

Powering Iowa's Future

Economics, Health, and Community in the Coal Transition

by Sean Finn

I. Introduction

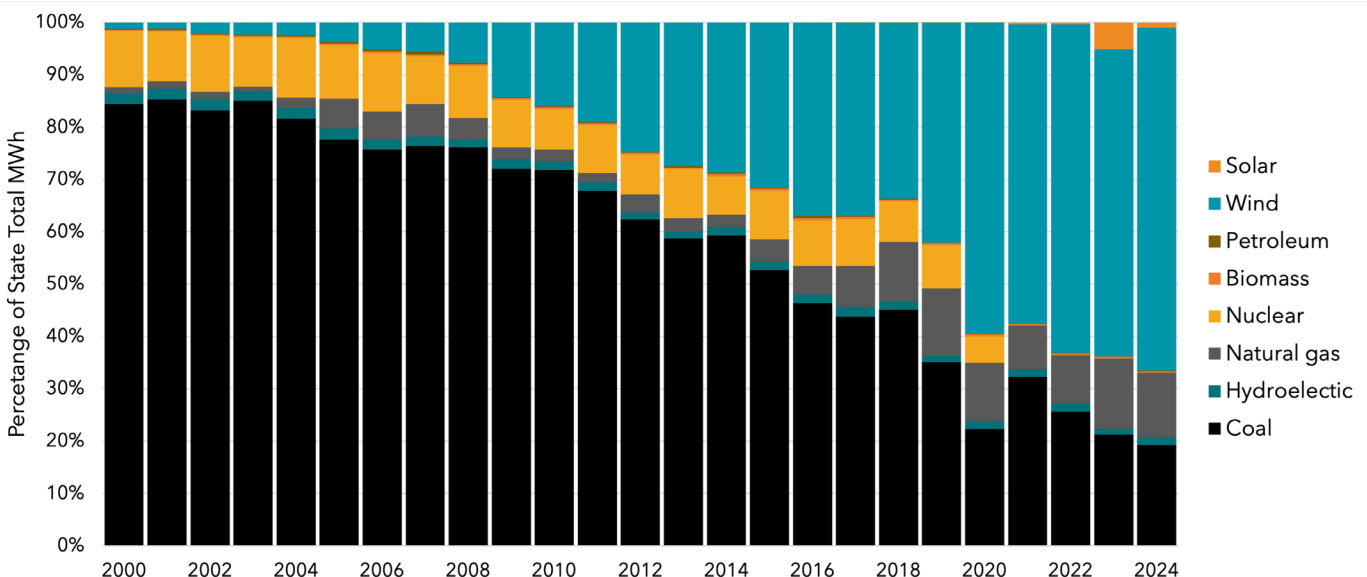
For most of the 20th century, coal was the foundation of Iowa's electric power system. Coal-fired power plants built between the 1960s and 1980s provided the baseload energy that fueled the state's manufacturing expansion, sustained unionized utility jobs, and supported public infrastructure through property-tax revenues. At its peak in 1985, coal supplied more than 88% of Iowa's electricity.

The state's energy landscape has undergone a dramatic transformation.

Since that time, the state's energy landscape has undergone a dramatic transformation. Iowa now generates 66% of its electricity from wind — the highest share in the nation. It continues to add solar and battery storage at accelerating rates. Despite the massive growth in renewable energy, coal remains a significant part of the mix, responsible for roughly a quarter of all generation and over three-quarters of the power sector's carbon emissions. The remaining coal fleet — primarily the Walter

Chart. Iowa's use of coal declines as wind energy rises in past two decades

Proportion of total electric generation by energy source in Iowa, 2000-2024



Source: U.S. Energy Information Administration

Scott Jr. Energy Center, George Neal Units 3 and 4, the Ottumwa Generating Station, and the Louisa Station — anchors the economies of several mid-sized industrial communities and supports hundreds of skilled workers whose livelihoods are intertwined with the plants' operations.

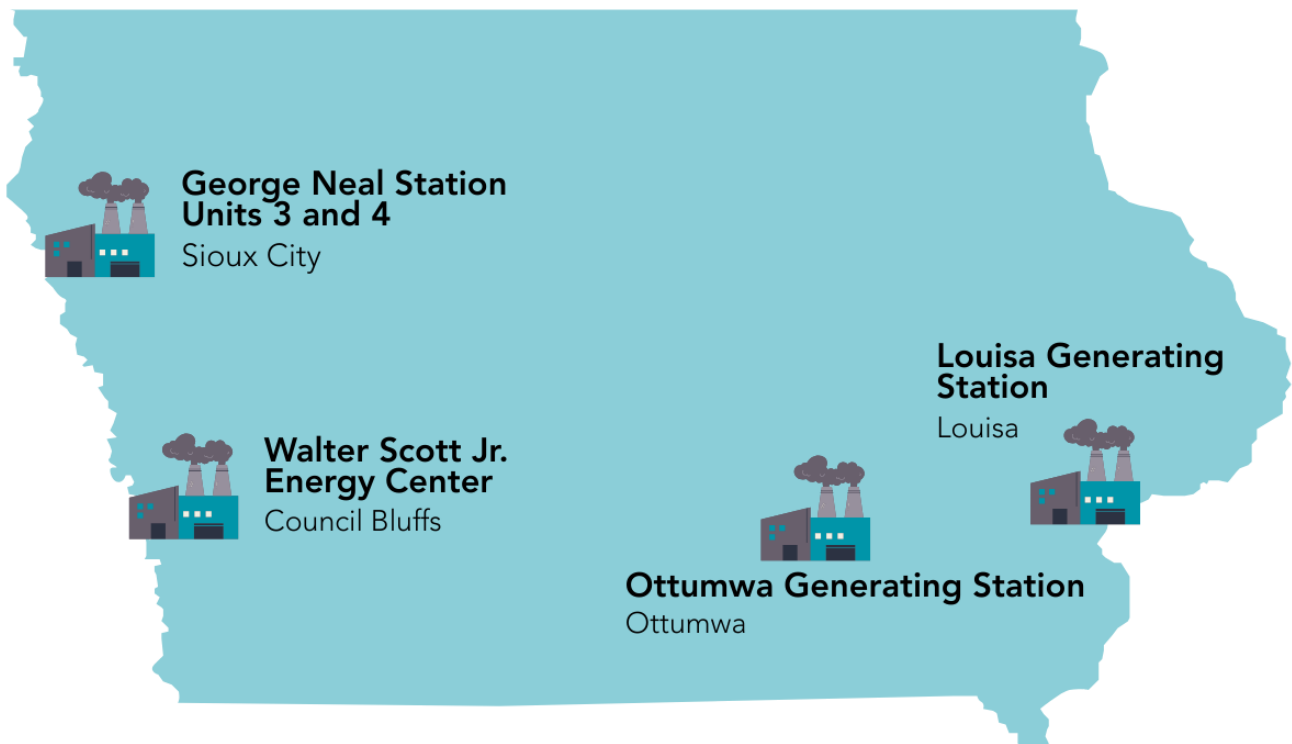
New wind, solar, and energy storage projects keep investment in-state, creating construction and maintenance jobs and contributing to the tax base.

