

Turning One Win Into Many

How pioneering third-party partnerships helped Volvo crush its energy reduction goals.

“Partnerships have helped Volvo’s New River Valley Plant drive significant improvements in energy efficiency. They are a necessary part of our program because they give us the extra “energy” needed to tackle issues and showcase our achievements. They also provide sources of funding, technical expertise, additional tools and a new group of colleagues across many industries.”

Michael Kijak, Energy Manager at the NRV Plant

Summary

Our story begins with the Volvo Group setting the objective to reduce energy use across facilities. To do this, one manufacturing plant, the New River Valley plant in Virginia, signed onto the Department of Energy’s Save Energy Now LEADER program – what would eventually become the Better Buildings, Better Plants Program. With support and guidance from the DOE they were able to quickly reduce their energy use by around 30% and achieve program goals. In doing so, the plant received a lot of good recognition. Other parts of the organization took notice, so Volvo decided to include all eight of its U.S. manufacturing plants in the Better Plants program. This has been the model for energy management across Volvo’s manufacturing plants: set a target and then establish third-party partnerships to help accomplish them—and, it’s been incredibly successful. Volvo recently achieved a 25% energy reduction goal—five years ahead of schedule, and now the company is working to set a new goal.

A Model for Success

Rick Robinson, director for health, safety and environment at Volvo, and Bert Hill, manager for the same department, have discovered a successful way to leverage partnerships to achieve scalable environmental wins. They built this framework through experience and “learning by doing,” and they have seen it play out successfully again and again in several

About The Volvo Group

The Volvo Group is one of the world’s leading manufacturers of trucks, buses, construction equipment and marine and industrial engines. The Group also provides complete solutions for financing and service. The Volvo Group, which employs about 100,000 people, has production facilities in 18 countries and sells its products in more than 190 markets.

About EDF Climate Corps

EDF Climate Corps embeds trained graduate students in organizations to help meet their energy goals by accelerating clean energy projects in their facilities. In just one summer, fellows get clean energy projects on the fast track to accomplishment – improving the organization’s bottom line and environmental impact at the same time.

“Learning by Doing” Model Steps

Step 1: *Set a goal.*

Commit to a measurable reduction in energy consumption or greenhouse gas emissions within a certain timeframe.

Step 2: *Identify a partner.*

Partners can bring in best practices and toolkits to streamline the planning process as well as provide manpower and assistance for implementation.

Step 3: *Support the relationship.*

Ensure there is sufficient internal bandwidth and funding, as well as a main point of contact to manage the relationship.

Step 4: *Communicate about the win.*

Internally share the story to inform employees about what the company is doing. Externally share the story to build the organization's reputation and brand.

Step 5: *Scale the partnership.*

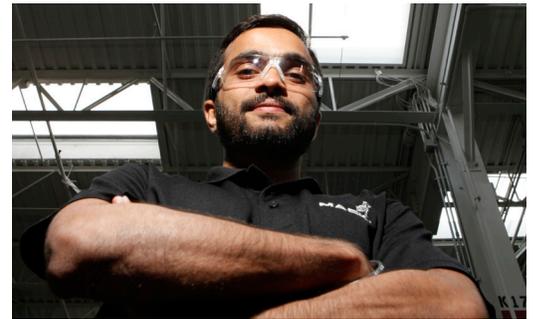
If successful, encourage new locations to replicate the work through: webinars, in-person gatherings or visits to the pilot facility.

different scenarios. Because it is a proven model that has enabled Volvo to work with a variety of partners to achieve goals of different scales and types, it is something they suggest not just Volvo, but any company, could utilize.

The model begins with the company **setting a goal**. This step involves making a public announcement and committing to what is typically a measurable reduction in energy consumption or greenhouse gas emissions within a certain timeframe. Because of the public nature of the goal, representatives from the highest levels of the organization must be engaged. This, as well as the measurability of the goal, drives accountability and follow-up. The goal does not necessarily have to be something the company already knows how to achieve, and in fact, setting a stretch goal can drive increased innovation, creativity and accelerated progress.

