Mid-Atlantic Solar & Storage Industries Association
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December 9, 2022

Sherri L. Golden
Secretary of the Board
New Jersey Board of Public Utilities
44 South Clinton Avenue, 1st Floor
Trenton, NJ 08625

Via email to:
secretary@bgu.nj.gov

Re: Docket No. QO24020126
IN THE MATTER OF THE 2024 ENERGY MASTER PLAN

Dear Secretary Golden:

The Mid-Atlantic Solar & Storage Industries Association (MSSIA) is pleased to present these comments in regard to the above-referenced matter.

MSSIA is a trade organization that has represented solar energy companies in New Jersey, Pennsylvania, and Delaware since 1997. During that 25-year period, the organization has spearheaded efforts in the Mid-Atlantic region to make solar energy a major contributor to the region's energy future. Its fundamental policy goals, which were recently expanded, are to: (1) grow solar energy and storage in our states as quickly as practicable; (2) do so at the lowest possible cost to ratepayers, while delivering the greatest possible benefit as a public good; (3) preserve diversity in the market, including opportunity for Jersey companies to grow and create local jobs, and (4) encourage policy to bring the benefits of solar energy to overburdened communities and households (https://mssia.org/fundamental-policy-objectives/).

MSSIA's comments at this stage in the 2024 Energy Master Plan proceedings are presented below and in the attached slide presentation, Attachment A.

As stated by BPU President Guhl-Sadovy in the first 2024 EMP stakeholder meeting, the 2019 EMP was a state-of-the-art plan. It used cost-benefit analysis to identify a Least-Cost Scenario leading to 100% clean energy by 2050.

The 2024 EMP, as stated by BPU and Governor's Office staff in the stakeholder meetings, will not only take a closer look at the topics covered in the 2019 EMP, but also accelerate the achievement of 100% clean energy to 2035.

As detailed in Attachment A, MSSIA has conducted a thorough study of the specific and *quantitative* recommendations made in the 2019 EMP, and requirements contained in existing executive orders, especially those dealing with solar energy and offshore wind. MSSIA took note of the fact that the Least Cost Scenario identified in-state *solar energy as the largest source of energy when the state achieves 100% clean energy* - MSSIA also studied load growth according to existing executive orders, laws, and NJDEP rules concerning electric vehicle sales and building electrification, including their extension through 2035. MSSIA found that

continuing on the current path laid out in the 2019 EMP, executive orders, laws, and rules will bring the state to 100% renewable energy + nuclear by 2035, with 96% coming from in-state nuclear and renewables and just 4% coming from out-of-state Class 1 renewables. That is great news for the environment, as well as great news for the economy of the state and the general welfare of its citizens.

Some particular points are briefly discussed below, and covered in greater detail in Attachment A.

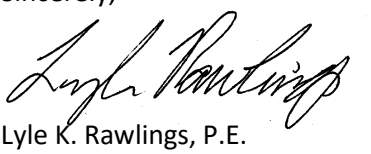
1. Cost/Benefit analysis
Renewable energy incentives are a societal investment intended to yield a return. That return consists of a number of services that can be quantified, and those include avoided social costs of climate and criteria pollutants; jobs, federal and private investment, and economic growth; profit that goes directly to New Jersey people, public and educational institutions, non-profits, and businesses, lower wholesale electric rates, resiliency, and more. This full value stack analysis should again serve as a central approach in producing the 2024 EMP.

2. Some electric costs and other energy costs dropping
Legacy SREC costs, ZECs, EVs saving fuel costs, energy efficiency savings, and other factors will cause an overall reduction in energy costs in this 100% clean energy future.

3. Grid Modernization must accelerate
With the BPU's proposed new interconnection rule, New Jersey is poise to become the nations leader in preparing for the clean, renewable grid of the future. Unfortunately, there recently as been a tremendous acceleration of denials of interconnection for distributed renewable projects. MSSIA expects there to be an unfortunate and significant solar-down of solar energy installations before these innovative new rules for interconnection can take effect statewide. In order to minimize this, MSSIA urges maximum possible speed in completing, adopting, and fully implementing the new rule.

MSSIA thanks staff for the opportunity to provide input on this matter.

Sincerely,



Lyle K. Rawlings, P.E.
President

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ATTACHMENT A

BPU DOCKET NO. QO24020126
2024 NJ ENERGY MASTER PLAN
MSSIA HOPES AND CONCERNS
June 12, 2024

- 2019 NJ ENERGY MASTER PLAN:
  + **Preserve the fundamental approach of the 2019 EMP**
  + What were the key findings for solar in the 2019 EMP "Least Cost Scenario"?
  + If we stay the course, when do we hit 100% (hint: sooner than you think)

- COST/BENEFIT AS THE DECISION-MAKING PARADIGM: YES OR NO?

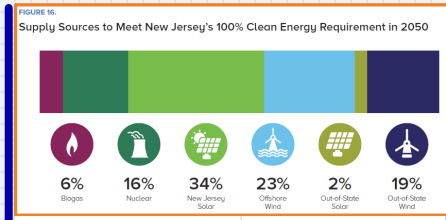
- VALUING THE BENEFITS OF DISTRIBUTED, IN-STATE SOLAR
  + What did the 2019 emp have to say about that?
  + Past studies, New Jersey and elsewhere, and the US/international state of the art
  + What values are unique to distributed solar. What values have not been studied?
  + Upcoming cost offsets

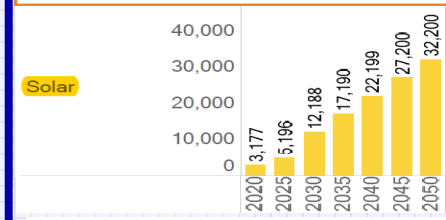
- WHAT DOES MSSIA FEAR FROM THE 2024 EMP?

