

Net-Zero Payments

Reaping the environmental and financial benefits of payments modernization



Contents

- 1 Introduction**
What is net-zero payments?
- 2 Power**
Reducing high levels of power consumption
- 3 Process**
Reducing inefficiencies and application spaghetti
- 4 People**
Eliminating unnecessary movement
- 5 Conclusion**
- 6 Case study**
North American bank reduces carbon footprint with CGI All Payments

Introduction



We strive to protect the environment by embracing responsible operating practices, delivering sustainability solutions to our clients, and committing to net-zero carbon emissions by 2030.

At CGI, we have been focused for a number of years on reducing our impact on the planet and helping our clients to do the same. We strive to protect the environment by embracing responsible operating practices, delivering sustainability solutions to clients, and committing to net-zero carbon emissions by 2030. In terms of this 2030 goal, we have empowered our operations across various geographies to achieve it earlier if they can.

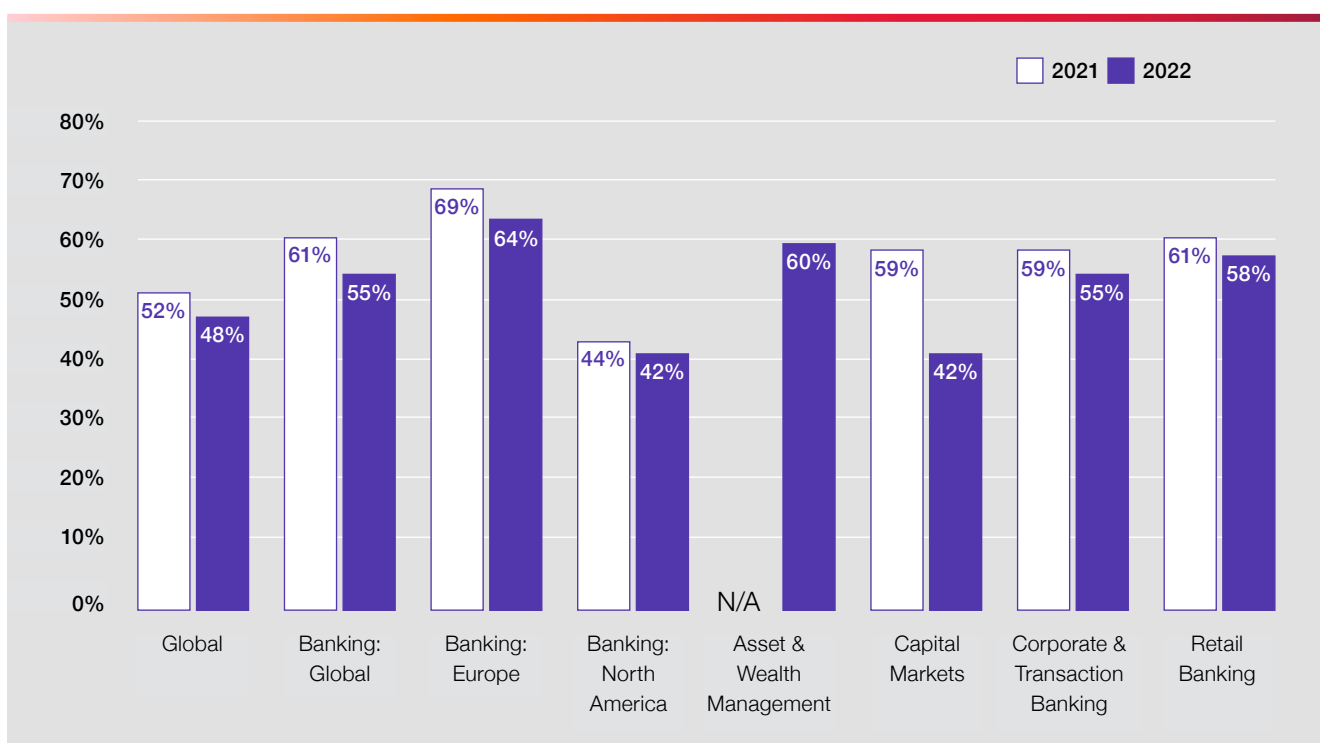
Like CGI, many financial institutions are evaluating their environmental footprint. However, as with many initiatives, improvements that are the easiest to make, don't necessarily yield the highest benefits. It is sometimes too easy for an organization to stop at green "feel good" activities and claim to be delivering on its environment, social and corporate governance (ESG) program while, in reality, failing to make substantive change.

