
Under the supervision of Dr. Lukas Neville and Judith Jayasuriya and with partnership from Manitoba Hydro, Anna Gilfillan has written this case solely for the Asper Leadership Case Competition (ALCC) 2023. The author has no intention to comment on or evaluate the handling of managerial decisions within Manitoba Hydro. Photocopying transmitting, distributing or reproduction this case in any form or by any means is strictly prohibited.

Manitoba Hydro: Developing & Leading a Change-Ready Organization to Meet the Demands of an Evolving Energy Landscape

February 2023

As Jay scrolled through the pages of the employee culture survey results, she experienced a wave of conflicting emotions, from optimism to anxiety.

After years of research, strategizing, planning, and consultation with external stakeholders, Manitoba Hydro had developed *Strategy 2040*, a vision for the organization's future. The strategy set the stage for Hydro to keep pace with customer expectations and sustain its future in a world of disruptive change that could see the electrical monopoly and provider of natural gas dealing with new market entrants and new customer demands. A massive restructuring of the organization was already well underway to create a structure that reflected Hydro's future needs.

But the employee culture report, along with her experience in leading change within the organization, convinced her that the success of the strategy and structure would depend on how well Hydro could prepare its talent pool to become more agile, innovative, and customer centric. Hydro's culture and ways of working as a Crown corporation were the result of the organization's environment. Hydro operated in a heavily regulated environment, subject to intense public scrutiny and political oversight. Its operations involve massive infrastructure projects in remote and complex environments, which made safety and risk management top of mind. It was one of the province's largest employers, with many of the rigid policies and procedures that often characterize large organizations.

The new landscape, however, would require new methods, greater collaboration, more risk-taking, a more empowered workforce, and a new set of skills and talent. On this snowy day, Jay

pondered the challenges that lay ahead in leading the organization through the evolving energy landscape driven by the forces of digitalization, decarbonization, and decentralization. She was aware that the organization would be facing an age of prolonged change that would require a culture shift and buy-in from their close to 5,000 employees. She wondered, how could they best prepare the organization's people and processes to meet these challenges?

History

Manitoba Hydro's history dates to the late 1800s. The Winnipeg Gas Company, a supplier of gas for lighting, was the first utility provider within the province. However, the late 1800s saw the energy industry evolve as many more gas, electricity, and electric-rail transportation companies entered the Manitoba market. Eventually, the market would consolidate, and Manitoba Hydro would become the sole provider of electricity and primary provider of natural gas for Manitobans. However, this wasn't always the case. In the early days, the industry was fragmented.

As electricity began to be seen as a necessity rather than a curiosity, a few farsighted individuals understood the advantages of large-scale generating facilities, including a number of public-spirited citizens who felt that electricity should be made available at the lowest possible cost to the consumer.¹ Following a period of growth and evolution within the sector that saw multiple new entrants as well as several mergers and acquisitions, The Manitoba Hydro-Electric Board Development Act was passed in 1949. Through this act, the government of Manitoba formed the Manitoba Hydro Electric Board (MHEB) and authorized the agency to acquire competing utility companies within the sector, with the intent to consolidate the industry and ensure adequate supply to the entire province.²

In 1961, Manitoba Hydro was formed when the provincial government amalgamated MHEB and MPC through the Manitoba Hydro Act. This made Manitoba Hydro the sole provider of electricity to the province except for central Winnipeg, which was served by Winnipeg Hydro. In 1999, Manitoba Hydro purchased Centra Gas, the province's purveyor of Natural Gas, making it the primary energy utility within the province. The period of amalgamation culminated in 2002 when Manitoba Hydro acquired the assets of Winnipeg Hydro and became the sole supplier of electricity for the entire province. Manitoba Hydro, operating at arm's length from the provincial government, now had a monopoly on electrical services within the province. Public ownership of the utility meant the government could ensure the provision of the necessary electrical and natural gas service for all Manitobans with a regulatory and governance structure that would serve the needs of the people.

Governance Structure

Provincial Government: As a crown corporation, Manitoba Hydro is designed to operated at arms length from the provincial government. The provincial government appoints members to the board that governs Manitoba Hydro as well as appoints members to the board that regulates utility rates. The provincial government may also set mandates for the crown corporation. The recently introduced *Manitoba Hydro Amendment and Public Utilities Board Amendment Act* sets new parameters dictating upper and lower limits for future rate increases. The provincial government also receives revenue from Manitoba Hydro in the form of water rental fees charged for the water that passes through Hydro's dams and determines the corporation's debt repayment rates.

Manitoba Hydro-Electric Board (MHEB): Hydro's Board, the MHEB, was formed through an act of legislature in 1949 and is responsible for ensuring Manitoba Hydro complies with its mandate. Directors are appointed by the provincial government, and the board reports to the Minister responsible for the Hydro Act. The board approves the corporate objectives and strategic direction, appoints the CEO, and ultimately ensures that Manitoba Hydro's policies are aligned with those of the provincial government to the maximum extent possible consistent with the best interests of the organization.

Public Utilities Board: The Public Utilities Board (PUB) is an independent quasi-judicial administrative tribunal appointed by the provincial government to oversee provincial utilities and monopolies such as Manitoba Hydro. The PUB is responsible for regulating the rates charged by Manitoba Hydro. In reviewing applications for rate increases, the PUB has a mandate to balance the needs of rate payers and the economic impact they would face with the financial health of the utility³. The hearings are open to the public and intervenor groups are invited to participate and voice their concerns over rate increases. The public forum ensures that Manitobans have a voice in the rate setting process and requires that Manitoba Hydro demonstrate that rate increases are necessary to covering costs. Some past applications for rate increases have been denied. A 2015 application for a 3.95% rate increase was rejected as the PUB did not believe the rate was in the public's interest⁴.

Present Day Operations

Today, Manitoba Hydro is one of the largest integrated electricity and natural gas distribution utilities in Canada⁵. It is the sole electricity provider and principal provider of natural gas within the province.

After several years of cuts to staffing levels, Manitoba Hydro has been experiencing growth (Exhibit 1). The company's approximately 5,000 employees include office

workers as well as those who work in the field. Some of these roles include Power Line Technicians responsible for constructing and maintaining electrical power transmission lines, Mechanical Technicians responsible for maintaining equipment and controls used in the generation of electricity, and Natural Gas Service workers responsible for responding to emergencies and repairing damaged gas lines, or inspecting residential or commercial appliances, among many other diverse roles. While many employees work out of Manitoba Hydro's downtown Winnipeg headquarters, a large number work out of offices spread out across the province, including remote rural areas, overseeing the operations and maintenance of generation, transmission, and distribution assets.

Approximately 80% of Manitoba Hydro's employees are represented by four separate unions, including CUPE, which represents office support staff, UNIFOR, which represents natural gas workers, IBEW, which represents electrical staff, and AMHSSE, an association for Manitoba Hydro supervisory staff. Negotiations are currently underway with each of the unions, some that have been ongoing since 2020.

Average tenure is 14.629 years, excluding student work placements, and Manitoba Hydro's workforce is aging. In 2022, approximately 14% of Hydro workers were eligible to retire, and Hydro had anticipated that 20% of those eligible would do so by the end of the year.⁶

Hydro's operations include:

Electrical generation: As of 2021, total generating capacity was 5,608 MW, 97% of which is clean, renewable electricity generated by 16 hydroelectric facilities on the Saskatchewan, Winnipeg, Burntwood, Laurie, and Nelson rivers⁷. These generating stations were located throughout the province, many of which were in remote, northern areas, far from Manitoba Hydro's headquarters in Winnipeg (Exhibit 2). Additionally, Manitoba Hydro operates one thermal and four remote diesel generating stations serving remote communities.⁸

Electrical transmission: Manitoba Hydro operates 11,000 kilometers of high voltage lines connecting communities throughout Manitoba, with interconnections to neighbouring provinces and two American states.

Electrical Distribution: Manitoba Hydro operates and maintains 75,000 kilometers of distribution lines, serving over 600,000 residential and industrial customers across Manitoba, with some of the lowest retail electricity rates in Canada.⁹

Wholesale Electrical Sales: In addition to serving Manitobans, Hydro provides wholesale electricity to four export markets in the United States and neighbouring provinces. Exports are handled by a division within the Customer Solutions & Experience business unit and account for 22% of revenue from 2010-2019¹⁰. Revenue from electricity exports is highly volatile, subject to fluctuation in water conditions, prices for natural

gas, and levels of wind power generation.¹¹ While Manitoba Hydro maintains some long-term contracts, it also sells “surplus” electricity to utilities in other provinces and states. The amount of “surplus” energy available to sell is dependent on water levels. When water levels are high, enough water passes through the hydroelectric dams to generate electricity beyond what is needed to meet the needs of Manitobans and existing export contracts, allowing the province to sell the extra energy to utilities outside the province. The alternative would be to divert excess water to generating station spillways rather than through the turbines, which is viewed by the organization as a lost opportunity to generate revenue. While export prices of surplus energy can be lower, the additional revenue helps keep domestic prices low, and can provide neighboring utilities with a lower emission source of electricity, compared to electricity generated from fossil fuels. A snapshot of 2019 exports to the US showed Manitoba Hydro as the third largest Canadian electricity exporter to the US¹² However, when the province experiences drought, the reduced water levels in the province’s rivers and lakes means lower electricity generation. As climate change causes changes in weather patterns, Manitoba’s electricity exports will be affected. Further, US energy policy and subsidies for wind power, as well as lower rates for natural gas, also affect demand from US customers for Hydro’s hydroelectricity.

