed up to the limit of the size of the ground coupling array installed at the key lot and sufficiently large for those homes that can take advantage of them. Unlike the solar farm, the extent of the ground coupling need not be limited to the area of the surface of the ground because modern ground coupling can use diagonally-inserted ground loops and these can be made more efficient using copper coils containing Freon instead of the less expensive and more common methods which employ plastic pipes filled with water.

Ground coupled heat pump provide all of these advantages:

- Drastically lowers energy consumption and demand of AC equipment connected to it,
- Facilitates energy conservation by timing (on an annual basis instead of on a daily basis), and
- Potentially helps to avoid, city-wide or local heat islands.

The battery energy storage systems [BESS] of the Solar Farm should be installed within homes adjacent to the key lot and provide all of

- Battery back-up of each home
- Facilitate inverted demand
- Facilitate demand response.
- Only release energy flow from the solar farm to ENO during Peak Hours
- Sell Frequency Regulation and Spinning Reserve services to ENO or MISO
- Etc.

Each of these equipment types, (i.e., PV, ground-coupling and BESS) greatly contribute to reducing electricity demand and the second kind of equipment even lowers the demand of other, conventional AC's operating nearby.

The energy equipment on the Key Lot will be a resource for all homes on the block to share. The equity interests of the various homeowners can be divided at the onset or redistributed like shares in a corporation as needed. Because of the economics of net metering, the highest value to any homeowner is limited by the amount of energy consumed, the resources will be shared and regularly redistributed according to the varying needs of the homes and the effects of newer energy efficiency retrofits employed. The resources can be shared in an ownership sense or leased out.

Another legal/economic mechanism for maintaining and distributing the value and energy assets of the solar farm could be a cooperative or condominium-type arrangement.

Notice that at 50 KW, it would take 6000 of these systems to displace the 300 MW of peak power ENO claims it needs. However, even that is an overestimate because the battery systems can be designed to move substantial power generated between 10 and 1 PM to peak hours, this can cause a 50 KW solar array to output like a 75KW array during the peak hours.

Notice that whether the solar farm is privately held or ENO fronts the cost of construction, ENO can lease all of the parts of the system and thereby generate a cash flow sufficient to pay all of the cost of

amortizing the debt. If this is case, the cost of this system of solar farms to ENO will also be  $\$0/\text{peak demand W}$ ".

The reason why the full capital cost can be amortized via leases is that the purely PV part of solar equipment can be expected to cost no more than  $\$1.5/\text{W}$ , the Battery back-up system no more than  $\$400/\text{kWh}$ . Assuming that on average, each home will want a 5 KW PV array and a 10 kWh battery back-up, for a block with 15 homes, the solar array will be 75 KW and the battery back-ups total 150 kWh. The costs can be estimated by  $\$102,500$  for the PV array and  $\$60,000$  for the Battery Back-up. Thus the total cost of the solar farm's electrical systems would be  $\$162,600$  to service 10 homes. However, people who can afford a natural gas fired electricity back-up generator are already paying about the same as this  $\$16,260$  for their equipment but such a purchase gets no benefits from reduced energy bills or cash flow from selling spinning reserve or frequency regulation power quality services to ENO or MISO. The frequency regulation service alone may be worth  $\$10,000$  a year. This means that the sale shouldn't be even slightly too hard to do.

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**Incentivize and provide legislative support for Community Solar in two ways: ii) promote much larger Solar Farms at distressed property found all around the city.**

The following quote from a May 2015 publication implicitly defines Community Solar, presents arguments for it and outlines how it is financed and administered.