In addition, when it comes to payments compliance—primarily driven by the global

migration to ISO 20022—many financial institutions have taken a minimum viable product (MVP) approach to compliance rather than investing in more time-consuming, yet more effective payments modernization.

The combined outcome of these two approaches—a focus on green "feel good" activities and MVP payments compliance—leads to missed opportunities and the potential for a greater negative impact on the environment rather than building a more sustainable future.

Sustainability remains a key focus area for banking



On average, the banking industry remains more concerned about sustainability than other industries. However, the degree of interest has fallen slightly

as banks start to execute against their sustainability plans and migrate these activities towards standard operating procedures.¹

Note: Asset and wealth management was added as a category in 2022.

¹ Source: CGI's 2022 Voice of Our Clients - Corporate and Transaction Banking | CGI, Inc.

What is net-zero payments?

By embracing a genuine change agenda for payments modernization, a bank can increase its financial profitability while fulfilling robust ESG goals.

Actions to be taken include some, or all, of the following:

- Pursuing a path of payment application modernization and rationalization
- Moving to a more efficient and technologically aligned infrastructure
- Increasing automation
- Adopting more efficient processes that require minimal intervention
- Improving data quality and automated straight-through processing
- Making highly secure infrastructure remotely accessible

We will dig into each of these actions further as we explore the concept of net-zero payments, which involves building a profit-and-planet focused, enterprise-level payments modernization strategy that pairs positive ESG outcomes with enhanced profitability.

As with most enterprise-level initiatives, this dual focus requires a significant change agenda and strong executive sponsorship. In addition, because moving money effectively is central to a bank's operations, there is usually a strong "if it ain't broke" aura around



payment systems. Despite all of the investment in digitizing other infrastructure, payments modernization is usually deemed a high risk and low priority.

However, by developing a strategy that delivers more compelling arguments than payments compliance alone, we reach a point where the case for major change significantly outweighs tinkering with the status quo. This is net-zero payments.

Developing such a strategy requires input from a number of disciplines, with an understanding of how to bring those disciplines together. It also requires key application upgrades, along with infrastructure, methodology, and workforce modernization and a strong focus on carbon accounting. A net-zero payments strategy will challenge your entire institution as it seeks to break down decades of inaction and near-zero evolution, but the outcome will benefit not only your customers, shareholders and employees, but also the planet.



So much more than software

The biggest downside to a minimalistic green or MVP compliance approach is that it removes the opportunity to cleanse your ecosystem of the sins of the past. For example, those applications built to plug in gaps between others, the robot that automatically corrects the typos of a major customer, or the mainframe database that is challenging to operate. All of these types of “sins” demand resources and create inefficiencies within a financial institution’s ecosystem.

In the early 2010s, banks began to purchase payment hub software with the goal of facilitating payment orchestration and moving payments processing into a more compact ecosystem. While this approach was theoretically strong, payment hubs have, on the whole, been half-heartedly implemented. As a result, they’ve added to the glut of legacy systems rather than alleviating the problem, generating technology debt as in past years.

This is further exacerbated by financial institutions that are keen to hang on to legacy processes and bake them into newly deployed solutions, creating more inefficiencies while preventing many of the benefits of software modernization. Others might try to modernize from the front channel backwards, developing highly digitized front ends that give the illusion of modernity while requiring middleware to solve the limitations of tired, back-end legacy IT.

A barrier to digital transformation

96%

of banks have legacy systems that are hindering the successful implementation of their digitization strategies.

Source:
2022 CGI Voice of Our Clients

The cost of legacy infrastructure

All of these inefficiencies have a marked effect on both the financial profitability and the carbon footprint of a bank. Invariably, each legacy software package requires its own operating system, hardware, and support team rather than having a common stack across the board. Anecdotal evidence exists of a Dutch bank retaining mainframe systems to service only a handful of accounts because none of its employees understood the delivered services enough to modernize and migrate.

Another financial institution is not upgrading key SWIFT infrastructure that supports a 30-year-old system because the risk of migration is deemed too high. Instead, it's bending the infrastructure out of shape with middleware in an attempt to remain compliant.