Natural Gas Distribution: Through its Centra Gas subsidiary, Manitoba Hydro provides natural gas to residential, commercial, and industrial customers throughout the province, supplied primarily from TransCanada’s Energy pipeline that runs through Manitoba. Centra Gas is wholly owned by Manitoba Hydro and operations are fully integrated. The subsidiary has no employees of its own. To provide natural gas within the province, Manitoba Hydro must go through a franchise application process that must be approved by rural municipalities and then the PUB. While Manitoba Hydro does not have a monopoly on providing natural gas within Manitoba, it is the sole distributor, responsible for 10,000 kilometers of gas distribution lines, serving 130 communities and 290,000 customers.¹³

Electricity and Natural Gas Rates: As a public utility, the business model is focused on cost recovery, with electrical and natural gas rates regulated by the Public Utilities Board of Manitoba (PUB). Currently, Manitoba Hydro has an application before the PUB to increase rates by 2% on September 1, 2023, and a further 2% on April 1, 2024. Each increase would add approximately \$3 to \$6 to the average residential customer’s monthly bill, and Manitoba Hydro must provide justification for these increases and show that they are necessary to meet its financial needs. Manitoba Hydro is unable to increase rates without the PUB’s approval. The general rate application takes approximately 10 months and requires the effort of supervisors, managers, directors, and VPs throughout the organization.

The Changing Energy Landscape

The senior leadership team at Hydro had spent considerable time discussing how its traditional business model – and its operations – were likely to be disrupted by three forces of change unfolding simultaneously in the sector (Exhibit 3): Decentralization, decarbonization, and digitalization.

Decentralization

For most of Manitoba Hydro's history, its model has been the centralized generation of energy, distributed to consumers through the grid. In Hydro's future, however, consumers may not only consume energy from the grid – they might generate and store it themselves.

Some consumers had already moved some energy production “behind the meter” with technologies like home solar panels, and while they currently sold generated power back to the grid, this could change over time. With improvements, decentralized energy generation (e.g., solar panels, geothermal, small wind turbines, etc.), combined with home battery storage options, could allow consumers to disconnect from the grid entirely. Hydro, which had existed for more than half a century as a near-monopoly utility provider, could feasibly be competing with a range of new entrants – including their own customers. For Hydro, this could mean decreased revenue, and even stranded assets, if generating facilities, transmission lines or elements of the grid were to become idle with disuse. For example, Manitoba Hydro had recently invested significantly in the construction of the Keeyask Generating Station and the Bipole III transmission line. Both assets, financed heavily with debt, are intended to increase the utility's generation and transmission capacity, ensuring the future needs of Manitobans are met. However, if demand for electricity from the grid were to decrease significantly and if assets such as these were to remain unused, they would lose their value and become liabilities.

To protect the investments that Manitobans had made in hydroelectric generation, transmission, and distribution assets, and protect revenue streams in a future with competition for energy services, Manitoba Hydro would need to become increasingly customer-centric. The organization would have to engage customers effectively to educate, build trust, and understand their evolving needs.

Jay was concerned that Hydro's organizational culture was not yet ready for this change. In a recent internal survey, employees were asked questions about the value of customer focus: More than 20% of employees responded “don't know” or “not relevant” to these questions. In September 2022, a local paper ran a story about a customer's experience phoning Manitoba Hydro. *“The phone was answered by a robot who told me my call was valuable to them and that my wait time would be less than two*

hours and thirty-five minutes,” the customer complained, expressing frustration that she was unable to talk to a representative in person, and feeling as though she was taken for granted as a customer due to the lack of competition in the sector¹⁴.

As the availability, cost, and capabilities of decentralized energy production and storage improved, consumers would no longer be locked into Hydro’s services – and, Jay worried, Hydro's customer orientation (or perceived lack thereof) could become a matter of organizational life and death.

Decarbonization

Globally, the focus to reduce GHG emissions is increasing the demand for electricity. Climate policies are accelerating electrification. Federal Bill C-12, for example, sets national GHG emissions targets for 2030, 2035, 2045, with a target for net zero GHG emissions by 2050¹⁵. To reach these goals, the federal government has set targets for electric vehicles to comprise 10% of new vehicle sales by 2025, 40% by 2030, and 100% by 2040¹⁶. This would mean EVs are projected to comprise 60% of all vehicles by 2040. Municipalities are likewise moving to electric busses. This shift to EV will lead to increased demand for charging infrastructure and increased demand for electricity, both locally and from other jurisdictions.

Further, federal initiatives aimed at decarbonizing buildings would increase the electrification of space and water heating, which will dramatically increase electricity usage in peak winter months. As the provincial and federal governments introduce new energy policies, Manitoba Hydro will need to be prepared. Mandates from the government affect how the organization delivers service, the rate at which it must repay its debt, its ability to generate revenue, and will affect demand for electricity from residential and industrial consumers. An opportunity exists for Manitoba Hydro to play a leadership role and collaborate with government to help shape the energy landscape in a way that benefits Manitobans. However, as the push for decarbonization drives the accelerated growth of electrification, asset planning will also become more challenging, and the organization will need to be prepared.

With one of the lowest GHG-intensive grids in Canada, Manitoba Hydro may well anticipate seeing an increased demand for electricity exports as municipalities across Canada and the US move to adopt more renewable electricity sources. However, average precipitation and water levels affect the amount of water that passes through Manitoba Hydro’s dams. As climate change contributes to changing weather patterns, the fluctuations in hydroelectricity available for export may become more volatile, especially should floods and droughts become more frequent. Manitoba Hydro will need to be both able to predict long-term changes in supply and adept at adjusting to unpredictable weather events.

For utilities across the country, the push for decarbonization will not only require significant investment to increase generating capacity, but significant investment will also be needed to modernize electrical grids to ensure they can adjust to changing peak demand levels and timing. Many electrical grids across the country can not yet support widespread EV adoption, and an increased use of residential chargers may lead to unreliable service or brownouts. However, like most Canadians, Manitobans may not yet understand the cost that will be required to modernize the grid to support increased electrification. Manitoba Hydro will need to engage with customers to educate them and address this gap in understanding.

Rapid electrification – from electric vehicles to electric HVAC – will also require Hydro to collaborate effectively across its various working groups and silos – operations, asset planning, customer solutions, digital and technology, and so on. But in the survey, Jay noted that one of the identified cultural weaknesses involved clarity and communication around where the organization was headed. For Hydro to adapt to a dynamic and fast-changing future, it would need to get better at finding ways to communicate the organization’s direction and priorities.

Digitalization

In an increasingly digital society, customers are looking for new ways to interact with service providers. They seek new digital products and services, and new communication channels to enhance convenience. Hydro’s customers are increasingly dealing with the utility through its web and mobile apps and turning to social media to report outages or receive updates.

New technologies may also shape how Hydro’s operations are managed. The “internet of things” is creating opportunities for automation and bundling of services, meaning the potential for new products and services. In addition, IoT technologies may change how utility companies [monitor, control, meter and manage their operations](#).

Digitalization may also intensify other pressures: For example, the rise of direct-to-consumer digital marketing may accelerate the rate of decentralization, as new entrants in the distributed/decentralized energy space can inexpensively and quickly attract new customers from Hydro.

Digitalization is changing the skills required within the organization, particularly within the Digital & Technology business unit. For the organization, it will be critical to attract the necessary talent. The impact of digitalization will also require increased collaboration throughout the organization to manage. But in the survey, Jay found grounds for concern about Hydro’s ability to collaborate effectively. Senior management

viewed Hydro's ability to work together as a system less favourably than did those closer to front line.

The Changing Operating Environment

In addition to the forces above, Hydro operates in a complex and dynamic multi-stakeholder environment, which produces a range of distinct constraints and challenges for enacting change.

The Regulatory/Legislative Environment

New Provincial legislation: Beyond 2024, new provincial legislation, *The Manitoba Hydro Amendment and Public Utilities Amendment Act*, sets two new constraints. The first stipulation is a rate cap that limits rate increases to the lower of 5% or the rate of inflation. The second condition requires that Manitoba Hydro must charge rates that are sufficient to reduce their debt level to targets set by the provincial government¹⁷. This piece of legislation is contentious politically, with opposition parties claiming it undermines the PUB and allows the provincial government to set rates without public consultation. Meanwhile, the provincial government counters that the legislation is necessary to ensure Manitoba Hydro meets debt reduction targets and that decreasing the frequency of rate applications is necessary to curtail the costs associated with the rate application process, estimated at \$10 million¹⁸.

