Economic and Energy Demand Growth Scenarios for the Kanata North Tech Park

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Executive Summary

The Kanata North Technology Park (the Tech Park), located in the City of Ottawa, is Canada's largest technology park. Comprising over 540 companies contributing to clean tech, AI, fintech and healthcare sectors, the Tech Park, represented by the Kanata North Business Association (KNBA), continues to grow every year. The Tech Park is positioned as a cornerstone of Ottawa's economic development, reflected in its designation as a Special Economic District by the municipality. As a result of this anticipated economic growth, the Tech Park's energy demand is increasing. From an economic development perspective, the Ottawa Climate Action Fund (OCAF) and partners, including Hydro Ottawa and KNBA strive to meet this growing demand for energy services at the Tech Park to bolster economic growth and ensure energy resilience in a least-cost, low-carbon and timely manner. Meeting this demand is seen as essential to attract new tech companies that have significant energy demand, reliability and quality requirements and growing sustainability mandates. Faced with a compelling opportunity for the Kanata North Tech Park, the partners aim to develop it into a leader in climate resilience and low-carbon energy management in the future.

The objective of this study was to assess the envisioned and potential economic growth scenarios for the Kanata North Tech Park over the next 25 years, and the corresponding implications for energy demand by 2050. Colliers Project Leaders (Colliers), in collaboration with Doyletech Corporation (Doyletech) and Arup (the Team), developed an integrated analytical framework that directly links projected economic expansion to long-term energy requirements. Doyletech's proprietary economic models established growth trajectories for the Tech Park's key sectors — semiconductors, defense, and data centers — while Arup translated these economic projections into energy demand forecasts using ASHRAE benchmarking and load factor methodologies to estimate the associated increases in electricity use (kWh) and demand (MW) by sector and building type.

The resulting forecasts ensure that energy demand growth accurately reflects the scale and pace of economic development defined across all three sectors. Accordingly, the modeled energy growth represents the intensification and operational expansion of existing data centers, together with the parallel growth of semiconductor and defense-related industries within the park. Note, new data centers included in the economic growth scenarios were excluded from the energy demand analysis as they do not represent confirmed development projects and lack the minimum definition required for electrical load modelling (i.e. mega watts capacity, commissioning year, connection point, power usage effectiveness, or operational profile). This approach provides a transparent, evidence-based projection of energy demand that mirrors the underlying economic growth assumptions and supports long-term infrastructure and grid planning in Kanata North.

Several main findings are important to note regarding the Tech Park Economic Profile. Kanata North contributes approximately 5.2% of the Ottawa-Gatineau CMA's GDP, indicating its significant role within the regional economy. Its economic profile confirms that foreign-controlled firms account for 75% of total Export Sector output, with particularly high concentrations in Telecommunications (94%), Defence and Aerospace (80%), and Manufacturing/Semiconductors (77%). The total direct output is $8.014 billion, with Telecommunications ($2.05B), Manufacturing/Engineering/Semiconductor ($1.42B), Other Technology Sector ($1.05B), and Software/Data & Cloud Services ($1.02B) representing 69% of total output. The Kanata North cluster's economic success has historically been driven by large, mature technology firms — particularly in Telecommunications, Semiconductors, and Enterprise Software. Notably absent from the recent firm attraction data are clean energy, robotics, quantum computing, digital health, or AI-native

ventures — the very sectors receiving preferential support from Canada's federal supercluster strategy and global innovation investors.

Total direct jobs number 27,858, with Telecommunications (9,338 jobs), Manufacturing/Engineering/ Semiconductor (4,431), Software/Data & Cloud Services (3,624), and Defence/Security/Aerospace (2,844) comprising 73% of employment. The Kanata North cluster is underpinned by its access to highly skilled knowledge workers, particularly in systems engineering, software design, and complex manufacturing. However, the economic profile reveals an emerging tension: the increasing demand for AI specialists, cybersecurity experts, and IP commercialisation talent is beginning to outpace both local supply and institutional capacity. This represents a strategic bottleneck not just in headcount, but in the very competencies required for the next wave of global competitiveness.

Through engagement, three growth scenarios were identified: semiconductors, data centres, and aerospace and defence. Stakeholders have identified five broad growth scenarios for Kanata North's semiconductor sector over the next 25 years, including diversification of existing companies into semiconductor R&D, attracting startups, fostering partnerships with academic and research institutions, leveraging government initiatives for financial incentives, and investing in infrastructure such as cleanrooms and fabrication plants to enhance supply chain linkages. A key growth opportunity is the establishment of a compound semiconductor fabrication (fab) facility in Kanata North or the greater Ottawa-Gatineau area. The fab would focus on materials such as gallium arsenide (GaAs), gallium nitride (GaN), indium phosphide (InP), and silicon carbide (SiC), serving applications in RF communication, radar, power electronics, electric vehicle powertrains, solar inverters, photonics, 5G/6G, and data centre interconnects.

Stakeholder engagement highlighted opportunities to improve digital infrastructure, particularly in AI and data centres. The main challenge is the absence of a domestic hyperscale data centre, while the opportunity lies in developing a green hyperscaler to anchor Kanata North's transition to a Green Energy Resilience District. Although this development would boost the region's economy and competitiveness, its primary effect would likely be raising industrial productivity, particularly for SMEs and startups.

Finally, the SecureTech & Defence Campus in Kanata North is designed to collocate anchor firms, scale-ups, startups, and applied R&D infrastructure. This opportunity emerges within a changing policy and spending landscape. In June 2025, Prime Minister Mark Carney declared that Canada would meet NATO's defence spending target of 2% of GDP by early 2026 and signaled alignment with NATO's collective goal of reaching 5% of GDP by 2035, covering both military and broader security-related expenditures.

Building on the economic analysis, Arup, in collaboration with the Team, developed an order-of-magnitude estimate of current and future energy demand for the Kanata North Tech Park under the defined growth scenarios. The analysis was designed to ensure full alignment between economic expansion and energy demand forecasting, translating sectoral growth trajectories—particularly in the semiconductor, defense, and data center sectors—into corresponding changes in electricity and thermal demand. Estimates were developed using the best available data, international benchmarking (ASHRAE/DOE prototypes), and project references from comparable climates and technology clusters. These were used to generate a comprehensive set of energy consumption and demand factors by building archetype (e.g., office, data center, mixed-use), vintage (pre-1980 to future), and gross floor area.

To facilitate consistent comparison and visualization of complex datasets, Arup employed spatial mapping techniques and key performance indicators (KPIs), including energy use intensity (EUI), end-use breakdowns, and load factors. The forecasting model incorporated anticipated updates to building codes and potential shifts in use types across existing and future developments. Each growth scenario outputs peak electrical demand (MW), annual electricity consumption (GWh), and thermal demand (GWh-thermal), with supporting assumptions documented transparently.

Two energy growth scenarios were developed in alignment with the economic analysis. Scenario 1 (Baseline Growth) reflects the projected economic growth rate for the City of Ottawa—approximately 33.8% between 2025 and 2046 (1.3% annually). Scenario 2 (Stakeholder-Guided Growth) builds on direct input from Kanata North businesses and represents accelerated growth across the three leading sectors. In both scenarios, new data centers were not included, consistent with the economic model; the energy projections therefore capture only the growth of existing data center operations alongside the expansion of semiconductor and defense industries.

The total estimated energy consumption of the park in 2025 is approximately 339 GWh, with an average energy intensity of 250 kWh/m² and a peak electrical demand of 82.1 MW. Electricity accounts for 79% of total energy use, with the balance primarily supplied by natural gas. The Information Sector—which includes data center operations—represents the largest energy user, driven by high electrical process loads. Under the two growth scenarios, total energy consumption is projected to rise to 465 GWh (Scenario 1) and 887 GWh (Scenario 2) by 2050, highlighting a doubling of both energy consumption and demand within the planning horizon.

Seasonal peak demand analysis further underscores the implications of growth. Both summer and winter peaks increase steadily under the baseline scenario but rise more rapidly under the Stakeholder-Guided Growth scenario. By 2050, summer peak demand may reach ~240 MW and winter peaks ~175 MW, nearly double the baseline projections. These results highlight the need for proactive year-round grid capacity planning, with particular emphasis on summer peaks as the dominant stress period under high-growth conditions.

In terms of the presentation of numerical data, rounding is often employed to avoid the implication of excessive precision. We have not rounded herein because of the extensive use of economic formulas, data techniques and linking within our models.

1.0 Economic Analysis

1.1 Economic Analysis Summary

The Economic Analysis Chapter provides a comprehensive economic, socio-environmental, competitive advantage, and SWOT analysis of the Kanata North Industrial Cluster as of 2025. It includes quantitative data, qualitative assessments, and strategic insights to inform growth scenarios and cluster development.

1.1.1 Economic Profile

The Kanata North Industrial Cluster encompasses approximately 800 firms segmented into two major sectors: the Export Market Sector and the Local Market Sector, comprising 17 industries in total. The data was gathered through primary and secondary research and analyzed using Doyletech's DT EconWin economic impact and industrial analysis system.

Key (Direct) Economic Indicators:

- **Output:** The total direct output is $8.014 billion, with Telecommunications ($2.05B), Manufacturing/Engineering/Semiconductor ($1.42B), Other Technology Sector ($1.05B), and Software/Data & Cloud Services ($1.02B) representing 69% of total output.
- **Value-Add (GDP):** The cluster's total direct value-add is $4.231 billion, predominantly generated by the Export Market Sector industries.
- **Employment:** Total direct jobs number 27,858, with Telecommunications (9,338 jobs), Manufacturing/Engineering/Semiconductor (4,431), Software/Data & Cloud Services (3,624), and Defence/Security/Aerospace (2,844) comprising 73% of employment.
- **Labour Income:** Total labour income is $2.83 billion, mainly from the Export Market Sector.
- **Number of Companies:** The largest industries by company count include Health & Wellness (124), Other Professional Services (107), Software/Data & Cloud Services (69), and Manufacturing/Engineering/Semiconductor (62).
- **Output per Employee:** The overall cluster average is $287,670 per employee, with the highest in VARS/Parts Suppliers/Agents ($656,000), Real Estate ($628,000), and Other Technology Sector ($539,000).

Sectoral Contributions and Control:

- The Export Market Sector, though only 39% of companies, generates 86% of revenues and 83% of employment.
- The Local Market Sector holds 61% of companies but accounts for 14% of revenues and 17% of employment.
- Foreign-controlled firms dominate output in the Export Market Sector, contributing 75% of its $6.86B output, despite being 37% of firms, while Canadian-controlled firms constitute 63% of firms but only 25% of output.

New Firm Attraction:

- Since 2018, most new firms in the Export Market Sector come from Software/Data & Cloud Services and Manufacturing/Engineering/Semiconductor.
- Notable new firms include Magnet Forensics, Leonardo DRS, Fullscript, and Alphawave Semi.
- The Local Market Sector attracted firms primarily in Health & Wellness, Dining, and Retail & Hospitality.

Economic Impact Relative to Ottawa:

- Kanata North contributes approximately 5.2% of the Ottawa-Gatineau CMA's GDP, indicating its significant role within the regional economy.

As a highly concentrated GDP node, Kanata North is: strategically important to regional planning (transit, housing, infrastructure), is a cluster anchor that attracts firms, talent, and investment, and any growth or decline there has noticeable macro impacts on the region's economy.

Kanata North is just one district within the CMA, but it generates over 1/20th of the entire region's GDP. Most other neighborhoods are not even measured individually, because their contributions are too small or diffuse. It means Kanata North is not just a local tech hub — it's a pillar of the Ottawa economy, on par with government and defense spending as a driver of growth.

1.1.2 Socio-Environmental and Qualitative Profile

The document employs a **PESTEL** analysis to evaluate macro-environmental factors influencing the cluster:

Political Factors:

- Government policies such as reshoring and Canadian procurement mandates support semiconductor, defence, aerospace, and security industries.
- Issues include repatriation of R&D, scaling difficulties for technology firms, data ownership, and critical minerals for economic sovereignty.
- Infrastructure improvements like LRT expansion and autonomous mobility are relevant.

Economic Factors:

- Preferences of younger workers for personal vehicle use affect land use and energy demand.
- Remote and hybrid work trends persist, impacting cluster dynamics.
- Competition for talent and investment cycles influence growth.
- Ottawa's status as Canada's Capital offers unique trade and business association opportunities.

Sociocultural Factors:

- Growth scenarios involving data centres, AI, and semiconductors offer indirect employment, strengthen the technology ecosystem, encourage community investment and sustainability, and increase industrial productivity.
- Collaboration with universities and promoting high-tech careers are highlighted.

- Expansion supports smart city initiatives, Canadian economic sovereignty, and data independency.

Technological Factors:

- Innovations in semiconductors, including Silicon Carbide and compound semiconductors, are prominent.
- Emerging AI technologies such as Explainable AI, Edge AI, and Quantum Machine Learning are developing within the cluster.
- Data centre technologies are evolving, with emphasis on energy efficiency, cooling systems, enterprise data centres, and AI data centres such as hyperscalers.
- Aerospace and defence technologies benefit from advanced materials and additive manufacturing.

Legal and Regulatory Factors:

- Compliance with environmental laws, building codes, telecommunications regulations, privacy laws, energy agreements, employment laws, and AI-specific regulations is mandatory.

Environmental Factors:

- High energy and water consumption by data centres and semiconductor manufacturing pose environmental challenges.
- Circular economy approaches and climate change impacts are considerations for sustainability.

1.1.3 Competitive Advantage Analysis

The Competitive Advantage Analysis (CAA) identifies Kanata North's specialization and export activity through Location Quotients (LQ):

- Several industries show very high LQs, indicating strong export orientation, including Computer and Peripheral Equipment Manufacturing (LQ 216.92), Semiconductor (LQ 87.21), Software Publishers (LQ 18.44), and Aerospace Product Manufacturing (LQ 17.58).
- Other industries show low LQs, indicating import reliance.
- Shift-Share Analysis reveals industries with positive Regional Effects (e.g., Semiconductor) and those lagging (somewhat) behind provincial trends (e.g., Software Publishers and Telecommunications).
- Core targets for investment include High LQ and Competitive Effect industries like Semiconductors and Computer Equipment Manufacturing.
- Diversification and emerging targets are identified to guide future growth and scenario planning.

Potential Manufacturing Opportunities:

- Manufacturing activities suited for Kanata North include aerospace systems, architectural engineering services, computer equipment, medical devices, transportation equipment, and semiconductor components.

Business Retention and Expansion (BR&E) Opportunities:

- Focus on addressing competitiveness decline in Software and Telecommunications sectors.
- Support manufacturing growth in semiconductor, electronic components, and communications equipment.
- Enhance consulting and transportation equipment manufacturing sectors.
- Initiate BR&E surveys, working groups, and programs involving stakeholders like Invest Ottawa and local universities.
- Investigate import replacement and cluster linkages with other Canadian regions.
- Promote local investment and celebrate entrepreneurial success.

1.1.4 SWOT Analysis

Strengths:

- Critical mass in computer systems design and related services, software, cloud services, telecommunications, semiconductors, wireless, and aerospace/defence/security.
- Internationally competitive firms with strong R&D and knowledge spillovers.
- Robust technology institutions and cooperative cluster dynamics.
- Specialized service providers supporting technology firms.
- International visibility and public-sector support.
- Availability of local capital and investors.
- Presence of visionary civic entrepreneurs and local champions.

Weaknesses:

- Insufficient angel and venture capital for early-stage innovation.
- Underrepresentation in emerging technologies like quantum, nanotech, clean tech, and medical devices.
- Decline in entrepreneurial culture and startup creation.
- Vulnerability due to high concentration of foreign-controlled firms.
- High corporate and other taxes.
- Shortage of senior management and sales skills.
- Competition from Toronto-Waterloo and Montréal clusters.
- Challenges in scaling startups leading to brain drain.
- Truncated companies and sectors.
- Lagging business dynamism and innovation.
- First buyer and early adopter syndrome in Canada.

Opportunities:

- Potential cluster renaissance emphasizing manufacturing and hardware alongside software.

- Expansion of domestic trade and inter-provincial supply chains.
- Strengthening cluster-to-cluster interactions, especially with Montréal and other regions.
- Leveraging Ottawa's unique position as Canada's Capital.

Threats:

- Remote and hybrid work reducing clustering benefits.
- Repatriation of FDI investment and R&D to mother country.
- Competition for talent, including remote recruitment from the cluster.
- Energy supply and resilience concerns.

1.1.5 Summary for Kanata North Semiconductors Growth Scenario

Kanata North presents a significant opportunity for advancing semiconductor development, primarily hindered by the lack of large-scale domestic semiconductor manufacturing which impacts Canada's economic sovereignty and supply chain integrity. The region excels in integrating multiple semiconductor technologies such as microelectronics, photonics, optoelectronics, wireless, and software, serving cutting-edge markets and fostering a robust tech ecosystem.

This diversity underscores Kanata North's capacity to integrate and innovate across semiconductor technologies.

Industry Trends and Strategic Advantages

Industry trends emphasize semiconductors as vital to national security, economic competitiveness, and technological progress. Canadian strengths lie in design, IP development, electronic design automation (EDA) software, packaging, testing, and software for hardware. Semiconductor clusters like Kanata North attract foreign direct investment due to ecosystem synergies, talent access, IP security, geopolitical stability, and ease of doing business. The high capital investment barrier necessitates new business models and partnerships, areas where Kanata North has demonstrated capability. Furthermore, leveraging Canada's critical materials can strengthen domestic supply chains and reduce foreign dependencies.

Local Context and Historical Significance

Kanata North's semiconductor cluster originated from Microsystems International Ltd. in 1969, fostering a start-up culture akin to Silicon Valley. The Canadian Photonic Fabrication Centre (CPFC), specializing in compound semiconductors like indium phosphide, gallium arsenide, and gallium nitride, serves as a unique public foundry supporting high-performance photonic devices. CMC Microsystems further supports innovation by providing design, manufacturing, and testing resources, connecting over 10,000 researchers and 1,200 companies. The semiconductor industry in Kanata North is a "STAR" industry with strong local concentration, cluster effects, and regional growth, representing a major economic sector by output, jobs, and value-add. It has a proven record of attracting investment and creating startups, exemplified by companies like RANOVUS Inc.

Semiconductor Cluster Across Ottawa-Gatineau

The region has a rich history of semiconductor firms and startups, contributing to sustained proficiency and reinforcing cluster development, including the significant relocation of Mitel's fabrication operations to Bromont, Québec, which catalyzed that microelectronics cluster.

Supply Chain Analysis and Industry Dynamics

Kanata North's semiconductor industry is highly interdependent within its own sector, purchasing 85% of its intermediate inputs internally, indicating strong clustering effects but also a truncated supply chain. This truncation limits broader supply chain development and economic multipliers. The industry's heavy reliance on internal inputs makes it vulnerable to supply chain disruptions, highlighting the need for enhanced domestic supply chain development to boost economic sovereignty and reduce vulnerabilities to external shocks. Expanding linkages with other local industries could increase economic multipliers and reduce leakages.

Opportunities for Growth

Stakeholders have identified five broad growth scenarios for Kanata North's semiconductor sector over the next 25 years, including diversification of existing companies into semiconductor R&D, attracting startups, fostering partnerships with academic and research institutions, leveraging government initiatives for financial incentives, and investing in infrastructure such as cleanrooms and fabrication plants to enhance supply chain linkages.

Specific Growth Scenario: Compound Semiconductor Fabrication Facility

A key growth opportunity is the establishment of a compound semiconductor fabrication (fab) facility in Kanata North or the greater Ottawa-Gatineau area. The fab would focus on materials such as gallium arsenide (GaAs), gallium nitride (GaN), indium phosphide (InP), and silicon carbide (SiC), serving applications in RF communication, radar, power electronics, electric vehicle powertrains, solar inverters, photonics, 5G/6G, and data centre interconnects.

Production Capacity and Economic Impact

Medium-Sized Facility: Operates at 20,000 to 30,000 wafers per month (200 mm wafers) with yields of 70-80%, resulting in approximately 168,000 to 288,000 good wafers annually. With wafer prices between USD 1,000 to 3,000, annual sales revenue could range from USD 336 million to 576 million (CAD $464M to $795M).

Large-Sized Facility: Can produce 50,000 to over 100,000 wafers monthly, e.g., 720,000 wafers annually with an 85% yield (612,000 good wafers). At an average price of USD 2,500 per wafer, annual revenue could reach USD 1.53 billion (CAD $2.1 billion).

For forecasting, the growth scenario uses the upper end of a medium-sized fab with an annual output of CAD $800 million incorporated into Kanata North's moderate upside growth baseline.

Growth Forecasts and Economic Multipliers

Incorporating the compound semiconductor fab into regional forecasts involves accounting for economic leakages and multiplier effects. Developing regional multipliers specific to Kanata North is essential to

accurately estimate the total economic impact of the CAD $800 million output, recognizing that regional multipliers are typically lower than national ones due to leakages.

Conclusion

Kanata North's semiconductor industry is strategically positioned for growth by leveraging its technological diversity, historical cluster strength, and emerging opportunities in compound semiconductor fabrication. Addressing supply chain truncation and investing in manufacturing infrastructure could enhance economic sovereignty and maximize regional economic benefits. The development of a compound semiconductor fab represents a pivotal growth scenario with significant potential output and economic impact, supported by strong market demand and local capabilities.

1.2 Economic Profile of The Kanata North Industrial Cluster, Quantitative Analysis

Part I herein provides a quantitative economic profile of The Kanata North Industrial Cluster as in 2025.[1]

1.2.1 Introduction

This profile is based on primary and secondary research during the period February-April 2025.[2] The data was then inserted into Doyletech's Industrial Analysis, Regional Science, and Economic Impact Computer Model **(DT EconWin)**[3] to calculate and assess the data.

1.2.2 Definitions, and Classifications

As shown in Figure 1-1, Kanata North was defined as all commercial entities within the outlined area on the map, as provided by KNBA. In addition, some entities in immediately adjacent areas where also included.[4]

[1] In terms of the presentation of numerical data, rounding is often employed to avoid the implication of excessive precision. We have not rounded herein because of the extensive use of economic formulas, data techniques and linking within our models.

[2] While assumptions and estimates were applied, this was complemented by extensive primary and secondary research, along with Doyletech's intelligence of Canada's technology sectors, and its proprietary techniques. Nevertheless, the data presented herein should be considered as being developed on a best-efforts basis.

[3] **DT EconWin** has been developed inhouse by Doyletech Corporation. It is based on advanced econometric modeling techniques and includes regional science and industrial analysis modules, as well as impact assessment. It also incorporates the most recent Statistics Canada Input-Output Tables and multipliers.

[4] Specifically, home-based entities operating in immediately surrounding residential areas to Kanata North were included, where possible.

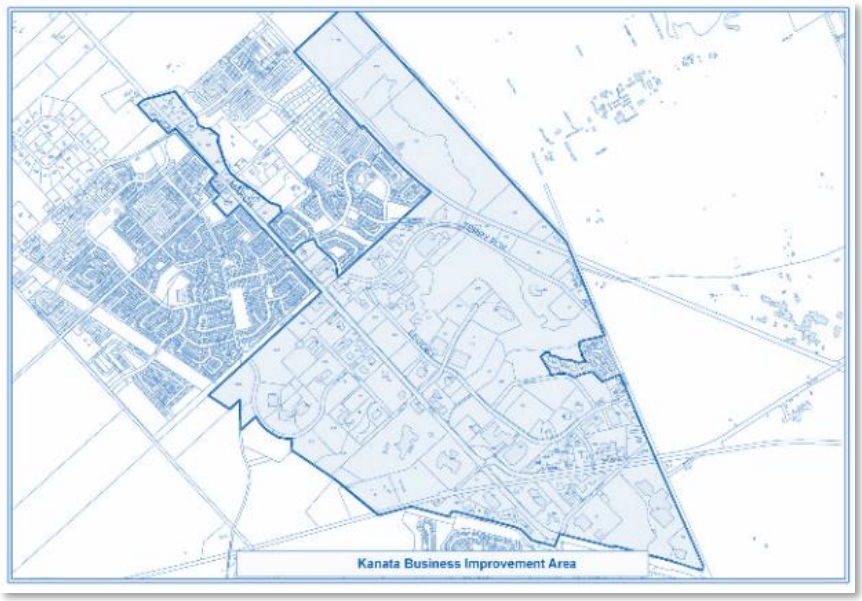

Figure 1-1. Map of Kanata North

Source: Kanata North Business Association (KNBA).

To comprehend the presentation of the economic indicators, the following frameworks and definitions are used:

- The Kanata North Industrial Cluster was segmented into two major Sectors: (1) The Kanata North Export Market Sector, and (2) The Kanata North Local Market Sector.[5]
- There are eight (8) Industries making up The Kanata North Export Market Sector and nine (9) Industries making up The Kanata North Local Market Sector, for a total of seventeen (17).
- These two Sectors and 17 Industries are the same as utilized in previous Kanata North economic studies; thus facilitating trend analysis.
- Additionally, this segmentation is required because the economic impact profile of export-oriented entities varies from that of local service providers.
- Each of the 800 firms in Kanata North were also assigned to an "Input-Output Industry Classification Code (IOIC Code)". This segmentation is required because it facilitates the development of the growth baselines and scenarios, and the economic impacts later in this report. Statistics Canada assigns an IOIC Code to each firm in Canada based on its primary business activity. However, in some cases, a Kanata North firm was assigned to a different IOIC

[5] In economic impact and industrial analysis, industries are often classified into a "traded or export-oriented" segment and a "local" segment. This is referred to as Economic Base Theory. Local relates to those industries that generally serve the regional population, including health care, food services, residential construction, or personal services. While these local clusters may be very interrelated, may share workers and are important for the well-being of the local population, they typically do not inject significant money into the local economy. Traded industries, on the other hand, do inject money into the local economy. Traded industries, generally speaking, make for and sell to those outside the local economy.

Code depending on what their primary business activity is in Kanata North. Each of the 17 industries are made up of firms from one, or a few, or many different IOIC industries. Appendix A3.1 provides a brief economic profile based on IOIC Code.

- In summary, there are two major Sectors which are composed of 17 Industries, with each industry being composed of individual IOIC Codes. Each of the 800 firms were assigned to this schema on a case-by-case basis.

Figure 1-2. Some of the Largest Companies in The Kanata North Export Market Sector (Based on Employment).

1.2.3 Economic Profile Summary – The Kanata North Sector and Industry Classification

The following section presents the economic profile summary on The Kanata North Sector and Industry Classification.

Output:

- The total (direct) output of The Kanata North Industrial Cluster is $8.014B.
- The largest industries in Kanata North based on output (revenues) are *Telecommunications* ($2.05B), *Manufacturing, Engineering, Semiconductor* ($1.42B), *Other Technology Sector* ($1.05B), and *Software, Data & Cloud Services* ($1.02B). In aggregate, these four industries represent 69% of the total output of The Kanata North Industrial Cluster.
- The smallest industries in Kanata North based on proportion of total output are *Clean Tech* (0.3%), Legal (0.5%), *VARS / Parts Suppliers / Agents* (0.6%), and *Education & Day Care* (0.6%).
- The seven largest Kanata North industries in terms of total output generated are all in The Kanata North Export Market Sector.

Value-Add (GDP):

- The total (direct) value-add of The Kanata North Industrial Cluster is $4.231B. Canada's total GDP is about $2.6 trillion (2025). $4B represents about 0.15% of national GDP — which is meaningful, especially since concentrated in one small area. Many specialized clusters in Canada (e.g., aerospace in Winnipeg, shipbuilding in Halifax) typically generate in the low billions of GDP contribution. A $4B value add places the Kanata North cluster among the top-tier regional contributors.
- The seven largest Kanata North industries in terms of total value-add generated are all in The Kanata North Export Market Sector.

Jobs:

- The total (direct) jobs in The Kanata North Industrial Cluster is 27,858.
- The largest industries in Kanata North based on jobs are *Telecommunications* (9,338), *Manufacturing, Engineering, Semiconductor* (4,431), *Software, Data & Cloud Services* (3,624), and *Defence, Security & Aerospace* (2,844). In aggregate, these four industries represent 73% of the total jobs of The Kanata North Industrial Cluster.
- The smallest industries in Kanata North based on proportion of total jobs are *VARS / Parts Suppliers / Agents* (0.3%), *Clean Tech* (0.4%), Legal (0.4%), and Education & Day Care (0.9%).
- The most common technology occupations in Kanata North are software developers and programmers, computer systems developers and programmers, information systems specialists / consultants / business systems specialists, and electrical and electronics engineers.
- Other occupations where there is strong developing niche in Kanata North are: AI and data scientists, cybersecurity specialists, reverse engineering, IP protection and management.

- The total (direct) jobs in The Kanata North Export Market Sector Cluster is 23,218. Based on a June 2024 study by The Dais[6], this is (approximately) 33% of technology industry jobs in Ottawa-Gatineau, 2.4% of total Canadian technology jobs, and 5% of all Ontario technology jobs (Lockhard & Vu, 2024).

Labour Income (Wages and Salaries):

- The total (direct) labour income generated by The Kanata North Industrial Cluster is $2.83B.
- The eight largest Kanata North industries in terms of total labour income generated are all in The Kanata North Export Market Sector.
- While technology jobs in Canada remain very well paid compared to other occupations, the gap with non-technology jobs has narrowed in recent years. This is being led, for example, by growth in various sub-sectors of real estate, construction, and finance.

Number of Companies:

- The largest industries in Kanata North based on number of companies are *Health & Wellness* (124), *Other Professional Services* (107), *Software, Data & Cloud Services* (69), and *Manufacturing, Engineering, Semiconductor* (62). In aggregate, these four industries represent 45% of the total number of companies in The Kanata North Industrial Cluster.
- The smallest industries in Kanata North based on proportion of total number of companies are *Clean Tech* (0.8%), *VARS / Parts Suppliers / Agents* (1.3%), and *Real Estate* (1.8%).

Output Per Employee:

- As expected, the output per employee varies widely among the seventeen industries In Kanata North.
- Across all seventeen industries, the overall output per employee for The Kanata North Industrial Cluster is $287,670.
- The industries with the highest output per employee are *VARS / Parts Suppliers / Agents* ($656,000), *Real Estate* ($628,000), *and Other Technology Sector* ($539,000).
- The industries with the lowest output per employee are *Health & Wellness* ($150,000), *Dining* ($165,000), *Other Professional Services* ($184,000).
- Several of the industries in The Kanata North Local Market Sector have high output per employee. Out of the total ten industries in terms of output per employee, six (60%) are from The Kanata North Export Market Sector while 4 (40%) are from The Kanata North Local Market Sector.
- Besides *Real Estate*, other industries in The Kanata North Local Market Sector in the top ten for output per employee are *Construction, Renovation, Architecture* ($438,000), *Finance & Accounting & Insurance* ($367,000), and *Legal* ($343,000).

[6] The Dais is a public policy and leadership think tank at Toronto Metropolitan University.

- There are five (5) companies in The Kanata North Export Market Sector estimated to generate $1M or more of output per employee per year. These firms are in *Software, Data & Cloud Services*, *Manufacturing, Engineering, Semiconductor*, *Other Technology Sector*, *Telecommunication, Wireless, and Photonics*, and *VARS / Parts Suppliers / Agents*. Typically, in Canada, firms that have revenues per employee of $1M or more tend to be large oil and gas (and other resource) companies, banks, insurance companies, and other financial companies, and pipelines.
- There are five (5) companies in The Kanata North Local Market Sector estimated to generate $1M or more of output per employee per year. These firms are in *Real Estate*, *Other Professional Services*, *Construction, Renovation, Architecture*, and *Retail & Hospitality (gas stations)*.
- Companies with the smallest output per employee tend to be service providers and/or home-based businesses. These include personal care services like makeup, hair and nail salons, yoga studios, coaches, as well as some providers of education services such as tutoring.

Taxes:

- Based on the value-add generated by Kanata North, it is estimated that Kanata North currently generates (approximately) $1.10B in federal taxes, $1.09B in provincial taxes, and $247M in municipal taxes across Canada, for total taxes of $2.44B.

Kanata North Export Market Sector vs. Kanata North Local Market Sector:

- While The Kanata North Export Market Sector constitutes only 39% of the total companies in Kanata North, it generates 86% of total revenues of the cluster and 83% of total employment.
- Conversely, while The Kanata North Local Market Sector has 61% of the total companies in Kanata North, it generates only 14% of total revenues and 17% of total employment.
- These trends are to be expected due to the economies of scale and scope generated by large private-sector firms.

Canadian vs. Foreign Controlled:

- Most firms in The Kanata North Local Market Sector are Canadian-controlled firms and entities. Thus, most of the revenues generated therein are by Canadian-controlled firms.
- From a controlling perspective, there is an inverse relationship between the number of entities and the revenues they are generating. While more entities are Canadian-controlled, most output or revenues are being generated by foreign-controlled firms.
- Out of The Kanata North Export Market Sector's total output of $6.86B, $1.72B is from Canadian-controlled firms (25%) and $5.14B is from foreign-controlled firms (75%).
- Out of The Kanata North Export Market Sector's total number of firms of 309, 196 are Canadian-controlled firms (63%) and 113 are foreign-controlled (37%).
- In terms of number of companies in The Kanata North Export Market Sector, the industries with the greatest proportion of Canadian-controlled firms are *Clean Tech* (100%), *VARS / Parts Suppliers / Agents* (80%), and *Other Technology Sector* (70%).

- In terms of number of companies in The Kanata North Export Market Sector, the industries with the greatest proportion of Foreign-controlled firms are *Telecommunication, Wireless, and Photonics* (51%) and *Manufacturing, Engineering, Semiconductor* (39%).
- In terms of output (revenues) in The Kanata North Export Market Sector, the industries with the greatest proportion of Canadian-controlled firms are *Clean Tech* (100%), *VARS / Parts Suppliers / Agents* (90%), and *Software, Data & Cloud Services* (53%).
- In terms of output (revenues) in The Kanata North Export Market Sector, the industries with the greatest proportion of Foreign-controlled firms are *Telecommunication, Wireless, and Photonics* (94%), *Defence, Security & Aerospace* (80%), and *Manufacturing, Engineering, Semiconductor* (77%).

New Firm Attraction:

- Since 2018, most new firms attracted to The Kanata North Export Market Sector have been from *Software, Data & Cloud Services* and from *Manufacturing, Engineering, Semiconductor*. Based on this survey (and past surveys), typically there is minimum new firm attraction from the Clean Tech industry or the *VARS / Parts Suppliers / Agents* industry.
- In terms of The Kanata North Export Market Sector, some notable new firm attractions since 2018 include Waterloo-based Magnet Forensics, Kanata West-based Leonardo DRS, Ottawa-based Fullscript, and Toronto-based Alphawave Semi.
- Since 2018, most of the firms attracted to The Kanata North Local Market Sector have been from *Health & Wellness, Dining*, and *Retail & Hospitality*.
- In terms of The Kanata North Local Market Sector, some notable new firm attractions since 2018 include Government of Canada Co-working and CU@kanata.
- There have been several new firms from *Construction, Renovation, Architecture*, such as Nautical Lands Group, webber Infrastructure, Fishburn Sheridan Group of Companies, ButtonEast Limited, Louise W. Bray Construction, Capacity Engineering, among others.

The Kanata North Export Market Sector attracted 97 new firms between 2018 and 2025 (opened or located). The Kanata North Local Sector attracted 249 firms over the same period.

Figure 1-3. Some of the Largest Companies in The Kanata North Local Market Sector (Based on Employment).

1.2.4 Economic Profile Details – The Kanata North Sector and Industry Classification

The following sections and sub-sections present the detailed economic profile (utilizing The Kanata North Sector and Industry Classification).

Overview of Economic Indicators, The Kanata North Industrial Cluster

As shown in Figure 1-4, the Kanata North cluster consists of 797 firms with total gross output of $8.014B and employment of 27,858 in 2025.

KN Export Sectors:	Employment	Revenues	Companies	Employment % of Total	Revenues % of Total	Companies % of Total
Clean Tech	106	24,860,926	6	0.4	0.3	0.8
Defence, Security & Aerospace	2,844	887,520,291	39	10.2	11.1	4.9
Life Sciences	849	352,609,043	26	3.0	4.4	3.3
Software, Data & Cloud Services	3,624	1,020,582,678	69	13.0	12.7	8.7
Manufacturing, Semiconductor, Eng,, Test.	4,431	1,422,852,894	62	15.9	17.8	7.8
Other Technology Sector	1,948	1,050,910,366	50	7.0	13.1	6.3
Telecommunications, Wireless, and Photonics	9,338	2,049,246,394	47	33.5	25.6	5.9
VARS, Parts Suppliers, Reps. and Agents	78	51,141,932	10	0.3	0.6	1.3
	23,218	**6,859,724,524**	**309**			

KN Local Market Sectors:	Employment	Revenues	Companies	Employment % of Total	Revenues % of Total	Companies % of Total
Real Estate	269	168,816,000	14	1.0	2.1	1.8
Other Professional Services	1,029	189,562,807	107	3.7	2.4	13.4
Construction, Renovation, Architecture	274	120,134,635	24	1.0	1.5	3.0
Legal	113	38,710,727	25	0.4	0.5	3.1
Education & Day Care	245	49,043,640	23	0.9	0.6	2.9
Dining	511	84,302,298	51	1.8	1.1	6.4
Retail & Hospitality	789	182,491,464	65	2.8	2.3	8.2
Finance & Accounting & Insurance	507	185,816,169	55	1.8	2.3	6.9
Health & Wellness	903	135,352,921	124	3.2	1.7	15.6
	4,640	**1,154,230,662**	**488**			

KN Export and Local Market Sectors:	Employment	Revenues	Companies			
KN Export Sectors + KN Local Market Sectors	**27,858**	**8,013,955,186**	**797**	**100.0**	**100.0**	**100.0**

Figure 1-4. Economic Indicators by Sector and Industry, 2025 (Doyle, 2025).

Figure 1-5, below, is a graphical representation of the economic indicators segmented by the seventeen (17) industries making up Kanata North.

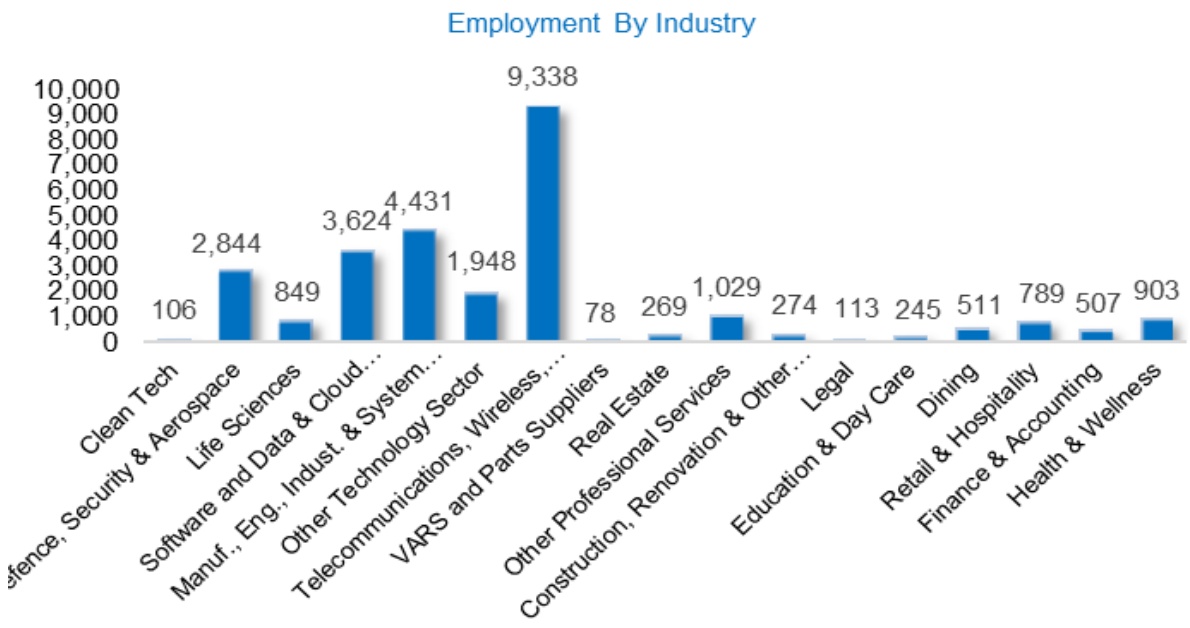

Figure 1-5. Economic Indicators by Industry, Graphical Comparison.

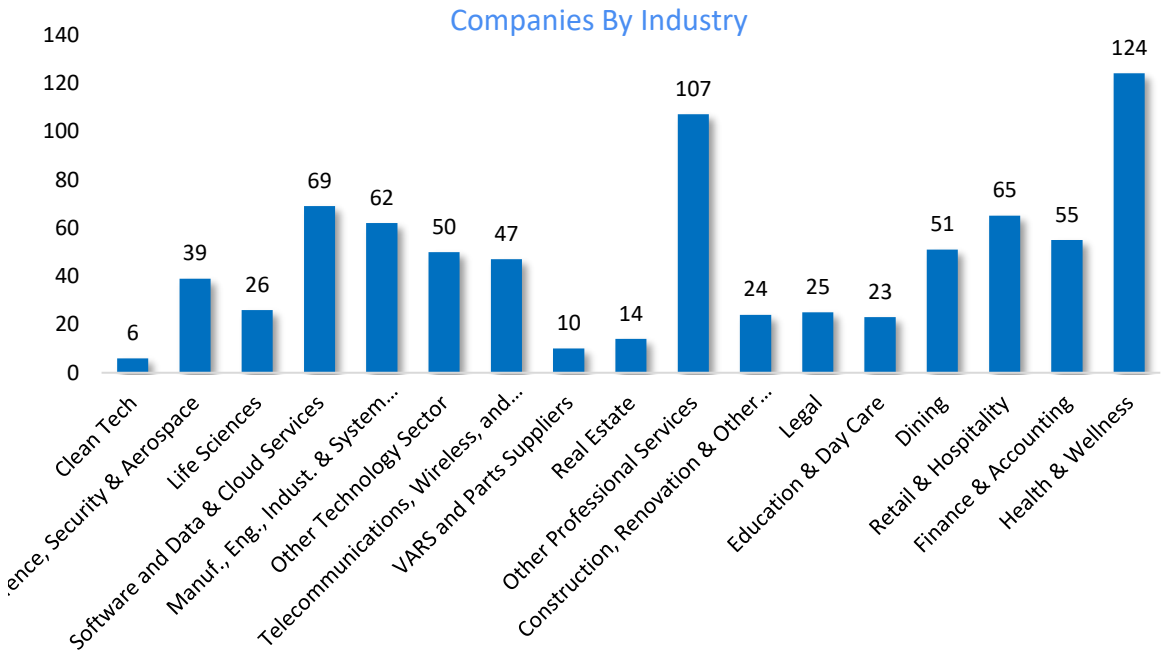

Figure 1-6. Comparisons by Industry, Graphical Comparison.

GDP Comparisons, Ottawa CMA and The Kanata North Industrial Cluster

Table 1, below, compares the total GDP of Ottawa-Gatineau CMA with The Kanata North Industrial Cluster (Canada S. , 2024). Note that this comparison is approximate due to variations in measurement methods and time periods.[7] It suggests roughly 5.2% of Ottawa's Total GDP is generated from The Kanata North Industrial Cluster.

Table 1. GDP Comparisons, Ottawa CMA and The Kanata North Industrial Cluster (Approximate).

Jurisdiction	GDP Value ($)	Description
Ottawa-Gatineau, Ontario Part (Statistics Canada data)	82,014,000,000	GDP; Based on Basic Prices for CMA, data for 2021 released in November 2024.
The Kanata North Industrial Cluster (Statistics Canada and Doyletech Corporation data). Datasets are from 2021-2025.	4,231,000,000 (5.2% of total CMA)	Based on Input-Output (IO) Multipliers for 2021 released in 2024, utilizing 2025 Gross Output and Value-Add data and estimated calculations by Doyletech Corporation.

Table 2, below, compares the economic indicators of The Kanata North Export Market Sector (as a whole) to The Kanata North Local Major Sector (as a whole).

Table 2. Economic Indicators, Kanata North Export vs. Kanata North Local.

Revenues by Major Grouping	Revenues	%
KN Export Sectors	6,859,724,524	85.6
KN Local Market Sectors	1,154,230,662	14.4
Total	**8,013,955,186**	**100.0**

Employment by Major Grouping	Employment	%
KN Export Sectors	23,218	83.3
KN Local Market Sectors	4,640	16.7
Total	**27,858**	**100.0**

Companies by Major Grouping	Companies	%
KN Export Sectors	309	38.8
KN Local Market Sectors	488	61.2
Total	**797**	**100.0**

Canadian vs. Foreign-Based Firms

Table 3 and Table 4 provide a breakdown of Canadian and foreign-based firms in the Kanata North Export Market Sector, by number of firms and output.

[7] The Statistics Canada data refers to the Ottawa-Gatineau CMA, Ontario Side and are for year 2021. The Kanata North Industrial Cluster number is based on value-add and incorporates Statistics Canada data based on the year 2021, along with Doyletech Corporation's estimates of Kanata North Output (revenues) for 2025.

Table 3. Canadian vs. Foreign-Based Firms in The Kanata North Export Sector, by Number of Firms.

KN Export Sector	Number of Firms				
Canadian vs. Foreign-Based Firms	Canadian	Foreign	Total	% Canadian	% Foreign
Clean Tech	6	0	6	100	0
Defence, Security & Aerospace	25	14	39	64	36
Life Sciences	17	9	26	65	35
Software, Data & Cloud Services	44	25	69	64	36
Manufacturing, Eng., Design, Testing, Semiconductor	38	24	62	61	39
Other Technology Sector	35	15	50	70	30
Telecommunications, Wireless, and Photonics	23	24	47	49	51
VARS / Parts Suppliers / Manufacturers Agents and Reps	8	2	10	80	20
Total	**196**	**113**	**309**		

Table 4. Canadian vs. Foreign-Based Firms in The Kanata North Export Sector, by Output.

KN Export Sector	Revenues of Firms				
Canadian vs. Foreign-Based Firms	Canadian	Foreign	Total	% Canadian	% Foreign
Clean Tech	24,860,926	0	24,860,926	100	0
Defence, Security & Aerospace	175,613,903	711,906,389	887,520,291	20	80
Life Sciences	149,680,000	202,929,043	352,609,043	42	58
Software, Data & Cloud Services	543,229,408	477,353,270	1,020,582,678	53	47
Manufacturing, Eng., Design, Testing, Semiconductor	324,261,205	1,098,591,689	1,422,852,894	23	77
Other Technology Sector	331,250,256	719,660,111	1,050,910,366	32	68
Telecommunications, Wireless, and Photonics	126,330,388	1,922,916,006	2,049,246,394	6	94
VARS / Parts Suppliers / Manufacturers Agents and Reps	46,004,307	5,137,625	51,141,932	90	10
Total	**1,721,230,391**	**5,138,494,133**	**6,859,724,524**		

1.3 Socio-Environmental & Qualitative Profile of The Kanata North Industrial Cluster

This sub-section herein provides a social-environmental and qualitative profile of The Kanata North Industrial Cluster.

1.3.1 PESTEL Analysis

To assess qualitative and social trends impacting Kanata North, a PESTEL Analysis was developed.

PESTEL Analysis is a tool to analyze and monitor macro-environmental factors that have an impact on the cluster. It examines the Political, Economic, Social, Technological, Environmental, and Legal Trends in the external environment. The PESTEL Analysis was employed to discern threats and weaknesses that should be addressed in the SWOT Analysis, as detailed in Part IV below (note: there is often significant interconnection among these factors).

Political Factors

These factors refer to current and emerging trends in government policy that could impact Kanata North and development of the growth scenarios:

Table 5. Political factors and their relevance to the Kanata North cluster.

Political Factor	Relevance to Kanata North Cluster
Reshoring	Semiconductor, defense, aerospace, and security are industries identified for Canadian repatriation. Funding and procurement programs sometimes mandate that a specified portion of materials be sourced from

Political Factor	Relevance to Kanata North Cluster
	Canada, or that final assembly must occur within Canadian borders. Canada's IRB Program requires offsetting Canadian purchases for foreign-purchased parts and supplies in aerospace and defense federal government procurement. In part, this is why the industry is growing regionally.
Foreign Repatriation of R&D	Repatriation of R&D back to the foreign-based head office. This could dramatically impact Kanata North.
Inability to Scale and Grow Technology Firms	This issue requires government action for resolution.
Potential New Investment Vehicles	Proposals for flow-through shares for Canadian technology firms and/or reduction in capital gains taxes if reinvested into Canadian companies could have a significant impact on future development.
Data Ownership / Privacy / IP Protection	Increasing concerns over who owns the data and who has access to it. Example: data centres may be located in Canada, but is the data stored in Canada. Example: AI raises concerns regarding intellectual property infringement and protection.
Critical Minerals for Economic Sovereignty	Increasingly, critical minerals and materials being framed in economic sovereignty terms. Example: explore direct linkages as The Ring of Fire develops. Stronger connections to firms in North Bay, Sudbury, and Timmins will be needed.
Transportation and Infrastructure	LRT expansion to Kanata and public-transit option for March Road. During peak commuting hours, traffic congestion on March Road can exceed that of Laurier Avenue. Example: demonstrate autonomous mobility on March Road connecting to the LRT.

Economic Factors

These factors include macro-level economics such as interest rates, tax changes, inflation, and exchange rates:

Table 6. Economic factors are relevance to Kanata North cluster.

Economic Factor	Relevance to Kanata North Cluster
Engineers / Younger Workers / Recent Graduates	These employees prefer using their own vehicles and are unlikely to pay for parking. Therefore, it is advisable to maintain ample free parking in Kanata North. This needs

Economic Factor	Relevance to Kanata North Cluster
	to be factored into forecasts of future land use and energy demand.
Remote and Hybrid Work	This trend has persisted for four years after Covid. It is likely to remain (to varying degrees and depending on industry).
Poaching Workers Remotely	Several tech firms outside Kanata North are targeting workers in the cluster for remote work opportunities. This affects cluster development, sustainability, and dynamics. Also, sometimes firms are acquired, and most workers relocate to HQ which is outside Kanata North. Nevertheless, some remain in Kanata North and work remotely. Moreover, the firm actively seeks out more remote workers from Kanata North.
Foreign Multinationals	Especially in semiconductors, telecommunications, and software. Creates a range of unique impacts and issues.
Competitively Priced Land for Expansion	There have been multiple missed opportunities for warehouse and storage development in Kanata North. This has resulted in new developments in Ottawa West and Stittsville. Logistics is a technology industry.
Investment Priorities	Prioritize Canadian-based firms that export (see Footnote 5). Example: potential EDC office in Kanata North.
Investment Cycles	Example: persistent demand for innovation and business requirements necessitates the constant upgrading of equipment within data centres, thereby creating ongoing opportunities for firms within clusters.
Leverage Ottawa's Unique Perks as Canada's Capital	Example: Ottawa is home to many national trade and business associations (and non-profits) and the cluster has attracted many such entities already.
Target Both Technology and Non-Technology Firms	Example: Ottawa-Based Med-Eng Systems became the world leader in bomb suits. There is a lot of advanced technology and advanced materials in their products.

Sociocultural Factors

Potential growth scenarios for Kanata North may include the establishment of a data centre, AI operations or an expanding capability in semiconductors. These activities, whether individually or collectively, not only promise significant economic growth and technological leadership but also introduce many societal benefits. The following are some social impacts that would result from these activities:

Table 7. Sociocultural factors and their relevance to the Kanata North cluster.

Sociocultural Factor	Relevance to Kanata North Cluster
Indirect Employment Opportunities	In addition to the many high paying direct employment opportunities for engineers, IT specialists and technicians, these activities will contribute to several indirect jobs for local businesses and service providers, real estate, maintenance staff, security personnel.
Strengthening the Technology Ecosystem	Attracting complementary businesses such as cloud services, cybersecurity firms, startups.
Collaboration with Universities	Drive demand for skilled trades and advanced degrees, encouraging investment in college and university programs.
Promote High Tech Careers	Open pathways for youth and underrepresented communities to enter high-tech careers via co-op, internship, and retraining programs.
Attract Talent	Offer an opportunity to attract and retain top talent in the community.
Community Investments	Encourage community investment by companies that like to engage in corporate social responsibility; e.g., by sponsoring events, STEM education programs, or infrastructure upgrades.
Made-in-Canada Solutions	Offer platforms to develop Made-in-Canada solutions that align with national values; e.g., by supporting green manufacturing, water conservation, and energy innovation projects.
Smart City Initiatives	A data centre would enable better support for smart city initiatives and local businesses needing robust data access; and would enhance the speed, reliability, and security of Internet and cloud services across the region.
Expanded Infrastructure	A data centre would provide infrastructure that enables AI, IoT, Fintech, and 5G development —benefiting especially new startups as well as existing enterprises; and would encourage tech companies to locate nearby due to the proximity of data infrastructure.
Municipality Initiatives	An AI operation would support municipal initiatives like traffic management, predictive maintenance, and public safety; and would lead to health care and climate monitoring tools that benefit the broader community.

Sociocultural Factor	Relevance to Kanata North Cluster
Canadian Sovereignty	An expanded semiconductor capability would provide support for Canadian sovereignty and economic security, especially in the areas of defence, security, health, communications, aerospace and infrastructure systems by reducing dependence on foreign supply chains, strengthening national resilience.

Technological Factors

These factors refer to new technologies that create new products, processes, services, and ways of doing business:

Table 8. Technological factors and their relevance to the Kanata North cluster.

