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Infrastructure Greenification Opportunities for the US Energy Grid

How ESG and Social Movements are Affecting Corporate Governance

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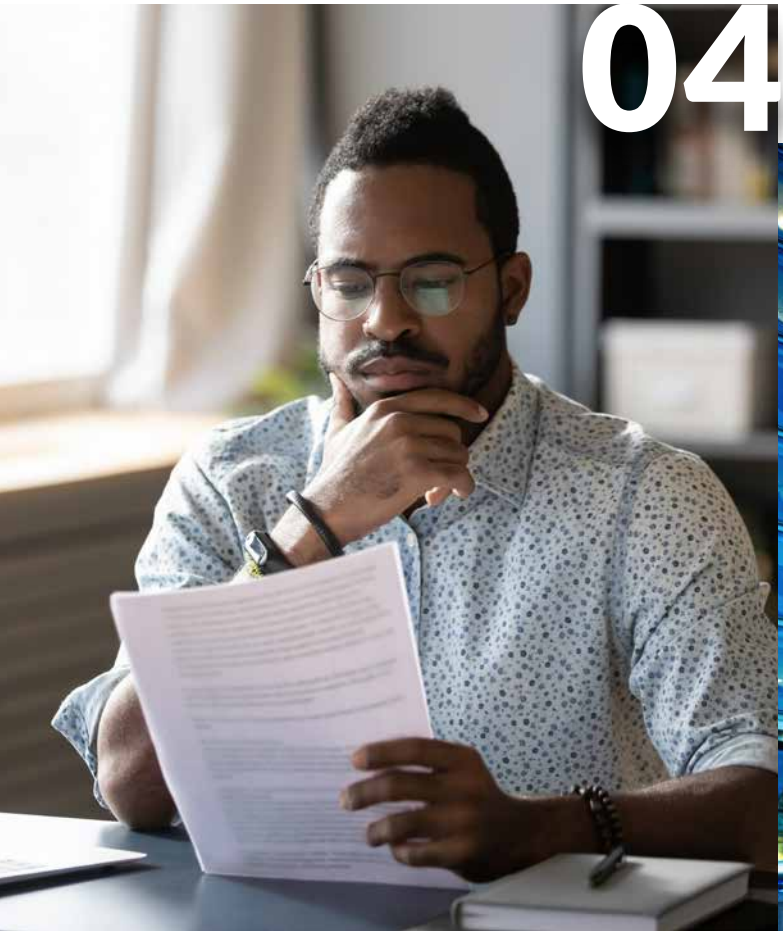


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Infrastructure Greenification Opportunities for the U.S. Energy Grid

In this article, the authors explain that as the Biden Administration lays out its vision for a clean energy future, a confluence of economic and policy factors is providing a unique opportunity to greenify the power grid's physical infrastructure by leveraging the economic opportunity in retired fossil power plants.

THE UNITED STATES IS ON THE PRECIPICE OF A WATERSHED moment for clean energy following the inauguration of Joseph R. Biden Jr. as America's 46th president. On the campaign trail and following his election and inauguration, President Biden has pledged and begun to implement an ambitious set of climate goals, striving to achieve net-zero emissions nationally by 2050,[1] with a goal of achieving carbon pollution-free energy generation by 2035, and to do so in a manner that encourages economic growth and environmental justice.

Federal energy policy under a Biden Administration stands to supercharge a transition already consuming the U.S. power sector, where a fleet of aging, carbon-intensive coal plants is moving rapidly to retirement. Between 2011 and the middle of 2020, American coal-fired power plants representing 95 gigawatts (GW) of capacity[2] were taken offline. While some of these shuttered generating stations have been converted to natural gas-fired plants, the majority have entered a state of limbo—ceasing operations but remaining unremediated and unutilized.

1. https://joebiden.com/climate-plan/. 2. https://www.eia.gov/todayinenergy/detail.php?id=44976.