Regulators are paying attention to this, issuing fines that are costly monetarily and damaging to reputations.

Key issues that impede ESG goals

In addition to legacy infrastructure impeding full digitization, green “feel good” activities fail to address three key issues that impede the achievement of ESG goals and the move towards net-zero payments:

- 1 Power**
High levels of power consumption
- 2 Processes**
Inefficient processes and application spaghetti
- 3 People**
Unnecessary movement of people

Power: Reducing high levels of power consumption



Less power, better production

Simply put, one of the best ways an IT organization can reduce its carbon footprint is to use the most energy-efficient hosting infrastructure possible. This requires moving towards shared, flexible resources and scalability that aligns with both minimal consumption and peak volumes, while at the same time, ensuring a high level of security. In essence, the cloud model approach becomes your biggest asset.

However, reducing consumption is not the only task. Ensuring that your data centers are powered with renewable energy also is key to moving to net-zero.

Both endeavors require a different set of disciplines within your organization and will challenge much of the status quo.

Reducing your energy consumption

Overall, energy consumption is a direct consequence of the IT resources that your infrastructure requires. Servers, network connections, and devices need a constant supply of electricity to work. Many, in fact, run 24/7/365.

However, there are a number of factors that constrain your ability to fully optimize energy usage:

- 1 Legacy applications that cannot be ported to more efficient types of infrastructure
- 2 A diverse application base that requires specific hardware
- 3 Environments that can't be replicated easily in virtual machines, requiring duplicate hardware for testing purposes

Ironing out these issues is not an overnight fix, but with expert support and executive alignment progress can be made and energy consumption reduced.



Arguments still rage about the eco-credentials of cloud versus mainframe, with mainframe manufacturers claiming their hardware is still the most efficient solution for high-volume processing such as payments. However, regardless of the differing opinions, the cloud offers a massive benefit over traditional data centers—scalability. Scalability gives financial institutions the flexibility to scale resource usage to match current consumption, as well as peak moments. With most payment systems experiencing a steady

hum during business hours and only sporadic peaks and troughs, a static infrastructure requires processing power to match peak usage. As a result, in many cases, infrastructure is oversized by as much as six times (versus daily average transaction flows). Further, even with optimization, the infrastructure is typically four times the average capacity requirement. However, when infrastructure is paired with cloud-native applications, financial institutions benefit from scalability, along with many other cloud advantages.

It takes about 60% less energy to process a payment in the cloud versus a legacy system through flexible capacity management alone.

Even assuming like-for-like energy usage in processing a payment in the cloud versus a legacy system, moving to the cloud can significantly reduce the overall energy needs of a payments system by approximately 60% through flexible capacity management alone. Those with more extreme processing profiles may even achieve energy reductions in the realm of 80% or more, as peaks are limited to 1-2 hours each day.²

However, moving infrastructure to the cloud is not easy. As described in a recent CGI white paper,³ it requires changes in the strategy and operation of your organization, as well as major changes in terms of cybersecurity and data protection. As discussed later in this paper, operational and IT staff need to be trained to think differently and to make the most of agile delivery and infrastructure optimization.

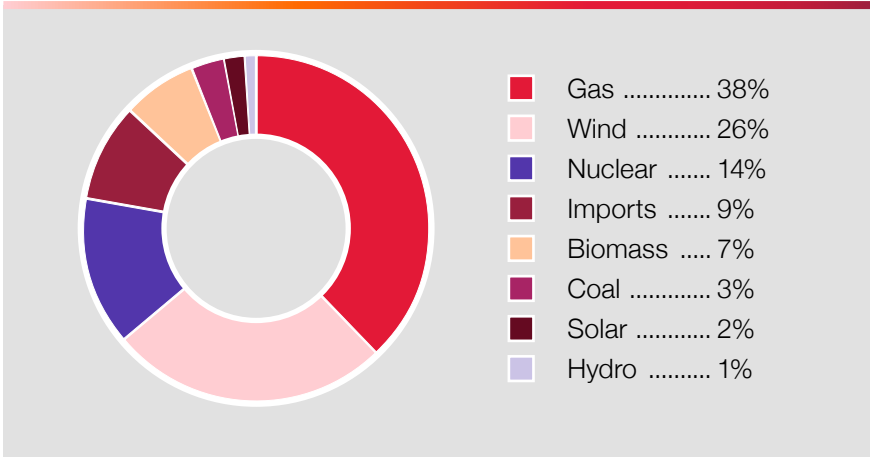
All of this takes time and investment to ensure the right outcomes, and some banks are working with external providers to acquire these services through platform-as-a-service delivery. PaaS offerings remove much of the pain experienced during the rapid adoption of cloud-based applications and can accelerate the move to the cloud when a financial institution is not yet equipped to meet the challenge.