The second step involves **identifying a partner** that can help the company navigate its way to success. When a goal is first set, the company may not have all of the in-house expertise and resources necessary to accomplish it. This is where partners are invaluable. They can bring in best practices and toolkits that can streamline the planning process as well as helpful manpower and assistance for implementation. The partner can help the company learn from the experience of others, enabling it to quickly jump from just having set a goal, to being on the leading edge and implementing creative solutions. Identifying the right partner is essential, and Robinson and Hill have found it helpful to try out, or “pilot” a partnership, with one facility before scaling company-wide.

Once the partner and the pilot facility are selected, the company must **support the relationship** by ensuring that there is sufficient internal bandwidth and funding for success. There will need to be a main point of contact to manage the relationship, staff will need to have time to gather and share data with the partner and funding will likely be required to implement recommended efficiency projects.



Ajith Das Menon, one of Volvo's seven EDF Climate Corps fellows, identified and analyzed potential efficiency projects and laid the groundwork for implementation at Mack Trucks' Lehigh Valley Operations.

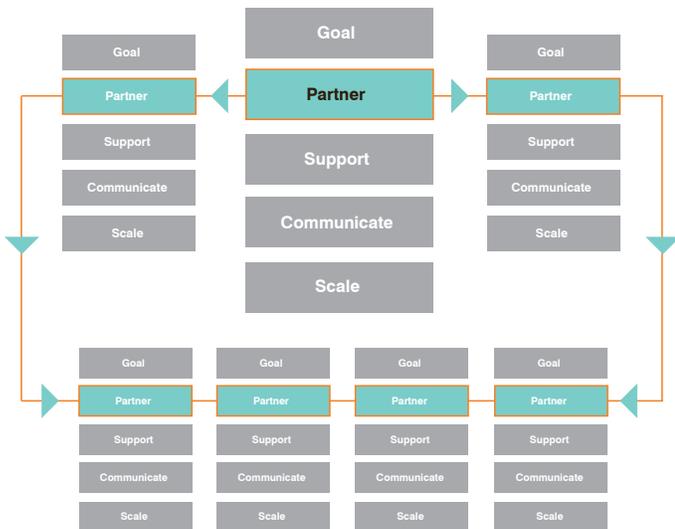
To make the most of the partnership, the company should ensure that several of its staff members are able to learn from the experience. In that way, the company will gain in-house expertise in these types of projects. This can be taken one step further by inviting representatives from a variety of facilities—not just the pilot location—or even representatives from other companies to learn from the partnership as well.

If the partnership is a success and the pilot facility achieves its goal, the next step is to **communicate about the win**. Sharing the story internally is important as a morale boost and to let employees know the good work their company is doing. Also, other facilities will be interested to hear about the work and to learn if their own facility should get involved. Externally, sharing the story can build the organization's reputation and brand. In many cases, communicating about the work is another way partners can lend a hand. The partner will want to share about the success so that they can encourage other companies to get involved as well.

The last step is to **scale the partnership**. If a collaboration is fruitful for one facility, the company's corporate sustainability team and representatives from the pilot facility can create an even greater impact by encouraging others to replicate the work in new locations. This can be done through webinars, in-person gatherings or through visits to the pilot facility during or after implementation.

This model reflects many of the same principles illustrated in the [Virtuous Cycle of Strategic Energy Management](#), an energy management framework developed by EDF and MIT, but highlights, in particular, the role the partner can play in providing pivotal resources and expertise as well as assisting companies in sharing their efforts and then scaling them. The next few sections expand upon real-world examples of energy work Volvo's manufacturing facilities have engaged in with the help of partners. Each of these stories follows the general model where, with the help of a partner, they were able to turn one energy efficiency win into many.

