Alternatives Built for the Past, Ready for the Future:

Unlocking Clean Energy at Fossil-Fuel Sites

Liz Stanton, PhD
Applied Economics Clinic
www.aeclinic.org
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Economic and Policy Analysis of Energy, Environment and Equity

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- Applied Economics Clinic (AEC) is a mission-based non-profit consulting group that offers expert services in the areas of energy, environment, consumer protection, and equity.

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- AEC works proactively to support and promote diversity in our areas of work by providing applied, on-the-job learning experiences to graduate students.

- AEC is committed to a just workplace that is diverse, pays a living wage, and is responsive to the needs of its eight full-time and seven part-time staff.

Insights from Fossil Fuel Replacement Case Studies

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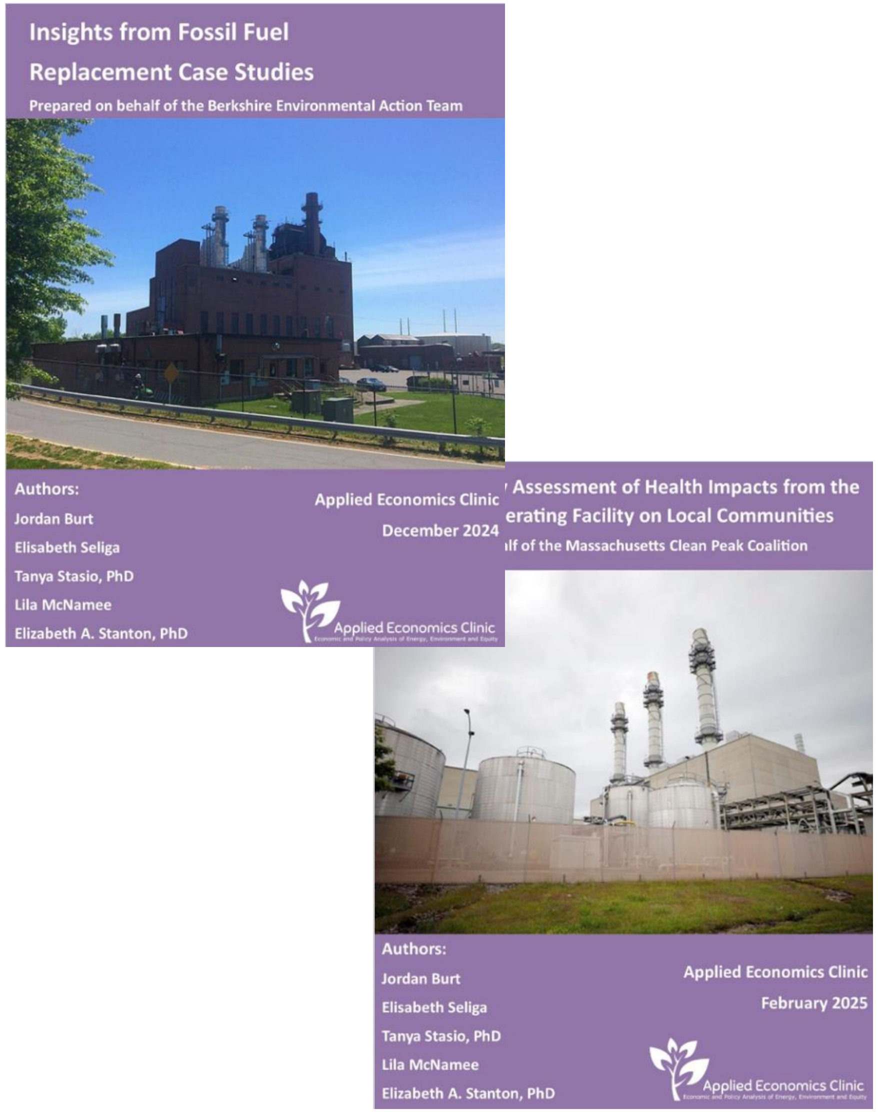
Findings:

- Fossil-fuel sites can be desirable locations for clean energy siting.
- Reducing reliance on fossil-fuel generation can help lessen the burden of environmental and health impacts on already overburdened communities.
- Fossil-fuel plant conversions are a tool that can be used to achieve state and local greenhouse gas emissions reductions.

