

ISO 50001 Energy Management System Case Study

2021

Canada

Kruger Products L.P.

Gatineau Plant's ISO 50001 Energy Management System Saves 943,653 GJ (\$6,488,825.22 CAD) Between 2016 and 2021



Kruger Products, Gatineau, QC, Canada plant

Organization Profile & Business Case

Kruger Products L.P. (KPLP) is Canada's leading manufacturer of tissue products for in-home and away-from-home use, with nine facilities in Canada and the U.S. Our well-known brands include Purex® and Cashmere® bathroom tissue, Scotties® facial tissue, SpongeTowels® paper towel and White Cloud®. In 2010, KPLP launched our first formal sustainability program, called *Sustainability 2015*, which included commitments to reduce energy, GHG emissions and water consumption, among others. 2020 was a unique year due to the pandemic, but it was also the final year of our second formal sustainability program, *Sustainability 2020*. We are proud of our achievements, having met or exceeded three of our four targets, including reducing energy consumption intensity and Scope 1 GHG emissions intensity by 15% and 26%, respectively, since 2009. In 2021, we launched *Reimagine 2030*, the next decade of our transformative growth and sustainable innovation. We are encouraged by our tangible steps to

Case Study Snapshot	
Industry	Consumer Products
Product/Service	Tissue/paper products
Location	Gatineau, Quebec, Canada
Energy management system	ISO 50001
Energy performance improvement period, in years	5.5 (2016-2021)
Energy Performance Improvement (%) over improvement period	12.92%
Total energy cost savings over improvement period	\$4,952,007.76 USD
Cost to implement EnMS	\$613,989.61 USD
Total Energy Savings over improvement period	943,653 GJ
Total CO ₂ -e emission reduction over improvement period	38,300 MT

reduce our environmental footprint but recognize that there is still much we can do. Sustainability is key to KPLP because it fosters employee pride and strengthens our brand with consumers, customers and other stakeholders. Specifically, KPLP is committed to reducing GHG emissions by 25% (intensity-based Scopes 1 and 2) from 2009 levels. We have focused on reducing our energy consumption over the past decade and while we do not have a specific target through *Reimagine 2030*, each KPLP site has an internal energy reduction target. Teams meet regularly to review data, progress and new ideas to continue to find opportunities to reduce our energy consumption. Our GHG emission reductions are more relevant to

consumers, customers and other stakeholders, so we make these publicly available.

Our business depends on natural resources, so for us to remain viable in the long-term, it is in our best interest to take care of our environment. We believe that we can operate and grow our business while having a positive impact on the planet well into the future. Addressing climate change is a global necessity and a strategic imperative for our business. At KPLP, we proactively identify and manage the risks and opportunities associated with climate change on our business. We focus on the areas of our business where we can have the greatest impact – our energy consumption and GHG emissions from our manufacturing operations – and where we believe we can have wider influence across our value chain.

Our vision is to be the most trusted, best loved tissue company in North America. Sustainability is intricately tied to this vision and represents our commitment to conducting business in a manner that ensures the long-term prosperity of our people, our communities, our company and our planet. Within our manufacturing operations across North America, our climate change mitigation efforts focus on improving energy efficiency, deploying GHG mitigation technologies, and using renewable energy. We rely on our dedicated team and external experts to identify opportunities for continuous improvements in our operations, and we regularly make investments through a portfolio of capital projects and new technologies to shrink our environmental footprint. Energy is a cost to our business, so improving our consumption saves money, allowing us to invest in more innovation to improve our performance and further reduce our environmental impact.

We make regular investments in energy management to continually improve the performance at each of our facilities. We integrated several technologies to improve our energy efficiency at our Gatineau plant between 2016-2018, such as a feedwater pump compressor and a steam showered replacement system. We certified

the plant under the ISO 50001 for Energy Management in 2019. The plant has an annual paper making capacity of 93,000 MT and employs 400 people. KPLP was the first Canadian company to receive this certification from the Bureau de normalisation du Québec (BNQ). The system provides the Gatineau plant with real time demand response capabilities and energy analytics that save an estimated 61,000 GJ of energy per year. Watch and learn more about Gatineau [here](#).

