Southern Renewable Energy Association
P.O. Box 14858, Haltom City, TX 76117

June 3, 2019

Ms. Lora W. Johnson
Clerk of Council
City Hall - Room 1E09
1300 Perdido Street
New Orleans, LA 70112

RE: Docket No. UD-19-01, *A Rulemaking Proceeding to Establish Renewable Portfolio Standards.*

Dear Ms. Johnson:

Please find attached the Southern Renewable Energy Association's comments in Docket No. UD-19-01, *A Rulemaking Proceeding to Establish Renewable Portfolio Standards.*

If you have any questions, please call me at 337-303-3723.

Sincerely,

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5120 Chessie Circle
Haltom City, TX 76137

BEFORE THE COUNCIL OF THE CITY OF NEW ORLEANS

In Re: A RULEMAKING PROCEEDING
TO ESTABLISH RENEWABLE
PORTFOLIO STANDARDS

DOCKET UD-19-01

Southern Renewable Energy Association Comments
Regarding a New Orleans Renewable Portfolio Standard

The Southern Renewable Energy Association (SREA) appreciates the opportunities to submit the following comments regarding a proposed Renewable Portfolio Standard for the City of New Orleans.

1. What would an appropriate RPS target for New Orleans be, and should it be a requirement or a goal

a. What percentage of ENO's load should be met through renewable resources, and what data or other information exists indicating that the target is achievable in New Orleans?

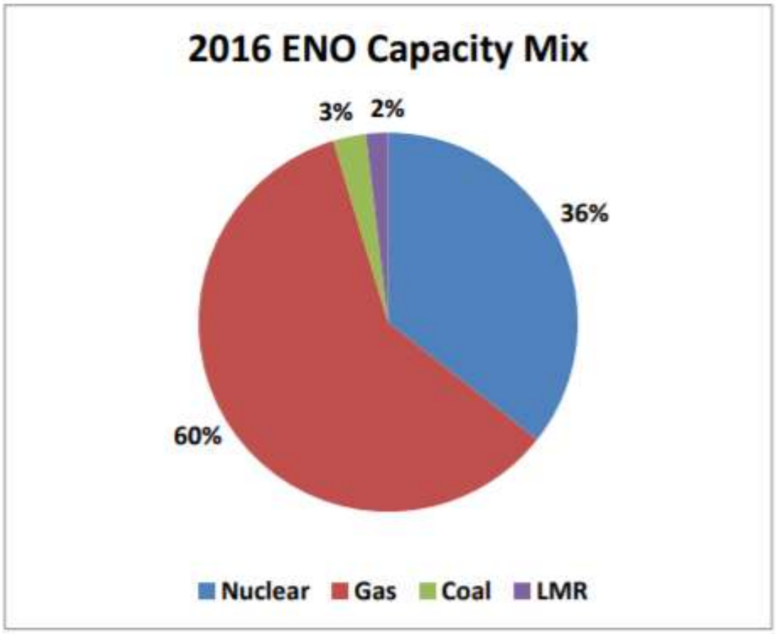
In order to perform an analysis on the energy needs of New Orleans, interveners and other parties would need access to currently unavailable data. Weather-normalized city hourly load and hourly generation profiles from each generation resource would help in answering these questions. With those data, interveners and other parties could determine the city's peak hourly power demand, peak power generation, as well as the city's lowest power demand requirements. Serving peak power demands is important and will become increasingly important over time; however, a utility's lowest load hour (a minimum peak) can provide opportunities and challenges, too. By determining hourly load and generation, interveners and other parties can help develop an optimal portfolio for near-term plans, and longer-term goals. Even without the data described previously, interveners and other parties do have a few benchmarks to assist in developing near-term plans. For example, ENO stated in its 2018 IRP that "Customers used over 5.7 million MWh of electricity" and that consumer demand peaked July 7th at 1,142 megawatts (MW).[1] Thus, over a full year, an average of 650 MW's was consumed each hour (5,700,000 MWh / 8,760 hours).

