CAPITAL PROJECTS – SUPPORT SERVICES

1.0 PURPOSE

This evidence provides descriptions and listings of capital projects, business case summaries, and in-service additions for OPG's Support Services' projects that support the regulated facilities.

As discussed in Ex. D3-1-1, since EB-2016-0152, OPG has initiated corporate strategies for Information Technology and Real Estate to enable the company to meet its post-Pickering cost structure and OM&A targets. These corporate strategies have resulted in OPG undertaking a number of new capital projects not previously identified in EB-2016-0152. In addition, this exhibit sets out the capital projects underpinning these strategies that form part of the IR term capital budgets presented in Ex. D3-1-1.

2.0 CAPITAL PROJECTS LISTING

OPG has used a tiered structure for reporting all capital projects. Information is presented for projects which have budgeted expenditures or in-service amounts during the 2022-2026 IR term.

The following information is provided for capital projects being undertaken by OPG's corporate groups:

- Tier 1: For projects with a total cost of $20M or greater, summary level information is provided in Ex. D3-1-2, Table 1a through 1b (Section 3.0 below).
- Tier 2: For projects with a total cost of $5M to $20M, summary level information is provided in Ex. D3-1-2, Tables 2a through 2d (Section 4.0 below).
- Tier 3: For projects with a total cost of less than $5M, aggregated information is provided in Ex. D3-1-2, Table 3 (Section 5.0 below).

There is also an unallocated IT project portfolio category. As discussed in Ex. D3-1-1, OPG will review the project portfolio on an annual basis to prioritize projects for execution each year. OPG expects that during the IR term, current projects being developed or other projects to be

identified, as new IT tools, innovations, and cybersecurity needs arise, will form part of the projects prioritization process, ultimately reducing the unallocated portfolio to zero.

3.0 TIER 1 CAPITAL PROJECTS

There are four Tier 1 capital projects with costs greater than $20M comprising two categories: Ongoing Projects from EB-2016-0152 and New Projects approved since EB-2016-0152. Exhibit D3-1-2, Table 1a presents the Tier 1 projects by the IT group and Real Estate groups discussed below. Business case summaries, where available, are provided in Attachments to this exhibit, and also listed in Ex. D3-1-2, Table 6.

3.1 Ongoing Projects from EB-2016-0152

Cyber Security – CSA N290.7 is an ongoing regulatory compliance program comprised of separate projects. The primary purpose of the program is to mitigate cyber security risks at each nuclear site by complying with Canadian Nuclear Safety Commission Action Items 2008-13-05 and 2008-04-08 to address vulnerabilities of Critical Cyber Assets identified in a self-assessment as part of the Canadian Standard Association N290.7 Cyber Security Standard. In EB-2016-0152, OPG had forecast the first of these projects as a Tier 2 project. With increased cybersecurity regulatory requirements, this project has since become a program of distinct projects to address discrete regulatory requirements as and when issued. The program started in 2017 and is expected to be completed in 2025 at an estimated cost of $40.7M.

3.2 New Projects

The **SAP Payroll Upgrade** is a sustaining project with the objective of upgrading the existing SAP Payroll system used at OPG, for which vendor support is expected to expire during the IR term. This project plans to start in 2024 with an estimated cost of $27.0M. Planned final in-service date is 2025.

The **700 University Workplace Transformation** project was not included in EB-2016-0152 but was completed in 2019 with a cost of $20.9M. This project reduced OPG's footprint at 700 University from five floors to two floors, largely enabled by transitioning to a 'free address' workspace. This has resulted in greater collaboration in the workplace, as well as reduced

operating and maintenance costs. This project has also enabled OPG to develop its Workplace Transformation expertise while it continues to execute other like projects over the bridge and IR term at other core OPG offices.

The **Clarington Corporate Campus** project includes the construction of a new corporate campus facility in Clarington adjacent to the current Darlington Energy Complex. This new building will be designed to accommodate at least 1,250 employee workstations and will function as OPG's new corporate head office. This initiative targets a reduction in square footage per employee in alignment with current industry standards, while providing a new workplace design that encourages and supports innovation, collaboration, and agility across OPG. This project is estimated to cost [redacted] with a planned final in-service date in 2025.

4.0 TIER 2 CAPITAL PROJECTS

There are 34 Tier 2 projects comprising three categories: Completed/Deferred Projects from EB-2016-0152; Ongoing Projects from EB-2016-0152; and New Projects approved since EB-2016-0152.

4.1 Completed/Deferred Projects from EB-2016-0152

Exhibit D3-1-2, Table 2a presents five Tier 2 projects that were completed by the IT group and Real Estate group discussed in Sections 4.1.1 and 4.1.2, respectively.

4.1.1 IT

The **Microsoft Windows Server Upgrade** was a sustaining project to support OPG's applications and servers as part of the company's asset lifecycle plan. The project started in 2015 and it was completed in 2017 at a cost of $7.4M.

Mainframe Purchase was a sustaining project for OPG to acquire two new mainframes as part of the IT asset lifecycle plan. It started in 2015 and it was completed in 2017 at a cost of $5.2M.

Storage Purchase was a sustaining project to enable OPG to acquire new storage equipment as part of the IT asset lifecycle plan. It started in 2015 and it was completed in 2017 at a cost of $6.6M.

The **Security and Emergency Services (SES) P25 Interoperability Radio System (SIRS)** was a regulatory project to restructure the integrated digital enhanced network for vendor support in order to provide wireless voice communication systems at the nuclear sites. The project started in 2016 and is expected to be complete in 2020 at a cost of $10.1M.

4.1.2 Real Estate

The **Darlington Nuclear Generating Station Site Road and Bridge Repair and Rehabilitation** was a sustaining project to conduct repairs at the Holt Road and Park Road at the Darlington site. The project started in 2016 and it was completed in 2018 at a cost of $7.4M.

4.2 Ongoing Projects from EB-2016-0152

Exhibit D3-1-2, Table 2a presents three ongoing Tier 2 projects being carried out by the IT group discussed in Section 4.2.1.

4.2.1 IT

Asset Suite Upgrade is a sustaining project for an enterprise resource management system used to support work management processes including materials management and plant maintenance across OPG. This project started in 2020 and is expected to be complete by 2022 at an estimated cost of $15.0M. Planned final in-service date is 2022.

Tempus Lifecycle Upgrade is a sustaining project with the objective of upgrading or migrating the existing software application to a web-based time entry system that is accessible remotely. The project started in 2017 at an estimated cost of $17.8M. Planned final in-service date is December 2020.

Energy Market Application Refresh Program is a regulatory project with the objective of upgrading a number of applications that support business activities from trading to outage

management. Many of these custom built applications are at end of life with respect to technology or vendor support. The project started in 2020 with an estimated cost of $9.7M. Planned final in-service date is 2023.

4.3 New Projects

Exhibit D3-1-2, Tables 2b through 2d, presents 26 Tier 2 projects that are being undertaken by the IT and Real Estate groups discussed in Section 4.3.1 and 4.3.2, respectively.

4.3.1 IT

Documentum Implementation was a sustaining project to implement a new enterprise content management system, Documentum, to replace the Curator/CorDoc content management application, which reached its end of life and is no longer supported by the vendor. The project started in 2016 and was completed in 2019 at a cost of $9.4M.

The **SAP ECC 6.0 Upgrade** was a sustaining project to upgrade from the SAP 4.7 enterprise resource planning system to the 6.0 version to ensure continued support by the vendor in the areas of Finance, Human Resources, Payroll and Real Estate, and to address security vulnerabilities. The project started in 2015 and was completed in 2018 at a cost of $6.3M.

Microsoft SharePoint Upgrade was a sustaining project to upgrade the outdated SharePoint 2007 software. The new version reduces onsite servers, storage, and ongoing support resource requirements. This project was to ensure existing infrastructure would be compatible with the new Microsoft Enterprise Agreement for the SharePoint Upgrade. The project started in 2016 and it was completed in 2019 at a cost of $6.2M.

The **Wireless Improvement Program** was a sustaining project that deployed a company wide Wi-Fi network to OPG-occupied office spaces, buildings and sites. The project started in 2017 and it is expected to be was completed in 2020 at a cost of $9.2M.

The **Network Segmentation Campus Switch Replacement** is a sustaining project to replace obsolete network hardware. The project started in 2017 and is expected to be complete in 2023 at an estimated cost of $14.9M.

The **Windows 10 Project (Windows 7 Lifecycle Upgrade)** was a sustaining project to mitigate the risk of utilizing an outdated operating system. Implementing Windows 10 helps ensure safe day-to-day operation. This project was to ensure existing infrastructure would be compatible with the new Microsoft Enterprise Agreement for the Windows upgrade. The project started in 2017 and was completed in 2019 at a cost of $9.7M.

OPG Telephone Upgrade was a sustaining project to support the implementation of a 'free address' office environment at 700 University by removing most fixed line telephones previously affixed to individual employee workstations and subsequently implementing a Skype telephone system via each individual user's laptop. The project started in 2017 and was completed in 2019 at a cost of $6.5M.

The **Reimagine Program** is a value enhancing project with the objective of seeking opportunities to leverage robotic process automation to shift Shared Services, Finance and Supply Chain away from manual activities. Reimagine also standardized processes, eliminated redundant work, and optimized existing tools. The project started in 2019 and was completed in 2020 at a cost of $17.5M.

Reimagine Program 2.0 is a value enhancing project aimed at improving the service delivery model across Shared Services, Human Resources, Finance and Supply Chain, resulting in timely fulfillment and less follow-up. The project started in 2020 and is expected to be complete in 2022 at an estimated cost of $14.0M.

The **Monitoring and Diagnostic Sensor Network** is a value enhancing project to implement sensor technology and analytics to deliver equipment health and operational information to the data repository, allowing for early detection and resolution of potential repairs. The project started in 2017 and is expected to be complete in 2021 at an estimated cost of $5.2M.

The **Enterprise Asset Management tool** is a sustaining project to enable an integrated, strategic and systematic approach to manage assets to maximize asset value. The project started in 2017 and is expected to be complete in 2021 at an estimated cost of $8.9M.

The **Training Information Management system (TIMS) II Upgrade** is a sustaining project intended to upgrade the existing Training Information Management System. It is the system of record for OPG nuclear training records, and includes managing employee credits, qualifications, and scheduled training events (classroom courses). This project plans to start in 2023 and is expected to be completed in the same year at an estimated cost of $6.0M.

The **Audio Visual Conferencing Room Refresh** is a sustaining project to upgrade the Avaya Aura conferencing equipment, the Scopia Bridge, Polycom video end points and Plantronics video conferencing equipment throughout OPG facilities that will reach end of life during the IR term. This project plans to start in 2023 and is expected to be complete in 2025 at an estimated cost of $7.5M.

The **Documentum Lifecycle Upgrade** project is a sustaining project to upgrade OPG's existing enterprise content management system, Documentum. The new release will provide enhanced performance and security, improved user experience and extended capability. This project plans to start in 2023 and is expected to be complete by 2024 at an estimated cost of $8.0M.

The **Human Resource System Replacement** a sustaining project to deploy an integrated suite of web-based human capital management applications to support OPG's HR system of record, including talent management, workforce analytics and succession planning – and pivot from disparate systems at end of life. This project plans to start in 2022 and is expected to be complete by 2023 at an estimated cost of $13.0M.

The **Nuclear Integrated Digital Enhanced Network** was a regulatory project to upgrade obsolete mobile communications technology that underpinned the day-to-day plant operation

communication, security and emergency communication within the plant, and external communication with Durham police and firefighters. The project started in 2015 and was completed in 2018 at a cost of $11.4M.