The Public Utilities Board process: For Manitoba Hydro staff, the General Rate Application (GRA) is a time-consuming process, requiring countless hours and detailed reporting. The process is determined by regulatory bodies, and Manitoba Hydro must comply with the process. In applying for rate increases, Manitoba Hydro must show costs to be reasonable to justify the impact on the public, which means careful projections and conservative plans. Further, any expenses seen as extravagant or as an irresponsible use of public funds can come under media scrutiny and become heated political topics. The application currently before the PUB will take almost a year to complete, and managers throughout the organization are currently working to respond to 1,600 information requests from the PUB and intervenors and anticipate more in the coming months. For employees throughout the organization, the information requests represent a significant addition to their already busy workloads, and managers feel the burden of juggling the extra effort on top of new strategy initiatives, ongoing reorganization of departments, and existing day-to-day responsibilities. "The challenge is prioritizing to ensure each department is focussed on the right thing and can execute efficiently without over-fatiguing the organization," said one director.

Governance relationships: Maintaining corporate autonomy while ensuring the

alignment of organizational and governmental policies can require careful balance. In 2018, 9 out of 10 MHEB directors resigned over an impasse reached with then-Premier Brian Pallister. At issue, according to the resigned members of the MHEB, was the “existential crisis” faced by Manitoba Hydro over its finances¹⁹. (See: Additional Reading)

Change Readiness and Change Fatigue

Over the past five years, Manitoba Hydro’s employees have experienced a period of significant change and disruption that has seen an era of new leadership, significant reductions in workforce, and a global pandemic.

Legacy values and ways of working: As a public institution, many employees have a tenure with the corporation that can be measured in decades, and many employees are from multi-generational “Hydro families.” Long-term employees have only ever known the traditional way of doing things within an energy sector where it has always been critical that processes and procedures comply with codes, professional standards, and regulations.

Compliance & policy orientation: Policies and processes within the organization have typically been designed to ensure strict compliance. Employees are accustomed to making decisions carefully with safety margins carefully considered and expenses carefully justified. Customer policies are created, revised, and updated by committee, and while the organization is moving to a new approach, it is not uncommon for an individual policy change to take two years to complete. The result is a culture that is highly risk averse. As a result, many employees might not be prepared for the anticipated rate of change.

Leadership renewal: Hydro’s President and CEO, Jay Grewal (Exhibit 4), joined the organization in February 2019, and 4 of 7 VPs have joined Hydro since 2020²⁰, ushering in a period of new leadership that coincided with a global pandemic.

Layoffs and cuts: As with most industries, the pandemic caused significant disruption, with projects temporarily paused, employees adjusting to new work arrangements, public health orders, and school closures creating new pressures. Facing pressures from the provincial government to cut costs amidst an unprecedented healthcare crisis, in May 2020 Manitoba Hydro announced that 600-700 employees would face temporary layoffs, expected to last four months²¹. Concerns over what this would do to employee morale, what skills might be lost, or how service might be disrupted dominated public debate. In June, Manitoba Hydro announced only 200 layoffs would be required, and later that most would be avoided, as deals were reached with unions for all workers to take three unpaid days off instead²².

Voluntary Departure Program: For many workers, the uncertainty and stress around their job security was not new. In 2017, Manitoba Hydro announced it would be cutting 900 jobs to cut costs as the organization faced high levels of debt following the completion of the Bipole III power line project and the Keeyask generating station, both of which ran overbudget. Following a reduction of 30% in VP positions earlier in the year²³, employees were given the option to apply for the voluntary departure program intended to reduce the ranks by 15% (Exhibit 5). At the time, this created a great deal of uncertainty for employees. *"If it's not achieved voluntarily, the company let us know that they would declare positions redundant and possibly move to layoffs,"* CUPE Local 998 President Chris Mravinec reported to the CBC at the time. *"So that's a great amount of uncertainty, it takes people off their game on the job."*²⁴

While layoffs were ultimately avoided due to the successful uptake of the voluntary withdrawal program, the unease around job security was quickly followed by a period of planning on how to achieve the same level of service for Manitobans with a reduced staff. Employees would now be faced with the challenge of absorbing the workloads of their departed colleagues.

Acceptance for Operational Changes: To improve customer service delivery, Manitoba Hydro has been working to identify processes in need of optimization. Initiatives aimed at improving internal processes have been met with varying degrees of employee acceptance. Some changes had been well received. For example, the implementation of the GeneSys Cloud platform in the Customer Contact Center, now rebranded the Customer Engagement Center, had been a success. The implementation of a modern cloud platform reduced employee effort by automating and optimizing some of the back-office tasks that had previously been intensely manual and prone to human error, often requiring rework. Employees were able to identify how the change would improve their lives by reducing the effort required to complete tasks, while also contributing to a higher level of service for customers. This, along with frequent project updates and employee-led user testing helped to create buy-in, particularly as employees were able to identify and implement improvements to the system.

Change Resistance: Other changes, however, are not so easily accepted. The Major Work Order process, for instance, is desperately in need of optimization. The process requires manual entries into seven different software applications, which requires significant effort, and often results in frustration for both employees and customers. As part of an ongoing Customer Journey Optimization initiative, Manitoba Hydro has identified the need to optimize and automate the MWO process to reduce effort and increase efficiency. However, while the changes are intended to make work easier for employees, early workshops held to map the MWO process have been met with resistance. Employees from certain functional areas voiced concern that the changes would negatively impact their roles and responsibilities. They worry about the

implication of automating tasks that they have always owned and express unease about what it might mean if duties are removed from their job description. The change has still not yet been implemented, and there is considerable angst among the employees – some who are hoping to see the process improved and are anxiously waiting for the changes to be implemented, while others voice opposition.

Talent Management

An aging workforce: In 2022, approximately 14% of Hydro workers were eligible to retire (Exhibit 6), and Hydro anticipated that 20% of those eligible would retire by the end of the year²⁵. The organization has identified that the aging workforce could create a bias in the impression that employees hold of customers and their needs. The organization was aware that it would need to base any initiatives for new digital enhancements on research rather than relying on opinions to ensure customer needs were accurately understood.

Talent Needs: The changing energy landscape will require new perspectives, more nuanced understanding of customer needs, and will require a more agile, adaptable, and empowered workforce. It will also require new skills and capabilities. Some skills are being developed through training while others are being recruited from outside the organisation, depending on the speed with which the skills are required to execute on business objectives. The HR department is currently working to develop a talent strategy to address the corporation's long-term talent needs and individual development opportunities.

Labour Relations

Approximately 80% of Manitoba Hydro's employees are represented by four separate unions, including IBEW, CUPE, UNIFOR, and AMHSSE, an association for Manitoba Hydro supervisory staff, which means achieving organizational change can be slow. Negotiations are currently underway with each of the unions, some that have been ongoing since 2020.

While union leaders are supportive of Strategy 2040 in principle, the concern remains achieving decent pay increases for workers, something that remains a challenge.

"It's been probably one of the most frustrating experiences that, I would say, anybody at the bargaining table has been a party of – on the corporation side, as well as ours," expressed IBEW Local 2034 business manager Mike Espenell, representing 2,300 Hydro workers, in a statement to the Winnipeg Free Press in May 2021²⁶.

At the time of the article, the union had been on strike for 60 days. With Manitoba

Hydro bound by bargaining mandates set by the provincial government, however, the corporation and union were at an impasse.

Aware that Manitoba Hydro would be unable to negotiate pay increases beyond these limits, the union had opted to strike and apply to the Manitoba labour board for arbitration, an option that's legally available after 60 days of a strike or lockout. Through arbitration or labour board-imposed contracts, workers have been able to achieve modest wage increases beyond the limits imposed by the provincial government. For IBEW, the May 2021 strike ended with a mandate from the labour board and a board-imposed contract that extended through 2022.

In June 2022, Unifor Local 681, representing 230 natural gas workers who had been without a contract since December 2020, similarly announced a strike, again with wages a central issue (See Additional Reading).

Jay, reviewing the survey, was heartened to see that the vast majority of Hydro employees took great pride in their work – and saw Hydro with a sense of pride. But this didn't change the challenging labour relations conditions the organization would need to navigate during this period of change.

Strategy 2040

Strategy 2040 is Manitoba Hydro's proactive, long-term vision to lead the energy transformation in Manitoba. As part of the strategy, Manitoba Hydro has unveiled a new mission statement: *Help all Manitobans efficiently navigate the evolving energy landscape, leveraging their clean energy advantage, while ensuring safe, clean, reliable energy at the lowest possible cost.*²⁷

The strategy is built on five pillars:

- Provide safe, reliable energy
- Serve customers efficiently, responsively, and digitally
- Help all Manitobans understand their energy options and make informed choices
- Ensure Manitobans get maximum value from their clean, dependable energy infrastructure
- Keep energy prices as low as possible while providing the level of service Manitobans expect

Manitoba Hydro has outlined 21 initiatives (Exhibit 7) in the Enterprise 2022/2023 report, each with key deliverables identified for 2023 (see Exhibit 8).