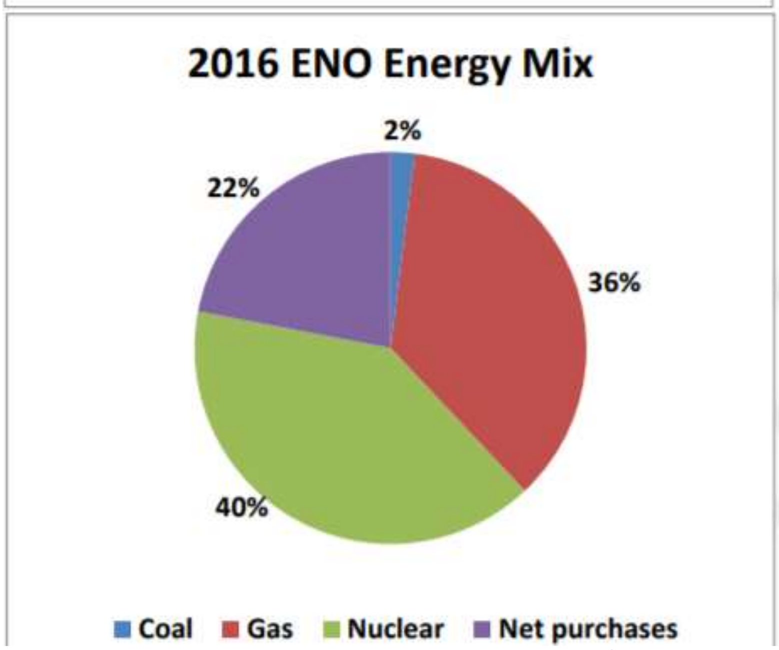
For comparison, SREA is providing the following narrative regarding each 100 MW's of solar energy and each 100 MW's of wind energy, as rough approximations of penetration levels for ENO: Solar energy resources generate power with 20-25% capacity factors. Therefore, for each 100 MW's of solar energy would generate approximately 175,200 MWh's to 219,000 MWh's annually. This amount of solar energy represents between 3%-4% of ENO's total annual energy demand. Wind energy resources generate power with possibly 35-45% capacity factors. Therefore, each 100 MW's of wind energy would generate approximately 306,600 MWh's to 394,200 MWh's. This amount of wind energy represents between 5%-7% of ENO's total annual energy demand. Solar energy and wind energy are complimentary, with solar power generation peaking in summertime afternoons and winter power generation peaking in wintertime nights. Incorporating a mix of renewable energy resources would allow higher levels of renewable energy penetration, and quickly.

Solar Energy and Wind Energy Generation Estimates (per 100 MW's)

	Est. Annual Energy Generation	Est. ENO Generation Mix
Utility-Scale Solar Energy (100 MW)	175,200-219,000 MWh's	3-4%
Utility-Scale Wind Energy (100 MW)	306,600-394,200 MWh's	5-7%

Entergy has stated that in 2016, the company received 40% of its electricity from nuclear, 36% from natural gas, 22% from "net purchases".[2] Because nuclear reactors typically do not ramp up and down to follow load to a significant extent, it can be difficult to incorporate significant quantities of renewable energy resources at low-load hours. ENO's existing nuclear energy contracts may be the largest limiting factor in achieving exceptionally high penetration levels of renewable energy resources. However, by adding small amounts of energy storage, New Orleans can also better capture "excess" power generated by nuclear reactors, solar energy and wind energy resources during periods of low local power demand. The proper mix of energy storage, solar energy and wind energy resources depends on ENO's ability to ramp down other power generation or curtail other power purchases.





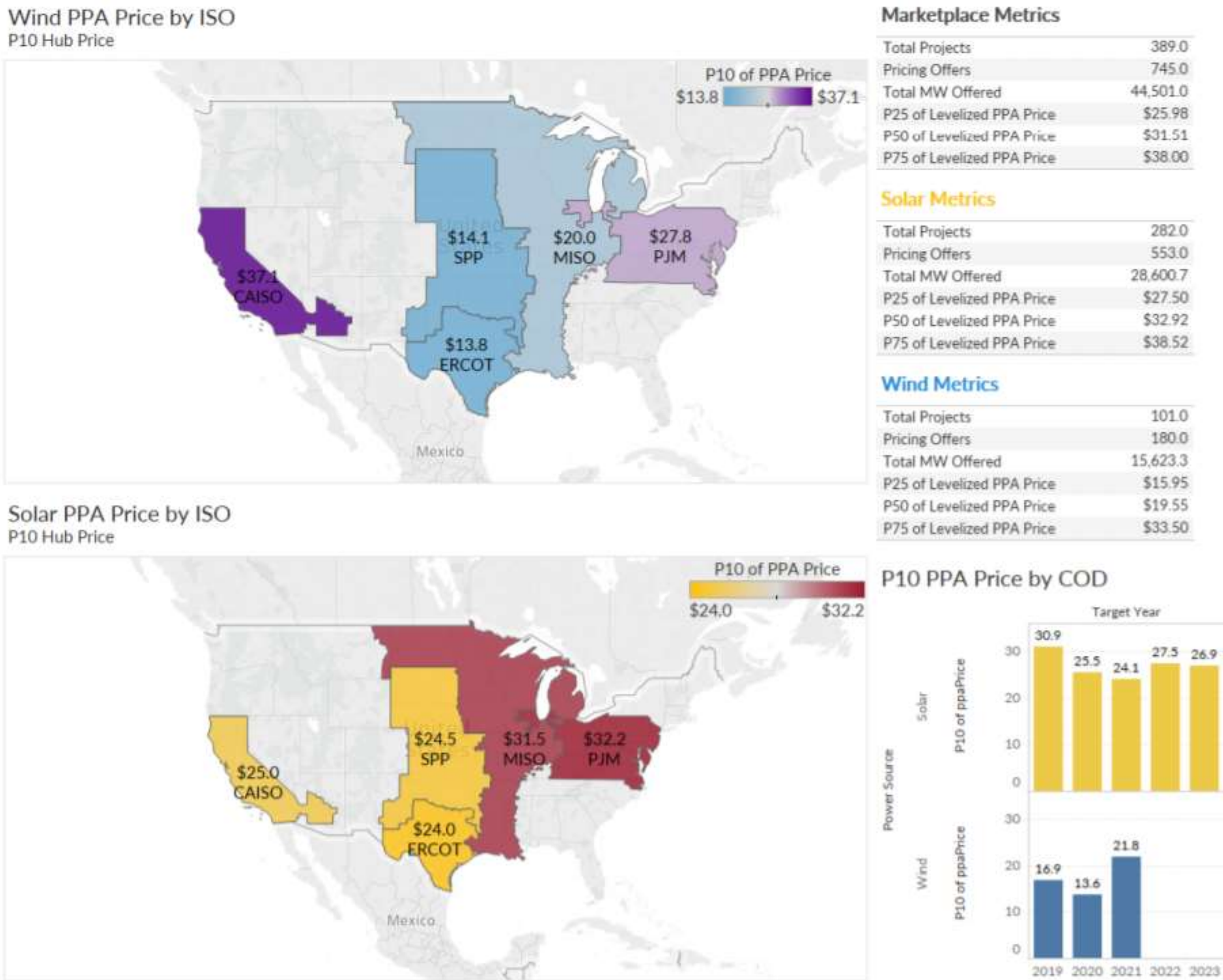
Source: Entergy New Orleans 2017[3]