The **Pickering Wi-Fi Power House Unit 1-8** is a sustaining project to establish a broadband wireless network infrastructure within the station to facilitate direct access to the data and applications required to perform field work. The project started in 2018 and is expected to be completed in 2023 at a cost of $18.3M.

The **Darlington Wireless Program** is a sustaining project to establish wireless network infrastructures within the station to facilitate direct access to data and applications required to perform field work. The project started in 2019 and is expected to be completed in 2021 at an estimated cost of $6.4M.

The **OPG Telecom Upgrade** is a sustaining project with the objective of upgrading the Avaya Private Branch Exchange (PBX) equipment supporting the Darlington Energy Complex and includes voice loggers used by physical plant security. This project plans to start in 2023 and is expected to be complete in 2025 at an estimated cost of $7.5M.

4.3.2 Real Estate

Ground Maintenance Complex was a sustaining project that includes engineering, procurement, and construction of 2 steel buildings for storing salt, transport work equipment, snow removal equipment and ground maintenance machinery at Darlington. The project started in 2018 and was complete in 2020 at a cost of $8.6M.

Darlington Heating Ventilation and Air Conditioning (HVAC) Systems R22 Replacement is a sustaining project to conduct upgrades to the antiquated HVAC system. The project started in 2020 and is expected to be complete in 2022 at an estimated cost of $9.0M.

Update of the Darlington Engineering Support Services Building ("ESSB") 2nd Floor is a sustaining project that will modernize the 2nd floor of the 20-year old building to replace

furniture and fixtures at end of life, revamp the outdated design to create an open office and comply with the *Accessibility for Ontarians with Disabilities Act* ("AODA"). This increase will enable OPG to accommodate staff presently located at 230 Westney Rd. (a leased facility), and will reduce OPG's overall leasing footprint and new build costs. This project is being planned independently from the ESSB 3rd floor as the design for this floor will have more space dedicated to individual work stations. In addition, it will allow operational experience from the 3rd floor to be captured into planning and construction of the 2nd floor. The project starts in 2021 and is expected to be complete in 2022 at an estimated cost of $10.1M.

Overhaul of the Darlington Energy Complex ("DEC") 2nd Floor is a sustaining project that reconfigures the floor to construct free address workspaces and remove obsolete equipment to increase accessibility and usage, while aligning with the new corporate head office as part of the Clarington Corporate Campus. The DEC will accommodate non-station staff (support staff who do not need to be at Nuclear or Renewable Generation stations) once the Darlington Refurbishment Program staff vacate the space. The refresh will include AODA upgrades along with free address furniture and upgraded technology to support improved collaboration. Up-front building assessments and pre-construction activities are included in the years preceding project execution as these will inform the design of both the 2nd and 3rd floors. The DEC will form part of the overall Clarington Corporate Campus ("Campus") footprint. Operational experience from this project will be incorporated into the design of the DEC 3rd floor project. Utilizing the DEC space is less expensive than the alternative of building additional new space or continuing to lease space outside of the Campus footprint. Planning the 3rd floor independently of the 2nd floor allows operational experience from the 2nd floor to be captured into plans and construction of the 3rd floor, and aligns with the space needs of the Darlington Refurbishment Program team. The project starts in 2021 and is expected to be complete in 2025 with an estimated cost of $10.2M.

Update of the Darlington ESSB 3rd Floor is a sustaining project that will modernize the 3rd floor of the 20-year old build to replace furniture and fixtures at end of life, reconfigure outdated design to create an open office and comply with the AODA. The project includes collaborative spaces for Darlington station staff. The design incorporates current AODA compliant design

and free address seating, increasing capacity by up to 30%. This increase will enable OPG to accommodate staff presently located at 230 Westney Rd. (a leased facility), and will reduce OPG's overall leasing footprint and new build costs. This project is being planned independently of the ESSB 2nd floor as the design for this floor will have more space dedicated to large group collaboration. In addition, operational experience from the 3rd floor will be captured into planning and construction of the 2nd floor. This project is also planned to align with modifications to the building support systems currently at end of life (e.g., HVAC upgrade). The project starts in 2020 and is expected to be complete in 2021 with an estimated cost of $10.4M.

Upgrade of the Pickering Administration Building is a sustaining project to refurbish the Pickering Administration Building, which is located in the protected area of station premises. This building will accommodate personnel critical to safe storage who are currently located in other buildings, which will be demolished at station end of life. Optimization of this office space through utilizing a free address design increases the building capacity up to 30% and incorporates a combination of used and new furniture and upgraded technology. The project starts in 2021 and is expected to be complete in 2022 at an estimated cost of $8.0M.

Overhaul of the Darlington Energy Complex 3rd Floor is a sustaining project to reconfigure this floor by constructing agile office workspaces and removing obsolete equipment to increase accessibility and usage, while aligning with the new corporate head office in forming part of the Campus. The DEC will accommodate non-station support staff who do not need to be located at a Nuclear or Renewable Generation station and will be available once the Darlington Refurbishment Program staff vacate the space. The DEC is part of the overall Campus footprint. The refresh will include AODA upgrades along with agile office furniture and upgraded technology to support improved collaboration. Utilizing the DEC space is less expensive than the alternative of building additional new space or continuing to lease space outside of the Campus footprint. Planning the 3rd floor independently of the 2nd floor allows operational experience from the 2nd floor to be captured into planning and construction of the 3rd floor, and aligns with the space needs of the Darlington Refurbishment Program team. The project starts in 2024 and is expected to be complete in 2025 with an estimated cost of $7.3M.

5.0 Tier 3 Capital Projects

Exhibit D3-1-2, Table 3 provides aggregated information for Tier 3 projects with a cost less than $5M. There are 203 Tier 3 projects.

ATTACHMENTS

Attachment 1:	700U Workplace Transformation – Execution Phase BCS
Attachment 2:	Clarington Corporate Campus – Developmental BCS

Business Case Summary

Project #	83900 (OM&A) and #83901 (CAP)	**Controlled Doc #**	
Project Title	2019CK: 700U Workplace Transformation		
Facility	700 University Ave. Toronto	**Investment Classification**	Value Enhancing
Project Level (Scalability)	B	**Financial Classification**	☒ OM&A ☒ Capital ☐ Capital Spare ☐ MFA ☐ CMFA ☐ Provision ☐ Others: [if applicable]
Release: Gate and Project Phase	☒ Superseding G0☐: Initiation ☐ Choose an item. G1☐: Choose an item.		☐ Choose an item. G2☐: Definition ☐ Choose an item. G3☒: Execution
Estimate Class (overall project)	Class 1	**Target Project Completion Date**	[AUG-2019]

Recommendation

This document supersedes the original BCS which was approved to release a budgetary allocation of $**26,359K including $2,396K of contingency, in 2018.**

The superseding BCS is required to change funding stream for Office Furniture from OMA to Capital due to the capitalization of furniture in 2019, $6,038K will need to be moved from OMA to Capital.

There is no change to the original BCS details relating to the scope of work, planning, and risks. Appendix A: Summary Estimate have been revised to reflect the projected spending from OMA to Capital funding.

We recommend the release of $25,895K, including $2,319K of contingency.
This is in addition to the initial release of 464K including 77K of contingency for the identification/initiation phase.
The estimated total project cost is $ 26,359K including $2,396K of contingency.

The quality of the estimate for this release is Class 1, and for the total project is Class 1.

This release will fund the following scope of work:

IDENTIFICATION & INITIATION (Phase 1): *Phase 1 is completes and was included in the initial release.*

- Develop and submit a project plan and space utilization study
- Provide report outlining design recommendations and budget

DEFINITION (Phase 2) – *This new release for the definition/execution phase (Phase 2 and 3) will the following scope of work:*

- Prepare full set of construction implementation drawings for two floors and develop and coordinate drawing set with Engineers and sub-consultants as required and finalize "permit drawing set" and drawing package for tender
- Development of the OPG Architectural and Furniture Standards Playbook
- Award construction/build.

EXECUTION (Phase 3): *This new release for the definition/execution phase (Phase 2 and 3) will the following scope of work:*

- Moves to temporary space (swing space) and into new space once built
- Asset recovery & redeployment on 18th and 19th floors
- Construct/build
- Post occupancy survey, reporting, photos, illustrations and communications

Summary of Preferred Alternative:

The preferred alternative is option 1 below, which includes occupying two floors and a free address model. This preferred alternative has an NPV of $9.8M. The following table provides the options considered, and their corresponding NPVs:

Business Case Summary

Recommendation

Option	Description	NPV ($M)	Notes
1	Occupy the 18th and 19th floors. Free address model.	$9.8	700U employees work in a free address environment. Project partially funded by tenant inducement allowance of $11.2M.
2	Occupy half of 9th floor, 18th and 19th floor. Fixed address model for everyone.	$7.8	All 700U employees have a designated workstation. Project partially funded by tenant inducement allowance of $11.2M.
3	Do nothing	$6.6	No project, and assume collect the tenant inducement allowance of $11.2M and workstation replacements where needed to meet current requirements.

History of BCS releases and project cost estimates:

The total project cost is now estimated at $26,359K including $2,396K of contingency, compared to the initial release of $464K including $77K of contingency for the identification/initiation phase.

History of scope and schedule changes:

The initial BCS included costs associated with only the Identification/Initiation phases. This new release is for the Definition and Execution phases.

Key Assumptions and Risks:

Key project assumptions include: OPG can release HLC in July 2019, and subletting or releasing H17 in 2020 and H9 in July 2021. Risks to cost and schedule are managed with contingency, contracts and contractor oversight.

Conclusion:

Free Address - 2 floor option provides the greatest financial benefits while achieving OPG's strategic objectives with respect to its real estate strategy.

Investment Cash Flows

$K	LTD	2018	2019	2020	2021	2022	2023	Future	Total
Previous releases	0	14	12						26
Current request	-								-
Total released to date	**0**	**14**	**12**	**-**	**-**	**-**	**-**	**-**	**26**
Future required	-								-
Total Project Cost	**0**	**14**	**12**	**-**	**-**	**-**	**-**	**-**	**26**
Ongoing Costs	-								
					Gate:	**G3**	**OAR Approval:**		$26 K

Business Case Summary

Approvals	Signatures	Date
The recommendation, including the identified ongoing costs, if any, represents the best option to meet the validated business need.		
Recommended by: Project Sponsor Chris Ginther Chief Administrative Officer	See Electronic Approval Attached	
I concur with the business decision as documented in this BCS.		
Finance Approval: John Mauti CFO and SVP-Finance per OPG-STD-0076	See Electronic Approval Attached	
I confirm that this investment/project, including the identified ongoing costs, if any, will address the business need, is of sufficient priority to proceed, and provides value for money.		
Line Approval per OAR 1.2: Ken Hartwick President and CEO	See Electronic Approval Attached	

EXECUTIVE SUMMARY – Project Overview

Business Need — For Project Level A or B

This full BCS is considered Value Enhancing as justified by the following:

- The NPV is $9.8M
- The project will be partially funded by the Tenant Inducement provided by the landlord up to $11.2 million
- The project reduces OPG's real estate footprint from 5 floors to 2 floors at 700 University Avenue (700U), allowing for the release of the Lower Concourse (HLC) floor and sub-leasing/release of 1.5 floors (17 and 9) to create incremental cash flow / savings through lower rental and operating costs. Currently, OPG pays approximately $2M/year in rental and operating costs per floor. This project is expected to provide $1M in rental and operating cost savings in 2019, $4M in 2020 and $6M/year in costs savings starting in 2020 until the end of the lease.
- OPG will realize a reduction in future years spending as a result of deploying IT and AV equipment (i.e. laptops, monitors, AV) in this project
- This project is expected to deliver productivity gains from reduced headcount, sickness and absenteeism
- The project includes LED lighting upgrades, which would generate Save on Energy incentives and reduce maintenance and energy costs
- The project is an executive level approved initiative to modernize the workspace for employees at the 700U office, to promote enhanced productivity, collaboration and engagement of employees, consistent with the OPG's direction on ONE OPG

Preferred Alternative: Free Address – 2nd Floor option — For Project Level A, B or C

Description of Preferred Alternative

The preferred alternative for this definition/execution phase of the project has an NPV of $9.8M. This is more favourable than doing nothing or the Fixed Address – 2.5 floor option.

