BEFORE THE
COUNCIL OF THE CITY OF NEW ORLEANS

IN RE: RESOLUTION REGARDING PROPOSED RULEMAKING TO ESTABLISH INTEGRATED RESOURCE PLANNING COMPONENTS AND REPORTING REQUIREMENTS FOR ENTERGY NEW ORLEANS, INC.		**DOCKET NO. UD-17-01** **FEBRUARY 3, 2017**

MOTION BY BUILDING SCIENCE INNOVATORS, LLC TO PERFORM INTEGRATED RESOURCE PLANNING (IRP) BY MARKET BASED ACQUISITION AND CORRECT ASSUMPTIONS AND CONDITIONS NEEDED FOR STATE-OF-THE-ART IRP FOR ENTERGY NEW ORLEANS (ENO)

ON MOTION OF BUILDING SCIENCE INNOVATORS, LLC (BSI), appearing herein through undersigned principal, represents the following:

WHEREAS, ENO failed to perform the 2015 IRP process credibly;

WHEREAS, the goal of this docket, UD-17-01, is to revise the ordinances that define how to do IRP work using explicit recommendations;

WHEREAS, an IRP is a comprehensive decision support tool and roadmap for meeting the company's objective of providing reliable and least-cost electric service to all customers while addressing the substantial risks and uncertainties inherent in the electric utility business.

WHEREAS, common tools of supply-side resource planning are utility-owned fossil, nuclear, or renewable energy-powered electricity generators, transmission lines, wholesale marketplaces that provide these assets and distribution systems; but smart meters and grid-scale batteries are new;

WHEREAS, traditional tools of demand-side resource planning are i) demand side management (DSM), ii) behavioral change through education. iii) energy efficiency, iv) demand response, v) thermal energy storage, vi) roof-top photovoltaic solar energy, vii) rate structures for energy use, viii) demand charges, ix) time-of-use (TOU) rates, and x) Net Energy Metering (NEM); new are i) electric batteries, ii) Community Solar, iii) smart grids, iv) smart appliances, v) connected electric vehicles, vi) computerized real-time controls, and viii) aggregated batteries and loads.

WHEREAS, a smart meter is an electronic device that records electricity use in intervals of an hour or less and sends that information daily back to the utility for monitoring and billing.

WHEREAS, time-independent electricity rates fail to encourage cost-effective use and true-valuing of important grid resources;

WHEREAS, ENO plans to deploy smart meters enabling time-of-use rates and less expensive fixes to distribution infrastructure;

WHEREAS, smart meters enable pilot projects to test and prove new technologies, two-way load controls and novel rate structures;

WHEREAS, DSM is an often employed, utility-funded program that seeks to modify consumer demand for energy through various methods such as financial incentives and behavioral change through education and rewards; more energy-efficient means reduced KWH use; DSM primarily promotes energy-efficiency;

WHEREAS, a major but often unclearly stated or poorly measured goal of DSM is to encourage the consumer to use less energy during peak hours, or to move the time of energy use to off-peak times such as nighttime and weekends; demand is measured in KW;

WHEREAS, the Council voted to expand DSM to defer demand by 2% annually;

WHEREAS, demand response is an opportunity for consumers to play a significant role in the operation of the electric grid by reducing or shifting their electricity usage during peak periods in response to time-based rates or other forms of financial incentives;

WHEREAS, optimal DSM programs must be properly financed, designed, deployed and sized;

WHEREAS, Net Energy Metering (NEM) is a special billing arrangement that provides credit to customers with solar PV systems for the full retail value of the electricity their system generates. When the system's production exceeds customer demand, the meter runs backwards; thereby, customers effectively receive the retail value of electricity "stored" on the grid for later use;

WHEREAS, Virtual Net Metering (VNM) is NEM but without the restriction that the solar energy is generated next to the consumption meter;

WHEREAS, a Community Solar (CS) project is a solar power plant whose electricity is shared by more than one ratepayer; CS is sited within the distribution system of the utility;

WHEREAS, VNM may be a critical component of financially successful CS farms;

WHEREAS, Distributed Energy Resources (DER) are smaller power sources that can be aggregated to meet regular demand;