It is possible for ENO to rapidly scale up its renewable energy procurement. For example, Lafayette Utilities System (LUS) in Lafayette, Louisiana made an announcement that it is procuring 20% of its energy from wind energy resources.[4] LUS was able to structure its contract for wind energy in a way that uses the Midcontinent Independent System Operator to help balance the power production. For a simple analysis, a 20% renewable energy penetration level for ENO would result in approximately 1.2 million MWh's of renewable energy generation. That amount of energy could be supplied by which could be supplied by approximately 500 MW's-600 MW's of utility-scale solar power, or approximately 300-400

MW's of utility-scale wind energy. A 50/50 split of solar energy and wind energy could result in approximately 300 MW's of utility-scale solar and approximately 170 MW's of wind energy. In fact, a number of ENO's own studies and scenarios in its draft Integrated Resource Plan (IRP) indicate the utility could easily add 200-400 MW's of renewable energy resources without much difficulty.[5] Given that ENO's net energy purchases currently exceed 20%, and the utility utilizes a fairly flexible natural gas power plant resource for an additional roughly 40%, ENO could be able to integrate up to 20%-60% renewable energy resources without significant operational difficulty. As mentioned previously, energy storage can also assist in increasing renewable energy penetration, and enhanced transmission connections with surrounding areas will also enable better balancing of renewable energy resources, while improving resiliency.

Renewable Energy and Energy Storage Resource Prices Continue Plummeting

ENO's 2018 IRP assumed solar energy resources and wind energy resources would cost $53.39/MWh and $44.82/MWh, respectively, in 2019.[6] The company also assumed battery storage prices of $177/kW-yr in 2019.[7] Those cost assumptions are significantly higher than current market offerings. New research published in the LevelTen Energy PPA Price Index highlights the low-cost nature of both wind energy and solar energy resources available to ENO; those resources are now expected in the $20-$30/MWh range.[8] In North Carolina, competitive procurement of solar energy resources recently led to an average price of $31.24/MWh per proposal.[9] As such, ENO's solar energy and wind energy cost assumptions in the IRP are approximately 50%-60% higher than current market offerings.



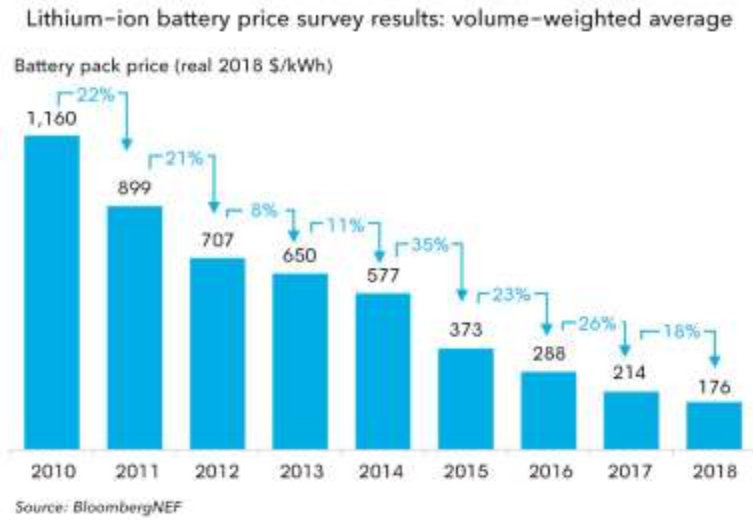
Source: LevelTen Energy PPA Price Index, 2019[10]

Regarding energy storage, Bloomberg New Energy Finance (BNEF) shows that energy storage costs have declined from $1,160/kWh in 2010 down to $176/kWh in 2018.[11] Battery storage costs have decreased by nearly 85% in 8 years, with average annual cost declines of approximately 20%. The Energy Storage Association notes that, when comparing multiple energy storage forecast reports, "cost declines of 8-15 percent year-on-year are projected."[12] It is likely that battery energy storage system prices will fall below $100/kWh by 2020.