Deliverables:	Associated Milestones (if any):	Target Date:
Previous releases:		
Identification and Initiation Phase Figure3 Phase 1 • Develop and submit a project plan • Space utilization study / program - Gather information about how OPG employees do their	Submission and acceptance of Project plan	Jan 16, 2018

Deliverables:	Associated Milestones (if any):	Target Date:
work in office spaces and identify alternative work spaces • Conduct interviews with function leaders to understand organization goals and individual job requirements. • Make recommendations for types of conference rooms/meeting room spaces along with the appropriate communication and IT technologies • Pre & Post Occupancy Survey tools • Stacking plans & Feasibility planning (or test fits) • Three Concept Designs – (look & feel only of which would be LEED compliant) • Develop recommendation for new space standard guidelines • Finalized furniture and IT planning – including Bill of Material for both furniture (compliant to AODA and Ergonomic Standards) and IT requirements for entire project. • Provide change management communications and support (i.e. communication tactics for website, employee communications, town halls, etc.) • Business case justification summary	Present summary of Connection point to ELT Present final report and recommendation to ELT	Feb.28, 2018 Mar.27, 2018
Definition Phase <u>Figure3 Phase 2</u> • Develop, coordinate, issue and manage an RFP for the procurement of all new furniture requesting from OPG's preferred furniture vendors • Prepare full set of construction implementation drawings for one (1) floor. Coordinate with Engineers and sub-consultants as required • Development of the OPG Architectural and Furniture Standards Playbook • Develop, Review and finalize 'Permit Drawing Set' with client. Develop and Submit drawing package for permit application. • Develop and Submit drawing package to Contractor for construction tender • Mock up of various workstation types - must include furniture and be compliant with AODA and ergonomic standards. • Work with OPG Supply Chain on Scope of Work for Construction/Build RFP. OPG to award construction/build • Update business case justification summary • Asset recovery and re-deployment	Final OPG approval to proceed to CDs Issue furniture RFI Issue furniture competitive bid Award furniture contract Move staff to Swing Space Asset Recovery and Re-deployment Issue competitive bid for GC Award GC contract.	Jun.19, 2018 Jun.15, 2018 Jul.2, 2018 Aug.13-17/18 Jul.15-Aug.15, 2018 Aug.15-Sept.14, 2018 Aug.15, 2018 Sept.24-28, 2018
Current release:		
Execution Phase • Project management for the build (includes infrastructure improvements, IT and office build) • Contract Administration • Site meetings & instructions	GC mobilization on site (includes demolition and construction)	Oct.1, 2018 – July 31, 2019

Deliverables:	Associated Milestones (if any):	Target Date:
• Change notices • Certificate of payment • Shop drawing review • Deficiency reporting • Deficiency follow through • Close out documents • Update business case justification • Post occupancy survey + reporting (after 6 months of occupancy) • Post occupancy professional photos, illustrations, communications and for use in internal communications and promotional materials.		
Future release:		

Alternative 2:	**Base Case – No Project** For Project Level A, B or Value-Enhancing
The NPV for no project for definition/execution phase of the project is $6.6M. If we do not do the project, OPG will need to use a portion of the tenant inducement allowance of $11.2M for workstation repairs/replacements and basic upgrades to meet current requirements. However, the biggest disadvantage with this option is that none of the rent and operating cost savings could be realized, which is considered less favourable than the Alternative 1 or 3.	

Alternative 3:	**Fixed Address – 2.5 Floor Option (option approved by ELT on March 27, 2018)** For Project Level A or B or Value-Enhancing
The NPV for the definition/execution phase of the project is $7.8M. The disadvantage is that none of the rent and operating cost savings from the release of the full 9th floor could not be realized, which is less favourable than Alternative 1 and more favourable than Alternative 2.	

Alternative 4:	**NA** For Project Level A or B
NA	

Key Risk Assessment For Project Level A, B or C

Risk Class	Description of Risk	Response Type/ Actions/Final TCD	For Additional Review	Residual Ranking
Cost	Unknown issue with space including electrical, civil, HVAC, etc.	Accept: • Provide extra budget for contingency purposes. Engineering studies prior to developing the estimate.	Choose an item.	Medium
Schedule	Delays are possible due to encountering unforeseen building issues.	Accept: • Contractors will be held responsible to complete on time per schedule with effective contractor onsight. As built drawings provided to engineering.	Choose an item.	Medium
Quality	Contractor/sub-contractor performance below expectation.	Mitigate: • Project manager to closely monitor work and ensure quality work is implemented.	Choose an item.	Low

Key Risk Assessment				For Project Level A, B or C
Risk Class	**Description of Risk**	**Response Type/ Actions/Final TCD**	**For Additional Review**	**Residual Ranking**
Choose an item.	[Describe the nature of the risk and quantify the financial impact if feasible.]	Choose an item.: • [Describe the planned activities to reduce or eliminate the risk.] **Final TCD: [MMM-YYYY]**	Choose an item.	Choose an item.

Additional Risk Analysis				For Project Level A or B
Risk Class	**Description of Risk**	**Risk Management Strategy**	**Post-Mitigation**	
			Probability	**Impact**
Scope	Potential impact from unseen organizational changes.	Validation of organization and dept. needs for space at VP level. Design is flexible.	Low	Low
Resources	Unavailability of required materials, labour or OPG labour.	Contractor to ensure materials and labour are on site when required. OPG to provide staff resources as needed.	Low	Medium
Technical	Unknown issue with space including electrical, civil, HVAC, etc.	As built drawings were create to reduce risk	Low	Medium

Financial Evaluation				For Project Level A, B (with multiple feasible alternatives) or Value-Enhancing	
$K	Preferred Alternative	Base Case (No Project)	Fixed Address	Alternative 4	Alternative 5
Project Cost	26,359	1,120	24,694		
NPV	9,776	6.643	7,777		
Other: (e.g., IRR)	NA	NA	NA		

Analysis of Financial Evaluation – Key Assumptions and Key Results:

The NPVs were calculated using the Excel-based tool provided on OPG's Investment Planning website.

Key assumptions and observations are as follows:

- Net rental savings were a primary benefit included in the calculation of the NPVs. A core benefit of executing the project is to reduce OPG's footprint in the 700U building.
- In all alternatives considered, the benefit of receiving the tenant inducement allowance of $11.2M was included.
- The option of doing nothing has an NPV of $6.6M. The recommended alternative has an NPV of $9.8M. As such, all assumptions and estimates would have to materialize as the project is delivered to achieve the calculated benefit, while not pursuing the project would culminate in a healthy benefit with no risk.
- The model used a discount rate of 9%, which is considered to be conservative for assessment purposes.

Qualitative Factors — For Project Level A or B

This project provides additional benefits including:

- Improved employee engagement, consistent with OPG's direction on One OPG
- Greater flexibility to exit our 700U occupancy prior to end of lease (better tenant attraction)
- Improved talent attraction
- Better opportunity for 700U employees to innovate and collaborate
- Access to daylight for all 700U employees
- Improved ergonomics by providing height adjustable tables to employees
- Flexibility to adapt to future organization changes with minimal move related costs
- LED lighting upgrades, which would generate Save on Energy incentives and reduce maintenance costs

Post Implementation Review (PIR) Plan (refer to OPG-PROC-0056)			
Type of PIR Report	Simplified/Standard PIR	**PIR Completion Date**	Jul-2020
☐ Detailed PIR KPIs will be provided in future BCS(s) when Choose an item. Phase BCS release is requested.			

PIR KPIs	Current Baseline	Target Result	How to measure?	Who will measure?
Actual Costs	BCS budget	Final Costs within budget	Costs will be tracked and monitored in financial reporting systems	RES/Finance
Occupancy Savings	Existing lease and operating costs	Release (or sublease) of floors as planned	Monitoring of lease and operating costs (net of sublease revenues)	RES/Finance
Ready for Occupancy Schedule	Project Schedule	Within project schedule	Based on move completion of affected groups	RES

Definitions and Acronyms
[Delete this section if not needed. See Guidance]

APPENDICES

Appendix A1: Summary of Estimate	Choose an item.									
Project Number:	**Project #83900 (OM&A) and #83901 (CAP)**									
Project Title:	**OPG Workplace Transformation Strategy**									
$K	**LTD**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**Future**	**Total**	**%**
Project Mgmt			30	126					156	1%
Inspection									-	0%
Engineering		70	3,309						3,379	13%
Procurement			215	5,750					5,965	23%
Construction				14,140					14,140	54%
Commissioning									-	0%
Closeout									-	0%
Subtotal	-	70	3,554	20,016	-	-	-	-	23,640	90%
Outside WBS									-	0%
Contingency				2,396					2,396	9%
Subtotal w/ Contingency	-	70	3,554	22,412	-	-	-	-	26,036	99%
Interest			15	308					323	1%
Other									-	0%
Total	**-**	**70**	**3,569**	**22,720**	**-**	**-**	**-**	**-**	**26,359**	**100%**
Removal Costs (incl. above)									-	0%

Appendix A2: Summary of Estimate – Notes			
Escalation Rate	2%	**Interest Rate (going-forward)**	5%

Appendix A3: Summary of Estimate – In-Service Estimates				
$K	Only applicable to capital projects. In-Service amount shall include interest but exclude removal costs.			
Project #	**Date (YYYY-MM-DD)**	**Description**	**Amount**	**%**
				0%
				0%
Total			-	0%

Prepared by:	Reviewed and Endorsed by:
See Electronic Approval Attached	See Electronic Approval Attached
Tami Boulton	Connie Hergert
Sr. Mgr. Projects and Accommodations Date	VP, Real Estate and Services Date
Project Leader	

$K	LTD	2017	2018	2019	2020	2021	2022	Future	Total
Capital #83901				6,395					6,395
OM&A #83900				(6,395)					(6,395)

Total Project Estimate Variance Explanation (delete if not required)

OM&A Furniture was not purchased 2018. Effective 2019 furniture is capitalized. Variance is to move furniture costs to Capital.

APPENDICES (Continued)

Appendix C: Financial Evaluation Assumptions	For Project Level A, B (with multiple feasible alternatives) or Value-Enhancing
Key assumptions used in the financial model of the project are:	
[See BCS Writing Guidance]	

References	For Project Level A or B
[See BCS Writing Guidance]	

From: Real Estate Facilities and Projects
To: MONTGOMERY Erica -PROJMANOFF
Cc: QUADROS Sachin -FIN & C CTRL; SINGH Mala -NUCLEAR
Subject: Approval has completed on 83901 83900 Superceding BCS for 700 U Workplace Transformation.
Date: Thursday, August 01, 2019 3:27:05 PM

Approval has completed on 83901 83900 Superceding BCS for 700 U Workplace Transformation.

Approval on 83901 83900 Superceding BCS for 700 U Workplace Transformation has successfully completed. All participants have completed their tasks.

Approval started by MONTGOMERY Erica -PROJMANOFF on 7/25/2019 9:18 AM
Comment: This superseding BCS for 700U Workplace Transformation. The intent is to update the project to show that furniture for this project can now be capitalized as per new finance rules in 2019.