²Source: [TARGET Annual Report 2020 | European Central Bank](#)

³Source: [Moving payments to the public cloud with CGI All Payments | CGI](#)

Choosing cleaner energy

Whichever strategy you choose for reducing your energy consumption, it needs to be paired with renewable energy sources (e.g., wind, solar and hydro-generated electricity), which are massive accelerators in moving towards net-zero. As CGI progresses towards our stated 2030 net-zero goal, we have been doing this for our owned and leased data centers. Pairing our global procurement team with experts from our ESG and sustainability practices has enabled us to validate electricity sourcing within all of our owned and leased locations, ensuring that every kilowatt is truly sustainable.



CGI's UK electricity generation mix for Q1 of 2021 shows the high availability of power from renewable resources.

Pairing renewable energy with an overall reduction in energy consumption is an essential component of an effective energy strategy. While each delivers a net reduction in carbon footprint, renewable energy production is not yet a net-zero exercise due to the limited resources available

to generate it. Driving down consumption serves as a strong counterbalance to this challenge.

Further, transitioning offices and data centers to passive building standards and introducing alternate heating and cooling technologies can assist with the move towards net-zero.



Processes: Reducing inefficiencies and application spaghetti

Getting lean, mean and green

As we enter the sixth decade of electronic payments deployment, the evolution of capabilities has led to major functional overlap and platform diversification.

With larger banks sometimes connecting more than 150 applications to their core payments processing systems, many smaller functions are performed inefficiently, which leads to higher costs and operational complexity. Often, the cost of maintaining applications is higher than the value they bring to a business. This is especially true for applications that have a small user base and spiraling maintenance costs due to technology obsolescence, software entropy, or DRR (deceased, redundant or retired).

Additionally, when payment applications were first deployed, they invariably took their processes from the paper systems they replaced. Many of those processes have undergone little or no change since initial implementation and taking the opportunity created by payments modernization to evaluate and improve these processes can significantly improve efficiencies.

Rationalizing applications

The first step in removing legacy applications from your payments infrastructure is to understand the functions they perform and the reason they were first deployed, as well as the new functionality required to replace them. Leading payment hubs such as CGI All Payments offer superior functions, but during a minimum-viable implementation, these often go unused as “there already is a system that does that part.”

When viewing payments modernization through an ESG lens, we see that the challenge is actually to determine how many applications you can remove during implementation. This is net-zero for applications. How many applications can I eliminate while still processing in the way that I want?

To get there, we need to analyze and understand which applications perform similar functions or manage the same data, which, in turn, raises other issues. In the case of duplicative processes or data, CGI recommends adding the functionality of one application to the other and decommissioning the redundant application.

Application rationalization also can be achieved by outsourcing application management. Many banks are examining the benefits of moving payments operations to third-party providers under frameworks such as the EBA outsourcing guidelines or working with platform-as-a-service providers to reduce the cost of payments modernization.



Optimizing business processes

Reducing manual intervention through process automation or artificial intelligence driven decisioning can dramatically reduce the cost of payment operations, as well as significantly reduce the number of operational resources required to achieve processing goals. Both impacts, in turn, reduce the carbon footprint of operations. The legacy challenge discussed earlier, which has led to both inefficient infrastructures and application spaghetti, is often driven by antiquated or unnecessarily complex processes that negatively impact a financial institution's ability to improve straight-through processing.

Effective modernization programs produce their greatest results through business process transformation and related change management programs. While modern payment processing applications such as CGI All Payments usually provide best practice workflows that deliver 95% straight-through processing by design, personalization to align with legacy bank workflows can drive this percentage downwards and subsequently negate the advantage of deploying modernized software. Along with the knowledge to create optimal payment workflows, CGI has vast experience in applying our proven business transformation methodology, CGI Application Services Optimization Program (CGI ASOP),⁴ to streamline business processes and align payment systems and the organization in a way that most efficiently supports those processes.