Across our organization, we encourage our people to bring forward ideas, especially when it comes to advancing our operations. We manage our plants through line centric accountability so that a set of dedicated line leaders are accountable for driving continuous improvements on the lines. We employ continuous energy monitoring and developed a report to measure our energy consumption in real time to identify opportunities to improve our energy consumption. Our continued focus on excellence in manufacturing is supported by mentoring key operational leaders through various programs to identify opportunities to improve our operations. We presented our ISO 50001 plan to two third-party organizations and received a grant to help with the financial investment.

We also formed a partnership with Zibi to provide post-industrial waste heat (energy) for their four-million-square-foot community in Ottawa and Gatineau. This is the first master-planned community in North America, and the region's first zero-carbon-emissions community. This partnership is a pride point for plant employees, management and corporate management.

“ The Gatineau plant is an energy management leader across our network of facilities. Our EMS and ISO 50001 energy efficiency certification have evolved our energy sources, enabling our company to grow our strategic sustainable action and conserve resources to make a positive difference now and far into the future.”

-Daniel Morneau, General Manager, Gatineau

Business Benefits

In 2019, KPLP’s Gatineau plant became certified under the ISO 50001 for Energy Management, which enhanced our monitoring and serves to develop a path for our other manufacturing facilities to benefit from this type of real-time monitoring. The system provides the plant with real time demand-response capabilities and energy analytics that are saving an estimated 61,000 GJ of energy (4% of the plant’s total) per year. We also have room to grow and reduce our consumption further, while still increasing production.



We set baseline energy and GHG metrics in 2015 for each operational mode at Gatineau. Even with ramped up production due to increased demand for our products during 2020, we were able to maintain our energy consumption per metric tonnes.

	Baseline	Reporting
Production (MT)	85,479	94,059
Electricity (GJ)	432,486	420,584
Natural Gas (GJ)	1,074,063	1,023,014
Total (GJ)	1,506,548	1,443,598
Electricity Intensity (GJ/MT)	5.06	4.47
Natural Gas Intensity (GJ/MT)	12.57	10.88
Total Intensity (GJ/MT)	17.62	15.35

These types of enhancements or innovations drive us towards achieving our corporate sustainability targets. We are proud of our corporate progress to reduce our energy consumption (intensity) by 15% since our 2009 baseline, meeting our Sustainability 2020 target. We achieved this progress while increasing our production nearly 30% during the same period.

Implementation Cost:

Item	Cost (USD)
I/E staff time to develop, implement, maintain EnMS (> 1 year)	\$308,363.55
Additional monitoring & meeting equipment	\$220,002.32
I/E staff time to prep for external audit	\$79,347.69
Third-party audit	\$6,276.05
Total	\$613,989.61

Energy Cost Saving: With the integration of capital investments to improve our energy efficiency, as well as the ISO 50001 management system, we have saved \$4,952,007.76 USD. This figure factors in the cost of electricity and natural gas, as well as production, during the 5.5-year period.

GHG Reduction: Even with increased production, we have maintained our annual GHG emissions, measured in CO₂e/MT, since implementing ISO 50001 and other capital investments since 2016. Our total GHG savings during the 5.5-year period (2016 – 2021) is 38,300 MT, which is based on our consumption of natural gas in GJ.

Non-energy Benefits: ISO 50001 real-time monitoring enables us to identify operational abnormalities much earlier than before. We can identify and address equipment that is beginning to fail before it impacts production efficiencies. Real-time monitoring also requires a shift in approach. Our Gatineau team adapted very quickly and has expanded this way of thinking across their work, so they are more aware of the roles they can play in making the plant more efficient and are more confident to bring forward ideas in real-time more often, allowing us to capitalize on

front-line innovative ideas to improve our performance. It also weaves into our HR team's employee engagement and culture strategy, *We See Your Greatness*, through which employees are provided with several opportunities to grow and learn new skills, contribute to something bigger, do more than they ever thought they could, and celebrate each other's successes. Finally, sustainability is also a key part of why employees stay with our company, and why others are attracted to join our team. People want to work for companies that care about people and the environment. Our energy reduction efforts are one way people know that KPLP cares for our environment.

