



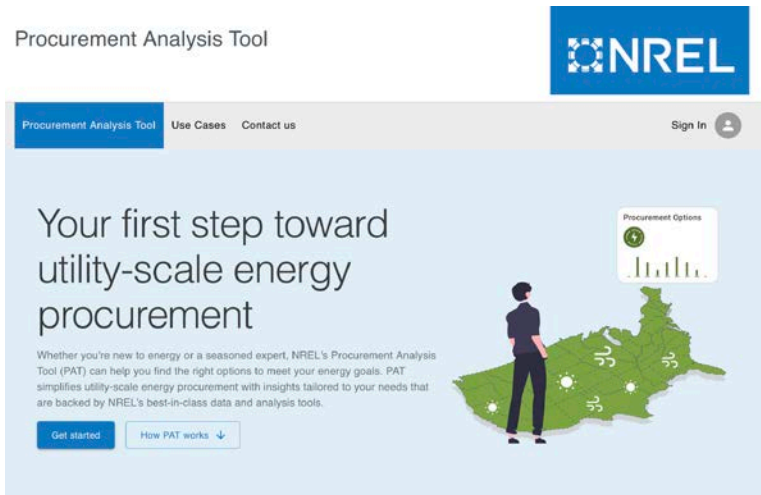
Procurement Analysis Tool (PAT) Informational Webinar

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PAT: A Free Platform for Off-Site Energy Analysis

PAT HOMEPAGE



www.pat.nrel.gov

KEY QUESTIONS ADDRESSED BY PAT



What energy procurement options exist by location?



How do energy procurement options align with certain end user objectives?



How does the value of different energy technologies vary by location?



How do different resources and procurement options vary on costs/impacts?

PAT: Key Inputs and Outputs

SCENARIO SETUP

User enters the scenario title, energy goals (%), and any additional notes.



LOAD AGGREGATION GROUPS

User aggregates electricity load by region, type of facility, and/or load size. User inputs specific facility information, such as annual load (MWh), address, and the utility/load-serving entity.



REFINEMENT BASED ON USER PREFERENCES

User answers 7 questions about their procurement preferences and knowledge of the process.

Contracting Experience

Price Certainty

Location Preference

Cost, Emissions, Grid Value, or a Combination

Financial Risk Tolerance

REC Ownership

Balancing Authority

The screenshot displays the PAT interface. At the top, it says 'PAT' and 'Scenarios > Edit scenario'. Below this is a progress bar with steps: Basic info, Locations, Filters, Procurement, Resource regions, and Results. The 'Procurement' step is currently active. The main content area is titled 'Orlando's procurement options' and shows a table of procurement options. Two options are visible: 'Utility green pricing' and 'Unbundled renewable energy credits'. Below the table, there is a section for 'Orlando's available resource regions' with a table of resource regions. The table has columns for Rank, Type, Annual generation, Potential capacity, Capacity factor, Battery capacity, State, Cost savings, and Emissions reduction.

Rank	Type	Annual generation	Potential capacity	Capacity factor	Battery capacity	State	Cost savings	Emissions reduction
1	solar	2,774,750 MWh	1,776 MW	18%	none	KY	\$ 4.5	55
2	solar	520,832 MWh	371 MW	18%	none	OH	\$ 4.5	55
3	solar	297,386 MWh	212 MW	18%	none	WV	\$ 4.5	55
4	solar	2,774,750 MWh	1,776 MW	18%	25 MW	KY	\$ 3.5	55
5	solar	2,774,750 MWh	1,776 MW	18%	75 MW	KY	\$ 3.5	55

PROCUREMENT OPTIONS

PAT shows procurement options such as green tariffs, competitive suppliers, green pricing, unbundled Renewable Energy Certificates (RECs), community solar, and/or Power Purchase Agreements (PPAs) based on the combination of user preferences and available offerings from the load-serving entity.

RESOURCE REGIONS

Select resource regions are optimized based on wholesale power markets, cost, grid value, emissions reduction, or a combined score.

Under the Hood: How PAT Optimizes

Annual Technology Baseline (ATB)

Consistent set of technology design and cost data



Energy Supply Curves

Clustered to identify best resource locations for each ReEDS balancing region



Cambium

Modeled cost, hourly emission, and operational data for a range of possible futures of the U.S. electricity sector through 2050



PAT

Leverages System Advisor Model (SAM) for system performance and battery dispatch considering cost reduction and emissions if participating in the wholesale markets as a merchant plant.