⁴ [CGI Application Services Optimization Program](#)

“Any platform can be delivered more effectively with lean and agile approaches. The only question is how far can you go with an agile approach? The answer will depend on some fundamental prerequisites. If these prerequisites are not dealt with upfront, the constraints on your agile delivery will be significant.”

Phillip Van Sickle

Vice President, Consulting Expert

Becoming more agile

Hand-in-hand with application rationalization and process optimization is the need for financial institutions to become more agile. Financial institutions considering a lean-agile transformation at scale also need to be prepared to rethink their outsourcing strategy to increase its effectiveness. Lean thinking and agile methods for application delivery and operations are built on the simple principle of a fast, flexible flow of information and value, which requires stable teams and a learning culture. Mature lean and agile organizations move away from projects and adopt a lean portfolio management system that is based on lean start-up principles to align strategy and execution.

In simpler terms, implementing new applications and new processes in a legacy waterfall environment can lead you back to where you started in a short

period of time. Many of our legacy payment clients are challenged in applying annual regulatory updates mandated by payment schemes simply because they are not structured for the constant evolution of their systems.

There is a belief that these platforms cannot be evolved to embrace agile delivery, but in the words of CGI agile transformation expert Phillip Van Sickle, “Any platform can be delivered more effectively with lean and agile approaches. The only question is how far can you go with an agile approach? The answer will depend on some fundamental prerequisites. If these prerequisites are not dealt with up front, the constraints on your agile delivery will be significant.”

People: Eliminating unnecessary movement

Enabling remote work

One of the major learnings that came from the recent global pandemic was just how many legacy systems required people to be on-site to maintain core activities such as a bank's ability to move money. From manual archive processes and report extracts to tape backups and physical network management, operational payments staff became essential workers in many organizations with legacy payment infrastructure.

However, during the same period, CGI implemented CGI All Payments for Vantage Bank of Texas using entirely remote delivery methods. By leveraging platform-as-a-service capabilities and the Microsoft Azure cloud, the bank delivered not only improved functionality for processing Fedwire, SWIFT and NACHA payments, but also removed its reliance on specific access terminals for operational staff through secure browser access. Remote access alone reduced the bank's carbon emissions.

Many legacy payment systems still require access through devices physically connected to the bank network and identified specifically for that task. Whether this is driven by application limitations or network security requirements, the need for staff to be in a physical location is a driver of secondary greenhouse gas emissions, as they typically need to commute to that location.



Typically, when working from home or satellite offices, employees still will use the same equipment and the same levels of environmental control for their desk areas. So, the major cost in terms of emissions per person is related to the commute, although there also is considerable energy expenditure involved in the use of shared areas such as meeting rooms, communal spaces, and office kitchens.

Remote work at CGI

At CGI, we realized during the COVID-19 pandemic that we could optimize our facilities and still meet our business requirements. As we returned to our offices post-pandemic, we have maintained these optimizations and expect our emission reductions to continue.

Essentially, in implementing the remote-accessible enterprise solutions required to maintain our business during the pandemic, our total real estate footprint began to downtrend, resulting in reduced Scope 1 and 2 emissions.



PaaS: The key to ESG and remote operations

CGI All Payments helps our clients transition their payment operations in a similar manner by enabling remote access for operational users and those managing the system. Further, if payment infrastructure is outsourced to a shared service provider through a platform-as-a-service offering such as that provided by CGI, a reduction in commutes can be amplified through a reduction in infrastructure operations resources.

To put this into numbers, according to the International Energy Agency,⁵ energy saved because of less commuting is about 4 times higher than the increase in residential energy consumption, which itself is

estimated to be between 7%–23%, depending on geography and climate. While care should be taken to align these calculations to each financial institution's location and circumstances, there is little doubt that remote operations and infrastructure management contribute significantly to achieving net-zero goals.

Care also should be taken to address the impact of increased employee energy consumption at home. Provide, for example, support for employees in accessing better sources of energy for their home offices through corporate policy and group purchase initiatives, where possible.

⁵[Working from home can save energy and reduce emissions. But how much? | International Energy Agency](#)

Increasing operational efficiencies

One of the biggest wins that can be achieved with a modernized payments infrastructure is improved operations. This typically results from the reallocation of staff from repetitive, functional activities to more value-added roles, including delighting customers.