Technological Factor	Relevance to Kanata North Cluster
Emerging Semiconductor Technologies	AI and IoT are driving innovation in the semiconductor sector. Manufacturers capable of addressing the requirements of both artificial intelligence and the Internet of Things for semiconductor chips are expected to become leaders in future markets. Silicon Carbide (SiC) offers significant advantages for power electronics and has immense potential in automotive, energy, and industrial applications. Manufacturing SiC semiconductors is difficult. Innovations will arise from better integration of design, manufacturing, and testing processes, enhancing yields and quality. Use of proven FD-SOI (Fully Depleted Silicon on Insulator) semiconductor process technologies will accelerate quantum's development towards real-world applications. Device as a Service (DaaS)[8] impacting both the semiconductor and photonics industries. Compound Semiconductors leveraging NRC-CPFC. III-V semiconductors (GaN, GaAs, and InP) manufacturing. Particularly relevant to Kanata North: GaN power systems and InP LiDAR sensing, development of InP for applications in communications, autonomous vehicles through advanced compound semiconductors, biosensor semiconductors.
Emerging AI Technologies	Recent investments in AI, totaling billions of dollars, have increased the demand for data centre infrastructure. Explainable AI (XAI) aims to make AI model decisions and outputs understandable to humans. Example: Ottawa-based Larus Technologies uses AI and ML applications to provide expert advice and solutions to retailers and businesses in e-commerce and supply chains (Umaletiya, 2025).

[8] Device as a Service (DaaS) is a subscription-based model where businesses get hardware (like laptops, tablets, and smartphones) and related services for a monthly fee instead of purchasing them outright.

Technological Factor	Relevance to Kanata North Cluster
	Edge AI developments are relevant to Kanata North's edge computing ecosystem. Deploying AI at the edge means running machine learning models on local devices like smartphones, IoT gadgets, and sensors instead of in distant data centres. Processing data locally reduces latency, benefiting edge computing. Kanata North firms in this space are Edge Signal and Improving (Umaletiya, 2025). Quantum Machine Learning is emerging. Ranovus Inc., based in Kanata North, designs energy-efficient and affordable semiconductor technology for AI and machine learning data needs.
Emerging Data Centre Technologies	Legacy Data Centres are generally unequipped for AI. Interest in small modular reactors (SMRs) is growing steadily; however, widespread deployment is not expected until after 2030 (JLL, 2025). In 2025, SMR announcements are expected to double in gigawatts (JLL, 2025). Nuclear power is becoming a preferred solution for growing energy demand as traditional grids struggle. Both large scale nuclear power and small modular reactors (SMRs) are being explored (JLL, 2025). Liquid cooling can support GPU advancements. Liquid cooling is often added in new buildings. It helps facilities handle higher density workloads, letting owners and investors improve their assets. Cooling systems reduce a facility's Power Usage Effectiveness (PUE), vital for data centre efficiency. Advanced environmental sensor systems for temperature, humidity, and airflow to help cooling systems operate efficiently. Significant sensor network capabilities locally (Ciena, Nokia, Larus, Armstrong Monitoring Corporation, Carleton University Sensor Systems Lab). Programmable logic controllers (PLCs) to control all of HVAC systems, backup generators, real-time monitoring and adjustments. Quantum Data Centre developments have started (Israel, Germany). Canada is a world-leader in quantum technologies. IBM has expanded its Quantum Data Center in Poughkeepsie, New York. Colorado is creating a quantum computing centre, while Illinois is developing the National Quantum Algorithm Center in collaboration with IBM, the University of Chicago, and the University of Illinois Urbana-Champaign. Edge Data Centre developments will be necessary for technologies like self-driving cars and the metaverse, which require lower latency and rapid data exchange to prevent lag. This is also true for many industry-specific AI models (i.e., financial).
Emerging Aerospace and Defence Technologies	Leading Canadian competencies that also exist in Kanata North / Ottawa include Aerospace Systems and Components, Armour, Defence Systems Integration, Electro-Optical / Infrared (EO/IR) Systems, Ground Vehicle Solutions, Marine Ship-Borne Mission and Platform Systems, Munitions, Shipbuilding Design and Engineering Services, Sonar and Acoustic Systems, Training and Simulation (Canada G. o., Key industrial capabilities, 2018).

Technological Factor	Relevance to Kanata North Cluster
	Canada is home to several firms in advanced materials and additive manufacturing, crucial technologies. Example: Kanata West-based Equispheres is a materials-focused products and services startup that will enable real mass production with additive manufacturing. One of its major clients is Lockheed Martin Canada, located across the street.

Legal and Regulatory Factors

These factors refer to the legal milieu in which firms and sectors operate:

Table 9. Legal and regulatory factors relevant to the Kanata North cluster.

Legal / Regulatory Factor	Relevance to Kanata North Cluster
Environmental Compliance	Federal and provincial environmental laws would apply to most growth scenarios for Kanata North; e.g., data centres use a great deal of power and generate heat, and an environmental assessment may need to be conducted especially around noise, air conditioning units, backup generators, and water usage.
Building Codes	Building code compliance will be mandatory, including enhanced fire suppression, electrical systems, and structural safety (especially for server-heavy floors).
Telecommunication Compliance	Federal CRTC regulations may apply if the data centre hosts telecom equipment or operates its own fiber networks.
Privacy Laws	Canada's privacy laws impose obligations on how data is stored and protected.
Energy Agreements	High-volume electricity supply contracts must be secured.
Employment Laws	Ontario’s Employment Standards Act will apply for all new hires, including health and safety regulations.
AI Specific Regulations	Canada's proposed Artificial Intelligence and Data Act (AIDA) (part of Bill C-27) will regulate high-impact AI systems, by imposing transparency, auditability, and bias detection requirements.

Environmental Factors

These factors refer to the environmental milieu in which firms and sectors operate:

Table 10. Environmental factors relevant to Kanata North cluster.

Environmental Factor	Relevance to Kanata North Cluster
Energy Consumption & Environmental Impact	High for some high growth industries like data centres, AI, semiconductor manufacturing. Data centres, quantum computing centres, and semiconductor facilities consume large quantities of water for cooling. In areas with water scarcity, this can be a significant environmental issue.
Circular Economy Approaches to Maximize Sustainability	Transition from take/make/dispose to a circular model, reusing equipment multiple times and reducing the negative impact of new manufacturing. Hence, reducing CO_2 emissions, sectoral waste, and fewer primary materials.
Weather Events & Climate Change	Weather events like ice and windstorms affect energy supply, and thus firm output and exports. There are many different impacts (i.e. higher insurance costs for companies).

1.4 Competitive Advantage Analysis of The Kanata North Industrial Cluster

This sub-section herein provides a Competitive Advantage Analysis (CAA) of The Kanata North Industrial Cluster as in 2025.

Regional growth is driven by the region's comparative advantage. Kanata North's economic growth will peak by leveraging its competitive advantage to boost and diversify exports.[9]

1.4.1 Competitive Advantage Analysis (CAA)

The Competitive Advantage Analysis (CAA) Toolset is a subroutine within Doyletech's Industrial Analysis, Regional Science, and Economic Impact Computer Model (DT EconWin)[10] that assesses the structure and performance of a specific economic area to identify existing (or potential) competitive advantages.

[9] Sub-provincial analysis in Canada is limited by publicly available Statistics Canada data.

[10] **DT EconWin's** regional science functions include location quotients, shift-share analysis, push-pull factoring, keystone industry identification, backward and forward linkages, field of influence, and more.

1.4.2 Location Quotients (LQ) – Level of Specialization and Export Activity

The Location Quotient indicates the **level of specialization** of a selected geographic area.[11] In this case, the formula is:

$$\textbf{Location Quotient (LQ)} = \frac{\%\text{ of local earnings in Industry A of Kanata North}}{\%\text{ of Ontario earnings in Industry A}}$$

LQs are also used to indicate the extent to which the local economy is importing, self-sufficient, or exporting goods and services in different sectors. A municipality's export industries are also called its Export Base, or Base Industries.

Interpreting a location quotient requires understanding where it fits into the following ranges:[12]

- **LQs < 0.75 ("low")** indicate that Kanata North needs are not being met by the sector and is importing goods and services in that sector.
- **LQs between 0.75 and 1.25 ("medium")** indicate that Kanata North is self-sufficient in that sector. LQs of 1.0 result if local % earnings is equal to provincial % earnings in that sector.
- **LQs > 1.25 ("high")** indicate that the sector is serving needs that extend beyond the boundaries of Kanata North. IT is exporting goods and services.

There are several industries in which Kanata North exports goods and services. Moreover, these industries have LQs much greater than 1.25, indicating very robust cluster formation locally and very significant 'exporting' in comparison to Ontario:

- Computer and peripheral equipment manufacturing [BS334100] 216.92
- Semiconductor and other electronic component manufacturing [BS334400] 87.21
- Other electronic product manufacturing [BS334A00] 26.37
- Software publishers [BS511200] 18.44
- Aerospace product and parts manufacturing [BS336400] 17.58
- Communications equipment manufacturing [BS334200] 14.81
- Computer systems design and related services [BS541500] 8.25
- Telecommunications [BS517000] 7.77
- Printing and related support activities [BS323000] 4.57
- Other transportation equipment manufacturing [BS336900] 4.47

[11] LQs aim to identify leading industries in a region. It is based on Economic Base Theory which states that the main determinants of regional economic growth are directly related to the demand for goods and services from outside the region.

[12] Places like Kanata North that have a (relatively) small overall employment, but a few very specialized businesses will return very high LQs.

Firms within these ten (10) industries would have an **inherent interest in location or relocation** in Kanata North due to very strong cluster effects. Thus, new firm attraction activities should be focused on these industries.

There are several industries which are not meeting the needs of Kanata North. Thus, importing is occurring:

- Clothing and clothing accessories stores [BS448000] 0.00
- Investigation and security services [BS561600] 0.00
- Other federal government services (except defence) [GS911A00] 0.00
- Truck transportation [BS484000] (0.00)
- Personal and household goods merchant wholesalers [BS414000] 0.00
- Activities related to credit intermediation [BS522300] 0.01
- Couriers and messengers [BS492000] 0.01
- Defence services [GS911100] 0.01
- Non-store retailers [BS454000] 0.01
- Repair and maintenance (except automotive) [BS811A00] 0.01
- Services to buildings and dwellings [BS561700] 0.01
- Sporting goods, hobby, book and music stores [BS451000] 0.01
- Other municipal government services [GS913000] 0.02
- Other provincial and territorial government services [GS912000] 0.02
- Advertising, public relations, and related services [BS541800] 0.03
- Electronics and appliance stores [BS443000] 0.03
- Grant-making, civic, and professional and similar organizations [NP813A00] 0.03
- Other engineering construction [BS23C500] 0.03
- Rental and leasing services (except automotive equipment) [BS532A00] 0.03
- Other miscellaneous manufacturing [BS339900] 0.03
- Travel arrangement and reservation services [BS561500] (0.03)
- Resin, synthetic rubber, and artificial and synthetic fibres and filaments manufacturing [BS325200] 0.04
- Warehousing and storage [BS493000] (0.04)
- Textile and textile product mills [BS31A000] (0.05)

This data indicates an **opportunity for 'import replacement'** by establishing a firm in Kanata North. Multiple factors need to be considered. For example. the general retail undersupply can be attributed to the substantial presence of retail establishments in adjacent areas of Kanata.

There are several industries which are sufficiently meeting the needs of Kanata North. These industries are not engaged in much importing nor exporting:

- Personal care services and other personal services [BS812A00] 1.42
- Business, professional and other membership organizations [BS813000] 1.06
- Architectural, engineering and related services [BS541300] 0.85
- Converted paper product manufacturing [BS322200] 0.81
- Breweries [BS312120] 0.76
- Employment services [BS561300] 0.74
- Food services and drinking places [BS722000] 0.72
- Specialized design services [BS541400] 0.69

This data suggests **limited opportunities** to open a new hair salon, chiropractic office, massage or physiotherapy studio, brewery, staffing firm, food provider, architecture firm, or graphic/media design services firm.

The data herein this section will serve to inform the forecasting and scenario development work.

1.4.3 Shift-Share Analysis – Source of Competitiveness

Shift-Share Analysis (SSA) is an economic method to analyze differences between growth in a local economy and growth in the provincial, national, or other regional economies. This method allows for isolating the effect of **local influences** on growth from effects that operate **industry-wide** or at the **provincial level**. SSA also helps create forecasts.

Thus, this method divides local employment into three components: (1) The National Share (NS); (2) The Industry Mix (IM); and (3) The Local Factors (LF). The national share reflects national (or provincial) trends. The industry mix refers to specific trends in the industry. Local factors account for local influences on an industry's performance.

In this case, the formula is:

Provincial Effect (The National Share):

> = Local Employment 2018 x Provincial % Growth Rate Overall 2018-2025 (all industries combined)

Industrial Effect (The Industrial Mix):

> = Local Employment 2025 x (Provincial Sector % Growth – Provincial % Growth Overall)

Regional Effect (The Local Factors):

> = Local Employment 2025 x (Local Sector % Growth – Provincial Sector % Growth).

When added together, the three effects should equal the actual or absolute change in the number of jobs in the Kanata North sector.

Interpreting a shift-share analysis requires understanding the number of local jobs lost or gained that is attributed to each effect:

- **Provincial Effect:** the number of local jobs lost or gained due to the influence of provincial growth overall.
- **Industrial Effect:** the number of local jobs lost or gained due to the influence of growth in the sector provincially.
- **Regional Effect:** the number of local jobs lost or gained due to local factors

SSA helps to identify industries in Kanata North that are strong or weak compared to elsewhere. It also helps to determine to what extent shifts in employment share are due to local factors or to broader trends and whether existing clusters are growing, stable, or declining. SSA also helps to avoid quick and incorrect conclusions about job growth figures

If the **Regional Effect is Positive**, Kanata North's job growth was above the rate of growth in the industry provincially. Table 11, below, identifies the Kanata North industries having the most positive **Regional Effect.**

Table 11. The Most Positive Kanata North Industries, The Regional Effect.

IOIC Industry	Jobs in 2018, Ontario	Jobs in 2025, Ontario	Change in Jobs, Ontario	Change in Jobs, Kanata North	Provincial Effect (local jobs lost or gained due to the influence of provincial growth overall)	Industrial Effect (local jobs lost or gained due to influence of growth in the sector provincially)	Regional Effect (local jobs lost or gained due to Kanata North factors)	Total Change in Jobs, 2018-2025 (Provincial Effect + Industrial Effect + Regional Effect)
Aerospace product and parts manufacturing [BS336400]	13,835	13,460	-375	1,192	31	-39	**1,200**	1,192
Semiconductor and other electronic component manufacturing [BS334400]	10,110	10,045	-65	748	396	-418	**770**	748
Computer and peripheral equipment manufacturing [BS334100]	915	1,205	290	851	57	102	**692**	851
Personal care services and other personal services [BS812A00]	69,005	60,885	-8,120	144	18	-37	**163**	144
Residential building construction [BS23A000]	216,620	275,940	59,320	158	2	3	**152**	158
Architectural, engineering and related services [BS541300]	85,525	100,080	14,555	166	11	6	**149**	166
Other transportation equipment manufacturing [BS336900]	4,740	4,050	-690	96	13	-29	**112**	96
Printing and related support activities [BS323000]	25,970	20,865	-5,105	22	61	-167	**128**	22
Social assistance [BS624000]	35,390	37,550	2,160	136	15	-7	**128**	136
Financial investment services, funds and other financial vehicles [BS52A00	101,575	105,405	3,830	100	16	-11	**95**	100
Food services and drinking places [BS722000]	446,060	435,665	-10,395	80	49	-59	**90**	80

Table 11 can be interpretated as follows: In Kanata North, employment in *Semiconductor and Other Electronic Component Manufacturing* grew from 3,493 in 2018 to 4,241 in 2025. Of the 748 jobs gained, 396 can be attributed to provincial growth. This industry *declined* by 0.64% provincially, which accounts for the Industrial Effect of -418, suggesting that 418 jobs would have been lost locally in the industry if Kanata North's economy had followed provincial trends. Meanwhile, a large proportion of the jobs gained can be attributed to favourable local factors, as reflected in the value of 770 for the *Regional Effect*.

If the **Regional Effect is Negative**, Kanata North's job growth was below the provincial rate for that industry. Table 12, below, identifies the Kanata North industries having the most negative Regional Effect.

Table 12. The Most Negative Kanata North Industries, The Regional Effect.

IOIC Industry	Jobs in 2018, Ontario	Jobs in 2025, Ontario	Change in Jobs, Ontario	Change in Jobs, Kanata North	Provincial Effect (local jobs lost or gained due to the influence of provincial growth overall)	Industrial Effect (local jobs lost or gained due to influence of growth in the sector provincially)	Regional Effect (local jobs lost or gained due to Kanata North factors)	Total Change in Jobs, 2018-2025 (Provincial Effect + Industrial Effect + Regional Effect)
Software publishers [BS511200]	24,585	41,360	16,775	-128	424	2,129	**-2,681**	-128
Telecommunications [BS517000]	49,650	55,465	5,815	-467	653	22	**-1,142**	-467
Pharmaceutical and medicine manufacturing [BS325400]	14,960	17,225	2,265	-340	63	21	**-425**	-340
Computer systems design and related services [BS541500]	145,190	249,330	104,140	1,706	326	1,739	**-359**	1,706
Management, scientific and technical consulting services [BS541600]	67,745	91,515	23,770	-88	32	67	**-187**	-88
Miscellaneous food manufacturing [BS311A]	39,740	48,190	8,450	-112	13	11	**-136**	-112
Other electronic product manufacturing [BS334A00]	10,850	13,210	2,360	45	90	83	**-128**	45
Non-residential building construction [BS23B000]	91,450	96,400	4,950	-116	21	-11	**-126**	-116
Dairy product manufacturing [BS3115]	8,800	8,545	-255	-110	12	-16	**-107**	-110
Legal services [BS541100]	48,010	56,060	8,050	-67	20	10	**-97**	-67

Table 13, below, adds two calculations to the shift-share analysis to assess current industrial competitiveness. The two calculations are:

Expected Change = Provincial Effect **+** Industrial Effect

Competitive Effect = Actual Change **–** Expected Change.[13]

Job change beyond the "expected change" can be attributed to Kanata North's unique competitive effect.[14]

[13] SSA does not indicate why these industries are competitive, or not competitive, currently.
[14] The competitive effect measures the job change that occurs within a regional industry that cannot be explained by broader trends (i.e. the National / Provincial Growth Effect and the Industrial Mix Effect).

Table 13. Kanata North Expected Change vs. Competitive Effect, The Current Leading Industries.

IOIC Industry	Expected Change (= Provincial Effect + Industrial Effect)	Competitive Effect (= Actual Change - Expected Change)
Aerospace product and parts manufacturing [BS336400]	-8	1,200
Semiconductor and other electronic component manufacturing [BS334400]	-22	770
Computer and peripheral equipment manufacturing [BS334100]	159	692
Personal care services and other personal services [BS812A00]	-19	163
Residential building construction [BS23A000]	6	152
Architectural, engineering and related services [BS541300]	17	149
Social assistance [BS624000]	8	128
Other transportation equipment manufacturing [BS336900]	-16	112
Financial investment services, funds and other financial vehicles [BS52A000]	5	95
Food services and drinking places [BS722000]	-10	90

Currently, some Kanata North industries are significantly outperforming provincial growth trends. Aerospace Product and Parts Manufacturing[15], Semiconductor and Other Electronic Component Manufacturing, and Computer and Peripheral Equipment Manufacturing are **Current Leading Industries**. That is, while the shift share analysis reveals provincial decline in some industries, there is a unique regional advantage in that industry that ought to be identified and fostered.

[15] The competitive effect for this industry is (somewhat) overstated because some of the Kanata North firms were reclassified into this IOIC industry.

Table 14, below, identifies the five Kanata North industries where the industry is declining in comparison to current provincial growth.

Table 14. Kanata North Expected Change vs. Competitive Effect, The Current Lagging Industries.

IOIC Industry	Expected Change (= Provincial Effect + Industrial Effect)	Competitive Effect (= Actual Change - Expected Change)
Software publishers [BS511200]	2,553	-2,681
Telecommunications [BS517000]	675	-1,142
Pharmaceutical and medicine manufacturing [BS325400]	85	-425
Computer systems design and related services [BS541500]	2,065	-359
Management, scientific and technical consulting services [BS541600]	99	-187

It is concerning that three of Kanata North's keystone (largest) industries appear as Current Lagging Industries. That is, these industries are growing provincially, but for some reason Kanata North faces some current disadvantage that is causing localized job loss in a provincially growing industry. It is understandable why Pharmaceutical and Medicine Manufacturing is lagging (historically, concentration has been in Toronto and Southern Ontario). However, the disadvantages in Software Publishers and Telecommunications should be investigated.[16]

[16] In the case of Software, some firms were reclassified during the 2025 Survey.

1.4.4 Industry Targeting with Leading and Lagging Industries

SSA can be used for industry targeting to identify industries that match a community's comparative advantages. The concept is to select industries for investment by considering Kanata North's existing businesses, regional and national growth trends, and its competitive strengths.

It also serves as a tool for assessing if local sectors need some attention or further investigation, perhaps through new **Business Retention & Expansion (BR&E)** activities. For example, a BR&E survey, or industry focus groups to identify specific issues/needs of businesses in those sectors may be warranted. In terms of identifying investment targets and BR&E activities, the following is noted:

- Ensure that high-performing industries continue to outperform provincial trends.
- Help underperforming industries align with provincial trends to boost the economy.
- Some industries are growing in Kanata North, but shift share reveals that the industry is actually growing even faster at the provincial level, meaning regional factors probably have limited influence on the regional boom.
- An industry may be declining in a region, but shift share reveals that it is declining even faster at the national level --- and thus the regional industry is actually outperforming the nation by stemming job loss.
- Identify and consult with cluster entrepreneurs specifically in the Current Leading Industries and the Current Lagging Industries for investment attraction and promotion guidance.

Core Targets

Industries in Kanata North with high location quotients, positive competitive effects, and significant employment are the primary targets for investment. These are the **Current Leading Industries**, as identified previously.

There are some interesting findings, based strictly on the most recent data and trends. For example, Semiconductors and Other Electronic Component Manufacturing and Computer and Peripheral Equipment Manufacturing are currently **Core Targets**, but not Telecommunications or Computer Systems Design and Related Services, historical core industries of Kanata North. Obviously, these historical industries should not, and must not, be ignored. In fact, the indication is that renewed efforts to retain these industries is required. The forecasting and scenario development will ensure significant representation from Core Targets.

Diversification Targets

Industries that are growing nationally or provincially and in which Kanata North is currently well-suited to take advantage of are **Diversification Targets**.

Semiconductors and Other Electronic Component Manufacturing and Computer and Peripheral Equipment Manufacturing (currently, **Core Targets**) can also be classified as **Diversification Targets**. They provide a critical opportunity for Kanata North to further diversify its industry portfolio from software-based to more systems and hardware-based activity. This diversification will also help Kanata North to be integrated into emerging and future growth trends (for example, increased spending on Aerospace, Defence & Security, Security in the Artic, Security of Critical Components and Systems, and Critical Minerals and Materials).

1.5 Emerging Targets

Emerging targets are those clusters that are not currently high concentrated in Kanata North but have significant potential to grow in importance. To identify **Emerging Targets**, the following criteria were applied:

- Cluster Employment = greater than 100 jobs **+**
- Job Growth = Positive job growth 2018-2025 **+**
- Location Quotient Growth = Positive LQ change **+**
- Shift-Share = Competitive Effect greater than zero.

The forecasting and scenario development will ensure that there is representation from Emerging Target industries. Moreover, a key point to model is how much the Emerging Target industries will grow over time. Table 15, below, shows that there are currently eight Emerging Targets.

Table 15. Identification of Emerging Targets, IOIC Industries.

IOIC Industry	Cluster Employment = Greater Than 100 Jobs	Job Growth = Positive Job Growth 2018-2025	Location Quotient Growth = Positive LQ Change (2018-2025)	Shift-Share = Competitive Effect Greater Than Zero.
Aerospace product and parts manufacturing [BS336400]	1,469	1,192	0.3966	1,200
Architectural, engineering and related services [BS541300]	266	166	1.4361	149
Computer and peripheral equipment manufacturing [BS334100]	1,353	851	0.1172	692
Financial investment services, funds and other financial vehicles [BS52A000]	241	100	2.2045	95
Medical equipment and supplies manufacturing [BS339100]	155	26	0.3831	43
Other transportation equipment manufacturing [BS336900]	207	96	0.2350	112
Printing and related support activities [BS323000]	562	22	0.6556	128
Semiconductor and other electronic component manufacturing [BS334400]	748	748	30.7050	770

Table 16, below, outlines potential **manufacturing activities** in Kanata North, based on the current companies and skillsets. This analysis shows that Kanata North needs more manufacturing, and it suggests the most suitable types.

Table 16. Potential Manufacturing Opportunities in Kanata North.

Aerospace product and parts manufacturing [BS336400]
■ aircraft assemblies, subassemblies and parts, manufacturing
■ airframe assemblies, for guided missiles, manufacturing
■ bomb racks, aircraft, manufacturing
■ developing and producing prototypes for aerospace products
■ developing and producing prototypes for guided missile and space vehicle components
■ guided missile and space vehicle and parts, manufacturing
Architectural, engineering and related services [BS541300]
■ civil engineering services
■ consulting engineering services
■ electrical and electronic engineering services
■ industrial engineering services
■ mechanical engineering services
■ architectural design services and advice
■ calibration and certification services
■ non-destructive testing services
■ land surveying services (except geophysical)
■ oceanic surveying (except geophysical) services
■ geographic information system (GIS) base mapping
■ geophysical surveying and mapping services
Computer and peripheral equipment manufacturing [BS334100]
■ bar code scanners, manufacturing
■ optical readers and scanners, manufacturing
■ input/output equipment, computer, manufacturing
■ portable computer, manufacturing
Medical equipment and supplies manufacturing [BS339100]
■ biosensor devices and systems

- dental equipment / instruments (e.g., sterilizers, pliers, drills, burs), manufacturing
- spectacles frames, mountings, lenses and parts (i.e., temples and fronts), manufacturing
- medical and related instruments, apparatus and equipment manufacturing

Other transportation equipment manufacturing [BS336900]

- armoured military vehicles and parts (except tanks), manufacturing
- tanks, military (including factory rebuilding), manufacturing

Semiconductor and other electronic component manufacturing [BS334400]

- connectors, electronic (e.g., coaxial, cylindrical, printed circuit, rack, panel), manufacturing
- fibre optic connectors, manufacturing
- harness assemblies (insulated wire/connectors) for electronic use, including printer cables, manufacturing
- integrated optical circuits (IOC), manufacturing
- loading of electronic components onto circuit boards
- optoelectronic devices, manufacturing
- photonic integrated circuits (pic), manufacturing
- printed circuit assemblies, manufacturing
- printed circuit boards, bare (i.e., without mounted electronic components), manufacturing
- printed circuit boards, loading
- radio frequency identification tags (RFID), manufacturing
- silicon waveguides, manufacturing

1.5.1 Business Retention and Expansion Opportunities (BR&E)

Often a cluster's best chance of creating new jobs comes from existing businesses. At its core, retention and expansion should be activities that provide value-added support to help businesses in Kanata North compete.

Based on the preceding analyses, the following BR&E-specific priorities are suggested:

- The **Software** and **Telecommunications** sectors have seen a decrease in competitiveness since 2018. Interview executives in these sectors to determine specific growth obstacles. Although many factors are externally driven, local action is still necessary.
- **Manufacturing** is vital for the economy, supply chain security, and competitive advantage for Canadian companies. Kanata North should increase and sustain its manufacturing, focusing on its strengths in semiconductor, electronic component, and telecommunications product

manufacturing. BR&E activities should also be focused on Computer Systems Design and Communications Equipment Manufacturing, both major employers in the cluster.

- Enhance the foundation established within **Management, Scientific, and Technical Consulting** firms in the cluster.
- Relevant segments of the **Transportation Equipment Manufacturing** industry for Kanata North include armoured vehicles, tanks, and other military equipment. Local capacity in these areas around Ottawa will increase due to anticipated growth in defence and security procurement.
- Kanata North has a growing number of **Physicians**, driven by population growth and residential development. KRP Properties is targeting its Gateway development (300-340 March Road) for these tenants.
- Some initial BR&E steps include (several of these activities could be undertaken with the assistance of Invest Ottawa):
    - BR&E Survey; ask firms in both the Kanata North Export Market Sector and the Kanata North Local Market Sector concerning their growth barriers. A TechTuesday event asking attendees specifically about BR&E issues may be appropriate.
    - Establish a BR&E Working Group and identify key performance indicators. Representation should include real estate brokers, site consultants, local and regional investors including angels, and executive participation from the largest industries. Participants from Carleton University, University of Ottawa, L-Spark, KRP Properties, and Invest Ottawa is also recommended.
    - Consider developing a formal BR&E Program.
    - Continue with The Kanata Networker; also develop a downloadable Cluster Profile, segmented by sector.
    - Consider an online Annual Survey of Business. Utilize this as an early warning system and develop a Red/Green Flag Follow-Up Worksheet, and subsequent engagement.
    - Access trends in KNBA's firmographics database which identifies firms that were acquired, changed names, moved out, or closed in Kanata North between 2018-2025.
    - Support local companies with offshored manufacturing / contract manufacturing operations to develop business cases to repatriate global manufacturing mandates to Kanata North.
    - Investigate specific linkages between Kanata North industry clusters and those elsewhere in Canada. For example, Kanata North has a small **Life Sciences** cluster (a Base industry); what supply / strategic linkages are possible with life sciences clusters in Guelph, Hamilton, Toronto, Laval, and Montréal?
    - In terms of a Kanata North Local (Non-Base) industry, **Financial Investment Services, Funds, and Other Financial Vehicles** continues to emerge; what links are possible with financial clusters in Toronto, New York or London?
    - Celebrate the success of clusterpreneurs; "Entrepreneur of the Year".
    - Consider "Made in Ottawa" or "Buy Local" initiatives. This could help both the Base and Non-Base industries in Kanata North.
    - Investigate opportunities for import replacement.

    - Encourage linkages with Eastern Ontario suppliers.
    - Investigate emerging AI tools for investment retention (Mobility is a Must, n.d.) and attraction (ResearchFDI, 2025).
- The **Clean Tech** industry in Kanata North is relatively small and has historically experienced limited growth. It is advisable to develop connections with Guelph[17], Montréal (International, 2022), and other clusters to foster expansion.

According to Cluster Theory (DEVELOPMENT, n.d.), the key determinant of successful inter-firm collaboration (clusters) is the implicit exchange of knowledge between businesses. As trust develops, businesses tend to exchange information and innovations, occasionally collaborating informally to foster innovation. BR&E activities should focus on these interactions to solve common problems and exploit opportunities.

[17] Guelph is home to 180 businesses in the clean technology sector.

1.5.2 Summary

Figure 1-7, below, provides a graphical summary of the Competitive Advantage Analysis.

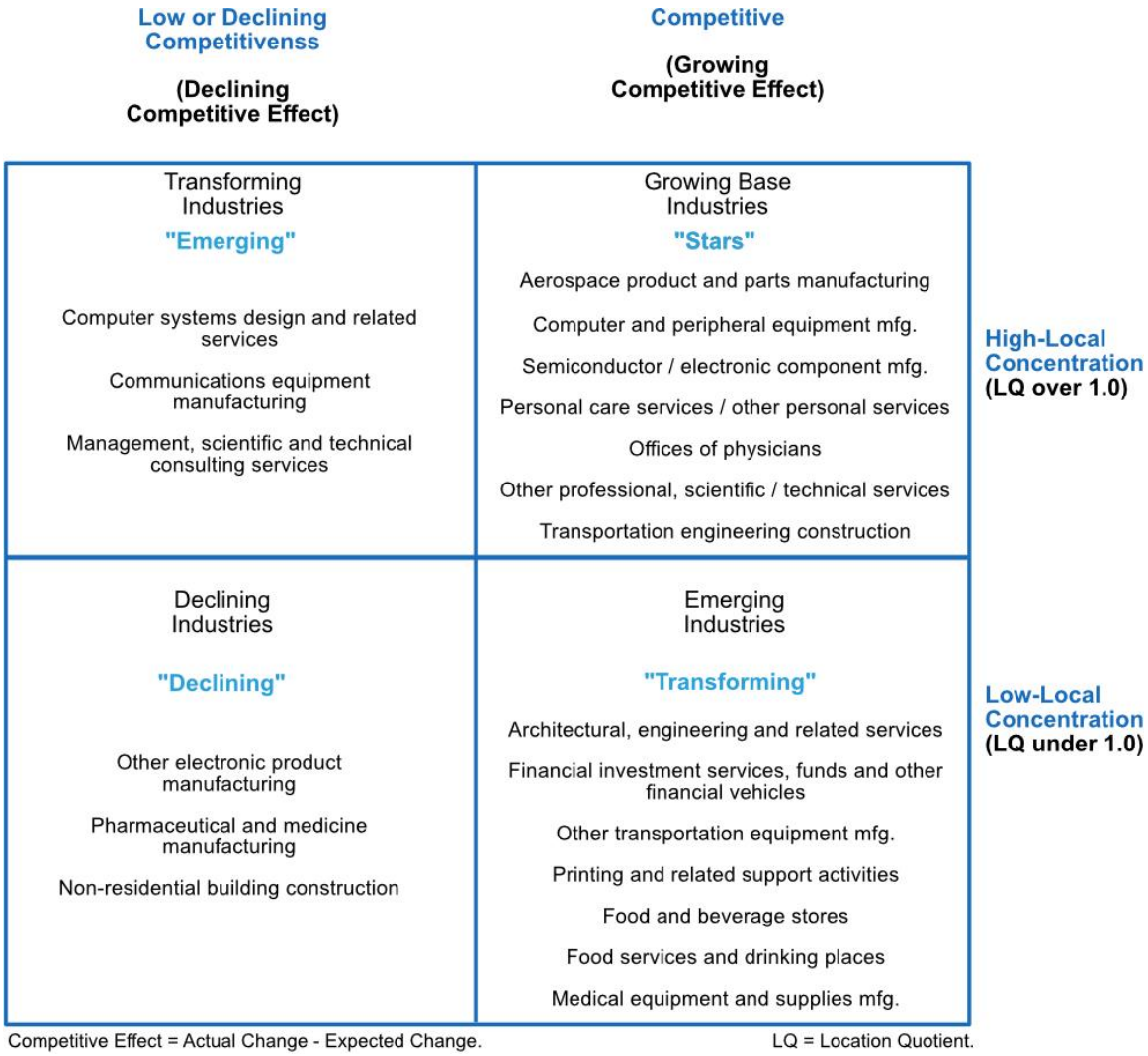

Figure 1-7. Competitive Advantage Analysis Summary.

1.6 Strengths, Weaknesses, Opportunities, and Threats (SWOT) Analysis

Section 1.6 herein provides a Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis of The Kanata North Industrial Cluster.

SWOT is an analysis tool that combines the study of the strengths and weaknesses of the cluster with that of the opportunities and threats of its environment. It serves to inform the forecasts and growth scenarios.

The SWOT Analysis was developed utilizing a **Cluster Framework**[18] since Kanata North is one of the few national technology clusters in Canada.

All statements made herein are based on the previously developed quantitative and qualitative analyses, as well as input from stakeholders in Kanata North. A virtual focus group was facilitated on June 26, 2025.

1.6.1 Strengths

Kanata North's strengths are its successful aspects that can be promoted.

Critical Mass and Agglomeration Economies.

Kanata North has critical mass in software and cloud services, computer systems and design, telecommunications, semiconductors / manufacturing / testing, and wireless. This critical mass includes both software and hardware, and ICT Manufacturing and ICT Services.

This makes the cluster attractive for new participants as the more companies there are in a certain set of industries, the more likely that higher levels of productivity and innovation will be achieved.

Competitiveness of Cluster Firms.

For Kanata North, competitiveness is measured in terms of sales but also in terms of the quality and importance of the research taking place. Kanata North is internationally competitive in terms of skills and research output. For example, the research and development taking place at the Kanata campuses of Nokia and Ciena are foundational to the success of these two multinationals.[19]

Shared access to a distinctive local knowledge base confers competitive advantages on the firms located in Kanata North. This is because innovation = competitiveness = exports (which, in Kanata North's case, are both 'sales' exports and 'research' exports).

Strong Technical Skills & Knowledge Spillovers.

As stated, Kanata North has significant technical skills. Knowledge spillovers refer to the exchange of information regarding market opportunities and technologies among individuals at different companies and research organizations within the cluster through a range of formal and informal connections.

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[18] Utilizing the proven attributes of successful technology clusters.

[19] Based on Doyletech interviews with company executives in 2018, 2024, and 2025.

Knowledge spillovers also include entrepreneurial skills and best practices. They are an important, albeit frequently undocumented, element of successful clusters. Kanata North has had several serial entrepreneurs (both past and present).

Strong Technology Engine & Ability to Innovate.

A cluster must contain not only firms, but also institutions that address their needs.

Kanata North benefits from significant R&D institutions and activity both in the immediate area and across Ottawa. Kanata North hosts CMC Microsystems, L-Spark, CENGEN, SECTR, Carleton University, and University of Ottawa. Across Ottawa, there are various NRC initiatives (for example, CPFC, NRC-IRAP), CRC, AAFC, Environment Canada, Invest Ottawa, Area XO, and more.

A robust technology engine requires proven technology transfer capabilities and supporting infrastructure. The cluster has historically performed well in technology transfer, but this performance has decreased in recent years.

Coopetition.

Interdependence involves firms gaining a competitive edge by being close to related firms, not just by cooperating or networking. The cooperation results in clear additional benefits to all participating cluster actors.

Specialized service providers have developed within Kanata North to specifically support technology firms. Examples include:

- **Legal Services** – LaBarge Weinstein LLP (technology-based M&A, buyouts, IPOs, IP and Licensing Agreements). Other examples include Aventum IP Law LLP, Tacit Law, ChoiTechAndLaw.
- **Financial Services** – BDC, Wesley Clover, Mor-Liquidity Mergers and Acquisitions.
- **Outsourced Manufacturing Services** – Sanmina, Artaflex Inc., Terra Nova Solutions Rewired, Electronics Test Centre, Flextra Electronic Cable Assembly, Syntronic.
- **Outsourced Prototyping and Product / Industrial Design** – Fidus, Electronics4All, NPS Labs, TelDesign Inc., BTA Design Services, Syntronic.
- **Recruiters & HR** – Talent Lab, Talent Map, Stratford Group, SECTR, Adecco, Calian, Peak Sales Recruiting, Procom, McConnell HR Consulting, WTW, CMC Microsystems.
- **Reverse Engineering, IP Protection & Investigation & Management** – Stratford Group, MOSAID Technologies, Cerio.
- **Electronics and Materials Reuse, Reclaiming & Recycling** – Renaissance Network Reinvest, EDI Distributors.
- **Testing / Vertification / Certification** – TUV SUD Canada, Prometric Testing, BenchMarket, eSAFE Product Approval Services.
- **Labels & Packaging** – AWT Labels & Packaging, Gilmour Printing, Elk Packaging & Logistics.
- **Other Unique Technology Services** – Lincoln-Parry SoftEscrow (software escrow service).

- **VARS and Parts Suppliers** – J-Squared Technologies, Starvoy Communications, Motion Micro Solutions.

Kanata North companies are increasingly relying on specialized partners so they can focus on their core competencies.

International Visibility and Reputation of the Cluster and its Actors.

Capital inflows, such as venture capital, foreign direct investments, and mergers and acquisitions, show investors recognize local knowledge assets and capabilities.

At one time or another, many of the largest and most successful U.S.-based venture capital firms have been active in Kanata North. There is also recognition of the cluster in publications, press and media, and its success stories are well known (for example, Mitel, Newbridge, Digital Equipment Corporation (DEC), Nortel, Mosaid, Tundra, Nordion, and more).

Public-Sector Awareness, Commitment, and Support.

Since inception, the Kanata cluster (perhaps because it is located in Canada's Capital Region) has received key support from public-sector officials. This includes the support and vision of Marianne Wilkinson, the first Mayor of the (then) City of Kanata. The cluster benefits from Canada's generous system of R&D tax credits, several publicly-funded research labs, NRC-IRAP, Invest Ottawa, and from its designation as a Special Economic Zone by the City of Ottawa.

Local Sources of Capital & Local Investors.

Local investors include Wesley Clover, Celtic House, Invest Ottawa, Capital Angel Network, Alacrity, NRC-IRAP, BDC, Infinite Venture Partners, and angels. Active national investors include RBC, SDTC, Mistral Venture Partners, Genesys Capital, among others.

Over the cluster's lifespan, angels have really made a difference in Kanata North, specifically in the early days when most of the tech angels were right here in the Ottawa region.

High Concentration of Foreign-Controlled Firms.

This provides significant strengths (as well as some threats) for the cluster. In terms of strengths, it provides access to operating capital and FDI, insertion into global value-chains, linkages with other technology clusters worldwide, and (generally-speaking) higher salaries for workers in Kanata North. An example is the aerospace and defence industry which provides for insertion into global supply chains.

Civic Entrepreneurs / Cluster-preneurs & Key Champions.

These are community leaders who have galvanized the potential opportunity for technology-based cluster development specifically in Kanata North.

Kanata North has had many civic entrepreneurs, including Bill Teron, Marianne Wilkinson, Terry Matthews, and Michael Cowpland. These leaders have been visionary, facilitative, analytical, and great at networking. In the 1960s, Bill Teron was developing the master-planned community of Kanata (Old Beaverbrook) and wanted to make sure there were jobs available locally. In 1963, he offered Denzil Doyle fifty-six acres of farmland (at a discount) if he moved DEC from Carleton Place to Kanata North

(Unknown, Digital Equipment of Canada Ltd., n.d.). The DEC facility eventually grew to over 500,000 square feet and employed about 2,000 people.

1.6.2 Weaknesses

Challenges in Kanata North are obstacles to opportunities, barriers to growth, and factors that could affect future sustainability.

Lack of Angel and Venture Capital.

Generally speaking, there is insufficient supply of risk capital to support the creation and development of innovative firms. The current focus is on (largely) follow-on placements, not new placements.

Underrepresentation in Some Emerging Technologies and Industries

The cluster is undercritical in quantum technologies, nanotechnology and nanoelectronics, clean tech, data centres, MEMS, advanced materials and additive manufacturing, blockchain, industrial biotechnology, medical devices, and in pharmaceutical / medicine manufacturing.

Reduction in Entrepreneurial Culture.

Startup creation has declined recently. There has also been a reduction in the entrepreneurial culture in the local scientific community and the existence of invisible barriers to movement between research and industry.

High Concentration of Foreign-Controlled Firms.

This exposures Kanata North to volatile international technology trends and investment / FDI patterns. The significant mergers and acquisitions, along with other activities among technology multinationals, have led to the reduction of their Kanata North presence. Recent examples include Avaya, Mitel, Barracuda, and HP.

High Taxes – Corporate / Property / Income / Capital Gains.

To a large extent, Kanata North's primary competition is derived from the investment and financial conditions that exist in other technology clusters in North America, and abroad. From this perspective, it can be argued that current tax burdens are too high.

As identified in the PESTEL Analysis, recent proposals for flow-through shares for Canadian technology firms and/or reduction in capital gains taxes if reinvested into Canadian companies could have a significant impact on future investment.

Sales and Management Skills / Truncated Companies and Skill Sets.

Due to the truncation of the cluster, several (senior) management and sales skills are in short supply. Such titles include Senior Product Managers, Sales Managers, and VPs of Product. There is also a

shortage of highly skilled people in Canada to serve as Board of Director members for Canadian technology-intensive firms.[20]

Competition from the Toronto-Waterloo Tech Corridor, and the Montréal Cluster.

Both clusters currently have much higher startup activity. R&D entities there are at the forefront of knowledge creation in a variety of fields and specifically seek to support entrepreneurship by spinning off new firms. The Southern Ontario cluster benefits from a strong technical and financial ecosystem while the Montréal cluster benefits from strong financial support from the Gouvernement du Québec.

Scaling Startups into Major Players / Brain Drain.

In Canada, few technology firms grow into large or global giants (Greenfield, 2024). This is a Canada-wide phenomena, despite the comparative strength of the Kanata North cluster.

A key factor behind this challenge is the limited availability of domestic venture capital at a scale comparable to Silicon Valley. Although Canadian venture capital investment has grown significantly in recent years, it is still small in comparison to the funding available in the U.S. As a result, many Canadian startups are forced to seek funding from American investors, who may require the companies to eventually relocate operations south of the border. This trend, often referred to as “brain drain” sees top Canadian startups acquired by larger U.S. companies, taking valuable talent and intellectual property out of Canada.

Faltering Business Dynamism and Lagging Innovation in Canada.

The macroeconomic conditions for starting new businesses, whether technology-related or not, are currently less strong compared to past periods.

First Buyer and Early Adopter Syndrome in Canada.

As Terry Matthews has said many times, when Newbridge Networks was first started it had to generate sales from BT Telecom and U.S. telcos before anyone in Canada would buy from them, including all levels of government. This syndrome still largely exists today for Canadian start-ups.

1.6.3 Opportunities

Opportunities signify potential avenues for future development and initiatives.

Cluster Renaissance.

The foregoing analyzes (and data) suggest that Kanata North could use a cluster renaissance. While all of the sustainable competitive advantages remain, it is clear that some of its core competencies (software and telecommunications, in particular) face hyper-competition from other clusters. Currently, the cluster is primarily focused on software and computer systems development; increasing **Manufacturing** activity could enhance inter-industry connections. While supply linkages are critical for cluster dynamism and evolution, more manufacturing would also facilitate better knowledge of end-users (and thus, existing and future market opportunities). It would result in less truncated companies.

[20] Based on Doyletech Corporation’s experience. This finding is supported by other sources.

While firms are still attracted to the cluster because of the strong concentration of technical skills and R&D capacities here (and across the region), in some ways it is not realizing the full competitive benefits that cluster development can offer.

What is being suggested is not a reduction in current cluster competencies but rather ensuring that manufacturing/hardware also remains a viable part of it, while also ensuring that Kanata North participates in key emerging technologies in which Canada has known competitive advantage (for example, quantum technologies, nanotechnology and nanoelectronics, silicon photonics, MEMS, advanced materials and additive manufacturing).

Kanata has a significant and long-standing competitive advantage in **Computer Systems Design and Related Services** (Canada G. o., Summary - Canadian Industry Statistics, 2025).[21] This must be preserved because it represents very-specific tacit and market knowledge involving different disciplines. It is not just writing code like what is taking place in India and Eastern Europe. From an impact perspective, the economic multipliers (for example, generation of value-add and income) that computer systems design provides is significantly higher than many other industries.

Expansion in Domestic Trade Opportunities.

The hope is that inter-provincial trade barriers will actually fall so there are more opportunities to develop stronger domestic supply relationships.

The current milieu suggests development of **Canada's Technology Cluster**, in addition to industry-specific clusters in Canadian cities.

Expansion of Cluster-to-Cluster Interaction.

Kanata North's expanding aerospace and defence cluster suggests more cluster-to-cluster supply relationships should be possible with Montréal. Likewise, linkages into the developing critical metals and materials supply chains should be investigated.

The idea of stronger ties to other clusters is gaining traction (for example, the Oxford-Cambridge Arc in the United Kingdom, where new relations are being encouraged to create stronger critical mass for both clusters), (Department for Levelling Up, 2021).

[21] As per ISED: expertise in the field of information technologies through one or more activities, such as writing, modifying, testing and supporting software to meet the needs of a particular customer, including the creation of Internet home pages; planning and designing computer systems that integrate hardware, software and communication technologies; on-site management and operation of clients' computer and data processing facilities; providing advice in the field of information technologies; and other professional and technical computer-related services.

1.6.4 Threats

Threats are potential trends that may impede Kanata North from leveraging its opportunities. These threats must be identified and addressed.

Remote and Hybrid Work / Shifting Focus on Workplace Flexibility.

Remote and hybrid work trends can reduce the benefits of industrial clustering.

New entrants to the job market are demanding more flexibility in their roles to support their well-being. Such arrangements help employees balance work with family responsibilities or even a second job.

Investment and R&D Repatriation.

While this is always an issue, it is of increasing concern at the present time (particularly back to the U.S.). Repatriation arises from external government pressure, better incentive policies elsewhere, better and lower cost of infrastructure, lower cost of labour, better R&D, and others.

Competition for Talent.

Firms that have no presence in the Kanata North cluster are recruiting remote workers specifically from the cluster.

Energy Supply and Resilience.

This threat is fully addressed later in this report.

1.7 Development of Growth Baselines

This sub-section herein develops the growth baselines on which the scenarios will be built.

The next chapter will create those scenarios by merging the previous analyses with the engagement results to predict **Future States**.

Before this can occur, this chapter develops the underlying growth baselines for Kanata North. It does so by combining the **Current State** with established forecasts of job and GDP growth.

Growth Baselines serve as the foundation, while the Growth Scenarios represent the structure built upon it. Separating the two reveals how Kanata North may develop if Future States are not realised.

Growth Baselines

Growth baselines are standardized reference points that capture the state of key performance indicators (KPIs). They serve as the basis against which future growth and development can be measured. For Kanata North, these baselines encompass:

- Economic Indicators: Employment figures, number of active companies, GDP contribution.
- Infrastructure Metrics: Availability and capacity of utility services, and digital infrastructure.
- Real Estate Data: Commercial and industrial occupancy rates, property values.
- Innovation and R&D: Levels of investment in innovation, research institutions present.

Establishing growth baselines for Kanata North is crucial for several reasons. They provide a factual foundation for setting realistic goals and priorities when considering the various growth scenarios. They also enable tracking of progress over time and an assessment of the validity of the assumptions made in developing the growth scenarios. Moreover, they demonstrate Kanata North's potential to investors and stakeholders.

1.7.1 Current State – Foundation for Growth Baselines

The Current State of Kanata North was developed in Part II (Economic Profile). Mathematically, the existing cluster **Output, Value-Add,** and **Employment** are combined with established forecasts to develop growth baselines. However, the formula is more complex, necessitating the development of various statistics and proportions. Requirements include industry-specific **Output Per Worker, GDP Per Worker,** and various proportional and structural insights on the Kanata North industries.

The Current State is presented in the first column of the tables below.

1.7.2 The Baseline Forecasts: Status Quo

Table 17, 18, and 19 present baseline forecasts for Kanata North in terms of Output, Value-Add, and Employment. They utilise Current State data and projects forward for the years 2036 and 2046, based on stringent assumptions.

These are **Baseline Forecasts** that represent a steady-state forecast for Kanata North. In the next section, **Moderate Upside Forecasts** will be developed.

The following is noted on these Baseline Forecasts (see Tables 17, 18, and 19):

- Retail-related IOIC Industry Codes were amalgamated and appear as 'Retail';[22]

[22] Consisting of eleven (11) retail-related IOIC Codes plus Breweries [BS312120] and Cannabis stores (licensed) [BS453BL0].

- Wholesale-related IOIC Industry Codes were amalgamated and appear as 'Wholesale';[23]
- Twenty-eight (28) IOIC Industry Codes were amalgamated and appear as 'Other (Not Elsewhere Classified)'. This was done for presentation and corporate confidentiality reasons. From an energy perspective, these industries are predominantly users of Class A and B office space (thus, assumed to have similar energy profiles).[24]
- As stated above, many of the economic variables, structures, and proportions that were developed in the Economic Profile were required to develop these forecasts.

The **Baseline Forecasts** were developed as follows:

City of Ottawa Planning, Infrastructure and Economic Development Department (Research and Forecasting Unit Planning, 2019) forecasts of the number of jobs[25] in Ottawa in 2036 and 2046 were utilized.[26] Those numbers are **764,398 in 2036** and **827,040 in 2046**.

The historical trend is that Kanata North represents approximately 5%[27] of total Ottawa number of jobs. This suggests (conservatively) direct jobs[28] in The Kanata North Industrial Cluster will grow from **27,858 in 2025 to 34,462 in 2036 to 37,286 in 2046** (Doyletech Corporation, 2025 Survey).

A segmentation of these jobs by IOIC Industry Classification Code was developed based on the existing industrial composition of Kanata North.[29] This was done for forecasting and impact assessment purposes.

Figure 1-8. Baseline forecasts for Kanata North in terms of Output, Value-Add, and Employment.

This baseline represents the status quo. It assumes no significant changes to the composition of Kanata North, such as the introduction of a major new manufacturing facility, or data centre, or semiconductor facility, or any industrial activity that is not already represented. These types of scenarios will be addressed in the next chapter.

In summary, the baseline takes City of Ottawa job forecasts (and other data) and allocates expected growth to each Kanata North industry. Inherently, the key assumptions are that Kanata North grows at the same rate as Ottawa overall while retaining its current industrial structure. These assumptions will be reconsidered below.

[23] The wholesale-related IOIC Codes relevant to Kanata North in 2025 are Machinery, equipment and supplies merchant wholesalers [BS417000] and Personal and household goods merchant wholesalers [BS414000].

[24] A possible exception to this is Dry cleaning and laundry services [BS812300].

[25] Includes multiple jobholders in Ottawa, as estimated by the City of Ottawa (this is consistent with Doyletech Corporation's 2025 job numbers for Kanata North which include home-based businesses).

[26] The input and assistance of Derrick Moodie - Director, Planning Services at City of Ottawa is appreciated, and Natalie Pulcine, Planner at City of Ottawa.

[27] Historically, proportions from the 2015 and 2018 and 2025 Doyletech Corporation surveys were assessed.

[28] This refers to direct (existing) jobs (it does not include indirect and induced jobs).

[29] In 2015 and 2018 and 2025, Doyletech Corporation conducted surveys on Kanata North. This involved a complete canvassing of all firms in all buildings, and the collection of employment and output data.

Table 17. Baseline Forecast for Output, Kanata North Industrial Cluster (2025-2046), (Research and Forecasting Unit Planning, 2019).