The result is an economic and environmental contradiction. Iowa's reliance on imported coal sends approximately \$200 million a year out of state, while the associated air-pollution and health costs impose \$110 to \$150 million in hidden damages here in Iowa. These figures represent a continuous outflow of wealth and opportunity from the state. By contrast, new wind, solar, and energy storage projects keep investment in-state, creating construction and maintenance jobs and contributing to local tax bases. The comparative economics of these resources — both efficiencies and

potential externalities — are central to understanding Iowa's energy choices. This report examines both the costs of continued coal dependence and the life-cycle economic and environmental trade-offs of renewable alternatives, providing a full picture of the transition landscape.

The policy environment surrounding Iowa's energy transition has grown more complex. Many of the clean-energy incentives established by the Biden Administration under the Inflation Reduction Act (IRA) and Bipartisan Infrastructure Law (BIL) have been weakened by legislative and judicial actions, injecting uncertainty into the financing and timeline of planned renewable projects nationwide.

Map. Four remaining coal plants produce most of Iowa's coal energy



For Iowa, this creates a dual challenge: ensuring that current investments remain viable while designing a long-term framework independent of unstable federal subsidies. The state's history of pragmatic energy development positions it well to adapt, but doing so will require clear data, forward-looking policy, and coordination among utilities, labor organizations, and local governments.

Transition is not optional. It is inevitable — and it is already underway. What remains uncertain is whether it will unfold by design or by default. Without deliberate planning, plant closures could destabilize local tax bases, erode workforces, and leave contaminated sites as lasting scars. Handled proactively, however, the same transition could unlock a new cycle of industrial renewal.

This report is designed to guide that process by integrating quantitative research and policy analysis to answer three central questions:

1. What are the true economic and health costs of continued coal dependence in Iowa?
2. How can affected workers and communities participate fully and fairly in the transition to a clean-energy economy?
3. What policies and investment mechanisms can ensure that the benefits of change — jobs, cleaner air, and fiscal stability — are shared broadly across the state?

The analysis that follows begins by quantifying the economic inefficiencies and externalities of Iowa's coal power fleet, then traces the human and environmental consequences borne by host communities. It presents case studies of successful transitions in other regions — from Centralia, Washington, to Appalachia — and identifies practical strategies for Iowa: community-benefit agreements, state transition funds, and high-road workforce standards that guarantee job quality and economic benefits. The report concludes with a policy roadmap that aligns economic competitiveness with environmental stewardship, positioning Iowa to lead the Midwest in energy transition governance.

Iowa now stands at a tipping point in its energy history. Decisions made over the next decade will determine whether the state continues to invest in aging, high-cost infrastructure or channels its industrial expertise toward cleaner, more resilient systems. With deliberate planning and shared commitment, the transition from coal can strengthen Iowa's economy, safeguard public health, and secure a reliable energy future rooted in the same practical ingenuity that has long defined the state's approach to growth and stewardship.

II. The Economic Reality of Coal Power in Iowa

Iowa's Coal Fleet and Its Supply Chain

Although Iowa is a national leader in wind energy, coal continues to play a significant role in the state's power generation portfolio. Coal supplied approximately 23% of Iowa's total electricity generation in 2024, down from more than 70% a decade earlier. The remaining four major coal-powered plants account for nearly 90% of the state's coal-fired generation. These plants are owned primarily by MidAmerican Energy and Alliant Energy, with partial ownership stakes in some facilities held by municipal or cooperative utilities.

Iowa has no active coal mines. The vast majority of coal burned in the state is shipped from Wyoming’s Powder River Basin by rail. That dependence on imported coal represents a steady outflow of capital. At full capacity, the Ottumwa plant alone consumes over 100 railcars of coal per day. Across the

Each remaining coal job is more capital-intensive and less locally integrated than comparable clean-energy or manufacturing roles.

state, Iowa utilities spend an estimated \$200-250 million annually on fuel purchases and transport contracts. These are dollars that flow to out-of-state mining and rail companies rather than recirculating through Iowa’s economy. This leakage stands in contrast to wind and solar projects, whose construction, operations, and land-lease payments create enduring local economic value.

The supply-chain footprint of coal has also contracted sharply. Employment related to rail shipping, maintenance, and environmental compliance has declined as generation has fallen. Each remaining coal job is more capital-intensive and less locally integrated than comparable clean-energy or manufacturing roles — an early indicator of the sector’s diminishing economic-multiplier effect.

Cost Structure and Competitiveness

Rising Costs and Aging Assets

The cost competitiveness of Iowa’s coal plants has eroded as maintenance and fuel-transport expenses have increased. The average capacity factor — the ratio of actual output to its maximum possible output — for Iowa’s coal units fell below 50% in 2023, down from 68% in 2012. These plants were designed for stable, baseload operation. Frequent ramping up and down to accommodate wind generation, as is required today, accelerates equipment wear and reduces efficiency.