The Challenge: Getting Ready for Execution

To achieve Strategy 2040 and prepare Hydro to meet a changing energy sector and operating environment, Hydro has identified three key priorities²⁸:

- The ability to **work across silos**
- The development of **new capabilities and skills** needed for the new energy landscape
- The flexibility to **redeploy talent and resources more quickly and effectively** to meet emerging needs

In practice: Energy Service Advisors

This sounded clear in principle – but the reality of making it happen was a leadership challenge. As one example, Jay reflected on the challenges the Energy Service Advisors had as they worked to support property developers in providing electricity and natural gas to their developments.

When the developers asked them for an update on the status of the project, it was a challenge for Hydro to provide an answer. Different technology was used by various units to track the Major Work Orders at various stages of a project, creating information silos. This meant employees had to access multiple systems to track down information and chase down a project and determine its status, making it difficult to provide timely responses to customers. Examples such as this highlight the frustration employees can feel in dealing with broken processes and legacy systems, and the effort required to work across the silos.

Jay knew it was common for employees to be left wondering how they would ever make progress when it was a struggle just to complete day-to-day tasks.

Structure

Manitoba Hydro's leadership understood that the successful implementation of Strategy 2040 would require aligning the business model and culture with the strategy to increase collaboration and reduce employee effort. Traditionally, Manitoba Hydro had been organized around Generation, Transmission, and Distribution functions.

However, as part of the move to align the business model with Strategy 2040, Manitoba Hydro began a structural reorganization to encourage more integration. The reorganization is intended to ensure the organization has the structure and talent in place to execute Strategy 2040 and successfully meet the challenges and opportunities that await.

At this stage in the structural reorganization, there are currently 7 business units reporting to the office of the President and CEO. A total of 28 divisions report to the 7 VPs (Exhibit 9). However, the changing energy landscape will require greater agility and

innovation and further reorganization is required to ensure better integration and collaboration across silos.

The Experience of Structural Change

Two years into the transformation though and Manitoba Hydro's Executive Leadership Team has become aware that there is significant fatigue within the organization. Divisions and departments have not only seen two years of change, but they have been taking on multiple strategic initiatives at once in addition to their regular responsibilities. Jay was aware that teams were juggling multiple priorities and that fatigue was starting to show.

The Director of Sales, Marketing & Product Development, Tanis Brako, described the challenge: "In my division of 83 employees, 46 jobs required new or revised job descriptions, pay grade levelling, and/or recruitment. Only five of these jobs have been completed. Another 13 are still being recruited. The rest are still waiting on job description revisions. These changes take time."

It was also a challenge to keep the team apprised of updates. Many employees feel distanced from Strategy 2040 and do not see themselves or their work reflected in the long-term strategy. Employees see communication as a challenge facing the organization.

Further, a few employees had been overheard saying the organization is growing "top-heavy", even though the numbers indicate otherwise. Within Sales, Marketing & Product Development, for instance, the division had decreased from four departments to three, which meant one less management position. However, as the organization continued to transform, as job descriptions continued to change, and as new talent continued to be recruited, this perception among staff persisted.

Culture

In a similar vein, Manitoba Hydro has identified the need to foster an innovative, customer-centric culture. Manitoba Hydro subscribes to the Shingo Model (Exhibit 10) that views culture as the foundation or heart of the enterprise. Behaviour is guided by principles of respect for everyone, leading with humility, seeking perfection, embracing scientific thinking, focussing on the process, assuring quality at the source, improving flow and pull, thinking systematically, creating constancy of purpose, and creating value for the customer²⁹ These guiding principles are the foundation on which the organization builds its culture, they drive continuous improvement, and ensure alignment with organizational goals.

Inspired by the Shingo Model, Manitoba Hydro had recently identified four key cultural behaviours that were rolled out and shared with employees late 2022 (Exhibit 11): we connect, we empower, we collaborate and align, we evaluate and innovate.

However, there was work to be done. The internal survey results (Exhibit 12) on organizational culture revealed barriers and challenges that would need to be addressed.

In addition to the results described earlier, survey respondents noted the need for process design improvements to enable employees to better work across the organization and across silos. They also identified long lead times and barriers to communication flows as ongoing challenges.

The survey had also pointed out an emerging divide between office and field workers, pointed to burnout of staff, particularly those in “non-desk” jobs. This divide was exacerbated by new work arrangements that had been implemented following the pandemic. While employees in some areas are eligible for hybrid work and have the option to work remotely on Mondays and Wednesdays, this accommodation is not extended to everyone. Those who work in the field are not eligible.

The survey found that views of the desired cultural behaviours differed across the organization hierarchy. VPs and division Directors were far less positive about Hydro’s capacity for collaboration and continuous improvement than staff and managers. It might be hard, Jay reflected, to motivate change when many front-line staff didn’t perceive the problem in the first place.

Execution vs. Innovation

Within the public utility, careful, hierarchical decision making was the norm. Collecting and measuring data, making conservative estimates, carefully assessing risk, following strict procedures, and ensuring compliance with guidelines and regulations were expected behaviours.

Empowering employees to make decisions at the right level was a challenge. And within an environment where costs were highly scrutinized and mistakes were politized, employees might understandably wonder what it meant to think big while continually evaluating risk.

Communicating the Strategy

Strategy 2040 has been communicated with employees through an internal website featuring videos from CEO Jay Grewal and inspiring stories celebrating employee initiatives that aligned with strategic goals. A dedicated Strategy 2040 website exists

that acts as a resource for employees and townhalls focussed on Strategy 2040 are held within each business unit and division throughout the company. Employees are encouraged to send questions to an “AskJay” email address.

However, communication of the strategy and ongoing changes has been identified as an area for improvement with survey respondents noting that transparent communication, updates on where the organization was going and what progress had been made were lacking. Further, employees were feeling burnt out and felt they lacked access to leadership and weren’t being heard.

Moving Forward

Jay reflected on the challenge ahead. Manitoba Hydro had a mandate to provide reliable electricity and natural gas service to Manitobans, and to keep costs low. The changing energy landscape, however, would lead to higher levels of demand, which would require careful asset planning and the upkeep of legacy technology. Further, customer expectations were changing, and they would increasingly want new, digital ways of interacting with the organization. Customers would want new products and services, and many were already adopting alternative power sources, such as solar power and geothermal heating. These changes would put pressure on the organization and its workforce.

Jay knew the solution was Strategy 2040 – the problem, though, was whether Hydro was ready to deliver on it. Its culture and ways of working had always stressed reliability, consistency, predictability, and careful control of risk. Could this organization develop the capacity to remain agile in a fast-changing external environment?

The efforts the organization was undertaking to align the business model with Strategy 2040 had already meant more than two years of change for employees, as reporting relationships changed, employees were moved to new units, new positions were created, and job descriptions were re-written. Employees had also been taking on multiple strategic initiatives at once in addition to ensuring the reliable delivery of service and day-to-day operations. Employees were facing fatigue. The recent survey specifically noted “excessive workload/burnout” as an organizational issue, noting concerns around burnout and safety relating to inadequate staffing levels, particularly in “non-desk” jobs. Given the disruption employees have felt over the past five years and the burnout that was setting in, Jay wondered, how could Manitoba Hydro prepare for the significant and sustained changes to come?

Reviewing the culture survey, Jay was heartened to see a number of very positive signals: Hydro employees felt a sense of personal accountability and ownership. They felt pride in their work and their organization, and they were positive about Hydro’s

long-standing safety culture. These had to be protected from the costs of change, Jay knew.

But as the organization moved toward Strategy 2040, questions remained. Among them:

- How can the organization better empower employees?
- How can Hydro develop an agile workforce that is prepared to face continuous and sustained change?
- How can they build trust with employees to increase collaboration?
- How can Hydro reduce the barriers and effort involved in working across silos?

In addressing these questions, Jay knew that resources would need to be carefully considered. The ongoing change management and restructuring work was being conducted by the organization's directors, managers, and supervisors in addition to new strategic initiatives and existing responsibilities. Jay knew that juggling these competing priorities was an ongoing challenge.

To execute Strategy 2040 and lead the organization through an evolving energy landscape driven by the forces of digitalization, decarbonization, and decentralization, Manitoba Hydro would have to adapt. The changes ahead would require greater agility, risk taking, and collaboration across departmental silos. Jay wondered: How would she prepare the organization and workforce for the challenges ahead?

Note: Strategy 2040 and the divisional reorganization are currently in progress both have the support of senior leadership and its key external stakeholders. The focus of your recommendations should be about building the capacity to execute change throughout the organization, not the underlying strategy.