IOIC Industry	2025 Survey	2036 Forecast	2046 Forecast
Accounting, tax preparation, bookkeeping and payroll services [BS541200]	18,370,200	22,724,601	24,586,870
Aerospace product and parts manufacturing [BS336400]	458,581,242	567,281,574	613,769,990
Agencies, brokerages and other insurance related activities [BS524200]	3,648,000	4,512,708	4,882,522
Alumina and aluminum production and processing [BS331300]	5,600,000	6,927,402	7,495,099
Architectural, engineering and related services [BS541300]	64,911,557	80,297,942	86,878,315
Automotive repair and maintenance [BS811100]	1,632,080	2,018,942	2,184,393
Banking and other depository credit intermediation [BS5221A0]	35,766,442	44,244,381	47,870,184
Communications equipment manufacturing [BS334200]	167,753,735	207,517,434	224,523,375
Computer and peripheral equipment manufacturing [BS334100]	356,172,000	440,597,639	476,704,376
Computer systems design and related services [BS541500]	1,535,846,161	1,899,897,220	2,055,592,763
Converted paper product manufacturing [BS322200]	24,488,377	30,293,007	32,775,503
Cutlery, hand tools and other fabricated metal product manufacturing [BS332A00]	10,795,428	13,354,335	14,448,715
Data processing, hosting, and related services [BS518000]	10,350,000	12,803,324	13,852,550
Educational services [BS610000]	12,219,600	15,116,087	16,354,842
Electric lighting equipment manufacturing [BS335100]	6,574,000	8,132,276	8,798,711
Employment services [BS561300]	33,644,604	41,619,591	45,030,294
Financial investment services, funds and other financial vehicles [BS52A000]	95,252,327	117,830,571	127,486,722
Food services and drinking places [BS722000]	84,302,298	104,284,990	112,831,088
Industrial machinery manufacturing [BS333200]	3,892,000	4,814,545	5,209,094
Legal services [BS541100]	38,710,727	47,886,569	51,810,847
Lessors of real estate [BS531100]	85,770,000	106,100,591	114,795,476
Management, scientific and technical consulting services [BS541600]	37,023,000	45,798,789	49,551,975
Medical equipment and supplies manufacturing [BS339100]	36,928,960	45,682,458	49,426,111
Miscellaneous ambulatory health care services [BS621A00]	21,701,021	26,844,947	29,044,876
Non-depository credit intermediation [BS522200]	26,134,615	32,329,464	34,978,846
Non-residential building construction [BS23B000]	33,303,635	41,197,800	44,573,938
Offices of dentists and physicians [BS621200 & BS621100]	64,251,763	79,481,753	85,995,240
Offices of real estate agents and brokers/activities related to real estate [BS531A00]	18,728,000	23,167,213	25,065,753
Other activities of the construction industry [BS23E000]	14,225,846	17,597,886	19,040,023
Other electrical equipment and component manufacturing [BS335900]	1,650,000	2,041,110	2,208,377
Other electronic product manufacturing [BS334A00]	523,603,062	647,715,915	700,795,882
Other general-purpose machinery manufacturing [BS333900]	3,856,483	4,770,609	5,161,558
Other miscellaneous manufacturing [BS339900]	1,200,000	1,484,443	1,606,093
Other professional, scientific and technical services [BS541900]	11,082,306	13,709,214	14,832,676
Other transportation equipment manufacturing [BS336900]	51,086,466	63,195,805	68,374,667
Personal care services and other personal services [BS812A00]	27,435,245	33,938,390	36,719,622
Pharmaceutical and medicine manufacturing [BS325400]	90,860,000	112,397,104	121,607,986
Printing and related support activities [BS323000]	103,322,111	127,813,186	138,287,407
Residential building construction [BS23A000]	83,218,000	102,943,674	111,379,852
Resin, synthetic rubber, artificial/synthetic fibres/filaments manufacturing [BS325200]	800,000	989,629	1,070,728
Scientific research and development services [BS541700]	2,480,000	3,067,850	3,319,258
Semiconductor and other electronic component manufacturing [BS334400]	1,129,667,584	1,397,439,638	1,511,959,056
Software publishers [BS511200]	1,118,850,879	1,384,058,982	1,497,481,863
Telecommunications [BS517000]	1,092,286,817	1,351,198,278	1,461,928,241
Transportation engineering construction [BS23C100]	36,450,000	45,089,968	48,785,066
Warehousing and storage [BS493000]	700,000	865,925	936,887
Waste management and remediation services [BS562000]	6,429,000	7,952,905	8,604,642
Retail	132,322,270	163,687,432	177,101,528
Wholesale	50,121,932	62,002,641	67,083,724
Other (Not Elsewhere Categorized)	237,655,414	293,988,338	318,080,522
Total:	**8,011,655,186**	**9,910,707,078**	**10,722,884,128**

Table 18. Baseline Forecast for Value-Add, Kanata North Industrial Cluster (2025-2046), (Research and Forecasting Unit Planning, 2019).

IOIC Industry	2025 Survey	2036 Forecast	2046 Forecast
Accounting, tax preparation, bookkeeping and payroll services [BS541200]	12,859,140	15,907,221	17,210,809
Aerospace product and parts manufacturing [BS336400]	162,337,760	200,817,677	217,274,577
Agencies, brokerages and other insurance related activities [BS524200]	2,393,088	2,960,336	3,202,934
Alumina and aluminum production and processing [BS331300]	2,139,200	2,646,268	2,863,128
Architectural, engineering and related services [BS541300]	40,504,812	50,105,917	54,212,069
Automotive repair and maintenance [BS811100]	887,852	1,098,304	1,188,310
Banking and other depository credit intermediation [BS5221A0]	28,183,956	34,864,572	37,721,705
Communications equipment manufacturing [BS334200]	73,811,643	91,307,671	98,790,285
Computer and peripheral equipment manufacturing [BS334100]	143,537,316	177,560,849	192,111,864
Computer systems design and related services [BS541500]	909,220,927	1,124,739,154	1,216,910,916
Converted paper product manufacturing [BS322200]	8,154,629	10,087,571	10,914,242
Cutlery, hand tools and other fabricated metal product manufacturing [BS332A00]	4,469,307	5,528,695	5,981,768
Data processing, hosting, and related services [BS518000]	5,764,950	7,131,452	7,715,870
Educational services [BS610000]	6,842,976	8,465,009	9,158,712
Electric lighting equipment manufacturing [BS335100]	2,912,282	3,602,598	3,897,829
Employment services [BS561300]	20,321,341	25,138,233	27,198,297
Financial investment services, funds and other financial vehicles [BS52A000]	28,861,455	35,702,663	38,628,477
Food services and drinking places [BS722000]	34,058,128	42,131,136	45,583,760
Industrial machinery manufacturing [BS333200]	1,720,264	2,128,029	2,302,420
Legal services [BS541100]	27,600,749	34,143,124	36,941,134
Lessors of real estate [BS531100]	53,606,250	66,312,869	71,747,173
Management, scientific and technical consulting services [BS541600]	24,213,042	29,952,408	32,406,992
Medical equipment and supplies manufacturing [BS339100]	15,510,163	19,186,633	20,758,967
Miscellaneous ambulatory health care services [BS621A00]	16,297,467	20,160,556	21,812,702
Non-depository credit intermediation [BS522200]	11,107,212	13,740,022	14,866,010
Non-residential building construction [BS23B000]	14,886,725	18,415,417	19,924,550
Offices of dentists and physicians [BS621200 & BS621100]	42,693,477	52,813,374	57,141,401
Offices of real estate agents and brokers/activities related to real estate [BS531A00]	9,176,720	11,351,934	12,282,219
Other activities of the construction industry [BS23E000]	9,445,962	11,684,996	12,642,575
Other electrical equipment and component manufacturing [BS335900]	495,000	612,333	662,513
Other electronic product manufacturing [BS334A00]	258,659,913	319,971,662	346,193,166
Other general-purpose machinery manufacturing [BS333900]	1,411,473	1,746,043	1,889,130
Other miscellaneous manufacturing [BS339900]	266,400	329,546	356,553
Other professional, scientific and technical services [BS541900]	5,940,116	7,348,139	7,950,314
Other transportation equipment manufacturing [BS336900]	16,603,101	20,538,637	22,221,767
Personal care services and other personal services [BS812A00]	14,458,374	17,885,531	19,351,241
Pharmaceutical and medicine manufacturing [BS325400]	38,615,500	47,768,769	51,683,394
Printing and related support activities [BS323000]	43,395,287	53,681,538	58,080,711
Residential building construction [BS23A000]	35,367,650	43,751,062	47,336,437
Resin, synthetic rubber, artificial/synthetic fibres/filaments manufacturing [BS325200]	304,800	377,049	407,948
Scientific research and development services [BS541700]	1,701,280	2,104,545	2,277,011
Semiconductor and other electronic component manufacturing [BS334400]	472,201,050	584,129,769	631,998,885
Software publishers [BS511200]	685,855,589	848,428,156	917,956,382
Telecommunications [BS517000]	661,925,811	818,826,156	885,928,514
Transportation engineering construction [BS23C100]	14,106,150	17,449,817	18,879,821
Warehousing and storage [BS493000]	485,100	600,086	649,263
Waste management and remediation services [BS562000]	3,433,086	4,246,851	4,594,879
Retail	81,964,087	101,392,539	109,701,602
Wholesale	35,211,598	43,558,020	47,127,576
Other (Not Elsewhere Categorized)	140,686,748	174,034,593	188,296,633
Total:	**4,226,606,905**	**5,228,465,529**	**5,656,935,433**

Table 19. Baseline Forecast for Employment, Kanata North Industrial Cluster (2025-2046), (Research and Forecasting Unit Planning, 2019).

IOIC Industry	2025 Survey	2036 Forecast	2046 Forecast
Accounting, tax preparation, bookkeeping and payroll services [BS541200]	78	96	104
Aerospace product and parts manufacturing [BS336400]	1,469	1,817	1,966
Agencies, brokerages and other insurance related activities [BS524200]	18	22	24
Alumina and aluminum production and processing [BS331300]	28	35	37
Architectural, engineering and related services [BS541300]	266	329	356
Automotive repair and maintenance [BS811100]	16	20	21
Banking and other depository credit intermediation [BS5221A0]	88	109	118
Communications equipment manufacturing [BS334200]	510	631	683
Computer and peripheral equipment manufacturing [BS334100]	1,353	1,674	1,811
Computer systems design and related services [BS541500]	4,585	5,672	6,137
Converted paper product manufacturing [BS322200]	59	73	79
Cutlery, hand tools and other fabricated metal product manufacturing [BS332A00]	28	35	37
Data processing, hosting, and related services [BS518000]	30	37	40
Educational services [BS610000]	108	134	145
Electric lighting equipment manufacturing [BS335100]	28	35	37
Employment services [BS561300]	77	95	103
Financial investment services, funds and other financial vehicles [BS52A000]	241	298	323
Food services and drinking places [BS722000]	511	632	684
Industrial machinery manufacturing [BS333200]	7	9	9
Legal services [BS541100]	113	140	151
Lessors of real estate [BS531100]	85	105	114
Management, scientific and technical consulting services [BS541600]	194	240	260
Medical equipment and supplies manufacturing [BS339100]	155	192	207
Miscellaneous ambulatory health care services [BS621A00]	110	136	147
Non-depository credit intermediation [BS522200]	50	62	67
Non-residential building construction [BS23B000]	72	89	96
Offices of dentists and physicians [BS621200 & BS621100]	298	369	399
Offices of real estate agents and brokers/activities related to real estate [BS531A00]	35	43	47
Other activities of the construction industry [BS23E000]	46	57	62
Other electrical equipment and component manufacturing [BS335900]	11	14	15
Other electronic product manufacturing [BS334A00]	839	1,038	1,123
Other general-purpose machinery manufacturing [BS333900]	10	12	13
Other miscellaneous manufacturing [BS339900]	5	6	7
Other professional, scientific and technical services [BS541900]	72	89	96
Other transportation equipment manufacturing [BS336900]	207	256	277
Personal care services and other personal services [BS812A00]	303	375	406
Pharmaceutical and medicine manufacturing [BS325400]	219	271	293
Printing and related support activities [BS323000]	562	695	752
Residential building construction [BS23A000]	179	221	240
Resin, synthetic rubber, artificial/synthetic fibres/filaments manufacturing [BS325200]	4	5	5
Scientific research and development services [BS541700]	19	24	25
Semiconductor and other electronic component manufacturing [BS334400]	4,241	5,246	5,676
Software publishers [BS511200]	3,613	4,469	4,836
Telecommunications [BS517000]	5,293	6,548	7,084
Transportation engineering construction [BS23C100]	73	90	98
Warehousing and storage [BS493000]	5	6	7
Waste management and remediation services [BS562000]	49	61	66
Retail	390	482	522
Wholesale	68	84	91
Other (Not Elsewhere Categorized)	1,038	1,284	1,389
Total:	**27,858**	**34,462**	**37,286**

1.7.3 The Moderate Upside Forecasts: Increasing Share of Ottawa-Gatineau Jobs

Table 20, Appendix 6 and 7, present moderate upside forecasts for Kanata North in terms of Output, Value-Add, and Employment.

The **Moderate Upside Forecasts** were developed as follows:

Oxford Economics Forecasts (Oxford Economics, n.d.)[30] **for Ottawa-Gatineau Employment (2025-2034) & Doyletech Corporation Trend Analysis** were utilized to estimate that Kanata North jobs would grow from **27,858** identified in the 2025 Doyletech Survey to **36,300** in 2036 to **40,000** in 2046, under a scenario of moderate upside growth.

Unlike the Baseline Forecasts, these Moderate Upside Forecasts assume a higher (but moderate) level of growth over the City of Ottawa Forecasts. They also assume that Kanata North's share of total Ottawa-Gatineau jobs does not remain the same over 2025-2046. Rather, the assumption is that Kanata North's proportion of total Ottawa-Gatineau jobs will gradually rise from **3.15% in 2025 to 3.61% in 2036 to 3.99% in 2046**. These proportions were developed, in part, based on proportional job growth experienced by Kanata North over the period 2015-2025.[31]

A segmentation of these jobs by IOIC Industry Classification Code was developed based on the industrial composition of Kanata North.[32] This was done for forecasting and impact assessment purposes.

[30] Oxford Economics was founded in Oxford (UK) in 1981 as a commercial venture with Oxford University's business college. It is an independent economic advisory firm with over 350 economists and analysts across more than 20 offices worldwide.

[31] Based on actual proportional change identified by Kanata North Surveys in 2015 and 2018 and 2025.

[32] In 2015 and 2018 and 2025, Doyletech Corporation conducted surveys on Kanata North. They involved a complete canvasing of all firms in all buildings, and the collection of employment and output data by industry.

Table 20. Moderate Upside Forecast for Output, Kanata North Industrial Cluster (2025-2046)[33], (Oxford Economics, n.d.).

IOIC Industry	2025 Survey	2036 Forecast	2046 Forecast
Accounting, tax preparation, bookkeeping and payroll services [BS541200]	18,370,200	23,937,607	26,379,763
Aerospace product and parts manufacturing [BS336400]	458,581,242	597,562,216	658,526,553
Agencies, brokerages and other insurance related activities [BS524200]	3,648,000	4,753,589	5,238,559
Alumina and aluminum production and processing [BS331300]	5,600,000	7,297,177	8,041,647
Architectural, engineering and related services [BS541300]	64,911,557	84,584,126	93,213,546
Automotive repair and maintenance [BS811100]	1,632,080	2,126,710	2,343,681
Banking and other depository credit intermediation [BS5221A0]	35,766,442	46,606,080	51,360,913
Communications equipment manufacturing [BS334200]	167,753,735	218,594,405	240,895,786
Computer and peripheral equipment manufacturing [BS334100]	356,172,000	464,116,082	511,466,012
Computer systems design and related services [BS541500]	1,535,846,161	2,001,310,893	2,205,488,110
Converted paper product manufacturing [BS322200]	24,488,377	31,910,003	35,165,517
Cutlery, hand tools and other fabricated metal product manufacturing [BS332A00]	10,795,428	14,067,169	15,502,326
Data processing, hosting, and related services [BS518000]	10,350,000	13,486,746	14,862,688
Educational services [BS610000]	12,219,600	15,922,961	17,547,449
Electric lighting equipment manufacturing [BS335100]	6,574,000	8,566,364	9,440,320
Employment services [BS561300]	33,644,604	43,841,182	48,313,936
Financial investment services, funds and other financial vehicles [BS52A000]	95,252,327	124,120,191	136,783,149
Food services and drinking places [BS722000]	84,302,298	109,851,567	121,058,815
Industrial machinery manufacturing [BS333200]	3,892,000	5,071,538	5,588,945
Legal services [BS541100]	38,710,727	50,442,682	55,588,933
Lessors of real estate [BS531100]	85,770,000	111,764,081	123,166,447
Management, scientific and technical consulting services [BS541600]	37,023,000	48,243,460	53,165,342
Medical equipment and supplies manufacturing [BS339100]	36,928,960	48,120,920	53,030,300
Miscellaneous ambulatory health care services [BS621A00]	21,701,021	28,277,891	31,162,850
Non-depository credit intermediation [BS522200]	26,134,615	34,055,162	37,529,529
Non-residential building construction [BS23B000]	33,303,635	43,396,877	47,824,302
Offices of dentists and physicians [BS621200 & BS621100]	64,251,763	83,724,371	92,266,077
Offices of real estate agents and brokers/activities related to real estate [BS531A00]	18,728,000	24,403,844	26,893,567
Other activities of the construction industry [BS23E000]	14,225,846	18,537,235	20,428,436
Other electrical equipment and component manufacturing [BS335900]	1,650,000	2,150,061	2,369,414
Other electronic product manufacturing [BS334A00]	523,603,062	682,290,022	751,898,437
Other general-purpose machinery manufacturing [BS333900]	3,856,483	5,025,257	5,537,943
Other miscellaneous manufacturing [BS339900]	1,200,000	1,563,681	1,723,210
Other professional, scientific and technical services [BS541900]	11,082,306	14,440,991	15,914,286
Other transportation equipment manufacturing [BS336900]	51,086,466	66,569,103	73,360,598
Personal care services and other personal services [BS812A00]	27,435,245	35,749,970	39,397,244
Pharmaceutical and medicine manufacturing [BS325400]	90,860,000	118,396,694	130,475,730
Printing and related support activities [BS323000]	103,322,111	134,635,663	148,371,427
Residential building construction [BS23A000]	83,218,000	108,438,654	119,501,754
Resin, synthetic rubber, artificial/synthetic fibres/filaments manufacturing [BS325200]	800,000	1,042,454	1,148,807
Scientific research and development services [BS541700]	2,480,000	3,231,607	3,561,301
Semiconductor and other electronic component manufacturing [BS334400]	1,129,667,584	1,472,032,876	1,622,212,230
Software publishers [BS511200]	1,118,850,879	1,457,937,981	1,606,679,349
Telecommunications [BS517000]	1,092,286,817	1,423,323,221	1,568,533,131
Transportation engineering construction [BS23C100]	36,450,000	47,496,803	52,342,509
Warehousing and storage [BS493000]	700,000	912,147	1,005,206
Waste management and remediation services [BS562000]	6,429,000	8,377,420	9,232,099
Retail	132,322,270	172,424,822	190,015,902
Wholesale	50,121,932	65,312,250	71,975,519
Other (Not Elsewhere Categorized)	237,655,414	309,680,996	341,275,190
Total:	**8,011,655,186**	**10,439,725,803**	**11,504,804,783**

[33] Doyletech Corporation estimates, with data from *Oxford Economics, Moderate Upside Forecasts* for Ottawa-Gatineau Total Employment and GDP (2024-2036).

1.7.4 Summary

Table 23 below, provides a summary of the growth baselines.

Table 21. Growth Baselines for Kanata North (Baseline Forecast vs. Moderate Upside Forecast)[34].

Growth Baseline	2025 Doyletech Corp. Actual	2036 Forecast	2046 Forecast
1. Baseline Forecast			
Output	8,011,655,186	9,910,707,078	10,722,884,128
Value-Add	4,226,606,905	5,228,465,529	5,656,935,433
Jobs	27,858	34,462	37,286
2. Moderate Upside Forecast			
Output	8,011,655,186	10,439,725,803	11,504,804,783
Value-Add	4,226,606,905	5,507,553,201	6,069,443,356
Jobs	27,858	36,301	40,005

This section has established the growth baselines that will underpin the development of particular growth scenarios which follow below.

The numerical values in this section have been rounded to the nearest whole number for simplicity.

1.8 Growth Scenario – Unlocking the Potential of Semiconductor

1.8.1 Semiconductor Development

The stakeholder engagement reveals a substantial opportunity for enhancing semiconductor development in Kanata North.

The main challenge is the absence of large-scale, domestic semiconductor manufacturing operations which would not only enhance Canada's economic sovereignty but also serve to alleviate the truncation within Canada's semiconductor and microelectronics industries. There is potential to further develop the domestic semiconductor supply chain alongside existing activities in electronic design and verification. This could create a variety of supply opportunities in sectors like critical minerals, critical and advanced materials, and gases, as well as lead to increased manufacturing, processing, and mining activity across Canada.

Semiconductors are the world's fourth-most-traded product after crude oil, refined oil, and cars (Canada G. A., n.d.).[35] Integrated chips (ICs) encompass five technologies, all of which have a notable presence in Kanata North and the region. These are: (1) **microelectronics** makes integrated circuits (ICs) smaller, faster, and cheaper, (2) **photonics** process, store, and transmit information using electrons and photons,

[34] Estimates from Doyletech Corporation, based on data and forecasts by Oxford Economics Limited, City of Ottawa - Planning, Infrastructure and Economic Development Department, and Doyletech Corporation.

[35] Additional details can be provided by Doyletech Corporation (February 2023; by Dennis Senik, Keith Belinko, and Jeffrey Doyle).

(3) **optoelectronics** converts electronic signals to and from photons, (4) **wireless** transmits signals using radio waves, and (5) **software** is the set of instructions to tell ICs what to do.[36]

As demonstrated in Table 22, below, Kanata North firms excel at integrating these technologies, evident in the cutting-edge markets that they address.

Table 22. Kanata North Semiconductor Technology Areas and Firms.

Technology	Applications and Firms in Kanata North
Silicon Photonics	Enablence, CPFC, Jabil, RANOVUS, Inpho
Silicon Photonic Biosensors for Biomedical and Chemical Sensing	Lab-on-a-chip and point-of-care diagnostic devices, CMC Microsystems, Celestra Health, Abbott, RANOVUS
Data Interconnects for Data Centres	Silicon photonics combined with quantum dot multi-wavelength laser technology, RANOVUS, Alphawave
Electronic Product Design & Engineering Services	Fidus Systems, Syntronic, Sanmina, Aplas, TriCim, TUV SUD, Jabil Canada, NPS Labs, CPFC
Compound Semiconductors	CPFC, RANOVUS
LiDAR Systems for Autonomous Vehicles	Nxp Semiconductors, BlackBerry QNX, Area X.O.
5G/6G and RF Photonics	Infinera, Ericsson, Nokia, Ciena, Dell, Cisco, CMC Microsystems, Sanmina, Syntronic
Semiconductor Intellectual Property	MOSAID, LaBarge Weinstein
Power Electronics	Materials like Silicon Carbide (SiC) and Gallium Nitride (GaN) replacing traditional silicon for power electronic devices, Infineon

Some groups are exploring different chip fabrication plant options for the region (Sali, 2023).

1.8.2 Rationalization Based on Industry Trends

The following industry trends suggest continued advancement in semiconductor development:

- Increasingly, semiconductors are critical to Canada's national security and sovereignty, its economy and competitiveness, and its productivity and technological challenges.
- Industry executives advise the federal government to focus on areas of the supply chain where Canada has clear advantages (Hemmadi, 2025). Canadian strengths include design and IP development, EDA software and tools, semiconductor packaging and testing, and software for hardware.

[36] Ibid.

- Especially in this industry, new foreign direct investment (FDI) will continue to gravitate to existing clusters like Kanata North, Markham, and Bromont. Such clustering allows firms to share intermediate inputs, infrastructure, labour pool; and benefit from knowledge spillovers, all of which reduce the costs of production and lead to innovation.
- The sheer size of the upfront investment required to build new capacity (and design cutting-edge chips) acts as a major barrier. Going forward, new business models, and new types of partnerships are going to be needed. Kanata North has demonstrated such capabilities.[37]
- Even if North American or European manufacturing capacity is expanded, there is still the issue of dependence on foreign sourcing of the many materials, chemicals, and gases used in semiconductor (and related) electronics manufacturing. Canada does have many of the critical materials and metals. Boosting domestic semiconductor activity would help establish, or strengthen, other Canadian supply chains (**Catalytic Effect**[38]).
- Governments no longer engage in negotiations focused solely on shifting manufacturing capacity. They aim to develop and scale domestic supply chains into global solution providers and create new business opportunities around these industrial competencies. That is the outcome expected here.
- Site selectors and location consultants identify the most important fab location criteria as “synergies with the local ecosystem / footprint”, “access to talent”, “security of IP and assets”, “geopolitical considerations”, and “easy of doing business” (Varas, Varadarajan, Goodrich, & Yinug, 2020). The Ottawa region is, or can be, competitive with respect to these criteria.
- Specialization has influenced the entire value chain, presenting additional opportunities for Kanata North. Electronic design automation (EDA) software is now a multibillion dollar supporting industry as are IP cores. Facilities are supplied by precision machinery makers, manufacturers of wafer ‘blanks’ and all the specialty chemicals used in manufacturing.

1.8.3 Rationalization Based on Local Context

Ottawa’s semiconductor cluster stems from Microsystems International Ltd. (MIL); created in 1969 by Nortel’s predecessor. MIL produced one of the world’s earliest microprocessors, the MF7114, and early microcomputers based on it. “Silicon Valley North” (SVN) was Canada’s first technology cluster, benefitting from significant publicly funded research, academic, and commercialization entities. It differed from other Canadian centres: cutting edge research with proportionately more local start-ups vs. other clusters’ MNEs and their sales and support operations. Historically, SVN’s single greatest asset has been its entrepreneurs and investors: a real start-up culture just like in Silicon Valley or Boston.

A specific opportunity is to leverage NRC’s Canadian Photonic Fabrication Centre (CPFC).[39] CPFC is North America's only publicly operated "pure-play" compound semiconductor foundry, specializing in III-V materials like indium phosphide (InP), gallium arsenide (GaAs), and gallium nitride (GaN). This specialization allows for creating high-performance photonic devices like lasers, modulators, and photonic

[37] See, for example, L-Spark Corporation, Hub 350, Kanata North Business Association, Mitel Accelerator.

[38] Catalytic Effect refers to the phenomenon where initial investments or funding are leveraged to spur broader economic growth (new supply chains).

[39] CPFC covers 48,000 square feet, with 11,000 square feet of cleanroom space (class 100/1000). The Canadian government has recently committed $115 million towards a significant expansion project. This initiative will add 8,000 square feet of advanced facilities designed to improve research, innovation, and commercialization capabilities.

integrated circuits (PICs). Ottawa's companies in gallium nitride (GaN) and silicon carbide (SiC) serve the market for power chips, expected to have a compound annual growth rate (CAGR) of 5% between 2025-2030 (Mordor Intelligence, 2024).

Kanata North is home to CMC Microsystems (CMC). CMC supports research and innovation in advanced technologies like microelectronics, photonics, MEMS, IoT, AI, and quantum software and hardware. By offering advanced design, manufacturing, and testing resources, CMC reduces the cost and complexity of technology adoption, helping researchers and businesses create innovative solutions.[40] CMC oversees Canada's National Design Network®, a collaborative ecosystem that includes over 10,000 researchers and more than 1,200 companies. The network enables the exchange of platform technologies and resources, promoting innovation and expediting the transition from research to commercialization (FABrIC, 2025).

The Kanata North Semiconductor Industry was identified as strategically important for cluster development in the Economic Profile. The comparative analysis indicated that the industry:

- Is a "STAR" industry; it has both a "Growing" Competitive Effect and a High Local Concentration.
- Has the second highest Location Quotient (LQ); it is serving needs that extend well beyond the boundaries of Kanata North and is exhibiting robust "Cluster Effects".[41]
- Has the second highest "Regional Effect"; based on changes in the sector provincially, Kanata North should have lost 418 jobs between 2018 and 2025 (the Industrial Effect). Instead, it gained 770 jobs.
- Is both a "Leading Industry" and a "Core Target", from an industrial targeting perspective.
- Is the second largest industry in Kanata North by Output – $1.13B.
- Is the second largest industry in Kanata North by Jobs – 4,431.
- Is the fourth largest industry in Kanata North by Value-Add – $472M.
- Is the third largest in Kanata North by Labour Income – $336M.
- Is the largest industry in Kanata North by International Imports – $368M. This suggests import replacement and supply-chain development opportunities.
- Has a proven track record in attracting external investment and M&A activity.
- Has a proven track record in creating new Canadian startups (see Figure below). A current example is RANOVUS Inc. (semiconductor laser technology that utilizes self-assembled quantum dots to generate multiple wavelengths simultaneously).

[40] In 2024, Canada invested $120 million in CMC Microsystems to expand its national network. This funding supports FABrIC, an initiative to boost Canadian IoT products and semiconductor manufacturing, train talent, and strengthen supply chains.

[41] Empirical evidence indicates that regions with strong clusters typically show better economic results, such as job creation, faster wage growth, and higher levels of new business formation. The cluster approach has been adopted by the Government of Canada in recent years.

- Expanded semiconductor activity could have a significant **Multiplier Effect**[42] on the entire electronics manufacturing sector in Canada. Canada, including Kanata North, needs more domestic manufacturing (see Part III: Competitive Advantage Analysis).

The box below, identifies key firms (both past and present) in the semiconductor industry across Ottawa-Gatineau. This signifies sustained proficiency in semiconductor startup activity and implies that the entire region would gain advantages from enhanced cluster development.

[42] ***Multiplier Effect*** refers to the phenomenon where an initial change in spending leads to a more significant overall change in economic activity via indirect and induced effects.

Major Canadian Firms: Corsa, Ross Video, Fidus, Blackberry/QNX, MDA, Edgewater Computer Systems, Enablence, WiLan, Artaflex, CAE, BTA Design, Alphawave, RANOVUS Inc., APREL, CMC Microsystems, Pleora Technologies, RBR, Electronics4All, MOSAID, Hyperlume, Metasemi Technology, TriCim, NPS Labs.

Major Foreign Firms: Taiwan Semiconductor, Microsemi Corporation, Semtech Canada, Texas Instruments Canada, Ribbon Communications, Synopsys, Ford, Nokia Canada, Sanmina, Syntronic, Cisco, Ciena Canada, Ericsson Canada, Juniper Networks, Infinera, NXP Semiconductor, Huawei Canada, AMD, Broadcom, Renesas Electronics, Avaya, Jabil Circuit, Siemens, Skyworks, CMC Electronics, Leonardo DRS, Mitel, Honeywell, Lockheed Martin Canada, Microchip Technology, Marvell Canada, Curtiss-Wright, Accenture, Infineon.

Past Notable Start-Ups: Rianta Solutions (acquired by Marvell), Tundra Semiconductor (acquired by IDT), Mosaid (acquired by Synopsys), Semiconductor Insights (acquired by CMP Technology), Chipworks (acquired by TechInsights), Symagery Microsystems (acquired by Psion Teklogix), Calmos (acquired by Newbridge), Newbridge Microsystems, Zarlink Semiconductor, SpaceBridge Semiconductor (acquired by Advantech AMT), DragonWave (acquired by Transform-X), Tropic Networks (acquired by Alcatel-Lucent), DesignPro (acquired by Altera), Skystone Systems (acquired by Cisco), Atmos Semiconductor (acquired by MoSys), Quake Semiconductor (acquired by AMCC), Potentia Semiconductor (acquired by Power Integrations), Cadabra Design (acquired by Numerical), Philsar Semiconductor (acquired by Conexant), Atsana Semiconductor, IceFyre Semiconductor, ENQ Semiconductor, Analog Design Automation (acquired by Synopsys), Interactive Circuits (acquired by Radstone), Critical Telecom (acquired by Telco), Chrysalis (acquired by Rainbow), Control Microsystems, Intronic Semiconductor, Nu-Wave Photonics, SiGe Semiconductor (acquired by Skyworks), Solantro Semiconductor (acquired by Huada Semiconductor), Solidum Systems (acquired by IDT), Cogency Semiconductor (merged with Power Trunk), Catena (acquired by Ciena), Extreme Packet Devices (acquired by PMC-Sierra), Seaway Networks (acquired by Freescale Semiconductor), XtremeEDA (acquired by Accenture), Kaben Wireless Silicon Inc., GaN Systems (acquired by Infineon), Sidense.

Recent Investors: BDC's Deep Tech Venture Fund, ArcTern Ventures, PSP Investments, Capital Angel Network, Y Combinator, Intel Capital, Quantum Innovation Fund, Celtic House Venture Partners, Federal Economic Development Agency for Southern Ontario, OMERS, The Group Ventures, Invest Ottawa, Sustainable Development Technology Canada, SOSV, GroundBreak Ventures, Reciprocal Ventures, Real Ventures, Roadmap Capital, VentureLink Innovation Fund, MUUS Climate Partners.

Moreover, Ottawa-based Mitel's 1981 relocation of its semiconductor fabrication operations to Bromont, Québec played a significant role in the development of the Bromont microelectronics cluster. While IBM came earlier (1971), Mitel's move was a key reinforcing event.

Rationalization Based on Supply Chain Analysis

Utilizing DT EconWin, Table 23, below, identifies the inter-industry relationship that Kanata North's semiconductor industry has with other industries in the cluster. As a *purchasing* industry (depicted as the column), it is demanding most of its *intermediate inputs* from three selling or *producing* industries

(depicted as the *rows*). Furthermore, it is purchasing 85% of its total intermediate inputs from within its *own* industry.

Table 23. Kanata North Semiconductor and Other Electronic Component Manufacturing Industry – Inter-Industry Transactions Matrix[43].

	Purchaser Industry	
Selling (Producing) Industry	Semiconductor and Other Electronic Component Manufacturing ($)	% of Total Intermediate Inputs
Semiconductor and Other Electronic Component Manufacturing	290,752,141	85.4
Computer Systems Design and Related Services	19,772,252	5.8
Computer and Peripheral Equipment Manufacturing	15,135,046	4.4
Top Three Industries Inputing to Semiconductor	**325,659,440**	**95.6**
All Industries Inputing to Semiconductor (U)	**340,480,284**	**100.0**
Total Output of Semiconductor (X)	**1,129,667,584**	
Total Find Demand (F) = C + G + I + NX (=X-U)	**789,187,300**	

The demand or **Total Output (X)** of an industry is composed of two major components: the demand for **Intermediate Inputs for Production (U)**, and the demand arising from **Final Demand (F)**. **F** is simply the combined demand arising from **Consumer Consumption (C)**, **Government Expenditure (G)**, **Investment (I)**, and **Net Exports (NX)**. Hence,

Total Output of An Industry (X) = U + F = U + C + G + I + (Exports-Imports).

In Kanata North, the Total Output, **X** for Semiconductor is **$1.13B**[44], with only **30%** arising from **U** (Intermediate Inputs for Production), and **70%** from **F** (Final Demand). That is, the local industry is primarily serving final demands from outside the region. Thus, it brings significant money to Kanata North and the region. Nevertheless, it should further extend its efforts in various manufacturing and related activities, including improved supply-chain coverage.

This can be referred to as a **truncated industry**.[45] While it brings in significant revenues from outside the region (thus having significant multiplier effects), a lot is being left on the table because the supply-chain is truncated locally.

In summary, Kanata North's semiconductor industry is:

- Highly dependent on the outputs from within its own industry for its operation.

[43] Doyletech Corporation, estimates from DT EconWin Regional Science and Computer Impact Model.

[44] See Part I Economic Profile.

[45] ***Truncated*** refers to a sector or segment of the economy that is systematically incomplete or lacking in certain ways.

- This tight dependency relationship means the performance of the industry is significantly influenced by activity within its own industry. Thus, disruptions in those supply chains would critically impact Kanata North's output and viability.
- Requires enhanced domestic supply chain development to bolster Canadian economic sovereignty.
- Local semiconductor firms have strong supply-chain linkages with other semiconductor firms, revealing important clustering effects. However, these effects are highly concentrated within the semiconductor industry itself. Fewer linkages with other local sectors indicate missed development opportunities for Kanata North as a whole. Conversely, the industry is not fully benefiting from the clustering effects that Kanata North can offer. This indicates a need for catalytic development.
- These supply chain vulnerabilities might manifest in **Economic Shocks**[46], affecting both the input supply and the resultant production capacity of Kanata North.

For economic developers and policymakers, the analysis suggests targeted support would lead to broader economic benefits through the enhancement of supply chain efficiencies and reductions in vulnerability to external shocks. Additionally, it would facilitate the development of broader connections with regional (and Canadian) suppliers.

This industry could serve as a key node in the entire economic network if it were sourcing inputs from more industries thus assuming a crucial role in connecting those industries together. The result would be higher economic multipliers since leakages would be reduced for several local industries.

1.8.4 Rationalization Based on Identified Local Opportunities

The discussion so far has justified focusing on the semiconductor industry for regional growth opportunities. Now the challenge is to consider the different ways semiconductor activity can grow over the coming 25 years in Kanata North.

Stakeholders identified potential scenarios, which were grouped into the following five broad categories:[47]

- Companies currently operating in Kanata North may diversify into semiconductor research and development to enhance their product offerings and maintain a competitive edge.
- The established tech ecosystem in Kanata North could attract semiconductor startups seeking a supportive environment with access to experienced professionals, potential partnerships, and existing infrastructure.
- Partnerships with local universities and research centres can foster innovation in semiconductor technologies, leading to the development of specialized programs and joint ventures.
- Federal and provincial government initiatives aimed at boosting domestic semiconductor capabilities could provide financial incentives for companies in Kanata North to invest in semiconductor manufacturing and research.

[46] Demand Shocks are sudden changes in consumer demand caused by shifts in consumer confidence, fiscal policy, or external economic conditions, affecting production and employment. Supply Shocks disrupt supply chains or production due to natural disasters, geopolitical events, or resource availability.

[47] Engagement with Kanata North stakeholders, February-May 2025 (see Appendix 4).

- Investments in facilities such as cleanrooms, testing labs, and fabrication plants can support the growth of semiconductor activities, and enhance **Backward and Forward Supply Linkages**.[48]

The box presented below, highlights the development opportunity identified by Kanata North stakeholders as having the greatest potential impact.[49]

Growth Scenario: Unlocking the Potential of Semiconductor
Development of Compound Semiconductor Fab

The demand for compound semiconductors has been increasing due to growth in sectors such as telecommunications (including 5G), automotive (electric vehicles), and consumer electronics. Technological advancements, innovations in manufacturing processes, and the launch of new electronic devices further contribute to this demand.

Stakeholders seek to develop a **Compound Semiconductor Fab** in the greater Ottawa-Gatineau or Kanata North Area, characterized as follows:

- **Materials:**
  - GaAs (Gallium Arsenide)
  - GaN (Gallium Nitride)
  - InP (Indium Phosphide)
  - SiC (Silicon Carbide)
- **Focus Areas:**
  - GaN: RF, radar, power electronics
  - SiC: EV powertrains, solar inverters, industrial drives
  - InP: Photonics, 5G/6G, data centre interconnects
- **International Companies (Market Demand):**
  - Wolfspeed (SiC)
  - Qorvo
  - MACOM
  - II-VI (Coherent), Infineon
- **Volume:**
  - Medium-to-High Volume Throughput.

1.8.5 Output Determination for Compound Semiconductor Fab

If a compound semiconductor fabrication facility is to be incorporated into the previous growth baseline (Moderate Upside Forecast) for Kanata North, the first step is to estimate its annual sales output.

[48] Backward Linkages refer to the connections between industries that arise when one sector purchases inputs from another sector to produce its goods or services. Forward Linkages refer to relationships established when a sector's output is sold and utilized as input for another sector.

[49] Interviews, focus groups, semiconductor working group meetings, 2025.

Estimating the annual sales output from a compound semiconductor fab involves considerations of production capacity, operational efficiency, yield rates, wafer pricing, market demand, and economic factors inherent within the semiconductor industry. This analysis is summarized below.

Growth Scenario: Unlocking the Potential of Semiconductor
Operating Characteristics of Medium and Large-Size Fabs

Medium-Sized Facility

A medium-sized compound semiconductor fab typically operates with a capacity ranging from several hundred wafers per month to several thousand. A common operational standard for medium-sized fabs is approximately 20,000 to 30,000 wafers-per-month (wpm) for a 200 mm wafer processing line, or about 10,000 to 15,000 wpm for 300 mm fabs, depending on the technology and the specific processes being used. Assuming an average yield of around 70%-80%—which can vary based on the complexity of the devices being manufactured—the effective output could be approximately 14,000 to 24,000 good wafers per month or 168,000 to 288,000 good wafers annually.

The annual sales can also be influenced by the average revenue generated per wafer. For compound semiconductors, particularly in high-value applications like RF communication or optoelectronics, the price per wafer can range substantially. Estimates suggest that average pricing may fall between U$1,000 to U$3,000 per wafer, depending on the complexity and application of the chips produced. For example, if a fab yields 168,000 good wafers selling at an average price of U$2,000, the revenue could reach U$336 million annually.

In summary, a medium-sized compound semiconductor fab could potentially estimate annual sales revenue in the range of **U$336 million (CAD $464M) to U$576 million (CAD $795M)**, depending on production efficiencies and market conditions.

Large-Sized Facility

A large-sized compound semiconductor fab typically has a capacity ranging from 50,000 to over 100,000 wafers per month. For instance, a 300 mm wafer fab can achieve monthly production levels in this range. If we assume, monthly wafer production of 60,000 wafers, annual production would be 720,000 wafers/year.

Yield rates in semiconductor manufacturing, particularly for advanced fabs producing complex devices, generally stand around 80% to 90%. The yield can be influenced by the sophistication of technology and production processes involved in fabricating compound semiconductors. Assuming an average yield rate of 85%, effective annual output would be 720,000 wafers × 0.85 = 612,000 good wafers/year.

The next step is to calculate average revenue per wafer. The price per wafer can vary significantly based on the type of compound semiconductor devices being manufactured. For instance, wafers used in RF applications or advanced optoelectronics can command higher prices, often between U$1,500 and U$3,000 per wafer. For estimation purposes, we can consider an average selling price of U$2,500 per wafer. The revenue calculation is 612,000 good wafers × U$2,500/wafer = U$1,530 million or U$1.53 billion

In summary, a large-sized compound semiconductor fab could realistically estimate its annual sales output to be approximately **U$1.53 billion (CAD $2.1 billion)**, based on a production

capacity of 720,000 wafers per year, an 85% yield, and an average sale price of U$2,500 per wafer.

Accordingly, a **CAD $800 million compound semiconductor fab will be incorporated into the Moderate Upside Forecast** for Kanata North. That is, the upper-end of a medium-sized facility will be used.

1.8.6 Growth Forecasts for Semiconductor Opportunities

In this section, growth forecasts are developed by incorporating the compound semiconductor fab into the Kanata North growth baseline.

Growth Scenario: Compound Semiconductor Fab Incorporated into Moderate Upside Forecast for Kanata North

When fully operational, the average annual sales output of the fab was assumed to be **CAD $800 million**, the upper-end of a medium-sized facility. Furthermore, it was assumed that the facility would be operating at this capacity by **2036** and continue at that level to **2046.**

How to Read Multipliers and Output Figures

1. Direct vs. indirect effects

- *Direct output* captures the fab's own sales.
- *Indirect output* reflects activity supported in upstream suppliers such as utilities, chemicals, logistics, and professional/technical services.
- Combined, these form the *total output impact*.

2. Understanding multipliers

- The **output multiplier** indicates how each dollar of fab sales translates into broader regional activity.
- In this analysis, a Type-I multiplier of **1.83** means every $100M of fab sales supports about **$183M** in total regional output (~$83M indirect).

3. Output vs. GDP

- Output counts gross sales across the supply chain.
- GDP (value-added) measures wages, profits, and taxes, and is the appropriate basis for fiscal and welfare analysis.
- Output figures should therefore be converted to GDP before drawing conclusions on fiscal revenues or welfare.

4. Timing and ramp effects

- Annual steady-state figures (e.g., approximately $1.46 billion per year) assume full capacity has been achieved.
- Delays in ramp-up reduce *cumulative benefits* (the area under the curve) even if the end state is unchanged.
- For infrastructure, workforce, and housing planning, cumulative output trajectories are more critical than peak values.

Table 24 below, shows the results of incorporating these numbers into the Moderate Upside Growth Forecast developed previously in Section 1.7.3. Please note that numerical values in this section have been rounded to the nearest whole number for simplicity.

Table 24. Unlocking Semiconductor – Forecasts for Specific Growth Scenario (Using the Moderate Upside Growth Baseline).

IOIC Industry	2025 Survey	2036 Forecast	2046 Forecast
Accounting, tax preparation, bookkeeping and payroll services [BS541200]	18,370,200	24,479,234	26,921,390
Aerospace product and parts manufacturing [BS336400]	458,581,242	597,805,606	658,769,942
Agencies, brokerages and other insurance related activities [BS524200]	3,648,000	4,756,926	5,241,895
Alumina and aluminum production and processing [BS331300]	5,600,000	7,355,866	8,100,336
Architectural, engineering and related services [BS541300]	64,911,557	84,812,838	93,442,258
Automotive repair and maintenance [BS811100]	1,632,080	2,208,455	2,425,425
Banking and other depository credit intermediation [BS5221A0]	35,766,442	63,710,747	68,465,580
Communications equipment manufacturing [BS334200]	167,753,735	233,853,433	256,154,814
Computer and peripheral equipment manufacturing [BS334100]	356,172,000	519,167,001	566,516,931
Computer systems design and related services [BS541500]	1,535,846,161	2,017,989,087	2,222,166,304
Converted paper product manufacturing [BS322200]	24,488,377	39,926,263	43,181,777
Cutlery, hand tools and other fabricated metal product manufacturing [BS332A00]	10,795,428	18,829,334	20,264,491
Data processing, hosting, and related services [BS518000]	10,350,000	14,750,324	16,126,265
Educational services [BS610000]	12,219,600	15,926,212	17,550,700
Electric lighting equipment manufacturing [BS335100]	6,574,000	8,734,312	9,608,267
Employment services [BS561300]	33,644,604	43,841,182	48,313,936
Financial investment services, funds and other financial vehicles [BS52A000]	95,252,327	135,377,113	148,040,070
Food services and drinking places [BS722000]	84,302,298	111,663,435	122,870,683
Industrial machinery manufacturing [BS333200]	3,892,000	9,358,862	9,876,269
Legal services [BS541100]	38,710,727	50,442,682	55,588,933
Lessors of real estate [BS531100]	85,770,000	116,425,568	127,827,934
Management, scientific and technical consulting services [BS541600]	37,023,000	48,243,460	53,165,342
Medical equipment and supplies manufacturing [BS339100]	36,928,960	50,176,828	55,086,207
Miscellaneous ambulatory health care services [BS621A00]	21,701,021	28,277,891	31,162,850
Non-depository credit intermediation [BS522200]	26,134,615	36,610,978	40,085,345
Non-residential building construction [BS23B000]	33,303,635	43,396,877	47,824,302
Offices of dentists and physicians [BS621200 & BS621100]	64,251,763	83,724,371	92,266,077
Offices of real estate agents and brokers/activities related to real estate [BS531A00]	18,728,000	24,643,349	27,133,072
Other activities of the construction industry [BS23E000]	14,225,846	18,932,424	20,823,625
Other electrical equipment and component manufacturing [BS335900]	1,650,000	31,607,603	31,826,956
Other electronic product manufacturing [BS334A00]	523,603,062	698,964,575	768,572,989
Other general-purpose machinery manufacturing [BS333900]	3,856,483	7,271,953	7,784,638
Other miscellaneous manufacturing [BS339900]	1,200,000	5,940,698	6,100,227
Other professional, scientific and technical services [BS541900]	11,082,306	18,393,974	19,867,269
Other transportation equipment manufacturing [BS336900]	51,086,466	66,745,476	73,536,972
Personal care services and other personal services [BS812A00]	27,435,245	35,924,367	39,571,641
Pharmaceutical and medicine manufacturing [BS325400]	90,860,000	118,760,628	130,839,664
Printing and related support activities [BS323000]	103,322,111	135,855,159	149,590,923
Residential building construction [BS23A000]	83,218,000	108,438,654	119,501,754
Resin, synthetic rubber, artificial/synthetic fibres/filaments manufacturing [BS325200]	800,000	2,269,257	2,375,610
Scientific research and development services [BS541700]	2,480,000	3,231,607	3,561,301
Semiconductor and other electronic component manufacturing [BS334400]	1,129,667,584	2,605,469,155	2,755,648,508
Software publishers [BS511200]	1,118,850,879	1,459,594,644	1,608,336,012
Telecommunications [BS517000]	1,092,286,817	1,426,733,631	1,571,943,542
Transportation engineering construction [BS23C100]	36,450,000	47,496,803	52,342,509
Warehousing and storage [BS493000]	700,000	1,166,378	1,259,437
Waste management and remediation services [BS562000]	6,429,000	9,363,898	10,218,577
Retail	132,322,270	184,227,219	201,818,299
Wholesale	50,121,932	116,322,803	122,986,072
Other (Not Elsewhere Categorized)	237,655,414	364,256,210	395,850,404
Total:	**8,011,655,186**	**11,903,455,346**	**12,968,534,326**

Source: Doyletech Corporation estimates, using DT EconWin Regional Science and Economic Impact Model.

Growth Scenario Comparisons

Figure 1-9, below, presents a comparison of the growth scenarios discussed so far in this report.

In terms of the presentation of numerical data, rounding is often employed to avoid the implication of excessive precision. We have not rounded herein because of the extensive use of economic formulas, data techniques and linking within our models.

Table 25. Output forecasts for 2036 and 2046 given 2025 survey results.

Output (C$)	2025 Survey	2036 Forecast	2046 Forecast
Utilizing the Baseline Forecasts by City of Ottawa	8,012,000,000	9,911,000,000	10,723,000,000
Utilizing the Moderate Upside Forecasts by Oxford Economics	8,012,000,000	10,440,000,000	11,505,000,000
Utilizing the Moderate Upside Forecasts by Oxford Economics and the Introduction of a Compound Semiconductor Fab Starting in 2036	8,012,000,000	11,903,000,000	12,969,000,000

Numbers rounded.

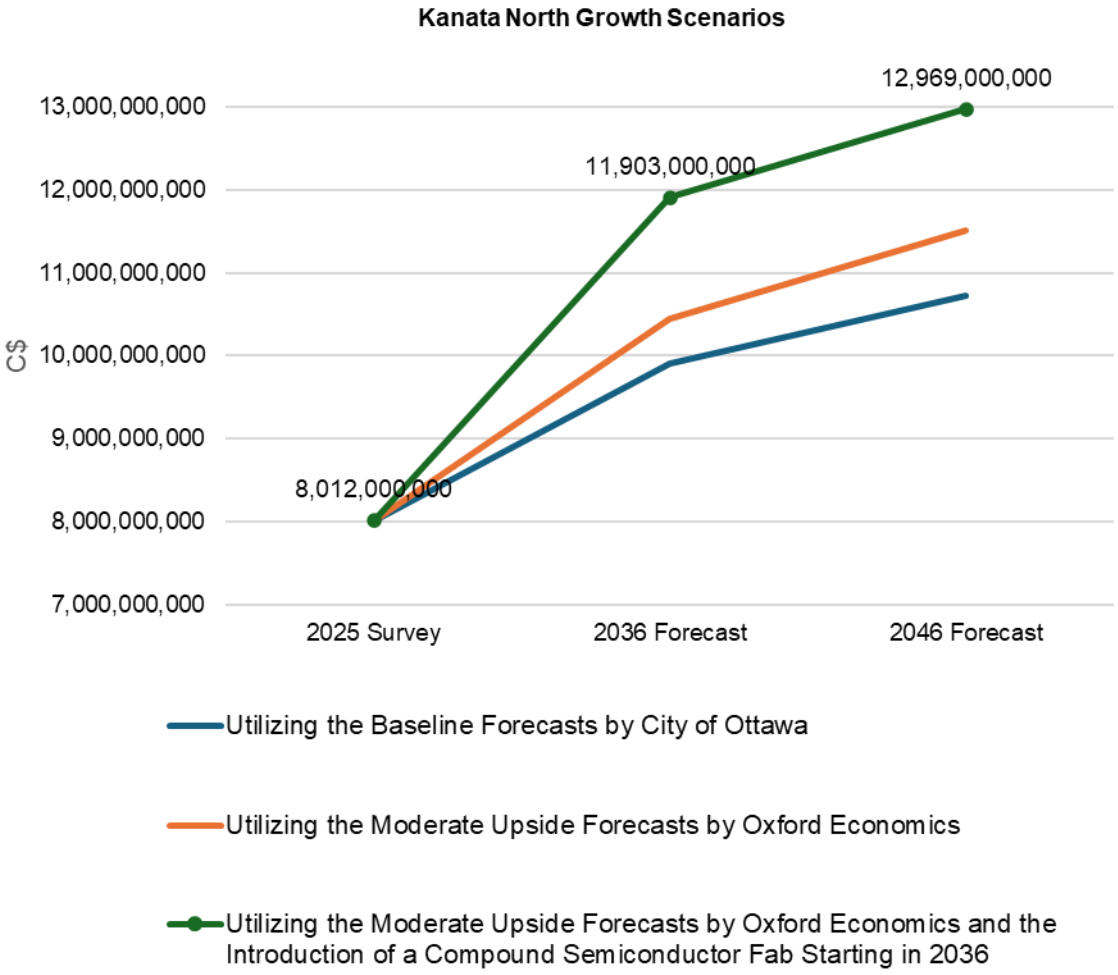

Figure 1-9. Comparison of the Growth Scenarios (To Now).

1.9 Growth Scenario – Digital Independence with Data Centres

Stakeholder engagement highlights opportunities to improve digital infrastructure, particularly in AI and data centres.

The main challenge is the absence of a local hyperscale data centre. This would boost the region's economy and competitiveness, but its primary effect would likely be raising industrial productivity, particularly for SMEs and startups.

1.9.1 Rationalization Based on Canadian Context

Regions with advanced data centre infrastructure signal:

- High connectivity.
- Power reliability.
- Skilled labour availability.
- Business and future readiness.

This attracts foreign direct investment and technology multinationals, introducing new suppliers and global best practices.

Canada benefits from energy efficiency due to its cold climate and the availability of affordable, reliable Canadian electricity, which is approximately 85% renewable and non-emitting. Nevertheless, Eastern Ontario's grid has capacity constraints. Hydro Ottawa has near-term transmission upgrade plans (e.g., new 230 kV feeders to Kanata North). Additionally, Canada holds one-fifth of the world's fresh drinking water reserves. An AI-generated 100-word email typically uses about half a litre of water, while images and videos consume significantly more.

