

## **BlocPower**

### The Brooklyn-Based Start-up turning Buildings into Teslas

#### **Executive Summary:**

"If Tesla can take the fossil fuel engine out of a car, we can now take all the fossil fuel equipment out of a building. We want to turn buildings into Teslas," says Donnel Baird, co-founder and Chief Executive Officer of BlocPower (D. Baird, personal communication, November 10, 2021).

According to the Environmental and Energy Study Institute, buildings represent almost 40% of greenhouse gas emissions in the United States (Dorsey, 2019). Therefore, to slow climate change, we need to decarbonize buildings. BlocPower's solution is to remove oil and gas boilers and replace them with heat pumps that run on electricity. The company seeks to reduce building-based emissions by helping owners finance retrofits with a green mortgage to make these sustainable solutions accessible for low-to-middle income communities. They make the building smarter by installing sensors that gather data, like temperature and air quality, which informs their machine learning platform to understand how retrofits can efficiently save energy. And since this equipment needs WiFi to function, BlocPower also installs community WiFi to those buildings in need. In the process, BlocPower trains a new generation of skilled workers in green infrastructure installation through its Pathways program, a Civilian Climate Corps partnership with New York City.

BlocPower wants to make American cities greener, smarter, and healthier. With the recent passing of Biden's Build Back Better bill, which includes \$6 billion for energy retrofits in homes, BlocPower's agenda has become even more relevant (Root & Grandoni, 2021). This case study aims to identify opportunities for BlocPower and other clean energy start-ups to strengthen their ability to operationalize sustainability strategies to deliver climate infrastructure solutions.

#### **Background**

BlocPower is a Brooklyn-based, private for-profit energy technology company that serves multi-family and small commercial building owners. It also partners with cities, utilities, corporations, and non-profits to deliver energy efficiency and electrification projects that improve health, wealth, and sustainability. Since its inception in 2014, the company has retrofitted more than 1,200 buildings in disadvantaged communities in New York City, with projects underway in 26 additional cities (staff, 2021). It has grown to over 60 employees, 75% of which are women or people of color (A. Dizon, personal communication, December 20, 2021). The company is backed by investors, including Kapor Capital, one of Uber's first investors, and Andreessen Horowitz, an early investor in Facebook, Twitter, Airbnb, and Lyft. To date, BlocPower has raised \$63 million, including \$55 million in debt financing, and in February of 2021, it completed a Series A round led by Goldman Sachs (staff, 2021).

The business delivers revenue through a dual-pronged business model. First, they have building owners of small to midsize buildings throughout the country who hire and pay BlocPower through private contracts to help them retrofit their building. Second, they have public entities such as city governments and utility companies that pay for these projects to help achieve sustainability goals. City governments have greenhouse gas reduction or renewable energy goals,

and utility companies want better energy consumption management through information on peak demand reduction.

There is an inherent complexity to greening a building by retrofitting it. There are multiple stakeholders, the physical act of retrofitting old buildings can be difficult, and low-to-middle-income communities cannot always afford it. The BlocPower difference is that they are a one-stop shop combining software, hardware, and an engaged workforce to deliver all the constituent parts required to update a building.

Before conducting any retrofits to capture energy savings, the developers need to understand the current heating, ventilation, and cooling systems that the building uses and assess how to upgrade any issues. To this end, BlocPower has embraced technology and hired software engineers and building energy analysts to deliver a machine-learning platform called BlocMaps that can analyze and finance sustainability projects on a building-by-building or block-by-block basis. At the building level, the first step is to put data collection in place through connected devices. Thermostats, heating system management devices, solar panel monitoring systems, and air quality sensors collect vast amounts of building data. With the information obtained from these connected devices, BlocPower can analyze an individual building's energy consumption and waste to help inform decision-making by the owners. At the city level, the individual building data is augmented by data scraped from the government and the local utility company to assess the energy efficiency of entire communities and cities. The automated digital recommendations mean faster decision-making for aging buildings to become greener.