Plan

Energy is a key factor in all capital investment projects at KPLP. Following our *Sustainability 2015* program, during which we invested in several capital projects to improve our energy performance and reduce GHG emissions, we sought a system that would involve our people across all levels to maintain the progress achieved and find other opportunities for savings.

In 2016, we partnered with a third-party to evaluate the benefits expected from implementing an energy management system (EMS) combined with an energy management information system (EMIS). Using the results of the audit, we developed a business case to justify the resource allocation in terms of personnel and capital to support the implementation of ISO 50001.

The Corporate Director of Energy Efficiency, the VP Manufacturing and the General Manager of the Gatineau plant sponsored and drove the proposal and implementation process. As we worked through the planning stage, we shifted from a phased approach to a global implementation strategy, covering the entire site. Half-way through the implementation process, we decided to commit to obtaining the ISO 50001 certification instead of only implementing the EMS.

The development of a business case (cost/benefits) of the implementation was key in obtaining financial

commitment. The funding available from KPLP and a third-party grant also contributed to making the investment attractive. Due to the rigor of the plan and that KPLP is ISO 9000 certified, the plan was quickly approved.

We can only improve what we measure. To that end, we identify energy consumption for each process, including paper machines, boilers and water treatment, as well as each piece of equipment (e.g., Yankee, pressurized steam vessel, burner, pumps/motor, vacuum pump) within each process. We installed equipment to track key consumption by source (electricity, natural gas and steam). This provides us with detailed information about how and where we consume energy. For each process, we formed working groups made up of machine operators and lower management to monitor, analyze and identify opportunities we can improve.

While working through the ISO 50001 certification, we converted energy consumption to a unit that was relevant to management and our operation team - dollars. This demonstrated the benefits to management in terms of positively impacting KPLP's bottom line while also improving our environmental footprint. Additionally, the dollar figure helps the operation team understand how the approach can benefit the plant and enable them to be more accountable for and in control of their energy consumption. Data is key. It clearly shows the investment, ROI and timeline for implementation and payback, allowing management to understand the full scope of ISO 50001 and engaging the front-line team to be an integral part of the process.

“The continuous monitoring of our energy intensity and associated costs provides us with much more control. The data empowers our entire team to find improvements to operate more efficiently as a company, and it instills a sense of pride in our work.”

—Dino Bianco, CEO, Kruger Products

Do, Check, Act

Our plan included specific actions for each process per energy consumption on three paper machines (PM3, PM5, PM4) and Auxiliary sources of consumption (e.g., lighting, heating, compressed air, heat exchange system, water filtration, repulping). The process included collaboration among a diverse team with employees from all levels and various fields, such as operations, maintenance, lower and middle management, and headquarters, each with specific roles and responsibilities.

KPLP’s senior leadership is very supportive of sustainable innovation to improve our environmental footprint. Management provided a variety of support, including hiring an energy engineer, as well as one process engineer per each process. At the corporate level, we applied for third-party grants to help with the upfront cost. Headquarter employees were excited and supportive of the implementation of the ISO 50001, and recognized the importance of it for the plant’s progress.

Our line-centric crew reviews the data daily. Team members meet with operation for review on a weekly basis, with management on a monthly basis, and with upper management annually. This real-time data analysis directly influences our energy consumption and associated cost.

For each operational mode at the Gatineau plant (e.g., shutdown, start-up, washup), we defined an internal energy target based on our baseline metrics. Targets vary based on key variables, including the season, specifically summer and winter, because of the variation in heating, cooling and lighting throughout the year, as well as product demand based on seasonality. These targets and our ability to meet them are reviewed every 6 months. Due to various circumstances, we did not meet the plant’s targets in 2019 or 2020. So far, we are on track to exceed our 2021 target by a significant margin.