WHEREAS, current technology allows utility dispatchers or other commercial aggregators to derive economic value from distributed behind-the-meter demand response and energy storage;

WHEREAS, IRP success in 2014 in West Los Angeles via an auction proved that market-based resource planning can greatly reduce costs;

WHEREAS, Los Angeles' auction demonstrated that electric and thermal energy storage deployed both on the "supply-side" and "behind-the-meter" to be among the most cost-effective peaking-power resources;

WHEREAS, in Feb 2015, the National Regulatory Research Institute (NRRI) published *Getting The Signals Straight: Modeling, Planning, And Implementing Non-Transmission Alternatives Study"*, (NTA), at http://nrri.org/download/nrri-15-02-nrri-non-transmission-alternatives/ ; A definition of ***Integrated Resource Planning by Market Based Acquisition,*** (**IRPbMBA**), found in Exhibit A, is BSI's interpretation of NTA's view of the state-of-the-art in IRP work;

WHEREAS, the NTA study illustrates that traditional IRP methods often fail to adequately model DER strategies that could prove capable of displacing the needs of traditional centralized infrastructure at lower cost;

WHEREAS, as Exhibit B to this motion, BSI submits that there are Broken Paradigms in New Orleans's IRP process; BSI's positions on these matters are shared by national experts including current and past leaders of RESNET: Dennis Stroer, Richard Faesy, Michael Holtz and Gary Klein who have individually expressed agreement on many to all of these issues;

WHEREAS while preparing BSI's Aug 2015 IRP intervention submission, BSI realized that an IRP cannot be calculated—as explained in the first five bullets of "Broken Paradigms";

WHEREAS, BSI developed a CLEP tariff, i.e., Customer Lowered Electricity Price, as a method to fully circumvent the fact that an IRP cannot be calculated; CLEP allows ratepayers to invest in their buildings and/or purchase part of a CS farm, i.e., to make negligible to multi-thousand-dollar investments, that can greatly lower their cost of electricity from CLEP cashflows that both lower the cost of operating a utility and lower the price of electricity for all ratepayers;

WHEREAS, CLEP's key ideas are 1) to pay ratepayers most of the utility savings from buying electricity when the wholesale price is low and buying from ratepayers when that price is high, and 2) pay a negative demand charge to residents proportional to the observed avoided demand during the hours that the utility is likely to experience its annual peak demand.

WHEREAS, CLEP's definitions are found in Exhibit C; since CLEP pilot programs were filed in UD-08-02 docket, a full CLEP description is already public record; those documents are also found in https://www.dropbox.com/sh/a7ohwfd2lpqfdaj/aadoci7fvr9-jdeb_sbj7ubsa?dl=0 ;

WHEREAS, BSI submits that following the deployment of smart meters, implementing and controlling CLEP may create a path to IRP's goal using every tool of supply- and demand-side resource planning—in a fashion that may make all other IRP work unnecessary;

WHEREAS, DER such as behind-the-meter investments in energy efficiency, demand response, solar energy and energy storage create long-lasting local employment opportunities;

WHEREAS, New Orleans signed the 2016 *Accord de Paris*—an agreement within the United Nations Framework Convention on Climate Change dealing with greenhouse gases emissions mitigation, adaptation and finance starting in the year 2020;

WHEREAS, Climate Change may retard or reverse growth in New Orleans for generations;

WHEREAS, POTUS Trump, local efforts are needed to replace national efforts on climate;

WHEREAS, Market-Based Acquisition is likely to receive support by a national government more interested in economic growth than environmental protection;

WHEREAS, Market-Based Acquisition speeds up deployment of renewable energy generation;

WHEREAS, reducing greenhouse gases emissions should be a priority for resource planning;

WHEREAS, electricity generation facilities are responsible for almost 30% of the carbon dioxide emissions—the most significant single contributor to climate change in the U.S.; (see http://www.eia.gov/todayinenergy/detail.php?id=26232 and https://www.epa.gov/ghgemissions/overview-greenhouse-gases);

WHEREAS, a rapidly growing solar energy industry is reducing utility costs;