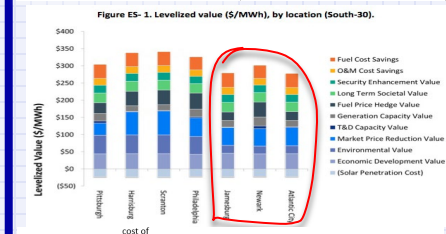
- CHALLENGE: INTERCONNECTION AND GRID MODERNIZATION

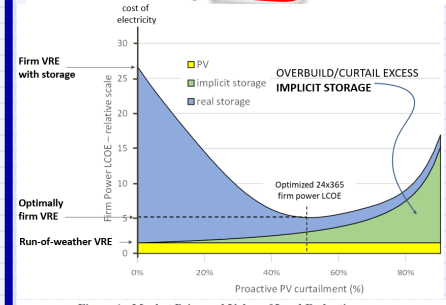
Do-able

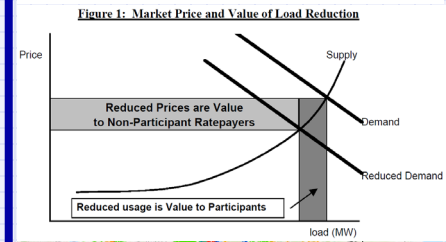
LYLE RAWLINGS
PRESIDENT. MSSIA

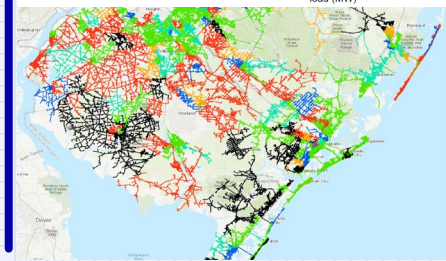












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2019 NJ ENERGY MASTER PLAN: PRESERVE THE FUNDAMENTAL APPROACH

- The 2019 EMP took a **cost/benefit approach.**

- The 2019 EMP evaluated the "full value stack" for distributed energy resources.

- Rocky Mountain Institute and Evolved Energy used this approach to identify the **"Least Cost Scenario"**.

- The Least Cost Scenario results reported in the 2019 Energy Master Plan included in-state **solar energy as the largest source of energy** when the state reaches 100% clean energy.

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COST/BENEFIT ANALYSIS

- Cost/benefit analysis is the de facto standard approach in federal and state regulatory and planning processes.
- New Jersey spending on renewables and other clean energy is not a gift; it is intended to generate monetary and societal benefits in excess of costs. That makes it an investment, by definition.
- Like any investment, it would be irrational to consider cost alone, without comparing costs to benefits.
- The term "technology neutral" is being proffered as an alternative approach. The term really means a cost-only approach, in which the lowest cost alternatives win, regardless of their benefits or lack thereof.
- If the cost-only approach prevails, MSSIA knows that distributed in-state solar loses. If the cost/benefit approach prevails, including the full value stack, MSSIA knows that distributed in-state solar wins.

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The 2019 EMP 2.1.6 states:

"Develop mechanisms to compensate distributed energy resources for their full value stack"* (emphasis added)

***2019 Energy Master Plan § 2.1.6 (p. 101)**

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New Jersey's Energy Master Plan
Least Cost Scenario

The 2019 EMP found that the Least Cost Scenario relied on in-state solar as the largest single source of clean energy, at 34% of the total.

FIGURE 16.

Supply Sources to Meet New Jersey's 100% Clean Energy Requirement in 2050

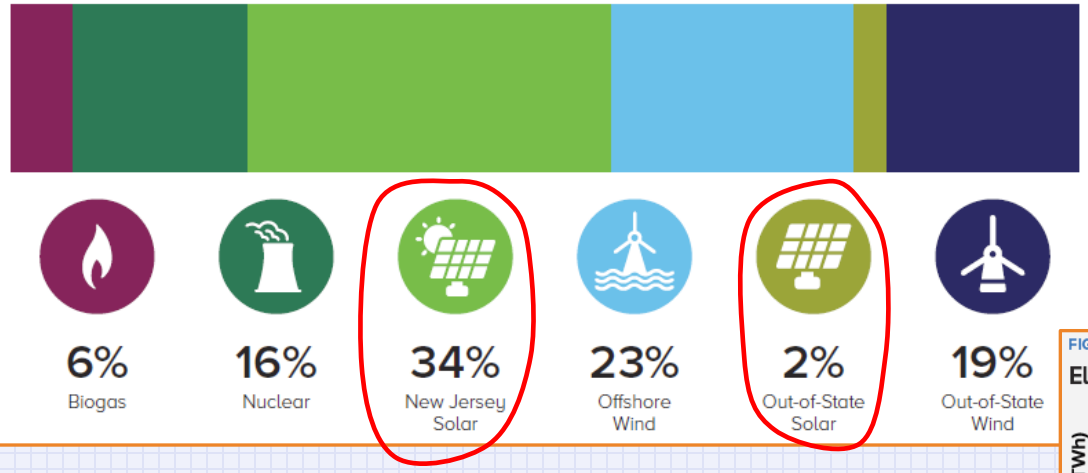
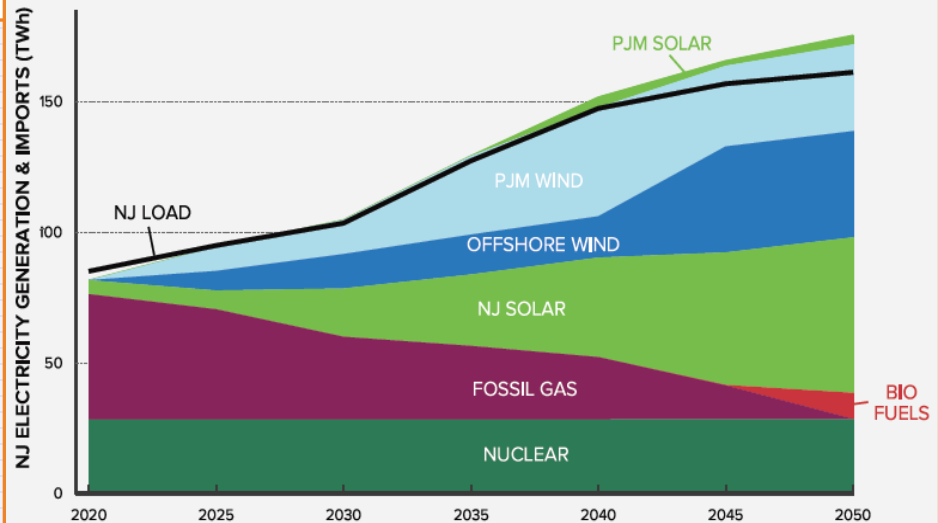


FIGURE 8.