Approved by BOULTON Tami -CORP RE on 7/26/2019 9:51 AM
Comment:

Approved by HERGERT Connie -CORP RE on 7/29/2019 11:28 AM
Comment:

Approved by GINTHER Chris -CAO on 8/1/2019 2:51 PM
Comment:

Approved by MAUTI John -FIN & C CTRL on 8/1/2019 3:19 PM
Comment:

Approved by HARTWICK Ken on 8/1/2019 3:26 PM
Comment:

View the workflow history.

☐ **Project Review Committee (PRC)**

_____
Date

ONTARIO POWER GENERATION

Internal Use Only
RES-FORM-0010 R002*

CHANGE REQUEST AUTHORIZATION

Project Title: 700 University Work Place Transformation	**Project Number:** 83900 & 83901	**Change Request Number (# from CSA):** 2019-CAP-008
Change Requestor: Tami Boulton, Sr. Manager Projects and Accommodation		**Date of Request:** June 6, 2019

DESCRIPTION:

Outline of Change $6,395K

Superseding BCS to be created to change funding stream for office furniture and technology from OMA to Capital in 2019. The target in service date of April extended to July. The original BCS was approved to release a budgetary allocation of $26,359K including $2,396K of contingency, in 2018. There is no change to the original BCS details relating to the scope of work, planning and risk.

Reason for Change

Due to the capitalization of furniture in 2019, $6,395K will need to be moved from OMA to Capital.

IMPACTS:

Effect on Scope No effect to the scope

Effect on Schedule There was a minor effect on schedule from April to July, but this was not due to the funding stream, but rather when mould was discovered and the remediation work that ensued.

Effect on Budget Funding stream changed from OMA to Capital, $6,038K, plus $357K in Contingency in 2019. Grand total of $6,395K from OMA + contingency to Capital + contingency.

Real Estate and Services:

☐ **Project Review Committee (PRC)**

Date

Internal Use Only
RES-FORM-0010 R002*

CHANGE REQUEST AUTHORIZATION

Prepared By: Bob Lim	**Reviewed By: Project Manager** Tami Boulton	**Authorized By: Project Sponsor** Alison Folosea
Signature: N/A	*Signature* See Electronic Attached	*Signature* See Electronic Attached
CSA	Sr. Manager, Projects & Accomm.	RES Director
June 6, 2019	June 6, 2019	June 6, 2019

☐ Concurred By: Name/Title dd/mon/year

Record Keeping / Distribution:

*Associated with RE-PM-GUID-00120-001, Project Management Guide

From: Real Estate Facilities and Projects
To: MONTGOMERY Erica -PROJMANOFF
Subject: Approval has completed on 83901 83900 2019-CAP-008 for 700U WPT.
Date: Wednesday, July 24, 2019 7:09:09 PM

Approval has completed on 83901 83900 2019-CAP-008 for 700U WPT.

Approval on 83901 83900 2019-CAP-008 for 700U WPT has successfully completed. All participants have completed their tasks.

Approval started by MONTGOMERY Erica -PROJMANOFF on 6/21/2019 2:59 PM
Comment: Please approve this change request to move OM&A funds to Capital for the 700U WPT project.

Approved by BOULTON Tami -CORP RE on 7/8/2019 8:21 AM
Comment:

Request updated by MONTGOMERY Erica -PROJMANOFF on 7/24/2019 4:20 PM
Request: Alison is away. Please approve on her behalf. This change request to move OM&A funds to Capital for the 700U WPT project.

Completed by MONTGOMERY Erica -PROJMANOFF on 7/24/2019 4:21 PM
Task assigned to FOLOSEA Alison -CORP RE was automatically completed because it was deleted by MONTGOMERY Erica -PROJMANOFF - Alison away on vacation, Alim will approve on her behalf.

Approved by YHAP Alim -CORP RE on 7/24/2019 7:09 PM
Comment: Approved on behalf of Alison per email.

View the workflow history.

Business Case Summary

Project #	84640	**Controlled Doc #**	CCH-BCS-00120.03-0834408
Project Title	Clarington Corporate Campus		
Facility	CCH	**Investment Classification**	Value Enhancing
Project Level (Scalability)	A	**Financial Classification**	☐ OM&A ☒ Capital ☐ Capital Spare ☐ MFA ☐ CMFA ☐ Provision ☐ Others: [if applicable]
Release: Gate and Project Phase	☐ Choose an item. G0☐: Initiation ☒ Full G1☐: Planning		☐ Choose an item. G2☐: Definition ☐ Choose an item. G3☐: Execution
Estimate Class (overall project)	Class 5	**Target Project Completion Date**	**Substantial Comp.**: Jun-2024 **Project Close-out**: Dec-2025

Recommendation

We recommend a release of [redacted], including [redacted] of contingency.
The estimated total project cost is [redacted], including contingency.

This release will fund the following Planning Phase scope of work:

1. Engage Contractor.
2. Gather all OPG user requirements.
3. Create the functional program based on the user requirements.
4. Select a preferred concept to be approved by OPG senior leadership.
5. Conduct a permitting assessment and initiate required technical studies.
6. Advance the design sufficiently such that the project can confidently determine the costs, schedule and risks prior to moving into the Execution phase.

The quality of the estimate for the total project is Class 5. At the conclusion of the Planning Phase a Class 3 quality estimate will be provided for the Execution Phase Business Case Summary (BCS).

Investment Cash Flows

$K	LTD	2020	2021	2022	2023	2024	2025	Future	Total
Previous releases	[redacted]								
Current request									
Total released to d									
Future required									
Total Project Cost									
Ongoing Costs									
				Gate:	**G1**		**OAR Approval:**	[redacted]	

Approvals	Signatures	Date
The recommendation, including the identified ongoing costs, if any, represents the best option to meet the validated business need.		
Recommended by: ***Tami Boulton*** Senior Manager Projects	Tami Boulton	Aug 21, 2020
I concur with the business decision as documented in this BCS.		
Finance Approval: ***Suneethi Viswanathan*** Finance Controller	Suneethi	Aug 21, 2020
I confirm that this investment/project, including the identified ongoing costs, if any, will address the business need, is of sufficient priority to proceed, and provides value for money.		
Line Approval per OAR 1.1: ***Connie Hergert*** VP Real-Estate	Connie Hergert	Aug 24, 2020

*Associated with OPG-STD-0076, Developing And Documenting Business Cases

EXECUTIVE SUMMARY – Project Overview

Business Need / Objective:

OPG's workspace needs are evolving as the company approaches the end of commercial operations at Pickering. OPG is also currently leasing a large number of properties throughout the GTA and Durham. There is an opportunity for OPG to reduce on-going leasing and building maintenance costs, and leverage the changing workspace needs, by transforming its real estate footprint.

Summary of Preferred Alternative:

The preferred alternative is to construct a new office building across the street from the existing Darlington Energy Complex (DEC). The office will be designed to accommodate 1,250 employee workspaces and will function as OPG's new corporate head office. The benefits of this new, modern, office include:

- An estimated cost reduction of approximately $65M (present value) over the next 40 years by moving away from a lease strategy and reducing the number of work locations (e.g. lower travel costs).
- The creation of a corporate campus will facilitate increased collaboration and further enhance the One OPG cultural mindset.
- A safe, modern and long-term office space will help attract and retain talent.
- The project reflects our long-term commitment to the local community and stakeholders, in line with our social license business imperative.
- The new office will function as OPG's new corporate head office, supporting an industry leading image of our organization to the public.
- [redacted]

The Planning Phase will enable the project to finalize the building concept and advance the detailed design.

The overall purpose of the Planning Phase will be to gather the user requirements (Functional Program) from internal stakeholders, develop a number of campus concepts to be approved by the Enterprise Leadership Team (ELT) and then progress the detailed design sufficiently such that the project can confidently determine the costs, schedule and risks prior to moving into the Execution Phase.

Key Risks:

- As part of the on-going evolution of OPG's workplace needs, there is a risk that the assumed size of the new office building will need to be modified. Depending on the magnitude and timing of the change in scope, this could potentially require a re-baselining of project schedule and costs, as well as an extension to the duration of the Planning Phase. As part of risk mitigation efforts, the Project is proactively engaging with OPG's workforce and business planning functions and other internal stakeholders.
- A number of permits and connection agreements will be needed from external stakeholders. There is a risk that obtaining these permits could take longer than expected due to a back-log of requests resulting from the COVID-19 pandemic. There is also a risk that a future resurgence of the pandemic could negatively impact the permitting process and the overall project schedule.
- The Region of Durham may proceed with the construction of an Organic Digester near the campus site. This could negatively impact the workplace appeal of the new office building and the DEC. If OPG decides to change the campus site in the future, the project schedule and cost would be substantially impacted.

Business Need

For Project Level A or B

OPG's workspace needs are changing (decreasing) as the company approaches the end of commercial operations at Pickering. OPG is also currently leasing a large number of properties throughout the GTA and Durham. There is an opportunity for OPG to reduce on going leasing and building maintenance costs, and leverage the changing workspace needs, by constructing a new corporate campus building in Clarington.

Issue Background:

The new corporate campus building would be near the current DEC to accommodate all non-plant staff. Based on current staffing forecasts, the new campus will be designed to accommodate at least 2,400 employees (all non-plant based staff in the GTA and Niagara). As a result, based on anticipated in-office occupancy rates, the new office building and the DEC will

Business Need For Project Level A or B

need a combined total of at least 1,680 workspaces. The DEC is expected to be renovated (outside the scope of this project) to accommodate approximately 440 workspaces, with the remainder to be accommodated in the new office building. To meet these needs, the new building and associated parking will be constructed with the capacity to host 1,250 individuals at any one time, on property that OPG already owns, across the street from the DEC.

Consolidation of workspace through the construction of a corporate campus allows OPG to optimize our real estate footprint and reduce costs. Consolidation will require the release / termination of current real estate interests over the next 5-7 years, coordinated with the construction of the new building and the workplace transformation at the DEC. Additionally, corporate campus structures are recognized as a strategic asset to strengthen employees' sense of corporate identify and encourage collaborative, innovative work.

Investment in the campus will support the four OPG Business Imperatives:

- Project Excellence (consistently exemplify prudent Project Management processes)
- Financial Strength (focused on providing value for shareholder and customers)
- Operational Excellence (modernized facilities, reduced O&M costs)
- Social License (continued commitment to the local community)

Key Assumptions:

- Pickering End of Commercial Operations will occur in 2025.
- Darlington Refurbishment will be completed in 2026.
- Certain training facilities and specialized lab / testing equipment will not be located in the new building.
- OPG will be the sole occupant of the building.
- OPG will build and own the building.
- Parking facilities will only need to accommodate the office staff / visitors.
- The new office will utilize an agile / free address work space arrangement.
- The DEC will be renovated (outside the scope of this project) to accommodate 440 workspaces.
- 30% of staff of will be out of the office at any point in time.
- 1,250 office spaces in the new building will be sufficient to meet OPG's workplace requirements by 2025.
- [redacted]
- [redacted].

Project Constraints:

- Site of the new campus is fixed (the property that we already own).
- The campus is restricted by the local zoning requirements.
- The project will need to conform to external stakeholder processes to obtain appropriate permits, agreements, etc.

Preferred Alternative: **New Office Building** For Project Level A, B or C

Description of Preferred Alternative

The preferred alternative is to construct a new office building across from the existing DEC. The office will be designed to accommodate 1,250 employee workspaces and will function as OPG's new corporate head office.