We used the “Good” method to calculate our energy performance, comparing energy intensity on July 1,

2020 to July 1, 2021. The variable we selected is the paper production weight (MT) since the majority (95%+) of the energy in our processes is used to remove, drain or dry water. The more paper produced, the more energy required to extract the water content. The plant is operating 24 hours a day, 7 days. The strategy of our EnMS is reducing the energy consumption to the minimum during shutdown periods and optimizing during production, so we believe this metric is the most appropriate in tracking energy improvement.

Our performance improved by 12.92%:

	Baseline	Reporting	Performance Improvement
E Intensity (GJ/MT)	5.06	4.47	11.62%
NG Intensity (GJ/MT)	12.57	10.88	13.44%
Total Intensity (GJ/MT)	17.62	15.35	12.92%

Engaging Employees: Employees are the driving force behind our progress and ongoing success. They are involved in our innovation in a number of ways:

OPEX: Energy consumption is integrated in our OPEX framework, so employees are trained on energy consumption and things to look for to help the plant improve our energy footprint.

Dashboards: The dashboard in the operating control cabin present our operation crew with real-time/continuous information on their processes. The dashboard monitors all variables that can affect the process, so they have a great sense of control through the data presented. The energy costs are included on the dashboard on top of the list, so employees looking at the data can clearly see the connection between energy and cost.

Set Targets: We determined targets for each process. If a parameter is out of operating range, we use a tri-colour-coded system to rapidly identify anomalies. We

discuss these daily, weekly and monthly to determine what is happening, (e.g., equipment is beginning to fail or poor-quality materials) and evaluate the best course of action.

DRS Board: This is a standard way of transferring information between shifts and between lower management and our operators.

Training: Employees across all levels (e.g., trainers, operators, management) received training as part of the integration of ISO 50001. The training included specific coaching on the system, the tracking tools and sensitization.

Line-centric Approach: All employees in the plant are accountable and empowered to share project ideas. Several in-house projects originated with suggestions from our operators.

The external audit represents 40 – 100 hours of KPLP resources. Our team prepared for the third-party EMS audit through the training of two internal staff to conduct audits in advance. We learned about areas we need to improve on before the actual audit took place. EPS assisted by training our staff, assisting with our first two audits and with reviewing the energy manual and administrative documents. Cumulatively, the preparation, coaching, updating and revision of required documents, corrective action from internal audits, and the actual third-party audits last in average 2-3 days.

Transparency

On November 8, 2019, a joint press conference was held at the Gatineau plant to announce the certification. The press conference included Mathieu Lacombe, Minister of Families and Minister Responsible

for the Outaouais Region; Dominique Deschênes, General Manager, Operations & Innovation, Transition énergétique Québec (TEQ); and Francis Jacques, Program Manager, BNQ. KPLP issued a press release after the conference.

We conduct annual third-party audits, part of which includes providing our data to ensure energy targets are maintained.

What We Would Have Done Differently: Understand Motivation: Finding the right unit that speaks to the user from the onset. Early in the process, we talked about saving GJ (energy). However, very few people understood what saving 10,000 GJ meant. When we translated energy reduction into dollars, the level of engagement rose very quickly.

Hired an Energy Engineer Sooner: Once we established a dedicated resource with expertise to manage energy consumption, we saw a notable improvement on performance. This resource and expertise would have made implementation faster and more efficient.

“Sustainability is intricately tied to our corporate success and has always been a priority for Kruger Products. We were the first Canadian tissue products company to earn Forest Stewardship Council® (FCS®) chain of council certification, and today 100% of our fibre is third-party certified. The ISO 50001 energy efficiency certification reinforces our commitment that we continue to take tangible steps to protect our environment.”

— Steven Sage, VP of Sustainability, Kruger Products

The Energy Management Leadership Awards is an international competition that recognizes leading organizations for sharing high-quality, replicable descriptions of their ISO 50001 implementation and certification experiences. The Clean Energy Ministerial (CEM) began offering these Awards in 2016. For more information, please visit www.cleanenergyministerial.org/EMAwards.