In December 2024, the Canadian government announced the Canadian Sovereign AI Compute Strategy, a $2-billion initiative aimed at financing the expansion of commercial AI data centres (see box below).

Key Pillars of the Strategy

- **Mobilizing Private Sector Investment** - Up to $700 million via the AI Compute Challenge, aimed at funding Canadian-based AI-specific data centres, sustainable hardware, high-performance compute clusters, and integrated solutions ready for commercial deployment.
- **Building Public Supercomputing Infrastructure** - Up to $705 million committed to the AI Sovereign Compute Infrastructure Program (SCIP), which will deliver a state-of-the-art, Canadian-owned, located supercomputing system to serve researchers and industry. An additional $200 million to augment existing public infrastructure immediately, such as resources managed by NRC or the Digital Research Alliance of Canada, to meet short-term compute needs.

- **AI Compute Access Fund** - Up to $300 million for affordable access to compute power for small and medium-sized enterprises (SMEs) to develop Made-in-Canada AI products and solutions.

As well, Canada's federal government may offer up to $15 billion to incentivize major domestic pension funds to invest in AI data centres powered by green energy (Reuters, 2024). To qualify, Canadian pension funds are required to invest their own capital at a ratio of 2:1 and become significant shareholders in an AI data centre project.

Rising need for data storage, cloud computing, 5G, and AI-powered services are driving demand for data centres. Major Canadian users include governments, financial and health systems, media, artificial intelligence (AI) and machine learning (ML) companies, and universities/laboratories.

Table 26 below, provides various growth estimates for the Canadian data centre market. Forecasts are highly variable.

Table 26. Growth Forecasts for Canadian Data Centre Market.

Source	Forecast
Ivery Business Review	• Canada is among the top 10 data centre markets, with estimated annual revenue around U$8 billion (Foster, 2024).
Research and Markets	• Canadian data centre market was valued at U$5.44 billion in 2024, with expected growth to U$12.27 billion by 2030 based on a 14.5% compounded average growth rate or CAGR (Arizton, 2025).
Next MSC / IC Research	• Canada's data centre market was valued at U$10.26 billion in 2023, projected to grow to U$22.24 billion by 2030 (11.7% CAGR), (NMSC, 2025).
Scite	• Canadian data centre market (including hyperscale, colocation, and enterprise facilities) is valued at roughly C$10-12 billion (Scite, 2025).
Mordor Intelligence	• Canadian data centre market is estimated at 1.37 thousand MW in 2025 and is expected to reach 2.01 thousand MW by 2030, growing at a CAGR of 8% (Intelligence, 2025).

The forecasts vary for several reasons: different valuation dates and growth horizons, different definitions for output, and different components and methodologies used in the calculations.

They reveal a great deal of uncertainty as to how large the market is currently, and how fast it may develop.

Recent developments in the Canadian market include:

- Cohere is a generative AI startup based in Toronto, with a valuation of $5.5 billion. They recently obtained CAD $240 million in subsidies from the federal government, marking the government's initial investment through the Canadian Sovereign AI Compute Strategy (Foster, 2024).
- Equinix created a $15 billion+ joint venture with the Canada Pension Plan Investment Board for U.S. data centre development (SOURCE Equinix, Inc., 2024).
- Québec government recently limited data centre development in the province.

- Canada was recently ranked as the top country in the world to build a data centre from an energy efficiency standpoint (Howell, 2024). This can be used by Kanata North for marketing and product positioning purposes.
- Calgary-based Beacon AI Centers plans to build upward of CAD $10 billion worth of AI data centres in the coming years, mostly in Alberta (Snyder, 2025).
- There is growing interest in the Canadian market among investors. Equinix's 2024 acquisition of 13 Bell Data Centres in Canada indicates strong valuation multiples for Canadian colocation facilities (approximately CAD $60 million per site on annual revenues of CAD $5-10 million per site). Sources are indicating very strong margins for established operators (30-60% EBITDA Margin).
- In Ontario, data centres are expected to account for approximately 13% of new electricity demand and about 4% of total projected energy demand by 2035. Data centres can leverage the province's investments in renewable energy sources.
- Montréal offers the most affordable power of any major market globally at $0.0533 per kilowatt hour per month.

The Canadian context suggests continued AI data centre development:

- **Data Sovereignty & National Security** – hosting sensitive data (e.g., government, healthcare, defence) within national borders ensures it is subject to Canadian privacy laws (e.g., Personal Information Protection and Electronic Documents Act, PIPEDA[50]), not foreign laws like the U.S. Patriot Act or CLOUD Act, which could compel access to data stored on U.S.-based servers. Additionally, it mitigates the risk of foreign surveillance or interference by maintaining control over essential infrastructure within the domestic realm.
- **Digital Independence** – without domestic hyperscale capacity, Canadian organizations must rely on foreign operators (e.g., companies like AWS, Google, and Microsoft) who have core operations in the U.S. Data often routes through the U.S. subjecting it to NSA surveillance and U.S. legal jurisdiction. Building local capacity ensures resilience and independence in times of geopolitical tension, trade disruption, or cross-border legal conflicts. Shared Services Canada (SSC) and provincial IT agencies have begun requiring data residency in Canada.
- **Economic Development & Innovation –** data centres serve as foundational infrastructure for AI, cloud and edge computing, SaaS developers, cleantech, fintech[51], and biotech startups. They can anchor tech clusters and attract talent thus supporting the domestic cloud ecosystem. While not labour-intensive themselves, they generate construction, engineering, security, maintenance, software and IT jobs, support local supply chains and industrial productivity. Multinational technology companies are more inclined to expand or localize their services within Canada if hyperscale infrastructure is established domestically.
- **Performance, Latency & Reliability** – processing data nearer to Canadian users enhances speed and responsiveness, crucial for real-time applications like AI, AR/VR, gaming, and 5G.

[50] PIPEDA allows personal data transfers across borders, including to the U.S., but Canadian companies are still responsible for that information even if a third party processes it abroad.
[51] A Canadian bank cannot hold crypto keys in an American-owned company data centre.

Domestic hosting avoids reliance on congested or expensive international data routes, which could reduce costs and boost performance.

Major Canadian firms supplying to data centres include:

- CDW Canada, Insight Canada, Synnex, Wajax – IT infrastructure distributors providing servers, storage, power systems, and cooling solutions.
- Computer Room Services Corp. (CRSC) – Provides neutral power, cooling, monitoring, and construction services for Tier I–III data centres.
- Enwave Energy – Offers systems such as "Deep Lake Water Cooling" (DLWC).
- Hypertec – Montréal-based firm offering data racks, power units, and server/storage solutions for hyperscale environments.
- TCA Developments – A national contractor specializing in the design-to-construction of colocation, hyperscale, and enterprise data centres.
- Synergy Data Centres – Offers mechanical, electrical, and structural engineering solutions designed for contemporary data centre environments.
- Tier 5 Systems – Provides cooling, environmental systems, and IT hardware.

Canada has developed a growing domestic ecosystem supporting the AI data centre market—from colocation to compute to sovereign services.

1.9.2 Rationalization Based on Local Context

Considering regional industrial structure, the data centres that appear most feasible in Eastern Ontario are:

- **Colocation Data Centres** – the presence of small to medium-sized tech firms (SaaS, Fintech, AI, Cybersecurity) suggests significant opportunities for colocation centres. These centres offer flexible solutions without high initial costs. Companies can rent space, power, and cooling in a shared infrastructure. They are often carrier-neutral and provide diverse connectivity options.

  Regional examples of colocation data centres include PureColo[52] (Kanata), Equinix OT1 (Gatineau), and the University of Ottawa Research Data Centre, and DNSnetworks IDC1. PureColo supports R&D initiatives for several Kanata North technology firms including Solace, Dell, CENGN, Nokia, and Solink.

  According to Scite (Scite, 2025), an Eastern Ontario colocation facility (5-10 MW capacity) has an annual revenue range of CAD $20M – $75M. This suggests a 5 MW colocation facility in Eastern Ontario with 80% utilisation would have approximate annual revenue of CAD $30M–$50M.[53]

  Colocation centres in Canada tend to have an EBITDA Margin in the range of 35%-60%, and a Net Profit Margin in the range of 10-25%.[54] This insight is helpful for assessing economic impacts.

[52] Recently acquired by Vancouver data centre company Carrier Connect Data Solutions.

[53] Ibid.

[54] This a typical range for many industries in Canada.

- **Edge Data Centres** – regional expertise in IoT, sensor networks, edge computing, autonomous systems, robotics, and Industry 4.0 necessitates edge data centres. Rural or distributed innovation hubs in Eastern Ontario are ideal for low-latency applications like AR/VR, telehealth, electronic health records, or smart agriculture.

  There are edge data centres in Toronto (e.g., Edge Connex – Toronto EDC, Whipcord Edge, STACK Infrastructure) but none were identified in Eastern Ontario (cloud, 2025).[55]

  A challenge associated with edge data centres is their generally small size, which consequently limits their economic impact. However, Canadian research indicates that investing in infrastructure development within underserved areas presents significant opportunities, as it can effectively reduce latency for users in rural and remote locations. Smaller, distributed edge facilities can be developed to support existing centralized data centres and address this gap.

  In Canada, a small or edge data centre typically earns CAD $1M to $10M annually.[56] They tend to have an EBITDA Margin in the range of 20%-40%, and a Net Profit Margin in the range of 5-15%.[57]

- **High-Performance Computing (HPC) Data Centres** – given the advanced research entities (universities, national labs), growing semiconductor cluster, genomics, climate modeling, and AI/ML firms there is growing regional demand for HPC. These centres are suitable for workloads that require parallel processing and high compute density, provide dense servers with liquid or advanced cooling, and are frequently associated with government or academic institutions.

  Regional examples of HPCs include the High-Performance Computing Virtual Laboratory (HPCVL) at Queen's University (Kingston) and the Canadian Nuclear Laboratories (CNL) in Chalk River.

  According to Scite (Scite, 2025), an Eastern Ontario HPC facility (1-5 MW capacity) has an annual revenue range of CAD $10M – $50M.

  HPC centres in Canada tend to have an EBITDA Margin in the range of 30%-55%, and a Net Profit Margin in the range of 10-25%.[58]

The **Hyperscale Data Centre** should be added to the list above. Typically, these are the largest data centres and are appropriate if a cluster includes large cloud service providers like AWS, Google, Microsoft, or there is significant AI/ML R&D taking place, Content Delivery Networks (CDNs) or there are Social Media Platforms, Big Data or SaaS Unicorns[59] present. These are large-scale, automated, custom-built for performance and energy efficiency, and typically located near major fibre routes and power sources. Hyperscales densify the tech ecosystem, which in turn broadens and deepens supply chains.

Hyperscale data centre development in North America is highly competitive. Although most centres are in the U.S., Canadian jurisdictions aim to create or attract them. Canada has abundant low-cost, clean hydroelectric energy, especially in Québec, British Columbia, and Manitoba—making it an ideal location

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[55] Nesda Cloud maintains a colocated, cloud-enabled edge data centre in Belleville (data stays in Canada).

[56] Based on multiple sources.

[57] This information is valuable for evaluating economic impacts.

[58] This information is valuable for evaluating economic impacts.

[59] A "unicorn company" is a privately held startup valued at over $1 billion. The term, coined by venture capitalist Aileen Lee, reflects the rarity and high growth potential of such companies.

for sustainable hyperscale data centres. Of course, lower ambient temperatures decrease cooling requirements. Reducing cooling needs lowers water use and GHG emissions in data centres.

Alberta has formulated a strategy to attract investment in data centres by establishing favourable conditions for investors and promoting long-term partnerships. They are directly competing with Virginia and Texas, the leaders in AI-driven data centres in North America (McLean, 2025).

Hyperscale centres in Canada tend to have an EBITDA Margin in the range of 50%-70%, and a Net Profit Margin in the range of 20-35%. These are very strong margins, especially for Canada.
So, why would the Ottawa region be appropriate, given the hyper-competition and the fact there is no Google or Microsoft cloud operation locally? A regional Hyperscale Data Centre is (potentially) appropriate because:

- Currently, there is no hyperscale centre in Ottawa-Gatineau or Eastern Ontario.
- Companies believe a local hyperscaler is needed. Shorter physical distance means lower round-trip time (RTT) for data packets. A local data centre reduces the 300-500 ms round-trip time (RTT) that is commonly experienced when transmitting data to and from distant regions, such as between Canada and the U.S. West Coast or Europe. Thus:
    - Improves latency for real-time AI/AR/ML applications (see Table 27, below). AI/ML applications — especially real-time inference (e.g., chatbots, fraud detection, autonomous vehicles) — benefit from millisecond-level latency reductions.
    - Provides local access to high-performance accelerators (GPUs, TPUs) reduces queue times and compute latency for AI/ML training.
    - Reduces networks costs and congestion. Traffic routed through fewer backbone hops or international exchanges improves consistency and quality of service.
    - Enables faster uploads from local data sources (e.g., IoT sensors, smart city infrastructure, hospitals).
- A major firm based in the region has recently examined the potential for developing a hyperscaler in the region.[60]
- Such infrastructure would serve as competitive advantage for the many SaaS startups that continue to be created in the region.[61]
- Some Canadian firms are hosting medical records of Canadians on foreign servers.[62]
- Domestic based hyperscalers would be supportive of the Government of Canada's coworking locations and evolving hybrid work models. Moreover, the government has extensive data records that must be stored domestically (e.g., medical, environmental, defense, industrial, passports, immigration, criminal and court records, procurements, tax returns).
- There has been discussion about a Data Centre Infrastructure Bank, modelled after the Canada Infrastructure Bank, to co-invest in site preparation, transmission upgrades, water and cooling systems, and edge network interconnects.

[60] Firm name withheld for corporate confidentiality purposes.
[61] Based on previous research.
[62] Ibid.

- Discussions have included mandating Canadian-hosted cloud services in public sector RFPs and procurements.
- Canadian pension funds and sovereign investors, such as the Canada Pension Plan (CPP) and the Caisse de dépôt et placement du Québec (CDPQ), have shown interest in investing in long-term digital infrastructure. Capital is also coming from real estate investment trusts (REITs), (McLean, 2025).
- The recent moratorium on data centre construction by the Québec Government creates immediate opportunities for Eastern Ontario. Québec Bill 12-2025 limits new projects to 10 MW until 2027's environmental review, while Ontario regulations are more lenient.

Table 27. How Local Hyperscaler Improves Latency for AI/ML.

Use Case	Latency Advantage from Local Hyperscaler
Autonomous Vehicle Routing	Updates in <10 ms instead of 100+ ms over WAN.
Financial Fraud Detection	Immediate scoring occurs near the time of transaction.
Smart Manufacturing (Industry 4.0)	Real-time closed-loop feedback for robots or sensors.
Health Diagnostics	Quicker inference for imaging or wearable health monitors.
Personalized Search & Ads	Local inference speeds up real-time personalization.
Real-Time Public Sector Applications	Emergency response, traffic management, health diagnostics.

There are some **Enterprise Data Centres**[63] in the region including the Government of Canada Enterprise Data Centre (Gatineau)[64] (not commercial), Equinix OT1 (Gatineau)[65], and Rogers Business Services (Kanata).[66]

According to Scite (Scite, 2025), an Eastern Ontario enterprise data facility (2 – 5 MW capacity) has an annual revenue range of CAD $5M – $25M.

Enterprise centres in Canada tend to have an EBITDA Margin in the range of 10%-25%, and a Net Profit Margin in the range of 0% (built for internal use such as a hospital or university and often not focused on profit).[67]

The region already has several firms and entities active in AL and data centres (or can serve this market, or could act as early adopters):

- **Ranovus** (next-gen optical transceivers for high-speed, energy-efficient data transmission in AI-focused data centres).
- **Calian** (potential user).
- **Purecolo** (data centre).
- **Rogers** (data centre).

[63] Often built for internal corporate use with, perhaps, some external service capacity.
[64] LEED® Silver certified; integral to the government's strategy to consolidate legacy data centres into modern, secure, and efficient facilities.
[65] Carrier-neutral connectivity with access to major telecom providers with ecosystems for enterprise, financial, and government sectors.
[66] Located at 436 Hazeldean Road in Kanata.
[67] This information is valuable for evaluating economic impacts.

- **Bell** (data centre).
- **Hiboo Networks** (fibre ring).
- **Telesat** (hybrid interconnects using satellite).
- **Kinaxis** (data-intensive SaaS solutions hosted in enterprise and cloud data centres; contributes to AI/data centre SaaS demand).
- **BlueWave-ai** (builds AI/edge/cloud platform for optimizing renewable-energy systems).
- **Jp2g Consultants** (site planning, HVAC, and electrical engineering for data centre builds and expansions).
- **AI Spectral** (potential user; multi-spectral imaging for ophthalmology).
- **Ross Video** (switchers, video servers, real-time graphics, routing + signal-processing systems, and automated content workflows).
- **Bluink** (software and identity management company that uses data centres to host their services).
- **Infineon** (Gallium Nitride power semiconductors that enables more energy-efficient power supplies for data centres; PSUs, server power, cooling systems).
- **Wind River** (software solutions that support edge and intelligent data centre infrastructure).
- **Solace** (real-time data streaming middleware).
- **SOLINK** (user; cloud-based video solution; Video Surveillance-as-a-Service).
- **Nokia** (supplier to the data centre market, particularly in the areas of network infrastructure, optical transport, IP routing, and edge/cloud-native data centres).
- **Field Effect Software** (threat detection and mitigation tools for data centre management firms and cloud service providers).
- **Ciena** (DWDM and routing solutions that power cloud-scale data centre interconnects, DCI).
- **BlackBerry QNX** (potential user).
- **Crypto4A** (quantum safe hardware needed by hyperscalers).
- **Hammond Power Solutions** (uninterruptible power systems (UPS), power distribution, and backup power solutions for data centres).
- **Fortinet Ottawa** (network security used in data centre environments for firewalls, SD-WAN, and segmentation).
- **MindBridge** (AI-powered analytics platform hosted via cloud and colocation data centres).
- **Ainsworth Ottawa** (HVAC, power, and cabling systems for data centres).
- **Celestra Health Systems** (platform uses cloud-hosted or colocation infrastructure to process sensor data and run AI algorithms).
- **Edge Signal** (AI-powered edge computing platform).

This analysis indicates how regional data centre infrastructure could impact many different industries, and the entire supply-chain. Entities include:

- CANARIE, CMC, CENGN, Carleton University, University of Ottawa / Smart Connected Vehicles Innovation Centre, Algonquin College, La Cité, Queen's University, NRC, Digital Research Alliance of Canada (DRAC), Government of Canada, DND, Government of Ontario, Invest Ottawa, City of Ottawa, National Capital Commission, Hydro Ottawa, L-Spark, ORION, Ottawa Hospital, and CHEO.

The list of firms above demonstrates that the region has significant technical talent in areas like modular data centre design, AI-enhanced cooling systems, data centre interconnects, cybersecurity, power systems, environmental consulting, and quantum-secure cloud services.

In addition, Carleton University and the University of Ottawa produce thousands of STEM graduates annually, many of whom are prepared for roles in data centre design, operations, and innovation—particularly in AI-heavy and secure infrastructure environments. Table 28, below, provides examples of existing post-secondary infrastructure for continued data centre development in the region.

Table 28. Examples of Regional Post-Secondary Infrastructure Support.

Institution	Unit / Department	Description
Carleton University	Institute for Data Science (CUIDS)	170 researchers from five faculties and 26 university departments are part of the Institute.
	School of Computer Science	BCS, MSc, and PhD in Computer Science. Specializations in AI, networks, and high-performance computing.
	Department of Systems and Computer Engineering	Focus on network systems, embedded systems, and distributed computing.
	Master of Infrastructure Protection and International Security (MIPIS)	Includes training relevant to securing data centres.
	Centre for Advanced Simulation and Visualization (V-Sim)	Relevant for managing high-performance computing used in AI/data centre operations.
University of Ottawa	Faculty of Engineering	Computer Engineering (BASc, MASc., PhD). Electrical Engineering. Software Engineering. AI Engineering Option.
	School of Electrical Engineering and Computer Science (EECS)	Offers interdisciplinary training in computing systems, including data centre architecture and networking.
	Faculty of Science	BSc and MSc in Computer Science. Specialization in Data Science and AI.
	Institute for Data Science (uO DS)	Offers research and graduate-level training in large-scale data processing, ML, and distributed computing.
Algonquin College	School of Advanced Technology	Computing, Cybersecurity, and Computer Engineering Technology.

Institution	Unit / Department	Description
		Artificial Intelligence Software Development (Co-op and Non-Co-op Version). Cloud Development and Operations (Co-op and Non-Co-op Version).

Current data centre initiatives identified regionally include:

- Corporate proponent in Kanata (name withheld).
- Avaio Digital Partners, with Adam Real Estate and Sunbird Energy, is planning a 52-acre, 50 MW hyperscale campus in Gatineau, featuring solar and storage integration (Swinhoe, 2024).
- Bell Canada designed and built an 82,000 ft² Tier III, LEED Gold data centre in Gatineau with passive cooling and rainwater reuse technologies (Urbacon, 2025).
- Shared Services Canada is refurbishing a data centre in Ottawa near the Macdonald-Cartier Airport to function as a development and testing hub, with plans for multi-year modernization funding exceeding CAD $80 million (Unknown, Shared Services Canada plans data centre expansion in Ottawa, 2015).

Two of these local examples demonstrate the growing involvement of renewables in data centre development. Global exemplars are briefly discussed in Table 29, below.

Table 29. Renewables in Data Centre Development: Global Examples.

Development	Description
Microsoft Data Centre Gävle, Sweden	A hyperscale data centre powered by 100% renewable energy, mostly wind and hydro from Sweden's grid. It employs rainwater cooling, heat recovery for district heating, AI-driven energy and server optimization.
Microsoft Data Centre, Ireland	This data centre is powered by the Lenalea Wind Farm.
Lefdal Mine Data Centre, Norway	This colocation data centre is built in a former mine. It is powered by hydropower and cooled by fjord water. It has near-zero-emission operation and extremely low power usage effectiveness (PUE) of under 1.1. It markets itself as one of the greenest data centres in the world.
Google Hamina Data Centre, Finland	This data centre uses seawater from the Gulf of Finland for efficient, eco-friendly cooling. It uses no chillers or compressors—relies on natural water temperature. It is built on the site of a former paper mill, repurposing industrial infrastructure.
Apple Viborg Data Centre, Denmark	This data centre is 100% powered by wind and solar energy via local and on-site sources. Apple built two 280 MW wind and solar projects to directly feed this centre.
Google Hyperscale The Dalles, Oregon	A hyperscaler supported by hydroelectric power from the Columbia River that participates in 24/7 carbon-free energy (CFE) tracking.
Keppel Data Centres' Floating Data Centre (FDC) Project, Singapore	Situated at near-shore locations, the FDC aims to harness seawater for cooling, thereby avoids the use of potable or industrial water, which are used for cooling in conventional data centres.

Development	Description
QScale, Lévis, Québec	This AI data centre runs solely on Québec's hydroelectricity and recycles its heat to power greenhouses. The aim is to achieve carbon neutrality and contribute to local food security.
Interxion Amsterdam, Holland	This colocation facility obtains all its energy through wind power contracts and incorporates green roof systems as well as energy reuse practices.

Also, in terms of local context, Hydro Ottawa is expanding its system to meet increasing electricity demand in Kanata North. The upgrades comprise approximately 2 km of underground duct infrastructure along Herzberg, Terry Fox, and March Roads. These improvements are designed to increase supply capacity, bolster system redundancy, and enhance reliability for end users. A new substation is planned for construction near Morgan's Grant and the Kanata North Business Park, with completion anticipated by 2028. These initiatives support Kanata North's transition to a Green Energy Resilience District.

1.9.3 Rationalization Based on Supply Chain Development

The box below shows potential supply chain opportunities for Kanata North and the region. It details specific supply chains developed or expanded due to data centre growth.

Growth Scenario: Digital Independence with Data Centres
Regional Supply Chain Opportunities

Construction & Civil Engineering Supply Chain
Data centres require large-scale, secure, climate-controlled buildings.

- Site prep & grading: Earthworks, road access
- Construction materials: Steel, concrete, fireproof insulation
- HVAC & plumbing: Chillers, pipes, pumps
- Electrical contractors: Power transformers, switchgear, cabling
- Security systems: Cameras, fencing, access controls, Modular builds: Prefab data centre modules

Energy Infrastructure Supply Chain
Hyperscale data centres require 10–100+ MW of power and robust backup.

- Utility-scale connections: High-voltage substations, transformers
- Power equipment: Generators (diesel/gas), uninterruptible power supplies (UPS), batteries
- Green power systems: Solar panels, fuel cells, microgrids
- Cooling technology: Liquid cooling, immersion cooling, heat exchangers

Information & Communications Technology (ICT) Supply Chain
Data centres are core infrastructure for the digital economy.

- Servers & storage: Racks, SSDs, GPUs, blades
- Networking: Routers, switches, fibre optic cabling
- Software: Data management, load balancing, monitoring, cybersecurity
- Maintenance services: Server upkeep, software patching, performance tuning

Cooling & Environmental Management Supply Chain
Temperature control is essential for uptime and energy efficiency.

- Cooling systems: Chillers, CRAH units, heat pumps
- Environmental monitoring: Sensors, AI-driven cooling optimization
- Water reuse systems: For evaporative cooling

Security & Compliance Supply Chain
Data centres must protect against physical and cyber threats.

- Physical security: Biometric access, perimeter security, guards
- Compliance consultants: SOC 2, ISO 27001, CCPA/GDPR
- Cybersecurity solutions: Firewalls, SIEM, identity management

Human Capital & Facility Management Supply Chain
Data centres need 24/7 operations, with specialized skillsets.

- Facility operators: Certified data centre technicians
- Remote hands: Hardware install, cable tracing, troubleshooting
- Custodial & logistics: Cleaning, delivery coordination

Support Services Supply Chain
Ongoing operation creates permanent demand for local services.

- Legal/accounting: Land leasing, contracts, tax management
- Insurance & risk services
- Waste management: E-waste, water treatment

1.9.4 Identified Data Centre Growth Opportunities and Output Determination

Earlier sections of this chapter have outlined the macroeconomic and microeconomic context and reasons for data centre development. We now present the specific Kanata North growth scenario that involves data centres. The project team decided on these specific developments on major energy users / businesses, residents, investors, public sector officials, Ottawa Hydro, and the Kanata North Business Association based on multiple and varying input from stakeholders, interviewees, research conducted as well.[68]

For illustrative purposes, the team assessed the following hypothetical developments to the Moderate Upside Forecast for Kanata North to reflect the different perspectives gathered during stakeholder consultations:

1. One (1) large-scale **Hyperscaler AI Data Centre** facility.
2. One (1) large-scale **Colocation AI Data Centre** facility.
3. Three (3) **Non-AI Enterprise Data Centre** facilities.

The rationale for investigating these hypothetical developments is outlined below:

1. The inclusion of the hyperscaler is meant to illuminate the upper end of energy use as well as economic impacts.
2. The inclusion of the colocation is meant to illuminate a likely case of AI development between now and 2036.
3. The inclusion of the non-AI enterprise data centres is meant to illuminate that demand for non-AI data centres is likely to continue, even as AI data centres eventually take over. Although enterprise data centres don't match hyperscalers in economic impact, they still consume considerable energy.

Note, these do not represent confirmed development projects and lack the minimum definition required for electrical load modelling (i.e. MW capacity, commissioning year, connection point, PUE, or operational profile). For that reason:

- They were acknowledged for economic scenario storytelling purposes only.
- They were not modelled in the energy analysis.
- They were not included as discrete MW additions in any scenario, including Figure 2-21 in the Energy Study section.

This approach reflects standard utility demand planning practice, which does not permit modelling of speculative loads.

Output Determination for Hyperscaler AI Data Centre

The box below, describes the hyperscaler opportunity identified by stakeholders.

[68] Engagement with Kanata North stakeholders (Summer 2025) including Virtual Focus Group held June 26, 2025 (see Appendix 4).

Growth Scenario: Digital Independence with Data Centres
Development of Green (Sustainable) Hyperscale Eastern Ontario Data Centre

With national clean technology and net-zero goals, stakeholders believe there is an opportunity to develop a new type of **hyperscaler** based on sustainable principles and technologies. This would help attract climate-conscious firms and organizations.

The following possibilities were identified:

- **Canadian owned hyperscaler data centre and cloud environment with everything hosted in Canada, complying with Canadian security regulations.** Hyperscale defined as being more than 5,000 dedicated servers; with tenancy defined as multi-tenant (public cloud) (i.e., not single tenant).
- **Must be a national solution.**
- **Must have high-performance AI compute capability.**
- **Must have full control over data routing and residency.**
- **Health records were identified as a significant opportunity (early-adopter group).** Bringing together health data across federal/provincial/territorial jurisdictions could result in stronger AI algorithms for the Canadian health care system. Stakeholders believe that AI can:
    - reduce the time spent on administrative tasks,
    - provide a more accurate view of a patient's medical history,
    - enable more one-on-one patient care,
    - enable proactive healthcare with earlier diagnosis.
- Many hyperscalers need dedicated power stations to meet their energy demands.
- Important first customers in the region could include City of Ottawa, Government of Canada, Hydro Ottawa, Hiboo Networks, Ottawa Hospital, CHEO, CENGN, Calian, Nokia, Ciena, Prospective Semiconductor Proponents, Telesat, CMC, NRC Quantum Canada.
- Must utilize renewable energy sources and heat reuse systems.
- Must incorporate energy-efficient design, water conservation, and carbon accounting.
- Must position facility as a "Green Cloud Services Hub for North America", and position Kanata North as the "Green Community Energy Resilient District".
- Scale up Canadian firms like OVHcloud Canada, ThinkOn, or CENGN, or create a new Crown-backed hyperscale operator for sovereign workloads (like Germany's GAIA-X Model).
- Examine prefab data centre modules to reduce costs. For example, according to the Uptime Institute Estimated Cost Per MW (USD) of $8–12 million for modular compared to $12–18 million for greenfield. Additionally, modular offers faster deployment and lower soft costs while greenfield typically means more land and permitting costs and longer timelines.
- Overcome the fact that companies do not want to store intellectual property in the cloud.
- Offer 'Supercomputer as a Service'.

Source: Engagement with Kanata North stakeholders (Summer 2025) including Virtual Focus Group held June 26, 2025 (see Appendix 4).

The box below identifies the output determination for the hyperscaler. For a large hyperscale data centre (e.g., 20–50+ MW), annual output (revenue) is (approximately) in the CAD $200 – 500 million range, depending on utilization and services offered.

Accordingly, a **CAD $300 million hyperscaler will be incorporated into the Moderate Upside Forecast** for Kanata North.

Growth Scenario: Digital Independence with Data Centres
Development of Green (Sustainable) Hyperscale National AI Data Centre

Research on Canadian data centres suggests:

- A hyperscaler in Canada can have an annual revenue range of $200M – $1B+ (CAD).
- Based on Uptime Institute and Synergy Research estimates, a 30–50 MW facility in Eastern Ontario could generate CAD $150–400 million/year in operating revenue.
- QScale's first phase (Lévis, QC HPC facility) is estimated to cost over CAD $200M to build, with future revenue expected in the hundreds of millions annually, once fully operational.
- Revenue per MW of IT load: CAD $10M–$25M/year.[1] So, a 40 MW hyperscale facility might generate CAD $400M–$1B/year in revenue depending on customer mix, utilization, and services.
- **Target Model for Eastern Ontario:**
    - CAD $100–200 million/year.
    - **CAD $250–500 million/year.**
    - CAD $500M–1B+/year (very rare in Canada).

Research on United States data centres suggests:

- A single high-capacity Amazon AWS site could generate annual output (sales) of U$500M–$1B/year. Microsoft Azure & Google Cloud sites appear to have similar scale per facility.

Output Determination for Colocation AI Data Centres

Stakeholder engagement also identified the possibility of establishing a colocation data centre.

The box below presents the output determination specifically for a colocation facility. This colocation facility will be included in the growth scenario, alongside the hyperscaler discussed above.

Growth Scenario: Digital Independence with Data Centres
Development of Green (Sustainable) Colocation National AI Data Centre

- A colocation data centre in Canada can have an annual revenue range of CAD $20M – $100M+.
- Canadian-firm OVH opened a 2 MW Cambridge/Toronto colocation site in 2024 with a CAD $145M investment. This facility might generate CAD $30-50M per year.
- Cologix mid-sized (5-10 MW) colocation facilities are estimated to generate roughly CAD $20-75M in annual revenue each.
- Equinix (approximately 1 MW) colocation sites are estimated to generate roughly CAD $5-10M in annual revenue each.
- **Target Model for Eastern Ontario:**
  - Low-End Colocation (2 MW): CAD $10–25 M/year.
  - **Mid-Sized Colocation (5 MW): CAD $20–50 M/year.**
  - Full-Scale Facility (10 MW): CAD $40–100 M/year.

Accordingly, a **CAD $50 million colocation will be incorporated into the Moderate Upside Forecast** for Kanata North.

Output Determination for Non-AI Enterprise Data Centres

Stakeholders anticipate ongoing use of non-AI enterprise data centres.

The box below, presents the output determination specifically for three (3) Non-AI Enterprise Data Centres. These facilities would be included in the data centres growth scenario, alongside the hyperscaler and the colocation facilities discussed above.

While AI-optimized enterprise data centres are focused on AI workloads such as Large Language Model (LLMs)[69], Machine Learning (ML)[70], training/inference, a Non-AI Enterprise Data Centre is focused on workloads such as:

- Enterprise Resource Planning (ERP) systems (e.g., SAP, Oracle).
- Customer Relationship Management (CRM) platforms.
- Email and collaboration tools.
- Secure data storage and backup and compliance.
- Disaster recovery and continuity.
- Databases and transaction systems.

[69] A type of AI program that can understand, generate, and translate human language.
[70] A field of artificial intelligence that focuses on enabling systems to learn from data and improve their performance on specific tasks without explicit programming.

- Web hosting and internal applications.

Growth Scenario: Digital Independence with Data Centres
Development of Three (3) Non-AI Enterprise Data Centres

The following scenario was indicated:

- **More than one Non-AI Enterprise Data Centre should be incorporated into the growth scenario. Hence, three (3) different facilities were added to growth forecasts, each having the same operating characteristics:**
    - Typically, Tier II or Tier III.
    - Moderate Computer Intensity (i.e., not very high (GPU-intensive).
    - Power Density 5–10 kW/rack (approximately).
    - Cooling Needs Standard HVAC; raised floor (i.e., not liquid or advanced air cooling).
    - Run on legacy or hybrid IT infrastructure (on-prem + cloud).
    - User typically internal business units (i.e., not AI teams, cloud services).
    - Owners typically hospitals, universities, large retailers, banks and other financial, governments, manufacturers, utilities, telcos.
- **Output Determination for a Privately Operated, Internal-Use (Non-AI) Enterprise Data Centre is difficult.**
    - Revenue is not reported directly because they are cost centres, not profit centres.
    - However, the imputed value of services (based on avoided cloud costs or internal billing) can be **$5M to $30M** CAD/year.
    - Non-AI data centres generate lower revenue per square foot or per MW than AI/hyperscale data centres.
    - Hence, C$30M x 3 data centres = **C$90M per year in incremental output**, starting in 2036, was added to this growth scenario (that is, in addition to the AI Hyperscaler and the AI Colocation Data Centre Scenarios, already described).
- Roughly speaking, $30M in direct output leads to total Canadian economic impact of C$67M (direct + indirect + induced) for each of the three data centres.

Accordingly, **CAD $90 million in Non-AI Enterprise Data Centre Output will be incorporated into the Moderate Upside Forecast** for Kanata North.

1.9.5 Growth Forecasts for Data Centre Opportunities

In this section, growth forecasts are developed for data centre opportunities.

Growth Scenario: One Hyperscaler Data Centre, One Colocation Data Centre, and Three Non-AI Enterprise Data Centres Incorporated into Moderate Upside Forecast for Kanata North

Table 30, below, shows the results of incorporating the data centres growth scenario into the Moderate Upside Forecast for Kanata North. As developed previously, this scenario represents a direct economic shock of **CAD$ 440 million** per year, beginning in 2036 (assumed) and continuing to 2046 (assumed).

Table 30. Digital Independence with Data Centres – Forecasts for Specific Growth Scenario (Using the Moderate Upside Growth Baseline).

IOIC Industry	2025 Survey	2036 Forecast	2046 Forecast
Accounting, tax preparation, bookkeeping and payroll services [BS541200]	18,370,200	28,198,806	30,640,962
Aerospace product and parts manufacturing [BS336400]	458,581,242	597,720,676	658,685,013
Agencies, brokerages and other insurance related activities [BS524200]	3,648,000	4,765,812	5,250,782
Alumina and aluminum production and processing [BS331300]	5,600,000	7,304,130	8,048,601
Architectural, engineering and related services [BS541300]	64,911,557	85,308,526	93,937,946
Automotive repair and maintenance [BS811100]	1,632,080	13,264,186	13,481,157
Banking and other depository credit intermediation [BS5221A0]	35,766,442	52,518,303	57,273,136
Communications equipment manufacturing [BS334200]	167,753,735	219,116,240	241,417,621
Computer and peripheral equipment manufacturing [BS334100]	356,172,000	471,970,517	519,320,447
Computer systems design and related services [BS541500]	1,535,846,161	2,039,089,851	2,243,267,068
Converted paper product manufacturing [BS322200]	24,488,377	36,269,420	39,524,934
Cutlery, hand tools and other fabricated metal product manufacturing [BS332A00]	10,795,428	14,770,381	16,205,538
Data processing, hosting, and related services [BS518000]	10,350,000	470,687,077	472,063,018
Educational services [BS610000]	12,219,600	35,570,111	37,194,599
Electric lighting equipment manufacturing [BS335100]	6,574,000	10,478,872	11,352,828
Employment services [BS561300]	33,644,604	43,841,182	48,313,936
Financial investment services, funds and other financial vehicles [BS52A000]	95,252,327	127,582,160	140,245,118
Food services and drinking places [BS722000]	84,302,298	118,020,660	129,227,908
Industrial machinery manufacturing [BS333200]	3,892,000	5,375,788	5,893,196
Legal services [BS541100]	38,710,727	50,442,682	55,588,933
Lessors of real estate [BS531100]	85,770,000	129,723,723	141,126,089
Management, scientific and technical consulting services [BS541600]	37,023,000	48,243,460	53,165,342
Medical equipment and supplies manufacturing [BS339100]	36,928,960	48,330,578	53,239,958
Miscellaneous ambulatory health care services [BS621A00]	21,701,021	28,277,891	31,162,850
Non-depository credit intermediation [BS522200]	26,134,615	34,645,773	38,120,140
Non-residential building construction [BS23B000]	33,303,635	43,396,877	47,824,302
Offices of dentists and physicians [BS621200 & BS621100]	64,251,763	83,724,371	92,266,077
Offices of real estate agents and brokers/activities related to real estate [BS531A00]	18,728,000	25,802,924	28,292,646
Other activities of the construction industry [BS23E000]	14,225,846	19,658,743	21,549,944
Other electrical equipment and component manufacturing [BS335900]	1,650,000	9,533,746	9,753,099
Other electronic product manufacturing [BS334A00]	523,603,062	686,200,836	755,809,251
Other general-purpose machinery manufacturing [BS333900]	3,856,483	5,539,889	6,052,575
Other miscellaneous manufacturing [BS339900]	1,200,000	2,499,001	2,658,530
Other professional, scientific and technical services [BS541900]	11,082,306	32,327,246	33,800,541
Other transportation equipment manufacturing [BS336900]	51,086,466	66,612,164	73,403,659
Personal care services and other personal services [BS812A00]	27,435,245	35,943,979	39,591,253
Pharmaceutical and medicine manufacturing [BS325400]	90,860,000	118,481,650	130,560,687
Printing and related support activities [BS323000]	103,322,111	137,097,930	150,833,694
Residential building construction [BS23A000]	83,218,000	108,438,654	119,501,754
Resin, synthetic rubber, artificial/synthetic fibres/filaments manufacturing [BS325200]	800,000	1,474,227	1,580,580
Scientific research and development services [BS541700]	2,480,000	3,231,607	3,561,301
Semiconductor and other electronic component manufacturing [BS334400]	1,129,667,584	1,498,927,926	1,649,107,279
Software publishers [BS511200]	1,118,850,879	1,516,875,082	1,665,616,450
Telecommunications [BS517000]	1,092,286,817	1,438,319,407	1,583,529,317
Transportation engineering construction [BS23C100]	36,450,000	47,496,803	52,342,509
Warehousing and storage [BS493000]	700,000	1,103,318	1,196,377
Waste management and remediation services [BS562000]	6,429,000	9,018,610	9,873,289
Retail	132,322,270	183,974,642	201,565,722
Wholesale	50,121,932	88,432,577	95,095,846
Other (Not Elsewhere Categorized)	237,655,414	406,431,275	438,025,469
Total:	**8,011,655,186**	**11,292,060,289**	**12,357,139,269**

Growth Scenario Comparisons

Table 31 presents a comparison of the growth scenarios discussed in the report.

Table 31. Comparison of the Growth Scenarios (To Now).

Output (C$)	2025 Survey	2036 Forecast	2046 Forecast
Utilizing the Baseline Forecasts by City of Ottawa	8,012,000,000	9,911,000,000	10,723,000,000
Utilizing the Moderate Upside Forecasts by Oxford Economics	8,012,000,000	10,440,000,000	11,505,000,000
Utilizing the Moderate Upside Forecasts by Oxford Economics and the Introduction of a Compound Semiconductor Fab Starting in 2036	8,012,000,000	11,903,000,000	12,969,000,000
Utilizing the Moderate Upside Forecasts by Oxford Economics and the Introduction of Five Data Centres Starting in 2036	8,012,000,000	11,292,000,000	12,357,000,000

Numbers rounded.

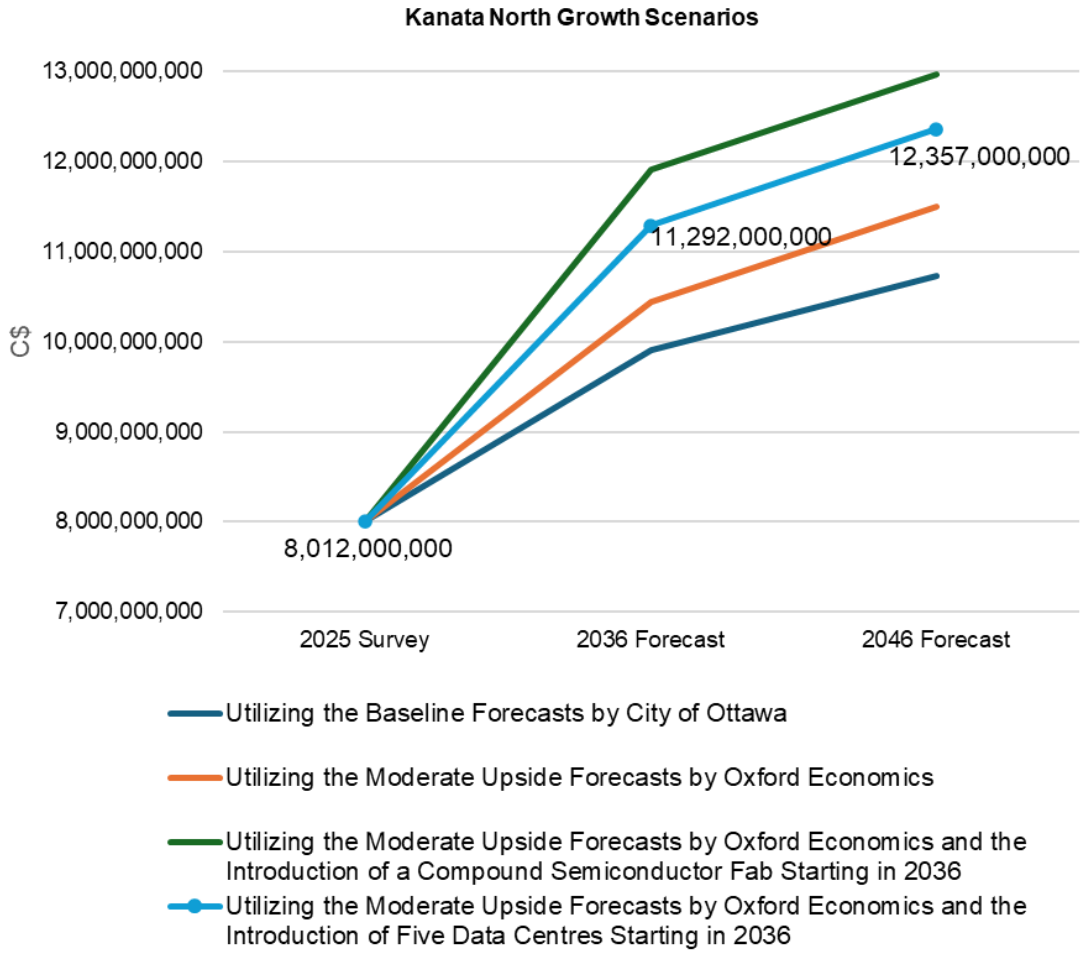


Figure 1-10. Visual comparison of the growth scenarios to now.

1.9.6 Rationalization Based on Lost Growth Opportunities

Hyperscale centres are not just job creators—they are **digital infrastructure multipliers**. A technology cluster that does not have access to an AI data centre may experience:

1. **Slower AI Innovation and R&D**

    - Reduced academic-industry collaboration slowing down the development of cutting-edge applications (e.g., robotics, vision systems, predictive analytics).
    - Startups, researchers, and firms must rely on distant or costly cloud resources, which increases latency, cost, and complexity.

2. **Fewer AI and SaaS Startups, and Investments**

    - AI startups require significant infrastructure and often establish themselves near affordable, low-latency computing resources. Ottawa has established a strong track record in the development of SaaS startups and stands to gain a significant competitive advantage through the integration of AI data centres.

3. **Stunted Cluster Development**

    - The cluster would lack engagement in supplier development, local business-to-business spending, and specialization in artificial intelligence operations.
    - AI spending would leave the region (leakages) due to shallow supply chains.

4. **Decreased Cluster Competitiveness**

    - Regions without an AI data centre may not be represented on the global AI infrastructure map, which can impact large enterprises and public-sector procurement.
    - This affects the ability to attract multinational technology anchors.

5. **Industrial Productivity**

    - Industries such as advanced manufacturing, agricultural technology, financial technology, and health technology are increasingly dependent on real-time artificial intelligence applications, including anomaly detection and computer vision.
    - Can spur cross-industry innovation.
    - Higher developer productivity, reduced downtime, better scalability in the software and IT industries.
    - Sending workloads to distant regions increases latency and costs, potentially hindering just-in-time operations or real-time analytics. This impacts the productivity and competitiveness of local firms.
    - Electronics manufacturing services (EMS) providers can prototype faster. Faster iteration leads to shorter product development cycles and quicker time-to-market.
    - Firms can engage in real-time decision-making, Industry 4.0, and higher automation (thus, better positioning them to gain positions in global value-chains).
    - Boosting AI adoption among Canadian SMEs, who contribute to half of Canada's GDP, could improve Canada's overall productivity.
    - A mere 35% of Canadian firms employ artificial intelligence, in contrast to 72% in the United States (Wells, 2023). The difference is partly due to the high proportion of SMEs in Canada, which employ 65% of the private workforce.
    - A Microsoft report based on Accenture research indicates that Generative AI (Gen AI) could add **$180 billion annually to the Canadian economy in labour productivity gains** by 2030 and save workers 125 hours per year, equivalent to a half-hour saved each workday (Barry, 2024).

- DT EconWin's (preliminary) analysis shows **gross output productivity gains of 6%-11%** by industry, with the highest in Software and IT.

1.9.7 Rationalization Based on Hypothetical Insertion of Hyperscaler in 2025

An analysis was conducted to quantify the lost opportunity resulting from the absence of a hyperscale facility in Kanata North in 2025:

- Using the analysis developed previously in *Output Determination for Hyperscale Data Centre Facility*, a 50 MW hyperscaler was added to the total 2025 Kanata North direct output of $8.01 billion. It was assumed that this facility would have direct output of CAD $300 million per year and be fully operational in 2025.
- The IOIC Code for data centres is *518210 – Data Processing, Hosting, and Related Services*. Consequently, the additional output amounting to CAD $300 million is incorporated into the existing output of IOIC Code 518210 for 2025 (that is, CAD $10.5 million existing + CAD $300 million hypothetical = CAD $310.5 million).[71]
- DT EconWin was then used to quantify the total economic impacts from this additional CAD $300 million. Total economic impacts include direct, indirect, and induced effects. The CAD $300 million is only the direct impact; it results in indirect and induced impacts as well.

Table 32, below, identifies the **lost opportunity of not already having a hyperscaler in Kanata North**. It shows that the incremental output of CAD $300 million in Kanata North would have resulted in total economic impact **across Canada** of CAD $584 million (when indirect and induced impacts are added to the direct impact of CAD $300 million).

Unlike many industries, most **job impacts** from an AI data centre come from indirect and induced effects combined (roughly 80%) rather than direct employment in the hyperscaler. Simply put, hyperscalers generate few direct jobs relative to their significant annual output. This is not to say that they do not have wide-ranging economic and catalytic impacts on the technology cluster; see previous comments, and discussion below.

As shown in Table 32, a CAD $300 million Canadian hyperscaler, based on research, employs approximately 75 people directly (typical range is 50-100). Also, based on research, **per 1 direct job** at a hyperscale data centre:

- **Indirect Jobs:** 2-5 jobs.
- **Induced Jobs:** 2-4 jobs.
- **Total Jobs:** 1 direct job supports 4-9 additional jobs (indirect + induced).

Thus, the 75 direct jobs support 375 indirect jobs + 300 induced jobs = 750 total Canadian jobs.

[71] As mentioned, data centres fall into Statistics Canada's IOIC Code *518210 – Data Processing, Hosting, and Related Services*. Per CAD $1 million in Output, 1.945 total jobs are created (that is, direct + indirect + induced). This is an average size jobs multiplier compared to other industries. The highest job multiplier is in *485100 – Urban Transit Systems (4.64)*.

Table 32. Lost opportunity from absence of hyperscaler data centre in Kanata North in 2025.

Kanata North in 2025	Direct	Indirect	Induced	Total
2025, Existing (Without Hyperscaler)				
Gross Ouput	8,013,955,186	3,687,146,090	3,193,308,146	14,894,409,421
Jobs	27,858	15,064	13,163	56,085
2025, Hypothetical Insertion of Hyperscaler				
Gross Ouput	8,313,955,186	3,838,346,090	3,325,608,146	15,477,909,421
Jobs	27,933	15,439	13,463	56,835
Increase From Hyperscaler				
Gross Output	300,000,000	151,200,000	132,300,000	583,500,000
Jobs	75	375	300	750

Table 33, below, shows how total Canadian impacts would vary with output size (i.e., what if the CAD $300 million hyperscaler were, in fact, a CAD $200 million facility, or a CAD $400 million facility).

Table 33. Sensitivity Analysis on output Size of Hyperscaler.

	Total Canada-Wide Impact	
Output of Hyperscaler in 2025	**Gross Output**	**Jobs**
CAD $200M facility	389,000,000	480
CAD $300M facility	**583,500,000**	**750**
CAD $400M facility	778,000,000	1,000

As noted earlier in Rationalization Based on Lost Growth Opportunities 1.9.6, an AI data centre would influence the **industrial productivity and competitiveness** of regional firms. These effects are not included in Table 32.

Specifically in terms of a hyperscaler, our brief analysis suggests the productivity lift is larger than the direct footprint, especially in AI, software, manufacturing, R&D, and services.[72]

Potential means to gauge these productivity-enhancing effects could include:

- Tracking the **output per worker** in Kanata North over time, including before and after the hyperscaler is operational.
- Conducting a regional survey to assess if **time-to-market** is reduced, especially for Canadian startups.
- Tracing productivity-enhancing **backward linkages** in the Kanata North cluster.

These analyses would necessitate further development.

[72] A full DT EconWin analysis of productivity effects is beyond the scope of this project.

1.10 Growth Scenario – SecureTech Campus: Canada's National Hub for Defence, Space and Cyber Innovation

Framing and Macro Assumptions

Ottawa, Ontario, stands out as one of Canada's leading centres for defence and security innovation, thanks to its proximity to federal agencies, advanced R&D facilities, specialised test ranges, and a dense concentration of engineering and scientific talent (Invest Ottawa, 2024). Globally, the city is emerging in the same league as mid-sized international hubs such as Arlington, USA; Adelaide, Australia; and Haifa, Israel — locations recognised for their ability to convert research into deployable military and dual-use capabilities (KPMG, 2023).

Why Now

Canada's defence and security landscape is entering a pivotal decade. Increasing geopolitical instability, NATO's expanded spending targets, and already-funded NORAD modernisation programs have created a time-sensitive opportunity to address capability gaps while building sovereign industrial capacity. Simultaneously, vulnerabilities in global supply chains for semiconductors, secure communications, and aerospace components are strengthening the case for domestic resilience (Canadian Centre for Cyber Security, 2023); (Public Services and Procurement Canada, 2024).

Impact at a Glance *(2025–2035)*

- **C$38.6B:** NORAD modernisation program already funded (Public Services and Procurement Canada, 2024)
- **38%:** Current Canadian-owned share of domestic ADS contracts (Aerospace Industries Association of Canada, 2023)
- **3,500+:** Potential new high-wage jobs in Kanata ADS cluster by 2035 (Innovation, Science and Economic Development Canada, 2023)
- **3–5×:** GDP multiplier on Campus-driven R&D investments (Innovation, Science and Economic Development Canada, 2022)

Strategic Challenge

Despite its strengths, Canada faces a growing capability gap. Allies are speeding up the integration of industry into mission delivery — the UK with AI-enabled ISR platforms (UK Ministry of Defence, 2024), Australia with sovereign guided weapons (Australian Department of Defence, 2023), and Japan with space-based early warning (Japan Ministry of Defence, 2024)— while Canada's industrial base remains more reliant on foreign primes and imported systems (Aerospace Industries Association of Canada, 2023). This gap is both an operational risk, reducing readiness and sovereign control, and an economic risk, limiting the domestic share of high-value contracts.