WHEREAS, NEM is falling out of favor in many states because it is widely believed that NEM may require one group of ratepayers to subsidize others. However, a full analysis with real data only available after smart meters are deployed may show any subsidy goes in the opposite direction, i.e., NEM customers may be subsidizing other customers; this may be because much solar electricity is generated when the wholesale electricity price is greater than the retail price;

WHEREAS, CLEP is clearly not a subsidy against non-CLEP customers, because, by CLEP's very definition, CLEP provides a subsidy for non-CLEP customers against CLEP customers;

WHEREAS, grid scale (i.e., roughly 1 MW or larger) solar farms organized as CS and financed with VNM creates such a lucrative economic project that CS investors can "give away" 10% ownership to low-income residents and still be very profitable for the investors;

WHEREAS, CLEP defined for Community Solar pays 5% to 15% better than VNM;

WHEREAS, because each component of ENO's current Continuously Effective (CE-IRP) resource plan is either incomplete or lacks optimally credible competence, the Council should:

- i) establish a Renewable Energy Portfolio Standard,
- ii) establish DSM for gas targeting of a least 1% drop in consumption,
- iii) deploy smart meters,
- iv) allow community solar,
- v) mandate minimum community solar ownership for low income,
- vi) stimulate energy storage investments,
- vii) resolve the best way to finance consumer-owned solar, and
- viii) find a way to pay consumers to buy very inexpensive wind power at night;

and the Council should review currently deployed

- ix) DSM,
- x) consumer education and
- xi) demand response

by engaging third-party consultants and/or a market-based-acquisition process;

WHEREAS, BSI submits, most of these deficiencies in ENO's current CE-IRP can be remediated by simply:

- i) deploying smart meters,
- ii) allowing unlimited Community Solar contingent on 10% low income owners, and
- iii) instituting the three CLEP pilots;

WHEREFORE, BSI PRAYS THAT, AFTER CONSIDERATION OF THIS MOTION, THE CITY COUNCIL ORDER AS FOLLOWS:

1. To rapidly create a complete and competent Continuously Effective (CE-IRP), in time to allow timely consideration of the proposed combustion turbine power plant and to quickly allow greater incorporation of relevant community knowledge, the Council shall:
    a. Mandate rapid deployment of smart meters;
    b. Establish that virtual net metering shall be made available to all ratepayers as one of many ways to finance community solar programs;
    c. Allow unlimited Community Solar with 10% low income ownership;
    d. Consider the idea that smart meters should include the ability to control aggregated distributed resources;
    e. Open an RFP process for pilot rate structures, batteries and community solar to maximize primary energy savings potential;
2. The Council shall correct all of the erroneous assumptions, understandings and approaches to IRP work described in the Broken Paradigms, i.e., Exhibit B.
3. The IRP process shall be administered by third-party consultants and that ENO will cooperate with these consultants and, independently, advise the Council whenever ENO believes that there is a need that requires a large expenditure;
4. The Council will adopt a plan to do IRPbMBA using lessons learned in NTA, Exhibit A:
    a. Make rules to establish both CE-IRP work and independently, Iterative IRP work with CE-IRP work happening at least every two years and Iterative IRP work only happening when and only when a major ENO investment may be needed;
    b. Set the goals of CE-IRP work to facilitate highly granular (both in cost and in time) investments by or for individual ratepayers in a manner that passes established tests like the total resource test and to avoid the need to do future iterative IRP work;
    c. Establish a minimum cost of a ENO investment that will initiate an iterative IRP;
    d. Establish how ENO will demonstrate that a major investment is needed: i.e., ENO must request, initiate and perform an industry-standard IRP process up to but not exceeding the first two steps of that process—wherein ENO will make its case that such an investment may be needed to assure that future electricity supply is adequate to meet future electricity demand;
    e. That iterative IRP work will not take place until CE-IRP work is deemed reasonably competent and complete and has had time to be measurably effective;
    f. That the Council will immediately initiate a complete and competent CE-IRP using lessons learned and documented in NRRI's NTA publication;
    g. That future resource planning will prioritize market-based acquisitions guided by environmental and total resource planning—consistent with DSM and renewable energy goals;
    h. after the Council experiences the power and ease of market-based acquisition for CE-IRP work it will consider using lessons learned and documented in NRRI's NTA publication to do iterative IRP work;