Electricity Generation, Least Cost Scenario



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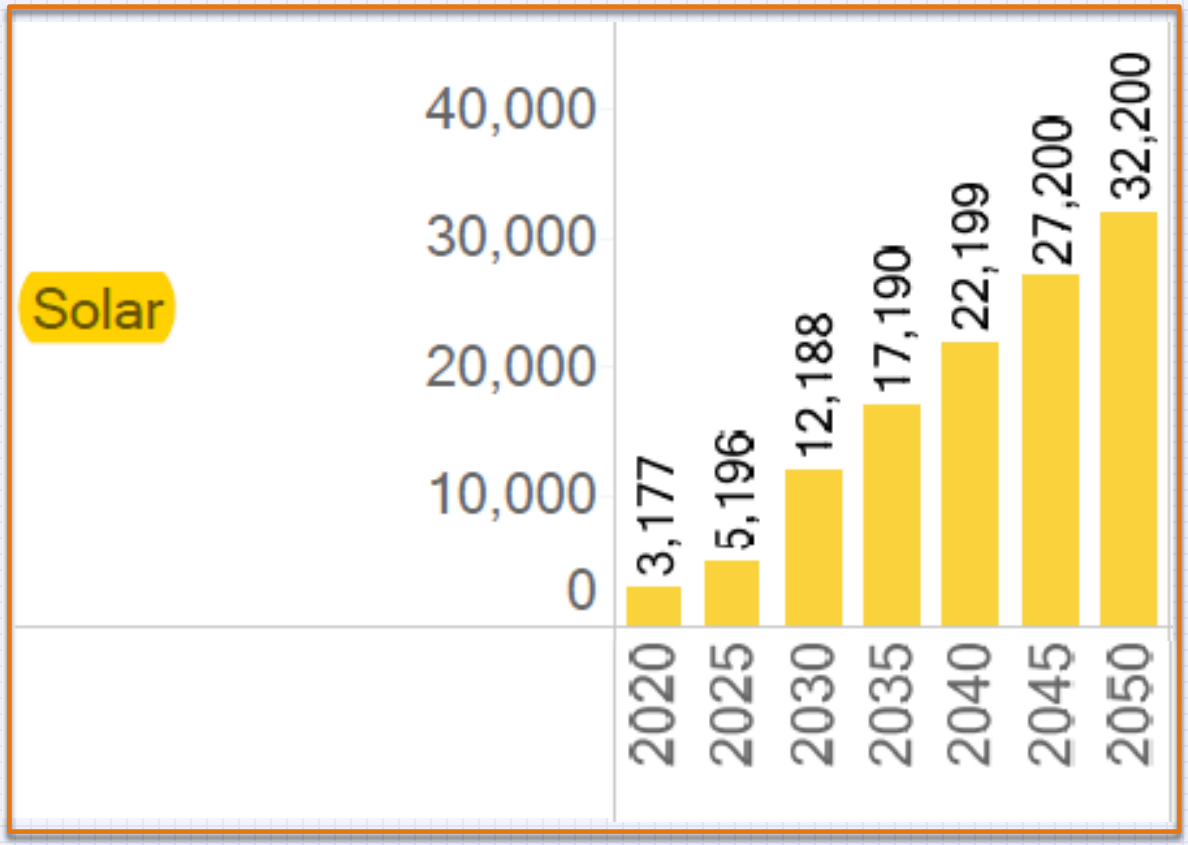
EMP 2.1.6 states:

"Develop mechanisms to compensate distributed energy resources for their full value stack" (p. 101)

A study of the full value stack for solar was conducted in New Jersey:



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100% Nuclear + Wind + Solar in NJ*: Sooner (and simpler) than you think

* Based on 2019 EMP and current laws and executive orders

Staying on course with existing nuclear, successful offshore wind development, and solar development according to the EMP Least Cost Scenario, only 4% out of state Class 1 renewables will be need to get to 100% by 2035:

Load growth – MSSIA analyzed load growth through 2035 using very optimistic assumptions for EV adoption, building electrification, and energy efficiency.
Result: predicted load is 82 million MWH/year by 2035.

Nuclear generation	=	33.9%
Offshore Wind	=	34.1%
Solar	=	24.5%
In-State Class 1	=	3.4%
Out-of-state Class 1	=	4.1%
Total	=	100%