A central strategic priority is to diversify the Aerospace, Defence & Security (ADS) sector toward more Canadian-owned and Canada-based SMEs and startups, increasing their share of domestic ADS contract value from the current 38% baseline to at least 55% by 2030 (Innovation, Science and Economic Development Canada, 2023). This will not displace foreign primes but complement them, ensuring that intellectual property, manufacturing, and sustainment capacity are firmly rooted in Canada.

The Role of the SecureTech & Defence Campus

The SecureTech & Defence Campus in Kanata North is designed to tackle this challenge by collocating anchor firms, scale-ups, startups, and applied R&D infrastructure. Its explicit aim is to accelerate the commercialisation of dual-use technologies in areas such as autonomy, secure communications, advanced sensors, and resilient infrastructure. Spillovers from dual-use technologies are expected to benefit sectors including clean energy, advanced manufacturing, space systems, and critical infrastructure protection (National Research Council Canada, 2024). Every £1 invested in Campus-driven R&D and firm growth is projected to produce £3–£5 in economic output, while also reducing delivery timelines and dependency on foreign suppliers—enhancing both regional GDP and national security readiness (Innovation, Science and Economic Development Canada, 2023).

Scenario Context – Defence Spending Trajectories

This opportunity emerges within a changing policy and spending landscape. In June 2025, Prime Minister Mark Carney declared that Canada would meet NATO's defence spending target of 2% of GDP by early 2026 and signaled alignment with NATO's collective goal of reaching 5% of GDP by 2035, covering both military and broader security-related expenditures (Unknown, Canada joins new NATO Defence Investment Pledge, 2025).

For planning purposes, three spending trajectories are modelled:

1. **High investment** – aligns with NATO's 5% GDP target by 2035, enabling accelerated anchor-firm attraction, R&D ramp-up, and expanded sovereign manufacturing capacity.

2. **Moderate** – reaches and sustains 2% by 2026, with targeted increases to ~3% by the early 2030s, supporting steady growth and selective capability expansion.

3. **NATO-minimum** – holds at 2% after 2026, with growth driven primarily by export markets and ITB policy capture.

Sensitivity bands are applied to all output forecasts to reflect these scenarios, ensuring that strategic planning remains robust under different funding environments.

Regional Technology Base

As discussed earlier in this report, Ottawa hosts one of Canada's most advanced concentrations of semiconductor design and manufacturing capability — a critical enabler for aerospace, defence, and secure communications. As of July 2025, the region is home to 62 semiconductor companies, including Fidus Systems, RANOVUS, and Hyperlume, alongside specialised small and medium-sized enterprises in photonics, compound semiconductors, and advanced packaging (Invest Ottawa, 2024). Ottawa accounts for 41% of Canada's semiconductor design employment, the highest share nationally, and ranks among the top five North American metropolitan areas for compound semiconductor patent filings (Statistics Canada, 2024) & (USPTO, 2025).

This industrial strength is supported by Ottawa's leadership in compound semiconductor R&D — underpinning 90% of Canada's industrial telecom R&D — and by the presence of the Canadian Photonics Fabrication Centre (CPFC), a national-scale facility capable of producing photonic integrated circuits for high-security applications (National Research Council Canada, 2024). The cluster's innovation output is

enhanced by the city's robust telecommunications and photonics networks, positioning the SecureTech & Defence Campus to develop sovereign semiconductor and secure communications supply chains that are insulated from foreign dependency.

Direct ADS Applications

Ottawa's semiconductor and photonics strengths have immediate application in:

- **NORAD Arctic Over-the-Horizon Radar (A-OTHR)** — high-performance gallium nitride (GaN) amplifiers and RF front ends for wide-area Arctic surveillance (Public Services and Procurement Canada, 2024).
- **Space-based ISR and EO/IR** — radiation-hardened semiconductor components for satellites and high-altitude platforms (Canadian Space Agency, 2024).
- **Secure military communications** — photonic encryption systems and ultra-low-latency optical switching for C4ISR networks (Canadian Centre for Cyber Security, 2023).

Talent Pipeline and R&D Integration

Ottawa's technology base is reinforced by a robust talent pipeline:

- **The University of Ottawa** and **Carleton University** graduate over 500 engineers annually in electrical, computer, and photonics engineering (Universities Canada, 2024).
- **Algonquin College** supports semiconductor technician and photonics manufacturing programs, which boast high industry placement rates (Algonquin College, 2024).
- **CPFC's internship programs** and NRC postdoctoral placements provide direct industry–R&D integration, accelerating technology readiness.

Strategic Sovereignty and Supply Chain Resilience

Globally, over 90% of advanced semiconductors are produced in East Asia, leaving Canada vulnerable to geopolitical supply chain risks (Organisation for Economic Co-operation and Development, 2023). Ottawa's ecosystem provides a foothold in trusted, domestic alternatives, especially when combined with IBM Bromont and C2MI in Québec, establishing a wholly Canadian design, fabrication, assembly, and testing capability. This would ensure strategic sovereignty for critical systems in aerospace, defence, and security, while also reducing exposure to tariff volatility and foreign export controls.

Dual-Use Spillovers

Beyond defence and aerospace, Ottawa's compound semiconductor and photonics capabilities have spillover potential into:

- **Clean energy** — high-efficiency photovoltaic systems and smart grid components.
- **Medical imaging** — advanced sensors for diagnostic equipment.
- **Quantum computing** — photonic qubits and secure quantum communications.
- **Advanced manufacturing** — high-precision robotics and industrial automation.

This combination of industrial density, R&D integration, skilled workforce, and sovereign manufacturing potential grants Ottawa one of the most comprehensive compound semiconductor ecosystems in North America — and a vital advantage for expanding the Kanata ADS cluster's secure technology capabilities.

"Invest in Security to Manufacture Resilience"

1.10.1 Rationalization Based on Industry Trends

Policy Backdrop

Canada will meet NATO's 2% of GDP defence spending target by early 2026, as confirmed by Prime Minister Mark Carney at the NATO Summit in June 2025, and has endorsed NATO's collective goal to reach 5% of GDP by 2035 for combined defence and security expenditures (Unknown, Canada joins new NATO Defence Investment Pledge, 2025). The 2024 *Defence Policy Update – Our North, Strong and Free* outlines plans to modernise procurement, strengthen the domestic defence industrial base, and invest in NORAD modernisation — demand drivers directly relevant to the Kanata ADS cluster (Government of Canada, 2024).

Geopolitical Instability Drives Demand

Melting Arctic Sea ice and increasing great-power competition have heightened the need for Arctic Over-the-Horizon Radar (A-OTHR) systems, which are part of a C$38.6 billion, 20-year NORAD modernisation package (Public Services and Procurement Canada, 2024). In the Indo-Pacific, Canada's ten-year strategy aims to enhance naval, ISR, and cyber capabilities in the region (Unknown, Global Affairs Canada, Canada's Indo-Pacific Strategy, 2024). Domestically, the Canadian Centre for Cyber Security's *National Cyber Threat Assessment 2023-24* highlights the growing presence of state-sponsored threats and ransomware, creating a sustained long-term demand for cyber defence solutions (Canadian Centre for Cyber Security, 2023).

Alliance Credibility Through Domestic Capability

A robust domestic industrial base enhances Canada's credibility within NATO, NORAD, and the Five Eyes, particularly if Ottawa maintains spending above 2% of GDP and delivers high-value industrial contributions in conjunction with operational outputs (Blanchfield, 2025).

Existing Industrial Strengths

Canada's land systems sector includes GDLS-Canada (LAV armoured vehicles), Colt Canada (C7/C8 service rifles), and Newcon Optik (night-vision and electro-optics) (Aerospace Industries Association of Canada, 2023). Aerospace strengths comprise CAE's flight simulators, the SkyAlyne Future Aircrew Training programme, and MRO services from IMP Aerospace & Defence (Aerospace Industries Association of Canada, 2023).

Emerging Strengths: Materials, Additive, and Semiconductors

Advanced composites and additive manufacturing are supported by the National Research Council's Aerospace Research Centre and Next Generation Manufacturing Canada (Unknown, We bring together advanced manufacturing and technology to drive digital transformation., 2025). Canada possesses sovereign semiconductor assets vital for secure communications, radar, and EO/IR, including

the Canadian Photonics Fabrication Centre (CPFC) in Ottawa, IBM Bromont's assembly and test facilities, and the MiQro Innovation Collaborative Centre (C2MI) (Invest Ottawa, 2024).

R&D Intensity and Spillovers

Defence and aerospace are among Canada's most R&D-intensive manufacturing sectors, characterised by higher-than-average wages and notable dual-use spillovers into robotics, AI, and clean technologies (Innovation, Science and Economic Development Canada, 2022).

Sustainment and MRO Capacity

Ageing fleets and global supply chain constraints make In-Service Support (ISS) and Maintenance, Repair, and Overhaul (MRO) capacity strategically important, with organisations like IMP Aerospace & Defence managing complex sustainment lines for the RCAF and Navy (Aerospace Industries Association of Canada, 2023).

Infrastructure Recapitalisation and Testing

DND's real property portfolio shows a considerable backlog of deferred maintenance, with Arctic infrastructure classified as "poor" or "very poor" condition (Office of the Auditor General, 2022). Increasing testing, validation, and demonstration activities in Canada can be facilitated through Area X.O (Ottawa), DRDC Valcartier, and NRC Aerospace facilities (Invest Ottawa, 2024).

Talent Pipelines and Clearances

High-wage aerospace and defence roles require specialised engineering, technical trades, and quick security clearance processing. Federal strategy aims to expand the skilled workforce while addressing clearance delays (Unknown, Research and development for NORAD modernization, 2025)

Leveraging the Industrial and Technological Benefits (ITB) Policy

The ITB Policy stipulates that significant foreign defence contracts must generate business activity in Canada equal to the contract value, with an emphasis on Key Industrial Capabilities (KICs) such as cyber, AI, and advanced materials (Innovation, Science and Economic Development Canada, 2023). The Kanata ADS cluster can function as an effective platform to absorb ITB work and transform Priority Rated Investments (PRIs) into scalable enterprises.

Risks

While the Kanata ADS Cluster aims to capitalise on long-term demand, emerging technologies, and policy tools like the ITB Policy, several systemic and external risks could threaten delivery timelines, cost competitiveness, and strategic progress. These risks include procurement procedures, physical infrastructure readiness, and exposure to international trade movements, each capable of disrupting programme execution and diminishing industry confidence.

Addressing these challenges proactively—through targeted mitigation strategies—will be essential to sustaining the Cluster's growth trajectory, maintaining operational readiness for the Canadian Armed Forces, and ensuring that investments achieve their intended economic and national security benefits. The following subsections outline the most urgent risk categories and their potential impacts.

- **Procurement Friction/delays:** Parliamentary reviews and the Parliamentary Budget Officer have highlighted delays, inflation risks, and project slippage across defence capital plans, reducing schedule certainty for suppliers (House of Commons—Standing Committee on National Defence , 2023); (Parliamentary Budget Officer, 2024).
- **Infrastructure Backlog (Real Property, Arctic):** DND reports approximately C$8.2 billion in deferred maintenance and "assets not in suitable condition"; the Auditor General highlights gaps in Arctic surveillance and ageing systems (Department of National Defence, 2025) and (Office of the Auditor General, 2022). Infrastructure shortfalls can delay deployments and testing (Department of National Defence, 2022).
- **Trade/Tariff Exposure (Parts & Engine MRO):** 2025 tariff volatility (US steel/aluminium and broader measures) has increased costs and uncertainty for aerospace parts and engine repair, prompting firms to re-examine contracts and delivery schedules (Reuters, 2025a; Reuters, 2025b; Reuters, 2025c; Reuters, 2025d). Even with partial aerospace carve-outs, policy whiplash still poses planning risks (Reuters, 2025d).

Overall, procurement delays, infrastructure backlogs, and trade/tariff exposure create a complex risk profile that can hinder capability delivery, increase costs, and reduce Canada's ability to respond promptly to emerging threats. These risks are interconnected: procurement delays can cause projects to enter periods of higher inflation; infrastructure gaps can slow down the integration and testing of new systems; and trade disruptions can heighten schedule and budget pressures.

Mitigating these challenges will require coordinated federal–provincial action, industry–government partnerships to streamline acquisition and certification processes, and deliberate investment in resilient domestic supply chains. By addressing these vulnerabilities alongside growth initiatives, the Kanata ADS Cluster can safeguard its competitiveness, protect operational readiness, and ensure that defence and security investments deliver maximum value to both Canada's economy and its allies.

Summary

Canada's scale differs from that of the United States or China. Nevertheless, it must make targeted investments in UAVs, autonomous systems, Arctic surveillance, solutions for harsh conditions, cybersecurity, quantum defence, satellite intelligence, next-generation radar, sensors, and secure communications to develop an agile industrial base capable of serving both defence and commercial (dual-use) markets. For the Kanata ADS Cluster, this involves focusing on high-impact niches where domestic capabilities align with long-term, already-funded demand—such as NORAD modernisation, trusted telecom/photonics manufacturing, and in-Canada testing and certification—while utilising policy tools like the ITB Policy to speed up SME growth and secure supply chains.

Success will depend on aligning federal and provincial investments, reducing procurement friction, recapitalising critical infrastructure, and safeguarding against trade and tariff shocks. By deliberately focusing on areas of comparative advantage, integrating Ottawa's existing high-tech assets, and closing capability gaps in sustainment and sovereign manufacturing, Canada can develop a resilient, export-ready ADS ecosystem that provides operational advantage for the Canadian Armed Forces and lasting economic value for the country.

1.10.2 Rationalisation Based on Local Context

Table 34, below, demonstrates that the region has critical mass in ADS. Furthermore, it demonstrates significant breadth in regional competencies. Firms include global multinationals (i.e., BAE Systems,

Boeing, General Dynamics, Leonardo, Lockheed Martin, Thales), large domestic firms (i.e., Bombardier, CAE, Calian, Magnet Forensics, MDA Space), as well as SMEs and startups (i.e., AirShare, CCX Technologies, Larus Technologies, Quantropi).

Table 34. Examples of Local ADS Firms.

Local ADS Firm	Local Industrial Competencies
AirShare	Designs and manufactures a system to detect, track, and safely mitigate wayward and malicious drones.
BAE Systems Canada	Cyber defence, threat intelligence, combat systems, aeronautics products, aircraft manufacture, avionics and navigation, cyber and intelligence, system integration & support, enhanced military training, and naval manufacturing & repair.
BMT Canada	Maritime-orientated design services and technical consulting firm.
Boeing	Ottawa office houses leadership for the Medium Heavy Lift Helicopter (MHLH) In-Service Support (ISS) program supporting the CH-147F Chinook fleet for the Royal Canadian Air Force.
Bombardier	Aviation and aerospace component manufacturing (both civil and defence).
CAE	Kanata North office engaged in defence & security business development, operational training & IT support services, training systems integration & programme delivery, manage complex defence missions, including ISR, mission systems, and lifecycle support programs (e.g., CF-18 sustainment, naval EW capabilities).
Calian Group	Systems engineering, IT & cybersecurity, operational training, and mission services to defence and first-responder agencies.
CCX Technologies	Networking and computing solutions for real-time operational networks in aerospace and defence systems.
Collins Aerospace	Design, development, support, modeling and simulation of wireless, ad-hoc networking technologies for tactical applications used by the Royal Canadian Navy and the Canadian Army. The Ottawa facility also serves as a focal point for all Collins systems, services, and repairs for Government of Canada customers.
Corsa Security	Network security virtualization platform that automates and scales firewall and traffic inspection capabilities.
Curtiss-Wright Defense Solutions	Embedded computing solutions for the defence, aerospace, and industrial markets. The Ottawa location houses manufacturing, sales, marketing, operations, finance, customer care, and business services. They specialize in rugged, reliable, and high-performance computing systems for mission-critical applications.
DEW Engineering and Development	Design, test, and manufacture a broad range of armour and defence equipment.
D-TA Systems	Solutions for Electro-Magnetic Spectrum Operations (EMSO).

Local ADS Firm	Local Industrial Competencies
Edge Autonomy	Autonomous systems, advanced optics, and resilient energy solutions.
Fortinet	Developer of cybersecurity products and platforms.
GasTOPS	Energy-based testing systems and gas turbine infrastructure, with strong ties to DRDC and defence clients.
General Dynamics Mission Systems Canada	C4ISR systems, in-service support, and systems integration for defence customers and public security agencies worldwide.
Honeywell Aerospace	Develops airborne communication systems.
Kongsberg Geospatial	Develops situational awareness tools and geospatial software, including UAS control and visualization systems.
Larus Technologies	Specializes in artificial intelligence (AI), machine learning (ML), and decision support systems for defence and public security clients.
Leonardo	Kanata North office manufactures defence communications and sensor systems, flight recorders and emergency beacons, supports EW simulation and training systems.
Lockheed Martin Canada	Design, engineering, integration, and support for hardware and software platforms, including naval and aerospace systems.
Magnet Forensics	Software engineering and product development, application and cloud security, vulnerability mitigation, and threat modeling for Magnet's SaaS and on-premises offerings.
MDA Space	Operates the David Florida Laboratory (DFL). This facility is Canada's only spacecraft assembly, integration, and testing (AI&T) centre, featuring cleanrooms, vibration and thermal-vacuum chambers, anechoic chambers, antenna testing.
MDS (MDS Aero Support)	Delivers gas turbine engine test facilities and aerospace engineering solutions; supports both civil and defence aviation.
Med-Eng	OEM of bomb-disposal, EOD protective equipment, and chemical detection systems widely used by armed forces and first-responder agencies worldwide.
Quantropi	Developer of quantum security products.
Rheinmetall Canada	Solutions for vehicle systems and integration, air defence as well as weapon, command and communications, soldier and robotic systems.
Saab Canada	Aeronautics, civil security, defence, information technology, engineering, and cybersecurity solutions.
Senstar Corporation	Perimeter intrusion detection, access control, video analytics and duress systems, protecting critical infrastructure and military installations globally.
Serco Canada Marine	Provider of turn-key ship design services, naval architecture, marine engineering, and maritime services. Supported the development of the Royal Canadian Navy's Joint Support Ship (JSS), the Halifax Class Patrol Frigates, the first fully electric green ferries in Ontario, and the Canadian Coast Guard's Offshore Fisheries Science Vessels.

Local ADS Firm	Local Industrial Competencies
Thales Canada	Building and sustaining systems for the Canadian Army's LC4ISR (Land Command, Control, Communications, Computers, Intelligence, Surveillance & Reconnaissance). This includes integrating sensors, networks, applications, and ISTAR capabilities within mission-critical systems.
Trend Micro	Developer of enterprise, cloud, and virtualization security software products.

Throughout its history, Defence Research and Development Canada (DRDC) Ottawa Research Centre—originally established in 1941 as the *Defence Research Establishment Ottawa (DREO)*—has been a cornerstone of Canada's science and technology contribution to national defence and security (Defence Research and Development Canada, 2023). The centre has consistently advanced critical capabilities in cybersecurity, radar systems, electronic warfare (EW), space systems, and artificial intelligence/machine learning (AI/ML), often in collaboration with Canadian industry and allied research institutions.

Key outputs include:

- Arctic surveillance systems, contributing to Over-the-Horizon Radar (OTHR) prototypes for NORAD modernisation (Defence Research and Development Canada, 2024a).
- Next-generation EW countermeasures integrated into RCAF and NATO platforms (North Atlantic Treaty Organization, 2023).
- Satellite-based ISR payloads and space situational awareness tools co-developed with the Canadian Space Agency (Canadian Space Agency, 2023).
- Machine learning algorithms for threat detection in complex signal environments are now embedded in several operational C4ISR systems (Defence Research and Development Canada, 2024b).

These R&D outputs directly spill over into the regional Aerospace, Defence, and Security (ADS) cluster, promoting technology transfer, joint prototyping, and commercialisation avenues for SMEs and primes in the National Capital Region.

Another essential local asset is Invest Ottawa's Area X.O. — a NATO DIANA-aligned innovation campus and test range, which serves as a national-scale testbed for secure telecommunications, connected and autonomous vehicles (CAVs), unmanned aerial vehicles (UAVs), and public safety systems (Invest Ottawa, 2024). This facility encompasses:

- 5G and secure networking infrastructure for mission-critical communications testing.
- CAV and UAV operational environments for autonomous systems validation under real-world and adverse-weather conditions.
- Sensor fusion and AI analytics platforms for multi-domain situational awareness.
- Public safety R&D zones supporting first responder technologies, disaster resilience solutions, and security integration testing (Public Safety Canada, 2025).

Area X.O's NATO DIANA alignment positions Ottawa as a gateway for allied technology qualification, enabling regional innovators to access transatlantic defence markets and joint experimentation initiatives. The co-location of DRDC Ottawa's deep R&D expertise with Area X.O's real-world test environment creates a unique research-to-certification pipeline within the Kanata ADS cluster, reducing time-to-deployment for critical defence and dual-use technologies.

Other key local resources include:

- Department of National Defence (DND).
- Canadian Security and Intelligence Service (CSIS).
- Public Safety Canada (PSC).
- Canadian Air Transport Security Authority (CATSA).
- Communications Research Centre Canada (CRC).
- Royal Canadian Mounted Police (RCMP).
- Communications Security Establishment Canada (CSE).
- Canada Border Services Agency (CBSA).
- National Research Council's Aerospace Research Centre (NRC).
- National Research Council's Canadian Photonics Fabrication Centre (CPFC).
- National Research Council's Ocean, Coastal and River Engineering Facility.
- National Research Council's Digital Technologies Research Centre.
- The David Florida Laboratory (DFL).
- Carleton University Aerospace (one of the largest and most comprehensive academic aerospace research programs in Canada).
- Canadian Association of Defence and Security Industries (CADSI) (over 900 member companies, runs CANSEC trade show in Ottawa and WIDS (Women in Defence and Security), and advocates industry-government collaboration). In 2025, CANSEC showcased 280+ ADS firms, occupied over 200,000 sq. ft. of exhibition space, drew more than 12,000 attendees including 50+ international delegations and 600+ VIPs and senor officials (CANSEC, 2025).
- Canadian Aeronautics and Space Institute (CASI).
- Home to key federal policymakers, procurement bodies responsible for national and international defence strategies.[73]
- Home to more than 130 embassies and 30+ NATO attachés.[74]
- Home to Canada's most educated workforce where 65% have a post-secondary degree or diploma.[75]

[73] Ibid.
[74] Ibid.
[75] Ibid.

- Home to seven post-secondary institutions that produce 168,000+ students including 28,000 in STEM.[76]
- Home to 190+ ADS companies with 10,000 skilled employees.[77]
- Home to the Ottawa-Gatineau Cybersecurity Cluster.
- Home to the uOttawa-IBM Cyber Range, a training and research facility where individuals and companies can practice comprehensive cybersecurity crisis management.[78]
- Home to ONE9, Canada's first security-focused venture capital and innovation platform (recently acquired by Kensington Capital Partners).[79]
- Home to active local investors such as Wesley Clover, Celtic House, Mistral Venture Partners, and the Capital Angel Network.

1.10.3 Rationalization Based on Identified Local Opportunities

The previous discussion has shown that the ADS sector suits regional industrial development. The next task is to examine the potential avenues for ADS industrial expansion in Kanata North over the next 25 years.

Table 35, below, suggests that Kanata North should brand itself around five (5) ADS Capability Pillars.[80]

Table 35. ADS Capability Pillars for Kanata North and Region.

ADS Capability	Why Kanata North / Ottawa is Competitive
Secure Communications & C4ISR	Firms like General Dynamics, Ciena, Nokia, and Kongsberg Geospatial are already active in secure systems and mission-critical networking. This pillar builds on Kanata North's extensive telecom and wireless capabilities. Secure communications / C4ISR have been identified by DND as one of the five major domestic threats / critical gaps currently facing Canada.
Artificial Intelligence (AI) / Machine Learning (ML) for Defence	Support Canadian companies such as Larus, Quantropi, and MindBridge AI for defence applications. Sovereign supply chains / domestic production of defence technologies has been identified by DND as one of the five major domestic threats / critical gaps currently facing Canada.
Cybersecurity & Quantum	With Trend Micro, Interset, and national cyber resources like CSE, Kanata North is positioned to lead in cyber-defence and threat detection. Cybersecurity firms would synergize with existing firms like Corsa Security, Trend Micro, Quantropi, and Interac (formerly 2Keys), and would help meet growing DND and NATO demand for secure cloud, hybrid AI-mission operations, and quantum-safe systems. Cybersecurity / cyber

[76] Ibid.
[77] Ibid.
[78] Ibid.
[79] Ibid.
[80] Engagement with Kanata North stakeholders, February-May 2025, with additional analysis by Doyletech Corporation (see Appendix 4).

ADS Capability	Why Kanata North / Ottawa is Competitive
	resilience has been identified by DND as one of the five major domestic threats / critical gaps currently facing Canada.
Autonomous Systems / UAVs	Area X.O. allows UAS and sensor testing; ING Robotics and QNX contribute autonomy stacks. The region should attract and target UAV / autonomy startups. Autonomous targets should also encompass maritime unmanned systems designed for Arctic and Naval applications. This approach corresponds with Canada's stated military focus on autonomous ISR, Arctic operations, and AI-enabled command systems. Arctic Sovereignty / Northern Operations have been identified by DND as one of the five major domestic threats / critical gaps currently facing Canada.
Space & RF Tech & Electronic Warfare (EW)	The region is already home to strong optics, satcom, radar signal processing talent and firms engaged in defence and aerospace supply chains. Examples of ideal target firms for Kanata North include advanced passive / active radar manufacturers, EW systems vendors, and antenna design and phased array radar companies. These are targets because they build on the presence of General Dynamics, Kongsberg Geospatial, QNX, and DRDC Ottawa (specializing in EW / RF) and they would support Canada's priorities in Arctic situational awareness and NATO interoperability.

“The Arlington of the North”

The long-term goal is to establish Kanata North as "*The Arlington of the North"*—Canada’s premier defence technology innovation hub. This comparison is inspired by Arlington, Virginia’s role as a vital centre for U.S. defence R&D, procurement, and private-sector innovation, due to its close proximity to the Pentagon, DARPA, and numerous U.S. federal agencies (Arlington Economic Development, 2023; U.S. Department of Defense, 2024). Arlington’s ecosystem combines federal contracting opportunities, research institutions, prime contractor headquarters, and a dense SME/startup community, fostering a high-trust, fast-paced environment for mission-critical technology deployment (Brookings Institution, 2022).

By adopting this positioning, Kanata North signals to federal policymakers that it is prepared to assume a national strategic role in Canada’s defence innovation system, transcending its current identity as a regional technology park. This elevated national profile aligns with the Government of Canada’s objectives in the *Defence Policy Update – Our North, Strong and Free* to expand domestic industrial capacity, strengthen NATO and NORAD contributions, and accelerate dual-use technology adoption (Government of Canada, 2024).

From an investment perspective, the “Arlington of the North” vision offers clarity to defence primes, scale-ups, and venture capitalists by emphasising Kanata North’s mission alignment, government connectivity, and readiness for capital-intensive, export-oriented projects. The presence of anchor R&D institutions (e.g., DRDC Ottawa Research Centre), applied testing infrastructure (Area X.O), and core industrial strengths (semiconductors, secure telecom, photonics) forms a vertically integrated innovation corridor akin to the Arlington–Pentagon City–Crystal City cluster in the U.S.

Table 36 below summarises key lessons from the Arlington Defence Cluster that can inform Kanata North's trajectory:

- **Federal proximity advantage** — utilise closeness to decision-makers and programme offices for early shaping of requirements.
- **Mixed-use zoning for R&D and commercial activities** — facilitate rapid prototyping, co-location of suppliers, and collaboration among government, industry, and academia.
- **Government-backed anchor tenants** — attract primes and SMEs through stable, long-term contracts and facility-sharing agreements.
- **Talent density and mobility** — foster incentives for high-clearance professionals to reside and work within the cluster.
- **Maintain a consistent, mission-focused brand identity** in communications with both domestic and international stakeholders.

Adopting this model would not be a simple replication — Canada's smaller scale and different procurement culture mean that Kanata North's success will depend on targeted capability niches (e.g., Arctic surveillance, autonomous systems, secure communications, quantum defence) rather than broad-spectrum dominance. However, the Arlington analogy offers a proven framework for aligning physical infrastructure, policy levers, and market signals to establish a globally competitive defence innovation hub.

Table 36. Arlington, Virginia – America's Premier Defence & Security Cluster.

Success Factor	Arlington, Virginia – America's Premier Defence & Security Cluster	Strategy to Replicate for Kanata North SecureTech Cluster
Anchor Institution	The Pentagon is the world's largest office building; home to approx. 26,000 defence personnel. Department of Defense (DoD), CIA, DHS, and Capitol Hill also located nearby.	Federal presence (e.g., DND, CSIS, CSE, DRDC, NRC) leads to cluster stability and innovation funding.
Presence of Major Defence Contractors	Lockheed Martin, Raytheon, Boeing, Northrop Grumman, Booz Allen Hamilton, SAIC, and others are located nearby. Amazon's selection of Arlington for HQ2 indicates the area's attractiveness to large employers in the knowledge sector, regardless of its connection to defence industries.	Key primes in the region. However, there is a need to create more Canadian (and Canada-based) ADS startups and scaleups.
Federal Procurement Access	Clustering was supercharged post-9/11 with massive increases in homeland security, defence tech, and cybersecurity budgets.	This provides fast-track access to federal contracts. Co-locate procurement, security clearance infrastructure.
Talent and Sustainability	Arlington has one of the most educated populations in the U.S. George Mason, Georgetown, George Washington, Virginia Tech are major universities located nearby.	Cultivate pipeline from military, technology, and academia. Long-term talent and tech pipeline are prerequisites for

Success Factor	Arlington, Virginia – America's Premier Defence & Security Cluster	Strategy to Replicate for Kanata North SecureTech Cluster
	Significant presence of former military and intelligence (security-cleared) personnel, offering deep domain knowledge. George Mason University and Virginia Tech both established Arlington campuses focused on public policy, cybersecurity, and engineering.	cluster growth and longevity. There are seven post-secondary institutions in the region.
R&D and Smart Infrastructure Assets	Arlington is directly across the Potomac River from Washington, D.C., making it an ideal location for federal agencies and contractors.	Area X.O., DFL, NRC, DRDC, L-Spark, uOttawa, Carleton University, etc.
Policy and Economic Development	Early adoption of SBIR/STTR programs and federal innovation grants seeded many small tech-defence startups. Virginia Economic Development Partnership (VEDP) has been successful in attracting and retaining defence contractors. Incentives for high-tech and cyber firms from Arlington Economic Development (AED) have attracted many startups and scaleups.	Leverage Canada's ITB Policy, procurement and IP policies, the new trade diversification fund, etc. Develop new financing vehicles for growth of Canadian tech firms (flow-thru shares, etc.). Global FDI pipelines are also provided through Invest Ottawa.
Cluster Focus	Based in Arlington, DARPA contracts fueled high-risk R&D, sparking startups and innovation.	Focus on the five ADS Capability Pillars identified in Table 37.

The box presented below, highlights a specific development opportunity identified by Kanata North stakeholders and Doyletech Corporation as having significant impact.[81]

Growth Scenario: SecureTech and Defence Campus – Canada's National Hub for Defence, Space & Cyber Innovation

Development of SecureTech and Defence Campus

- The **Ultimate Vision** is to develop a campus for the co-location of startups, primes, and defence R&D labs in Kanata North. It would be a national launchpad for homegrown solutions to Canada's evolving defence, security, and sovereignty needs—integrated with commercial innovation.
- **Major Roles** it would serve include:
  - Fuel the development of **homegrown defence solutions**, **scaleup domestic ADS firms**, while **attracting more global primes**.
  - Use **public procurement** to catalyze ecosystem growth—just like the U.S. federal government helped fuel Arlington.
  - Strengthen Canada's **industrial base** across aerospace, defence, cyber, space, and Intelligence, Surveillance, and Reconnaissance (ISR). It would also help create **sovereign supply chains** in semiconductors, optics, and related critical technologies to reduce Canadian reliance on countries such as China and the U.S. Ottawa already has the largest concentration of semiconductor companies in Canada.
  - Encourage the development of **Canadian-owned ADS startups** (and IP retention), to complement the many multinationals in the region. The focus would be on developing the five **ADS Capability Pillars** identified for Kanata North (see Table 37, above).
  - Encourage primes to sponsor **corporate venture building**, offering problems, mentorship, and testbeds. For example, if a foreign prime needs edge-AI for satellite imagery it could partner with a local AI startup (funds and co-develops the spinout).
  - Help Canadian ADS firms access the **global supply chains** of the primes.
  - Leverage existing **R&D infrastructure** in the region.
  - Concurrently, efforts would continue to **attract global primes** to locate labs and to develop their own ADS startups in Kanata North. Foreign primes sometimes create new ADS startups in Canada to meet specific **ITB Requirements** (see Table 37, below).
  - The region is already home to many foreign multinationals who could be approached to assess the potential for **new startups** (see Table 37, below).
  - Encourage **shared testbeds** (e.g., C4ISR sim labs, drone test zones, cyber ranges). This would further develop **Area X.O.**
  - Support NORAD modernization & NATO missions with **Made-in-Canada** tech.
  - Embed Kanata North in **NORAD Modernization** initiatives.
  - Pitch Ottawa/Kanata as a Canadian site NATO innovation accelerator **(DIANA)**.
  - Adjust **CCV weighting** to prioritize Canadian-controlled dual-use technology.

In summary, this hub would anchor a pan-Canadian effort that translates the 2% GDP NATO commitment into domestic industry, talent, technology, IP, jobs, and exports.

Tagline:
Whether you're a global prime, a sovereign investor, a federal agency, or a scale-up, the SecureTech Campus is your gateway to **Canada's sovereign tech advantage**.

[81] Interviews with Invest Ottawa and KNBA officials, June 2025 virtual focus group, semiconductor working group meetings in 2025, with additional analysis by Doyletech Corporation.

1.10.4 Output Determination for SecureTech and Defense

Incorporating a SecureTech and Defence Campus into the *Moderate Upside Forecast* for Kanata North requires a structured estimate of its annual economic output. The approach builds on prior scenario modelling in this report, which measured incremental output — the net new economic activity generated by specific high-impact developments.

In earlier scenarios, the "economic shock" could be clearly defined:

- **Scenario 1:** The commissioning of a large-scale semiconductor fabrication facility by 2036, estimated to contribute C$300 million per year to the Kanata North economy through direct operations, supply chain activity, and induced spending (Statistics Canada, 2024a; The Organisation for Eocnomic Co-operation and Development, 2023).
- **Scenario 2:** The launch of a hyperscale data centre generating approximately C$800 million annually in local economic impact, driven by high-intensity capital investment, energy demand, and recurring service revenues (Innovation, Science and Economic Development Canada, 2023; Commerical Real Estate Services, 2024).

In this third growth scenario, the SecureTech and Defence Campus functions as a more dispersed and long-term economic catalyst. The scale and timing of its output growth are less predictable, due to the complexity of defence innovation ecosystems, procurement processes, and the phased development of co-located facilities. Unlike manufacturing or data centre projects, which can reach near-full operational capacity within a few years, the realisation of a multi-role secure technology campus can take decades.

Historical Context and Growth Horizon

The development trajectory of the Kanata North Technology Cluster offers a helpful analogy. Its origins date back over 60 years, starting with the 1963 establishment of Digital Equipment of Canada's headquarters and manufacturing facility — a move that helped establish Ottawa as a technology hub (City of Ottawa Archives, 2023). Since then, the cluster's growth has been influenced by its history, shaped by key tenant arrivals (e.g., Mitel, Nortel), government R&D activities (DRDC Ottawa), and successive waves of SME creation and acquisitions (Invest Ottawa, 2024).

Similarly, a SecureTech and Defence Campus will likely progress through multi-decade phases:

1. **Foundation Phase (Years 0–5)** — Establishment of site infrastructure, early tenant attraction, and initial joint R&D programs.
2. **Acceleration Phase (Years 5–15)** — Expansion of test and certification facilities, growth in SME tenancy, and integration into national procurement pipelines (e.g., NORAD modernisation, ITB projects).
3. **Maturity Phase (Years 15–30)** — Diversification into export markets, deep integration into allied supply chains, and sustained high-value job creation.

Initial Output Estimates (Conservative Case)

To provide a baseline, the initial roles of the SecureTech and Defence Campus — as outlined in the below box:

- Serving as a co-location hub for anchor firms, SMEs, and scale-ups in ADS technologies.

- Acting as a national test, validation, and certification facility for secure communications, autonomous systems, and aerospace/defence components.
- Functioning as a training and talent pipeline accelerator in partnership with local universities, colleges, and military institutions.

Based on similar facilities in NATO countries (such as the UK's Defence and Security Accelerator hubs and Arlington's National Landing innovation district), conservative initial estimates indicate that direct annual output could range from C$75–125 million within the first decade. This would be complemented by indirect and induced impacts — generally increasing the total economic footprint by 40–60% (Brookings Institution, 2022; North American Treaty Organisation, 2024).

Although modest compared to capital-intensive manufacturing projects, this initial footprint is strategically important. Defence innovation clusters usually show compound annual growth over extended periods, driven by increased technology adoption, growing defence budgets, and the integration of SMEs into high-value supply chains (Organisation for Economic Co-operation and Development, 2023) and (Government of Canada, 2024).

Growth Scenario: SecureTech and Defence Campus – Canada's National Hub for Defence, Space & Cyber Innovation

Operating Characteristics of SecureTech and Defence Campus

The **long-term vision** for the SecureTech Campus is that of a multifunctional ADS cluster existing within Kanata North. It would include defence and aerospace companies, startups, SMEs, multinationals, and their facilities. While such development may require several decades to achieve its full potential, it has been asserted that the Ottawa region possesses optimal conditions for this growth.

The various industrial development roles that SecureTech would serve were identified earlier. However, its **primary (initial) objective would be to promote the growth of Canada-based and Canadian-owned ADS firms, and innovation activity**. Foreign primes and multinationals dominate Canada's industry, leading to shortened domestic supply chains. Additionally, it is essential for Canadian SMEs and startups to have improved access to the global supply chains of the primes.

Canada's **Industrial and Technological Benefits (ITB) Policy** is one way to promote this activity domestically. Specifically, foreign multinationals in receipt of ITB funds could be approached to establish new ADS investments / startups in Canada. The following is a list of foreign multinationals operating in Canada who are **currently receiving ITB funding**:

- Airbus Defence and Space
- Arcfield Canada
- Babcock Canada
- Bell Helicopter Textron Canada
- Boeing Defence, Space and Security
- Chantier Davie Canada
- General Atomics Aeronautical Systems
- General Dynamics Land Systems Canada
- L3Harris Technologies MAS
- Leonardo
- Lockheed Martin
- Logistik Unicorp

- Mack Defence
- Mercedes Benz Canada
- QinetiQ Group
- Rafael Advanced Defense Systems
- Raytheon Canada
- Raytheon Missiles & Defense
- Raytheon Technologies
- Rheinmetall Canada
- Saab Microwave Systems Canada
- Seaspan Vancouver Shipyards
- Seaspan Victoria Shipyards
- Sikorsky Aircraft
- Standard Aero
- Textron Aviation
- Textron Systems Canada
- Thales Canada
- Thales Canada Optronics
- Thales Joint Venture Canada/Australia
- Top Aces
- ViaSat
- Weatherhaven

The idea is to further **multinational corporate venturing, spinoffs, and innovation through ITB and other government policies**. Recent examples include:

- Equispheres, headquartered in Kanata, secured a $5 million USD investment from Lockheed Martin as part of its ITB commitments. This investment allowed Equispheres, a materials science company, to expand its operations in supplying materials for advanced technologies, including additive manufacturing, 3D printing, and cold spray deposition. The company now has customers in many sectors, in addition to aerospace and defence.
- ISED has designated some Canadian innovation facilities as Public Research Institutes (PRIs). This makes investments by foreign multinationals as eligible for offsets under DND procurement. Area X.O. qualifies as a PRI.
- As part of its ITB obligations for the P-8, Boeing invested $13 million in COTA Aviation, an Indigenous-owned company located in Parksville, B.C. This investment established an aerospace manufacturing training facility focused on increasing the representation and participation of Indigenous peoples in the aerospace and defence sectors.
- Also, because of the P-8 win, Boeing will invest $48 million to build research and development capacity within its Vancouver facility. Boeing Vancouver will utilize advanced modelling and machine learning techniques to develop program management tools that support aircraft fleet sustainment. This initiative will enable Boeing Vancouver to optimize aircraft performance and minimize sustainment costs.

Other policy initiatives that would facilitate development of SecureTech include:

- Introduce procurement quotas for SMEs (like the U.S. SBIR).
- Make SecureTech a national defence hub with its own Strategic Innovation Fund and federal support.
- Extend IRAP to defence SMEs.
- Require innovation offsets that support Canadian businesses.
- Renew the NRC's IP Assist and Elevate IP Programs.

The key question is how many new ADS firms could be launched or drawn to Kanata North during the forecast period. The bottom-up forecast, below, estimates firm numbers and the incremental Output ($) they would bring to Kanata North.

Please note that the growth identified in the following table is **in addition to** the growth already captured in the **Growth Baseline Scenarios.**

Table 37. Output Characteristics of SecureTech and Defence Campus.

Growth Component	Growth Assumption	Growth Justification	Estimated Addition to Annual Kanata North Output (CAD $)
New ADS Anchor Firms Examples: A global prime contractor setting up an R&D outpost. An international cyber or AI security firm expanding to Kanata North.	**1 every 3 years.** Reason: Between 2018-2025 Kanata North attracted one new ADS anchor (large) firm (Leonardo). Now, this rate will double from SecureTech.[82]	It is envisioned that the SecureTech cluster could attract one new ADS anchor firm every three years (especially if it had its own Strategic Innovation Fund (SIF) in place).	**120 million.** Research indicates that CAD $120 million would be appropriate for an average anchor firm. This number was arrived at by examining current ADS anchor firms in Kanata North. These anchors currently have annual sales in the CAD $40-123 million range (Doyletech Corporation, 2025 Survey).
New ADS Startup Firms Example: New composites materials firm is started in Kanata North.	**2 every year.** Reason: Slightly higher rate of ADS startup firm creation than was experienced in Kanata North between 2018-2025 (Doyletech Corporation, 2025 Survey).	It is envisioned that Canada's ITB Policy would result in the creation of two new ADS startup firms per year in Kanata North. This could come about because of ITB requirements placed on foreign multinationals (primes).	**4 x 2 = 8 million.** Research indicates that ADS startups typically generate less than CAD $5 million annually, often starting with federal or IDEaS contracts. Early-stage startups are in the CAD $0-2 million range while Seed to Series A startup are in the range of CAD $2-5 million.[83]
New ADS Scaleup and SME Firms	**1 every year.**	It is envisioned that the SecureTech cluster	**20 million.**

[82] Source: Doyletech Corporation, 2025 Survey. Also, Adelaide, Australia added Boeing Defence, Saab, and BAE Systems (all ADS anchors) in under 10 years.
[83] Sources: Various.

Growth Component	Growth Assumption	Growth Justification	Estimated Addition to Annual Kanata North Output (CAD $)
Example: A scaling Canadian secure tech company moves into Kanata North.	Reason: This recently occurred with Waterloo-based Magnet Forensics opening a facility in Kanata North.	could attract one new ADS scaleup or SME firm to Kanata North.	Research indicates that the average annual sales of Canadian aerospace and defence SMEs fall in the range of CAD $5–20 million per year.[84]
New ADS R&D Spending Example: In 2025, Kongsberg Geospatial expanded its footprint in Kanata North. The expansion is linked to NAV Canada's new Digital Aerodrome Air Traffic Services Project, which aims to create the world's largest remote digital air traffic management system.	**10 million per year.** Reason: This amount is highly variable, and hard to estimate.	It is envisioned that the SecureTech cluster would benefit from incremental new R&D spending in Kanata North.	**$3 in Output (Sales) for every $1 of R&D.** OECD and Canadian studies indicate that each $1 of R&D yields $2-3 in direct firm sales (however, the multiplier should be on the higher end for Kanata North due to the density of export-led aerospace and defence companies). High-impact innovation (dual-use, export-ready technology) yields stronger multipliers. [85]

When these four growth factors are combined, the average annual ADS Output in Kanata North is estimated to rise by about C$100 million during the initial years. To be consistent with the other growth scenarios, it is assumed that this additional Output would begin in 2036 and continue to 2046.[86]

1.10.5 Growth Forecasts for SecureTech and Defense Campus

In this section, growth forecasts are developed for the SecureTech and Defence Campus.

Growth Scenario: SecureTech and Defence Campus Incorporated into Moderate Upside Forecast for Kanata North

[84] Sources: Various, including CSA. Average revenue across all Canadian defence-related firms in 2022 was approximately CAD $24 million, but that average includes larger primes and public-sector-linked suppliers. Smaller firms typically fall well below that number, often in the CAD $5–20 million range, consistent with aerospace SME averages.
[85] Note: there is always a time lag between the time of the R&D investment and the subsequent increase in direct firm Output (Sales). This lag can be five years or more. Such lags have not been incorporated into this growth forecast.
[86] This is a subjective, and simplifying, assumption (a start date before 2036 is also likely).

Table 38, below, shows the results of incorporating this growth scenario with the Moderate Upside Forecast for Kanata North.

Table 38. SecureTech and Defence Campus: Canada's National Hub for Defence, Space & Cyber Innovation – Forecasts for Specific Growth Scenario (Using the Moderate Upside Growth Baseline).

IOIC Industry	2025 Survey	2036 Forecast	2046 Forecast
Accounting, tax preparation, bookkeeping and payroll services [BS541200]	18,370,200	24,628,889	27,071,045
Aerospace product and parts manufacturing [BS336400]	458,581,242	750,122,859	811,087,196
Agencies, brokerages and other insurance related activities [BS524200]	3,648,000	4,753,737	5,238,707
Alumina and aluminum production and processing [BS331300]	5,600,000	9,722,191	10,466,662
Architectural, engineering and related services [BS541300]	64,911,557	87,162,148	95,791,568
Automotive repair and maintenance [BS811100]	1,632,080	2,134,625	2,351,596
Banking and other depository credit intermediation [BS5221A0]	35,766,442	47,601,511	52,356,344
Communications equipment manufacturing [BS334200]	167,753,735	219,013,041	241,314,422
Computer and peripheral equipment manufacturing [BS334100]	356,172,000	464,146,173	511,496,103
Computer systems design and related services [BS541500]	1,535,846,161	2,002,135,503	2,206,312,721
Converted paper product manufacturing [BS322200]	24,488,377	32,031,354	35,286,868
Cutlery, hand tools and other fabricated metal product manufacturing [BS332A00]	10,795,428	14,853,305	16,288,462
Data processing, hosting, and related services [BS518000]	10,350,000	14,103,019	15,478,960
Educational services [BS610000]	12,219,600	15,937,365	17,561,853
Electric lighting equipment manufacturing [BS335100]	6,574,000	8,568,233	9,442,188
Employment services [BS561300]	33,644,604	43,841,182	48,313,936
Financial investment services, funds and other financial vehicles [BS52A000]	95,252,327	124,544,545	137,207,502
Food services and drinking places [BS722000]	84,302,298	110,132,224	121,339,472
Industrial machinery manufacturing [BS333200]	3,892,000	5,143,178	5,660,585
Legal services [BS541100]	38,710,727	50,442,682	55,588,933
Lessors of real estate [BS531100]	85,770,000	111,949,112	123,351,478
Management, scientific and technical consulting services [BS541600]	37,023,000	48,243,460	53,165,342
Medical equipment and supplies manufacturing [BS339100]	36,928,960	48,166,210	53,075,590
Miscellaneous ambulatory health care services [BS621A00]	21,701,021	28,277,891	31,162,850
Non-depository credit intermediation [BS522200]	26,134,615	34,137,475	37,611,842
Non-residential building construction [BS23B000]	33,303,635	43,396,877	47,824,302
Offices of dentists and physicians [BS621200 & BS621100]	64,251,763	83,724,371	92,266,077
Offices of real estate agents and brokers/activities related to real estate [BS531A00]	18,728,000	24,423,269	26,912,992
Other activities of the construction industry [BS23E000]	14,225,846	18,563,080	20,454,281
Other electrical equipment and component manufacturing [BS335900]	1,650,000	2,344,904	2,564,257
Other electronic product manufacturing [BS334A00]	523,603,062	682,782,277	752,390,692
Other general-purpose machinery manufacturing [BS333900]	3,856,483	5,110,647	5,623,332
Other miscellaneous manufacturing [BS339900]	1,200,000	1,736,199	1,895,729
Other professional, scientific and technical services [BS541900]	11,082,306	15,700,317	17,173,612
Other transportation equipment manufacturing [BS336900]	51,086,466	66,587,202	73,378,697
Personal care services and other personal services [BS812A00]	27,435,245	35,761,641	39,408,916
Pharmaceutical and medicine manufacturing [BS325400]	90,860,000	118,496,042	130,575,079
Printing and related support activities [BS323000]	103,322,111	134,731,449	148,467,213
Residential building construction [BS23A000]	83,218,000	108,438,654	119,501,754
Resin, synthetic rubber, artificial/synthetic fibres/filaments manufacturing [BS325200]	800,000	1,202,083	1,308,436
Scientific research and development services [BS541700]	2,480,000	3,231,607	3,561,301
Semiconductor and other electronic component manufacturing [BS334400]	1,129,667,584	1,472,247,534	1,622,426,888
Software publishers [BS511200]	1,118,850,879	1,458,171,708	1,606,913,076
Telecommunications [BS517000]	1,092,286,817	1,423,797,881	1,569,007,791
Transportation engineering construction [BS23C100]	36,450,000	47,496,803	52,342,509
Warehousing and storage [BS493000]	700,000	936,996	1,030,055
Waste management and remediation services [BS562000]	6,429,000	8,924,575	9,779,254
Retail	132,322,270	173,844,432	191,435,512
Wholesale	50,121,932	70,047,311	76,710,580
Other (Not Elsewhere Categorized)	237,655,414	314,891,093	346,485,287
Total:	**8,011,655,186**	**10,618,380,863**	**11,683,459,844**

1.11 Growth Scenario Comparisons

Table 39, below, presents a comparison of the growth scenarios discussed in this report.

Table 39. Comparison of Growth Scenarios (All).

Output (C$)	2025 Survey	2036 Forecast	2046 Forecast
Utilizing the Baseline Forecasts by City of Ottawa	8,012,000,000	9,911,000,000	10,723,000,000
Utilizing the Moderate Upside Forecasts by Oxford Economics	8,012,000,000	10,440,000,000	11,505,000,000
Utilizing the Moderate Upside Forecasts by Oxford Economics and the Introduction of a Compound Semiconductor Fab Starting in 2036	8,012,000,000	11,903,000,000	12,969,000,000
Utilizing the Moderate Upside Forecasts by Oxford Economics and the Introduction of Five Data Centres Starting in 2036	8,012,000,000	11,292,000,000	12,357,000,000
Utilizing the Moderate Upside Forecasts by Oxford Economics and the Introduction of $100M in New ADS Annual Output Starting in 2036	8,012,000,000	10,618,000,000	11,683,000,000

Numbers rounded.

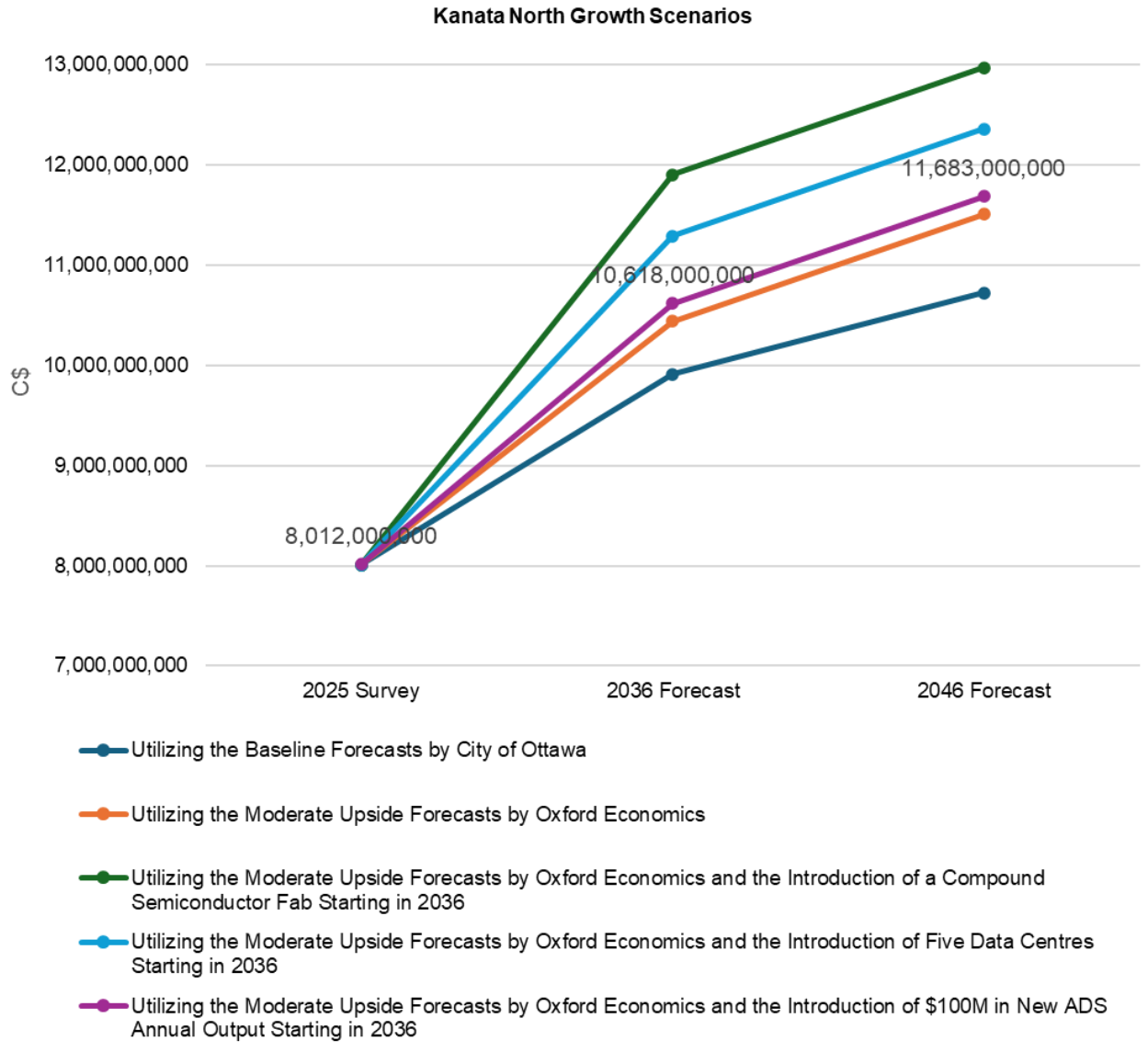


Figure 1-11. Visual comparison of the Growth Scenarios (All).

