



# Building a Sustainable Future for General Electric in Schenectady, New York & Lynn, Massachusetts

**An Analysis of US Industrial Policy and Supply Chains in Defense Contracting and Energy Systems**

November, 2021

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# EXECUTIVE SUMMARY

## Introduction

In Fall 2020, the congressional delegations that represent Schenectady (NY) and Lynn (MA) wrote to General Electric to express their alarm at GE's ongoing disinvestment in both locations. They urged GE to engage in a joint improvement study with labor and community organizations to secure the viability of GE's plants in the company's founding cities. GE declined to participate.

The Cornell University School of Industrial and Labor Relations and the UMass Boston Labor Resource Center took up this appeal and assembled a team of experts to carry out this study without GE's support. Our focus on the GE plants in Lynn and Schenectady revealed that the trajectory of these facilities is not unique. These plants serve as essential case studies for GE's corporate strategy and US industrial policy in defense contracting and energy systems.

Our full report includes detailed studies of GE's history, current practices, and future prospects in Lynn and Schenectady. At the national level, we investigate GE's manufacturing strategies and plant closures across the US; the extensive government subsidies and contracts GE receives; and how GE executives and board members have extracted value from the company instead of re-investing in production and innovation. Finally, we analyze GE's role in two issues of pressing concern to our President and Congress: 1) the inherent risks that globalized supply chains pose to our national security and defense industrial base; and 2) the need to grow our domestic renewable energy sector – from production through generation – to combat climate change.

General Electric has come under much criticism over the past decade, and our findings largely reflect the validity of these critiques. Our work shows that GE's trajectory in Schenectady and Lynn, mirrored by plant closures and workforce reductions nationwide, is unsustainable. At the same time, we show how GE's production and profits are shaped by federal contracts, subsidies, and the policies surrounding them. These piecemeal policies do not, at present, constitute a coherent industrial vision for the US, nor do they incentivize sustained investment in domestic manufacturing.

Despite these very real challenges, we believe the company, labor, and government can chart a better path, one that expands profitable production in Lynn and Schenectady and positions GE to lead the reshoring of manufacturing and the domestic production of renewable energy systems. To build back better in Lynn, Schenectady, and the US more broadly, we urge GE to modernize and re-invest in its historic manufacturing sites. We urge our elected leaders to strengthen existing provisions and programs and to embrace new strategies that will ensure work subsidized or contracted by the US government generates sustainable, robust investment in US manufacturing. Doing so will re-invigorate economies and communities in Lynn, Schenectady, and across the US.

## Findings

### 1. GE's approach in Schenectady and Lynn is hollowing out these plants and cities, which GE is doing in facilities and communities around the nation.

- GE has outsourced, offset, and transferred products around the world and cut production personnel by 90% in Schenectady and Lynn since the 1980s.

- GE has not fully modernized these plants despite generous contracts and subsidies from every level of government and clear evidence that both sites retain skilled workforces and locational advantages for industrial production in the US.
- In 1989, GE employed 277,000 people in the US, 29% of whom worked under union contracts. By 2009, GE employed 134,000 people in the US, 15% of whom were unionized, and by 2019, GE employed only 70,000 people, 9.6% of whom were unionized.
- This is not a simple “rust-belt/sun-belt” or “blue-state/red-state” story: GE and its suppliers have recently closed plants in [Virginia](#), [Ohio](#), [Georgia](#), [Arkansas](#) and [South Dakota](#), and have transferred work away from sites in [Kentucky](#) and [Kansas](#).

## **2. GE’s manufacturing strategy is not simply driven by costs. Rather, GE responds to international and domestic political pressure in locating new plants and jobs.**

- GE’s manufacturing profits come from service and maintenance contracts, not initial sales of equipment (e.g. turbines, jet engines). GE moves work – domestically and globally – to generate the political capital it needs to secure such contracts.
- When GE purchased Alstom’s power business in 2015, the French government stepped in to preserve French jobs and plants. GE’s own evaluations showed its power business in Schenectady was far more efficient, but the company obliged. GE Renewable Energy [launched with a federal grant in Schenectady in 2011](#); it is now [headquartered in Paris](#).
- Last year, [political pressure](#) on the Tennessee Valley Authority (the nation’s only federally-owned power generation authority) kept GE from outsourcing turbine work from Schenectady to Poland, as GE had originally intended.

## **3. Building a sustainable future for GE in Schenectady and Lynn demands political action to ensure government contracts and subsidies generate domestic manufacturing jobs.**

- Taxpayer dollars – in the form of government contracts and subsidies – have bankrolled GE’s transient approach to manufacturing. Profits from military aviation contracts fund GE’s outsourcing of parts in its commercial aviation business, while massive subsidies for wind energy have fueled GE’s global growth in renewables.
- Meanwhile, cities including Schenectady and Lynn have been left to bear the social and economic costs of disinvestment while GE’s ever-expanding supply chains generate inherent national security risks and contribute to climate change.
- We need new legislation, regulation, and executive action to re-shore supply lines and generate domestic investment in manufacturing, particularly of wind energy systems.