Even though SREA is providing cost estimates for energy storage from BNEF in a $/kWh value, SREA recommends including multiple formats for reporting and calculating energy storage costs. The Energy Storage Association (ESA) rightfully notes that:

> "Many sources report storage capital costs as a function of duration at rated capacity ($/kWh) so as to make their figures applicable to range of project durations. This is a flawed approach, however, as only the battery costs scale with duration; power controls and other balance of system costs do not vary significantly with battery duration. The result is to overstate the cost of longer-duration storage, when

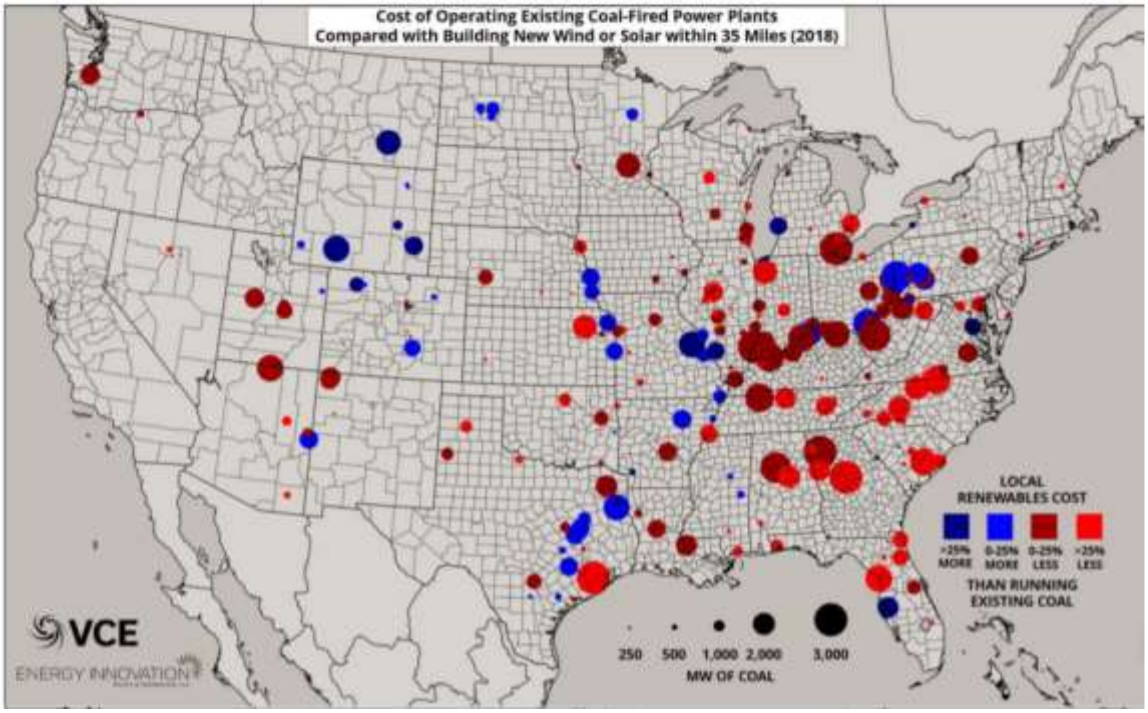
PCS/BOS costs are a smaller proportion of total cost, and understate the cost of shorter-duration storage, when PCS/BOS costs are a larger proportion of total cost. For this reason, ESA recommends that estimates for varying durations (e.g., 30-minutes, 2-hour, 8-hour) of battery storage facilities use capital cost figures ($/kW) specifically estimated for those project durations."[13]



Source: BNEF 2019[14]

Review of Existing Entergy Facilities Shows Renewable Energy is Lower Cost

A recent analysis by Vibrant Clean Energy (VCE) and Energy Innovation LLC found that "America has officially entered the 'coal cost crossover' – where existing coal is increasingly more expensive than cleaner alternatives. Today, local wind and solar could replace approximately 74 percent of the U.S. coal fleet at an immediate savings to customers. By 2025, this number grows to 86 percent of the coal fleet."[15] As mentioned previously, ENO has significant wind energy and solar energy resources available in the near-term at costs of roughly $20-$30/MWh. Even though VCE's analysis evaluated only coal-fired power plant, and ENO has limited coal-fired capacity, VCE's fundamental analysis shows that renewable energy resources can now out-compete power generated by existing units for roughly $35-$40/MWh, and higher. Therefore, if ENO procures existing energy resources for over $35-$40/MWh, it is highly likely that ENO ratepayers are over-paying compared to lower-cost renewable energy resources.



Source: Vibrant Clean Energy and Energy Innovation LLC, 2019[16]

Relatively higher cost power plants pose financial risks to owners. According to Moody's Investors Service,

> "Some coal plants still perform economically, but competitiveness could come under pressure as market conditions evolve... Most municipal- or G&T-owned coal plants in the US are old and have high production costs. According to the report, 72.3% of these plants, or about 65.0 gigawatts, have operating costs exceeding $30 per megawatt hour, which Moody's views as the threshold above which coal plants are vulnerable to be displaced by cheaper generation options. Newer units that came online after 2000 use more efficient technology and run at lower heat rates and operating costs, enabling many of them to be competitive with the market and achieve higher capacity factors. Others are located adjacent to coal mines, allowing them to eliminate transportation costs from their overall fuel expenses. Nonetheless, each plant's competitiveness will ultimately depend on external factors including the price of natural gas and renewable energy in the vicinity, regional transmission organization reserve margins and the extent of political support for various fuels."[17]

As Moody's points out, broader energy market forces will render higher cost energy resources (such as existing steam turbine generation) obsolete and likely to be out-competed by lower cost energy resources such as renewable resources.