This data is also key to unlocking loans to make these upgrades accessible for low-to-middle income communities, a group that banks have historically neglected. With a better understanding of energy efficiency and cost savings, banks are more likely to sign off on building retrofitting loans that the federal government subsidizes. BlocPower helps owners with the finance application that functions as a green mortgage bond, and they developed this offering through early conversations with Wall Street. Backed by up to \$50 million from Goldman Sachs' Urban Investment Group, it leases the smart equipment to building owners, who pay it off over 10 to 15 years (Roberts, 2021). These cost savings, about 20-40% saved on energy bills each year, make the retrofit appealing to building owners (*BlocPower | Upgrade to ultra-efficient heating & cooling*, n.d.). General Manager, Keith Kinch, says, "the average building owner is not thinking about climate change; from Monday to Friday, they are thinking about how to lower costs while running the building and making necessary improvements" (Grindley, 2021). One cost-savings example occurred at St. Bartholomew's Episcopal Church in White Plains. Built in the 1920s, the church was too hot in the summer and too cold in the winter. A year after BlocPower installed heat pumps, the church saved 55% on its utility bills and reduced 70% of its greenhouse gas emissions. In addition, now that the assembly hall is air-conditioned, the church can rent it out year-round, bringing about \$35,000 in new revenue each year (Brandon, 2021).

Other start-ups in the sustainability space can apply how BlocPower systematically identified building upgrade barriers for each stakeholder and built solutions into its business offering. Understanding the motivations and issues for the building owners, local government, and investors was key to BlocPower's growth. Smaller green energy start-ups, like Radiator Labs and

Phase Change Solutions, in New York City, can look at how BlocPower built stakeholder adoption tactics into their strategic planning to better serve low-to-middle income communities.

While software can deliver informed and automated recommendations, the core of the retrofit is hardware installation. BlocPower installs air source heat pumps into aging urban buildings that are currently reliant on burning fossil fuels, like oil and gas, as a heat source. These all-electric, highly efficient systems extract heat energy and transfer it where and when it is needed across seasons. In summer, heat is transferred from inside the building to outside to keep you cool; we know this system as an air conditioner. In winter, heat is transferred from outside to inside to keep you warm; it's an air conditioner in reverse. These heat pumps running on electricity make buildings more energy-efficient, lower utility bills, and decrease greenhouse gases by up to 40% (Charles, 2020). It also makes the air cleaner for the people who reside in the dwelling, making for a healthier place to live and lessening the risk for chronic respiratory illnesses like asthma. For the heat pumps to work as efficiently as possible, they need to connect to high-speed internet that allows for accurate tracking of usage data points. Many of the buildings in the low-income communities that BlocPower had set out to serve did not have functioning WiFi, so the company evolved to provide community-enabled WiFi through roof web installations. In addition to cleaner energy, these buildings now have faster, cheaper, community-controlled WiFi. Working within the community helped BlocPower see that it had to approach sustainable solutions from a systems-level that went beyond heat pump installation. As BlocPower completed more projects, it became clearer that the electricity was only as clean as the grid from which it is sourced. Since the electric grid is still powered primarily by fossil fuels, BlocPower started offering solar panel installations so a building could be completely self-sufficient and manage its energy production and usage. To date, it has designed a community-owned clean energy solar microgrid in partnership with New York State (*NWBCC, BlocPower to Use Solar Energy to Reduce Building Costs, 2015*).

The installations themselves are outsourced to construction companies who have a contractual obligation with BlocPower and New York City to hire from hard-to-employ populations throughout the city. BlocPower created a workforce installation training program called Pathways to ensure this pipeline. This pilot is underway with New York City and the Precision Employment Initiative. In September 2021, BlocPower received a \$37 million contract from the Mayor's Office of Criminal Justice to train 1,500 at-risk residents to install clean energy and broadband technologies (Apter, 2021). Bringing green jobs to areas hardest hit by gun violence will expand, diversify, and strengthen New York City's clean energy workforce. In a press conference, Mayor DeBlasio said, "They are not just jobs, they are good-paying jobs, they are green jobs, they are jobs with a future. We are working with a great, Brooklyn-based climate technology start-up BlocPower. This is a wonderful firm doing amazing work, that is socially conscious, that is trying to solve multiple problems at once through their work" (Apter, 2021).