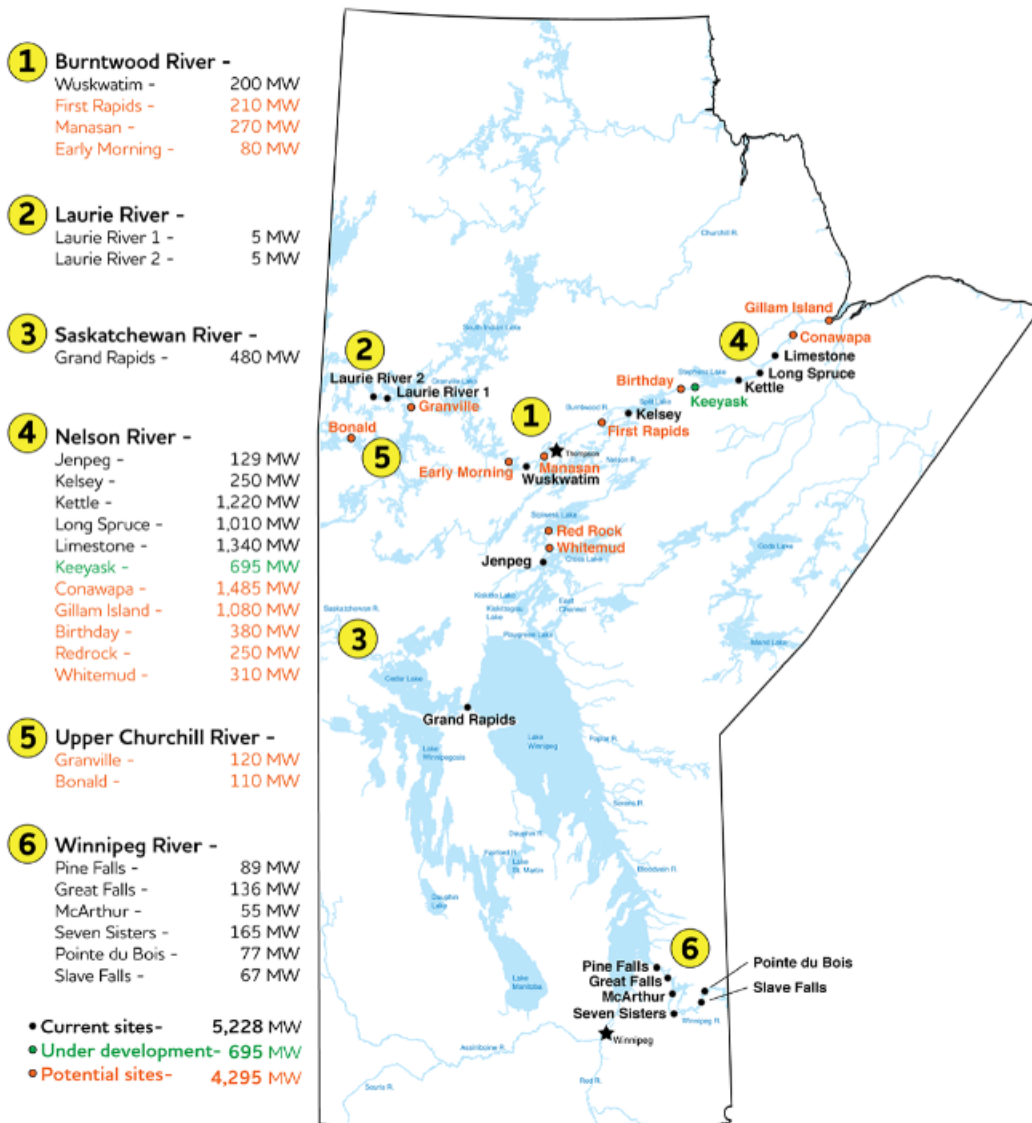
Exhibit 1: Employee Counts as at December 31, 2017-2022

TOTAL COUNT OF EMPLOYEES BY JURISDICTION						
Count of Pers.no.						
Personnel Subarea	2017	2018	2019	2020	2021	2022
AMHSSE	859	798	772	736	764	805
Board Members	10	10	10	10	10	9
Corp. Exempt	564	505	481	453	480	517
CUPE 998	1,017	911	879	770	836	856
Executive	38	35	38	38	39	40
IBEW	2,759	2,530	2,455	2,277	2,293	2,345
Prof. Engineers	599	559	527	492	504	532
Unifor	284	255	240	226	247	263
Grand Total	6,130	5,603	5,402	5,002	5,173	5,367

*Part-time employees and students are included in these counts

Source: table created with information provided by Manitoba Hydro

Exhibit 2: Manitoba Hydro's Generating Stations



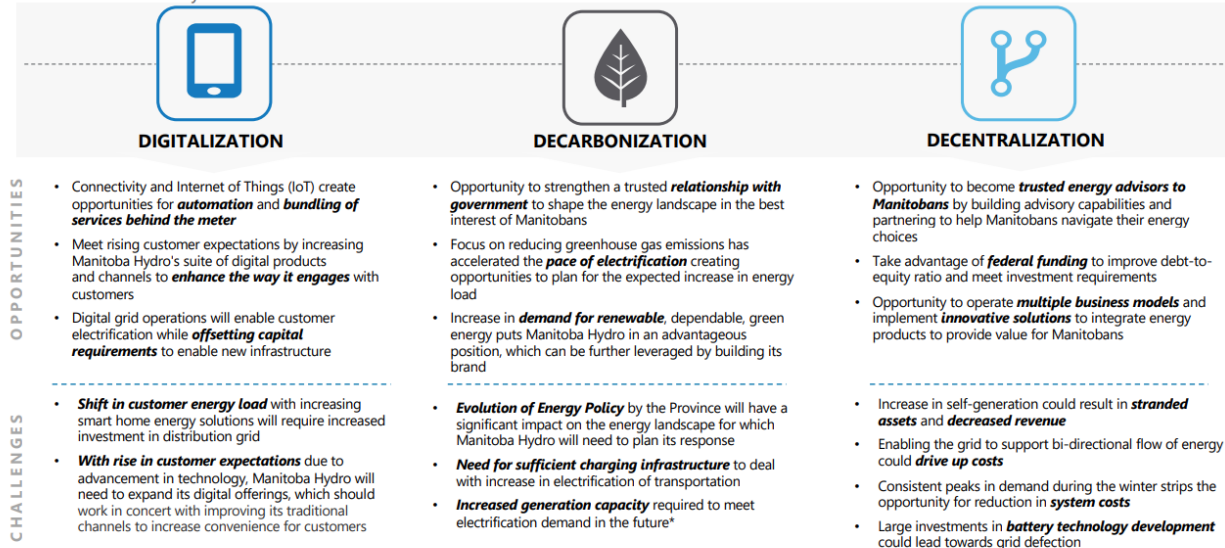
Source: <https://www.manitobahydropower.com/who-we-are/>

Exhibit 3: Opportunities and Challenges Created by the 3Ds



Implications of the 3Ds on Manitoba Hydro

Strategy 2040 is all about the opportunities and challenges presented by the 3Ds and how Manitoba Hydro will need to think, act, and serve customers differently



*Electrification demand is estimated at 600MW in 2040 and could be greater with the electrification of public transit and long-haul fleets

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Source: https://www.hydro.mb.ca/corporate/news_media/pdf/enterprise_plan_2022_23.pdf

Exhibit 4: Leadership



Jay Grewal President & Chief Executive Officer

Jay joined Manitoba Hydro as President & Chief Executive Officer (CEO) in February 2019.

Jay is a proven leader with almost three decades of leadership and corporate management experience including at executive levels in the utility, resource and consulting sectors. She has joined Manitoba Hydro from the Northwest Territories Power Corporation where she held the position of President & CEO. Before then Jay held senior executive roles with Capstone Mining Corp, Accenture, Inc., BC Hydro, and CIBC World Markets.

Jay holds both a bachelor of arts (honours) from the University of British Columbia as well as a master's degree in business administration, finance from the Richard Ivey School of Business, University of Western Ontario.