The workers and communities whose taxes bankroll GE deserve stable, sustainable investment from GE in return. Work can be brought back to the US if voters and political leaders condition new business for GE on the company’s commitment to build back better here. Under CEO Larry Culp, GE has [recommitted to its “core four” industrial business](#). The question is not whether GE is still an industrial company. It is whether GE is still committed to industrial production at its plants in the US, and whether we have the political will to ensure that commitment.

## Recommendations

### 1. We urge GE to join in an independent study of its operations in Schenectady and Lynn.

- Such a study would demonstrate the capacity of these plants to bring back work that is currently offset or outsourced and confirm the need, and potential, for investment.
- Findings could be used to shape policy and presented at Congressional hearings.

### 2. We urge GE to fully re-invest Schenectady and Lynn as “brilliant” factories.

- Since 2014, GE has celebrated the opening of “brilliant factories” around the world that combine “four pillars”: lean manufacturing, technological advances/automation, 3-D additive printing, and connectivity through digital threads.
- In Lynn and Schenectady, GE reports that they are engaged in lean manufacturing, but without the other three pillars in place, this does not constitute substantive reinvestment.
- GE tags its reports on brilliant factories with “[Factory of the Future](#).” The company built an “[Automated Factory of the Future](#)” to much fanfare in Lynn in the early 1980s but closed it in 1992. GE should include Lynn and Schenectady in its new vision for the future.

### 3. We urge GE and Congress to invest in supplier parks in Schenectady and Lynn.

- GE has long incentivized its suppliers’ choices of location, including [urging US suppliers to move to Mexico](#) after the passage of the North American Free Trade Agreement (NAFTA).
- GE could build state-of-the-art manufacturing facilities for itself and turnkey facilities for its suppliers on the company’s Lynn and Schenectady properties. These could include additive manufacturing equipment, as the company is doing with [the US Air Force in Oklahoma](#).

### 4. We urge Congress and the President to investigate whether products and parts GE makes overseas for US government contracts can be made at these plants.

- In both the bipartisan infrastructure bill and new rule-making, the President and Congress are moving to strengthen existing provisions, including [Buy American](#), Buy America, the Jones Act, and Title III of the Defense Production Act.
- We urge lawmakers to expand and strengthen enforcement of measures that give preference to domestic suppliers of defense goods, and to increase domestic content requirements in all federal procurement, as well as in subsidies and tax waivers.
- Congress is also moving to freeze and reduce the use of waivers for domestic production. Hearings on domestic manufacturing and these waivers, in particular, are warranted.

### 5. We urge Congress to enact new policy instruments to ensure that receipt of government contracts leads to re-investment in American manufacturing

- Rather than simply urging companies like GE to build and buy American, Congress could require that a percentage of profit from government contracts be re-invested in US manufacturing, so as to ensure that GE’s historic domestic plants are as modern, productive and efficient as their newer overseas factories.

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**Congress could require that a percentage of profit from government contracts be re-invested in existing US facilities.**

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- Congress could consider the effort, led by Sen. Chris Coons of Delaware, to charter an [Industrial Finance Corporation](#) to support manufacturing growth domestically,

**6. We urge Congress to [ban stock buybacks](#) and to allow workers to elect one-third of their companies' boards of directors to end predatory value extraction at GE and beyond.**

- From 2014-2016, GE generated a profit of \$17.9 billion, but distributed \$26.6 billion in dividends (148% of profit) and \$27.5 billion in stock buybacks (another 153% of profit).
- From 2017-2019, GE incurred a total loss of \$33.1 billion, yet distributed \$13.8 billion in dividends and \$3.8 billion in buybacks.
- Congress should pass the [Reward Work Act](#), proposed by Sen. Tammy Baldwin (D-WI) in the [Senate](#) and Reps. Jesus “Chuy” Garcia (D-IL) and Ro Khanna (D-CA) in the [House](#).

**7. We urge Congress to link subsidies for developing renewable energy capacity to US manufacturing.**

- Power purchase agreements, federal grants, tax credits, and subsidies that drive privately funded wind-energy projects should be tied to “local content requirements” (LCRs) and supply-chain standards in order to build a robust domestic wind energy sector.
- The Biden Administration has [proposed \\$10 billion for new IRC Section 48C tax credits](#) to fund advanced energy manufacturing projects in its [FY 2022 Budget Proposals](#). Expanding this program, with updated domestic content requirements, is an excellent place to start.
- It is no accident that the Tennessee Valley Authority – the only federally owned power authority – was able to convince GE to manufacture turbines for TVA plants domestically. To replicate this success, Congress and the President should expand their oversight of private power providers so that elected representatives can demand domestic production.

**8. We urge Congress to enact new policy instruments to build a domestic wind energy sector from production through installation and generation.**

- Congress could explore use of the existing [200 mile coastal conservation zone](#) – whose [origins demonstrate](#) that this zone was meant to be a space for the protection of national security and economic interest – to create a federal permitting process, with domestic content and job requirements, for the sourcing and installation of offshore wind farms.

Some of our recommendations concern existing legislation or proposals, while others seek to reimagine US industrial policy on a broad scale. As detailed in our full report, the scale of the challenges facing GE plants and their communities across the nation is vast. Nonetheless, with coordinated action from the company, labor, community organizations, and government, we believe GE can serve as a model for the rebirth of a domestic manufacturing sector that secures the health of our communities, our national security, and the future of our environment.