- *“Since 2010, residential solar installations have added more than 2,500 megawatts of clean energy<sup>1</sup> - enough to power more than two million homes for a year. Yet nearly 75% of residential rooftop space is prohibited from participating in individual programs such as net metering due to structural constraints or ownership issues. Community solar aims to resolve this impediment, providing restricted residents access to solar in a virtual fashion. An administering entity will cover the cost of installing a large solar array and recoup these costs by allowing co-investors to buy into the project. Co-investing participants then receive the benefits from their share’s solar energy production.”<sup>7</sup>*
- *This same just quoted report points out that i) there are Community Solar [CS] programs in 19 states including Washington, D.C. and ii) D.C.’s CS regulation requires that instantaneous excess generation is not “stored for future use” by the owners of the CS, but instead is given to the low-income community. These last two clauses are decisions made by utility regulators based upon due consideration of the passing the non-participant test. The first indirectly asserts that in over 18 jurisdictions, the regulator decided that the cost thrown onto non-participants either didn’t exist or was negligible compared to benefits. The second sentence states that in DC, the regulators decided that whether or not negligible, DC’s regulators decided to provide a consideration for low-income people that would defeat any argument against CS. For the average net-metering customer, less than 10% of the energy generated by a PV system goes to the grid. This 10% gift to the low-income community is small enough to keep from spoiling the economics for the residents who will buy into the CS array in order to gain virtual net-metering.*
- *Although the report is focused upon Utility-Sponsored, Community Solar, the Utility does not wind up owning the solar plant; i.e., it does not wind up in the rate base, it is owned by the tens to hundreds of individual residents who finance their shares. Neither does the original sponsorship have to be a utility; the economics of CS is well enough explained to outline a plan for a private investor to sponsor and own the whole project. Moreover, since CS programs described in this report go all the way back to 2005, most of the currently existing CS projects have significantly higher capital costs than a new CS system owner would have to pay today; namely, about \$2.5 / W was the stated capital cost in the example given in the guide while ENO’s IRP says they could build their PV power plants at half that price.*

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<sup>7</sup> Design Decisions for Utility-Sponsored Community Solar, <http://innovation.luskin.ucla.edu/content/guide-design-decisions-utility-sponsored-community-solar>, May, 2015.

**Incentivize the installation of battery energy storage systems [BESS] in every building by allowing the batteries to earn money by providing valuable utility services and inverting demand from traditional peak times to other times of the day.**

Besides for the homes adjacent to solar farms on key lots, battery energy storage systems [BESS] can provide services to each and every building and to the utility whether or not that building has its own PV system at the building or even in a virtual sense as in community solar. As explained in the IDCC talk, BESS without PV is more economical than PV without BESS, for a variety of reasons, that is, as long as the utility regulator allows one of these easily available cash-flows to inure to the benefit of the owner of BESS:

- i) Enact time-of-day or some other rate mechanism that pays consumers to use more electricity when wholesale electricity prices are cheap and less when it is expensive.
- ii) Pay customers for assured drops in peak demand.
- iii) Pay customers for supplying power during peak demand times at above retail prices.
- iv) Allow a BESS owner to sell Frequency Regulation
- v) Allow a BESS owner to sell Spinning Reserve.

Note that the two measures in iv) and v) above do not directly affect drops in peak demand, but they greatly help to finance the batteries that can then participate in major drops in peak demand via i), ii) or iii).

Note that BESS is at least 25% more economic today that it was more than a year ago when IDCC was first conceived. This results from the difference in price and longevity of batteries available a year ago and those available today. Thus if BESS were cost-effective then, it is still cost-effective and costs 25% less today.

BSI further asserts that the economics of BESS is far greater on the consumer side of the meter than on the utility side of the meter. As is explained in the IDCC paper, this is the case because of the extra reliability batteries provide to their buildings; half of the first costs of a BESS can be paid off in less than 5 years by this cash-flow. Moreover, via batteries, the responsibility for electricity reliability can gradually shift from the utility to the building's BESS. As it does, it takes great economic burdens off of the utility; this benefits the building with BESS as well as lowering the cost of electricity for buildings without BESS..

**Stop adding generation resources to the rate-base now and for the foreseeable future.**

BSI points out that the 300 to 400 MW shortfall described in ENO's IRP presentation that will present itself in 2016 when Michoud is fully decommissioned does not create a speed bump or hill for ENO's ratepayers. This is because from the perspective of the cost of electricity, ENO has already been purchasing power from MISO instead of making it with Michoud because Michoud's efficiency is so poor.

According to ENO's IRP, ratepayers of ENO will only begin to gain from a newly constructed generating plant in 2019 when either a CT or CCGT comes on line (given that ENO is successful in convincing its regulator both that building a new generator is the cheapest option and either of the fossil fuel plants should be built).