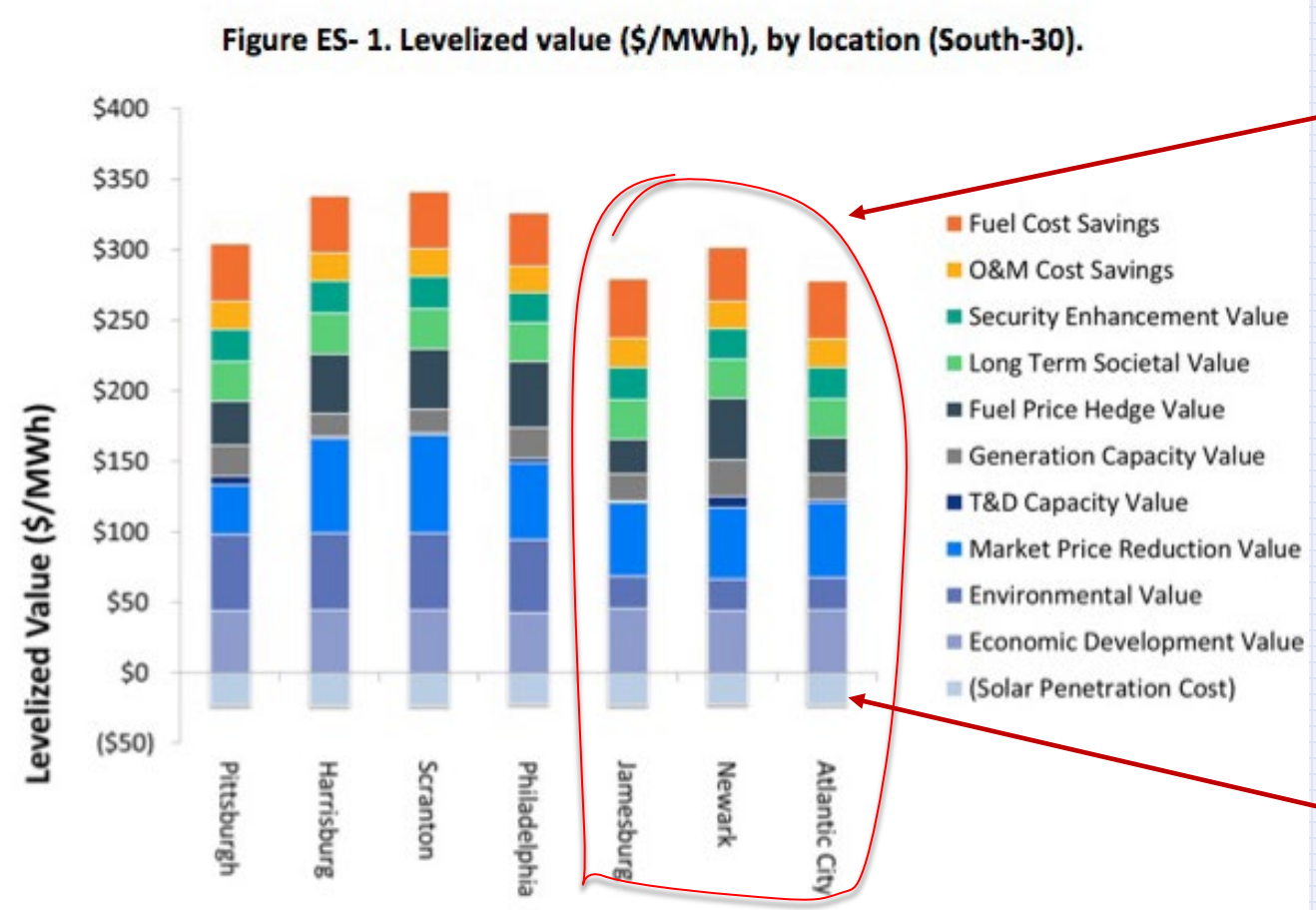
The "Full Value Stack" for Solar – More NJ Studies

EMP 2.1.6 states:

"Develop mechanisms to compensate distributed energy resources for their full value stack" (p. 101)

A study of the full value stack for solar was conducted in New Jersey:

The Value of Distributed Solar Electric Generation to New Jersey and Pennsylvania
Clean Power Research, 2012



The average value of solar (bundled energy + attributes) was $264/MWH in New Jersey

The cost of grid modernization was included

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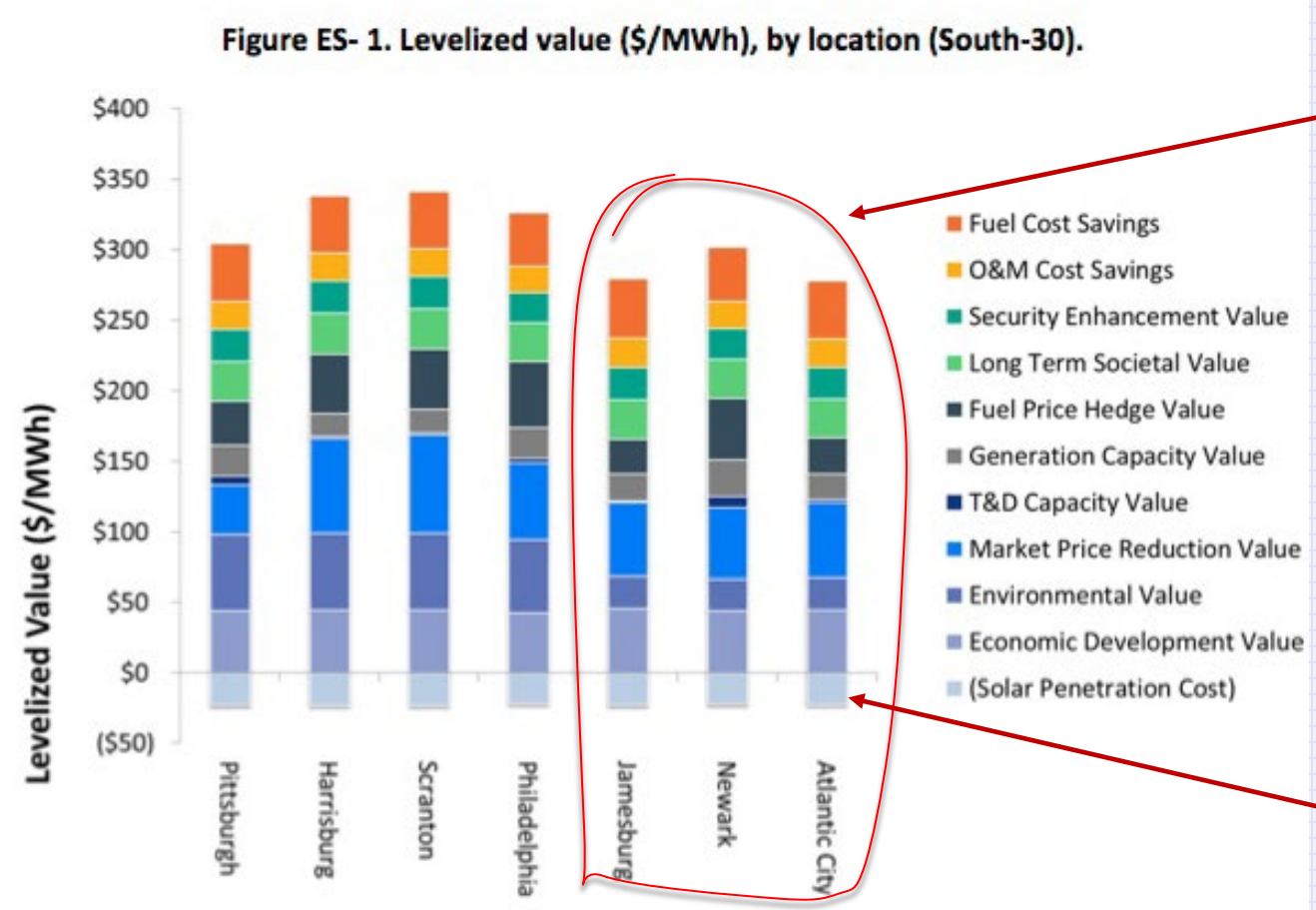