We will need a scalable pipeline of highly skilled infrastructure workers to address climate change. Other organizations can adopt this community workforce integration into their sustainability mission. BlocPower learned early on the importance of trust in working with communities historically left out of the sustainability movement; seeing people employed by green jobs that improve the community is a strategic imperative for the business. BlocPower continues to evolve its organization by offering new solutions to increase sustainable behavior

adoption throughout the stakeholder's journey. Other companies should look at this business model evolution, apply the same systems-level thinking, and be innovative to offer new solutions as issues arise.

### **Definition of Sustainability**

BlocPower defines sustainability as positively impacting the environment and the community it serves because climate change and social inequality are inextricably linked. These non-environmental factors include a commitment to serve low-to-middle income communities on the frontlines of the climate crisis and systemic racism. These communities also have been historically neglected by sustainability investment and innovation.

The company believes that when you invest in and electrify buildings, you create multiple sustainable outcomes: 1) Create access to wealth and economic opportunities (through energy savings, investment returns, improving internet connectivity, and creating good jobs); 2) Improve the health of our communities and planet (by reducing greenhouse gas emissions and improving indoor/outdoor air quality); 3) Build a diverse workforce for the good green jobs of the future (Supporting a Black-owned company where 75% of employees are women or people of color and creating training and career paths for people to work in and improve their communities. 4) Empowering communities to reach their full potential (by giving them control and creating more comfortable and safe places to call home) (E. McNevin, personal communication, October 27, 2021).

As a start-up, BlocPower has yet to define a complete public-facing version of how they measure their definition of sustainability. However, it is possible to assess their standard sustainability definition through physical building metrics. Fundamentally they are seeking to prevent the burning of fossil fuels for energy, so the key metrics against this are 1) Energy Efficiency: The reduction of GHG emissions by 40-70% in current projects (*Knowledge Base | BlocPower*, n.d.), 2) Healthier Air: The removing harmful air particulates, 3) Solar Transition: The number of buildings shifting off fossil fuel grid to renewable energy.

They also include atypical definitions, focusing less on physical measurements and more on social benefits on communities. They call this "The BlocPower effect," and key metrics for this are 1) Household Access to WiFi: Number of buildings installed, 2) Potential Job Creation: Number of new jobs created, 3) Affordable Access to the Retrofit: Number of leasing agreements signed, 4) Lower Energy Costs to Low-to-Middle Income Communities: Dollars saved, 5) Worker Training Programs: Workers enrolled, 6) DE&I: 75% of the workforce is women or people of color (E. McNevin, personal communication, October 27, 2021).

BlocPower is still in start-up mode, but as it builds upon its momentum over the last year, it should create a reporting system that consistently discloses a track record against its sustainability metrics. While the company shares metrics on its website and with news publications, it does not currently publish a report that makes all its workings transparent, from human resources to supply chain management. This report should also include more routine compliance checks and outline the worker benefits and safety as part of its job training program.

A significant amount of effort has been made to identify customers and stakeholders. Currently, they have identified five main stakeholders as follows 1) building owners, 2) utility companies, 3) policymakers in local government, 4) investors, and 5) community. An annual sustainability report would help sharpen the outcomes for all these stakeholders, and a live dashboard should be considered part of the overall software stack development. Other companies with multiple stakeholders should also apply this recommendation to manage communications better and track essential data.

While sustainability extends to almost all aspects of the organization's internal culture and value proposition, it is not apparent how BlocPower ensures sustainability practices with its supply chain partners, such as manufacturers and installation contractors. Information about the third-party companies that manufacture the heat pumps and solar panels is not published on BlocPower's website. A best practice in sustainability reporting is to share information on how products are made and transported. Partnering with a green certification organization could provide a shorthand for consumers and stakeholders to feel confident that the entire supply chain is tracking sustainability metrics. Making this information transparent is important since traditional heat pumps use hydrofluorocarbon refrigerants, which carry a global warming risk (McManan-Smith, 2021). BlocPower should work with suppliers to phase out hydrofluorocarbon refrigerants in favor of more sustainable alternatives.