Entergy publishes data regarding all its generation fleet across the company footprint. Compared to utility-scale solar energy and wind energy resources, a number of Entergy's power plants cost significantly more than what the company could procure from a competitive solicitation.

Entergy Generation Statistics 2017

Company	Plant	Unit	ETR %	COD	MW	Fuel	Status	BTU/KWH	MWH Gen	Exp/MWH	$,000's	CF%
ELL	Acadia	2	100%	2002	551	Gas	Intermediate	7,323	2,651,010	$28.6	75,823	55%
ELL	Buras	8	100%	1971	11	Gas/Oil	Peaking	17,944	4,624	$195.6	904	5%
ELL	Little Gypsy	2	100%	1966	409	Gas/Oil	Intermediate	11,181	2,146,213	$43.9	94,156	26%
ELL	Little Gypsy	3	100%	1969	517	Gas/Oil	Intermediate					
ELL	Ninemile Point	4	100%	1971	681	Gas/Oil	Intermediate	10,228	4,427,688	$38.8	171,874	35%
ELL	Ninemile Point	5	100%	1973	753	Gas/Oil	Intermediate					
ELL	Ninemile Point	6	100%	2014	560	Gas/Oil	Intermediate	7,065	4,349,242	$28.7	124,780	89%
ELL	Perryville	1	100%	2002	534	Gas	Intermediate	7,286	1,900,770	$33.2	63,111	32%
ELL	Perryville	2	100%	2001	154	Gas	Peaking					
ELL	Sterlington	7	100%	1974	47	Gas/Oil	Peaking	13,012	8,848	$127.5	1,128	2%
ELL	Waterford	1	100%	1975	407	Gas/Oil	Intermediate	11,240	829,226	$58.4	48,404	12%
ELL	Waterford	2	100%	1975	407	Gas/Oil	Intermediate					
ELL	Waterford	4	100%	2009	33	Oil	Peaking					
ELL	Willow Glen	2	100%	1964	-	Gas/Oil	Retired					
ELL	Willow Glen	4	100%	1973	-	Gas/Oil	Retired					
ELL	Roy S. Nelson	4	100%	1970	425	Gas/Oil	Retired					
ELL	Calcasieu	1	100%	2000	143	Gas	Peaking	12,283	357,373	$61.2	21,878	14%
ELL	Calcasieu	2	100%	2001	156	Gas	Peaking					
ELL	Ouachita	3	100%	2002	249	Gas	Intermediate	7,112	1,250,592	$29.6	36,984	57%
ELL	Roy S. Nelson	6	40%	1982	221	Coal	Base	11,890	1,092,417	$37.4	40,882	56%
ELL	Big Cajun 2	3	24%	1983	139	Coal	Base	10,734	783,859	$32.3	25,333	64%
ELL	River Bend	1	100%	1986	967	Nuclear	Base	10,896	7,032,282	$31.9	224,272	83%
ELL	Waterford	3	100%	1985	1,169	Nuclear	Base	10,879	8,347,047	$28	233,896	82%
ELL	Union Power	3	100%	2003	497	Gas	Intermediate	7,312	5,591,466	$27.5	153,960	64%
ELL	Union Power	4	100%	2003	494	Gas	Intermediate					

Entergy (2018). Entergy Statistical Report and Investor Guide 2017.
[http://www.entergy.com/content/investor_relations/docs/2017_Investor_Guide.pdf]