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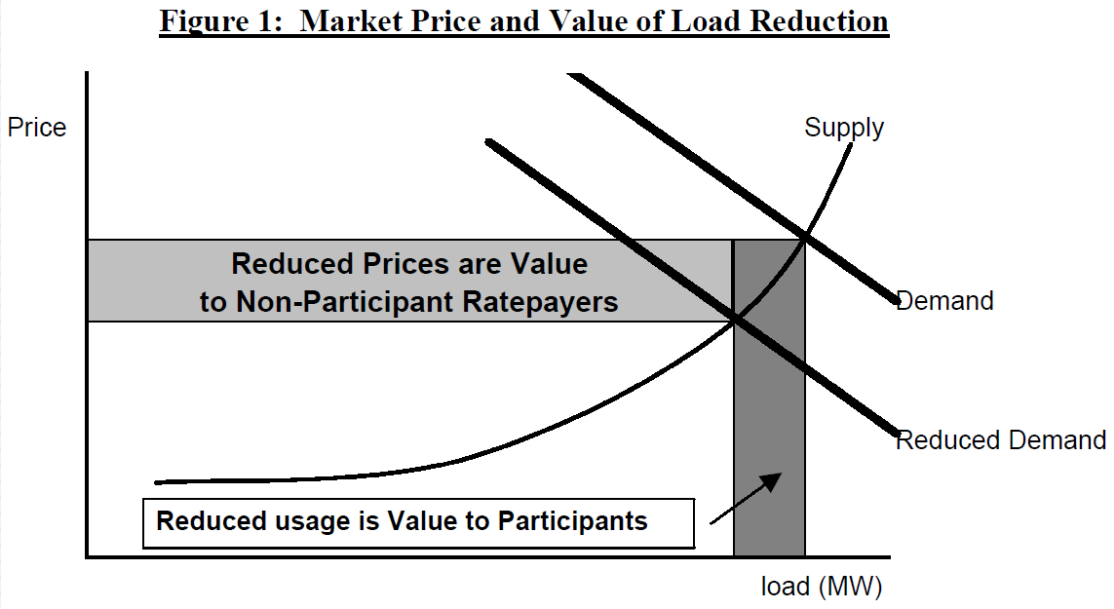
Solar Energy Forces Reduction in Wholesale (LMP) Prices: How it Works

Mid-Atlantic States Cost Curve Analysis (2000) - JBS Energy, Inc.



"As demand rises, particularly in peak periods, the price of energy rises relatively rapidly. If demand can be reduced, for example due to the installation of more efficient appliances, the price will tend to fall as demand falls, benefiting not only the customer whose demand is reduced but all other customers who receive the lower prices of spot market energy. Figure 1 shows the effect graphically for a given hour. The reduction in usagemultiplied by the original market price is a benefit to the customer(s) reducing load. The reduced price multiplied by the usage after the reduction benefits all other loads. The sum of these two shaded blocks is the total value of load reduction. Dividing the sum of the blocks by the MWh of load savings gives a value in $/MWh that is higher than the market price."

"It is clearly in the best interest of society to spend money and send price signals beyond the market price to encourage energy efficiency and load shifting, particularly during the summer peak. ***Distributed photovoltaic generation, with its relatively strong correlation with peak loads, could be particularly important in this regard****.*

NOTE: The case study found that the overall annual load reduction value for New Jersey PV was 268% of the market price.

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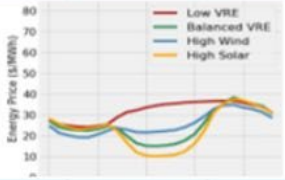
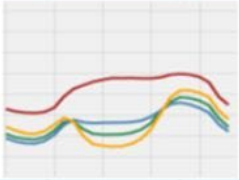
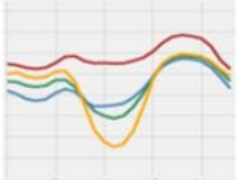
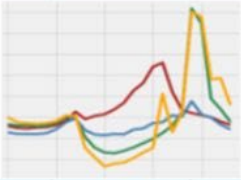
Lawrence Berkeley Lab: Solar energy reduces wholesale (LMP) prices

"Impacts of High Variable Renewable Energy Futures on Wholesale Electricity Prices and on Electric-Sector Decision Making" – Lawrence Berkeley National Laboratory

Lending support to a part of the CPR study for New Jersey, it found that **a solar-heavy scenario for 40% to 50% solar & wind by 2030 would lower wholesale prices in NYISO by 39%.**

Wholesale Price Effects of 40-50% Wind & Solar

(Wind: 30% wind & 10+% solar | Balanced: 20% wind & 20% solar | Solar: 30% solar & 10+% wind)