# HISTORY

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## **IV Origins of the Crisis: A Brief History of Disinvestment**

Deindustrialization is a familiar story in the United States, but GE, as a corporation, has not deindustrialized. In March 2020, [CEO Lawrence Culp announced the sale of GE Capital Aviation Services](#) as a “transformational” moment for the company, allowing it to focus on its “core four industrial businesses.” GE has signed massive contracts to provide turbines to [offshore wind farms in Massachusetts](#) – as the White House [signals increased investment](#) in this industry and region – and [on-shore facilities in Oklahoma](#). GE has invested in major research and production centers in [India](#) and [Vietnam](#) and production facilities in [France](#) and [Brazil](#). GE has also announced [a next-generation engine](#) to succeed its long-running T700 helicopter engine, which is currently manufactured in Lynn. The question is not whether GE is still an industrial company, but whether it is still committed to industrial production at its existing plants in the US.

Schenectady and Lynn were joined at GE’s founding in 1892 and served for decades as hubs for two of GE’s most profitable industrial businesses: Power (Schenectady) and Aviation (Lynn). These plants spanned hundreds of acres and employed tens of thousands of workers, who moved products from concept to reality and took advantage of multimodal transit to ship them around the nation and across the world. GE paychecks fueled the local and regional economies of both cities for several generations. Today, however, GE employs 800 unionized hourly production workers in Schenectady, down from nearly 30,000 in 1970, and 1,200 such workers in Lynn, down from 13,000 in 1985. GE’s demolition of buildings at these once-proud plants mirrors the decline that the company’s disinvestment has wrought outside the plant gates in these industrial cities.

Lynn’s story is instructive. GE built the first jet engine in the United States in 1941 at the River Works plant and has been producing engines there ever since. However, since its peak as a jet engine manufacturer in the mid-1980s, the Lynn plant has witnessed a steady stream of outsourcing, offsetting, transfers of work, and outright cuts. Throughout the 1990s, GE took advantage of new trade laws – particularly the North American Free Trade Agreement (NAFTA) – to move production out of the country and to encourage its suppliers to do the same. This effort culminated [in a supplier conference in Monterrey, Mexico, in 1999](#), at which GE demanded 10-14% price reductions. GE offered to help its suppliers meet these targets by moving to Mexico, going so far as to offer suitable space, new machinery, and workforce recruitment and training. GE plants, and those of their suppliers, downsized or shut their doors across Massachusetts and the US as a result. While the Lynn River Works survived, the work done at the plant has dwindled both in size and scope. Today, far fewer workers produce fewer parts for fewer engines, and GE no longer produces turbine components in Lynn. In addition to the negative impact of downsizing on the local economy, this narrow focus leaves the plant vulnerable to shifts in demand.

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Throughout these years of decline, workers and their union in Lynn have willingly partnered with management to adapt. From early [pilot programs in computer-managed production](#) in the 1960s and 1970s through the construction of the “[factory of the future](#)” in the 1980s and launch of “[team](#)” [production](#) in the early 2000s, the workers of IUE-CWA Local 201 have repeatedly endeavored to work with GE. Their international union today employs a lean manufacturing expert ready to take part, alongside independent evaluators, in efforts to revitalize production and profitability in Lynn.



## FINDINGS

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### **V Disinvestment & Managerial Disarray: A Performance Study of Lynn River Works**

Our research at the Lynn River Works indicates that GE is treating the Lynn facility as a mature business with a limited future. GE appears to be diverting any positive cash flow from Lynn to fund other domestic and foreign growth opportunities while failing to include Lynn in its modernization and high investment strategy. As noted above, this failure to include Lynn in business expansion and modernization, and particularly GE's unwillingness to invest in new technologies at the River Works, appears to condemn the Lynn site to a spiral of failure.

This overall approach is revealed by GE's drive to outsource Lynn's work to foreign facilities. Over the past 50 years, a steady stream of value-added work, along with the associated work hours, has been moved to plants all over the world, systemically damaging Lynn's profitability and long-term viability. IUE-CWA Local 201, representing the hourly employees in Lynn, has vigorously resisted these moves, offering production improvements and even concessions to persuade management not to farm work out, but to no avail. The Lynn facility is increasingly dependent on an ever-widening supply chain, a network of parts and systems providers that leave the plant vulnerable to regional conflicts and disruptions.

Declining direct labor needed to offset the overhead expenses associated with support services and underutilized space will eventually make it appear the Lynn facility is not economically viable. However, if Lynn becomes economically unviable it will be because GE has made intentional decisions not to invest in Lynn, not to modernize Lynn, and not to expand Lynn's business. It is abundantly clear to us that the union and conditions in Lynn are not the problem.