Entergy Generation Statistics 2017

Company	Plant	Unit	ETR %	COD	MW	Fuel	Status	BTU/KWH	MWH Gen	Exp/MWH	$,000's	CF%
EAI	Independence	1	32%	1983	263	Coal	Base	10,330	999,311	$28.7	28,679	43%
EAI	White Bluff	1	57%	1980	465	Coal	Base	10,247	4,563,427	$27.6	126,074	56%
EAI	White Bluff	2	57%	1981	468	Coal	Base					
EAI	ANO	1	100%	1974	833	Nuclear	Base	10,373	12,692,915	$32.5	412,431	80%
EAI	ANO	2	100%	1980	985	Nuclear	Base					
EAI	Ouachita	1	100%	2002	252	Gas	Intermediate	7,169	2,918,656	$27.6	80,418	66%
EAI	Ouachita	2	100%	2002	253	Gas	Intermediate					
EAI	Hot Spring	1	100%	2002	606	Gas	Intermediate	7,471	3,447,996	$27	92,951	65%
EAI	Union	2	100%	2003	507	Gas	Intermediate	7,361	1,618,334	$32.5	52,542	36%
EAI	Lake Catherine	4	100%	1970	528	G/O	Peaking	13,122	93,574	$244.1	22,844	2%
EAI	Carpenter	1	100%	1932	30	Hydro	Peaking		69,475	$17.9	1,242	13%
EAI	Carpenter	2	100%	1932	30	Hydro	Peaking					
EAI	Remmel	1	100%	1925	4	Hydro	Peaking		23,963	$33.5	804	23%
EAI	Remmel	2	100%	1925	4	Hydro	Peaking					
EAI	Remmel	3	100%	1925	4	Hydro	Peaking					
EMI	Attala	1	100%	2001	453	Gas	Intermediate	7,058	2,295,278	$28.1	64,529	58%
EMI	Hinds	1	100%	2001	460	Gas	Intermediate	7,037	3,245,510	$25.8	83,843	81%
EMI	Baxter Wilson	1	100%	1967	532	Gas/Oil	Peaking	10,994	633,632	$55.8	35,375	7%
EMI	Baxter Wilson	2	100%	1971	531	Gas/Oil	Peaking					
EMI	Gerald Andrus	1	100%	1975	729	Gas/Oil	Peaking	12,163	386,449	$67.5	26,092	6%
EMI	Rex Brown	3	100%	1951	29	Gas/Oil	Peaking	12,041	166,515	$61.9	10,312	8%
EMI	Rex Brown	4	100%	1959	200	Gas/Oil	Peaking					
EMI	Rex Brown	5	100%	1968	9	Oil	Peaking					
EMI	Independence	1	25%	1983	204	Coal	Base	10,547	1,903,544	$28	53,359	52%
EMI	Independence	2	25%	1984	211	Coal	Base					
ENO	Union Power	1	100%	2003	491	Gas	Intermediate		2,675,414	$27.1	72,495	62%
	NOLA Solar	1	100%	2016	1	Solar	N/A		2,005	$23.9	48	
SERI	Grand Gulf	1	90%	1985	1,271	Nuclear	Base	10,708	6,622,966	$39.6	262,272	59%
ETI	Roy S. Nelson	6	30%	1982	164	Coal	Base	11,890	807,440	$37.2	30,075	56%
ETI	Big Cajun 2	3	18%	1983	102	Coal	Base	10,734	579,377	$32.3	18,728	65%
ETI	Lewis Creek	1	100%	1970	251	Gas/Oil	Intermediate	11,016	1,735,247	$39.9	69,183	39%
ETI	Lewis Creek	2	100%	1971	252	Gas/Oil	Intermediate					
ETI	Sabine	1	100%	1962	212	Gas/Oil	Intermediate	10,904	3,497,946	$43.4	151,929	27%
ETI	Sabine	3	100%	1966	268	Gas/Oil	Intermediate					
ETI	Sabine	4	100%	1974	534	Gas	Intermediate					
ETI	Sabine	5	100%	1979	449	Gas/Oil	Intermediate					

Entergy (2018). Entergy Statistical Report and Investor Guide 2017.
[http://www.entergy.com/content/investor_relations/docs/2017_Investor_Guide.pdf]

b. In what year should ENO be required to meet this target, and should ENO have specific, incremental targets to meet?

ENO should have specific, incremental targets over this RPS's time horizon. Absent hourly load and generation analysis, it appears ENO should be able to incorporate up to 20% renewable energy penetration levels relatively soon, like Lafayette. Also, because the Union Power Station is due to retire in the early 2030s, that likely provides another inflection point for the city and ENO. ENO's contracting with nuclear reactors may provide a final inflection point. Over the past few years, Grand Gulf has been operating sporadically and has caused significant disruptions in the MISO South footprint. ENO contracts for several hundred megawatts of capacity from Grand Gulf, and based on Entergy's data, the reactor operates at close to $40/MWh, significantly higher than solar energy or wind energy resources. At some point, Grand Gulf and other nuclear reactors across MISO south will need to retire and will likely cause another inflection point for ENO to consider significant renewable energy procurement. Absent significant modeling, SREA recommends a near-term mandate of 20% renewable energy penetration by 2023, with a 60% renewable energy mandate by 2030, and a long-term goal of 100% clean energy when the rest of ENO's contracted nuclear energy resources are retired.

2. How should a New Orleans RPS target be satisfied?
a. Should ENO be allowed to purchase RECs to satisfy the requirement, and if so what, if any, limitations should be applied to the use of RECs? If RECs are allowed, how should they be certified or verified?

New power purchase agreements will lock in low-cost energy resources and supplant higher-cost energy resources. Renewable Energy Credits (RECs) do not have the ability to stabilize energy costs. RECs are a relatively low-cost option to certify renewable energy generation, with some REC programs available now for $5/MWh, or $0.005/kWh, and possibly lower. However, these costs are additional costs on top of existing ratepayer cost structures and provide little to no guarantee that local or regional jobs will be created. If RECs are allowed, they should be Green-E certified, subscriptions should be voluntary based on ratepayer opt-in, and should only make up a very small portion of the overall renewable energy portfolio program.

b. What resources should be included in the definition of resources that may be used to meet the target (whether through the addition of resources to ENO's system or through the purchase of RECs) -- Solar Water Heat, Solar Space Heat, Geothermal Electric, Solar Thermal Electric, Solar Thermal Process Heat, Solar Photovoltaics, Wind (Large and Small), Biomass, Hydroelectric, Geothermal Heat Pumps, Combined Heat & Power, Landfill Gas, Hydroelectric (Large and Small), Geothermal Direct- Use, Anaerobic Digestion, Fuel Cells using Renewable Fuels, other?