It is both clear now and every indication in the future, that MISO will have excess electricity generation at low prices as long even if ENO's consumers do none of

growth in PV, increase in DSM or growth of BESS.

This is because MISO's off, off peak electricity is being sold below production costs and the case for this is strongest within the wind farms. This is explained in the IDCC talk.

The situation will tend to grow; because of EPA's Clean Power regulation and addendum to the federal Clean Air Act, more and more jurisdictions will be economically pushed to build new renewable energy generators. However, wind only has a 14% capacity factor, and PV only has a 25% capacity factor according to assertions by ENO representatives at IRP meetings; this means that the overwhelming majority of their electricity will be generated out of step with peak demand. Thus any wholesale purchaser of electricity who can buy now for later use will find himself in a grossly one-sided buyer's market.

Because of the Clean Power regulation and actions by regulators independently motivated to reduce the causes of Global Warming who have already instituted Renewable Portfolio Standards, this situation will only become more and more of a buyer's marketplace for the foreseeable future.

Wind-powered electricity is commonly sold at night within MISO at less than \$0.01 / kWh. Compare that to the Levelized cost of electricity for a new CT or CCGT which is nearly 7 times as high. [Quote an EIA.gov site.]

**Break this chain of logic at every link: ENO makes more profit only by building more generators; DSM cannot displace the need for new generation; DSM is under ENO's control.**

- As long as ENO only makes more money by building new generators, the CEO and other top executives should expect to be fired by the board of directors if they cannot sell the need to build new generators to the regulator. As explained on the previous page, building new generators should not happen. If construction of new generators stops, what should be done to promote/allow profit making? The obvious answer is to decouple the profit calculation for an IOU (investor owned utility) from the amount of capital the IOU owns. If that is not the metric for profit, what should it be? BSI has no intention to weigh in with its own creative formula, but BSI agrees that this is the right direction to go and will look to other intervenors' comments with an expectation to support them.
- However, if this incentive problem is not solved, what can you expect from ENO? It will be forced to argue that any DSM cannot displace the need for new generation. Thus ENO has a vested interest in making sure that every IRP shows that any DSM cannot be effective fast enough to displace the need for new generation. This motivation is obvious, thus the tendency to make sure that the IRP provides this assertion is literally mandated by ENO's profit situation.
- Given that ENO has a vested interest in having any DSM done on its customers will never compete with a new generating plant's ability to make sure supply meets demand, it is not at all surprising that ENO pushed the City Council of New Orleans a few years ago and insisted that any DSM must be run by ENO. ENO got what it paid for, ENO didn't want its DSM to have significant success: therefore it didn't have it.
- For the ratepayers of New Orleans to enjoy a healthy and significant amount of DSM, the only way it can happen is if ENO has nothing to do with controlling it, choosing the administrators, choosing the implementers, choosing the metrics or choosing the retrofits.

## Elaboration of Recommendations

### *Part 2: Recommendations to Improve the Integrated Resource Planning Process*

- Improve public confidence, input, input effectiveness, collaborative process and result finding.
- Publicize how, when and where key assumptions are made and how they can be changed.
- Publicize examples of effective input by the public and, thereby, facilitate it happening again.
- Pay intervenors when they effectively contribute to a regulatory decision that saves money.
- Fund the Center for Excellence in the Built Environment (described as the 2<sup>nd</sup> most important recommendation of the Energy Hawk, the 2007 report of the New Orleans Energy Policy Task Force) by paying intervenors.
- Pay a third-party consultant to choose and implement the IRP modelling software employed.
- Select from among pre-certified IRP modelling software to confirm its competence to:
  - Fully handle demand, supply and storage options located on either side of the meter,
  - Perform automated, what-if analyses on the broadest range of issues — including risk,
  - Warn against classes of input errors and inappropriate interpretation of results.
- Vet third-party consultants to assure that motivations are not compromised by self-interest or on-going relationships with any utility, business, industry, or government policy purveyor.