In 2019, GE Aviation generated \$32.9 billion in revenue, nearly 40% of GE's total revenues and almost 62% of its profits. Work with commercial customers generated \$24.2 billion in revenue, while work for the US military, the core of Lynn's production, brought in \$4.4 billion. The division employs about 45,000 people worldwide, 25,000 of whom work in the US. Since 2010, GE has invested over \$4.3 billion in its Aviation Division in the US and another \$1.1 billion abroad. The company has opened or modernized at least seven facilities in the US, as well as operations in Romania, South Korea, India, Italy, and Turkey. Investments have included additive (3D) manufacturing, digital engine monitoring, and electrical distribution.

However, since 2017, GE's annual investment in Lynn has only once topped \$20 million (\$21.1 million in 2019), with \$36 million scheduled for 2021. Lynn's hourly workforce has declined almost 34% since 2009, from 1,900 to 1,200 today (the plant employed nearly 3,000 hourly workers in 1996 and roughly 13,000 in 1985). As longtime highly skilled workers take early retirement, GE has hired replacement workers at a lower wage structure, resulting in skills and experience mismatches with the plant's aging equipment. Sophisticated lathes for cutting high-strength steel are more than 15 years old; many are in disrepair, sitting idle or underutilized. Deteriorating equipment makes it harder to hold critical tolerances when making precision parts, resulting in higher reject and scrap rates that drive up costs and lower the plant's competitive position.

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**GE's unwillingness to invest in new technologies at the River Works appears to condemn the Lynn site to a spiral of failure.**

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Joint efforts by the local union and local management have kept Lynn competitive – lowering costs, improving efficiency and meeting on-time delivery – but GE’s ongoing disinvestment in the plant makes for an uphill struggle.

## **VI Potential for Renewable Energy Systems Production and Multimodal Distribution at Schenectady and Lynn**

As world energy production shifts to renewable energy sources and systems, there is a smaller market for the type of generators currently produced at the Schenectady plant (for which Lynn historically produced parts, as well). Nonetheless, both facilities offer optimal opportunities for expansion and investment in the production of clean energy power generators because of the skill mix of their workforces, their existing plant equipment, and their strategic geographic locations.

The [sprawling General Electric \(GE\) campus in Schenectady](#) is encircled by the Mohawk River in the north, I-890 in the north and east, and local and national freight rail lines in the west and south. To use terminology from transportation geography, the campus is embedded in a [multi-modal freight distribution network](#) (see image in Appendix). In general, access to multiple modes of transportation in one place allows firms to reduce costs and realize efficiencies in shipping and receiving freight. In that way, multimodal networks can help lower the [friction of goods distribution](#).

Beyond this strategic locational importance, GE’s broader Capital Region (Albany, NY) sites include the firm’s [onshore wind business headquarters and engineering office](#), its [global wind turbine repair innovation lab](#), and a [newly-renovated factory facility with centers of excellence for turbine and generator engineering](#). In other words, GE is already equipped to bring what it calls “[the future of wind energy](#)” to life at its Capital region facilities, through its Capital region workforce. The region therefore appears to be *well-positioned* to absorb new wind production operations.

GE’s Capital Region campus and existing workforce are well-suited to produce Wind Turbine components. GE has multiple designs and offshore wind products, including the Haliade 150-6MW and the Haliade-X offshore turbines. The workforce at the Schenectady facility has extensive experience in building large turbines and the logistical expertise to transport generating equipment. The skills from decades of building turbines along with additional training would be a national asset for the production of the Haliade nacelles (turbines) for large scale offshore wind production.

The Lynn River Works is effectively embedded in a multimodal freight distribution network, as well. The plant sits less than ten miles from Logan International Airport, Interstate 95 (the most important highway on the East Coast), the Port of Boston (where a significant expansion is [nearly complete](#)), and multiple freight rail terminals and lines.

While Lynn’s workforce does not currently produce energy generation components, it has historically done so given the overlapping skills and equipment involved in producing turbines both for jet engines and energy generation. Despite building demolition and some property sales, GE retains ample space on the site for investment.

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**Building supplier parks on the Schenectady and Lynn campuses would enable large scale wind turbine production on the East Coast.**

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Building supplier parks on the Schenectady and Lynn campuses would enable large scale wind turbine production on the East Coast of the United States, bringing jobs and much needed technological investment while dramatically lowering transportation and logistical costs. Aerial maps of both sites show the potential for collaborations between the two facilities, indicating their access to multiple modes of transportation, including large waterways that can facilitate transportation of heavy parts and equipment (See Appendix).

## **VII Unmoored Factories: GE's Industrial Production Strategy in the United States**

The phenomena we studied in Schenectady and Lynn are not unique to these plants, nor are they explained by traditional stories of decline in unionized, “rust belt” cities in “blue” states with strong labor protections. Reports from GE plants across the country, including those in “red” and “sun belt” states with right-to-work laws, demonstrate similar processes at work. Between 2009 and 2019, GE’s total US workforce declined from 133,000 to 70,000 workers. While some of this decline is explained by the sale of GE divisions including Appliances and Transportation, outsourcing and offshoring have played significant roles. Former GE CEO Jack Welch famously declared “ideally, you’d have every factory you own on a barge.” While GE does not yet have this ability, its approach to industrial production in the US reflects Welch’s exhortations to transience.

