

Proposal for 100% renewable energy in NY:

Enshrined into law through the Climate Leadership and Community Protection Act, New York is on a path to achieving its mandated goal of a zero-emissions electricity sector by 2040, including **70 percent renewable energy generation by 2030**, and to reach economy-wide carbon neutrality. **How do we get there?**

We feel that an open and transparent process is a way to protect ratepayers interests. This is based on successful work done by team members over a decade ago on the NYSolarMap.com. We propose a significant upgrade on that action to include all renewables and more tools for reporting actions to achieve 100% renewable energy here.

The breakthrough we propose to create a 100% renewable Energy Grid in NY comes in two steps:

Step one: A scientific evaluation of the historical and existing NY grid and usage. The fundamental success of this approach has now been demonstrated in multiple grids/nations. To accomplish this we would need several years of NYISO load data.

Option 1 (fastest/answers to prioritize 2021 actions)	\$TBD	Investigate least-cost 100% PV grid-wide solution assuming either: (1) homogeneously deployed PV, (2) centralized generation near existing major load centers, or (3) combinations of both. Results based on 3-5 years of high resolution solar resource data (SolarAnywhere license)
Option 2 (add federal funding need)	\$TBD could be done simutiously	In addition to #1 above, investigate high resiliency deployment options where PV could meet localized demands in to-be specified regional clusters. Likely we would need more detailed info and collaboration with the grid operator for regional load data and power grid architecture.
Option 3 (add federal funding need)	\$TBD as a alternative to option 2	Same as 1 (or 2), but with an optimum combination of PV, wind & other 100% renewable energy sources.

Option 4 (add federal funding need)	\$TBD	Add on to 1, 2 or 3: provide detailed analysis of USGS ground surface classification to identify available space to deploy X%- capable PV resources (note: X% represents 100% in case of options 1 or 2 and optimum solar/wind fraction in case option 3)
Option 5 (add federal funding need)	\$TBD	Same as 4, but with a detailed cadaster of all roofs deployment potential throughout the Island (much like what Tria did for New York, but we are equipped to do this anywhere on the planet – this has been done before previously run 10 cities in Asia, Africa and S.America for IRENA)

For background see :Dr. Richard Perez put in on [Youtube](https://youtu.be/OUpgDsfYhec). <https://youtu.be/OUpgDsfYhec>

Richard's son Dr. Marc Perez who has done the breakthrough research has analyzed alternative pathways to achieving 100% renewable energy production across the Midcontinent Independent System Operator (MISO) service territory. The resulting [Solar Potential Analysis – MISO Region](#) As you might imagine way up north in Mid continent America you do not get ideal sunlight but the numbers work.

Slides and a recording of this webinar have been posted on the website at: <https://www.cesa.org/event/using-overbuilding-curtailment-to-achieve-100-clean-electricity/>

In this new study a team led by Dr. Marc Perez brought out an important tool: oversizing of PV systems relative to storage capacity. In an analysis of matching supply and demand on an hourly basis over the course of a year, Dr. Perez showed how over-building solar relative to energy storage results in lower combined system costs, while creating a system that can provide power 24/7.

The study shows that Minnesota – a northern state with high seasonal solar variation and little hydro – can reach 95% wind and solar at a generation cost of 3.6 cents per kilowatt- hour (KWh). A ongoing study of an Island with a population of 1,000,000 residents is now also proving the reliability and cost savings of this method for smaller isolated island grids.

Traditionally market change advocates have been pushed to the side by dominant existing players. This has been critically been the case in the change to 100% renewable energy by utilities and their spokespersons like Doug (dumb old utility guy).

Associations that are loosely designed to advocate for renewable interests be they NGO or associations have had little effect other than at times of extreme outrage given voice to an aggregated response to market delaying tactics, corruption or inaction. What is likely necessary to stop the "Power Grab" is to do something else, that specifically is to use markets and capital to force change.

Markets will not willingly do things for the good if they do not have have an unassailable position, a product that is superior or cheaper than the alternate. Luckily this is not the case any more for clean power and a cohesive scientific plan must be put forward to show legislators and the ratepayers that alternatives are both cheaper and more reliable while offering long term debt relief to pay down excessive (criminal) burdens of stranded assets and the associated bank debt.