5. To improve the IRP process and set reasonably high levels of success, the Council shall
    a. State the goal that New Orleans wishes to elevate its IRP process to meet or exceed the current state-of-the-art in IRP work,
    b. Upgrade the CURO staff to include experts who can advise the Council on IRPbMBA and the host of documents available within NARUC or NRRI publications.
    c. Formally request help from NRRI, the National Regulatory Research Institute—much of which it may obtain at no cost;
    d. Invite experts within and beyond NRRI to hold educational sessions and/or training for Council members, CURO, staff, Council advisers, intervenors and members of the public to reach the stated goal;
    e. Invite participation of ENO and New Orleans ratepayers in pilot programs initiated by NRRI and other well respected entities to help advance IRP design and application;
    f. Start a rulemaking proceeding to fashion a way to compensate interveners using as starting points the research provided in BSI's august 2015 submission which highlights hundred-million-dollar success stories in California, New Jersey and two other states.
6. The decision to build a combustion turbine power plant must be resolved within an iterative IRP process specifically devoted to that question; any further consideration of specific pre-planned resource initiatives such as the proposed combustion turbine facility are contingent upon previous steps described herein being completed.

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Exhibit A Integrated Resource Planning by Market-Based Acquisition (IRPbMBA)

means enabling and empowering the marketplace, to achieve all cost-effective supply- and demand-side distributed energy resources, in order to minimize future utility investments while ensuring reliable electricity service at the lowest practical total resource cost.

IRPbMBA requires continuously effective as well as iterative actions by the regulator, utility and customers.

Although CLEP, as yet untested, may be the only "complete" means of IRPbMBA that is continuous (i.e., without interruptions and not stimulated by substantial, discrete events),

CLEP tariff requires acts by the regulator and causes cash flows by and for the consumer after (s)he voluntarily accepts the CLEP tariff. (For a full explanation of CLEP, see https://www.dropbox.com/sh/a7ohwfd2lpqfdaj/AADOci7fvR9-JDEB_sbj7ubSa?dl=0.)

a host of states already provide complementary programs, rates or reverse auctions, etc. that facilitate MBA, a.k.a. "non-wires" or Non-Transmission Alternatives, [1] **some are continuously effective and others are iterative;**

these include VT, ME, CA, NY, HI, MI, NJ, MN, WI, MA, MD, and CT.

The following is a three-part proposal for iterative IRPbMBA.

1. The utility regulator shall determine a threshold dollar value for utility investments. Prior to the regulator pre-approving any combined utility investments above that threshold value, the utility must initiate an IRP process, subject to public review and input, and the result of that process (described in steps 2 and 3) shall be to determine that the new investment is the most reasonable and prudent available option. The appropriate dollar value threshold can be determined by review of the utility's largest annual expenditures over the most recent decade. The dollar value should be low enough to trigger market-based review prior to pre-approval of any major transmission, distribution or central station power plant expenditures.
2. The utility shall prepare its justification for such an expenditure using the kinds of tools it has traditionally used to initiate an IRP, but only execute the IRP work up to the first or second public hearing. Nothing akin to creating a set of alternative portfolios or guesses at future sizes of demand side management will be included in those hearings. No decisions shall be reached on a preferred plan until step 3 is implemented; that is, all available distributed energy resources have been fully evaluated and compared to the identified transmission, distribution, or central station power alternatives proposed by the utility.
3. The preferred approach to market-based analysis is for the regulator to engage a third-party consultant to investigate distributed energy resources, non-wires, and market-based alternatives, using an open, public, community-driven process for investigating these options. If that investigation identifies practical market-based alternatives, then the same or another third-party should manage the process of acquiring and implementing those solutions. That acquisition and implementation could utilize reverse-auction mechanisms combined with the advantages available through appropriate utility rate designs, so that the alternatives will be procured in a timely manner at the lowest practical *utility* resource cost and *total* resource cost. This generally describes the mechanisms already demonstrated successfully in the State of Maine, and proceeding now in multiple New York utility jurisdictions.