In the past five years alone, GE has shuttered several factories in the United States. At GE’s established plant in [Salem, Virginia](#), the workforce dwindled from 3,500 to less than 300 before GE shifted remaining work on components for its renewable energy business to China and India in 2016. In [Waynesboro, Georgia](#), over 200 workers in renewables were victims of consolidation in 2019, while nearly 500 workers lost their jobs in [Little Rock, Arkansas](#) making blades for wind turbines in 2020. A GE supplier, [Molded Fiber Glass](#), is [shutting down in South Dakota](#), at a cost of 300 jobs, even as [GE supplies 92 turbines](#) to the Triple H Wind project in the state. This constant churn devastates workers and communities and hampers the building of a domestic wind industry.

On the Aviation side, the GE plant in Madisonville, Kentucky and repair facility at Strother Field in Kansas have witnessed offsets, work transfers, and hiring cancelations similar to those in both Schenectady and Lynn. While some of these issues [are the result of the COVID-19 pandemic](#), workers at these plants rightly understand them in the context of long-running disinvestment. Highly skilled, unionized workers in Madisonville prototyped high-volume, high-profit-margin parts for the GE-90 engine in 2014 and 2015, only to see this work outsourced at the cost of 250 jobs. At Strother Field, [David Norton left GE become Plant Manager at Mint Turbine in Oklahoma](#) in 2019 after 30 years with GE Aviation and most recently as the business leader of General Electric’s Engine Services Passport/CF34 new production line in Arkansas City. Outsourced work followed him there in 2021, highlighting the continued degree of control GE exercises over its suppliers. As in Lynn and Schenectady, what these facilities need is long-term investment of the kind [GE and the US Air Force have announced at Tinker Air Force Base in Oklahoma](#). Reinforcing the point that GE’s moves are political, the company has now made two major investments in Oklahoma since Senator Jim Inhofe became chair (now ranking member) of the Senate Armed Services Committee.

GE’s helter-skelter moves around the nation and the globe are not primarily driven by a search for the lowest labor rates to reduce production costs, as the standard narrative might suggest. While marginal gains of this kind play a role, the principal driver is GE’s overall profit strategy over the

past thirty years, as outlined by Thomas Gryta and Ted Mann in their book *Lights Out*. As these two *Wall Street Journal* reporters explain, “It was in servicing industrial machinery – not in selling it – that all the profits lay.” Winning long-term service and maintenance contracts has consistently proven far more important to GE’s profits than making individual products more cheaply.

The essential role service contracts play in GE’s manufacturing profits explains much about the company’s behavior. CEO Larry Culp’s focus on the company’s “core four” industrial businesses – power, aviation, renewables, and medical equipment – is a focus on the four businesses that general such contracts and profits most reliably. GE’s sale of its appliance division in 2016 and its lighting division in 2020 (with GE’s branding still attached to both divisions for decades to come) are likewise explained by the lack of long-term service contracts in these industries. The loss of eighty-one jobs at the former GE facility in Bucyrus, Ohio is a direct consequence of these moves.

GE’s moves jobs and plants as part of its drive to secure service contracts. Winning new contracts for GE products and service – particularly from domestic and international state entities including militaries and power authorities – requires political support. Locating a plant – and the jobs it provides – in a particular place generates goodwill that GE leverages into political power, which in turn helps the company expand its market share. GE has not abandoned Lynn, Schenectady, Waynesboro, or Little Rock primarily because labor costs there are too high or the plants are uncompetitive. Rather, GE has taken work to the places in which GE jobs will generate the most political capital. This makes it all the more imperative for elected politicians to wield power and shape policies that keep GE’s US workforces stable and growing roots, not floating away.

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**GE has taken work to the places in which GE jobs will generate the most political capital.**

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## **VIII Heavily Subsidized Disinvestment: GE’s Record of Government Subsidies**

With its diverse subsidiaries and far-flung US operations, General Electric has a long history of seeking government subsidy awards, mainly tax breaks. As tallied in [Good Jobs First’s Subsidy Tracker database](#), GE has received subsidies from local, state, and federal agencies with a combined value of nearly \$2.2 billion over the past twenty years. About two-thirds of those dollars are federal, including grants for its nuclear energy division, for turbine development, aid from the American Recovery and Reinvestment Act, and Pentagon engine research.

Some state and/or local packages involve multiple kinds of tax breaks, grants and discounts. Under the terms of a 2014 Cincinnati, Ohio deal, for example, GE workers are effectively “paying taxes to the boss” because a projected \$75.6 million of their state and local income taxes were awarded to the company. The City also gave GE a 100% property tax abatement for 15 years, worth another \$12.5 million, and \$10 million more was awarded in training grants and parking discounts, for a total of more than \$98 million.

US subsidies, while generous, do not amount to a comprehensive industrial policy that takes account of workers’ interest, especially when compared to other countries. In 2011, GE received a [federal grant worth \\$5 million and a package of tax breaks to start a renewable energy business in Schenectady](#). However, when GE purchased Alstom SA in 2015, the French government stepped in to preserve French jobs and facilities. Despite GE’s own internal evaluations showing that its Schenectady-based Power business was [much more efficient](#), GE obliged to make the sale, [moving its renewable energy production headquarters to France](#) despite growing US demand.