While the rapidly expanding ranks of shuttered coal plants might initially call to mind images of blight and unemployment, there is opportunity lurking. As the number of old coal sites grows, developers, operators, and asset managers will have more opportunities to greenify these old assets, by converting them to renewable energy hubs and storage centers. By leveraging the physical attributes and advantages of these sites with a variety of policy incentives, greenification projects can pose an attractive opportunity to turn idling liabilities into new, clean, economically viable assets.

Greenification: The Basics

For a developer, operator, independent power producer, or asset manager, aging and shuttered fossil plants present a few clear models for redevelopment, depending on the stage of the plant's life cycle. For generating stations that have already ceased operating, a site can be acquired, remediated, and outfitted with new solar and battery storage; carbon capture and sequestration technology; clean hydrogen; or any other variety of clean energy equipment, much as with any other new facility.

The same financing incentives can be deployed as would be used in a greenfield project, including tax equity financing via the investment tax credit (ITC), the premium tax credit (PTC), the Section 45Q tax credit,[3] or other tax credits. Existing infrastructure with remaining useful lifespan (including technical infrastructure such as substations, but also run-of-the-mill infrastructure, such as roads and parking) can be repurposed and built into the new facility.

A plant need not be sitting abandoned for it to present an attractive greenification target. An alternative model might involve greenifying a site while it remains in operation. Under this model, a fossil plant could continue to operate during a gradual revitalization ramp-up period, all while continuing to generate cash flows from its existing operations. As the coal-fired units on site enter retirement, new power purchase agreements (PPAs) could be entered into for clean energy generation on the site, leaving the owner with two very different, but continuously operating assets.

Despite the radically different asset classes, each model can present an owner or operator distinct advantages over greenfield developments.

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3. 26 U.S.C.S. § 45Q.

Leveraging the Opportunity in Shuttered Coal Power Plants

Repurposing retired industrial sites—including for renewable energy development—is not a new idea. The U.S. Environmental Protection Agency (EPA) launched its Brownfields Program in 1995, and state programs followed, encouraging the redevelopment of polluted or potentially polluted sites through provision of grants, technical assistance, and, following the passage of amendments to the Comprehensive Environmental Response, Compensation, and Liability Act in 2002, certain limitations on federal environmental liability.

Retired coal plants have already garnered some redevelopment interest in the United States. In 2018, Google broke ground on a new, $600 million data center, sited on the campus of the Widows Creek fossil plant in Jackson County, Alabama, a 1.6 GW Tennessee Valley Authority-operated facility that was shuttered in 2015.

But the repurposing of coal plants specifically for clean energy generation, storage, and technology is a separate, growing phenomenon, with some attractive benefits for the right participants. The benefits and potential opportunities available to greenification projects include:

- **Existing infrastructure**. While coal-fired plants themselves may continue to become outdated and uneconomical to operate, the existing transmission infrastructure associated with these power stations can be utilized and repurposed. In practice, utilizing a plant's existing interconnection and transmission infrastructure and the ability to avoid initiating a new interconnection process solves one of the biggest complications facing clean energy projects today—obtaining access to the grid. And while greenfield renewables projects frequently struggle with the lack of transmission infrastructure to bring power to load centers, dated fossil plants largely present the advantage of being sited in or near urban areas.
- **Location, siting, and permitting**. Unlike with greenfield projects, greenifying an existing power station means that the project site will already be zoned for industrial use and (likely) owned by a single landowner, significantly easing the site acquisition phase of project development (though additional environmental permits may be needed, depending on remediation and development activities).

  In addition, the fact that many existing structures are located near energy and transportation hubs provides unique geographic advantages. For example, in the burgeoning offshore wind industry, certain developers have already begun exploring opportunities to acquire retired generating

stations located near the coasts to store the energy generated offshore (through rapidly advancing storage technology) that will inevitably face complications coming onshore and online.