Output

Comparative Data based on marginal cost, grid value, and emissions for fixed system sizes calculated over a 25-year system lifetime.

PAT Can Analyze Multiple Customer Use Cases

User Group:

 **Commercial & Industrial Buyers**

 **Local Governments & Agencies**

 **Colleges, Universities & Campuses**

 **Utilities & Energy Providers**

 **Regulators & Commissions**

How PAT Helps:

Evaluate off-site procurement options across multiple facilities nationwide.

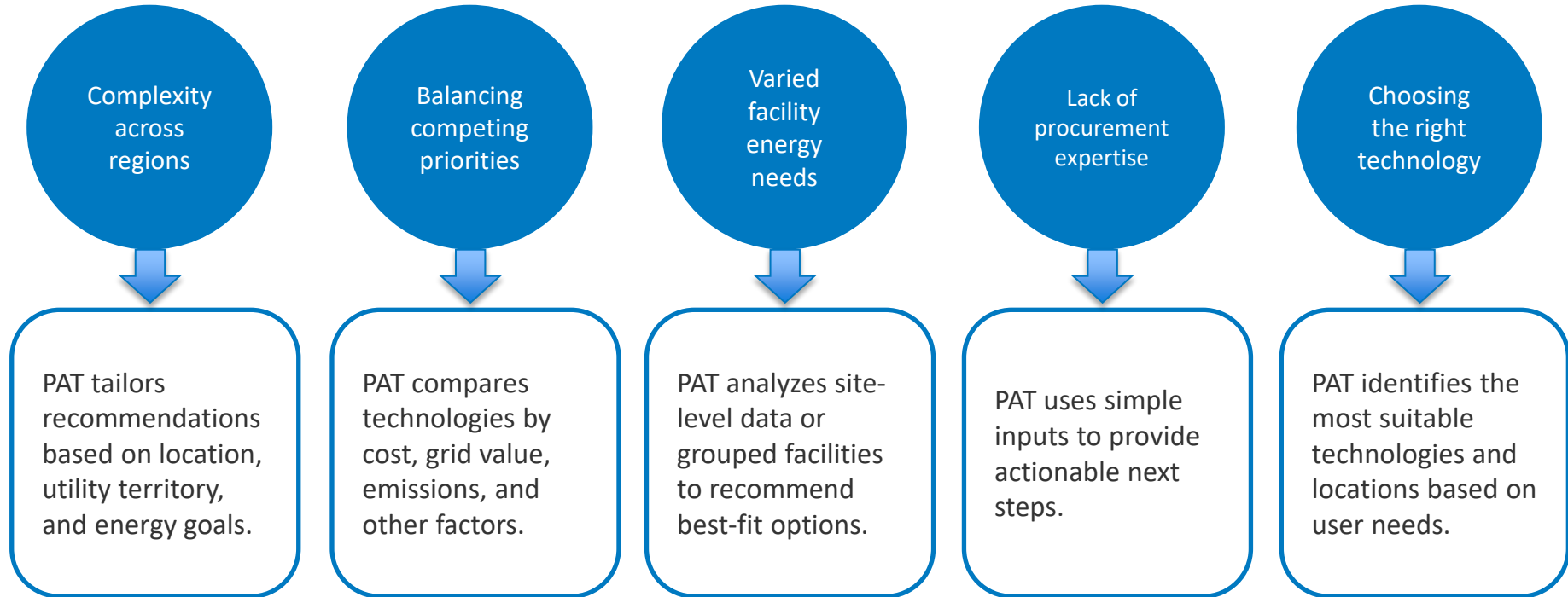
Assess options for powering city operations or jurisdiction-wide demand.

Plan energy procurement for labs, classrooms, housing, and campus services.

Analyze customer demand and assess feasibility for procurement programs (e.g., green tariffs).

Plan for voluntary utility-scale programs and shifting customer energy strategies.

Key Procurement Challenges And Solutions



Live Demo



www.pat.nrel.gov

PAT Analysis Is the First Step in Your Energy Procurement Journey

What To Do Next:

PAT provides foundational analysis to support your energy procurement journey. If you are interested in pursuing energy further, you might consider the following next steps.