Source: <https://www.hydro.mb.ca/corporate/leadership/#>

Exhibit 5: Workforce Reductions Through Voluntary Departure Program

	FY 16/17 Pre-VDP	FY 17/18 VDP Start	FY 18/19 VDP Complete	FY 19/20 Pre-Pandemic	FY 20/21 Pandemic/Cost Savings	FY 21/22 Forecast	FY 22/23 Proposed Budgeted
Senior Management	41	36	34	35	36	37	39
Management	149	130	111	105	99	102	107
Employees	6,221	5,832	5,330	5,253	4,819	4,883	5,029
Total FTE Count	6,411	5,998	5,475	5,393	4,954	5,022	5,175^(a)

Source: https://www.hydro.mb.ca/corporate/news_media/pdf/enterprise_plan_2022_23.pdf

Exhibit 6: Labour Relations and Retirements



Staffing: Labour Relations and Retirements

Labour Relations

- Approximately **80%** of Manitoba Hydro’s employees are **represented by labour unions of which over 40% are IBEW employees**
- In August 2021, the Manitoba Labour Board issued an order settling the terms and conditions of a collective agreement between Manitoba Hydro and its largest union (IBEW Local 2034) with binding arbitration, which is in effect until February 4, 2022. **Negotiations with IBEW** are expected to commence in early 2022
- The collective agreements for the three other **unions representing Manitoba Hydro unionized employees expired** at the end of the calendar 2020. Manitoba Hydro continues negotiations with these unions - CUPE, UNIFOR and AMHSS
- The FY 22/23 O&A **proposed budget does not incorporate any wage increases** not yet negotiated within a collective agreement

Retirements

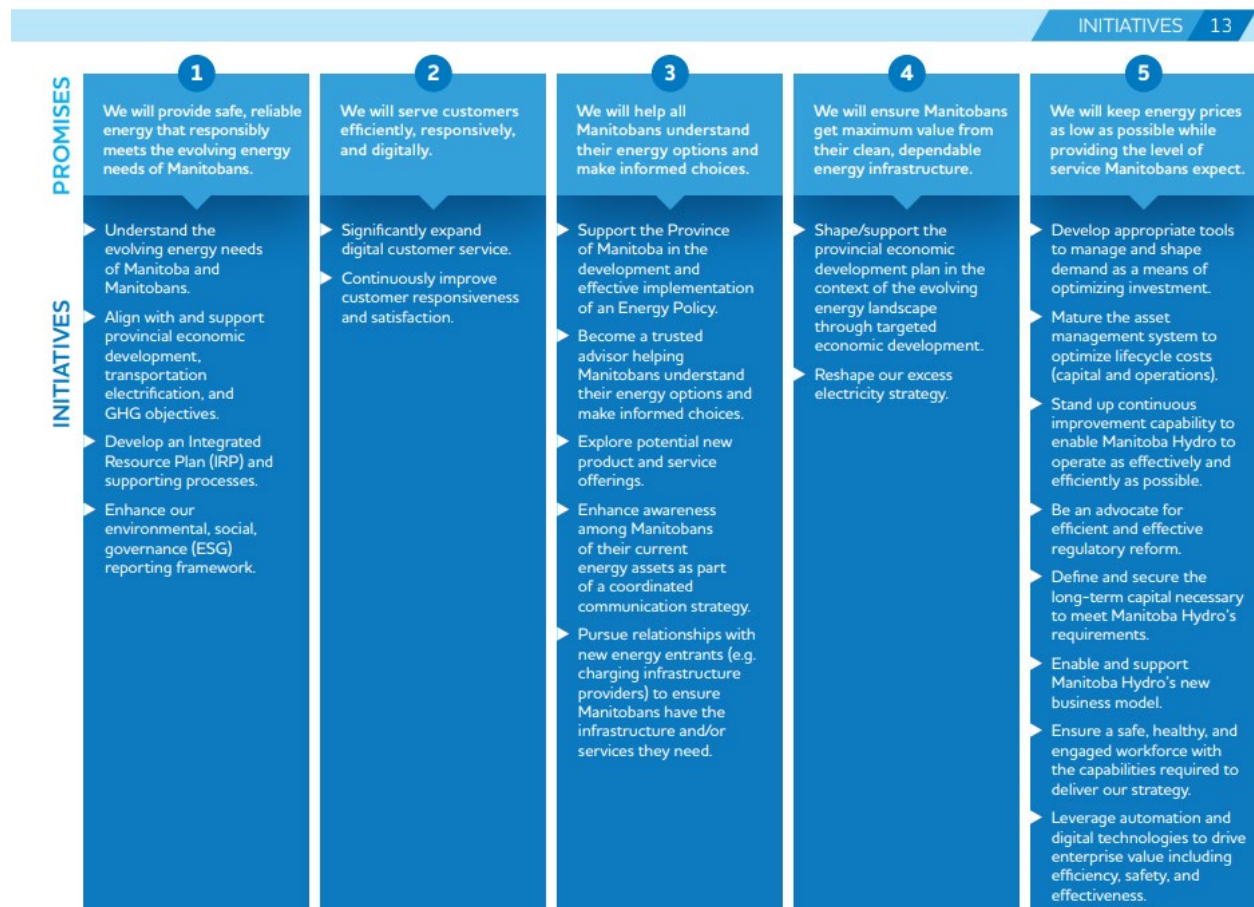
- There are **708 employees** (approximately 14% of the workforce) eligible to retire by the end of calendar year 2022. The number of employees newly eligible to retire continues to increase over the coming years: an additional 138 employees will become eligible to retire by the end of the calendar year 2023; an additional 147 by end of the calendar year 2024; and an additional 156 employees by end of the calendar year 2025. Manitoba Hydro estimates that **20% of eligible employees will retire** (approximately 140 by the end of calendar year 2022), which has been considered in the hiring plan for the year

Calendar Year	Newly Eligible to Retire	Forecasted Retirements
2022	171	142
2023	138	141
2024	147	142
2025	156	145

48

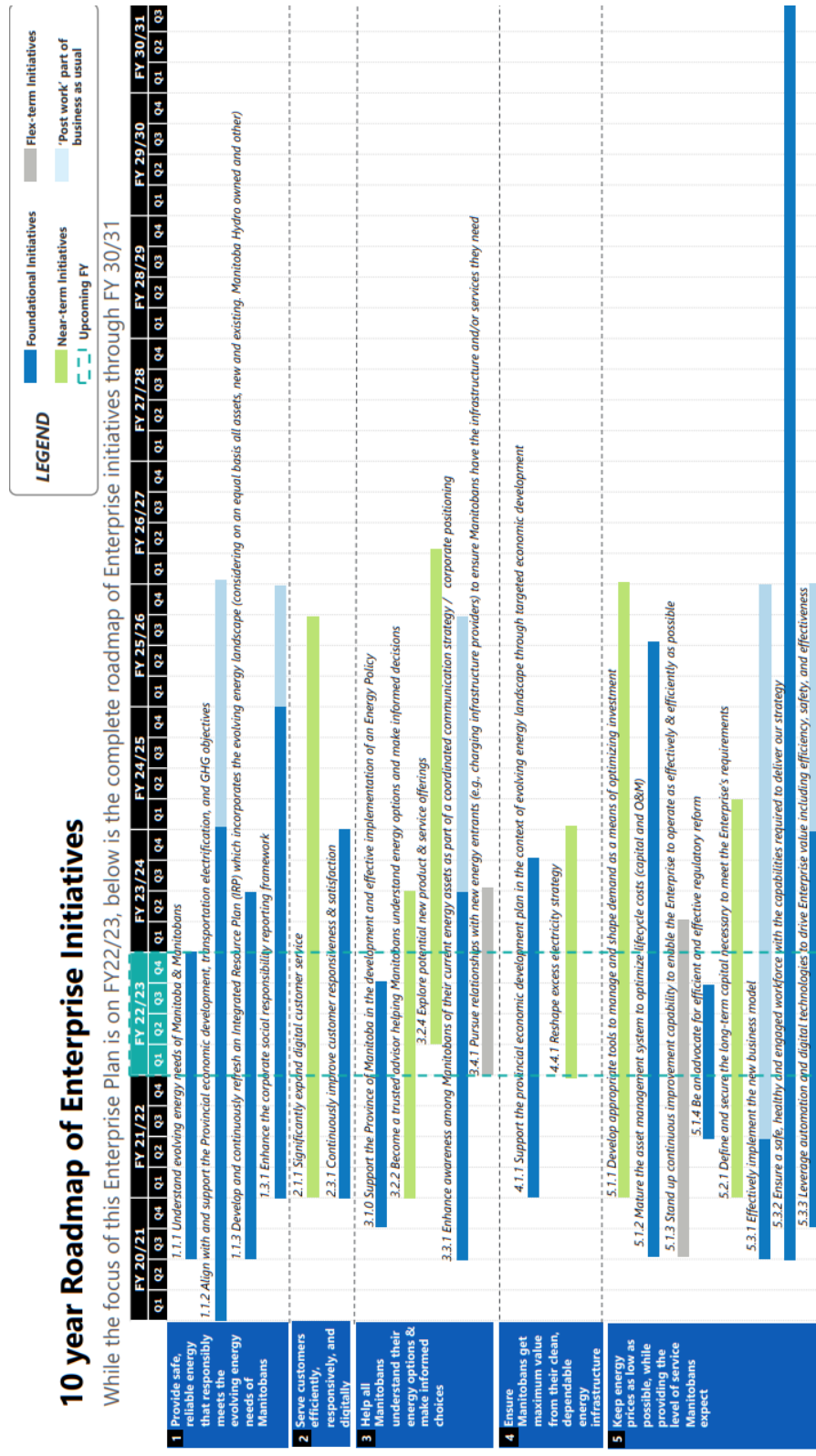
Source: https://www.hydro.mb.ca/corporate/news_media/pdf/enterprise_plan_2022_23.pdf

Exhibit 7: Strategy 2040 Pillars and Initiatives



Source: Manitoba Hydro

Exhibit 8: 10 Year Roadmap of Enterprise Initiatives







Source: https://www.hydro.mb.ca/corporate/news_media/pdf/enterprise_plan_2022_23.pdf