1.11.1 Growth Scenario Aggregation

Figure 1-12, below, compares the Moderate Upside Forecasts for Output to an *amalgamation* of the three growth scenarios as at 2036 and 2046.

Table 40. Amalgamation of the three growth scenarios as at 2036 and 2046.

Output (C$)	2025 Survey	2036 Forecast	2046 Forecast
All Three Growth Scenarios Aggregated (As At Date)	8,012,000,000	12,934,000,000	14,000,000,000
Utilizing the Moderate Upside Forecasts by Oxford Economics	8,012,000,000	10,440,000,000	11,505,000,000

Numbers rounded.

Table 41. Forecasted 2046 output.

	2046 Output (CAD$)
Moderate Upside Forecast for Output from Oxford Economics	11,504,804,783
Incremental Output from Compound Semiconductor Fab (Direct + Indirect)	1,463,729,542
Incremental Output from Data Centres (Direct + Indirect)	852,334,486
Incremental Output from Expansion of ADS Cluster (Direct + Indirect)	178,655,060
	13,999,523,872

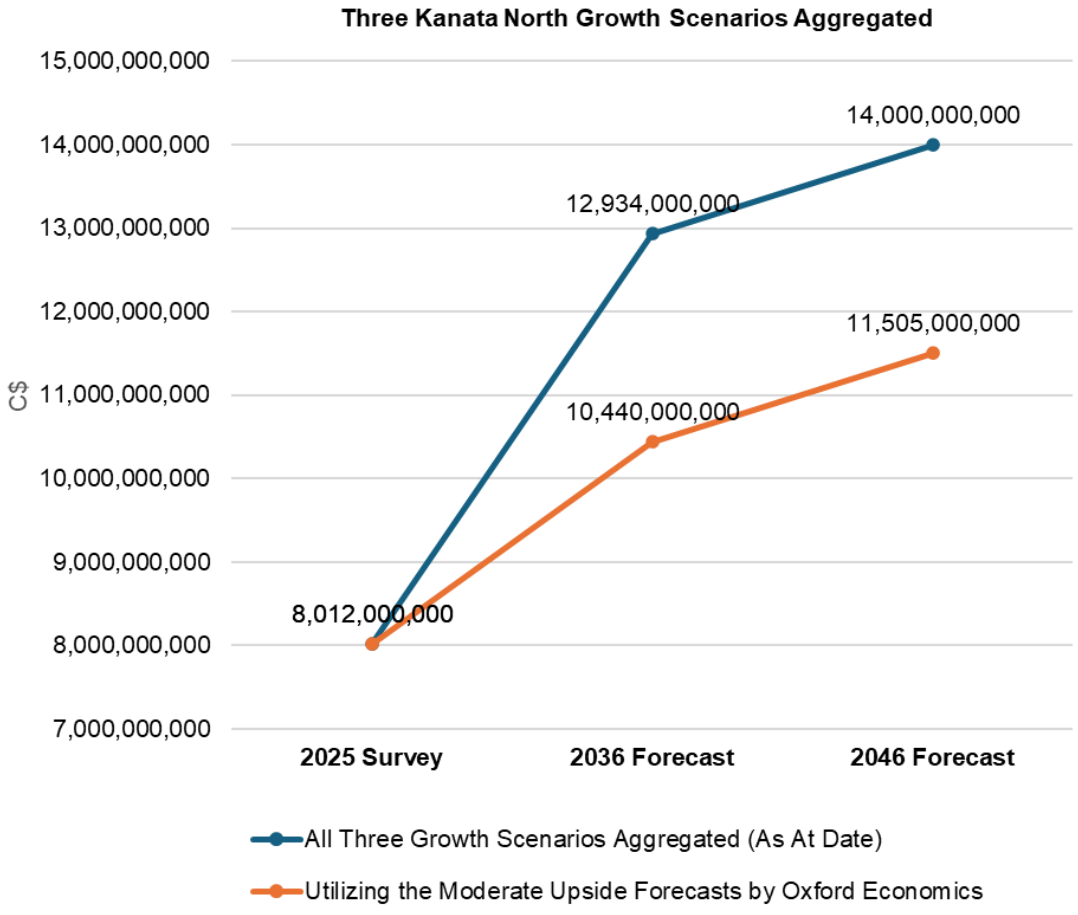


Figure 1-12. Amalgamation of the three growth scenarios.

2.0 Energy Study

2.1 Energy Study Summary

2.1.1 Purpose of the Study

In response to anticipated economic growth and increasing energy needs at Kanata North Technology Park, this study aims to support strategic planning for energy resilience, sustainability, and economic development. Through this study, OCAF, Hydro Ottawa, and the KNBA align in their efforts to deliver energy services that are cost-effective, low-carbon, and reliable to bolster economic growth and promote energy resilience.

2.1.2 Context and Scope

The Tech Park is Canada's largest tech park. Home to over 540 companies in various sectors that include clean tech, AI, fintech, and healthcare the Tech Park is represented by the KNBA, the park is a key driver of Ottawa's economic growth and has been designated a Special Economic District.

As the park expands, OCAF, Hydro Ottawa, and KNBA are working together to anticipate rising energy demands to provide reliable, low-carbon, and cost-effective energy solutions and align with the City of Ottawa's Climate objectives to reduce community greenhouse gas (GHG) emissions by 100% by 2050.

Ensuring energy resilience and sustainability is vital for attracting new tech companies and positioning the park as a leader in climate resilience and low-carbon energy management. This study models current and future energy profiles and the impacts of economic growth scenarios to assess future electricity and natural gas consumption, electrical demand, usage intensity and end-use breakdowns of the Tech Park.

2.1.3 Methodology

In this study, two scenarios were developed to project future energy consumption in Kanata North Tech Park.

• **Scenario 1 – Baseline Growth**: Based on the City of Ottawa's first economic growth scenario, which projects an overall 33.8% increase between 2025 and 2046 (approximately 1.3% annually). This scenario provides a consistent, population-driven benchmark for energy demand aligned with regional planning assumptions. Note that the Moderate Upside Forecast introduced in the Economic Analysis section is already integrated as the baseline into the three sector-based economic growth scenarios in Part 1 (Semiconductor, Digital Infrastructure/Data, and Defence/SecureTech).

• **Scenario 2 – Stakeholder-Guided Growth Scenario**: This scenario builds upon insights gathered from stakeholder interviews and is directly aligned with the sectoral economic growth scenarios developed for the Kanata North Tech Park. It focuses on the three key industries identified as primary drivers of future growth — semiconductors, defense technologies, and AI data centres — ensuring that projected energy demand scales consistently with the corresponding economic expansion. Stakeholder inputs were used to validate and refine these sectoral pathways rather than to introduce new or independent growth assumptions.

As noted, new data centres expected to be added to the Park in the future were not included in this energy scenario; the projections instead capture the growth and operational intensification of existing data centres already active in the region.

Additionally, information obtained from stakeholder interviews regarding sustainability or decarbonization objectives — such as planned electrification, efficiency upgrades, or emissions-reduction targets — was incorporated into the model where applicable. These objectives informed adjustments to the energy intensity of specific businesses or sectors, ensuring that Scenario 2 reflects both economic expansion and the anticipated effects of major sustainability initiatives within the Park.

2.1.4 Key Findings

The total estimated energy consumption of the park for 2025 is approximately 339 GWh, with an average energy intensity of 250 kWh/m^2, and maximum monthly electrical peak demand of 82.1 MW. Electricity accounts for approximately 79% of total energy use, while the remainder is assumed to be predominantly natural gas. Among all NAICS sectors analyzed, the Information Sector contributes the largest share of overall energy consumption, with electrical process loads driving the demand for energy. The two scenarios project increases in total energy consumption of 465 GWh and 887 GWh, respectively, over the next 25 years, indicating significant increases in both consumption and demand. Energy partners can use this analysis to plan for the required electrical capacity and delivery infrastructure to meet expected needs of the Tech Park. Renewables, battery energy storage, and resiliency measures to support the growing demand for clean, reliable energy will also be important considerations.

Seasonal peak demand analysis further highlights the implications of this growth. Both **summer** and **winter** peaks show steady increases under the baseline but rise much more rapidly in the Stakeholder-Guided Growth Scenario. By 2050, summer peaks could approach **240 MW**, while winter peaks may exceed **175 MW**, nearly doubling the baseline projections. This indicates that **year-round grid capacity planning** will be critical, with summer peaks emerging as the dominant stress point under high-growth conditions.

2.2 Energy Analysis Overview

2.2.1 About OCAF and the Broader Climate Context

The Ottawa Climate Action Fund is a city-focused initiative established to accelerate Ottawa's transition to an equitable, carbon-neutral future. Formed in 2021, OCAF's mission is to help bring Ottawa's city-wide carbon emissions to net-zero by 2050 while also enhancing the resilience of homes, businesses, natural spaces, and infrastructure against the impacts of climate change. OCAF was initially incubated by the Ottawa Community Foundation (OCF) and funded by the Federation of Canadian Municipalities (FCM). This funding was part of a broader federal initiative to support local climate action through the Low Carbon Cities Canada (LC3) network, which aims to scale up local climate solutions across seven major Canadian cities. As of October 2024, OCAF became an independent charity, continuing its mandate to drive local climate resilience and scale effective low-carbon solutions.

One of OCAF's focuses is on removing barriers to climate solutions, strengthening partnerships, and supporting business models that can be scaled for greater impact. In alignment with this effort, OCAF is partnered with Kanata North Business Association (KNBA) and Ottawa Hydro to conduct this study with the overall goal of bolstering economic growth and ensure energy resilience in least-cost, low-carbon, and timely manner.

2.2.2 Purpose of the Report

Arup is the study project partner undertaking the energy consumption and demand portion of the study stemming from the economic results. The objectives of the study are as follows:

1. Detail the current economic status at the Tech Park and potential economic growth scenarios
2. Outline the current and expected demand for energy services at the Tech Park while estimating the scale of potential growth opportunity for energy services.
3. Deliver insights on trends, opportunities, and challenges with respect to the economic and energy status of the Tech Park with the mission to bolster economic growth and ensure energy resilience in a least-cost, low-carbon, and timely manner.

This report has been developed to support OCAF in understanding the energy demand of Kanata North Tech Park. Building on the outcomes of the economic growth analysis, this report investigates how the energy needs of the Tech Park will evolve over the next 25 years. The modelled scenarios focus on classifying the growth in different business sectors and building types found in the Tech Park. This report highlights the process involved in studying the existing state of energy consumption, the baseline energy growth scenario, and possible alternate future scenarios due to expansion and climate objectives of businesses at the Tech Park.

2.2.3 Limitations of this Study

Existing and future building demand and consumption values within this analysis are based on best available received data. Any missing data was estimated using building function specific factors. The estimated future electricity demand and consumption are based on a range of assumptions and parameters. The actual future utility demand and consumption will vary depending on parameters, including but not limited to the actual building area developed and associated space programming, actual building performance level, future climate change conditions, past and future retrofit measures and modifications to existing infrastructure, and more. The assumptions, methodology, results, and takeaways associated with the study are expanded upon later in the report, and detailed assumptions and data limitations are included in Appendix 4.

2.2.4 Project Background

KNBA is the representative body for over 540 companies and over 1.4 million square metres of buildings in Canada's largest technology park, advocating for business growth, innovation, and collaboration within the Ottawa region. The association provides support, promotes the tech park as a hub for technology and talent, and works closely with city and industry stakeholders to address member needs and foster economic development. To ensure the continued growth and sustainability of the tech park, the association is conducting an energy study to gain insights into future energy requirements, enabling businesses and stakeholders to plan effectively and support the development of efficient, reliable infrastructure for the years ahead. This study is highly relevant to the technology park, which hosts several major enterprises—including data centers and technical manufacturing firms—with substantial electricity requirements. Anticipated rapid growth within these companies underscores the increasing necessity for this study.

The map in Figure 2-1 outlines the general boundary lines of the Tech Park, however, KNBA has expanded to include small businesses scattered throughout the surrounding area as well. Data provided by Doyletech includes surrounding areas, though it is different from the boundary identified by the City of Ottawa. The latter is the boundary shown in the map, and there are some businesses included in the

Doyletech database which are mainly home offices. There are multiple different types of buildings including residential, commercial, retail, and office towers. The total number of buildings in this study sums to 254 while the total number of businesses in the database sums to 797. It is common that multiple businesses are situated within a single building.

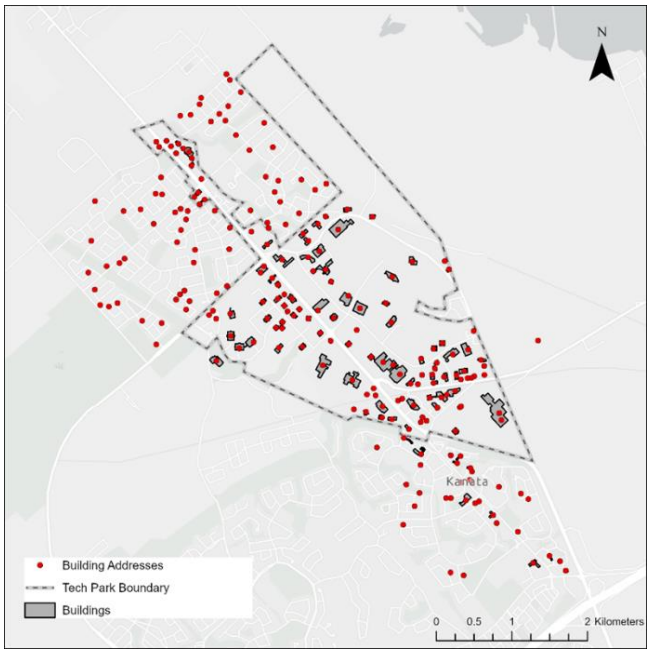


Figure 2-1. Map of Kanata North Tech Park

2.3 Energy Demand Analysis

2.3.1 Introduction

This section outlines the methodology, assumptions, sources, and considerations used to estimate energy consumption at the Tech Park. It presents the 2025 energy profile, analyzes Scenario 1 (Baseline Growth) and Scenario 2 (Stakeholder-Guided Growth). Additional supporting comments and details regarding the methodology are provided in Appendix 1.

Scenario 1 is based on the City of Ottawa's first economic growth scenario, which reflects population-driven growth at the macro level. Scenario 2, while also grounded in the same sectoral economic growth forecasts, refines the analysis by focusing on high-impact industries identified as key growth drivers—specifically semiconductors, defense technologies, and AI data centres. The approach ensures that energy demand projections remain directly tied to the corresponding economic growth trajectories for these sectors, rather than introducing new or independent assumptions.

Once again, new data centres anticipated to be added to the Tech Park were not included in this scenario; instead, the modelling captures the growth and operational intensification of existing data centres. Moreover, inputs from stakeholder interviews provided additional context regarding sustainability and decarbonization objectives (e.g., planned electrification or efficiency upgrades), which were incorporated where applicable to refine projected energy intensities. This combined approach ensures that Scenario 2 accurately reflects both sector-specific economic expansion and the anticipated sustainability transitions within the Kanata North Tech Park.

The following sources underpin the current and future energy model:

- Database of KNBA businesses (Doyletech): master business list with business characteristic information including NAICS Code, address, and operation notes.
- KNBA building inventory (Colliers): list of buildings with information including the address, year built, building floor area, and number of employees.
- Ottawa Hydro Kanata feeder data (Ottawa Hydro): 8760 hour by hour annual raw electrical data by feeder used for testing and verification of total energy consumption and demand verification only. Raw data was not included in projections or analysis.
- Economic growth scenarios presented in Economic Analysis.

2.3.2 Methodology

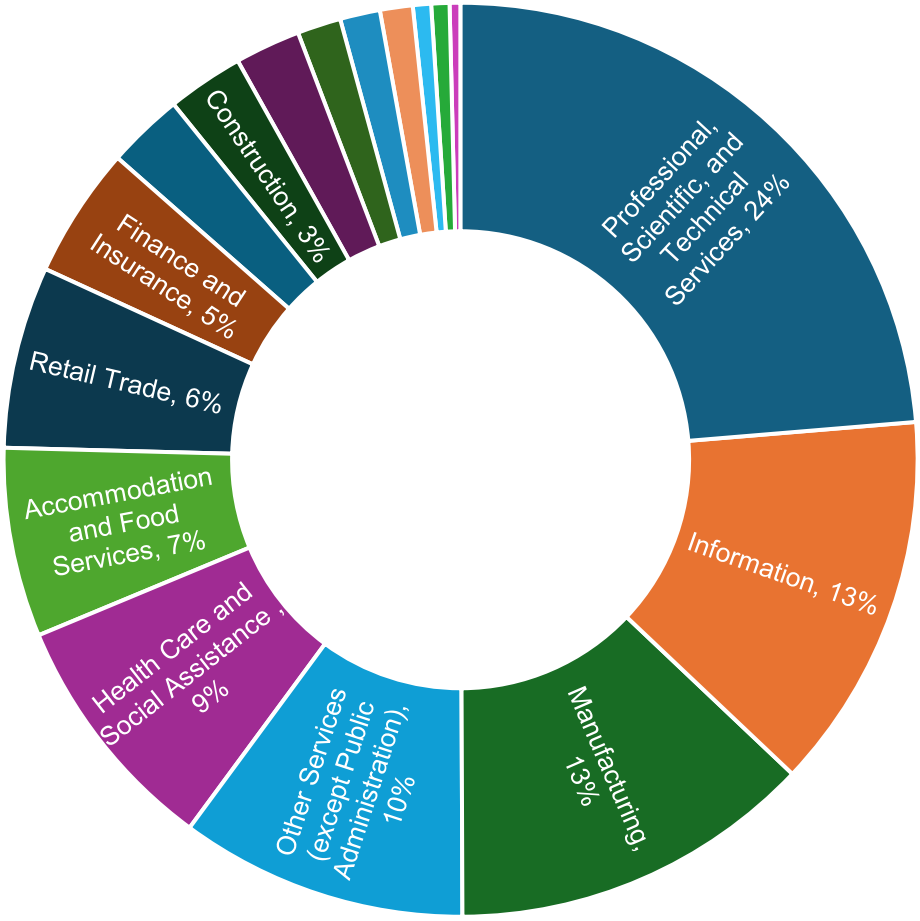
Overview of Business Sectors

All businesses at the Tech Park were categorized using the North American Industry Classification System (NAICS) (Statistics Canada, 2025), based on the outcomes of the Doyletech economic analysis. The business database was referenced to extract the required information as it contains information such as the full industrial sector classification number, financial metrics, address, and other characteristics of each business.

Figure 2-2 depicts the breakdown of primary business sectors by number of businesses present under a specific sector at the Tech Park. The first number that appears with the sector label indicates the number of companies mapped under that sector, while the following percentage value represents the contribution if that sector to the total number businesses in the Tech Park. There are 17 categories represented,

comprising 777 companies. Figure 2-2 shows three key sectors contributing to half of the businesses: (1) Professional, scientific, and technical services, (2) Information, and (3) Manufacturing.

Figure 2-2. Tech Park Businesses Distribution Rate by NAICS Sector.



Mapping NAICS Sectors to Building Prototypes

To understand the energy demand of the park, energy use was approximated at the building level and then aggregated to form a picture of the entire Tech Park.

Business attributes and sector classifications provided in the Doyletech database were mapped to distinct buildings in the Colliers database. Each business was assigned a representative building prototype based on its NAICS Sector classification (For example, an "Information and Cultural Industries" sector was assumed to operate from office buildings, while "Manufacturing" sectors were assigned warehouse-style light industrial or flex space building types). Businesses were mapped to representative building types based on the NAICS description of the function and activities performed within the sector, as shown in Table 42.

Table 42. Building Type and EUI Allocation by NAICS Sector.

NAICS Code	Sector Title	Energy Use Intensity (kWh/m^2)	Selected Building Prototype Description
23, 31, 33, 41, 42, 48, 49	Construction // Manufacturing // Wholesale Trade // Transportation and Warehousing	**120**	Warehouse (non-refrigerated)
44, 45	Retail Trade	**252**	Strip Mall
51, 52, 53, 54, 55, 56, 61, 62, 81, 91, 92	Information // Finance and Insurance // Real Estate and Rental and Leasing // Professional, Scientific, and Technical Services // Management of Companies and Enterprises // Administrative and Support, Waste Management and Remediation Services // Educational Services // Other Services // Public Administration	**134**	Medium Office
517, 518	Telecommunications // Data Processing, Hosting, and	**650**	Data Centre
62	Health Care and Social Assistance	**206**	Medical Office
71	Arts, Entertainment, and Recreation	**239**	Entertainment / Public Assembly
72	Accommodation and Food Services	**356**	Fast Food Restaurant

* A comprehensive table with the options between US DOE and EnergyStar EUIs is also included in this report for reference in Appendix 4.

The proportional occupancy of each building was also estimated using employment data for each business located within a building. This mapping enabled us to understand the type of activities that occur in each building, and in what proportion.

The following sources were then used to model energy use intensity (EUI) of each business by assigning each business an energy profile based on the associated building prototype. The US DOE data was a preferred starting point for EUI mapping due to its more relevant building stock and climate-specific data. The Energy Star data was used to verify, add detail and adjust values to be appropriate to the tech park and the Canadian building stock.

Source 1: US DOE Commercial Reference Buildings

The US Department of Energy (DOE) has developed Building Energy Prototypes, which are model buildings that represent typical structures across the U.S. commercial and residential sectors. The prototypes simulate energy performance of 16 reference building types (including offices, schools, hospitals, and hotels) across 16 U.S. climate zones (Office of Energy Efficiency and Renewable Energy, n.d.). The models are based on real-world building stock data and building standards. From these models we can extract typical EUI as well as energy end-use breakdowns for each building type.

The prototypes are based on the requirements set out in ASHRAE 2013 standards, following the methodology of Standard 90.1 Performance Rating Method Appendix G (ASHRAE, 2013).

Source 2: Energy Star Portfolio Manager

Energy Star is a benchmarking database of national median reference EUI values for all Portfolio Manager property types (U.S. Environmental Protection Agency, 2025), and is based on survey data from Statistics Canada, in partnership with Natural Resources Canada. The Survey on Commercial and Institutional Energy Use (SCIEU) for 2019 (Government of Canada, 2019) uses the statistical building register and includes buildings of all vintages.

Source Attributes & Justification:

Climate Zone

DOE data is climate-zone based and can be translated to the most representative climate zone matching Ottawa (ASHRAE Climate Zone 5b), while Energy Star data more broadly includes buildings across Canada and is not separated by climate zone.

Age of Buildings

The average age of the buildings in Kanata is 35 years (1990) this is more aligned with DOE data than with Energy Star data which is buildings of all vintages including historic.

End Use Breakdowns

DOE data is more detailed, giving annual energy profiles and energy end-use breakdowns catered by climate zone. This data is not available from the Energy Star source. Prioritizing DOE data allows the method to apply end-use breakdowns for building prototypes with greater precision.

Specificity

While there are 16 DOE prototypes available, there are 98 specific building functions in the Energy Star database. There are some businesses which have uses that are not a strong fit for the DOE prototypes, and in these cases, the Energy Star source is used to provide a more suitable estimate of energy intensity.

Data Centres

Average EUI for data centres are difficult to find reference for based on the variable operating performances of data centres. Data centre EUIs can range from the low hundreds, to higher than 10,000 kWh/m², depending on several factors including age of equipment, function, HVAC system type, etc. Data centre assumptions related to Gross Floor Area (GFA) and EUI are critical as they can impact the total energy consumption estimations of the Tech Park by entire orders of magnitude. For this reason, a starting point reference that was used in this analysis was the “Energy Star Data Center Estimates in the United States and Canada” which states that the average source energy use intensity for a data centre that occupies greater than 10% of the property floor area is around 600 kWh/m^2 (Energy Star Portfolio Manager, 2018). This EUI estimate was increased to calibrate the total estimated electrical energy consumption of the Tech Park to the total electrical energy consumption recorded in electrical feeder data serving the tech park. The total consumption of the Tech Park was compared with data from Ottawa Hydro to ensure calibrate and verify the methodology. The EUI for the existing data

centres was updated to 650 kWh/m^2, bringing the total estimated electrical consumption for 2025 to be about 270 GWh. This value was calibrated with feeder data and includes consideration for businesses included in the study that are located outside of the area served by these feeders.

Energy Consumption Baseline Methodology

To estimate the current energy consumption of the Tech Park, the mapped EUIs were translated to annual energy consumption using GFA data.

GFA Data

Three approaches were used to determine GFA, depending on the availability and sensitivity of data:

1. **Colliers Database**: Where available, GFA values were taken directly from the Colliers dataset. These data were available for 89 of the 255 unique businesses in the Doyletech database.

2. **Employment-Based Estimation**: For all businesses other than data centers, GFA was estimated based on Full-Time Equivalent (FTE) employment figures. Both employment figures and GFA values were provided for many of the businesses studied. These data together were used to develop a benchmark of GFA per employee, specific to the tech park. This enabled the approximation of a building's GFA based on the number of employees per business. Where GFA data was not available, it was approximated using 86 square meters per employee. Where there are multiple businesses in a building, the building's GFA is divided amongst businesses according to the proportion of FTEs per business.

3. **Desktop Study for Data Centers**: Given the sensitivity and limited availability of data center GFA, a dedicated desktop study was conducted to estimate GFA for these buildings more accurately. To capture the relatively low occupant density of data centres and acknowledging the impact that data centre projections have on the overall tech park, it was important to take a more detailed approach to estimate the GFA of buildings that house businesses in the data processing and telecoms sector. In such cases, the GFA of these buildings was estimated using the Google Maps area measuring tool.

This multi-pronged approach ensured that the energy estimates were based on the most reliable and context-specific data available.

Estimating Energy Consumption

Using the GFA data from Colliers' database, and prototype energy profiles assigned to each business within the building, the EUI could be translated to a quantitative annual energy use based on commercial reference buildings provided in the U.S. DOE database. The estimated energy consumption for each business in 2025 was calculated by multiplying the GFA by the representative EUI.

The Energy Star building type and EUI was selected as more appropriate for three primary NAICS Sectors listed below:

- "Health Care and Social Assistance" (62)
- "Arts, Entertainment, and Recreation" (71)
- "Accommodation and Food Services" (72)

These sectors are associated with the Energy Star building types labelled “Medical Office”, “Entertainment / Public Assembly”, and “Fast Food Restaurant” respectively:

Energy End Use Breakdown

To create additional insight from the energy profile analysis, energy end use breakdowns were allocated to each building type as shown in Figure 2-3. These breakdowns represent the average percentage of energy used in each building towards needs which include space heating, cooling, lighting, and others.

- In Figure 2-3, (E) indicates electricity and (NG) indicates natural gas. There are eight possible breakdown categories.
- For each unique U.S. DOE building type as shown in Table 42, the energy end use breakdown was extracted based on the climate zone of 6A in Kanata
- Energy Star was selected as the building type and EUI for three NAICS Sectors but does not provide breakdowns. The closest related U.S. DOE building type’s breakdown was applied to those businesses.
- The energy end use breakdown for data centres was referenced from the Institute of Electrical and Electronics Engineers (Dayarathna, Wen, & Fan, 2015).

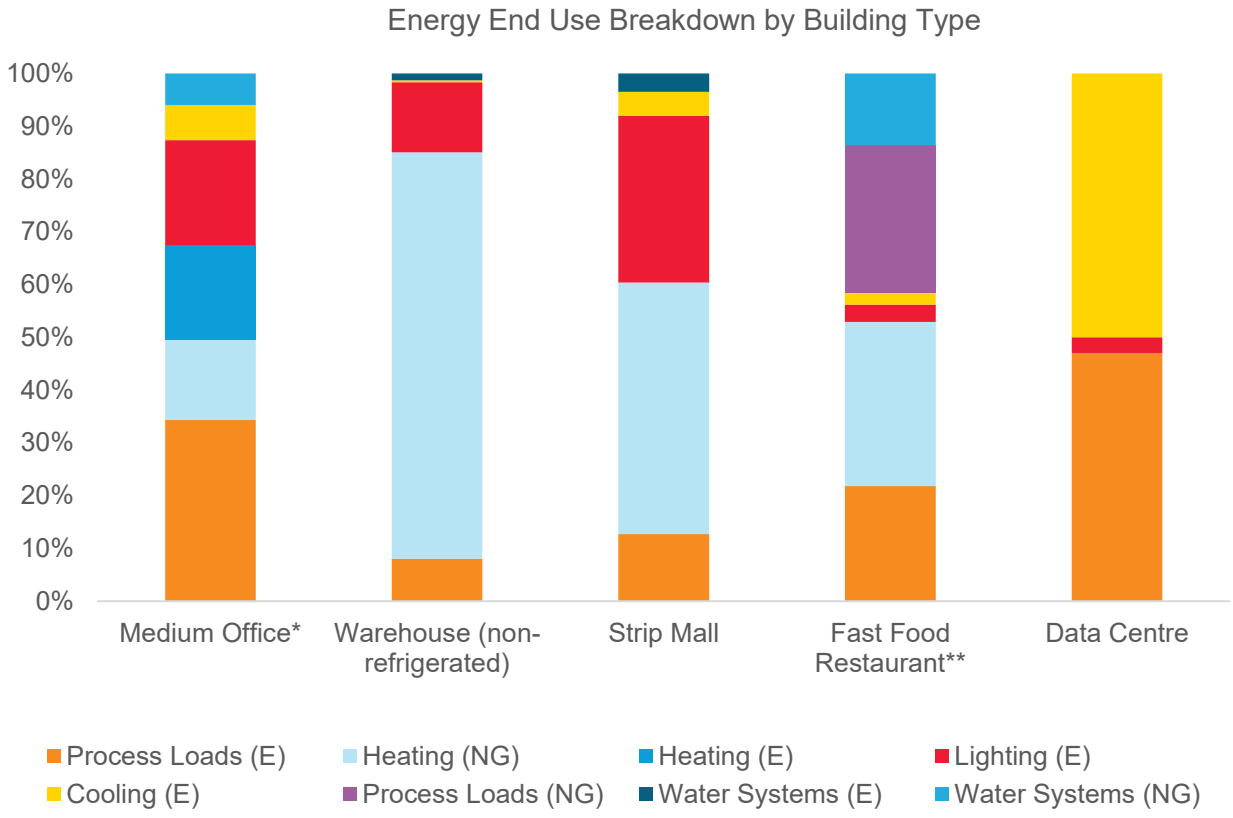


Figure 2-3: End Use Energy Breakdowns by Building Type

**Includes Medical Office and Entertainment / Public Assembly*
***includes Accommodation and Food Service uses*

Estimated Future Energy Consumption

The 2025 energy profile analysis was used as the starting point for a 25-year forecast to 2050. This is conducted to understand what current energy trends and demands would occur and be required in the future. This modelling uses the following assumptions:

- Growth Baselines were supplied with forecast values in 2036 and 2046. Forecasts were aggregated based on the first two digits of the NAICS Sector code.
- Linear interpolation used between 2025 to 2036 and 2036 to 2046. Annual growth percentage is the same between sectors.
- The rate of growth gradually decreases and remains constant from 2037 onwards. The same annual growth rate from 2046 is used to extend the analysis to 2050.
- Used the file as reference for growth forecast "OCAF-StatusQuo-Growth-Baselines-distributed-draft-may6- Economic Growth based of number of jobs- City of Ottawa"
- There are NAICS codes (55, 71, 91) for businesses in the Doyletech OCAF Database that are not reflected in the Growth Baselines file. To conduct a growth forecast for these, the "other (not elsewhere categorized)" line item (under NAICS 81) was used to project the growth.

2.3.3 Current Energy Profile (2025)

Current energy consumption

The estimated energy consumption for KNBA in 2025 is 339 eGWh. A comparison between natural gas and electricity consumption is shown in Figure where a significant proportion of total energy is sourced from electricity.

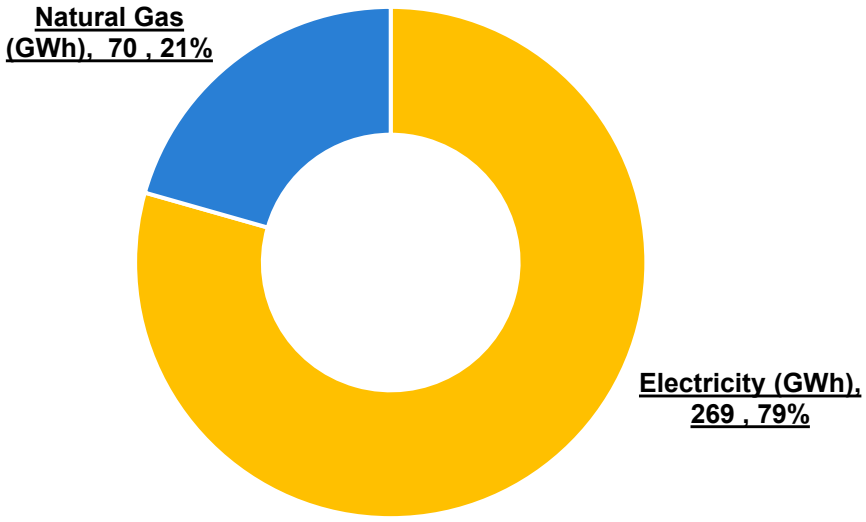


Figure 2-4: Total Electricity and Natural Gas Use 2025

Figure 2-5 illustrates a heat map of the properties in this study as circle with different colours and sizes. The deeper the colour and larger its size, the greater the amount of energy consumption. One building stands out as consuming the greatest quantity of energy on an annual basis at the Tech Park, followed by a few other buildings in nearby proximity. The reasons for high energy consumption can range from the sector and building type due to the higher energy intensity of certain buildings over others, and how many businesses are located within a given building.

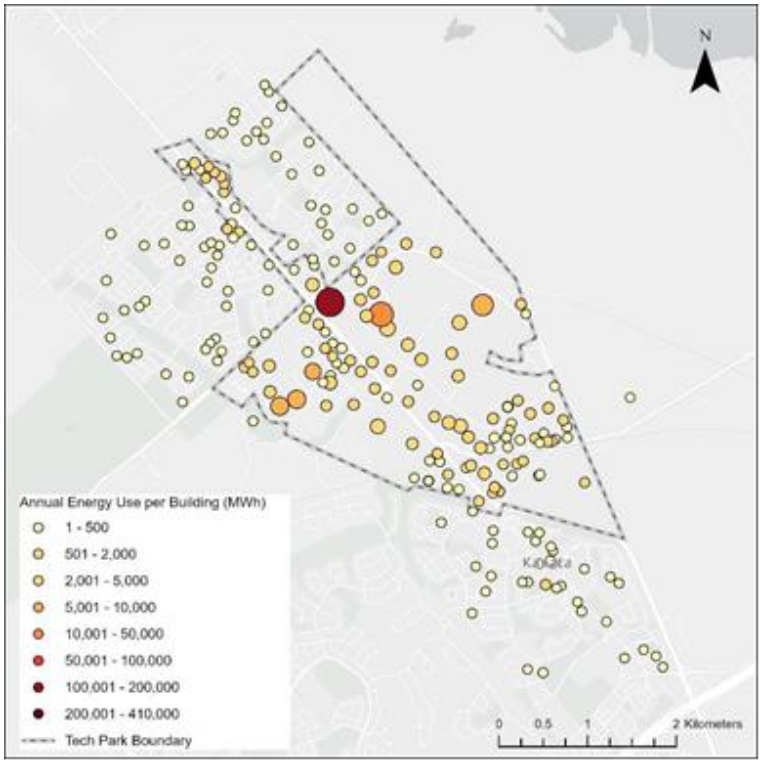


Figure 2-5. Current Energy Profile (2025) Map of Annual Energy Consumption per Building.

In addition to the total energy use, it is also important to understand which end uses are contributing the most to the total. Figure 2-6 estimates the energy end use breakdown across eight categories. Electrical consumption, indicated by (E), is estimated to be responsible for about 80% of the Tech Park's energy profile, signalling that the focus of current and future operation of businesses will rely on the supply of electricity to meet demands[87]. Estimated energy use by on site combustion of natural gas is indicated by (NG).

[87] Note that electricity and natural gas were the only two energy sources studied in this analysis. There may be other sources used at the Tech Park such as propane or burning oil, however, these are typically used in low quantity compared to electricity and natural gas, and the given data does not provide indication of other notable energy sources.

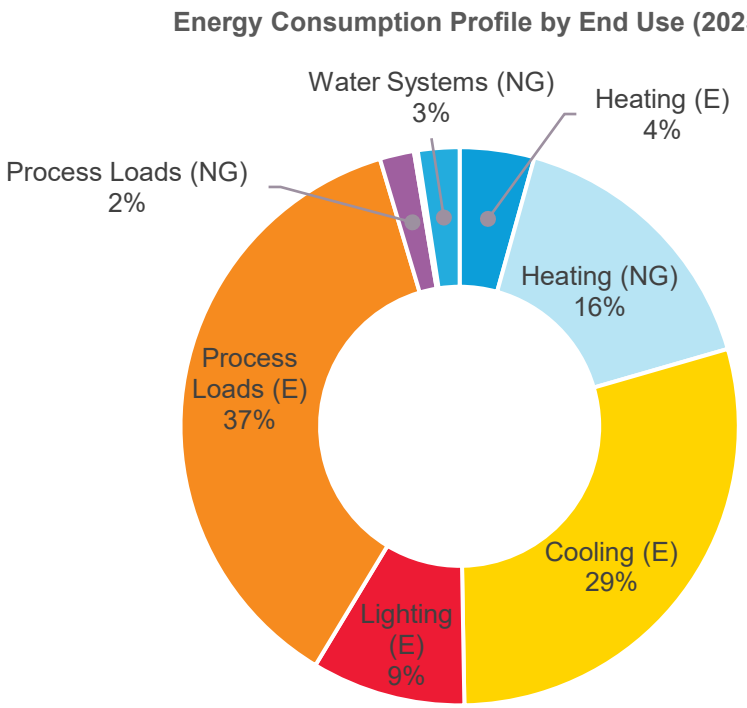


Figure 2-6. Energy Consumption Profile by End Use 2025.

Figure 2-7 provides a comparison of the heavy energy consumers between primary NAICS Sectors. Data
center businesses within the Telecommunications sector are driving more than half of Tech Park's electrical consumption, while the other top sectors are less than 50 GWh combined.

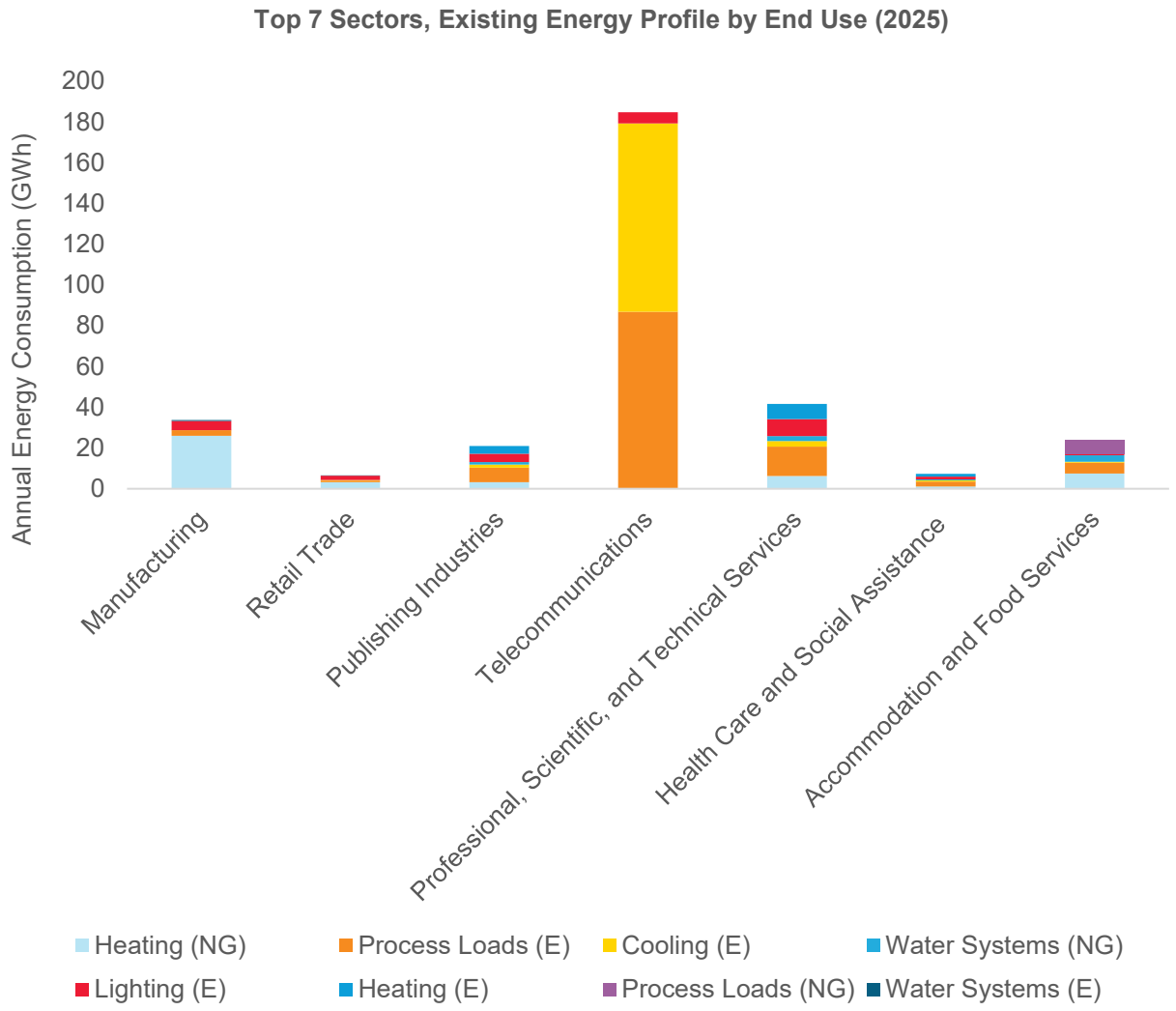


Figure 2-7. Top 7 Sectors, Existing Energy Profile by End Use (2025).

Figure 2-8 presents the portion of end use energy breakdown in each building type and compares it against the seven types. Data centre cooling and process loads lead the energy demand followed by process loads at offices and natural gas heating at warehouse-related businesses.

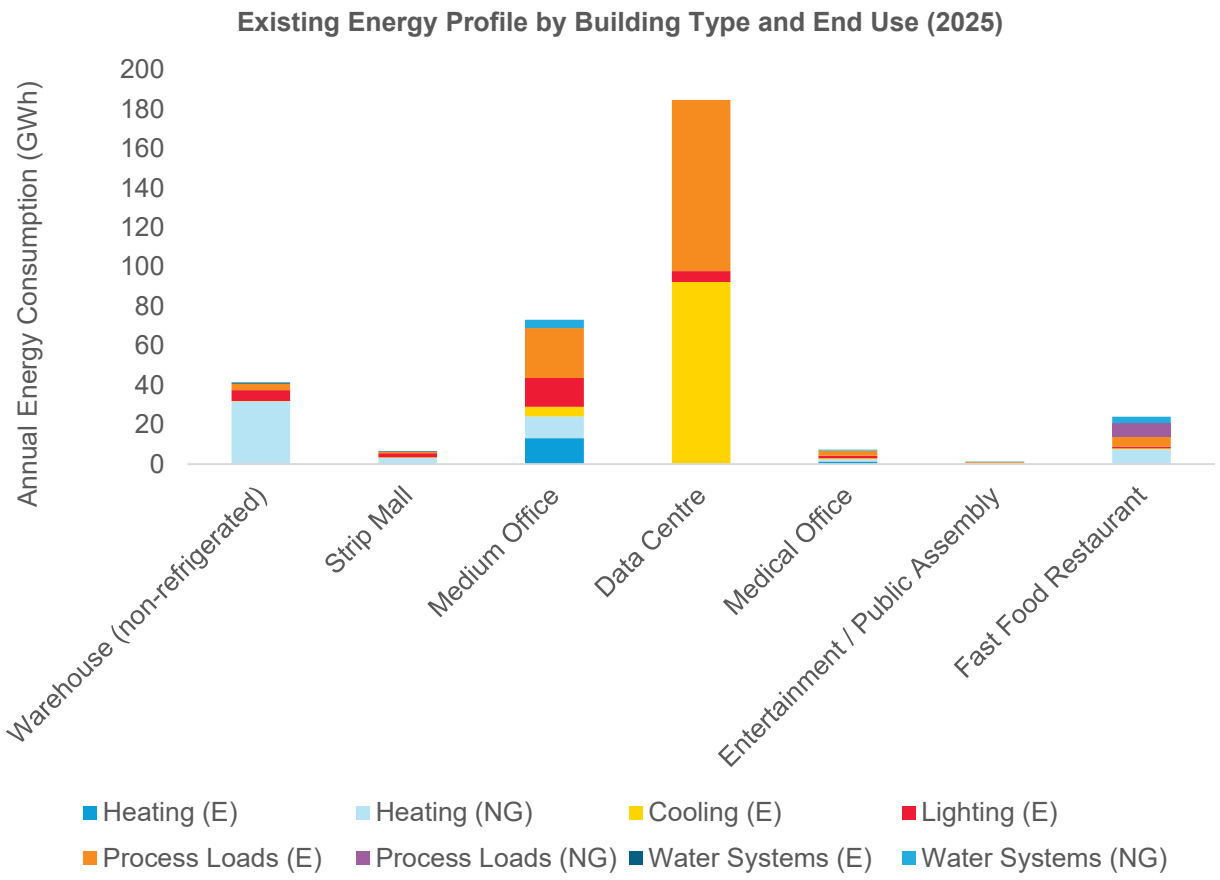


Figure 2-8. Total energy use by building type with end use breakdown (2025).

Current energy Peak Demand

Table 43 displays a heat map of the peak demand experienced at the Tech Park on a monthly basis over five years, from 2020-2024. The inputs into this analysis were sourced from the various feeder historical electrical data records. The deeper the blue, the lower the peak demand, while the more intense the red, the higher the peak demand. Generally, it is found that the relatively lower peak demands occur in the spring and fall months whereas the relatively higher peak demand months fall in the summer season, with some high peaks in certain winter months. It must be noted that across the years and into the future, the energy demand fluctuates based on the businesses present, weather variations, and other factors, all of which contribute to the energy consumption and peak demand figures month to month. It is noted that the peak demands are estimated by aggregating the daily peaks from the five different feeders, and returning the greatest daily peak experienced for a given month.

Table 43. Heat map of aggregate historical peak demand.

Month	2020	2021	2022	2023	2024
January	2020-01-17 12:00	2021-01-29 8:00	2022-01-11 8:00	2023-01-05 17:00	2024-01-31 17:00
February	2020-02-14 7:00	2021-02-01 8:00	2022-02-01 7:00	2023-02-03 7:00	2024-02-02 17:00
March	2020-03-23 10:00	2021-03-02 7:00	2022-03-28 7:00	2023-03-03 6:00	2024-03-21 7:00
April	2020-04-01 7:00	2021-04-08 17:00	2022-04-01 8:00	2023-04-13 17:00	2024-04-04 17:00
May	2020-05-27 16:00	2021-05-21 14:00	2022-05-30 15:00	2023-05-31 15:00	2024-05-22 17:00
June	2020-06-22 14:00	2021-06-28 16:00	2022-06-16 14:00	2023-06-27 17:00	2024-06-18 17:00
July	2020-07-10 16:00	2021-07-06 16:00	2022-07-20 15:00	2023-07-05 16:00	2024-07-15 15:00
August	2020-08-11 13:00	2021-08-26 16:00	2022-08-29 16:00	2023-08-16 16:00	2024-08-01 15:00
September	2020-09-02 16:00	2021-09-08 17:00	2022-09-09 16:00	2023-09-05 15:00	2024-09-16 15:00
October	2020-10-12 8:00	2021-10-12 16:00	2022-10-05 16:00	2023-10-04 15:00	2024-10-01 13:00
November	2020-11-25 17:00	2021-11-29 17:00	2022-11-17 17:00	2023-11-29 17:00	2024-11-14 17:00
December	2020-12-16 17:00	2021-12-07 17:00	2022-12-20 13:00	2023-12-07 17:00	2024-12-23 17:00

From the peak demand analysis presented in Table 43. Heat map of aggregate historical peak demand, the greatest frequency of high peak demand values occurred in the summer months across all years, typically in the late afternoon between June and September. However, in 2024, the peak demand occurred in the late afternoon of winter months and Summer. This change in the pattern in peak demand should be a key consideration in future energy supply decisions.

2.3.4 Scenario 1: Baseline (Population-Growth-Driven)

Scenario 1 Description

In Scenario 1, also known as the baseline case, the Tech Park is assumed to grow in alignment with the population and economic growth factors projected by Doyletech in their “Growth Baselines Report” (OCAF). As stated in the “Development of Growth Baseline” section of Doyletech’s report, “the baseline takes City of Ottawa job forecasts and allocates expected growth to each Kanata North industry”. The key assumptions are that Kanata North grows at the same rate as Ottawa overall, while retaining its current industrial structure.” Under this case, there is no consideration of specific plans or commitments from businesses within the Tech Park. Furthermore, this scenario assumes that energy consumption increases proportionally to the economic growth forecast. As the Tech Park undergoes changes and growth, it is possible that new companies join and require additional energy inputs for their operation, however, this is not modelled within Scenario 1.

Scenario 1 Estimated future Energy Consumption to 2050

The energy consumption growth of the respective NAICS Sectors is shown in Figure 2-9 with an estimated total energy consumption in 2050 of 465 GWh, a 140 percent increase from 339 GWh in 2025.

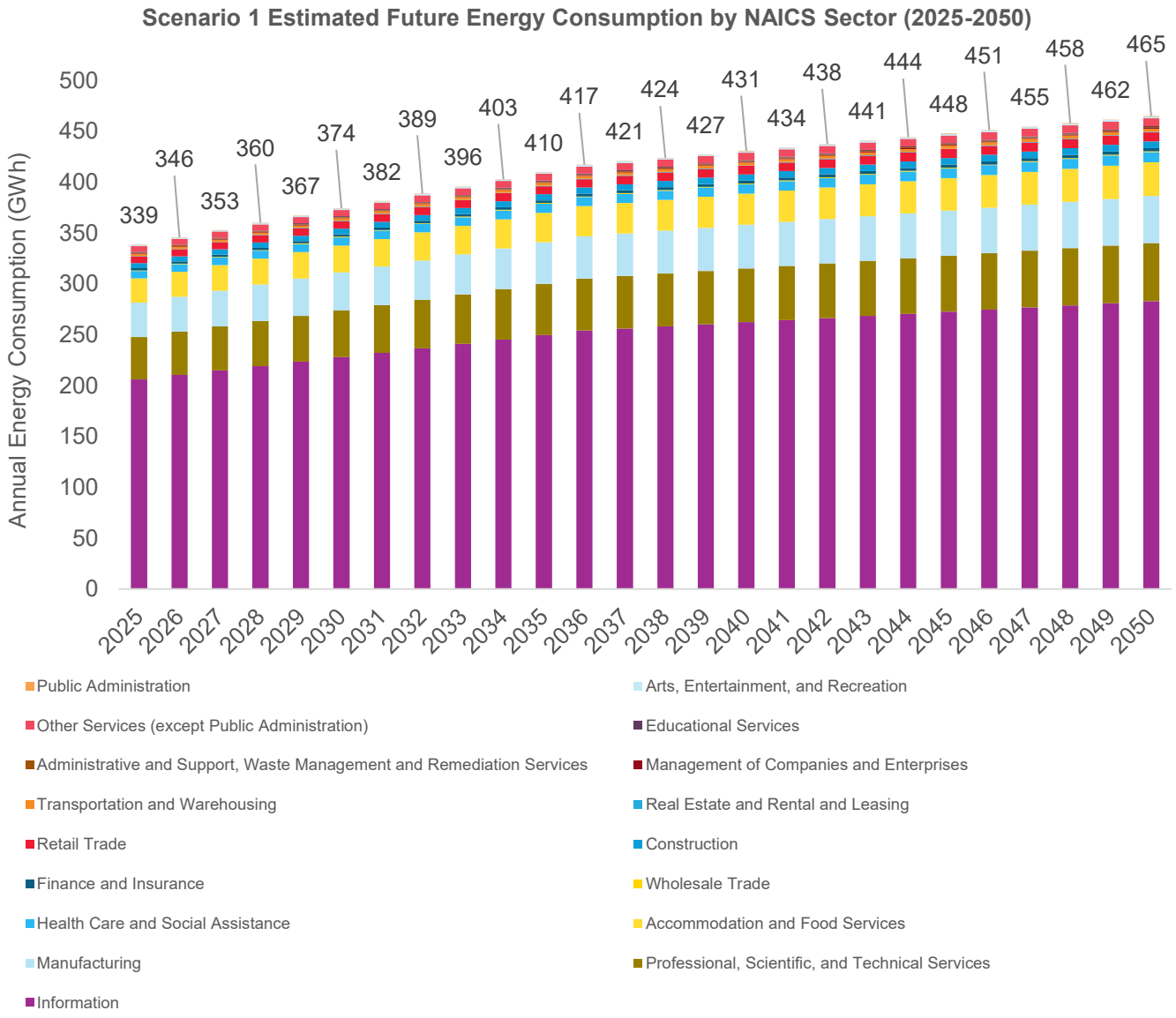


Figure 2-9. Scenario 1 Estimated Future Energy Consumption by NAICS Sector (2025-2050).