1

Analyze Procurement Options

Review the available procurement options identified for your groups. Compare attributes like pricing, contract terms, and procurement processes to make informed decisions.

2

Engage Key Stakeholders

Collaborate with internal teams, regulators, and utilities to assess feasibility. If needed, initiate discussions with consultants to support your decision-making.

3

Negotiate and Develop

Partner with utilities and project developers to finalize contract terms and implementation plans. Define stakeholder roles and responsibilities for new projects.

4

Request and Evaluate Proposals

Issue Requests for Information (RFI) or Proposals (RFP) as needed. Carefully review submissions, considering associated risks and alignment with your goals.

5

Finalize Procurement and Track Benefits

Sign contracts and begin implementation. Monitor key metrics like energy production, avoided emissions, cost savings, and price variability to ensure success.

What PAT does not do:

- PAT is not intended to present the user with a specific set of existing generation assets.
- PAT does not perform detailed financial analyses on potential resource regions.

Key Takeaways from PAT

- Supports **customized scenario analysis** using user-entered facility and consumption data.

- Helps users **evaluate energy resources** and **compare procurement pathways** (e.g., PPA, tariffs).

- Enables decisions that balance **cost, grid value, emissions, any buyer preferences**

- Serves a wide range of users: **software, cloud operators/IT, cities, campuses, companies, utilities, and regulators.**



Web based self-service energy procurement assistant



Aids voluntary energy procurement by commercial and industrial buyers



Analyzes utility scale energy options



Serves as a **screening and planning tool** for buyers



240+ early adopters nationally across counties and cities

User Support and Contact

FAQs

Here, you'll find information on topics such as setting user preferences, understanding procurement options, data updates, and more. Still have questions? Feel free to contact us at pat.support@nrel.gov.

General

- ❓ Can users import facility information in bulk and organize it into different/groups? 
- ❓ Will this tool connect to the ENERGY STAR Portfolio Manager to load energy/location data for buildings in a portfolio? 
- ❓ Will this tool be integrated with any other NREL tools? 
- ❓ Does PAT allow for analysis in Alaska, Hawaii, or multi-national analysis? 

- ❑ For questions, check out the FAQ section on the tool's site.
- ❑ For user support, and feedback, contact us at: PAT.Support@nrel.gov



www.pat.nrel.gov

Q&A

www.nrel.gov

Need help? Email us at pat.support@nrel.gov.

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Appendix

PAT Walkthrough

PAT Walkthrough (1/6): Scenarios and Inputs



Basic Info



Locations



Filters



Procurement



Resource regions




Results

STEP 1

Basic Info


Scenario name

Provide a unique name to describe this scenario.

Scenario name* 12/40 

Renewable energy goal

Provide a percentage of your electricity usage (excluding any current on-site renewables or offsite agreements) that you want to source from new, utility-scale renewable energy. You can always update this later.

Renewable energy goal* % 

Enter a value between 0 and 100

Interested in on-site renewables instead?

For on-site renewable options, explore our [REopt](#) or [SAM](#) tool. 

OVERVIEW AND SALIENT POINTS

Step 1 of the input process: This is the first step where users define the scope of their analysis by creating a scenario.

Scenario Name: Users provide a unique name to help track and distinguish between different procurement analyses.

Renewable Energy Goal: Users enter a percentage (0–100%) representing how much of their electricity usage they aim to meet with new, utility-scale energy.

Includes Off-Site Systems: The tool focuses on off-site utility-scale procurement; current on-site systems or PPAs should not be included in this goal.

Flexibility: Scenario inputs can be modified later, enabling iterative planning.

Optional Redirect: If users are more interested in on-site solutions, they are directed to REopt or SAM for relevant modeling tools.

PAT Walkthrough (2a/6): Load Aggregation Groups



LOAD AGGREGATION

STEP 2

Locations

- **Groups:** Group facilities by region or energy use. Groups are color-coded on the map and analyzed separately. Create multiple groups for facilities in different areas or with varying energy needs. For combined results, use a single group.
- **Facilities:** Within each group, add details for each facility, including its location, annual electricity consumption, and utility provider. This information is crucial for identifying suitable renewable energy options and procurement strategies.

Add at least one group and one facility to continue.