The time to start this process in now starting with Public Service Announcement commercials for 100% renewable energy on local TV or other media. Secondly since the law exists on the books, act 17, and that this is supported by the change in administration a meeting with the entities that control the purse strings must make sure that capital is not wasted, corruptly spent or misdirected to stop change from occurring.

Capital in the case of NY already exists from federal & state resources, that funding should be tied down to real reform not the 16 billion asked by NY utilities in their phase 1 & 2 grid "renovation" plan.

The project the Renewable Energy Coalition has been advocated for (in the last 5 years) conversely requires an open process publicly viewed a build back better on line under the NYSolarmap.com REV. What is needed to make this work is a united proposal based on hard science to show how both debt is relieved and the change can occur rapidly based on outside funding coupled with existing federal relief funding. This would be ideal managed by an independent board of independent unassailable experts who are only beholden to ratepayers.

Step two now that federal \$billion's are promoted. A independent oversight is necessary to insure that the progress (unlike what occurred in 2016 where we were supposed to have to get to 30% renewable energy and did not achieve 23%) 70% of renewable energy power by 2030 happens and subsequent additions are done in a way to be accretive rather than scattershot projects randomly located and possibly harming an newly organized resilient grid buildout. We would like to suggest additions to the existing boards a group of outside experts to be accretive to establishing a similar group of local experts in NY.

To do this in a thoughtful way we think bringing together the best minds and independent thinkers and possibly substantial outside capital creating jobs and a robust economy is the way forward. We want to prevent mistakes made in the past,

In the early years all of these renewable projects were essentially the Guinea Pig for clean power and interconnection was arduous and overly costly, we know better now but fundamental reform has not taken hold yet! Thus only the baker's dozen of large projects approved mostly upstate & the punishing tax on residential net metered projects at the beginning of the year. This happening at the same time as the utilities places a crushing increase on the cost of electricity so much so as home ratepayers are likely unable to pay their bills in many cases, as Covid rears its ugly head again and the Oil War is happening in Europe.

This was reflected in our testimony before the NYS PSC many times by The Renewable Energy Coalition. The solution to the issue of ramping which relates to frequency VARS and voltage regulation is not to require each site to have to solve the decrepit grid's issues. Our proven and vetted solution is a combination of addressing multiple larger renewable projects in the proper location before the distribution grid as a virtual resource. In many cases these can be physically close so a combined battery buffer can handle multiple plants. Secondly of the existing substations (that have been evaluated by the NY power authority) strategically located energy storage can benefit all ratepayers and provide protection for storm outages and increased resilience overall. We propose to provide resources engineering and funding to make the grid more secure and protect the distribution grid.

Fundamentally grid control needs to be separated from those that produce the power, to protect against conflict of interest. This was first done in NY (and the East Coast) after a massive outage in 1965. A independent system operator (ISO) controls the, day ahead procured production allocation, flow and demand of instantaneous power ebb/flows. We now have the added resource of the NYS Power authority's new digital grid control center in White planes NY to evaluate built specifically with the new two direction grid in mind and monitoring power needs down to a building usage level. We don't have to start from scratch to build back better in NY.

We have approached (informally) outside possible board members to discuss the structure and possible creation of a, cooperative, outside and combined NY Green energy board.

David Crane Former CEO NRG, Jon B. Wellinghoff -Former FERC Chair, Alfred Griffith-former CEO NY Green Bank, Dr. Richard Perez- NY Atmospheric Sciences Research Center & Dr. Amory Lovins- Rocky Mountain Institute, Karl Rabago-Karl has been a public utility commissioner, a federal executive at the US Department of Energy, a utility executive . Contemplated 5 more local elected officials board members. We know how to make this work.

Conforming to the law 100% renewable energy law in place on NY is not the goal it is a mandate.