Table. Millions of dollars in coal costs leave the Iowa economy each year

Estimated annual economic leakage from Iowa coal plant fuel imports

Plant Nameplate mega-watts (MW)	Approx Coal Use (million tons/year)	Delivered Fuel Cost (\$/ton)	Annual Fuel Expenditure (\$ million)	Dollars Leaving Iowa Economy (\$ million)
Ottumwa (726 MW)	1.6-1.8	\$38-45	\$60-80	\$57-76
Louisa (812 MW)	1.4-1.6	\$38-45	\$55-70	\$52-67
George Neal 3 & 4 (1,280 MW combined)	2.2-2.5	\$38-45	\$85-110	\$81-105
Walter Scott Jr 3 & 4 (1,645 MW combined)	1.7-1.9	\$38-45	\$65-85	\$62-81
Total (4 major plants)	6.9-7.8	—	\$265-345 M	\$252-329 M

All figures are approximate and based on recent EIA Form 923 fuel receipt data, plant capacity factors reported in 2022–2024 filings, and Powder River Basin (PRB) coal pricing ranges.

Table. Wind and solar energy provide cheaper energy than fossil fuels

Levelized Cost of Electricity (LCOE) by generation type, Midwest region, 2024 USD/MWh

Generation Type	Average LCOE (USD/MWh)	Capacity Factor (%)	Fuel Cost Share of LCOE (%)	Typical New Build Year
Coal	\$73 – \$110	45 – 60	40 – 50	1970 – 1985
Natural Gas	\$55 – \$70	55 – 65	65 – 70	1990 – 2010
Utility-Scale Wind	\$26 – \$32	40 – 45	0	2018 – 2025
Utility-Scale Solar	\$30 – \$42	25 – 30	0	2020 – 2025

Sources: Department of Energy, National Laboratory of the Rockies Annual Technology Baseline 2024, and Iowa Environmental Council

Even before factoring in carbon and health externalities, the levelized cost of electricity (LCOE) for existing coal units now exceeds that of new renewable generation. LCOE is a measure that represents the average revenue per unit of energy production that factors in all investment and operating costs. The U.S. Department of Energy (DOE)'s 2024 analysis places the average operating cost of coal in the Midwest at \$73-\$110 per megawatt-hour (MWh), compared to \$26-\$32 for wind and \$30-\$42 for utility-scale solar. As maintenance costs and coal-delivery prices rise, the economic logic of continued operation weakens further.

Uneconomic Dispatch and Regulatory Inertia

If coal is so uncompetitive, why does it persist? The answer lies partly in the structure of Iowa's electric-utility regulation and regional market rules.

Iowa's major investor-owned utilities, Alliant and MidAmerican, operate within the Midcontinent Independent System Operator (MISO) wholesale power market, the nonprofit grid operator for the central U.S. that oversees the interconnected energy flow throughout the region. However, these companies also retain vertically integrated generation portfolios. They can therefore choose to "self-commit" coal units — running them continuously rather than bidding them competitively into the regional market. This practice, sometimes called "uneconomic dispatch," allows utilities to recover fixed costs through regulated retail rates even when market prices for electricity fall below the plant's variable operating cost. A 2024 analysis by Grid Strategies LLC and Natural Resources Defense Council identified these practices across MISO, estimating that ratepayers nationally pay billions of dollars annually for coal generation that could be replaced by cheaper sources.

This phenomenon reflects a deeper regulatory inertia in Iowa's system. Unlike many neighboring states, Iowa lacks a statutory process that requires utilities to justify their generation decisions based on cost and social impact, known as Integrated Resource Planning (IRP). Without such oversight, utilities can prolong the operation of their aging assets well beyond their economic life spans. Additionally, since Iowa's utilities are still guaranteed by Iowa regulation to recover costs associated with plant investments, there are few financial incentives to retire depreciated coal units early, even when doing so would save customers money. The result is a form of policy lock-in — coal plants remain online not because they are needed or efficient, but because the regulatory framework shields the utilities from the consequences of inefficiency.

This inertia also carries grid-level consequences. Self-committed units can crowd out lower-cost renewables in the dispatch queue (the order in which energy generation sources are utilized to meet demand), reducing the economic value of wind and solar generation and slowing the pace of transition. The inefficiency compounds across time. Economic and environmental costs accumulate, while cleaner, cheaper resources sit underutilized.

The Opportunity Cost of Delay

Every year that Iowa utilities continue to operate legacy coal units imposes an opportunity cost of delay — the foregone economic, environmental, and health benefits of reallocation to cleaner and more efficient technologies.

Every year that Iowa utilities operate legacy coal units imposes an opportunity cost.

The outflow of over \$200 million per year for imported coal represents money not invested in Iowa. From an investment standpoint, each dollar directed toward maintaining obsolete coal infrastructure is a dollar not available for grid modernization, energy storage, or community redevelopment. Modeling by the Iowa Environmental Council suggests that retiring the remaining coal fleet by 2035 could reduce statewide generation costs by 12% and create several thousand construction and maintenance jobs in the renewable sector.

Iowa's energy future thus hinges on whether its regulatory, economic, and institutional frameworks can align to capture those benefits. The coal era that powered Iowa's past has already reached its economic limits; the question is how quickly and equitably the state will move beyond it.

Out-of-State Spending: Renewables vs. Coal

A common argument for preserving Iowa's coal fleet has been its perceived economic contribution to local communities. Yet when examined closely, coal generation functions less as an in-state industry than as a conduit for capital outflow. Renewable energy development presents a fundamentally different expenditure profile. Although wind, solar, and battery projects depend on equipment and materials sourced partly from outside Iowa, the bulk of lifetime spending occurs locally — through land leases, construction wages, property taxes, and long-term operations and maintenance. Analyses by the National Renewable Energy Laboratory's *Jobs and Economic Impact (JEDI)* model and DOE's *Land-Based Wind Market Report* show that wind projects typically retain 60% to 75% of construction expenditures and 85% to 90% of operating expenditures within the state. Solar projects retain slightly less — about 45% to 55% during construction and 75% to 80% in operation — and battery-storage facilities retain roughly two-thirds of total lifecycle spending locally once they are operational.

Iowa's established manufacturing base amplifies those returns. Blade and tower production at TPI Composites (Newton), Siemens Gamesa (Fort Madison), and Trinity Towers (Sioux City) supplies components both to in-state projects and to neighboring states, turning renewable expansion into a regional export industry rather than a drain on local resources. By contrast, each new trainload of coal represents a fresh import liability.