Figure 2-10 presents an illustrative heat map of estimated energy consumption within the Kanata North Tech Park for Baseline (Scenario 1). The map on the left shows energy consumption for the 2025 base year, while the map on the right shows projected energy consumption for 2050 under Scenario 1. A handful of buildings represent significant energy use and are located in the center of the Tech Park boundary, indicated by the large red and orange circles.

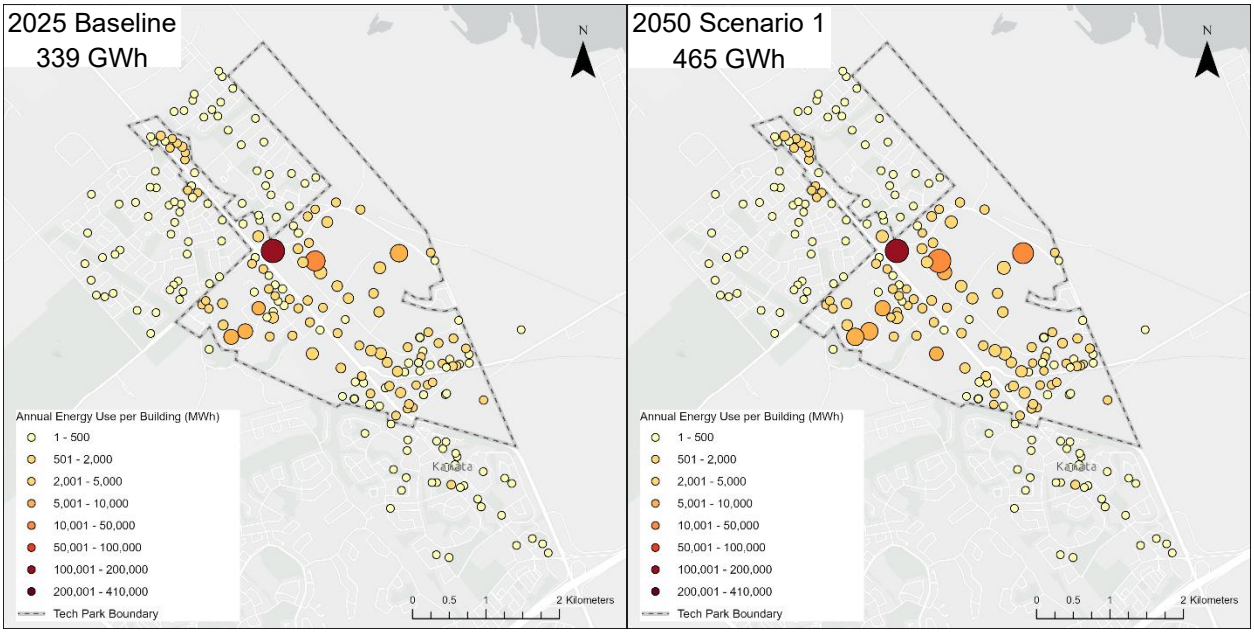


Figure 2-10. Current Energy Profile (2025, left) versus Scenario 1 Future Energy Profile (2050, right)

Figure 2-11 depicts the approximate trend in total energy consumption by energy source. Electricity maintains an approximate 80% share of total energy use, with natural gas representing about 20%. This constant proportion is due to the method of forecasting which applies growth of the Tech Park consistently to each sector over the 15 years.

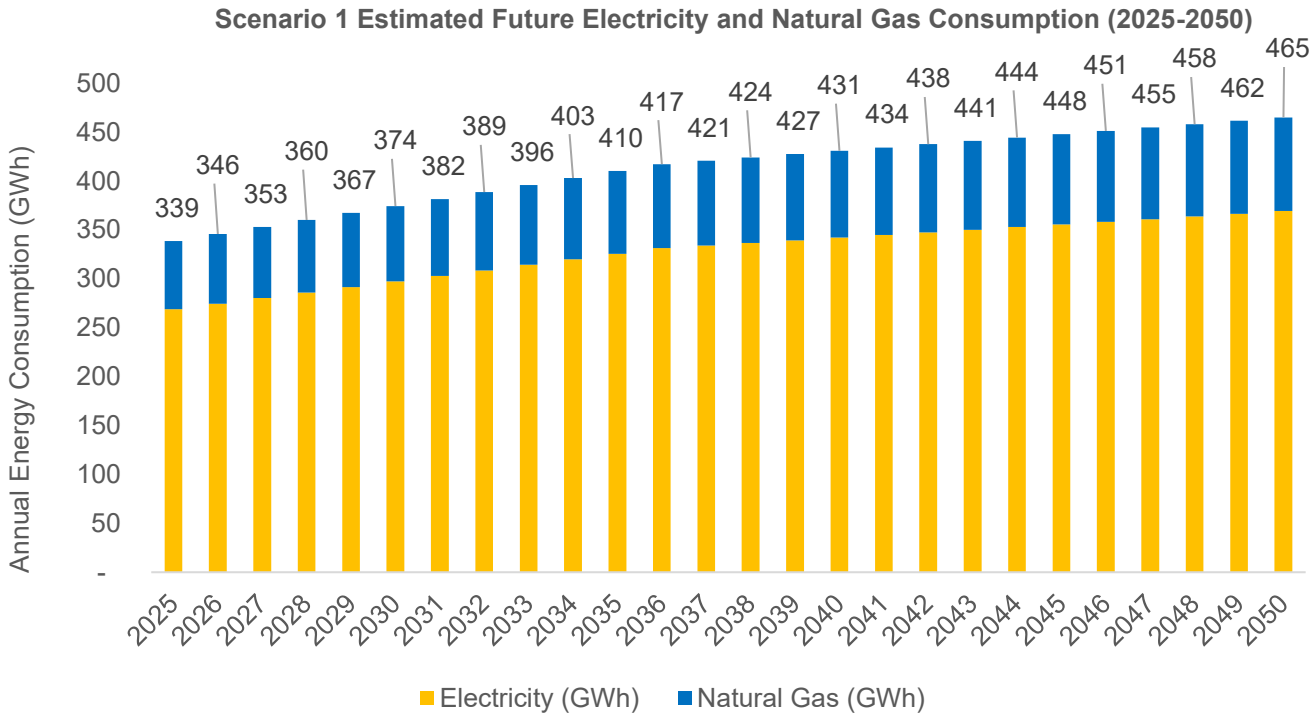


Figure 2-11: Scenario 1 Estimated Future Electricity and Natural Gas Consumption (2025-2050)

Figure 2-12 illustrates the estimated future energy consumption by building type. Data centres, followed by offices and warehouse type buildings, lead the growth consistently over the years.

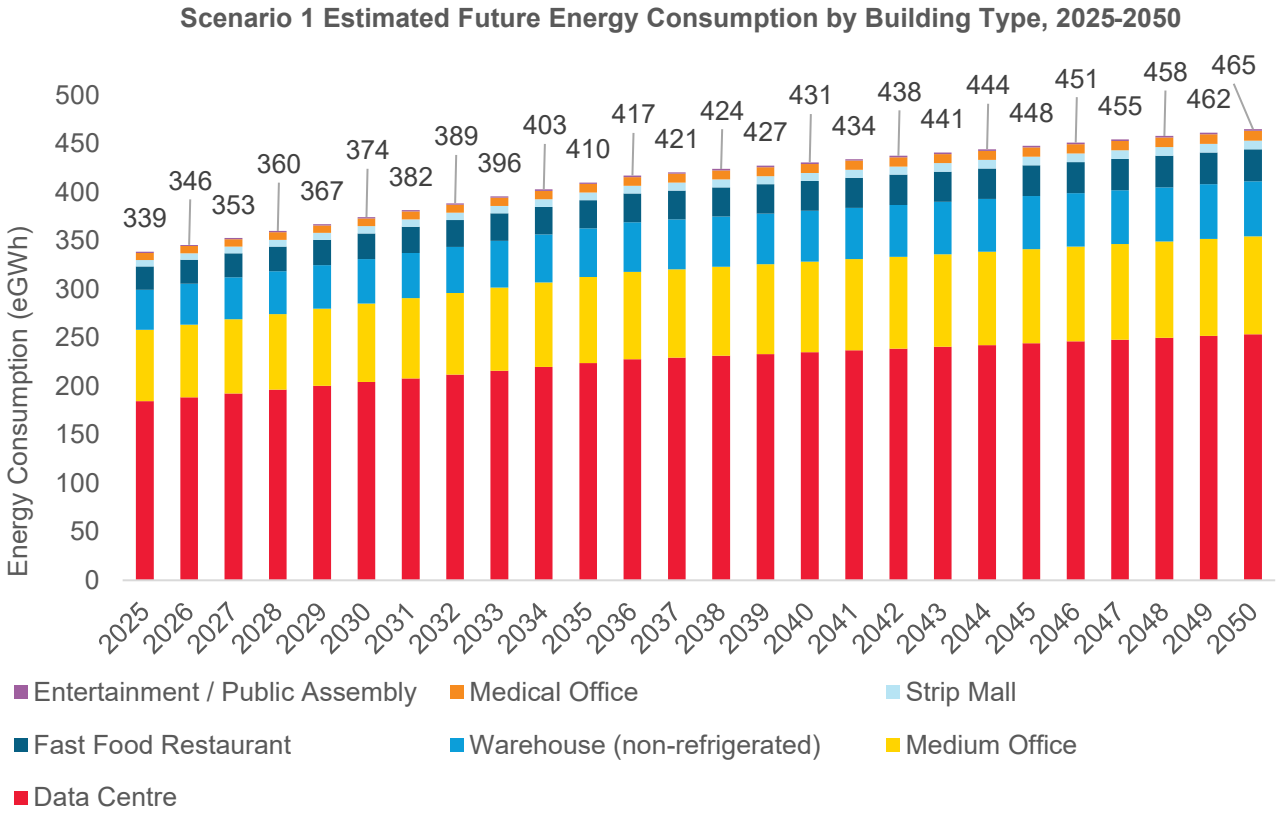


Figure 2-12. Scenario 1 Estimated Future Energy Consumption by Building Type, 2025-2050.

Figure 2-13 demonstrates the contribution to total energy consumption from the eight different energy end uses in this study. Due to the same growth rate across industries from 2025 to 2050, the proportions do not change, only the grand total in 2025 versus 2050.

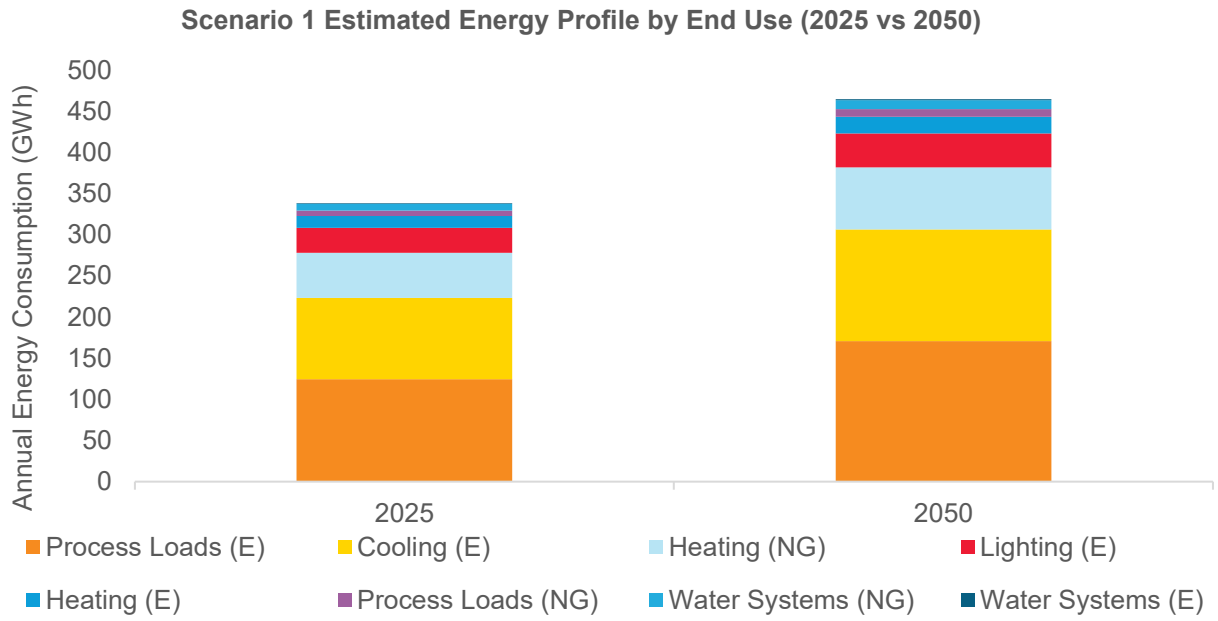


Figure 2-13: Scenario 1 Estimated Energy Profile by End Use (2025 vs 2050)

2.3.5 Scenario 2: Future Energy Projection (Stakeholder-Guided Growth Scenario)

Scenario 2 Description

Scenario 2 represents a higher-growth pathway aligned with the economic growth scenarios outlined in Part 1. It focuses on three key sectors driving Kanata North's future energy needs — semiconductors, defense technologies, and data centres — while integrating insights from local business engagement.

The model ensures a direct link between sectoral economic expansion and projected energy demand, capturing proportional increases in electricity and thermal use. Illustrative developments mentioned in 1.0, such as the example data centres and semiconductor fabrication facility, were not included in the energy modelling, as they do not represent confirmed projects.

Where available, sustainability and decarbonization objectives from major firms were incorporated as energy-intensity improvements up to the target year, held constant thereafter. For companies without stated objectives, energy growth followed sector-specific economic projections.

Overall, this scenario translates the combined effects of industrial growth and corporate sustainability actions into a realistic energy-demand forecast for Kanata North's evolving technology ecosystem.

Scenario 2 Methodology

Scenario 2 builds directly upon the economic growth scenarios developed for the Kanata North Tech Park and represents a higher-growth, stakeholder-guided trajectory. The methodology ensures full alignment between sectoral economic expansion and energy demand forecasting, capturing the growth of three principal industries — AI data centres, semiconductors, and defense technologies — which are expected to drive most of the Park's future energy needs. The second scenario has been developed based on two following pillars:

1- Energy Growth Alignment with Economic Scenarios

Energy demand growth was modeled as a direct function of the projected economic output for each sector, ensuring proportional scaling between the economic and energy models. This approach provides a consistent and traceable link between industry expansion and the associated increases in electricity and thermal demand.

Again, the five data-centre facilities and the semiconductor fabrication plant referenced in 1.0 were part of the economic narrative only and were included to illustrate a range of stakeholder perspectives. These facilities do not represent confirmed development projects and lack the minimum definition required for electrical-load modelling (e.g., MW capacity, commissioning year, connection point, or operational profile). Accordingly, they were not modelled as discrete additions in Scenario 2. Given the speculative nature and lack of minimum definition for the additional data centres and semiconductor fabrication, the team agreed to follow standard utility-planning practice, which limits energy modelling to substantiated or well-defined loads. The energy model therefore captures the operational growth of existing data centres already located within the Park, together with the projected increases in energy use from the semiconductor and defense sectors.

Stakeholder interviews were used to validate and contextualize these growth patterns rather than to define independent energy trajectories. This avoided any duplication or double counting between the top-down economic model and bottom-up business insights, ensuring that all energy growth remained grounded in the same economic assumptions.

2- Integration of Sustainability and Decarbonization Targets

In parallel with economic growth alignment, the model also incorporated sustainability and decarbonization objectives reported by interviewed businesses. Where large firms specified clear targets — for example, carbon-neutral operations by 2030, 2035, or 2040 — these objectives were integrated into the model as modifiers to future energy intensity, representing the expected reduction in fossil-fuel use or increased electrification over the target period. For the years following each company's declared milestone, energy intensity was assumed to remain steady, reflecting the achievement and maintenance of that goal.

For businesses that did not specify sustainability objectives, or that were not interviewed, energy growth was modeled strictly according to their sector's economic growth trajectory, without additional sustainability adjustments. This ensures that the overall projection reflects both macroeconomic expansion and known corporate sustainability initiatives, while maintaining methodological transparency and consistency across all sectors.

Key Assumptions

- **Businesses outside primary growth sectors**: Businesses in Kanata North Tech Park that do not fall under the three primary sectors represented in the economic growth scenarios (semiconductors, data centres, and tech/defense) — such as smaller offices, professional services, startups, and supporting services — were assumed to maintain constant energy use from 2025 through 2050. These types of businesses represent a relatively small share of the Tech Park's total energy demand and are not expected to experience material changes in consumption compared to the high-growth sectors. This conservative assumption avoids overstating demand and ensures alignment with the economic analysis, which focused on the principal drivers of growth.
- **Post-target stabilization**: Where businesses provided defined sustainability or decarbonization objectives with specific milestone years (e.g., full electrification or HVAC system replacement by 2030), the model applies these changes progressively up to the stated target year. After that point, the improved energy intensity is held constant through 2050, reflecting the sustained performance of implemented measures. This approach assumes continued operation under the upgraded systems and avoids speculative extrapolation of further improvements beyond the disclosed targets.
- **Electricity supply assumptions**: Broader system-wide factors such as grid decarbonization, renewable generation, or renewable energy credits were not explicitly modelled in Scenario 2. These elements are recommended for consideration in future studies once more detailed data becomes available.

Scenario 2 Estimated future Energy consumption to 2050

Based on the analysis for Scenario 2, the energy use is estimated to grow from 339 GWh in 2025 and reach 887 GWh in 2050, as illustrated in Figure 2-14: Scenario 2 Total Tech Park Estimated Future Energy Consumption Figure This represents an increase of 260 percent in total energy consumption based on the economic growth scenarios. This scenario does not include changes in energy consumption or demand for the remainder of KNBA. Instead, the energy consumption of the remainder of businesses is held constant.

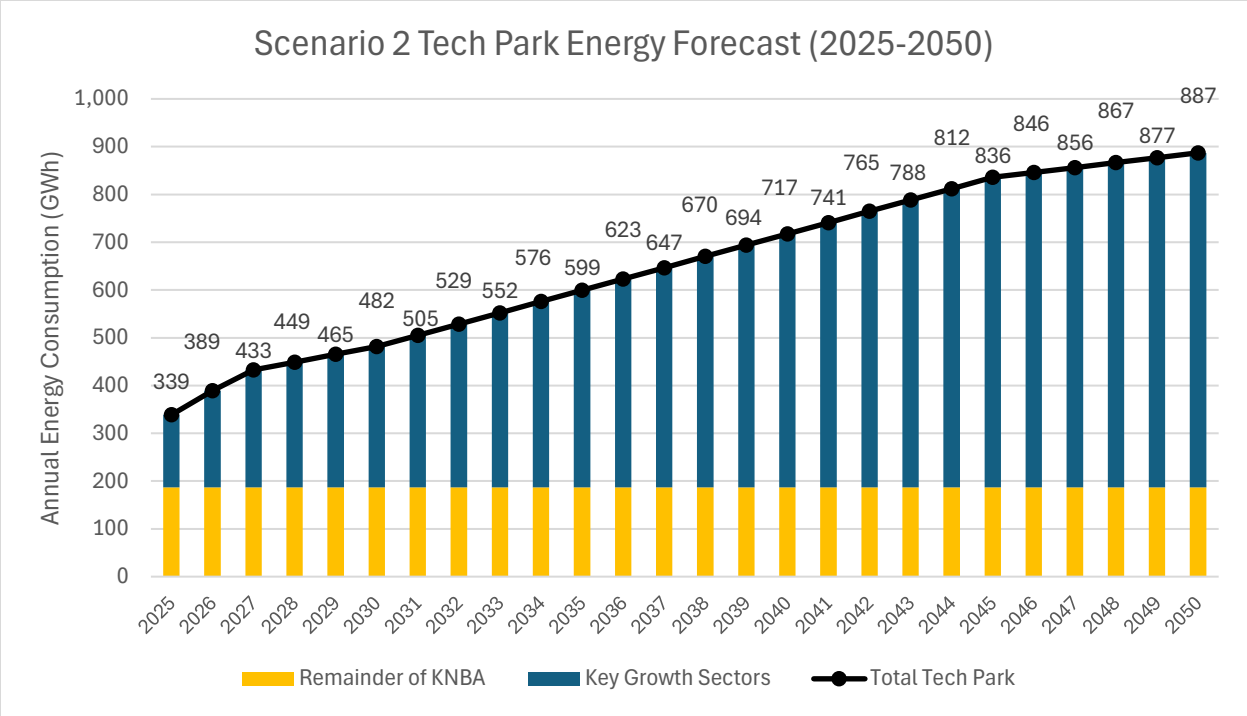


Figure 2-14: Scenario 2 Total Tech Park Estimated Future Energy Consumption

Figure 2-15 represents the 2025 (left) and 2050 (right) annual energy use of each building based on the Scenario 2 analysis. There are marked increases modelled in the central-southwest area of the park.

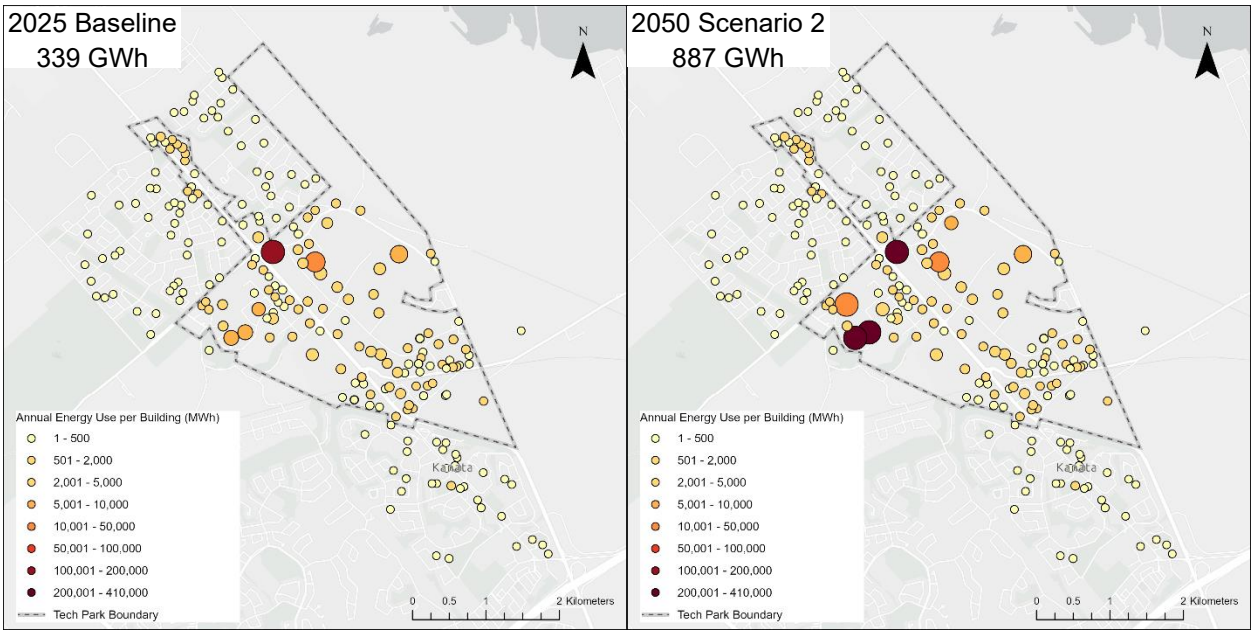


Figure 2-15: Current Energy Profile (2025, left) versus Scenario 2 Future Energy Profile (2050, right)

The electricity and natural gas use contribution to the total Tech Park energy consumption is shown in Figure 2-16. Electricity consumption increases from 269 GWh in 2025 to 821 GWh in 2050 (300 percent

increase) while natural gas use is expected to decrease from 70 GWh in 2025 to 66 GWh in 2050 (6 percent decrease).

These changes are anticipated in response to the operational and climate objectives modelled from these businesses. Operational growth translates to increased operational electricity consumption. Therefore, there is a marked increase in electricity consumption, particularly due to energy intensive data uses which rely on electricity.

In addition, as decarbonisation measures are applied, natural gas use is expected to decrease aligned with net zero targets of the interviewed businesses. Natural gas use represents a smaller portion of overall energy use, and therefore, a relatively small decrease in natural gas consumption is observed due to the shifts away from natural gas use associated with sustainability objectives. This also leads to a slight increase in electrical consumption as electrification disrupts natural gas use, however, this increase is small compared to the operational electricity consumption estimated.

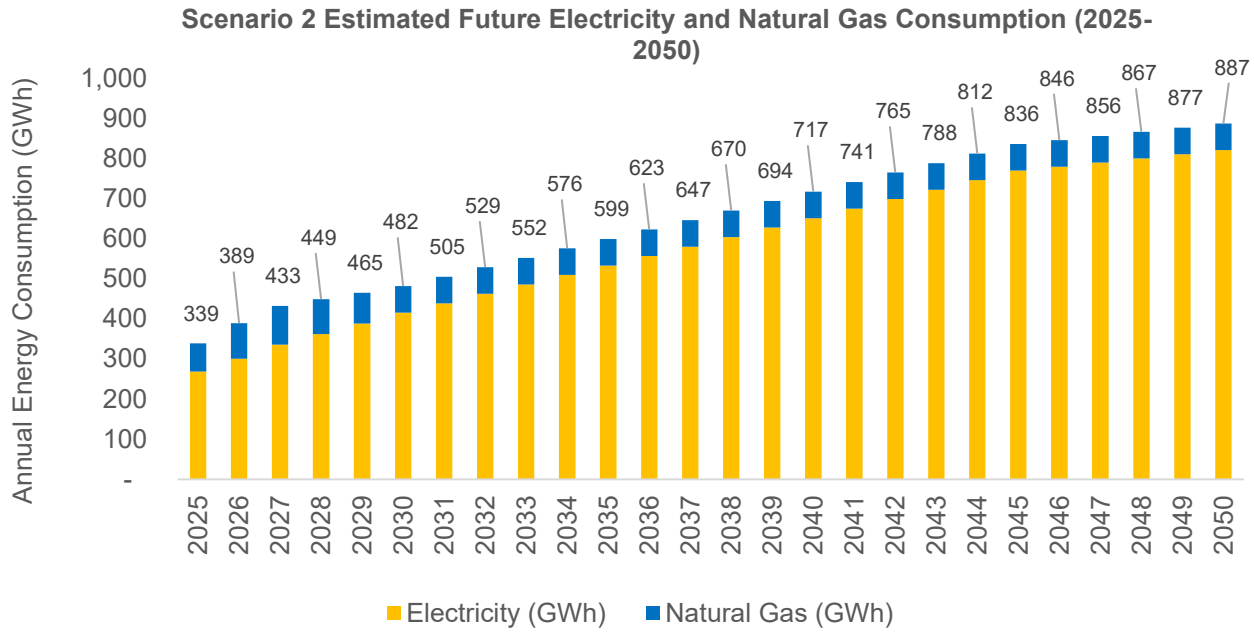


Figure 2-16: Scenario 2 Estimated Future Electricity and Natural Gas Consumption (2025-2050)

The significant growth in electrical demand is primarily attributed to businesses within the NAICS Information Sector, followed by Manufacturing and the Administrative and Support, Waste Management and Remediation Services NAICS Sectors. This contribution is shown in Figure 2-17.

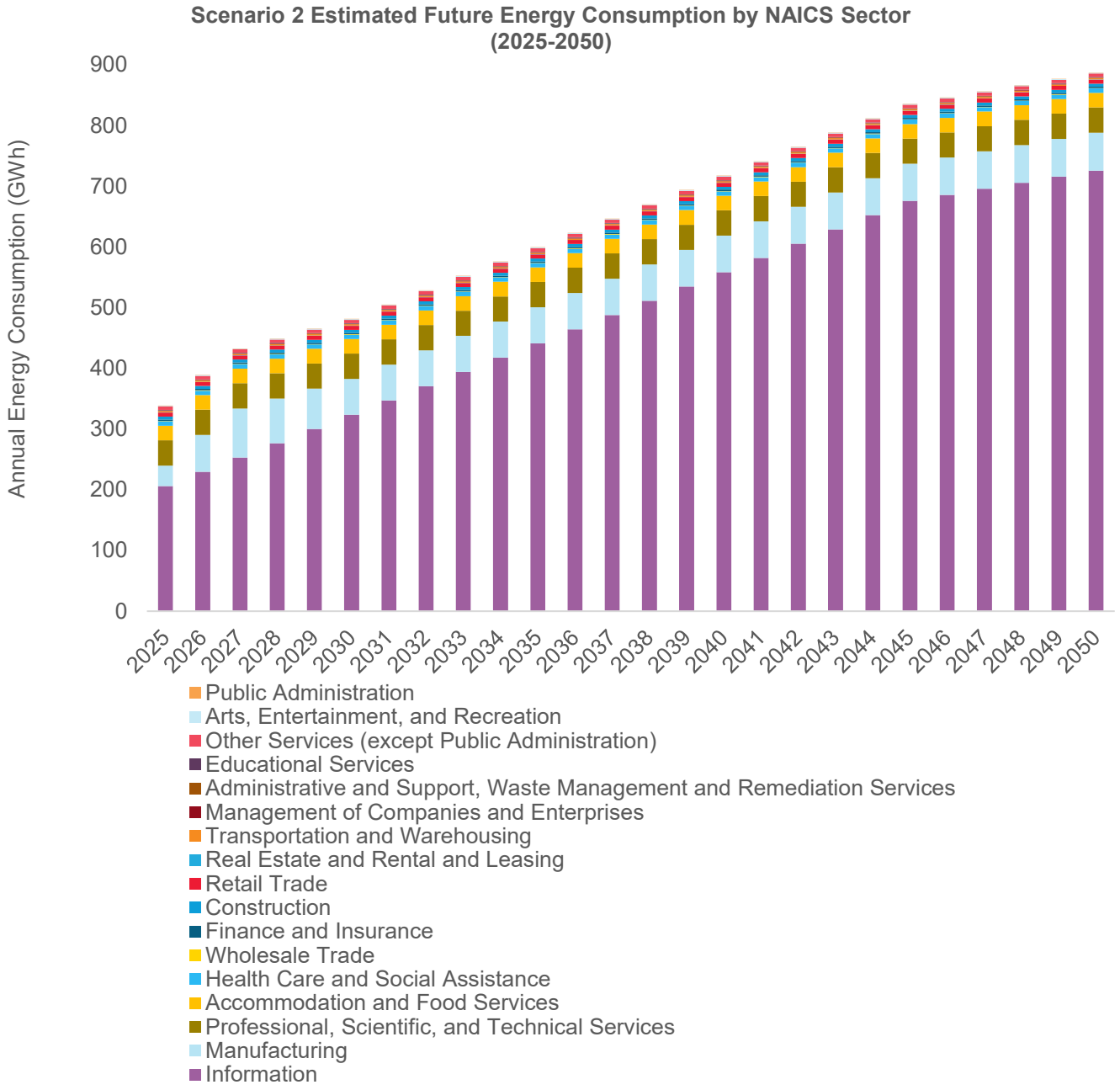


Figure 2-17. Scenario 2 Estimated Future Energy Consumption by NAICS Sector (2025-2050).

There are eight different energy end uses associated with the total energy consumption. The end use breakdown of the total energy consumption is shown in Figure 2-18. Scenario 2 estimates that process loads and cooling will be the main drivers of energy consumption in 2050.

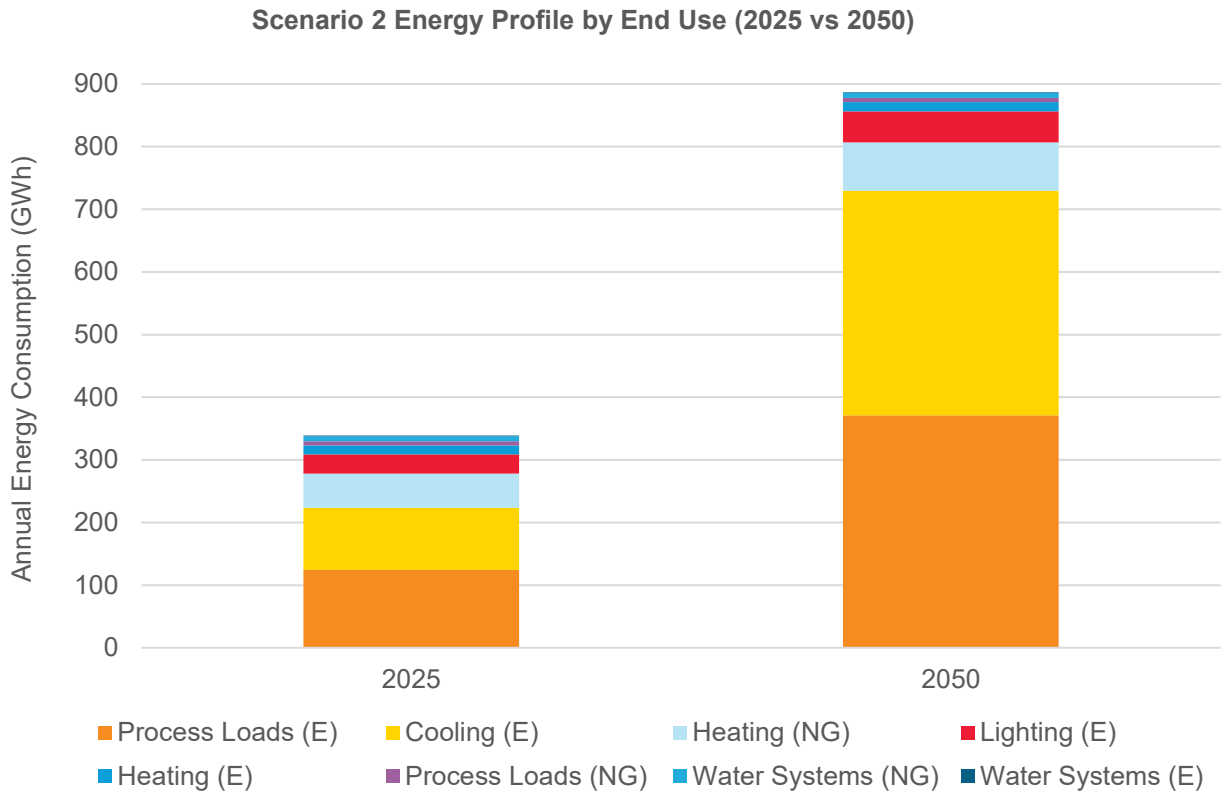


Figure 2-18. Scenario 2 Energy Profile by End Use (2025 vs 2050).

2.4 Comparative Summary of Scenario 1 and Scenario 2

2.4.1 Key Differences in Energy Demand

The two scenarios each demonstrate a growth in energy consumption between 2025 and 2050. These are compared in Figure 2-19, including the contribution of natural gas and electricity to the total energy projection. From the current energy profile assessed at 339 GWh in 2025, Scenario 1 experiences growth to 465 GWh in 2050 which equates to an increase of 140 percent whereas Scenario 2 is projected to significantly increase to 887 GWh which equates to a 260 percent increase, compared to 2025.

In the current energy use profile, the model estimates an energy use intensity of 233 kWh/m^2 in 2025 and 320 kWh/m^2 in 2050 under Scenario 1, and 611 kWh/m^2 in 2050 under Scenario 2. This assumes the total KNBA building floor area remains constant at roughly 1.45 million square meters. As a consequence of the continued energy growth without the addition of new floor area, there will be a higher energy density in the Tech Park overall.

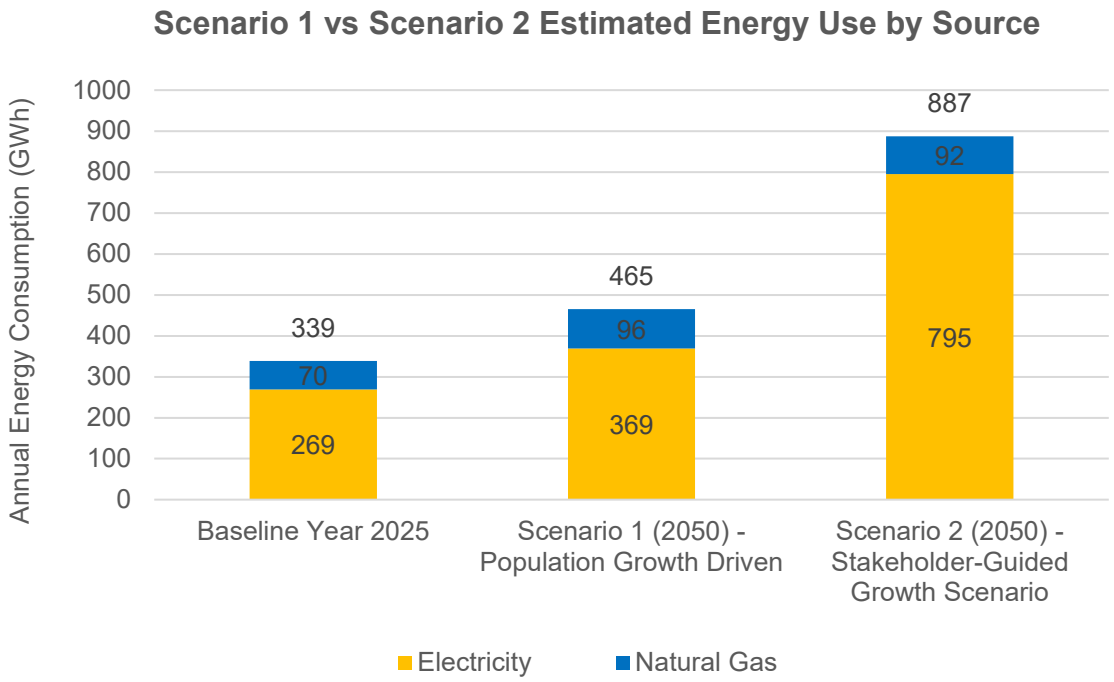


Figure 2-19. Scenario 1 vs Scenario 2 Estimated Energy Use by Source.

The stacked bars in Figure 2-20 illustrate the estimated end uses of energy consumed in the buildings and contrasts the proportion of the total energy use at the Tech Park across Scenarios. The current 2025 profile and Scenario 1 have the same proportions due to the same growth factors across sectors while in Scenario 2, there is a relative increase in the cooling and process load categories driven by significant growth in the NAICS Information Sector.

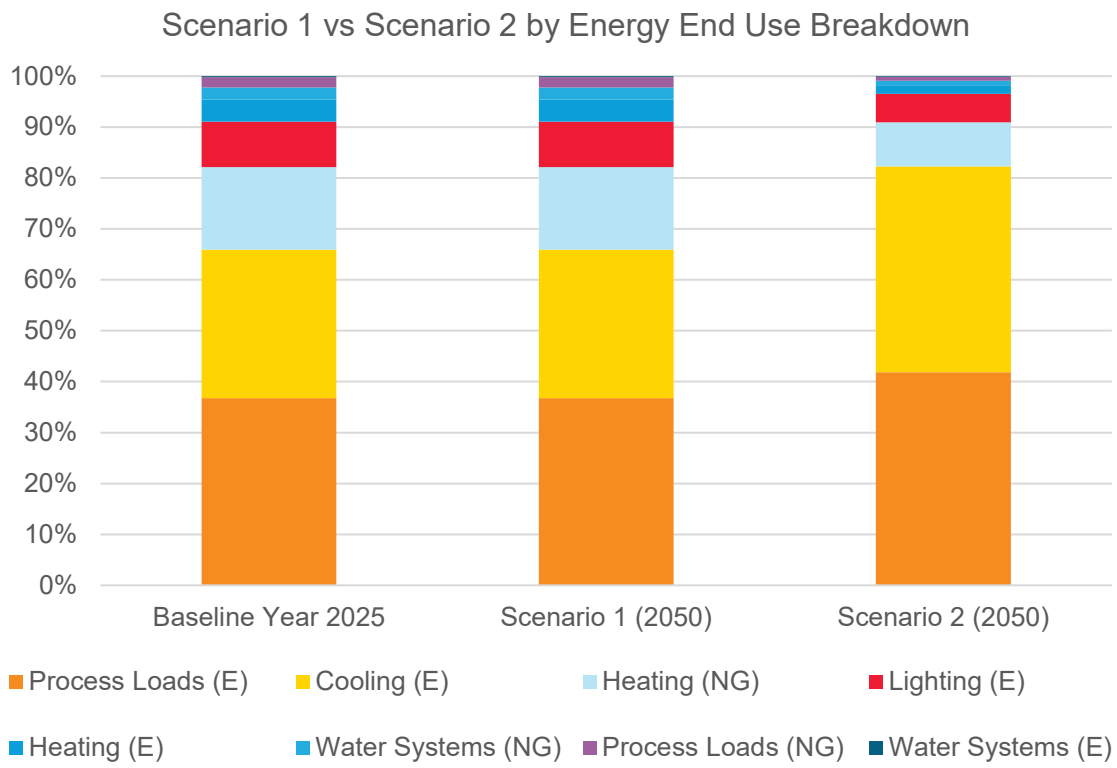


Figure 2-20. Scenario 1 vs Scenario 2 by Energy End Use Breakdown.

2.5 Energy Demand and Peak Electrical Load

2.5.1 Purpose

This section presents the estimated electrical demand (MW) for the Kanata North Tech Park under both the Baseline Scenario and the Stakeholder-Guided Growth Scenario. The objective is to develop seasonal peak demand (MW) at the tech park to support capacity planning and alignment with Hydro Ottawa feeder capability.

2.5.2 Methodology

Inputs:
Annual electricity by building type was taken from ASHRAE/DOE archetypes and adapted to the Kanata North building mix (Heating, Cooling, Lighting, Process Loads, Water Systems).

Monthly Allocation:

- **Heating:** 30 % of annual electric heating allocated to **January**, plus **20 % to July** to capture reheat and shoulder-season loads.
- **Cooling:** 30 % of annual electric cooling allocated to **July**, plus **20 % to January** to capture server room cooling, ventilation cooling, and shoulder-season operation.

- **Lighting, process, water loads:** distributed evenly across months (1/12 per month).

This cross-season allocation better reflects year-round operation and avoids underestimating summer heating or winter cooling contributions.

Monthly Average Power:
Monthly energy (kWh) was divided by 744 hours to obtain monthly average power (kW).

Load Factor Development:
A month-specific load factor (LF_m) was calculated using a two-level schedule (open vs. closed hours):

$$LF_m = \frac{U_m \cdot H_{\text{open}} + B_m \cdot (744 - H_{\text{open}})}{744}$$

where:

- H_m = 744 hours per month
- H_{open} = occupied hours per month by archetype
- U_m = average daytime load fraction of peak
- B_m = base load fraction of peak during closed hours

Examples: offices assumed 12 h/day on weekdays with U≈0.8 (Jan) and B≈0.3; data centres modeled nearly flat with LF≈0.95.

The load factor calculated for this study presented in Appendix 4, Table 50.

Monthly Peak Demand:

$$P_{\text{peak},m} = \frac{\overline{P}_m}{LF_m}$$

where $\dot{P}_m$ is the monthly average power. Results were converted to MW.

Park-Level Peak:
Monthly energy was summed across all building types to create a park-level monthly kWh. The park's average power was then divided by a **weighted park LF** to yield a **coincident park peak MW**. This approach preserves coincidence across building types and avoids overstating demand by summing individual peaks.

Sensitivity and Quality Checks:
Heating/cooling shares were varied (±5 %), and schedule parameters (U, B) adjusted ±10 % to confirm robustness. All inputs, intermediate calculations, and resulting MW are traceable and auditable. To further

validate the findings, the results of the energy demand analysis were cross-checked against multiple independent sources, including IESO (Independent Electricity System Operator, 2020) and Hydro Ottawa data.

2.6 Results

The projected energy demand analysis for Kanata North Tech Park focuses on seasonal peak loads, reflecting both summer and winter electrical demand growth between 2025 and 2050. Results are presented for two scenarios: the Baseline Scenario, which assumes business-as-usual growth, and the Stakeholder-Guided Growth Scenario, which reflects a higher growth trajectory aligned with economic growth scenarios.

Table 44 summarizes the projected summer and winter peak demand for the study period. Overall, results show steady but modest growth in the baseline case, while the Stakeholder-Guided Growth case projects a much sharper increase in both summer and winter peaks, with significant implications for grid capacity planning.

Table 44: Projected Summer Peak Demand, and Winter Peak Demand (MW) for Kanata North Tech Park (2025–2050)

Kanata North Tech Park Electrical Energy Summer Peak Demand (MW)													
Year	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Baseline Scenario	82.1	98.2	100.3	102.3	104.3	106.3	108.4	110.4	112.4	114.5	114.5	118.5	119.5
Stakeholder-Guided Growth Scenario	82.7	104.9	113.0	118.7	124.5	130.2	136.6	143.0	149.3	155.7	162.1	168.5	174.8
Kanata North Tech Park Electrical Energy Winter Peak Demand (MW)													
Baseline Scenario	68.9	70.3	71.8	73.2	74.7	76.1	77.6	79.0	80.5	81.9	83.4	84.9	85.5
Stakeholder-Guided Growth Scenario	68.9	75.9	82.3	86.4	90.5	94.5	99.3	104.0	108.7	113.4	118.1	122.8	127.6

Kanata North Tech Park Electrical Energy Summer Peak Demand (MW)													
Year	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Baseline Scenario	120.4	121.4	122.4	123.3	124.3	125.3	126.2	127.2	128.1	129.1	130.1	131.1	132.1
Stakeholder-Guided Growth Scenario	181.2	187.6	194.0	200.4	206.7	213.1	219.5	225.9	228.6	231.4	234.1	236.4	239.6
Kanata North Tech Park Electrical Energy Winter Peak Demand (MW)													
Baseline Scenario	86.2	86.9	87.6	88.3	89.0	89.7	90.4	91.1	91.7	92.4	93.1	93.8	94.6
Stakeholder-Guided Growth Scenario	132.3	137.0	141.7	146.4	151.1	155.9	160.6	165.3	167.3	169.4	171.4	173.0	175.5

2.6.1 Summer Peak Demand

Summer peak demand shows the strongest overall growth, with demand diverging significantly between the two scenarios (Figure 2-21).

- In the **Baseline Scenario**, summer peak demand increases gradually from **~82 MW in 2025** to **~132 MW in 2050**, representing steady growth over the period.
- In the **Stakeholder-Guided Growth Scenario**, demand rises much more rapidly, from **~83 MW in 2025** to nearly **240 MW in 2050**.
- The gap between the two scenarios widens substantially after 2030. By 2040, **Stakeholder-Guided Growth** demand reaches **~194 MW**, compared to **~122 MW** in the baseline.

This suggests that, under a Stakeholder-Guided Growth pathway, **summer peak demand could become a key limiting factor** for the park's electrical infrastructure.

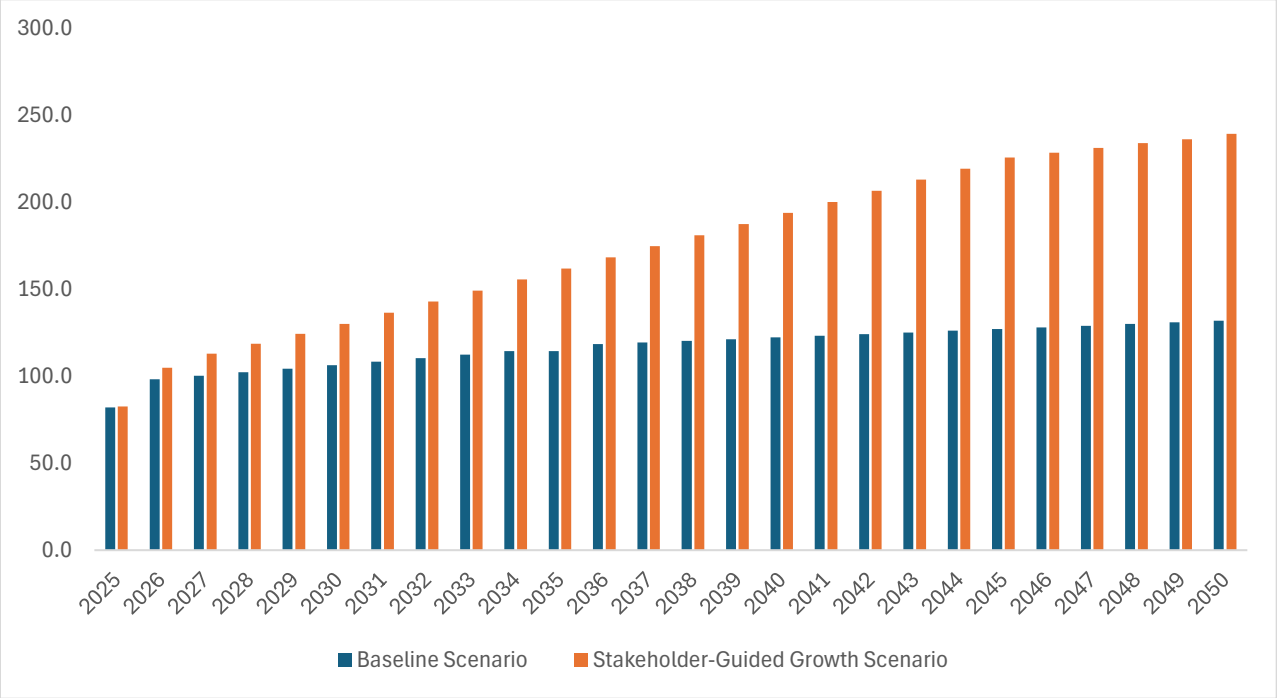


Figure 2-21: Projected Summer Peak Demand, 2025–2050 (MW)

Winter peak demand also increases under both scenarios, though from a lower starting point compared to summer (Figure 2-22).

- The **Baseline Scenario** shows moderate growth, from **~69 MW in 2025** to **~95 MW in 2050**.
- The **Stakeholder-Guided Growth** projects a steeper rise, reaching **~176 MW by 2050**, nearly double the baseline projection.

- By 2035, **Stakeholder-Guided Growth** winter peak demand is already **40% higher** than the baseline case, with the difference exceeding **80 MW by 2050**.

Although winter peaks are lower than summer peaks overall, their accelerated growth under the **Stakeholder-Guided Growth Scenario** suggests that **year-round capacity planning will be required** to maintain grid reliability.

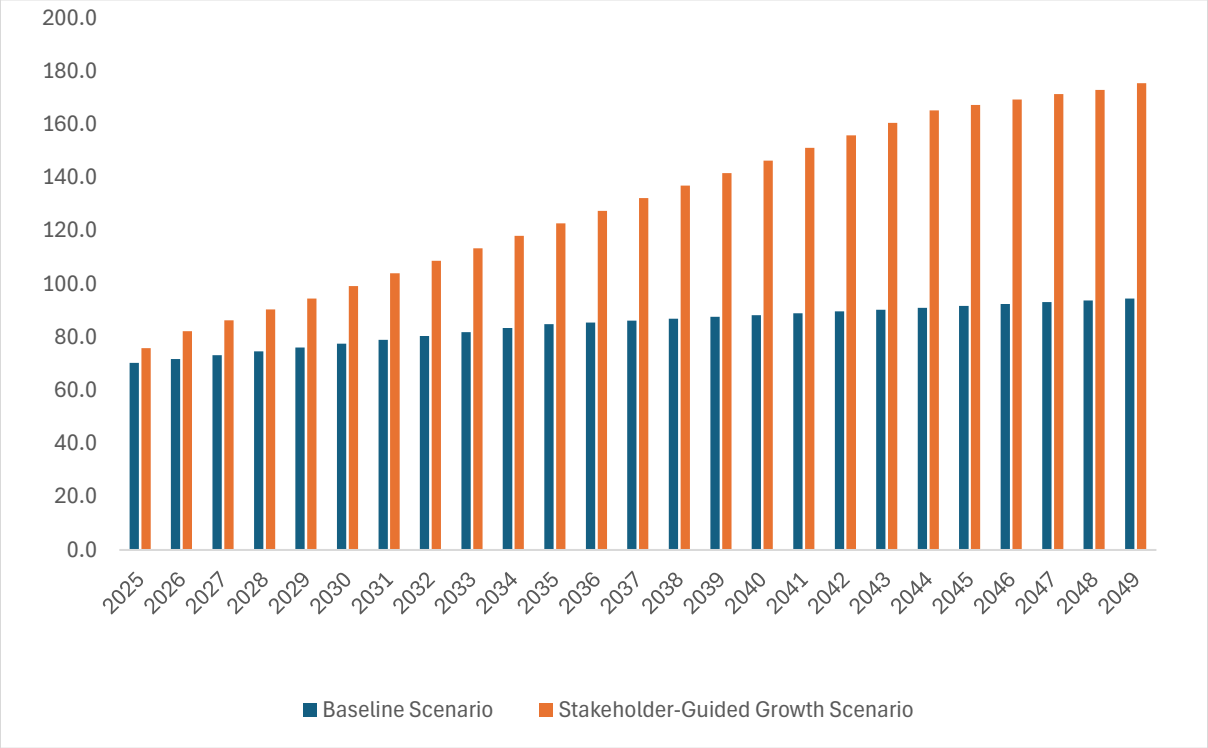


Figure 2-22: Projected Winter Peak Demand, 2025–2050 (MW)

2.6.2 Illustrative Geospatial Mapping

When considering electrical supply within the Tech Park, it is critical to address both spatial and temporal factors that influence efficient and reliable operation. Spatial considerations involve the physical distribution of power across diverse buildings with varying energy intensities, such as data centres and multi-tenant facilities, which require robust infrastructure to ensure even and dependable energy delivery. Temporal considerations pertain to how electrical demand varies—or remains consistent—over time, often shaped by the continuous, high-load requirements of technology-driven businesses. Addressing these dimensions is essential for maintaining power quality, supporting sensitive equipment, and accommodating the evolving needs of the Tech Park.

Figure 2-23 illustrates and contrasts the heat maps of annual energy use by building at KNBA for the current energy profile of 2025, and the future energy profiles in 2050 of Scenario 1 and Scenario 2. The location of the buildings with highest estimated current and future energy demands are in the central-southwest area of the Tech Park boundary. Most of these buildings contain high energy use intensity building types like data centres and some have multiple businesses located within one building.