A Scalable Model



Performance-Based Contracts with Energy Efficiency Service Companies

Robinson and Hill recall that one of the first instances when they saw this model in action was when their facilities began signing performance-based contracts to tackle energy efficiency projects. The Volvo Group places tremendous emphasis on environmental care, and as a result, its manufacturing plants see it as their goal to be part of the solution.

Around the year 2000, Volvo Trucks' New River Valley facility (NRV) in Virginia wanted to become more strategic about energy efficiency. They were not yet experts in the space, so they decided to work with a partner to kick-start their efforts. They signed onto a performance-based contract with Siemens, because in this arrangement, Volvo would not have to put up any capital to implement energy projects, but Siemens would guarantee that they would realize energy savings. It was a win-win opportunity. After signing on, the Building Automation System facilitated the identification and automatic control of several energy savings opportunities.

As NRV began to see success from its partnership with Siemens and receive praise for their efficiency efforts, other Volvo facilities decided to sign onto their own performance-based contracts to realize similar results.

“They signed onto a performance-based contract with Siemens. In this arrangement, Siemens guaranteed energy savings without requiring capital from Volvo. It was a win-win opportunity.”

Green Revolving Funds

The NRV plant manager's forward-thinking decision to allocate \$200,000 in seed money for energy efficiency projects became very successful. To ensure funding for projects in the future, Volvo made the commitment to return the savings from implemented projects back into this same energy fund. In just one year, the energy committee at New River Valley was able to increase the fund to \$600,000, and it rose to around \$1,000,000 the following year.

Success with the Better Plants Program convinced Robinson and Hill that their other manufacturing facilities should join as well. They produced reports highlighting the partnership and they presented along with NRV representatives about the work on an internal webinar. The result was that all eight U.S. manufacturing locations agreed to sign onto the program on a company-wide basis. Volvo increased the scope of their partnership and moved into the Challenge level of the Better Plants program, a higher-level leadership club of manufacturers that openly share their performance data and energy-saving solutions to help other companies follow their lead.

U.S. Department of Energy's Better Buildings, Better Plants Challenge

After their initial work with Siemens, the Volvo Group signed on to the EPA Climate Leaders program in 2004. The program was set up to challenge companies to reduce their greenhouse gas emissions, and both Volvo Trucks and Mack Trucks set goals to reduce their emissions 20 percent by 2010.

To help speed their process toward achieving that goal, NRV joined the DOE's Better Plants program. The partnership with DOE enabled NRV to conduct assessments of three different energy systems – the process heating, fan and compressed air systems – and allowed them to attend training sessions with other peer manufacturing companies. To support this work, NRV established an energy committee and the plant manager allocated \$200,000 in initial funding to carry out recommendations. Out of this partnership, NRV was



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able to reduce its energy intensity 25 percent in just one year, and they were also able to achieve DOE's Superior Energy Performance (SEP) certification. SEP is a plant-based certification program that requires conformance with the ISO 50001 international energy management standard and a threshold level of third-party verified energy savings.

After launching the scaled Better Plants partnership, the facilities hosted several In-Plant Trainings offered through DOE. These training events included energy system analyses as well as focused training on optimizing the energy efficiency of common industrial systems. In these events, DOE experts would visit the facility to teach energy efficiency skills in both classroom and field settings. Volvo would also welcome staff from their different facilities as well as representatives of other companies to these events. After seeing similar success to NRV, two additional manufacturing locations achieved the Superior Energy Performance certification – Mack Trucks' Lehigh Valley Operations in Macungie, Pennsylvania, as well as the Volvo Group Powertrain facility in Hagerstown, Maryland – and by 2014, the portfolio had reduced its energy intensity by 27 percent.

Hands-On Help from EDF Climate Corps

Around the time when the Volvo Group scaled its partnership with DOE's Better Plants, the Mack Trucks facility began working with EDF Climate Corps – a program that embeds trained graduate students within companies to accelerate energy projects over the summer. By signing up for EDF Climate Corps, Mack Trucks gained the help of a trained student who could focus entirely on energy management. That focus would allow them the time to identify potential efficiency projects, analyze them to determine which were the most promising and then lay the groundwork for implementation.