[Add group](#)

Universities Nationwide 5 facilities with a total of 2,500,000 MWh annual load

[+ Add facility in this group](#)

Facility name ↑	Load serving entity	State	Actions
Berkeley University	PACIFIC GAS & ELECTRIC CO	CA	
City University	CONSOLIDATED EDISON CO-NY INC	NY	
Illinois Urbana	AMEREN ILLINOIS COMPANY	IL	
Miami Dade University	FLORIDA POWER & LIGHT CO	FL	
University of Southern California	LOS ANGELES DEPARTMENT OF WATER & POWER	CA	

Rows per page: 5 | 1-5 of 5



[Close map](#)



OVERVIEW AND SALIENT POINTS

Step 2 of the input process: Users define the physical locations and electricity usage of the facilities.

Group facilities strategically: Facilities can be grouped by geography, energy load, or procurement approach. Each group is analyzed separately, and results are specific to each group. Users can create multiple groups

Add facility-level details: For each facility, users provide key attributes such as location, utility provider, and electricity consumption.

Total load calculation: The tool aggregates the total annual electricity load across all facilities in the group—critical for identifying scalable procurement opportunities.

Map-enabled planning: Each group and facility can be visualized geographically to better assess regional resource potential and utility service areas.

PAT Walkthrough (2b/6): Facility Inputs

FACILITY/LOAD SPECIFIC INPUTS

OVERVIEW AND SALIENT POINTS

STEP 2

Locations

- **Groups:** Group facilities by region or energy use. Groups are color-coded on the map in different areas or with varying energy needs. For combined results, use a single group.
- **Facilities:** Within each group, add details for each facility, including its location, which is crucial for identifying suitable renewable energy options and procurement strategies.

Add at least one group and one facility to continue.

Add group

Universities Nationwide	5 facilities with a total load of 1,234 MWh
+ Add facility in this group	
Facility name ↑	Load serving entity
Berkeley University	PACIFIC GAS & ELECTRIC CO
City University	CONSOLIDATED EDISON CO-NY INC
Illinois Urbana	AMEREN ILLINOIS COMPANY
Miami Dade University	FLORIDA POWER & LIGHT CO
University of Southern California	LOS ANGELES DEPARTMENT OF WATER & POWER

UNIVERSITIES NATIONWIDE

Add new facility

Facility name
Provide a unique name to describe this facility

Facility name * 0/40

Facility annual load (MWh)
Provide the annual load of this facility

Facility annual load * MWh

Facility location
Search for the facility location below and choose the right location from the dropdown menu

Search facility location * 🔍

Address will auto-populate

Load serving entity
Select the utility or provider responsible for delivering electricity to this location

Select a load serving entity *

Cancel Add facility



Step 2: Define facilities within a group – Users add individual facilities that share a common load aggregation strategy.

Input key facility details – Enter the facility name, annual electricity use (in MWh), physical location, and utility provider.

Add multiple facilities per group – Reflect campuses, departments, or regional clusters for joint procurement planning.

Select the correct utility provider – Procurement options in PAT are tied to the utility serving each facility, so accurate selection is critical.

Use the map to verify locations – Visualize and confirm each facility's placement to improve the precision of scenario analysis.

Lays the groundwork for joint procurement – Accurate facility data enables PAT to evaluate aggregated load and identify suitable off-site energy options.

PAT Walkthrough (3a/8): Filter Questions



Basic Info



Locations



Filters



Procurement



Resource regions



Results

FILTER QUESTIONS PAGE

STEP 3

Filters

Refine your procurement options by answering the filter questions below. This allows the tool to provide tailored procurement options based on your responses and location data.

Answer all questions to proceed. You can adjust your selections after analysis.



1/6 Why do we ask this?

ENERGY PROCUREMENT
CONTRACTING

Do you have, or are willing to acquire, significant energy and financial transaction experience needed to carry out a virtual power purchase agreement?