- **Cost opportunities**. While every plant and potential transaction will have its own unique cost considerations, as a general matter there is economic opportunity in greenifying distressed or soon-to-be distressed assets. Sites themselves can be obtained for as little as one dollar,[4] financed or refinanced, and revitalized at a fraction of typical development costs.

  As discussed above, existing infrastructure can be repurposed for the new facility, cutting construction costs. These savings come on top of a trend of falling development costs for clean power installations, where the price of components (including photovoltaic panels and batteries) continues to fall and clean tech capabilities (including clean hydrogen and carbon capture utilization and storage (CCUS)) are accelerating.

- **Emergence of storage, carbon capture, clean hydrogen, and related technology**. Another recent trend making greenification an economic reality is the booming technological advances and practices in the energy storage, CCUS, and clean hydrogen businesses. The storage market in the United States is growing exponentially, and it will only continue to grow as technological advances emerge (such as long-duration battery storage), larger batteries get built, and costs continue to fall.

  Relatedly, following the Internal Revenue Service's recent clarification of the 45Q tax credit for carbon capture and sequestration project and President Biden's recent executive orders on climate change, the U.S. carbon capture industry could also see significant growth in the coming years.

  Clean hydrogen, likewise, is becoming increasingly viewed as key to a net-zero emissions economy due to its potential industrial and transportation applications. While the economics of clean hydrogen remain difficult, certain utilities and project developers, such as NextEra, are already pursuing greenification projects at retired coal plants, or updating existing natural gas plants, to use turbines that can be powered by natural gas in the short term with the goal of converting completely to clean hydrogen in the long term.

- **Community buy-in and environmental justice**. Among the primary motivations for the EPA Brownfields Program were complaints that abandoned brownfield sites were a physical blight on communities, and shuttered coal plants are no exception. One of the most beneficial aspects of greenifying idle plants is that it allows generators to develop community buy-in.

  In today's environmental, social, and corporate governance-driven investing world, replacing a polluting power source with clean power can help achieve buy-in from the full range of stakeholders: from local community members to shareholders.

4. https://www.enchantenergy.com/farmington-agreement/.

Federal and state incentives—including tax credits offered by a number of states for remediation and redevelopment of brownfields—may further support the economics of greenification projects.

Government Programs Can Help

One critical advantage of greenification projects is the broad variety of government incentives that may be available to them. A number of state and federal programs exist specifically to promote the redevelopment of brownfields and the revitalization of the communities in which they are sited.

These programs are likely to receive renewed focus under the Biden Administration. In one of the Administration's first climate actions, an executive order on "Tackling the Climate Crisis at Home and Abroad," the federal government was specifically directed to coordinate efforts on turning idled dirty energy assets into "new hubs for the growth of our economy." Among the government programs and incentives already in existence today are:

- **RE-Powering America's Lands**. The RE-Powering America's Lands program,[5] launched in 2008, has established itself as a clearinghouse for information about these projects by identifying sites, commissioning feasibility studies, convening stakeholders, and promoting the use of liability comfort letters. The RE-Powering program also maintains a compendium of renewable energy projects on contaminated lands, identifying 417 such installations to date (though only two such projects are sited on retired coal-generating facilities).
- **POWER initiative and the Appalachia Regional Commission**. In 2015, the Obama Administration launched the multi-agency Partnerships for Opportunity and Workforce and Economic Revitalization (POWER) initiative, aimed at revitalizing communities suffering economically from the decline of the coal industry. While much of the POWER initiative has lain dormant since 2016, the Appalachia Regional Commission (ARC)[6] has continued to receive funding to implement the program and could be a program revitalized through its grantmaking authority by the Biden Administration. ARC has used its grant-making authority to aid a number of coal plant conversion projects.
- **Federal and state tax incentives**. Federal and state incentives—including tax credits offered by a number of states for remediation and redevelopment of brownfields—may further support the economics of greenification projects. These tax credits would be on top of any ITC, PTC, or 45Q tax incentives that a project may be eligible for, as well as any state-law renewables incentives.
- **Department of Energy Loan Programs Office**. Pursuant to the Title 17 Innovative Energy Loan Guarantee Program (and other programs specifically related to the automotive sector and tribal lands), the Department of Energy Loan Programs Office (LPO) has more than $40 billion in loan and loan guarantee authority to help develop innovative energy projects in the United States. Greenification projects involving renewable energy technology or CCUS could potentially take advantage of an LPO loan or loan guarantee.