As the actions highlighted earlier drive significant efficiencies in both transaction processing and system monitoring, both business and infrastructure operations can be managed more effectively by smaller teams. Further, as indicated earlier in the “Process” section above, containerized applications deployed into a cloud framework such as Kubernetes create an environment that can be both self-healing and proactively managed, reducing downtime and manual work.

Higher levels of application availability can be achieved than through traditional on-premises deployments, with remote monitoring and automation of previously manual tasks all part of the delivery model. Further, it is

Total international payments per year	252,711,329	
STP rate - wires/international	90%	95%
Number of STEs per year	25,271,133	12,635,556
Number of STEs per bank day	114,869	57,434
Average exceptions per operator, per hour	70	
Average exceptions per operator, per day	560	
Number of operators	205	103

A comparison of the reduction in operators needed as STP rates increase using figures from a European financial institution

significantly easier to allow a third party to manage your payments infrastructure with this model.

CGI All Payments is delivered as part of a platform-as-a-service model, including cloud deployment, fully managed infrastructure, and full application managed services. Using a vendor to provide these services enables operational staffing to be shared across a number of deployments and, therefore, resource levels can be reduced by up to 80% per bank.

Reducing the focus on the technical operations of your payments platform allows a greater focus on the business operations,

and subsequent improvements in straight-through processing rates can have a major impact on operational staffing levels. A recent study by CGI with a European financial institution demonstrated that improving STP rates for international payments from 90% to 95% would reduce manual interventions by 50%. Coupling this with a shift from a legacy mainframe application to a modern cloud-based solution would reduce cost-per-payment by more than 55% and give the financial institution the ability to reassign more than 100 staff to other value-added roles.

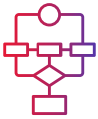
Conclusion

An effective net-zero payments strategy at the enterprise level will enable any financial institution to make a big difference to the monetary and planetary cost of their payments business.

To achieve net-zero payments, you must tackle the following three issues:



High levels of **POWER** consumption



Inefficient **PROCESSES** and application spaghetti



Unnecessary movement of **PEOPLE**

A net-zero payments strategy will help you reduce your power consumption, drive process efficiencies, and reduce unnecessary movement of people based on an assessment of the current status of your organization and the development a roadmap that will enable you to meet ESG obligations while modernizing your payments infrastructure.

A key starting point is conducting an inventory of your existing infrastructure and operating practices. This inventory can be used as a baseline from which you can develop and execute your strategy. It is often said that what gets measured and made visible, gets done. Embedding a transparent, data-driven approach

to monitoring and managing your payments infrastructure is a fundamental element to successfully navigating your pathway to net-zero.

This key step often is easier said than done and can sometimes be overlooked. However, it leads to a requisite baseline that drives the formation of clear operational and organizational boundaries and clear consideration of the impact of processes and infrastructure on emissions. Once a detailed baseline has been established, a net-zero payments strategy will help your organization navigate and overcome the complexities of the power, processes and people challenges to create a more sustainable business.



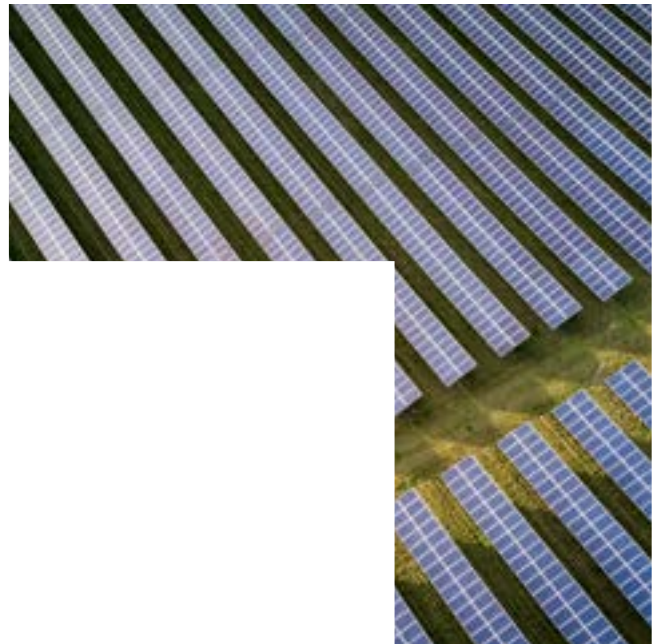
CASE STUDY

North American bank to reduce carbon footprint by 1,903 tons with CGI All Payments