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[1] i.e., "energy efficiency, demand management, and distributed generation", https://microgridknowledge.com/utilities-embracing-disruptive-energy-non-wires-alternatives/ also add "electricity and thermal storage, load management, and rate design" according to http://nrri.org/download/nrri-15-02-nrri-non-transmission-alternatives/

Exhibit B   Broken Paradigms of New Orleans's Integrated Resource Planning Processes

1. ***"Energy Efficiency in Buildings"* is not the right concept to describe the full set of retrofits to a building to reduce the grid's cost to provide the needed electricity; the right concept is *"Primary Energy Conservation in Buildings"***. *Energy Efficiency* is measured in avoided kWh use. Primary Energy is the fuel consumed to make electricity. Primary Energy Conservation can be measured in avoided CO_2 production. *Control* as an energy saving strategy is purposely ignored by standard energy design software for residences and *timing* (which generally does not decrease kWh use but does reduce CO_2 production) is hardly modelled by standard software.
2. **Since none of the optimal size, cost or variety approaches of DSM can be calculated...** because the needed software to fully consider both *timing* and *control* strategies does not exist for most building types, **optimal DSM cannot be calculated**. But see #11.
3. **A host of DER are not modelled by current, industry-standard (IRP) software; notably among these are batteries, community solar, and a variety of other technologies.** But see #11. The definition in the new NARUC Staff Manual on Rate Design for DER is much broader and rather officially accepted by virtue of being published in http://pubs.naruc.org/pub/19FDF48B-AA57-5160-DBA1-BE2E9C2F7EA0 .
4. **Although Resource Planning is practiced in New Orleans under the name "Integrated Resource Planning".** But see #11. The distinction is important because without focusing upon "Integrating", i.e., generating, comparing and optimizing, the best choice of supply- and demand-side options against each other, one cannot confirm that either choice is optimal.
5. **Integrated Resource Planning cannot be calculated.** But see #11. Since neither a full set of demand side nor supply side choices are currently modelled by IRP software, the "best" choices are not even generated for comparison.
6. **No conclusion derived from *any* industry-standard IRP calculation is credible.**
7. **It is likely that many utilities are aware of these defects in industry-standard IRP software and "game" IRPs to their advantage.**
8. **Publishing the size and cost of DSM programs at the end of an industry-standard IRP calculation process is a misleading public policy.** This is because both the size and cost of DSM are inputs of IRP calculations, not outputs.
9. **To know how much DSM is feasible, we also must know how much market-based DSM is occurring with little or no utility ratepayer-funded incentives.** This is not done here.
10. **Doing the right DSM program design is also critically important**. Common 20th Century program design will unduly limit both cost-effectiveness and scope. Since NRRI personnel now know how to achieve much deeper retrofits using extremely little ratepayer funds, much more DSM is achievable within the *de minimus* budgets that utilities advocate. However, current DSM planning in New Orleans cannot recognize optimal program design.
11. **An IRP's goal can be very well approached without industry-standard IRP calculation; market-based acquisition may be the best way.**
12. **Integrated Resource Planning is not always iterative; Continuously Effective IRP (CE-IRP) work includes sizing and mandating DER, a.k.a., non-wires, NTA.** That is, "very

good" resource planning can and should happen "continuously". Rulemaking that helps to push the mixture of deployed demand and supply-side investments towards the "best" mixture can be ***continuously effective as opposed to iterative*** and get started at other times than during a major IRP process or auction. CE-IRP work includes sizing and mandating DSM, *Renewable Energy Portfolios,* deploying smart meters, educating consumers, deploying demand response, establishing NEM rules, authorizing Community Solar, providing market incentives for electric as well as thermal storage purchases, *providing two thousand dollar Rebates for energy storage installations that avoid a kW of peak demand*, and investigating novel ways to do all of the above via pilot programs, i.e., facilitating highly granular investments by or for individual rate-payers in a manner that passes tests like the Total Resource Test. Continuously Effective IRP done at least once every few years should be enough to notice 101 big-picture ideas. A major goal of CE_IRP work is to avoid the need to do future Iterative IRP work.