Yes No
Unsure

Next



Universities Nationwide's procurement options

7 are available based on your responses

Procurement option	Description
Community solar	Community solar programs allow customers to buy a subscription in a shared distributed-scale solar project (typically less than 20 megawatts) that can be used to offset their grid-electricity consumption.
Community choice aggregator (CCA)	Some states allow communities to develop community choice aggregation program, where the community procures renewable energy on behalf of all customers (residential and nonresidential) within the community. These entities then act similar to other electricity service providers such as competitive suppliers.
Bilateral agreement	Those customers that are served by a utility with the sole authority to serve the customer may be able to negotiate a one-off agreement with their utility and a project developer to procure renewable energy from a utility-scale renewable energy project. The rate and contract terms are unique to the particular customer entering the agreement with the utility and the project developer. NREL tracked the use of bilateral agreements by utilities to procure utility-scale renewable energy projects for typically large corporate customers. Any municipality located in a utility service territory that had entered into one of these bilateral agreements with a customer at the time of data collection (2018) is presumed to have this option available.
Unbundled renewable energy certificates	Any non-residential customer can buy "unbundled" renewable energy credits (RECs) from utility-scale renewable energy projects that offer their RECs for purchase in the marketplace. This category refers only to sales of unbundled RECs directly to retail customers, it excludes sales of unbundled RECs through other green power products (e.g., utility green pricing).
Competitive supplier	States with restructured electricity markets allow retail electricity customers to choose from competitive electricity suppliers. Customers in competitive electricity markets can often elect or negotiate a green or renewable power option. <small>You requested long-term price certainty.</small>

OVERVIEW AND SALIENT POINTS

Step 3: Final step of the input process – Users answer a structured set of questions to refine and personalize results.

Covers up to 9 filter questions – Focused on financial preferences, environmental priorities, grid impacts, and geographic constraints.










Tailors procurement scenarios – Responses determine which procurement options (utility contracts, power purchase agreement etc.) are available in your utility service territory.

Improves recommendation accuracy – Filters ensure outputs align with the user's goals, risk tolerance, and location preferences.

Simplifies complex decisions – Translates user priorities into actionable, customized procurement insights.

Improved "Why do we ask this?" info bubbles – Provide helpful context on each question's purpose and how responses affect results.

PAT Walkthrough (3b/8): Filter Questions

Type of Question	Filter Questions	Options
 Energy Procurement Contracting	Do you have, or are willing to acquire, significant energy and financial transaction experience needed to carry out a virtual power purchase agreement?	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Unsure
 Financial	Are you willing to take on financial risk associated with energy procurement?	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Unsure
 Financial	Do you only want to see options with long-term price certainty?	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Unsure
 Environmental	Do you wish to own the renewable energy credits (RECs)?	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Unsure
 Grid Impact	Do you want to prioritize cost savings, emission reduction, grid value, or all three combined?	<input checked="" type="checkbox"/> Cost <input checked="" type="checkbox"/> Grid Value <input checked="" type="checkbox"/> Emissions <input checked="" type="checkbox"/> Combined
 Geography	Do you have a preference on where the project is located?	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No
 Geography sub	Site renewable project in the same state as at least one facility in the group?	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No
 Geography sub	Site renewable project in the same balancing authorities as at least one facility in group?	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No
 Geography sub	Electricity balancing authorities are not clearly defined. Please select whether you wish to use the balancing authorities as outlined by NREL or NERC.	<input checked="" type="checkbox"/> NREL <input checked="" type="checkbox"/> NERC

PAT Walkthrough (4/6): Procurement Options



PROCUREMENT OPTIONS PAGE

STEP 4

Procurement

Based on your facility data and filter answers, below are the available procurement options and the relative cost considerations for your groups.



Select the procurement options you want to explore for each group to continue.



Northwest | **Northeast** | Midwest | West | Pacific NW

Northeast's procurement options

5 procurement options are available based on your answers

Procurement option	Description	Notes
<input checked="" type="checkbox"/>  Competitive supplier	States with restructured electricity markets allow retail electricity customers to choose from competitive electricity suppliers. Customers in competitive electricity markets can often elect or negotiate a green or renewable power option.	NH Available suppliers <ol style="list-style-type: none">1. Agera Energy LLC2. Ambit Energy Holdings, LLC3. Calpine Energy Solutions, LLC4. Champion Energy Services5. Clearview Electric Inc. Download all NH suppliers (.csv)
<input checked="" type="checkbox"/>  Community choice aggregator (CCA)	Some states allow communities to develop community choice aggregation program, where the community procures renewable energy on behalf of all customers (residential and nonresidential) within the community. These entities then act similar to other electricity service providers such as competitive suppliers.	Available programs <ul style="list-style-type: none">• New York - Additional information is at http://www3.dps.ny.gov• New Hampshire - Additional information is at https://www.nhmunicipal.org



OVERVIEW AND SALIENT POINTS

The first page in the outputs – This is where users begin reviewing customized procurement pathways based on inputs. **Procurement options organized by load aggregation group** – Each group sees tailored results reflecting its specific facilities, utility, and location.