The end of life for a heat pump should also be considered as part of a sustainable circular economy. The average life of a heat pump is 15-25 years, and since BlocPower is only seven years old, it hasn't needed to address aging equipment yet (*How Long Will My HVAC System Last? | Life Expectancy of HVAC, 2018*). A service to return and repair broken machines at the manufacturer so they don't wind up in landfills is a function that BlocPower should think about as the company matures. Using electric vehicles when making trips to install the heat pumps is another area of opportunity for BlocPower and other start-ups to become educators and leaders for industry best practices on sustainable supply chain management.

One of BlocPower's immediate next steps should be to hire a sustainability management team to measure its suppliers' environmental impact to evaluate current and future partnerships.

### **Leadership**

Donnel Baird, the co-founder, and Chief Executive Officer, was a former community organizer for the Obama campaign, has a background focusing on job creation for green and sustainability jobs in disadvantaged communities, and is particularly adept at delivering a vision for sustainable business. In many ways, he has become the voice for BlocPower. His extroverted style and approachability have helped gain traction with key audiences like the media and investors. Whether press releases, email announcements, newsletter updates, or social media posts, sustainability and the overarching mission are always visible and delivered inspiringly. There is no opposition internally to this way of thinking, with all leadership strongly supporting sustainability.

One of the best examples of BlocPower's leadership commitment to sustainability is an excerpt from Donnel Baird's testimony before the House Energy and Commerce Committee in Washington, D.C., on April 20, 2021. "During my time in Brownsville, New York, I saw a lot of

wasted energy in the buildings, burning oil to overheat buildings, having windows open during freezing winter weather due to overheating, and I also saw a waste of human potential due to high rates of unemployment, and incarceration. The community of Brownsville had a juvenile justice center but no high school, and that's where they expected the teenagers and children to end up. I started my tech company to fix that waste, of fossil fuels, and waste of human potential" (Baird, 2021).

Perhaps realizing that he cannot do it alone, his peers have ably supported him. Co-founder and General Manager Keith Kinch and Business Growth Developer Ian Harris have come to the fore at highly visible climate and media gatherings, such as 2021's Web Summit and the Next City podcast, to talk about Bloc Power. Donnel himself led the charge at COP26, and the business has proven itself adept at being part of the conversation on the stages that matter. BlocPower is an example of a modern purpose-driven business. New companies starting in the sustainability sector should look to BlocPower's passionate leadership to set an example that flows through the company and reaches everyone who works on the business.

There is no head of sustainability; rather, most employees have an aspect of sustainability in their job role. From a building energy analyst who works with the software that measures the energy efficiency to a growth product manager in charge of acquiring new customers, or to the head of engineering who is optimizing building and heat pump performance, almost every role has an aspect of sustainability attached to it. However, the company would benefit from a leadership team or internal department that is focused solely on measuring and reporting the sustainability impact of BlocPower and its suppliers and contractors.

### **Organization Structure and Capacity**

The leadership team of BlocPower consists of the Chief Executive Officer and co-founder (Donnel Baird), the General Manager and co-founder (Keith Kinch), the Chief of Engineering (Dom Lempereur), Chief Operations Officer (Jon Moeller), and Chief Revenue Officer (Glen Shatz). Following the leadership described above, the next level of the organization consists of Director and Vice President titles serving functions in finance, operations, engineering, technology, business development, partnerships, product management, project management, and legal counsel. Engineering as a function split into product and software, with four roles focused on full-stack software development and services. Further down the organizational structure, there are analyst roles for building energy and finance, mid-level construction management, project and product management, and business development roles. About half the staff fall into the engineering, technology, and product management roles, aligning with software and hardware's core business model functions.

Building energy analysts serve a crucial role in setting the benchmarks that measure the building's current energy consumption, which help building owners track progress and local governments understand where the opportunities lie for energy efficiency citywide. As installation projects progress, these same analysts use the software developed by BlocPower to measure the energy efficiency and report the amount of reduction in greenhouse gases. Demonstrating efficacy in the heat pump's ability to save energy and money is key to proving that BlocPower is fulfilling its promise to green buildings.