Burt, J., E. Seliga, T. Stasio, L. McNamee, and E.A. Stanton. 2024. ***Insights from Fossil Fuel Replacement Case Studies***. Applied Economics Clinic. Prepared on behalf of Berkshire Environmental Action Team. [Online]

Companion Study: Burt, J., E. Seliga, T. Stasio, L. McNamee, and E.A. Stanton. 2025. ***A Community Assessment of Health Impacts from the Pittsfield Generating Facility on Local Communities***. Applied Economics Clinic. Prepared on behalf of Massachusetts Clean Peak Coalition. [Online]



Fossil-fuel sites can be desirable locations for clean energy siting.

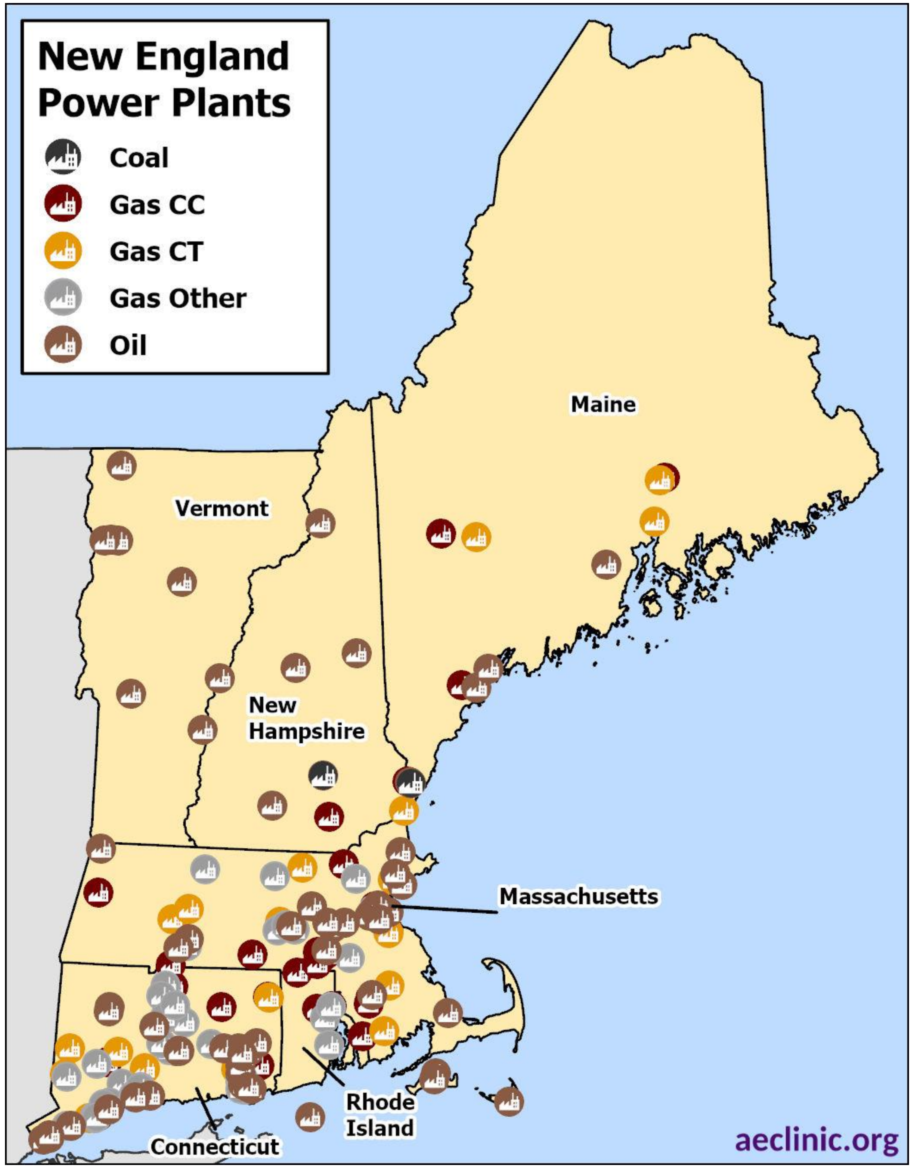
AEC "Insights" report presents six U.S. case studies of fossil fuel peakers replaced by clean energy resources.