Speaking of Amory's group (RMI) active in NY for decades we have proposed a collaboration with them and expert outside independent board members to immediately go to step two. The issue is pressing due to the short timeline to make substantial progress and integrate planned projects like the massive 900MW offshore wind previously on the street and the new bids recently received. We propose a two step process partnering with Rocky Mountain Institute:

First is the sophisticated, customized analyses of the existing grid-
By 2030, the United States needs to reduce greenhouse gas emissions by 50–65 percent below 2005 levels to limit climate change to 1.5°C of warming. Fortunately, after four years of a leadership vacuum at the federal level, the Biden-Harris administration is already moving to enact sweeping federal policies to rapidly drive down emissions. NY stands to directly benefit from federal efforts not only by existing funding but in the two bills on Infrastructure and the combined follow up covering green energy.

This is welcome news (pending votes), but it's not enough. Reducing emissions at the scale and speed required calls for a [whole-of-society](#) approach. US locations are a critical part of the solution. In the absence of federal leadership, states and other non-federal entities have led the way on climate action with ambitious commitments and action aligned with the Paris agreement goals. States are continuing to lead by partnering with the federal government to drive a unified American response to climate change through [America Is All In](#), US Climate Alliance, and other coalitions.

A Tool to Drive Climate Action

One of the challenges that states face in driving climate action is a lack of robust state-level analytical tools to help policymakers and advocates identify and support the most impactful decarbonization policies across all sectors of the economy. To address this, RMI has launched a new State Policy Analysis and Modeling initiative with three core values:

- **Data democratization.** Trusted data is critical to inform policymaking and advocacy. Our analysis products use open-source data wherever possible and are freely accessible to all, making robust analytical capacity available to all stakeholders, encouraging dialogue and reducing information asymmetry.
- **Analysis at the speed of policy.** Policymakers and advocates need the tools to take action *now*; our focus on accessible analysis and tools reduces friction and equips users for informed action in the near term.
- **Lighting the path for rapid climate action.** Our analysis provides users with the tools to inform evidence-based policy that secures a 1.5°C future.

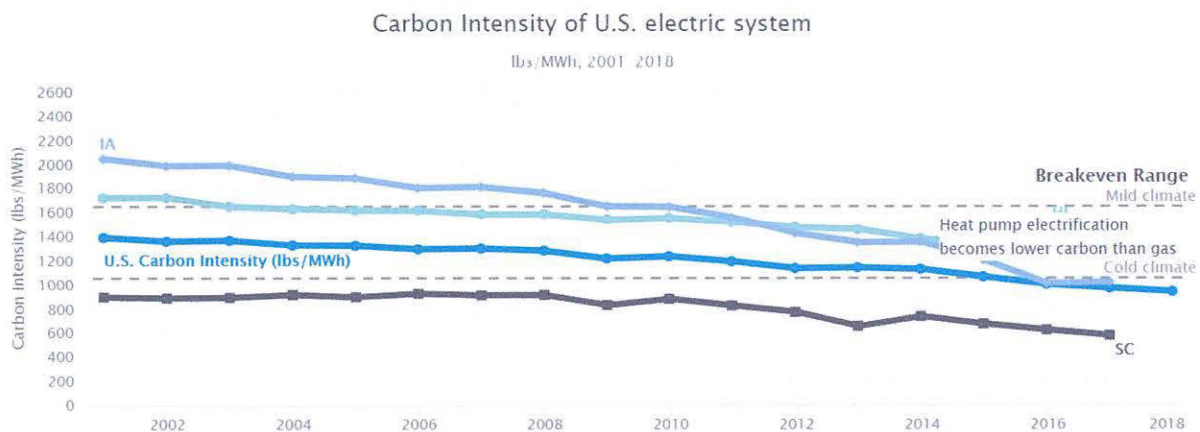
RMI's first effort under this initiative is a partnership with Energy Innovation to develop state-level models of the [Energy Policy Simulator \(EPS\)](#). EPS is an open-source, peer-reviewed model for estimating the environmental, economic, and human health impacts of hundreds of climate and energy policies. It is a simplified version of the [deep](#)

[decarbonization pathways modeling approach](#) with additional attention to modeling common policy tools such as carbon pricing.

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The EPS is provided in a user-friendly web app that calculates estimated impacts in seconds. While it doesn't fully replace more sophisticated, customized analyses, the EPS serves as a screening tool to help policymakers understand the relative impacts of different policies and identify the most impactful policies for accelerating decarbonization.