Exhibit 9: Business Units

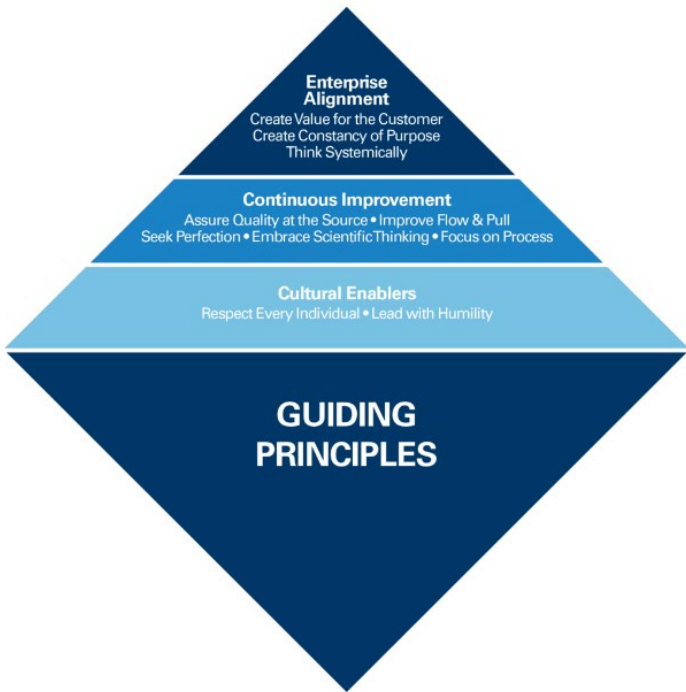
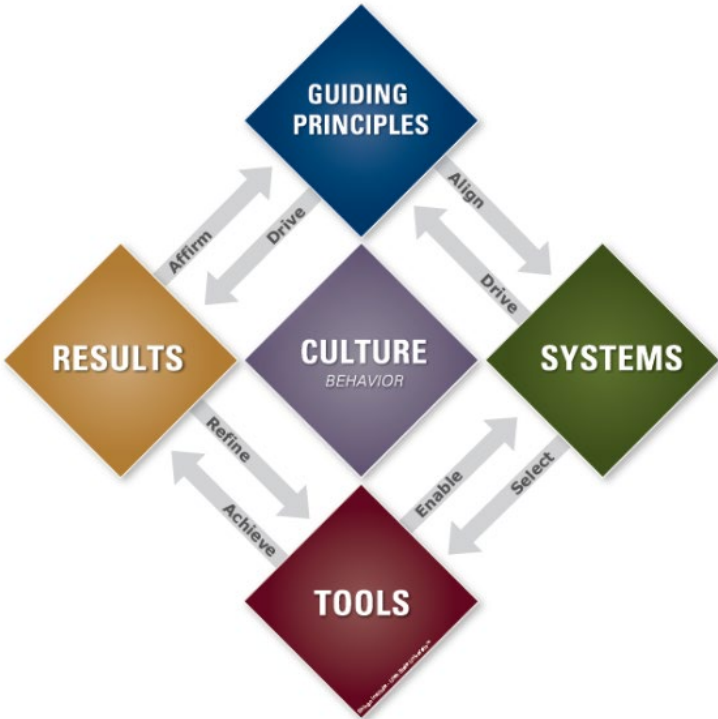
Manitoba Hydro's Business Units



	Customer Solutions & Experience	Operations	Asset Planning & Delivery	Digital & Technology	CFO	External, Indigenous Relations & Communications	Human Resources & Safety, Health & Environment
BU MANDATES							
	As champions of customer-centricity, we deliver customer solutions and experiences that are responsive to the evolving needs and expectations of Manitobans while optimizing net revenue, supporting provincial economic development and inspiring our employees to feel connected to Hydro's mission and brand	As asset operators, we maintain a resilient power system and are responsible for the safe, cost-effective supply of energy to meet present and future customer and market requirements	To plan, deliver and manage Manitoba Hydro's energy system assets through their lifecycle to meet the evolving energy needs of Manitobans and maximize value to customers and the Province's clean energy advantage.	As a catalyst for developing digital value, we empower and enable the Enterprise to achieve our strategic objectives by delivering secure and reliable technologies, and fostering an innovative, agile and insight-driven culture	Be a trusted advisor and strategic partner to the Enterprise across our functions, enable the execution of Strategy 2040, implement comprehensive Enterprise risk management and strategic regulatory functions, and manage the procurement of goods and services while maintaining core financial accountabilities	Enable the achievement of our strategic objectives by managing the organization's reputation, enabling effective internal and external communication, driving a consistent approach to engaging stakeholders, proactively building meaningful relationships with Indigenous Peoples, and providing legal services and expertise	Be a trusted advisor and strategic partner to the Enterprise; inspire and enable a safe, healthy and engaged workforce, and ensure we meet our commitments to public safety, while being stewards of the environment.
BU DIVISIONS	<ul style="list-style-type: none"> Sales, Marketing & Product Development Customer Care Customer Strategy & Experience Energy Markets 	<ul style="list-style-type: none"> System Operations Generation Operations & Maintenance Transmission Operations & Maintenance Distribution Operations & Maintenance (Rural) Distribution Operations & Maintenance (WPK) Operations Business Solutions & Services 	<ul style="list-style-type: none"> Integrated Resource Planning Asset Management Engineering Construction Project Management 	<ul style="list-style-type: none"> Information Technology Digital Cyber Security & Architecture 	<ul style="list-style-type: none"> Corporate Controller Treasury Internal Audit Rates & Regulatory Strategy & Enterprise Planning Enterprise Risk Management Manitoba Hydro International Supply Chain 	<ul style="list-style-type: none"> General Counsel & Corporate Secretary Indigenous & Community Relations Stakeholder Relations Corporate Communications 	<ul style="list-style-type: none"> Safety, Health & Environment Human Resources

Source: https://www.hydro.mb.ca/corporate/news_media/pdf/enterprise_plan_2022_23.pdf

Exhibit 10: Shingo Model Illustration



Source: <https://shingo.org/shingo-model/>





Exhibit 11: The Four Cultural Behaviours

HOW WE PROVIDE			
energy for life			
WE CONNECT	WE EMPOWER	WE COLLABORATE & ALIGN	WE EVALUATE & INNOVATE
<p>Connect all we do to creating value for our customers, and supporting the well-being of our people, communities, and environment.</p>	<p>Empower our people so they can fully contribute with their hearts, hands and minds to a thriving Manitoba Hydro of the future.</p>	<p>Work together across Manitoba Hydro and with our customers and communities to cultivate trust, respect, and agility.</p>	<p>Continually challenge to improve today and innovate for tomorrow.</p>
WE COMMIT TO...	WE COMMIT TO...	WE COMMIT TO...	WE COMMIT TO...
<ul style="list-style-type: none"> ✓ Ask questions of our customers to better understand and meet their evolving needs. ✓ Build systems that integrate our customers' voice. ✓ Protect the health and safety of our people, the public and the environment. ✓ Work collaboratively to strengthen our relationships with Indigenous communities. ✓ Act socially and fiscally responsible in everything we do. ✓ Connect our everyday tasks to our purpose: energy for life. 	<ul style="list-style-type: none"> ✓ Act with humility and respect. ✓ Invest in our people to help them realize their full potential. ✓ Recognize and celebrate the contributions of individuals and teams. ✓ Equip and encourage people to make decisions at the right level. ✓ Remove barriers that impede the progress of our teams. ✓ Provide a physically and psychologically safe environment. 	<ul style="list-style-type: none"> ✓ Seek input and feedback from others in the pursuit of quality. ✓ Celebrate diversity of thought and experience. ✓ Involve those closest to the challenge in all phases of problem solving and innovation. ✓ Consider how work and improvements align and impact other areas. ✓ Prioritize by focusing on what matters most with clear and measurable goals. 	<ul style="list-style-type: none"> ✓ Explore innovation and see mistakes as opportunities to learn. ✓ Continually measure, monitor and evaluate business value and risk to make good decisions. ✓ Find the best outcomes through deliberate testing and evaluation. ✓ Design and improve our work with customers and employees in mind. ✓ Think big, start small, and adapt quickly.

Source: provided by Manitoba Hydro

Exhibit 12: Culture Survey Results

Engagement and Culture

	Pride in Work	83% of respondents indicate they are proud of the work they do either “Most of the time” or “Always”
	Organizational Pride	69% of respondents would recommend this organization as a place to work either “Most of the time” or “Always”
	Inspiration in Work	47% indicate that their job inspires them either “Most of the time” or “Always”
	Satisfaction vs. Culture	A “Very Satisfied” employee will rate cultural indicators twice as high as a “Very Dissatisfied” employee



8

Cultural Enablers – Strengths and Opportunities

	Strength - Safety	Addressing safety concerns before accidents happen, treating each other with dignity and respect, and raising work-related concerns to management without fear of negative consequences.
	Opportunity - Recognition	Valuing the suggestions and opinions of others, providing unbiased recognition, and distributing rewards in consistent, unbiased ways.