After signing up, Mack Trucks was assigned a graduate student, [Rohini Sankapal](#), who spent ten weeks analyzing projects including:

- Installing variable frequency drives on applicable motors
- Installing occupancy sensors
- Fixing compressed air leaks
- Installing high-volume, low-speed fans
- Upgrading compressed-air driven manufacturing tools

Sankapal also developed a tool that would enable Mack Trucks to monitor its energy use and strategize moving forward about how to reduce consumption. In total, Sankapal's recommended projects would save more than 2 million kilowatt hours of electricity annually. Having found

success with the program, Mack Trucks has continued to participate in EDF Climate Corps ever since, and the facility has signed up to host another student in 2016.

Mack Trucks shared information about its successful partnership with EDF Climate Corps with their counterparts at other the Volvo Group manufacturing facilities. Because of this, the Volvo Group Powertrain facility in Hagerstown, Maryland and the Volvo Construction Equipment facility in Shippensburg, Pennsylvania elected to participate in EDF Climate Corps as well. Through six of these summer fellowships so far, Volvo facilities have received help with and recommendations for projects that could save more than 9.5 million kilowatt hours of electricity annually.

Engaging Employees through Treasure Hunts

One of the newest initiatives Volvo is pursuing – energy treasure hunts – is also following this same, scalable model. What Robinson and Hill wanted to do was focus more on operational aspects of energy efficiency. They had heard that Alcoa had been doing so by organizing energy treasure hunts, so they decided to look into this idea. Alcoa is a member of the Better Plants Program, so they generously welcomed Hill from Volvo to visit one of their facilities and take part in one of their treasure hunts.

The treasure hunts are focused on low- or no-cost energy projects and involve teams of employees going around the facility for a few days, including off-hours, uncovering opportunities by observing conditions and interviewing staff members. Because Volvo had already accomplished many of the capital intensive projects and “low-hanging fruit,” Robinson and Hill saw these treasure hunts as a great way to start working on the more behavioral aspects of energy management.

Working with Bremer Energy Consulting Services, Inc., the partner that developed the process and had helped Alcoa conduct their treasure hunts, Hill gathered a group to conduct

Breaking Down Silos

In 2012, the facilities requested that the Volvo Group form an internal network for them to continue sharing and learning from each other. As a result, Bert Hill began leading the Volvo Group Energy Network North America – called the VENNA network. The group of around 15-20 staff members meets twice a year in person and a few other times on remote webinars. Part of the logic behind formally setting up the VENNA network, was to open communication lines and spread best practices, and the group had been very effective at allowing for information sharing across facilities. Members of the group have become familiar with each other and can now reach out more easily to collaborate and consult on ideas.

an energy treasure hunt at the Volvo Construction Equipment facility in Shippensburg, Pennsylvania. Subsequently, the team has conducted another treasure hunt at the Powertrain facility in Hagerstown, Maryland and anticipates continuing those in the future with additional plants.

Managing the Partnerships

In addition to the partnerships described above, Volvo also participates in WWF Climate Savers and organizes its own Academic Partner Program with several universities. Managing all of these partnerships is a big task, spread across the entire organization. For his part, Hill coordinates Volvo's internal VENNA network (see "Breaking Down Silos") and the Better Plants Program with the DOE. He communicates about events and learning opportunities that may be of interest as well as other resources such as the energy assessments available from the Department of Energy's Industrial Assessment Centers. Meanwhile, Robinson plays a role in ensuring funding for activities related to the VENNA network and the treasure hunts and for implementing ISO 50001/SEP and the SEP certification. Finally, on the individual plant level, the energy coordinators and their teams have to identify projects to implement and crunch the numbers to determine which initiatives would have the best return on investment. The energy teams also organize and provide energy data whenever it is needed.