Impacts in 2030 relative to baseline with 2016 wind & solar shares	Southwest Power Pool (2016: 18% wind & 0% solar)			NYISO (New York) (2016: 3% wind & 1% solar)			CAISO (California) (2016: 7% wind & 14% solar)			ERCOT (Texas) (2016: 16% wind & 1% solar)		
	Wind	Balanced	Solar	Wind	Balanced	Solar	Wind	Balanced	Solar	Wind	Balanced	Solar
Lower Average Prices [$/MWh]	-19%	-21%	-27%	-37%	-38%	-39%	-25%	-23%	-27%	-25%	-17%	-15%
More Hours <$5/MWh In baseline: 0% of all hours	6%	8%	13%	2%	7%	11%	6%	7%	11%	6%	11%	19%
Changes in Diurnal Price Profile red baseline shows 2016 wind & solar shares												
More Price Variability	1.8x	2.1x	2.5x	2.1x	2.3x	2.5x	3.0x	2.9x	3.4x	1x	4.7x	6.6x
Higher AS Prices Regulation Down	5x	6x	9x	2x	2x	3x	3x	3x	3x	2x	3x	4x
Change in Timing of Top Net-Load Hours	Shift from 4pm to 7pm			Shift from 3pm to 5-7pm			No further shift 7pm			Shift from 3pm to 6-8pm		

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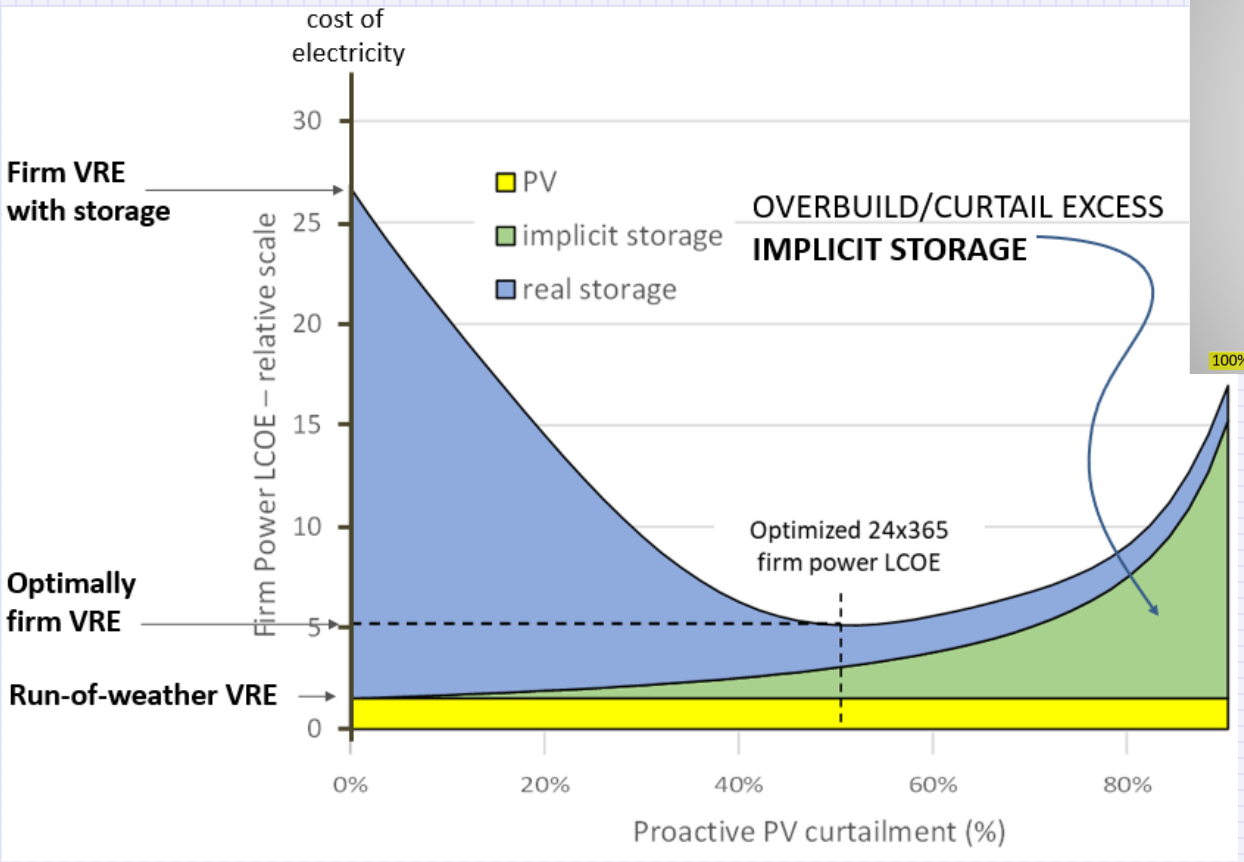
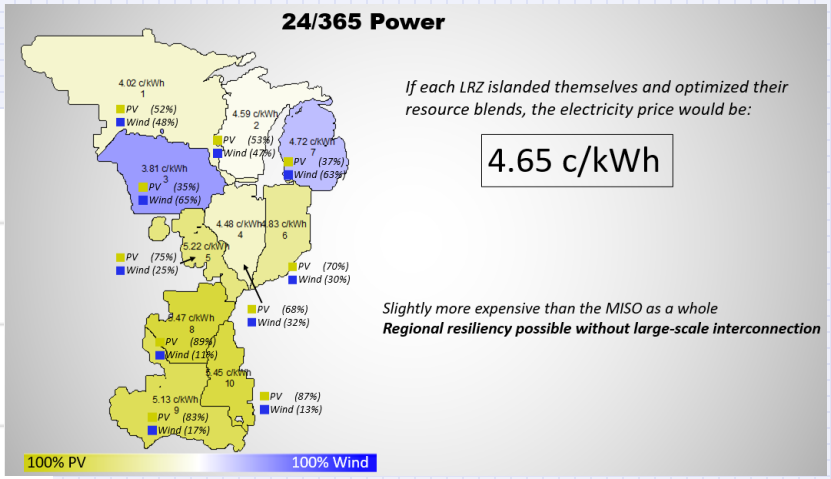
IEA 100% renewable optimization studies

Finding the lowest-cost combination of resources and measures to match load

It's like baking a cake – the recipe must have the right ingredients in the right amounts.