Focused, relevant results – Options include utility-scale contract types such as PPAs and tariffs, aligned with the user's geography, utility, and filter responses.

Explanations for unavailable options – If certain pathways are not shown, PAT clearly explains why—pointing back to user inputs or utility constraints.

Built on latest data – Results are informed by the 2025 Procurement Options Databook, ensuring relevance, and accuracy

Supports user decision-making – This page helps users narrow down practical pathways before comparing cost, grid value, and emissions across sites.

PAT Walkthrough (5a/6): Resource Regions



STEP 5

Resource regions

PAT has pre-selected resource regions that align with your scenario, renewable energy goal, and preferences. You can use the table below to adjust the selected resources regions or sort the resource regions by other criteria (cost savings, emission reduction, grid value, or combined).

Continue to results when you are happy with your resource selections.

Universities
Nationwide

Universities Nationwide's summary Renewable energy goal met: 3 wind selected

Total annual load	Renewable energy goal	Nameplate capacity required	Resources selected	Potential energy generation	Renewable energy goal met
2,500,000 MWh	2,500,000 MWh (100%)	4.8e+2 - 1.4e+3 MW	3 wind	2,500,000 MWh	Renewable energy goal met

Universities Nationwide's available resource regions

Download table (csv)

Sort by: Cost savings Emission reduction Grid value Combined

Rank	Type	Annual generation	Potential capacity	Capacity factor	Battery capacity	State	Cost savings	Emission reduction
1	wind	1,156,334 MWh	306 MW	43%	none	CA	5/5	1/5

The second page in the outputs– This page presents prioritized geographic regions that meet your scenario's energy needs.

Modeled data, NOT real projects – This page offers a foundation to begin your procurement journey, not final investment guidance.

Each region is scored using 3 key metrics –

Marginal Cost: Investment + operating costs over 25 years

Grid Value: Estimated wholesale market revenue potential

Avoided Emissions: Emissions offset per MWh based on Cambium data

Regions ranked by your scenario preferences – Filters like geography, marginal cost of generation, grid value, and avoided emissions help sort regions from most to least aligned.

Based on the latest NREL datasets – Includes Cambium emissions/market data and NREL ATB cost assumptions.

PAT Walkthrough (5b/6): Resource Regions

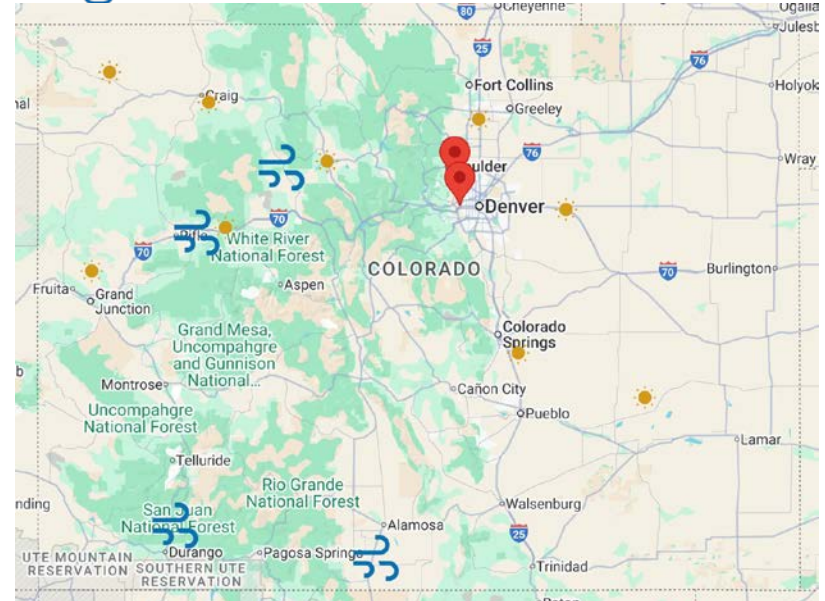
NREL's available resource regions

Download table (csv)