Additionally RMI: provides the building's step in solving this problem is understanding it., Rocky Mountain Institute is launching a new tool to accomplish just that. [The Impact of Fossil Fuels in Buildings: A Fact Base](#) is a cross-cutting database illustrating the source and impact of direct building emissions across the country.



While the transition to cleaner, healthier all-electric buildings is a national imperative, the extent of the problem varies state by state. Use our [interactive website](#) to isolate your state and see how the following factors have changed over time: emissions from buildings, primary fuel sources, miles of gas mains, proportion of all-electric homes, and more.

RMI can also take care of herding the cats after we do the hard work of studying the exact Grid preparing a basis for moving forward by examining grid assets. History of energy use and demand loads.

Community engagement is key and what we wish to achieve is a open process that is transparent guaranteeing that hardware/technology will be move forward in a orderly manner and that a counter party that is bankable and above corruption would be in charge of the process of allocating the 20Billion in federal money will not be wasted?

Based on this recommend the specific technologies sizes and metrics to provide cheap reliable 100% renewable energy.

We have some great research for the MISO done by Marc Perez's group Clean Power Research. To show how this can be done quickly, the work of Marc Perez, [who notes in a published paper](#) that the price of solar has dropped so much that one could overbuild the system to provide enough energy, even on cloudy days.

"In the past decade, solar module prices plummeted more than 90%, according to energy research firm Wood Mackenzie. Meanwhile, the cost to build conventional plants such as coal rose by 11%. Solar panels have become so cheap that the true cost of electricity is shifting from solar arrays themselves to the steel and land needed to house them. ...The low cost overcame renewables' traditional weakness: the intermittency of supply if the sun or wind fails to appear. Oversizing a system by a factor of three, they found, was optimal."

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As part of the [Minnesota Solar Pathways](#) project, Clean Power Research analyzed alternative pathways to achieving 100% renewable energy production across the Midcontinent Independent System Operator (MISO) service territory. The resulting [Solar Potential Analysis—MISO Region](#) showed that overbuilding plus curtailment of PV and wind resources was the most cost-effective implementation strategy. Overbuilding + curtailment acts as "implicit storage" enabling these resources to deliver 100%-ready power 24/365 without fail while using only a small affordable fraction of the seasonal storage reserves that would be required otherwise.

Carl Rabago selfless ongoing work promoted a model showing residential solar is a big \$ contributor to the NYS grid just like in CA <https://vimeo.com/578217779>. https://www.vibrantcleanenergy.com/wp-content/uploads/2021/10/VCE-VS-NY_Slides.pdf

The present study hones in on the state of New York and how it might decarbonize the economy by 2050. The study was seeking to determine the benefits of decarbonization and the inclusion of distributed co-optimization into the logic.

The study found that New York could save \$28 billion by 2050 aided through deployments of distributed solar PV and storage. Additionally, the study identified the buildout within Disadvantaged Communities (DACs) and found that substantial amounts of investment would flow to these regions when considering distributed resources. Further, it is found that the average energy burden (the cost of all energy products) for residential and commercial customers would fall by approximately \$1,343 per year by 2050; amounting to a reduction of almost 20%. Retail rates would fall by 1.7¢/kWh from today's rates, and creates 600,000 (200,000 by 2030) new net in-state jobs compared with today.

The study was produced by VCE for Local Solar For All. Vibrant Clean Energy, LLC performed all the modeling using the WIS:dom®-P model with nationally recognized publicly available data and assumptions. The VCE study report is provided here as well as a webinar on the study. More details can be found at the Local Solar For All website. Technical documentation for the WIS:dom®-P model can be found here.

Of course others have made our job easier like Nature conservancy state wide Map <https://tnc.maps.arcgis.com/apps/webappviewer/index.html?id=d61dfb3bad544d544d544d544d544d544>

We need to consold the tools and resources to make rapid process because if Covid & energy wars teach us anything our security and economy depends on a clean and stable grid.

NY is essentially a tale of 2 grids. The upstate traditionally cleaner grid many say the result of (former NY Governor) FDR’s creation of NYPA who holds most of NY’s hydro assets. The 40% of the load downstate with dirty power.