Table. Investment in renewable energy circulates in local economies

Estimated in-state retention of spending by energy type

Technology	In-State Retention (Construction Phase)	In-State Retention (Operations Phase)	Primary Out-of-State Expenditures
Wind	60–75%	85–90%	Blades, nacelles (partial import), engineering services
Solar (Utility-Scale)	45–55%	75–80%	PV modules, inverters, racking systems
Battery Storage	30–40%	65–75%	Battery cells, advanced electronics
Coal	20–25%	30–40%	Imported coal fuel, rail transport, external compliance

The distinction between up-front capital investments and ongoing operational costs also matters. Renewable investments are front-loaded: most costs occur once, during construction, and generate durable assets that provide decades of low-cost power with minimal ongoing imports. Fossil-fuel plants, by contrast, tie local economies to perpetual fuel purchases whose prices and availability are outside state control. Once wind turbines and solar panels are installed, replacement components and service contracts largely sustain local employment rather than perpetuating external dependence.

Overall, renewable generation retains two to three times more value within the state economy than coal generation. In monetary terms, this difference translates into roughly \$25 to \$30 per megawatt-hour of additional local economic benefit when measured across wages, land payments, and avoided fuel imports. Even allowing for imported modules or turbine parts, renewable energy development produces a net inflow of value, while continued coal dependence produces a continuous outflow. The shift from a fuel-based to a capital-based energy economy is among the most consequential economic transformations now underway in Iowa's transition to clean power.

III. The Human and Health Toll

Coal's impact in Iowa is measured not only in megawatts but also in the daily realities of human health, community well-being, and environmental degradation. Although Iowa's remaining coal plants represent a declining share of power generation, their pollution footprint is immense. These facilities, relics of the 1970s and 1980s, continue to shape the health of surrounding communities.

Research leaves little doubt about the human cost of coal combustion.

Air and Water Impacts

Peer-reviewed research leaves little doubt about the human cost of coal combustion. Particulate matter from coal-fired power plants remains the one of the largest contributors to premature mortality in the U.S., responsible for more than 460,000 deaths between 1999 and 2020. The pollutants of greatest concern — fine particulate matter (PM_{2.5}), sulfur dioxide (SO₂), nitrogen oxides (NO_x), and mercury — each carry specific health burdens. Fine particulates penetrate deep into the lungs, increasing the risk

of asthma, heart disease, and stroke. SO₂ and NO_x contribute to ground-level ozone formation and respiratory irritation. Mercury bio-accumulates in fish and the human nervous system.

Iowa's monitoring data mirror national findings. Air sensors in Ottumwa, Muscatine, and Woodbury counties routinely record PM_{2.5} concentrations approaching or exceeding the Environmental Protection Agency (EPA)'s annual standard. Epidemiologists from the University of Iowa College of Public Health have linked elevated particulate exposure in southeastern Iowa with higher hospital admissions for cardiovascular disease. These effects fall disproportionately on older adults and children, amplifying existing rural-health inequities.

Water contamination compounds these risks. The Iowa Environmental Council's *Toxic By Design* (2025) and Earthjustice's *Iowa Coal Ash State Fact Sheet* (2024) document widespread exceedance of arsenic, boron, cobalt, and lithium in groundwater near coal-ash ponds. Ninety-one percent of monitored wells around Iowa's coal-ash disposal sites exceed federal health benchmarks for at least one contaminant. Peer-reviewed studies of coal-ash leachate chemistry confirm that these metals remain mobile in unlined basins for decades, posing chronic exposure risks to nearby drinking-water sources. With many ponds located in floodplains along the Des Moines, Missouri, and Mississippi rivers, increasingly frequent extreme-weather events threaten to transport buried waste into surface waters.

Health Externalities as Economic Costs

These environmental impacts translate directly into economic and social costs. Using the EPA's Benefits Mapping and Analysis Program (BenMAP), the Iowa Environmental Council estimated that emissions from coal-fired power generation cause roughly 110 premature deaths and 650 hospitalizations each year, at an aggregate annual cost of \$110 to \$150 million. Those estimates are consistent with national meta-analyses by the National Academies of Sciences and the Health Effects Institute, which value the external health damages of coal combustion at roughly \$25 to \$35 per MWh of electricity generated — often higher than the market price of the electricity itself.

Emissions from coal-fired power generation cause roughly 110 premature deaths and 650 hospitalizations a year in Iowa.

The burden is not evenly distributed. Because Iowa's remaining coal plants are located near midsize manufacturing towns rather than in distant industrial zones, pollution exposure aligns closely with residential areas and schools. In Ottumwa, for instance, asthma hospitalization rates are more than 25% above the statewide average. The resulting health-care costs fall on local hospitals and public insurers, creating a secondary fiscal drag on counties already facing reduced tax revenues from aging industrial infrastructure.

Peer-reviewed studies reinforce these findings. Di et al. (2017) in *The New England Journal of Medicine* demonstrated a nearly linear relationship between PM_{2.5} exposure and mortality risk even at concentrations below current regulatory limits, implying that further reductions yield proportional public-health gains. Pope et al. (2020) in *PNAS* quantified the monetized benefits of particulate reduction, finding that every 10 µg/m³ decrease in PM_{2.5} produces health benefits valued at \$9 million per 100,000 residents per year. Applying these coefficients to Iowa underscores the fact that

Table. Coal-powered energy creates significant economic harm to Iowa

Health and environmental externalities of coal power in Iowa (2024 estimates)

Category	Annual Impact Estimate	Economic Value (\$ million)	Notes / Source
Premature Deaths (from PM2.5 exposure)	≈ 110 people	\$1,250	EPA BenMAP / IEC 2025
Hospitalizations & Emergency Visits	≈ 650 cases	\$38	Iowa Dept. of Public Health; EPA
Lost Work Days & Productivity	≈ 90,000 days	\$12	CDC productivity valuation
Groundwater Remediation Liability (Coal Ash)	—	\$30 – \$50	Earthjustice 2024 Iowa Coal Ash Fact Sheet
Total Estimated External Cost	—	\$110 – \$150 million per year	IEC Condition of the State 2025

transitioning from coal could prevent dozens of deaths annually and generate health benefits rivaling the total payroll of a mid-sized plant.