Because all of these partnerships overlap and dove-tail in various ways, another aspect of Robinson and Hill's work is to find programs that interface well with each other. For instance, while ISO-50001 and Superior Energy Performance certification is very technical, the treasure hunts are able to address more behavioral issues, such as employee engagement. As another example, DOE's Better Plants Program provides in-depth, technical expertise, while EDF Climate Corps provides the hands-on help to identify projects and funding opportunities.

Hindsight is 20-20

Having worked in this space for over a decade and participated in just about every partnership in the industry, Robinson and Hill have several pieces of advice to share:

For Companies:

- Sustainability is a never-ending journey. You'll never reach the pinnacle or be finished with the work.



Dr. Kathleen Hogan of the DOE (center) pays a visit to the New River Valley Assembly Plant.

- Start small with a pilot project. You may not know how a particular partnership or retrofit will work out, so try it in one location first.
- Find a champion. When you are looking for a site to pilot an initiative, find one with a facility manager who is really driven and loves working on these types of initiatives. Then, make his or her energy efficiency responsibilities part of their job description.
- Share your story. If you're going to do the good thing and invest in energy efficiency and sustainability, you might as well get some recognition for your work.
- Engage your employees from the start. While it is natural to begin on the more technical side of energy efficiency, having engagement programs incentivizes employees to share with you their ideas about projects and initiatives you didn't even know were there.
- Figure out how sustainability fits into your corporate values. At the Volvo Group, environmental care is a top consideration. Having that mindset is what started New River Valley on its energy saving journey.

For Partners:

- Volvo's partnership with the DOE has been so successful because they have not only issued the Better Plants Challenge, but they also help facilities accomplish it. Companies do not always have the in-house expertise needed, and this is where partners such as DOE can be invaluable.
- Moving forward, Volvo plans to look into renewables, engaging suppliers and water efficiency. These are areas other companies are looking to explore as well, so any resources and assistance available from partners in these issue areas will be in high demand.

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Volvo’s Sustainability Timeline

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- 1972**
The first Volvo Environmental policy was established when the former President and CEO Pehr G. Gyllenhammar stated “We are part of the problem – but we are also part of the solution” during the United Nations Conference on the Human Environment in Stockholm, Sweden.
 - 1990**
Volvo began awarding its annual Environment Prize for outstanding innovations or scientific discoveries in the environmental field.
 - 2003**
Mack Trucks and Volvo Trucks join the EPA Climate Leaders program and set a goal to reduce greenhouse gas emissions by 20 percent per unit by 2010.
 - 2009**
Volvo Trucks’ New River Valley plant joins the U.S. Department of Energy’s Save Energy Now LEADER initiative and set a goal to reduce its energy use by 25 percent.
 - 2010**
Volvo Trucks’ New River Valley plant achieves its 25 percent Save Energy Now LEADER goal.
Volvo Group North America sets a goal to reduce energy intensity 25 percent by 2020.
 - 2011**
To share best practices in energy management across facilities, the Volvo Group Energy Network North America is established.
Mack Trucks’ Lehigh Valley Operations facility participates in EDF Climate Corps for the first time.
 - 2012**
Volvo Trucks’ New River Valley plant achieves Superior Energy Performance certification.
Volvo Group Powertrain facility in Hagerstown plant participates in EDF Climate Corps.
 - 2013**
Volvo Group North America expands its participation in the U.S. Department of Energy’s Better Buildings, Better Plants Challenge to all U.S. manufacturing sites.
Volvo Construction Equipment’s Shippensburg plant participates in EDF Climate Corps.
 - 2014**
Volvo Group North America achieves its Better Buildings, Better Plants Challenge goal of reducing energy intensity by 25 percent – five years ahead of schedule.
 - 2015**
Volvo Group North America re-pledges to another Better Buildings Better Plants Challenge to reduce its energy intensity by 25 percent over the next ten years.