Building renewables/ storage on pre-existing fossil fuel facilities offers:

- Infrastructure needed to supply energy to the grid
- Time and money saved in development
- Reduced risk of stranded assets
- Avoided disruption of undeveloped sites

Case Study Fossil Fuel-Fired Facilities							Clean Energy or Storage Replacement		
Facility Name	Fuel	Nameplate Capacity (MW)	Capacity Factor (%)	Number of units	Retirement Capacity (MW)	Year of Retirement	Resource	Nameplate Capacity (MW)	Expected Year of Operation
Arthur Kill Power Station	Gas	896	13.3%	3	18	2025	Storage	15	2025
Astoria Generating Station	Gas	1,345	6.2%	5	16	Delayed to 2027	Storage	135	2024
Dynegy Oakland Power Plant	Jet fuel	149	0.5%	2	149	Unit 1 & 3: TBD; Unit 2: 2021	Storage	74	2025; Phase 1 (43.75 MW)
Ravenswood Generating Station	Gas	2,096	14.7%	5	1,915	Unknown	Wind	1,400	Unknown
Tunnel Jet Peaking Facility	Hydro; Jet Fuel	19	6.6%	3	17	2023 (Jet Fuel Generators)	Storage	17	2025
West Springfield Generation Station	Gas; Oil	0	0.0%	6	353	2021/2022	Storage	45	2025

New England's Fossil Fuel Power Plants



	Nameplate Capacity (MW)					
State	Coal	Oil	Gas CC	Gas CT	Gas Other	TOTAL
CT	0	2,537	4,192	625	563	7,917
MA	0	2,477	7,151	587	102	10,317
ME	0	883	1,389	354	0	2,626
NH	559	521	1,396	5	0	2,481
RI	0	7	1,910	15	27	1,958
VT	0	167	0	0	0	167
TOTAL	559	6,592	16,037	1,586	692	25,465

	# of generating units					
State	Coal	Oil	Gas CC	Gas CT	Gas Other	TOTAL
CT	0	67	30	18	45	160
MA	0	82	43	20	37	182
ME	0	7	8	5	0	20
NH	4	14	6	1	0	25
RI	0	4	17	3	8	32
VT	0	11	0	0	0	11
TOTAL	4	185	104	47	90	430

Source: 2023 EIA Form 860

Reducing reliance on fossil-fuel generation can help lessen environmental and health impacts.

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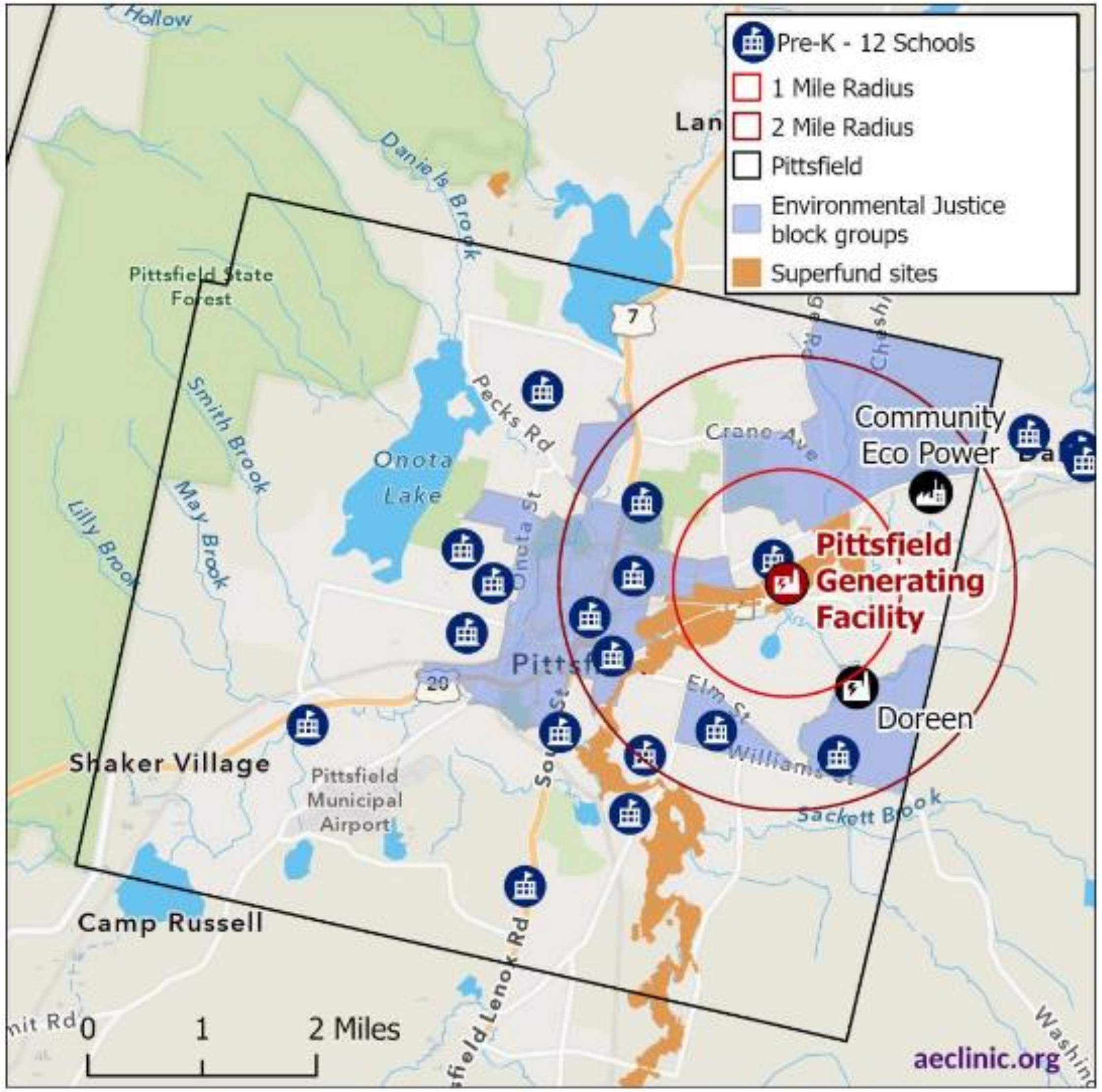
AEC "Health Impacts" report documents health and other non-economic impacts to communities neighboring the Pittsfield Generating Facility in Pittsfield, Massachusetts.