External agencies mostly conduct public relations and branding to support messaging and communications. Most of the media coverage has been interviews with Donnel Baird as BlocPower completes projects and local governments award new ones. BlocPower has maintained a steady public relations presence by appearing at relevant current events, such as WebSummit in London, COP26 in Glasgow, and meeting with the United States Vice President, Kamala Harris New York City. These appearances are documented on the organization's website and social media accounts and get picked up by news organizations covering climate change. In 2021, they have been featured in The New York Times, Washington Post, CNBC, and Fast Company.

To solidify their commitment to providing climate solutions to underserved communities, BlocPower should invest in a sustainability management team. There is no dedicated sustainability role or department; instead, the function exists throughout the organization. Now that BlocPower is growing at a fast rate, there is an opportunity to hire sustainability managers focused on reporting and supply chain compliance. This role could function as a department or sit within the operations team, creating internal sustainability metrics for its headquarters, much like how Etsy has created the "greenest, living, breathing building" in the tech sector (Mohan, 2017). Since BlocPower's headquarters are in Brooklyn Navy Yard, one recommendation would be to work with the property developer to electrify its heating and cooling system, making the complex more sustainable. Doing so will set an example for greening its building and drive other sustainable start-ups working with them to do the same.

### **Internal Perceptions of Sustainability**

Sustainability is central to the organization's mission, and all programs are related to environmental, economic, and social sustainability. There is a belief that if you work at BlocPower, you either are or will become passionate about climate change. In an interview with the podcast, My Climate Journey, Donnel Baird shares the following observation about new employees through the Pathways workforce training program, "So we trained and hired a couple of cohorts of low-income people who are not climate activists. But what was interesting is after six months of being on the job, they got way into it, following the headlines and current events. It has given them a good job, health care, dignity. So that they can take care of their family and be proud of themselves, and they are working every day on removing fossil fuels from buildings. Even though they're ex-offender, now, over six months of training to do their job, they have developed an affinity for climate, and now they are a climate activist. And that is the thing that people miss about how you broaden and deepen the climate movement" (Jacobs, 2021).

Most of the employees who work at BlocPower's headquarters are there because they want to improve sustainability outcomes for underserved communities. Alyssa Dizon, a growth product manager at BlocPower, says, "everyone here is individually passionate about solving climate change. We have a Slack channel for all climate change news, and we are constantly posting and commenting on issues and potential solutions. Being successful and making progress as an organization in sustainability means delivering experiences, technologies, and solutions to people who haven't had access before to underserved communities. Many cities want to achieve net-zero by 2030, but they don't know how to do it. BlocPower knows how to execute the electrification of buildings to achieve net-zero goals. That's what we all work toward" (A. Dizon, personal communication, November 16, 2021). And while BlocPower's start-up agility lets them move

fast to deliver solutions for other people, "there is not much time or resource for internal introspection on our own sustainability choices as an organization," says Alyssa Dizon (A. Dizon, personal communication, November 16, 2021). BlocPower and other sustainability start-ups should invest in resources that can help internal teams better understand the climate impact of their choices to run the business. For instance, knowing the climate impact of a software provider or manufacturer could help employees understand how to make product decisions that support the overall sustainability mission.

Sustainability is viewed as an important part of the organization's success. Uniting all departments is the goal to complete more electric energy retrofits in more buildings, so more underserved communities have healthier air, lower bills, and green-paying jobs. Engineering, software development, construction, product and business development, partnerships, and community outreach functions strive for this common goal. Currently, these objectives are being met with over 1,200 retrofit projects completed, but the organization is constantly expanding its goals to include community WiFi, solar panels, and entire city electrification.

Like many start-ups, many internal processes are not codified. There are opportunities to improve on-boarding and provide updates on sustainability efforts, current initiatives, and future goals. As the business develops from a start-up into a mature company, a critical marker of their evolution will be incorporating sustainability management if they want to continue to have employees value sustainability as an essential part of the organization's mission and daily work.