OPG's non-plant based staff are currently spread among 12 different leased office locations around the Greater Toronto Area (GTA), the OPG-owned Kipling Ave office and in the region of Niagara. The preferred alternative is to terminate the majority of these occupancies and move all of the employees from these sites to the new campus, which will consist of the DEC and the new office building to be constructed as part of this project. The financial modeling of this preferred alternative has shown a decrease in on-going Operations and Maintenance (O&M) costs as compared to the base case. Additionally, the new office will leverage modern workplace design to promote innovation, provide flexibility to handle growth and will be technology focused.

The estimated cost of the Planning Phase is [redacted] and includes hiring the necessary Planning Phase contractors, gathering user requirements, developing the office concept and advancing the detailed design until a Class 3 project estimate can be established.

The preliminary financial evaluation for this project suggests that the net financial benefit of proceeding with the preferred alternative is approximately $65M (PV) of reduced costs over the next 40 years. [redacted]

Preferred Alternative:	**New Office Building**	For Project Level A, B or C

Description of Preferred Alternative

[redacted]

Pros:

- The project will realize real-estate cost savings by moving away from a lease strategy and reducing the number of work locations (e.g., lower travel costs).
- The creation of a corporate campus will facilitate increased collaboration and further enhance the One OPG cultural mindset.
- A safe, modern and long-term office space will help attract and retain talent.
- The project reflects our long-term commitment to the local community and stakeholders, in line with our social license business imperative.
- The new office will function as OPG's new corporate head office, supporting an industry leading image of our organization to the public.

Cons:

- Certain employees may be unwilling to move to the new office location.
- Inability to attract a segment of new talent given the new office location.

Key Risk:
Given the very early stage of the project, there is a risk, through detailed design, that the estimated cost of the new office vision could increase from the current forecast.

Deliverables:	**Associated Milestones (if any):**	**Target Date:**
Current release:		
Planning Phase BCS Approved	BCS approved by the appropriate OAR	2020-Aug
Gate 1 Approved	Gate 1 committee approves the project to proceed into the Planning phase	2020-Aug
Owner's Representative Contract Awarded	Execute contract with preferred vendor to advance the Planning Phase deliverables	2020-Nov
User Requirements Assessment Complete	Programming Document from CM vendor finalized	2021-Mar
Project Concept Frozen	ELT selects the preferred concept for the new campus building	2021-May
Contractor Provides Execution Phase Estimates	Vendor provides a detailed cost and schedule estimate for the Execution Phase	2021-Oct
Gate 3 Approved	Gate 3 committee approves the project to proceed into the Execution phase	2021-Nov
Execution Phase BCS Approved	Execution phase BCS approved by the appropriate OAR	2021-Dec
*Future release: *Subject to change once the concept has been finalized*		
Substructure Complete	Excavation and foundation work complete	2022-Jun
Exterior Cladding and Curtain Walls Complete	The building is fully enclosed	2023-Apr
Fit Out Start	Contractor has started the interior completion work	2023-Oct
Utilities Connected	All gas, water, hydro, etc. connections are complete	2023-Nov
Substantial Completion	The construction works are substantially complete as per the terms of the vendor contract	2024-Jun
Project Completion	Project Close-out	2025-Dec

Alternative 2:	**Base Case – No Project and Continue Leasing**	For Project Level A, B or Value-Enhancing

Not proceeding with the project would necessitate continuing with a leasing approach, in our applicable current office buildings or new leases. The net present value of this alternative, assuming a 40 year outlook, is estimated to be approximately [redacted]. In selecting this alternative, OPG would be foregoing the opportunity for cost savings of approximately $65M (PV) as estimated in the financial analysis. Additionally, it would be significantly more difficult to achieve the same sense of a 'One OPG' campus and its associated benefits of increased collaboration, engagement and innovation as in the preferred alternative, as there is currently no available office space for lease next to the DEC. Hence, even if OPG decided to move all non-plant based staff to Clarington, their office locations would not be within a walkable distance of one another. Overall, this alternative is expected to continue to result in a more fragmented workspace footprint for the company.

Pros:

- No significant up front investment.
- OPG may be less likely to move as many employees, reducing the risk of not being able to retain employees who may be unwilling to change work locations to Clarington.

Cons:

- The long term cost of leasing is higher than building a new office building.
- OPG would fail to capitalize on the many benefits of having most of its employees physically located in one location (increased innovation, collaboration, enhancing the One OPG mindset, etc.).

This alternative is **not recommended** due to the long-term costs of on-going leases and the missed opportunity of increased collaboration as a result of being co-located.

Alternative 3:	**Delay Work – Defer Project**	For Project Level A or B or Value-Enhancing

This project is primarily driven by cost savings and positive workplace cultural shifts. Reasonable delays within the overall project schedule may be justifiable, such as a delay in obtaining appropriate permitting or unanticipated geotechnical features. However, an overall project deferral would require extensions of a number of our office leases, which would result incremental costs to OPG and erode the value of the savings.

Pros:

- Deferral of capital funds expenditures.

Cons:

- Additional real estate (leases) costs as compared to the Preferred Alternative.
- Significant delay would result in misalignment with the planned end of Pickering commercial operations.

This alternative is **not recommended**. There are not any substantial benefits from delaying the campus project. OPG would be subject to additional leasing costs.

Alternative 4:	**New Office Building Not in Clarington**	For Project Level A or B or Value-Enhancing

The campus could be located at an alternative location (other than Clarington). However, the current site leverages property that OPG already owns, and synergizes with the nearby location of the existing DEC building. Selecting a different site for the new office would increase the cost of the project, as new land would need to be purchased. Additionally, to achieve the vision of a single corporate campus at a different location, the new building would need to accommodate more workspaces given forgone DEC synergies.

Pros:

- Potentially better ability to attract a segment of new talent who may be uninterested in the Clarington location.

Cons:

- Increased project cost and potential schedule impact associated with the purchase of new land and larger footprint.

Alternative 4:	**New Office Building Not in Clarington**	For Project Level A or B or Value-Enhancing

This alternative has not been assessed in detail and is **not recommended** on the basis of incremental costs relative to the preferred alternative.

Key Risk Assessment — For Project Level A, B or C

Risk Class	Description of Risk	Response Type/ Actions/Final TCD	For Additional Review	Residual Ranking
Cost	Changes in assumptions, dependencies and scope (outside the control of the project team) could increase the cost of the project. An example would include the requirement for additional workspaces beyond what has been assumed in this BCS.	Accept: • The project team will continue to engage with ELT, the workforce and business planning functions, and other SPOCs throughout the organization, to ensure continued alignment on OPG's future business needs. **Final TCD: -**	No	Medium
Schedule	COVID-19 resurgence may negatively impact industry productivity, up to and including a site work shutdown and permit applications being put on hold.	Accept: • The project will leverage the pandemic experiences in 2020 to mitigate project impacts to the extent possible if COVID-19 risks increase, with due regard to employee and contractor safety. **Final TCD: -**	No	Medium
Schedule	Permitting and approvals could take longer than anticipated, resulting in project schedule delays.	Mitigate: • Early engagement with the relevant stakeholders to ensure alignment on permitting requirements. • Sufficient schedule contingency built into the project schedule to mitigate delays. **Final TCD: Jun-2022**	Yes	Medium
Social Licence	The region of Durham may construct an Organic Digester nearby. If OPG decides to relocate the campus, there will be significant cost and schedule impacts to the project.	Mitigate: • OPG is engaging with the Region of Durham and the Municipality of Clarington to address OPG's concerns with the location of the Organic Digester. **Final TCD: Dec-2021**	No	Low

Additional Risk Analysis — For Project Level A or B

Not required at this time.

Financial Evaluation — For Project Level A, B (with multiple feasible alternatives) or Value-Enhancing

$M	Preferred Alternative	Base Case (No Project)	Delay work	New Office Not in Clarington
Project Cost	[redacted]			
NPV				
Other: (e.g., IRR)				

Analysis of Financial Evaluation – Key Assumptions and Key Results:

The quality of the estimate for the total project is Class 5. The project cost is a parametric estimate for a typical curtain wall office building. The project team also reviewed cost data for similar projects completed by large construction firms to calibrate the estimate. An updated project cost estimate (AACE Class 3 along with a higher confidence level) will be provided in the Execution Phase BCS once the Planning Phase work has been substantially complete.

	Financial Evaluation	For Project Level A, B (with multiple feasible alternatives) or Value-Enhancing

In selecting the preferred alternative, OPG is estimated to realize a Present Value cost reduction of approximately $65M. This is a preliminary financial evaluation which will be updated prior to the Execution Phase BCS when higher confidence project cost and other information is available.

Key Assumptions Used for the Financial Evaluation:

- The Preferred Alternative includes the following office spaces for on-going O&M accounting:
  New campus building, DEC, 1549 Victoria St.
- The Base Case includes the following office spaces for on-going O&M accounting:
  Consolidate to 700 University Ave, 889 Brock Rd, 800 Kipling Ave, DEC, 1549 Victoria St.
  The lease rates for these locations are considered to be representative of comparable properties.
- 40 year time horizon.
- DEC renovation costs not included as part of this project, as they are expected to proceed in both the base case and the preferred alternative.
- Office refresh costs have been included for 800 Kipling Ave. and 889 Brock Rd. in the base case.
- An estimate of reductions in ongoing travel and other costs, as well as assumed impacts on one-time employee costs, such as household moves, have been included in the financial model.
- Cost of Capital: 3.5%
- Lease escalation rate: 3%
- [redacted]

Qualitative Factors	For Project Level A or B

The *Power With Purpose* strategic direction of OPG is to provide low cost power in safe, clean, reliable and sustainable manner for the benefit of the customers and shareholder. Four strategic imperatives are defined as part of this direction, and the project aligns with each of them as follows:

- *Operational Excellence*: The project represents a long-term investment in OPG's workplace that will modernize our facilities and reduce on-going O&M costs.
- *Project Excellence*: To ensure project excellence, a detailed scope of work will be developed by a highly qualified external contractor who has expertise in commercial office building construction. The project management will be aligned with OPG's Project Management governance.
- *Financial Strength*: Investing in the campus provides value for our shareholder and customers, as there will be significant savings in long term real estate costs.
- *Social License*: Execution of this project will demonstrate support to our local host communities by contributing incremental economic benefits to the region.

Post Implementation Review (PIR) Plan (refer to OPG-PROC-0056)

Type of PIR Report	Simplified/Standard PIR	**PIR Completion Date**	12 months after project substantial completion

☒ Detailed PIR KPIs will be provided in future BCS(s) when Execution Phase BCS release is requested.

Definitions and Acronyms

DEC – Darlington Energy Complex
ELT – Enterprise Leadership Team
GTA – Greater Toronto Area
NPV – Net Present Value
SPOC – Single Point Of Contact
TCD – Target Completion Date

Project #: 84640
Project Title: Clarington Corporate Campus
Document #: CCH-BCS-00120.03-0834408

OPG Confidential
OPG-FORM-0076-R006
Business Case Summary

APPENDICES

Appendix A1: Summary of Estimate										
Project Number:	**84640**									
Project Title:	**Clarington Corporate Campus Project**									
$K	**LTD**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**Future**	**Total**	**%**
Project Management	[redacted]									
Procurement										
Eng. and Construction (CM Contractor)										
Cost Only										
Execution Phase*										
Subtotal										
Contingency										
Subtotal w/ Contingency										
Interest										
Other										
Total										

*Execution Phase costs are not part of this BCS. They are included here for reference only.

Appendix A2: Summary of Estimate – Notes			
Escalation Rate	2.00%	**Interest Rate (going-forward)**	3.5%

Appendix A3: Summary of Estimate – In-Service Estimates				
$K	Only applicable to capital projects. In-Service amount shall include interest but exclude removal costs.			
Project #	**Date (YYYY-MM-DD)**	**Description**	**Amount**	**%**
		To Be Determined		0%
Total			-	0%

Prepared by:	Reviewed and Endorsed by:
Matt Sikstrom **Matt Sikstrom** Project Manager, RG PMO Aug 21, 2020	Tami Boulton **Tami Boulton** Senior Manager Projects, Real Estate Aug 21, 2020

Numbers may not add due to rounding.