Power plants are disproportionately located in vulnerable communities and neighborhoods with other multiple hazards:

- Local pollutants with adverse community health effects
- Disproportionate negative health impacts for BIPOC and low-income communities
- Disproportionate exposure to PM for BIPOC and low-income communities



Fossil-fuel plant conversions are a tool in achieving state and local greenhouse gas limits.

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New England states have ambitious decarbonization mandates that can not be achieved without deep greenhouse gas emission reductions from the electric sector.

In addition, decarbonizing the electric sector is crucial to support the electrification of buildings and transportation. To achieve this, most New England states have established Renewable Portfolio Standards (RPS) and Clean Energy Standards (CES) aimed at transitioning their electric grids to cleaner energy sources.

≥80% by 2050	Five states mandate greenhouse gas reductions economy wide: MA, CT, ME, RI, and VT (mostly below 1990 levels)
Net-Zero by 2050 80% by 2050	MA statewide GHG emissions limit MA clean energy standard
90% by 2050	VT renewable energy requirement
100% by 2050 Carbon-Neutral by 2045	ME renewable energy requirement ME emissions goal
100% by 2040	CT zero-carbon electricity goal
100% by 2030	RI renewable energy goal

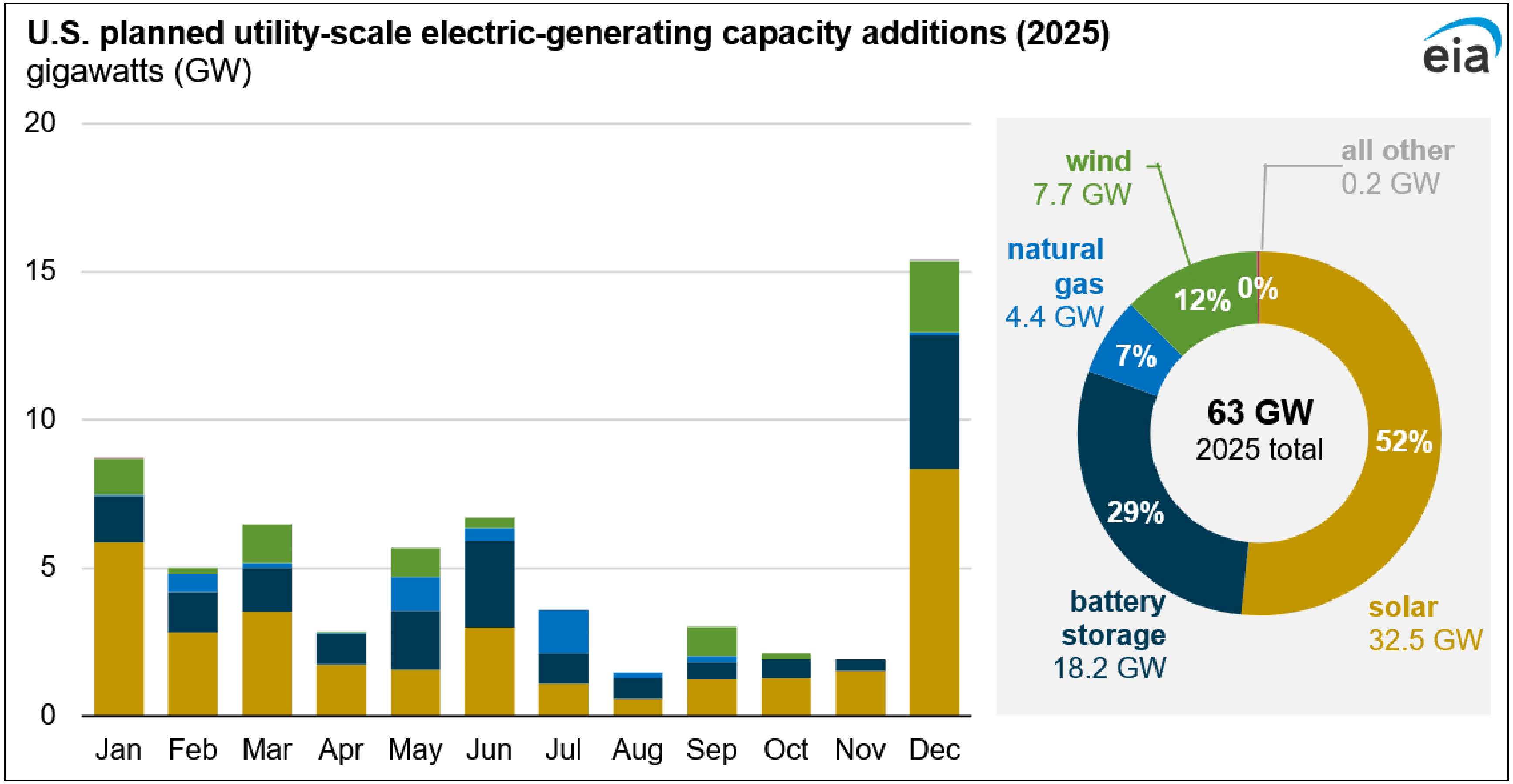
Source: https://isonewswire.com/2022/02/25/the-new-england-states-frameworks-for-reducing-greenhouse-gas-emissions-and-increasing-renewable-energy-continue-to-evolve/

Alternatives to fossil fuel peakers

Alternatives to fossil fuel peakers include: solar+storage; wind+storage; grid+storage; vehicle-to-grid programs; demand response; energy efficiency; and other peak shifting or shaving measures.

Alternative resources are (**depending on specific location/context**):

- Commercially available
- Ready for interconnection