Credit: Dr. Richard Perez, Clean Power Research





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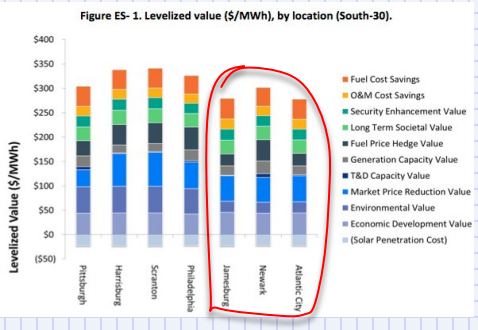
The "Full Value Stack" for Solar – Important Values Yet to be Studied:



1. Forcing down fossil fuel prices by reducing demand

When renewables displace fossil-fueled power, they can force prices down regionally. This can be seen clearly in natural gas prices, which can spike severely during unusual circumstances such as extreme cold weather periods. On the other hand, when demand is low, prices stay low.

2. Resiliency

Solar+storage microgrids at scales from gas stations and hotels to hospitals to giant sewage and water treatment plants can keep essential community services going.

3. Direct return of incentive monies to NJ households, local gov't, schools, non-profits, businesses - "Profit to the People":

All renewable energy projects produce net earnings (or they don't happen). But who gets those net earnings?

- Distributed, in-state solar is the only renewable resource that pays part or all of those net earnings to households, low-income subscribers, local & state government, schools, non-profits, businesses, etc. The benefits are in cash, and they are spread widely (although not perfectly evenly) among the populace.
- As an example, MSSIA studied public records for solar projects at 40 schools in NJ. It found that for every $100 in solar incentives paid to the school projects, the schools realize net earnings of $150. The projects provided benefits greater than the cost of incentives, and whole towns benefitted. Already, more than one third of all schools in New Jersey have built solar projects on site. The EMP would bring that to 100% before 2035.
- Up until now, 1/2 to 2/3 of net earnings for nearly all local government, school, and non-profit projects have gone to 3rd party owners of the solar equipment. Now that the IRA allows "direct pay" of the ITC to government and non-profit entities, the net earnings to public & non-profit entities can now double or triple.

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Offsets to the costs of clean energy incentives:
Energy costs for consumers will drop significantly

Clean energy incentive costs dropping off, energy savings, and potential new sources of funds, will lower net consumer energy costs substantially.

Furthermore, costs of electric infrastructure upgrades that serve in common distributed solar, EVs, building electrification, etc. should not be double-counted. Those costs should not be attributed to solar alone, but rather shared among those policy priorities.

Cost-reducing item:	Savings
Renewable incentives dropping off:	
1. Legacy SREC payments expiring	$820 million thru 2033
2. Nuclear ZECs not needed (Federal IRA funding fills that role)	$300 million per year
Energy cost savings scaling up:	
3. Electric vehicles consumer savings on fuel alone by 2035	~$1.5 billion per year
4. Savings from energy efficiency gains, per EMP goals by 2035	$600 million per year
Potential new sources of funds for renewables, EVs, efficency:	
5. Collecting the Orsted guarantee money	up to $300 million
6. Settling Platkin [NJ AG] v. Fossil Fuel Defendants	$billions?

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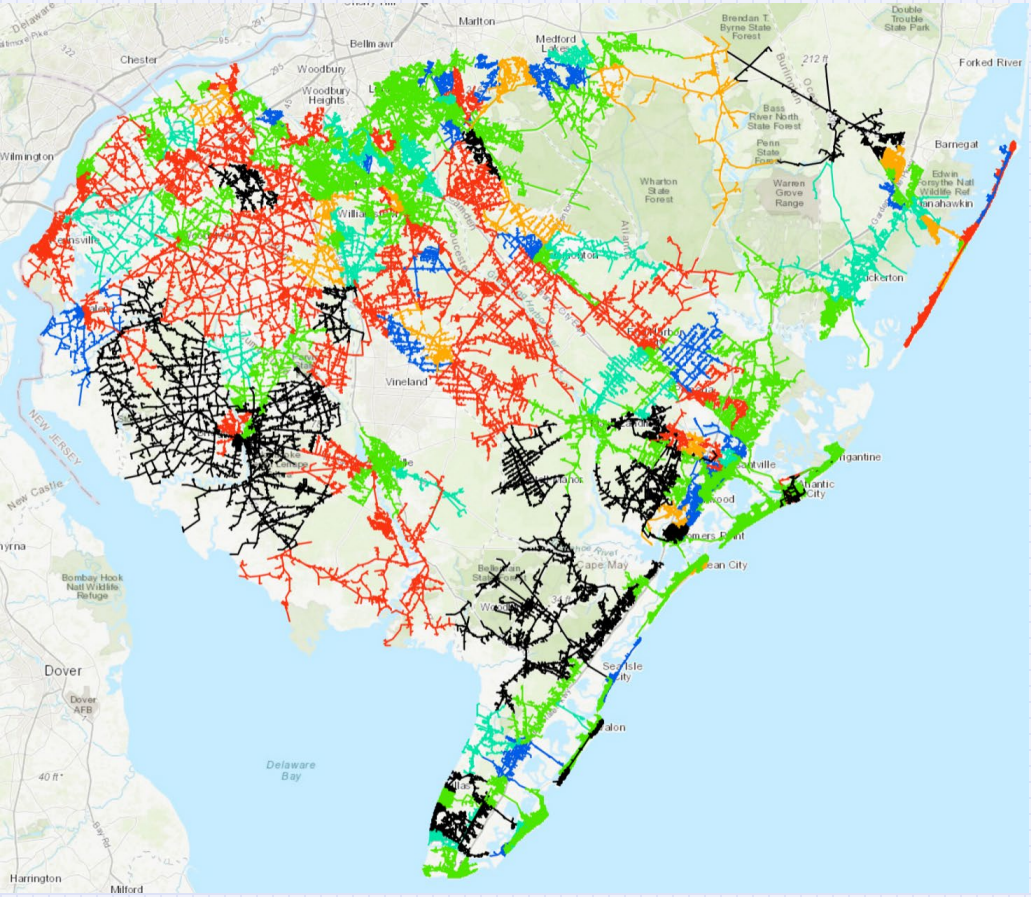
Grid Modernization:
Growth of restricted circuits, acceleration of interconnection denials



- Interconnection and grid modernization remain a big challenge to achievement of the state's renewable goals.
- BPU and legislative initiatives for grid modernization are underway, but denials of interconnection are accelerating rapidly. MSSIA believes that a substantial slow-down in solar development is likely before grid modernization efforts catch up.
- Hawaii is years ahead of New Jersey in high penetration of PV on the grid. Experience there has shown that high penetration of circuits works well even without interventions (like the "low hanging fruit" technologies). With them, circuit hosting capacities in NJ could expand by more than 250%.