With the release of its American Jobs Plan in March 2021, the Biden Administration specifically called for increasing the capacity of these and other government programs to engage with these projects. The American Jobs Plan pointed to the Economic Development Agency's Public Works program and HUD's Main Street program, both of which provide government grants for municipal-level revitalization projects. An increase in federal grant dollars for economic redevelopment may lead to increased pressure from communities themselves to bring former generating facilities into productive use.

An Early Model for Success

While the opportunities to greenify retiring coal stations are growing rapidly, only a handful of these projects have been developed to date in the United States.

One of the early successes has been ENGIE North America's redevelopment of Mount Tom station in Holyoke, Massachusetts. The 146-megawatt (MW) coal plant, originally built in 1960, powered down in 2014, and was immediately targeted by the city of Holyoke for redevelopment. The resulting redevelopment took only four years, with ENGIE opening a six-MW solar farm on the site in 2017 and a three-MW integrated storage system (at the time, Massachusetts' largest) the following year.

The greenification of the Mount Tom site was made possible by the right alignment of opportunities and incentives. The Massachusetts Clean Energy Center—a state economic development agency—provided early technical assessments and assisted in convening stakeholders on the site's redevelopment. Transmission infrastructure was repurposed, allowing easy interconnection with the grid.

5. https://www.epa.gov/re-powering. 6. https://www.arc.gov/.

On the money side, tax equity financing was put in place for the redevelopment, and Massachusetts' renewable portfolio standard helped pave the way for the project's 20-year PPA with local utility HG&E.

The model may be rapidly scaling for success. In January 2021, rapper-turned-solar developer Akon announced the creation of the Black Sunrise Fund, with an initial investment of $725 million, dedicated to recommissioning coal plants as solar energy facilities.

Similarly, just recently, J-Power and Fortress Investment Group have partnered on the development of a greenification hub on the site of the Birchwood coal plant in King George County, Virginia.

Some Key Issues Remain

Though greenification projects carry a number of advantages, as with any new project type, developers will need to work through some key issues.

The elephant in the room, of course, is environmental liability. While state and federal brownfields programs provide some comfort here, parties will need to carefully consider how known and unknown environmental liabilities are priced into and segregated within these transactions. With public support for greenification coming directly from the Biden Administration, it is not unreasonable to suspect that further incentives relating to environmental matters could be on the table for parties willing to take on such revitalization projects.

Financing considerations will also need to be addressed. Despite existing brownfields policies, lenders may remain skittish about the prospect of potential exposure under state and federal environmental laws. And even where a developer is greenifying a site it already owns, it may need to navigate its own financing covenants—either funding the greenification project with equity or convincing its lenders to assume a new type of project risk.

Finally, despite the various economic advantages, greenification results in a new scale of project. Only portions of a given site will be suitable for renewables development, and the resulting projects are likely to be a fraction of the capacity of the original plant, leaving a fundamentally different project in its place.

Takeaways

As the Biden Administration lays out its vision for a clean energy future, a confluence of economic and policy factors is providing a unique opportunity to greenify the physical infrastructure of the U.S. energy grid. As more fossil plants continue to shutter, there will be increasing opportunity to repurpose the valuable infrastructure that has tied them to the grid for decades at attractive costs. A solar, storage, and carbon capture industry that is rapidly growing cheaper and more versatile is primed to seize the moment. And with a new administration that has organized itself on the principle of building back into a clean energy future, developers and operators may find themselves with very willing governmental partners.

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