- Readily available for purchase
- Cheaper than fossil-fuel peakers
- Quicker to bring online than new gas peakers
- Able to provide sufficient back-up generation for 4- to 8-hour peak events



Source: https://www.eia.gov/todayinenergy/detail.php?id=64586

Thank you!
Questions?

Liz Stanton, PhD

liz.stanton@aeclinic.org

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Related AEC publications

Applied Economics Clinic
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Stanton, E.A. 2025. *Testimony on East Kentucky Power Cooperative Certificates of Public Convenience and Need.* Applied Economics Clinic. Testimony to the Kentucky Public Service Commission on behalf of Appalachian Citizens' Law Center, Kentuckians for the Commonwealth, and Mountain Association, Case No. 2024-00370. [Online]

Stasio, T., E. Seliga, B. Woods, and E.A. Stanton. 2024. *Energy Storage Equity: An Assessment of Three Massachusetts Programs*. Applied Economics Clinic. Prepared on behalf of Clean Energy Group. [Online]

Lala, C.T., E. Seliga, J.R. Castigliego, and E.A. Stanton. 2024. *Assessing Alternatives to the Proposed Chesterfield Energy Reliability Center (CERC)*. Applied Economics Clinic. Prepared on behalf of Southern Environmental Law Center (SELC). [Online]

Stasio, T., E. Seliga, D. Garraway, B. Woods, and E.A. Stanton. 2023. *Distributed Energy Storage: The Missing Piece in North Carolina's Decarbonization Efforts*. Applied Economics Clinic. Prepared on behalf of Clean Energy Group. [Online]

Lala, C., J. Burt, and S. Peddada. 2023. *The Interconnection Bottleneck: Why Most Energy Storage Projects Never Get Built*. Applied Economics Clinic. Prepared on behalf of Clean Energy Group. [Online]

Lala, C., B. Woods, S. Peddada, G. Lewis, T. Rakotoarisoa, E. Seliga, E.A. Stanton, and E. Tavares. 2022. *Energy Storage Benefit-Cost Analysis*. Applied Economics Clinic. Prepared on behalf of Clean Energy State Alliance. [Online]