Coal Ash and Long-Term Environmental Liabilities

The residual by-products of coal combustion — fly ash, bottom ash, and flue-gas-desulfurization sludge — pose a long-term liability extending well beyond plant closures. Coal ash contains a range of toxic components that are mobile in groundwater and can degrade drinking water quality and aquatic ecosystems. The costs of these environmental impacts are wide-ranging and cannot be neatly summarized with a dollar figure. The longer these pollutants are allowed to permeate Iowa’s environment, the greater the cumulative cost becomes.

Iowa hosts 69 coal ash disposal sites and 40 federally-regulated coal ash ponds and landfills. The total volume of coal ash at these sites — many unlined and located near bodies of water — exceeds 19 million cubic yards. While utility-specific remediation cost estimates vary widely, the experience in other states suggests that comprehensive cleanup and secure relocation of ash residues can run into the tens of millions of dollars per site, depending on volume and site constraints.

MidAmerican Energy and Alliant Energy together report annual capital expenditures of roughly \$1.3-\$1.6 billion (FERC Form 1 filings, 2024). Incorporating coal-ash remediation into long-term capital expenditure plans would allow for gradual but persistent progress on cleanup efforts. Reallocating annual coal fuel costs to coal-ash cleanup, for example, could realistically result in at least a dozen thorough site remediations within the next ten years.

Cleanup obligations are not inherently financially prohibitive, but they require proactive regulatory enforcement and planning to ensure that environmental liabilities are addressed before site reuse. Comprehensive cleanup also unlocks redevelopment value. Without remediation, contaminated groundwater and site restrictions constrain reuse; with it, properties could become viable sites for industrial, renewable, or research facilities.

Workforce Impacts and Skills Legacy

While the environmental health effects of coal are well-quantified, the social health of communities depends on employment and stability. Coal's workforce footprint in Iowa has shrunk substantially over the past decade. The state's operating coal plants collectively employ fewer than 450 workers, down from more than 1,000 in 2010. These workers' skills — ranging from high-voltage electrical systems to mechanical operations — represent a form of human infrastructure that should anchor the state's transition strategy rather than be discarded.

Transitions succeed when wages and benefits are protected through collective bargaining and project-labor agreements.

Research on energy-sector transitions emphasizes that job quality and retraining success hinge on policy design. Studies from the Berkeley Labor Center and Cornell ILR School show that transitions succeed when wages and benefits are protected through collective bargaining and project-labor agreements. Without safeguards, post-coal employment can result in income losses of 20%-30%, discouraging participation in retraining. Similar findings emerge from *Cornell's Working Conditions in the Texas Clean Energy Transition (2024)*, which warns that deregulated renewable markets can replicate non-renewables' low-wage, high-turnover patterns unless strong labor standards are embedded from the start.

Iowa's existing network of community colleges and union apprenticeship programs provides a strong foundation for designing equitable, high-quality transition pathways. For example, the Midwest Economic Policy Institute (2021) found that between 2010 and 2017, almost 14,000 apprentices were enrolled in construction or utility registered apprenticeship programs in Iowa. These apprentices represent the next generation of energy infrastructure construction.

Cumulative Community Consequences

The health and employment effects described above interact with broader socioeconomic dynamics. County-level analyses by the Iowa Environmental Council (2023) found that property values within five miles of active coal plants are 6% to 12% lower than comparable properties elsewhere, a difference that diminishes within five years of plant retirement. School districts reliant on coal-plant property taxes often experience short-term fiscal stress but recover when sites are redeveloped for new industrial or clean-energy uses. The experience of Centralia, Washington, is illustrative. In 2011 the state of Washington mandated the shutdown of its last remaining coal plants by 2025. Anchored by a \$55 million community transition fund and targeted infrastructure projects, Centralia reversed its economic decline within a decade of the new investments. Applying a similar model in Iowa could not only mitigate job loss but also deliver economic growth to areas that have suffered the harm of coal plant exposure and decline.

In sum, the human toll of coal in Iowa is multifaceted: chronic illness and premature mortality, environmental contamination that outlives the plants themselves, and socioeconomic dislocation tied to an industry in structural decline. Each dollar invested in accelerated retirement and site cleanup yields multiple dollars in avoided health costs, new employment, and higher community well-being — returns that can define Iowa's next chapter of energy development.

IV. Paths Forward for Iowa Communities

The coming decade offers Iowa a narrow but transformative window. Aging coal plants can either become stranded assets or the foundations of a new industrial geography rooted in clean energy, advanced manufacturing, and community ownership. **The question is not whether Iowa's coal units will close, but when and how — and who benefits when they do.**

Learning from Successful Transitions

Few models illustrate a deliberate and equitable coal transition better than the case of Centralia, Washington. When the Centralia coal plant and adjacent mine announced retirement in 2011, state, labor, and corporate leaders negotiated a \$55 million transition fund financed by the plant's owner, TransAlta. The fund supported worker retraining, local business development, energy-efficiency programs, and clean-energy start-ups. Within a decade, the county's employment and wage growth outpaced state and national averages. The Centralia experience underscores two lessons relevant to Iowa. First, early certainty about retirement dates empowers communities to plan. Second, locally governed transition funds are more effective than ad hoc corporate philanthropy because they ensure resources circulate through the local economy.

Parallel lessons emerge from the Appalachian region. The ReImagine Appalachia report *Make It in Appalachia* (2025) proposes transforming shuttered coal plants into eco-industrial parks that cluster complementary industries — renewable-component manufacturing, battery assembly, data-center operations, materials recycling, and circular-economy ventures — around existing grid interconnections and water infrastructure.

Such reuse both preserves the tax base and converts environmental liabilities into productive assets. Peer-reviewed evaluations of similar redevelopment in Europe and China find that co-location of clean-energy manufacturing and research facilities at former fossil sites can double local employment multipliers relative to greenfield investments.

Properly remediated, Iowa coal sites are ideal anchors for new clean-energy hubs.

These examples matter for Iowa because its coal sites share the same physical advantages: rail access, high-voltage transmission connections, industrial zoning, and available cooling water. Properly remediated, they are ideal anchors for new clean-energy hubs.