13. **Iterative IRP should be done every time a major investment decision is under consideration.** Otherwise, how can the regulator know that the *best* choice is being made? The NRRI NTA paper quoted above suggests that regulators should ensure that there are sufficient opportunities for the review and presentation of specific Non-Wires Alternatives that might defer or displace each major investment in utility generation, transmission or distribution infrastructure. The process needed to allow DER to replace such major investments must to be something different than the process used for Continuously Effective IRP's—with careful geotargeting and much more granular attention to localized needs, uses and potential solutions.
14. **The best way to approach the IRP goal is to "fully" employ both continuously effective and iterative rule-making and make every effort to only embark on iterative IRP work AFTER a "competent" mixture of CE-IRP mandated programs has had time to work.**
15. **CLEP may be the only continuously effective method that can avoid all iterative IRPs.**
16. **Neither Council Utility Regulatory Office (CURO) nor the Council's outside Advisers have identified these problems and solutions; both of their staffs need improvement.**
17. **Entergy New Orleans should not be called upon to do any IRP work.** ENO was not able to do creditable resource planning under advisers' and intervenors' prodding, plan and execute DSM, run auctions or RFP's for renewable energy, properly estimate the economic feasibility of any of a variety DER, or even optimally promote its own economic interests.
18. **Time of use (TOU) electricity rates should be optional**. Mandatory TOU rates do not reliably generate the desired effects. Optional TOU rates (buying) and pricing (selling), using aggregators has been very effective in isolated cases in the US.
19. **Net Energy Metering, Value of Solar and CLEP are alternative ways to compensate consumer investments in solar.** Each have advantages and disadvantages. The best choice may not be known without pilot programs and smart meters. Moreover, some of these clearly do not involve any subsidies; it is possible that none of these involve subsidies.
20. **The lack of an *Intervenor Compensation Rule* has under-funded and thus undermined optimal pursuit of the public's welfare.** The city's electricity regulation is not adequately protected by adequately funded interveners.

Exhibit C Definitions of Customer Lowered Electricity Price, (CLEP)

For a *residential* ratepayer who voluntarily accepts the CLEP tariff,

A Monthly CLEP Payment = CLEPm + $\sum$ **CLEP5**

where: **CLEP5 = p * n * (e - w)** is calculated every 5 min

p = Utility-regulator determined, "percent" and $0 < p < 2$;

n = Number of kWh purchased by the customer.

If the flow is outbound (i.e., a sale), **n** is negative;

w = Wholesale cost of power

e = Monthly average cost of energy (***fuel cost adjustment***)

where: **CLEPm = q** * $50 * **d** is calculated monthly

d = ***Average demand during utility peak hours*** avoided

(*i.e.,* **d** = observed reference building demand **minus** observed demand)

q = Utility-regulator determined "percent" and $0 < q < 2$.

For a *non-residential* ratepayer who voluntarily accepts the CLEP tariff,

CLEP is the same as defined for residential ratepayers except,

CLEPm is redefined and replaces all demand charges

CLEPm = q * -$50 * **d** is calculated monthly

d = ***Average demand during utility peak hours***

When used to finance *Community Solar*, CLEP is the same as defined for non-residential ratepayers except,

CLEP5 is replaced with **p * n * w**

Notes:

A. *The "$50" factor in CLEPm's definitions may be adjusted to optimally encourage CLEP acceptance but not undermine: CLEP transactions lower the electricity price for all customers.*

B. *The negative demand charge paid to a residential customer viewed in $/KW-y should not exceed 2x the highest demand charge paid by a non-residential, non-CLEP customer in $/KW-y.*

C. *If a customer does not have air-conditioner-dominated demand, then replace $50 with $50/2.*

D. *Utility peak hours are annual and assumed to occur in fewer than 6 months, only happen on weekdays and are restricted to 2 PM to 7 PM; otherwise CLEPm = $0 for that month.*

E. *CLEPm generates a payment whenever* ***average demand during peak hours*** *is negative.*

F. *Avoided demand is observed by* Realtime *comparison to performance of homes of similar age.*

G. *"p" and "q" are extra controls to allow the utility regulator to insure that goals are met.*