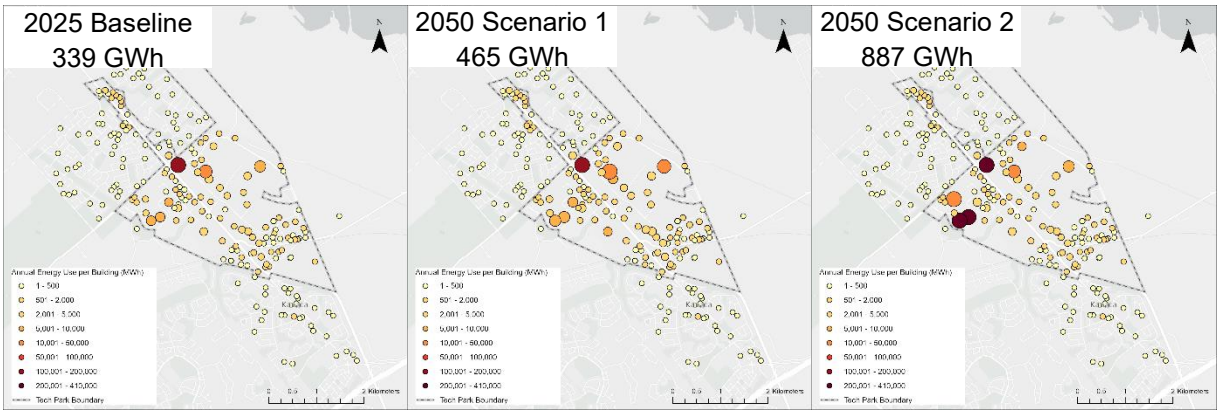


Figure 2-23. Current Energy Profile (2025, left), Scenario 1 Future Energy Profile (2050, middle), and Scenario 2 Future Energy Profile (2050, right)

2.6.3 Spatial and Temporal Characteristics

The maintenance and reinforcement of physical infrastructure supplying the Tech Park will be critical to supplying the projected energy needs of businesses. Both scenarios indicated clusters of energy intense businesses, which will require increased services and reliability. Remediating any existing issues with power quality and improving the electrical capacity and reliability in the future given the insight from stakeholders, will place KNBA in a better position to serve its numerous businesses.

In addition, the concentration of high electrical consumption within specific areas of the Tech Park offers a strategic opportunity to site Battery Energy Storage Systems (BESS) or renewable generation close to major load centers. Opportunities for thermal energy recovery or shared infrastructure such as district heating and cooling networks could be potential future options to meet demands while increasing efficiency. Holistic solutions such as these enable stakeholders to optimize infrastructure placement for maximum efficiency, resilience, and service reliability.

Furthermore, across the three maps, low-energy-use and high-energy-use buildings remain within very similar consumption brackets; there are no buildings in 2050 which begin with low energy consumption and then becoming a high consumer of energy. Rather, the already high consuming buildings continue to grow but at a greater rate in Scenario 2, than in Scenario 1 at 2050. This trend provides insights into where increases in energy capacity are likely to occur in the future.

In both scenarios, the electrical consumption and demand of the tech park rapidly increases. Because the new electrical demand is concentrated within the NAICS Information Sector, it is generally assumed that this adds a consistent load demand. This is a characteristic of data centre buildings as they continuously operate with a predictable and near-full load profile. This growth predominantly stems from electrical demands that occur at buildings located within the center of the Tech Park.

Maintaining high power quality is essential to these businesses and poses a challenge alongside the strain of increasing total consumption. Strategies to supply consistent power and reliable back-up power (e.g. BESS or on-site generation) should be considered alongside infrastructure updates and capacity improvements.

2.7 Insights and Recommendations

In summary, this study estimates rapid growth in energy consumption and demand. The ongoing evolution of the Tech Park's energy landscape presents both significant opportunities and pressing challenges. As electrical demand intensifies, particularly within high-consumption sectors that include data centres, the imperative for strategic planning, reliability, and adoption of innovative, low-carbon solutions becomes ever more critical. The concentration of energy needs around the Tech Park provides a unique chance to implement targeted infrastructure, such as BESS and shared thermal networks optimized for maximum efficiency and resilience. These opportunities are balanced by notable risks, including supply constraints and the sensitivities of businesses that depend on reliable, high-quality power and back-up power.

Building upon the results of this report, future studies should deliver actionable insights into how strategic investments and collaborative planning can best address the challenges of intensifying electrical loads, evolving business needs, and sustainability objectives. Recommended next steps include:

1. Assess the reliability and efficiency of existing systems and infrastructure, in collaboration with energy partners such as Ottawa Hydro. Identify possible interventions for improving power quality and managing the increasing load and understanding tenant back-up power requirements and subsequent spatial requirements.
2. Understand the sustainability objectives and targets affecting the Tech Park and quantify current and projected emissions to optimize investments and rollout of green energy infrastructure.
3. Conduct a technoeconomic study to guide investments in energy infrastructure that will:
    - address the needs of stakeholders,
    - identify low-carbon technologies,
    - plan for resilience and optimization of systems, and
    - conduct cost-benefit analyses of proposed solutions.

By advancing these initiatives through coordinated action and stakeholder driven decision-making, the Tech Park can successfully navigate its evolving energy landscape while setting a benchmark for sustainable development.

Glossary

ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
BAU	Business as usual
BESS	Battery Energy Storage Systems
E	Energy
EUI	Energy use intensity
eGWh	Equivalent gigawatt hours
FTE	Full-time equivalent
GWh	Gigawatt-hours
GHG	Greenhouse gas
GFA	Gross floor area
HVAC	Heating, ventilation, and air conditioning
IOIC	Input-Output Industry Classification
KNBA	Kanata North Business Association
kWh	Kilowatt-hour
MW	Megawatt
MVA	Megavolt-amperes
NG	Natural Gas
NAICS	North American Industry Classification System
OCAF	Ottawa Climate Action Fund
m^2	Square meters
SCIEU	Survey on Commercial and Institutional Energy Use

U.S. DOE United States Department of Energy

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Appendix 1 SUPPLEMENTARY METHODOLOGY

A1.1. Energy Use Intensity (EUI) Mapping from Building Prototypes to NAICS Sector

- In the Doyletech business database, each business is already assigned a 6-digit NAICS industrial classification code (e.g., BS541500)
- The analysis of energy profile is conducted to the detail of the primary NAICS Sector, in other words, based on the first two digits of the NAICS Code.
- Therefore, the NAICS Sector mapped to a given business is to the detail of its first two NAICS Code

A1.2. Methodology for NAICS Sector 51 Mapping

- There are several data centre facilities at KNBA
- Data centre buildings are assumed to fall under the broad category of NAICS 51 Code
- “Information”.
- However, not all types of buildings that are classified under the “Information” label are data
- centres as some are better allocated to office buildings.
- Due to the high EUIs that are expected at data centres, it was decided that a more accurate approach for this specific sector should use the first three digits of the NAICS Code for greater detail.
- The first three NAICS digits of businesses under the “Information” classification were extracted
- from the export and local business list. The unique NAICS codes stemming from that were: 511, 512, 517, 518, 519.
- 517 and 518 were associated with data centres while 511, 512, and 519 were associated to office buildings based on their classification description

Table 45. Building Type and EUI Allocation by NAICS Sector

NAICS Code	Sector Title	Selected Representative EUI	Selected Building Prototype Description	US DOE Building Type	US DOE EUI	EnergyStar Building Type	Energy Star EUI
23	Construction	120	Warehouse (non-refrigerated)	Warehouse (non-refrigerated)	120	Warehouse/Distribution Centre	200
31, 33	Manufacturing	120	Warehouse (non-refrigerated)	Warehouse (non-refrigerated)	120	Warehouse/Distribution Centre	200
41, 42	Wholesale Trade	120	Warehouse (non-refrigerated)	Warehouse (non-refrigerated)	120	Warehouse/Distribution Centre	200
44, 45	Retail Trade	252	Strip Mall	Strip Mall	252	Mall	228
48,49	Transportation and Warehousing	120	Warehouse (non-refrigerated)	Warehouse (non-refrigerated)	120	Warehouse/Distribution Centre	200
511	Publishing Industries	134	Medium Office	Medium Office	134	Office	242
512	Motion Picture and Sound Recording Industries	134	Medium Office	Medium Office	134	Office	242
517	Telecommunications	**650**	Data Centre	-	-	-	-
518	Data Processing, Hosting, and Related Services	**650**	Data Centre	-	-	-	-
519	Other Information Services	134	Medium Office	Medium Office	134	Office	242
52	Finance and Insurance	134	Medium Office	Medium Office	134	Office	242
53	Real Estate and Rental and Leasing	134	Medium Office	Medium Office	134	Office	242
54	Professional, Scientific, and Technical Services	134	Medium Office	Medium Office	134	Office	242
55	Management of Companies and Enterprises	134	Medium Office	Medium Office	134	Office	242
56	Administrative and Support, Waste Management and Remediation Services	134	Medium Office	Medium Office	134	Office	242
61	Educational Services	134	Medium Office	Medium Office	134	Office	242
62	Health Care and Social Assistance	206	Medical Office	Hospital	399	Medical Office	206
71	Arts, Entertainment, and Recreation	239	Entertainment / Public Assembly	Medium Office	134	Entertainment / Public Assembly	239
72	Accommodation and Food Services	356	Fast Food Restaurant	Quick Service Restaurant	2037	Fast Food Restaurant	356
81	Other Services (except Public Administration)	134	Medium Office	Medium Office	134	Office	242
91,92	Public Administration	134	Medium Office	Medium Office	134	Office	242

A1.3. End Use Breakdown Additional Methodology Comments

- Different businesses within one building often have different NAICS Codes. Since the NAICS Codes are mapped to different building types to obtain EUI, the applicable GFA was broken down to calculate an energy consumption estimate for a given business' EUI
- Building types from the US DOE prototype models were chosen based on how closely they relate
- to the expected building type for a given primary NAICS Sector. EnergyStar does not have associated energy end use breakdowns for the building types listed in its reference table.
- Next, to extract the most relevant breakdowns, the location aspect is incorporate. The nearest
- weather station to KNBA is located at Ottawa Intl Airport which is assigned climate zone 6A (cold-humid). Out of the list of unique climate zone locations in the US DOE, Rochester Intl Airport was selected as the best match as it is also a climate zone 6A.
- The purpose of allocating an appropriate location is to source the best estimate of energy use
- breakdown which is predicated upon the weather/climate patterns of a given location. Therefore, the energy model data for each building type is extracted based on this location and then used to assign the breakdown of space heating, cooling, etc... associated with that building type.
- Once the percentage breakdowns are known, these are applied as a multiplication to the total

energy consumption estimated for the corresponding NAICS Sector.

- From desktop research, the City of Ottawa does not provide property-type-specific end-use breakdowns which would otherwise be used to lend greater specificity to the analysis.
- The following table lists the energy end use breakdowns for the five unique building types used in the exercise.

End Uses	Medium Office	Warehouse	Strip Mall	Fast Food Restaurant	Data Centre
Heating (E)	18%	0%	0%	0%	0%
Heating (NG)	15%	77%	48%	31%	0%
Cooling (E)	7%	0%	5%	2%	50%
Lighting (E)	20%	13%	32%	3%	3%
Process Loads (E)	34%	8%	13%	22%	37%
Process Loads (NG)	0%	0%	0%	28%	0%
Water Systems (E)	0%	1%	3%	0%	0%
Water Systems (NG)	6%	0%	0%	14%	0%

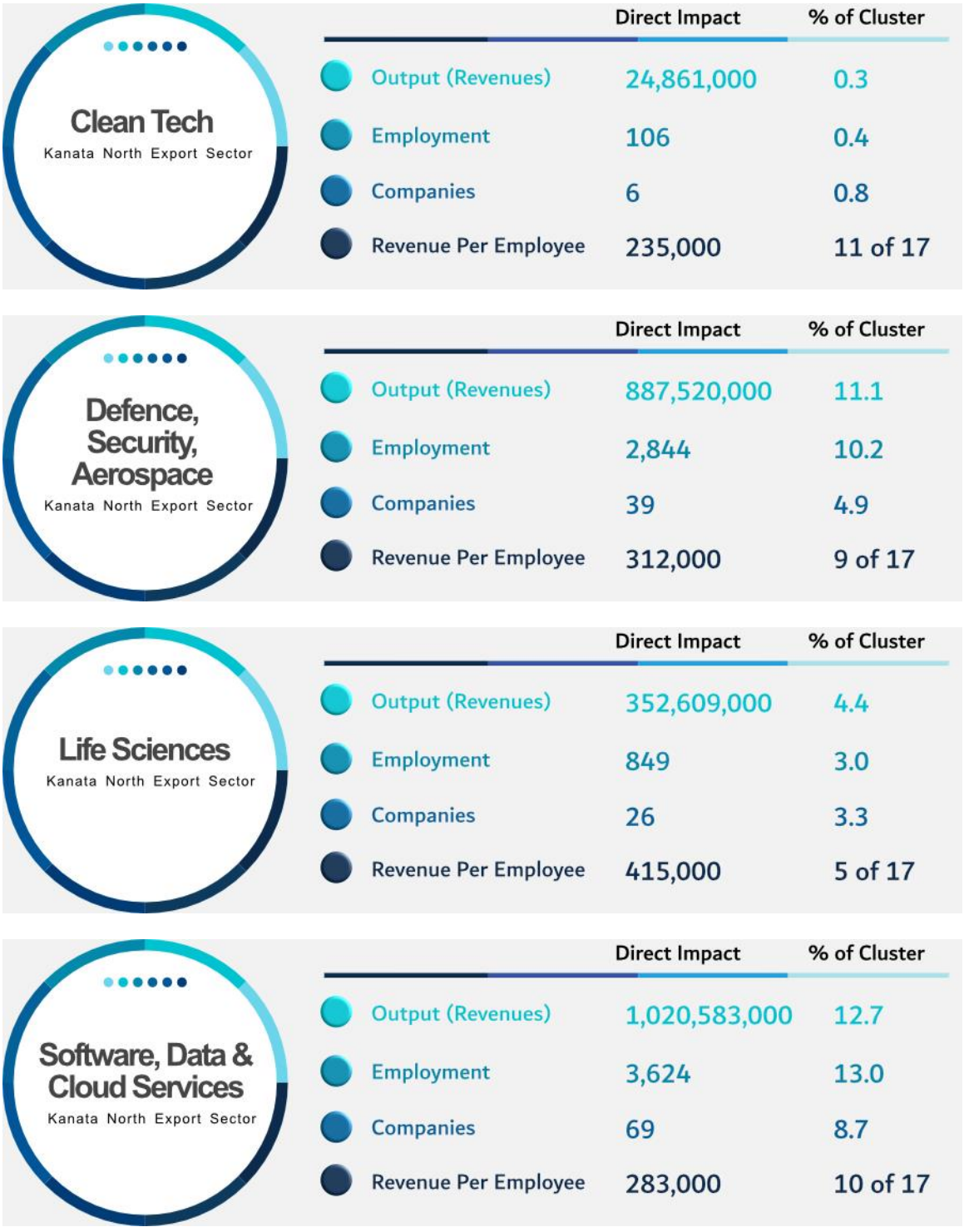
A1.4. Scenario 2 Detailed Assumptions

When applying energy growth commitments to the energy use forecast, each year receives an equal increase in energy by taking the total energy increase by the commitment end date and dividing it by the number of years from 2025.

To convert electrical capacity growth figures to energy consumption figures, it is assumed that the businesses operate 8760 hours of operation which equates to the number of hours in a year. Specifically, only Cisco Systems and Ciena Canada provide energy growth in Megawatts. Understanding that the primary function of these buildings is to serve data servers which typically operate at full capacity for the duration of the year, taking a direct conversion by annual hours to obtain electricity consumption is followed.

The portion of annual natural gas that is phased into electricity is based on the climate target set by the company. For example, if the goal is net zero by 2040, it is assumed that 100% of natural gas will be transitioned to electricity by 2040 and for each year between 2025 and 2040, an equal percentage of increase will occur (6.7%). Since heat pumps are the selected technology that is assumed to replace natural gas boiler equipment, an efficiency conversion factor of 3.5 is applied. This reflects what is known as the annualized coefficient of performance commonly found in heat pump technology.

Appendix 2 Summary of Key Economic Indicators By Kanata North Industry, 2025



	Direct Impact	% of Cluster
Output (Revenues)	1,423,000,000	17.8
Employment	4,431	15.9
Companies	62	7.8
Revenue Per Employee	321,000	8 of 17

	Direct Impact	% of Export Sector
Output (Revenues)	1,051,000,000	13.1
Employment	1,948	7.0
Companies	50	6.3
Revenue Per Employee	539,000	3 of 17

	Direct Impact	% of Cluster
Output (Revenues)	2,049,000,000	25.6
Employment	9,338	33.5
Companies	47	5.9
Revenue Per Employee	219,000	13 of 17

	Direct Impact	% of Cluster
Output (Revenues)	51,142,000	0.6
Employment	78	0.3
Companies	10	1.3
Revenue Per Employee	656,000	1 of 17


Real Estate
Kanata North Local Sector
Direct Impact
% of Cluster
Output (Revenues)
168,816,000
2.1
Employment
269
1.0
Companies
14
1.8
Revenue Per Employee
628,000
2 of 17


Other Professional Services
Kanata North Local Sector
Direct Impact
% of Cluster
Output (Revenues)
189,563,000
2.4
Employment
1,029
3.7
Companies
107
13.4
Revenue Per Employee
184,000
15 of 17


Construction, Renovation, Architecture
Kanata North Local Sector
Direct Impact
% of Cluster
Output (Revenues)
120,135,000
1.5
Employment
274
1.0
Companies
24
3.0
Revenue Per Employee
438,000
4 of 17


Legal
Kanata North Local Sector
Direct Impact
% of Cluster
Output (Revenues)
38,711,000
0.5
Employment
113
0.4
Companies
25
3.1
Revenue Per Employee
343,000
7 of 17

	Direct Impact	% of Cluster
Output (Revenues)	49,000,000	0.6
Employment	245	0.9
Companies	23	2.9
Revenue Per Employee	200,000	14 of 17

	Direct Impact	% of Cluster
Output (Revenues)	84,302,000	1.1
Employment	511	1.8
Companies	51	6.4
Revenue Per Employee	165,000	16 of 17

	Direct Impact	% of Cluster
Output (Revenues)	182,500,000	2.3
Employment	789	2.8
Companies	65	8.2
Revenue Per Employee	231,000	12 of 17

	Direct Impact	% of Cluster
Output (Revenues)	185,800,000	2.3
Employment	507	1.8
Companies	55	6.9
Revenue Per Employee	366,500	6 of 17

Source: Doyletech Corporation, DT EconWin Economic Impact and Industrial Analysis Model.

Appendix 3 ECONOMIC PROFILE USING IOIC CODES

In this section, an economic profile is developed using Input-Output Industry Classification Codes.

A3.1. Economic Indicators by IOIC Code, Largest Industries

Figure 9.1 identifies the largest industries in Kanata North based on various economic metrics. It includes all IOIC Codes for The Kanata North Export Market Sector and The Kanata North Local Market Sector.[88]

Largest Industries - By Output (Revenues)

Computer systems design and related services [BS541500]	1,535,846,161
Semiconductor and other electronic component manufacturing [BS334400]	1,129,667,584
Software publishers [BS511200]	1,118,850,879
Telecommunications [BS517000]	1,092,286,817
Other electronic product manufacturing [BS334A00]	523,603,062
Aerospace product and parts manufacturing [BS336400]	458,581,242
Computer and peripheral equipment manufacturing [BS334100]	356,172,000

Figure 0-1. Largest Industries in Kanata North.

As the broadest measure of economic activity, Output captures the value of goods and services for final consumption or export, plus those that are consumed during the production process (referred to as intermediate inputs).

Largest Industries - By Value-Add

Computer systems design and related services [BS541500]	909,220,927
Software publishers [BS511200]	685,855,589
Telecommunications [BS517000]	661,925,811
Semiconductor and other electronic component manufacturing [BS334400]	472,201,050
Other electronic product manufacturing [BS334A00]	258,659,913
Aerospace product and parts manufacturing [BS336400]	162,337,760
Computer and peripheral equipment manufacturing [BS334100]	143,537,316

Figure 0-2. Largest Industries in Kanata North.

The most common measure of production in the economy is Gross Domestic Product (GDP) or Value-Add. It captures the value of goods and services produced for final domestic consumption, export, or investment (called Final Demand or Final Use). Specifically, it covers only the final, unduplicated output.

[88] The numbers all refer to direct values only (that is, they do not include the indirect and induced impacts which would be in addition to these values).

Largest Industries - By Labour Income

Computer systems design and related services [BS541500]	752,564,619
Software publishers [BS511200]	516,909,106
Semiconductor and other electronic component manufacturing [BS334400]	335,511,272
Telecommunications [BS517000]	199,888,487
Other electronic product manufacturing [BS334A00]	153,415,697
Computer and peripheral equipment manufacturing [BS334100]	123,235,512
Aerospace product and parts manufacturing [BS336400]	115,103,892
Communications equipment manufacturing [BS334200]	57,204,024

Labour income is the total amount of wages and salaries that a sector generates.

Largest Industries - By Gross Operating Surplus

Telecommunications [BS517000]	447,837,595
Software publishers [BS511200]	170,065,334
Computer systems design and related services [BS541500]	161,263,847
Aerospace product and parts manufacturing [BS336400]	55,029,749
Lessors of real estate [BS531100]	35,165,700
Other electronic product manufacturing [BS334A00]	19,171,460
Pharmaceutical and medicine manufacturing [BS325400]	17,354,260
Social assistance [BS624000]	14,182,795
Gasoline stations [BS447000]	13,555,800
Banking and other depository credit intermediation [BS5221A0]	13,376,649

Gross Operating Surplus (GOS) is the excess of gross output over the costs incurred in production.[89]

Largest Industries - By International Imports

Semiconductor and other electronic component manufacturing [BS334400]	368,271,632
Aerospace product and parts manufacturing [BS336400]	172,885,128
Telecommunications [BS517000]	138,720,426
Other electronic product manufacturing [BS334A00]	137,707,605
Computer and peripheral equipment manufacturing [BS334100]	119,317,620
Computer systems design and related services [BS541500]	116,724,308
Software publishers [BS511200]	96,221,176
Communications equipment manufacturing [BS334200]	50,829,382
Transportation engineering construction [BS23C100]	4,264,650

International Imports are the amounts of imports from outside Canada generated by each industry.

A3.2. Industry and Technology Growth Forecasts

Table 46, below, presents industry growth forecasts. These are critical inputs to development of the forecasts and growth scenarios.

[89] GOS is a broad measure of profitability in the sense that it is surplus before deducting consumption of fixed capital, dividends, interest, royalties, land rent, and direct taxes payable. It is similar to the accounting concept of Earnings Before Interest, Taxes, Depreciation, and Amortization (EBITDA).

Table 46. Industry and Technology Growth Forecasts.

Advanced Materials

Growth Statement	Source	Link
the global advanced materials for semiconductor market size will exceed USD 157.87 billion by 2033, growing at a CAGR of 12.10% from 2023 to 2033.		https://www.startus-insights.com/innovators-guide/semiconductors-trends-innovation/

Data Centres

Growth Statement	Source	Link
Global data center capacity is projected to grow at 15% per year but this will not be sufficient to meet growing demand	Jones Lang LaSalle	https://www.jll.ca/en/trends-and-insights/research/data-center-outlook
IoT semiconductor component market to grow at a CAGR of 19%, from USD 33 billion in 2020 to USD 80 billion in 2025.	IoT Analytics	https://www.startus-insights.com/innovators-guide/semiconductors-trends-innovation/

A3.3. List of Study Participants

Table 47, presented below, identifies the participants who contributed input to this study. The input included a workshop to develop, illuminate, and enhance the PESTRL and SWOT analyses, interviews with industry stakeholders, and a community focus group to develop future growth scenarios.

Table 47. List of Study Participants.

Participant & Title	Organization

Appendix 4 SUPPLEMENTARY ENERGY STUDY METHODOLOGY

Modelling Assumptions and Data Limitations:

- Limited availability of detailed building data (e.g., GFA, GFA per business, and specific business use) required the use of assumptions and generalized estimates.
- Static assumptions: Occupant behavior, plug loads, and equipment usage patterns are simplified, where in reality they vary significantly.
- Weather data: Prototype models rely on historical or Typical Meteorological Year (TMY) data, which may not reflect future climate conditions or extreme events.
- Future occupancy/use: Changes in tenancy, density, or space use may make forecasts inaccurate.
- Technology changes: Retrofits, equipment degradation, and maintenance practices can diverge from model assumptions.
- Policy and codes: Future regulations (e.g., carbon pricing, electrification mandates) are uncertain.
- Climate change: Long-term weather patterns may diverge from historical baselines.
- Benchmarking Data: Benchmarking data gives an approximate representation of buildings based on their general use and does not include specific energy consumption data about each building.

Energy Use Intensity (EUI) Mapping from Building Prototypes to NAICS Sector

- In the Doyletech business database, each business is assigned a 6-digit NAICS industrial classification code (e.g., BS541500). For this analysis, energy profiles were assessed at the level of the primary NAICS sector, i.e., using the first two digits of the NAICS code. Therefore, the NAICS Sector mapped to a given business is to the detail of its first two NAICS Code.

Methodology for NAICS Sector 51 Mapping

- There are several data centre facilities at KNBA
- Data centre buildings are assumed to fall under the broad category of NAICS 51 Code “Information”.
- However, not all types of buildings that are classified under the “Information” label are datacentres, as some are better allocated to office buildings.
- The Information Sector includes “511 - Publishing Industries”, “512 - Motion Picture and Sound Recording”, “517 - Telecommunications”, and “518 - Data Processing, Hosting, and Related Services”. Due to the high EUIs that are expected for the uses associated with businesses in Sector 518, it was decided that a more accurate approach for the Information Sector should use the first three digits of the NAICS Code to more specifically distinguish data centre uses from the other listed uses in the sector.
- The first three NAICS digits of businesses under the “Information” classification were extracted from the export and local business list. The unique NAICS codes stemming from that were: 511, 512, 517, 518, 519.

- 517 and 518 were associated with data centre uses while 511, 512, and 519 were associated to office buildings based on their classification description

Table 48: Building Type and EUI Allocation by NAICS Sector

NAICS Code	Sector Title	Selected Representative EUI	Selected Building Prototype Description	U.S. DOE Building Type	U.S. DOE EUI (kWh/m²)	EnergyStar Building Type	Energy Star EUI (kWh/m²)
23	Construction	120	Warehouse (non-refrigerated)	Warehouse (non-refrigerated)	120	Warehouse/Distribution Centre	200
31, 33	Manufacturing	120	Warehouse (non-refrigerated)	Warehouse (non-refrigerated)	120	Warehouse/Distribution Centre	200
41, 42	Wholesale Trade	120	Warehouse (non-refrigerated)	Warehouse (non-refrigerated)	120	Warehouse/Distribution Centre	200
44, 45	Retail Trade	252	Strip Mall	Strip Mall	252	Mall	228
48,49	Transportation and Warehousing	120	Warehouse (non-refrigerated)	Warehouse (non-refrigerated)	120	Warehouse/Distribution Centre	200
511	Publishing Industries	134	Medium Office	Medium Office	134	Office	242
512	Motion Picture and Sound Recording Industries	134	Medium Office	Medium Office	134	Office	242
517	Telecommunications	650	Data Centre	-	-	-	-
518	Data Processing, Hosting, and Related Services	650	Data Centre	-	-	-	-
519	Other Information Services	134	Medium Office	Medium Office	134	Office	242
52	Finance and Insurance	134	Medium Office	Medium Office	134	Office	242
53	Real Estate and Rental and Leasing	134	Medium Office	Medium Office	134	Office	242
54	Professional, Scientific, and Technical Services	134	Medium Office	Medium Office	134	Office	242
55	Management of Companies and Enterprises	134	Medium Office	Medium Office	134	Office	242
56	Administrative and Support, Waste Management and Remediation Services	134	Medium Office	Medium Office	134	Office	242
61	Educational Services	134	Medium Office	Medium Office	134	Office	242
62	Health Care and Social Assistance	206	Medical Office	Hospital	399	Medical Office	206
71	Arts, Entertainment, and Recreation	239	Entertainment / Public Assembly	Medium Office	134	Entertainment/ Public Assembly	239

NAICS Code	Sector Title	Selected Representative EUI	Selected Building Prototype Description	U.S. DOE Building Type	U.S. DOE EUI (kWh/m^2)	EnergyStar Building Type	Energy Star EUI (kWh/m^2)
72	Accommodation and Food Services	356	Fast Food Restaurant	Quick Service Restaurant	2037	Fast Food Restaurant	356
81	Other Services (except Public Administration)	134	Medium Office	Medium Office	134	Office	242
91,92	Public Administration	134	Medium Office	Medium Office	134	Office	242

End Use Breakdown Additional Methodology Comments

- Different businesses within one building often have different NAICS Codes. Since the NAICS Codes are mapped to different building types to obtain EUI, the applicable GFA was broken down to calculate an energy consumption estimate for a given business' EUI
- Building types from the US DOE prototype models were chosen based on how closely they relate to the expected building type for a given primary NAICS Sector. Energy Star does not have associated energy end use breakdowns for the building types listed in its reference table.
- Next, to extract the most relevant breakdowns, the location aspect is incorporated. The nearest weather station to KNBA is located at Ottawa International Airport which is assigned climate zone 6A (cold-humid). Out of the list of unique climate zone locations in the U.S. DOE, Rochester International Airport was selected as the best match as it is also in climate zone 6A. The purpose of allocating an appropriate location is to source the best estimate of energy use breakdown which is predicated upon the weather/climate patterns of a given location. Therefore, the energy model data for each building type is extracted based on this location and then used to assign the breakdown of space heating, cooling, and other building loads associated with that building type.
- Once the percentage breakdowns are known, these are applied as a multiplication to the total energy consumption estimated for the corresponding NAICS Sector.
- From desktop research, the City of Ottawa does not provide property-type-specific end-use breakdowns which would otherwise be used to lend greater specificity to the analysis.
- The following table lists the energy end use breakdowns for the five unique building types used in the exercise.

Table 49: Energy End Use Breakdowns by Building Type

End Uses	Medium Office	Warehouse	Strip Mall	Fast Food Restaurant	Data Centre
Heating (E)	18%	0%	0%	0%	0%
Heating (NG)	15%	77%	48%	31%	0%
Cooling (E)	7%	0%	5%	2%	50%
Lighting (E)	20%	13%	32%	3%	3%
Process Loads	34%	8%	13%	22%	37%
Process Loads	0%	0%	0%	28%	0%
Water Systems	0%	1%	3%	0%	0%
Water Systems	6%	0%	0%	14%	0%

Peak Demand Detailed Assumptions

- The following table lists the seasonal electrical demand load factors that were used in the peak demand analysis.

Table 50: Calculated Load Factor for Kanata North Tech Park Energy Demand

Warehouse (non-refrigerant) refrig.)	220	0.7	0.15	0.7	0.15
Strip Mall	300	0.7	0.25	0.7	0.25
Medium Office	264	0.8	0.3	0.75	0.25
Data center	744	0.95	0.95	0.95	0.95
Medical Office	300	0.75	0.35	0.75	0.35
Entertainment / Assembly	150	0.6	0.15	0.6	0.15
Fast Food Restaurant	480	0.8	0.45	0.8	0.45

Appendix 5 OCAF ENGAGEMENT SUMMARY

This thematic analysis is based on a series of in-depth, one-on-one interview sessions with senior representatives from four leading firms operating in Kanata North: Nokia, Cisco, Ericsson, and PureColo. These organisations collectively represent a cross-section of the region's most energy-intensive and infrastructure-critical sectors, including wireless and 6G innovation, data infrastructure and colocation, and enterprise-scale R&D. The interviews aimed to uncover core insights on long-term business growth trajectories, expected energy demands, GHG reduction objectives, and the operational, policy, and infrastructure barriers to adopting clean technology.

Each firm brings a unique operational profile and energy stance to the district. Nokia, the largest of the group in terms of physical presence and energy demand, is moving towards a high-density, low-footprint model that could see energy requirements double or triple within 20 years. Cisco aims for up to 30 MW of electrical demand in the near future while exploring advanced recovery and storage systems. Ericsson, focused on software-driven wireless infrastructure, is pursuing a global net-zero strategy alongside managing the constraints of leased facilities. PureColo, operating at the edges of traditional incentive structures, exemplifies agile infrastructure provisioning — but also highlights gaps in policy alignment for non-R&D service providers.

Together, their insights form the empirical foundation for this analysis, surfacing both shared imperatives and sector-specific frictions. The goal is to understand where current systems support or hinder progress, and to identify actionable pathways for building a resilient, low-carbon, and innovation-ready energy district in Kanata North.

I. Strategic Growth Outlook: Intensifying Load Horizons

Theme: Densification and Infrastructure-Driven Growth

- **Nokia's** forward trajectory reflects not just linear growth, but a compounding effect driven by internal infrastructure densification and strategic realignment (e.g., consolidation of 150 employees from KRP to the main campus). Their energy use, already at 10 MW/hour, is projected to double or triple without expanding their physical footprint. This hints at a systemic shift in the energy-to-square-footage ratio, with broader implications for grid demand modelling and planning assumptions across Kanata North.
- **Ericsson**, although operating within a fixed footprint, anticipates increased energy demand linked to its 6G R&D investments. Their situation reflects a critical efficiency-growth paradox: while energy per unit of computation is decreasing, total energy demand is still increasing due to the rise in volume and complexity. They're not pushing physical boundaries but are quietly intensifying demand per m²—this hidden densification needs to be surfaced in district planning models.
- **Cisco's** projected growth to 25–30 MW over five years highlights a significant load compression challenge. Their infrastructure approach is highly specialised—rather than spreading out physically, it is layered with complexity: ice storage, heat recovery, solar integration. This serves

as a model for future campuses but demands high detail in grid response and infrastructure integration (e.g., smart load shedding or storage buffers).

- **PureColo** is the wildcard. With latent capacity to increase demand fivefold based on client uptake, and the operational agility to scale up quickly, they embody an "on-demand" infrastructure profile. Yet they face systemic response limitations—HydroOttawa's failure to respond to their 5 MW request highlights a disconnect between utility responsiveness and business agility. Their model prompts a rethink of how utility planning and district-level energy forecasts are operationalised.

Strategic Insight: Growth is not just vertical (more buildings) or horizontal (more space)—it's internal, infrastructural, and conditional. Planning frameworks must shift from square footage-based forecasting to models that focus on infrastructure density and operational elasticity.

II. Energy Demand, GHG Targets, and Monitoring

Theme: Target-Driven Action—But Dependency on External Enablers

- All firms surveyed are GHG-aware and have ambitious decarbonisation targets. Nokia (carbon-neutral by 2040) and Ericsson (net-zero by 2030 for operations, 2040 for the full chain) exemplify how global corporate pressure aligns with local operations. However, their capacity to act locally varies—Ericsson's leased facilities restrict their retrofit options, revealing a policy blind spot concerning landlord-tenant dynamics in sustainability.
- Tracking is robust. Nokia has site-specific energy and carbon reporting across its global footprint. Cisco centralizes its metrics in a unified hub. However, this detailed internal monitoring is inconsistent with external infrastructure uncertainty—they know what they need, but the system doesn't always deliver it.
- Battery infrastructure, LEED certification, and night-time grid interaction models like Nokia's offer a scalable way to smooth demand peaks and incorporate low-carbon supply. Their 2,000 tonnes CO_2 savings provide concrete data but also reveal a regulatory and incentive gap. These efforts are mainly driven by self-interest rather than system rewards.

Critical Insight: Internal ambition is abundant, but external capability and alignment are underdeveloped. Without faster grid responses, clearer pathways for tenant-controlled emissions actions, and flexible funding tools, these targets risk remaining aspirational.

III. Clean Technology and Sustainability Investment

Theme: Committed Actors with Conditional Investment Behaviour

- **Nokia's** decision to charge its batteries at night (when nuclear power dominates) and discharge during the day exemplifies intelligent carbon load-shifting. It's not just about reducing demand—it's about managing when and how that demand occurs. This underscores the potential of temporal optimisation of energy use, which should be part of any district-level resilience strategy.
- **Cisco** is assessing a diverse energy portfolio—including solar, heat recovery, and thermal storage. However, each project must undergo a viability test. This cost-risk assessment highlights the importance of accurate economic modelling tools that can factor in carbon savings, not merely direct ROI.

- **Ericsson's** experience with KRP highlights the difficulty of implementing renewable retrofits in non-owner-occupied buildings. Even with financial models in place, tenant control limits feasibility. This indicates the need for landlord engagement policies, possibly supported through co-investment incentives or performance-based leases.
- **PureColo's** strategy is sustainability-conscious but non-incentivised. They participate in reclaimed generator programmes and retain unused thermal capacity that could be shared, yet no mechanism rewards this. Their candid reflection that "there's no benefit other than doing the right thing" exposes a market failure in sustainability alignment.
- **Strategic Opportunity**: The foundation for a clean-tech transition exists. The next step is to build the enabling ecosystem of incentives, shared infrastructure agreements, and policy clarity, without which clean tech adoption will remain patchy and uneven.

IV. Infrastructure and Energy Reliability

Theme: Reliability Is the Non-Negotiable Baseline

- Ericsson and Nokia both highlight power reliability as crucial. Lab equipment and R&D environments cannot withstand interruptions. Even minor fluctuations can undo months of work or affect sensitive calibrations. This raises a high standard for uptime assurance—more than what standard grid services currently provide.
- EV load stress, lightning-induced instability, and emerging brownouts indicate that Ottawa's grid faces multi-faceted strain—temporal (peak loads), spatial (dense campuses), and environmental (climate volatility). Nokia's proactive planning with battery backup offers a temporary fix—but it is a self-funded resilience patch, not a systemic solution.
- HydroOttawa's slow or non-responsive behaviour, as noted by PureColo, is more than an operational concern—it's a competitive disadvantage. Firms now benchmark cities not just by tax or talent, but by infrastructure responsiveness and adaptive capacity.

Strategic Imperative: Build a Kanata Resilience Protocol—a coordinated infrastructure response model that includes outage-prevention tools, DER-based load buffers, and smart-grid adaptability.

V. Collective Leadership and District Energy Models

Theme: Conditions Are Ripe for Collaboration—If Structured Effectively

- **Nokia** recognises strategic and reputational alignment in spearheading district efforts—particularly as client preferences move towards decarbonised supply chains. This is not altruism—it's market positioning.
- **Cisco and Ericsson** are open to collaboration but remain cautious. They seek clarity on governance, funding, and benefits. Any strategy must ensure decision-making fairness, especially for firms that do not own their buildings.
- **PureColo** is already supporting KRP operationally but lacks the structure or incentives to expand further. However, their reclaimed thermal and power assets could serve as anchors for a community-scale energy loop—if such a mechanism existed.

- **Tactical Need**: Establish a Green Energy Governance Council—a structured public-private entity with a budget, mandate, and decision-making rights to coordinate implementation across tenants, owners, and utilities.

VI. Alignment with Green Energy Resilience District Vision

Theme: Alignment in Principle, Conditional Support in Practice

- There is strong conceptual alignment—firms like Nokia and Cisco view the Green Energy Resilience District (GERD) as both consistent with their brand and strategically beneficial. However, implementation must be based on viable economic and infrastructural mechanisms.
- Firms seek predictability and mutual benefits: Will DER investments be bundled? Will there be preferential rates for district participants? Will there be zoning, permitting, or interconnection fast-tracks?
- Most critically, how will the governance and operational model function? Without this, GERD risks becoming a theoretical label without the strength of coordinated infrastructure action.

Strategic Shift: Transition from vision to architecture—develop the policy frameworks, partnership models, and infrastructure roadmaps necessary to operationalise the GERD ambition.

Strategic Recommendations:

Enabling a Net-Zero-Capable Energy District in Kanata North

As the Kanata North technology district moves towards a shared vision of energy resilience and decarbonisation, its stakeholders encounter a crucial turning point—one that uncovers both the hidden potential of collective infrastructure transformation and the structural limitations of the current system. The data from leading firms like Nokia, Cisco, Ericsson, and PureColo indicates a consistent trend: operational growth exceeds grid flexibility, while internal sustainability goals are hindered by fragmented incentives, outdated delivery models, and a lack of systemic coordination. What is unfolding is not just a series of corporate energy strategies—it is the early phase of a territorial energy transition, where the load dynamics, carbon risks, and technology investments of key firms collectively reshape the regional energy landscape.

Yet the tools to navigate this transition remain incomplete. Utility planning still relies on reactive rather than anticipatory models. Federal and provincial funding programmes too often exclude operational innovation, especially when the beneficiaries are infrastructure enablers rather than IP generators. Landlord-tenant structures—pervasive in Kanata North—complicate the implementation of retrofit or renewable solutions, even when tenants are willing to act. At the same time, firms are progressing where they can: installing battery systems, monitoring energy usage in real time, and exploring heat recovery technologies that demonstrate a willingness to lead. What they lack is a cohesive, risk-aligned framework to act together at scale.

This suite of recommendations therefore focuses not only on what needs to be done, but on how to operationalize a district-wide response that matches the pace of technological and market change. The emphasis is on system readiness, policy realignment, and collaborative governance that moves beyond aspirational vision to executable delivery. This is not about nudging incremental progress; it is about structuring a regional demonstration of how advanced economies can align innovation, decarbonization, and infrastructure performance within real-world constraints. The opportunity—and the necessity—is to act as a model for net-zero implementation at the urban-district scale.

Recommendations

1. Modernise Grid Infrastructure with an Adaptive, Demand-Led Investment Framework

Collaborate on a joint investment and modernisation plan with Hydro Ottawa and the IESO, focusing on substation upgrades, distribution automation, and district-level energy resilience (e.g., DER integration, storage optimisation).

Policy Rationale: The current grid architecture is not designed for the densification trends and demand elasticity now emerging at Kanata North. Nokia’s load doubling, Cisco’s 30 MW projection, and PureColo’s latent 5–20 MW bursts demonstrate that planning-to-peak is no longer practical. An adaptive framework must incorporate predictive analytics, real-time forecasting, and location-based resilience tools.

Funding Alignment:

- Leverage NRCan's Smart Grid Program (expansion expected in 2025 Budget).
- Apply under Infrastructure Canada's "Green and Inclusive Community Buildings" if including public or research elements.
- Explore IESO's Grid Innovation Fund for distributed energy pilots.

Critical Note: Investments should focus on temporal reliability and spatial responsiveness—not merely capacity expansion. Companies require power where, when, and how they operate—not averaged system metrics.

2. Activate Targeted Incentives to De-Risk Sustainability Transitions

Action: Create a policy and advocacy strategy to unlock customised incentive measures—focusing on retrofits, clean technology deployment, and shared energy infrastructure (e.g., microgrids, energy loops).

Policy Gaps Identified:

- Existing programs (IRAP, SRED) fail to recognize operational innovation—PureColo is excluded despite providing infrastructure for others' research.
- Current capital grant structures do not encourage shared or cooperative investment models, where multiple tenants benefit from a single installation.

Recommended Instruments:

- Broaden IRAP eligibility to include operational or tenant-led energy efficiency innovations.
- Introduce green bond guarantees to de-risk shared solar, storage, or waste heat recovery infrastructure across non-owner-occupied buildings.
- Offer performance-based tax credits linked to measurable CO_2 reductions over a 10-year period.

Strategic Payoff: Without targeted incentives, firms will revert to minimum-effort compliance, not transformational energy leadership. Investment flows to where the risk is lowest—policy must alter the calculation.

3. Establish a Purpose-Built Governance and Delivery Entity

Action: Establish a Green Energy District Implementation Council (GEDIC) to oversee the Kanata North initiative, with authority to coordinate infrastructure strategy, funding alignment, and stakeholder engagement.

Why It's Needed:

- The district is multi-tenanted, multi-infrastructural, and trans-organisational. Without a neutral, empowered delivery entity, coordination risks fragmentation or paralysis.
- Stakeholders such as Ericsson, leasing from KRP, lack decision-making authority; Cisco requires decision alignment across global operations; PureColo supports but does not steer.

Composition & Function:

- Co-chaired by industry organisations (e.g., Nokia) and public agencies (e.g., City of Ottawa or Hydro Ottawa). Includes representation from tenants, building owners, utilities, researchers, and economic development.
- Mandated to supervise project bundling for grant access, district-wide procurement, and zoning/permitting alignment.

Funding Hook: Present GEDIC as a pilot for net-zero governance architecture—highlighting Kanata North as a national showcase of distributed urban decarbonisation governance.

4. Scale Impact Through Technologically Anchored Pilot Programs

Action: Develop a network of interconnected, district-scale demonstration projects using existing site innovations (e.g., Nokia's battery bank, Cisco's thermal systems, PureColo's waste heat) as key components.

Objective: Move beyond proof-of-concept to proof-of-district—demonstrating how coordinated, modular projects can combine to provide significant grid relief and carbon reduction.

Pilot Priorities:

- Integrated DER operations with smart grid integrations (battery + solar + building load optimisation).
- Feasibility of district heating and cooling using reclaimed energy from PureColo and others.
- Real-time carbon tracking dashboards across multiple tenants to inform load-shifting incentives.

Funding Pathways:

- Natural Resources Canada: Clean Fuels Fund, Low Carbon Economy Challenge.
- ISED: Strategic Innovation Fund (net-zero track).
- Federation of Canadian Municipalities: Green Municipal Fund (especially for energy loops).

Strategic Critique: Current innovation efforts are disconnected and under-utilised. District coherence will turn isolated successes into fundable, system-wide transformation.

Appendix 6 MODERATE UPSIDE FORECAST FOR VALUE ADD, KANATA NORTH INDUSTRIAL CLUSTER

Table 21. Moderate Upside Forecast for Value Add, Kanata North Industrial Cluster (2025-2046)[90], (Oxford Economics, n.d.)

IOIC Industry	2025 Survey	2036 Forecast	2046 Forecast
Accounting, tax preparation, bookkeeping and payroll services [BS541200]	12,859,140	16,756,325	18,465,834
Aerospace product and parts manufacturing [BS336400]	162,337,760	211,537,025	233,118,400
Agencies, brokerages and other insurance related activities [BS524200]	2,393,088	3,118,355	3,436,495
Alumina and aluminum production and processing [BS331300]	2,139,200	2,787,522	3,071,909
Architectural, engineering and related services [BS541300]	40,504,812	52,780,496	58,165,254
Automotive repair and maintenance [BS811100]	887,852	1,156,930	1,274,962
Banking and other depository credit intermediation [BS5221A0]	28,183,956	36,725,591	40,472,400
Communications equipment manufacturing [BS334200]	73,811,643	96,181,538	105,994,146
Computer and peripheral equipment manufacturing [BS334100]	143,537,316	187,038,781	206,120,803
Computer systems design and related services [BS541500]	909,220,927	1,184,776,049	1,305,648,961
Converted paper product manufacturing [BS322200]	8,154,629	10,626,031	11,710,117
Cutlery, hand tools and other fabricated metal product manufacturing [BS332A00]	4,469,307	5,823,808	6,417,963
Data processing, hosting, and related services [BS518000]	5,764,950	7,512,118	8,278,517
Educational services [BS610000]	6,842,976	8,916,858	9,826,572
Electric lighting equipment manufacturing [BS335100]	2,912,282	3,794,899	4,182,062
Employment services [BS561300]	20,321,341	26,480,074	29,181,617
Financial investment services, funds and other financial vehicles [BS52A000]	28,861,455	37,608,418	41,445,294
Food services and drinking places [BS722000]	34,058,128	44,380,033	48,907,761
Industrial machinery manufacturing [BS333200]	1,720,264	2,241,620	2,470,314
Legal services [BS541100]	27,600,749	35,965,633	39,634,909
Lessors of real estate [BS531100]	53,606,250	69,852,551	76,979,030
Management, scientific and technical consulting services [BS541600]	24,213,042	31,551,223	34,770,134
Medical equipment and supplies manufacturing [BS339100]	15,510,163	20,210,786	22,272,726
Miscellaneous ambulatory health care services [BS621A00]	16,297,467	21,236,696	23,403,300
Non-depository credit intermediation [BS522200]	11,107,212	14,473,444	15,950,050
Non-residential building construction [BS23B000]	14,886,725	19,398,404	21,377,463
Offices of dentists and physicians [BS621200 & BS621100]	42,693,477	55,632,473	61,308,194
Offices of real estate agents and brokers/activities related to real estate [BS531A00]	9,176,720	11,957,884	13,177,848
Other activities of the construction industry [BS23E000]	9,445,962	12,308,724	13,564,481
Other electrical equipment and component manufacturing [BS335900]	495,000	645,018	710,824
Other electronic product manufacturing [BS334A00]	258,659,913	337,051,271	371,437,828
Other general-purpose machinery manufacturing [BS333900]	1,411,473	1,839,244	2,026,887
Other miscellaneous manufacturing [BS339900]	266,400	347,137	382,553
Other professional, scientific and technical services [BS541900]	5,940,116	7,740,371	8,530,057
Other transportation equipment manufacturing [BS336900]	16,603,101	21,634,958	23,842,194
Personal care services and other personal services [BS812A00]	14,458,374	18,840,234	20,762,348
Pharmaceutical and medicine manufacturing [BS325400]	38,615,500	50,318,595	55,452,185
Printing and related support activities [BS323000]	43,395,287	56,546,978	62,315,999
Residential building construction [BS23A000]	35,367,650	46,086,428	50,788,245
Resin, synthetic rubber, artificial/synthetic fibres/filaments manufacturing [BS325200]	304,800	397,175	437,695
Scientific research and development services [BS541700]	1,701,280	2,216,882	2,443,053
Semiconductor and other electronic component manufacturing [BS334400]	472,201,050	615,309,742	678,084,712
Software publishers [BS511200]	685,855,589	893,715,983	984,894,441
Telecommunications [BS517000]	661,925,811	862,533,872	950,531,078
Transportation engineering construction [BS23C100]	14,106,150	18,381,263	20,256,551
Warehousing and storage [BS493000]	485,100	632,118	696,608
Waste management and remediation services [BS562000]	3,433,086	4,473,542	4,929,941
Retail	81,964,087	106,804,721	117,701,124
Wholesale	35,211,598	45,883,081	50,564,153
Other (Not Elsewhere Categorized)	140,686,748	183,324,300	202,027,363
Total:	**4,226,606,905**	**5,507,553,201**	**6,069,443,356**

[90] Doyletech Corporation estimates, with data from *Oxford Economics, Moderate Upside Forecasts* for Ottawa-Gatineau Total Employment and GDP (2024-2036).

Appendix 7 MODERATE UPSIDE FORECAST FOR EMPLOYMENT, KANATA NORTH INDUSTRIAL CLUSTER

Table 22. Moderate Upside Forecast for Employment, Kanata North Industrial Cluster (2025-2046)[91].

IOIC Industry	2025 Survey	2036 Forecast	2046 Forecast
Accounting, tax preparation, bookkeeping and payroll services [BS541200]	78	102	112
Aerospace product and parts manufacturing [BS336400]	1,469	1,914	2,109
Agencies, brokerages and other insurance related activities [BS524200]	18	23	26
Alumina and aluminum production and processing [BS331300]	28	36	40
Architectural, engineering and related services [BS541300]	266	347	382
Automotive repair and maintenance [BS811100]	16	21	23
Banking and other depository credit intermediation [BS5221A0]	88	115	126
Communications equipment manufacturing [BS334200]	510	665	732
Computer and peripheral equipment manufacturing [BS334100]	1,353	1,763	1,943
Computer systems design and related services [BS541500]	4,585	5,975	6,584
Converted paper product manufacturing [BS322200]	59	77	85
Cutlery, hand tools and other fabricated metal product manufacturing [BS332A00]	28	36	40
Data processing, hosting, and related services [BS518000]	30	39	43
Educational services [BS610000]	108	141	155
Electric lighting equipment manufacturing [BS335100]	28	36	40
Employment services [BS561300]	77	100	111
Financial investment services, funds and other financial vehicles [BS52A000]	241	314	346
Food services and drinking places [BS722000]	511	666	734
Industrial machinery manufacturing [BS333200]	7	9	10
Legal services [BS541100]	113	147	162
Lessors of real estate [BS531100]	85	111	122
Management, scientific and technical consulting services [BS541600]	194	253	279
Medical equipment and supplies manufacturing [BS339100]	155	202	223
Miscellaneous ambulatory health care services [BS621A00]	110	143	158
Non-depository credit intermediation [BS522200]	50	65	72
Non-residential building construction [BS23B000]	72	94	103
Offices of dentists and physicians [BS621200 & BS621100]	298	388	428
Offices of real estate agents and brokers/activities related to real estate [BS531A00]	35	46	50
Other activities of the construction industry [BS23E000]	46	60	66
Other electrical equipment and component manufacturing [BS335900]	11	14	16
Other electronic product manufacturing [BS334A00]	839	1,093	1,205
Other general-purpose machinery manufacturing [BS333900]	10	13	14
Other miscellaneous manufacturing [BS339900]	5	7	7
Other professional, scientific and technical services [BS541900]	72	94	103
Other transportation equipment manufacturing [BS336900]	207	270	297
Personal care services and other personal services [BS812A00]	303	395	435
Pharmaceutical and medicine manufacturing [BS325400]	219	285	314
Printing and related support activities [BS323000]	562	732	807
Residential building construction [BS23A000]	179	233	257
Resin, synthetic rubber, artificial/synthetic fibres/filaments manufacturing [BS325200]	4	5	6
Scientific research and development services [BS541700]	19	25	27
Semiconductor and other electronic component manufacturing [BS334400]	4,241	5,526	6,090
Software publishers [BS511200]	3,613	4,708	5,188
Telecommunications [BS517000]	5,293	6,897	7,601
Transportation engineering construction [BS23C100]	73	95	105
Warehousing and storage [BS493000]	5	7	7
Waste management and remediation services [BS562000]	49	64	70
Retail	390	508	560
Wholesale	68	89	98
Other (Not Elsewhere Categorized)	1,038	1,353	1,491
Total:	**27,858**	**36,301**	**40,005**

[91] Doyletech Corporation estimates, with data from Oxford Economics, Moderate Upside Forecasts for Ottawa-Gatineau Total Employment and GDP (2024-2036).