Recognizing significant changes in U.S. and global payments systems in the run up to SWIFT's November 2025 ISO 20022 deadline, one of the oldest North American banks and a CGI client for 35+ years, boldly decided to migrate from a mainframe legacy system to CGI All Payments, delivered under a cloud-based, platform-as-a-service model. In conjunction with this transformation, the bank also is rationalizing

its SWIFT infrastructure and looking to increase overall efficiencies in its international payments operations.

In line with the bank's published ESG strategy, one of the driving factors behind its leap from mainframe to cloud-based PaaS was a reduction in its energy usage and the ability to **reduce its overall carbon footprint** through improved operations.



Legacy infrastructure

Currently, the bank's international payments operations are deployed on 6 dual-core HP NB56000 NonStop servers (2012), configured as two nodes both running 18.5 hours per day, with an additional server running SAA. Total storage of 150GB on the servers is available over 25 HDDs. Each node draws 652W per hour running, meaning a total daily consumption of 23.125kWh.

Approximately 50 operational staff are employed to monitor and manage this

infrastructure, alongside 400 back-office staff looking after their 2 million SWIFT transactions per day and servicing an average 207,000 exceptions daily. Each of these back-office operators leverage older, office-bound secure Dell PCs to access the application (drawing 300W when used and 90W when sleeping), located primarily in the northeast U.S. These 450 devices use approximately 4.02kWh each per day, or 1.81MWh in total, or the same power as nearly 200 homes. With 76.8% of

the state's electricity generated using natural gas (23.2% is renewable), it is likely that most of this is produced by burning fossil fuels.

The bank's 450 users face an average 80-minute round trip commute each of their 250 working days, whether by car or public transport, tied to the office by secure access needs rather than any bank policy. This adds up to an estimated total carbon footprint for the bank's legacy SWIFT infrastructure of 1,115 tons of CO₂e.

Total operations and back-office staff

450

Daily SWIFT transactions

2M+

Annual power demand in megawatt hours

460.5

Estimated annual tons of carbon dioxide equivalent

1,114.7

CGI All Payments PaaS

Moving forwards, the bank will migrate both its legacy wire room and SAA functions to a single application, the CGI All Payments wire room module. This will be hosted in a multi-node, dual region Microsoft Azure infrastructure 100% powered by renewable energy as of 2025. The system will support the same 2 million messages per day, with each message using approximately 30kB of processing and storage.

The 50 internal operational staff will mostly migrate to new roles with PaaS operations provided by CGI, requiring 5 CGI

FTE to monitor and manage the cloud-based environments. With approximately 6 bank IT staff still working on the solution, there is an overall IT operational staff reduction of 80%, removing \$3.55M out of the annual cost of payment systems IT operations. A further 209 back-office staff can be redeployed as STP rates improve by approximately 6%. The remaining 215 staff members also will access the solution through secure remote channels, allowing them to take advantage of the bank's flexible work program that allows up

to 100% remote working. With remote access secured, the bank's newer Energy Star 8.0-compliant laptops can be used in place of older desktops, lowering energy use per device to a peak of 54W.

From a power perspective, the PaaS solution uses up to 432 MWh less per year than legacy, which at the current 17.17¢ per kWh is a direct \$77k in annual savings. This, coupled with an overall possible carbon footprint reduction of up to 1,097 tonnes of CO₂e, represents a significant win for shareholders and the environment.

Possible staff count

235

Daily SWIFT transactions

2M+

Annual power demand in megawatt hours

28.4

Estimated annual tons of carbon dioxide equivalent

18

Estimated annual savings

\$3.6M



About CGI

Founded in 1976, CGI is among the largest IT and business consulting services firms in the world.

We are insights-driven and outcomes-based to help accelerate returns on your investments. Across hundreds of locations worldwide, we provide comprehensive, scalable and sustainable IT and business consulting services that are informed globally and delivered locally.

For more information visit [cgi.com](https://www.cgi.com)

© 2022 CGI Inc.