GE Renewable Energy has since garnered enormous profits indirectly from US production tax credits for wind energy. One [study from the Texas Public Policy Foundation](#), using US Energy Information Agency (EIA) data, found that the US government offered tax relief in excess of \$25 billion dollars to energy companies between 2007-2016, and is set to offer more than \$48 billion through the end of the program (which the Biden Administration has proposed extending). According to the EIA, GE is the single largest provider of turbines for installation to the US market, accounting for 40% of production in 2018. The company's sales of renewable energy products and service contracts attached to them were supercharged by these tax credits, despite the fact that many of these components are not manufactured in the United States.

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**GE's sales of renewable energy products and service contracts were supercharged by tax credits, although many relevant components are not manufactured in the United States.**

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Finally, while GE implemented cuts across many divisions in response to the COVID-19 pandemic, the company's executives benefited from government largesse yet again. The Federal Reserve [purchased millions of dollars of GE's corporate bonds](#), along with those of other companies, in an attempt to keep Americans employed during the pandemic. Instead, the result was that the Fed [juiced stock prices](#) during a recession, helping net [a \\$47 million bonus](#) for GE CEO Larry Culp as the company continued to cut jobs and ship them overseas.

While government contracts, subsidies, tax relief, and monetary policy have all proven essential to GE's bottom line, they have not generated sustained investment in US workers or communities.

## **IX Predatory Value Extraction over Investment: Corporate Decision Making at GE**

General Electric provides a prime example of how corporate governance under the thumb of activist investors destroys existing American jobs while [undermining the capability of a major business enterprise to invest in innovative products](#) that can create new employment opportunities. In 2019, before the pandemic, GE had \$95 billion in revenues, ranking it [33rd in the Fortune 500](#) 2020 list of largest US companies by revenues. A decade earlier, GE [ranked 4th](#), notwithstanding decline in its revenues as a result of the financial crisis of 2008-2009.

At the end of 2009, GE employed 304,000 people worldwide, including 133,000 in the US. Ten years later, at the end of 2019, GE employed 205,000 people worldwide, with 70,000 in the US. This steep decline was a result of the sale of GE units, as well as cuts to existing GE workforces. These cuts, when contrasted with dividend payouts and stock buybacks, reveal GE's commitment to using its profits not to invest internally but to enrich senior executives and hedge-fund activists.

- From 2014-2016, GE generated a profit of \$17.9 billion, but distributed \$26.6 billion in dividends (148% of profit) and \$27.5 billion in stock buybacks (another 153% of profit).
- From 2017-2019, GE incurred a total loss of \$33.1 billion, yet distributed \$13.8 billion in dividends and \$3.8 billion in buybacks.

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**Because of decisions made by senior executives, board members, and activist shareholders the company is now a shadow of its former self.**

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GE remains a very large company with world-leading capabilities in electric power and jet engines, as well as a major presence in wind energy. Yet because of decisions made by senior executives, board members, and activist shareholders that privilege value extraction for their own financial gain over rewarding GE's value-creating employees and investing in innovative products, the company is now a shadow of its former self.

In its 2020 Industrial Capabilities Report to Congress, the Department of Defense takes pointed aim at these practices, writing, "a U.S. business climate that has favored short-term shareholder earnings (versus long-term capital investment), deindustrialization, and an abstract, radical vision of "free trade," without fair trade enforcement, have severely damaged America's ability to arm itself today and in the future."

Given the looting of GE by senior executives and hedge-fund activists that had previously taken place, current CEO Lawrence Culp is now, by necessity, seeking to stabilize GE's position in its core businesses. But the company remains a long way from returning to its tradition of investing in the productive capabilities of its domestic labor force and the innovative products that they can generate.

## ANALYSIS AND IMPLICATIONS

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GE's production now spans the globe, part of the corporate shift to globalized production, long supply lines, and just-in-time manufacturing. All these strategies save companies money, but all of them generate significant risks to US industrial capacity, national security, and the environment.

### **X US Manufacturing, Global Supply Lines, and National Security**

Defense production experts have [long warned](#) that vulnerabilities in global supply chains generate national security risks for the US defense industrial base. Recent examples of the dangers inherent in global supply chains abound, from the inability of so-called “industrialized” nations to produce enough personal protective equipment in the first months of the COVID-19 pandemic to the SolarWinds cyberattacks to the March 2021 disruption of Suez Canal traffic. Mexico [ordered the closing of plants that supply the US defense industry](#) during the early months of the pandemic, deeming their work “non-essential.” As the House Armed Services Committee’s Future of Defense Task Force [reported in 2020](#), “a lack of domestic manufacturing capability and access to reliable supply chains is among our greatest national security and economic vulnerabilities.”

The [White House](#), the [House Armed Services Committee](#), and the [Department of Defense](#) have all renewed the call to re-shore supply chains and rebuild American manufacturing capacity within the

last two years as an essential component of national security. The message is broadly the same. In DoD’s 2020 Industrial Capabilities Report to Congress, the first point in a four-part twenty-first century defense industrial strategy is “Reshore our defense industrial base and supply chains to the United States and to allies.” The same report cites DoD’s \$20 million contract with GE Aviation “to sustain critical industrial base capability for highly-specialized engineering resources,” created in response to the coronavirus pandemic. This is an important first step, but as our research shows, GE Aviation’s supply chains remain rife with potential insecurities.