Technological Options and Emerging Demand Pressures

Iowa's electricity demand is projected to rise between 30% and 60% over the next 20 years, driven largely by the proliferation of data centers associated with artificial-intelligence workloads, cloud computing, and large-scale manufacturing electrification. These facilities already account for roughly one-fifth of MidAmerican Energy's retail load. If uncoordinated, this surge could justify new, costly gas construction and prolonged dependence on coal. If managed strategically, however, it could catalyze Iowa's clean-energy build-out and supply-chain diversification.

To meet that challenge, Iowa must expand generation while maintaining both affordability and reliability. The most economical portfolio, according to multiple analyses by the National Renewable

Energy Laboratory and the Energy Systems Integration Group (2023), combines wind, solar, and battery storage with targeted transmission upgrades and demand-response programs. Storage costs continue to decline by roughly 15% per year, while wind and solar’s levelized costs of electricity remain below \$40/MWh in the Midwest — well under half the operating cost of Iowa’s coal units. Incorporating demand flexibility from large industrial and data-center users can further flatten peak loads, reducing strain on energy systems.

Iowa must expand energy generation while maintaining both affordability and reliability.

Advanced nuclear concepts, such as small-modular reactors (SMRs) being developed by TerraPower and NuScale, have also entered Iowa’s policy conversation. These technologies promise zero-carbon power but remain commercially unproven at scale. A prudent strategy would treat them as a potential second-wave resource — complementary to renewables rather than a near-term replacement — while prioritizing options with established cost curves that can be deployed more quickly. Unlike wind and solar deployment, which are backed by a capable Iowa workforce, these new nuclear technologies will require external expertise and workforce training as well. As scholars like Sovacool and Geels (2021) caution, overreliance on untested technologies can divert capital from proven solutions and delay emissions reductions.

Converting existing coal boilers to natural gas — an idea periodically floated by utilities — offers only marginal benefit. Lifecycle analyses show that methane leakage and long asset lifespans can erase most climate gains within a decade. From both economic and environmental perspectives, gas conversions should be viewed as short-term bridge measures, not core strategy.

Community Benefit Agreements and Transition Funds

International and domestic research converges on a clear conclusion: communities fare better when they negotiate explicit, enforceable agreements governing plant closures and redevelopment. One important set of tools are Community Benefit Agreements (CBAs), which provide a legal framework for

Table. Intentional planning of energy redevelopment benefits communities

Potential Iowa Community Benefit Agreement framework

	Example Provision	Implementation Mechanism	Potential Funding Source
Workforce Transition	Guaranteed wage parity for retrained employees	Project labor agreements	Utility transition fund
Health & Environment	Local health-impact monitoring program	Utility-County MOA	CBA contributions / philanthropy
Community Investment	Reuse of brownfield sites for solar or industrial hubs	City redevelopment plans	DOE / EDA / philanthropy
Governance	Community transition advisory board	Statutory mandate	State legislature / utilities

local governments, workers, and residents to secure commitments on job retention, wage standards, environmental remediation, and reinvestment of savings from plant retirement. With provisions for local hiring, living wages, and targeted procurement, CBAs can strengthen the economic benefits to host communities by directing jobs and purchasing toward local workers and businesses.

In Iowa communities facing a plant retirement, officials could use a CBA to tie retirement approvals to concrete deliverables, like full remediation of ash ponds, guaranteed funding for community college retraining programs, preferential hiring of incumbent workers for clean-energy construction, and allocation of a fixed percentage of tax benefits to local infrastructure projects. State policymakers could amplify this model by establishing a State Energy Transition Fund, seeded by a mix of utility contributions and federal grants, to co-finance redevelopment of coal-plant properties into eco-industrial parks. The Berkeley Labor Center (2024) highlights that predictable, multiyear funding streams are the single most important determinant of successful labor transitions; short-term pilot programs rarely achieve durable outcomes.

Communities fare better when they negotiate explicit, enforceable agreements governing plant closures and redevelopment.

Implementing CBAs would also rebuild Iowa's leadership in labor standards. Evidence from Cornell's Texas study (2024) shows that union-negotiated renewable projects have 40% lower turnover and 25% higher productivity than non-union equivalents. Embedding prevailing-wage and apprenticeship requirements into Iowa's transition framework would thus serve both equity and efficiency.

Data Centers as Catalysts for Transition

Paradoxically, the rise of hyperscale data centers, while a challenge to grid planners, may create an opening for strong energy transition policies. Iowa's new data-center clusters already drive billions in investment. Each facility demands hundreds of megawatts of reliable power and competes for skilled technicians and construction labor. Leveraging these projects through CBAs and renewable-sourcing requirements could transform them into anchor customers for coal-community redevelopment.

For example, if Ottumwa's eventual coal-plant retirement were paired with on-site grid-connected solar and battery installations, a nearby data-center tenant could secure stable renewable supply while providing long-term property-tax revenue. Similar symbiosis is emerging in former coal regions of Virginia and Ohio, where data centers have repurposed substation interconnections and cooling infrastructure from retired fossil plants. Iowa can adopt this approach to ensure that new digital-age industries compensate communities bearing the costs of the old energy economy.

Designing an Iowa Model for a Fair Energy Transition

Bringing these strands together suggests a coherent path forward. Iowa's transition will succeed if it is predictable, participatory, and place-based. Predictability means firm retirement timelines and transparent utility planning so communities can organize around known dates. Participation requires including workers, local governments, and residents in formal decision-making — whether through task forces or negotiated CBAs. Place-based design ensures that benefits flow to the specific counties that endured decades of coal pollution.

Academic consensus supports this approach. A 2022 meta-analysis in Energy Research & Social Science reviewing 170 transition case studies concluded that participatory governance and targeted regional funding are the two variables most strongly correlated with successful socioeconomic outcomes. Iowa's advantage lies in its existing renewable leadership, manufacturing base, and civic infrastructure; its challenge lies in converting these strengths into equitable local outcomes rather than utility-balance-sheet gains.