Table 1a
Capital Project Listing - Support Services
(Capital Projects Impacting Nuclear Rate Base or IR Term Asset Service Fee)
Projects ≥ $20M Total Project Cost[1]

Line No.	Project Name	Project Summary Ref. No.	Category	Project Start Date	Final In-Service Date	Total Project Cost[2] ($M)	Total Project Cost EB-2016-0152 ($M)	1st Execution Business Case ($M)	1st Execution Business Case- EB-2016-0152[3] ($M)	Total In-Service ($M)	In-Service LTD[4] ($M)	In-Service IR Term ($M)	In-Service 2020 ($M)	In-Service 2021 ($M)	In-Service 2022 ($M)	In-Service 2023 ($M)	In-Service 2024 ($M)	In-Service 2025 ($M)	In-Service 2026 ($M)
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)
	ONGOING PROJECTS FROM EB-2016-0152																		
	IT - Nuclear Rate Base																		
1	Cyber Security – CSA N290.7 Compliance[5]	82924 83690 83692 83800 TBD	Regulatory	Jul-17	Dec-25	40.7	6.5	N/A	N/A	40.7	12.3	22.0	1.9	4.5	8.0	8.0	5.0	1.0	0.0
	NEW PROJECTS NOT LISTED IN EB-2016-0152																		
	IT - Asset Service Fee																		
2	SAP Payroll Upgrade[6]	TBD	Sustaining	Jan-24	Dec-25	27.0	N/A	N/A	N/A	27.0	0.0	27.0	0.0	0.0	0.0	0.0	0.0	27.0	0.0
	Real Estate - Asset Service Fee																		
3	700U Workplace Transformation	83901	Value Enhancing	Nov-17	Jun-19	20.9	N/A	26.4	N/A	20.9	20.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Clarington Corporate Campus	84640	Value Enhancing	Jan-20	Jun-25	[redacted]	N/A	N/A	N/A	[redacted]									
5	**Subtotal**					[redacted]	6.5	26.4				[redacted]							
6	**Total Projects**					[redacted]	6.5	26.4				[redacted]							

Notes:

1. Projects with expenditures during IR term OR In-Service amounts in Bridge or IR term and Completed/Deferred projects (from EB-2016-0152 or subsequent).
2. Total Project Costs reflect BCS capital amounts (balance to be released) or the actual costs for completed projects, unless otherwise indicated.
3. The designation of "n/a" means the project has not advanced to a First Execution BCS.
4. Life Time to Date (LTD) means in service amounts as of Dec 31, 2019.
5. Satisfaction of the CSA N290.7 cyber security standards is an ongoing compliance program which initially started in 2017 with a smaller scope based on initial forecast that has evolved to comprise of multiple, distinct projects to address discrete requirements as and when issued. Total Project Costs are a combination of actual costs for completed elements of the program and estimated amounts in anticipation of future requirements to be released. The expansion of project scope is reflected in the change in Total Project Cost from EB-2016-0152. Projects 82924, 83690, 83692 and 83800 have 1st Execution BCS amounts of $3.7M, $7.63M, $5.24M and $2.89, respectively.
6. An upgrade of the SAP payroll system that will be required during the IR term with vendor support of key modules set to expire.
   Total Project Costs represent the current estimated amount to undertake the upgrade; the final cost will be refected in a BCS upon commencement of detailed work.

Numbers may not add due to rounding.

Table 1b
Capital Project Listing - Support Services
(Capital Projects Impacting Nuclear Rate Base or IR Term Asset Service Fee)
Projects ≥ $20M Total Project Cost[1]

Line No.	Project Name	Project Summary Ref. No.	2016 Actual	2017 Actual	2018 Actual	2019 Actual	2020 Plan	2021 Plan	2022 Plan	2023 Plan	2024 Plan	2025 Plan	2026 Plan
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)
	ONGOING PROJECTS FROM EB-2016-0152												
	IT - Nuclear Rate Base												
1	Cyber Security – CSA N290.7 Compliance[5]	82924 83690 83692 83800 TBD	0 0	2.4	5 2	4 8	1.5	4.5	8.0	8.0	5 0	1.0	0 0
	NEW PROJECTS NOT LISTED IN EB-2016-0152												
	IT - Asset Service Fee												
2	SAP Payroll Upgrade[6]	TBD	0 0	0 0	0 0	0 0	0.0	0.0	0.0	0.0	22 0	5.0	0 0
	Real Estate - Asset Service Fee												
3	700U Workplace Transformation	83901	0 0	0 0	3 2	17.7	0.0	0.0	0.0	0.0	0 0	0.0	0 0
4	Clarington Corporate Campus	84640	0 0	0 0	0 0	0 0							
5	**Subtotal**		0 0	2.4	8 5	22 5							
6	**Total Projects**		0 0	2.4	8 5	22 5							

Notes:

1 Projects with expenditures during R term OR In-Service amounts in Bridge or R term and Completed/Deferred projects (from EB-2016-0152 or subsequent).

2 Total Project Costs reflect BCS capital amounts (balance to be released) or the actual costs for completed projects, unless otherwise indicated.

3 The designation of "n/a" means the project has not advanced to a First Execution BCS.

4 Life Time to Date (LTD) means in service amounts as of Dec 31, 2019.

5 Satisfaction of the CSA N290.7 cyber security standards is an ongoing compliance program which initially started in 2017 with a smaller scope based on initial forecast that has evolved to comprise of multiple, distinct projects to address discrete requirements as and when issued. Total Project Costs are a combination of actual costs for completed elements of the program and estimated amounts in anticipation of future requirements to be released. The expansion of project scope is reflected in the change in Total Project Cost from EB-2016-0152. Projects 82924, 83690, 83692 and 83800 have 1st Execution BCS amounts of $3.7M, $7.63M, $5.24M and $2.89, respectively.

6 An upgrade of the SAP payroll system that will be required during the IR term with vendor support of key modules set to expire. Total Project Costs represent the current estimated amount to undertake the upgrade; the final cost will be refected in a BCS upon commencement of detailed work.

Numbers may not add due to rounding.

Table 2a
Capital Project Listing - Support Services
(Capital Projects Impacting Nuclear Rate Base or IR Term Asset Service Fee)
Projects $5M - $20M Total Project Cost[1]

Line No.	Project Name	Category	Project Description	Start Date	Final In-Service Date	Total Project Cost[2] ($M)	In-Service IR Term ($M)	In-Service 2020 ($M)	In-Service 2021 ($M)	In-Service 2022 ($M)	In-Service 2023 ($M)	In-Service 2024 ($M)	In-Service 2025 ($M)	In-Service 2026 ($M)
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)
	COMPLETED/DEFERRED PROJECTS FROM EB-2016-0152													
	IT - Asset Service Fee													
1	MS Windows Server Upgrade	Sustaining	To upgrade Microsoft Windows Server infrastructure that support OPG's applications and services due to the end of the support lifecycle for the current infrastructure.	Jul-15	Sep-17	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Mainframe Purchase	Sustaining	The business objective for this project is for OPG to obtain ownership of mainframe assets, which were near the end of their economic life, to gain operational efficiencies.	Dec-15	Dec-17	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	Storage Purchase	Sustaining	The business objective for this project is for OPG to obtain ownership of storage equipment to gain operational efficiencies.	Dec-15	Dec-17	6.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	**Subtotal**					19.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	IT - Nuclear Rate Base													
5	Security and Emergency Services (SES) P25 Interoperability Radio System (SIRS)[3]	Regulatory	Provide OPG's Nuclear Security and Operations staff with wireless communications as the current IDEN radio system used by Nuclear Operations will be no longer supported by the service provider by the end of 2015.	Dec-16	Dec-20	10.1	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0
6	**Subtotal**					10.1	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0
	Real Estate - Nuclear Rate Base													
7	Darlington Nuclear Generating Station Site Park Road & Holt Road Bridge Repair & Rehabilitation	Sustaining	Conduct repairs at the Holt Road and Park Road bridges at the Darlington Nuclear Generating Station Site.	Jan-16	Dec-18	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	**Subtotal**					7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ONGOING PROJECTS FROM EB-2016-0152													
	IT - Asset Service Fee													
9	Asset Suite Upgrade[4]	Sustaining	To upgrade the Asset Suite application system used to support work management processes including materials management, plant maintenance, and project system across OPG.	Jul-20	Dec-22	15.0	1.0	0.0	14.0	1.0	0.0	0.0	0.0	0.0
10	Tempus Lifecycle Upgrade	Sustaining	The business objective for this project is to upgrade the Tempus time reporting system at the end of its lifecycle.	Dec-17	Dec-20	17.8	0.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0
11	Energy Market Application Refresh Program	Regulatory	The objective of the project is to review the application suite within Commercial Operations ensuring critical applications can be sustained effectively and reduce risks to the organization for having dated, unsupported tools.	Jan-20	Dec-23	9.7	9.7	0.0	0.0	0.0	9.7	0.0	0.0	0.0
12	**Subtotal**					32.8	10.7	15.0	14.0	1.0	9.7	0.0	0.0	0.0
13	**Total Projects**					69.6	10.7	16.6	14.0	1.0	9.7	0.0	0.0	0.0

Notes:
1 Projects with expenditures during IR term OR In-Service amounts in Bridge or IR term AND Completed/Deferred projects (from EB-2016-0152 or subsequent).
2 Total Project Costs reflect BCS capital amounts (balance to be released) or the actual costs for completed projects, unless otherwise indicated.
3 Project was formerly named Radio Communication Program in EB-2016-0152, Ex. D3-1-2 Table 2, line 14.
4 Detailed scope requirements for this Asset Suite upgrade to avoid technical obsolescence are in the midst of being developed.
Total Project Costs represent the current estimated amount to undertake the upgrade; the final cost will be refected in a BCS upon commencement of detailed work.

Numbers may not add due to rounding.