SREA agrees with including many of the aforementioned resources as qualifying renewable energy resources. In a competitive resource solicitation process, utility-scale solar energy and utility-scale wind energy are likely to be the lowest cost energy solutions. As such, creating carve-outs, incentives, or requirements for any of the previously mentioned renewable energy resources will likely lead to higher overall costs associated with the RPS.

c. Should there be a requirement that some portion of the RPS must be met through specific types of renewables (or RECs), such as solar or distributed generation?

SREA recognizes there are benefits to creating "carve-outs" for RPS goals, such as requiring a certain percentage of energy come from local or distributed generation resources to create local jobs or improve geographic diversity. However, utility-sale solar energy and wind energy resources are significantly lower-cost compared to localized or distributed generation requirements. Importing renewable energy resources from outside of the city of New Orleans will likely keep overall ratepayer costs low, and overall RPS programmatic costs in check. Fulfilling an RPS program with the lowest cost energy resources via competitive bidding practices will also assist in reducing ratepayer costs.

d. Should the Council consider adopting a method of encouraging local renewable resources, such as by providing ENO with greater credit toward meeting the RPS requirement for local resources than for remote resources?

As stated previously, allowing competitive bidding practices for all renewable energy resources will help assist in keeping the RPS implementation costs low. Creating additional requirements beyond a competitive bidding process will increase costs; however, such costs may be justifiable based on externalized non-energy benefits, such as local economic growth, or resiliency. Such benefits need to be clearly defined and calculated to properly weigh the associated additional costs. For example, resiliency can be greatly improved by upgrading local distribution system equipment, creating microgrids and installing energy storage systems; however, all those efforts almost inherently fall outside the development of an RPS without some sort of additional requirements within the RPS.

Provisions should be developed to ensure that private companies and residents are able to directly access and promote renewable energy resources, beyond ENO sole-ownership models.

3. How should the RPS standard be enforced, should the Council consider a penalty or Alternative Compliance Payment structure?

Penalties levied on ENO regarding RPS non-compliance may increase costs to local ratepayers, unless fines are levied somehow against Entergy's shareholders. One option may be a stock option where the city of New Orleans becomes a shareholder and fines are paid to the city in shares of company stock.

4. What protections should be put in place to protect ratepayers from unreasonable increases in rates due to the RPS?

In order to keep RPS costs low, the RPS needs to be implemented quickly to take advantage of federal tax credits, competitive procurements need to be prioritized, and ENO needs to stop relying on capacity-only resource planning and instead focus on energy-based planning.

Federal Tax Credits are Expiring Soon

If New Orleans wants to procure significant quantities of renewable energy resources, now is the time to act. The federal Production Tax Credit (PTC) and Investment Tax Credit (ITC) are the primary incentives for the wind energy industry and solar energy industry, respectively. Because of congressional action in 2015, the PTC and ITC are being phased out, even while federal incentives for conventional forms of generation remain in place. Wind energy developers can qualify projects for specific PTC vintages by commencing construction in a year and bringing such projects online within four calendar years. For example, a wind energy project that commenced construction by the end of 2016 has until the end of 2020 to begin operation, and still qualify for the full PTC. Projects that began construction in 2017 have until the end of 2021 to become operational, 2018 projects by 2022, and 2019 projects by 2023. Renewable energy project developers frequently safe harbor qualified clean energy equipment, in anticipation of a future contract and reflect cost reductions in the proposals. Rules for the solar ITC are slightly different compared to the wind PTC. Based on IRS Notice 2018-59, "As modified, § 48 phases down the ITC for solar energy property the construction of which begins after December 31, 2019, and before January 1, 2022, and further limits the amount of the § 48 credit available for solar energy property that is not placed in service before January 1, 2024." In effect, the ITC phase-out for solar ends for projects that commence construction in 2019, 2020 or 2021 by January 1, 2024. For solar projects that begin construction on or after January 1, 2022, a permanent 10% ITC is available.[18] In order to maximize use of federal tax incentives and reduce overall costs, New Orleans should procure a large quantity of renewable energy in the near-term, preferably in the 2022-2023 timeframe.

Competitive Procurements Result in Low-Cost Renewable Energy Resources

Xcel Energy, a Colorado electric utility, published the results of its 2017 All-Source Solicitation request for proposals in December 2017.[19] Xcel received over 400 bids representing over 100,000 MW of capacity from a wide variety of technologies; however, most bids provided wind energy or solar power resources. The median bid price or equivalent for stand-alone wind energy resources was $18.10/MWh, suggesting several projects below and above that price. Adding battery storage to wind energy resulted in median bids of $21/MWh. For stand-alone solar energy resources, the median bid was $29.50/MWh. Adding battery storage to solar energy resulted in median prices of $36/MWh.