GE produces turbines and engines essential to national security and defense in its Power and Aviation divisions. Components for these products are produced all over the world, from gas turbine elements whose production GE moved to [Poland](#) from Schenectady to digital control systems for renewables, which GE shifted from [Salem, Virginia](#) to [India](#). Parts for military jet engines assembled in Lynn are now produced in South Korea and Romania. In a networked world, hackers and hostile nations can exploit weaknesses nearly anywhere along the supply chain and use these to access systems as a whole (such as power grids or aircraft). Examples include the SolarWinds cyberattack, in which [Russian hackers penetrated energy networks](#) around the United States, and [China’s use of similar tactics in India](#) as a foreign policy instrument.

Perhaps the most alarming consequence of offshoring is the depletion of U.S. manufacturing capacity. In the case of GE’s Lynn and Schenectady plants, the loss of manufacturing capacity to

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***“(A) lack of domestic manufacturing capability and access to reliable supply chains is among our greatest national security and economic vulnerabilities.”***

– Report of the Future of Defense Task Force, U.S. House Armed Services Committee, September 29, 2020

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overseas plants impacts not only short-term productivity, but also affects the long-term viability of the plants themselves. Workers terminated from these plants are not reemployed, rather they are replaced by foreign employees, with the consequent loss of local jobs and significant economic disruption. Moreover, as manufacturing processes themselves are offshored, the loss of intellectual property and intellectual capital with the accompanying knowledge transfer to offshore producers, capacity leaves U.S. shores permanently. Throughout high-technology manufacturing, [but perhaps most dramatically in the software industry](#), this knowledge transfer destroys the ability of domestic manufacturing to improve processes, develop product improvements, and improve manufacturing efficiency; instead, these advantages are transferred offshore. Such loss destroys decades-old relationships among labor, management, and lower-tier suppliers designed to improve manufacturing efficiency and safety. These cannot easily be rebuilt should foreign production be disrupted.

The notion that cheap overseas production for US government contracts benefits US taxpayers excludes the social and economic costs of American deindustrialization. The loss of good, value-added manufacturing jobs all over the US in cities like Lynn and Schenectady has long been correlated with poverty, unemployment, crime, homelessness, alcohol and drug abuse, suicide, and domestic violence. GE's moves effectively outsource these social costs to all Americans.

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**The notion that cheap overseas production for US government contracts benefits US taxpayers excludes the social and economic costs of American deindustrialization.**

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## **XI Renewable Energy Production, Climate Change, and Supply Chains**

As the US invests heavily in renewable energy, coordinated policies and industrial development are needed at home to build domestic capacity to produce, as well as install, renewable energy systems, particularly wind turbines. As discussed earlier in this report, GE enjoys enormous direct and indirect subsidies to its renewables business, despite producing only a fraction of its components in the United States and actively closing factories that produce these components. As President Biden [pushes ambitious goals to combat climate change](#) – making the US net-zero in carbon emissions by 2050 – domestic wind manufacturing must be scaled up significantly. Instead, as discussed earlier, GE has shuttered three renewables-producing plants in the past year – in Georgia, Arkansas, and South Dakota – despite continuing to benefit directly and indirectly from significantly subsidies to wind power. To meet ambitious goals, plants like these must remain open.

The experience of European countries whose wind power industries are far more mature is instructive. Nations where GE and its competitors produce wind energy components have enjoyed economic development as a result, while those that have focused primarily on construction and have not expanded domestic manufacturing capacity have seen job growth far below promises made by government actors to justify subsidies. In Scotland, government subsidies to non-UK based wind companies in the form of long-term power purchase agreements (PPAs) were expected to create 20,000 local jobs. PPAs protect wind companies from market competition, and they exist to secure profits for renewable energy companies. However, [a recent study by the Scottish Trade Union Congress](#) (STUC) revealed vast underperformance in this sector. According to the STUC study, “Without a domestic industrial base for the LCRE economy, not only will workers in Scotland miss out, but there are serious implications in terms of tax, transparency, economic democracy and meeting climate targets.” The same is true in the United States.



In the US, corporations in the wind energy sector, including GE, benefit from both PPAs and Federal Production Tax Credits (PTCs) which guarantee that every unit of electricity generated will yield revenues regardless of whether or not the energy is used. The profits that accrue to companies like GE are such that major corporations such as Apple, Walmart, General Motors, and Google can negotiate their own deals (known as “corporate PPAs”) with GE. By increasing the amount of wind energy generated, the PTC subsidy can be shared between the producer (GE) and the buyer (for example, Google).

**[GE is a major broker of these agreements, including Google’s.](#)**

Signing PPAs with renewable energy companies allows corporations to indicate their concern for the environment, but securing subsidized energy at a predetermined price also drives these decisions. As [Apple CEO Tim Cook put it](#), “We are doing this because it's right to do, but you may also be interested to know that it's good financially to do it. We expect to have a very significant savings, because we have a fixed price for the renewable energy.” Congress can and should establish domestic sourcing requirements and supply-chain standards for power purchase agreements, whose favorable rates are made possible by tax credits.