Table 2b
Capital Project Listing - Support Services
(Capital Projects Impacting Nuclear Rate Base or IR Term Asset Service Fee)
Projects $5M - $20M Total Project Cost[1]

Line No.	Project Name	Category	Project Description	Start Date	Final In-Service Date	Total Project Cost[2] ($M)	In-Service IR Term ($M)	In-Service 2020 ($M)	In-Service 2021 ($M)	In-Service 2022 ($M)	In-Service 2023 ($M)	In-Service 2024 ($M)	In-Service 2025 ($M)	In-Service 2026 ($M)
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)
	NEW PROJECTS NOT IN EB-2016-0152													
	IT - Asset Service Fee													
14	Documentum Implementation	Sustaining	Curator/CorDoc systems has reached end of life and the vendor no longer supports this application. As part of IT strategy to consolidate and leverage existing systems, documentum has been chosen as a replacement system.	Sep-16	Dec-19	9.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	SAP ECC 6.0 Upgrade	Sustaining	Existing SAP 4.7 will no longer be supported by vendor in areas of Finance, HR, Payroll and Real Estate unless OPG upgrades to 6.0 version. An upgrade will also ensure security vulnerabilities due to older version no longer exist.	Nov-15	Dec-18	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	Microsoft Sharepoint Upgrade	Sustaining	Current Microsoft Sharepoint 2007 is being upgraded due to end of life. This will reduce on site servers, storage, and ongoing support resource requirement.	Sep-16	Apr-19	6.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	Wireless Improvement Program	Sustaining	This project will deploy a company wide Wi-Fi network to office spaces across OPG occupied buidings/sites.	Jan-17	Dec-20	9.2	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
18	Network Segmentation - Campus Switch Replacement Project	Sustaining	This project will be replacing obsolete Network Hardware. It will also improve performance while meeting mobile workforce requirements, and meet wireless needs.	Feb-17	Jun-23	14.9	2.5	1.4	1.3	2.0	0.5	0.0	0.0	0.0
19	Windows 10 Project (Windows 7 Lifecycle Upgrade)	Sustaining	This project is to mitigate the risk of running on an outdated operating system and ensure safe day to day operation.	Aug-17	Dec-19	9.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	OPG Telephone Upgrade	Sustaining	The objective of the project is to install an "address free" office environment at 700 University.	Nov-17	May-19	6.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	Reimagine Program	Value Enhancing	This project uses an automation first approach to identifying opportunities that drive process efficiencies, effectiveness, and enhanced controls, with opportunities for savings to achieve the 2020 Business Plan in the short to mid-range timeframe across Shared Services, Finance and Supply Chain.	Mar-19	Apr-20	15.0	0.0	17.5	0.0	0.0	0.0	0.0	0.0	0.0
22	Reimagine Program 2.0[3]	Value Enhancing	This Program aims to improve cost and quality across corporate functions, establish an end state that requires fewer staff delivering better service with ease and enables better access, timely fulfillment and less follow-up.	Jun-20	Jun-22	14.0	2.0	0.0	12.0	2.0	0.0	0.0	0.0	0.0
23	Monitoring and Diagnostic Sensor Network	Value Enhancing	This project provides the infrastructure capable of interacting with sensors, gateways, and Data Acquisition & Analysis System (DAAS) securely and efficiently delivering operational information to the data repository.	Jan-17	Dec-21	5.2	0.0	0.6	1.0	0.0	0.0	0.0	0.0	0.0
24	Enterprise Asset Management (EAM) Tool	Sustaining	The EAM tool enables an integrated, strategic and systematic approach to manage assets with the intent to maximize asset value within constraints.	Jan-17	Dec-21	8.9	0.0	0.9	1.2	0.0	0.0	0.0	0.0	0.0
25	2022 TIMS II Upgrade[4]	Sustaining	Training Information Management system (TIMS) II Upgrade project upgrades the existing TIMS used at OPG. TIMS is the system of record for OPG nuclear training records; which includes managing employee credits, qualifications, and scheduled training events (classroom courses).	Jan-23	Dec-23	6.0	6.0	0.0	0.0	0.0	6.0	0.0	0.0	0.0
26	Audio Visual Conferencing Room Refresh[4]	Sustaining	Audio Visual Conferencing Room Refresh project upgrades the Avaya Aura conferencing equipment, the Scopia Bridge, Polycom video end points and Plantronics video conferencing equipment throughout OPG facilities that will be at end of life with the then-current teleconference equipment.	Jan-23	Dec-25	7.5	7.5	0.0	0.0	0.0	0.0	0.0	7.5	0.0
27	Documentum Lifecycle Upgrade[4]	Sustaining	Documentum Lifecycle project upgrades OPG's existing enterprise content management system, Documentum. The new release will provide enhanced performance and security, improved user experience and extended capability.	Jan-23	Dec-24	8.0	8.0	0.0	0.0	0.0	0.0	8.0	0.0	0.0
28	HR System Replacement[4]	Sustaining	Human Resources System Replacement project deploys an integrated suite of human capital management web-based applications supporting OPG's HR system of record including Talent Management, Workforce Analytics and Succession planning. This project will enable digitization of our records and enable better management of OPG's human capital.	Jan-22	Dec-23	13.0	13.0	0.0	0.0	0.0	13.0	0.0	0.0	0.0
29	**Subtotal**					139.9	39.0	21.4	15.5	4.0	19.5	8.0	7.5	0.0

Notes:
1 Projects with expenditures during IR term OR In-Service amounts in Bridge or IR term AND Completed/Deferred projects (from EB-2016-0152 or subsequent).
2 Total Project Costs reflect BCS capital amounts (balance to be released) or the actual costs for completed projects, unless otherwise indicated.
3 Detailed scope requirements for this project are being developed; Total Project Costs represent the current estimated amount to implement enhancements.
The final cost will be refected in a BCS upon commencement of detailed work.
4 This represents a project the organization is planning to undertake during the IR term to avoid technical obsolescence, ensure continued vendor support and enhance user experience.
Total Project Costs reflect the current estimated amount to implement this project; the final cost will be reflected in a BCS upon commencement of detailed work.

Numbers may not add due to rounding.

Table 2c
Capital Project Listing - Support Services
(Capital Projects Impacting Nuclear Rate Base or IR Term Asset Service Fee)
Projects $5M - $20M Total Project Cost[1]

Line No.	Project Name	Category	Project Description	Start Date	Final In-Service Date	Total Project Cost[2] ($M)	In-Service IR Term ($M)	In-Service 2020 ($M)	In-Service 2021 ($M)	In-Service 2022 ($M)	In-Service 2023 ($M)	In-Service 2024 ($M)	In-Service 2025 ($M)	In-Service 2026 ($M)
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)
	NEW PROJECTS NOT IN EB-2016-0152 continued													
	IT - Nuclear Rate Base													
30	Nuclear Integrated Digital Enhanced Network (IDEN)	Regulatory	Upgrade 'end of life' system with Nuclear Integrated Digital Enhanced Network (IDEN), which is a new technology. DEN is used by Nuclear plants for the day to day plant operation communications as well as security and emergency communications within the plant, and externally with Durham police and firefighters.	Jan-15	Dec-18	11.4	0 0	0.0	0.0	0 0	0.0	0.0	0 0	0.0
31	Nuclear Fleet Management Initiative - Pickering Wi-Fi - Power House Unit 1-8	Sustaining	Establishment of wireless network infrastructures will provide up to date technology to improve efficiency, quality and timeliness completion of work flows for the work control process by field staff. Wi Fi will facilitate the ability for field staff, direct access to data and applications required to perform work in the field.	Jan-18	Dec-23	18.3	0 0	9.8	0.0	0 0	0.0	0.0	0 0	0.0
32	Darlington Wireless Program	Sustaining	Establishment of wireless network infrastructures will provide up to date technology to improve efficiency, quality and timeliness completion of work flows for the work control process by field staff. Wi Fi will facilitate the ability for field staff, direct access to data and applications required to perform work in the field.	Jan-19	Dec-21	6.4	0 0	2.9	3.5	0 0	0.0	0.0	0 0	0.0
33	OPG Telecom Upgrade (PBX equipment)[3]	Sustaining	OPG Telecom project upgrades the Avaya Private Branch Exchange (PBX) equipment supporting the Darlington Energy Complex and includes voice loggers used by physical plant security.	Jan-23	Dec-25	7 5	7 5	0.0	0.0	0 0	0.0	0.0	7 5	0.0
34	**Subtotal**					43.6	7 5	12.7	3.5	0 0	0.0	0.0	7 5	0.0

Notes:
1 Projects with expenditures during IR term OR In-Service amounts in Bridge or R term AND Completed/Deferred projects (from EB-2016-0152 or subsequent).
2 Total Project Costs reflect BCS capital amounts (balance to be released) or the actual costs for completed projects, unless otherwise indicated.
3 This represents a project the organization is planning to undertake during the IR term to avoid technical obsolescence, ensure continued vendor support and enhance user experience.
Total Project Costs reflect the current estimated amount to implement this project; the final cost will be reflected in a BCS upon commencement of detailed work.

Numbers may not add due to rounding.

Table 2d
Capital Project Listing - Support Services
(Capital Projects Impacting Nuclear Rate Base or R Term Asset Service Fee)
Projects $5M - $20M Total Project Cost[1]

Line No.	Project Name	Category	Project Description	Start Date	Final In-Service Date	Total Project Cost[2] ($M)	In-Service IR Term ($M)	In-Service 2020 ($M)	In-Service 2021 ($M)	In-Service 2022 ($M)	In-Service 2023 ($M)	In-Service 2024 ($M)	In-Service 2025 ($M)	In-Service 2026 ($M)
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)
	NEW PROJECTS NOT IN EB-2016-0152 continued													
	Real Estate - Nuclear Rate Base													
35	Ground Maintenance Complex	Sustaining	Engineering, procurement, and construction of 2 steel buildings for storing salt, transport work equipment, snow removal equipment and ground maintenance machinery at Darlington.	Jun-18	Mar-20	8.6	0 0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
36	Darlington HVAC Systems R22 Replacement	Sustaining	Conduct upgrades to the antiquated HVAC system	Jan-20	Dec-22	9.0	2 5	3.5	3.0	2.5	0.0	0.0	0.0	0.0
37	Update of Darlington Engineering Support Services Building Floor 2[3]	Sustaining	Modernize the 2nd floor of the 20-year old Engineering Support Services Building to replace furniture and fixtures at end of life, revamp the outdated design to create an open office and comply with the AODA	Sep-21	Dec-22	10.1	10.1	0.0	0.0	10.1	0.0	0.0	0.0	0.0
38	Overhaul of the Darlington Energy Complex 2nd Floor[3]	Sustaining	Reconfigure the floor to construct agile workspaces and remove obsolete equipment to increase accessibility and usage, while aligning with the new corporate head office in forming the part of the Clarington Corporate Campus	Sep-21	Dec-25	10.2	10 2	0.0	0.0	0.0	0.0	0.0	10.2	0.0
39	Update Darlington Engineering Support Services Building Floor[3]	Sustaining	Modernize the 3rd floor of the 20-year old Engineering Support Services Building to replace furniture and fixtures at end of life, reconfigure outdated design to create an open office and comply with the AODA	Sep-20	Dec-21	10.4	0 0	0.0	10.4	0.0	0.0	0.0	0.0	0.0
40	Upgrade of the Pickering Administration Building Workplace Transformation[3]	Sustaining	Refurbish the Pickering Administration Building - located in the protected area of station premises - to accommodate personnel critical to safe storage currently located in buildings to be demolished at station end of life	Jan-21	Dec-22	8.0	8 0	0.0	0.0	8.0	0.0	0.0	0.0	0.0
41	Overhaul of the Darlington Energy Centre 3rd Floor[3]	Sustaining	Reconfigure the floor to construct agile workspaces and remove obsolete equipment to increase accessibility and usage, while aligning with the new corporate head office in forming the part of the Clarington Corporate Campus	Jan-24	Dec-25	7.3	7 3	0.0	0.0	0.0	0.0	0.0	7.3	0.0
42	**Subtotal**					63.7	38 2	4.0	13.4	20.6	0.0	0.0	17.5	0.0
43	**Total Projects**					316.7	95.4	54.7	46.4	25.6	29.2	8.0	32.5	0.0

Notes:
1 Projects with expenditures during IR term OR In-Service amounts in Bridge or IR term AND Completed/Deferred projects (from EB-2016-0152 or subsequent).
2 Total Project Costs reflect BCS capital amounts (balance to be released) or the actual costs for completed projects, unless otherwise indicated.
3 Detailed scope requirements for this project are being developed; Total Project Costs represent the current estimated amount to implement the upgrades in future years.

Numbers may not add due to rounding.