V. Policy and Investment Recommendations

A successful transition away from coal will not happen by market forces alone. Iowa's current trajectory — aging baseload plants, uncertain retirement schedules, and uneven planning for load growth — reflects a failure of coordination rather than a shortage of technological solutions. The tools for a fair and economically efficient transition already exist; what remains is the political will to align policy, regulation, and investment.

In the past decade, Iowa lawmakers have taken many steps to reduce worker power, such as limiting collective bargaining and banning the use of project-labor agreements by state and local governments. Successful energy transition policy will require such leaders to shift their perspective and recognize the importance of labor standards and union jobs to ensuring that the benefits of investment and redevelopment reach local communities and workers.

State-Level Policy Frameworks

The first step is to create a clear institutional home for transition governance. The state should charter an Iowa Energy Transition Task Force — comprising representatives from utilities, labor organizations, local governments, community groups, academia, and public-health institutions — to coordinate plant-closure schedules, workforce programs, and redevelopment funding. Comparable bodies in Colorado, Illinois, North Carolina, and Washington have proven instrumental in translating high-level decarbonization goals into specific community outcomes. Such a task force would consolidate data collection, guide and support implementation of Community Benefit Agreements (CBAs), and report annually to the legislature on progress.

A successful transition away from coal will not happen by market forces alone.

As a second, complementary measure, the State should establish a State Energy Transition Fund. This fund would pool revenues from multiple sources — state appropriations, utility contributions linked to avoided coal expenditures, and possibly federal grants. Funds would be earmarked for three categories of expenditure: (1) environmental remediation of coal-ash and legacy contamination sites; (2) workforce retraining and wage-replacement programs; and (3) community redevelopment projects, including eco-industrial parks and renewable generation sited on former coal properties. The economic rationale is clear: every \$1 million invested in clean-energy construction generates roughly seven full-time-equivalent jobs, compared with three in fossil-fuel extraction. Redirecting Iowa's \$200 million annual coal-import outflow into in-state capital projects would therefore produce a net employment gain even before accounting for health benefits.

State law should also require utilities to file Integrated Resource Plans (IRPs) consistent with a 2035 carbon-free target. Iowa is one of the few Midwestern states without a binding IRP requirement. The absence of a transparent, regulator-approved planning process has enabled coal plants to continue operating even when market prices are lower than variable costs. Mandating IRPs would force utilities to justify such decisions publicly and to model the full social cost of continued coal operation, including the \$110-\$150 million annual health externalities.

Utilities and regulators can reduce ratepayer exposure to inefficient coal operation by strengthening oversight of dispatch and procurement practices, including scrutiny of self-scheduling decisions that can keep higher-cost coal units running when lower-cost resources are available. In MISO, recent analysis estimates that using coal power as opposed to cheaper resources imposed more than \$1.1 billion in excess costs across the region from 2021-2023, including roughly \$50 million in Iowa. Minnesota regulators have also opened formal oversight of utilities' self-commitment and self-scheduling practices to protect consumers and prevent market distortions that crowd out renewables.

Finally, the state should codify health-impact and environmental-justice assessments for all major energy projects. Integrating public-health metrics into permitting and rate-case proceedings ensures that transition decisions account for real community costs. Peer-reviewed studies in Environmental Science & Technology demonstrate that embedding health valuations into cost-benefit analyses can alter resource-planning outcomes by 10% to 20%, tipping decisions toward cleaner generation.

The state should codify health-impact and environmental-justice assessments for all major energy projects.

Local Government Actions

At the operational level, utilities and local governments will shoulder most of the implementation burden. Local governments must prepare for plant closures well before decommissioning dates. Counties should establish coal site redevelopment working groups to guide remediation and repurposing of retiring properties, similar to brownfield redevelopment agencies used for industrial sites. Coordination with community colleges can create on-site training centers during decommissioning to ensure that displaced workers keep earning while they acquire new skills.

The fiscal dimension is equally important. Many host counties depend on coal-plant property taxes to fund schools and public services. Policymakers should mitigate revenue shocks by authorizing Transitional Revenue Replacement Grants, financed through a state transition fund, to bridge short-term gaps until redevelopment generates a new tax base. Illinois' 2021 Climate and Equitable Jobs Act offers a working precedent: its Energy Transition Community Grant Program provides up to \$40 million per year for affected local governments, funded by a small utility surcharge.

Designing High-Road Workforce and Investment Policies

A fair energy transition must guarantee not only employment continuity but also job quality. Experience from the U.S. Gulf Coast and European refinery transitions shows that workers who move into clean-energy jobs without wage and benefit protections suffer persistent income losses of 20% to 30%. Iowa should avoid this outcome by embedding high-road labor standards into all publicly

supported energy projects. These include prevailing-wage requirements, apprenticeship utilization targets, and strong safety oversight. Such provisions have been proven to reduce turnover, enhance productivity, and build durable local skills ecosystems.

Investment policy should mirror these labor principles. Done well, clustering clean-energy manufacturing, recycling, and research facilities on remediated coal sites can generate regional employment multipliers — meaning each direct job supports additional others in local services. Iowa’s eco-industrial park pilots could replicate this model by co-locating solar-component manufacturing, battery-assembly, and data-center operations at coal sites like Ottumwa and Louisa post-retirement. Integration with local public-utility infrastructure would keep tax revenues within host counties while reducing strain on transmission lines.

Philanthropy and Civic Leadership

Philanthropic and civic institutions are well positioned to amplify these efforts by providing the connective tissue between policy design and community implementation. Evidence from coal-region transitions in Germany’s Ruhr Valley and Spain’s Asturias region reveal that early public engagement can improve community satisfaction and reduce resistance to change. Iowa’s nonprofit ecosystem — from environmental to labor and faith-based organizations — is well positioned to play this role.

A fair energy transition must guarantee not only employment continuity but also job quality.

The transition of Germany’s Ruhr region unfolded over several decades and relied heavily on structured engagement among national and regional governments, labor unions, municipalities, and industry representatives. Coal and steel phase-downs were managed through negotiated agreements that paired closure decisions with advance commitments on pensions, retraining, and regional investment, enabling workers and local governments to participate in planning rather than

responding solely after decisions were made. Regional development agencies coordinated long-term land reuse, infrastructure investment, and education funding, including the redevelopment of former industrial sites through planning processes that involved municipal governments and social partners.