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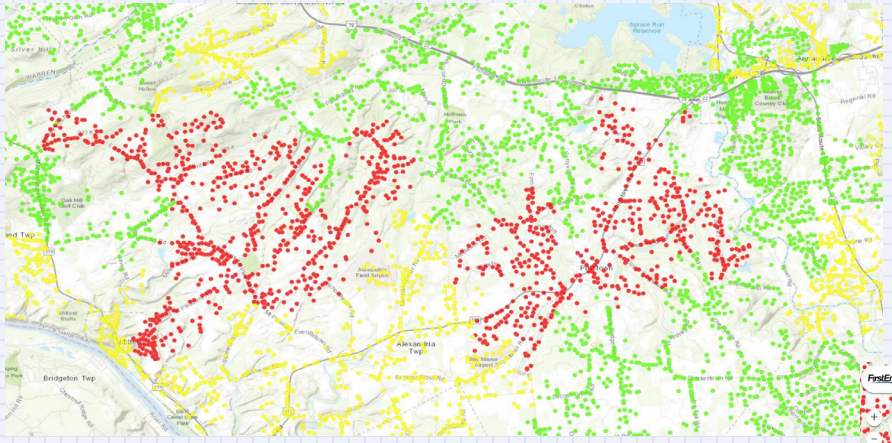
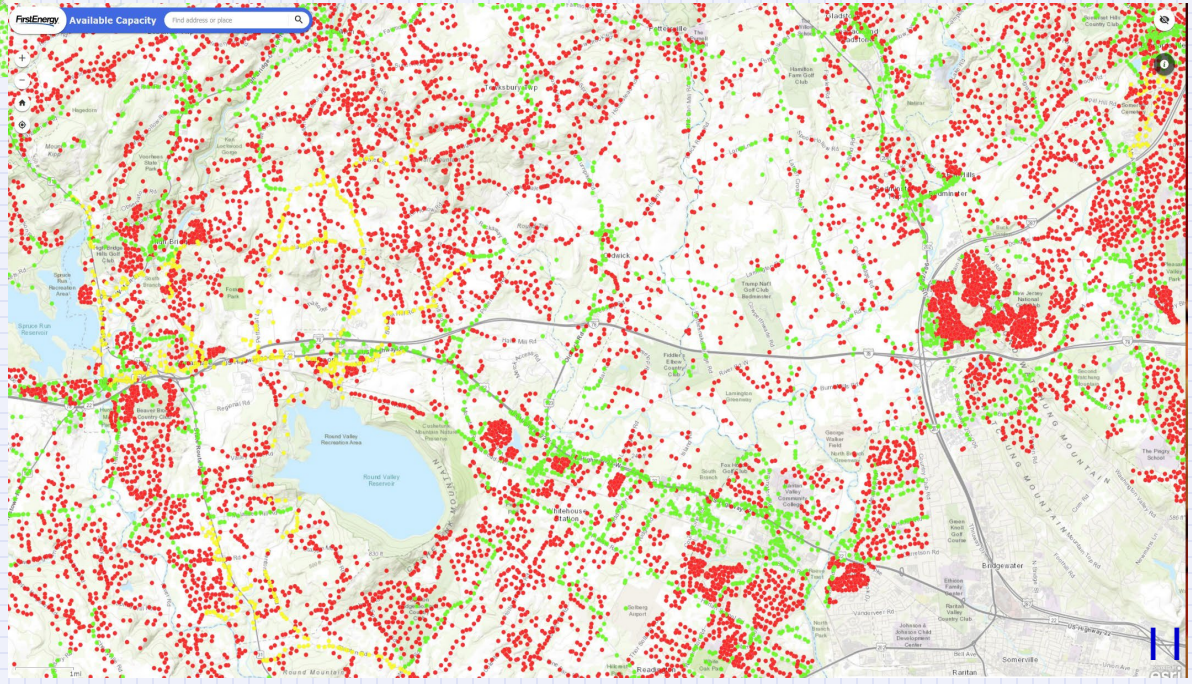
Growth of restricted circuits, JCP&L

Feb. 2020:



Nov. 2023:



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Further Detail – Screenshot of MSSIA 2035 Renewables Model: Case 1: Current Policy (Executive Orders for Wind, EMP-LCS for Solar)

NUCLEAR AND CLASS 1 PRODUCTION BY 2035 - CASE 1: CURRENT POLICY - ACHIEVE WIND E.O. AND SOLAR EMP LEAST COST SCENARIO

Clean Energy Type	Case No.*	2035 Capacity	Unit	Amount according to:	Capacity Factor / Production Factor	Unit	2035 Production MWH	% of Total Load
Nuclear		3,452	MW	Existing	92.0%	% (Cap. Factor)	27,820,358	33.9%
Wind	1	7,500	MW	Exec. Order	42.5%	% (Cap. Factor)	27,922,500	34.1%
Class 1 In-State Non-Solar		400	MW	EIA data + projection	80.0%	% (Cap. Factor)	2,803,200	3.4%
Existing+Approved In-State Solar		5,574	MW	BPU Solar Activity Report 1-31-24	1,150	MWH/YR./MW (Prod. Factor)	6,410,100	7.8%
NEW In-State Solar	1	11,625	MW	EMP 2019 Least-Cost Scenario	1,175	MWH/YR./MW (Prod. Factor)	13,659,375	16.7%
IN-STATE CLEAN ENERGY AS % OF TOTAL LOAD								
Total In-State Clean Energy (sum of above)							78,615,533	95.9%
Out-of-State Class 1 Renewable (by difference)							3,350,518	4.1%
TOTAL LOAD							81,966,051	100.0%