Northern Indiana Public Service Company (NIPSCO), an electric company in the MISO system, held an integrated resource plan (IRP) meeting on July 24, 2018 to discuss renewable energy options. As part of its IRP process, NIPSCO shared results from an all source request for proposals (RFP) summary. NIPSCO received bids for wind energy, solar energy, energy storage, and amalgamations of those resources together. The company received proposals across five states, predominately via power purchase agreement (PPA), but also as asset sale or option. Resources offered as asset sale or as an option were provided at an average bid cost of $1,151.01/kW for solar energy projects, and $1,457.07/kW for wind energy projects. For PPA's, average bids for solar energy reached $35.67/MWh, and average bids for wind energy reached $26.97/MWh. Solar plus energy storage projects were offered as asset sales at $1,182.79/kW and as a PPA at $5.90/kW-Mo plus $35/MWh.[20] These values provide recent market data that are relevant to states in MISO and further south. Subsequently, NIPSCO's IRP recommended[21]:

- By 2023, the IRP preferred plan calls for adding approximately 1,150 MW of solar and solar+ storage, 160 MW of wind, 125 MW of DSM and 50 MW of market purchases to the NIPSCO supply portfolio
- Retire all of NIPSCO's coal capacity by the end of 2028

ENO Should Use Energy-Focused Resource Planning

Entergy's subsidiary companies use the same modeling methodologies across the companies' jurisdictions. All companies us AURORA planning software, and all companies overly rely on capacity-based planning. Entergy Louisiana's recent Final IRP stated that, "AURORA has the capability to assess deactivations in the capacity expansion algorithm, but there are data requirements which make this impractical within the scope of an IRP analysis."[22] In effect, Entergy's companies are not comparing new renewable energy resources against their existing power plant fleet costs. As mentioned previously, many of Entergy's power plants currently operate at prices above the cost of new renewable energy resources, including a number of coal, natural gas and nuclear reactor units. Because of Entergy's reliance on capacity-based planning, its existing resource planning methodologies are not optimizing energy planning or cost reductions opportunities. Similar to the results of the VCE study mentioned previously, renewable energy resources can out-compete many existing thermal power units and reduce overall ratepayer costs.

Taken to the extreme, a capacity-only planning process could lead to unusual model results that recommend significant power generation development or legacy generation retention that are rarely used, at the expense of low-cost energy options. Capacity-focused planning does not initially address economic costs; alternatively, an energy-based financial dispatch model would efficiently dispatch necessary resources. ENO should evaluate energy planning options, not just capacity. Synapse Energy Economics have noted the deficiency of capacity expansion models, stating:

> "In addition, some capacity expansion models are unable to endogenously retire EGUs, and require these decisions to be made outside of the model construct. While making decisions outside the model reduces computational requirements, it may introduce user error or bias. For example, a modeler may not review economic retirements, and thus fail to capture a cost-effective compliance mechanism."[23]

Two recent IRPs used better data assumptions and methodologies than ENO. The Southwestern Electric Power Company (SWEPCO), with customers in Arkansas, Louisiana and Texas, recently completed its IRP in Arkansas.[24] SWEPCO modeled wind energy resources, stating "The resource had a LCOE of $21.85/MWh in 2021 with an 80% PTC, without congestion and losses. The levelized congestion and losses for the 2021 wind resource is estimated to be approximately $6/MWh." SWEPCO also modeled utility-scale solar, stating "Initial costs for Tier 1 were approximately $1,180/kW in 2021 with the ITC. Tier 2 has an initial cost of approximately $1,310/kW in 2021 with the ITC."
SWEPCO's Preferred Portfolio:

- "Adds utility-scale solar resources in 2025 through 2032, for a total of 1,300MW (nameplate) of utility-scale solar by the end of the planning period."
- "Adds 600MW (nameplate) of wind resources in 2022 and 2023 and 200MW (nameplate) in 2024, with additional wind resources added through 2029, for a total of 2,000MW (nameplate) by the end of the planning period."

Cleco Power LLC, an electric utility in Louisiana, recently published its Draft IRP. Cleco found that "The preferred portfolio includes acquiring up to 400 MW of installed solar capacity, as well as up to 1,000 MW of installed wind capacity."

- Cleco evaluated wind energy with a PPA. Cleco states, "The wind PPA assumed a fixed price of $20/Mwh over the term of the study with an additional $7/MWh adder for potential firm transmission costs, whether incurred by congestion costs between MISO North and South or for wheeling out of SPP. Due to the increased prevalence and strength of wind as a resource in certain geographic areas in TRG 1 areas relative to MISO South, a higher capacity factor of 48%-53% will be used for the wind PPA." These prices are in line with SWEPCO's IRP, NIPSCO's RFP and Xcel's RFP.
- Cleco also evaluated solar energy with a PPA. Cleco states, "The solar PPA will use a fixed price of $35/MWh over the term of the study. Since it is assumed to be in MISO South, no transmission adder or capacity factor adjustment will be made relative to the self-build option." These prices are in line with SWEPCO's IRP, NIPSCO's RFP and Xcel's RFP.

<u>CERTIFICATE OF SERVICE</u>

I hereby certify that I have this day served a copy of the within and foregoing Southern Renewable Energy Association's Motion to Intervene upon all parties listed below via electronic service or by hand delivery and addressed as follows:

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