9

Continuous Improvement – Strengths and Opportunities



Strength - **Ownership**

Managers/Supervisors and Employees view improvement, quality, and performance as a personal responsibility.



Strength – **Understand**

Managers/Supervisors and Employees seek to thoroughly understand processes with data and can visually identify what is normal vs. abnormal.



Opportunity – **Process Design**

Designing processes to make waste visible and improving process design.



Opportunity – **Eliminating Waste**

Reducing lead times and barriers to flow.



10

Enterprise Alignment – Strengths and Opportunities



Strength - **Alignment**

Aligning goals and objectives to enterprise purpose and objectives



Opportunity – **Clarity and Communication**

Maintaining and communicating a clear direction of where the organization is heading and why.



Opportunity – **Defining and Measuring Value for the Customer**

Building systems that allow for timely feedback to employees on how to improve value for the customer



11

Other key findings



Connecting to Customers

More than 20% of respondents indicated “Don’t Know” or “Not Relevant” when asked questions related to defining and measuring customer value.



Continuous Improvement – *Differing Perspectives*

VPs & Directors score our Continuous Improvement behaviours significantly lower than Managers/Supervisors and Employees



Working Together as a System – *Differing Perspectives*

VPs & Directors rate our behaviours related to “working together across the system” significantly lower than Managers/Supervisors and Employees



Cultural Enablers – *Differing Perspectives*

Managers/Supervisors rate Cultural Enablers higher than VPs & Directors or Employees



12

Source: Manitoba Hydro

Glossary of Terms

Behind the Meter: “Behind the meter” refers to the position of energy generation in relation to your electrical meter. Electricity generated on site that does not pass through your meter, such as that generated with a rooftop solar panel, small wind turbine, or even a gas-powered generator, is considered “behind-the-meter.” In contrast, energy that is supplied to you from the energy grid via your utility company that passes through your electricity meter before it can be used is referred to as “front-of-meter³⁰.”

Greenhouse Gas (GHG) Emissions: Greenhouse gasses are gasses in the earth’s atmosphere that trap and retain heat. These include carbon dioxide (CO₂), methane, and nitrous oxide, among others. Increasing levels of GHG within the atmosphere contribute to climate change. Human activity is a leading contributor of GHG emissions, particularly burning fossil fuels (natural gas, diesel, gasoline, oil, coal) for heating, transportation or as sources of electricity generation³¹.

Internet of Things: IoT describes a network of physical devices (“things”) with sensors that allow for the transmission and exchange of data. Devices such as home appliances or pieces of industrial equipment can be equipped with sensors and software such that they can relay information over a network without human intervention. This allows for automation of services (for example, a sensor may detect when a piece of equipment requires preventative maintenance and may automatically send a notification to book a service appointment)³². For utilities, the IoT has further implications for developing a smart grid³³.

Stranded Assets: In the context of this case, stranded assets refer to any asset – such as generating stations, transmission or distribution lines, or other corporate capital assets -- that becomes idle through disuse and therefore loses value.

Additional Readings

- A History of Electric Power in Manitoba:
https://www.hydro.mb.ca/corporate/history/history_of_electric_power_book.pdf
- Hydro Act: <https://web2.gov.mb.ca/laws/statutes/ccsm/h190e.php>
- Enterprise Plan 2022/2023
https://www.hydro.mb.ca/corporate/news_media/pdf/enterprise_plan_2022_23.pdf
- General Rate Application
https://www.hydro.mb.ca/regulatory_affairs/electric/gra_2023_2025/
- Manitoba Hydro's Environmental, Social, and Governance (ESG) Report for the year ended March 31, 2022: https://www.hydro.mb.ca/corporate/esg/pdf/esg_2021_22.pdf
- Governance Challenges & MHEB Resignations:
<https://www.cbc.ca/news/canada/manitoba/hydro-pallister-riley-board-resignation-pub-manitoba-government-1.4591630>
- A Period of Great Change: <https://www.cbc.ca/news/canada/manitoba/manitoba-hydro-voluntary-departure-1.4058224#:~:text=%28Darren%20Bernhardt%2FCBC%29%20Manitoba%20Hydro%20employees%20will%20have%20a,in%20a%20cost-saving%20effort%20to%20shrink%20its%20workforce.>
- Labour Relations: <https://www.cbc.ca/news/canada/manitoba/natural-gas-workers-manitoba-hydro-strike-1.6498202#:~:text=The%20union%20that%20represents%20natural,two%20years%20without%20a%20contract.>
- Manitoba Hydro Climate Change Report (2020):
https://www.hydro.mb.ca/environment/pdf/climate_change_report_2020.pdf

-
- ¹ <https://www.hydro.mb.ca/corporate/history/>
- ² https://www.hydro.mb.ca/corporate/history/history_of_electric_power_book.pdf
- ³ <http://www.pubmanitoba.ca/v1/about-pub/pubs/pub-strategic-plan-2020-23-final-2022.pdf>
- ⁴⁴ <https://www.winnipegfreepress.com/local/2015/01/29/utilities-regulator-rejects-hydros-rate-increase>
- ⁵ https://www.hydro.mb.ca/corporate/news_media/pdf/enterprise_plan_2022_23.pdf, page 8
- ⁶ https://www.hydro.mb.ca/corporate/news_media/pdf/enterprise_plan_2022_23.pdf, Page 48
- ⁷ https://www.hydro.mb.ca/corporate/teachers/pdf/manitoba_energy_supply.pdf
- ⁸ <https://www.hydro.mb.ca/corporate/facilities/>
- ⁹ <https://www.hydroquebec.com/data/documents-donnees/pdf/comparison-electricity-prices.pdf>
- ¹⁰ https://www.hydro.mb.ca/corporate/electricity_exports/
- ¹¹ https://www.hydro.mb.ca/corporate/electricity_exports/
- ¹² <https://www.cer-rec.gc.ca/en/data-analysis/energy-markets/market-snapshots/2020/market-snapshot-nearly-50-companies-that-export-electricity-three-account-more-than-half-all-exports-in-2019.html>
- ¹³ https://www.hydro.mb.ca/corporate/news_media/pdf/enterprise_plan_2022_23.pdf, page 8
- ¹⁴ <https://www.winnipegfreepress.com/breakingnews/2022/09/05/this-is-customer-disservice>
- ¹⁵ https://www.hydro.mb.ca/articles/2020/12/moving_to_net_zero_manitoba_hydro_ready_to_meet_federal_guidelines/
- ¹⁶ <https://www.pwc.com/ca/en/industries/automotive/publications/accelerating-canadas-electric-vehicle-transition.html>
- ¹⁷ <https://web2.gov.mb.ca/bills/42-4/b036e.php>
- ¹⁸ <https://www.cbc.ca/news/canada/manitoba/manitoba-hydro-rate-increases-capped-hearings-reduced-1.6393983>
- ¹⁹ <https://www.cbc.ca/news/canada/manitoba/hydro-pallister-riley-board-resignation-pub-manitoba-government-1.4591630>
- ²⁰ <https://www.hydro.mb.ca/corporate/leadership/>
- ²¹ <https://www.cbc.ca/news/canada/manitoba/manitoba-hydro-layoffs-1.5564810>
- ²² <https://www.cbc.ca/news/canada/manitoba/manitoba-hydro-avoids-layoffs-1.5625859>
- ²³ <https://www.bnnbloomberg.ca/manitoba-hydro-to-offer-buyouts-next-week-in-bid-to-slash-15-of-workforce-1.717101>
- ²⁴ <https://www.cbc.ca/news/canada/manitoba/manitoba-hydro-voluntary-departure-1.4058224#:~:text=%28Darren%20Bernhardt%2FCBC%29%20Manitoba%20Hydro%20employees%20will%20have%20a,in%20a%20cost-saving%20effort%20to%20shrink%20its%20workforce.>
- ²⁵ https://www.hydro.mb.ca/corporate/news_media/pdf/enterprise_plan_2022_23.pdf, Page 48
- ²⁶ <https://www.winnipegfreepress.com/breakingnews/2021/05/18/labour-board-to-determine-new-contract-for-hydro-electrical-workers>
- ²⁷ https://www.hydro.mb.ca/corporate/news_media/pdf/enterprise_plan_2022_23.pdf, page 3
- ²⁸ https://www.hydro.mb.ca/corporate/news_media/pdf/enterprise_plan_2022_23.pdf
- ²⁹ <https://shingo.org/shingo-model/>
- ³⁰ <https://news.energysage.com/behind-the-meter-overview/>
- ³¹ <https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/greenhouse-gas-emissions.html>
- ³² <https://www.oracle.com/ca-en/internet-of-things/what-is-iot/>
- ³³ <https://www2.deloitte.com/us/en/insights/focus/internet-of-things/iot-in-electric-power-industry.html>