Table 3
Capital Project Listing - Support Services
(Capital Projects Impacting Nuclear Rate Base or IR Term Asset Service Fee)
Projects < $5M Total Project Cost[1]

Line No.	Project Description	Number of Projects	Total Project Cost ($M)	Average Cost Of All Projects ($M)	In-Service IR Term ($M)	In-Service 2020 ($M)	In-Service 2021 ($M)	In-Service 2022 ($M)	In-Service 2023 ($M)	In-Service 2024 ($M)	In-Service 2025 ($M)	In-Service 2026 ($M)
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
1	**IT - Nuclear Rate Base**	48	51.1	1.1	35.2	13.0	2.9	21.0	8.3	3.5	2.4	0.0
2	**IT - Asset Service Fee**	98	109.4	1.1	83.1	18.0	8.3	27.5	23.4	15.8	11.2	5.2
3	**Real Estate - Nuclear Rate Base**	43	42.2	1.0	22.6	10.6	8.9	10.7	3.2	2.5	2.4	4.0
4	**Real Estate - Asset Service Fee**	14	10.5	0.7	4.0	5.2	1.3	1.0	1.0	1.0	1.0	0.0
5	**Total**	203	213.1	1.0	144.9	46.8	21.4	60.1	35.9	22.7	17.0	9.2

Notes:
1 Projects with expenditures during IR term OR In-Service Amounts in Bridge or IR term.

Numbers may not add due to rounding.

Table 4
Capital-Support Services Listing - Support Services
(Capital In-Service Impacting Nuclear Rate Base or IR Term Asset Service Fee)
In-Service Summary - All Capital

Line No.	Capital In-Service Description	Reference	In-Service 2020 ($M)	In-Service 2021 ($M)	In-Service 2022 ($M)	In-Service 2023 ($M)	In-Service 2024 ($M)	In-Service 2025 ($M)	In-Service 2026 ($M)
			(a)	(b)	(c)	(d)	(e)	(f)	(g)
	In-Service								
	Projects ≥ $20 M - Rate Base								
1	**IT**	D3-1-2 Table 1	1.9	4.5	8.0	8.0	5.0	1.0	0.0
2	**Real Estate**	D3-1-2 Table 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Projects ≥ $20 M - Asset Service Fee								
3	**IT**	D3-1-2 Table 1	0.0	0.0	0.0	0.0	0.0	27.0	0.0
4	**Real Estate**	D3-1-2 Table 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	**Clarington Corporate Campus - RE Asset Service Fee**		0.0	0.0	0.0	0.0	[redacted]		
	Projects $5M - $20M - Rate Base								
6	**IT**	D3-1-2 Table 2a/c	14.3	3.5	0.0	0.0	0.0	7.5	0.0
7	**Real Estate**	D3-1-2 Table 2a/d	4.0	13.4	20.6	0.0	0.0	17.5	0.0
	Projects $5M - $20M - Asset Service Fee								
8	**IT**	D3-1-2 Table 2a/b	36.4	29.5	5.0	29.2	8.0	7.5	0.0
	Projects < $5M - Rate Base								
9	**IT**	D3-1-2 Table 3	13.0	2.9	21.0	8.3	3.5	2.4	0.0
10	**Real Estate**	D3-1-2 Table 3	10.6	8.9	10.7	3.2	2.5	2.4	4.0
	Projects < $5M - Asset Service Fee								
11	**IT**	D3-1-2 Table 3	18.0	8.3	27.5	23.4	15.8	11.2	5.2
12	**Real Estate**	D3-1-2 Table 3	5.2	1.3	1.0	1.0	1.0	1.0	0.0
13	**Unallocated IT - Rate Base**			25.5	8.0	18.6	23.5	17.0	26.9
14	**Unallocated IT - Asset Service Fee**			18.5	6.6	(11.0)	16.1	0.2	41.7
	Non-Project Related In-Service List								
15	**Microsoft Enterprise Agreement - IT Asset Service Fee**		22.9	0.0	0.0	23.0	0.0	0.0	23.0
16	**Minor Fixed Assets**		5.7	3.5	3.2	3.2	3.2	3.2	3.2
17	**Total In-Service Amounts**		132.0	119.8	111.6	106.8	[redacted]		

Numbers may not add due to rounding.

Table 5a

Comparison of In-Service Capital Additions - Support Services ($M) 2016-2021

Line No.	Business Unit	2016 Budget	(c)-(a) Change	2016 Actual	(g)-(c) Change	2017 OEB Approved[1]	(g)-(e) Change	2017 Actual	(k)-(g) Change	2018 OEB Approved[1]	(k)-(i) Change	2018 Actual
		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
1	**IT - Nuclear Rate Base**	3.3	0.0	3.3	4.7	5.8	2.2	8.0	10.3	12.7	5.6	18.3
2	**IT - Asset Service Fee**	41.0	(12.9)	28.1	(5.0)	7.1	16.0	23.1	13.2	11.7	24.6	36.3
3	**Real Estate - Nuclear Rate Base**	5.6	0.0	5.6	(5.7)	24.0	(24.0)	0.0	15.0	4.7	10.3	15.0
4	**Real Estate - Asset Service Fee**	7.2	(0.6)	6.6	(1.0)	2.0	3.6	5.6	(0.7)	3.0	1.9	4.9
5	**Clarington Corporate Campus**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	**Microsoft Enterprise Agreement**	0.0	0.0	0.0	23.6	0.0	23.6	23.6	(23.6)	0.0	0.0	0.0
7	**Minor Fixed Assets**	1.2	1.2	2.4	(2.3)	1.2	(1.1)	0.1	1.0	1.2	(0.1)	1.1
8	**Total Support Services**	58.3	(12.3)	46.0	14.3	40.1	20.3	60.4	15.2	33.3	42.3	75.6

Line No.	Business Unit	2018 Actual	(e)-(a) Change	2019 OEB Approved[1]	(e)-(c) Change	2019 Actual	(i)-(e) Change	2020 OEB Approved[1]	(i)-(g) Change	2020 Budget	(k)-(i) Change	2021 Budget
		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
9	**IT - Nuclear Rate Base**	18.3	(1.9)	0.0	16.3	16.3	12.8	3.7	25.5	29.2	7.3	36.4
10	**IT - Asset Service Fee**	36.3	0.3	17.0	19.7	36.7	17.8	17.0	37.4	54.4	1.9	56.3
11	**Real Estate - Nuclear Rate Base**	15.0	10.8	7.7	18.0	25.7	(11.1)	1.0	13.6	14.6	7.7	22.3
12	**Real Estate - Asset Service Fee**	4.9	20.1	3.0	22.0	25.0	(19.8)	3.0	2.2	5.2	(3.9)	1.3
13	**Clarington Corporate Campus**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	**Microsoft Enterprise Agreement**	0.0	0.0	0.0	0.0	0.0	22.9	0.0	22.9	22.9	(22.9)	0.0
15	**Minor Fixed Assets**	1.1	1.7	1.2	1.6	2.8	2.9	1.2	4.5	5.7	(2.3)	3.5
16	**Total Support Services**	75.6	30.9	28.9	77.6	106.5	25.5	25.9	106.1	132.0	(12.2)	119.8

Notes:

1 Per EB-2016-0152, D3-1-2 Table 5 except for IT and Real Estate rate base values which are allocations of Support Services values shown on EB-2016-0152 J21.1 Att 2, Table 1

Numbers may not add due to rounding.

Table 5b

Comparison of In-Service Capital Additions - Support Services ($M) 2021-2026

Line No.	Business Unit	2021 OEB Approved[1]	(c)-(a) Change	2021 Budget	(e)-(c) Change	2022 Plan	(g)-(e) Change	2023 Plan	(i)-(g) Change	2024 Plan	(k)-(i) Change	2025 Plan
		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
17	**IT - Rate Base**	2.2	34.2	36.4	0.5	36.9	(2.1)	34.8	(2.9)	31.9	(4.0)	27.9
18	**IT - Asset Service Fee**	17.0	39.3	56.3	(17.2)	39.1	2.5	41.6	(1.7)	39.9	6.0	45.9
19	**Real Estate - Rate Base**	1.0	21.3	22.3	9.0	31.3	(28.2)	3.2	(0.7)	2.5	17.4	19.9
20	**Real Estate - Asset Service Fee**	3.0	(1.7)	1.3	(0.3)	1.0	0.0	1.0	0.0	1.0	0.0	1.0
21	**Clarington Corporate Campus**	0.0	0.0	0.0	0.0	0.0	0.0	[redacted]				
22	**Microsoft Enterprise Agreement**	0.0	0.0	0.0	0.0	0.0	23.0	23.0	(23.0)	0.0	0.0	0.0
23	**Minor Fixed Assets**	1.2	2.3	3.5	(0.3)	3.2	0.0	3.2	0.0	3.2	0.0	3.2
24	**Total Support Services**	24.4	95.4	119.8	(8.2)	111.6	(4.8)	[redacted]				

Line No.	Business Unit	2025 Plan	(c)-(a) Change	2026 Plan
		(a)	(b)	(c)
25	**IT - Rate Base**	27.9	(1.0)	26.9
26	**IT - Asset Service Fee**	45.9	1.0	46.9
27	**Real Estate - Rate Base**	19.9	(15.9)	4.0
28	**Real Estate - Asset Service Fee**	1.0	(1.0)	0.0
29	**Clarington Corporate Campus**	[redacted]		
30	**Microsoft Enterprise Agreement**	0.0	23.0	23.0
31	**Minor Fixed Assets**	3.2	0.0	3.2
32	**Total Support Services**	[redacted]		

Notes:

1 Per EB-2016-0152, D3-1-2 Table 5 except for IT and Real Estate rate base values which are allocations of Support Services values shown on EB-2016-0152 J21.1 Att 2, Table 1

Table 6
Capital Projects - Support Services
(Capital Projects Impacting Nuclear Rate Base or IR Term Asset Service Fee)
Listing of Business Case Summaries Filed

Line No.	Project Number	Business Case Summary (BCS) Title	BCS Approval Date	Project Stage	BCS Status	BCS Status in EB-2016-0152
	(a)	(b)	(c)	(d)	(e)	(f)
1	83901	700U Workplace Transformation	Nov-17	Completed	Final	N/A
2	84640	Clarington Corporate Campus	Jan-20	Planned	Planning	N/A

Table 7
Capital Projects - Support Services
(Capital Projects Impacting Nuclear Rate Base or IR Term Asset Service Fee)
Status of Projects $5M and Greater with 2017-2021 In-Service Dates in EB-2016-0152

Line No.	Project Number	Project Name	In-Service Date at Time of EB-2016-0152 Application	Project Stage at Time of EB-2016-0152 Application	Current Project Status	
					Project Status	Projected/Actual In-Service Date
	(a)	(b)	(c)	(d)	(e)	(f)
1	84975	Asset Suite Upgrade	Dec-21	Planning	Ongoing	Dec-22
2	82161	MS Windows Server Upgrade	Dec-16	Planning	Completed	Sep-17
3	80176	OPG Cyber Security Program [2]	Dec-21	Planning	Completed	Nov-17
4	83045	Mainframe Purchase	Dec-16	Planning	Completed	Dec-17
5	83034	Storage Purchase	Dec-16	Planning	Completed	Dec-17
6	82856	Tempus Lifecycle Upgrade	Dec-19	Planning	Closeout	Dec-20
7	82924, 83690, 83692, 83800	Cyber Security - CSA N290.7 Compliance	Dec-21	Planning	Closeout	Dec-20
8	83382	SES P25 Interoperability Radio System (SIRS)[1]	Dec-16	Planning	Completed	Dec-20
9	82967	Darlington Nuclear Generating Station Site Park Road & Holt Road Bridge Repair & Rehabilitation	Dec-17	Planning	Completed	Dec-18
10	84772	Energy Market Application Refresh Program	Dec-21	Planning	Ongoing	Dec-23

Notes:
1 Project was formerly named Radio Communication Program in EB-2016-0152, Ex. D3-1-2 Table 2, line 14.
2 Project not included in D3-1-2 Table 1, 2 or 3 as total project cost was less than $5M