### **The Future of Sustainability in the Organization**

BlocPower's mission is to bring cleaner energy and job opportunities for low-to-middle income communities most affected by climate change and inequality. While they have built an internal culture through a leadership team committed to sustainability, there are a few areas that they can improve upon to continue their positive momentum, specifically as it pertains to bringing sustainability management into the organization.

Firstly, hiring sustainability managers responsible for internal and external sustainability data management and reporting would deliver transparency against Key Performance Indicators. Reporting on their sustainability metrics and carbon footprint would instill confidence in investors and help employees better understand their impact within the organization. Sustainability managers would help employees understand the environmental and socioeconomic effects of choosing partners and products to source. Having this function would also help BlocPower codify how sustainability is part of each employee's role and responsibilities and assist in making more informed decisions around human resource functions like travel policies and divesting their 401k from fossil fuels.

Additionally, as they are scale, they are in an excellent position to require partners to comply with sustainability commitments. For instance, they require installation contractors to hire people of color from low to middle-income communities. They could put a similar requirement in place for electric vehicles used for installation, mandating a 25% electric vehicle fleet by 2023 and a 100% fleet by 2030. BlocPower should also co-create a repair program for supplier and manufacturer partners to make the business more circular. Instead of going to a landfill, homeowners could return heat pumps that have reached the end of life so they could be repaired



and remanufactured. Similarly, the removed oil and gas boilers should have a reuse program. When BlocPower removes the boilers, they can take them to recycling and material refinement centers to extricate the metals for use in other products.

BlocPower has laid a strong foundation for delivering sustainable solutions in various cities. Now, it has set its sights on the audacious goal to decarbonize every building in every city through electrification. It will have a chance to pilot this with the recent award from Ithaca in upstate New York to electrify the entire city, over 6,000 buildings and homes, by 2030 (Root, 2021). Current projections estimate that this will cut about 40% of the city's overall carbon footprint, saving approximately 160,000 tons of carbon dioxide by 2030 (Root, 2021). Given the size of this project, BlocPower will need to implement even more strident sustainability metrics and reporting to set benchmarks for its first electrification of an entire city. It will also need to hire more contractors and suppliers to implement this project, so having sustainability management to create partnership guidelines and supply chain compliance will mitigate unintended consequences that could offset any carbon reduction gains.

At the writing of this case study, these steps have been discussed, but there are currently no official plans or timelines to implement them. Signs point to their ability to evolve and build out the capabilities necessary to achieve their goals in sustainability. Still, the Ithaca 100% decarbonization project could prove to be too big for the company's current structure, and BlocPower should act quickly to bring sustainability management into the organization.

Other challenges that BlocPower faces will be the evolution from a start-up to a mature company. Climate technology start-ups face four valleys of death, according to Third Derivative, a climate technology accelerator founded by Rocky Mountain Institute and New Energy Nexus in December of 2020 (Hara and Yee, 2020). BlocPower has progressed through the first three valleys (1) start-up formation, 2) product development, 3) market validation) and now must surmount the fourth valley, establish a track record. While it has initial backing from Kapor Capital, Andreessen Horowitz, and Goldman Sachs' debt and infrastructure investment, BlocPower will need to continue to prove how it can decarbonize entire cities, like the Ithaca project mentioned above. Some companies on a similar trajectory in the clean energy space that could provide helpful lessons for BlocPower are Volt Energy Utility in Washington D.C., and Dunamis Clean Energy Partners, in Detroit, Michigan. Along with BlocPower, these companies have been chosen by Apple to join its Impact Accelerator of minority-owned companies creating innovative solutions for communities most impacted by climate change (*Apple Selects 15 Black-and-Brown-owned businesses for Impact Accelerator*, 2021). On December 7, 2021, BlocPower also received \$5.5 million from The Bezos Earth Fund. It plans to use this grant to add 125 million buildings and additional cities to its BlocMaps software database, helping it further establish a track record as it scales (Doniger 2021).

All in all, there is a considerable amount of positive energy in the business at present. Investing in sustainability management can further the company's impact to create a more sustainable future for BlocPower.

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