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BSI notes that the processes used for insuring public input is grossly deficient primarily because, besides for a few devotees who truly educate themselves about the process, jargon and technical information, comments from the public are almost always viewed as ancillary expressions of concern with little to no merit regarding the issues under current discussion. The field of utility regulation is very complex and thus precludes competent public comment from almost anyone who does not invest the needed time to understand the playing field, in general, and the details currently on the table, in particular. Thus public comments are, by and large, an exercise that allows public venting of frustration but does not contribute to the process in a meaningful way.

However, that general description of public comments does not apply to all parties. The exceptions are, most notably: the Alliance for Affordable Energy, and secondarily intervenors like: Green Coast Enterprises, and the Gulf States Renewable Energy Industries Association (GSREIA); BSI counts itself in this group.

During the time Myron Katz (the primary author of this document) has been watching, namely since the early 1980's, many, many groups of people and businesses have come forward and given many thousands of hours to help direct the fortunes of New Orleans's electricity rate payers. The most notable examples in my memory are

- 1) The effort leading up to the May 1983 and May 1985 Get NOPSI Back referenda where more activists were working on that project than were working on all other environmental issues in the State of Louisiana put together.
- 2) The effort leading up to the release of the Energy Hawk, the report of the New Orleans Energy Policy Task Force; it benefitted from the work of hundreds of well-educated and well-informed volunteers.

These efforts were actions taken by private citizens in order to improve the governance of their utility. However, none of these people were ever paid by the City or its utility for their services. As a result, the level of participation of people with competent knowledge has deeply waned yet again. This is to the public's great detriment. What New Orleans needs is a process that will support public comments from competent sources. The only way to get that is to pay for it. California recognized this dilemma decades ago and created a "pay the intervenor" mechanism. New Orleans should do the same.

Ratepayers of ENO, i.e., citizens of New Orleans, have higher bills and contribute to more global warming because ENO is more poorly regulated than it would be if more privately funded or publicly funded business or non-profits could depend upon some income to compensate them for their efforts as intervenors.

BSI conjectures that if one of the groups just mentioned believed that a member of the public had an argument that could contribute to better governance of the utility and by presenting this argument more money would be garnered to support intervenor activities, it would be in the best interest of that



intervenor to encourage a full expression of the concern so that that issue can be properly presented within an IRP. As it is now, the Alliance and other groups are grossly strapped for resources to promote the issues they already have on their plates.

BSI also notes that the process used to affect what assumptions were used in the IRP modelling was not made known to BSI until it was too late. Admittedly, BSI was not an intervenor at the onset of public meetings and BSI only became an intervenor after the 2<sup>nd</sup> or 3<sup>rd</sup> public meeting, however, at the last meeting of the IRP a city employee pointed out that a decision was made to choose assumptions; that this decision was made with the input of the intervenors and thus the opportunity happened and BSI missed that opportunity. Perhaps that is due process, but the plan for this process was not made public either. BSI proposed that it was important to include batteries into the IRP modelling at every meeting BSI went to, including the first public meeting and most of the subsequent meetings, however, BSI was not at the right meeting nor was BSI informed about a meeting where the assumptions to be used in the modelling was decided.

BSI notes that the public came to the last meeting and some of them urgently pointed out that Global Warming is on the line and ENO is not concerned. BSI found no evidence that ENO's IRP considers avoiding the causes of Global Warming a goal within the IRP planning process. After that meeting, BSI was told that Global Warming is of great concern to perhaps a majority of New Orleans's City Council. There seems to be disconnect here. BSI thinks that the right way to address global warming within an IRP is to create a market-based mechanism that entices people to act in their environmental best interest as an ancillary effect of pursuing their economic best interest. ENO's IRP shows no evidence that it shares this view.