Sort by: Cost savings Emission reduction Grid value Combined

Rank	Type	Annual generation	Potential capacity	Capacity factor	Battery capacity	State	Cost savings	Emission reduction
<input type="checkbox"/>	wind	379,823 MWh	259 MW	17%	100 MW	CO	\$ 1/5	2/5
<input type="checkbox"/>	wind	418,211 MWh	268 MW	18%	100 MW	CO	\$ 1/5	3/5
<input type="checkbox"/>	wind	379,823 MWh	259 MW	17%	75 MW	CO	\$ 1/5	2/5
<input type="checkbox"/>	wind	452,090 MWh	257 MW	20%	100 MW	CO	\$ 1/5	3/5
<input type="checkbox"/>	wind	418,211 MWh	268 MW	18%	75 MW	CO	\$ 1/5	3/5
<input checked="" type="checkbox"/>	wind	468,151 MWh	236 MW	23%	100 MW	CO	\$ 1/5	3/5
<input checked="" type="checkbox"/>	wind	452,090 MWh	257 MW	20%	75 MW	CO	\$ 1/5	3/5
<input checked="" type="checkbox"/>	solar	594,973 MWh	338 MW	20%	100 MW	CO	\$ 2/5	4/5
<input checked="" type="checkbox"/>	solar	5,724,511 MWh	3,045 MW	21%	100 MW	CO	\$ 2/5	4/5
<input checked="" type="checkbox"/>	solar	5,923,838 MWh	3,175 MW	21%	100 MW	CO	\$ 2/5	4/5

Open map



Flexible selection – Users can select any region, regardless of rank, to explore further procurement scenarios.

Analyzes over ~1,000 modeled resource regions – PAT selects a minimum number of regions needed to meet your clean energy target, based on technical potential.

PAT Walkthrough (6/6): Results



CONSOLIDATED RESULTS

OVERVIEW AND SALIENT POINTS

STEP 6

Results

Here are the results for each of your groups, including key cost and procurement data. Scroll down to the [Next Steps](#) section for guidance on leveraging this information effectively.

Northeast's summary

Total annual load	Renewable energy goal	Nameplate capacity required	Resources selected	Potential energy generation	Renewable energy goal met
1,500,000 MWh	1,500,000 MWh (100%)	2.9e+2 - 8.6e+2 MW	2 wind	1,500,000 MWh	Renewable energy goal met

[View selected resource regions](#) [View procurement options](#) [View locations](#)

Midwest's summary

Total annual load	Renewable energy goal	Nameplate capacity required	Resources selected	Potential energy generation	Renewable energy goal met
1,000,000 MWh	1,000,000 MWh (100%)	1.9e+2 - 5.7e+2 MW	1 wind	1,000,000 MWh	Renewable energy goal met

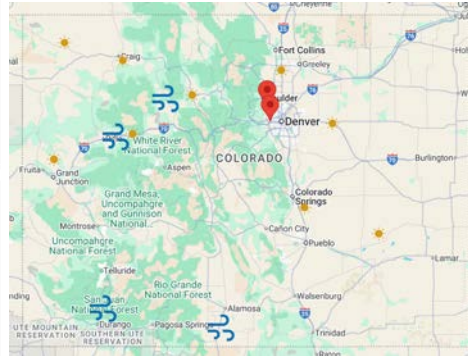
[View selected resource regions](#) [View procurement options](#) [View locations](#)

Northeast's selected resource regions

2 resource regions selected

[Download table \(csv\)](#)

Rank	Type	Annual generation	Potential capacity	Capacity factor	Battery capacity	State	Cost savings	Emissions reduction	Grid value
1	wind	1,202,889 MWh	281 MW	49%	none	VT	5/5	1/5	1/5
2	wind	1,301,741 MWh	294 MW	51%	none	NH	5/5	4/5	1/5



Final page in the PAT workflow –

Summarizes all user inputs and results in one comprehensive view.

Displays key scenario elements – Includes energy goal, selected procurement options, load aggregation groups, and ranked resource regions.

Easy-to-navigate layout – Users can review how each decision and filter impacted the final recommendations.

Downloadable results – Export scenario outputs and summary data for internal review, presentations, or further analysis.

Designed to support next steps – PAT helps users understand viable procurement pathways but is not the final step—results provide a strong foundation for market engagement.