In 2019, [across the on-shore wind industry](#), over 90% of nacelles were assembled in the US and 65-85% of towers were built here, but only 40-70% of blades and hubs were US-built, and less than 20% of nacelle internals contained domestic content. These numbers are lower for offshore wind, in which the US has lagged until recently. As discussed earlier, GE’s US market share for wind turbine installation in the US was 40% as of 2018, making it the single largest player in the US market. The company is uniquely positioned to lead the development of a truly domestic wind industry, from component production through generation. The [Texas Public Policy Foundation Report](#) cited earlier argues that production tax credits for wind energy enrich corporations with taxpayer money. We agree, but we differ on the solution; rather than eliminating such credits, Congress should condition such benefits on the use of domestically sourced content and supply chains. US communities and their political leaders should be as insistent in the pursuit of good manufacturing jobs in the renewable sector as France was in preserving jobs for Alstom workers in their renewable division when that company was bought by General Electric.

More broadly, studies across several industries, including [agricultural products](#) and [consumer electronics](#), have revealed that supply lines constitute [a significant portion](#) of corporate carbon footprints. To cite one example, GE boasts that its state-of-the-art plant in [Haiphong, Vietnam](#), exports one hundred percent of its electrical control and renewable energy systems [for the US and Europe](#). The carbon necessary to transport these products, coupled with the fact that [Vietnam still produces over half of its power with coal](#), works at cross purposes with the goal of slowing climate change through the manufacture and use of renewables.

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**The company is uniquely positioned to lead the development of a truly domestic wind industry, from component production through generation.**

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**Congress can and should establish domestic sourcing requirements and supply-chain standards for power purchase agreements, whose favorable rates are made possible by tax credits.**

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## RECOMMENDATIONS

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### XII What Can GE Do?

- GE should invest robustly in Schenectady and Lynn, both to keep existing work at these plants and to expand them. For example, the T-901 helicopter engine is a successor to the Lynn-built T-700 and should be built in Lynn. More broadly, our research shows that GE has physical space and site benefits at both of these plants to rebuild them as [“brilliant” factories](#), should it choose to invest long-term in renewable energy system production in the US.
- GE has spent decades demanding low-cost parts from suppliers, going so far as to promote their moves out of the US. GE justifies their ever-growing supply lines with accounting that ignores environmental and security risks and takes no account of the social cost of deindustrialization in the US. GE should reverse course and invest in bringing suppliers back to the US. [GE’s current partnership with the US Air Force](#) to create a cutting-edge metal parts additive manufacturing facility at Tinker Air Force Base could serve as one model.

### XIII What Can the United States Government Do?

- To secure supply chains and the US defense industrial base, Congress should continue to close loopholes in existing provisions, including Buy American, Buy America, the Jones Act, and Title III of the Defense Production Act. Lawmakers should also expand and strengthen enforcement of measures that give preference to domestic suppliers of defense goods and increase domestic content requirements in all federal procurement. This should include freezing and then reducing the use of waivers in defense contracts pending independent studies of claims, like those GE makes, that parts cannot be made in the United States.
- Congress should set conditions for developing renewable energy capacity. Power purchase agreements, federal grants, tax credits, and subsidies that drive privately funded projects should be tied to “local content requirements” (LCRs) and supply-chain standards in order to build a robust domestic wind energy sector. The Biden Administration has [proposed \\$10 billion for new IRC Section 48C tax credits](#) (whose original \$2.3 billion jumpstarted the production tax credit process discussed above) to fund advanced energy manufacturing projects in its [FY 2022 Budget Proposals](#). These are an excellent place to start.
- Congress should [ban stock buybacks](#) and allow workers to directly elect one-third of their company’s board of directors by passing the [Reward Work Act](#), proposed by Sen. Tammy Baldwin (D-WI) in the [Senate](#) and Reps. Jesus “Chuy” Garcia (D-IL) and Ro Khanna (D-CA) in the [House](#).
- Existing policies and programs can be enforced, expanded, and adjusted with significant benefit. In our recommendations at the start of this report, we also envision new strategies toward developing a comprehensive industrial policy for the United States. These include requiring corporations to set aside a portion of their profits from defense contracts for reinvestment in US plants and jobs, and using the 200 mile coastal conservation zone to create a federal permitting and oversight process for offshore wind energy production.

## **XIV** What Can Workers at GE Do?

- The workers of IUE-CWA Local 201 (in Lynn, MA) and IUE-CWA Local 301 (in Schenectady, NY) have proven both flexible and adaptable in their efforts to preserve work at plants in Lynn and Schenectady. Their International Union maintains a lean manufacturing expert to further assist them. IUE locals should continue to demand a full and honest accounting both of the work lost from these plants and the calculations used by GE to justify outsourcing, offshoring, work transfers, and the like. This data should be cross-referenced with the union's own internal knowledge of manufacturing processes and productivity in order to generate a complete picture of the potential of these plants.

# XV Appendix: Aerial Maps of Schenectady (NY) and Lynn (MA) Sites

## 1. Schenectady (NY) Site



## 2. Lynn (MA) Site



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