BSI notes that public concerns were also expressed about the mismatch between ENO's approved DSM retrofits and the needs of the public to find comfort at high humidity and low electric bills. However, this issue seemed to fall right onto the ground since ENO's personnel are not home energy consultants and could not speak to the issue. However, BSI can speak to the issue as energy and moisture consultants for New Orleans buildings. *BSI has already expressed the fact that ENO's DSM is significantly incompetent to recognize or specify home energy retrofits that cost-effectively control moisture. That discourse is found among the more than a dozen deficiencies of ENO's DSM plan presented earlier in this document.*

**Fund the Center for Excellence in the Built Environment [CEBE] (described as the 2<sup>nd</sup> most important recommendation of the Energy Hawk, the 2007 report of the New Orleans Energy Policy Task Force [NOEPTF]) by paying intervenors.**

BSI was a key author of the Energy Hawk and helped to guide the CEBE resolution through the process of finding consensus for getting the resolution passed and placed near the top of the recommendations put in front of the City Council. Many of NOEPTF's recommendations were taken, including using an IRP process. The City Council actually voted and approved the CEBE and its functions in 2008 in every way described, except CCNO did not approve any funding. The CEBE idea need not be dead, it just needs a funding source. BSI thinks that paying intervenors is a good start for a funding source.

BSI's two principals are both senior citizens in age and expertise. We do not need major salaries to encourage us to participate in Utility Regulatory Interventions. Moreover, we would, because our senior statuses want to find alternative personnel to replace our expertise within a few years.

This could be a win-win for New Orleans.

Notice the synergy and overlap between the content of this document and the stated proposed functions of the CEBE.

Sincerely,

Myron Katz and Norman Witriol,  
VP for Research and President of BSI, respectively.

- **Pay a third-party consultant to choose and implement the IRP modelling software employed.**
- **Select from among pre-certified IRP modelling software to confirm its competence to:**
  - **Fully handle demand, supply and storage options located on either side of the meter,**
  - **Perform automated, what-if analyses on the broadest range of issues — including risk,**
  - **Warn against classes of input errors and inappropriate interpretation of results.**
- **Vet third-party consultants to assure that motivations are not compromised by self-interest or on-going relationships with any utility, business, industry, or government policy purveyor.**

BSI believes that the 2014-2015 ENO IRP process was degraded by insufficiencies in all but perhaps the last of the above categories. However, since the software used was chosen by ENO and implemented by ENO personnel, the ratepayers of New Orleans should have little to no confidence that either the software was competent nor that the use of the software was optimal.

BSI's VP of Research is an expert in mathematical modelling and knows that either poor software or poorly handled software will grossly degrade the result of software use.

Even if the software were chosen by a third-party who was chosen by a vetting process that protected the public from compromised self-interest, it is clear from looking at the nascent field of distributed generation and battery sizing that it would be very difficult indeed to find software that could easily handle batteries and integrate their economics into a sufficiently robust model for Integrated Resource Planning.

## Bill for Services Rendered

BSI knows that the City of New Orleans does not pay for the services of intervenors. However, that is not a good thing. In fact, California has been paying intervenors in utility rate cases for many decades.

<http://www.cpuc.ca.gov/NR/ronlyres/A0BD21F9-7644-477E-94F4-85B504D43F66/0/UpdatedIntervenorCompensationProgramGuide.pdf>

Because BSI normally charges \$200/hour for consulting time for its clients and this project has taken over 100 hours, the normal billed cost of the report would be \$20,000.

BSI hopes that the City of New Orleans will institute a process similar to the one utilized in CA and make this invoice retroactively acceptable.

Of course, BSI does not really expect to be paid unless the City Council of New Orleans agrees that

- 1) It should pay for the quality efforts of intervenors in utility rate cases,
- 2) The decision the City Council made was significantly swayed by BSI's arguments, and
- 3) The resulting decision saves the ratepayers more money than BSI's consulting fee.

BSI believes that it has special expertise and experience in the matter of Integrated Resource Planning, the historic and present condition of utility regulation, the building stock of New Orleans and the profession of Energy Performance Design and retrofit contracting. As such, BSI has taken steps to prepare this document, but in the future, if such efforts are not properly met with economic remuneration, BSI will not be able to afford to provide this help in the future. However, should BSI get this economic help, it plans to hire researchers and authors to augment this work into the future.

BSI is not the only intervenor who should be paid for its historic efforts in utility regulation. The most notable example of an unpaid public servant is the Alliance for Affordable Energy. Its efforts have contributed to avoiding many hundreds of millions of dollars since 1985 when it was first formed. The Alliance is a public servant and deserves public funds according to the same California process BSI recommends to the City Council of New Orleans.

Sincerely,

Myron Katz and Norman Witriol.