In Asturias, coal transition governance was formalized through Spain’s Just Transition framework, which established negotiated territorial agreements among the national government, regional authorities, municipalities, labor unions, and employers. The Just Transition Agreements were informed by local socioeconomic assessments and consultation processes involving workers, mayors, and civil-society organizations to identify priority investments and employment needs. A dedicated national Just Transition Institute coordinated implementation and provided technical assistance to local governments, helping smaller municipalities engage despite limited administrative capacity. Public participation was explicitly incorporated into both planning and implementation, and agreements specifying employment measures, retraining programs, and regional development projects were aligned with the timing of mine and plant closures.

Philanthropy can also fill crucial data gaps. The state lacks consistent longitudinal tracking of displaced workers, health outcomes, and environmental-remediation progress. Creating an open-access Iowa Energy Transition Data Portal would allow policymakers, journalists, and communities to monitor

transition metrics in real time. Transparency is both a democratic and economic asset: investor confidence in clean-energy projects rises when social-impact data are available and verifiable.

The Economic Dividend of Action

The economic dividend from an accelerated transition is substantial. In 2023, clean energy growth accounted for around 6% of GDP growth in the U.S. Just-transition programs yield long-term economic returns through increased labor participation, reduced health expenditures, and higher local multipliers. By those metrics, Iowa's transition is not a fiscal burden but a high-yield investment in public prosperity.

Iowa's path forward demands coordination among state, local, and private actors, underpinned by thorough planning and thoughtful investment. Establishing an Energy Transition Task Force and Fund, reforming utility operations, embedding high-road labor standards, and leveraging philanthropic capital together can form the institutional backbone of a fair energy transition. This agenda will not only decarbonize the grid but also strengthen Iowa's economy, rebuild its industrial base, and improve the health and well-being of the communities that power the state.

VI. Conclusion: A Just Transition for Iowa

Iowa's coal legacy is both a story of achievement and an urgent call to renewal. For more than half a century, coal-fired power plants supplied the reliable electricity that fueled the state's manufacturing base, powered its farms, and sustained hundreds of middle-class careers. Yet the same facilities that once symbolized progress now anchor Iowa to an increasingly uncompetitive and unhealthy past. The data are conclusive: coal generation is no longer cost-competitive, its externalities impose millions in avoidable health and environmental damages each year, and its continuation crowds out investment in the very technologies that could secure Iowa's next century of prosperity.

The state stands at a pivotal inflection point. Iowa's utilities spend more than \$200 million annually importing Powder River Basin coal — money that immediately leaves the state's economy — while wind, solar, and storage offer lower electricity costs and more local job creation and retention. The health analysis revealed a hidden burden of roughly \$110 to \$150 million per year in premature deaths, hospitalizations, and lost productivity, concentrated in the same counties that depend most on coal plants for tax revenue and employment. And the policy analysis outlines a path to replace this declining industry with a diversified portfolio of clean-energy resources and industrial redevelopment, while emphasizing community benefits and economic growth.

Transition, however, is not simply a matter of technology or economics; it is a question of fairness, foresight, and governance. If managed carelessly, plant retirements will likely replicate patterns of disinvestment that have hollowed out other industrial regions. But with deliberate planning, the transition can become a generational opportunity to rebuild Iowa's industrial heartlands. Well-funded, locally governed transition programs can help replace lost jobs as they improve public health and stabilize the economy.

Transition is not simply a matter of technology or economics; it is a question of fairness, foresight, and governance.

For Iowa, success will hinge on three commitments:

- 1. The state must recognize that the market alone will not deliver an equitable outcome.** Legislative action to create an Energy Transition Task Force and State Transition Fund and support robust labor standards and community benefit agreements would provide the coordination and resources that private actors cannot.
- 2. Utilities must align resource planning with economic reality:** transparent, integrated planning will reduce stranded-asset risk and free ratepayers from subsidizing uneconomic dispatch.
- 3. Communities themselves must be empowered as partners.** Decisions about site remediation, workforce training, and new industrial tenants belong as much to local residents and workers as to corporate boards or regulators.

Decisions made in the next few years will determine whether the benefits of the energy transition flow broadly or concentrate narrowly.

The broader dividends of such an approach extend well beyond the energy sector. Cleaner air and water will reduce chronic disease and associated health care spending. Investments in renewable manufacturing and grid modernization will diversify the state's economic base. Transparent, participatory planning will strengthen public trust in government at a time when civic confidence is fragile. In short, a fair energy transition offers not only a pathway to decarbonization but also a framework for revitalizing Iowa's social contract.

Scholars of industrial transformation often describe moments like this as "critical junctures" — periods when choices made within a decade can shape a region's development trajectory for generations. Iowa is in precisely such a moment. With foresight and coordination, the state can transform its coal communities from symbols of the old energy economy into models of 21st-century resilience, where clean power, dignified work, and community wealth reinforce one another. The challenge is considerable, but so are the rewards.

The decisions made in the next few years will determine whether the benefits of the energy transition flow broadly or concentrate narrowly. Iowa can lead the Midwest by proving that environmental responsibility and economic vitality are not opposing goals but two sides of the same coin. A deliberate, inclusive, and data-driven transition will ensure that when the final coal trains arrive, what replaces them is not absence but renewal — a cleaner grid, healthier communities, and a fortified economic future.

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Common Good Iowa is a nonpartisan, nonprofit organization built on a collective 50 years of experience of two respected Iowa organizations — the Child and Family Policy Center and Iowa Policy Project. Our team of policy advocates and researchers leverage reliable data, solid analysis and collaborative relationships to craft people-centered policy solutions for our state’s most pressing issues. Common Good Iowa informs smart policymaking to turn Iowa values — pragmatism, fairness, empathy and accountability — into concrete solutions that advance opportunity for all Iowans. Learn more at www.commongoodiowa.org.

Work on this report was supported by the **Iowa Environmental Council**, the largest and most comprehensive environmental coalition in Iowa, with the mission to achieve a just, healthy environment and sustainable future for all Iowans. Through education, advocacy, and coalition-building, IEC raises awareness, generates action, and creates large-scale change. Learn more at www.iaenvironment.org.